1993 Integrated Resource Planning Report

SP10111

South Carolina Public Service Authority

June, 1993

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1. INTRODUCTION

The South Carolina Public Service Authority (Santee Cooper) is a body corporate and politic of the State of South Carolina. Santee Cooper's Board of Directors consisting of eleven members is appointed by the Governor of the State with the advice and consent of the South Carolina State Senate. Santee Cooper operates an integrated electric utility system, including facilities for generation, transmission, and distribution of electric power and energy at retail and wholesale.

Santee Cooper currently sells retail electric power and energy to three military installations, 29 large industrial customers, and approximately 94,000 residential, commercial, and small industrial customers in parts of Berkeley, Georgetown, and Horry Counties. Santee Cooper sells wholesale power to Central Electric Power Cooperative, Inc. (Central) and to two municipal electric systems, the City of Georgetown and the Town of Bamberg. Central is an association of 15 electric distribution cooperatives located in 35 of the 46 counties serving residential, commercial, and industrial customers. Through these wholesale customers, approximately 405,000 additional consumers are served.

Santee Cooper's peak demand in 1992 was 2,620 Megawatts (MW). Sales of electricity to territorial customers during the twelve months ending December 31, 1992 were 14,033 Gigawatt-hours (GWh). The aggregate summer peak dependable capacity of Santee Cooper's various generating resources currently is 3,079 MW. This includes a 215 MW purchase from the Southeastern Power Administration (SEPA) and 84 MW of capacity made available to Santee Cooper from the St. Stephen Hydro Station owned by the U. S. Army Corps of Engineers.

Santee Cooper is directly interconnected with South Carolina Electric & Gas Company (SCE&G) at six locations, with Carolina Power & Light Company (CP&L) at five locations, and with the Southern Company (Southern) at one location. Santee Cooper is also interconnected with SCE&G, Duke Power Company (Duke), Southern, and SEPA through a five-way interconnection at SEPA's J. Strom Thurmond Hydroelectric Project and with Southern and SEPA through a three-way interconnection at SEPA's R. B. Russell Hydroelectric Project. Through these interconnections, Santee Cooper's system is interconnected with the regional transmission system serving the southeastern area of the United States.

Santee Cooper is a member of the Virginia-Carolinas Subregion of the Southeastern Electric Reliability Council (VACAR and SERC, respectively) which are organizations of interconnected utilities that exist for the purpose of safeguarding the reliability of electric service of the members and the interconnected system. Other members of VACAR are SCE&G, CP&L, Duke, SEPA, Yadkin, Inc., Virginia Power, and Nantahala Power & Light Company.

2. EXECUTIVE SUMMARY

Overview

Santee Cooper's overall power supply objective is to continue to provide electric power and energy needs of its customers with economical, dependable, and reliable service. To satisfy this objective, the System Planning Division of the Engineering and Operations Department, under the direction of the Santee Cooper Corporate Planning Committee, develops and maintains an integrated resource plan.

In creating this integrated resource plan, information was provided by all other Departments and Divisions of Santee Cooper. Corporate Forecasting, Rates and Marketing is responsible for updating forecasts of future customer demand and energy needs, and for demand-side management programs (DSM). Cost benefit analyses of DSM programs are evaluated through joint efforts of System Planning and Corporate Forecasting, Rates and Marketing during the integrated resource planning process. Information related to existing capacity and future capacity options is provided by the Production Department.

This report focuses on the latest efforts to formulate and maintain a least-cost integrated resource plan capable of meeting future customer requirements through 2013. Since integrated resource planning is a dynamic process, this report represents current analysis of an ongoing process. Therefore, as with any planning document addressing long-term considerations, the information contained herein is subject to continuing refinement as necessitated by changing circumstances and the availability of updated information.

The Planning Process

Integrated resource planning practices at Santee Cooper presently involve:

- Preparing a long-range energy and demand forecast.
- Evaluating the energy and demand forecast for two base scenarios, with and without Alumax of South Carolina, Inc. (Alumax), an integrated aluminum company that purchases 304 MW of firm power used by a two-potline primary reduction aluminum plant located near Goose Creek, S. C.:
  1. Alumax leaving the system in April, 2000 by not renewing its power contract with Santee Cooper at the end of the current contract period.
  2. Alumax remaining on the system beyond the current contract period by successive extensions of the current contract.

- Evaluating high- and low-growth sensitivities to the load forecast.
- Integrating into the planning process sulfur dioxide (SO_2) emission constraint requirements as outlined in the Clean Air Act Amendment of 1990.
- Evaluating all cost information related to present capacity and future capacity options.
- Studying potential DSM programs and associated costs and, including all cost-effective programs in the final plan.
- Determining the lowest cost expansion plan which provides for customer requirements in a reliable manner, giving equal consideration to DSM and future capacity options.

Scenario Analysis

Developing a least-cost plan involves simulating and comparing alternative plans to determine the plan which has the lowest annual revenue requirements throughout the planning period, satisfactory reliability, and financial soundness. This was accomplished for this study with the Scenario Construction and Analysis Package (SCAP). The SCAP package is a series of computer programs developed by Santee Cooper System Planning engineers for evaluating alternative resource plans with a high level of detail. The results of the screening process also provide detailed analysis reports of financial and operating information associated with the least-cost plan.

With every possible combination from a given set of input information and load forecast evaluated with a high level of detail, there is a high degree of confidence that the plan selected in the screening process represents the least-cost plan for the given input data. Over 150 million scenarios were produced and evaluated in this study.

Clean Air Act Amendment of 1990

In addition to selecting plans based on revenue requirements, reliability, and financial soundness, the SCAP package was used to address sulfur dioxide (SO_2) constraint considerations associated with the Clean Air Act (CAA) as amended November, 1990. Evaluating and planning for compliance with the CAA as part of the integrated resource planning process allows compliance strategies to be evaluated at a system level. Because of the CAA, the objective of integrated resource planning is no longer finding the least-cost plan, but rather finding the least-cost compliant plan.

In accordance with the CAA, SO_2 emissions will be limited for Santee Cooper starting in the year 2000 since Santee Cooper is a "Phase II Company". Santee Cooper will be allocated approximately 46,000 SO_2 allowances per year through 2009, and approximately 43,000 allowances for each year thereafter, where one allowance permits one ton of SO_2 to be emitted into the atmosphere.

The CAA provides for the trading, purchasing, selling, and donating of allowances. Allowances allocated for specific units can be pooled and addressed on a system level. In addition, unused allowances at the time of year-end accounting can be held in accounts for use in future years.

Each plan generated and evaluated with the SCAP package must demonstrate long-range compliance with the CAA before the plan is accepted for further least-cost analysis. A plan is considered compliant if the annual emissions in any given year do not exceed annual allotments plus any allowances held in accounts from previous years.

Two primary options for achieving compliance were evaluated in the planning process. These options are (1) retrofitting existing units with flue gas desulfurization (FGD) systems, and (2) modifying the economic dispatching of generating units to reduce SO_2 emissions, a process labeled Environmentally Sensitive Economic Dispatching (ESED). ESED modifies the unit commitment table and biases the dispatch toward reduced SO_2 emissions by adding an emission related cost to the fuel cost.

Use of economic dispatch for dealing with environmental issues good as long as it meets the power supply objective of the Company.

Was this forecast used? Approved 5/24/93 and report was filed 6/93

System Peak Load and Energy Forecast

In 1992, Santee Cooper retained Resource Management International, Inc. (RMI) to develop a long-range energy and demand forecast. This forecast was completed in the spring of 1993 and was adopted by Santee Cooper's Board of Directors on May 24, 1993. The base forecast scenario developed by RMI assumes Alumax will not renew its contract in April, 2000. The forecast assumes that there will be no national economic recessions throughout the forecast periods.

Reserve Capacity Requirements

In this study, capacity reserves were set at a minimum of 17 percent of territorial load, resulting in an average capacity reserve of approximately 20 percent.

Future Capacity Options

The four future capacity options considered in the integrated resource planning process were:

1. 80 MW Combustion Turbine Unit
2. 40 MW Heat Recovery Unit (added to CT)
3. 320 MW Coal Unit
4. 560 MW Coal Unit

Previous studies have addressed a variety of capacity options, including new technologies such as wind turbines and fuel cells. The options listed above have emerged as the primary practical options for Santee Cooper at this time.

Purchase Power Options

Power purchases, other than those currently under contract, were not directly addressed in this study. Instead, this study provides the basic cost information necessary to determine the maximum prices that Santee Cooper should pay for purchased power and energy. Prior to committing to future capacity additions, Santee Cooper will issue requests for proposals (RFPs) to sell power to Santee Cooper in lieu of constructing additional capacity. The least-cost alternative having satisfactory reliability and financial soundness will be selected. Independent power producers, appropriate co-generators, and other qualifying facilities will be included in the request for proposal distribution.

Excess Capacity Reserve Sale Options

Sales of capacity reserves were not addressed in this study, other than those already under contract. Sales of future capacity may be possible after the completion of baseload capacity additions, but sales of future capacity were not used in this study since it was considered that the inclusion of such sales for long-range planning purposes would bias study results toward higher average reserve levels.

Demand-Side Management Options

The following eight demand-side management options, initially screened from a total of 30, were considered in the integrated resource planning process:

Residential

Swimming Pool Load Management Program
Geothermal Heat Pump Program
Water Conservation Program
Duct Leakage Program

Commercial

Thermal Storage Program
High Efficiency Space Conditioning Equipment Program
High Efficiency Lighting Program
Standby Generator Program

Results

Results based on the integrated resource planning efforts of this study are listed below. For this study it has been assumed no changes will be made in existing federal or state laws or regulations to reflect, among other things, more stringent environmental requirements and changes in tax laws (such as a carbon tax law). Certain assumptions and study considerations reflect conditions or events assumed to take place at a future

date. To the extent that actual conditions or events differ from those assumed in this study, the results set forth can be expected to change.

- Additional capacity will be needed in 2003 if Alumax leaves the system in April, 2000 (Figure 1).
- Additional capacity will be needed in 2000 if Alumax remains on the system.
- At least eight 80 MW combustion turbine units should be added before baseload capacity is needed after the addition of Cross 1 in 1995.
- The next baseload generation added should be a 560 MW coal-fueled unit in 2011 if Alumax leaves the system in April, 2000. This coincides with the assumed retirement year of the two 85 MW coal-fueled Grainger units.
- The next baseload generation should be a 320 MW coal-fueled unit in 2008, and a 560 MW coal-fueled unit in 2011 if Alumax remains on the system.
- Flue gas desulfurization (FGD) retrofits will not be needed if Alumax leaves the system in April, 2000 (Figure 2). Least-cost compliance with the CAA can be achieved by using Environmentally Sensitive Economic Dispatching (ESED). Allowance purchase and sale decisions should be based on the increased fuel and operating costs associated with reducing SO_2 emissions by using ESED.

- The Winyah 1 unit (270 MW, coal-fueled) should be retrofitted with an FGD system if Alumax remains on the system. The retrofit will be needed in 2000, unless it is deferred by purchasing allowances or by using ESED. Preliminary results of subsequent study efforts indicate ESED could allow a deferral of approximately 2 years. Additional retrofits would not be needed for compliance with the CAA.
- Of the eight demand-side management options considered in the integrated resource planning process, the following seven were found to be cost effective in the near term:

  Residential

  Swimming Pool Load Management Program
  Geothermal Heat Pump Program
  Water Conservation Program
  Duct Leakage Program

  Commercial

  Thermal Storage Program
  High Efficiency Space Conditioning Equipment Program
  High Efficiency Lighting Program

- Of the eight demand-side management options considered in the integrated resource planning process, the following program was not found to be cost effective until combustion turbine capacity is scheduled to be added:

  Commercial

  Standby Generator Program

FIGURE 1 – CAPACITY EXPANSION PLANS

Year	ALUMAX LEAVING IN APRIL, 2000					ALUMAX REMAINING ON SYSTEM				
	FUTURE UNITS				DEMAND	FUTURE UNITS				DEMAND
	CT	CC	C1	C2	(MW)	CT	CC	C1	C2	(MW)
1993	–	–	–	–	2,780	–	–	–	–	2,780
1994	–	–	–	–	2,884	–	–	–	–	2,884
1995	–	–	–	–	2,923	–	–	–	–	2,923
1996	–	–	–	–	2,985	–	–	–	–	2,985
1997	–	–	–	–	3,052	–	–	–	–	3,052
1998	–	–	–	–	3,078	–	–	–	–	3,078
1999	–	–	–	–	3,103	–	–	–	–	3,103
2000	–	–	–	–	2,962	2	–	–	–	3,178
2001	–	–	–	–	2,933	1	–	–	–	3,244
2002	–	–	–	–	3,013	1	–	–	–	3,324
2003	1	–	–	–	3,092	2	–	–	–	3,403
2004	2	–	–	–	3,204	1	–	–	–	3,515
2005	1	–	–	–	3,296	2	–	–	–	3,607
2006	2	–	–	–	3,391	1	–	–	–	3,702
2007	1	–	–	–	3,476	2	–	–	–	3,787
2008	1	–	–	–	3,574	–	–	1	–	3,885
2009	2	–	–	–	3,673	–	–	–	–	3,984
2010	1	–	–	–	3,775	–	–	–	–	4,086
2011	–	–	–	1	3,893	–	–	–	1	4,204
2012	–	–	–	–	3,990	–	–	–	–	4,301
2013	–	–	–	–	4,088	–	–	–	–	4,399
Totals	11	0	0	1		12	0	1	1	
				01.Dc					02.Dc	

CT: 80 MW Combustion Turbine
CC: 120 MW Combined Cycle
C1: 320 MW Coal
C2: 560 MW Coal

FIGURE 2 – CLEAN AIR ACT COMPLIANCE

GENERAL SO2 COMPLIANCE AND ALLOWANCE TRADING STRATEGIES

ALUMAX LEAVING IN APRIL, 2000	ALUMAX REMAINING ON SYSTEM
Compliance can be achieved by Environmentally Sensitive Economic Dispatching (ESED).	Compliance can be achieved by retrofitting Winyah #1 with an FGD system.
Allowance purchase strategies should be based on the fuel and operating costs of using ESED to reduce SO2 emissions.	Allowance purchase strategies should be based on the fuel and operating costs of using ESED to reduce SO2 emissions, in combination with savings incurred by deferring the Winyah #1 FGD retrofit.
Allowance sale strategies should be based on the fuel and operating costs of using ESED to reduce SO2 emissions.	Allowance sale strategies should be based on the fuel and operating costs of using ESED to reduce SO2 emissions.

Recommendations

The following recommendations of actions to be taken by Santee Cooper are based on results of analyses performed during this study:

1. Continue the construction of Cross 1 and place in service as soon as possible (COD May, 1995).

2. Continue investigating the possibility of selling reserve capacity following the completion of Cross 1.

3. Develop site plans for the construction of several combustion turbine unit installations. At least eight combustion turbine units will be needed over an approximately 10-year period beginning 1998-2005.

4. Continue to monitor and evaluate possibilities for buying and selling SO_2 allowances. The buying and selling of allowances could offset costs associated with the CAA compliance strategies outlined in this report.

5. Develop preliminary plans and schedules for retrofitting the Winyah 1 unit with an FGD system and determine the critical decision date for committing to the addition of the system. An FGD system will be needed for Winyah 1 if Alumax remains on the system unless other more cost effective compliance strategies emerge.

6. Continue investigating other methods for achieving compliance with the CAA, including purchasing allowances, using fuel with a lower sulfur content, using Environmentally Sensitive Economic Dispatching, using natural gas at Winyah and other existing coal-fueled facilities, etc. Also investigate cost effective methods for deferring the Winyah 1 FGD system retrofit. Emerging technologies and markets, or other compliance options, may prove to be more cost effective to achieve CAA compliance if Alumax remains on the system.

7. Continue existing DSM programs, and monitor and evaluate the programs to reflect the appropriate costs and incentives. Existing DSM programs were found to be cost effective in this study.

8. Develop a plan to further evaluate and implement the identified and feasible DSM programs. Proposed new DSM programs were found to be cost effective in this study.

9. Continue reviewing and improving integrated resource planning procedures and study methodologies, and continue conducting integrated resource studies and sensitivity analyses based on updated input information and revised study assumptions. Periodically have an integrated resource plan conducted by an outside consulting agency to take advantage of additional sources of data on DSM programs and capacity expansion options.

10. Develop contingency plans to install future capacity to meet the highest growth scenario with the flexibility to defer the additions to meet the lowest growth scenario. The timing of new capacity additions following the completion of Cross 1 varies among the forecast scenarios studied.

3. GENERAL STUDY INFORMATION

- Provide basis for planning process. Very little info concerning methodology employed, input assumptions, etc. Potential accuracy of these forecasts?

3.1 System Peak Load and Energy Forecast

In 1992, Santee Cooper retained Resource Management International, Inc. (RMI) to develop a long-range energy and demand forecast. This forecast was completed in the spring of 1993 and was adopted by Santee Cooper's Board of Directors on May 24, 1993. Load forecasts are essential in facilitating the integrated resource planning process and form the basis on which all production simulation and economic analysis is performed.

The base forecast scenario developed by RMI assumes Alumax of South Carolina, Inc. (Alumax), an integrated aluminum company that purchases 304 MW of firm power used by a two-potline primary reduction aluminum plant located near Goose Creek, S. C., will not renew its power contract with Santee Cooper at the end of the current contract period ending April, 2000. With this exception, the forecast does not seek to project business cycle behavior, and, as such, assumes that there will be no national economic recessions throughout the forecast periods.

In addition to the RMI forecast, System Planning developed and evaluated a second base scenario with Alumax remaining on the system by adding the forecast Alumax demand and energy back into the RMI forecast. In addition, two forecast sensitivities were evaluated: RMI forecast less 1/2 percent per year reduced growth and RMI forecast with Alumax remaining plus 1/2 percent per year additional growth. These sensitivities were evaluated to show the effects of accelerated or suppressed economic growth relative to Santee Cooper's resource plan based upon the officially adopted load forecast. Peak system demands for each load level are shown in Figure 3 and system energies are shown in Figure 4. All four load levels were utilized as input to the integrated resource planning process and least-cost plans were developed for each.

FORECAST DEMAND (MW)

	Alumax leaves		Alumax remains	
Year	less 0.5%	base	base	plus 0.5%
1993	2780	2780	2780	2780
1994	2872	2886	2886	2900
1995	2899	2928	2928	2957
1996	2950	2995	2995	3040
1997	3005	3066	3066	3128
1998	3020	3097	3097	3175
1999	3034	3127	3127	3222
2000	2866	2968	3203	3317
2001	2851	2968	3279	3412
2002	2920	3055	3366	3521
2003	2989	3143	3454	3631
2004	3086	3261	3572	3773
2005	3159	3355	3666	3892
2006	3238	3456	3767	4019
2007	3314	3555	3866	4146
2008	3394	3659	3970	4278
2009	3473	3763	4074	4412
2010	3555	3871	4182	4552
2011	3640	3984	4295	4698
2012	3726	4098	4409	4847
2013	3812	4212	4523	4996

Figure 3

FORECAST ENERGY (MWh)

	Alumax leaves		Alumax remains	
Year	less 0.5%	base	base	plus 0.5%
1993	14990484	14990484	14990484	14990484
1994	15168823	15245055	15245055	15321276
1995	15222446	15375825	15375825	15529964
1996	15409103	15642577	15642577	15878379
1997	15703643	16021688	16021688	16344524
1998	15910293	16314095	16314095	16726028
1999	16129575	16622051	16622051	17126966
2000	14366437	14879478	16915316	17516281
2001	13937182	14507431	17214014	17914716
2002	14211168	14866962	17573545	18380322
2003	14489267	15234064	17940647	18858088
2004	14965410	15813755	18520338	19564761
2005	15254417	16200147	18906730	20072815
2006	15548888	16595852	19302435	20595368
2007	15848994	17001169	19707752	21132973
2008	16155781	17417350	20123933	21687146
2009	16468965	17844209	20550792	22257896
2010	16789395	18282812	20989395	22846590
2011	17118873	18735275	21441858	23455788
2012	17456632	19200930	21907513	24084999
2013	17794391	19666585	22373168	24714210

Figure 4

3.2 Existing System Capacity

The existing generation system consists of four coal-fueled generating stations, one-third ownership of the V. C. Summer Nuclear Generating Station jointly owned with SCE&G, one oil-fueled generating station, three hydro stations, and two combustion turbine generating stations. The remaining capacity consists of purchases from the Southeastern Power Administration (SEPA) and capacity made available to Santee Cooper from the St. Stephen Hydro Station owned by the U. S. Army Corps of Engineers. Existing system capacity is summarized in Figure 5.

Santee Cooper generates electricity using a mixture of coal, nuclear, oil/gas, and hydro capacity. Presently, the generation system is predominately coal-fueled capacity as shown in Figure 6.

EXISTING SYSTEM CAPACITY

Unit	Location	Fuel Type	Total Capacity (MW) Summer	Winter
Jefferies Steam 1,2	Moncks Corner	#6 Oil	92	92
Jefferies Steam 3,4	Moncks Corner	Coal	306	306
Grainger Steam 1,2	Conway	Coal	170	170
Winyah Steam 1,2,3,4	Georgetown	Coal	1080	1080
Cross Steam 2	Cross	Coal	520	520
Summer Nuclear (1/3)	Parr	Uranium	295	298
Myrtle Beach CT 1,2	Myrtle Beach	#2 Oil/Gas	20	22
Myrtle Beach CT 3,4	Myrtle Beach	#2 Oil	40	45
Myrtle Beach CT 5	Myrtle Beach	#2 Oil	30	35
Hilton Head CT 1,2	Hilton Head	#2 Oil	40	50
Hilton Head CT 3	Hilton Head	#2 Oil	57	70
Spillway Hydro	Lake Marion	Hydro	2	2
Jefferies Hydro 1,2,3,4,6	Moncks Corner	Hydro	128	128
St. Stephen Hydro 1,2,3	St. Stephen	Hydro	84	84
Thurmond Hydro 1–7 (SEPA)	Clarks Hill	Hydro	129	129
Russell Hydro 1–4 (SEPA)	Calhoun Falls	Hydro	86	86

Figure 5

EXISTING SOURCES OF GENERATING CAPACITY BY FUEL TYPE

Type of Capacity	Summer Capacity	Percent of Total
Coal	2076 MW	67%
Nuclear	295 MW	10%
Oil / Gas	279 MW	9%
Hydro	429 MW	14%

Figure 6

Cross 1

Cross 1, scheduled to begin testing in November 1994 and with commercial operation scheduled for May 1995, is a 540 MW coal-fueled generating unit similar to the existing Cross 2. At $818 per kW, the incremental cost of constructing Cross 1 is substantially lower than the expected cost of constructing new coal-fueled generation primarily due to (1) the use of an existing site, (2) the existence of common facilities already installed with Cross 2, (3) the prior purchase of the turbine-generator and step-up transformer, and (4) the present lack of new orders for coal-fueled stations which has depressed the station construction market. Cross 1 is expected to be completed on time and is not considered a future capacity option, but rather a firm future capacity addition.

Power Purchases and Sales

Santee Cooper has contracted with Virginia Power (VP) to purchase a maximum of 75 MW in 1993 and 200 MW in 1994. These capacity purchases will allow Santee Cooper to maintain adequate reserve capacity through 1994, after which time Cross 1 is expected to be available.

Santee Cooper has contracted to provide North Carolina Eastern Municipal Power Agency (NCEMPA) with capacity and energy sales through 1998. Peak capacity sales to NCEMPA include 77 MW in 1993, 100 MW from 1994 through 1997, and 50 MW in 1998.

Capacity Retirements

An operating life of 45 years for all thermal units and unlimited life for all hydro units were assumed is this study. These assumptions were based on historical performance and current maintenance practices. Under these assumptions, the following units were retired during the study period through 2013:

Unit name	Total Capacity	Year of Retirement
Jefferies 1,2	92 MW	2000
Myrtle Beach CT 1,2	20 MW	2007
Grainger 1,2	170 MW	2011

3.3 Reserve Capacity Requirements

Capacity reserves are required to meet load requirements in a reliable manner. Typical industry requirements range from 15 to 25 percent of total load. In this study, capacity reserves were set at a minimum of 17 percent of territorial load, resulting in an average capacity reserve of approximately 20 percent.

Add info on new supply-side options could be helpful. Why these options and not others.

3.4 Future Capacity Options

Since it would not be valid to compare plans that have large differences in capacity, increments of capacity additions selected for study purposes must be carefully chosen such that the total capacities added in alternative plans are approximately equal. Several capacity options were selected for evaluation in this study.

Previous studies have addressed a variety of capacity options, including new technologies such as wind turbines and fuel cells. The options listed below have emerged as the primary practical options for Santee Cooper at this time.

Future Generic Coal-Fueled Unit

Two future generic baseload coal-fueled alternatives were considered. One future generic coal-fueled unit was assumed to be a 320 MW unit at an estimated capital cost of $1,500 per kW in 1993 dollars. The other future generic coal-fueled unit was assumed to be a 560 MW unit at an estimated capital cost of $1,300 per kW in 1993 dollars.

Combustion Turbine

One future combustion turbine alternative, an 80 MW unit, was considered at an assumed capital cost of $400 per kW in 1993 dollars.

Heat Recovery/Combined Cycle

One future heat recovery alternative was considered at an assumed capital cost of $1,150 per kW in 1993 dollars for the heat recovery cycle. The future heat recovery unit was assumed to be a 40 MW unit which, when combined with an 80 MW combustion turbine, creates a 120 MW combined cycle unit.

Power Purchases and Sales

In December, 1990, Santee Cooper issued Requests for Offers to Purchase in which other electric utility power suppliers were solicited to purchase certain amounts of bulk electric power and energy from Santee Cooper. Although utilities are interested in making mutually beneficial power arrangements, the lack of response to the issued request indicated reluctance to make commitments addressing major needs for time frames several years into the future.

Santee Cooper will continue to address and negotiate capacity purchases and sales which are beneficial and appropriate. However, for long-range planning purposes, the financial effect of such transactions is not addressed. It is likely that sales of future capacity will be possible after the completion of baseload capacity additions, but sales of future capacity were not used in this study since it was considered that the inclusion of such sales for long-range planning purposes would bias study results toward higher average reserve levels.

Capacity purchases beyond 1994 were not considered in this study as a future capacity option. Future capacity requirements after Cross 1 are planned to be met with additional generation facilities and demand-side management options. Santee Cooper's strategy is to continue evaluating future purchasing opportunities based on the cost information associated with the least-cost integrated resource plan.

Cogeneration and Small Power Production

In December, 1990, Santee Cooper issued Requests for Power Supply Proposals in which qualified parties were solicited to supply Santee Cooper with certain amounts of bulk electric power and energy. Based on analysis of responses to this request, options in this category were omitted from consideration at this time. Santee Cooper's strategy is to continue evaluating future purchasing opportunities based on the cost information associated with the least-cost integrated resource plan.

Prior to committing to future capacity additions, Santee Cooper will issue requests for proposals (RFPs) to sell power to Santee Cooper in lieu of constructing additional capacity. The least-cost alternative having satisfactory reliability and financial soundness will be selected. Independent power producers, appropriate co-generators, and other qualifying facilities will be included in the request for proposal distribution.

3.5 Economic Parameters

The period of financial study for integrated resource planning must be sufficiently long to accommodate the debt service associated with all the options under consideration. In addition, a sufficient period must be chosen to ensure an accurate evaluation of capital and operating costs over the life expectancy of all generation options. The financial planning period for this study covers a 65-year period from 1993 through 2057, which includes a 21-year period with load growth from 1993 through 2013 and a 44-year extension period with no load growth.

After review of the current and future financial markets, an interest rate of 7.0 percent was chosen to address the time value of money. This interest rate was used for all present value calculations. A finance term of 30 years and a fixed charge of 5.75 percent were assumed for all future capacity options.

3.6 Capital Costs

Future unit capital costs assumed for future generation options are shown below.

Future Unit	Capital Cost (93$)	Annual Capital Inflation
80 MW Combustion Turbine	$32,000,000	4.0%
120 MW Combined Cycle	$78,000,000	4.0%
320 MW Coal	$480,000,000	4.0%
560 MW Coal	$728,000,000	4.0%

Unit retirement was dealt with in two ways. Any generation deficiency associated with the retirement of existing units through 2013 was integrated into the planning process of selecting capacity to satisfy minimum reserve requirements. All units retiring after 2013 (units retired after the detailed planning period) were replaced with identical units using escalated capital costs.

Typical cash flows were used to estimate Allowance for Funds Used During Construction (AFUDC). A 7.0 percent interest rate was used in conjunction with the following cash flows to estimate AFUDC (funded interest):

Future Capacity	year 1 (%)	year 2 (%)	year 3 (%)	year 4 (%)
80 MW combustion turbine	60	40	0	0
120 MW combined cycle	10	50	40	0
320 MW coal	5	25	50	20
560 MW coal	5	25	50	20

3.7 Operation and Maintenance Costs

For study purposes, the mean value of the fixed O&M cost during a forecast three-year budget period was used as a representative value for fixed O&M. As with the fixed costs, the variable costs were obtained by taking the mean value of the variable O&M costs during the same forecast three-year budget period and dividing by the expected generation in the second year. The following table summarizes fixed and variable O&M costs used in this study. Start-up costs represent the costs, in 1993 dollars, for starting individual generating units and were based on current operating costs. Start-up costs for future units were developed from the costs for starting existing units.

Generating Unit	Unit Fixed O&M ($/kW)	Variable O&M ($/MWh)	Unit Start-up
Jefferies 1,2	$9.96	$21.37	$5,117
Jefferies 3,4	$12.26	$1.46	$2,714
Grainger 1,2	$12.09	$2.87	$1,890
Winyah 1,2,3,4	$11.78	$1.03	$8,136
Cross 1	$11.18	$0.84	$34,201
Cross 2	$11.18	$0.84	$31,545
Existing CTs	$2.98	$5.50	$0
Future 560 MW Coal	$8.03	$0.84	$36,951
Future 320 MW Coal	$8.03	$0.84	$11,310
Future CTs	$0.45	$5.50	$0
Future Comb. Cycle	$6.95	$5.50	$2,212

O&M and start-up costs are inflated at 4 percent annually.

3.8 Fuel Costs

For long-range planning purposes, a common fuel price was used for all similarly fueled units. For existing and future coal-fueled units, the fuel price was $1.641 per MBTU in 1993 dollars. For existing and future combustion turbines and future combined cycle units using #2 oil, the fuel price was assumed to be $5.143 per MBTU in 1993 dollars. For units burning #6 oil, the cost was assumed to be $2.548 per MBTU in 1993 dollars. Nuclear fuel price used for the V. C. Summer unit was assumed to be $0.517 per MBTU.

Fuel inflation rates were based on actual contract prices and a corresponding rate to inflate prices beyond the contract periods. The contract prices and the extension rate were combined to yield a starting 1993 price and a level inflation rate for the entire period. The annual inflation rate used for coal is 4.5 percent, #2 oil is 4.9 percent, #6 oil is 4.9 percent, and nuclear is 4.7 percent.

The calculation of SO_2 emissions requires fuel sulfur content as input. The fuel sulfur content was determined by taking the weighted mean value of the percentage sulfur contained in actual historical deliveries and as contracted for future fuel purchases. These values are: 1.261 percent for coal, 0.260 percent for #2 oil, and 2.150 percent for #6 oil.

3.9 Generating Unit Characteristics

Heat Rate Data

The following tables show the average heat rate for each existing and future unit at rated net power output.

Existing Unit	Heat Rate (BTu/kWh)
Jefferies 1	11,992
Jefferies 2	11,992
Jefferies 3	10,631
Jefferies 4	10,357
Grainger 1	10,810
Grainger 2	10,810
Winyah 1	9,875
Winyah 2	11,238
Winyah 3	11,043
Winyah 4	10,811
Cross 1	9,509
Cross 2	9,509
Myrtle Beach 1,2,3,4,5	16,766
Hilton Head 1,2,3	16,804

Future Unit	Heat Rate (BTu/kWh)
80 MW Combustion Turbine	12,100
120 MW Combined Cycle	8,600
320 MW Coal	9,509
560 MW Coal	9,509

The dispatch method used by Santee Cooper for integrated resource planning is an hour-by-hour dispatching methodology using input/output curves for each unit described by a fourth order polynomial equation in the form of:

$$Input(MBTU) = A_0 + A_1\left(\frac{MW}{100}\right) + A_2\left(\frac{MW}{100}\right)^2 + A_3\left(\frac{MW}{100}\right)^3 + A_4\left(\frac{MW}{100}\right)^4$$

where MW = net output of generating unit in megawatts.

Planned Maintenance

Planned maintenance for the detailed study period was obtained by extending current maintenance schedule practices through 2013. The maintenance schedules of future units are coordinated with those of the existing units to maintain adequate capacity reserves during maintenance periods.

3.10 Existing Demand-Side Management Programs

Santee Cooper has several demand-side management programs in place including (1) a Residential Good Cents program which promotes energy efficient homes with a reduced electric rate, (2) a Commercial Good Cents program which promotes the construction of new energy efficient commercial buildings, (3) a loan program at an attractive interest rate for energy efficient home improvements, (4) an off-peak storage water heater program which provides rebates and monthly credits to

customers for allowing Santee Cooper to control their operation during peak periods. Residential Good Cents, Commercial Good Cents and off-peak storage water heating programs are also offered to direct-served customers of Central, the City of Georgetown, and the Town of Bamberg.

In addition to demand-side management programs, Santee Cooper has developed and offers time-of-use, interruptible, and off-peak rates to its direct-served commercial and industrial customers. These rates are designed to encourage customers to reduce their peak demand. As of December 31, 1992 Santee Cooper had 3 MW of time-of-use power, 129 MW of interruptible power, and 33 MW of off-peak power under contract.

Impact On System Load

The Good Cents Programs and the H_2O Advantage Program have a significant projected impact on system load levels. The programs combined are projected to reduce system peak demand and energy in 1993 by 20 MW and 24,000 MWh, respectively. This impact is forecast to grow to approximately 270 MW and 434,000 MWh by 2013.

4. OTHER INPUT CONSIDERATIONS

4.1 Demand-Side Management (DSM) Options

Background and Approach

Demand-side management (DSM) options have become increasingly important components of the electric utility industry strategy for meeting goals of providing quality electrical services at minimum cost. DSM options have been pursued by electric utilities to satisfy a variety of different objectives which include:

- Improving the utilization of existing generation, transmission and distribution plant, thereby reducing upward pressures on rates.
- Reducing vulnerability to competition by providing higher valued services and/or improving service quality.
- Avoiding or postponing the need for making new investments in generation and/or transmission facilities.
- Developing new businesses and markets that result in mutual benefits to the customer and the utility.
- Promoting local economic development.

DSM is regarded in the integrated resource planning process as a highly desirable alternative to installing new capacity by impacting the load served by the system. Load impacts are achieved by leveling load curves and reducing load peaks of short duration which require expensive generating facilities to be constructed. The most prevalent benefit of effective DSM programs is therefore the postponement of investment in such facilities.

Analysis of DSM begins with the accumulation of possible programs. The programs are then screened for benefit. Programs that show no positive impact on system costs are rejected in this screening. Programs that show potential benefit are included for further analysis, and are integrated into the resource planning process to determine their overall impact. Long-term savings obtained by the inclusion of DSM are noted and the DSM programs are re-evaluated to determine the net DSM benefit.

Programs determined to be cost effective are selected for implementation, while programs not determined to be cost effective are rejected. The entire process is an iterative one.

Of the 30 DSM programs that were addressed in the initial screening process, eight programs were selected for inclusion in the integrated resource planning process. These include:

Residential

Swimming Pool Load Management Program
Geothermal Heat Pump Program
Water Conservation Program
Duct Leakage Program

Commercial

Thermal Storage Program
High Efficiency Space Conditioning Equipment Program
High Efficiency Lighting Program
Standby Generator Program

Combined together, these programs are projected to provide a maximum demand reduction of 126 MW in 2013.

Swimming Pool Load Management Program

This program would reduce summer peak load by preventing residential pool pumps from operating at peak hours. Pool pumps would be interrupted by radio-controlled communication devices. An incentive would possibly be offered to encourage customer participation.

Geothermal Heat Pump Program

This program would reduce summer and winter peak demands of residential customers by promoting heat pump technology utilizing water as the medium of heat transfer to the ground. Rebates would possibly be offered to customers who install equipment with higher than standard efficiencies to offset a portion of their higher costs for such equipment.

Water Conservation Program

This program would be targeted at existing residential homes in which older high-flow showerheads would be replaced with low-flow showerheads. The savings would be derived from the reduced energy requirement for heating water.

Duct Leakage Program

This program would lower residential energy consumption by locating and correcting leakage in existing household duct work.

Thermal Storage Program

This program would shift energy used by commercial customers for air conditioning from peak to off-peak hours by utilizing thermal energy stored in a medium such as ice or water. Rebates and/or rate incentives would possibly be offered to customers who install this type of equipment. A time-of-use meter would be installed for this program.

High-Efficiency Space Conditioning Equipment Program

This program involves the implementation of high-efficiency space conditioning equipment for commercial and industrial customers and would reduce peak demand in both summer and winter through the installation of more efficient space heating and cooling equipment. Rebates would be offered to customers who install equipment with higher than standard efficiencies.

High-Efficiency Lighting Program

This program involves the implementation of high-efficiency lighting equipment for commercial and industrial customers and would reduce peak demand in both summer and winter. Rebates would be offered to customers who install equipment with higher than standard efficiencies.

Standby Generator Program

This program involves commercial and industrial customers serving their own load with their own generators during peak hours, and would reduce the summer and winter peak demands as metered by Santee Cooper. Each participating customer would receive a monthly payment based on capacity and energy, as determined by a special meter installed on the customer's equipment.

4.2 Clean Air Act Amendment of 1990

General Information

The Clean Air Act (CAA) as amended November, 1990 sets annual limitations on sulfur dioxide (SO_2) emissions while providing both a banking feature and a market based system for purchasing, trading, transferring, and selling allowances, where one allowance permits one ton of SO_2 to be emitted into the atmosphere. The flexibility associated with the provisions of the CAA has had a major impact on the integrated resource planning process, and requires full integration of these provisions into the planning process. Integrating considerations of the CAA into the planning process allows compliance strategies to be evaluated at a system level, which in turn ensures that overall economic impacts are taken into consideration. Other features of the CAA include limits on oxides of nitrogen (NO_x) and other pollutants. These features are being addressed separately at Santee Cooper outside of this report.

The CAA is divided into two major phases for addressing SO_2 constraints. Phase I addresses units affected in the 1995-1999 time frame, while Phase II addresses units affected in 2000 and beyond. All Santee Cooper units affected by the CAA are Phase II units. These include all existing Santee Cooper coal-fueled units, Jefferies 1 and 2, and Cross 1.

Under the CAA, the affected units are allocated annual allowances which are placed into accounts associated with the units. These allowances are pooled to establish a system-wide annual allocation. Santee Cooper will be allocated approximately 46,000 SO_2 allowances per year through 2009, and approximately 43,000 allowances for each year thereafter.

The system-wide annual total of available allowances is of primary interest in the integrated resource planning process. Each plan evaluated must demonstrate long-range compliance with the CAA before the plan is analyzed further. Non-compliant plans are discarded by SCAP. A plan is considered compliant if the total emitted tons of SO_2 from all generating units in a given year do not exceed the total available allowances. The total available allowances include annual allotments plus any allowances held in accounts from previous years. Unused allowances at the time of year-end accounting can be held in accounts for use in future years.

General Compliance Strategies

Two primary options for achieving compliance were addressed in this study. One of these options involved the retrofitting of existing generating units with flue gas desulfurization (FGD) systems. These systems are used to "scrub" a percentage of SO_2 from the flue gas, thereby reducing total atmospheric emissions associated with the unit.

The following FGD retrofit options, along with the percent SO_2 removal and associated capital costs (1993 dollars), were considered for developing compliance strategies in this study:

FGD retrofit	Existing % Removal	Retrofitted % Removal	Capital (93$)	Capital Inflation
Winyah 1	0%	90%	$54,000,000	4.0%
Winyah 2	46%	90%	$27,300,000	4.0%
Jefferies 3	0%	90%	$32,130,000	4.0%
Jefferies 4	0%	90%	$32,130,000	4.0%
Grainger 1	0%	90%	$17,850,000	4.0%
Grainger 2	0%	90%	$17,850,000	4.0%

Fixed and variable O&M costs associated with each retrofit option are as follows:

FGD retrofit	Fixed O&M (93$)	Variable O&M (93$/MWh)
Winyah 1	$675,000	$0.40
Winyah 2	$675,000	$0.40
Jefferies 3	$1,025,000	$0.45
Jefferies 4	$1,025,000	$0.45
Grainger 1	$1,025,000	$0.45
Grainger 2	$1,025,000	$0.45

The fixed O&M costs are annual costs. Both the fixed and variable costs were inflated 4.0 percent annually.

Although FGD system retrofits may take several years of planning and permitting, the following cash flows of major costs were used in conjunction with a 7 percent interest rate to estimate AFUDC (funded interest) associated with financing the FGD retrofits. A 30-year finance term was assumed.

FGD Retrofit Unit	year 1 (%)	year 2 (%)	year 3 (%)	year 4 (%)
Winyah 1	50	50	0	0
Winyah 2	50	50	0	0
Jefferies 3	50	50	0	0
Jefferies 4	50	50	0	0
Grainger 1	50	50	0	0
Grainger 2	50	50	0	0

Another option considered for achieving compliance involved modifying the economic dispatching of generating units to reduce SO_2 emissions. Dispatching was accomplished using a method System Planning has labeled Environmentally Sensitive Economic Dispatching (ESED).

Economic dispatching is presently based on unit commitment order, unit input/output curves, and fuel costs. ESED uses an assumed cost related to SO_2 emissions ($/ton) and associates this cost with the sulfur contained within the fuel. The sulfur cost, based in part on the sulfur content of the fuel and FGD efficiency, is added to the fuel cost used in dispatching the units. The additional cost related to SO_2 emissions is used only for biasing the dispatch, and does not enter into actual fuel

cost calculations. ESED also modifies the unit commitment order to start certain units equipped with FGD systems prior to starting units without FGD systems.

The biasing of the units with SO_2 related costs has the effect of penalizing units which are not equipped with FGD systems or units burning coal with a higher sulfur content, thereby forcing them to produce less energy. Since similar units equipped with FGD systems generally will have a lower overall efficiency, this methodology results in increased fuel consumption, but with reduced total system SO_2 emissions.

All future coal-fueled units considered were modeled with FGD systems having 90 percent SO_2 removal. This has the effect of reducing overall system emissions when new coal capacity is added since the newer units would operate at a high load factor, displacing energy that would have been produced by existing units which are not equipped with FGD systems. Therefore, the addition of baseload capacity, inherently considered in the planning process, is another means for achieving compliance.

5. STUDY PROCEDURE

5.1 Overall Concept and Approach

Generating capacity generally consists of three types of units, namely:

- Baseload units, such as: run-of-river hydro, coal-fueled, and nuclear units, which operate around the clock.

- Intermediate or cycling units, such as: older coal-fueled and oil-fueled units, which operate during the shoulder periods for up to about 20 hours per day.

- Peaking units, such as: combustion turbines or pondage and pumped storage hydro which only operate for a few hours during the peak periods.

There is an optimum mix of capacity for each system that produces the lowest energy costs to its customers. This optimum mix primarily depends on the system load shape and the characteristics of existing and future generating units, including: size, availability, efficiency, and capital and operating costs. To be most economical, a system with a high load factor will require more baseload capacity, whereas a low-

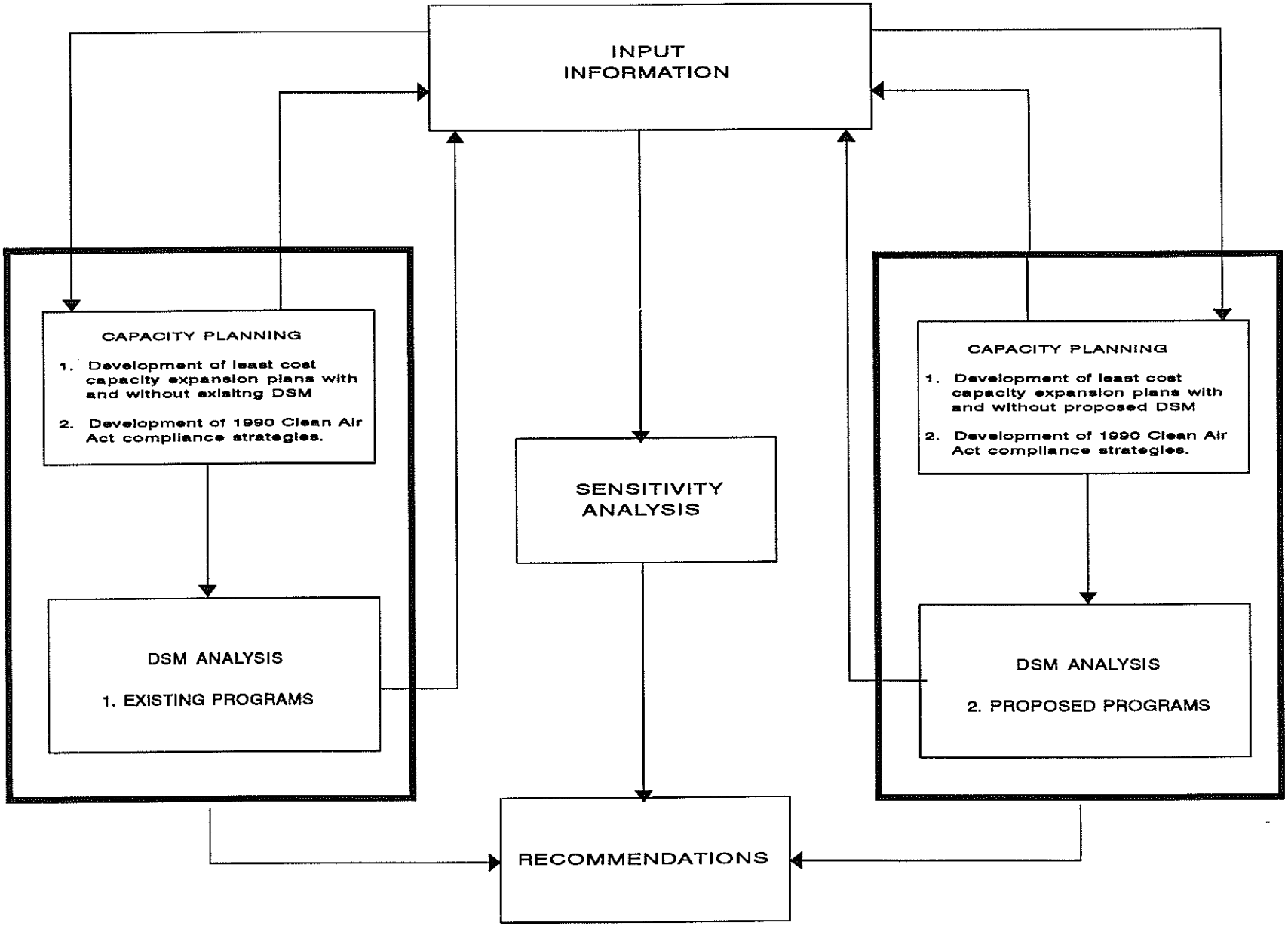
load factor system will require a relatively higher level of peaking capacity. Therefore, the integrated resource planning can be considered as a process of determining the optimum mix of capacity resources and DSM programs from a given set of options.

The overall integrated resource planning process is shown in Figure 7. Input information, which includes a load forecast, capacity expansion options, DSM options, financial information, compliance strategies, generating unit technical information, etc., is used to develop least-cost capacity expansion plans both with and without existing or proposed DSM programs. Integrated into the process of developing the least-cost expansion plans are the evaluation and selection of strategies for achieving compliance with the CAA. Results of the capacity expansion planning process are then used to evaluate the DSM programs. The DSM analysis in turn is used to modify the input information (i.e., include or exclude certain programs), and the entire process is re-iterated.

In developing the least-cost plans, existing and proposed new DSM programs were evaluated separately. This allowed those programs which have already been implemented to be verified for continuing cost effectiveness before the proposed new programs were addressed. In addition, this approach also required that the proposed programs independently demonstrate cost effectiveness.

Once the existing programs were verified, the various proposed new programs were evaluated. Proposed programs included in the integrated resource planning process were selected based on a prior DSM screening process as outlined in Appendix C of this report.

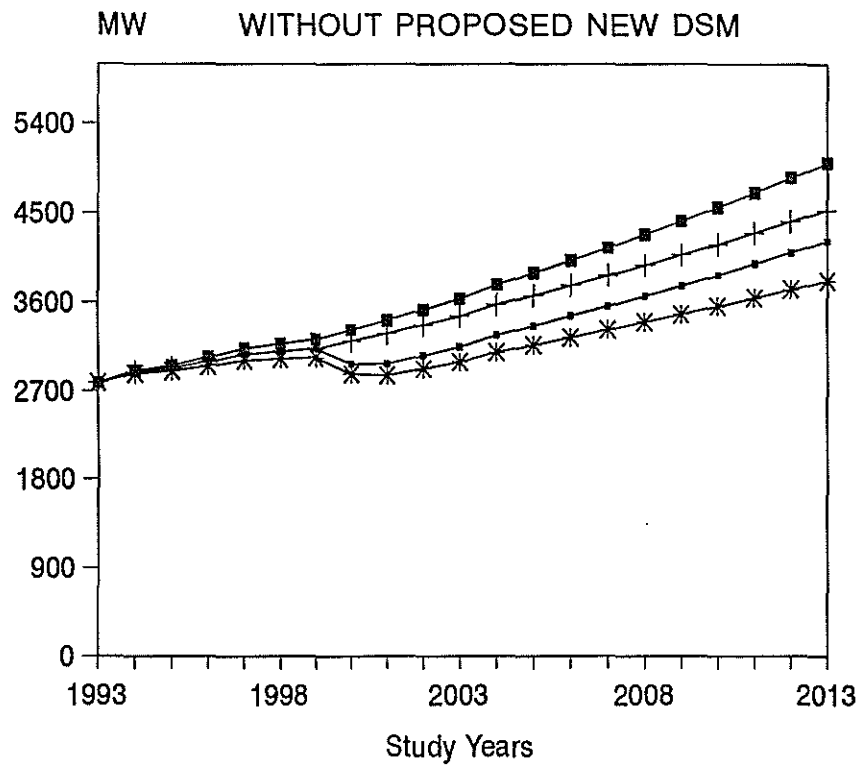
FIGURE 7- INTEGRATED RESOURCE PLANNING PROCESS

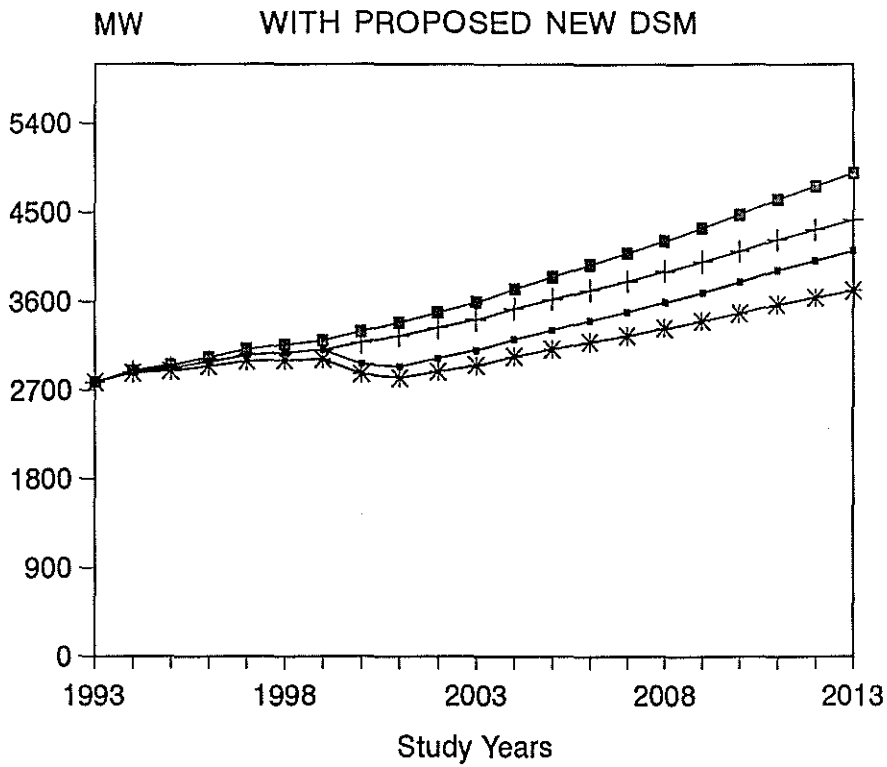


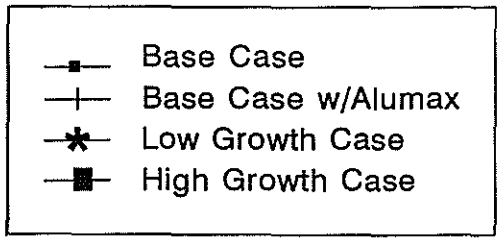
The development of least-cost capacity expansion plans along with the evaluation of DSM programs was completed for both base forecast scenarios, where Alumax either remains on the system or leaves in April, 2000. The evaluation of Alumax staying or leaving is a sensitivity analysis. At approximately 300 MW, the Alumax load represents such a significant part of Santee Cooper's load that the consideration of it staying or leaving was evaluated within the framework of the overall integrated resource planning process. In effect, two separate integrated resource plans, one with Alumax leaving and one with Alumax remaining, were produced.

The final analysis phase of the planning process in this study, referred to as load forecast sensitivity analysis, involved developing least-cost plans for two forecast scenarios representing high- and low-growth cases. The high-growth case was based on the forecast where Alumax remains, while the low-growth case was based on the forecast where Alumax leaves the system in April, 2000. By using this approach, a bandwidth encompassing both base forecast scenarios was established (Figure 8). These special cases, in conjunction with the base forecasts with Alumax remaining or leaving, establish differing possible futures to be used in addressing the actions to take in the event actual future load conditions deviate significantly from the officially adopted forecast.

FIGURE 8 - FORECAST SENSITIVITIES







5.2 Scenario Construction and Analysis

The most complex aspect of integrated resource planning is a process referred to as scenario construction and analysis. The least-cost capacity expansion plan for each base forecast is developed using the Scenario Construction and Analysis Package (SCAP). SCAP is a series of computer programs developed in house by engineers in the System Planning Division for generating and evaluating resource plans (Figure 9). The SCAP package is used to develop and evaluate all possible capacity combinations for a given set of input information with a high level of detail over a twenty-one year period (over 150 million plans were screened for this study).

The approach used by the SCAP software is made possible by the availability of high-power computing resources. Production simulations use an hour-by-hour dispatch methodology and are produced on an IBM 3081 mainframe. Results of these simulations are transferred to an RS/6000 LAN where they are used in the construction and evaluation of scenarios.

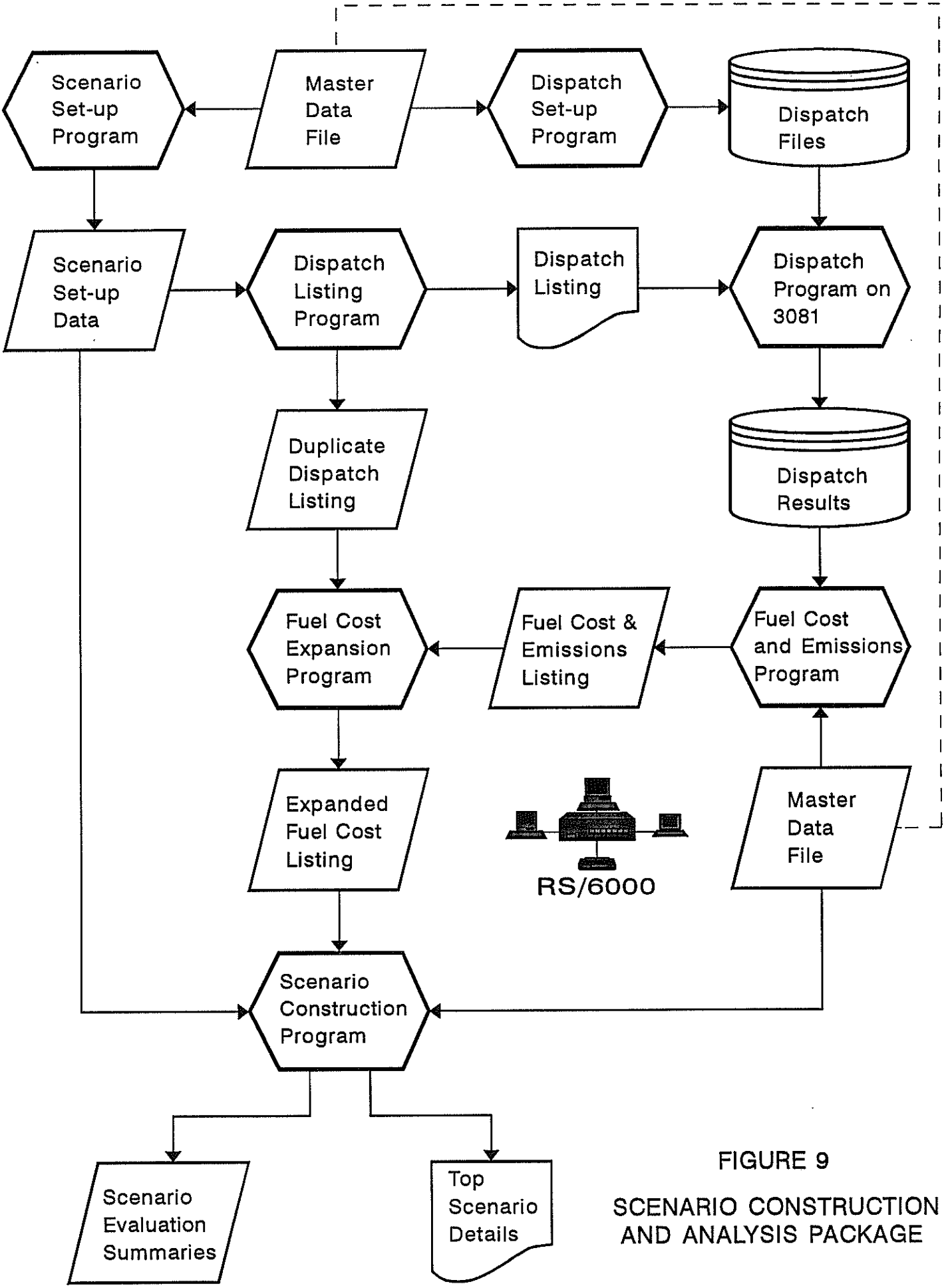


FIGURE 9

SCENARIO CONSTRUCTION AND ANALYSIS PACKAGE

The SCAP package was used to outline those plans having the least cost based on the sum of revenue requirements discounted to 1993 dollars at 7 percent. Plans having the least cost and demonstrating long-range compliance with the CAA were also outlined in the output. Various compliance strategies were included as input to the screening process until the least-cost compliant plan was found. All plans were compared against a base plan, which is defined as the least-cost compliant plan without the inclusion of compliance strategies.

In developing scenarios, four main factors were varied: the load level, the cost of pollution in Environmentally Sensitive Economic Dispatching (ESED), the unit commitment order, and the addition of any FGD system retrofits. Using combinations of these factors, different case scenarios were developed which all represent possible futures for Santee Cooper.

ESED was produced with the sensitivity varied by changing the SO_2 related costs added to the fuel costs. It is again important to note that these costs were only used to bias the dispatch toward a state with lower SO_2 emissions, and do not enter into any financial calculations, other than indirectly through increased fuel costs associated with operating the system at overall lower fuel efficiencies to achieve the SO_2 reduction. The unit commitment order was also altered in ESED according to the level of SO_2 per energy output starting in 2000. For example, without

consideration of pollution, Winyah 1 was scheduled to start before Winyah 4 due to its higher efficiency. With ESED, Winyah 4, with 80 percent FGD, was scheduled to start before Winyah 1, which has no FGD system.

6. STUDY RESULTS

6.1 Overview

For this study it has been assumed no changes will be made in existing federal or state laws or regulations to reflect, among other things, more stringent environmental requirements and changes in tax laws (such as a carbon tax law). Certain assumptions and study considerations reflect conditions or events assumed to take place at a future date. To the extent that actual conditions or events differ from those assumed in this study, the results set forth can be expected to change.

A total of eight resource plans are summarized in this report for the base forecasts; four plans for the forecast with Alumax leaving in April, 2000, and four plans for the forecast with Alumax staying. However, literally millions were generated and screened, both with and without proposed new DSM, and with and without Clean Air Act compliance strategies. Additional summaries of some alternate plans are included in Appendix B of this report.

The first two plans for each forecast represent least-cost plans without proposed new DSM, while the third and fourth plans represent least-cost plans with proposed new DSM. Of the two pairs of plans presented for each forecast scenario, each pair representing the inclusion or exclusion of DSM, the first plan is referred to as the base plan. The base plan is the least-cost plan assuming no CAA compliance strategies (i.e., no FGD retrofits or ESED) are implemented. The second plan in each pair is the least-cost plan developed with compliance strategies. In all cases, implementing compliance strategies allowed baseload generation to be deferred, and resulted in substantial savings over both the long- and short-term.

On all summaries presented, long-term refers to the 65-year financial analysis period, while short-term refers to the 21-year scenario development period (the period over which load growth occurs). Economic comparisons should be based only on the long-term comparisons since they include the overall economic impact associated with the operation and financing of facilities. The short-term results are presented for information to show the short-term comparative economic impact.

6.2 Existing DSM Programs

Prior to developing least-cost integrated resource plans involving the evaluation of proposed new DSM programs, existing DSM programs were evaluated for continuing cost effectiveness. Figure 10 summarizes the results of this evaluation for the base load forecast which assumes Alumax leaves the system in April, 2000.

Existing programs include the Good Cents Programs and the H_2O Advantage program. Evaluation shows these programs to be cost effective, and continue to have beneficial demand and energy impacts. Santee Cooper will continue to evaluate these programs and make appropriate changes.

FIGURE 10 – IMPACT OF EXISTING DSM PROGRAMS

1993 BASE CASE LOAD FORECAST

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	LEAST COST PLAN WITHOUT EXISTING DSM ESED: $300/TON – WINYAH #1 FGD 2016					LEAST COST PLAN WITH EXISTING DSM ESED: $300/TON – NO FGD RETROFITS					TOTAL DSM		COST REDUCTIONS ASSOCIATED WITH DSM		
	FUTURE UNITS				DEMAND	FUTURE UNITS				DEMAND	DEMAND	ENERGY	ANNUAL TOTAL	FIXED RATE	VARIABLE RATE
	CT	CC	C1	C2	(MW)	CT	CC	C1	C2	(MW)	(MW)	(MWh)	($000)	($/kW)	($/kWh)
1993	–	–	–	–	2,800	–	–	–	–	2,780	20	23,844	$859	$0.00	$0.036
1994	–	–	–	–	2,916	–	–	–	–	2,886	30	28,127	$1,038	$0.00	$0.037
1995	–	–	–	–	2,964	–	–	–	–	2,928	36	36,409	$904	$0.00	$0.025
1996	–	–	–	–	3,039	–	–	–	–	2,995	44	43,179	$1,159	$0.00	$0.027
1997	–	–	–	–	3,119	–	–	–	–	3,066	53	50,168	$2,109	$0.00	$0.042
1998	1	–	–	–	3,158	–	–	–	–	3,097	61	56,858	$2,458	$0.72	$0.042
1999	–	–	–	–	3,196	–	–	–	–	3,127	69	64,201	$6,207	$52.17	$0.041
2000	–	–	–	–	3,068	–	–	–	–	2,968	100	71,167	$6,257	$36.01	$0.037
2001	–	–	–	–	3,053	–	–	–	–	2,968	85	78,295	$6,782	$42.39	$0.041
2002	1	–	–	–	3,146	1	–	–	–	3,055	91	85,268	$7,436	$39.62	$0.045
2003	1	–	–	–	3,241	1	–	–	–	3,143	98	92,241	$7,460	$36.81	$0.042
2004	2	–	–	–	3,365	2	–	–	–	3,261	104	99,240	$10,394	$34.70	$0.068
2005	2	–	–	–	3,472	1	–	–	–	3,355	117	106,235	$10,175	$31.36	$0.061
2006	1	–	–	–	3,569	1	–	–	–	3,456	113	113,269	$15,681	$73.89	$0.065
2007	2	–	–	–	3,676	2	–	–	–	3,555	121	120,318	$17,313	$69.05	$0.074
2008	2	–	–	–	3,785	2	–	–	–	3,659	126	127,310	$18,642	$66.36	$0.081
2009	1	–	–	–	3,894	1	–	–	–	3,763	131	134,298	$20,195	$63.86	$0.088
2010	2	–	–	–	4,008	–	1	–	–	3,871	137	141,333	$22,943	$49.75	$0.114
2011	–	–	–	1	4,136	–	–	–	1	3,984	152	148,372	$14,529	$27.80	$0.069
2012	–	–	–	–	4,246	–	–	–	–	4,098	148	155,433	$20,440	$28.16	$0.105
2013	–	–	–	–	4,356	–	–	–	–	4,212	144	162,494	$22,963	$28.51	$0.116
Totals	15	0	0	1 [01.c]		11	1	0	1 [01.Dc]		CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle		C1: 320 MW Coal C1: 360 MW Coal		

6.3 Resource Plans - Alumax leaving April, 2000

Results of the capacity planning phase of the integrated resource planning process for the base forecast scenario where Alumax leaves in April, 2000, are shown in Figures 11 and 12. Figure 11 shows the base and least-cost plans without proposed new DSM programs, while Figure 12 shows the base and least-cost plans with the proposed new DSM programs. Figure 13 shows a comparison between the two least-cost plans. The results are summarized as follows:

1. Least cost compliance with the Clean Air Act Amendment of 1990 can be achieved by using an Environmentally Sensitive Economic Dispatch (ESED). Using ESED to achieve compliance results in substantial savings over the base plans by deferring baseload capacity. For the base plans, achieving compliance requires the addition of baseload capacity in 2004 without proposed new DSM programs, and in 2007 with proposed new DSM programs. ESED allows this baseload capacity to be deferred to 2011, resulting in long-term savings of approximately $256 million for the scenario without DSM, and approximately $215 million for the scenario with DSM.

2. The least-cost plans both with and without the proposed new DSM programs include the addition of eleven 80 MW combustion turbine units before the next baseload capacity is added. This represents an increase in the percentage of peaking capacity on the Santee Cooper system from 9 percent in 1993 to approximately 23 percent in 2013. This percentage increase in peaking capacity is primarily the result of Alumax leaving in April, 2000, and the high percentage of coal, nuclear, and high load factor hydro generation in the existing mix.

3. The addition of the proposed new DSM programs results in the deferral of 80 MW combustion turbine units within the planning period and the deferral of a 120 MW combined cycle unit beyond the planning period. Results of the detailed analysis of each DSM program in the proposed package are included in Appendix C of this report.

Of the eight DSM options considered in the integrated resource planning process, the following seven were found to be cost effective in the near term:

Residential

Swimming Pool Load Management Program
Geothermal Heat Pump Program
Water Conservation Program
Duct Leakage Program

Commercial

Thermal Storage Program
High Efficiency Space Conditioning Equipment Program
High Efficiency Lighting Program

Of the eight DSM options considered in the integrated resource planning process, the following program was not found to be cost effective until combustion turbine capacity is scheduled to be added:

Commercial

Standby Generator Program

FIGURE 11 – BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 01a — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON — NO FGD RETROFITS								ALTERNATE PLAN 2 01c — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON — NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.3%	–	–	–	–	–	–	–	15.3%	–	–	–	$0
1995	–	–	–	–	26.4%	–	–	–	–	–	–	–	26.4%	–	–	–	$0
1996	–	–	–	–	23.3%	–	–	–	–	–	–	–	23.3%	–	–	–	$0
1997	–	–	–	–	20.1%	–	–	–	–	–	–	–	20.1%	–	–	–	$0
1998	–	–	–	–	18.4%	–	–	–	–	–	–	–	18.4%	–	–	–	$0
1999	–	–	–	–	16.9%	–	–	–	–	–	–	–	16.9%	–	–	–	$0
2000	–	–	–	–	20.3%	44,092	2,181	4.7%	–	–	–	–	20.3%	35,695	10,578	22.9%	$924
2001	–	–	–	–	20.3%	40,477	7,977	17.2%	–	–	–	–	20.3%	32,142	24,709	53.4%	$766
2002	1	–	–	–	19.4%	44,537	9,713	21.0%	1	–	–	–	19.4%	37,001	33,981	73.4%	$983
2003	1	–	–	–	18.6%	46,560	9,426	20.4%	1	–	–	–	18.6%	38,903	41,351	89.4%	$930
2004	–	–	–	1	32.4%	34,478	21,221	45.9%	2	–	–	–	19.2%	40,067	47,557	102.8%	($3,641)
2005	–	–	–	–	28.4%	38,448	29,046	62.8%	1	–	–	–	18.2%	44,468	49,362	106.7%	($95,660)
2006	–	–	–	–	24.4%	40,945	34,375	74.3%	1	–	–	–	17.0%	47,497	48,138	104.0%	($84,502)
2007	–	–	–	–	20.1%	40,638	40,010	86.5%	2	–	–	–	17.7%	47,123	47,288	102.2%	($79,832)
2008	1	–	–	–	18.8%	44,425	41,858	90.5%	2	–	–	–	18.8%	51,649	41,912	90.6%	($61,976)
2009	1	–	–	–	17.6%	47,064	41,067	88.7%	1	–	–	–	17.6%	54,686	33,499	72.4%	($50,170)
2010	–	–	1	–	22.9%	40,179	44,362	102.0%	–	1	–	–	17.4%	54,286	22,687	52.2%	($50,870)
2011	2	–	–	–	18.9%	42,813	45,023	103.0%	–	–	–	1	24.2%	41,566	24,595	56.6%	($142,951)
2012	1	–	–	–	17.5%	44,933	43,564	100.2%	–	–	–	–	20.6%	44,602	23,467	54.0%	($5,869)
2013	–	1	–	–	17.1%	44,397	42,641	98.1%	–	–	–	–	17.1%	44,476	22,465	51.7%	($10,226)
Totals	7	1	1	1					11	1	0	1					

Short term present worth difference: ($210,321)

Long term present worth difference: ($255,679)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C4CP05/16/93

FIGURE 12 – BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST WITH DSM

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 01.Dc ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 2 01.Dc ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.4%	–	–	–	–	–	–	–	15.4%	–	–	–	$0
1995	–	–	–	–	26.8%	–	–	–	–	–	–	–	26.8%	–	–	–	$0
1996	–	–	–	–	24.0%	–	–	–	–	–	–	–	24.0%	–	–	–	$0
1997	–	–	–	–	21.0%	–	–	–	–	–	–	–	21.0%	–	–	–	$0
1998	–	–	–	–	19.6%	–	–	–	–	–	–	–	19.6%	–	–	–	$0
1999	–	–	–	–	18.2%	–	–	–	–	–	–	–	18.2%	–	–	–	$0
2000	–	–	–	–	21.0%	43,437	2,836	6.1%	–	–	–	–	21.0%	34,830	11,443	24.7%	$872
2001	–	–	–	–	22.2%	40,007	9,102	19.7%	–	–	–	–	22.2%	31,479	26,237	56.7%	$876
2002	–	–	–	–	18.7%	43,906	11,469	24.8%	–	–	–	–	18.7%	36,125	36,384	78.6%	$930
2003	1	–	–	–	18.1%	45,920	11,823	25.5%	1	–	–	–	18.1%	38,264	44,394	95.9%	$932
2004	2	–	–	–	19.0%	46,080	12,015	26.0%	2	–	–	–	19.0%	38,876	51,791	111.9%	$719
2005	1	–	–	–	18.0%	50,433	7,855	17.0%	1	–	–	–	18.0%	43,644	54,420	117.6%	$858
2006	2	–	–	–	19.5%	52,752	1,376	3.0%	2	–	–	–	19.5%	46,082	54,612	118.0%	$895
2007	–	–	–	1	32.9%	38,770	8,879	19.2%	1	–	–	–	18.2%	46,549	54,335	117.4%	$682
2008	–	–	–	–	29.0%	43,479	11,673	25.2%	1	–	–	–	17.1%	50,307	50,302	108.7%	($101,315)
2009	–	–	–	–	25.3%	45,543	12,403	26.8%	2	–	–	–	18.4%	53,251	43,323	93.6%	($89,469)
2010	–	–	–	–	21.8%	45,345	10,532	24.2%	1	–	–	–	17.3%	53,201	33,597	77.3%	($76,246)
2011	–	–	1	–	21.9%	41,641	12,365	28.4%	–	–	–	1	24.1%	40,457	36,613	84.2%	($93,076)
2012	–	–	–	–	18.8%	43,838	12,001	27.6%	–	–	–	–	20.9%	42,775	37,313	85.8%	($34,603)
2013	1	–	–	–	17.9%	43,652	11,823	27.2%	–	–	–	–	17.9%	43,473	37,314	85.8%	($32,175)
Totals	7	0	1	1					11	0	0	1					

Short term present worth difference: ($133,195)

Long term present worth difference: ($215,404)

C&CP05/18/93

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

FIGURE 13 – IMPACT OF PROPOSED DSM PROGRAMS

1993 BASE CASE LOAD FORECAST

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	LEAST COST PLAN WITHOUT DSM ESED: $300/TON – NO FGD RETROFITS					LEAST COST PLAN WITH DSM ESED: $300/TON – NO FGD RETROFITS					TOTAL DSM		COST REDUCTIONS ASSOCIATED WITH DSM		
	FUTURE UNITS				DEMAND	FUTURE UNITS				DEMAND	DEMAND	ENERGY	ANNUAL TOTAL	FIXED RATE	VARIABLE RATE
	CT	CC	C1	C2	(MW)	CT	CC	C1	C2	(MW)	(MW)	(MWh)	($000)	($/kW)	($/kWh)
1993	–	–	–	–	2,780	–	–	–	–	2,780	0	0	$0	$0.00	$0.000
1994	–	–	–	–	2,886	–	–	–	–	2,883	3	5,903	$204	$0.00	$0.035
1995	–	–	–	–	2,928	–	–	–	–	2,920	8	17,740	$273	$0.00	$0.015
1996	–	–	–	–	2,995	–	–	–	–	2,980	15	35,875	$1,594	$0.00	$0.044
1997	–	–	–	–	3,066	–	–	–	–	3,045	21	54,033	$1,457	$0.00	$0.027
1998	–	–	–	–	3,097	–	–	–	–	3,070	27	71,463	$1,594	$0.00	$0.022
1999	–	–	–	–	3,127	–	–	–	–	3,094	33	87,417	$2,472	$0.00	$0.028
2000	–	–	–	–	2,968	–	–	–	–	2,953	15	102,318	$2,573	$0.00	$0.025
2001	–	–	–	–	2,968	–	–	–	–	2,925	43	117,234	$3,081	$0.00	$0.026
2002	1	–	–	–	3,055	–	–	–	–	3,006	49	133,668	$3,843	$1.04	$0.028
2003	1	–	–	–	3,143	1	–	–	–	3,087	56	149,131	$9,546	$75.20	$0.036
2004	2	–	–	–	3,261	2	–	–	–	3,200	61	164,815	$9,432	$69.07	$0.032
2005	1	–	–	–	3,355	1	–	–	–	3,293	62	179,613	$12,749	$67.97	$0.048
2006	1	–	–	–	3,456	2	–	–	–	3,389	67	194,004	$14,349	$62.06	$0.053
2007	2	–	–	–	3,555	1	–	–	–	3,474	81	208,419	$12,550	($7.94)	$0.063
2008	2	–	–	–	3,659	1	–	–	–	3,572	87	222,209	$15,423	$51.49	$0.049
2009	1	–	–	–	3,763	2	–	–	–	3,671	92	232,863	$21,955	$105.22	$0.053
2010	–	1	–	–	3,871	1	–	–	–	3,773	98	243,186	$13,915	$59.55	$0.033
2011	–	–	–	1	3,984	–	–	–	1	3,891	93	252,504	$26,605	$151.91	$0.049
2012	–	–	–	–	4,098	–	–	–	–	3,988	110	262,056	$28,906	$129.08	$0.056
2013	–	–	–	–	4,212	–	–	–	–	4,086	126	271,669	$28,635	$113.27	$0.053
Totals	11	1	0	1 [01.c]		11	0	0	1 [01.Dc]		CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle		C1: 320 MW Coal C2: 560 MW Coal		

6.4 Resource Plans - Alumax remaining

Results of the capacity planning phase of the integrated resource planning process for the base forecast scenario where Alumax remains are shown in Figures 14 and 15. Figure 14 shows the base and least-cost plans without proposed new DSM programs, while Figure 15 shows the base and least-cost plans with the proposed new DSM programs. Figure 16 shows a comparison between the two least-cost plans. The results are summarized as follows:

1. Least-cost compliance with the Clean Air Act Amendment of 1990 can be achieved by installing an FGD system on Winyah 1. The FGD retrofit of Winyah 1 is required in 2000 unless it is deferred using ESED or purchased allowances. Preliminary results of subsequent study efforts indicate ESED would allow the retrofit to be deferred by approximately two years.

2. The least-cost plan without the proposed new DSM programs includes the addition of thirteen 80 MW combustion turbine units before the next baseload capacity is added. With the proposed new DSM programs included, twelve 80 MW combustion turbine units are added. This represents an increase in the percentage of peaking capacity on the Santee Cooper system from 9 percent in 1993 to approximately 22 percent in 2013. This percentage increase in peaking capacity is primarily the result of the high percentage of coal, nuclear, and high load factor hydro generation in the existing generation mix.

3. The addition of the proposed new DSM programs result in the deferral of 80 MW combustion turbine units within the planning period and the deferral of an 80 MW combustion turbine unit beyond the planning period. Results of the detailed analysis of each DSM program in the proposed package are included in Appendix C of this report.

FIGURE 14 – BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 02.a ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 3 02.d ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.3%	–	–	–	–	–	–	–	15.3%	–	–	–	$0
1995	–	–	–	–	26.4%	–	–	–	–	–	–	–	26.4%	–	–	–	$0
1996	–	–	–	–	23.3%	–	–	–	–	–	–	–	23.3%	–	–	–	$0
1997	–	–	–	–	20.1%	–	–	–	–	–	–	–	20.1%	–	–	–	$0
1998	–	–	–	–	18.4%	–	–	–	–	–	–	–	18.4%	–	–	–	$0
1999	–	–	–	–	16.9%	–	–	–	–	–	–	–	16.9%	–	–	–	$0
2000	–	–	–	1	29.6%	39,867	6,406	13.8%	3	–	–	–	18.9%	36,903	9,370	20.3%	$2,211
2001	–	–	–	–	26.4%	38,781	13,898	30.0%	1	–	–	–	18.5%	36,792	18,852	40.7%	($68,011)
2002	–	–	–	–	22.9%	43,513	16,658	36.0%	1	–	–	–	17.8%	41,059	24,065	52.0%	($61,390)
2003	–	–	–	–	19.5%	44,691	18,240	39.4%	1	–	–	–	17.1%	42,114	28,225	61.0%	($54,382)
2004	1	–	–	–	17.7%	45,325	19,188	41.5%	2	–	–	–	17.7%	43,835	30,663	66.3%	($50,961)
2005	–	–	1	–	23.8%	41,892	23,569	50.9%	2	–	–	–	19.2%	47,587	29,349	63.4%	($37,077)
2006	–	–	–	–	20.3%	44,505	25,337	54.8%	1	–	–	–	18.0%	48,955	26,666	57.6%	($82,419)
2007	1	–	–	–	18.7%	44,097	27,513	59.5%	2	–	–	–	18.7%	49,474	23,465	50.7%	($79,130)
2008	1	–	–	–	17.5%	47,873	25,913	56.0%	–	–	1	–	23.9%	45,530	24,208	52.3%	($88,986)
2009	2	–	–	–	18.5%	50,562	21,623	46.7%	–	–	–	–	20.5%	47,175	23,305	50.4%	($5,558)
2010	–	–	–	1	29.4%	38,959	26,138	60.1%	–	–	–	–	17.3%	47,982	18,798	43.2%	($20,970)
2011	–	–	–	–	21.6%	42,247	27,365	62.9%	–	–	–	1	23.6%	36,663	25,608	58.9%	($183,268)
2012	–	–	–	–	18.3%	45,181	25,658	59.0%	–	–	–	–	20.2%	38,758	30,324	69.8%	($24,538)
2013	1	–	–	–	17.1%	44,042	25,090	57.7%	–	–	–	–	17.1%	39,485	34,313	78.9%	($20,021)
Totals	6	0	1	2					13	0	1	1					

Short term present worth difference: ($311,761)
Long term present worth difference: ($371,876)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C:\CP05/18/93

FIGURE 15 – BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX – WITH DSM
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 02.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 3 02.Dd ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.4%	–	–	–	–	–	–	–	15.4%	–	–	–	$0
1995	–	–	–	–	26.8%	–	–	–	–	–	–	–	26.8%	–	–	–	$0
1996	–	–	–	–	24.0%	–	–	–	–	–	–	–	24.0%	–	–	–	$0
1997	–	–	–	–	21.0%	–	–	–	–	–	–	–	21.0%	–	–	–	$0
1998	–	–	–	–	19.6%	–	–	–	–	–	–	–	19.6%	–	–	–	$0
1999	–	–	–	–	18.2%	–	–	–	–	–	–	–	18.2%	–	–	–	$0
2000	–	–	–	1	31.1%	39,223	7,050	15.2%	2	–	–	–	17.5%	36,296	9,977	21.6%	$2,011
2001	–	–	–	–	28.2%	38,174	15,149	32.7%	1	–	–	–	17.6%	36,294	19,956	43.1%	($72,357)
2002	–	–	–	–	24.8%	42,763	18,658	40.3%	1	–	–	–	17.1%	40,239	25,991	56.2%	($65,933)
2003	–	–	–	–	21.6%	44,315	20,616	44.6%	2	–	–	–	19.1%	41,908	30,355	65.6%	($63,515)
2004	–	–	–	–	17.5%	44,436	22,453	48.5%	1	–	–	–	17.5%	43,030	33,599	72.6%	($51,761)
2005	2	–	–	–	19.0%	48,711	20,015	43.3%	2	–	–	–	19.0%	47,235	32,637	70.5%	($40,997)
2006	1	–	–	–	18.0%	50,752	15,536	33.6%	1	–	–	–	18.0%	48,196	30,713	66.4%	($27,950)
2007	2	–	–	–	19.1%	50,361	11,448	24.7%	2	–	–	–	19.1%	48,913	28,074	60.7%	($30,501)
2008	–	–	1	–	24.6%	47,545	10,176	22.0%	–	–	1	–	24.6%	44,062	30,285	65.4%	($40,439)
2009	–	–	–	–	21.4%	49,643	6,806	14.7%	–	–	–	–	21.4%	46,172	30,386	65.7%	($32,883)
2010	–	–	–	–	18.2%	49,228	1,052	2.4%	–	–	–	–	18.2%	46,816	27,044	62.2%	($28,525)
2011	–	–	–	1	24.5%	41,303	3,222	7.4%	–	–	–	1	24.5%	36,506	34,012	78.2%	($62,011)
2012	–	–	–	–	21.5%	44,034	2,663	6.1%	–	–	–	–	21.5%	38,038	39,448	90.7%	($46,987)
2013	–	–	–	–	18.7%	42,801	3,336	7.7%	–	–	–	–	18.7%	38,573	44,349	102.0%	($44,349)
Totals	5	0	1	2					12	0	1	1					

Short term present worth difference: ($252,858)
Long term present worth difference: ($390,226)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C4CP05/16/93

FIGURE 16 – IMPACT OF PROPOSED DSM PROGRAMS

1993 BASE CASE LOAD FORECAST PLUS ALUMAX
(ALUMAX LOAD IN ALL YEARS)

Year	LEAST COST PLAN WITHOUT DSM ESED: $0/TON – WINYAH #1 FGD 2000					LEAST COST PLAN WITH DSM ESED: $0/TON – WINYAH #1 FGD 2000					TOTAL DSM		COST REDUCTIONS ASSOCIATED WITH DSM		
	FUTURE UNITS				DEMAND	FUTURE UNITS				DEMAND	DEMAND	ENERGY	ANNUAL TOTAL	FIXED RATE	VARIABLE RATE
	CT	CC	C1	C2	(MW)	CT	CC	C1	C2	(MW)	(MW)	(MWh)	($000)	($/kW)	($/kWh)
1993	–	–	–	–	2,780	–	–	–	–	2,780	0	0	$0	$0.00	$0.000
1994	–	–	–	–	2,886	–	–	–	–	2,883	3	5,903	$204	$0.00	$0.035
1995	–	–	–	–	2,928	–	–	–	–	2,920	8	17,740	$273	$0.00	$0.015
1996	–	–	–	–	2,995	–	–	–	–	2,980	15	35,875	$1,594	$0.00	$0.044
1997	–	–	–	–	3,066	–	–	–	–	3,045	21	54,033	$1,457	$0.00	$0.027
1998	–	–	–	–	3,097	–	–	–	–	3,070	27	71,463	$1,594	$0.00	$0.022
1999	–	–	–	–	3,127	–	–	–	–	3,094	33	87,417	$2,472	$0.00	$0.028
2000	3	–	–	–	3,203	2	–	–	–	3,169	34	102,453	$2,923	$1.38	$0.028
2001	1	–	–	–	3,279	1	–	–	–	3,236	43	117,974	$7,315	$90.53	$0.029
2002	1	–	–	–	3,366	1	–	–	–	3,317	49	133,668	$8,310	$79.49	$0.033
2003	1	–	–	–	3,454	2	–	–	–	3,398	56	148,736	$13,192	$68.64	$0.063
2004	2	–	–	–	3,572	1	–	–	–	3,511	61	164,798	$5,641	($6.97)	$0.037
2005	2	–	–	–	3,666	2	–	–	–	3,604	62	179,253	$15,903	$65.71	$0.066
2006	1	–	–	–	3,767	1	–	–	–	3,700	67	193,993	$19,201	$60.85	$0.078
2007	2	–	–	–	3,866	2	–	–	–	3,785	81	208,143	$22,359	$50.35	$0.088
2008	–	–	1	–	3,970	–	–	1	–	3,883	87	221,709	$15,340	$46.92	$0.051
2009	–	–	–	–	4,074	–	–	–	–	3,982	92	232,823	$16,372	$44.39	$0.053
2010	–	–	–	–	4,182	–	–	–	–	4,084	98	243,082	$14,570	$41.70	$0.043
2011	–	–	–	1	4,295	–	–	–	1	4,202	93	252,504	$13,913	$43.98	$0.039
2012	–	–	–	–	4,409	–	–	–	–	4,299	110	262,056	$18,653	$37.21	$0.056
2013	–	–	–	–	4,523	–	–	–	–	4,397	126	271,608	$22,128	$32.51	$0.066
Totals	13	0	1	1		12	0	1	1						

01.d

02.Dd

CT: 80 MW Combustion Turbine
CC: 120 MW Combined Cycle
C1: 320 MW Coal
C2: 560 MW Coal

6.5 Sensitivity Analysis

In both the high- and low-growth sensitivity analyses, least cost compliance with the CAA can be achieved by installing an FGD system on Winyah 1. In the low-growth scenario, the Winyah 1 FGD system is needed in 2011, while in the high-growth scenario, the system is needed in 2000.

Low Growth Scenario

Additional results of the sensitivity analyses for the low-growth scenario are as follows:

1. The addition of new capacity is deferred two years. Without the proposed new DSM, the addition of new capacity is deferred from 2002 to 2004. With the proposed new DSM, the addition is deferred from 2003 to 2005.

2. No new coal units are added through 2013. Only combustion turbine and combined cycle units are added in the low-growth plans.

High Growth Scenario

Additional results of the sensitivity analyses for the high-growth scenario are as follows:

1. The addition of new capacity is accelerated by two years. The addition of new capacity is accelerated from 2000 to 1998.

2. The first coal unit is added in 2006. The first coal unit added is a 560 MW unit in 2006 instead of a 320 MW unit in 2008. The second coal unit, a 560 MW unit in 2011, is the same as in the plan for the base forecast.

FIGURE 17 – SENSITIVITY ANALYSIS
1993 BASE CASE LOAD FORECAST
(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE FORECAST WITHOUT PROPOSED NEW DSM					LOW GROWTH CASE WITHOUT PROPOSED NEW DSM					AVERAGE SYSTEM BUSBAR COSTS IN $/MWh		
	FUTURE UNITS				DEMAND	FUTURE UNITS				DEMAND	BASE	LOW GROWTH	
	CT	CC	C1	C2	(MW)	CT	CC	C1	C2	(MW)	FORECAST	SCENARIO	% DIFFERENCE
1993	–	–	–	–	2,780	–	–	–	–	2,780	$45.61	$45.61	0.00%
1994	–	–	–	–	2,886	–	–	–	–	2,872	$47.59	$47.70	0.23%
1995	–	–	–	–	2,928	–	–	–	–	2,899	$47.66	$47.92	0.56%
1996	–	–	–	–	2,995	–	–	–	–	2,950	$49.44	$49.85	0.84%
1997	–	–	–	–	3,066	–	–	–	–	3,005	$51.23	$51.82	1.14%
1998	–	–	–	–	3,097	–	–	–	–	3,020	$51.97	$52.68	1.37%
1999	–	–	–	–	3,127	–	–	–	–	3,034	$54.42	$55.30	1.61%
2000	–	–	–	–	2,968	–	–	–	–	2,866	$60.35	$61.55	1.98%
2001	–	–	–	–	2,968	–	–	–	–	2,851	$62.33	$63.74	2.27%
2002	1	–	–	–	3,055	–	–	–	–	2,920	$65.16	$66.82	2.55%
2003	1	–	–	–	3,143	–	–	–	–	2,989	$68.05	$69.70	2.41%
2004	2	–	–	–	3,261	1	–	–	–	3,086	$70.11	$71.75	2.34%
2005	1	–	–	–	3,355	1	–	–	–	3,159	$74.31	$75.92	2.17%
2006	1	–	–	–	3,456	1	–	–	–	3,238	$77.86	$79.57	2.20%
2007	2	–	–	–	3,555	2	–	–	–	3,314	$80.63	$82.73	2.60%
2008	2	–	–	–	3,659	1	–	–	–	3,394	$85.24	$87.57	2.73%
2009	1	–	–	–	3,763	1	–	–	–	3,473	$89.56	$91.80	2.50%
2010	–	1	–	–	3,871	1	–	–	–	3,555	$93.10	$95.86	2.96%
2011	–	–	–	1	3,984	2	1	–	–	3,640	$96.88	$100.62	3.86%
2012	–	–	–	–	4,098	–	2 *	–	–	3,726	$109.01	$109.34	0.31%
2013	–	–	–	–	4,212	–	3 *	–	–	3,812	$112.45	$112.53	0.07%
Totals	11	1	0	1		5	6	0	0				

CT: 80 MW Combustion Turbine
CC: 120 MW Combined Cycle
C1: 320 MW Coal
C2: 560 MW Coal
* 40 MW heat recovery unit only.

Difference in Total System Costs ($1993)
(Base Forecast – Low Growth Scenario)

Short Term Difference: $370,559,000
Long Term Difference: $1,331,570,000

FIGURE 18 – SENSITIVITY ANALYSIS
1993 BASE CASE LOAD FORECAST
(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE FORECAST WITH PROPOSED NEW DSM					LOW GROWTH CASE WITH PROPOSED NEW DSM					AVERAGE SYSTEM BUSBAR COSTS IN $/MWh		
	FUTURE UNITS				DEMAND	FUTURE UNITS				DEMAND	BASE	LOW GROWTH	
	CT	CC	C1	C2	(MW)	CT	CC	C1	C2	(MW)	FORECAST	SCENARIO	% DIFFERENCE
1993	–	–	–	–	2,780	–	–	–	–	2,780	$45.61	$45.61	0.00%
1994	–	–	–	–	2,883	–	–	–	–	2,869	$47.59	$47.70	0.23%
1995	–	–	–	–	2,920	–	–	–	–	2,891	$47.69	$47.96	0.56%
1996	–	–	–	–	2,980	–	–	–	–	2,935	$49.45	$49.86	0.83%
1997	–	–	–	–	3,045	–	–	–	–	2,984	$51.31	$51.91	1.16%
1998	–	–	–	–	3,070	–	–	–	–	2,993	$52.10	$52.81	1.37%
1999	–	–	–	–	3,094	–	–	–	–	3,001	$54.56	$55.45	1.64%
2000	–	–	–	–	2,953	–	–	–	–	2,851	$60.60	$61.83	2.04%
2001	–	–	–	–	2,925	–	–	–	–	2,808	$62.62	$64.08	2.33%
2002	–	–	–	–	3,006	–	–	–	–	2,871	$65.49	$67.17	2.57%
2003	1	–	–	–	3,087	–	–	–	–	2,933	$68.09	$70.08	2.92%
2004	2	–	–	–	3,200	–	–	–	–	3,025	$70.24	$72.20	2.79%
2005	1	–	–	–	3,293	1	–	–	–	3,097	$74.35	$76.06	2.31%
2006	2	–	–	–	3,389	1	–	–	–	3,171	$77.91	$79.81	2.45%
2007	1	–	–	–	3,474	1	–	–	–	3,233	$80.88	$82.93	2.53%
2008	1	–	–	–	3,572	2	–	–	–	3,307	$85.44	$87.66	2.59%
2009	2	–	–	–	3,671	1	–	–	–	3,381	$89.50	$92.20	3.02%
2010	1	–	–	–	3,773	1	–	–	–	3,457	$93.59	$96.44	3.05%
2011	–	–	–	1	3,891	1	4 *	–	–	3,547	$96.76	$101.27	4.67%
2012	–	–	–	–	3,988	–	2 *	–	–	3,616	$108.99	$110.25	1.15%
2013	–	–	–	–	4,086	–	2 *	–	–	3,686	$112.55	$114.30	1.55%
Totals	11	0	0	1		0	8	0	0				

CT: 80 MW Combustion Turbine
CC: 120 MW Combined Cycle
C1: 320 MW Coal
C2: 560 MW Coal
* 40 MW heat recovery unit only.

Difference in Total System Costs ($1993)
(Base Forecast – Low Growth Scenario)

Short Term Difference: $347,747,000
Long Term Difference: $1,221,211,000

FIGURE 19 – SENSITIVITY ANALYSIS
1993 BASE CASE LOAD FORECAST PLUS ALUMAX
(ALUMAX LOAD IN ALL YEARS)

Year	BASE FORECAST WITHOUT PROPOSED NEW DSM					HIGH GROWTH CASE WITHOUT PROPOSED NEW DSM					AVERAGE SYSTEM BUSBAR COSTS IN $/MWh		
	FUTURE UNITS				DEMAND	FUTURE UNITS				DEMAND	BASE	HIGH GROWTH	
	CT	CC	C1	C2	(MW)	CT	CC	C1	C2	(MW)	FORECAST	SCENARIO	% DIFFERENCE
1993	–	–	–	–	2,780	–	–	–	–	2,780	$45.61	$45.61	0.00%
1994	–	–	–	–	2,886	–	–	–	–	2,900	$47.59	$47.48	–0.22%
1995	–	–	–	–	2,928	–	–	–	–	2,957	$47.66	$48.06	0.86%
1996	–	–	–	–	2,995	–	–	–	–	3,040	$49.44	$49.04	–0.82%
1997	–	–	–	–	3,066	–	–	–	–	3,128	$51.23	$50.67	–1.09%
1998	–	–	–	–	3,097	1	–	–	–	3,175	$51.97	$51.30	–1.28%
1999	–	–	–	–	3,127	1	–	–	–	3,222	$54.42	$53.80	–1.14%
2000	3	–	–	–	3,203	2	–	–	–	3,317	$56.10	$55.57	–0.95%
2001	1	–	–	–	3,279	2	–	–	–	3,412	$57.74	$56.88	–1.48%
2002	1	–	–	–	3,366	1	–	–	–	3,521	$60.73	$59.94	–1.29%
2003	1	–	–	–	3,454	2	–	–	–	3,631	$63.56	$62.72	–1.33%
2004	2	–	–	–	3,572	2	–	–	–	3,773	$65.62	$64.85	–1.17%
2005	2	–	–	–	3,666	2	–	–	–	3,892	$69.89	$69.05	–1.20%
2006	1	–	–	–	3,767	–	–	–	1	4,019	$74.06	$70.88	–4.29%
2007	2	–	–	–	3,866	–	–	–	–	4,146	$76.62	$78.46	2.40%
2008	–	–	1	–	3,970	–	–	–	–	4,278	$79.73	$81.93	2.76%
2009	–	–	–	–	4,074	1	–	–	–	4,412	$87.26	$85.10	–2.47%
2010	–	–	–	–	4,182	2	–	–	–	4,552	$92.16	$88.14	–4.35%
2011	–	–	–	1	4,295	–	–	–	1	4,698	$92.92	$90.71	–2.37%
2012	–	–	–	–	4,409	–	–	–	–	4,847	$104.05	$101.06	–2.88%
2013	–	–	–	–	4,523	1	–	–	–	4,996	$107.49	$104.00	–3.25%
Totals	13	0	1	1		17	0	0	2				

CT: 80 MW Combustion Turbine
CC: 120 MW Combined Cycle
C1: 320 MW Coal
C2: 560 MW Coal

Difference in Total System Costs ($1993)
(Base Forecast – High Growth Scenario)

Short Term Difference: –$495,405,000
Long Term Difference: –$1,524,393,000

FIGURE 20 – SENSITIVITY ANALYSIS
1993 BASE CASE LOAD FORECAST PLUS ALUMAX
(ALUMAX LOAD IN ALL YEARS)

Year	BASE FORECAST WITH PROPOSED NEW DSM					HIGH GROWTH CASE WITH PROPOSED NEW DSM					AVERAGE SYSTEM BUSBAR COSTS IN $/MWh		
	FUTURE UNITS				DEMAND	FUTURE UNITS				DEMAND	BASE	HIGH GROWTH	
	CT	CC	C1	C2	(MW)	CT	CC	C1	C2	(MW)	FORECAST	SCENARIO	% DIFFERENCE
1993	–	–	–	–	2,780	–	–	–	–	2,780	$45.61	$45.61	0.00%
1994	–	–	–	–	2,883	–	–	–	–	2,897	$47.59	$47.48	–0.22%
1995	–	–	–	–	2,920	–	–	–	–	2,949	$47.69	$47.44	–0.54%
1996	–	–	–	–	2,980	–	–	–	–	3,025	$49.45	$49.03	–0.85%
1997	–	–	–	–	3,045	–	–	–	–	3,107	$51.31	$50.75	–1.11%
1998	–	–	–	–	3,070	1	–	–	–	3,148	$52.10	$51.43	–1.28%
1999	–	–	–	–	3,094	–	–	–	–	3,189	$54.56	$53.93	–1.15%
2000	2	–	–	–	3,169	3	–	–	–	3,283	$56.27	$55.51	–1.34%
2001	1	–	–	–	3,236	1	–	–	–	3,369	$57.71	$57.05	–1.14%
2002	1	–	–	–	3,317	2	–	–	–	3,472	$60.72	$59.92	–1.32%
2003	2	–	–	–	3,398	1	–	–	–	3,575	$63.35	$62.62	–1.15%
2004	1	–	–	–	3,511	2	–	–	–	3,712	$65.90	$64.81	–1.66%
2005	2	–	–	–	3,604	2	–	–	–	3,830	$69.71	$68.84	–1.25%
2006	1	–	–	–	3,700	–	–	–	1	3,952	$73.81	$70.92	–3.92%
2007	2	–	–	–	3,785	–	–	–	–	4,065	$76.29	$78.43	2.80%
2008	–	–	1	–	3,883	–	–	–	–	4,191	$79.85	$82.16	2.90%
2009	–	–	–	–	3,982	–	–	–	–	4,320	$87.45	$85.29	–2.46%
2010	–	–	–	–	4,084	2	–	–	–	4,454	$90.80	$88.25	–2.80%
2011	–	–	–	1	4,202	–	–	–	1	4,605	$93.37	$90.76	–2.79%
2012	–	–	–	–	4,299	–	–	–	–	4,737	$104.45	$101.04	–3.27%
2013	–	–	–	–	4,397	–	1	–	–	4,870	$107.81	$103.94	–3.60%
Totals	12	0	1	1		14	1	0	2				

CT: 80 MW Combustion Turbine
CC: 120 MW Combined Cycle
C1: 320 MW Coal
C2: 560 MW Coal

Difference in Total System Costs ($1993)
(Base Forecast – Low Growth Scenario)

Short Term Difference: $481,473,000
Long Term Difference: $1,504,119,000

7. RECOMMENDATIONS

Good - development of recommendations serve as future guidelines; also basis for follow-up and review.

The following recommendations of actions to be taken by Santee Cooper are based on results of analyses performed during this study:

1. Continue the construction of Cross 1 and place in service as soon as possible (COD May, 1995).

2. Continue investigating the possibility of selling reserve capacity following the completion of Cross 1.

3. Develop site plans for the construction of several combustion turbine unit installations. At least eight combustion turbine units will be needed over an approximately 10-year period beginning 1998-2005.

4. Continue to monitor and evaluate possibilities for buying and selling SO_2 allowances. The buying and selling of allowances could offset costs associated with the CAA compliance strategies outlined in this report.

5. Develop preliminary plans and schedules for retrofitting the Winyah 1 unit with an FGD system and determine the critical decision date for committing to the addition of the system. An FGD system will be needed for Winyah 1 if Alumax remains on the system unless other more cost effective compliance strategies emerge.

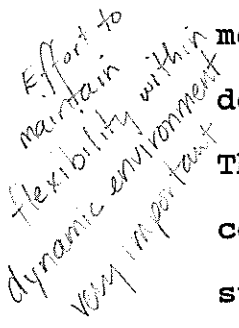
6. Continue investigating other methods for achieving compliance with the CAA, including purchasing allowances, using fuel with a lower sulfur content, using Environmentally Sensitive Economic Dispatching, using natural gas at Winyah and other existing coal-fueled facilities, etc. Also investigate cost effective methods for deferring the Winyah 1 FGD system retrofit. Emerging technologies and markets, or other compliance options, may prove to be more cost effective to achieve CAA compliance if Alumax remains on the system.

7. Continue existing DSM programs, and monitor and evaluate the programs to reflect the appropriate costs and incentives. Existing DSM programs were found to be cost effective in this study.

8. Develop a plan to further evaluate and implement the identified and feasible DSM programs. Proposed new DSM programs were found to be cost effective in this study.

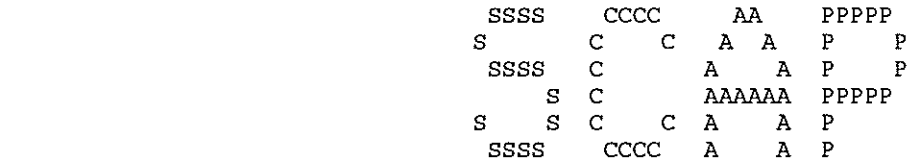
9. Continue reviewing and improving integrated resource planning procedures and study methodologies, and continue conducting integrated resource studies and sensitivity analyses based on updated input information and revised study assumptions. Periodically have an integrated resource plan conducted by an outside consulting agency to take advantage of additional sources of data on DSM programs and capacity expansion options.

10. Develop contingency plans to install future capacity to meet the highest growth scenario with the flexibility to defer the additions to meet the lowest growth scenario. The timing of new capacity additions following the completion of Cross 1 varies among the forecast scenarios studied.



APPENDIX A

Sample SCAP Summary Output



Start: Thu Jun 10 14:28:50 EDT 1993
End: Thu Jun 10 18:50:41 EDT 1993

Top 20 plans based on long-term present values

CATAGORY 4
SO2 compliance with 0% reserves required

Base Case Analysis - 1993 Load Forecast
Alumax load continued after April, 2000
Sequence 02

Total number of evaluated scenarios is: 1147658

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 1
Evaluated scenario is 2040

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	2	0	0	0	0	0	0	0	2752	1580	0	215	3866	0	17.0	0	621	681	60	18.7	46273	49474	23465	50.7
2008	0	0	1	0	0	0	0	0	2752	1900	0	215	3970	0	17.0	0	638	897	259	23.9	46273	45530	24208	52.3
2009	0	0	0	0	0	0	0	0	2752	1900	0	215	4074	0	17.0	0	656	793	137	20.5	46273	47175	23305	50.4
2010	0	0	0	0	0	0	0	0	2752	1900	0	215	4182	0	17.0	0	674	685	11	17.3	43474	47982	18798	43.2
2011	0	0	0	1	0	0	0	0	2582	2460	0	215	4295	0	17.0	0	694	962	268	23.6	43474	36663	25608	58.9
2012	0	0	0	0	0	0	0	0	2582	2460	0	215	4409	0	17.0	0	713	848	135	20.2	43474	38758	30324	69.8
2013	0	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	34313	78.9

Short-term present value of the plan is $ 12741356945. ($ 0. greater than the rank 1 plan)
Long-term present value of the plan is $ 34245518954. ($ 0. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 2
Evaluated scenario is 7480

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	0	0	1	0	0	0	0	0	2752	1740	0	215	3866	0	17.0	0	621	841	220	23.0	46273	41977	30962	66.9
2008	0	0	0	0	0	0	0	0	2752	1740	0	215	3970	0	17.0	0	638	737	99	19.6	46273	45530	31705	68.5
2009	1	0	0	0	0	0	0	0	2752	1820	0	215	4074	0	17.0	0	656	713	57	18.5	46273	47175	30802	66.6
2010	1	0	0	0	0	0	0	0	2752	1900	0	215	4182	0	17.0	0	674	685	11	17.3	43474	47982	26295	60.5
2011	0	0	0	1	0	0	0	0	2582	2460	0	215	4295	0	17.0	0	694	962	268	23.6	43474	36663	33105	76.1
2012	0	0	0	0	0	0	0	0	2582	2460	0	215	4409	0	17.0	0	713	848	135	20.2	43474	38758	37821	87.0
2013	0	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	41810	96.2

Short-term present value of the plan is $ 12739045585. ($ -2311360. greater than the rank 1 plan)
Long-term present value of the plan is $ 34248166772. ($ 2647818. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 3
Evaluated scenario is 15024

Available future units

1	80 MW	Combustion_Turbine
2	40 MW	Heat_Recovery_Unit
3	320 MW	Type_2_Coal_Unit
4	560 MW	Type_1_Coal_Unit

	Geneartion plan																					
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	0	0	1	0	0	0	0	0	2772	1660	0	215	3767	0	17.0	0	604	880	276	24.8	46273	41354	34268	74.1
2007	0	0	0	0	0	0	0	0	2752	1660	0	215	3866	0	17.0	0	621	761	140	20.8	46273	41977	38564	83.3
2008	0	0	0	0	0	0	0	0	2752	1660	0	215	3970	0	17.0	0	638	657	19	17.5	46273	45530	39306	84.9
2009	2	0	0	0	0	0	0	0	2752	1820	0	215	4074	0	17.0	0	656	713	57	18.5	46273	47175	38404	83.0
2010	1	0	0	0	0	0	0	0	2752	1900	0	215	4182	0	17.0	0	674	685	11	17.3	43474	47982	33896	78.0
2011	0	0	0	1	0	0	0	0	2582	2460	0	215	4295	0	17.0	0	694	962	268	23.6	43474	36663	40707	93.6
2012	0	0	0	0	0	0	0	0	2582	2460	0	215	4409	0	17.0	0	713	848	135	20.2	43474	38758	45423	104.5
2013	0	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	49411	113.7

Short-term present value of the plan is $ 12739349488. ($ -2007458. greater than the rank 1 plan)
Long-term present value of the plan is $ 34251539975. ($ 6021022. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 4
Evaluated scenario is 48459

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																					
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	0	0	1	0	0	0	0	0	2772	1500	0	215	3666	0	17.0	0	587	821	234	23.8	46273	39295	37641	81.3
2006	0	0	0	0	0	0	0	0	2772	1500	0	215	3767	0	17.0	0	604	720	116	20.3	46273	41354	42560	92.0
2007	1	0	0	0	0	0	0	0	2752	1580	0	215	3866	0	17.0	0	621	681	60	18.7	46273	41977	46856	101.3
2008	1	0	0	0	0	0	0	0	2752	1660	0	215	3970	0	17.0	0	638	657	19	17.5	46273	45530	47598	102.9
2009	2	0	0	0	0	0	0	0	2752	1820	0	215	4074	0	17.0	0	656	713	57	18.5	46273	47175	46696	100.9
2010	1	0	0	0	0	0	0	0	2752	1900	0	215	4182	0	17.0	0	674	685	11	17.3	43474	47982	42188	97.0
2011	0	0	0	1	0	0	0	0	2582	2460	0	215	4295	0	17.0	0	694	962	268	23.6	43474	36663	48999	112.7
2012	0	0	0	0	0	0	0	0	2582	2460	0	215	4409	0	17.0	0	713	848	135	20.2	43474	38758	53715	123.6
2013	0	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	57703	132.7

Short-term present value of the plan is $ 12733143459. ($ -8213486. greater than the rank 1 plan)
Long-term present value of the plan is $ 34257322838. ($ 11803884. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 5
Evaluated scenario is 2073

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	2	0	0	0	0	0	0	0	2752	1580	0	215	3866	0	17.0	0	621	681	60	18.7	46273	49474	23465	50.7
2008	0	0	0	1	0	0	0	0	2752	2140	0	215	3970	0	17.0	0	638	1137	499	30.3	46273	40578	29160	63.0
2009	0	0	0	0	0	0	0	0	2752	2140	0	215	4074	0	17.0	0	656	1033	377	26.8	46273	42005	33428	72.2
2010	0	0	0	0	0	0	0	0	2752	2140	0	215	4182	0	17.0	0	674	925	251	23.3	43474	42983	33920	78.0
2011	0	0	1	0	0	0	0	0	2582	2460	0	215	4295	0	17.0	0	694	962	268	23.6	43474	36663	40730	93.7
2012	0	0	0	0	0	0	0	0	2582	2460	0	215	4409	0	17.0	0	713	848	135	20.2	43474	38758	45446	104.5
2013	0	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	49435	113.7

Short-term present value of the plan is $ 12733797564. ($ -7559381. greater than the rank 1 plan)
Long-term present value of the plan is $ 34258509835. ($ 12990881. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 6
Evaluated scenario is 8042

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	0	0	0	1	0	0	0	0	2752	1980	0	215	3866	0	17.0	0	621	1081	460	29.6	46273	36880	36060	77.9
2008	0	0	0	0	0	0	0	0	2752	1980	0	215	3970	0	17.0	0	638	977	339	26.0	46273	40578	41755	90.2
2009	0	0	0	0	0	0	0	0	2752	1980	0	215	4074	0	17.0	0	656	873	217	22.6	46273	42005	46023	99.5
2010	0	0	0	0	0	0	0	0	2752	1980	0	215	4182	0	17.0	0	674	765	91	19.3	43474	42983	46514	107.0
2011	0	0	1	0	0	0	0	0	2582	2300	0	215	4295	0	17.0	0	694	802	108	19.7	43474	36663	53325	122.7
2012	1	0	0	0	0	0	0	0	2582	2380	0	215	4409	0	17.0	0	713	768	55	18.3	43474	38758	58040	133.5
2013	1	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	62029	142.7

Short-term present value of the plan is $ 12739909671. ($ -1447274. greater than the rank 1 plan)
Long-term present value of the plan is $ 34261136382. ($ 15617428. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 7
Evaluated scenario is 988

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan								Exist	Fut			Total		Des		Des	Act		Act	SO2	SO2	SO2	SO2
Year	1	2	3	4	5	6	7	8	Gen	Gen	Pur	SEPA	Load	Sales	%Res	Adder	Res	Res	Diff	%Res	Allow	Emit	Bank	%Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	2	0	0	0	0	0	0	0	2752	1580	0	215	3866	0	17.0	0	621	681	60	18.7	46273	49474	23465	50.7
2008	1	0	0	0	0	0	0	0	2752	1660	0	215	3970	0	17.0	0	638	657	19	17.5	46273	53060	16678	36.0
2009	0	0	0	1	0	0	0	0	2752	2220	0	215	4074	0	17.0	0	656	1113	457	28.8	46273	42005	20946	45.3
2010	0	0	0	0	0	0	0	0	2752	2220	0	215	4182	0	17.0	0	674	1005	331	25.3	43474	42983	21437	49.3
2011	0	0	0	0	0	0	0	0	2582	2220	0	215	4295	0	17.0	0	694	722	28	17.7	43474	41863	23047	53.0
2012	0	0	1	0	0	0	0	0	2582	2540	0	215	4409	0	17.0	0	713	928	215	22.1	43474	38758	27763	63.9
2013	0	0	0	0	0	0	0	0	2582	2540	0	215	4522	0	17.0	0	732	815	83	18.9	43474	39485	31752	73.0

Short-term present value of the plan is $ 12734883678. ($ -6473268. greater than the rank 1 plan)
Long-term present value of the plan is $ 34261349667. ($ 15830713. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 8
Evaluated scenario is 7605

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																					
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	0	0	1	0	0	0	0	0	2752	1740	0	215	3866	0	17.0	0	621	841	220	23.0	46273	41977	30962	66.9
2008	0	0	0	0	0	0	0	0	2752	1740	0	215	3970	0	17.0	0	638	737	99	19.6	46273	45530	31705	68.5
2009	1	0	0	0	0	0	0	0	2752	1820	0	215	4074	0	17.0	0	656	713	57	18.5	46273	47175	30802	66.6
2010	0	0	0	1	0	0	0	0	2752	2380	0	215	4182	0	17.0	0	674	1165	491	29.4	43474	39739	34538	79.4
2011	0	0	0	0	0	0	0	0	2582	2380	0	215	4295	0	17.0	0	694	882	188	21.6	43474	36663	41348	95.1
2012	0	0	0	0	0	0	0	0	2582	2380	0	215	4409	0	17.0	0	713	768	55	18.3	43474	38758	46064	106.0
2013	1	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	50053	115.1

Short-term present value of the plan is $ 12741312857. ($ -44088. greater than the rank 1 plan)
Long-term present value of the plan is $ 34265997352. ($ 20478398. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 9
Evaluated scenario is 105290

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	0	0	1	0	0	0	0	0	2772	1340	0	215	3572	0	17.0	0	571	755	184	22.5	46273	36432	38066	82.3
2005	0	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	39295	45043	97.3
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	41354	49963	108.0
2007	2	0	0	0	0	0	0	0	2752	1580	0	215	3866	0	17.0	0	621	681	60	18.7	46273	41977	54258	117.3
2008	1	0	0	0	0	0	0	0	2752	1660	0	215	3970	0	17.0	0	638	657	19	17.5	46273	45530	55001	118.9
2009	2	0	0	0	0	0	0	0	2752	1820	0	215	4074	0	17.0	0	656	713	57	18.5	46273	47175	54099	116.9
2010	1	0	0	0	0	0	0	0	2752	1900	0	215	4182	0	17.0	0	674	685	11	17.3	43474	47982	49591	114.1
2011	0	0	0	1	0	0	0	0	2582	2460	0	215	4295	0	17.0	0	694	962	268	23.6	43474	36663	56402	129.7
2012	0	0	0	0	0	0	0	0	2582	2460	0	215	4409	0	17.0	0	713	848	135	20.2	43474	38758	61117	140.6
2013	0	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	65106	149.8

Short-term present value of the plan is $ 12738277986. ($ -3078959. greater than the rank 1 plan)
Long-term present value of the plan is $ 34266435311. ($ 20916357. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 10
Evaluated scenario is 973

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																					
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	2	0	0	0	0	0	0	0	2752	1580	0	215	3866	0	17.0	0	621	681	60	18.7	46273	49474	23465	50.7
2008	1	0	0	0	0	0	0	0	2752	1660	0	215	3970	0	17.0	0	638	657	19	17.5	46273	53060	16678	36.0
2009	0	0	1	0	0	0	0	0	2752	1980	0	215	4074	0	17.0	0	656	873	217	22.6	46273	47175	15775	34.1
2010	0	0	0	0	0	0	0	0	2752	1980	0	215	4182	0	17.0	0	674	765	91	19.3	43474	47982	11268	25.9
2011	0	0	0	1	0	0	0	0	2582	2540	0	215	4295	0	17.0	0	694	1042	348	25.5	43474	36663	18078	41.6
2012	0	0	0	0	0	0	0	0	2582	2540	0	215	4409	0	17.0	0	713	928	215	22.1	43474	38758	22794	52.4
2013	0	0	0	0	0	0	0	0	2582	2540	0	215	4522	0	17.0	0	732	815	83	18.9	43474	39485	26783	61.6

Short-term present value of the plan is $ 12740064013. ($ -1292932. greater than the rank 1 plan)
Long-term present value of the plan is $ 34266678454. ($ 21159500. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 11
Evaluated scenario is 2055

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	2	0	0	0	0	0	0	0	2752	1580	0	215	3866	0	17.0	0	621	681	60	18.7	46273	49474	23465	50.7
2008	0	0	0	1	0	0	0	0	2752	2140	0	215	3970	0	17.0	0	638	1137	499	30.3	46273	40578	29160	63.0
2009	0	0	0	0	0	0	0	0	2752	2140	0	215	4074	0	17.0	0	656	1033	377	26.8	46273	42005	33428	72.2
2010	0	0	0	0	0	0	0	0	2752	2140	0	215	4182	0	17.0	0	674	925	251	23.3	43474	42983	33920	78.0
2011	1	0	0	0	0	0	0	0	2582	2220	0	215	4295	0	17.0	0	694	722	28	17.7	43474	41863	35530	81.7
2012	0	0	1	0	0	0	0	0	2582	2540	0	215	4409	0	17.0	0	713	928	215	22.1	43474	38758	40246	92.6
2013	0	0	0	0	0	0	0	0	2582	2540	0	215	4522	0	17.0	0	732	815	83	18.9	43474	39485	44234	101.7

Short-term present value of the plan is $ 12740619718. ($ -737227. greater than the rank 1 plan)
Long-term present value of the plan is $ 34267437931. ($ 21918977. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 12
Evaluated scenario is 15889

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	0	0	0	1	0	0	0	0	2772	1900	0	215	3767	0	17.0	0	604	1120	516	31.5	46273	36199	39423	85.2
2007	0	0	0	0	0	0	0	0	2752	1900	0	215	3866	0	17.0	0	621	1001	380	27.4	46273	36880	48816	105.5
2008	0	0	0	0	0	0	0	0	2752	1900	0	215	3970	0	17.0	0	638	897	259	23.9	46273	40578	54511	117.8
2009	0	0	0	0	0	0	0	0	2752	1900	0	215	4074	0	17.0	0	656	793	137	20.5	46273	42005	58779	127.0
2010	0	0	0	0	0	0	0	0	2752	1900	0	215	4182	0	17.0	0	674	685	11	17.3	43474	42983	59270	136.3
2011	0	0	1	0	0	0	0	0	2582	2220	0	215	4295	0	17.0	0	694	722	28	17.7	43474	36663	66081	152.0
2012	2	0	0	0	0	0	0	0	2582	2380	0	215	4409	0	17.0	0	713	768	55	18.3	43474	38758	70797	162.8
2013	1	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	74785	172.0

Short-term present value of the plan is $ 12740512912. ($ -844034. greater than the rank 1 plan)
Long-term present value of the plan is $ 34267811651. ($ 22292697. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 13
Evaluated scenario is 15149

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																					
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	0	0	1	0	0	0	0	0	2772	1660	0	215	3767	0	17.0	0	604	880	276	24.8	46273	41354	34268	74.1
2007	0	0	0	0	0	0	0	0	2752	1660	0	215	3866	0	17.0	0	621	761	140	20.8	46273	41977	38564	83.3
2008	0	0	0	0	0	0	0	0	2752	1660	0	215	3970	0	17.0	0	638	657	19	17.5	46273	45530	39306	84.9
2009	2	0	0	0	0	0	0	0	2752	1820	0	215	4074	0	17.0	0	656	713	57	18.5	46273	47175	38404	83.0
2010	0	0	0	1	0	0	0	0	2752	2380	0	215	4182	0	17.0	0	674	1165	491	29.4	43474	39739	42139	96.9
2011	0	0	0	0	0	0	0	0	2582	2380	0	215	4295	0	17.0	0	694	882	188	21.6	43474	36663	48950	112.6
2012	0	0	0	0	0	0	0	0	2582	2380	0	215	4409	0	17.0	0	713	768	55	18.3	43474	38758	53666	123.4
2013	1	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	57654	132.6

Short-term present value of the plan is $ 12737864833. ($ -3492113. greater than the rank 1 plan)
Long-term present value of the plan is $ 34269370555. ($ 23851601. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 14
Evaluated scenario is 4727

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	1	1	0	0	0	0	0	0	2752	1540	0	215	3866	0	17.0	0	621	641	20	17.6	46273	49367	23572	50.9
2008	0	0	1	0	0	0	0	0	2752	1860	0	215	3970	0	17.0	0	638	857	219	22.8	46273	45868	23977	51.8
2009	0	0	0	0	0	0	0	0	2752	1860	0	215	4074	0	17.0	0	656	753	97	19.5	46273	47590	22660	49.0
2010	1	0	0	0	0	0	0	0	2752	1940	0	215	4182	0	17.0	0	674	725	51	18.3	43474	47927	18207	41.9
2011	0	0	0	1	0	0	0	0	2582	2500	0	215	4295	0	17.0	0	694	1002	308	24.6	43474	36948	24733	56.9
2012	0	0	0	0	0	0	0	0	2582	2500	0	215	4409	0	17.0	0	713	888	175	21.2	43474	39012	29195	67.2
2013	0	0	0	0	0	0	0	0	2582	2500	0	215	4522	0	17.0	0	732	775	43	18.0	43474	39241	33428	76.9

Short-term present value of the plan is $ 12735593725. ($ -5763221. greater than the rank 1 plan)
Long-term present value of the plan is $ 34272131148. ($ 26612195. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 15
Evaluated scenario is 7993

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																					
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	0	0	0	1	0	0	0	0	2752	1980	0	215	3866	0	17.0	0	621	1081	460	29.6	46273	36880	36060	77.9
2008	0	0	0	0	0	0	0	0	2752	1980	0	215	3970	0	17.0	0	638	977	339	26.0	46273	40578	41755	90.2
2009	0	0	0	0	0	0	0	0	2752	1980	0	215	4074	0	17.0	0	656	873	217	22.6	46273	42005	46023	99.5
2010	0	0	0	0	0	0	0	0	2752	1980	0	215	4182	0	17.0	0	674	765	91	19.3	43474	42983	46514	107.0
2011	3	0	0	0	0	0	0	0	2582	2220	0	215	4295	0	17.0	0	694	722	28	17.7	43474	41863	48125	110.7
2012	0	0	1	0	0	0	0	0	2582	2540	0	215	4409	0	17.0	0	713	928	215	22.1	43474	38758	52840	121.5
2013	0	0	0	0	0	0	0	0	2582	2540	0	215	4522	0	17.0	0	732	815	83	18.9	43474	39485	56829	130.7

Short-term present value of the plan is $ 12740863959. ($ -492987. greater than the rank 1 plan)
Long-term present value of the plan is $ 34272848919. ($ 27329966. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 16
Evaluated scenario is 18558

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	1	1	0	0	0	0	0	0	2772	1300	0	215	3666	0	17.0	0	587	621	34	18.0	46273	47513	29423	63.6
2006	2	0	0	0	0	0	0	0	2772	1460	0	215	3767	0	17.0	0	604	680	76	19.1	46273	48838	26858	58.0
2007	1	0	0	0	0	0	0	0	2752	1540	0	215	3866	0	17.0	0	621	641	20	17.6	46273	49367	23764	51.4
2008	0	0	1	0	0	0	0	0	2752	1860	0	215	3970	0	17.0	0	638	857	219	22.8	46273	45868	24169	52.2
2009	0	0	0	0	0	0	0	0	2752	1860	0	215	4074	0	17.0	0	656	753	97	19.5	46273	47590	22851	49.4
2010	1	0	0	0	0	0	0	0	2752	1940	0	215	4182	0	17.0	0	674	725	51	18.3	43474	47927	18398	42.3
2011	0	0	0	1	0	0	0	0	2582	2500	0	215	4295	0	17.0	0	694	1002	308	24.6	43474	36948	24925	57.3
2012	0	0	0	0	0	0	0	0	2582	2500	0	215	4409	0	17.0	0	713	888	175	21.2	43474	39012	29387	67.6
2013	0	0	0	0	0	0	0	0	2582	2500	0	215	4522	0	17.0	0	732	775	43	18.0	43474	39241	33620	77.3

Short-term present value of the plan is $ 12739644232. ($ -1712713. greater than the rank 1 plan)
Long-term present value of the plan is $ 34273387470. ($ 27868516. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 17
Evaluated scenario is 7696

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	1	0	0	0	0	0	0	0	2772	1420	0	215	3767	0	17.0	0	604	640	36	18.0	46273	48955	26666	57.6
2007	0	0	1	0	0	0	0	0	2752	1740	0	215	3866	0	17.0	0	621	841	220	23.0	46273	41977	30962	66.9
2008	0	0	0	0	0	0	0	0	2752	1740	0	215	3970	0	17.0	0	638	737	99	19.6	46273	45530	31705	68.5
2009	0	1	0	0	0	0	0	0	2752	1780	0	215	4074	0	17.0	0	656	673	17	17.4	46273	47590	30387	65.7
2010	2	0	0	0	0	0	0	0	2752	1940	0	215	4182	0	17.0	0	674	725	51	18.3	43474	47927	25935	59.7
2011	0	0	0	1	0	0	0	0	2582	2500	0	215	4295	0	17.0	0	694	1002	308	24.6	43474	36948	32461	74.7
2012	0	0	0	0	0	0	0	0	2582	2500	0	215	4409	0	17.0	0	713	888	175	21.2	43474	39012	36923	84.9
2013	0	0	0	0	0	0	0	0	2582	2500	0	215	4522	0	17.0	0	732	775	43	18.0	43474	39241	41156	94.7

Short-term present value of the plan is $ 12733943405. ($ -7413541. greater than the rank 1 plan)
Long-term present value of the plan is $ 34273833606. ($ 28314652. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 18
Evaluated scenario is 48584

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	0	0	1	0	0	0	0	0	2772	1500	0	215	3666	0	17.0	0	587	821	234	23.8	46273	39295	37641	81.3
2006	0	0	0	0	0	0	0	0	2772	1500	0	215	3767	0	17.0	0	604	720	116	20.3	46273	41354	42560	92.0
2007	1	0	0	0	0	0	0	0	2752	1580	0	215	3866	0	17.0	0	621	681	60	18.7	46273	41977	46856	101.3
2008	1	0	0	0	0	0	0	0	2752	1660	0	215	3970	0	17.0	0	638	657	19	17.5	46273	45530	47598	102.9
2009	2	0	0	0	0	0	0	0	2752	1820	0	215	4074	0	17.0	0	656	713	57	18.5	46273	47175	46696	100.9
2010	0	0	0	1	0	0	0	0	2752	2380	0	215	4182	0	17.0	0	674	1165	491	29.4	43474	39739	50431	116.0
2011	0	0	0	0	0	0	0	0	2582	2380	0	215	4295	0	17.0	0	694	882	188	21.6	43474	36663	57242	131.7
2012	0	0	0	0	0	0	0	0	2582	2380	0	215	4409	0	17.0	0	713	768	55	18.3	43474	38758	61958	142.5
2013	1	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	65946	151.7

Short-term present value of the plan is $ 12740718118. ($ -638827. greater than the rank 1 plan)
Long-term present value of the plan is $ 34275153418. ($ 29634464. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 19
Evaluated scenario is 15240

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																					
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	2	0	0	0	0	0	0	0	2772	1340	0	215	3666	0	17.0	0	587	661	74	19.2	46273	47587	29349	63.4
2006	0	0	1	0	0	0	0	0	2772	1660	0	215	3767	0	17.0	0	604	880	276	24.8	46273	41354	34268	74.1
2007	0	0	0	0	0	0	0	0	2752	1660	0	215	3866	0	17.0	0	621	761	140	20.8	46273	41977	38564	83.3
2008	0	0	0	0	0	0	0	0	2752	1660	0	215	3970	0	17.0	0	638	657	19	17.5	46273	45530	39306	84.9
2009	1	1	0	0	0	0	0	0	2752	1780	0	215	4074	0	17.0	0	656	673	17	17.4	46273	47590	37989	82.1
2010	2	0	0	0	0	0	0	0	2752	1940	0	215	4182	0	17.0	0	674	725	51	18.3	43474	47927	33536	77.1
2011	0	0	0	1	0	0	0	0	2582	2500	0	215	4295	0	17.0	0	694	1002	308	24.6	43474	36948	40062	92.2
2012	0	0	0	0	0	0	0	0	2582	2500	0	215	4409	0	17.0	0	713	888	175	21.2	43474	39012	44524	102.4
2013	0	0	0	0	0	0	0	0	2582	2500	0	215	4522	0	17.0	0	732	775	43	18.0	43474	39241	48757	112.2

Short-term present value of the plan is $ 12740283137. ($ -1073808. greater than the rank 1 plan)
Long-term present value of the plan is $ 34277206810. ($ 31687856. greater than the rank 1 plan)

Long-term present value list

Top 20 cost catagory # 4
Top 20 scenario rank is 20
Evaluated scenario is 52664

Available future units

1 80 MW Combustion_Turbine
2 40 MW Heat_Recovery_Unit
3 320 MW Type_2_Coal_Unit
4 560 MW Type_1_Coal_Unit

	Geneartion plan																				
Year	1	2	3	4	5	6	7	8	Exist Gen	Fut Gen	Pur	SEPA	Total Load	Sales	Des %Res	Adder	Des Res	Act Res	Diff	Act %Res	SO2 Allow	SO2 Emit	SO2 Bank	SO2 %Res
1993	0	0	0	0	0	0	0	0	2864	0	75	215	2703	77	1.0	0	25	374	349	15.0	0	58619	0	.0
1994	0	0	0	0	0	0	0	0	2864	0	200	215	2786	100	1.0	0	26	393	367	15.3	0	60846	0	.0
1995	0	0	0	0	0	0	0	0	2864	540	0	215	2828	100	17.0	0	444	691	247	26.4	0	43650	0	.0
1996	0	0	0	0	0	0	0	0	2864	540	0	215	2895	100	17.0	0	456	624	168	23.3	0	47035	0	.0
1997	0	0	0	0	0	0	0	0	2864	540	0	215	2966	100	17.0	0	468	553	85	20.1	0	50074	0	.0
1998	0	0	0	0	0	0	0	0	2864	540	0	215	3047	50	17.0	0	481	522	41	18.4	0	48441	0	.0
1999	0	0	0	0	0	0	0	0	2864	540	0	215	3127	0	16.0	0	466	492	26	16.9	0	52252	0	.0
2000	3	0	0	0	0	0	0	0	2772	780	0	215	3203	0	17.0	0	508	564	56	18.9	46273	36903	9370	20.3
2001	1	0	0	0	0	0	0	0	2772	860	0	215	3279	0	17.0	0	521	568	47	18.5	46273	36792	18852	40.7
2002	1	0	0	0	0	0	0	0	2772	940	0	215	3366	0	17.0	0	536	561	25	17.8	46273	41059	24065	52.0
2003	1	0	0	0	0	0	0	0	2772	1020	0	215	3454	0	17.0	0	551	553	2	17.1	46273	42114	28225	61.0
2004	2	0	0	0	0	0	0	0	2772	1180	0	215	3572	0	17.0	0	571	595	24	17.7	46273	43835	30663	66.3
2005	0	0	0	1	0	0	0	0	2772	1740	0	215	3666	0	17.0	0	587	1061	474	30.7	46273	34786	42150	91.1
2006	0	0	0	0	0	0	0	0	2772	1740	0	215	3767	0	17.0	0	604	960	356	27.0	46273	36199	52224	112.9
2007	0	0	0	0	0	0	0	0	2752	1740	0	215	3866	0	17.0	0	621	841	220	23.0	46273	36880	61618	133.2
2008	0	0	0	0	0	0	0	0	2752	1740	0	215	3970	0	17.0	0	638	737	99	19.6	46273	40578	67313	145.5
2009	1	0	0	0	0	0	0	0	2752	1820	0	215	4074	0	17.0	0	656	713	57	18.5	46273	42005	71581	154.7
2010	1	0	0	0	0	0	0	0	2752	1900	0	215	4182	0	17.0	0	674	685	11	17.3	43474	42983	72072	165.8
2011	0	0	1	0	0	0	0	0	2582	2220	0	215	4295	0	17.0	0	694	722	28	17.7	43474	36663	78883	181.4
2012	2	0	0	0	0	0	0	0	2582	2380	0	215	4409	0	17.0	0	713	768	55	18.3	43474	38758	83599	192.3
2013	1	0	0	0	0	0	0	0	2582	2460	0	215	4522	0	17.0	0	732	735	3	17.1	43474	39485	87587	201.5

Short-term present value of the plan is $ 12737904014. ($ -3452931. greater than the rank 1 plan)
Long-term present value of the plan is $ 34277307215. ($ 31788261. greater than the rank 1 plan)

APPENDIX B

Additional Capacity Expansion Plan Summaries

BASE AND ALTERNATE PLAN COMPARISONS

1993 BASE CASE LOAD FORECAST

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN ESED: $0/TON No FGD Retrofits				ALT. PLAN 1 ESED: $150/TON No FGD Retrofits				ALT. PLAN 2 ESED: $300/TON No FGD Retrofits				ALT. PLAN 3 ESED: $0/TON Winyah #1 FGD in 2006			
	FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS			
	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2
1993	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1994	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1995	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1996	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1997	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1998	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1999	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2001	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2002	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2003	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2004	–	–	–	1	2	–	–	–	2	–	–	–	2	–	–	–
2005	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2006	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2007	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2008	1	–	–	–	–	–	1	–	2	–	–	–	2	–	–	–
2009	1	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
2010	–	–	1	–	1	–	–	–	–	1	–	–	–	1	–	–
2011	2	–	–	–	–	–	1	–	–	–	–	1	–	–	–	1
2012	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
2013	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Totals	7	1	1	1	10	1	2	0	11	1	0	1	11	1	0	1
Savings over Base Plan																
Through 2013 (1993 Dollars)					$164,291,000				$210,321,000				$190,555,000			
Through 2057 (1993 Dollars)					$150,437,000				$255,679,000				$201,025,000			

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 01a — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON — NO FGD RETROFITS								ALTERNATE PLAN 1 01b — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON — NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.3%	–	–	–	–	–	–	–	15.3%	–	–	–	$0
1995	–	–	–	–	26.4%	–	–	–	–	–	–	–	26.4%	–	–	–	$0
1996	–	–	–	–	23.3%	–	–	–	–	–	–	–	23.3%	–	–	–	$0
1997	–	–	–	–	20.1%	–	–	–	–	–	–	–	20.1%	–	–	–	$0
1998	–	–	–	–	18.4%	–	–	–	–	–	–	–	18.4%	–	–	–	$0
1999	–	–	–	–	16.9%	–	–	–	–	–	–	–	16.9%	–	–	–	$0
2000	–	–	–	–	20.3%	44,092	2,181	4.7%	–	–	–	–	20.3%	36,827	9,446	20.4%	$606
2001	–	–	–	–	20.3%	40,477	7,977	17.2%	–	–	–	–	20.3%	33,014	22,705	49.1%	$519
2002	1	–	–	–	19.4%	44,537	9,713	21.0%	1	–	–	–	19.4%	38,090	30,888	66.8%	$656
2003	1	–	–	–	18.6%	46,560	9,426	20.4%	1	–	–	–	18.6%	40,107	37,054	80.1%	$557
2004	–	–	–	1	32.4%	34,478	21,221	45.9%	2	–	–	–	19.2%	41,320	42,007	90.8%	($4,053)
2005	–	–	–	–	28.4%	38,448	29,046	62.8%	1	–	–	–	18.2%	45,799	42,481	91.8%	($96,114)
2006	–	–	–	–	24.4%	40,945	34,375	74.3%	1	–	–	–	17.0%	48,883	39,871	86.2%	($84,990)
2007	–	–	–	–	20.1%	40,638	40,010	86.5%	2	–	–	–	17.7%	48,401	37,744	81.6%	($80,297)
2008	1	–	–	–	18.8%	44,425	41,858	90.5%	–	–	1	–	23.5%	43,914	40,103	86.7%	($73,807)
2009	1	–	–	–	17.6%	47,064	41,067	88.7%	–	–	–	–	19.8%	47,152	39,224	84.8%	$2,959
2010	–	–	1	–	22.9%	40,179	44,362	102.0%	1	–	–	–	18.5%	47,481	35,216	81.0%	($2,212)
2011	2	–	–	–	18.9%	42,813	45,023	103.0%	–	–	1	–	18.9%	40,901	37,790	86.9%	($90,787)
2012	1	–	–	–	17.5%	44,933	43,564	100.2%	1	–	–	–	17.5%	44,059	37,205	85.6%	($3,926)
2013	–	1	–	–	17.1%	44,397	42,641	98.1%	–	1	–	–	17.1%	44,252	36,427	83.8%	($794)
Totals	7	1	1	1					10	1	2	0					

Short term present worth difference: ($164,291)

Long term present worth difference: ($150,437)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/18.03

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 01A — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON — NO FGD RETROFITS								ALTERNATE PLAN 2 01.C — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON — NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.3%	–	–	–	–	–	–	–	15.3%	–	–	–	$0
1995	–	–	–	–	26.4%	–	–	–	–	–	–	–	26.4%	–	–	–	$0
1996	–	–	–	–	23.3%	–	–	–	–	–	–	–	23.3%	–	–	–	$0
1997	–	–	–	–	20.1%	–	–	–	–	–	–	–	20.1%	–	–	–	$0
1998	–	–	–	–	18.4%	–	–	–	–	–	–	–	18.4%	–	–	–	$0
1999	–	–	–	–	16.9%	–	–	–	–	–	–	–	16.9%	–	–	–	$0
2000	–	–	–	–	20.3%	44,092	2,181	4.7%	–	–	–	–	20.3%	35,695	10,578	22.9%	$924
2001	–	–	–	–	20.3%	40,477	7,977	17.2%	–	–	–	–	20.3%	32,142	24,709	53.4%	$766
2002	1	–	–	–	19.4%	44,537	9,713	21.0%	1	–	–	–	19.4%	37,001	33,981	73.4%	$983
2003	1	–	–	–	18.6%	46,560	9,426	20.4%	1	–	–	–	18.6%	38,903	41,351	89.4%	$930
2004	–	–	–	1	32.4%	34,478	21,221	45.9%	2	–	–	–	19.2%	40,067	47,557	102.8%	($3,641)
2005	–	–	–	–	28.4%	38,448	29,046	62.8%	1	–	–	–	18.2%	44,468	49,362	106.7%	($95,660)
2006	–	–	–	–	24.4%	40,945	34,375	74.3%	1	–	–	–	17.0%	47,497	48,138	104.0%	($84,502)
2007	–	–	–	–	20.1%	40,638	40,010	86.5%	2	–	–	–	17.7%	47,123	47,288	102.2%	($79,832)
2008	1	–	–	–	18.8%	44,425	41,858	90.5%	2	–	–	–	18.8%	51,649	41,912	90.6%	($61,976)
2009	1	–	–	–	17.6%	47,064	41,067	88.7%	1	–	–	–	17.6%	54,686	33,499	72.4%	($50,170)
2010	–	–	1	–	22.9%	40,179	44,362	102.0%	–	1	–	–	17.4%	54,286	22,687	52.2%	($50,870)
2011	2	–	–	–	18.9%	42,813	45,023	103.0%	–	–	–	1	24.2%	41,566	24,595	56.6%	($142,951)
2012	1	–	–	–	17.5%	44,933	43,564	100.2%	–	–	–	–	20.6%	44,602	23,467	54.0%	($5,869)
2013	–	1	–	–	17.1%	44,397	42,641	98.1%	–	–	–	–	17.1%	44,476	22,465	51.7%	($10,226)
Totals	7	1	1	1					11	1	0	1					

Short term present worth difference: ($210,321)

Long term present worth difference: ($255,679)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C4CP05/16/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 01a — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON; NO FGD RETROFITS								ALTERNATE PLAN 3 01d — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON; WINYAH #1 FGD RETROFIT IN 2006								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.3%	–	–	–	–	–	–	–	15.3%	–	–	–	$0
1995	–	–	–	–	26.4%	–	–	–	–	–	–	–	26.4%	–	–	–	$0
1996	–	–	–	–	23.3%	–	–	–	–	–	–	–	23.3%	–	–	–	$0
1997	–	–	–	–	20.1%	–	–	–	–	–	–	–	20.1%	–	–	–	$0
1998	–	–	–	–	18.4%	–	–	–	–	–	–	–	18.4%	–	–	–	$0
1999	–	–	–	–	16.9%	–	–	–	–	–	–	–	16.9%	–	–	–	$0
2000	–	–	–	–	20.3%	44,092	2,181	4.7%	–	–	–	–	20.3%	44,092	2,181	4.7%	$0
2001	–	–	–	–	20.3%	40,477	7,977	17.2%	–	–	–	–	20.3%	40,477	7,977	17.2%	$0
2002	1	–	–	–	19.4%	44,537	9,713	21.0%	1	–	–	–	19.4%	44,537	9,713	21.0%	$0
2003	1	–	–	–	18.6%	46,560	9,426	20.4%	1	–	–	–	18.6%	46,560	9,426	20.4%	$0
2004	–	–	–	1	32.4%	34,478	21,221	45.9%	2	–	–	–	19.2%	46,951	8,749	18.9%	($4,358)
2005	–	–	–	–	28.4%	38,448	29,046	62.8%	1	–	–	–	18.2%	50,746	4,276	9.2%	($96,473)
2006	–	–	–	–	24.4%	40,945	34,375	74.3%	1	–	–	–	17.0%	37,896	12,653	27.3%	($82,975)
2007	–	–	–	–	20.1%	40,638	40,010	86.5%	2	–	–	–	17.7%	38,212	20,714	44.8%	($70,081)
2008	1	–	–	–	18.8%	44,425	41,858	90.5%	2	–	–	–	18.8%	41,922	25,065	54.2%	($51,923)
2009	1	–	–	–	17.6%	47,064	41,067	88.7%	1	–	–	–	17.6%	43,808	27,530	59.5%	($39,970)
2010	–	–	1	–	22.9%	40,179	44,362	102.0%	–	1	–	–	17.4%	44,284	26,720	61.5%	($40,703)
2011	2	–	–	–	18.9%	42,813	45,023	103.0%	–	–	–	1	24.2%	33,678	36,515	84.0%	($134,694)
2012	1	–	–	–	17.5%	44,933	43,564	100.2%	–	–	–	–	20.6%	35,639	44,350	102.0%	$3,965
2013	–	1	–	–	17.1%	44,397	42,641	98.1%	–	–	–	–	17.1%	36,066	51,759	119.1%	($155)
Totals	7	1	1	1					11	1	0	1					

Short term present worth difference: ($190,555)

Long term present worth difference: ($201,025)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/10/93

BASE AND ALTERNATE PLAN COMPARISONS

1993 BASE CASE LOAD FORECAST – WITH DSM

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN ESED: $0/TON No FGD Retrofits				ALT. PLAN 1 ESED: $150/TON No FGD Retrofits				ALT. PLAN 2 ESED: $300/TON No FGD Retrofits				ALT. PLAN 3 ESED: $0/TON Winyah #1 FGD in 2007			
	FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS			
	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2
1993	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1994	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1995	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1996	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1997	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1998	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1999	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2001	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2002	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2003	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2004	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2005	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2006	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2007	–	–	–	1	1	–	–	–	1	–	–	–	1	–	–	–
2008	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2009	–	–	–	–	–	–	–	1	2	–	–	–	2	–	–	–
2010	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
2011	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–	1
2012	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
2013	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Totals	7	0	1	1	11	0	0	1	11	0	0	1	11	0	0	1
Savings over Base Plan																
Through 2013 (1993 Dollars)					$89,178,000				$133,195,000				$117,137,000			
Through 2057 (1993 Dollars)					$192,820,000				$215,404,000				$164,727,000			

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST WITH DSM

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 01.Da — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON — NO FGD RETROFITS								ALTERNATE PLAN 1 01.Da — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON — NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.4%	–	–	–	–	–	–	–	15.4%	–	–	–	$0
1995	–	–	–	–	26.8%	–	–	–	–	–	–	–	26.8%	–	–	–	$0
1996	–	–	–	–	24.0%	–	–	–	–	–	–	–	24.0%	–	–	–	$0
1997	–	–	–	–	21.0%	–	–	–	–	–	–	–	21.0%	–	–	–	$0
1998	–	–	–	–	19.6%	–	–	–	–	–	–	–	19.6%	–	–	–	$0
1999	–	–	–	–	18.2%	–	–	–	–	–	–	–	18.2%	–	–	–	$0
2000	–	–	–	–	21.0%	43,437	2,836	6.1%	–	–	–	–	21.0%	35,887	10,386	22.4%	$580
2001	–	–	–	–	22.2%	40,007	9,102	19.7%	–	–	–	–	22.2%	32,327	24,332	52.6%	$632
2002	–	–	–	–	18.7%	43,906	11,469	24.8%	–	–	–	–	18.7%	37,186	33,419	72.2%	$608
2003	1	–	–	–	18.1%	45,920	11,823	25.5%	1	–	–	–	18.1%	39,485	40,207	86.9%	$545
2004	2	–	–	–	19.0%	46,080	12,015	26.0%	2	–	–	–	19.0%	40,072	46,408	100.3%	$330
2005	1	–	–	–	18.0%	50,433	7,855	17.0%	1	–	–	–	18.0%	44,936	47,746	103.2%	$419
2006	2	–	–	–	19.5%	52,752	1,376	3.0%	2	–	–	–	19.5%	47,461	46,558	100.6%	$415
2007	–	–	–	1	32.9%	38,770	8,879	19.2%	1	–	–	–	18.2%	47,868	44,963	97.2%	$192
2008	–	–	–	–	29.0%	43,479	11,673	25.2%	1	–	–	–	17.1%	51,670	39,565	85.5%	($101,822)
2009	–	–	–	–	25.3%	45,543	12,403	26.8%	–	–	–	1	30.0%	38,258	47,580	102.8%	($107,648)
2010	–	–	–	–	21.8%	45,345	10,532	24.2%	–	–	–	–	26.3%	39,223	51,831	119.2%	$20,897
2011	–	–	1	–	21.9%	41,641	12,365	28.4%	–	–	–	–	17.6%	41,588	53,717	123.6%	$17,563
2012	–	–	–	–	18.8%	43,838	12,001	27.6%	2	–	–	–	18.8%	43,987	53,203	122.4%	($62,392)
2013	1	–	–	–	17.9%	43,652	11,823	27.2%	1	–	–	–	17.9%	44,623	52,054	119.7%	($47,575)
Totals	7	0	1	1					11	0	0	1					

Short term present worth difference: ($89,178)

Long term present worth difference: ($192,820)

C&CP05/18/93

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST WITH DSM

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 01.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 2 01.Dc ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.4%	–	–	–	–	–	–	–	15.4%	–	–	–	$0
1995	–	–	–	–	26.8%	–	–	–	–	–	–	–	26.8%	–	–	–	$0
1996	–	–	–	–	24.0%	–	–	–	–	–	–	–	24.0%	–	–	–	$0
1997	–	–	–	–	21.0%	–	–	–	–	–	–	–	21.0%	–	–	–	$0
1998	–	–	–	–	19.6%	–	–	–	–	–	–	–	19.6%	–	–	–	$0
1999	–	–	–	–	18.2%	–	–	–	–	–	–	–	18.2%	–	–	–	$0
2000	–	–	–	–	21.0%	43,437	2,836	6.1%	–	–	–	–	21.0%	34,830	11,443	24.7%	$872
2001	–	–	–	–	22.2%	40,007	9,102	19.7%	–	–	–	–	22.2%	31,479	26,237	56.7%	$876
2002	–	–	–	–	18.7%	43,906	11,469	24.8%	–	–	–	–	18.7%	36,125	36,384	78.6%	$930
2003	1	–	–	–	18.1%	45,920	11,823	25.5%	1	–	–	–	18.1%	38,264	44,394	95.9%	$932
2004	2	–	–	–	19.0%	46,080	12,015	26.0%	2	–	–	–	19.0%	38,876	51,791	111.9%	$719
2005	1	–	–	–	18.0%	50,433	7,855	17.0%	1	–	–	–	18.0%	43,644	54,420	117.6%	$858
2006	2	–	–	–	19.5%	52,752	1,376	3.0%	2	–	–	–	19.5%	46,082	54,612	118.0%	$895
2007	–	–	–	1	32.9%	38,770	8,879	19.2%	1	–	–	–	18.2%	46,549	54,335	117.4%	$682
2008	–	–	–	–	29.0%	43,479	11,673	25.2%	1	–	–	–	17.1%	50,307	50,302	108.7%	($101,315)
2009	–	–	–	–	25.3%	45,543	12,403	26.8%	2	–	–	–	18.4%	53,251	43,323	93.6%	($89,469)
2010	–	–	–	–	21.8%	45,345	10,532	24.2%	1	–	–	–	17.3%	53,201	33,597	77.3%	($76,246)
2011	–	–	1	–	21.9%	41,641	12,365	28.4%	–	–	–	1	24.1%	40,457	36,613	84.2%	($93,076)
2012	–	–	–	–	18.8%	43,838	12,001	27.6%	–	–	–	–	20.9%	42,775	37,313	85.8%	($34,603)
2013	1	–	–	–	17.9%	43,652	11,823	27.2%	–	–	–	–	17.9%	43,473	37,314	85.8%	($32,175)
Totals	7	0	1	1					11	0	0	1					

Short term present worth difference: ($133,195)

Long term present worth difference: ($215,404)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/18/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST WITH DSM

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 01.0a ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 3 01.0d ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON WINYAH #1 FGD RETROFIT IN 2007								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.4%	–	–	–	–	–	–	–	15.4%	–	–	–	$0
1995	–	–	–	–	26.8%	–	–	–	–	–	–	–	26.8%	–	–	–	$0
1996	–	–	–	–	24.0%	–	–	–	–	–	–	–	24.0%	–	–	–	$0
1997	–	–	–	–	21.0%	–	–	–	–	–	–	–	21.0%	–	–	–	$0
1998	–	–	–	–	19.6%	–	–	–	–	–	–	–	19.6%	–	–	–	$0
1999	–	–	–	–	18.2%	–	–	–	–	–	–	–	18.2%	–	–	–	$0
2000	–	–	–	–	21.0%	43,437	2,836	6.1%	–	–	–	–	21.0%	43,437	2,836	6.1%	$0
2001	–	–	–	–	22.2%	40,007	9,102	19.7%	–	–	–	–	22.2%	40,007	9,102	19.7%	$0
2002	–	–	–	–	18.7%	43,906	11,469	24.8%	–	–	–	–	18.7%	43,906	11,469	24.8%	$0
2003	1	–	–	–	18.1%	45,920	11,823	25.5%	1	–	–	–	18.1%	45,920	11,823	25.5%	$0
2004	2	–	–	–	19.0%	46,080	12,015	26.0%	2	–	–	–	19.0%	46,080	12,015	26.0%	$0
2005	1	–	–	–	18.0%	50,433	7,855	17.0%	1	–	–	–	18.0%	50,433	7,855	17.0%	$0
2006	2	–	–	–	19.5%	52,752	1,376	3.0%	2	–	–	–	19.5%	52,752	1,376	3.0%	$0
2007	–	–	–	1	32.9%	38,770	8,879	19.2%	1	–	–	–	18.2%	37,727	9,922	21.4%	$2,234
2008	–	–	–	–	29.0%	43,479	11,673	25.2%	1	–	–	–	17.1%	40,680	15,514	33.5%	($91,006)
2009	–	–	–	–	25.3%	45,543	12,403	26.8%	2	–	–	–	18.4%	42,687	19,100	41.3%	($79,018)
2010	–	–	–	–	21.8%	45,345	10,532	24.2%	1	–	–	–	17.3%	43,104	19,470	44.8%	($65,790)
2011	–	–	1	–	21.9%	41,641	12,365	28.4%	–	–	–	1	24.1%	33,045	29,899	68.8%	($84,445)
2012	–	–	–	–	18.8%	43,838	12,001	27.6%	–	–	–	–	20.9%	34,372	39,001	89.7%	($24,418)
2013	1	–	–	–	17.9%	43,652	11,823	27.2%	–	–	–	–	17.9%	35,297	47,178	108.5%	($22,017)
Totals	7	0	1	1					11	0	0	1					

Short term present worth difference: ($117,137)

Long term present worth difference: ($164,727)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/16/93

BASE AND ALTERNATE PLAN COMPARISONS

1993 BASE CASE LOAD FORECAST PLUS ALUMAX

(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN ESED: $0/TON No FGD Retrofits				ALT. PLAN 1 ESED: $150/TON No FGD Retrofits				ALT. PLAN 2 ESED: $300/TON No FGD Retrofits				ALT. PLAN 3 ESED: $0/TON Winyah #1 FGD in 2000				ALT. PLAN 4 ESED: $150/TON Winyah #1 FGD in 2000				ALT. PLAN 5 ESED: $300/TON Winyah #1 FGD in 2002			
	FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS			
	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2
1993	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1994	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1995	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1996	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1997	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1998	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1999	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2000	–	–	–	1	–	–	–	1	3	–	–	–	3	–	–	–	3	–	–	–	3	–	–	–
2001	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2002	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	1	–	–	–	1	–	–	–
2003	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2004	1	–	–	–	1	–	–	–	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2005	–	–	1	–	2	–	–	–	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2006	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2007	1	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2008	1	–	–	–	1	–	–	–	1	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–
2009	2	–	–	–	2	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2010	–	–	–	1	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2011	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1
2012	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2013	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Totals	6	0	1	2	10	0	0	2	10	0	0	2	13	0	1	1	13	0	1	1	13	0	1	1
Savings over Base Plan																								
Through 2013 (1993 Dollars)					$166,915,000				$205,557,000				$311,761,000				$311,413,000				$315,996,000			
Through 2057 (1993 Dollars)					$302,987,000				$330,666,000				$371,876,000				$371,083,000				$369,872,000			

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 1 ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.3%	–	–	–	–	–	–	–	15.3%	–	–	–	$0
1995	–	–	–	–	26.4%	–	–	–	–	–	–	–	26.4%	–	–	–	$0
1996	–	–	–	–	23.3%	–	–	–	–	–	–	–	23.3%	–	–	–	$0
1997	–	–	–	–	20.1%	–	–	–	–	–	–	–	20.1%	–	–	–	$0
1998	–	–	–	–	18.4%	–	–	–	–	–	–	–	18.4%	–	–	–	$0
1999	–	–	–	–	16.9%	–	–	–	–	–	–	–	16.9%	–	–	–	$0
2000	–	–	–	1	29.6%	39,867	6,406	13.8%	–	–	–	1	29.6%	30,484	15,789	34.1%	$875
2001	–	–	–	–	26.4%	38,781	13,898	30.0%	–	–	–	–	26.4%	30,190	31,873	68.9%	$788
2002	–	–	–	–	22.9%	43,513	16,658	36.0%	–	–	–	–	22.9%	35,395	42,750	92.4%	$815
2003	–	–	–	–	19.5%	44,691	18,240	39.4%	–	–	–	–	19.5%	36,122	52,901	114.3%	$737
2004	1	–	–	–	17.7%	45,325	19,188	41.5%	1	–	–	–	17.7%	37,944	61,231	132.3%	$581
2005	–	–	1	–	23.8%	41,892	23,569	50.9%	2	–	–	–	19.2%	42,908	64,595	139.6%	($354)
2006	–	–	–	–	20.3%	44,505	25,337	54.8%	1	–	–	–	18.0%	45,104	65,765	142.1%	($61,509)
2007	1	–	–	–	18.7%	44,097	27,513	59.5%	2	–	–	–	18.7%	45,605	66,432	143.6%	($57,133)
2008	1	–	–	–	17.5%	47,873	25,913	56.0%	1	–	–	–	17.5%	50,326	62,380	134.8%	($48,331)
2009	2	–	–	–	18.5%	50,562	21,623	46.7%	2	–	–	–	18.5%	52,667	55,986	121.0%	($41,605)
2010	–	–	–	1	29.4%	38,959	26,138	60.1%	1	–	–	–	17.3%	53,053	46,407	106.7%	($47,989)
2011	–	–	–	–	21.6%	42,247	27,365	62.9%	–	–	–	1	23.6%	40,780	49,101	112.9%	($183,488)
2012	–	–	–	–	18.3%	45,181	25,658	59.0%	–	–	–	–	20.2%	44,302	48,272	111.0%	($37,655)
2013	1	–	–	–	17.1%	44,042	25,090	57.7%	–	–	–	–	17.1%	44,092	47,655	109.6%	($37,433)
Totals	6	0	1	2					10	0	0	2					

Short term present worth difference: ($166,915)
Long term present worth difference: ($302,987)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/18/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX

(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN [02.a] ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 2 [02.b] ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.3%	–	–	–	–	–	–	–	15.3%	–	–	–	$0
1995	–	–	–	–	26.4%	–	–	–	–	–	–	–	26.4%	–	–	–	$0
1996	–	–	–	–	23.3%	–	–	–	–	–	–	–	23.3%	–	–	–	$0
1997	–	–	–	–	20.1%	–	–	–	–	–	–	–	20.1%	–	–	–	$0
1998	–	–	–	–	18.4%	–	–	–	–	–	–	–	18.4%	–	–	–	$0
1999	–	–	–	–	16.9%	–	–	–	–	–	–	–	16.9%	–	–	–	$0
2000	–	–	–	1	29.6%	39,867	6,406	13.8%	3	–	–	–	18.9%	46,225	48	0.1%	$1,109
2001	–	–	–	–	26.4%	38,781	13,898	30.0%	1	–	–	–	18.5%	45,641	679	1.5%	($75,661)
2002	–	–	–	–	22.9%	43,513	16,658	36.0%	–	–	–	1	33.0%	34,368	12,585	27.2%	($73,335)
2003	–	–	–	–	19.5%	44,691	18,240	39.4%	–	–	–	–	29.4%	35,153	23,704	51.2%	$24,153
2004	1	–	–	–	17.7%	45,325	19,188	41.5%	–	–	–	–	24.9%	36,877	33,100	71.5%	$23,983
2005	–	–	1	–	23.8%	41,892	23,569	50.9%	–	–	–	–	21.5%	41,553	37,820	81.7%	$18,582
2006	–	–	–	–	20.3%	44,505	25,337	54.8%	–	–	–	–	18.0%	43,808	40,285	87.1%	($52,006)
2007	1	–	–	–	18.7%	44,097	27,513	59.5%	2	–	–	–	18.7%	44,298	42,261	91.3%	($52,475)
2008	1	–	–	–	17.5%	47,873	25,913	56.0%	1	–	–	–	17.5%	48,840	39,694	85.8%	($43,592)
2009	2	–	–	–	18.5%	50,562	21,623	46.7%	2	–	–	–	18.5%	51,159	34,808	75.2%	($36,819)
2010	–	–	–	1	29.4%	38,959	26,138	60.1%	1	–	–	–	17.3%	51,610	26,671	61.4%	($43,218)
2011	–	–	–	–	21.6%	42,247	27,365	62.9%	–	–	–	1	23.6%	39,681	30,464	70.1%	($178,595)
2012	–	–	–	–	18.3%	45,181	25,658	59.0%	–	–	–	–	20.2%	42,978	30,960	71.2%	($32,839)
2013	1	–	–	–	17.1%	44,042	25,090	57.7%	–	–	–	–	17.1%	42,878	31,555	72.6%	($32,668)
Totals	6	0	1	2					10	0	0	2					

Short term present worth difference: ($205,557)

Long term present worth difference: ($330,666)

C4CP05/18/03

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX

(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN (02.a) ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 3 (02.d) ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.3%	–	–	–	–	–	–	–	15.3%	–	–	–	$0
1995	–	–	–	–	26.4%	–	–	–	–	–	–	–	26.4%	–	–	–	$0
1996	–	–	–	–	23.3%	–	–	–	–	–	–	–	23.3%	–	–	–	$0
1997	–	–	–	–	20.1%	–	–	–	–	–	–	–	20.1%	–	–	–	$0
1998	–	–	–	–	18.4%	–	–	–	–	–	–	–	18.4%	–	–	–	$0
1999	–	–	–	–	16.9%	–	–	–	–	–	–	–	16.9%	–	–	–	$0
2000	–	–	–	1	29.6%	39,867	6,406	13.8%	3	–	–	–	18.9%	36,903	9,370	20.3%	$2,211
2001	–	–	–	–	26.4%	38,781	13,898	30.0%	1	–	–	–	18.5%	36,792	18,852	40.7%	($68,011)
2002	–	–	–	–	22.9%	43,513	16,658	36.0%	1	–	–	–	17.8%	41,059	24,065	52.0%	($61,390)
2003	–	–	–	–	19.5%	44,691	18,240	39.4%	1	–	–	–	17.1%	42,114	28,225	61.0%	($54,382)
2004	1	–	–	–	17.7%	45,325	19,188	41.5%	2	–	–	–	17.7%	43,835	30,663	66.3%	($50,961)
2005	–	–	1	–	23.8%	41,892	23,569	50.9%	2	–	–	–	19.2%	47,587	29,349	63.4%	($37,077)
2006	–	–	–	–	20.3%	44,505	25,337	54.8%	1	–	–	–	18.0%	48,955	26,666	57.6%	($82,419)
2007	1	–	–	–	18.7%	44,097	27,513	59.5%	2	–	–	–	18.7%	49,474	23,465	50.7%	($79,130)
2008	1	–	–	–	17.5%	47,873	25,913	56.0%	–	–	1	–	23.9%	45,530	24,208	52.3%	($88,986)
2009	2	–	–	–	18.5%	50,562	21,623	46.7%	–	–	–	–	20.5%	47,175	23,305	50.4%	($5,558)
2010	–	–	–	1	29.4%	38,959	26,138	60.1%	–	–	–	–	17.3%	47,982	18,798	43.2%	($20,970)
2011	–	–	–	–	21.6%	42,247	27,365	62.9%	–	–	–	1	23.6%	36,663	25,608	58.9%	($183,268)
2012	–	–	–	–	18.3%	45,181	25,658	59.0%	–	–	–	–	20.2%	38,758	30,324	69.8%	($24,538)
2013	1	–	–	–	17.1%	44,042	25,090	57.7%	–	–	–	–	17.1%	39,485	34,313	78.9%	($20,021)
Totals	6	0	1	2					13	0	1	1					

Short term present worth difference: ($311,761)

Long term present worth difference: ($371,876)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/18.83

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 02.a ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 4 02.f ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.3%	–	–	–	–	–	–	–	15.3%	–	–	–	$0
1995	–	–	–	–	26.4%	–	–	–	–	–	–	–	26.4%	–	–	–	$0
1996	–	–	–	–	23.3%	–	–	–	–	–	–	–	23.3%	–	–	–	$0
1997	–	–	–	–	20.1%	–	–	–	–	–	–	–	20.1%	–	–	–	$0
1998	–	–	–	–	18.4%	–	–	–	–	–	–	–	18.4%	–	–	–	$0
1999	–	–	–	–	16.9%	–	–	–	–	–	–	–	16.9%	–	–	–	$0
2000	–	–	–	1	29.6%	39,867	6,406	13.8%	3	–	–	–	18.9%	36,209	10,064	21.8%	$2,291
2001	–	–	–	–	26.4%	38,781	13,898	30.0%	1	–	–	–	18.5%	35,911	20,426	44.1%	($67,906)
2002	–	–	–	–	22.9%	43,513	16,658	36.0%	1	–	–	–	17.8%	40,082	26,618	57.5%	($61,371)
2003	–	–	–	–	19.5%	44,691	18,240	39.4%	1	–	–	–	17.1%	41,213	31,678	68.5%	($54,425)
2004	1	–	–	–	17.7%	45,325	19,188	41.5%	2	–	–	–	17.7%	42,800	35,151	76.0%	($51,000)
2005	–	–	1	–	23.8%	41,892	23,569	50.9%	2	–	–	–	19.2%	46,255	35,169	76.0%	($37,161)
2006	–	–	–	–	20.3%	44,505	25,337	54.8%	1	–	–	–	18.0%	47,733	33,709	72.8%	($82,512)
2007	1	–	–	–	18.7%	44,097	27,513	59.5%	2	–	–	–	18.7%	48,211	31,771	68.7%	($79,200)
2008	1	–	–	–	17.5%	47,873	25,913	56.0%	–	–	1	–	23.9%	44,433	33,611	72.6%	($89,074)
2009	2	–	–	–	18.5%	50,562	21,623	46.7%	–	–	–	–	20.5%	46,090	33,793	73.0%	($5,658)
2010	–	–	–	1	29.4%	38,959	26,138	60.1%	–	–	–	–	17.3%	46,752	30,516	70.2%	($21,009)
2011	–	–	–	–	21.6%	42,247	27,365	62.9%	–	–	–	1	23.6%	35,982	38,007	87.4%	($181,956)
2012	–	–	–	–	18.3%	45,181	25,658	59.0%	–	–	–	–	20.2%	38,111	43,371	99.8%	($24,333)
2013	1	–	–	–	17.1%	44,042	25,090	57.7%	–	–	–	–	17.1%	38,644	48,201	110.9%	($20,008)
Totals	6	0	1	2					13	0	1	1					

Short term present worth difference: ($311,413)
Long term present worth difference: ($371,083)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/16/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX

(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN [02.a] ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 5 [02.c] ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON WINYAH #1 FGD RETROFIT IN 2002								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.3%	–	–	–	–	–	–	–	15.3%	–	–	–	$0
1995	–	–	–	–	26.4%	–	–	–	–	–	–	–	26.4%	–	–	–	$0
1996	–	–	–	–	23.3%	–	–	–	–	–	–	–	23.3%	–	–	–	$0
1997	–	–	–	–	20.1%	–	–	–	–	–	–	–	20.1%	–	–	–	$0
1998	–	–	–	–	18.4%	–	–	–	–	–	–	–	18.4%	–	–	–	$0
1999	–	–	–	–	16.9%	–	–	–	–	–	–	–	16.9%	–	–	–	$0
2000	–	–	–	1	29.6%	39,867	6,406	13.8%	3	–	–	–	18.9%	46,225	48	0.1%	$1,109
2001	–	–	–	–	26.4%	38,781	13,898	30.0%	1	–	–	–	18.5%	45,641	679	1.5%	($75,661)
2002	–	–	–	–	22.9%	43,513	16,658	36.0%	1	–	–	–	17.8%	39,785	7,167	15.5%	($67,535)
2003	–	–	–	–	19.5%	44,691	18,240	39.4%	1	–	–	–	17.1%	40,921	12,519	27.1%	($53,525)
2004	1	–	–	–	17.7%	45,325	19,188	41.5%	2	–	–	–	17.7%	42,497	16,295	35.2%	($50,111)
2005	–	–	1	–	23.8%	41,892	23,569	50.9%	2	–	–	–	19.2%	45,877	16,691	36.1%	($36,212)
2006	–	–	–	–	20.3%	44,505	25,337	54.8%	1	–	–	–	18.0%	47,393	15,571	33.7%	($81,576)
2007	1	–	–	–	18.7%	44,097	27,513	59.5%	2	–	–	–	18.7%	47,849	13,995	30.2%	($78,294)
2008	1	–	–	–	17.5%	47,873	25,913	56.0%	–	–	1	–	23.9%	44,115	16,153	34.9%	($88,091)
2009	2	–	–	–	18.5%	50,562	21,623	46.7%	–	–	–	–	20.5%	45,757	16,669	36.0%	($4,645)
2010	–	–	–	1	29.4%	38,959	26,138	60.1%	–	–	–	–	17.3%	46,407	13,736	31.6%	($20,015)
2011	–	–	–	–	21.6%	42,247	27,365	62.9%	–	–	–	1	23.6%	35,778	21,432	49.3%	($180,595)
2012	–	–	–	–	18.3%	45,181	25,658	59.0%	–	–	–	–	20.2%	37,893	27,013	62.1%	($23,248)
2013	1	–	–	–	17.1%	44,042	25,090	57.7%	–	–	–	–	17.1%	38,425	32,062	73.7%	($19,000)
Totals	6	0	1	2					13	0	1	1					

Short term present worth difference: ($315,996)

Long term present worth difference: ($369,872)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/16.R03

BASE AND ALTERNATE PLAN COMPARISONS

1993 BASE CASE LOAD FORECAST PLUS ALUMAX – WITH DSM

(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN ESED: $0/TON No FGD Retrofits				ALT. PLAN 1 ESED: $150/TON No FGD Retrofits				ALT. PLAN 2 ESED: $300/TON No FGD Retrofits				ALT. PLAN 3 ESED: $0/TON Winyah #1 FGD In 2000				ALT. PLAN 4 ESED: $150/TON Winyah #1 FGD In 2000				ALT. PLAN 5 ESED: $300/TON Winyah #1 FGD In 2002			
	FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS			
	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2
1993	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1994	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1995	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1996	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1997	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1998	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1999	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2000	–	–	–	1	–	–	–	1	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2001	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2002	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	1	–	–	–	1	–	–	–
2003	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2004	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2005	2	–	–	–	2	–	–	–	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2006	1	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2007	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2008	–	–	1	–	1	–	–	–	1	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–
2009	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2010	–	–	–	–	2	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2011	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1
2012	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2013	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Totals	5	0	1	2	9	0	0	2	9	0	0	2	12	0	1	1	12	0	1	1	12	0	1	1
Savings over Base Plan																								
Through 2013 (1993 Dollars)					$91,980,000				$137,211,000				$252,858,000				$252,368,000				$256,892,000			
Through 2057 (1993 Dollars)					$284,526,000				$317,479,000				$390,226,000				$387,343,000				$385,656,000			

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX – WITH DSM

(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 02.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 1 02.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.4%	–	–	–	–	–	–	–	15.4%	–	–	–	$0
1995	–	–	–	–	26.8%	–	–	–	–	–	–	–	26.8%	–	–	–	$0
1996	–	–	–	–	24.0%	–	–	–	–	–	–	–	24.0%	–	–	–	$0
1997	–	–	–	–	21.0%	–	–	–	–	–	–	–	21.0%	–	–	–	$0
1998	–	–	–	–	19.6%	–	–	–	–	–	–	–	19.6%	–	–	–	$0
1999	–	–	–	–	18.2%	–	–	–	–	–	–	–	18.2%	–	–	–	$0
2000	–	–	–	1	31.1%	39,223	7,050	15.2%	–	–	–	1	31.1%	29,497	16,776	36.3%	$933
2001	–	–	–	–	28.2%	38,174	15,149	32.7%	–	–	–	–	28.2%	29,672	33,377	72.1%	$796
2002	–	–	–	–	24.8%	42,763	18,658	40.3%	–	–	–	–	24.8%	34,357	45,293	97.9%	$817
2003	–	–	–	–	21.6%	44,315	20,616	44.6%	–	–	–	–	21.6%	35,632	55,933	120.9%	$648
2004	–	–	–	–	17.5%	44,436	22,453	48.5%	–	–	–	–	17.5%	36,892	65,315	141.2%	$582
2005	2	–	–	–	19.0%	48,711	20,015	43.3%	2	–	–	–	19.0%	41,892	69,695	150.6%	$667
2006	1	–	–	–	18.0%	50,752	15,536	33.6%	1	–	–	–	18.0%	43,847	72,121	155.9%	$576
2007	2	–	–	–	19.1%	50,361	11,448	24.7%	2	–	–	–	19.1%	44,804	73,590	159.0%	$472
2008	–	–	1	–	24.6%	47,545	10,176	22.0%	1	–	–	–	18.1%	48,815	71,048	153.5%	$2,424
2009	–	–	–	–	21.4%	49,643	6,806	14.7%	1	–	–	–	17.1%	50,989	66,333	143.4%	($70,823)
2010	–	–	–	–	18.2%	49,228	1,052	2.4%	2	–	–	–	18.2%	51,606	58,201	133.9%	($63,138)
2011	–	–	–	1	24.5%	41,303	3,222	7.4%	–	–	–	1	24.5%	39,131	62,544	143.9%	($65,685)
2012	–	–	–	–	21.5%	44,034	2,663	6.1%	–	–	–	–	21.5%	42,154	63,864	146.9%	($61,227)
2013	–	–	–	–	18.7%	42,801	3,336	7.7%	–	–	–	–	18.7%	42,849	64,489	148.3%	($59,318)
Totals	5	0	1	2					9	0	0	2					

Short term present worth difference: ($91,980)

Long term present worth difference: ($284,526)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/18/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX – WITH DSM

(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 02.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 2 02.Db ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.4%	–	–	–	–	–	–	–	15.4%	–	–	–	$0
1995	–	–	–	–	26.8%	–	–	–	–	–	–	–	26.8%	–	–	–	$0
1996	–	–	–	–	24.0%	–	–	–	–	–	–	–	24.0%	–	–	–	$0
1997	–	–	–	–	21.0%	–	–	–	–	–	–	–	21.0%	–	–	–	$0
1998	–	–	–	–	19.6%	–	–	–	–	–	–	–	19.6%	–	–	–	$0
1999	–	–	–	–	18.2%	–	–	–	–	–	–	–	18.2%	–	–	–	$0
2000	–	–	–	1	31.1%	39,223	7,050	15.2%	2	–	–	–	17.5%	45,454	819	1.8%	$954
2001	–	–	–	–	28.2%	38,174	15,149	32.7%	1	–	–	–	17.6%	45,107	1,985	4.3%	($79,976)
2002	–	–	–	–	24.8%	42,763	18,658	40.3%	–	–	–	1	32.6%	33,407	14,851	32.1%	($77,263)
2003	–	–	–	–	21.6%	44,315	20,616	44.6%	–	–	–	–	29.2%	34,622	26,502	57.3%	$20,193
2004	–	–	–	–	17.5%	44,436	22,453	48.5%	–	–	–	–	24.8%	35,875	36,900	79.7%	$20,132
2005	2	–	–	–	19.0%	48,711	20,015	43.3%	–	–	–	–	21.3%	40,604	42,569	92.0%	$20,221
2006	1	–	–	–	18.0%	50,752	15,536	33.6%	–	–	–	–	18.0%	42,466	46,376	100.2%	$10,754
2007	2	–	–	–	19.1%	50,361	11,448	24.7%	2	–	–	–	19.1%	43,442	49,207	106.3%	$5,811
2008	–	–	1	–	24.6%	47,545	10,176	22.0%	1	–	–	–	18.1%	47,344	48,137	104.0%	$7,814
2009	–	–	–	–	21.4%	49,643	6,806	14.7%	1	–	–	–	17.1%	49,478	44,932	97.1%	($65,373)
2010	–	–	–	–	18.2%	49,228	1,052	2.4%	2	–	–	–	18.2%	50,176	38,230	87.9%	($57,706)
2011	–	–	–	1	24.5%	41,303	3,222	7.4%	–	–	–	1	24.5%	38,147	43,558	100.2%	($60,225)
2012	–	–	–	–	21.5%	44,034	2,663	6.1%	–	–	–	–	21.5%	40,986	46,046	105.9%	($55,815)
2013	–	–	–	–	18.7%	42,801	3,336	7.7%	–	–	–	–	18.7%	41,680	47,839	110.0%	($53,879)
Totals	5	0	1	2					9	0	0	2					

Short term present worth difference: ($137,211)

Long term present worth difference: ($317,479)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/16/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX – WITH DSM

(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 02.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 3 02.Dd ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.4%	–	–	–	–	–	–	–	15.4%	–	–	–	$0
1995	–	–	–	–	26.8%	–	–	–	–	–	–	–	26.8%	–	–	–	$0
1996	–	–	–	–	24.0%	–	–	–	–	–	–	–	24.0%	–	–	–	$0
1997	–	–	–	–	21.0%	–	–	–	–	–	–	–	21.0%	–	–	–	$0
1998	–	–	–	–	19.6%	–	–	–	–	–	–	–	19.6%	–	–	–	$0
1999	–	–	–	–	18.2%	–	–	–	–	–	–	–	18.2%	–	–	–	$0
2000	–	–	–	1	31.1%	39,223	7,050	15.2%	2	–	–	–	17.5%	36,296	9,977	21.6%	$2,011
2001	–	–	–	–	28.2%	38,174	15,149	32.7%	1	–	–	–	17.6%	36,294	19,956	43.1%	($72,357)
2002	–	–	–	–	24.8%	42,763	18,658	40.3%	1	–	–	–	17.1%	40,239	25,991	56.2%	($65,933)
2003	–	–	–	–	21.6%	44,315	20,616	44.6%	2	–	–	–	19.1%	41,908	30,355	65.6%	($63,515)
2004	–	–	–	–	17.5%	44,436	22,453	48.5%	1	–	–	–	17.5%	43,030	33,599	72.6%	($51,761)
2005	2	–	–	–	19.0%	48,711	20,015	43.3%	2	–	–	–	19.0%	47,235	32,637	70.5%	($40,997)
2006	1	–	–	–	18.0%	50,752	15,536	33.6%	1	–	–	–	18.0%	48,196	30,713	66.4%	($27,950)
2007	2	–	–	–	19.1%	50,361	11,448	24.7%	2	–	–	–	19.1%	48,913	28,074	60.7%	($30,501)
2008	–	–	1	–	24.6%	47,545	10,176	22.0%	–	–	1	–	24.6%	44,062	30,285	65.4%	($40,439)
2009	–	–	–	–	21.4%	49,643	6,806	14.7%	–	–	–	–	21.4%	46,172	30,386	65.7%	($32,883)
2010	–	–	–	–	18.2%	49,228	1,052	2.4%	–	–	–	–	18.2%	46,816	27,044	62.2%	($28,525)
2011	–	–	–	1	24.5%	41,303	3,222	7.4%	–	–	–	1	24.5%	36,506	34,012	78.2%	($62,011)
2012	–	–	–	–	21.5%	44,034	2,663	6.1%	–	–	–	–	21.5%	38,038	39,448	90.7%	($46,987)
2013	–	–	–	–	18.7%	42,801	3,336	7.7%	–	–	–	–	18.7%	38,573	44,349	102.0%	($44,349)
Totals	5	0	1	2					12	0	1	1					

Short term present worth difference: ($252,858)

Long term present worth difference: ($390,226)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C4CP05/18.03

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX – WITH DSM
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 02.0a ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 4 02.0f ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.4%	–	–	–	–	–	–	–	15.4%	–	–	–	$0
1995	–	–	–	–	26.8%	–	–	–	–	–	–	–	26.8%	–	–	–	$0
1996	–	–	–	–	24.0%	–	–	–	–	–	–	–	24.0%	–	–	–	$0
1997	–	–	–	–	21.0%	–	–	–	–	–	–	–	21.0%	–	–	–	$0
1998	–	–	–	–	19.6%	–	–	–	–	–	–	–	19.6%	–	–	–	$0
1999	–	–	–	–	18.2%	–	–	–	–	–	–	–	18.2%	–	–	–	$0
2000	–	–	–	1	31.1%	39,223	7,050	15.2%	2	–	–	–	17.5%	35,702	10,571	22.8%	$2,113
2001	–	–	–	–	28.2%	38,174	15,149	32.7%	1	–	–	–	17.6%	35,460	21,384	46.2%	($72,213)
2002	–	–	–	–	24.8%	42,763	18,658	40.3%	1	–	–	–	17.1%	39,320	28,337	61.2%	($65,895)
2003	–	–	–	–	21.6%	44,315	20,616	44.6%	2	–	–	–	19.1%	40,968	33,643	72.7%	($63,609)
2004	–	–	–	–	17.5%	44,436	22,453	48.5%	1	–	–	–	17.5%	41,986	37,930	82.0%	($51,818)
2005	2	–	–	–	19.0%	48,711	20,015	43.3%	2	–	–	–	19.0%	45,941	38,262	82.7%	($41,134)
2006	1	–	–	–	18.0%	50,752	15,536	33.6%	1	–	–	–	18.0%	46,984	37,551	81.2%	($28,102)
2007	2	–	–	–	19.1%	50,361	11,448	24.7%	2	–	–	–	19.1%	47,629	36,195	78.2%	($30,540)
2008	–	–	1	–	24.6%	47,545	10,176	22.0%	–	–	1	–	24.6%	43,105	39,364	85.1%	($40,510)
2009	–	–	–	–	21.4%	49,643	6,806	14.7%	–	–	–	–	21.4%	44,992	40,645	87.8%	($32,925)
2010	–	–	–	–	18.2%	49,228	1,052	2.4%	–	–	–	–	18.2%	45,618	38,501	88.6%	($28,548)
2011	–	–	–	1	24.5%	41,303	3,222	7.4%	–	–	–	1	24.5%	35,856	46,119	106.1%	($60,604)
2012	–	–	–	–	21.5%	44,034	2,663	6.1%	–	–	–	–	21.5%	37,293	52,301	120.3%	($46,659)
2013	–	–	–	–	18.7%	42,801	3,336	7.7%	–	–	–	–	18.7%	37,822	57,953	133.3%	($44,058)
Totals	5	0	1	2					12	0	1	1					

Short term present worth difference: ($252,368)
Long term present worth difference: ($387,343)

CACP05/16/93

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISONS

1993 BASE CASE LOAD FORECAST LESS 0.5% PER YEAR GROWTH
(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN ESED: $0/TON No FGD Retrofits				ALT. PLAN 1 ESED: $150/TON No FGD Retrofits				ALT. PLAN 2 ESED: $300/TON No FGD Retrofits				ALT. PLAN 3 ESED: $0/TON Winyah #1 FGD in 2011			
	FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS			
	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2
1993	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1994	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1995	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1996	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1997	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1998	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1999	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2001	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2002	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2003	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2004	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2005	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2006	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2007	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2008	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2009	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2010	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2011	–	–	–	1	–	–	1	–	–	–	1	–	2	1	–	–
2012	–	–	–	–	1	–	–	–	1	–	–	–	–	2 *	–	–
2013	–	–	–	–	1	–	–	–	1	–	–	–	–	3 *	–	–
Totals	8	0	0	1	10	0	1	0	10	0	1	0	5	6	0	0
Savings over Base Plan													* 40 MW heat recovery unit only			
Through 2013 (1993 Dollars)					$19,555,000				$17,106,000				$40,913,000			
Through 2057 (1993 Dollars)					$82,037,000				$75,177,000				$212,397,000			

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST LESS 0.5% PER YEAR GROWTH
(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 04a — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON — NO FGD RETROFITS								ALTERNATE PLAN 1 04d — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON — NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.9%	–	–	–	–	–	–	–	15.9%	–	–	–	$0
1995	–	–	–	–	27.9%	–	–	–	–	–	–	–	27.9%	–	–	–	$0
1996	–	–	–	–	25.4%	–	–	–	–	–	–	–	25.4%	–	–	–	$0
1997	–	–	–	–	22.8%	–	–	–	–	–	–	–	22.8%	–	–	–	$0
1998	–	–	–	–	21.7%	–	–	–	–	–	–	–	21.7%	–	–	–	$0
1999	–	–	–	–	20.8%	–	–	–	–	–	–	–	20.8%	–	–	–	$0
2000	–	–	–	–	24.9%	41,647	4,626	10.0%	–	–	–	–	24.9%	33,456	12,817	27.7%	$559
2001	–	–	–	–	25.6%	37,623	13,275	28.7%	–	–	–	–	25.6%	29,768	29,322	63.4%	$726
2002	–	–	–	–	22.4%	41,622	17,926	38.7%	–	–	–	–	22.4%	33,896	41,700	90.1%	$739
2003	–	–	–	–	19.4%	42,953	21,246	45.9%	–	–	–	–	19.4%	35,406	52,567	113.6%	$675
2004	1	–	–	–	18.1%	42,392	25,127	54.3%	1	–	–	–	18.1%	36,116	62,723	135.6%	$590
2005	1	–	–	–	17.9%	46,024	25,376	54.8%	1	–	–	–	17.9%	40,114	68,883	148.9%	$475
2006	1	–	–	–	17.5%	48,665	22,985	49.7%	1	–	–	–	17.5%	42,533	72,613	156.9%	$544
2007	2	–	–	–	19.1%	47,466	21,791	47.1%	2	–	–	–	19.1%	42,047	76,839	166.1%	$503
2008	1	–	–	–	18.7%	50,972	17,092	36.9%	1	–	–	–	18.7%	45,949	77,163	166.8%	$336
2009	1	–	–	–	18.2%	53,467	9,897	21.4%	1	–	–	–	18.2%	48,334	75,102	162.3%	$374
2010	1	–	–	–	17.7%	52,343	1,029	2.4%	1	–	–	–	17.7%	47,584	70,991	163.3%	$419
2011	–	–	–	1	26.2%	42,287	2,215	5.1%	–	–	1	–	19.2%	40,689	73,777	169.7%	($5,107)
2012	–	–	–	–	23.1%	44,086	1,603	3.7%	1	–	–	–	18.5%	43,408	73,843	169.9%	($42,321)
2013	–	–	–	–	20.2%	42,562	2,515	5.8%	1	–	–	–	17.9%	42,794	74,523	171.4%	($35,414)
Totals	8	0	0	1					10	0	1	0					

Short term present worth difference: ($19,555)
Long term present worth difference: ($82,037)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/18/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST LESS 0.5% PER YEAR GROWTH
(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 04a — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON — NO FGD RETROFITS								ALTERNATE PLAN 2 04b — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON — NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT−BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.9%	–	–	–	–	–	–	–	15.9%	–	–	–	$0
1995	–	–	–	–	27.9%	–	–	–	–	–	–	–	27.9%	–	–	–	$0
1996	–	–	–	–	25.4%	–	–	–	–	–	–	–	25.4%	–	–	–	$0
1997	–	–	–	–	22.8%	–	–	–	–	–	–	–	22.8%	–	–	–	$0
1998	–	–	–	–	21.7%	–	–	–	–	–	–	–	21.7%	–	–	–	$0
1999	–	–	–	–	20.8%	–	–	–	–	–	–	–	20.8%	–	–	–	$0
2000	–	–	–	–	24.9%	41,647	4,626	10.0%	–	–	–	–	24.9%	32,481	13,792	29.8%	$832
2001	–	–	–	–	25.6%	37,623	13,275	28.7%	–	–	–	–	25.6%	28,993	31,073	67.2%	$954
2002	–	–	–	–	22.4%	41,622	17,926	38.7%	–	–	–	–	22.4%	32,995	44,350	95.8%	$1,018
2003	–	–	–	–	19.4%	42,953	21,246	45.9%	–	–	–	–	19.4%	34,360	56,263	121.6%	$1,005
2004	1	–	–	–	18.1%	42,392	25,127	54.3%	1	–	–	–	18.1%	35,041	67,494	145.9%	$956
2005	1	–	–	–	17.9%	46,024	25,376	54.8%	1	–	–	–	17.9%	38,913	74,854	161.8%	$892
2006	1	–	–	–	17.5%	48,665	22,985	49.7%	1	–	–	–	17.5%	41,342	79,785	172.4%	$974
2007	2	–	–	–	19.1%	47,466	21,791	47.1%	2	–	–	–	19.1%	40,844	85,214	184.2%	$947
2008	1	–	–	–	18.7%	50,972	17,092	36.9%	1	–	–	–	18.7%	44,676	86,811	187.6%	$825
2009	1	–	–	–	18.2%	53,467	9,897	21.4%	1	–	–	–	18.2%	46,981	86,104	186.1%	$907
2010	1	–	–	–	17.7%	52,343	1,029	2.4%	1	–	–	–	17.7%	46,301	83,277	191.2%	$938
2011	–	–	–	1	26.2%	42,287	2,215	5.1%	–	–	1	–	19.2%	39,578	87,173	200.5%	($4,195)
2012	–	–	–	–	23.1%	44,086	1,603	3.7%	1	–	–	–	18.5%	42,209	88,438	203.4%	($41,731)
2013	–	–	–	–	20.2%	42,562	2,515	5.8%	1	–	–	–	17.9%	41,608	90,305	207.7%	($34,787)
Totals	8	0	0	1					10	0	1	0					

Short term present worth difference: ($17,106)
Long term present worth difference: ($75,177)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/18/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST LESS 0.5% PER YEAR GROWTH

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 04.a ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 3 04.c ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON WINYAH #1 FGD RETROFIT IN 2011								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	15.9%	–	–	–	–	–	–	–	15.9%	–	–	–	$0
1995	–	–	–	–	27.9%	–	–	–	–	–	–	–	27.9%	–	–	–	$0
1996	–	–	–	–	25.4%	–	–	–	–	–	–	–	25.4%	–	–	–	$0
1997	–	–	–	–	22.8%	–	–	–	–	–	–	–	22.8%	–	–	–	$0
1998	–	–	–	–	21.7%	–	–	–	–	–	–	–	21.7%	–	–	–	$0
1999	–	–	–	–	20.8%	–	–	–	–	–	–	–	20.8%	–	–	–	$0
2000	–	–	–	–	24.9%	41,647	4,626	10.0%	–	–	–	–	24.9%	41,647	4,626	10.0%	$0
2001	–	–	–	–	25.6%	37,623	13,275	28.7%	–	–	–	–	25.6%	37,623	13,275	28.7%	$0
2002	–	–	–	–	22.4%	41,622	17,926	38.7%	–	–	–	–	22.4%	41,622	17,926	38.7%	$0
2003	–	–	–	–	19.4%	42,953	21,246	45.9%	–	–	–	–	19.4%	42,953	21,246	45.9%	$0
2004	1	–	–	–	18.1%	42,392	25,127	54.3%	1	–	–	–	18.1%	42,392	25,127	54.3%	$0
2005	1	–	–	–	17.9%	46,024	25,376	54.8%	1	–	–	–	17.9%	46,024	25,376	54.8%	$0
2006	1	–	–	–	17.5%	48,665	22,985	49.7%	1	–	–	–	17.5%	48,665	22,985	49.7%	$0
2007	2	–	–	–	19.1%	47,466	21,791	47.1%	2	–	–	–	19.1%	47,466	21,791	47.1%	$0
2008	1	–	–	–	18.7%	50,972	17,092	36.9%	1	–	–	–	18.7%	50,972	17,092	36.9%	$0
2009	1	–	–	–	18.2%	53,467	9,897	21.4%	1	–	–	–	18.2%	53,467	9,897	21.4%	$0
2010	1	–	–	–	17.7%	52,343	1,029	2.4%	1	–	–	–	17.7%	52,343	1,029	2.4%	$0
2011	–	–	–	1	26.2%	42,287	2,215	5.1%	2	1	–	–	18.0%	36,393	8,110	18.7%	$844
2012	–	–	–	–	23.1%	44,086	1,603	3.7%	–	2 *	–	–	17.4%	38,399	13,185	30.3%	($70,185)
2013	–	–	–	–	20.2%	42,562	2,515	5.8%	–	3 *	–	–	17.9%	37,072	19,587	45.1%	($84,189)
Totals	8	0	0	1					5	6	0	0					

Short term present worth difference: ($40,913)

Long term present worth difference: ($212,397)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/10.03

BASE AND ALTERNATE PLAN COMPARISONS

1993 BASE CASE LOAD FORECAST LESS 0.5% PER YEAR GROWTH – WITH DSM
(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN ESED: $0/TON No FGD Retrofits				ALT. PLAN 1 ESED: $150/TON No FGD Retrofits				ALT. PLAN 2 ESED: $300/TON No FGD Retrofits				ALT. PLAN 3 ESED: $0/TON Winyah #1 FGD in 2011			
	FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS			
	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2
1993	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1994	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1995	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1996	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1997	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1998	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1999	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2001	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2002	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2003	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2004	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2005	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2006	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2007	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2008	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2009	–	–	–	1	1	–	–	–	1	–	–	–	1	–	–	–
2010	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2011	–	–	–	–	–	–	1	–	–	–	1	–	1	4 *	–	–
2012	–	–	–	–	–	–	–	–	–	–	–	–	–	2 *	–	–
2013	–	–	–	–	1	–	–	–	1	–	–	–	–	2 *	–	–
Totals	5	0	0	1	8	0	1	0	8	0	1	0	0	8	0	0
Savings over Base Plan													* 40 MW heat recovery unit only			
Through 2013 (1993 Dollars)					$78,668,000				$76,270,000				$93,145,000			
Through 2057 (1993 Dollars)					$97,436,000				$90,892,000				$165,554,000			

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST LESS 0.5% PER YEAR GROWTH – WITH DSM
(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 04.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 1 04.Dd ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	16.1%	–	–	–	–	–	–	–	16.1%	–	–	–	$0
1995	–	–	–	–	28.3%	–	–	–	–	–	–	–	28.3%	–	–	–	$0
1996	–	–	–	–	26.1%	–	–	–	–	–	–	–	26.1%	–	–	–	$0
1997	–	–	–	–	23.8%	–	–	–	–	–	–	–	23.8%	–	–	–	$0
1998	–	–	–	–	22.9%	–	–	–	–	–	–	–	22.9%	–	–	–	$0
1999	–	–	–	–	22.2%	–	–	–	–	–	–	–	22.2%	–	–	–	$0
2000	–	–	–	–	25.6%	41,118	5,155	11.1%	–	–	–	–	25.6%	32,908	13,365	28.9%	$645
2001	–	–	–	–	27.7%	37,240	14,187	30.7%	–	–	–	–	27.7%	29,195	30,443	65.8%	$715
2002	–	–	–	–	24.7%	40,846	19,614	42.4%	–	–	–	–	24.7%	32,987	43,729	94.5%	$750
2003	–	–	–	–	21.9%	42,127	23,760	51.3%	–	–	–	–	21.9%	34,431	55,571	120.1%	$694
2004	–	–	–	–	17.9%	41,451	28,582	61.8%	–	–	–	–	17.9%	34,713	67,131	145.1%	$624
2005	1	–	–	–	17.7%	45,413	29,442	63.6%	1	–	–	–	17.7%	39,173	74,231	160.4%	$598
2006	1	–	–	–	17.5%	47,556	28,158	60.9%	1	–	–	–	17.5%	41,406	79,097	170.9%	$647
2007	1	–	–	–	17.0%	46,293	28,138	60.8%	1	–	–	–	17.0%	40,910	84,460	182.5%	$281
2008	2	–	–	–	19.4%	49,910	24,501	52.9%	2	–	–	–	19.4%	44,662	86,071	186.0%	$370
2009	–	–	–	1	34.3%	39,453	31,321	67.7%	1	–	–	–	19.1%	46,905	85,439	184.6%	$3,729
2010	–	–	–	–	31.2%	38,290	36,505	84.0%	1	–	–	–	18.8%	46,278	82,635	190.1%	($117,133)
2011	–	–	–	–	22.5%	40,334	39,645	91.2%	–	–	1	–	20.1%	38,902	87,207	200.6%	($28,218)
2012	–	–	–	–	20.0%	42,575	40,544	93.3%	–	–	–	–	17.7%	41,774	88,906	204.5%	($20,017)
2013	–	–	–	–	17.6%	41,706	42,311	97.3%	1	–	–	–	17.6%	41,332	91,049	209.4%	($19,310)
Totals	5	0	0	1					8	0	1	0					

Short term present worth difference: ($78,668)
Long term present worth difference: ($97,436)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

C&CP05/18/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST LESS 0.5% PER YEAR GROWTH – WITH DSM

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 04.Da — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON — NO FGD RETROFITS								ALTERNATE PLAN 2 04.Db — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON — NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	16.1%	–	–	–	–	–	–	–	16.1%	–	–	–	$0
1995	–	–	–	–	28.3%	–	–	–	–	–	–	–	28.3%	–	–	–	$0
1996	–	–	–	–	26.1%	–	–	–	–	–	–	–	26.1%	–	–	–	$0
1997	–	–	–	–	23.8%	–	–	–	–	–	–	–	23.8%	–	–	–	$0
1998	–	–	–	–	22.9%	–	–	–	–	–	–	–	22.9%	–	–	–	$0
1999	–	–	–	–	22.2%	–	–	–	–	–	–	–	22.2%	–	–	–	$0
2000	–	–	–	–	25.6%	41,118	5,155	11.1%	–	–	–	–	25.6%	31,948	14,325	31.0%	$919
2001	–	–	–	–	27.7%	37,240	14,187	30.7%	–	–	–	–	27.7%	28,438	32,159	69.5%	$936
2002	–	–	–	–	24.7%	40,846	19,614	42.4%	–	–	–	–	24.7%	32,108	46,324	100.1%	$1,022
2003	–	–	–	–	21.9%	42,127	23,760	51.3%	–	–	–	–	21.9%	33,439	59,159	127.8%	$1,018
2004	–	–	–	–	17.9%	41,451	28,582	61.8%	–	–	–	–	17.9%	33,695	71,736	155.0%	$964
2005	1	–	–	–	17.7%	45,413	29,442	63.6%	1	–	–	–	17.7%	38,037	79,972	172.8%	$995
2006	1	–	–	–	17.5%	47,556	28,158	60.9%	1	–	–	–	17.5%	40,146	86,099	186.1%	$1,097
2007	1	–	–	–	17.0%	46,293	28,138	60.8%	1	–	–	–	17.0%	39,664	92,709	200.4%	$741
2008	2	–	–	–	19.4%	49,910	24,501	52.9%	2	–	–	–	19.4%	43,397	95,585	206.6%	$868
2009	–	–	–	1	34.3%	39,453	31,321	67.7%	1	–	–	–	19.1%	45,551	96,307	208.1%	$4,269
2010	–	–	–	–	31.2%	38,290	36,505	84.0%	1	–	–	–	18.8%	45,021	94,760	218.0%	($116,596)
2011	–	–	–	–	22.5%	40,334	39,645	91.2%	–	–	1	–	20.1%	37,827	100,407	231.0%	($117,435)
2012	–	–	–	–	20.0%	42,575	40,544	93.3%	–	–	–	–	17.7%	40,569	103,311	237.6%	($19,414)
2013	–	–	–	–	17.6%	41,706	42,311	97.3%	1	–	–	–	17.6%	40,171	106,615	245.2%	($18,721)
Totals	5	0	0	1					8	0	1	0					

Short term present worth difference: ($76,270)

Long term present worth difference: ($90,892)

C&CP05/18/93

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST LESS 0.5% PER YEAR GROWTH – WITH DSM

(ALUMAX LOAD REDUCTION BEGINNING APRIL, 2000)

Year	BASE PLAN 04.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 3 04.Dc ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON WINYAH #1 FGD RETROFIT IN 2011								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	16.1%	–	–	–	–	–	–	–	16.1%	–	–	–	$0
1995	–	–	–	–	28.3%	–	–	–	–	–	–	–	28.3%	–	–	–	$0
1996	–	–	–	–	26.1%	–	–	–	–	–	–	–	26.1%	–	–	–	$0
1997	–	–	–	–	23.8%	–	–	–	–	–	–	–	23.8%	–	–	–	$0
1998	–	–	–	–	22.9%	–	–	–	–	–	–	–	22.9%	–	–	–	$0
1999	–	–	–	–	22.2%	–	–	–	–	–	–	–	22.2%	–	–	–	$0
2000	–	–	–	–	25.6%	41,118	5,155	11.1%	–	–	–	–	25.6%	41,118	5,155	11.1%	$0
2001	–	–	–	–	27.7%	37,240	14,187	30.7%	–	–	–	–	27.7%	37,240	14,187	30.7%	$0
2002	–	–	–	–	24.7%	40,846	19,614	42.4%	–	–	–	–	24.7%	40,846	19,614	42.4%	$0
2003	–	–	–	–	21.9%	42,127	23,760	51.3%	–	–	–	–	21.9%	42,127	23,760	51.3%	$0
2004	–	–	–	–	17.9%	41,451	28,582	61.8%	–	–	–	–	17.9%	41,451	28,582	61.8%	$0
2005	1	–	–	–	17.7%	45,413	29,442	63.6%	1	–	–	–	17.7%	45,413	29,442	63.6%	$0
2006	1	–	–	–	17.5%	47,556	28,158	60.9%	1	–	–	–	17.5%	47,556	28,158	60.9%	$0
2007	1	–	–	–	17.0%	46,293	28,138	60.8%	1	–	–	–	17.0%	46,293	28,138	60.8%	$0
2008	2	–	–	–	19.4%	49,910	24,501	52.9%	2	–	–	–	19.4%	49,910	24,501	52.9%	$0
2009	–	–	–	1	34.3%	39,453	31,321	67.7%	1	–	–	–	19.1%	52,128	18,646	40.3%	$3,192
2010	–	–	–	–	31.2%	38,290	36,505	84.0%	1	–	–	–	18.8%	51,155	10,966	25.2%	($117,556)
2011	–	–	–	–	22.5%	40,334	39,645	91.2%	1	4 *	–	–	17.7%	50,523	3,916	9.0%	($113,099)
2012	–	–	–	–	20.0%	42,575	40,544	93.3%	–	2 *	–	–	17.7%	37,431	9,959	22.9%	($43,601)
2013	–	–	–	–	17.6%	41,706	42,311	97.3%	–	2 *	–	–	17.6%	36,001	17,432	40.1%	($44,474)
Totals	5	0	0	1					0	8	0	0					

Short term present worth difference: ($93,145)

Long term present worth difference: ($165,554)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/18/93

BASE AND ALTERNATE PLAN COMPARISONS

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN ESED: $0/TON No FGD Retrofits				ALT. PLAN 1 ESED: $150/TON No FGD Retrofits				ALT. PLAN 2 ESED: $300/TON No FGD Retrofits				ALT. PLAN 3 ESED: $300/TON Winyah #1 FGD in 2000				ALT. PLAN 4 ESED: $150/TON Winyah #1 FGD in 2000				ALT. PLAN 5 ESED: $0/TON Winyah #1 FGD in 2002			
	FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS			
	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2
1993	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1994	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1995	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1996	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1997	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1998	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
1999	–	1 *	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2000	–	–	–	1	–	–	–	1	–	–	–	1	2	–	–	–	2	–	–	–	2	–	–	–
2001	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2002	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2003	–	–	–	1	–	–	–	–	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2004	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2005	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	–	–	–	1
2006	–	–	–	–	2	–	–	–	2	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–
2007	1	–	–	–	2	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2008	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–
2009	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	2	–	–	–
2010	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2011	4	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1
2012	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2013	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
Totals	5	1	1	3	10	0	0	3	10	0	0	3	17	0	0	2	17	0	0	2	17	0	0	2
Savings over Base Plan																								
Through 2013 (1993 Dollars)					$248,155,000				$245,552,000				$430,918,000				$433,440,000				$420,544,000			
Through 2057 (1993 Dollars)					$434,677,000				$428,524,000				$607,613,000				$613,944,000				$608,880,000			

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal * 40 MW heat recovery unit only.

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 05a ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 1 05a ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	14.7%	–	–	–	–	–	–	–	14.7%	–	–	–	$0
1995	–	–	–	–	25.1%	–	–	–	–	–	–	–	25.1%	–	–	–	$0
1996	–	–	–	–	21.2%	–	–	–	–	–	–	–	21.2%	–	–	–	$0
1997	–	–	–	–	17.5%	–	–	–	–	–	–	–	17.5%	–	–	–	$0
1998	1	–	–	–	18.0%	–	–	–	1	–	–	–	18.0%	–	–	–	$0
1999	–	1 *	–	–	17.2%	–	–	–	1	–	–	–	18.5%	–	–	–	($502)
2000	–	–	–	1	28.7%	42,519	3,754	8.1%	–	–	–	1	30.0%	34,612	11,661	25.2%	$841
2001	–	–	–	–	24.9%	41,986	8,041	17.4%	–	–	–	–	26.1%	34,463	23,472	50.7%	$1,582
2002	–	–	–	–	20.8%	47,212	7,102	15.3%	–	–	–	–	22.0%	40,080	29,664	64.1%	$2,516
2003	–	–	–	1	33.3%	37,502	15,873	34.3%	–	–	–	–	18.0%	42,919	33,019	71.4%	($2,924)
2004	–	–	–	–	27.9%	37,789	24,357	52.6%	2	–	–	–	17.8%	43,726	35,565	76.9%	($108,450)
2005	–	–	–	–	23.8%	42,896	27,734	59.9%	2	–	–	–	18.4%	49,880	31,958	69.1%	($92,650)
2006	–	–	–	–	19.7%	45,678	28,329	61.2%	2	–	–	–	18.6%	52,945	25,286	54.6%	($78,795)
2007	1	–	–	–	17.3%	45,094	29,509	63.8%	2	–	–	–	18.3%	52,562	18,997	41.1%	($68,061)
2008	–	–	–	1	27.3%	39,376	36,406	78.7%	–	–	–	1	28.3%	43,901	21,369	46.2%	($75,543)
2009	–	–	–	–	23.2%	42,951	39,728	85.9%	–	–	–	–	24.2%	47,037	20,605	44.5%	($73,879)
2010	–	–	–	–	19.3%	42,634	40,568	93.3%	–	–	–	–	20.2%	47,545	16,534	38.0%	($73,260)
2011	4	–	–	–	18.7%	45,807	38,235	87.9%	–	–	–	1	25.0%	39,321	20,687	47.6%	($71,123)
2012	–	–	1	–	21.8%	43,914	37,795	86.9%	–	–	–	–	20.9%	41,832	22,329	51.4%	$44,333
2013	–	–	–	–	18.0%	44,186	37,083	85.3%	–	–	–	–	17.2%	43,153	22,650	52.1%	($50,347)
Totals	5	1	1	3					10	0	0	3					

Short term present worth difference: ($248,155)
Long term present worth difference: ($434,677)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/18.93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH

(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 05.a — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON, NO FGD RETROFITS								ALTERNATE PLAN 2 05.b — ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON, NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	14.7%	–	–	–	–	–	–	–	14.7%	–	–	–	$0
1995	–	–	–	–	25.1%	–	–	–	–	–	–	–	25.1%	–	–	–	$0
1996	–	–	–	–	21.2%	–	–	–	–	–	–	–	21.2%	–	–	–	$0
1997	–	–	–	–	17.5%	–	–	–	–	–	–	–	17.5%	–	–	–	$0
1998	1	–	–	–	18.0%	–	–	–	1	–	–	–	18.0%	–	–	–	$0
1999	–	1 *	–	–	17.2%	–	–	–	1	–	–	–	18.5%	–	–	–	($502)
2000	–	–	–	1	28.7%	42,519	3,754	8.1%	–	–	–	1	30.0%	33,568	12,705	27.5%	$1,129
2001	–	–	–	–	24.9%	41,986	8,041	17.4%	–	–	–	–	26.1%	33,485	25,493	55.1%	$1,865
2002	–	–	–	–	20.8%	47,212	7,102	15.3%	–	–	–	–	22.0%	38,906	32,859	71.0%	$2,876
2003	–	–	–	1	33.3%	37,502	15,873	34.3%	–	–	–	–	18.0%	41,512	37,621	81.3%	($2,479)
2004	–	–	–	–	27.9%	37,789	24,357	52.6%	2	–	–	–	17.8%	42,348	41,546	89.8%	($108,010)
2005	–	–	–	–	23.8%	42,896	27,734	59.9%	2	–	–	–	18.4%	48,255	39,565	85.5%	($92,103)
2006	–	–	–	–	19.7%	45,678	28,329	61.2%	2	–	–	–	18.6%	51,357	34,481	74.5%	($78,243)
2007	1	–	–	–	17.3%	45,094	29,509	63.8%	2	–	–	–	18.3%	51,066	29,688	64.2%	($67,509)
2008	–	–	–	1	27.3%	39,376	36,406	78.7%	–	–	–	1	28.3%	42,743	33,217	71.8%	($75,081)
2009	–	–	–	–	23.2%	42,951	39,728	85.9%	–	–	–	–	24.2%	45,687	33,803	73.1%	($73,340)
2010	–	–	–	–	19.3%	42,634	40,568	93.3%	–	–	–	–	20.2%	46,264	31,013	71.3%	($72,713)
2011	4	–	–	–	18.7%	45,807	38,235	87.9%	–	–	–	1	25.0%	38,501	35,986	82.8%	($70,573)
2012	–	–	1	–	21.8%	43,914	37,795	86.9%	–	–	–	–	20.9%	40,878	38,582	88.7%	$44,790
2013	–	–	–	–	18.0%	44,186	37,083	85.3%	–	–	–	–	17.2%	42,172	39,894	91.7%	($49,843)
Totals	5	1	1	3					10	0	0	3					

Short term present worth difference: ($245,552)

Long term present worth difference: ($428,524)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/18.A3

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 05.a ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 3 05.d ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	14.7%	–	–	–	–	–	–	–	14.7%	–	–	–	$0
1995	–	–	–	–	25.1%	–	–	–	–	–	–	–	25.1%	–	–	–	$0
1996	–	–	–	–	21.2%	–	–	–	–	–	–	–	21.2%	–	–	–	$0
1997	–	–	–	–	17.5%	–	–	–	–	–	–	–	17.5%	–	–	–	$0
1998	1	–	–	–	18.0%	–	–	–	1	–	–	–	18.0%	–	–	–	$0
1999	–	1 *	–	–	17.2%	–	–	–	1	–	–	–	18.5%	–	–	–	($502)
2000	–	–	–	1	28.7%	42,519	3,754	8.1%	2	–	–	–	17.1%	38,562	7,711	16.7%	$2,635
2001	–	–	–	–	24.9%	41,986	8,041	17.4%	2	–	–	–	18.6%	39,305	14,679	31.7%	($70,205)
2002	–	–	–	–	20.8%	47,212	7,102	15.3%	1	–	–	–	17.1%	43,704	17,248	37.3%	($57,788)
2003	–	–	–	1	33.3%	37,502	15,873	34.3%	2	–	–	–	18.0%	45,123	18,398	39.8%	($54,045)
2004	–	–	–	–	27.9%	37,789	24,357	52.6%	2	–	–	–	17.8%	46,964	17,707	38.3%	($145,602)
2005	–	–	–	–	23.8%	42,896	27,734	59.9%	2	–	–	–	18.4%	51,376	12,604	27.2%	($119,148)
2006	–	–	–	–	19.7%	45,678	28,329	61.2%	–	–	–	1	29.1%	40,978	17,899	38.7%	($131,248)
2007	1	–	–	–	17.3%	45,094	29,509	63.8%	–	–	–	–	24.4%	41,301	22,871	49.4%	($16,176)
2008	–	–	–	1	27.3%	39,376	36,406	78.7%	–	–	–	–	20.4%	45,812	23,332	50.4%	($16,109)
2009	–	–	–	–	23.2%	42,951	39,728	85.9%	1	–	–	–	18.5%	47,974	21,631	46.7%	($128,578)
2010	–	–	–	–	19.3%	42,634	40,568	93.3%	2	–	–	–	18.3%	48,492	16,613	38.2%	($120,587)
2011	4	–	–	–	18.7%	45,807	38,235	87.9%	–	–	–	1	23.2%	39,427	20,660	47.5%	($137,155)
2012	–	–	1	–	21.8%	43,914	37,795	86.9%	–	–	–	–	19.2%	41,601	22,533	51.8%	$3,265
2013	–	–	–	–	18.0%	44,186	37,083	85.3%	1	–	–	–	17.2%	42,492	23,515	54.1%	($86,680)
Totals	5	1	1	3					17	0	0	2					

Short term present worth difference: ($430,918)
Long term present worth difference: ($607,613)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/10/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 05.a ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 4 05.f ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	14.7%	–	–	–	–	–	–	–	14.7%	–	–	–	$0
1995	–	–	–	–	25.1%	–	–	–	–	–	–	–	25.1%	–	–	–	$0
1996	–	–	–	–	21.2%	–	–	–	–	–	–	–	21.2%	–	–	–	$0
1997	–	–	–	–	17.5%	–	–	–	–	–	–	–	17.5%	–	–	–	$0
1998	1	–	–	–	18.0%	–	–	–	1	–	–	–	18.0%	–	–	–	$0
1999	–	1 *	–	–	17.2%	–	–	–	1	–	–	–	18.5%	–	–	–	($502)
2000	–	–	–	1	28.7%	42,519	3,754	8.1%	2	–	–	–	17.1%	38,821	7,452	16.1%	$2,307
2001	–	–	–	–	24.9%	41,986	8,041	17.4%	2	–	–	–	18.6%	39,604	14,121	30.5%	($70,516)
2002	–	–	–	–	20.8%	47,212	7,102	15.3%	1	–	–	–	17.1%	44,048	16,345	35.3%	($58,158)
2003	–	–	–	1	33.3%	37,502	15,873	34.3%	2	–	–	–	18.0%	45,442	17,176	37.1%	($54,411)
2004	–	–	–	–	27.9%	37,789	24,357	52.6%	2	–	–	–	17.8%	47,304	16,144	34.9%	($145,963)
2005	–	–	–	–	23.8%	42,896	27,734	59.9%	2	–	–	–	18.4%	51,808	10,609	22.9%	($119,514)
2006	–	–	–	–	19.7%	45,678	28,329	61.2%	–	–	–	1	29.1%	41,276	15,606	33.7%	($131,677)
2007	1	–	–	–	17.3%	45,094	29,509	63.8%	–	–	–	–	24.4%	41,615	20,264	43.8%	($16,611)
2008	–	–	–	1	27.3%	39,376	36,406	78.7%	–	–	–	–	20.4%	46,119	20,419	44.1%	($16,597)
2009	–	–	–	–	23.2%	42,951	39,728	85.9%	1	–	–	–	18.5%	48,332	18,360	39.7%	($129,078)
2010	–	–	–	–	19.3%	42,634	40,568	93.3%	2	–	–	–	18.3%	48,856	12,978	29.9%	($121,082)
2011	4	–	–	–	18.7%	45,807	38,235	87.9%	–	–	–	1	23.2%	39,593	16,860	38.8%	($138,088)
2012	–	–	1	–	21.8%	43,914	37,795	86.9%	–	–	–	–	19.2%	41,793	18,541	42.6%	$2,712
2013	–	–	–	–	18.0%	44,186	37,083	85.3%	1	–	–	–	17.2%	42,696	19,319	44.4%	($87,208)
Totals	5	1	1	3					17	0	0	2					

Short term present worth difference: ($433,440)
Long term present worth difference: ($613,944)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/19.83

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 05.a ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 5 05.c ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON WINYAH #1 FGD RETROFIT IN 2002								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	14.7%	–	–	–	–	–	–	–	14.7%	–	–	–	$0
1995	–	–	–	–	25.1%	–	–	–	–	–	–	–	25.1%	–	–	–	$0
1996	–	–	–	–	21.2%	–	–	–	–	–	–	–	21.2%	–	–	–	$0
1997	–	–	–	–	17.5%	–	–	–	–	–	–	–	17.5%	–	–	–	$0
1998	1	–	–	–	18.0%	–	–	–	1	–	–	–	18.0%	–	–	–	$0
1999	–	1 *	–	–	17.2%	–	–	–	1	–	–	–	18.5%	–	–	–	($502)
2000	–	–	–	1	28.7%	42,519	3,754	8.1%	2	–	–	–	17.1%	39,664	6,609	14.3%	$2,337
2001	–	–	–	–	24.9%	41,986	8,041	17.4%	2	–	–	–	18.6%	40,557	12,324	26.6%	($70,525)
2002	–	–	–	–	20.8%	47,212	7,102	15.3%	1	–	–	–	17.1%	45,232	13,365	28.9%	($58,148)
2003	–	–	–	1	33.3%	37,502	15,873	34.3%	2	–	–	–	18.0%	46,619	13,020	28.1%	($54,361)
2004	–	–	–	–	27.9%	37,789	24,357	52.6%	2	–	–	–	17.8%	48,524	10,769	23.3%	($145,897)
2005	–	–	–	–	23.8%	42,896	27,734	59.9%	–	–	–	1	29.2%	39,755	17,287	37.4%	($145,640)
2006	–	–	–	–	19.7%	45,678	28,329	61.2%	–	–	–	–	24.9%	42,288	21,272	46.0%	($31,473)
2007	1	–	–	–	17.3%	45,094	29,509	63.8%	–	–	–	–	20.4%	42,786	24,759	53.5%	($30,513)
2008	–	–	–	1	27.3%	39,376	36,406	78.7%	1	–	–	–	18.4%	47,388	23,645	51.1%	($30,338)
2009	–	–	–	–	23.2%	42,951	39,728	85.9%	2	–	–	–	18.5%	49,694	20,224	43.7%	($137,533)
2010	–	–	–	–	19.3%	42,634	40,568	93.3%	2	–	–	–	18.3%	50,209	13,488	31.0%	($124,035)
2011	4	–	–	–	18.7%	45,807	38,235	87.9%	–	–	–	1	23.2%	40,395	16,568	38.1%	($142,495)
2012	–	–	1	–	21.8%	43,914	37,795	86.9%	–	–	–	–	19.2%	42,593	17,449	40.1%	($342)
2013	–	–	–	–	18.0%	44,186	37,083	85.3%	1	–	–	–	17.2%	43,593	17,330	39.9%	($90,464)
Totals	5	1	1	3					17	0	0	2					

Short term present worth difference: ($420,544)
Long term present worth difference: ($608,880)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/1693

BASE AND ALTERNATE PLAN COMPARISONS

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH – WITH DSM
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN ESED: $0/TON No FGD Retrofits				ALT. PLAN 1 ESED: $150/TON No FGD Retrofits				ALT. PLAN 2 ESED: $300/TON No FGD Retrofits				ALT. PLAN 3 ESED: $300/TON Winyah #1 FGD in 2000				ALT. PLAN 4 ESED: $150/TON Winyah #1 FGD in 2000				ALT. PLAN 5 ESED: $0/TON Winyah #1 FGD in 2000			
	FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS				FUTURE UNITS			
	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2	CT	CC	C1	C2
1993	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1994	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1995	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1996	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1997	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1998	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
1999	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2000	–	–	–	1	–	–	–	1	–	–	–	1	3	–	–	–	3	–	–	–	3	–	–	–
2001	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2002	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2003	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–	–
2004	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2005	–	–	–	1	2	–	–	–	–	–	–	1	2	–	–	–	2	–	–	–	2	–	–	–
2006	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1
2007	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2008	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2009	2	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2010	–	–	–	1	–	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–	2	–	–	–
2011	–	–	–	–	–	–	–	1	5	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1
2012	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
2013	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	–
Totals	5	0	1	3	7	1	0	3	12	0	1	2	14	1	0	2	14	1	0	2	14	1	0	2
Savings over Base Plan																								
Through 2013 (1993 Dollars)					$110,037,000				$80,574,000				$310,228,000				$312,742,000				$313,084,000			
Through 2057 (1993 Dollars)					$287,877,000				$342,383,000				$552,507,000				$558,936,000				$560,386,000			

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH – WITH DSM
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 05.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 1 05.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	14.8%	–	–	–	–	–	–	–	14.8%	–	–	–	$0
1995	–	–	–	–	25.4%	–	–	–	–	–	–	–	25.4%	–	–	–	$0
1996	–	–	–	–	21.9%	–	–	–	–	–	–	–	21.9%	–	–	–	$0
1997	–	–	–	–	18.3%	–	–	–	–	–	–	–	18.3%	–	–	–	$0
1998	1	–	–	–	19.1%	–	–	–	1	–	–	–	19.1%	–	–	–	$0
1999	–	–	–	–	17.1%	–	–	–	–	–	–	–	17.1%	–	–	–	$0
2000	–	–	–	1	28.8%	42,584	3,689	8.0%	–	–	–	1	28.8%	33,891	12,382	26.8%	$665
2001	–	–	–	–	25.3%	41,643	8,320	18.0%	–	–	–	–	25.3%	33,780	24,875	53.8%	$649
2002	–	–	–	–	21.3%	46,865	7,727	16.7%	–	–	–	–	21.3%	39,003	32,144	69.5%	$664
2003	–	–	–	–	17.6%	49,426	4,575	9.9%	–	–	–	–	17.6%	41,639	36,778	79.5%	$531
2004	2	–	–	–	17.6%	49,162	1,686	3.6%	2	–	–	–	17.6%	42,881	40,170	86.8%	$570
2005	–	–	–	1	29.2%	42,011	5,948	12.9%	2	–	–	–	18.2%	49,064	37,379	80.8%	($388)
2006	–	–	–	–	25.0%	44,689	7,532	16.3%	2	–	–	–	18.6%	51,810	31,842	68.8%	($96,460)
2007	–	–	–	–	20.8%	44,151	9,654	20.9%	–	1	–	–	17.7%	52,021	26,095	56.4%	($88,568)
2008	–	–	–	–	17.0%	49,706	6,221	13.4%	–	–	–	1	28.1%	41,475	30,893	66.8%	($80,444)
2009	2	–	–	–	17.2%	52,389	106	0.2%	–	–	–	–	24.0%	44,793	32,372	70.0%	$43,782
2010	–	–	–	1	26.7%	41,536	2,044	4.7%	–	–	–	–	20.1%	46,466	29,380	67.6%	$30,637
2011	–	–	–	–	18.5%	44,489	1,029	2.4%	–	–	–	1	24.9%	37,321	35,533	81.7%	($97,922)
2012	–	–	1	–	22.1%	42,822	1,681	3.9%	–	–	–	–	21.2%	40,545	38,462	88.5%	$38,097
2013	–	–	–	–	18.6%	43,197	1,958	4.5%	–	–	–	–	17.8%	42,581	39,355	90.5%	($54,637)
Totals	5	0	1	3					7	1	0	3					

Short term present worth difference: ($110,037)
Long term present worth difference: ($287,877)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/18.93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH – WITH DSM
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 05.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 2 05.Db ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON NO FGD RETROFITS								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	14.8%	–	–	–	–	–	–	–	14.8%	–	–	–	$0
1995	–	–	–	–	25.4%	–	–	–	–	–	–	–	25.4%	–	–	–	$0
1996	–	–	–	–	21.9%	–	–	–	–	–	–	–	21.9%	–	–	–	$0
1997	–	–	–	–	18.3%	–	–	–	–	–	–	–	18.3%	–	–	–	$0
1998	1	–	–	–	19.1%	–	–	–	1	–	–	–	19.1%	–	–	–	$0
1999	–	–	–	–	17.1%	–	–	–	–	–	–	–	17.1%	–	–	–	$0
2000	–	–	–	1	28.8%	42,584	3,689	8.0%	–	–	–	1	28.8%	32,884	13,389	28.9%	$947
2001	–	–	–	–	25.3%	41,643	8,320	18.0%	–	–	–	–	25.3%	32,827	26,836	58.0%	$940
2002	–	–	–	–	21.3%	46,865	7,727	16.7%	–	–	–	–	21.3%	37,902	35,207	76.1%	$994
2003	–	–	–	–	17.6%	49,426	4,575	9.9%	–	–	–	–	17.6%	40,299	41,181	89.0%	$962
2004	2	–	–	–	17.6%	49,162	1,686	3.6%	2	–	–	–	17.6%	41,504	45,950	99.3%	$1,024
2005	–	–	–	1	29.2%	42,011	5,948	12.9%	–	–	–	1	29.2%	32,542	59,681	129.0%	$1,239
2006	–	–	–	–	25.0%	44,689	7,532	16.3%	–	–	–	–	25.0%	35,632	70,322	152.0%	$1,190
2007	–	–	–	–	20.8%	44,151	9,654	20.9%	–	–	–	–	20.8%	36,265	80,330	173.6%	$1,102
2008	–	–	–	–	17.0%	49,706	6,221	13.4%	–	–	–	–	17.0%	40,972	85,631	185.1%	$1,293
2009	2	–	–	–	17.2%	52,389	106	0.2%	2	–	–	–	17.2%	44,052	87,852	189.9%	$1,068
2010	–	–	–	1	26.7%	41,536	2,044	4.7%	2	–	–	–	17.3%	44,990	86,336	198.6%	($951)
2011	–	–	–	–	18.5%	44,489	1,029	2.4%	5	–	–	–	18.5%	47,566	82,224	189.2%	($123,596)
2012	–	–	1	–	22.1%	42,822	1,681	3.9%	–	–	1	–	22.1%	44,035	81,683	187.9%	($92,783)
2013	–	–	–	–	18.6%	43,197	1,958	4.5%	–	–	–	–	18.6%	45,285	79,873	183.7%	($89,020)
Totals	5	0	1	3					12	0	1	2					

Short term present worth difference: ($80,574)
Long term present worth difference: ($342,383)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/BA3

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH – WITH DSM
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 05.De ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 3 05.Dd ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $300/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	14.8%	–	–	–	–	–	–	–	14.8%	–	–	–	$0
1995	–	–	–	–	25.4%	–	–	–	–	–	–	–	25.4%	–	–	–	$0
1996	–	–	–	–	21.9%	–	–	–	–	–	–	–	21.9%	–	–	–	$0
1997	–	–	–	–	18.3%	–	–	–	–	–	–	–	18.3%	–	–	–	$0
1998	1	–	–	–	19.1%	–	–	–	1	–	–	–	19.1%	–	–	–	$0
1999	–	–	–	–	17.1%	–	–	–	–	–	–	–	17.1%	–	–	–	$0
2000	–	–	–	1	28.8%	42,584	3,689	8.0%	3	–	–	–	18.4%	38,175	8,098	17.5%	$2,127
2001	–	–	–	–	25.3%	41,643	8,320	18.0%	1	–	–	–	17.7%	38,591	15,780	34.1%	($68,130)
2002	–	–	–	–	21.3%	46,865	7,727	16.7%	2	–	–	–	18.9%	43,074	18,978	41.0%	($60,425)
2003	–	–	–	–	17.6%	49,426	4,575	9.9%	1	–	–	–	17.6%	44,950	20,302	43.9%	($49,320)
2004	2	–	–	–	17.6%	49,162	1,686	3.6%	2	–	–	–	17.6%	46,256	20,319	43.9%	($39,630)
2005	–	–	–	1	29.2%	42,011	5,948	12.9%	2	–	–	–	18.2%	50,743	15,849	34.3%	($31,016)
2006	–	–	–	–	25.0%	44,689	7,532	16.3%	–	–	–	1	29.3%	40,017	22,105	47.8%	($149,246)
2007	–	–	–	–	20.8%	44,151	9,654	20.9%	–	–	–	–	25.0%	40,887	27,491	59.4%	($37,667)
2008	–	–	–	–	17.0%	49,706	6,221	13.4%	–	–	–	–	21.0%	44,763	29,001	62.7%	($23,096)
2009	2	–	–	–	17.2%	52,389	106	0.2%	–	–	–	–	17.2%	47,020	28,235	61.1%	($14,145)
2010	–	–	–	1	26.7%	41,536	2,044	4.7%	2	–	–	–	17.3%	47,460	24,268	55.8%	($23,336)
2011	–	–	–	–	18.5%	44,489	1,029	2.4%	–	–	–	1	22.1%	38,404	29,337	67.5%	($173,993)
2012	–	–	1	–	22.1%	42,822	1,681	3.9%	–	–	–	–	18.6%	40,655	32,157	74.0%	($16,471)
2013	–	–	–	–	18.6%	43,197	1,958	4.5%	–	1	–	–	17.8%	41,615	34,015	78.2%	($109,281)
Totals	5	0	1	3					14	1	0	2					

Short term present worth difference: ($310,228)
Long term present worth difference: ($552,507)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/16/93

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH – WITH DSM
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 05.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 4 05.Di ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $150/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	14.8%	–	–	–	–	–	–	–	14.8%	–	–	–	$0
1995	–	–	–	–	25.4%	–	–	–	–	–	–	–	25.4%	–	–	–	$0
1996	–	–	–	–	21.9%	–	–	–	–	–	–	–	21.9%	–	–	–	$0
1997	–	–	–	–	18.3%	–	–	–	–	–	–	–	18.3%	–	–	–	$0
1998	1	–	–	–	19.1%	–	–	–	1	–	–	–	19.1%	–	–	–	$0
1999	–	–	–	–	17.1%	–	–	–	–	–	–	–	17.1%	–	–	–	$0
2000	–	–	–	1	28.8%	42,584	3,689	8.0%	3	–	–	–	18.4%	38,425	7,848	17.0%	$1,786
2001	–	–	–	–	25.3%	41,643	8,320	18.0%	1	–	–	–	17.7%	38,877	15,244	32.9%	($68,442)
2002	–	–	–	–	21.3%	46,865	7,727	16.7%	2	–	–	–	18.9%	43,409	18,108	39.1%	($60,798)
2003	–	–	–	–	17.6%	49,426	4,575	9.9%	1	–	–	–	17.6%	45,272	19,108	41.3%	($49,673)
2004	2	–	–	–	17.6%	49,162	1,686	3.6%	2	–	–	–	17.6%	46,594	18,787	40.6%	($39,981)
2005	–	–	–	1	29.2%	42,011	5,948	12.9%	2	–	–	–	18.2%	51,174	13,887	30.0%	($31,368)
2006	–	–	–	–	25.0%	44,689	7,532	16.3%	–	–	–	1	29.3%	40,305	19,855	42.9%	($149,676)
2007	–	–	–	–	20.8%	44,151	9,654	20.9%	–	–	–	–	25.0%	41,203	24,924	53.9%	($38,098)
2008	–	–	–	–	17.0%	49,706	6,221	13.4%	–	–	–	–	21.0%	45,057	26,140	56.5%	($23,604)
2009	2	–	–	–	17.2%	52,389	106	0.2%	–	–	–	–	17.2%	47,348	25,066	54.2%	($14,637)
2010	–	–	–	1	26.7%	41,536	2,044	4.7%	2	–	–	–	17.3%	47,798	20,742	47.7%	($23,832)
2011	–	–	–	–	18.5%	44,489	1,029	2.4%	–	–	–	1	22.1%	38,571	25,645	59.0%	($174,902)
2012	–	–	1	–	22.1%	42,822	1,681	3.9%	–	–	–	–	18.6%	40,835	28,284	65.1%	($17,019)
2013	–	–	–	–	18.6%	43,197	1,958	4.5%	–	1	–	–	17.8%	41,827	29,931	68.8%	($109,824)
Totals	5	0	1	3					14	1	0	2					

Short term present worth difference: ($312,742)
Long term present worth difference: ($558,936)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C4CP05/10.03

BASE AND ALTERNATE PLAN COMPARISON

1993 BASE CASE LOAD FORECAST PLUS ALUMAX PLUS 0.5% PER YEAR GROWTH – WITH DSM
(ALUMAX LOAD IN ALL YEARS)

Year	BASE PLAN 05.Da ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON NO FGD RETROFITS								ALTERNATE PLAN 5 05.Dc ENVIRONMENTALLY SENSITIVE ECONOMIC DISPATCH BASED ON $0/TON WINYAH #1 FGD RETROFIT IN 2000								COST DIFFERENCE ($000)
	FUTURE UNITS				CAP	SO2			FUTURE UNITS				CAP	SO2			
	CT	CC	C1	C2	RES	EMIT	BANK	RES	CT	CC	C1	C2	RES	EMIT	BANK	RES	ALT–BASE
1993	–	–	–	–	15.0%	–	–	–	–	–	–	–	15.0%	–	–	–	$0
1994	–	–	–	–	14.8%	–	–	–	–	–	–	–	14.8%	–	–	–	$0
1995	–	–	–	–	25.4%	–	–	–	–	–	–	–	25.4%	–	–	–	$0
1996	–	–	–	–	21.9%	–	–	–	–	–	–	–	21.9%	–	–	–	$0
1997	–	–	–	–	18.3%	–	–	–	–	–	–	–	18.3%	–	–	–	$0
1998	1	–	–	–	19.1%	–	–	–	1	–	–	–	19.1%	–	–	–	$0
1999	–	–	–	–	17.1%	–	–	–	–	–	–	–	17.1%	–	–	–	$0
2000	–	–	–	1	28.8%	42,584	3,689	8.0%	3	–	–	–	18.4%	39,240	7,033	15.2%	$1,812
2001	–	–	–	–	25.3%	41,643	8,320	18.0%	1	–	–	–	17.7%	39,866	13,440	29.0%	($68,420)
2002	–	–	–	–	21.3%	46,865	7,727	16.7%	2	–	–	–	18.9%	44,547	15,166	32.8%	($60,799)
2003	–	–	–	–	17.6%	49,426	4,575	9.9%	1	–	–	–	17.6%	46,429	15,010	32.4%	($49,531)
2004	2	–	–	–	17.6%	49,162	1,686	3.6%	2	–	–	–	17.6%	47,821	13,462	29.1%	($39,937)
2005	–	–	–	1	29.2%	42,011	5,948	12.9%	2	–	–	–	18.2%	52,596	7,140	15.4%	($31,212)
2006	–	–	–	–	25.0%	44,689	7,532	16.3%	–	–	–	1	29.3%	41,258	12,155	26.3%	($149,718)
2007	–	–	–	–	20.8%	44,151	9,654	20.9%	–	–	–	–	25.0%	42,365	16,062	34.7%	($38,096)
2008	–	–	–	–	17.0%	49,706	6,221	13.4%	–	–	–	–	21.0%	46,171	16,164	34.9%	($23,562)
2009	2	–	–	–	17.2%	52,389	106	0.2%	–	–	–	–	17.2%	48,621	13,816	29.9%	($14,618)
2010	–	–	–	1	26.7%	41,536	2,044	4.7%	2	–	–	–	17.3%	49,070	8,212	18.9%	($23,820)
2011	–	–	–	–	18.5%	44,489	1,029	2.4%	–	–	–	1	22.1%	39,335	12,351	28.4%	($176,424)
2012	–	–	1	–	22.1%	42,822	1,681	3.9%	–	–	–	–	18.6%	41,579	14,245	32.8%	($17,245)
2013	–	–	–	–	18.6%	43,197	1,958	4.5%	–	1	–	–	17.8%	42,650	15,069	34.7%	($109,935)
Totals	5	0	1	3					14	1	0	2					

Short term present worth difference: ($313,084)
Long term present worth difference: ($560,386)

CT: 80 MW Combustion Turbine CC: 120 MW Combined Cycle C1: 320 MW Coal C2: 560 MW Coal

* 40 MW heat recovery unit only.

C&CP05/16.83

APPENDIX C

Results of DSM Analysis

DSM PROGRAMS INDEX

DSM PROGRAM EVALUATION SUMMARY

I. Santee Cooper's Marketing Division has completed an evaluation of the present and future Demand-Side Management program for the Santee Cooper system. The process of evaluation included the following steps:

(1) Selection of Potential Programs

(2) Initial Screening of Programs

(3) Final Screening of Programs

(4) Final Selection of Programs

(5) Recommendation of changes to existing programs and implementation of new programs

1. Potential programs were selected from several sources. Other electric utilities were contacted to review programs they had found to be successful. Previously completed studies by outside consultants were reviewed for potential programs recommendations. Meetings were held with representatives of our resale customers to discuss programs they were offering or felt would be successful. From these sources, a list of 30 potential programs was compiled, which are as follows:

Residential Programs

Swimming Pool Load Management Program

Geothermal Heat Pump Program

Water Conservation Program

Duct Leakage Program

Insulation/Infiltration Reduction

High Efficiency Air Source Heat Pump

Electric Water Heater Wrap

Heat Pump Water Heater

Solar Water Heater

High Efficiency Central Air Conditioners

Direct Load Control of Central Air Conditioners

High Efficiency Room Air Conditioners

Direct Load Control of Room Air Conditioners

Dual Fuel with Add-On Heat Pump

Heat Pump Replacement

Cool Storage

High Efficiency Refrigerators

High Efficiency Freezers

Commercial Programs

Thermal Storage Program

High Efficiency Space Conditioning Equipment Program

High Efficiency Lighting Program

Standby Generator Program

Direct Load Control of Air Conditioners

Heat Recovery Systems

Ventilation Reduction

Ground Coupled Heat Pumps

Energy Management Systems (EMS)

High Efficiency Street Lighting

High Efficiency Refrigeration Equipment

Direct Load Control of Electric Water Heaters

2. The initial screening of potential programs was designed to eliminate programs that would not accomplish our goals. The main criteria for eliminating a potential program was no (or questionable) reduction of peak demand. A secondary criteria for elimination was limited target market. Some programs which reduce peak demand apply only to a small percentage of customers. These programs will be reconsidered in future planning, after programs with broad market appeal have been implemented. The list of 30 potential programs was reduced to 8 through this screening.

The four Residential Programs that were evaluated to be included with the Integrated Resource Plan are as follows:

- Swimming Pool Load Management Program
- Geothermal Heat Pump Program
- Water Conservation Program
- Duct Leakage Program

The four Commercial Programs that were evaluated are as follows:

- Thermal Storage Program
- High Efficiency Space Conditioning Equipment Program
- High Efficiency Lighting Program
- Standby Generator Program

3. A final screening was performed on the 8 remaining potential programs. Load profiles were developed for each program for a 20 year period, based on hourly intervals. These profiles were used to determine the load impact of each program, in terms of both demand reduction and energy savings.

4. The load profiles for the 8 proposed programs were totalized. System Planning then altered the base forecast scenario, based on the effects of the combined programs. The Scenario Construction and Analysis Package (SCAP) was used to compare the annual revenue requirements of the base forecast scenario and the DSM altered base forecast scenario. The difference in annual revenue requirements of the two forecasts was allocated between demand and energy savings, based on the annual fixed and variable cost reductions, respectively. An economic analysis, based on a 5 year program life (but including remaining cost and benefits over a 20 year measure life) was performed on each of the 8 programs. All but one of the programs have a positive net present value over the study period. One program, the Commercial Standby Generator Program, is not cost effective at present. Based on the current forecast, it will not be cost effective until 2001.

5. The existing programs were also evaluated through the SCAP. The existing programs are achieving demand and energy reductions, and will be continued. However, due to changing values of demand and energy reductions, the costs for each program will be reevaluated to ensure all expenditures are appropriate.

The Demand-Side Management Programs that were evaluated and are recommended for implementation are the following:

	Net Present Value 1993
Residential Programs	
Swimming Pool Load Management Program	$ 1,415,991
Geothermal Heat Pump Program	430,700
Water Conservation Program	1,171,993
Duct Leakage Program	750,216
Commercial Programs	
Thermal Storage Program	102,500
High Efficiency Space Conditioning Equipment Program	3,533,100
High Efficiency Lighting Program	18,972,500
Total	$26,377,000

Summary Review of Recommended DSM Programs

RESIDENTIAL PROGRAMS

SWIMMING POOL LOAD MANAGEMENT PROGRAM

The objective of this residential load control program is to reduce system demand on an as-needed basis. The program is available to all residential consumers who allow the participating utility to install radio controlled load management devices on residential pool pumps.

The program offers an up-front rebate and monthly billing credits to residential customers who choose to participate.

Energy Consumer Sectors
WHOLESALE/RETAIL
RESIDENTIAL - SINGLE FAMILY

Technologies
RADIO CONTROLLED LOAD MANAGEMENT DEVICES

Status
DEVELOPMENT - PROJECTED START DATE:
3rd QUARTER OF 1993

Demand Savings	(MW)	Annual Funding ($000)
1st YEAR (1993):	.2	1st YEAR (1993): $129.0
5th YEAR (1997):	.3	5th YEAR (1997): $163.7

Net Present Value	Total Funding ($000)
1993: $1,415,991	5 YEAR: $629.2

GEOTHERMAL HEAT PUMPS

The objective of this program is to reduce peak demand through the installation of energy efficient geothermal heat pumps. This will also provide conservation benefits through the improved efficiency of the heating and cooling system. An up-front rebate will be offered to customers to offset the additional initial cost of installation compared to air source heat pumps.

Energy Consumer Sectors
WHOLESALE/RETAIL
RESIDENTIAL SINGLE AND MULTI-FAMILY RESIDENCES

Technologies
CONSERVATION/EFFICIENCY

Status
PILOT PROGRAM TO BE IMPLEMENTED 4th QUARTER OF 1993

Demand Savings	(MW)	Annual Funding ($000)
1st YEAR (1994):	.2	1st YEAR (1994): $222.9
5th YEAR (1998):	.5	5th YEAR (1998): $470.9

Net Present Value	Total Funding ($000)
1993: $430,700	5 YEAR: $1,664.7

WATER CONSERVATION PROGRAM

This is a conservation program that would be targeted to older homes in which older high flow showerheads would be replaced with low-flow showerheads. The savings would be derived from reduced water and energy consumption. The program would make available a packaged kit that would be available at a lower cost than what is currently available.

Energy Consumer Sectors
RETAIL
RESIDENTIAL - SINGLE AND MULTI-FAMILY RESIDENCES

Technologies
CONSERVATION/EFFICIENCY

Status
DEVELOPMENT - IF FEASIBLE, IMPLEMENT 4th QUARTER OF 1993

Demand Savings	**(MW)**	**Annual Funding ($000)**
1st YEAR (1993):	0	1st YEAR (1993): $70.0
5th YEAR (1997):	0	5th YEAR (1997): $7.5

Net Present Value
1993: $1,171,993

Total Funding ($000)
5 YEAR: $100.0

DUCT LEAKAGE PROGRAM

Analyses performed in adjacent states of homes with central Heating, Ventilation and Air Conditioning (HVAC) systems have identified excessive leakage from duct systems. Due to excessive infiltration rates from leaky ducts, HVAC system operating efficiencies are reduced up to 50%. Santee Cooper will initiate a pilot program in the 1st Qtr of 1994 which will require increased duct installation standards. Customers will receive an up-front rebate to offset the additional cost to meet the standards. If the pilot program is successful, Santee Cooper will extend eligibility to wholesale customers it serves.

Energy Consumer Sectors
RETAIL
RESIDENTIAL - SINGLE FAMILY

Technologies
CONSERVATION/EFFICIENCY/LOAD MANAGEMENT

Status
DEVELOPMENT - PILOT TO BEGIN 1st QUARTER OF 1994

Demand Savings	**(MW)**	**Annual Funding ($000)**
1st YEAR (1994):	.1	1st YEAR (1994): $60.4
5th YEAR (1998):	.4	5th YEAR (1998): $98.8

Net Present Value
1993: $750,216

Total Funding ($000)
5 YEAR: $388.4

THERMAL STORAGE COOLING PROGRAM

The program will reduce summer peak loads by shifting cooling loads to off peak periods through the use of thermal storage systems. Rebates will be paid to customers who install storage systems, with emphasis given to full storage systems. A rate rider, which defines on peak hours without penalizing peak usage that cannot be shifted, will be offered to participants. Packaged direct expansion (DX) storage systems, which should become readily available by the end of the decade, comprise a majority of the projected demand reduction. The program is targeted towards both new construction and retrofit projects.

Energy Consumer Sectors
WHOLESALE/RETAIL
COMMERCIAL
INDUSTRIAL

Technologies
LOAD SHIFTING

Status
DEVELOPMENT - PROGRAM TO BEGIN 3rd QUARTER OF 1993

Demand Savings (MW)		**Annual Funding ($000)**	
1st YEAR (1994):	.1	1st YEAR (1994):	$27.5
5th YEAR (1998):	.7	5th YEAR (1998):	$83.9

Net Present Value	**Total Funding ($000)**
1993: $102,500	5 YEAR: $207.6

HIGH EFFICIENCY SPACE CONDITIONING EQUIPMENT PROGRAM

This program will reduce peak demand (summer and winter) by reducing the electrical consumption of heating and air conditioning systems. Rebates will be paid to eligible customers who install high efficiency HVAC systems (including chillers, heat pumps, and air conditioners). This program will be targeted towards the retrofit market, although new construction will be eligible to participate.

Energy Consumer Sectors
WHOLESALE/RETAIL
COMMERCIAL
INDUSTRIAL

Technologies
STRATEGIC CONSERVATION

Status
DEVELOPMENT - IMPLEMENTATION 1994

Demand Savings (MW)		**Annual Funding ($000)**	
1st YEAR (1994):	.3	1st YEAR (1994):	$85.8
5th YEAR (1998):	1.1	5th YEAR (1998):	$292.9

Net Present Value	**Total Funding ($000)**
1993: $3,533,100	5 YEAR: $1,011.9

HIGH EFFICIENCY LIGHTING EQUIPMENT PROGRAM

This program will reduce peak demand (summer and winter) by reducing the electrical consumption of lighting systems. Rebates will be paid to eligible customers who install high efficiency lighting systems or components. Existing fluorescent lighting systems are the primary target, but new construction and other systems will be eligible for incentives.

Energy Consumer Sectors
WHOLESALE/RETAIL
COMMERCIAL
INDUSTRIAL

Technologies
STRATEGIC CONSERVATION

Status
DEVELOPMENT - IMPLEMENTATION 1994

Demand Savings (MW)
1st YEAR (1994): 1.0
5th YEAR (1998): 2.6

Annual Funding ($000)
1st YEAR (1994): $291.6
5th YEAR (1998): $729.2

Net Present Value
1993: $18,972,500

Total Funding ($000)
5 YEAR: $3,471.9

STANDBY GENERATOR CONTROL PROGRAM

This program will reduce peak demand (summer and winter) by having customers use their standby generation to displace load on the Santee Cooper system. This program would be initiated by the system dispatcher. Generator operation would be limited to 200 hours annually and 8 hours daily. Monthly billing credits, based on available capacity and actual energy generated, would be paid to each participant. A special recording meter will be installed at each participant.

Energy Consumer Sectors
WHOLESALE/RETAIL
COMMERCIAL
INDUSTRIAL

Technologies
PEAK SHAVING

Status
DEFER TO YEAR 2000. RE-EVALUATE NEXT I.R.P.

Demand Savings (MW)
1st YEAR (2001): 2.5
5th YEAR (2005): 1.2

Annual Funding ($000)
1st YEAR (2001): $147.9
5th YEAR (2005): $313.4

Net Present Value
1993: $138,800
(If implemented in year 2000)

Total Funding ($000)
5 YEAR: $1,017.5

III. SUMMARY REVIEW OF PROGRAMS NOT RECOMMENDED FOR IMPLEMENTATION

A. Residential

The following residential DSM options were considered to be infeasible for development as separate DSM programs:

- Insulation/Infiltration Reduction
- High Efficiency Air Source Heat Pump
- Electric Water Heater Wrap
- Heat Pump Water Heater
- Solar Water Heater
- High Efficiency Central Air Conditioners
- Direct Load Control of Central Air Conditioners
- High Efficiency Room Air Conditioners
- Direct Load Control of Room Air Conditioners
- Dual Fuel with Add-On Heat Pump
- Heat Pump Replacement
- Cool Storage
- High Efficiency Refrigerators
- High Efficiency Freezers

1. Water heater DSM strategies of promoting storage water heating and direct load control are incorporated in our existing H_2O Advantage Off Peak water heating program. We estimated that the incremental benefits did not justify the promotion of:

a. Electric water heater wraps which are addressed with the enactment of the 1990 energy legislation requiring that manufactures produce water heaters that comply with the ASHRAE Std 90 water heating standard (R6 or better tank insulation);

b. Heat pump water heaters which have questionable life cycle durations and high first costs that minimize consumer acceptance as a feasible alternative to traditional methods of water heating; and

c. Solar water heating, which is normally supplemented with electric resistance water heating, produces peaking demand requirements that are difficult to predict and, thus, cannot be considered as equal to other potential DSM opportunities.

2. Many DSM space conditioning options are targeted with the existing Good ¢ents "New" and "Improved" Home Programs. Those options currently incorporated are energy efficient construction, insulation/infiltration reduction, high efficiency central air conditioning, high efficiency room air conditioning, heat pump replacement, and dual fuel with add-on high efficiency gas furnace. DSM options that are currently considered to be infeasible are:

a. Cool storage as the technology is not a readily available, cost justifiable option; and

b. Direct load control of central and room air conditioning equipment due to greater potential system impacts from the implementation of Good ¢ents Home programs.

3. Other DSM options such as residential reduced wattage lighting programs, electric thermal storage and energy efficient refrigerators and freezers were not evaluated. Due to minimal system impacts and/or the lack of data to accurately project end use and system impacts, these programs will be evaluated in subsequent integrated resource plans submitted at a later date.

B. Commercial

The following commercial DSM options were considered to be infeasible for development as separate DSM programs:

- Direct Load Control of Air Conditioners
- Heat Recovery Systems
- Ventilation Reduction
- Ground Coupled Heat Pumps
- Energy Management Systems (EMS)
- High Efficiency Street Lighting
- High Efficiency Refrigeration Equipment
- Direct Load Control of Electric Water Heaters

1. In the past, direct control of commercial air conditioning systems has not been accepted by customers. Programs such as direct load control of air conditioners result in hotter than normal space conditions during peak load hours in the summer in some cases. A substantial initial investment may be required to install the control system, which would entail the risk of low customer participation making the program non-cost effective. Both the thermal storage and high efficiency space conditioning programs which were evaluated offer peak demand reductions from the same target group without any reduction in comfort conditions.

2. Heat recovery from refrigeration and space conditioning equipment is a viable energy conservation measure. There are heat recovery systems available which can reduce the energy used in space conditioning and water heating. Due to technical design constraints, maintenance requirements, end use energy source(s), and wide variances in water and space conditioning loads, the target market for this program is limited. When programs with wider target markets have been implemented, this program may be evaluated.

3. Reduced outdoor air ventilation rates can reduce energy consumption, but DSM opportunities from ventilation reduction are diminishing. With the incorporation of ASHRAE Standard 1989-62 (IAQ-Indoor Air Quality) into building codes, outside ventilation rates are increasing, not decreasing. IAQ has become a source of litigation, with large lawsuits becoming commonplace. If Santee Cooper advocates reduced ventilation rates, we may become a target for these types of suits. This risk does not justify the development of this type of program. This type of load can be reduced with heat recovery systems, and may be addressed in the future (see above).

4. Earth coupled (also known as water source) heat pumps are frequently used in residential applications. These systems have limited potential as a commercial DSM program. Because most commercial applications require larger tonnage equipment, the increased space requirements for loop installation become cost prohibitive. Combined with the small size of most new commercial building sites, the target market for this program is extremely limited.

5. Energy Management Systems (EMS) can reduce the peak demand of a facility. However, it is very difficult to make predictions of load reductions that can be achieved. Also, since these devices are essentially computer control systems, the programming is subject to change and no degree of permanency is assured. These two factors make implementation of this type of this program very difficult.

6. High Efficiency Street Lighting. Santee Cooper is an Electric Utility Ally in the EPA Green Lights program. As part of our commitment to this program, we have decided to replace all of our leased lighting with high pressure sodium luminaries as the existing fixtures fail.

7. High Efficiency Refrigeration Equipment represents a very small portion of our commercial load and, thus, offers a very small target market. When programs with larger target markets have been implemented, this program may be evaluated.

8. Direct Load Control of Electric Water Heaters is projected to be infeasible. Many commercial customers have residential type water heaters with low usage. Because of the low usage, there is a low (and uncertain) coincidence with peak demands, which makes it uneconomical to offer direct control (as in the residential H_2O Advantage program). Customers with larger systems need to have continuous availability of hot water, which would require the installation of storage facilities, which are expensive and space consuming. These two factors combine to prevent a cost effective program.

IV. DETAILED DESCRIPTION OF RECOMMENDED DSM PROGRAMS

A. Residential - The list of residential end uses that were evaluated to be included in Santee Cooper's Integrated Resource Plan are:

- Swimming Pool Load Management Program
- Geothermal Heat Pump Program
- Water Conservation Program
- Duct Leakage Program

1. Swimming Pool Load Management Program

a. The targeted end use is the direct control of residential pool pumps. An average 1 horsepower rating for pool pump motors is assumed for this evaluation. The assumption is supported from evaluations performed by other utilities, Palmetto Electric Cooperative, Florida Power, and Tampa Electric, as well as inquiries among the pool pump service industry within our own retail system in the Grand Strand area of South Carolina.

b. Control of the load management devices will be achieved through the use of Central's radio controlled communication system. The designated controlled periods for the winter will be December 15 through March 15 during the hours of 6 a.m. through 10 a.m. and 6 p.m. through 10 p.m. The designated period of control for the summer begin June 15 and end August 31. The hours of control are 3 p.m. until 7 p.m. The strategy for controlling the load management devices will be executed on an "as needed basis" comparable to the strategy used for "interruptible" industrial customers. Control of the load management devices will be limited to 40 minutes of each hour of control during the winter season to prevent freezing of residential pool pumps. A maximum of 5 hours of continuous control has been established to minimize customer inconvenience.

c. The projected number of eligible participants (Central and Retail System) was estimated using customer survey data and the most current estimates of system growth. 3.3% of Central's residential customers and 2.88% of Santee Cooper's direct served residential customers were projected to have pools. This evaluation assumes that 40% of all customers with pools will participate within the 20-year program evaluation period.

d. The estimated kW reduction (CP) for each participant is .8 kW (summer) and .2 kW (winter). The total megawatt reduction achieved through implementation using the participation projection reported above is .3 megawatts.

2. Geothermal Heat Pump Program

a. The targeted end use is space conditioning. The utility savings achieved through the promotion of this technology are to be gained from utilizing water as the medium of heat transfer in lieu of air (smaller design temperature differences for water based equipment) with decreased strip heating requirements during the winter due to the higher Btu heat content of water at peak heating conditions. The savings from geothermal heat pumps are over and above savings that would be attributable to Good ¢ents Home participation. Good ¢ents savings are already factored into rate pricing structures.

b. The projected number of eligible participants are based on the number of Good ¢ents homes with water source heating equipment as well as discussions with heat pump contractors in Santee Cooper's retail service area. The percentage of Good ¢ents with water source heat pumps was applied to the total number of residential customers to obtain the best

estimate of eligible participants. Another factor limiting consumer acceptance of this technology is high first costs which must include the cost of installing the required loops.

c. A potential estimated coincident peak savings of .7 kW (summer) and 4.8 kW (winter) per participant was estimated for was used for evaluation purposes.

3. Water Conservation Program

a. The program is targeted to conserve water in residential dwellings and reduce the energy requirement for heating water. The program was evaluated as a conservation program with no estimated coincident peak demand impacts resulting from participation. Customers electing to participate will benefit from energy savings obtained from their purchase of a water conservation kit at a price that would be negotiated by Santee Cooper. Santee Cooper will incur the marketing and administrative program costs.

b. No demand impacts.

c. Potential participants include all existing customers that have not replaced their showerheads with a low-flow showerhead. The program will be marketed to all residential customers that meet this criteria. Because customers will be required to purchase the water conservation kits, only 10% of all eligible customers are projected for participation.

d. The program was evaluated from a field survey in which 32 homes had low-flow showerheads installed. Based on the field measurements before and after showerhead installations, typical showerhead flow rates were reduced by .9 gallons per minute. The average monthly water savings were calculated to be 604 gallons resulting in a savings of 52 kilowatt-hours per month.

4. Duct Leakage Program

a. This program is targeted to reduce peak demands and conserve energy, both summer and winter, through the improved installation standards of duct systems for residential structures. Rebates will be offered to customers to offset the higher costs for the improved quality of installation. This program will be focused primarily on the retrofit market. It will be done on a pilot program basis in 1994 and, if feasible, will be extended to both wholesale and retail customers on the Santee Cooper system.

b. Load impacts were determined by estimating energy and peak demand savings using information collected in Florida and North Carolina by utility research organizations.

c. Growth estimates were based on the growth in participation in the Santee Cooper's Good ¢ents Loan Program.

d. The estimated coincident peak savings at .5 kW per participant were used for evaluation purposes.

B. Commercial - The Commercial Programs that were evaluated to be included in Santee Cooper's Integrated Resource Plan are:

- Thermal Storage Cooling Program
- High Efficiency Space Conditioning Equipment Program
- High Efficiency Lighting Equipment Program
- Emergency Generator Control Program

1. Thermal Storage Cooling Program

a. This program will achieve peak load reduction in the summer by shifting energy used for air conditioning from peak to off peak hours. Thermal energy is stored in a media, usually ice or water. The energy

is stored off peak, then reclaimed during on peak periods when cooling is required. Rebates will be offered to customers who install these systems, along with a rate rider. A Time-of-Use meter will be installed on the service, which is the only monitoring that will be required.

b. Cooling load profiles were developed for four types of commercial customers: retail, office, large hotel, and school. These profiles were developed by Trane Trace 600 computer simulation, with actual metered data, from an existing project used to check the office profile. These profiles were used to predict electrical usage resulting from air conditioning.

c. Load Forecast 9101 was used to estimate the growth rate for commercial customers. Central Electric provided growth projections to 2001, and Load Forecast 9101 projections were used after that for wholesale customers. The 1992 Commercial Survey was used to estimate the amount of air conditioned area, segmented by customer type and air conditioning system type (either chilled water or direct expansion). Participation rates were applied to four different groups (retail, wholesale, chilled water and DX), with 33% of the chilled water and 15% of the DX installations in 2012 participating in the program.

d. The program is projected to achieve .7 MW of load reduction during the summer peak in 2012.

2. High Efficiency Space Conditioning Equipment Program

a. This program will reduce peak demands (both summer and winter) through the installation of more efficient space conditioning (heating and cooling) equipment. Rebates will be offered to customers who

install systems with higher than standard efficiencies. This program would be focused primarily on the retrofit market. No rate riders or special metering will be required.

b. Cooling load profiles were developed for five types of commercial customers: retail, office, motel, grocery/convenience, and school. These profiles were developed by Trane Trace 600 computer simulation. These profiles were used to predict load reductions resulting form the installation of more efficient space conditioning equipment.

c. Load Forecast 9101 was used to estimate the growth rate for commercial customers. Central Electric provided growth projections to 2001, and LF 9101 projections were used after that for wholesale customers. The 1992 Commercial Survey was used to estimate the amount of air conditioned area, segmented by customer type and air conditioning system type (either chilled water or direct expansion). Participation rates were applied to four different groups (retail, wholesale, chilled water and DX), with 40% of the chilled water and 30% of the DX installations in 2012 participating in the program.

d. The program is projected to achieve 1.1 MW of load reduction during the summer peak in 2012.

3. High Efficiency Lighting Equipment Program

a. This program will reduce peak demands (both summer and winter) through the installation of more efficient lighting equipment. Rebates will be offered to customers who install high efficiency lighting systems. This program would be focused primarily on the retrofit market. No rate riders or special metering will be required.

b. Lighting profiles were developed for thirteen types of commercial customers: retail, restaurant, office, school, hotel/motel, community center, grocery store, convenience store, hospital, government center, shopping malls, auditorium, and other. Lithonia L-Spec lighting computer software was used to develop these profiles, which were used to predict electrical load reductions resulting from the installation of more efficient lighting equipment.

c. Load Forecast 9101 was used to estimate the growth rate for commercial customers. Central Electric provided growth projections to 2001, and Load Forecast 9101 projections were used after that for wholesale customers. The 1992 Commercial Survey was used to estimate the amount of area that has both lighting and air conditioning, segmented by customer type. Participation rates were applied to four different groups (retail, wholesale, existing and new construction), with 50% of the new construction and 1% of the existing customers in 2012 participating in the program.

d. The program is projected to achieve 2.6 MW of load reduction during the summer peak in 2012.

4. Standby Generator Control Program

a. This program will reduce peak demands (both summer and winter) by having customers with standby emergency generators use them and reduce their demands on the Santee Cooper system. A monthly payment, based on both capacity and energy, would be paid to each participant. A special recording meter would be installed at each participant, and special monthly billing will be required.

b. This program will be controlled by system dispatch, initiated at our request. Total run time would not exceed 200 hours annually or 8 hours daily. This program would actually function the same as a peaking generation unit.

c. Data from the 1992 Commercial Survey was used to estimate the current amount of customer installed emergency generation capacity on our system, segmented into four different rate classes. Load Forecast 9101 was used to estimate the growth rate for commercial customers. Central Electric provided growth projections to 2001, and Load Forecast 9101 projections were used after that for wholesale customers. The program projects that 10% to 15% (depending on rate class) of the customers with generation will participate in the program in the year 2012.

d. The program is projected to make available 1.2 MW of customer owned generation capacity during the summer peak in 2012.

ECONOMIC EVALUATION OF RECOMMENDED DSM PROGRAMS

ECONOMIC EVALUATION

OFF PEAK POOL PUMP PROGRAM

YEAR	PARTIC-IPATION (1)	NEW LOAD RED. (MW) (2)	TOTAL LOAD RED. (MW) (3)	ENERGY SAVED (MWH) (4)	COSTS FIXED ($ 000) (5)	COSTS VARIABLE ($ 000) (6)	COSTS REBATES ($ 000) (7)	TOTAL COST ($ 000) (8)	SAVINGS FIXED ($/KW) (9)	SAVINGS FIXED TOTAL ($ 000) (10)	SAVINGS FUEL ($/KWH) (11)	SAVINGS FUEL TOTAL ($ 000) (12)	TOTAL SAVINGS (000 $) (13)	NET SAVINGS (000 $) (14)
1993	275	0.2	0.2	12.2	$53.0	$48.1	$27.9	$129.0	$0.0	$0.0	$0.000	$0.0	$0.0	($129.0)
1994	208	0.1	0.3	688.5	$30.2	$37.9	$21.9	$90.0	$0.0	$0.0	$0.035	$24.1	$24.1	($65.9)
1995	267	0.2	0.5	1,752.8	$31.4	$50.5	$28.5	$110.5	$0.0	$0.0	$0.015	$26.3	$26.3	($84.2)
1996	339	0.2	0.7	3,573.5	$32.6	$66.7	$36.7	$136.0	$0.0	$0.0	$0.044	$157.2	$157.2	$21.2
1997	413	0.3	1.0	6,038.2	$33.9	$84.6	$45.2	$163.7	$0.0	$0.0	$0.027	$163.0	$163.0	($0.6)
1998	0	0.0	1.0	6,038.2	$29.2	$0.0	$4.5	$33.7	$0.0	$0.0	$0.022	$132.8	$132.8	$99.1
1999	0	0.0	1.0	6,038.2	$30.4	$0.0	$4.5	$34.9	$0.0	$0.0	$0.028	$169.1	$169.1	$134.2
2000	0	0.0	1.0	6,038.2	$31.6	$0.0	$4.5	$36.1	$0.0	$0.0	$0.025	$151.0	$151.0	$114.9
2001	0	0.0	1.0	6,038.2	$32.8	$0.0	$4.5	$37.4	$0.0	$0.0	$0.026	$157.0	$157.0	$119.6
2002	0	0.0	1.0	6,038.2	$34.2	$0.0	$4.5	$38.7	$1.0	$1.1	$0.028	$169.1	$170.1	$131.5
2003	0	0.0	1.0	6,038.2	$35.5	$0.0	$4.5	$40.0	$75.2	$77.3	$0.036	$217.4	$294.6	$254.6
2004	0	0.0	1.0	6,038.2	$36.9	$0.0	$4.5	$41.5	$69.1	$71.0	$0.032	$193.2	$264.2	$222.7
2005	0	0.0	1.0	6,038.2	$38.4	$0.0	$4.5	$42.9	$68.0	$69.8	$0.048	$289.8	$359.7	$316.7
2006	0	0.0	1.0	6,038.2	$40.0	$0.0	$4.5	$44.5	$62.1	$63.8	$0.053	$320.0	$383.8	$339.3
2007	0	0.0	1.0	6,038.2	$41.6	$0.0	$4.5	$46.1	($7.9)	($8.2)	$0.063	$380.4	$372.2	$326.2
2008	0	0.0	1.0	6,038.2	$43.2	$0.0	$4.5	$47.7	$51.5	$52.9	$0.049	$295.9	$348.8	$301.0
2009	0	0.0	1.0	6,038.2	$45.0	$0.0	$4.5	$49.5	$105.2	$108.1	$0.053	$320.0	$428.1	$378.7
2010	0	0.0	1.0	6,038.2	$46.7	$0.0	$4.5	$51.3	$59.6	$61.2	$0.033	$199.3	$260.4	$209.2
2011	0	0.0	1.0	6,038.2	$48.6	$0.0	$4.5	$53.1	$151.9	$156.1	$0.049	$295.9	$452.0	$398.8
2012	0	0.0	1.0	6,038.2	$50.6	$0.0	$4.5	$55.1	$129.1	$132.6	$0.056	$338.1	$470.8	$415.7
2013	0	0.0	0.8	6,026.0	$52.6	$0.0	$3.7	$56.3	$113.3	$95.1	$0.053	$319.4	$414.5	$358.2
2014	0	0.0	0.7	5,337.6	$54.7	$0.0	$3.1	$57.7	$113.9	$79.4	$0.055	$293.6	$372.9	$315.2
2015	0	0.0	0.5	3,584.7	$56.9	$0.0	$2.3	$59.1	$114.5	$58.9	$0.058	$207.9	$266.8	$207.7
2016	0	0.0	0.3	11.2	$59.2	$0.0	$1.2	$60.4	$115.2	$32.5	$0.060	$0.7	$33.2	($27.2)
TOTAL	1,502	1.0		117,597.6	$989.1	$287.8	$238.1	$1,514.9		$1,051.6		$4,821.1	$5,872.7	$4,357.8

1993 NET PRESENT VALUE OF THE PROGRAM **$1,415,991**

(1) ANNUAL PARTICIPATION – NUMBER OF CUSTOMERS
(2) TOTAL LOAD REDUCTION FOR CURRENT YEAR (MW)
(3) CUMULATIVE LOAD REDUCTION TO DATE (MW)
(4) TOTAL ENERGY SAVINGS FOR CURRENT YEAR (MWH)
(5) ANNUAL FIXED COSTS INCLUDING ADMINISTRATION, MARKETING ($ 000)
(6) ANNUAL ADMINISTRATIVE COSTS ASSOCIATED WITH NEW PROGRAM PARTICIPANTS ($ 000)
(7) ANNUAL COST OF INCENTIVES TO PARTICIPATING CUSTOMERS, BASED ON $150 UP FRONT REBATE AND $3 MONTHLY INCENTIVE PER PARTICIPANT ($ 000)
(8) TOTAL COSTS OF PROGRAM FOR CURRENT YEAR ($ 000)
(9) AVOIDED FIXED COST OF DEMAND REDUCTION FOR CURRENT YEAR ($/KW)
(10) TOTAL SAVINGS FOR DEMAND REDUCTIONS FOR CURRENT YEAR ($ 000)
(11) AVOIDED FUEL COST FOR CURRENT YEAR ($/KWH)
(12) TOTAL FUEL SAVINGS FOR CURRENT YEAR ($ 000)
(13) TOTAL SAVINGS FOR CURRENT YEAR ($ 000)
(14) NET SAVINGS FOR CURRENT YEAR [PROGRAM SAVINGS LESS COSTS] ($ 000)

OFF PEAK POOL PUMP PROGRAM PARTICIPATION SUMMARY TOTAL SYSTEM				
	Growth	Market	PARTICIPANTS	
YEAR	Rate:	Share:	Annual:	Cumulative:
1993	0.00%	2.18%	275	275
1994	75.64%	3.80%	208	483
1995	55.28%	5.86%	267	750
1996	45.20%	8.51%	339	1,089
1997	37.92%	11.80%	413	1,502
1998	33.42%	15.81%	502	2,004
1999	29.39%	20.66%	0	2,004
2000	25.57%	26.34%	0	2,004
2001	21.68%	32.63%	0	2,004
2002	18.17%	39.27%	0	2,004
2003	14.82%	45.77%	0	2,004
2004	12.43%	52.07%	0	2,004
2005	10.67%	58.13%	0	2,004
2006	8.69%	63.29%	0	2,004
2007	6.40%	66.69%	0	2,004
2008	4.21%	67.93%	0	2,004
2009	2.43%	67.22%	0	2,004
2010	1.20%	65.20%	0	2,004
2011	0.49%	62.54%	0	2,004
2012	0.17%	59.70%	0	2,004

ECONOMIC EVALUATION

GEOTHERMAL HEAT PUMPS

YEAR	PARTIC-IPATION (1)	NEW LOAD RED. (MW) (2)	TOTAL LOAD RED. (MW) (3)	ENERGY SAVED (MWH) (4)	COSTS FIXED ($ 000) (5)	COSTS VARIABLE ($ 000) (6)	COSTS REBATES ($ 000) (7)	TOTAL COST ($ 000) (8)	SAVINGS FIXED ($/KW) (9)	SAVINGS FIXED TOTAL ($ 000) (10)	SAVINGS FUEL ($/KWH) (11)	SAVINGS FUEL TOTAL ($ 000) (12)	TOTAL SAVINGS ($ 000) (13)	NET SAVINGS ($ 000) (14)
1993	0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.000	$0.0	$0.0	$0.0
1994	330	0.2	0.2	189.1	$35.4	$0.0	$165.0	$200.4	$0.00	$0.0	$0.035	$6.8	$6.8	($193.7)
1995	424	0.2	0.4	607.3	$36.8	$0.0	$211.8	$248.6	$0.00	$0.0	$0.015	$9.1	$9.1	($239.5)
1996	537	0.3	0.8	1,154.0	$38.2	$0.0	$268.6	$306.8	$0.00	$0.0	$0.044	$50.8	$50.8	($256.1)
1997	655	0.4	1.2	1,851.6	$39.8	$0.0	$327.6	$367.4	$0.00	$0.0	$0.027	$50.0	$50.0	($317.4)
1998	796	0.5	1.7	2,722.5	$41.4	$0.0	$397.9	$439.3	$0.00	$0.0	$0.022	$59.9	$59.9	($379.4)
1999	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.028	$76.2	$76.2	$76.2
2000	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.025	$68.1	$68.1	$68.1
2001	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.026	$70.8	$70.8	$70.8
2002	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$1.04	$1.7	$0.028	$76.2	$76.0	$76.0
2003	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$75.20	$124.7	$0.036	$98.0	$222.7	$222.7
2004	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$69.07	$114.5	$0.032	$87.1	$201.6	$201.6
2005	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$67.97	$112.7	$0.048	$130.7	$243.4	$243.4
2006	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$62.06	$102.9	$0.053	$144.3	$247.2	$247.2
2007	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	($7.94)	($13.2)	$0.063	$171.5	$158.4	$158.4
2008	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$51.49	$85.4	$0.049	$133.4	$218.8	$218.8
2009	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$105.22	$174.5	$0.053	$144.3	$318.8	$318.8
2010	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$59.55	$98.7	$0.033	$89.8	$188.6	$188.6
2011	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$151.91	$251.9	$0.049	$133.4	$385.3	$385.3
2012	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$129.08	$214.0	$0.056	$152.5	$366.5	$366.5
2013	0	0.0	1.7	2,722.5	$0.0	$0.0	$0.0	$0.0	$113.27	$187.8	$0.053	$144.3	$332.1	$332.1
2014	0	0.0	1.5	2533.4	$0.0	$0.0	$0.0	$0.0	$113.87	$167.2	$0.055	$139.3	$306.6	$306.6
2015	0	0.0	1.2	1926.2	$0.0	$0.0	$0.0	$0.0	$114.50	$139.9	$0.058	$111.7	$251.6	$251.6
2016	0	0.0	0.9	772.1	$0.0	$0.0	$0.0	$0.0	$115.17	$103.8	$0.060	$46.3	$150.1	$150.1
2017	0	0.0	0.5	508.3	$0.0	$0.0	$0.0	$0.0	$115.84	$58.0	$0.063	$32.0	$90.0	$90.0
TOTAL	2,742	1.7		53,102.6	$191.5	$0.0	$1,370.9	$1,562.5		$1,924.5		$2,226.4	$4,151.0	$2,588.5

1993 NET PRESENT VALUE OF THE PROGRAM $274,319

(1) ANNUAL PARTICIPATION
(2) TOTAL LOAD REDUCTION FOR CURRENT YEAR (MW)
(3) CUMULATIVE LOAD REDUCTION TO DATE (MW)
(4) TOTAL ENERGY SAVINGS FOR CURRENT YEAR (MWH)
(5) ANNUAL FIXED COSTS INCLUDING ADMINISTRATION, MARKETING ($ 000)
(6) VARIABLE O & M COSTS ARE INCLUDED IN FIXED COSTS FOR THIS PROGRAM ($ 000)
(7) ANNUAL COST OF INCENTIVES TO PARTICIPATING CUSTOMERS, BASED ON $500 PER PARTICIPANT REBATE TO NEW PARTICIPANTS ($ 000)
(8) TOTAL COSTS OF PROGRAM FOR CURRENT YEAR ($ 000)
(9) AVOIDED FIXED COST OF DEMAND REDUCTION FOR CURRENT YEAR ($/KW)
(10) TOTAL SAVINGS FOR DEMAND REDUCTIONS FOR CURRENT YEAR ($ 000)
(11) AVOIDED FUEL COST FOR CURRENT YEAR ($/KWH)
(12) TOTAL FUEL SAVINGS FOR CURRENT YEAR ($ 000)
(13) TOTAL SAVINGS FOR CURRENT YEAR ($ 000)
(14) NET SAVINGS FOR CURRENT YEAR [PROGRAM SAVINGS LESS COSTS] ($ 000)

GEOTHERMAL HEAT PUMPS PROGRAM
PARTICIPATION SUMMARY
TOTAL SYSTEM

	NEW CONSTRUCTION				EXISTING CONSTRUCTION			
	Growth	Market	Participants		Growth	Market	Participants	
YEAR	Rate:	Share:	Annual:	Cumulative:	Rate:	Share:	Annual:	Cumulative:
1993	0.00%	0.00%	0	0	0.00%	0.00%	0	0
1994	0.00%	0.13%	222	222	0.00%	0.06%	108	108
1995	128.38%	0.29%	285	507	128.33%	0.14%	139	247
1996	71.30%	0.48%	362	869	71.24%	0.24%	176	422
1997	50.79%	0.71%	441	1,310	50.72%	0.35%	214	636
1998	40.92%	0.97%	536	1,845	40.85%	0.47%	260	896
1999	34.09%	1.27%	0	1,845	34.02%	0.61%	0	896
2000	28.61%	1.58%	0	1,845	38.27%	0.77%	0	896
2001	23.71%	1.90%	0	1,845	40.75%	0.92%	0	896
2002	19.54%	2.20%	0	1,845	41.50%	1.07%	0	896
2003	15.76%	2.47%	0	1,845	39.96%	1.20%	0	896
2004	13.11%	2.71%	0	1,845	38.42%	1.31%	0	896
2005	11.19%	2.92%	0	1,845	37.04%	1.41%	0	896
2006	9.05%	3.08%	0	1,845	33.33%	1.49%	0	896
2007	6.64%	3.19%	0	1,845	26.67%	1.54%	0	896
2008	4.36%	3.23%	0	1,845	18.67%	1.56%	0	896
2009	2.51%	3.21%	0	1,845	11.20%	1.55%	0	896
2010	1.22%	3.15%	0	1,845	5.60%	1.52%	0	896
2011	0.49%	3.07%	0	1,845	2.29%	1.48%	0	896
2012	0.16%	2.98%	0	1,845	0.74%	1.44%	0	896

ECONOMIC EVALUATION

WATER CONSERVATION PROGRAM

YEAR	PARTIC-IPATION (# CUST) (1)	NEW LOAD RED. (MW) (2)	TOTAL LOAD RED. (MW) (3)	ENERGY SAVED (MWH) (4)	COSTS FIXED ($ 000) (5)	COSTS VARIABLE ($ 000) (6)	COSTS REBATES ($ 000) (7)	TOTAL COST ($ 000) (8)	SAVINGS FIXED ($/KW) (9)	SAVINGS FIXED TOTAL ($ 000) (10)	SAVINGS FUEL ($/KWH) (11)	SAVINGS FUEL TOTAL ($ 000) (12)	TOTAL SAVINGS ($ 000) (13)	NET SAVINGS ($ 000) (14)
1993	4,053	0.0	0.0	1,835.0	$70.0	$0.0	$0.0	$70.0	$0.00	$0.0	$0.000	$0.0	$0.0	($70.0)
1994	2,382	0.0	0.0	2,826.0	$7.5	$0.0	$0.0	$7.5	$0.00	$0.0	$0.035	$98.9	$98.9	$91.4
1995	1,209	0.0	0.0	3,240.0	$7.5	$0.0	$0.0	$7.5	$0.00	$0.0	$0.015	$48.6	$48.6	$41.1
1996	612	0.0	0.0	3,354.0	$7.5	$0.0	$0.0	$7.5	$0.00	$0.0	$0.044	$147.6	$147.6	$140.1
1997	325	0.0	0.0	3,367.0	$7.5	$0.0	$0.0	$7.5	$0.00	$0.0	$0.027	$90.9	$90.9	$83.4
1998	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.022	$74.1	$74.1	$74.1
1999	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.028	$94.3	$94.3	$94.3
2000	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.025	$84.2	$84.2	$84.2
2001	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.026	$87.5	$87.5	$87.5
2002	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$1.04	$0.0	$0.028	$94.3	$94.3	$94.3
2003	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$75.02	$0.0	$0.036	$121.2	$121.2	$121.2
2004	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$69.07	$0.0	$0.032	$107.7	$107.7	$107.7
2005	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$67.97	$0.0	$0.048	$161.6	$161.6	$161.6
2006	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$62.06	$0.0	$0.053	$178.5	$178.5	$178.5
2007	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	($7.94)	$0.0	$0.063	$212.1	$212.1	$212.1
2008	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$51.49	$0.0	$0.049	$165.0	$165.0	$165.0
2009	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$105.22	$0.0	$0.053	$178.5	$178.5	$178.5
2010	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$59.55	$0.0	$0.033	$111.1	$111.1	$111.1
2011	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$151.91	$0.0	$0.049	$165.0	$165.0	$165.0
2012	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$129.08	$0.0	$0.056	$188.6	$188.6	$188.6
2013	0	0.0	0.0	3,367.0	$0.0	$0.0	$0.0	$0.0	$113.27	$0.0	$0.053	$178.5	$178.5	$178.5
2014	0	0.0	0.0	1,532.0	$0.0	$0.0	$0.0	$0.0	$113.87	$0.0	$0.055	$84.3	$84.3	$84.3
2015	0	0.0	0.0	541.0	$0.0	$0.0	$0.0	$0.0	$114.50	$0.0	$0.058	$31.4	$31.4	$31.4
2016	0	0.0	0.0	127.0	$0.0	$0.0	$0.0	$0.0	$115.17	$0.0	$0.060	$7.6	$7.6	$7.6
2017	0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$115.84	$0.0	$0.063	$0.0	$0.0	$0.0
TOTAL	8,581	0.0		70,694.0	$100.0	$0.0	$0.0	$100.0		$0.0		$2,711.3	$2,711.3	$2,611.3

1993 NET PRESENT VALUE OF THE PROGRAM **$1,171,993**

(1) ANNUAL PARTICIPATION -- NUMBER OF CUSTOMERS
(2) TOTAL LOAD REDUCTION FOR CURRENT YEAR (MW)
(3) CUMULATIVE LOAD REDUCTION TO DATE (MW)
(4) TOTAL ENERGY SAVINGS FOR CURRENT YEAR (MWH)
(5) ANNUAL FIXED COSTS INCLUDING ADMINISTRATION, MARKETING ($ 000)
(6) VARIABLE O & M COSTS ARE INCLUDED IN FIXED COSTS FOR THIS PROGRAM ($000)
(7) NO CUSTOMER INCENTIVES ARE OFFERED FOR THIS PROGRAM ($ 000)
(8) TOTAL COSTS OF PROGRAM FOR CURRENT YEAR ($ 000)
(9) AVOIDED FIXED COST OF DEMAND REDUCTION FOR CURRENT YEAR ($/KW)
(10) TOTAL SAVINGS FOR DEMAND REDUCTIONS FOR CURRENT YEAR ($ 000)
(11) AVOIDED FUEL COST FOR CURRENT YEAR ($/KWH)
(12) TOTAL FUEL SAVINGS FOR CURRENT YEAR ($ 000)
(13) TOTAL SAVINGS FOR CURRENT YEAR ($ 000)
(14) NET SAVINGS FOR CURRENT YEAR [PROGRAM SAVINGS LESS COSTS] ($ 000)

WATER CONSERVATION PROGRAM
PARTICIPATION SUMMARY
RETAIL SYSTEM

YEAR	Growth Rate:	Market Share:	PARTICIPANTS Annual:	Cumulative:
1993	0.00%	5.15%	4,053	4,053
1994	58.77%	8.18%	2,382	6,436
1995	18.78%	9.71%	1,209	7,645
1996	8.01%	10.49%	612	8,257
1997	3.94%	10.90%	325	8,582
1998	0.00%	10.90%	0	8,582
1999	0.00%	9.13%	0	8,582
2000	0.00%	8.87%	0	8,582
2001	0.00%	8.61%	0	8,582
2002	0.00%	8.36%	0	8,582

ECONOMIC EVALUATION

DUCT LEAKAGE PROGRAM

YEAR	PARTIC-IPATION (1)	NEW LOAD RED. (MW) (2)	TOTAL LOAD RED. (MW) (3)	ENERGY SAVED (MWH) (4)	COSTS FIXED ($ 000) (5)	COSTS VARIABLE ($ 000) (6)	COSTS REBATES ($ 000) (7)	TOTAL COST ($ 000) (8)	SAVINGS FIXED $/KW (9)	SAVINGS FIXED TOTAL ($ 000) (10)	SAVINGS FUEL $/KWH (11)	SAVINGS FUEL TOTAL ($ 000) (12)	TOTAL SAVINGS ($ 000) (13)	NET SAVINGS ($ 000) (14)
1993	0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.000	$0.0	$0.0	$0.0
1994	50	0.1	0.1	86.8	$35.4	$0.0	$25.0	$60.4	$0.0	$0.0	$0.035	$3.0	$3.0	($57.3)
1995	60	0.1	0.1	360.6	$36.8	$0.0	$30.0	$66.8	$0.0	$0.0	$0.015	$5.4	$5.4	($61.4)
1996	75	0.1	0.2	859.7	$38.2	$0.0	$37.5	$75.7	$0.0	$0.0	$0.044	$37.8	$37.8	($37.9)
1997	94	0.1	0.3	1,647.9	$39.8	$0.0	$46.9	$86.7	$0.0	$0.0	$0.027	$44.5	$44.5	($42.2)
1998	115	0.1	0.4	2,789.9	$41.4	$0.0	$57.4	$98.8	$0.0	$0.0	$0.022	$81.4	$81.4	($37.4)
1999	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.028	$78.1	$78.1	$78.1
2000	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.025	$69.7	$69.7	$69.7
2001	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.026	$72.5	$72.5	$72.5
2002	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$1.0	$0.4	$0.028	$78.1	$78.6	$78.6
2003	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$75.2	$32.1	$0.036	$100.4	$132.6	$132.6
2004	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$69.1	$28.5	$0.032	$89.3	$118.8	$118.8
2005	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$68.0	$29.0	$0.048	$133.9	$162.9	$162.9
2006	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$62.1	$26.5	$0.053	$147.9	$174.4	$174.4
2007	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	($7.9)	($3.4)	$0.063	$175.8	$172.4	$172.4
2008	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$51.5	$22.0	$0.049	$136.7	$158.7	$158.7
2009	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$105.2	$44.9	$0.053	$147.9	$192.8	$192.8
2010	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$59.6	$25.4	$0.033	$92.1	$117.5	$117.5
2011	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$151.9	$64.9	$0.049	$138.7	$201.6	$201.6
2012	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$129.1	$55.1	$0.056	$156.2	$211.4	$211.4
2013	0	0.0	0.4	2,789.9	$0.0	$0.0	$0.0	$0.0	$113.3	$42.2	$0.053	$147.9	$190.1	$190.1
2014	0	0.0	0.3	2,703.1	$0.0	$0.0	$0.0	$0.0	$113.9	$35.0	$0.055	$148.7	$183.7	$183.7
2015	0	0.0	0.2	2,342.5	$0.0	$0.0	$0.0	$0.0	$114.5	$25.9	$0.058	$135.9	$161.8	$161.8
2016	0	0.0	0.1	1,482.8	$0.0	$0.0	$0.0	$0.0	$115.2	$16.7	$0.060	$89.0	$105.6	$105.6
2017	0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$115.8	$5.0	$0.063	$0.0	$5.0	$5.0
TOTAL	394	$0.4		54,121.4	$191.5	$0.0	$196.8	$388.3		$451.4		$2,288.8	$2,740.2	$2,351.9

1993 NET PRESENT VALUE OF THE PROGRAM $750,216

(1) ANNUAL PARTICIPATION – NUMBER OF CUSTOMERS
(2) TOTAL LOAD REDUCTION FOR CURRENT YEAR (MW)
(3) CUMULATIVE LOAD REDUCTION TO DATE (MW)
(4) TOTAL ENERGY SAVINGS FOR CURRENT YEAR (MWH)
(5) ANNUAL FIXED COSTS INCLUDING ADMINISTRATION, MARKETING ($ 000)
(6) VARIABLE O & M COSTS ARE INCLUDED IN FIXED COSTS FOR THIS PROGRAM ($ 000)
(7) ANNUAL COST OF INCENTIVES TO PARTICIPATING CUSTOMERS, BASED ON $500 REBATE TO NEW PARTICIPANTS ($ 000)
(8) TOTAL COSTS OF PROGRAM FOR CURRENT YEAR ($ 000)
(9) AVOIDED FIXED COST OF DEMAND REDUCTION FOR CURRENT YEAR ($/KW)
(10) TOTAL SAVINGS FOR DEMAND REDUCTIONS FOR CURRENT YEAR ($ 000)
(11) AVOIDED FUEL COST FOR CURRENT YEAR ($/KWH)
(12) TOTAL FUEL SAVINGS FOR CURRENT YEAR ($ 000)
(13) TOTAL SAVINGS FOR CURRENT YEAR ($ 000)
(14) NET SAVINGS FOR CURRENT YEAR [PROGRAM SAVINGS LESS COSTS] ($ 000)

DUCT LEAKAGE PROGRAM
PARTICIPATION SUMMARY
TOTAL SYSTEM

YEAR	Growth Rate:	Market Share:	PARTICIPANTS Annual:	Cumulative:
1993		0.00%	0	0
1994	0.00%	0.05%	105	105
1995	120.00%	0.11%	126	231
1996	68.18%	0.18%	158	389
1997	50.68%	0.26%	197	585
1998	41.20%	0.36%	241	827
1999	35.01%	0.47%	0	1,116
2000	29.82%	0.60%	0	1,116
2001	25.27%	0.72%	0	1,116
2002	21.18%	0.85%	0	1,116
2003	17.48%	0.97%	0	1,116
2004	14.13%	1.07%	0	1,116
2005	11.15%	1.16%	0	1,116
2006	8.52%	1.22%	0	1,116
2007	6.09%	1.26%	0	1,116
2008	4.02%	1.27%	0	1,116
2009	2.51%	1.26%	0	1,116
2010	1.35%	1.24%	0	1,116
2011	0.60%	1.21%	0	1,116
2012	0.21%	1.18%	0	1,116

ECONOMIC EVALUATION

COMMERCIAL THERMAL ENERGY STORAGE PROGRAM

YEAR	PARTIC-IPATION (000 SQFT) (1)	NEW LOAD RED. (MW) (2)	TOTAL LOAD RED. (MW) (3)	ENERGY SAVED (MWH) (4)	COSTS FIXED ($ 000) (5)	COSTS VARIABLE ($ 000) (6)	COSTS REBATES ($ 000) (7)	TOTAL COST ($ 000) (8)	SAVINGS FIXED ($/KW) (9)	SAVINGS FIXED TOTAL ($ 000) (10)	SAVINGS FUEL ($/KWH) (11)	SAVINGS FUEL TOTAL ($ 000) (12)	TOTAL SAVINGS ($ 000) (13)	NET SAVINGS ($ 000) (14)
1993	0.0	0.0	0.0	0.0	$15.0	$0.0	$0.0	$15.0	$0.00	$0.0	$0.000	$0.0	$0.0	($15.0)
1994	42.3	0.1	0.1	0.9	$4.0	$4.7	$18.8	$27.5	$0.00	$0.0	$0.035	$0.0	$0.0	($27.5)
1995	37.0	0.1	0.2	1.6	$4.2	$4.1	$16.4	$24.7	$0.00	$0.0	$0.015	$0.0	$0.0	($24.6)
1996	52.4	0.1	0.3	2.5	$4.3	$5.9	$23.6	$33.8	$0.00	$0.0	$0.044	$0.1	$0.1	($33.7)
1997	59.9	0.1	0.4	3.6	$4.5	$6.7	$26.6	$37.7	$0.00	$0.0	$0.027	$0.1	$0.1	($37.7)
1998	147.9	0.3	0.7	4.4	$4.7	$15.9	$63.4	$83.9	$0.00	$0.0	$0.022	$0.1	$0.1	($83.8)
1999	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.028	$0.1	$0.1	$0.1
2000	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.025	$0.1	$0.1	$0.1
2001	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.026	$0.1	$0.1	$0.1
2002	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$1.04	$0.8	$0.028	$0.1	$0.9	$0.9
2003	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$75.02	$55.8	$0.036	$0.2	$56.0	$56.0
2004	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$69.07	$51.4	$0.032	$0.1	$51.5	$51.5
2005	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$67.97	$50.6	$0.048	$0.2	$50.8	$50.8
2006	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$62.06	$46.2	$0.053	$0.2	$46.4	$46.4
2007	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	($7.94)	($5.9)	$0.063	$0.3	($5.6)	($5.6)
2008	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$51.49	$38.3	$0.049	$0.2	$38.5	$38.5
2009	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$105.22	$78.3	$0.053	$0.2	$78.5	$78.5
2010	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$59.55	$44.3	$0.033	$0.1	$44.4	$44.4
2011	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$151.91	$113.0	$0.049	$0.2	$113.2	$113.2
2012	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$129.08	$96.0	$0.056	$0.2	$96.3	$96.3
2013	0.0	0.0	0.7	4.4	$0.0	$0.0	$0.0	$0.0	$113.27	$84.3	$0.053	$0.2	$84.5	$84.5
2014	0.0	0.0	0.7	3.5	$0.0	$0.0	$0.0	$0.0	$113.87	$74.0	$0.055	$0.2	$74.2	$74.2
2015	0.0	0.0	0.6	2.8	$0.0	$0.0	$0.0	$0.0	$114.50	$65.0	$0.058	$0.2	$65.2	$65.2
2016	0.0	0.0	0.5	1.9	$0.0	$0.0	$0.0	$0.0	$115.17	$51.8	$0.060	$0.1	$51.9	$51.9
2017	0.0	0.0	0.3	0.8	$0.0	$0.0	$0.0	$0.0	$115.84	$36.7	$0.063	$0.0	$36.8	$36.8
TOTAL	339.5	0.7		87.6	$36.7	$37.2	$148.8	$222.7		$880.6		$3.6	$884.3	$661.6

1993 NET PRESENT VALUE OF THE PROGRAM **$102,484**

(1) TOTAL PARTICIPATION IN THOUSANDS OF SQUARE FEET
(2) TOTAL LOAD REDUCTION FOR CURRENT YEAR (MW)
(3) CUMULATIVE LOAD REDUCTION TO DATE (MW)
(4) TOTAL ENERGY SAVINGS FOR CURRENT YEAR (MWH)
(5) ANNUAL FIXED COSTS INCLUDING ADMINISTRATION, MARKETING ($ 000)
(6) ANNUAL ADMINISTRATIVE COSTS ASSOCIATED WITH NEW PROGRAM PARTICIPANTS ($ 000)
(7) ANNUAL COST OF INCENTIVES TO PARTICIPATING CUSTOMERS, BASED ON $200 PER KW REBATE TO NEW PARTICIPANTS ($ 000)
(8) TOTAL COSTS OF PROGRAM FOR CURRENT YEAR ($ 000)
(9) AVOIDED FIXED COST OF DEMAND REDUCTION FOR CURRENT YEAR ($/KW)
(10) TOTAL SAVINGS FOR DEMAND REDUCTIONS FOR CURRENT YEAR ($ 000)
(11) AVOIDED FUEL COST FOR CURRENT YEAR ($/KWH)
(12) TOTAL FUEL SAVINGS FOR CURRENT YEAR ($ 000)
(13) TOTAL SAVINGS FOR CURRENT YEAR ($ 000)
(14) NET SAVINGS FOR CURRENT YEAR [PROGRAM SAVINGS LESS COSTS] ($ 000)

COMMERCIAL THERMAL STORAGE PROGRAM								
	SYTEM GROWTH RATE				MARKET SHARE			
	RETAIL		WHOLESALE		RETAIL		WHOLESALE	
YEAR	CW	DX	CW	DX	CW	DX	CW	DX
1993	3.03%	3.03%	3.44%	3.44%	0%	0%	0%	0%
1994	5.02%	5.02%	3.32%	3.32%	25%	0%	10%	0%
1995	1.32%	1.32%	3.27%	3.27%	30%	0%	15%	0%
1996	2.93%	2.93%	3.23%	3.23%	33%	0%	20%	0%
1997	3.00%	3.00%	3.22%	3.22%	33%	0%	25%	0%
1998	2.99%	2.99%	3.16%	3.16%	33%	1%	30%	1%
1999	2.98%	2.98%	3.06%	3.06%	33%	2%	33%	2%
2000	2.75%	2.75%	2.90%	2.90%	33%	4%	33%	4%
2001	2.89%	2.89%	3.10%	3.10%	33%	8%	33%	8%
2002	2.81%	2.81%	2.81%	2.81%	33%	12%	33%	12%
2003	2.60%	2.60%	2.60%	2.60%	33%	15%	33%	15%
2004	2.79%	2.79%	2.79%	2.79%	33%	15%	33%	15%
2005	2.71%	2.71%	2.71%	2.71%	33%	15%	33%	15%
2006	2.64%	2.64%	2.64%	2.64%	33%	15%	33%	15%
2007	2.63%	2.63%	2.63%	2.63%	33%	15%	33%	15%
2008	2.68%	2.68%	2.68%	2.68%	33%	15%	33%	15%
2009	2.61%	2.61%	2.61%	2.61%	33%	15%	33%	15%
2010	2.55%	2.55%	2.55%	2.55%	33%	15%	33%	15%
2011	2.55%	2.55%	2.55%	2.55%	33%	15%	33%	15%
2012	2.55%	2.55%	2.55%	2.55%	33%	15%	33%	15%
2013	2.55%	2.55%	2.55%	2.55%	33%	15%	33%	15%

ECONOMIC EVALUATION

COMMERCIAL HIGH EFFICIENCY SPACE CONDITIONING EQUIPMENT PROGRAM

					COSTS				SAVINGS					
	PARTIC-IPATION	NEW LOAD RED.	TOTAL LOAD RED.	ENERGY SAVED	FIXED	VARIABLE	REBATES	TOTAL COST	FIXED		FUEL		TOTAL SAVINGS	NET SAVINGS
YEAR	(000 SQFT) (1)	(MW) (2)	(MW) (3)	(MWH) (4)	($ 000) (5)	($ 000) (6)	($ 000) (7)	($ 000) (8)	($/KW) (9)	TOTAL ($ 000) (10)	($/KWH) (11)	TOTAL ($ 000) (12)	($ 000) (13)	($ 000) (14)
1993	0.0	0.0	0.0	0.0	$20.0	$0.0	$0.0	$20.0	$0.00	$0.0	$0.000	$0.0	$0.0	($20.0)
1994	1,322.8	0.3	0.3	688.5	$8.0	$15.6	$62.2	$85.8	$0.00	$0.0	$0.035	$24.1	$24.1	($61.7)
1995	2,094.1	0.5	0.8	1,752.8	$8.3	$24.3	$97.2	$129.8	$0.00	$0.0	$0.015	$26.3	$26.3	($103.5)
1996	3,533.1	0.8	1.6	3,573.5	$8.7	$41.3	$165.0	$214.9	$0.00	$0.0	$0.044	$157.2	$157.2	($57.7)
1997	4,784.3	1.1	2.7	6,038.2	$9.0	$55.9	$223.6	$288.5	$0.00	$0.0	$0.027	$163.0	$163.0	($125.5)
1998	4,846.2	1.1	3.9	8,537.5	$9.4	$56.7	$226.8	$292.9	$0.00	$0.0	$0.022	$187.8	$187.8	($105.0)
1999	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.028	$239.1	$239.1	$239.1
2000	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.025	$213.4	$213.4	$213.4
2001	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.026	$222.0	$222.0	$222.0
2002	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$1.04	$4.0	$0.028	$239.1	$243.1	$243.1
2003	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$75.02	$290.6	$0.036	$307.4	$598.0	$598.0
2004	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$69.07	$267.6	$0.032	$273.2	$540.8	$540.8
2005	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$67.97	$263.3	$0.048	$409.8	$673.1	$673.1
2006	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$62.06	$240.4	$0.053	$452.5	$692.9	$692.9
2007	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	($7.94)	($30.8)	$0.063	$537.9	$507.1	$507.1
2008	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$51.49	$199.5	$0.049	$418.3	$617.8	$617.8
2009	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$105.22	$407.6	$0.053	$452.5	$860.1	$860.1
2010	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$59.55	$230.7	$0.033	$281.7	$512.4	$512.4
2011	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$151.91	$588.5	$0.049	$418.3	$1,006.8	$1,006.8
2012	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$129.08	$500.1	$0.056	$478.1	$978.2	$978.2
2013	0.0	0.0	3.9	8,537.5	$0.0	$0.0	$0.0	$0.0	$113.27	$438.8	$0.053	$452.5	$891.3	$891.3
2014	0.0	0.0	3.6	7,849.1	$0.0	$0.0	$0.0	$0.0	$113.87	$405.7	$0.055	$431.7	$837.4	$837.4
2015	0.0	0.0	3.1	6,784.7	$0.0	$0.0	$0.0	$0.0	$114.50	$352.3	$0.058	$393.5	$745.8	$745.8
2016	0.0	0.0	2.3	4,964.0	$0.0	$0.0	$0.0	$0.0	$115.17	$259.4	$0.060	$297.8	$557.2	$557.2
2017	0.0	0.0	1.1	2,499.3	$0.0	$0.0	$0.0	$0.0	$115.84	$131.4	$0.063	$157.5	$288.8	$288.8
TOTAL	16,580.5	3.9		170,750.3	$63.3	$193.7	$774.8	$1,031.8		$4,549.1		$7,234.7	$11,783.8	$10,752.0

1993 NET PRESENT VALUE OF THE PROGRAM **$3,533,111**

(1) TOTAL PARTICIPATION IN THOUSANDS OF SQUARE FEET
(2) TOTAL LOAD REDUCTION FOR CURRENT YEAR (MW)
(3) CUMULATIVE LOAD REDUCTION TO DATE (MW)
(4) TOTAL ENERGY SAVINGS FOR CURRENT YEAR (MWH)
(5) ANNUAL FIXED COSTS INCLUDING ADMINISTRATION, MARKETING ($ 000)
(6) ANNUAL ADMINISTRATIVE COSTS ASSOCIATED WITH NEW PROGRAM PARTICIPANTS ($ 000)
(7) ANNUAL COST OF INCENTIVES TO PARTICIPATING CUSTOMERS, BASED ON $200 PER KW REBATE TO NEW PARTICIPANTS ($ 000)
(8) TOTAL COSTS OF PROGRAM FOR CURRENT YEAR ($ 000)
(9) AVOIDED FIXED COST OF DEMAND REDUCTION FOR CURRENT YEAR ($/KW)
(10) TOTAL SAVINGS FOR DEMAND REDUCTIONS FOR CURRENT YEAR ($ 000)
(11) AVOIDED FUEL COST FOR CURRENT YEAR ($/KWH)
(12) TOTAL FUEL SAVINGS FOR CURRENT YEAR ($ 000)
(13) TOTAL SAVINGS FOR CURRENT YEAR ($ 000)
(14) NET SAVINGS FOR CURRENT YEAR [PROGRAM SAVINGS LESS COSTS] ($ 000)

HIGH EFFICIENCY SPACE CONDITIONING EQUIPMENT PROGRAM								
	SYSTEM GROWTH RATE				PARTICIPATION RATE			
	RETAIL		WHOLESALE		RETAIL		WHOLESALE	
YEAR	CW	DX	CW	DX	CW	DX	CW	DX
1993	3.03%	3.03%	3.44%	3.44%	0%	0%	0%	0%
1994	5.02%	5.02%	3.32%	3.32%	25%	10%	0%	0%
1995	1.32%	1.32%	3.27%	3.27%	30%	20%	10%	5%
1996	2.93%	2.93%	3.23%	3.23%	35%	30%	20%	10%
1997	3.00%	3.00%	3.22%	3.22%	40%	40%	30%	20%
1998	2.99%	2.99%	3.16%	3.16%	45%	40%	40%	30%
1999	2.98%	2.98%	3.06%	3.06%	50%	40%	50%	40%
2000	2.75%	2.75%	2.90%	2.90%	50%	40%	50%	40%
2001	2.89%	2.89%	3.10%	3.10%	50%	40%	50%	40%
2002	2.81%	2.81%	2.81%	2.81%	50%	40%	50%	40%
2003	2.60%	2.60%	2.60%	2.60%	50%	40%	50%	40%
2004	2.79%	2.79%	2.79%	2.79%	50%	40%	50%	40%
2005	2.71%	2.71%	2.71%	2.71%	50%	40%	50%	40%
2006	2.64%	2.64%	2.64%	2.64%	50%	40%	50%	40%
2007	2.63%	2.63%	2.63%	2.63%	50%	40%	50%	40%
2008	2.68%	2.68%	2.68%	2.68%	50%	40%	50%	40%
2009	2.61%	2.61%	2.61%	2.61%	50%	40%	50%	40%
2010	2.55%	2.55%	2.55%	2.55%	50%	40%	50%	40%
2011	2.55%	2.55%	2.55%	2.55%	50%	40%	50%	40%
2012	2.55%	2.55%	2.55%	2.55%	50%	40%	50%	40%
2013	2.55%	2.55%	2.55%	2.55%	50%	40%	50%	40%

ECONOMIC EVALUATION

COMMERCIAL HIGH EFFICIENCY LIGHTING EQUIPMENT PROGRAM

YEAR	PARTIC-IPATION (000 SQFT) (1)	NEW LOAD RED. (MW) (2)	TOTAL LOAD RED. (MW) (3)	ENERGY SAVED (MWH) (4)	COSTS FIXED ($ 000) (5)	COSTS VARIABLE ($ 000) (6)	COSTS REBATES ($ 000) (7)	TOTAL COST ($ 000) (8)	SAVINGS FIXED ($/KW) (9)	SAVINGS FIXED TOTAL ($ 000) (10)	SAVINGS FUEL ($/KWH) (11)	SAVINGS FUEL TOTAL ($ 000) (12)	TOTAL SAVINGS ($ 000) (13)	NET SAVINGS ($ 000) (14)
1993	0.0	0.0	0.0	0.0	$25.0	$0.0	$0.0	$25.0	$0.00	$0.0	$0.000	$0.0	$0.0	($25.0)
1994	2,241.5	1.0	1.0	4,129.6	$10.0	$76.8	$204.8	$291.6	$0.00	$0.0	$0.035	$144.5	$144.5	($147.1)
1995	5,069.5	2.3	3.3	13,464.7	$10.4	$173.7	$463.2	$647.3	$0.00	$0.0	$0.015	$202.0	$202.0	($445.3)
1996	7,347.3	3.4	6.7	27,012.2	$10.8	$251.8	$671.4	$934.0	$0.00	$0.0	$0.044	$1,188.5	$1,188.5	$254.5
1997	6,833.3	3.1	9.8	39,605.5	$11.2	$234.2	$624.4	$869.8	$0.00	$0.0	$0.027	$1,069.3	$1,069.3	$199.6
1998	5,709.0	2.6	12.4	50,125.1	$11.7	$195.7	$521.8	$729.2	$0.00	$0.0	$0.022	$1,102.8	$1,102.8	$373.6
1999	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.028	$1,403.5	$1,403.5	$1,403.5
2000	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.025	$1,253.1	$1,253.1	$1,253.1
2001	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$0.00	$0.0	$0.026	$1,303.3	$1,303.3	$1,303.3
2002	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$1.04	$12.9	$0.028	$1,403.5	$1,416.4	$1,416.4
2003	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$75.02	$932.3	$0.036	$1,804.5	$2,736.9	$2,736.9
2004	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$69.07	$858.4	$0.032	$1,604.0	$2,462.4	$2,462.4
2005	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$67.97	$844.7	$0.048	$2,406.0	$3,250.7	$3,250.7
2006	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$62.06	$771.3	$0.053	$2,656.6	$3,427.9	$3,427.9
2007	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	($7.94)	($98.7)	$0.063	$3,157.9	$3,059.2	$3,059.2
2008	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$51.49	$639.9	$0.049	$2,456.1	$3,096.0	$3,096.0
2009	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$105.22	$1,307.7	$0.053	$2,656.6	$3,964.3	$3,964.3
2010	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$59.55	$740.1	$0.033	$1,654.1	$2,394.2	$2,394.2
2011	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$151.91	$1,887.9	$0.049	$2,456.1	$4,344.1	$4,344.1
2012	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$129.08	$1,604.2	$0.056	$2,807.0	$4,411.2	$4,411.2
2013	0.0	0.0	12.4	50,125.1	$0.0	$0.0	$0.0	$0.0	$113.27	$1,407.7	$0.053	$2,656.6	$4,064.3	$4,064.3
2014	0.0	0.0	11.4	45,995.4	$0.0	$0.0	$0.0	$0.0	$113.87	$1,298.6	$0.055	$2,529.7	$3,828.3	$3,828.3
2015	0.0	0.0	9.1	36,660.4	$0.0	$0.0	$0.0	$0.0	$114.50	$1,040.6	$0.058	$2,126.3	$3,166.9	$3,166.9
2016	0.0	0.0	5.7	23,112.9	$0.0	$0.0	$0.0	$0.0	$115.17	$660.0	$0.060	$1,386.8	$2,046.8	$2,046.8
2017	0.0	0.0	2.6	10,519.6	$0.0	$0.0	$0.0	$0.0	$115.84	$302.2	$0.063	$662.7	$965.0	$965.0
TOTAL	27,200.7	12.4		1,002,501.5	$79.2	$932.1	$2,485.6	$3,496.9		$14,210.0		$42,091.7	$56,301.7	$52,804.9

1993 NET PRESENT VALUE OF THE PROGRAM $18,972,535

(1) TOTAL PARTICIPATION IN THOUSANDS OF SQUARE FEET
(2) TOTAL LOAD REDUCTION FOR CURRENT YEAR (MW)
(3) CUMULATIVE LOAD REDUCTION TO DATE (MW)
(4) TOTAL ENERGY SAVINGS FOR CURRENT YEAR (MWH)
(5) ANNUAL FIXED COSTS INCLUDING ADMINISTRATION, MARKETING ($ 000)
(6) ANNUAL ADMINISTRATIVE COSTS ASSOCIATED WITH NEW PROGRAM PARTICIPANTS ($ 000)
(7) ANNUAL COST OF INCENTIVES TO PARTICIPATING CUSTOMERS, BASED ON $200 PER KW REBATE TO NEW PARTICIPANTS ($ 000)
(8) TOTAL COSTS OF PROGRAM FOR CURRENT YEAR ($ 000)
(9) AVOIDED FIXED COST OF DEMAND REDUCTION FOR CURRENT YEAR ($/KW)
(10) TOTAL SAVINGS FOR DEMAND REDUCTIONS FOR CURRENT YEAR ($ 000)
(11) AVOIDED FUEL COST FOR CURRENT YEAR ($/KWH)
(12) TOTAL FUEL SAVINGS FOR CURRENT YEAR ($ 000)
(13) TOTAL SAVINGS FOR CURRENT YEAR ($ 000)
(14) NET SAVINGS FOR CURRENT YEAR [PROGRAM SAVINGS LESS COSTS] ($ 000)

HIGH EFFICIENCY LIGHTING EQUIPMENT PROGRAM						
	SYSTEM GROWTH RATE		PARTICIPATION RATE			
			RETAIL		WHSL	
YEAR	RETAIL	WHSL	NEW	EXIST	NEW	EXIST
1993	3.03%	3.44%	0%	0.0%	0%	0.0%
1994	5.02%	3.32%	20%	2.5%	10%	2.5%
1995	1.32%	3.27%	40%	5.0%	20%	5.0%
1996	2.93%	3.23%	40%	5.0%	40%	5.0%
1997	3.00%	3.22%	40%	4.0%	40%	4.0%
1998	2.99%	3.16%	40%	3.0%	40%	3.0%
1999	2.98%	3.06%	40%	2.5%	40%	2.5%
2000	2.75%	2.90%	40%	2.0%	40%	2.0%
2001	2.89%	3.10%	40%	2.0%	40%	2.0%
2002	2.81%	2.81%	40%	2.0%	40%	2.0%
2003	2.60%	2.60%	40%	2.0%	40%	2.0%
2004	2.79%	2.79%	40%	2.0%	40%	2.0%
2005	2.71%	2.71%	40%	2.0%	40%	2.0%
2006	2.64%	2.64%	40%	2.0%	40%	2.0%
2007	2.63%	2.63%	40%	2.0%	40%	2.0%
2008	2.68%	2.68%	40%	1.8%	40%	1.8%
2009	2.61%	2.61%	40%	1.6%	40%	1.6%
2010	2.55%	2.55%	40%	1.4%	40%	1.4%
2011	2.55%	2.55%	40%	1.2%	40%	1.2%
2012	2.55%	2.55%	40%	1.0%	40%	1.0%
2013	2.55%	2.55%	40%	1.0%	40%	1.0%

ECONOMIC EVALUATION

COMMERCIAL STANDBY GENERATOR PROGRAM

YEAR	NEW CAPACITY (MW) (1)	NEW LOAD RED. (MW) (2)	TOTAL LOAD RED. (MW) (3)	ENERGY SAVED (MWH) (4)	COSTS FIXED ($ 000) (5)	COSTS VARIABLE ($ 000) (6)	COSTS REBATES ($ 000) (7)	TOTAL COST ($ 000) (8)	SAVINGS FIXED ($/KW) (9)	SAVINGS FIXED TOTAL ($ 000) (10)	SAVINGS FUEL ($/KWH) (11)	SAVINGS FUEL TOTAL ($ 000) (12)	TOTAL SAVINGS ($ 000) (13)	NET SAVINGS ($ 000) (14)
1993	0.0	0.0	0.0	0.0	$50.0	$0.0	$0.0	$50.0	$0.0	$0.0	$0.000	$0.0	$0.0	($50.0)
1994	2.6	2.5	2.5	719.8	$20.0	$15.5	$55.3	$90.8	$0.0	$0.0	$0.035	$25.2	$25.2	($65.6)
1995	1.7	1.6	4.1	0.0	$20.8	$10.5	$108.6	$139.9	$0.0	$0.0	$0.015	$0.0	$0.0	($139.9)
1996	1.8	1.7	5.8	216.1	$21.6	$11.7	$168.4	$201.8	$0.0	$0.0	$0.044	$9.5	$9.5	($192.2)
1997	1.9	1.8	7.7	322.8	$22.5	$13.0	$229.7	$265.1	$0.0	$0.0	$0.027	$8.7	$8.7	($256.4)
1998	1.3	1.2	8.9	1,012.7	$23.4	$8.7	$293.6	$325.8	$0.0	$0.0	$0.022	$22.3	$22.3	($303.5)
1999	0.0	0.0	8.9	1,012.7	$24.3	$0.0	$313.4	$337.7	$0.0	$0.0	$0.028	$28.4	$28.4	($309.4)
2000	0.0	0.0	6.4	326.5	$25.3	$0.0	$299.7	$325.0	$0.0	$0.0	$0.025	$8.2	$8.2	($316.8)
2001	0.0	0.0	4.8	33.5	$26.3	$0.0	$211.9	$238.2	$0.0	$0.0	$0.026	$0.9	$0.9	($237.4)
2002	0.0	0.0	3.0	170.4	$27.4	$0.0	$161.2	$188.6	$1.0	$3.2	$0.028	$4.8	$7.9	($180.6)
2003	0.0	0.0	1.2	62.2	$28.5	$0.0	$101.6	$130.1	$75.0	$89.8	$0.036	$2.2	$92.0	($38.1)
2004	0.0	0.0	0.0	0.0	$0.0	$0.0	$39.5	$39.5	$69.1	$0.0	$0.032	$0.0	$0.0	($39.5)
2005	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$68.0	$0.0	$0.048	$0.0	$0.0	($0.0)
2006	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$62.1	$0.0	$0.053	$0.0	$0.0	$0.0
2007	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	($7.9)	$0.0	$0.063	$0.0	$0.0	$0.0
2008	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$51.5	$0.0	$0.049	$0.0	$0.0	$0.0
2009	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$105.2	$0.0	$0.053	$0.0	$0.0	$0.0
2010	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$59.6	$0.0	$0.033	$0.0	$0.0	$0.0
2011	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$151.9	$0.0	$0.049	$0.0	$0.0	$0.0
2012	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$129.1	$0.0	$0.056	$0.0	$0.0	$0.0
TOTAL	9.4	8.9		3876.5	$290.1	$59.4	$1,982.9	$2,332.5		$93.0		$110.1	$203.1	($2,129.4)

1993 NET PRESENT VALUE OF THE PROGRAM **($1,480,436)**

(1) ANNUAL PARTICIPATION IN MW OF GENERATOR CAPACITY
(2) TOTAL LOAD REDUCTION FOR CURRENT YEAR (MW)
(3) CUMULATIVE LOAD REDUCTION TO DATE (MW)
(4) TOTAL ENERGY SAVINGS FOR CURRENT YEAR (MWH)
(5) ANNUAL FIXED COSTS INCLUDING ADMINISTRATION, MARKETING ($ 000)
(6) ANNUAL ADMININSTRATIVE COSTS ASSOCIATED WITH NEW PROGRAM PARTICIPANTS ($ 000)
(7) ANNUAL COST OF INCENTIVES TO PARTICIPATING CUSTOMERS, BASED ON $2.75 MONTHLY PER KW OF GENERATOR CAPACITY, AND $.02/KWH ($ 000)
(8) TOTAL COSTS OF PROGRAM FOR CURRENT YEAR ($ 000)
(9) AVOIDED FIXED COST OF DEMAND REDUCTION FOR CURRENT YEAR ($/KW)
(10) TOTAL SAVINGS FOR DEMAND REDUCTIONS OF CURRENT YEAR ($ 000)
(11) AVOIDED FUEL COST FOR CURRENT YEAR ($/KWH)
(12) TOTAL FUEL SAVINGS FOR CURRENT YEAR ($ 000)
(13) TOTAL SAVINGS FOR CURRENT YEAR ($ 000)
(14) NET SAVINGS FOR CURRENT YEAR [PROGRAM SAVINGS LESS COSTS] ($ 000)

ECONOMIC EVALUATION
COMMERCIAL STANDBY GENERATOR PROGRAM

YEAR	NEW CAPACITY (MW) (1)	NEW LOAD RED. (MW) (2)	TOTAL LOAD RED. (MW) (3)	ENERGY SAVED (MWH) (4)	COSTS FIXED ($ 000) (5)	COSTS VARIABLE ($ 000) (6)	COSTS REBATES ($ 000) (7)	TOTAL COST ($ 000) (8)	SAVINGS FIXED ($/KW) (9)	SAVINGS FIXED TOTAL ($ 000) (10)	SAVINGS FUEL ($/KWH) (11)	SAVINGS FUEL TOTAL ($ 000) (12)	TOTAL SAVINGS ($ 000) (13)	NET SAVINGS ($ 000) (14)
1993	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.000	$0.0	$0.0	$0.0
1994	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.035	$0.0	$0.0	$0.0
1995	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.015	$0.0	$0.0	$0.0
1996	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.044	$0.0	$0.0	$0.0
1997	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.027	$0.0	$0.0	$0.0
1998	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.022	$0.0	$0.0	$0.0
1999	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.028	$0.0	$0.0	$0.0
2000	0.0	0.0	0.0	0.0	$50.0	$0.0	$0.0	$50.0	$0.0	$0.0	$0.025	$0.0	$0.0	($50.0)
2001	2.6	2.5	2.5	17.4	$20.0	$20.4	$41.3	$81.7	$0.0	$0.0	$0.026	$0.5	$0.5	($81.2)
2002	1.7	1.6	4.1	229.7	$20.8	$13.8	$113.2	$147.9	$1.0	$4.3	$0.028	$6.4	$10.7	($137.2)
2003	1.8	1.7	5.8	303.7	$21.6	$15.4	$170.1	$207.2	$75.0	$438.2	$0.036	$10.9	$449.1	$241.9
2004	1.9	1.8	7.7	230.6	$22.5	$17.0	$227.8	$267.3	$69.1	$530.9	$0.032	$7.4	$538.3	$270.9
2005	1.3	1.2	8.9	257.6	$23.4	$11.5	$278.5	$313.4	$68.0	$603.8	$0.048	$12.4	$616.1	$302.7
2006	0.0	0.0	6.4	12.8	$24.3	$0.0	$293.4	$317.7	$62.1	$397.2	$0.053	$0.7	$397.9	$80.2
2007	0.0	0.0	4.8	71.7	$25.3	$0.0	$212.7	$238.0	($7.9)	($38.0)	$0.063	$4.5	($33.4)	($271.4)
2008	0.0	0.0	3.0	76.1	$26.3	$0.0	$159.3	$185.6	$51.5	$156.6	$0.049	$3.7	$160.4	($25.3)
2009	0.0	0.0	1.2	2.4	$27.4	$0.0	$100.4	$127.8	$105.2	$125.9	$0.053	$0.1	$126.1	($1.7)
2010	0.0	0.0	0.0	0.0	$0.0	$0.0	$39.5	$39.5	$59.6	$0.0	$0.033	$0.0	$0.0	($39.5)
2011	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0	$0.0	$151.9	$0.0	$0.049	$0.0	$0.0	$0.0
2012	0.0	0.0	0.0	0.0	$0.0	$0.0	$0.0		$129.1	$0.0	$0.056	$0.0	$0.0	$0.0
TOTAL	9.4	8.9		1202.0	$261.7	$78.2	$1,636.3	$1,976.2		$2,219.0		$46.6	$2,265.6	$289.4

1993 NET PRESENT VALUE OF THE PROGRAM $138,838

(1) ANNUAL PARTICIPATION IN MW OF GENERATOR CAPACITY
(2) TOTAL LOAD REDUCTION FOR CURRENT YEAR (MW)
(3) CUMULATIVE LOAD REDUCTION TO DATE (MW)
(4) TOTAL ENERGY SAVINGS FOR CURRENT YEAR (MWH)
(5) ANNUAL FIXED COSTS INCLUDING ADMINISTRATION, MARKETING ($ 000)
(6) ANNUAL ADMININSTRATIVE COSTS ASSOCIATED WITH NEW PROGRAM PARTICIPANTS ($ 000)
(7) ANNUAL COST OF INCENTIVES TO PARTICIPATING CUSTOMERS, BASED ON $2.75 MONTHLY PER KW OF GENERATOR CAPACITY, AND $.02/KWH ($ 000)
(8) TOTAL COSTS OF PROGRAM FOR CURRENT YEAR ($ 000)
(9) AVOIDED FIXED COST OF DEMAND REDUCTION FOR CURRENT YEAR ($/KW)
(10) TOTAL SAVINGS FOR DEMAND REDUCTIONS OF CURRENT YEAR ($ 000)
(11) AVOIDED FUEL COST FOR CURRENT YEAR ($/KWH)
(12) TOTAL FUEL SAVINGS FOR CURRENT YEAR ($ 000)
(13) TOTAL SAVINGS FOR CURRENT YEAR ($ 000)
(14) NET SAVINGS FOR CURRENT YEAR [PROGRAM SAVINGS LESS COSTS] ($ 000)

COMMERCIAL STANDBY GENERATOR PROGRAM						
YEAR	SYSTEM GROWTH RATE	PARTICIPATIONRATE BY CLASS				
		GL	GN	GS	GV	WHSL
1993	3.03%	0%	0%	0%	0%	0%
1994	5.02%	5%	3%	3%	3%	3%
1995	1.32%	7%	5%	5%	5%	5%
1996	2.93%	9%	7%	7%	7%	7%
1997	3.00%	11%	9%	9%	9%	9%
1998	2.99%	13%	10%	10%	10%	10%
1999	2.98%	15%	10%	10%	10%	10%
2000	2.75%	15%	10%	10%	10%	10%
2001	2.89%	15%	10%	10%	10%	10%
2002	2.81%	15%	10%	10%	10%	10%
2003	2.60%	15%	10%	10%	10%	10%
2004	2.79%	15%	10%	10%	10%	10%
2005	2.71%	15%	10%	10%	10%	10%
2006	2.64%	15%	10%	10%	10%	10%
2007	2.63%	15%	10%	10%	10%	10%
2008	2.68%	15%	10%	10%	10%	10%
2009	2.61%	15%	10%	10%	10%	10%
2010	2.55%	15%	10%	10%	10%	10%
2011	2.55%	15%	10%	10%	10%	10%
2012	2.55%	15%	10%	10%	10%	10%

FILE COPY

STATE OF SOUTH CAROLINA

State Budget and Control Board

DIVISION OF GENERAL SERVICES

HELEN T. ZEIGLER
DEPUTY DIRECTOR

STATE ENERGY OFFICE
915 MAIN STREET, ROOM 201
COLUMBIA, SOUTH CAROLINA 29201
(803) 734-3364

JAY A. FLANAGAN, P.E.
DIRECTOR

May 25, 1994

XC: Lonnie Carter
Byron Rodgers
John West
Tom Abrams
B. Sutton

Mr. William R. Sutton
Vice President
Planning and Power Supply
SC Public Service Authority
PO Box 2946101
Moncks Corner, SC 29461-2901

Dear Mr. Sutton:

Enclosed are comments regarding Santee Cooper's 1993 Integrated Resource Plan which was submitted to the State Energy Office for review. Also enclosed is a guideline to integrated resource planning developed by Oak Ridge National Laboratory. These documents may be helpful to you as you prepare your annual update to your Integrated Resource Plan.

If you have any questions concerning this information, please contact me at (803) 734-3364.

Sincerely,

Katie Morgan

Katie Morgan
Management Analyst

enclosures

Comments on the 1993 Integrated Resource Plan of the SC Public Service Authority.

OVERVIEW: The IRP process of the Public Service Authority will be used by the company to achieve its overall power supply objective. This objective is to minimize annual revenue requirements under the constraints of satisfactory reliability, financial integrity and compliance with the environmental requirements of the Clean Air Act Amendment of 1990.

The IRP process has several strong points which should increase the benefits of the process if implemented successfully.

* Santee Cooper's effort to maintain flexibility within a dynamic environment is very important.

* The development of recommendations to serve as future guidelines is commendable and will provide both the company and the State Energy Office a means by which to follow-up and review the IRP process.

* The exploration of numerous alternative scenarios as outlined on page 7 is also a good aspect of the process.

* The proposed or actual use of environmental dispatch for dealing with environmental issues is commendable as long as it meets the power supply objective of the company.

RECOMMENDATIONS:

1. It is important to establish a formal comment process in order to involve consumers and obtain constructive input from them. As the electric industry changes as a result of the movement toward greater competition, more emphasis is going to be placed on the needs of the consumers. The IRP process provides an excellent tool for bringing constructive input within the utility planning process.

Tried to do this

2. It would be helpful to have more information pertaining to the new supply-side options considered in the IRP. Why were these options chosen rather than different size options. More support documentation is needed.

3. Because the energy and peak forecast provide the basis of the planning process, it is critical to know the input assumptions and methodologies used in developing these forecasts. More information should be provided in the filed IRP concerning these areas.

4. It is important to develop a clear objective for consideration and development of DSM programs. On page 36 a variety of objectives are listed but no one objective is adopted by the PSA as its underlying goal.

5. The PSA should provide more detail on how DSM benefits are estimated and how it arrives at the actual achieved benefits of existing programs. The PSA is encouraged to continually enhance the methodology used to estimate those DSM impacts in a cost-effective manner. In addition, it would be useful for the PSA to calculate and provide results of the major tests used across the country to evaluate new and existing DSM options such as the Total Resource Test, Rate Impact Test, Participant Test, and the

Utility Cost Test. Measuring DSM benefits leaves much to be desired for many companies.

7. The PSA should provide more detail on the implementation process for the DSM options. This is necessary to ensure that options were adequately marketed and that optimum market penetration was achieved.

July 8, 1993

Comments on the 1993 Santee Cooper IRP

From: Glenn Rhyne

OVERVIEW: The IRP process of Santee Cooper is a tool to achieve the company's overall power supply objective as set out on page four of the plan. The objective of the Santee IRP process is to minimize annual revenue requirements under the constraints of satisfactory reliability, financial integrity and compliance with environmental requirements under the Clean Air Act.

POTENTIAL STRONG POINTS:
The IRP process has several good points which should enhance the achievement of benefits given proper implementation. The Company's effort to maintain flexibility within a dynamic environment is very important(page 79, item 10). The development of recommendations to serve as future guidelines is commendable and provides a basis for follow-up and review by the Company and the Energy Office. The exploration of numerous alternative scenarios is also a good aspect of the process.(How did they perform and evaluate over 150 million scenarios for this IRP? page 7. The forecast was completed in the spring of 1993 and adopted by the Board on May 24 and the IRP was filed in June 1993.page 9. There appears to be some discrepancy or the Company used its previous forecast in developing the filed IRP.) The proposed or actual use of environmental dispatch for dealing with environmental issues is also commendable as long as it meets the power supply objective of the Company. I am not aware of many utilities currently using environmental dispatch but there could be more than I suspect.

RECOMMENDATIONS:

IRP RELATED ISSUES:

1. A formal effort to involve consumers and obtain constructive input from them is an important part of the IRP process. As the electric industry changes as a result of the movement toward greater competition more emphasis is going to be placed on the needs of the consumers. The IRP process

provides an excellent tool for bringing constructive input within the utility planning process which can improve the ability to deal with a dynamic environment(on the supply side and retail side).

2. Additional information pertaining to the new supply-side options considered within the IRP would be helpful. These options don't appear to be fully documented or supported within the filed IRP. Why those options rather than others or different size options?

3. The energy and peak forecast provide the basis for any planning process. There is very little information provided concerning the methodologies employed and the inputs assumptions, etc. An outside agency developed the forecast. The potential accuracy of these forecasts should be considered.

DSM RELATED ISSUES:

1. The development of a clear objective for the consideration and development DSM programs might be useful. I have found that every Company has a different actual objective for its DSM programs. It is stated at one point within the IRP that the main criteria for the selection of a DSM option is the potential reduction in peak demand while one of the options (Water Conservation)enhances energy efficiency and does not reduce demand. How did it pass the screening? A clear objective can improve the efficiency of the DSM consideration process over time. Perhaps the Company has one but it was not clear.

2. Encourage the Company to make use of pilot programs for potential DSM options to obtain specific information about possible options. It would be good to work jointly with other utilities and/or through the Energy Office to develop such pilot programs.

3. More detail on how the Company estimates DSM benefits(and all DSM impacts) and how it arrives at the so-called actual achieved benefits of a program that is in place. The Company needs to be encouraged to continually enhance the methodology that it uses to estimate those DSM impacts in a cost-effective manner. Measuring DSM benefits leaves much to be desired for many Companies.

4. The Company might look at certain DSM programs not only on a stand alone basis but look at joint benefits. There could

be one DSM option which was not cost effective when considered alone but by coupling it with another option the combined result would be cost effective.

5. The Company should seek to deal with lost opportunities in a cost effective manner. This involves working with third parties concerning construction,insulation, etc. to attempt to take advantage of energy savings opportunities when they arise.

6. It would be worthwhile to look in more detail at the methodology followed by the Company in evaluating existing DSM options for cost effectiveness(the Screening methodology). The inputs, assumptions, testing procedures, etc. In addition, it would be useful for the Company to calculate and provide results of the major tests used across the country to evaluate new and existing DSM options such as the Total Resource Test, Rate Impact Test, Participant Test, and the Utility Cost Test.

7. More detail on the implementation process for DSM options. This is necessary to ensure that options were adequately marketed and that optimum market penetration was achieved. The information is not available to evaluate.

The IRP of Santee appears to be a good start. However, much more information is needed to get behind the planning process to adequately understand the process. I don't know the level of detail that you wish to achieve in evaluating the IRP. You will find it to be very informative to go behind the report and discuss with the Company the specifics. I would be glad to assist in any way.

Santee Cooper

One Riverwood Drive, P.O. Box 2946101, Moncks Corner, South Carolina 29461-2901 • (803) 761-8000

July 2, 1993

Mr. Jay A. Flanagan, P.E.
Director
S.C. State Budget and Control Board
Division of General Services
State Energy Office
915 Main Street, Room 201
Columbia, South Carolina 29201

Re: Santee Cooper Integrated Resource Planning Report Dated June 1993

Dear Mr. Flanagan:

Per your telephone request today, enclosed are two additional copies of the subject report.

Sincerely,

Bonnie C. Cooper

for: William R. Sutton
Vice President
Planning and Power Supply

WRS/bcc

Enclosures

(WRS#1:IRP-3.WP5)

7/6/93

Dr. Ryan -
This is the Santee Cooper IRP we discussed today. We will be interested in your comments.

Jay Flanagan