LAKELAND ELECTRIC
Your Essential Link to a Quality Life

ORIGINAL

Florida Public Service Commission
Blanca S. Bayó, Director
Bureau of Records & Hearing Services
Betty Easley Conference Center, Rm. 110
4075 Esplanade Way
Tallahassee, Florida 32399-0850

April 1, 2003

Dear Ms. Bayó:

Pursuant to Section 186.801, Florida Statutes and Rules 25-22.070-072 of Florida Administrative Code, Lakeland Electric hereby submits 25 printed copies of its 2003 Ten Year Site Plan. Also included on the enclosed CD is one electronic copy of the document in Adobe .PDF format. If you have any questions please do not hesitate to contact us.

Sincerely,

Paul H. Elwing
Legislative & Regulatory Affairs

xc: J. Flanigan
Enclosure

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LAKELAND ELECTRIC

2003 Ten-Year Site Plan
For
Electrical Generating Facilities
And
Associated Transmission Lines

April 2003

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1.0 Introduction

This report contains the 2003 Lakeland Electric Ten-Year Site Plan (TYSP) pursuant to Florida Statutes and as adopted by Order No. PSC-97-1373-FOF-EU on October 30, 1997. The Lakeland TYSP reports the status of the utility's resource plans as of December 31, 2002. The TYSP is divided into the following nine sections: Introduction, General Description of Utility, Forecast of Electrical Power Demand and Energy Consumption, Demand-Side Management Programs, Forecasting Methods and Procedures, Forecast of Facilities Requirements, Generation Expansion Analysis Results and Conclusions, Environmental and Land Use Information, and Ten-Year Site Plan Schedules. The contents of each section are summarized briefly in the remainder of this Introduction.

1.1 General Description of the Utility

Section 2.0 of the TYSP discusses Lakeland's existing generation and transmission facilities. The section includes a historical overview of Lakeland's system, and a description of existing power generating and transmission facilities. This section includes tables which show the source of the utility's current 1039 MW of net winter generating capacity and 963 MW of net summer generating capacity (in the year 2002).

1.2 Forecast of Electrical Power Demand and Energy Consumption

Section 3.0 of the TYSP provides a summary of Lakeland's load forecast. Lakeland is projected to remain a winter peaking system throughout the planning period. The projected annual growth rates in peak demand for the winter and summer are 2.37% and 2.25% percent, respectively, for 2003 through 2012.

Net energy for load is projected to grow at an average annual rate of 2.24% percent for 2003 through 2012, a lower growth rate than occurred over the past 10 years. Projections are also developed for high and low load growth scenarios.

1.3 Demand-Side Management Programs

Section 4.0 provides descriptions of the existing conservation and demand-side management programs. Additional details regarding Lakeland's demand-side management programs are on file with the Florida Public Service Commission (FPSC).

Lakeland's current conservation and demand management programs include the following programs for which demand and energy savings can readily be demonstrated:

- Residential Programs:
  - SMART Load Management Program.

- Commercial Programs:
  - Commercial Lighting Program.
  - Thermal Energy Storage Program.

Lakeland also currently conducts the following conservation and demand-side management programs which promote energy savings and efficiency:

- Residential Programs:
  - Energy Audit Program.
  - Public Awareness Program.
  - Mobile Display Unit.
  - Speakers Bureau.
  - Informational Bill Inserts.
- Commercial Programs:
  - Commercial Audit Program.

1.4 Forecasting Methods and Procedures

Section 5.0 discusses the forecasting methods used for the TYSP and outlines the assumptions applied for system planning. This section also summarizes the integrated resource plan for Lakeland and provides planning criteria for the Florida Municipal Power Pool, of which Lakeland is a member. The integrated resource plan is fully incorporated in the TYSP. Fuel price projections are provided for coal, natural gas, oil, and petroleum coke; with brief descriptions of the methodology. Assumptions for the economic parameters and evaluation criteria which are being applied in the evaluation are also included in Section 5.0.

1.5 Forecast of Facilities Requirements

Section 6.0 integrates the electrical demand and energy forecast with the conservation and demand-side management forecast to determine Lakeland's requirements for the ten-year planning horizon. Application of the reserve margin criteria indicates no need for additional capacity during the current ten year reporting period.

1.6 Generation Expansion Analysis Results and Conclusions

Section 7.0 discusses the current status of any supply-side evaluation being undertaken by Lakeland to identify the best option for its system. It also discusses basic methodology used by Lakeland in its Generation Expansion Planning Process.

1.7 Environmental and Land Use Information

Section 8.0 discusses the land and environmental features of Lakeland's TYSP.

1.8 Ten-Year Site Plan Schedules

Section 9.0 presents the schedules required by the Florida Public Service Commission (FPSC) for the TYSP.

2.0 General Description of Utility

2.1 City of Lakeland Historical Background

2.1.1 Generation

The City of Lakeland was incorporated on January 1, 1885, when 27 citizens approved and signed the city charter. Shortly thereafter the original light plant was built by Lakeland Light and Power Company at the corner of Cedar Street and Massachusetts Avenue. This plant had an original capacity of 50 kW. On May 26, 1891, plant manager Harry Sloan threw the switch to light Lakeland by electricity for the first time with five arc lamps. Incandescent lights were first installed in 1903.

Public power in Lakeland was established in 1904, when foresighted citizens and municipal officials purchased the small private 50 kW electric light plant from owner Bruce Neff for $7,500. The need for an expansion led to the construction of a new power plant on the north side of Lake Mirror in 1916. The initial capacity of the Lake Mirror Power Plant is estimated to have been 500 kW. The plant has since been expanded three times. The first expansion occurred in 1922 with the addition of 2,500 kW; in 1925, 5,000 kW additional capacity was added, followed by another 5,000 kW in 1938. With the final expansion, the removal of the initial 500 kW unit was required to make room for the addition of the 5,000 kW generating unit, resulting in a total peak plant capacity of 12,500 kW.

As the community continued to grow, the need for a new power plant emerged and the Charles Larsen Memorial Power Plant was constructed on the southeast shore of Lake Parker in 1949. The initial capacity of the Larsen Plant Steam Unit No. 4 completed in 1950 was 20,000 kW. The first addition to the Larsen Plant was Steam Unit No. 5 (1956) which had a capacity of 25,000 kW. In 1959, Steam Unit No. 6 was added and increased the plant capacity by another 25,000 kW. Three gas turbines, each with a nominal rating of 11,250 kW, were installed as peaking units in 1962. In 1966, a third steam unit capacity addition was made to the Larsen Plant. This was Steam Unit No.7 having a nominal 44,000 kW capacity and an estimated cost of $9.6 million. This brought the total Larsen Plant nameplate capacity up to a nominal 147,750 kW.

In the meantime, the Lake Mirror Plant, with its old and obsolete equipment, became relatively inefficient and hence was no longer in active use. It was kept in cold standby and then retired in 1971.

As the city continued to grow during the late 1960's, the demand for power and electricity grew at a rapid rate, making evident the need for a new power plant. A site was purchased on the north side of Lake Parker and construction commenced during

1970. Initially, two diesel units with a peaking capacity of a nominal rating 2,500 kW each were placed into commercial operation in 1970.

Steam Unit No. 1, with a nominal rating of 90,000 kW, was put into commercial operation on February 24, 1971, for a total cost of $15.22 million. In June of 1976, Steam Unit No. 2 at Plant 3 was placed into commercial operation, with a nominal rated capacity of 114,707 kW and at a cost of $25.77 million. This addition increased the total capacity of the Lakeland system to approximately 360,000 kW. At this time, Plant 3 was renamed the C. D. McIntosh, Jr. Power Plant in recognition of the former Electric and Water Department director.

On January 2, 1979, construction was started on McIntosh Unit No. 3, a nominal 334 MW coal fired steam generating unit which became commercial on September 1, 1982. The unit is capable of using low sulfur oil as an alternate fuel and supplemented by prepared solid waste. The plant utilized sewage effluent for cooling tower makeup water. This unit is jointly owned with the Orlando Utilities Commission (OUC) which has a 40 percent undivided interest in the unit.

As load continued to grow, Lakeland continually studied and reviewed alternatives for accommodating the additional growth. Alternatives included both demand- and supply-side resources. A wide variety of conservation and demand-side management programs were developed and marketed to Lakeland customers to encourage increased energy efficiency and conservation in keeping with the Florida Energy Efficiency and Conservation Act of 1980 (FEECA). These programs are discussed in further detail in Section 4.0.

Although demand and energy savings arose from Lakeland's conservation and demand-side management programs, additional capacity was required in the early 1990's. Least cost planning studies resulted in the construction of Larsen Unit No. 8, a natural gas fired combined cycle unit with a nameplate generating capability of 124,000 kW. Larsen Unit No. 8 began simple cycle operation in July 1992, and combined cycle operation in November of that year.

In 1994, Lakeland made the decision to retire the first unit at Larsen Plant, Steam Unit No. 4. This unit, put in service in 1950 with a capacity of 20,000 kW, had reached the end of its economic life. In March of 1997, Lakeland placed into cold shutdown, Larsen Unit No. 6, a 25 MW oil fired unit that was also nearing the end of its economic life.

In 1999, the construction of McIntosh Unit No. 5 Simple Cycle combustion turbine was completed. The unit was released for commercial operation in May, 2001. Beginning in September 2001, the unit underwent conversion to a combined cycle unit through the addition of a nominal 120 MW steam turbine generator. Construction was completed in Spring 2002 with the unit being declared commercial in May 2002. The resulting combined cycle capacity of the unit is 322 MW summer and 365 MW winter.

During the summer of 2001, Lakeland took its first steps into the world of distributed generation with the groundbreaking of its Winston Peaking Station. The Winston Peaking Station, consists of 20 quick start reciprocating engines each driving a 2.5 MW electric generator. This provides Lakeland with 50 MW of peaking capacity that can be started and put on line at full load in ten minutes. The Station was declared commercial in late December 2002.

2.1.2 Transmission

The first phase of the Lakeland 69 kV transmission system was placed in operation in 1961 with a step-down transformer at the Lake Mirror Plant to feed the 4 kV bus, nine 4 kV feeders, and a new substation in the southwest section of town with two step-down transformers feeding four 12 kV feeders.

In 1966, a 69 kV line was completed from the northwest substation to the south-west substation, completing the loop around town. At the same time, the old tie to Bartow was reinsulated for a 69 kV line and placed in operation, feeding a new step-down substation in Highland City with four 12 kV feeders. In addition, a 69 kV line was completed from Larsen Plant around the southeast section of town to the southwest substation. By 1972, 20 sections of 69 kV lines, feeding a total of nine step-down substations, with a total of 41 distribution feeders, were completed and placed in service. By the fall of 1996, all of the original 4 kV equipment and feeders had been replaced and/or upgraded to 12 kV service. By 1998, 29 sections of 69 kV lines were in service feeding 20 distribution substations.

As the Lakeland system continued to grow, the need for additional and larger transmission facilities grew as well. In 1981, Lakeland's first 230 kV facilities went into service to accommodate Lakeland's McIntosh Unit No. 3 and to tie Lakeland into the State transmission grid at the 230 kV level. A 230 kV line was built from McIntosh Plant to Lakeland's west substation. A 230/69 kV autotransformer was installed at each of those substations to tie the 69 kV and 230 kV transmission systems together. In 1988, a second 230 kV line was constructed from the McIntosh Plant to Lakeland's Eaton Park substation along with a 230/69 kV autotransformer at Eaton Park. That line was the next phase of the long-range goal to electrically circle the Lakeland service territory with 230 kV transmission to serve as the primary backbone of the system.

In 1999, Lakeland added generation at its McIntosh Power Plant that resulted in a new 230/69/12kV substation being built and energized in March of that year. The substation, Tenoroc, replaced the switching station called North McIntosh. In addition to

Tenoroc, another new 230/69/12kV substation was built. The substation, Interstate, went on line June of 1999 and is connected by what was the McIntosh West 230 kV line. This station was built to address concerns about load growth in the areas adjacent to the I-4 corridor which were causing problems at both the 69kV and distribution levels in this area.

In 2001, Lakeland began the next phase of its 230kV transmission system with the construction of the Crews Lake 230/69kV substation. The substation was completed and placed in service in 2001. This project includes two 230kV ties and one 69kV tie with Tampa Electric, a 150MVA 230/69kV autotransformer and a 230kV line from Lakeland's Eaton Park 230kV substation to the Crews Lake substation.

Early transmission interconnections with other systems included a 69 kV tie at Larsen Plant with Tampa Electric Company (TECO), established in the mid 1960s. A second tie with TECO was later established at Lakeland's Highland City substation. A 115 kV tie was established in the 1970s with Florida Power Corporation (FPC) and Lakeland's west substation and was subsequently upgraded and replaced with the current two 230 kV lines to FPC in 1981. At the same time, Lakeland interconnected with Orlando Utilities Commission (OUC) at Lakeland's McIntosh Power Plant. In August 1987, the 69 kV TECO tie at Larsen Power Plant was taken out of service and a new 69 kV TECO tie was put in service connecting Lakeland's Orangedale substation to TECO's Polk City substation. In mid-1994, a new 69 kV line was energized connecting Larsen Plant to the Ridge Generating Station (Ridge), an independent power producer. Lakeland has a 30-year firm power-wheeling contract with Ridge to wheel up to 40 MW of their power to FPC. In early 1996, a new substation, East, was inserted in the Larsen Plant to the Ridge 69 kV transmission line. Later in 1996, the third tie line to TECO was built from East to TECO's Gapway substation. As mentioned above, in August of 2001, Lakeland completed two 230kV ties and one 69kV tie with TECO at Lakeland's Crews Lake substation. The multiple 230 kV interconnection configuration of Lakeland is also tied into the bulk transmission grid and provides access to the 500 kV transmission network via FPC, providing for greater reliability. At the present time, Lakeland has a total of approximately 114 miles of the 69 kV transmission and 27.6 miles of the 230 kV transmission lines in service along with six 150 MVA 230/69 kV autotransformers.

2.2 General Description: Lakeland Electric

2.2.1 Existing Generating Units

This section provides additional detail on Lakeland's existing units and transmission system. Lakeland's existing generating units are located at the two existing plant sites: Charles Larsen Memorial (Larsen) and C.D. McIntosh Jr. (McIntosh). Both plant sites are located on Lake Parker in Polk County, Florida. The two plants have multiple units with different technologies and fuel types. The following paragraphs provide a summary of the existing generating units for Lakeland. Table 2-1 summarizes the environmental considerations for Lakeland's steam turbine generators and Table 2-2 provides other physical characteristics of all Lakeland generating units.

The Larsen site is located on the southeast shore of Lake Parker in Lakeland. The site has six existing units. The total net winter (summer) capacity of the plant is 201 MW (171 MW). Units 2 and 3, General Electric combustion turbines, have a combined net winter (summer) rating of 27 MW (19 MW). These units burn natural gas as the primary fuel with diesel backup. Unit No. 6 is a conventional steam boiler unit powering a General Electric generator with a net 24 MW rating. The unit burns natural gas as its primary fuel with No.6 residual oil as backup. This unit was placed in cold shutdown in the mid 1990's but was returned to service in 1998 due to the termination of two purchase power agreements. Unit No. 6 was then slated for retirement in March 1999, but due to the delay of commercial operation of McIntosh Unit No. 5, Unit No. 6 remained in operation until August 2001 when it was placed into extended cold stand-by. Lakeland is no longer counting the units capacity towards reserves at this point in time, but is reserving the option to re-power the unit if the economics are right at some future date. Unit No. 7 is also a conventional steam boiler unit powering a General Electric generator with a net 50 MW rating. The unit also burns natural gas as the primary fuel with No. 6 residual oil as a backup fuel. Historically, Larsen Unit No. 5 consisted of a boiler for steam generation and steam turbine to convert the steam to electrical power. When the boiler began to show signs of degradation beyond economical repair, a gas turbine with a heat recovery steam generator, Unit No. 8, was added to the facility. This allowed the gas turbine (Unit No. 8) to generate electricity and the waste steam from the turbine to be injected into the former Unit No. 5 steam turbine for a combined cycle configuration. The former Unit No. 5 steam turbine currently has a net winter (summer) rating of 31 MW (29 MW) and is referred to as Unit No. 8 Steam Turbine from this point on in this document and in the reporting of this unit. The Unit No. 8 combustion turbine has a net winter (summer) rating of 93 MW (73 MW).

The McIntosh site is located in the City of Lakeland along the northeastern shore of Lake Parker and encompasses 513 acres. Electricity generated by the McIntosh units is stepped up in voltage by generator step-up transformers to 69 kV and 230 kV for transmission via the power grid. The McIntosh site currently includes seven units in commercial operation having a total net winter and summer capacity of 788 MW and 742 MW, respectively. Unit CT1 consists of a General Electric combustion turbine with a net winter (summer) output rating of 20 MW (17 MW). Unit No. 1 is a natural gas/oil fired General Electric steam turbine with a net winter and summer output of 87 MW. Unit No. 2 is a natural gas/oil fired Westinghouse steam turbine with a winter and summer output of 106 MW. Unit No. 3 is a 342 MW pulverized coal fired unit owned 60 percent by Lakeland and 40 percent by OUC. Lakeland's share of the unit yields net winter and summer output of 205 MW. Technologies used for Unit 3 are very innovative making it a very environmentally friendly coal unit. Unit No. 3 was one of the first "zero-discharge" plants built, meaning no waste water products leave the plant site untreated. Unit No. 3 also includes a wet flue gas scrubber for SO_2 removal and uses treated sewage water for cooling water. The unit also burns municipal solid refuse along with the coal to reduce the City's impact to the county landfill. Two small diesel units with a net output of 2.5 MW each are also located at the McIntosh site.

McIntosh Unit No. 5, a Westinghouse 501G combustion turbine, was placed into commercial operation May, 2001. The combustion turbine unit had a net output of 268 MW (221 MW) in the winter (summer) and burns natural gas as the primary fuel in simple cycle operation. This unit was taken off line for conversion to combined cycle starting in mid September 2001 with construction being completed in December 2001. The unit was returned to commercial service in May 2002 with a total combined cycle rating of 365 MW winter and 322 MW summer.

Lakeland Electric, constructed a 50-megawatt electric peaking station adjacent to its Winston Substation in 2001. The purpose of the peaking plant was to provide additional quick start generation for Lakeland's system during times of peak loads. This is Lakeland's first experience with distributed generation.

The station consists of twenty (20) EMD 20 cylinder reciprocating engines driving 2.5 MW generators. The units are currently fueled by #2 fuel oil. The units will burn natural gas with a 5% mix of #2 fuel oil (for ignition) as the primary fuel once a natural gas pipeline is completed to the site.

The plant has remote start/run capability for extreme emergencies at times when the plant is unmanned. The station does not use open cooling towers. This results in minimal water or wastewater requirements. Less than three quarters of the six (6) acre site was developed leaving considerable room for water retention.

The engines are equipped with hospital grade noise suppression equipment on the exhausts. Emission control is achieved by Selective Catalytic Reduction (SCR) using 19% aqueous ammonia. The SCR system will allow the plant to operate within the Minor New Source levels permitted by the Florida Department of Environmental Protection (DEP).

This is Lakeland's first venture into distributed generation. Winston Peaking Station (WPS) was constructed adjacent to Lakeland's Winston Distribution Load Substation. Power generated at WPS goes directly into Winston Substation at the 12.47kV distribution level of the substation and has sufficient capacity to serve the substation loads. Winston Substation serves several of Lakeland's largest and most critical accounts. Should Winston loose all three 69kV circuits to the substation, WPS can be on line and serving load in ten minutes. In addition to increasing the substation's reliability, this arrangement will allow Lakeland to delay the installation of a third 69kV to 12.47kV transformer by several years and also contributes to lowering loads on Lakeland's transmission system.

2.2.2 Capacity and Power Sales Contracts

Lakeland has one firm power sales contract in place as of December 31, 2002. The power sales contract is with the Florida Municipal Power Agency (FMPA) for capacity and energy. The contract is for 50 MW from December 15, 2000 to June 14, 2001; then 100 MW from June 15, 2001 through December 15, 2010.

Lakeland shares ownership of the C. D. McIntosh Unit 3 with OUC. The ownership breakdown is a 60 percent share for Lakeland and a 40 percent ownership share for OUC. The energy and capacity delivered to OUC from McIntosh Unit 3 is not considered a power sales contract because of the OUC ownership share.

2.2.3 Capacity and Power Purchase Contracts

Lakeland currently has no long term firm power purchase contracts.

2.2.4 Planned Unit Retirements

Lakeland currently has no set retirement plans in place for its units. Previous Ten Year Site Plans contemplated retiring several older, less efficient units as new capacity came on line and it made economical sense to do so. In late 2001, Lakeland revisited its long range generation plans by commissioning a complete review of its existing portfolio of resources and all plans on hand at the time. Throughout 2002, plans were continually evaluated, but no clear decisions were arrived at, in part, due to the current economic conditions of the electric utility industry and the uncertainty that those conditions present.

When that is combined with the ample reserve margin on hand from recent additions, Lakeland deems that its most prudent decision for the moment is to continue to put all expansion and retirement plans into abeyance until market conditions encourage a change. As noted in the previous section, Larsen Unit No. 6 has been placed on extended cold stand-by and its capacity removed from Lakeland's resource portfolio. The unit is not being slated for dismantlement as Lakeland wishes to preserve the option of re-powering that unit in the future if it makes economical sense to do so.

2.2.5 Load and Electrical Characteristics

Lakeland's load and electrical characteristics have many similarities with those of other peninsular Florida utilities. The peak demand has historically occurred during the winter months. Lakeland's actual total peak demand in the winter of 2001/02 was 659 MW. This could be reduced to a net demand of 608 MW had residential load management been implemented. Lakeland did not utilize its load management as ample capacity was available to serve the total load. This peak occurred on January 09, 2002. The actual summer peak in 2002 was 576 MW and occurred on July 17, 2002. Lakeland's historical and projected summer and winter peak demands are presented in Section 3.0.

Lakeland is a member of the Florida Municipal Power Pool (FMPP), along with Orlando Utilities Commission (OUC), Florida Municipal Power Agency's (FMPA) All-Requirements Project, and Kissimmee Utility Authority (KUA). The FMPP operates as an hourly energy pool with all FMPP capacity from its four members committed and dispatched together. Commitment and dispatch services for FMPP are provided by OUC. Each member of the FMPP retains the responsibility of adequately planning its own system to meet native load and Florida Reliability Coordinating Council (FRCC) reserve requirements.

2.3 Service Area

Lakeland's electric service area is shown on Figure 2-1 and is entirely located in Polk County. Lakeland serves approximately 246 square miles of which approximately 199 square miles is outside of Lakeland's city limits.

Table 2-1
Lakeland Electric and Water Utilities
Existing Generating Facilities
Environmental Considerations for Steam Generating Units

Plant Name	Unit	Particulate	Flue Gas Cleaning		Type
			SO_x	NO_x	
Charles Larsen Memorial	6	None	None	None	OTF
	7	None	None	None	OTF
	8ST	N/A	N/A	N/A	
C. D. McIntosh, Jr.	1	None	None	None	OTF
	2	None	LS	FGR	WCTM
	3	EP	S	LNB	WCTM
	5ST	N/A	N/A	N/A	

FGR = Flue gas recirculation
LNB = Low NO_x burners
EP = Electrostatic precipitators
LS = Low sulfur fuel
S = Scrubbed
OTF = Once-through flow
WCTM = Water cooling tower mechanical
N/A = Not applicable to waste heat applications

Source: Lakeland Environmental Staff

Table 2-2a
Lakeland Electric and Water Utilities Existing Generating Facilities

Plant Name	Unit No.	Location	Unit Type[3]	Fuel[4] Pri	Fuel[4] Alt	Fuel Transport[5] Pri	Fuel Transport[5] Alt	Alt Fuel Days Use[2]	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Net Capability Summer MW	Net Capability Winter MW
Charles Larsen Memorial	2	16-17/28S/24E	GT	NG	DFO	PL	TK	---	11/62	Unknown	11,500	10	14
	3		GT	NG	DFO	PL	TK	---	12/62	Unknown	11,500	9	13
	6		ST	NG	RFO	PL	TK	---	12/59	Extended Cold Standby 8/01	25,000	0	0
	7		ST	NG	RFO	PL	TK	---	02/66	Unknown	50,000	50	50
	8		CA	WH	---	---	---	---	04/56	Unknown	25,000	29	31
	8		CT	NG	DFO	PL	TK	---	07/92	Unknown	101,520	73	93
Plant Total												171	201

[1]Lakeland's 60 percent portion of joint ownership with Orlando Utilities Commission.
[2]Lakeland does not maintain records of the number of days that alternate fuel is used.

[3]Unit Type
- CA Combined Cycle Steam Part
- CT Combined Cycle Combustion Turbine
- GT Combustion Gas Turbine
- ST Steam Turbine

[4]Fuel Type
- DFO Distillate Fuel Oil
- RFO Residual Fuel Oil
- BIT Bituminous Coal
- WH Waste Heat
- NG Natural Gas

[5]Fuel Transportation Method
- PL Pipeline
- TK Truck
- RR Railroad

Table 2-2b
Lakeland Electric and Water Utilities Existing Generating Facilities

Plant Name	Unit No.	Location	Unit Type[3]	Fuel[4] Pri	Fuel[4] Alt	Fuel Transport[5] Pri	Fuel Transport[5] Alt	Alt Fuel Days Use[2]	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Net Capability Summer MW	Net Capability Winter MW
Winston Peaking Station	1-20	21/28S/23E	IC	NG	DFO	PL	TK	NR	12/01	Unknown	2,500 each	50	50
Plant Total												50	50
C.D. McIntosh, Jr.	D1	4-5/28S/24E	IC	DFO	---	TK	---	NR	01/70	Unknown	2,500	2.5	2.5
	D2		IC	DFO	---	TK	---	NR	01/70	Unknown	2,500	2.5	2.5
	GT1		GT	NG	DFO	PL	TK	NR	05/73	Unknown	26,640	17	20
	1		ST	NG	RFO	PL	TK	NR	02/71	Unknown	103,000	87	87
	2		ST	NG	RFO	PL	TK	NR	06/76	Unknown	126,000	106	106
	3[1]		ST	BIT	---	RR	---	NR	09/82	Unknown	363,870	205	205
	5		CT	NG	DFO	PL	TK	NR	05/01	Unknown	292,950	210	243
	5		CA	WH	---	---	---	NR	05/02	Unknown	135,000	112	122
Plant Total												742	788
System Total												**963**	**1039**

[1]Lakeland's 60 percent portion of joint ownership with Orlando Utilities Commission.

[2]Lakeland does not maintain records of the number of days that alternate fuel is used.

[3]Unit Type

CA	Combined Cycle Steam Part
CT	Combined Cycle Combustion Turbine
GT	Combustion Gas Turbine
ST	Steam Turbine

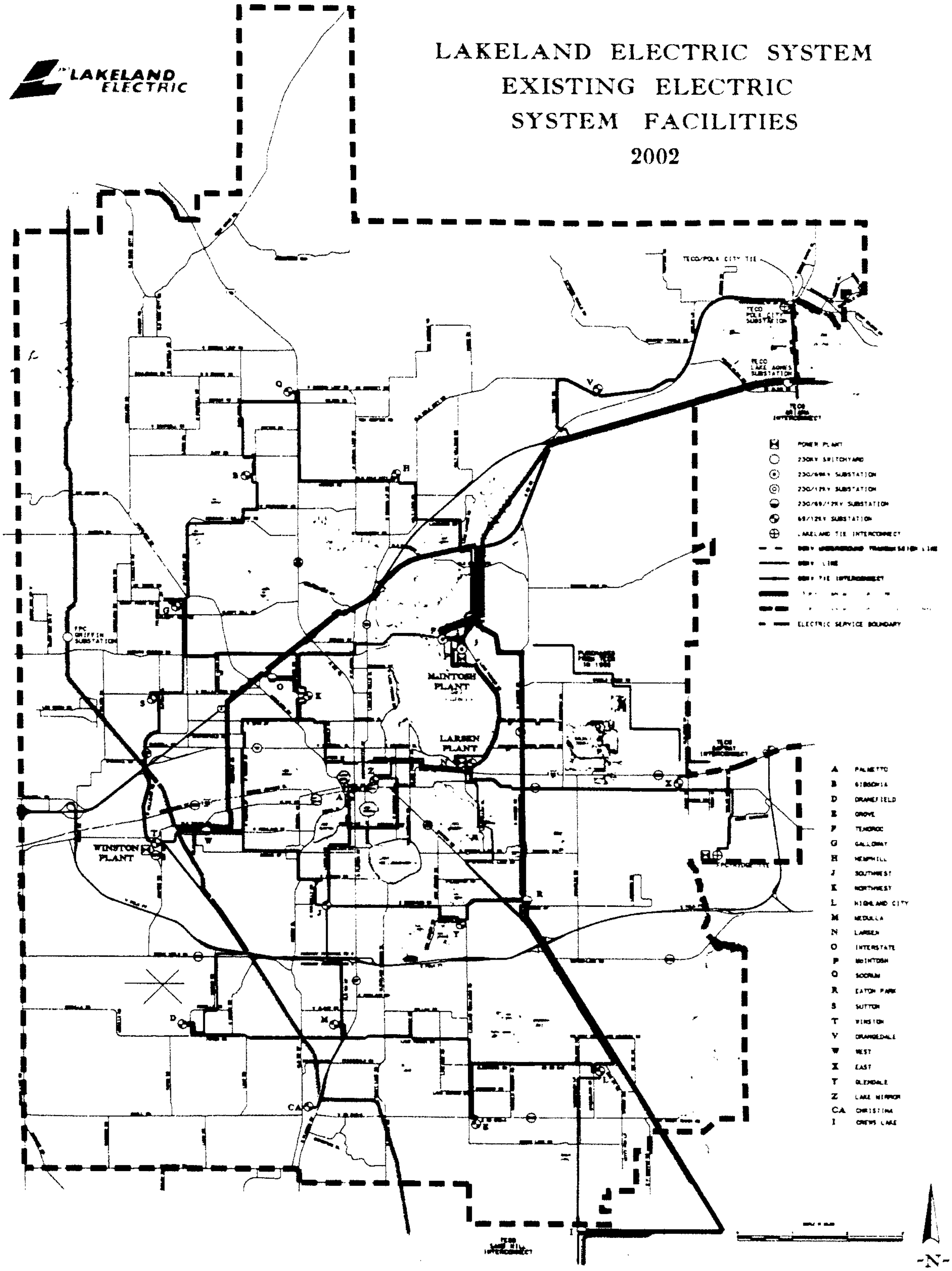
[4]Fuel Type

DFO	Distillate Fuel Oil
RFO	Residual Fuel Oil
BIT	Bituminous Coal
WH	Waste Heat
NG	Natural Gas

[5]Fuel Transportation Method

PL	Pipeline
TK	Truck
RR	Railroad

Figure 2-1


LAKELAND ELECTRIC SYSTEM
EXISTING ELECTRIC
SYSTEM FACILITIES
2002
LAKELAND ELECTRIC
McINTOSH PLANT
LARSEN PLANT
WINSTON PLANT
-N-

3.0 Forecast of Electrical Power Demand and Energy Consumption

Lakeland routinely develops a detailed long-term electric load and energy forecast for use in its planning studies. This is undertaken on a fiscal year basis with each year ending September 30th. Techniques employed include econometric and multiple regression modeling, study of historical relationships and growth rates, trend analysis and exponential smoothing. Lakeland also develops monthly, short-term forecasts for budgeting and planning purposes using historical monthly ratios.

The long-term forecast categories below are discussed at length in the remaining portion of this section:

- Service Territory Population;
- Number of Accounts;
- Energy Sales;
- Net Energy for Load;
- Summer Peak Demand;
- and Winter Peak Demand.

3.1 Service Territory Population Forecast

Projections of electric service territory population were developed using multiple techniques. A regression model using Polk County population as an independent variable was created. Exponential smoothing (1971-2002), historical trending (1971-2002 and 1992-2002) and historical growth rates were also used.

Polk County population projections were gathered from the Bureau of Economic and Business Research's (BEBR) 2002 Long-Term Economic Forecast. These projections incorporate Census 2000 data.

Prior to fiscal year 1989, Lakeland's historical population estimates were generated by multiplying residential accounts for inside and outside the city limits by values representing average household size (AHS). Polk County AHS was obtained from published BEBR information. From fiscal years 1990 through 1998, Lakeland used its 1994 Appliance Saturation Survey to establish AHS estimates. Since fiscal year 1999, the average of these two methodologies has served to yield population estimates for the city. At this time, there is no means of reliably estimating AHS for inside and outside the city limits. Consequently, values for inside and outside the city limits have been estimated from projections of 1999 data using growth rates paralleling those of BEBR's Polk County AHS rates for the same time period. In the future, it is planned to utilize Census 2000 block data to arrive at AHS values for population forecasts.

Electric service territory population for the City of Lakeland is projected to increase at a 1.41% average annual growth rate (AAGR) from fiscal years 2003 through 2012. This represents a slight increase over last year's projected 1.34% AAGR (presented Table 9-2).

3.2 Number of Accounts Forecast

Lakeland forecasts the number of accounts for the following categories and subcategories (presented in Tables 9-2 and 9-3):

- Residential
- Commercial
  - General Service
  - General Service Demand
- Industrial
  - General Service Large Demand
  - Contract
  - Interruptible
- Street & Highway Lighting
  - Private Area Lighting
- Other
  - Electric
  - Water
  - Municipal

Projections for inside and outside the city have been developed for residential, commercial, industrial and private area lighting accounts. Significant shifts among these are due to the large number annexations that have taken place since fiscal year 2001. Forecasts for inside and outside the city have been adjusted to reflect these in addition to those projected to occur between now and fiscal year 2006.

3.2.1 Residential Accounts

Total residential account projections, as well as those for outside the city, were based on weighted averages of several methods that included study of historical growth rates (1991-2002, 1997-2000 and 1992-1997), trend analysis (1991-2002) and exponential smoothing (1992-2002). Examination of historical relationship to Polk County population and total residential accounts also determined the final outside residential account forecast.

Residential account projections for inside city limits were determined by taking the difference between total residential accounts and those outside of the city.

Projected AAGR for total residential accounts is 1.41% for fiscal years 2003 through 2012 (presented in Table 9-2).

3.2.2 Commercial and Industrial Accounts

Total General Service (GS) accounts was projected using a weighted average of historical relationship to total commercial accounts and Polk County population, trend analysis (1996-2002) and exponential smoothing (1996-2002). General Service (GS) account projections for inside the city limits were determined by analyzing their historical relationship to total GS accounts. GS account projections for outside the city limits were based on the difference between accounts inside the city limits and the total number of GS accounts.

Total General Service Demand (GSD) accounts were projected based on a combination of their historical relationship to Polk County population and exponential smoothing (1984-2002). GSD account projections for inside the city limits were gathered from their historical relationship to total GSD accounts. GSD account projections for outside the city limits were based on the difference between total GSD accounts and inside GSD accounts.

The Commercial category found on the TYSP forms for this filing represents the combination of GS and GSD classes. The percentages of GS and GSD to total commercial accounts forecast were used to yield final GS and GSD account forecasts. Commercial accounts are projected to increase by an AAGR of 1.44% for the 10-year reporting period (presented in Table 9-2).

Industrial accounts represents the combination of General Service Large Demand (GSLD), Contract and Interruptible accounts. Projections for inside and outside the city were developed from study of their historical relationship to Polk County population, residential accounts, as well as, to the combined total of Commercial and Industrial categories(GS, GSD, GSLD, and CONT & INT). Historical growth rates (1988-1995, prior to establishment of Contract and Interruptible rate classes) were also examined in conjunction with these ratios to determine the final forecast.

Industrial accounts are expected to increase at approximately 1.40% AAGR over the 10-year reporting period (presented in Table 9-2).

3.2.3 Total Accounts

The Total Account Forecast for the City of Lakeland is the sum of individual forecasts provided above. Total accounts are expected to increase at 1.47% AAGR over the 10-year reporting period. This is a slight rise from last year's forecast AAGR of 1.37% but less than the 1.60% AAGR Lakeland has experienced over the past 10 years.

3.3 Energy Sales Forecast

Lakeland forecasts energy sales for the following categories and subcategories (presented in Tables 9-2 and 9-3):

- Residential
- Commercial
  - General Service
  - General Service Demand
- Industrial
  - General Service Large Demand
  - Contract
  - Interruptible
- Street & Highway Lighting
  - Private Area Lighting
- Other
  - Electric
  - Water
  - Municipal
  - Unmetered

Projections are developed for inside and outside of the city for residential, commercial, industrial, and private area lighting energy sales. Significant shifts among these are due to the large number annexations that have taken place since fiscal year 2001. Forecasts for inside and outside the city have been adjusted to reflect these in addition to those projected to occur between now and fiscal year 2006.

3.3.1 Residential Sales Forecast

The residential energy sales forecast for inside the city limits was developed from a combination of methods including study of historical relationship to total residential energy sales and historical growth rates (1980-2002, 1996-2000 and 1990-2002), trend analysis (1996-2002, 1989-2002 and 1982-2002) and exponential smoothing (1980-2002).

The total residential energy sales forecast was based on a combination of regression analysis, trend analysis (1980-2002, 1989-2002 and 1996-2002), study of historical growth rates (1992-2002) and exponential smoothing (1973-2002).

The forecast for residential energy sales outside the city was determined by taking the difference between total residential energy sales and residential energy sales inside the city.

The Total Residential Energy Sales Forecast is projected to increase at 2.25% AAGR over the 10-year reporting period (presented in Table 9-2).

3.3.2 Commercial and Industrial Sales

General Service (GS) energy sales inside the city was projected using a weighted average of methods that included exponential smoothing (1984-2002 and 1992-2002), study of historical growth rates (1992-1998), as well as, the historical relationship to residential energy sales and total GS energy sales. Total GS energy sales was projected using a weighted average of methods that included study of historical relationships to residential energy sales and historical growth rates (2000-2002), trend analysis (1992-2002 and 1987-2002) and exponential smoothing (1992-2002 and 1984-2002). Projected GS energy sales for outside the city was developed by taking the difference between total GS energy sales and GS energy sales for inside the city.

Total GS energy sales is expected to increase at 2.41% AAGR over the 10-year reporting period.

General Service Demand (GSD) energy sales for inside the city was developed using a weighted average of historical growth rates (1996-2000) and relationships to residential energy sales and Polk County population, trend analysis (1987-2002) and exponential smoothing (1984-2002). Total GSD energy sales was developed using a weighted average of historical growth rates (1995-2002) and relationships to Polk County population, trend analysis (1987-2002 and 1995-2002) and exponential smoothing (1973-2002, 1984-2002 and 1990-2002). Projections for GSD energy sales outside the city limits was developed by taking the difference between total GSD energy sales and GSD energy sales inside the city.

The Commercial category represents the combination of GS and GSD classes. Ratio of GS and GSD energy sales to this total value was used as a final check in developing the forecast. Commercial energy sales are expected to increase at 2.00% AAGR over the 10-year reporting period (presented in Table 9-2).

GSLD energy sales for inside the city was developed using a weighted average of methods that included trend analysis (1984-2001), as well as, study of historical relationships to residential energy sales and total GSLD energy sales. Total GSLD energy sales was projected based on a weighted average of historical growth rates (1995-2000), trend analysis (1984-2002) and regression analysis. Energy sales projections for GSLD accounts outside the city limits were developed by taking the difference between the total GSLD energy sales and GSLD energy sales inside the city limits.

Total GSLD energy sales are projected to increase at a 2.90% AAGR over the 10-year reporting period.

3.3.3 Other Sales

Other energy sales is comprised of municipal, private area lighting, water, electric and unmetered energy sales.

Municipal energy sales was based on a combination of techniques including study of historical growth rates (1985-2002) and relationship to Polk County Population, trend analysis (1985-2002 and 1997-2002) and exponential smoothing (1984-2002 and 1970-2002). Municipal energy sales are projected to increase at 2.71% AAGR over the 10-year reporting period.

Water energy sales was developed by taking a weighted average of historical relationships to municipal energy sales and growth rates (1994-2002), trend analysis (1994-2002) and usage per account estimates. Water energy sales are projected to increase at 1.64% AAGR over the 10-year reporting period.

Electric energy sales was based on a combination of techniques including historical growth rates (1992-2002), trend analysis (1992-2000 and 1992-2002), historical relationships to municipal energy sales and exponential smoothing (1984-2002). Electric energy sales are projected to increase at a 2.80% AAGR over the 10-year forecast period.

Private area lighting sales for total and outside the city were based on a weighted average of exponential smoothing (1992-2002), trend analysis (1992-2002) and study of historical relationships to total private area lighting sales. Private area lighting energy sales for inside was based on the difference between accounts forecasted for total and outside the city. Energy sales for private area lighting are expected to increase at 3.37% AAGR over the 10-year reporting period.

Unmetered energy sales represents total municipal street and highway lighting. The forecast was developed by taking a weighted average of trend analysis (1993-1998), historical growth rates (1988-2002) and historical ratios to municipal energy sales.

Other energy sales is expected to increase at 2.36% AAGR over the 10-year reporting period (presented in Table 9-3).

3.3.4 Total Sales

The Total Energy Sales Forecast for the City of Lakeland is the sum of the individual forecasts provided above along with the effect of energy conservation programs. Total energy sales is projected to grow at 2.29% AAGR over the 10-year reporting period which is a slight increase over last year's projection of 2.04% AAGR (presented in Table 9-3).

3.4 Net Energy for Load Forecast

Net energy for load is defined as the electricity generated by a system's own generating plants in addition to energy purchased from others less that delivered for resale. Included in its final value is the effect of energy conservation programs.

The Net Energy for Load Forecast was developed using a weighted average of trend analysis (1982-2002 and 1992-2002), historical growth rates (1998-2002) and exponential smoothing (1974-2002). Electric losses, energy loss as a percentage of total system energy, is expected to average a constant 4.9% of total sales over the 10-year forecast. Net energy for load is projected to increase at 2.24% AAGR over the 10-year reporting period which is a slight increase over the prior year's forecasted 2.08% AAGR (presented in Table 9-4).

3.5 Peak Demand

Lakeland Electric's winter season is defined as November through March; the utility's summer season is defined as April through October.

The Winter Peak Demand Forecast (base-case of 30.22°) represents the average outcome of six regression models, trend analysis (1977-2002, 1989-2002, and 1996-2002) and load factor analyses. Each regression model used different combinations of the following independent variables: day of week, temperature at midnight, temperature at time of winter peak, annual minimum temperature, heating degree-days, average temperature prior to day of winter peak and minimum temperature of day prior to winter peak. Consistently, temperature at winter peak and minimum temperature proved the most significant independent variables. The Total Winter Peak Demand Forecast less conservation is expected to increase at 2.38% AAGR over the 10-year reporting period which is a slight increase over last year's forecasted 2.13% AAGR (presented Table 9-6).

The Summer Peak Demand Forecast (base-case at 94.93°) was developed using a combination of two regression models, trend analysis (1977-2002, 1987-2002, 1980-2002 and 1996-2002), exponential smoothing (1980-2002), as well as, historical load factor-derived load analysis. The primary drivers in these regression models included annual maximum temperature, temperature at time of summer peak and Polk County population. Polk County population proved the most significant model variable. The Summer Peak Demand Forecast less conservation is expected to increase at 2.17% AAGR over the 10-year reporting period which is a slight decrease from last year's forecasted 2.20% AAGR (presented Table 9-5).

Table 3-1 Historical and Projected Heating and Cooling Degree Days		
Year	HDD	CDD
1992	642	3196
1993	702	3117
1994	429	4060
1995	399	3607
1996	812	3395
1997	314	3611
1998	618	3450
1999	405	3497
2000	481	3233
2001	780	3238
2002	425	3743
2003	493	3446
2004	493	3446
2005	493	3446
2006	493	3446
2007	493	3446
2008	493	3446
2009	493	3446
2010	493	3446
2011	493	3446
2012	493	3446

Table 3-2
Historical Monthly Peaks and Date

	2000		2001		2002	
Jan	610	Jan-27	655	Jan-05	659	Jan-09
Feb	508	Feb-06	508	Feb-06	582	Feb-28
Mar	407	Mar-31	431	Mar-08	536	Mar-05
Apr	416	Apr-03	472	Apr-13	515	Apr-30
May	504	May-26	494	May-30	524	May-06
Jun	532	Jun-20	542	Jun-13	551	Jun-03
Jul	552	Jul-20	539	Jul-30	576	Jul-17
Aug	539	Aug-24	546	Aug-29	557	Aug-06
Sep	528	Sep-14	519	Sep-04	526	Sep-03
Oct	510	Oct-05	471	Oct-24	509	Oct-11
Nov	476	Nov-22	360	Nov-01	448	Nov-12
Dec	597	Dec-31	465	Dec-27	525	Dec-16

3.6 Sensitivity Cases

A high load growth case and a low load growth case were created in addition to that of the base-case forecast. These two additional sensitivity cases provide a bandwidth across which Lakeland can evaluate potential power supply planning alternative scenarios. The bandwidth for these was developed at a first sigma level confidence with an assumption of non-normally distributed data.

3.6.1 High Load Sensitivity

The high-case demand forecasts were based on a summer temperature at time of peak of 95.8° and a winter temperature at time of peak of 28.3°. The high load forecast has 2.27% AAGR for winter and 2.09% AAGR for summer (presented in Tables 3-3 and 3-4).

3.6.2 Low Load Sensitivity

The low-case demand forecasts were based on a summer temperature at time of peak of 94.0° and a winter temperature at time of peak of 32.1° degrees. The low load forecast has 2.37% AAGR for summer and 2.51% AAGR for winter (presented in Tables 3-3 and 3-4).

3.6.3 High and Low Net Energy for Load

Forecasts were prepared using cases for high and low net energy for load. The bandwidth for these was developed at a first sigma level confidence with an assumption of non-normally distributed data (presented in Table 3-5).

Table 3-3
Summer Peak Demand (MW)

Year	Low	Base	High
2003	540	568	620
2004	554	582	634
2005	570	598	650
2006	584	612	664
2007	598	626	678
2008	612	640	692
2009	626	654	706
2010	640	668	720
2011	654	681	734
2012	667	694	747
AAGR 2003-2012	2.37%	2.25%	2.09%

Table 3-4
Winter Peak Demand (MW)

Year	Low	Base	High
2002/03	605	632	675
2003/04	622	646	692
2004/05	639	663	709
2005/06	656	680	726
2006/07	672	696	742
2007/08	689	713	759
2008/09	706	730	776
2009/10	723	747	796
2010/11	739	763	809
2011/12	756	780	826
AAGR 2003-2012	2.51%	2.37%	2.27%

Table 3-5
Net Energy for Load (GWH)

Year	Low	Base	High
2003	2,724	2,845	2,966
2004	2,792	2,913	3,034
2005	2,861	2,981	3,102
2006	2,929	3,050	3,171
2007	2,999	3,119	3,240
2008	3,068	3,189	3,310
2009	3,138	3,259	3,380
2010	3,209	3,330	3,450
2011	3,280	3,401	3,521
2012	3,351	3,472	3,593
AAGR 2003-2012	2.33%	2.24%	2.15%

4.0 Demand-Side Management Programs

Lakeland Electric is committed to reducing system demand and promoting more efficient use of electric energy to the extent to which it is cost-effective for all its consumers. Lakeland has in place several cost-effective Demand-Side Management (DSM) programs and is continuing to pursue additional cost-effective conservation and DSM programs. Presented in this section are the existing programs. Further details can be found in Lakeland's Demand-Side Management Plan for Docket No. 930556-EG, which is on file with the Florida Public Service Commission.

This section also includes a brief description of Lakeland's advances in solar technology and a new LED traffic light retrofit program. Lakeland has assumed a leadership position in the deployment and commissioning of numerous solar energy devices and has established their reputation as a pro-solar electric utility.

4.1 Existing Conservation and Demand-Side Management Programs

Lakeland has several existing conservation and demand-side management programs that are currently available and address three major areas of demand-side management:

- Reduction in weather sensitive peak loads.
- Reduction of energy needs on a per customer basis.
- Movement of energy to off-peak hours when it can be generated at a lower cost.

The programs can be divided into two groups: those programs with demonstrable demand and energy savings and programs in which the impact of demand and energy savings cannot be directly measured.

4.1.1 Existing Programs with Demonstrable Demand and Energy Savings

Lakeland has several programs that demonstrate demand and energy savings for the system. The following are programs that are in place currently:

- Residential Programs:
  - SMART Load Management Program.
- Commercial Programs:
  - Commercial Lighting Program.
  - Thermal Energy Storage Program.

4.1.1.1 Residential Programs.

4.1.1.1.1 SMART Load Management Program. In 1981, Lakeland began the Load Management Program. The program focused on the direct load control of electric water heaters to reduce peak demand. The program was changed in 1990 to cyclically control heating, air conditioning, and ventilation systems, combined with continuous control of water heating. This change came about as newer, more cost-effective control technologies became available. This made control of HVAC systems cost-effective along with continued control of hot water heaters.

Lakeland required all new residential construction projects to have mandatory controls when the program was expanded. Lakeland has since relaxed the mandatory portion of the program for new customers due to diminished cost-effectiveness of the program. The program remains as a voluntary program which is still enjoying good response from its customers and continued demand savings. The SMART program is projected to reduce winter peak demand by 1 kW per account from each water heater control and 1.2 kW per account from control of HVAC systems.

4.1.1.2 Commercial Programs.

4.1.1.2.1 Commercial Lighting Program. The Commercial Lighting Program began in 1996 to enhance/maintain customer lighting levels while reducing the facilities associated energy needs. Commercial/Industrial account managers, in conjunction with energy consultants, perform a thorough lighting audit and provide customers with up-to-date lighting efficiency standards from the Florida Building Code and Federal Energy Policy Act of 1992. Customers are shown that through the installation of energy efficient fixtures these goals can be realized. Account managers also show how quickly a lighting investment can be paid back based on associated energy savings.

4.1.1.2.2 Thermal Energy Storage Program. The Thermal Energy Storage (TES) Program has provided Lakeland's commercial and industrial customers an effective method of transferring cooling and heating requirements to off-peak time periods. This is accomplished through TES systems that are on par in efficiency with standard systems. Lakeland has implemented two rate tariffs which are designed for load shift technologies, such as TES. This provides further economic incentive for customers to switch to TES technologies.

4.1.2 Non-Measurable Demand and Energy Savings

The programs outlined in this section cannot directly be measured in terms of demand and energy savings, but are very important in that they have been shown to influence public behavior and thereby help reduce energy requirements. Lakeland considers the following programs to be important part of its objective to cost-effectively reduce energy consumption:

- Residential Programs:
  - Energy Audit Program.
  - Public Awareness Program.
  - Mobile Display Unit.
  - Speakers Bureau.
  - Informational Bill Inserts.
- Commercial Programs:
  - Commercial Audit Program.

4.1.2.1 Residential Programs.

4.1.2.1.1 Residential Energy Audits. The Energy Audit Program promotes high energy-efficiency in the home and gives the customer an opportunity to learn about other utility conservation programs. The program provides Lakeland with a valuable customer interface and a good avenue for increased customer awareness.

4.1.2.1.2 Public Awareness Program. Lakeland believes that an informed public aware of the need to conserve electricity is the greatest conservation resource. Lakeland's public awareness programs provide customers with information to help them reduce their electric bills by being more conscientious in their energy use.

4.1.2.1.3 Mobile Display Unit. The mobile display unit is presented at a number of area activities each year, including the Engineering Expo held at the University of South Florida, the Polk County Home Show, and numerous school engagements through the year. The display centers on themes of energy and water conservation, including electric safety.

4.1.2.1.4 Speakers Bureau. Lakeland provides speakers to local group meetings to help inform the public of new energy efficiency technologies and ways to conserve energy in the commercial and residential sectors.

4.1.2.1.5 Informational Bill Inserts. Monthly billing statements provide an excellent avenue for communicating timely energy conservation information to its customers. In this way, Lakeland conveys the message of better utilizing their electric resources on a regular basis in a low cost manner.

4.1.2.2 Commercial Programs.

4.1.2.2.1 Commercial Energy Audits. The Lakeland Commercial Audit Program includes educating customers about high efficiency lighting and thermal energy storage analysis for customers to consider in their efforts to reduce costs associated with their electric usage.

4.1.3 Demand-Side Management Technology Research

Lakeland has made a commitment to study and review promising technologies in the area of conservation and demand-side management. Some of these efforts are summarized below.

4.1.3.1 Direct Expansion Ground Source Heat Pump Study.

In cooperation with ECR Technologies of Lakeland, Lakeland Electric was given the Governor's Energy Award for work in the evaluation and analysis of direct expansion ground source heat pump (GSHP) technology. This technology will reduce weather sensitive loads and promote greater energy efficiency for Lakeland's system. A study of the demand and energy savings associated with this technology was completed in an effort to establish its cost-effectiveness for new construction, as well as retrofitting the technology to existing homes. The original units were installed over ten years ago and are still in service. There is little customer interest due to the cost of the units. Currently, no new sites are being developed.

4.1.3.2 Whole House Demand Controller Study/Real Time Pricing.

The concept of this technology is to control multiple appliances in the customer's home. The initial study was designed such that when a customers' demand reached a pre-set level, no additional appliances would be allowed to turn on. There has been no customer interest in this program as initially offered.

4.1.3.3 Time-of-Day Rates.

Lakeland is currently offering a time of day program and plans to continue as this makes consumers aware of the variation in costs during the day. To date, there has been limited interest by Lakeland's customers in this demand-side management program.

4.2 Solar Program Activities

Lakeland Electric views solar energy devices as distributed generators whether they interconnect to the utility grid or not. As such they can potentially fill the much-desired role that an electric utility needs to avoid future costs of building new (and/or re-working existing) distribution systems.

4.2.1 Solar Powered Street Lights.

Distributed generation produces the energy in end use form at the point of load by the customer, thereby eliminating many of the costs, wastes, pollutants, environmental degradation, and other objections to central station generation.

Solar powered streetlights offer a reliable, cost-effective solution to remote lighting needs. As shown in Figure 4-1, they are completely self-contained, with the ability to generate DC power from photovoltaic modules and batteries. During daylight hours solar energy is stored in the battery bank used to power the lights at night. By installing these self sufficient, stand-alone solar lighting products, Lakeland Electric was able to avoid the construction costs related to expansion of its distribution system into remote areas. These avoided costs are estimated to be approximately $20,000. It is Lakeland's stated desire to continue to install solar area-lighting products where similar circumstances exist.

Lakeland currently has 20 solar powered streetlights that are in service. Each of these lights replaces a traditional 70 watt fixture that Lakeland typically would use in this type of application and displaces the equivalent amount of energy that the 70 watt fixture would use on an annual basis. The primary application for this type of lighting is for remote areas as stated above. Lakeland installed these 20 lights in mid-1994 in a grant program with the cooperation of the Florida Solar Energy Center (FSEC). Lakeland is continuing to collect operational and maintenance data to further assess the long-term cost-effectiveness, maintenance needs, and reliability of this type of lighting.

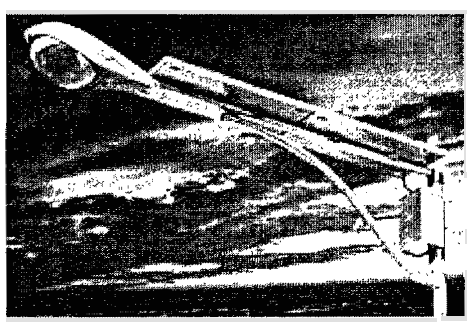


Figure 4-1
Solar Powered Streetlight

4.2.2 Solar Thermal Collectors for Water Heating.

The most effective application for solar energy is the heating of water for domestic use. Solar water heating provides energy directly to the end-user and results in a high level of end-user awareness. The sun's energy is stored directly in the heated water itself, reducing the effect of converting the energy to other forms.

Lakeland presently owns and operates 61 solar water heaters. These units are installed on the roofs of residential customers' homes, i.e. – at the point of consumption. Since this method of energy delivery bypasses the entire transmission and distribution system, there are other benefits than only avoided generation costs.

In Lakeland's program, each solar water heater remains the property of the utility, thereby allowing the customer to avoid the financial cost of the purchase. Lakeland's return on this investment is realized through the sale of the solar generated energy as a separate line item on the customer's monthly bill. This energy device is monitored by using a utility-utility Btu meter calibrated to read in kWh.

One of the purposes of this program is to demonstrate that solar thermal energy can be accurately metered and profitably sold to the everyday residential end-user of hot water. Lakeland Electric's fleet of 61 solar thermal energy generators displaces approximately 3,000 kWh per year per installation on average.

4.2.3 Utility-Interactive Residential Photovoltaic Systems

This project is a collaborative effort between the Florida Energy Office (FEO), FSEC, the Lakeland, and Siemens Solar Industries. The primary objectives of this program are to develop approaches and designs that integrate photovoltaic (PV) arrays into residential buildings, and to develop workable approaches to interconnection of PV systems into the utility grid. Lakeland currently has 20 PV systems installed and operating, all of which are directly interconnected to the utility grid. These systems have an average nominal power rating of approximately 2 kilowatts peak (kWp) and are displacing approximately 2000 kWh per year per installation at standard test conditions.

Lakeland will own, operate, and maintain the systems for at least 5 years. FSEC will conduct periodic site visits for testing and evaluation purposes. System performance data will be collected via telephone modem line for at least 2 years. Lakeland and FSEC will analyze the results of utility and systems simulation tests and prepare recommendations for appropriate interconnection requirements for residential PV systems. FSEC will prepare technical reports on system performance evaluation, onsite utilization, coincidence of PV generation with demand profiles, and utilization of PV generated electricity as a demand-side management option.

4.2.4 Utility-Interactive Photovoltaic Systems on Polk County Schools

Lakeland is also actively involved in a program called "Portable Power." The focus of the program is to install Photovoltaic Systems on portable classrooms in the Polk County School District. This program is a partnership including the City of Lakeland, Polk County School District, Siemens Solar Industries, Florida Solar Energy Research and Education Foundation, Florida Solar Energy Center and the Utility Photovoltaic Group. It will allow seventeen portable classrooms to be enrolled in former President Clinton's "Million Solar Roofs Initiative." With the installation of the photovoltaic systems 80 percent of the electricity requirements for these classrooms will be met.

Along with the photovoltaic systems, there will also be a specially designed curriculum on solar energy appropriate to various grade levels. An education package has been delivered to the schools for their teachers' use in the explanation of solar sciences. By addressing solar energy technologies in today's public school classrooms, Lakeland is informing the next generation of the environmental and economic need for alternate forms of energy production.

The "Portable Power" in the schools, shown in Figure 4-2, consists of installing 2kWp photovoltaics systems on seventeen portable classrooms. In addition to the educational awareness benefits of photovoltaic programs in schools, there are several practical reasons why portable classrooms are most appropriate as the platforms for photovoltaics. They have nearly flat roofs and are installed in open spaces, so final orientation is of little consequence. Another reason is the primary electric load of the portable classroom is air conditioning, which is reduced by the shading effect of the panels on their short stand-off mounts. Most important, the total electric load on the portable classroom has high coincidence with the output from the PV system. The hot, sunny day which results in the highest cooling requirements also produce the maximum PV output.

Of extreme value to the photovoltaic industry, Lakeland Electric, in a partnership with the FSEC, provided on-site training sessions while installing the solar equipment on these school buildings. Attendees from other electric utilities were enrolled and given a hands-on opportunity to develop the technical and business skills needed to implement their own solar energy projects. The training classes covered all aspects of the solar photovoltaic experience from system design and assembly, safety and reliability, power quality, and troubleshooting to distributed generation and future requirements of deregulation.

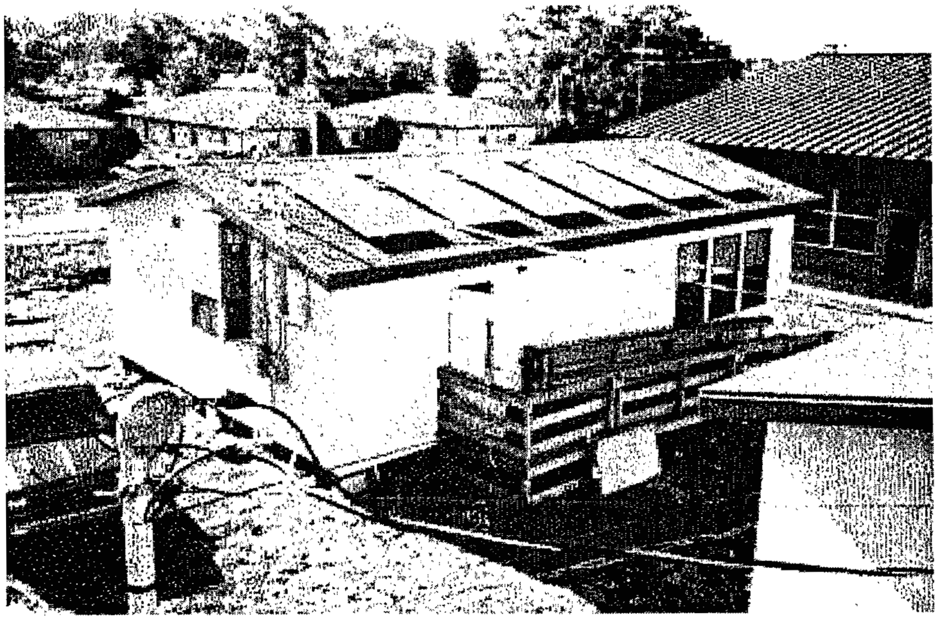


Figure 4-2
Portable Classroom Topped by PV Panels

Lakeland will own, operate, and maintain the systems that are installed on these classrooms. Lakeland will monitor the performance and FSEC will conduct periodic testing of the equipment. Through the cooperative effort of the partnership, different ways to use photovoltaics efficiently and effectively in today's society will be evaluated.

4.2.5 Integrated Photovoltaics for Florida Residences

Lakeland's existing integrated photovoltaic program supports former President Clinton's "Million Solar Roofs Initiative". The Department of Energy granted five million dollars for solar electric businesses in addition to the existing privately funded twenty-seven million dollars, for a total of thirty-two million dollars for the program. Through the Utility Photovoltaic Group, the investment will support 1,000 PV systems in 12 states and Puerto Rico and hopes to bring photovoltaics to the main market. The 1,000 systems are part of the 500,000 commitments received for the initiative to date. The goal is to have installed solar devices on one million roofs by the year 2010. Lakeland is helping to accomplish this national goal.

This program provides research in the integration of photovoltaics in newly constructed homes. Two new homes, having identical floor plans, were built in "side-by-side" fashion. The dwellings are being measured for performance under two conditions: occupied and unoccupied. Data is being collected for end-use load and PV system interface. As a research project, the goal is to see how much energy could be saved without factoring in the cost of the efficiency features.

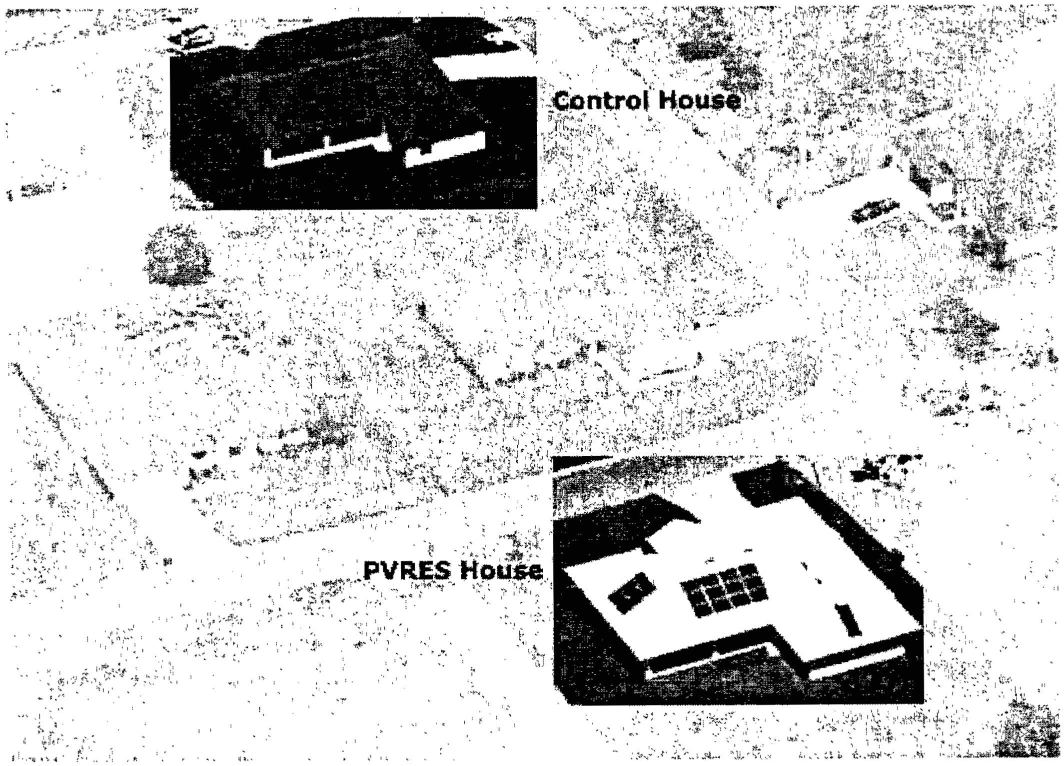


Figure 4-3
Solar House and Control House

The first solar home was unveiled May 28, 1998, in Lakeland, Florida. The home construction includes a 4 kW photovoltaic system, white tiled roof, argon filled windows, exterior wall insulation, improved interior duct system, high performance heat pump and high efficiency appliances. An identical home with strictly conventional construction features was also built as a control home. The homes are 1 block apart and oriented in the same direction as shown in Figure 4-3. For the month of July 1998, the occupied solar home air conditioning consumption was 72 percent lower than the unoccupied control house. Living conditions were simulated in the unoccupied home. With regard to total power, the solar home used 50 percent less electricity than the air conditioning consumption of the control home.

The solar home was designed to provide enough power during the utility peak that it would not place a net demand on the grid. If the solar home produces more energy than what is being consumed on the premises, the output of the photovoltaic system could be sent into the utility grid. The objective was to test the feasibility of constructing a new, single family residence that was engineered to reduce air conditioning loads to an absolute minimum so most of the cooling and other daytime electrical needs could be accomplished by the PV component.

4.3 Green Pricing Program

Because no long-term budgets have been established for the deployment of solar energy devices, many utilities are dependent on infrequent, somewhat unreliable sources of funding for their solar hardware purchases. To provide for a more regularly available budget, a number of utilities are looking into the voluntary participation of their customers. Recent market studies performed in numerous locations and among diverse population groups reveal a public willingness to pay equal or even slightly higher energy prices knowing that their payments are being directed towards renewable fuels.

The Florida Municipal Electric Association (FMEA) has assembled a workgroup called "Sunsmart". This workgroup is a committee composed of member utilities. Its purpose is to raise environmental awareness and implement "Green Pricing" programs that would call for regular periodic donations from customers who wish to invest in renewables. The Florida Solar Energy Center (FSEC) co-hosts this effort by providing meeting places and website advertising to recruit from statewide responses. A grant from the State of Florida Department of Community Affairs, Florida Energy Office has been appropriated to encourage utility involvement with Green Pricing. Lakeland Electric is an active member of this committee and is investigating the marketability and public acceptance of a Green Pricing Program in its service territory.

4.4 LED Traffic Light Retrofit Program

The City of Lakeland is responsible for the operation and maintenance of 3,411 traffic lights at over 171 intersections. Historically, these traffic signals have used incandescent bulbs which are replaced every 18 months and use approximately 135 watts of electricity per bulb. This amounts to an annual electrical consumption of 1,633,525 kwh for all 12" red and green signals, arrow signals and pedestrian crossing signals.

This project will retrofit the existing bulbs with highly efficient Light Emitting Diodes (LEDs). The LEDs will use approximately 10 watts of energy which is more than a 90% decrease in energy consumption as compared to their incandescent counterparts and have a longer life span, up to seven years, which reduces maintenance costs as well.

The Florida Department of Transportation (FDOT) has agreed to help fund Lakeland's project to retrofit the signals. The FDOT will contribute $50,000 for new LED traffic signal equipment at 14 key intersections on state roadways within Lakeland's city limits. The FDOT views this as a "good neighbor policy" since FDOT depends on city crews to maintain the signals on its roads and highways within the city's limits.

The project began in December, 2002 and is expected to take 5 months to complete the retrofitting of the signals. The project is expected to save the City of Lakeland $150,000 per year in maintenance and electricity costs.

Later this year, Lakeland Electric plans to add backup power supply equipment at 14 intersections earmarked for FDOT-funded LED signals. The UPS systems will improve safety by keeping traffic signals operating during power outages and accidents. Lakeland will be one of the first cities in Florida to have the UPS systems applied to the LED signals.

5.0 Forecasting Methods and Procedures

This section describes and presents Lakeland's long-term integrated resource planning process, the economic parameter assumptions, plus the fuel price projections being used in the current evaluation process.

5.1 Integrated Resource Planning

Lakeland selects its capacity resources through an integrated resource planning process which it has used for a number of years. Lakeland's planning considers both conservation and demand-side management measures. The integrated resource planning process employed by Lakeland continuously monitors supply and demand-side alternatives. As promising alternatives emerge, they are included in the evaluation process.

5.2 Florida Municipal Power Pool

Lakeland is a member of the Florida Municipal Power Pool (FMPP) along with the Orlando Utilities Commission (OUC), Kissimmee Utility Authority, and the All-Requirements Project of the Florida Municipal Power Agency (FMPA). The four utilities operate as one control area. All FMPP capacity resources are committed and dispatched together from the OUC Operations Center. Beginning June 2003, Kissimmee Utility Authority will become a member of the All-Requirements Project of the FMPA.

The FMPP is not a capacity pool meaning that each member must plan for and maintain sufficient capacity to meet their own individual demands and reserve obligations. Any member of the FMPP can withdraw from FMPP with 1 year written notice. Lakeland, therefore, must ultimately plan on a stand-alone basis as reflected in this document.

5.3 Economic Parameters and Evaluation Criteria

This section presents the assumed values adopted for economic parameters and inputs used in Lakeland's planning process. The assumptions stated in this section are applied consistently throughout this document. Subsection 5.3.1 outlines the basic economic assumptions. Subsections 5.3.2 and 5.3.3 outline the base case, high and low, and constant differential fuel forecasts.

5.3.1 Economic Parameters

This section presents the values assumed for the economic parameters currently being used in Lakeland's least-cost planning analysis.

5.3.1.1 Inflation and Escalation Rates. The general inflation rate applied is assumed to be 2.5 percent per year. A 1.5 escalation rate is applied to operation and maintenance (O&M) expenses. Fuel price escalation rates are discussed below in Section 5.3.2.

5.3.1.2 Bond Interest Rate. Consistent with the traditional tax exempt financing approach used by Lakeland, the self-owned supply-side alternatives assume 100 percent debt financing. Lakeland's long-term tax exempt bond interest rate is assumed to be 5.0 percent.

5.3.1.3 Present Worth Discount Rate. The present worth discount rate used in the analysis is set equal to Lakeland's assumed bond interest rate of 5.0 percent.

5.3.1.4 Interest During Construction. During construction of the plant, progress payments will be made to the EPC contractor and interest charges will accrue on loan draw downs. The interest during construction rate is assumed to be 5.0 percent.

5.3.1.5 Fixed Charge Rates. The fixed charge rate is the sum of the project fixed charges as a percent of the project's total initial capital cost. When the fixed charge rate is applied to the initial investment, the product equals the revenue requirements needed to offset fixed costs for a given year. A separate fixed charge rate can be calculated and applied to each year of an economic analysis, but it is most common to use a Levelized fixed charge rate that has the same present value as the year by year fixed charged rates. Included in the fix charged rate calculation is an assumed 2.0 percent issuance fee, a 1.0 percent annual insurance cost, and a 6-month debt reserve fund earning interest at a rate equal to the bond interest rate.

5.3.2 Fuel Price Projections

This section presents the fuel price projections for coal, petroleum coke, natural gas and oil. The forecast presented has been prepared by Lakeland Electric's Wholesale Energy and Fuels Staff. The most recent Annual Energy Outlook (AEO) 2003 reports forecast of fuels is also presented for comparative purposes. The AEO 2003 report is published by the Energy Information Administration (EIA), which is an independent agency of the Department of Energy (DOE). The AEO 2003 energy data is a nationally known source of domestic and international energy supply, consumption, and price information. It should be noted that the AEO reports represent national averages and do not always track conditions unique to specific geographical regions such as Florida.

AEO 2003 provides an energy price forecast through the year 2025 and attempts to take into account a number of important factors, some of which include:

- Restructuring of the U.S. electricity markets.
- Current regulations and legislation affecting the energy markets.

- Current energy issues:
  - Appliance, gasoline and diesel fuel, and renewable portfolio standards.
  - Expansion of natural gas industry.
  - Carbon emissions.
  - Competitive electricity pricing.

AEO 2003 energy information is considered objective and nonpartisan by Lakeland. It is used widely by both government and private sectors to assist in decision-making processes and in analyzing important policy issues.

AEO 2003 publishes real fuel price projections for the individual years of 2000, 2001, 2005, 2010, 2015, 2020 and 2025. Table 5-1 shows the real AEO 2003 forecast for the various fuel types. Table 5-2 is Lakeland's fuel price forecast in 2003 real dollars by fuel type. Additional assumptions and results of the fuel price forecasts are discussed by fuel type in the following subsections.

Table 5-1
2003 Annual Energy Outlook Real Fuel Price Projections

AEO Forecast	2005	2010	2015	2020	2025
No. 2 Oil, $/mmbtu	5.01	5.13	5.60	6.06	6.18
Residual Oil, $/mmbtu	3.85	3.97	4.07	4.21	4.40
Coal, $/mmbtu	1.22	1.17	1.15	1.12	1.10
Natural Gas, $/mmbtu	3.27	3.79	4.14	4.30	4.60
Source: DOE Energy Information Administration Annual Energy Outlook 2003 Page 123					

5.3.2.1 Natural Gas. Natural gas, also known as methane, is a colorless, odorless fuel that burns cleaner than many other traditional fossil fuels. Natural gas can be used for heating, cooling, and production of electricity, and other industry uses.

Natural gas is found in the Earth's crust. Once the gas is brought to the surface, it is refined to remove impurities such as water, sand, and other gases. The natural gas is then transmitted through pipelines and delivered to the customer either directly from the pipeline or through a distribution company or utility. When natural gas reaches its destination through a pipeline, it is often stored prior to distribution.

Table 5-2
Base Case Fuel Price Forecast Summary (Real Price $/mmbtu, No Inflation Added)

	McIntosh 3 Coal[1]	Natural Gas[2]	High Sulfur #6 Oil[1]	Low Sulfur #6 Oil[1]	#2 Diesel Oil[1]	Petroleum Coke[1]
2003	1.78	4.47	5.36	6.34	6.89	1.45
2004	1.87	4.03	5.05	5.93	6.42	1.50
2005	1.82	3.87	4.86	5.71	6.17	1.40
2006	1.83	4.11	4.67	5.48	5.89	1.40
2007	1.85	4.15	4.71	5.54	5.93	1.40
2008	1.87	4.19	4.76	5.59	5.96	1.40
2009	1.88	4.24	4.81	5.65	5.99	1.40
2010	1.90	4.28	4.86	5.71	6.02	1.40
2011	1.92	4.32	4.91	5.77	6.06	1.40
2012	1.94	4.37	4.96	5.83	6.09	1.41
2013	1.95	4.41	5.01	5.89	6.12	1.41
2014	1.97	4.46	5.07	5.95	6.15	1.41
2015	1.99	4.51	5.12	6.01	6.19	1.41
2016	2.01	4.55	5.17	6.07	6.22	1.41
2017	2.03	4.60	5.22	6.13	6.25	1.41
2018	2.05	4.65	5.28	6.20	6.29	1.41
2019	2.06	4.69	5.33	6.26	6.32	1.41
2020	2.08	4.74	5.39	6.32	6.35	1.41
2021	2.10	4.79	5.44	6.39	6.38	1.41
2022	2.12	4.84	5.50	6.45	6.42	1.41
Average Annual Growth Rate	0.92%	0.42%	0.14%	0.09%	-0.37%	-0.15%

[1]Prices represent delivered prices.

[2]Does not include reservation charges.

5.3.2.1.1 Natural gas supply and availability. Natural gas reserves exist both in the United States and North American mainland and coastal regions. Natural gas reserves are mostly dependent on domestic production. Increasing demand for natural gas as a fuel for both home and heating and new power generation projects is contributing to the price volatility seen in recent years.

5.3.2.1.2 Natural gas transportation. There are now two transportation companies serving Peninsular Florida, Florida Gas Transmission Company (FGT) and Gulfstream. Lakeland Electric has interconnections and service agreements with both companies to provide diversification and competition in delivery.

5.3.2.1.2.1 Florida Gas Transmission Company. FGT is an open access interstate pipeline company transporting natural gas for third parties through its 5,000-mile pipeline system extending from South Texas to Miami, Florida. FGT is a subsidiary of Citrus Corporation, which in turn, is jointly owned by Enron Corporation, the largest integrated natural gas company in America, and El Paso Energy Corporation, one of the largest independent producers of natural gas in the United States.

The FGT pipeline system accesses a diversity of natural gas supply regions, including:

- Anadarko Basin (Texas, Oklahoma, and Kansas).
- Arkona Basin (Oklahoma and Arkansas).
- Texas and Louisiana Gulf Areas (Gulf of Mexico).
- Black Warrior Basin (Mississippi and Alabama).
- Louisiana – Mississippi – Alabama Salt Basin.
- Mobile Bay

FGT's total receipt point capacity is in excess of 3.0 billion cubic feet per day and includes connections with 10 interstate and 10 intrastate pipelines to facilitate transfers of natural gas into its pipeline system. FGT reports a current delivery capability to Peninsular Florida in excess of 1.4 billion cubic feet per day.

5.3.2.1.2.2 Florida Gas Transmission market area pipeline system. The FGT multiple pipeline system corridor enters the Florida Panhandle in northern Escambia County and runs easterly to a point in southwestern Clay County, where the pipeline corridor turns southerly to pass west of the Orlando area. The mainline corridor then turns to the southeast to a point in southern Brevard County, where it turns south generally paralleling Interstate Highway 95 to the Miami area. A major lateral line (the St. Petersburg Lateral) extends from a junction point in southern Orange County westerly to terminate in the Tampa, St Petersburg, Sarasota area. A major loop corridor (the West Leg Pipeline) branches from the mainline corridor in southeastern Suwannee County to run southward through western Peninsular Florida to connect to the St. Petersburg Lateral system in northeastern Hillsborough County. Each of the above major corridors includes stretches of multiple pipelines (loops) to provide flow redundancy and transport capability. Numerous lateral pipelines extend from the major corridors to serve major local distribution systems and industrial/utility customers.

5.3.2.1.2.3 Gulfstream pipeline. The Gulfstream pipeline is a 744-mile pipeline originating in the Mobile Bay region and crossing the Gulf of Mexico to a landfall in Manatee County (south Tampa Bay). The pipeline has the capability to supply Florida with 1.1 billion cubic feet of gas per day serving existing and prospective electric generation and industrial projects in southern Florida. Figure 5-1 shows the route for the Gulfstream pipeline. Phase I of the pipeline has been completed and ends in Polk County, Florida. The pipeline will be extended to Lake Okeechobee as part of Phase II to be completed during years 2004 and 2005.

The 1.6 billion-dollar pipeline won FERC approval, subject to environmental review, on April 24, 2000. Final environmental and routing approvals by FERC were given in February of 2001. Construction for the Gulfstream pipeline began in 2001 and was completed in 2002.

The first major acquisition of right-of-way occurred July 20, 2000 with a signed agreement between Coastal Corporation and the Manatee County Port Authority. The Gulfstream pipeline gained the permanent right of way easement to cross through Port Manatee.

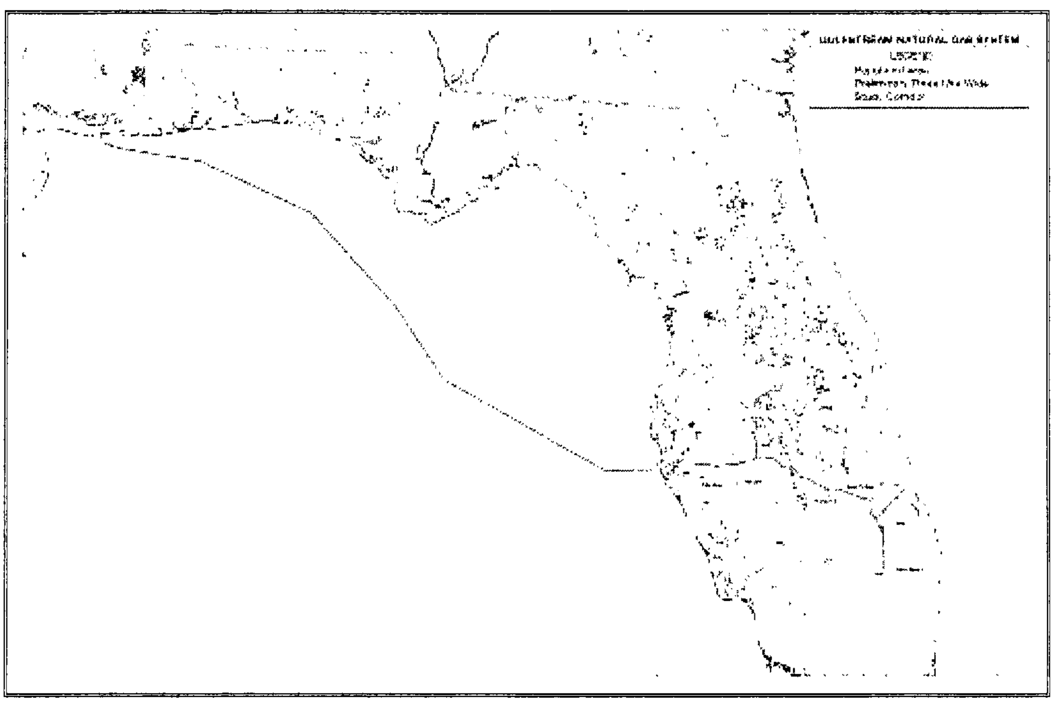


Figure 5-1
Gulfstream Natural Gas Pipeline

5.3.2.1.3 Natural gas price forecast. The price forecast for natural gas developed by Lakeland is based on historical experience and future expectations for the market. The forecast takes into account the fixed long term contracts that Lakeland has in place for a portion of its gas along with new or spot purchases of gas to meet its needs. The cost of reservation is not included in the price of natural gas in Table 5-2. All other fuel types in the table are delivered prices. As previously stated, natural gas prices have been extremely volatile in recent years. Lakeland saw average monthly purchase prices swing from $2.62/mmbtu to as high as $4.14/mmbtu with an average 2002 calendar year price of $3.29/mmbtu.

Lakeland currently has a ten-year contract with El Paso for the supply of natural gas for a portion of Lakeland's base natural gas requirements. Lakeland purchases "seasonal" gas to supplement the base requirement and purchase "as needed" daily gas to round out its supply needs.

Natural gas transportation from FGT is currently supplied under two tariffs, FTS-1 and FTS-2. Rates in FTS-1 are based on FGT's Phase II expansion and rates in FTS-2 are based on the Phase III expansion. The Phase III expansion was extensive and rates for FTS-2 transportation are significantly higher than FTS-1. Rates for the Phase IV, Phase V, and any other future expansions will be set by the Federal Energy Regulatory Commission (FERC) rate cases at the completion of the projects. Costs for future expansions are anticipated to be rolled in with Phase III costs and the resultant rates are expected to be similar to the existing Phase III rates. Current FTS-1 and FTS-2 transportation rates along with FGT's interruptible transportation rate ITS-1 are shown in Table 5-3.

For purposes of projecting delivered gas prices, transportation charges of $0.62/mmbtu were applied for existing units as this is the average cost for Lakeland to obtain natural gas transportation for those units. This average rate is realized through a current mix of FTS-1, FTS-2 and Gulfstream FTS transportation, including consideration of Lakeland's ability to relinquish FTS-2 transportation and acquire other firm and interruptible gas transportation on the market.

Table 5-3
Natural Gas Tariff Transportation Rates

Rates And Surcharges	Rate Schedules			
	FGT FTS-1 w/surcharges (cents/DTH)*	FGT FTS-2 w/surcharges (cents/DTH)*	FGT ITS-1	Gulfstream FTS-1
Reservation	37.53	77.85	33.84	80.65
Usage	4.34	2.63	0.00	0.02
Total	41.87	80.48	33.84	80.67
Fuel Charge	2.75%	2.75%	2.75%	1.27%

* A DTH is equivalent to 1 mmbtu or 1 mcf

5.3.2.2 Coal. Coal has been used as an energy source for hundreds of years and provided the energy which fueled the Industrial Revolution of the 19th Century and it was a primary fuel of the electric era in the 20th Century. As of 1998, some 37 percent of the electricity generated worldwide and over half (57 percent) of the electricity generated in the United States was produced from coal.

5.3.2.2.1 Coal supply and availability. Lakeland's current coal purchase contracts are approximately 60 percent long-term and 40 percent spot purchases. Spot purchases can extend from several months to two years in length. Lakeland maintains a 30 – 35 day coal supply reserve (90,000 – 110,000 tons) at the McIntosh site.

5.3.2.2.2 Coal transportation. McIntosh Unit 3 is Lakeland's only unit burning coal. Lakeland projects McIntosh Unit 3 will burn approximately 850,000 tons of coal per year. The coal sources are located in eastern Kentucky, which affords Lakeland a single rail line haul via CSX Transportation.

5.3.2.2.3 Coal price forecast

Currently, Lakeland's long-term purchase of coal for McIntosh 3 is under two contracts which expire in December of 2006. Lakeland is expecting a steady increase in coal costs as new contracts are crafted for 2007 and beyond. The AEO 2003 forecast exhibits similar trends for coal. Lakeland's forecast for coal is slightly higher due to the additional transportation costs to get the coal to Florida.

5.3.2.3 Petroleum Coke price forecast. Lakeland utilizes petroleum coke as a supplemental fuel in its McIntosh Unit 3 as a means of reducing overall costs to its customers. Petroleum coke is a by-product of the oil refining process. This by-product is a solid residue produced from the cracking of heavy residual oil to produce lighter hydrocarbons. Petroleum coke is high in fixed carbon with heating values in the range of 14,200 to 14,600 Btu/lb. Other product characteristics are low volatile content, low ash content, high sulfur content and varying degrees of hardness. The physical and chemical specifications of petroleum coke are a direct function of the oils being processed by the refinery. The amount of petroleum coke produced is increasing due to the increase in refining capacity for heavy crude oils and the declining demand for residual fuel oil. The coking process allows for a higher yield of light oil products, specifically gasoline.

McIntosh Unit 3 burns approximately 100,000 tons of petroleum coke annually, a very small amount compared to overall market availability. The petroleum coke burned in McIntosh Unit 3 is a higher grade, lower sulfur, more expensive petroleum coke than what would be burned in a unit specifically designed to burn petroleum coke. Therefore, the petroleum coke price forecast resembles the expected price for the higher grade, low sulfur petroleum coke that can be supplemented in existing coal fired units. Petroleum coke prices for new solid fuel units designed to burn this fuel would be at a discount to the forecast presented here.

5.3.2.3.2 Petroleum coke transportation. In general, petroleum coke is amenable to transport by truck, rail, barges, ocean going ships, or a combination of these modes of transportation. Currently, petroleum coke for McIntosh 3 is transported to the McIntosh site by truck.

5.3.2.3.3 Petroleum coke price forecast. The petroleum coke price presented in this forecast is based on Lakeland's historical experience, Lakeland's current contract for the fuel and the expected supply and demand conditions in the petroleum coke market in the future.

5.3.2.4 Fuel Oil

5.3.2.4.1 Fuel oil supply and availability. The City of Lakeland currently obtains all of its fuel oil through spot market purchases and has no long-term contracts. This strategy provides the lowest cost for fuel oil consistent with usage, current price stabilization, and on-site storage. Lakeland's Fuels Section continually monitors the cost-effectiveness of spot market purchasing.

5.3.2.4.2 Fuel oil transportation. Although the City of Lakeland is not a large consumer of fuel oils, a small amount is consumed during operations for backup fuel and diesel unit operations. Fuel oil is transported to Lakeland by truck.

5.3.2.4.3 Fuel oil price forecast. Lakeland's price forecast for residual fuels is reasonably consistent with the AEO 2003 forecast. Both forecasts expect residual and distillate oil prices to remain relatively flat over the forecast period.

5.3.3 Fuel Forecast Sensitivities

Lakeland did not forecast fuel price sensitivities in this years planning cycle. As mentioned earlier in this report. Based on current installed capacity versus forecasted demand, Lakeland shows no need for additional resources in the next ten years thus making fuel forecast sensitivities a moot point for this planning cycle.

6.0 Forecast of Facilities Requirements

6.1 Need for Capacity

This section addresses the need for additional electric capacity to serve Lakeland's electric customers in the future. The need for capacity is based on Lakeland's load forecast, reserve margin requirements, power sales contracts, existing generating and unit capability and scheduled retirements of generating units.

6.1.1 Load Forecast

The load forecast described in Section 3.0 is used to determine the need for capacity. A summary of the load forecast for winter and summer peak demand for base, high, and low projections are provided in Tables 3-4 & 3-5. The peak demands reflect reductions for Lakeland's conservation and demand-side management programs and interruptible loads.

6.1.2 Reserve Requirements

Prudent utility planning requires that utilities secure firm generating resources over and above the expected peak system demand to account for unanticipated demand levels and supply constraints. Several methods of estimating the appropriate level of reserve capacity are used. The most commonly used approach is the reserve margin method, which is calculated as follows:

$$\frac{\text{system net capacity - system net peak demand}}{\text{system net peak demand}}$$

Lakeland began using a probabilistic approach to determine its reserve margin needs in late 1999. This was done by applying certainty factors to capacity availability at time of peak, firm load forecasts, load management and interruptible load availability at time of peak. Ten years of historical data and performance were analyzed and revealed that capacity availability had a significant impact on reserve margin. Components on the load side, forecast uncertainty and availability of load management and interruptible load had a very small impact on reserves, indicating that Lakeland's forecasting process is reasonably adequate.

Generation availability is reviewed annually and is found to be within industry standards for the types of units that Lakeland has in its fleet, indicating adequate and prudent maintenance is taking place. This analysis, reviewed at the end of 2002 indicated an increase in unit availability which contributes to the need for a slightly smaller reserve margin level. The addition of Lakeland's first major venture into distributed generation via the Winston Peaking Station has also contributed to a smaller reserve margin need. As a result of these changes, Lakeland has lowered its winter reserve margin target from 22% to 20%. As Lakeland's needs and fleet of resources continue to change through time, reserve margin levels will be reviewed and adjusted as appropriate.

6.1.3 Additional Capacity Requirements

By comparing the load forecast plus reserves with firm supply, the additional capacity required on a system over time can be identified. Lakeland's requirements for additional capacity are presented in Tables 6-1 through 6-4 which show the projected reliability levels for winter and summer base cases, and winter high and low load demands, respectively. Lakeland's capacity requirements are driven by the winter peak demand forecasts.

The last column of Table 6-1 indicates that using the base winter forecast, Lakeland will not need any additional capacity in the current ten year planning cycle. In late 2001, Lakeland revisited its long range generation plans by commissioning a complete review of its existing portfolio of resources and all plans on hand at the time. Throughout 2002, plans were continually evaluated, but no clear decisions were arrived at, in part, due to the current economic conditions of the electric utility industry and the uncertainty that those conditions present. When that is combined with the ample reserve margin on hand from recent additions, Lakeland deems that its most prudent decision for the moment is to continue to put all expansion and retirement plans into abeyance until market conditions encourage a change. As noted previously in this document, Larsen Unit No. 6 has been placed on extended cold stand-by and its capacity removed from Lakeland's resource portfolio. The unit is not being slated for dismantlement as Lakeland wishes to preserve the option of re-powering that unit in the future if it makes economical sense to do so. All capacity currently counted for in Lakeland's forecasted load and reserve obligations is capable of running for the next ten years with proper maintenance thus making the decision to forgo any retirements achievable.

Table 6-2 also indicates that no additional capacity is needed during the summer peak seasons for the current ten year planning cycle. Tables 6-3 and 6-4 show the high and low winter load forecasts for Lakeland. The high winter forecast indicates a single year of potential need for capacity for the winter of 2009/10 while the low forecast projects no need for capacity until well beyond the current ten year planning cycle.

Table 6-1
Projected Reliability Levels - Winter / Base Case

Year	Net Generating Capacity (MW)	Net System Purchases (MW)	Net System Sales (MW)	Net System Capacity (MW)	System Peak Demand		Reserve Margin		Excess/ (Deficit) to Maintain 20% Reserve Margin	
					Before Interruptible and Load Management (MW)	After Interruptible and Load Management (MW)	Before Interruptible and Load Management (%)	After Interruptible and Load Management (%)	Before Interruptible and Load Management (MW)	After Interruptible and Load Management (MW)
2002/2003	1039	0	100	939	694*	632**	35.3	48.6	106	181
2003/2004	1039	0	100	939	708	646	32.6	45.4	89	164
2004/2005	1039	0	100	939	725	663	29.5	41.6	69	143
2005/2006	1039	0	100	939	742	680	26.5	38.0	49	123
2006/2007	1039	0	100	939	758	696	23.9	34.9	29	104
2007/2008	1039	0	100	939	775	713	21.2	31.7	9	83
2008/2009	1039	0	100	939	792	730	18.6	28.6	(11)	63
2009/2010	1039	0	100	939	809	747	16.1	25.7	(32)	43
2010/2011	1039	0	0	1039	826	763	25.8	36.2	48	123
2011/2012	1039	0	0	1039	843	780	23.3	33.2	27	103
2012/2013	1039	0	0	1039	860	797	20.8	30.4	7	83

* Actual Jan 2003 Peak, No Load Management and/or Interruptible used at time of Peak

** Adjusted Jan 2003 Peak if Load Management and Interruptible had been used at time of Peak

Table 6-2
Projected Reliability Levels - Summer / Base Case

					System Peak Demand		Reserve Margin		Excess/ (Deficit) to Maintain 20% Reserve Margin	
Year	Net Generating Capacity (MW)	Net System Purchases (MW)	Net System Sales (MW)	Net System Capacity (MW)	Before Interruptible and Load Management (MW)	After Interruptible and Load Management (MW)	Before Interruptible and Load Management (%)	After Interruptible and Load Management (%)	Before Interruptible and Load Management (MW)	After Interruptible and Load Management (MW)
2003	963	0	100	863	601	568	43.6	51.9	142	181
2004	963	0	100	863	615	582	40.3	48.3	125	165
2005	963	0	100	863	631	598	36.8	44.3	106	145
2006	963	0	100	863	645	612	33.8	41.0	89	129
2007	963	0	100	863	660	626	30.8	37.9	71	112
2008	963	0	100	863	674	640	28.0	34.8	54	95
2009	963	0	100	863	688	654	25.4	31.9	37	78
2010	963	0	100	863	702	668	22.9	29.2	21	61
2011	963	0	0	963	716	681	34.5	41.4	104	146
2012	963	0	0	963	729	694	32.1	38.8	88	130

Table 6-3
Projected Reliability Levels - Winter / High Case

Year	Net Generating Capacity (MW)	Net System Purchases (MW)	Net System Sales (MW)	Net System Capacity (MW)	System Peak Demand		Reserve Margin		Excess/ (Deficit) to Maintain 20% Reserve Margin	
					Before Interruptible and Load Management (MW)	After Interruptible and Load Management (MW)	Before Interruptible and Load Management (%)	After Interruptible and Load Management (%)	Before Interruptible and Load Management (MW)	After Interruptible and Load Management (MW)
2002/2003	1039	0	100	939	694*	632**	35.3	48.6	106	181
2003/2004	1039	0	100	939	754	692	24.5	35.7	34	109
2004/2005	1039	0	100	939	771	709	21.8	32.4	14	88
2005/2006	1039	0	100	939	788	726	19.2	29.3	7	68
2006/2007	1039	0	100	939	804	742	16.8	26.5	(26)	49
2007/2008	1039	0	100	939	821	759	14.4	23.7	(46)	28
2008/2009	1039	0	100	939	838	776	12.1	21.0	(67)	8
2009/2010	1039	0	100	939	858	796	9.4	18.0	(91)	(16)
2010/2011	1039	0	0	1039	872	809	19.2	28.4	(7)	68
2011/2012	1039	0	0	1039	889	826	16.9	25.8	(28)	48
2012/2013	1039	0	0	1039	910	847	14.2	22.7	(53)	23

* Actual Jan 2003 Peak, No Load Management and/or Interruptible used at time of Peak

** Adjusted Jan 2003 Peak if Load Management and Interruptible had been used at time of Peak

Table 6-4
Projected Reliability Levels - Winter / Low Case

Year	Net Generating Capacity (MW)	Net System Purchases (MW)	Net System Sales (MW)	Net System Capacity (MW)	System Peak Demand		Reserve Margin		Excess/ (Deficit) to Maintain 20% Reserve Margin	
					Before Interruptible and Load Management (MW)	After Interruptible and Load Management (MW)	Before Interruptible and Load Management (%)	After Interruptible and Load Management (%)	Before Interruptible and Load Management (MW)	After Interruptible and Load Management (MW)
2002/2003	1039	0	100	939	694*	632**	35.3	48.6	106	181
2003/2004	1039	0	100	939	684	622	37.3	51.0	118	199
2004/2005	1039	0	100	939	701	639	34.0	46.9	98	172
2005/2006	1039	0	100	939	718	656	30.8	43.1	77	152
2006/2007	1039	0	100	939	734	672	27.9	39.7	58	133
2007/2008	1039	0	100	939	751	689	25.0	36.3	38	112
2008/2009	1039	0	100	939	768	706	22.3	33.0	17	92
2009/2010	1039	0	100	939	785	723	19.6	29.9	3	71
2010/2011	1039	0	0	1039	802	739	29.6	40.6	77	152
2011/2012	1039	0	0	1039	819	756	26.9	37.4	56	132
2012/2013	1039	0	0	1039	836	773	24.3	34.4	36	111

* Actual Jan 2003 Peak, No Load Management and/or Interruptible used at time of Peak

** Adjusted Jan 2003 Peak if Load Management and Interruptible had been used at time of Peak

7.0 Generation Expansion Analysis Results and Conclusions

This section discusses the status of Lakeland's Generation Expansion plans as of December 31, 2002. At the time of this filing, Lakeland is continuing its evaluation of resource options along with existing resources and what the proper mix of existing and/or new resources should be, if any. Options being considered have included but were not limited to remaining in or leaving the generation business, diversification of existing resource portfolio and proper diversification of future resource portfolio's. As no final decision has been made at the time of this writing, all resources and plans have been frozen in place meaning no planned retirements of existing facilities and no planned additions are being proposed for the current ten year planning cycle. The demand and capacity analysis presented in Section 6 indicates that this position is feasible and achievable for the current planning cycle.

7.1 Supply-Side Economic Analysis

The supply-side evaluations of generating unit alternatives are performed in house by Lakeland staff utilizing Lakeland's production costing program, POWRSYM3, along with Lakeland's outside consultants using market analysis tools covering the Southeast region of the U.S.

7.2 Demand-Side Economic Analysis

Lakeland continues to actively monitor Demand-Side Options to find the most cost-effective way to meet our customers' needs. To date, no additional cost-effective DSM measures have been identified. Lakeland continues to include the effects of existing DSM programs in the overall analysis.

7.3 Sensitivity Analysis

In Lakeland's normal course of analysis a preferred option would be selected. Lakeland would then perform several sensitivity analyses to measure the impact of important assumptions on the option(s) selected. The sensitivity analyses may include but not be limited to the following:

- High load and energy growth.
- Low load and energy growth.
- High fuel price escalation.
- Low fuel price escalation.

- Constant differential between oil/gas and coal prices over the planning horizon.

For each sensitivity analysis, a best plan over the planning horizon would be identified. The sensitivity analyses would be performed over the same planning period used throughout the economic evaluations, with a projection of annual costs and cumulative present worth costs.

7.4 Transmission

All options selected would be analyzed for impacts to the transmission system and the costs of any upgrades would be factored into the final analysis and decision.

At present, Lakeland does not anticipate the need for any major transmission upgrades to accommodate additional generation resources.

8.0 Environmental and Land Use Information

Lakeland's 2003 Ten-Year Site Plan has no capacity additions in it and thus no additional environmental or land use information is required at this time. All existing units are fully permitted and meet all permitted requirements. Any future additions would comply with all applicable environmental and land use requirements.

9.0 Ten-Year Site Plan Schedules

The following section presents the schedules required by the Ten-Year Site Plan rules for the Florida Public Service Commission. Lakeland has attempted to provide complete information for the FPSC whenever possible.

9.1 Abbreviations and Descriptions

The following abbreviations are used throughout the Ten-Year Site Plan Schedules.

Abbreviation	Description
Unit Type	
CA	Combined Cycle Steam Part
GT	Combustion Gas Turbine
ST	Steam Turbine
CT	Combined Cycle Combustion Turbine
IC	Internal Combustion Engine
Fuel Type	
NG	Natural Gas
DFO	Distillate Fuel Oil
RFO	Residual Fuel Oil
BIT	Bituminous Coal
WH	Waste Heat
Fuel Transportation Method	
PL	Pipeline
TK	Truck
RR	Railroad
Unit Status Code	
RE	Retired
SB	Cold Standby (Reserve)
TS	Construction Complete, not yet in commercial operation
U	Under Construction
P	Planned for installation

Table 9-1a
Schedule 1.0: Existing Generating Facilities as of December 31, 2002

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
				Fuel		Fuel Transport						Net Capability[1]	
Plant Name	Unit No.	Location	Unit Type	Pri	Alt	Pri	Alt	Alt Fuel Days Use	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Summer MW	Winter MW
Charles Larsen Memorial	2	16-17/28S/24E	GT	NG	DFO	PL	TK	28	11/62	Unknown	11,500	10	14
	3		GT	NG	DFO	PL	TK	28	12/62	Unknown	11,500	9	13
	6		ST	NG	RFO	PL	TK		12/59	Extended Cold Standby 8/01	25,000	0	0
	7		ST	NG	RFO	PL	TK	7	02/66	Unknown	50,000	50	50
	8		CA	WH	---				04/56	Unknown	25,000	29	31
	8		CT	NG	DFO	PL	TK	5	07/92	Unknown	101,520	73	93
Plant Total												171	201

[1]Net Normal.

Source: Lakeland Power Production Unit Rating Group

Table 9-1b
Schedule 1.0: Existing Generating Facilities as of December 31, 2002

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
				Fuel		Fuel Transport						Net Capability[1]	
Plant Name	Unit No.	Location	Unit Type	Pri	Alt	Pri	Alt	Alt Fuel Days Use	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Summer MW	Winter MW
Winston Peaking Station	1-20	21/28S/23E	IC	NG	DFO	PL	TK	3	12/01	Unknown	2,500 each	50	50
Plant Total												50	50
C.D. McIntosh, Jr.	D1	4-5/28S/24E	IC	DFO	---	TK	---		01/70	Unknown	2,500	2.5	2.5
	D2		IC	DFO	---	TK	---		01/70	Unknown	2,500	2.5	2.5
	GT1		GT	NG	DFO	PL	TK	2	05/73	Unknown	26,640	17	20
	1		ST	NG	RFO	PL	TK	29	02/71	Unknown	103,000	87	87
	2		ST	NG	RFO	PL	TK	25	06/76	Unknown	126,000	106	106
	3[2]		ST	BIT	---	RR	---		09/82	Unknown	363,870	205	205
	5		CT	NG	DFO	PL	TK	3	05/01	Unknown	292,950	210	243
	5		CA	WH	---				05/02	Unknown	135,000	112	122
Plant Total												742	788
System Total												963	1039

[1]Net Normal.
[2]Lakeland's 60 percent portion of joint ownership with Orlando Utilities Commission.

Source: Lakeland Power Production Unit Rating Group

Table 9-2
Schedule 2.1: History and Forecast of Energy Consumption and Number of Customers by Customer Class

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Rural & Residential					Commercial		
Fiscal Year	Population	Members per Household	GWh	Average No. of Customers	Average kWh Consumption per Customer	GWh	Average No. of Customers	Average kWh Consumption per Customer
1993	201,649	2.54	1,012	79,493	12,731	536	9,759	54,924
1994	206,040	2.55	1,085	80,909	13,410	563	9,887	56,943
1995	210,095	2.55	1,134	82,445	13,755	594	10,030	59,222
1996	213,347	2.55	1,213	83,656	14,500	588	9,747	60,326
1997	216,782	2.55	1,231	84,941	14,492	607	9,835	61,718
1998	219,021	2.55	1,249	85,840	14,550	625	10,033	62,294
1999	221,123	2.54	1,239	87,222	14,205	642	10,338	62,053
2000	224,963	2.54	1,263	88,740	14,233	659	10,550	62,684
2001	224,386	2.53	1,328	88,663	14,978	665	10,529	63,159
2002	229,134	2.52	1,328	90,915	14,607	686	10,725	63,963
Forecast								
2003	232,800	2.52	1,360	92,323	14,731	700	10,772	64,983
2004	236,447	2.52	1,393	93,731	14,862	714	10,946	65,229
2005	240,271	2.52	1,428	95,190	15,002	729	11,128	65,510
2006	244,015	2.53	1,460	96,630	15,109	743	11,313	65,677
2007	247,576	2.53	1,493	98,024	15,231	757	11,490	65,883
2008	250,998	2.53	1,528	99,382	15,375	771	11,673	66,050
2009	254,330	2.53	1,561	100,720	15,498	785	11,855	66,217
2010	257,620	2.52	1,594	102,050	15,620	799	12,034	66,395
2011	260,868	2.52	1,628	103,371	15,749	813	12,213	66,568
2012	264,076	2.52	1,661	104,685	15,867	827	12,387	66,764

Table 9-3
Schedule 2.2: History and Forecast of Energy Consumption and Number of Customers by Customer Class

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Industrial						
Fiscal Year	GWh	Average No. of Customers	Average kWh Consumption per Customer	Railroads and Railways	Street & Highway Lighting GWh	Other Sales to Public Authorities GWh	Total Sales to Ultimate Consumers GWh
1993	377	50	7,540,000	0	13	67	2,005
1994	387	51	7,588,235	0	14	69	2,118
1995	429	51	8,411,765	0	15	73	2,245
1996	428	56	7,508,772	0	15	77	2,321
1997	459	62	7,403,226	0	16	78	2,391
1998	462	62	7,451,613	0	16	80	2,432
1999	485	70	6,928,571	0	17	79	2,462
2000	507	83	6,108,434	0	18	84	2,531
2001	488	80	6,100,000	0	19	82	2,582
2002	513	89	5,764,045	0	20	80	2,627
Forecast							
2003	539	90	5,988,889	0	20	82	2,701
2004	557	91	6,120,879	0	21	85	2,770
2005	574	93	6,172,043	0	22	87	2,840
2006	591	94	6,287,234	0	23	89	2,906
2007	608	95	6,400,000	0	23	91	2,972
2008	626	97	6,453,608	0	24	93	3,042
2009	644	98	6,571,429	0	25	95	3,110
2010	662	100	6,620,000	0	26	97	3,178
2011	679	101	6,722,772	0	27	99	3,246
2012	697	102	6,833,333	0	27	102	3,314

Table 9-4
Schedule 2.3: History and Forecast of Energy Consumption and Number of Customers by Customer Class

(1)	(2)	(3)	(4)	(5)	(6)
Fiscal Year	Sales for Resale GWh	Utility Use & Losses GWh	Net Energy for Load GWh	Other Customers (Average No.)	Total No. of Customers
1993	0	135	2,140	0	89,302
1994	0	161	2,279	0	90,847
1995	0	145	2,390	0	92,526
1996	0	127	2,448	0	93,459
1997	0	52	2,443	0	94,838
1998	0	117	2,549	0	95,935
1999	0	123	2,585	0	97,630
2000	0	138	2,669	0	99,373
2001	0	112	2,694	0	99,272
2002	0	150	2,777	0	101,729
Forecast					
2003	0	144	2,845	0	103,185
2004	0	143	2,913	0	104,768
2005	0	141	2,981	0	106,411
2006	0	144	3,050	0	108,037
2007	0	147	3,119	0	109,609
2008	0	147	3,189	0	111,152
2009	0	149	3,259	0	112,673
2010	0	152	3,330	0	114,184
2011	0	155	3,401	0	115,685
2012	0	158	3,472	0	117,174

Table 9-5
Schedule 3.1: History and Forecast of Summer Peak Demand Base Case (MW)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Residential		Commercial/Industrial		
Year	Total	Wholesale	Retail	Interrupt.	Load Management	Conservation	Load Management	Conservation	Net Firm Demand
1993	459	0	459	0	0	0	0	0	459
1994	455	0	455	0	0	0	0	0	455
1995	481	0	481	0	0	0	0	0	481
1996	490	0	490	0	0	0	0	0	482
1997	509	0	509	0	0	0	0	0	509
1998	535	0	535	0	0	0	0	0	535
1999	557	0	557	0	22	0	0	0	535
2000	573	0	573	0	21	0	0	0	552
2001	546	0	546	0	0	0	0	0	546
2002	576	0	576	0	0	0	0	0	576
Forecast									
2003	601	0	601	12	21	0	0	0	568
2004	615	0	615	12	21	0	0	0	582
2005	631	0	631	12	21	0	0	0	598
2006	645	0	645	12	21	0	0	0	612
2007	660	0	660	12	22	0	0	0	626
2008	674	0	674	12	22	0	0	0	640
2009	688	0	688	12	22	0	0	0	654
2010	702	0	702	12	22	0	0	0	668
2011	716	0	716	13	22	0	0	0	681
2012	729	0	729	13	22	0	0	0	694

Table 9-6
Schedule 3.2: History and Forecast of Winter Peak Demand Base Case (MW)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Residential		Comm./Ind.		
Year	Total	Wholesale	Retail	Interrupt.	Load Management	Conservation	Load Management	Conservation	Net Firm Demand
1993/94	485	0	485	0	0	0	0	0	445
1994/95	578	0	578	0	40	0	0	0	538
1995/96	655	0	655	0	45	0	0	0	610
1996/97	552	0	552	0	0	0	0	0	552
1997/98	476	0	476	0	0	0	0	0	476
1998/99	611	0	611	0	0	0	0	0	611
1999/2000	661	0	661	0	51	0	0	0	610
2000/01	706	0	706	0	51	0	0	0	655
2001/02	659	0	659	0	0	0	0	0	659
2002/03	694	0	694	0	0	0	0	0	694
Forecast									
2003/04	708	0	708	11	51	0	0	0	646
2004/05	725	0	725	11	51	0	0	0	663
2005/06	742	0	742	11	51	0	0	0	680
2006/07	758	0	758	11	51	0	0	0	696
2007/08	775	0	775	11	51	0	0	0	713
2008/09	792	0	792	11	51	0	0	0	730
2009/10	809	0	809	11	51	0	0	0	747
2010/11	826	0	826	11	52	0	0	0	763
2011/12	843	0	843	11	52	0	0	0	780
2012/13	860	0	860	11	52	0	0	0	797

Table 9-7
Schedule 3.3: History and Forecast of Annual Net Energy for Load – GWh
Base Case

(1)	(2)	(3)	(5)	(6)	(7)	(8)	(9)	(10)
Year	Total	Residential Conservation	Comm./Ind. Conservation	Retail	Wholesale	Utility Use & Losses	Net Energy for Load	Load Factor %
1993	2,005	0	0	2,005	0	135	2,140	53.5
1994	2,118	0	0	2,118	0	161	2,279	58.5
1995	2,245	0	0	2,245	0	145	2,390	50.7
1996	2,321	0	0	2,321	0	127	2,448	45.4
1997	2,391	0	0	2,391	0	52	2,443	50.5
1998	2,432	0	0	2,432	0	117	2,549	61.1
1999	2,462	0	0	2,462	0	123	2,585	48.3
2000	2,531	0	0	2,531	0	138	2,669	49.8
2001	2,582	0	0	2,582	0	112	2,694	47.0
2002	2,627	0	0	2,627	0	150	2,777	48.1
Forecast								
2003	2,701	0	0	2,701	0	144	2,845	51.6
2004	2,770	0	0	2,770	0	143	2,913	51.4
2005	2,840	0	0	2,840	0	141	2,981	51.2
2006	2,906	0	0	2,906	0	144	3,050	51.2
2007	2,972	0	0	2,972	0	147	3,119	51.2
2008	3,042	0	0	3,042	0	147	3,189	50.9
2009	3,110	0	0	3,110	0	149	3,259	50.9
2010	3,178	0	0	3,178	0	152	3,330	50.9
2011	3,246	0	0	3,246	0	155	3,401	50.9
2012	3,314	0	0	3,314	0	158	3,472	50.7

Table 9-8
Schedule 4: Previous Year and Two Year Forecast of Retail Peak Demand and Net Energy for Load by Month

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Month	Actual		2003 Forecast		2004 Forecast	
	Peak Demand[1] MW	NEL GWh	Peak Demand[1] MW	NEL GWh	Peak Demand[1] MW	NEL GWh
January	659	227	629	239	646	244
February	582	182	592	206	608	211
March	536	213	515	213	529	218
April	515	228	450	207	461	212
May	524	259	512	244	524	250
June	551	248	555	265	568	271
July	576	271	562	279	576	286
August	557	271	568	285	582	292
September	526	268	553	265	567	272
October	509	254	488	227	501	232
November	448	190	465	203	577	208
December	525	231	569	228	584	233

[1]After Load Management, Conservation and Interruptible Load exercised as needed.

Table 9-9
Schedule 5: Fuel Requirements

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
				Calendar Year										
	Fuel Requirements	Type	Units	2002 - Actual	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
(1)	Nuclear		Trillion Btu											
(2)	Coal[1]		1000 Ton	478	564	435	554	565	571	560	564	545	547	552
(3)	Residual	Steam	1000 BBL	98	18	3	0	0	9	84	112	74	85	2
(4)		CC	1000 BBL	0	0	0	0	0	0	0	0	0	0	0
(5)		CT	1000 BBL	0	0	0	0	0	0	0	0	0	0	0
(6)		Total	1000 BBL	98	18	3	0	0	9	84	112	74	85	2
(7)	Distillate	Steam	1000 BBL	0	0	0	0	0	0	0	0	0	0	0
(8)		CC	1000 BBL	0	0	0	0	0	0	0	0	0	0	0
(9)		CT	1000 BBL	33	29	7	1	1	2	27	37	27	30	38
(10)		Total	1000 BBL	33	29	7	1	1	2	27	37	27	30	38
(11)	Natural Gas	Steam	1000 MCF	1,717	2,127	589	208	270	323	1,902	2,179	1,874	2,054	3,027
(12)		CC	1000 MCF	2,715	15,326	17,283	16,474	16,926	17,250	17,389	17,771	16,880	17,021	17,400
(13)		CT	1000 MCF	10,967	54	6	2	2	3	68	83	65	81	114
(14)		Total	1000 MCF	15,399	17,507	17,878	16,684	17,198	17,576	19,359	20,033	18,819	19,156	20,541
(15)	Other		Trillion Btu											

[1] Includes Petroleum Coke and Refuse Derived Fuel.

Table 9-10
Schedule 6.1: Energy Sources

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
				Calendar Year										
	Energy Sources	Type	Units	2002 - Actual	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
(1)	Inter-Regional Interchange		GWh	-333	-984	-751	-833	-863	-873	-986	-1040	-707	-688	-745
(2)	Nuclear		GWh	0	0	0	0	0	0	0	0	0	0	0
(3)	Coal[1]		GWh	1,361	1,431	1,101	1,405	1,434	1,452	1,420	1,433	1,378	1,384	1,399
(4)	Residual	Steam	GWh	65	369	125	11	15	18	111	149	92	103	172
(5)		CC	GWh	0	0	0	0	0	0	0	0	0	0	0
(6)		CT	GWh	0	0	0	0	0	0	0	0	0	0	0
(7)		Total	GWh	65	369	125	11	15	18	111	149	92	103	172
(8)	Distillate	Steam	GWh	0	0	0	0	0	0	0	0	0	0	0
(9)		CC	GWh	5	0	0	0	0	0	0	0	0	0	0
(10)		CT	GWh	19	17	0	0	0	0	1	1	1	1	1
(11)		Total	GWh	24	17	0	0	0	0	1	1	1	1	1
(12)	Natural Gas	Steam	GWh	372	224	61	21	27	38	241	286	232	256	305
(13)		CC	GWh	267	1,784	2,373	2,376	2,436	2,483	2,380	2,401	2,312	2,320	2,308
(14)		CT	GWh	1,021	4	4	1	1	1	22	29	22	25	32
(15)		Total	GWh	1,660	2,012	2,438	2,398	2,464	2,522	2,643	2,716	2,566	2,601	2,645
(16)	NUG			0	0	0	0	0	0	0	0	0	0	0
(17)	Hydro			0	0	0	0	0	0	0	0	0	0	0
(18)	Other (Specify)													
(19)	Net Energy for Load		GWh	2,777	2,845	2,913	2,981	3,050	3,119	3,189	3,259	3,330	3,401	3,472

[1] Includes Petroleum Coke and Refuse Derived Fuel.

Table 9-11
Schedule 6.2: Energy Sources

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
				Calendar Year										
	Energy Source	Type	Units	2002 - Actual	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
(1)	Inter-Regional Interchange		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(2)	Nuclear		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(3)	Coal[1]	Total	%	49.01	50.30	37.80	47.13	47.02	46.55	44.53	43.97	41.38	40.69	40.29
(4)	Residual	Steam	%	2.34	12.97	4.29	0.37	0.49	0.58	3.48	4.57	2.76	3.03	4.95
(5)		CC	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(6)		CT	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(7)		Total	%	2.34	12.97	4.29	0.37	0.49	0.58	3.48	4.57	2.76	3.03	4.95
(8)	Distillate	Steam	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(9)		CC	%	0.18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(10)		CT	%	0.68	0.60	0.0	0.0	0.0	0.0	0.03	0.03	0.03	0.03	0.03
(11)		Total	%	0.68	0.60	0.0	0.0	0.0	0.0	0.03	0.03	0.03	0.03	0.03
(12)	Natural Gas	Steam	%	13.40	7.87	2.09	0.70	0.89	1.22	7.56	8.78	6.97	7.53	8.78
(13)		CC	%	9.61	62.71	81.46	79.90	79.87	79.61	74.63	73.67	69.43	68.22	66.47
(14)		CT	%	36.77	0.14	0.14	0.03	0.03	0.03	0.69	0.89	0.66	0.74	0.92
(15)		Total	%	59.78	70.72	83.69	80.44	80.79	80.86	82.88	83.34	77.06	76.48	76.18
(16)	NUG			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Hydro			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Other (Specify)[2]		%	-11.99	-34.59	-25.78	-27.94	-28.30	-27.99	-30.92	-31.91	-21.23	-20.23	-21.46
(18)	Net Energy for Load		%	100	100	100	100	100	100	100	100	100	100	100

[1] Includes Petroleum Coke and Refuse Derived Fuel.
[2] Other = Firm Sale to FMPA as Net Interchange.

Table 9-12
Schedule 7.1: Forecast of Capacity, Demand, and Scheduled Maintenance at Time of Summer Peak

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Year	Total Installed Capacity	Firm Capacity Import	Firm Capacity Export	Projected Firm Net To Grid from NUG	Total Capacity Available	System Firm Peak Demand	Reserve Margin Before Maintenance[1]		Scheduled Maintenance	Reserve Margin After Maintenance[1]	
	MW	MW	MW	MW	MW	MW	MW	%	MW	MW	%
2003	963	0	100	0	863	568	295	51.9	0	295	51.9
2004	963	0	100	0	863	582	281	48.3	0	281	48.3
2005	963	0	100	0	863	598	265	44.3	0	265	44.3
2006	963	0	100	0	863	612	251	41.0	0	251	41.0
2007	963	0	100	0	863	626	237	37.9	0	237	37.9
2008	963	0	100	0	863	640	223	34.8	0	223	34.8
2009	963	0	100	0	863	654	209	31.9	0	209	31.9
2010	963	0	100	0	863	668	195	29.2	0	195	29.2
2011	963	0	0	0	963	681	282	41.4	0	282	41.4
2012	963	0	0	0	963	694	269	38.8	0	269	38.8

[1] Included exercising Load Management and Interruptible Load.

Table 9-13
Schedule 7.2: Forecast of Capacity, Demand, and Scheduled Maintenance at Time of Winter Peak

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Year	Total Installed Capacity	Firm Capacity Import	Firm Capacity Export	Projected Firm Net To Grid from NUG	Total Capacity Available	System Firm Peak Demand	Reserve Margin Before Maintenance[1]		Scheduled Maintenance	Reserve Margin After Maintenance[1]	
	MW	MW	MW	MW	MW	MW	MW	%	MW	MW	%
2003/04	1039	0	100	0	939	646	293	45.4	0	293	45.4
2004/05	1039	0	100	0	939	663	276	41.6	0	276	41.6
2005/06	1039	0	100	0	939	680	259	38.0	0	259	38.0
2006/07	1039	0	100	0	939	696	243	34.9	0	243	34.9
2007/08	1039	0	100	0	939	713	226	31.7	0	226	31.7
2008/09	1039	0	100	0	939	730	209	28.6	0	209	28.6
2009/10	1039	0	100	0	939	747	192	25.7	0	192	25.7
2010/11	1039	0	0	0	1039	763	276	36.2	0	276	36.2
2011/12	1039	0	0	0	1039	780	259	33.2	0	259	33.2
2012/13	1039	0	0	0	1039	797	242	30.4	0	242	30.4

[1] Included exercising Load Management and Interruptible Load.

Table 9-14
Schedule 8.0: Planned and Prospective Generating Facility Additions and Changes

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Plant Name	Unit No.	Location	Unit Type	Fuel		Fuel Transport		Const Start	Commercial In-Service	Expected Retirement	Gen Max Nameplate	Net Capability		Status
				Pri.	Alt.	Pri.	Alt.	Mo/Yr	Mo/Yr	Mo/Yr	kW	Sum MW	Win MW	

Table 9-15
Schedule 9.1: Status Report and Specifications of Approved Generating Facilities

(1)	Plant Name and Unit Number:	
(2)	Capacity:	
(3)	Summer MW	
(4)	Winter MW	
(5)	Technology Type:	
(6)	Anticipated Construction Timing:	
(7)	Field Construction Start-date:	
(8)	Commercial In-Service date:	
(9)	Fuel	
(10)	Primary	
(11)	Alternate	
(12)	Air Pollution Control Strategy:	
(13)	Cooling Method:	
(14)	Total Site Area:	
(15)	Construction Status:	
(16)	Certification Status:	
(17)	Status with Federal Agencies:	
(18)	Projected Unit Performance Data:	
(19)	Planned Outage Factor (POF):	
(20)	Forced Outage Factor (FOF):	
(21)	Equivalent Availability Factor (EAF):	
(22)	Resulting Capacity Factor (%):	
(23)	Average Net Operating Heat Rate (ANOHR):	
(24)	Projected Unit Financial Data:	
(25)	Book Life:	
(26)	Total Installed Cost (In-Service year $/kW):	
(27)	Direct Construction Cost ($/kW):	
(28)	AFUDC Amount ($/kW):	
(29)	Escalation ($/kW):	
(30)	Fixed O&M ($/kW-yr):	
(31)	Variable O&M ($/MWh):	

Table 9-16
Schedule 9.2: Status Report and Specifications of Proposed Generating Facilities

(1)	Plant Name and Unit Number:	None in Current Planning Cycle
(2)	Capacity:	
(3)	Summer MW	
(4)	Winter MW	
(5)	Technology Type:	
(6)	Anticipated Construction Timing:	
(7)	Field Construction Start-date:	
(8)	Commercial In-Service date:	
(9)	Fuel	
(10)	Primary	
(11)	Alternate	
(12)	Air Pollution Control Strategy:	
(13)	Cooling Method:	
(14)	Total Site Area:	
(15)	Construction Status:	
(16)	Certification Status:	
(17)	Status with Federal Agencies:	
(18)	Projected Unit Performance Data:	
(19)	Planned Outage Factor (POF):	
(20)	Forced Outage Factor (FOF):	
(21)	Equivalent Availability Factor (EAF):	
(22)	Resulting Capacity Factor (%):	
(23)	Average Net Operating Heat Rate (ANOHR):	
(24)	Projected Unit Financial Data:	
(25)	Book Life:	
(26)	Total Installed Cost (In-Service year $/kW):	
(27)	Direct Construction Cost ($/kW):	
(28)	AFUDC Amount ($/kW):	
(29)	Escalation ($/kW):	
(30)	Fixed O&M ($/kW-yr):	
(31)	Variable O&M ($/MWh):	

Table 9-17
Schedule 10: Status Report and Specifications of Proposed Directly Associated Transmission Lines

(1)	Point of Origin and Termination:	None planned.
(2)	Number of Lines:	None planned.
(3)	Right of Way:	None planned.
(4)	Line Length:	None planned.
(5)	Voltage:	None planned.
(6)	Anticipated Construction Time:	None planned.
(7)	Anticipated Capital Investment:	None planned.
(8)	Substations:	None planned.
(9)	Participation with Other Utilities:	None planned.