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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 2007 Ten Year Site Plan.

If you have any questions please do not hesitate to contact us.

Sincerely,

CMP _____
COM _____ John P. Guiseppi
CTR _____ System Planning Section

ECR _____

GCL _____

OPC _____
RCA _____ Enclosure

SCR _____

SGA _____

SEC _____

OTH Kim P. Zlys



ORIGINAL

**2007 Ten-Year Site Plan
For
Electrical Generating Facilities
And
Associated Transmission Lines**

April 2007

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1.0 Introduction

This report contains the 2007 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, 2006. 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 995 MW of net winter generating capacity and 913 MW of net summer generating capacity (as of the end of calendar year 2006).

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 1.19 % and 1.09% percent, respectively, for 2007 through 2016.

Net energy for load is projected to grow at an average annual rate of 1.61% percent for 2007 through 2016. 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:

- 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.
 - Speakers Bureau.
 - Informational Bill Inserts.
- Commercial Programs:
 - Commercial Audit Program.

Section 4.0 also contains discussions of Lakeland's solar technology programs. While these types of programs are not traditionally thought of as DSM, they have the same effect of conserving demand and energy normally generated by fossil fuels as DSM programs do by virtue of their avoidance of fossil fuels through the use of renewable energy.

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 and is discussed in further detail in Sections 6 and 7 of this report. 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 require-

ments 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 was designed to use low sulfur oil as an alternate fuel but an alternate fuel has never been used in the unit. The unit uses a minimal amount of natural gas or #2 diesel oil for flame stabilization during startups. Petroleum Coke has been used in recent years as a supplemental fuel to coal based on economics. The plant utilizes 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). Changes to the FEECA rules in 1993 exempted Lakeland from conservation requirements, but Lakeland has remained active in promoting and implementing cost-effective conservation programs. 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 retired, Larsen Unit No. 6, a 25 MW oil fired unit that was also nearing the end of its economic life. In October of 2004, Lakeland retired Larsen Unit 7, a 50MW oil fired steam unit. The capacity from

these units has been officially retired but no dismantlement of either unit has taken place. This leaves open the possibility of re-powering those units sometime in the future should the economics become advantageous to do so.

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 371 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 southwest 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 117 miles of 69 kV transmission and 28 miles of 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 three units. The total net winter (summer) capacity of the plant is 148 MW (121 MW). Units 2 and 3, General Electric combustion turbines, have a combined net winter (summer) rating of 27 MW (19 MW). The units burn natural gas as a primary fuel with diesel as a backup. 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 90 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 783 MW and 734 MW, respectively. Unit CT1 consists of a General Electric combustion turbine with a net winter (summer) output rating of 19 MW (16 MW). Unit No. 1 is a natural gas/oil fired General Electric steam turbine with a net winter and summer output of 80 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 SO₂ removal and uses treated sewage water for cooling water. 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 combined cycle unit, was initially built and operated as a simple cycle combustion turbine that was placed into commercial operation May, 2001. The unit was taken off line for conversion to combined cycle starting in mid September 2001 and was returned to commercial service in May 2002 as a combined cycle unit with a rating of 368 MW winter and 322 MW summer. The unit is equipped with a Selective Catalytic Reduction (SCR) module for NO_x control.

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 but have the capability to burn a mix of 5% #2 oil and 95% natural gas. Lakeland currently does not have natural gas service 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 was 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 lose all three 69kV circuits to the substation the WPS can be on line and serving load within 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, 2004. The power sales contract is with the Florida Municipal Power Agency (FMPPA) for capacity and energy. The contract is for 100 MW and runs through December 15, 2007.

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 due to the current economic conditions of the electric utility industry and the uncertainty that those conditions present. When that is combined with an ample reserve margin, 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. Lakeland is currently in the midst of an Integrated Resource Planning Process that is identifying optimal solutions for supply and demand side needs and resources.

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 2005/06 was 680 MW which occurred on February 14th. The actual summer peak in 2006 was 628 MW and occurred on August 2nd. Lakeland normally is winter peaking and expects to continue to do so in the future based on expected normal weather. 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) and the Florida Municipal Power Agency's (FMPPA) All-Requirements Project. The FMPP operates as an hourly energy pool with all

FMPP capacity from its 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

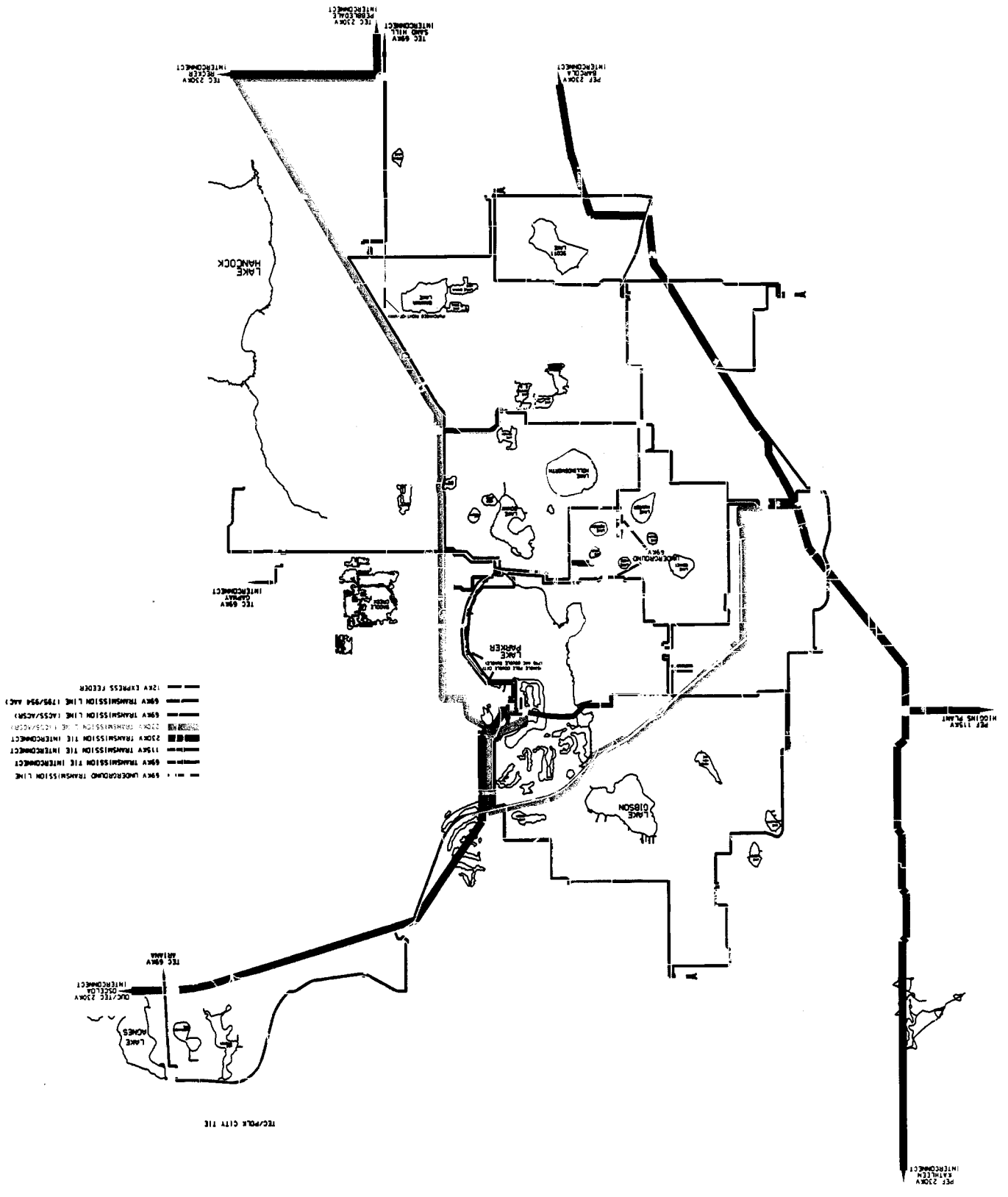
Lakeland's electric service area is shown on Figure 2-1 and is entirely located in Polk County. Lakeland serves approximately 246 square miles of which approximately 199 square miles is outside of Lakeland's city limits.

Table 2-1 Lakeland Electric Existing Generating Facilities Environmental Considerations for Steam Generating Units					
Plant Name	Unit	Particulate	Flue Gas Cleaning		Type
			SO _x	NO _x	
Charles Larsen Memorial	8ST	N/A	N/A	N/A	OTF
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	WCTM
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 Existing Generating Facilities

Plant Name	Unit No.	Location	Unit Type ³	Fuel ⁴		Fuel Transport ⁵		Alt Fuel Days Use ²	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Net Capability	
				Pri	Alt	Pri	Alt					Summer MW	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
	8		CA	WH	---	---	---	---	04/56	Unknown	25,000	29	31
	8		CT	NG	DFO	PL	TK	---	07/92	Unknown	101,520	73	90
Plant Total											121	148	
² Lakeland does not maintain records of the number of days that alternate fuel is used.													
³Unit Type				⁴Fuel Type				⁵Fuel Transportation Method					
CA	Combined Cycle Steam Part			DFO	Distillate Fuel Oil			PL	Pipeline				
CT	Combined Cycle Combustion Turbine			RFO	Residual Fuel Oil			TK	Truck				
GT	Combustion Gas Turbine			BIT	Bituminous Coal			RR	Railroad				
ST	Steam Turbine			WH	Waste Heat								
				NG	Natural Gas								

Table 2-2b Lakeland Electric Existing Generating Facilities													
Plant Name	Unit No.	Location	Unit Type ³	Fuel ⁴		Fuel Transport ⁵		Alt Fuel Days Use ²	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Net Capability	
				Pri	Alt	Pri	Alt					Summer MW	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	16	19
	1		ST	NG	RFO	PL	TK	NR	02/71	Unknown	103,000	80	80
	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	207	244
	5	CA	WH	---	---	---	NR	05/02	Unknown	135,000	115	124	
Plant Total												734	783
System Total												905	981
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				⁴ Fuel Type				⁵ Fuel Transportation Method					
CA	Combined Cycle Steam Part			DFO	Distillate Fuel Oil			PL	Pipeline				
CT	Combined Cycle Combustion Turbine			RFO	Residual Fuel Oil			TK	Truck				
GT	Combustion Gas Turbine			BIT	Bituminous Coal			RR	Railroad				
ST	Steam Turbine			WH	Waste Heat								
				NG	Natural Gas								





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3.0 Forecast of Electrical Power Demand and Energy Consumption

Lakeland routinely develops a detailed short-term (1-yr) electric load and energy forecast for budget purposes and a longer-term (20-yr) forecast for use in its planning studies. This is undertaken on a fiscal year basis with each year ending September 30th. Lakeland forecasts monthly data and then summarizes annually.

In 2006, Lakeland began using an advanced statistical program called MetrixND for analysis and forecasting time series data such as number of customers, energy and demand consumption. Short-term and long-term forecasts are generated using the same model. The model allows Lakeland to incorporate economic, demographic, price, elasticities, end-use saturations and efficiencies, and various weather variables into the forecast.

MetrixND is well known and used in the forecasting industry. Many utilities use MetrixND to produce their short and long-term forecasts. Those utilities include: Tampa Electric Company, Orlando Utilities Commission, Florida Power and Light, Ameren, Exelon, PPL, ConEdison, Vectren and Indianapolis Power and Light.

The economic and demographic variables used in this forecast were purchased from Economy.com and the Bureau of Business and Economic Research (BEER). Economy.com is a leading independent provider of economic, financial, and industry research. The Bureau of Economic and Business Research (BEER) is an applied research center in the Warrington College of Business at the University of Florida.

Many variables were evaluated for the forecast, but the variables used in the current forecast include: non-manufacturing employment, total employment, disposable personal income, household size, household growth, price, price elasticities, structural changes (saturation and efficiency trends) and weather. Binary variables were also used to explain outliers in historical billing data, trend shifts, monthly seasonality, rate migration between classes, etc...

The real price of electricity was developed using a 12-month moving average of real average revenue. The historical price data along with the Consumer Price Index (CPI) was used to develop a price forecast for use in the MetrixND structure. Price was evaluated in this forecast; however, it was not used in any of the models. The inclusion of the Price variable yielded spurious and inconsistent results. Due to time constraints these

results were not able to be fully explained and thus Price was not included at this time. Work will continue this year to better understand the impacts of the Price variable on the model results.

All of the models of the forecast are developed using 20-year normal weather. The utility owns and operates its own weather stations. The weather stations are strategically placed throughout the service territory to provide the best estimate of overall temperature for the Lakeland service area.

Heating and cooling degrees days are variables that attempt to explain a customer's behavior to either hot or cold weather. The industry standard for calculating degree days is: (Average Daily Temperature – 65 degrees = Heating or Cooling Degree Day). If the Average Daily Temperature is higher than 65 degrees than it is a Cooling Degree Day (CDD). Example: 75 - 65 = 10 CDD). If the Average Daily Temperature is lower than 65 degrees than it is a Heating Degree Day (HDD). Example: 55 – 65 = 10 HDD).

Base temperatures of HDD-Base 65°, HDD-Base 60°, CDD-Base 65°, and CDD-Base 75° were also evaluated during model development in 2006. This analysis was performed to further refine the appropriate breaks for defining HDD and CDD.

Techniques employed to generate the forecasts include econometric and multiple regression modeling, study of historical relationships and growth rates, trend analysis, and exponential smoothing. Lakeland also reviews the forecasts for reasonableness, compares projections to historical patterns, and modifies the results as needed using informed judgment.

MetrixND also incorporates a forecasting approach called SAE (Statistically Adjusted End-Use) modeling. This approach allows for appliance saturations and efficiencies among other variables to be incorporated into an interactive equation for use in a regression for sales models. Included in this equation are: end-use saturation and efficiency trends, HDD, CDD, price, elasticities, income and household size.

Regression models are estimated in MetrixND to forecast monthly sales by class. The results of all classes are summed to create a total sales forecast. A loss-factor (based on 4-years of historical monthly data) is applied to convert total sales into energy (NEL).

Regression models are estimated in MetrixND to forecast monthly peaks, which are driven by the monthly energy and actual peak-producing weather conditions. The forecast is generated under assumptions of "normal" peak-producing weather conditions.

The winter peak forecast has been developed under the assumption that its occurrence will be on a January weekday. Winter temperatures at peak ranging from 28.5° to 32.8° have typically occurred on January to March weekdays between 7 and 8 a.m. Lakeland Electric remains a winter peaking utility with projected winter demand increases averaging 10 MW per year over the forecast horizon.

Summer temperatures at peak ranging from 94.1° to 96.1° have typically occurred on August weekdays between 3 and 6 p.m. Over the 10-year forecast, an average 8 MW summer demand increase per year is expected.

Twenty four hourly regression models and one daily energy neural network model were developed in MetrixND to generate the 20-year hourly load profile. Each of these models relates weather (dry bulb temperature, dew point temperature, etc) and calendar-conditions (day-of-week, month, holidays, etc.) to load. The un-calibrated hourly load shape is then scaled to the energy forecast and the peak forecast using MetrixLT. The result is an hourly load shape that is calibrated to the system energy and system peak forecasts. Forecasts are generated with these models by using assumptions of "normal" daily weather conditions.

In August of 2005, the United States Congress passed the Energy Policy Act, which changes the dates of both the start and end of daylight savings time (DST). This went into effect in March 2007. DST will begin three weeks earlier and will end one week later than what has traditionally occurred. The calendar data used internally in the models was modified to reflect this change.

Lakeland currently does not have any demand side management and therefore does not assume any deductions in peak load for demand side management.

The forecast for Fiscal Year 2007 shows some inconsistencies with the other years of the forecast. This is due to the fact that the models were estimated with actual data through February 2007. Therefore, October 2006 – February 2007 is actual data and not predicted values based on normal weather.

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
- Winter Peak Demand

3.1 Service Territory Population Forecast

The electric service territory population estimate for the City of Lakeland for Fiscal Year 2006 is 253,405 persons (presented in Table 9-2). The 2006 estimate for population in the Lakeland/Winter-Haven MSA is 552,059 persons.

Projections for electric service territory population were developed using projected persons per household estimates (Economy.com and BEBR) and projected number of residential accounts.

Lakeland's electric service territory population is projected to increase at a 1.34% average annual growth rate (AAGR) from 2007 through 2016 (presented in Table 9-2). This represents a decrease from last year's projected 1.78% AAGR. Polk County's population (Lakeland/Winter-Haven MSA) is growing at 1.76% AAGR.

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
 - General Service
 - General Service Demand
- Commercial
 - General Service Large Demand
 - Contract
 - Interruptible
- Other
 - Private Area Lighting
 - Roadway Lighting
 - Electric
 - Water
 - Municipal

3.2.1 Residential Accounts

Regression analysis was used to develop the residential account forecast. Total residential accounts were projected as a function of the number of households. Historical data suggests that a strong correlation exists between the population growth in Polk County (Lakeland Winter-Have MSA) and the number of new residential accounts in the Lakeland service territory. The number of residential accounts for outside the city limits was developed using an exponential smoothing model.

Lakeland uses the number of households rather than total population as its demographic driver in the forecast. Population forecasts reflect a declining average household size (persons per household) during the 20-year forecast horizon. Using the number of households as the driver will more effectively capture the record growth Lakeland has experienced over the past several years.

Projected AAGR for total residential accounts is 1.77% for 2007 through 2016. (presented in Table 9-2).

3.2.2 Commercial, Industrial, and Other Accounts

The General Service (GS) projections for number of new accounts are a function of residential accounts. The general assumption is that, as more people move into the area the demand for small commercial businesses will increase.

General Service accounts are expected to increase at an AAGR of 1.52% from 2007-2016.

Total General Service Demand (GSD) accounts for inside and outside city limits were developed using regression models. The primary driver used for both models is non-manufacturing employment. The GSD total account class is expected to grow at a rate of 0.52% from 2007-2016.

Commercial (GS and GSD) accounts are projected to increase by an AAGR of 1.42% for the 10-year reporting period.

Industrial accounts represent the combination of General Service Large Demand (GSLD), Contract, and Interruptible accounts.

Lakeland currently has sixteen (11 inside and 5 outside) Interruptible accounts. Interruptible accounts are large-demand customers permitting service interruptions in exchange for reduced rates.

Lakeland has twenty-seven Contract accounts all which remain outside the city limits. Throughout the 2007 Fiscal Year their contracts will begin to expire. The base forecast was prepared as if they will remain on Contract rate. Once the on-going rate study is complete (April 1, 2007) an updated forecast can be generated for planning and budget purposes.

Projections for the industrial customers were modeled independently of MetrixND. Each customer was evaluated to account for their expected future energy and demand consumption. Special consideration was also given to new major commercial and industrial development projects.

Industrial accounts are expected to increase on average approximately 1 new account a year over the 10-year reporting period (presented in Table 9-2).

Other accounts are comprised of municipal, electric, water, private area lighting and roadway lighting. Historical data for these classes are very inconsistent and difficult to model. Therefore, the account projections for this category were based on time trends, historical growth rates and knowledge of future projects and developments. Most of these models were exogenous forecasts built outside of MetrixND and were added to the other customer forecasts to generate the Total Account Forecast.

The Other Account category is expected to increase at 0.19% AAGR over the 10-year reporting period.

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 1.59% AAGR over the 10-year reporting period. The forecast of total accounts for this year is higher than what was projected last year. This is consistent throughout the forecast horizon.

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
- Other
 - Electric
 - Water
 - Municipal
 - Unmetered
 - Private Area Lighting
 - Roadway Lighting

The energy sales models are based on an approach developed by Itron, for use in MetrixND, called SAE (Statistically Adjusted End-Use) modeling. This approach allows for appliance saturations and efficiencies among other variables to be incorporated into an interactive equation for use in a regression for sales models.

3.3.1 Residential Sales Forecast

Personal disposable income, average household size, persons per household, price, weather, employment, appliance saturations and efficiencies etc... are all variables that impact the average energy use of a residential customer. Customer growth is driven primarily by number of households and population.

For these reasons, residential sales models for inside and outside the city limits were broken down into two separate forecast models; a customer model and an average use model.

The equation used to develop residential energy sales is as follows:

$$Res\ Sales_t = Cust_t \times AvgUse_t$$

Customer projections are a function of the number of households in the Lakeland/Winter-Haven MSA area.

The average use regression model was based on the following average use equation:

$$AvgUse_t = B_0 + B_1XCool_t + B_2XHeat_t + B_3XOther_t + e_t$$

Where:

XCOOL = AC saturation (central, room AC), AC efficiency, thermal efficiency, home size, income, average household size, price and cooling degree days (CDD).

$$XCool_{y,m} = CoolIndex_y \times CoolUse_{y,m}$$

$$CoolIndex_y = StructuralIndex_y \times \sum_{Type} Weight^{Type}_y \times \frac{\left(\frac{Sat_y^{Type}}{Eff_y^{Type}} \right)}{\left(\frac{Sat_{01}^{Type}}{Eff_{01}^{Type}} \right)}$$

$$CoolUse_{y,m} = \left(\frac{CDD_{y,m}}{CDD_{01}} \right) \times \left(\frac{HHSize_{y,m}}{HHSize_{01}} \right)^{0.20} \times \left(\frac{Income_{y,m}}{Income_{01}} \right)^{0.20} \times \left(\frac{Price_{y,m}}{Price_{by}} \right)^{-0.20}$$

XHEAT = Heating saturation (resistance, heat pump), heating efficiency, thermal efficiency, home size, income, household size, price and heating degree days (HDD).

$$XHeat_{y,m} = HeatIndex_y \times HeatUse_{y,m}$$

$$HeatIndex_y = StructuralIndex_y \times \sum_{Type} Weight^{Type}_y \times \frac{\left(\frac{Sat_y^{Type}}{Eff_y^{Type}} \right)}{\left(\frac{Sat_{01}^{Type}}{Eff_{01}^{Type}} \right)}$$

$$HeatUse_{y,m} = \left(\frac{HDD_{y,m}}{HDD_{01}} \right) \times \left(\frac{HHSize_{y,m}}{HHSize_{01}} \right)^{0.20} \times \left(\frac{Income_{y,m}}{Income_{01}} \right)^{0.20} \times \left(\frac{Price_{y,m}}{Price_{01}} \right)^{-0.20}$$

XOTHER = saturation levels (water heat, appliances, lighting densities, plug loads), appliance efficiency, income, household size, price and number of billing days.

- Nonweather-sensitive end-use saturation and efficiency trends
- Number of billing days
- Hours of light
- Household size and income
- Water temperature
- Prices

The Total Residential Energy Sales Forecast is projected to increase at 1.94% AAGR over the 10-year reporting period.

3.3.2 Commercial and Industrial Sales

Commercial Energy Sales

General Service (GS) and General Service Demand (GSD) energy sales were projected for both inside and outside the city limits. A separate model was developed for each using the SAE modeling approach. Binary variables were also used to help explain fluctuations in historical billing data due to rate migrations etc...

$$Sales_m = a + b_c \times XCool_m + b_h \times XHeat_m + b_o \times XOther_m + e_m$$

Commercial energy sales (GS and GSD) are expected to increase at 1.17% AAGR over the 10-year reporting period.

Industrial Energy Sales

Total GSLD energy sales were projected on an individual basis to determine future expected demand and energy requirements. Close contact was made with the Account Managers on all accounts. Large industrial customer, demand and energy sales forecasts were modeled independently of MetrixND and later imported into the model to generate the Total Sales Forecast.

Total GSLD energy sales are projected to increase at a 1.43% AAGR over the 10-year reporting period.

3.3.3 Other Sales

Other energy sales are comprised of municipal, private area lighting, roadway lighting, water, electric and unmetered energy sales. Models are very difficult to develop for these rate classes due to the large fluctuations in the historical billing data. Therefore, the projections for this category were based on historical trends and growth rates. Special consideration was given to account for new projects and developments.

Other energy sales are expected to increase at 0.07% AAGR over the 10-year reporting period.

3.3.4 Total Sales

The Total Energy Sales Forecast for the City of Lakeland is the sum of the individual forecasts provided above. Total energy sales are projected to grow at 1.56% AAGR over the 10-year reporting period.

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.

The Net Energy for Load Forecast was developed through MetrixND. Regression models are estimated in MetrixND to forecast monthly sales by class (Res, GS, GSD, etc). The results of all classes are summed to create a total sales forecast. A loss-factor is applied to convert total sales into energy. Electric losses, energy loss as a percentage of total system energy (NEL) were estimated using four years of historical monthly data.

Net energy for load is projected to increase at 1.61% AAGR over the 10-year reporting period.

3.5 Peak Demand

Lakeland is typically, and expects to continue to be, a winter peaking utility. Lakeland Electric's winter season is defined as November through March; the Utility's summer season is defined as April through October.

Regression models are estimated in MetrixND to forecast monthly peaks, which are driven by the monthly energy and actual peak-producing weather conditions. The forecast is generated under assumptions of "normal" peak-producing weather conditions.

Historical weather and load data was adjusted for the hurricanes of 2004.

Interruptible accounts have the potential load reduction of 12 MW in winter and 14 MW in summer.

The Total Annual Peak Demand Forecast is expected to increase at approximately 10 MW's a year over the 10-year reporting period. The Summer Peak Demand Forecast is expected to increase at 8 MW's over the 10-year reporting period.

Table 3-1
Historical and Projected
Heating and Cooling Degree Days

Year	HDD	CDD
1997	314	3,611
1998	618	3,450
1999	405	3,497
2000	481	3,233
2001	780	3,238
2002	425	3,743
2003	748	3,302
2004	595	3184
2005	413	3353
2006	516	3,474
2007	620	3,068
2008	620	3,068
2009	620	3,068
2010	620	3,068
2011	620	3,068
2012	620	3,068
2013	620	3,068
2014	620	3,068
2015	620	3,068
2016	620	3,068

Table 3-2
Historical Monthly Peaks and Date

	2004		2005		2006	
Jan	578	Jan-29	648	Jan-24	522	Jan-08
Feb	523	Feb-19	498	Feb-11	680	Feb-14
Mar	412	Mar-11	476	Mar-03	434	Mar-20
Apr	460	Apr-26	456	Apr-01	541	Apr-21
May	547	May-27	523	May-24	559	May-31
Jun	572	Jun-24	578	Jun-15	594	Jun-21
Jul	580	Jul-06	616	Jul-28	613	Jul-26
Aug	563	Aug-20	639	Aug-18	628	Aug-02
Sep	554	Sep-01	568	Sep-19	580	Sep-25
Oct	530	Oct-04	542	Oct-10	537	Oct-20
Nov	475	Nov-02	427	Nov-16	474	Nov-21
Dec	573	Dec-15	520	Dec-22	434	Dec-08

3.6 Sensitivity Cases

3.6.1 High & Low Load Sensitivity

A high and low case scenario was generated for the following forecast categories: total customers, system net energy for load and system peak demands. Higher economic and customer growth is reflected in the high case scenario and slower economic and customer growth is reflected in the low case scenario. Economic and demographic variables were adjusted to reflect either outlook in the forecast.

These two additional sensitivity cases provide a bandwidth across which Lakeland can evaluate potential power supply planning alternative scenarios.

Table 3-3 Summer Peak Demand (MW)			
Year	Low	Base	High
2007	618	635	650
2008	622	641	659
2009	628	648	666
2010	635	655	673
2011	642	662	680
2012	649	669	688
2013	656	676	695
2014	663	684	703
2015	670	691	711
2016	679	700	720
AAGR	1.05%	1.09%	1.14%

Table 3-4 Winter Peak Demand (MW)			
Year	Low	Base	High
2007/08	688	706	722
2008/09	694	713	730
2009/10	702	721	739
2010/11	710	730	747
2011/12	719	738	756
2012/13	728	747	766
2013/14	736	756	774
2014/15	745	765	784
2015/16	754	775	794
2016/17	764	785	804
AAGR	1.17%	1.19%	1.20%

Year	Low	Base	High
2007	2955	3025	3091
2008	2985	3100	3209
2009	3021	3140	3253
2010	3066	3187	3301
2011	3112	3235	3350
2012	3163	3287	3403
2013	3206	3332	3449
2014	3254	3382	3500
2015	3303	3433	3552
2016	3361	3493	3614
AAGR	1.44%	1.61%	1.75%

Model Evaluation and Statistics

Several steps are taken to ensure the best models are used for determining future customer, demand and energy requirements. The first step is to determine the forecast drivers. Once the drivers are determined, the model statistics are evaluated. MetrixND calculates the following list of statistical tests for use in determining the best model.

Adjusted R-Squared

Durbin Watson Statistic

F-Statistic

Probability (F-Statistic)

Mean Absolute Deviation (MAD)

Mean Absolute Percent of Error (MAPE)

Data Sources

Bureau of Economic and Business Research (BEBR) Annual Forecast, 2006 Forecast, University of Florida.

Coincident Peak Information, Lakeland Electric Load Research, 2006.

Current List of Large Customers, Lakeland Electric.

Customer Statistics Reports, Lakeland Electric.

Economy.com, Quarterly Update for Florida Counties, Septemer 2006.

Historical Billing Information, CIBS Database & UMS.

Historical Hourly Loads, Lakeland Electric.

Itron's Fundamentals of Budget and Long-Term Sales Forecasting Presentation,
May 2005

Load & Energy Forecast (2005/2006), Lakeland Electric.

Load Generation Summary, Lakeland Electric.

Monthly Peak Record, Lakeland Electric.

Municipal Breakdown Report, Lakeland Electric.

Temperature, Rainfall and Humidity Data, Lakeland Electric.



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4.0 Demand-Side Management Programs

Lakeland Electric is committed to the efficient use of electric energy and is committed to providing cost-effective conservation and demand reduction programs for all its consumers. Lakeland is not subject to FEECA rules but has in place several Demand-Side Management (DSM) programs and remains committed to utilizing cost-effective conservation and DSM programs that will benefit its customers. Presented in this section are the currently active programs.

This section also includes a brief description of Lakeland's advances in solar technology and a new LED traffic light retrofit program. Lakeland has been a pioneer in the deployment and commissioning of solar energy devices and continues to support and look for opportunities to promote solar energy technologies.

4.1 Existing Conservation and Demand-Side Management Programs

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

- 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.

4.1.1 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 an important part of its objective to cost-effectively reduce energy consumption:

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

4.1.1.1 Residential Programs.

4.1.1.1.1 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.

4.1.1.1.2 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.

4.1.1.1.3 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.

4.1.1.1.4 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.

4.1.1.2 Commercial Programs.

4.1.1.2.1 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.

4.1.2 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.

4.1.2.1 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 reduces weather sensitive loads and promotes greater energy efficiency. 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 in the 1980's and are still in service. There is little customer interest due to the cost of the units. Currently, no new sites are being developed.

4.1.2.2 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 customer's 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.

4.1.2.3 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. Solar also contributes to reducing both peak demand and energy linking it to demand side management. 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) supply side resources and delivery 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 \$40,000.

For 13 years Lakeland had 20 solar powered streetlights in service. Each of these lights offset the need for a traditional 70 watt fixture that Lakeland typically would use in this type of application and displaced 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. In 2006, Lakeland's distribution system was developed

in the areas where the solar powered streetlights were installed. Lakeland has chosen to phase-out the solar powered streetlights due to their age. Lakeland installed these 20 lights in mid-1994 in a grant program with the cooperation of the Florida Solar Energy Center (FSEC).

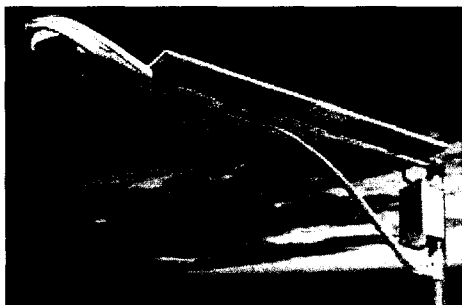


Figure 4-1
Solar Powered Streetlight

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 57 solar water heaters. Lakeland recently chose a second type of solar water heater with a simpler connection and metering setup. Two of these new units are currently installed and data is being gathered to compare their efficiency to the 55 installed in prior years. All 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-quality 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 57 solar thermal energy generators displaces over 2,000 kWh per year per installation on average.

Lakeland Electric is also the first utility to successfully trade Renewable Energy Credits (REC's) that were produced by these solar water heaters. In 2004 a transaction took place between Lakeland and two REC buyers: Keys Energy Services of Key West and the Democratic National Convention in Boston. Keys Energy needed the REC's for its retail Green Pricing program. The Democratic National Convention used the REC's to offset the emissions produced during that convention.

4.2.3 Utility-Interactive Residential Photovoltaic Systems

This project is a collaborative effort between the Florida Energy Office (FEO), FSEC, Lakeland Electric, and Shell Solar Industries. The primary objective of this program is 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 originally installed 3 PV systems, all of which were directly interconnected to the utility grid. These systems have an average nominal power rating of approximately 2.6 kilowatts peak (kWp) and are displacing approximately 2900 kWh per year per installation at standard test conditions. During 2005 title to these systems was transferred to those homeowners in return for their extended voluntary participation.

Lakeland owned, operated, and maintained the systems for at least 7 years. FSEC conducted periodic site visits for testing and evaluation purposes. System performance data was continuously collected via telephone modem line during those years and, at one site, continues to do so. Lakeland and FSEC will continue to analyze the results of utility and systems simulation tests and prepare recommendations for appropriate interconnection requirements for residential PV systems. FSEC prepared 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.

Four additional photovoltaic systems have been privately purchased in the Lakeland Electric service territory. These newer systems generate a total of 16.6 kw of electric capacity. Lakeland Electric has allowed the interconnection of these systems in "net meter" fashion. Lakeland Electric is now the hosting utility to 7 privately-owned, grid-connected solar photovoltaic generators. An eighth system (6.5 kw) is scheduled for installation during March, 2007. This will be the first non-residential PV system in Lakeland. It will serve the pumping and other electrical loads at a commercial tropical fish breeding facility.

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 Lakeland Electric, Polk County School District, Shell Solar Industries, Florida Solar Energy Research and Education Foundation, Florida Solar Energy Center and the Solar Electric Power Association, formerly known as 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, a specially designed curriculum on solar energy appropriate to various grade levels has been developed. 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 1.8kWp photovoltaic systems on 17 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 owns, operates, and maintains the systems that are installed on these classrooms. Lakeland monitors the performance and FSEC conducts periodic testing of the equipment. Through the cooperative effort of the partnership, different ways to use photovoltaics efficiently and effectively in today's society are being evaluated.

As a result of aging, several portable classrooms have been retired. And, where shifting populations have caused school officials to relocate some classrooms to schools that are outside Lakeland's service territory, Lakeland has removed the PV systems from those classrooms. Because the equipment is still capable of generating, budgets are being created that would have these systems re-installed on buildings owned by the City of Lakeland.

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 supported 1,000 PV systems in 12 states and Puerto Rico with hopes to bring photovoltaics to the main market. The 1,000 systems were 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 were 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.

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.

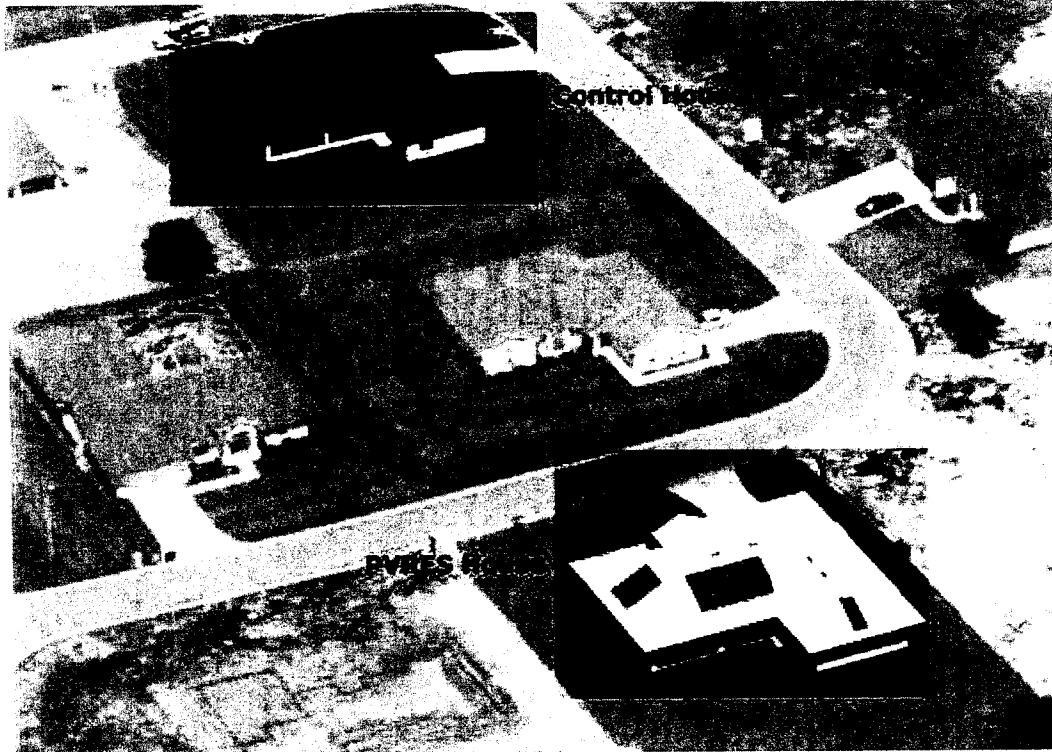


Figure 4-3
Solar House and Control House

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 payments 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 retrofitted the existing bulbs with highly efficient Light Emitting Diodes (LEDs). The LEDs 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) agreed to help fund Lakeland's project to retrofit the signals. The FDOT contributed \$50,000 for these new LED traffic lamps on all 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 was completed in June 2003. The project is expected to save the City of Lakeland \$150,000 per year in maintenance and electricity costs.

As a next step, Lakeland Electric added backup power supply equipment at 14 critical intersections earmarked for FDOT-funded LED signals. These improvements were limited to those intersections that are located on state-funded roadways. The UPS systems will improve safety by keeping traffic signals operating during power outages and accidents. Emergency vehicles in Lakeland will see the added benefit of having easier access to desired areas such as fire and medical locations. Lakeland anticipates being one of the first cities in Florida to have the UPS systems applied to the LED signals.

4.5 Renewable Resources

4.5.1 Energy and Demand

This year the Florida Reliability Coordination Council (FRCC) received a request from the Florida Public Service Commission (FPSC) to help in determining the amount of energy and demand derived from renewable resources. The FRCC asked members this year to supply the information and sent out a template for consistency. The following tables represent the information Lakeland Electric supplied to the FRCC this year.

Table 4-1

Existing FIRM Capacity and Energy by Primary Fuel Type

Base Year: 2006		Utility: Lakeland Electric				Net Energy For Load	
Generation by Primary Fuel		Gross (MW) Capability				MWh	%
		Summer (MW)	Summer (%)	Winter (MW)	Winter (%)		
1	Coal	219.0	26.2%	219.0	24.7%	1,447.0	48.2%
2	Nuclear						
3	Residual	82.0	9.8%	82.0	9.3%	20.0	0.7%
4	Distillate	55.0	6.6%	55.0	6.2%	3.0	0.1%
5	Natural Gas	479.0	57.4%	530.0	59.8%	1,154.0	38.4%
6	Renewables (Purchases)						
7	Renewable (Owned)						
8	Purchases (Other)					381.0	12.7%
9	Total	835.0	100.0%	886.0	100.0%	3,005.0	100.0%

Coal from above ~ Jointly owned LAK 60% of 365MW = 219.0MW Lakeland Electric

Notes

- > Capacities requested are Gross MW.
- > Winter MW: Use value selected by your utility for chosen winter month (Jan '06 - Mar '06).
- > NEL is annual for 2006 calendar year.
- > "Renewable Purchases" (Line 13) and "Owned Renewables" (Line 14) are broken down in Table B1 (next tab in this workbook).

Table 4-2

Existing FIRM Renewable Report by Fuel Type

Base Year: 2006		Utility: Lakeland Electric				Net Energy For Load	
Renewable Fuel Type*	Gross (MW) Capability				MWh	%	
	Summer (MW)	Summer (%)	Winter (MW)	Winter (%)			
1	Biomass						
2	Landfill Gas						
3	Hydro						
4	Geothermal						
5	Biofuels						
6	Solar						
7	Ocean Energy						
8	Wind						
9	Other						
10	Total	0	0	0	0	0	0

* Based on values contained in Row 6 (Line 13) and Row 7 (Line 14) of Table A1.

Table 4-2b

Existing NON-FIRM Renewable Report by Fuel Type

Base Year: 2006		Utility: Lakeland Electric				Net Energy For Load	
Renewable Fuel Type*	Gross (MW) Capability				MWh	%	
	Summer (MW)	Summer (%)	Winter (MW)	Winter (%)			
1	Biomass						
2	Landfill Gas						
3	Hydro						
4	Geothermal						
5	Biofuels						
6	Solar	0.2	100.0%	0.2	100.0%	362.0	100.0%
7	Ocean Energy						
8	Wind						
9	Other						
10	Total	0.2	100.0%	0.2	100.0%	362.0	100.0%

Notes

- > Capacities requested are Gross MW.
- > Winter MW: Use value selected by your utility for chosen winter month (Jan '06 - Mar '06).
- > NEL is annual for 2006 calendar year.
- > Line 17 = (Line 13 + Line 14) [Table A1]
- > Table B1 is for owned capacity and firm contractual purchases from renewable resources (NUGs, IPPs, and Imports).
- > Table B1-b is for non-firm purchases from non-firm renewable resources.

Table 4-3

Existing NON-FIRM Self-Service Renewable Generation Facilities

Base Year: 2006	Utility: Lakeland Electric						
Facility Name	Unit No.	Gross MW	Net MW	Fuel Type	Self-Service MW	Self-Service MWh	In-Service Date
Solar Hot Water (Fleet of 57)		0.1	0.1	Sunlight			1998-2002
Solar Photovoltaic (Fleet of 16)		0.1	0.1	Sunlight			1998-2007

Notes

- > Capacities requested are Gross MW. Enter WINTER capacities.
- > NEL is annual for 2006 calendar year.
- > Provide as much data available for facilities/resources "behind the meter" (as data permits).
- > A 'Facility Name' may include an aggregated quantity (i.e., Pool Heaters, Solar-Powered Interstate Call Boxes, Photovoltaic Lighting, etc.).
- > Self-Service MW and MWh pertain to power and energy consumed by the entity, whether it be a named facility or aggregated quantity.
- > Indicate values that are estimated with "(est)" appended to the Facility Name.
- > For most common renewable fuel types, see tab in workbook "Fuel Types"



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. Lakeland's planning process considers conservation, demand-side management measures, and supply-side resources along with the needs of the T&D system. 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) and the All-Requirements Project of the Florida Municipal Power Agency (FMPA). The three utilities operate as one control area. All FMPP capacity resources are committed and dispatched together from the OUC Operations Center.

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 to meet its own load and reserve requirements 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 3.0 percent per year based on the US forecasted Producer Price Index. A 2.5 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 4.7 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 4.7 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 4.7 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. This year's fuel price forecast for natural gas has been prepared with the assistance of Risk Management Inc. for Lakeland Electric. The fuel price forecast for solid fuels and oils has been prepared by Lakeland Electric's staff.

5.3.2.1 Natural Gas. Natural gas, 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 sometimes stored prior to distribution.

Table 5-1
Base Case Fuel Price Forecast Summary (Real Price \$/mmbtu, No Inflation Added)

	McIntosh 3 Coal ¹	Natural Gas ¹	High Sulfur #6 Oil ¹	Low Sulfur #6 Oil ¹	#2 Diesel Oil ¹	Petroleum Coke ¹
2007	2.79	7.25	7.37	9.02	13.10	2.73
2008	3.10	8.07	7.94	9.59	13.67	2.14
2009	3.30	7.85	8.11	9.76	13.84	2.16
2010	3.40	7.50	8.15	9.82	13.95	2.19
2011	3.50	7.15	8.25	9.94	14.11	2.21
2012	3.61	6.83	8.34	10.06	14.28	2.50
2013	3.72	6.53	8.45	10.18	14.46	2.53
2014	3.83	6.33	8.55	10.30	14.63	2.56
2015	3.94	6.19	8.65	10.42	14.80	2.59
2016	4.06	6.04	8.75	10.55	14.98	2.62
Average Annual Growth Rate	4.25%	-2.01%	1.93%	1.75%	1.50%	-0.47%

¹Prices represent delivered prices.

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. Liquefied Natural Gas (LNG) feasibility is currently being explored by two projects proposing pipelines from the Bahamas to Florida, and several projects in the Gulf of Mexico.

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.

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 2.0 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 FP&L's Martin Plant. Construction for the Gulfstream pipeline began in 2001 and Phase II was completed in 2005.

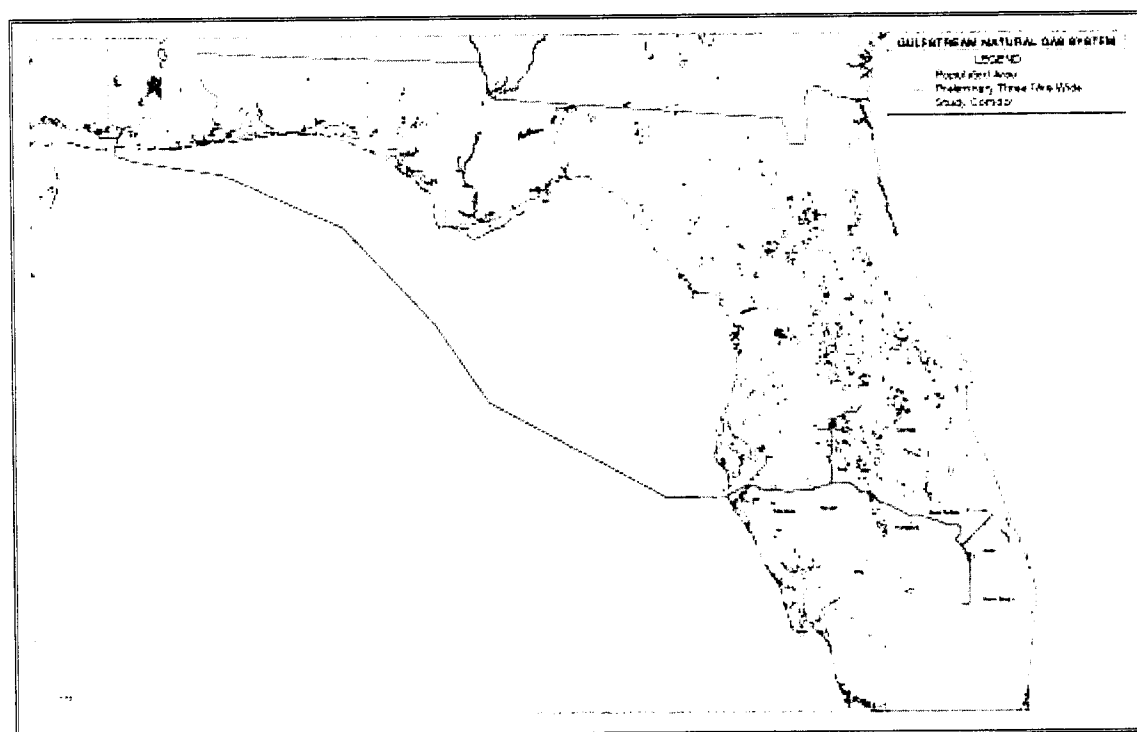


Figure 5-1
Gulfstream Natural Gas Pipeline

5.3.2.1.3 Natural gas price forecast. The price forecast for natural gas 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 5-1. All other fuel types in the table are delivered prices. As previously stated, natural gas prices have been extremely volatile in

recent years. To address this volatility, Lakeland Electric has initiated a formal fuels hedging program in 2003. Risk Management Inc., a Chicago company, was selected as a consultant to assist in the formation of policies and procedures as well as the implementation of the program.

Lakeland currently has a ten-year contract with British Gas (assigned to BG by El Paso) for the supply of natural gas for a portion of Lakeland's base natural gas requirements. Lakeland also has two years remaining on a ten-year natural gas pre-paid agreement through Florida Gas Utility (FGU) for approximately 6% of its average needs, and has entered into another pre-paid agreement with FGU that commences upon the expiration of the first pre-pay (January, 2009), and extends for 20-years. 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 5-2.

Table 5-2 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	38.55	76.18	65.16	80.65
Usage	6.93	6.78	0.00	0.02
Total	47.36	82.96	65.16	80.67
Fuel Charge	3.27%	3.27%	3.27%	2%

* A DTH is equivalent to 1 mmbtu or 1 mcf

For purposes of projecting delivered gas prices, transportation charges of \$0.61/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.

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. Lakeland's McIntosh Unit #3 is a 365 mega watt coal burning generator that was placed into service in the early 1980's.

5.3.2.2.1 Coal supply and availability. Lakeland's current coal purchase contracts are approximately 50 percent long-term and 50 percent spot purchases. Spot purchases can extend from several months to one year 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 1,000,000 tons of coal/petroleum coke per year. The coal sources are located in eastern Kentucky, which affords Lakeland a single rail line haul via CSX Transportation. Lakeland also imports a portion of its coal needs from South American sources.

5.3.2.2.3 Coal price forecast. Currently, Lakeland's long-term purchase of coal for McIntosh 3 is under two contracts which extend through 2010. Lakeland is expecting an increase in coal costs due to the expiration of two lower-priced contracts at the end of 2006, and as new contracts are crafted for 2007 and beyond.

5.3.2.3 Petroleum Coke price forecast. Lakeland has utilized 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 recently has burned approximately 80,000 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. Lakeland will continue to evaluate the price and availability and will supplement this fuel as economics allow.

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. Petroleum coke for McIntosh 3 has been transported to the McIntosh site by truck.

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. Recent world events appear to have placed oil prices at a new level in the world market. Lakeland has adjusted its oil price forecast to reflect current market pricing and what the anticipated future price may be.

5.3.3 Fuel Forecast Sensitivities

Lakeland is not presenting specific forecasted fuel price sensitivities. In the 2005 IRP study, fuel price sensitivity cases were run for natural gas and coal. Natural gas price sensitivity cases included: + \$1.00/mmbtu, + \$2.00/mmbtu, + \$3.00/mmbtu and - \$1.00/mmbtu from the base case price forecast. Coal price sensitivities included +/- \$0.50/mmbtu from the base case price forecast. No price sensitivities were run on oil fuels as they only make up a very small part of total energy production and cost in the forecast period.



6.0



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 3-3 and 3-4. 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. A commonly used approach is the reserve margin method, which is calculated as follows:

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

Lakeland has looked at probabilistic approaches to determine its reliability needs in the past. These have included indices such as LOLP and EUE. Lakeland has found that due to the strength of its transmission system, assisted LOLP or EUE values were so small that reserves based on those measures would be nearly non-existent. Conversely, isolated probabilistic values come out overly pessimistic calling for excessively high levels of reserves due to approximately 50% of Lakeland's capacity being made up by only two units. As a result, Lakeland has stayed with the reserve margin method based on the equation presented above. When combined with regular review of unit performance at times of peak, Lakeland finds reserve margin to be the proper reliability measure for its system.

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. Lakeland's winter and summer reserve margin

target is currently 15%. This complies with the FRCC reserve margin criteria for the FRCC Region. 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. Lakeland completed Phase I of its detailed Integrated Resource Planning process in November 2005. As previously mentioned, absent any retirements, Lakeland does not need additional capacity in the current ten year planning horizon. Results of the IRP do indicate the need for additional capacity shortly beyond the current ten year planning horizon and therefore Lakeland has moved into a second phase of that study (Phase II) to identify the best alternative(s) for Lakeland and its customers based on factors such as least cost, risk avoidance and other strategic concerns. Lakeland has concluded from Phase I of the IRP that additional fuel diversity is in the best interests of Lakeland and its customers. Further study is taking place regarding the potential disposition of two existing Lakeland resources. Possible scenarios include but are not limited to retirements, fuel conversion strategies, fuel diversification strategies, and long term capacity replacement based on fuel savings or combinations of any of these. Depending on the outcome of that analysis, the need for new capacity could be shifted to occur in the current ten year planning horizon. Results of this next phase of the IRP study are expected to be complete by October of 2007 and will be included in the 2008 filing of this document.

As Lakeland expects to continue to be a winter peaking utility, 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.

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 15% 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)
					2007/2008	981	0	0	981	706
2008/2009	981	0	0	981	713	713	37.6	37.6	161	161
2009/2010	981	0	0	981	721	721	36.1	36.1	152	152
2010/2011	981	0	0	981	730	730	34.4	34.4	142	142
2011/2012	981	0	0	981	738	738	32.9	32.9	132	132
2012/2013	981	0	0	981	747	747	31.3	31.3	122	122
2013/2014	981	0	0	981	756	756	29.8	29.8	112	112
2014/2015	981	0	0	981	765	765	28.2	28.2	101	101
2015/2016	981	0	0	981	775	775	26.6	26.6	90	90
2016/2017	981	0	0	981	785	785	25.0	25.0	78	78

Table 6-2
Projected Reliability Levels - Summer / 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 15% 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)
					2007	905	0	100	805	635
2008	905	0	0	905	641	641	41.2	41.2	168	168
2009	905	0	0	905	648	648	39.7	39.7	160	160
2010	905	0	0	905	655	655	38.2	38.2	152	152
2011	905	0	0	905	662	662	36.7	36.7	144	144
2012	905	0	0	905	669	669	35.3	35.3	136	136
2013	905	0	0	905	676	676	33.9	33.9	128	128
2014	905	0	0	905	684	684	32.3	32.3	118	118
2015	905	0	0	905	691	691	31.0	31.0	110	110
2016	905	0	0	905	700	700	29.3	29.3	100	100

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 15% 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)
2007/2008	981	0	0	981	722	722	35.9	35.9	151	151
2008/2009	981	0	0	981	730	730	34.4	34.4	142	142
2009/2010	981	0	0	981	739	739	32.7	32.7	131	131
2010/2011	981	0	0	981	747	747	31.3	31.3	122	122
2011/2012	981	0	0	981	756	756	29.8	29.8	112	112
2012/2013	981	0	0	981	766	766	28.1	28.1	100	100
2013/2014	981	0	0	981	774	774	26.7	26.7	91	91
2014/2015	981	0	0	981	784	784	25.1	25.1	79	79
2015/2016	981	0	0	981	794	794	23.6	23.6	68	68
2016/2017	981	0	0	981	804	804	22.0	22.0	56	56

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 15% 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)
2007/2008	981	0	0	981	688	688	42.6	42.6	190	190
2008/2009	981	0	0	981	694	694	41.4	41.4	183	183
2009/2010	981	0	0	981	702	702	39.7	39.7	174	174
2010/2011	981	0	0	981	710	710	38.2	38.2	165	165
2011/2012	981	0	0	981	719	719	36.4	36.4	154	154
2012/2013	981	0	0	981	728	728	34.8	34.8	144	144
2013/2014	981	0	0	981	736	736	33.3	33.3	135	135
2014/2015	981	0	0	981	745	745	31.7	31.7	124	124
2015/2016	981	0	0	981	754	754	30.1	30.1	114	114
2016/2017	981	0	0	981	764	764	28.4	28.4	102	102



n.º 7



7.0 Generation Expansion Analysis Results and Conclusions

This section discusses the status of Lakeland's Generation Expansion plans as of December 31, 2006. At the time of this filing, Lakeland has completed Phase I of its 2005 Integrated Resource Plan (IRP). The results of the first phase were a statistical dead heat between the six final cases that were studied. These cases included various solid fuel as well as all natural gas fired addition scenarios. Because a single clear cut winner could not be determined solely on an economic basis Lakeland has proceeded with the second phase of the 2005 IRP study to perform risk assessment and strategic concern analysis on the six final cases to determine the best course of action for Lakeland and its customers. In the last few years the volatility of oil and natural gas prices has required careful analysis and consideration when considering new generation. As shown in Section 6 and again in the Tables in Section 9, Lakeland does not have an immediate capacity need in the current ten year planning horizon. This gives Lakeland the ability to continue, in a timely but unhurried manner, 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, retirements, environmental compliance strategies, fuel switching and proper fuel diversification of future resource portfolio's. As no final decision has been made at the time of this writing, all resources are assumed available over the planning cycle meaning no planned retirements of existing facilities 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 a variety of tools to identify possible supply side technologies. Lakeland's utilizes higher level optimization programs to screen literally thousands of possibilities and identify a more manageable set of scenarios that can then be analyzed in more detail. Lakeland uses a detailed production costing program, POWRSYM3, to perform the more detailed analysis of scenarios to identify the best solution to meet the future needs of the utility.

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 traditional cost-effective DSM measures have been identified. Lakeland was able to demonstrate its solar thermal water heating program cost-effective through the use of the PSC approved FIRE model in the 2005 IRP. The main driver for this program being cost-effective is because it has its own self-sustaining rate, meaning there is no revenue loss to the utility and other customers do not subsidize the program. Participants are billed for the thermal energy used at a separate rate from their normal KWH consumption. As a result Lakeland is developing a business plan to present to its management to increase the penetration of its solar thermal hot water program. This program has been highly successful in its R&D stage and should be considered a hybrid between DSM and distributed generation. It should be noted that despite this program being cost-effective, even the most aggressive implementation of this program would not

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 and Distribution

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



0.8



8.0 Environmental and Land Use Information

Lakeland's 2007 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.



2
3



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.

<u>Abbreviation</u>	<u>Description</u>
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, 2004													
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Plant Name	Unit No.	Location	Unit Type	Fuel		Fuel Transport		Alt Fuel Days Use	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Net Capability ¹	
				Pri	Alt	Pri	Alt					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
	8		CA	WH	---				04/56	Unknown	25,000	29	31
	8		CT	NG	DFO	PL	TK	5	07/92	Unknown	101,520	<u>73</u>	<u>90</u>
Plant Total											121	148	

¹Net Normal.
Source: Lakeland Energy Supply Unit Rating Group

Table 9-1b
Schedule 1.0: Existing Generating Facilities as of December 31, 2004

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Plant Name	Unit No.	Location	Unit Type	Fuel		Fuel Transport		Alt Fuel Days Use	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Net Capability ¹	
				Pri	Alt	Pri	Alt					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	16	19
	1		ST	NG	RFO	PL	TK	29	02/71	Unknown	103,000	80	80
	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	207	244
5	CA	WH	---				05/02	Unknown	135,000	115	124		
Plant Total												734	783
System Total												905	981

¹Net Normal.

²Lakeland's 60 percent portion of joint ownership with Orlando Utilities Commission.

Source: Lakeland Energy Supply 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)
Year	Rural & Residential					Commercial		
	Population	Members per Household	GWh	Average No. of Customers	Average kWh Consumption per Customer	GWh	Average No. of Customers	Average kWh Consumption per Customer
1997	215,544	2.54	1,170	84,941	13,774	625	9,835	61,718
1998	217,681	2.54	1,249	85,840	14,550	642	10,033	62,294
1999	221,060	2.53	1,239	87,222	14,205	659	10,338	62,101
2000	224,882	2.53	1,263	88,740	14,233	665	10,553	62,447
2001	231,044	2.56	1,328	90,332	14,701	686	10,637	62,518
2002	234,210	2.55	1,328	91,875	14,454	688	10,639	64,480
2003	236,890	2.54	1,418	93,126	15,227	693	11,013	62,472
2004	243,576	2.58	1,403	93,620	14,986	734	11,248	61,611
2005	247,942	2.58	1,443	96,205	14,996	734	11,480	63,937
2006	253,405	2.59	1,438	98,680	14,571	753	11,832	63,642
Forecast								
2007	258,681	2.59	1,425	100,213	14,221	750	12,025	62,355
2008	262,085	2.59	1,483	101,779	14,573	763	12,189	62,563
2009	266,163	2.58	1,510	103,537	14,588	772	12,341	62,577
2010	270,292	2.58	1,542	105,385	14,632	783	12,506	62,649
2011	273,989	2.57	1,575	107,240	14,685	794	12,675	62,655
2012	277,585	2.55	1,610	109,146	14,753	806	12,849	62,738
2013	281,112	2.54	1,642	111,124	14,779	814	13,030	62,507
2014	284,750	2.53	1,677	113,121	14,826	825	13,216	62,415
2015	288,313	2.51	1,714	115,197	14,878	836	13,406	62,323
2016	291,563	2.50	1,756	117,308	14,972	850	13,604	62,446

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	Industrial			Railroads and Railways	Street & Highway Lighting GWh	Other Sales to Public Authorities GWh	Total Sales to Ultimate Consumers GWh
	GWh	Average No. of Customers	Average kWh Consumption per Customer				
1997	459	62	7,396,935	0	16	78	2,330
1998	462	62	7,650,935	0	17	80	2,432
1999	486	70	6,654,671	0	17	79	2,463
2000	507	83	6,269,363	0	18	84	2,531
2001	488	80	6,087,383	0	19	83	2,583
2002	513	89	6,192,833	0	19	80	2,626
2003	536	90	6,059,818	0	19	80	2,741
2004	556	91	5,950,484	0	20	81	2,753
2005	543	83	6,513,108	0	20	84	2,824
2006	584	87	6,711,874	0	21	83	2,883
Forecast							
2007	605	98	6,168,827	0	21	85	2,886
2008	604	100	5,989,680	0	21	85	2,951
2009	610	101	5,949,040	0	21	85	2,990
2010	617	102	5,909,235	0	21	85	3,035
2011	622	102	5,927,853	0	21	86	3,080
2012	634	104	5,832,125	0	21	86	3,130
2013	641	105	5,794,724	0	21	86	3,172
2014	647	106	5,758,245	0	21	86	3,220
2015	658	107	5,722,430	0	21	86	3,269
2016	665	108	5,687,278	0	21	87	3,328

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)
Year	Sales for Resale GWh	Utility Use & Losses GWh	Net Energy for Load GWh	Other Customers (Average No.)	Total No. of Customers
1997	0	123	2,471	10,100	104,936
1998	0	71	2,531	10,271	106,800
1999	0	110	2,567	10,622	108,710
2000	0	117	2,666	10,614	110,457
2001	0	128	2,694	10,699	111,993
2002	0	70	2,771	10,583	113,734
2003	0	169	2,898	10,517	115,050
2004	0	142	2,847	10,362	116,010
2005	0	133	2,939	10,206	118,002
2006	0	122	3,005	10,016	120,615
Forecast					
2007	0	140	3,025	9,990	122,326
2008	0	149	3,100	10,043	124,111
2009	0	150	3,140	10,069	126,048
2010	0	152	3,187	10,094	128,087
2011	0	155	3,235	10,119	130,136
2012	0	157	3,287	10,144	132,243
2013	0	160	3,332	10,170	134,429
2014	0	162	3,382	10,196	136,639
2015	0	164	3,433	10,222	138,932
2016	0	165	3,593	10,246	141,266

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

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interrupt.	(6) Residential		(8) Commercial/Industrial		(10) Net Firm Demand
					(7) Conservation	(9) Conservation			
1997	509	0	509	0	0	0	0	0	509
1998	550	0	550	0	0	0	0	0	550
1999	542	0	542	0	22	0	0	0	520
2000	556	0	556	0	21	0	0	0	525
2001	549	0	549	0	0	0	0	0	549
2002	578	0	578	0	0	0	0	0	578
2003	579	0	579	0	0	0	0	0	579
2004	584	0	584	0	0	0	0	0	584
2005	639	0	639	0	0	0	0	0	639
2006	631	0	631	0	0	0	0	0	631
Forecast									
2007	635	0	635	0	0	0	0	0	635
2008	641	0	641	0	0	0	0	0	641
2009	648	0	648	0	0	0	0	0	648
2010	655	0	655	0	0	0	0	0	655
2011	662	0	662	0	0	0	0	0	662
2012	669	0	669	0	0	0	0	0	669
2013	676	0	676	0	0	0	0	0	676
2014	684	0	684	0	0	0	0	0	684
2015	691	0	691	0	0	0	0	0	691
2015	700	0	700	0	0	0	0	0	700

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

(1) Year	(2) Total	(3) Wholesale	(4)		(5) Interrupt.	(6)		(7) Conservation	(8)		(9) Conservation	(10) Net Firm Demand
			Retail	Load Management		Residential	Comm./Ind.					
1997/98	487	0	487		0	0	0	0	0	0	0	487
1998/99	613	0	613		0	51	0	0	0	0	0	562
1999/2000	610	0	610		0	51	0	0	0	0	0	559
2000/01	656	0	656		0	0	0	0	0	0	0	656
2001/02	659	0	659		0	0	0	0	0	0	0	659
2002/03	694	0	694		0	0	0	0	0	0	0	694
2003/04	570	0	570		0	0	0	0	0	0	0	570
2004/05	648	0	648		0	0	0	0	0	0	0	648
2005/06	680	0	680		0	0	0	0	0	0	0	680
2006/07	596	0	596		0	0	0	0	0	0	0	596
Forecast												
2007/08	706	0	706		0	0	0	0	0	0	0	706
2008/09	713	0	713		0	0	0	0	0	0	0	713
2009/10	721	0	721		0	0	0	0	0	0	0	721
2010/11	730	0	730		0	0	0	0	0	0	0	730
2011/12	738	0	738		0	0	0	0	0	0	0	738
2012/13	747	0	747		0	0	0	0	0	0	0	747
2013/14	756	0	756		0	0	0	0	0	0	0	756
2014/15	765	0	765		0	0	0	0	0	0	0	765
2015/16	775	0	775		0	0	0	0	0	0	0	775
2016/17	785	0	785		0	0	0	0	0	0	0	785

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 %
1997	2,348	0	0	2,348	0	123	2,471	38.3
1998	2,460	0	0	2,460	0	71	2,531	52.5
1999	2,457	0	0	2,457	0	110	2,567	47.8
2000	2,549	0	0	2,549	0	117	2,666	49.9
2001	2,566	0	0	2,566	0	128	2,694	46.9
2002	2,701	0	0	2,701	0	70	2,771	48.0
2003	2,729	0	0	2,729	0	169	2,898	47.7
2004	2,725	0	0	2,725	0	142	2,867	56.0
2005	2,809	0	0	2,809	0	133	2,942	51.8
2006	2,883	0	0	2,883	0	122	3,005	50.4
Forecast								
2007	2,885	0	0	2,885	0	140	3,025	54.6
2008	2,951	0	0	2,951	0	149	3,100	50.1
2009	2,990	0	0	2,990	0	152	3,140	50.3
2010	3,035	0	0	3,035	0	152	3,187	50.5
2011	3,080	0	0	3,080	0	155	3,235	50.6
2012	3,130	0	0	3,130	0	157	3,287	50.8
2013	3,172	0	0	3,172	0	160	3,332	50.9
2014	3,220	0	0	3,220	0	162	3,382	51.1
2015	3,269	0	0	3,269	0	164	3,433	51.2
2016	3,328	0	0	3,328	0	165	3,493	51.5

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		2007 Forecast		2008 Forecast	
	Peak Demand ¹ MW	NEL GWh	Peak Demand ¹ MW	NEL GWh	Peak Demand ¹ MW	NEL GWh
January	522	225	565	228	706	249
February	680	211	596	216	555	214
March	434	216	488	233	493	236
April	541	234	484	223	489	226
May	559	263	568	279	573	282
June	594	283	577	275	583	278
July	613	295	610	297	616	300
August	631	310	635	313	641	316
September	581	278	570	276	576	280
October	542	249	534	255	539	258
November	474	214	466	220	470	223
December	434	223	556	245	562	249

¹After 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)
	Fuel Requirements	Type	Units	Calendar Year										
				2006 - Actual	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
(1)	Nuclear		Trillion Btu		0	0	0	0	0	0	0	0	0	0
(2)	Coal ¹		1000 Ton		408	614	535	558	618	585	594	578	559	612
(3)	Residual	Steam	1000 BBL		0	61	32	0	0	0	0	0	0	0
(4)		CC	1000 BBL		0	0	0	0	0	0	0	0	0	0
(5)		CT	1000 BBL		0	0	0	0	0	0	0	0	0	0
(6)		Total	1000 BBL		0	61	32	0	0	0	0	0	0	0
(7)	Distillate	Steam	1000 BBL		0	0	0	0	0	0	0	0	0	0
(8)		CC	1000 BBL		0	0	0	0	0	0	0	0	0	0
(9)		CT	1000 BBL		37	40	22	41	59	55	62	66	85	104
(10)		Total	1000 BBL		37	40	22	41	59	55	62	66	85	104
(11)	Natural Gas	Steam	1000 MCF		2859	2702	2189	2550	2785	2968	2716	3023	3513	3745
(12)		CC	1000 MCF		11813	18647	18690	18824	18661	19165	17205	18352	18847	19104
(13)		CT	1000 MCF		583	510	379	437	487	482	522	569	683	787
(14)		Total	1000 MCF		15255	21859	21257	21810	21932	22615	20442	21944	23043	23636
(15)	Other		Trillion Btu		0	0	0	0	0	0	0	0	0	0

¹ Includes Petroleum Coke.

Table 9-10
Schedule 6.1: Energy Sources

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Energy Sources	Type	Units	Calendar Year										
				2006 - Actual	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
(1)	Inter-Regional Interchange		GWh		0	0	0	0	0	0	0	0	0	0
(2)	Nuclear		GWh		0	0	0	0	0	0	0	0	0	0
(3)	Coal ¹		GWh	1447	1047	1583	1376	1433	1588	1501	1518	1480	1432	1570
(4)	Residual	Steam	GWh	20	0	26	13	0	0	0	0	0	0	0
(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	20	0	26	13	0	0	0	0	0	0	0
(8)	Distillate	Steam	GWh	0	0	0	0	0	0	0	0	0	0	0
(9)		CC	GWh	1	0	0	0	0	0	0	0	0	0	0
(10)		CT	GWh	2	22	24	13	24	35	32	37	39	51	62
(11)		Total	GWh	3	22	24	13	24	35	32	37	39	51	62
(12)	Natural Gas	Steam	GWh	123	236	222	174	210	238	251	232	263	309	334
(13)		CC	GWh	1030	1603	2595	2611	2625	2610	2674	2397	2552	2628	2658
(14)		CT	GWh	1	35	33	24	28	31	31	33	0	43	334
(15)		Total	GWh	1154	1874	2850	2809	2863	2879	2956	2662	2815	2980	3326
(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) ²			381	82	-1383	-1071	-1133	-1249	-1202	-885	-952	-1030	-1465
(19)	Net Energy for Load		GWh	3005	3025	3100	3140	3187	3253	3287	3332	3382	3433	3493

¹ Includes Petroleum Coke.

² Intra-Regional Net Interchange including Firm Sale to FMPA

Table 9-11
Schedule 6.2: Energy Sources

(1)	(2)	(3)	(4)	(5) - (15)												
				Calendar Year												
	Energy Source	Type	Units	2006 - Actual	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		
(1)	Inter-Regional Interchange		%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
(2)	Nuclear		%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
(3)	Coal ¹		%	48.15	34.62	51.06	43.81	44.96	48.81	45.65	45.56	43.77	41.71	44.96		
(4)	Residual	Steam	%	0.67	0.00	0.84	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
(5)		CC	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
(6)		CT	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
(7)		Total	%	0.67	0.00	0.84	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
(8)	Distillate	Steam	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
(9)		CC	%	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
(10)		CT	%	0.07	0.73	0.77	0.41	0.75	1.08	0.97	1.11	1.15	1.49	1.77		
(11)		Total	%	0.10	0.73	0.77	0.41	0.75	1.08	0.97	1.11	1.15	1.49	1.77		
(12)	Natural Gas	Steam	%	4.09	7.80	7.16	5.54	6.59	7.32	7.64	6.96	7.78	9.00	9.56		
(13)		CC	%	34.28	52.99	83.71	83.15	82.37	80.23	81.35	71.94	75.46	76.55	76.10		
(14)		CT	%	0.03	1.16	1.06	0.76	0.88	0.95	0.94	0.99	0.00	1.25	9.56		
(15)		Total	%	38.40	61.95	91.94	89.46	89.23	88.50	89.93	79.89	83.23	86.80	95.22		
(16)	NUG Hydro Other (Specify) ²		%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
				%	12.68	2.70	-44.61	-34.11	-35.55	-38.39	-36.56	-26.57	-28.15	-30.00	-41.95	
(18)	Net Energy for Load		%	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00		

¹ Includes Petroleum Coke.

² Other = Intra-Regional Net Interchange Including Firm Sale to FMPA.

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	%		
2007	905	0	100	0	805	635	170	26.8	0	170	26.8		
2008	905	0	0	0	905	641	264	41.2	0	264	41.2		
2009	905	0	0	0	905	648	257	39.7	0	257	39.7		
2010	905	0	0	0	905	655	250	38.2	0	250	38.2		
2011	905	0	0	0	905	662	243	36.7	0	243	36.7		
2012	905	0	0	0	905	669	236	35.3	0	236	35.3		
2013	905	0	0	0	905	676	229	33.9	0	229	33.9		
2014	905	0	0	0	905	684	221	32.3	0	221	32.3		
2015	905	0	0	0	905	691	214	31.0	0	214	31.0		
2016	905	0	0	0	905	700	205	29.3	0	205	29.3		

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	%		
2006/07	981	0	100	0	881	596	285	47.8	0	285	47.8		
2007/08	981	0	0	0	981	706	275	39.0	0	275	39.0		
2008/09	981	0	0	0	981	713	268	37.6	0	268	37.6		
2009/10	981	0	0	0	981	721	260	36.1	0	260	36.1		
2010/11	981	0	0	0	981	730	251	34.4	0	251	34.4		
2011/12	981	0	0	0	981	738	243	32.9	0	243	32.9		
2012/13	981	0	0	0	981	747	234	31.3	0	234	31.3		
2013/14	981	0	0	0	981	756	225	29.8	0	225	29.8		
2014/15	981	0	0	0	981	765	216	28.2	0	216	28.2		
2015/16	981	0	0	0	981	775	206	26.6	0	206	26.6		

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	

None At Time of This Filing

Table 9-15

Schedule 9.1: Status Report and Specifications of Approved Generating Facilities

(1) Plant Name and Unit Number:	N/A
(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

<p>(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):</p>	<p>None in Current Planning Cycle</p>
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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.

