Lakeland Electric

Ten-Year Site Plan 2025-2034

April 2025

Submitted to:

Florida Public Service Commission

LAKELAND ELECTRIC
POWERED FOR LIFE

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1.0 Introduction [SECTION 1]

This report contains the 2025 Lakeland Electric (LE) 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 TYSP outlines a comprehensive strategy for Lakeland Electric (LE) to deliver affordable, dependable, and sustainable energy to its customers, thereby catalyzing economic growth in Lakeland over the coming decade. TYSPs are non-binding in Florida, but they do provide state, regional, and local agencies a notice of proposed power plants and transmission facilities in near future.

The TYSP 2025 is divided into the following eight sections:

- Section 1: Introduction
- Section 2: General Description of the Utility
- Section 3: Forecast of Electric Demand and Energy
- Section 4: Energy Conservation & Management Programs
- Section 5: Forecasting Methods and Procedures
- Section 6: Forecast of New Capacity Requirements
- Section 7: Environmental and Land Use Information
- Section 8 Ten-Year Site Plan Schedules

The contents of each section are summarized in the remainder of this section.

1.1 General Description of the Utility [SECTION 2]

Section 2 of the TYSP discusses a historical overview of Lakeland Electric's system and a description of the existing power generating and transmission facilities. This section includes tables which show the source of the utility’s current 840 MW of net winter generating capacity and 777 MW of net summer generating capacity (as of the end of year 2024). To increase grid reliability and energy supply, LE added 120 MW of gas based modular Reciprocating Internal Combustion Engines (RICE) in January 2025. Lakeland plans to add 74.8 MW of solar energy in 2027, bringing the total installed solar in the Lakeland System to 89 MW.

1.2 Forecast of Electric Demand and Energy [SECTION 3]

Section 3 of the TYSP offers a summary of Lakeland's electric load and energy forecast methodology. LE uses statistical and mathematical models that link electricity usage to several key input parameters such as region's economic activity, population growth, demographic data, and energy efficiency characteristics on electrical appliances. Forecasts included in this section are on population, customer classes, energy sales, net energy requirement, and system peak demand in an hourly basis in its service territory. In addition, sensitivity cases on high and low load growth scenarios are developed on energy sales to customers, system net energy and peak load requirements for LE's customers.

1.3 Energy Conservation & Management Programs [SECTION 4]

Section 4 provides the description of the existing energy conservation and management programs as adopted by Lakeland Electric. Additional details regarding Lakeland Electric's energy conservation and management programs are on file with the Florida Public Service Commission (FPSC).

Lakeland Electric's existing energy conservation and management programs include the following programs which promote cost-effective measures for both electric demand and energy savings, especially during peak hours:

- Residential Programs:
  - Insulation rebate
  - Energy Savings Kits
  - HVAC Maintenance Incentive
  - Heat Pump Rebates
  - On-Line Energy Audit
  - Energy Star Appliance Rebate

Section 4 also contains discussions on Lakeland Electric's roof-top solar programs. While these types of programs are not traditionally thought of as Demand Side Management (DSM), they have the same effect of conserving energy normally generated by fossil fuels as DSM programs do by virtue of their avoidance of fossil fuels with the use of renewable energy. Lakeland Electric has capacity to generate about 14 MW of power from solar, enough to supply power for more than 7,000 households during a sunny day in the summer. Lakeland Electric is determined to continuously increase the solar power for its customers with additional utility scale solar and customer's roof top solar.

1.4 Load Forecasting Methods and Procedures [SECTION 5]

Forecasting long-term electric load and energy is the first step in planning future generation. Based on future energy requirements, Lakeland Electric coordinates and manages its existing resources to meet the future energy requirements at the lowest cost possible for its customers.

Section 5 summarizes the Integrated Resource Planning process utilized by Lakeland Electric and explains Lakeland Electric's participation in the Florida Municipal Power Pool (FMPP). There are two other utilities which are the members of FMPP including Lakeland Electric. In FMPP, each member operates its power plants sharing the reserves and using the lowest cost of energy to balance the combined load by means of exchange of energy among the members.

While Section 3 discusses the forecast, methods used for the TYSP, Section 5 outlines the economic and fuel assumptions applied to planning capacity and energy in the future.

1.5 Forecast of New Capacity Requirements [SECTION 6]

Section 6 describes the process Lakeland Electric uses to assess the need for additional capacity to serve Lakeland Electric's customers. This section concludes by reaffirming Lakeland Electric's commitment to maintaining Reserve Margins of at least 15% for both summer and winter peak loads throughout the current ten-year planning period, in compliance with the Florida Reliability Coordinating Council's (FRCC) minimum reserve margin criteria for the FRCC Region.

1.6 Environmental and Land Use Information [SECTION 7]

Section 7 addresses environmental and land use issues related to Lakeland Electric's recently added 120 MW new Reciprocating Internal Combustion Engines (RICE) at Lakeland Electric's McIntosh Power Plant (see Table 7-1). This section summarizes different control strategies adopted to comply with various environmental emissions standards for existing major generating units. Also analyzed are the issues related to land use and air/operating permits for newly installed generating units in the McIntosh Power Plant site.

1.7 Ten-Year Site Plan Schedules [SECTION 8]

Section 8 presents the schedules of new generation and any retirements including any power purchase necessary to meet reliability required by the Florida Public Service Commission (FPSC) for the TYSP.

Tables 8-1 and 8-1a summarize the detailed information on existing generating units owned by Lakeland Electric. Tables 8-2 through 8-5 provide information by customer class. Tables 8-2 through 8-8 provide demand and energy history and forecasts. Table 8-9 provides a history and forecast of fuel requirements by fuel type. Tables 8-10 and 8-11 provide a history and forecast of energy produced by fuel type. Tables 8-12 and 8-13 provide comparisons of Lakeland Electric resources to Lakeland Electric demand. These tables demonstrate that Lakeland Electric's expected Reserve Margin exceeds 15% in each year in winter during this planning period. However, LE may need to have some capacity purchase necessary to meet the reserve margin of 15% in summer. Table 8-14 provides information related to Lakeland Electric's planned new generating units and any changes/modifications on existing units. Tables 8-15 and 16 present the specifications of proposed new generating units and transmission lines within Lakeland's territory, aimed at meeting the impending increase in electricity demand.

2.0 General Description of the 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 was 500 kW. The plant was 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 south-east shore of Lake Parker in 1949. The initial capacity of the Larsen Plant Steam was Unit No. 4 (20,000kW) and it was completed in 1950. 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 energy grew at a rapid rate, making evident the need for a new power plant site. 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 MW, was put into commercial operation in February 1971, for a total cost of $15.22 million. In June of 1976, Steam Unit No. 2 was placed into commercial operation, with a nominal rated capacity of 115 MW and at a cost of $25.77 million. This addition increased the total capacity of the Lakeland system to approximately 360 MW. At this time, the new plant site on the north shore of Lake Parker 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 this feature was later decommissioned. McIntosh Unit No. 3 was later modified so that its nominal gross output was increased to 365 MW. The unit used a minimal amount of natural gas for flame stabilization during startups. The plant utilized sewage effluent for cooling tower makeup water. This unit was jointly owned with the Orlando Utilities Commission (OUC) which has a 40 percent undivided interest in the unit. McIntosh Unit No. 3 was retired on April 4, 2021 and has since been demolished.

Larsen Unit No. 8, a natural gas fired combined cycle unit has a nameplate generating capacity of 131.5 MW at present. Larsen Unit No. 8 began its simple cycle operation in July 1992, and combined cycle operation in November of that year. A fogger system was re-commissioned during the Fall of 2022, which provides an additional 3 MW of Summer Capacity. A new Peak Fire controls system was also implemented and commissioned during the Fall of 2022, which added 2 MW of year-round capacity.

In 1994, Lakeland made the decision to retire the first unit at the Larsen Plant, Steam Unit No. 4. This unit, put in service in 1950 with a capacity of 20 MW, 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 50 MW oil fired steam unit.

In 1999, the construction of McIntosh Unit No. 5, a simple cycle, natural gas fired combustion turbine was completed, having a summer nominal capacity of 225 MW. 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 gross capacity of the unit is 345 MW summer and 360 MW winter. In December of 2020, Unit No. 5 went through a major outage to install “NextGen Hardware” that increased the capacity of the combined cycle to 339 MW (net 332 MW) in summer and 385 MW (net 378 MW) in winter. Addition of Steam Power Augmentation (SPAG) increased the capacity to 349 MW (net 342 MW) in summer and 395 MW (net 388 MW) in winter. The final capacity was made achievable to 359 MW in summer and 405 MW in winter with SPAG and Flex Fire combined.

During the summer of 2001, Lakeland took its first step into the world of distributed generation with the groundbreaking of its Winston Peaking Station. The Winston Peaking Station consists of 20 quick start reciprocating internal combustion (RICE) engines each driving a 2.5 MW electric generator. This provides Lakeland with 50 MW of peaking capacity that can be started and put online at full load in ten minutes. The Station went in commercial operation in December 2001.

McIntosh Gas Turbine No. 2 at the McIntosh Plant was online on June 22, 2022. This unit has gross ratings of 125 (120) MW in winter (summer). McIntosh Unit No. 3 (a coal unit) was retired from its operations on April 4, 2021. This unit had been in operation since 1982. The decision to retire this unit was made possible due to significant savings realized on fuel and operation cost compared to energy from natural gas-based generation. While ensuring that LE’s capability grows and changes with time to supply low cost and environmentally friendly electricity to its customers, LE built six (6) new small modular reciprocating internal combustion engines (RICE) in McIntosh power plant. Each unit is now capable of producing 20 MWs in less than 2 minutes for a total of 120 MWs in total. This enhanced flexibility of these units will help to firm up the energy variability of solar units being planned in Lakeland's territory in near future. Engines 4-6 were made available in December 2024 and remaining three were made commercially available in January 2025. LE plans to install additional 74.8 MW solar capacity in 2027.

2.1.2 Transmission

The first phase of the Lakeland 69 kV transmission system became operational 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 the 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 the town. At the same time, the old tie to Bartow was reinsulated for a 69 kV line and went into 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 the 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 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 a generation unit at its McIntosh Power Plant that resulted in a new 230/69/12kV substation being built and energized in March of that year. The Tenoroc substation replaced the switching station called North McIntosh. In addition to Tenoroc, another new 230/69/12kV substation was built. The substation, Interstate, went into operation in June of 1999 and is connected by what was the McIntosh West 230 kV line. This station was built to address concerns on 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 its 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 Company (TECO), 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 including a 69 kV tie line at Larsen Plant with TECO, was established in 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 Progress Energy of Florida (PEF), now Duke Energy Florida (DEF) and Lakeland's West substation and was subsequently upgraded and replaced with the current two 230 kV lines to PEF in 1981. At the same time, Lakeland was interconnected with the 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 had a 30-year firm power-wheeling contract with Ridge to wheel up to 40 MW of their power to DEF. In early 1996, a new substation, East, was installed in the Larsen Plant to the Ridge 69 kV transmission line. However, as of January 31, 2019, Ridge Generating Station was permanently shut down. As a result, the 69 kV East to Ridge tie line was no longer in use. 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 230 kV ties and one 69 kV 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 DEF, providing greater reliability.

At present, Lakeland has a total of about 130 miles of 69 kV and 28 miles of 230 kV transmission lines in service along with six 150 MVA 230/69 kV autotransformers. In 2020, Lakeland added a 150 MVA 69/13.8 kV auto transformer to connect the recently installed McIntosh Gas Turbine No. 2 into the Distribution System. In February 2022, Lakeland completed building the new 69/12.47 kV Bridgewater substation to accommodate the rising electric demand in the northeastern part of the service area. In September 2024, the Opal Fuels 69/4.16kV substation, located near the previous Ridge Generation plant, was put into service to serve the new Opal Fuels customer. The East to Ridge 69 kV transmission line was extended to serve the new Opal Fuels 69/4.16kV substation. The East to Opal Fuels 69kV line and the Opal Fuels 69/4.16kV substation were energized in September 2024.

To accommodate the rising electric demand in the southwest part of the service area, Lakeland is in the process of building a new 69/12.47 kV substation on Hamilton Rd. The new 69/12.47kV Hamilton substation will be served by the Hamilton-Dranefield 69kV line and is expected to be in service by Summer 2025. Hamilton substation is planned to have an additional 69 kV transmission line connected to TECO's JD Page Substation, which is expected to be in service in 2027. Lakeland has installed six Reciprocating Internal Combustion Engine (MREP) units (each of 20 MW) at McIntosh Power Plant site. This MREP plant is linked to the grid via a new MREP-Tenoroc 69 kV line, which became operational in January 2025.

2.2 General Description: Lakeland Electric

2.2.1 Existing Generating Units

This section provides additional details on Lakeland Electric's existing generating plants. Lakeland Electric's existing generating units are located at two different plant sites: Charles Larsen Memorial (Larsen) and C.D. McIntosh Jr. (McIntosh). Both plant sites are located at Lake Parker in Polk County, Florida. The two plants have multiple units with different technologies and fuel types. Table 2-1 provides technical and other general characteristics of all Lakeland Electric generating units.

The Larsen plant site is located on the south-east shore of Lake Parker in Lakeland. The site has three units. Larsen Unit 8 (CC) has a net winter (summer) capacity of 124 MW (114 MW). The Unit's combustion turbine has a net winter (summer) rating of 95 MW (85 MW).

Larsen 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 the primary fuel with diesel as the backup. These two units are temporarily out of service for major maintenance.

Historically, Larsen Unit No. 5 consisted of a boiler for steam generation and steam turbine generator 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, Larsen Unit No. 8, was added to the facility. This allowed the gas turbine (Larsen Unit No. 8) to generate electricity and the waste heat from the gas turbine to repower the former Larsen Unit No. 5 steam turbine in a combined cycle configuration.

The McIntosh site, located in the City of Lakeland along the northeastern shore of Lake Parker, spans 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 site currently comprises eleven (11) units in commercial operation, with a total net winter (summer) rating of 840 MW (777 MW), as shown in Table 2-2. McIntosh Gas Turbine 1 consists of a General Electric combustion turbine with a net winter (summer) output rating of 19 MW (17 MW). Whereas Gas Turbine No. 2 has a total net winter (summer) capacity of 125 MW (120 MW) and was installed in the summer of 2020.

McIntosh Unit No. 3, a 342 MW net pulverized coal-fired steam unit, was owned 60% by Lakeland Electric and 40% by the OUC. The unit was retired on April 4, 2021. Decommissioning of Unit 3, along with the previously retired Units 1 and 2 at the McIntosh Plant, was completed in 2024, and the units have been removed from the site. Two small internal combustion engines, each with a net output of 2.5 MW, remain at the McIntosh site and will continue to operate.

McIntosh Unit No. 5, a Siemens 501G combined cycle unit, was initially built and operated as a simple cycle combustion turbine that was placed into commercial operation in May 2001. The unit was taken out of service 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 net winter (summer) rating of 354 MW (338 MW). The unit is equipped with Selective Catalytic Reduction (SCR) for NO_x control. In December of 2020, Unit 5 underwent through a major outage, with Siemens' Next Gen Hardware, that increased the capacity of the combined cycle to 339 MW (net 332 MW) in summer and 385 MW (net 378 MW) in winter; the capacity with Steam Power Augmentation (SPAG) to 349 MW (net 342 MW) in summer and 395 MW (net 388 MW) in winter; and capacity with SPAG and Flex Fire to 359 MW (net 352 MW) in summer and 405 MW (net 398 MW) in winter.

Lakeland Electric constructed 50 MW peaking units adjacent to its Winston Substation in 2001. The purpose of the peaking plant is to provide additional quick start generation capability for Lakeland's changing system demand and during the times of high demand assuring extra reliability in Lakeland's System operation. The Winston station consists of twenty (20) cylinder RICE engines producing 2.5 MW of generation each. Altogether, the 20 diesel engines provide 50 MW of installed Capacity. The units are currently fueled by #2 fuel oil but have the capability to burn a mix of 5% by #2 oil and 95% natural gas. Lakeland Electric 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.

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 (FDEP).

Power generated at Winston Peaking Station goes directly into Winston Substation at 12.47 kV distribution level of the substation and has sufficient capacity to serve the substation loads. Winston Substation serves several of Lakeland Electric's largest and most critical accounts. Should the Winston Substation lose all three 69 kV circuits to the substation, the WPS can be online and serving load within ten minutes. In addition to increasing the substation's reliability, this arrangement allows Lakeland to delay the installation of a third 69kV to 12.47kV transformer by several years and contributes to lowering loads on Lakeland's transmission system.

2.2.2 Planned Unit Retirements

Lakeland Electric recently retired its McIntosh Unit No. 3 - a coal-fired steam unit in 2021. As an enhanced fleet modernization effort, Lakeland Electric will evaluate the performance of existing older peaking units and examine how LE can meet future power demand in a more innovative and reliable way. This may require retiring some additional older and less-efficient gas or oil units in the future.

2.2.3 *Planned Unit Additions*

Lakeland Electric recently added six (6) modular size (20 MW each, 120 MW total) reciprocating internal combustion (RICE) engines which were made commercial in January 2025. These units are expected to maintain the resource adequacy and flexibility in Lakeland Electric System. Additionally, plans are underway to expand solar infrastructure, and LE continues to conduct feasibility studies on integrating solar with battery storage and microgrid solutions to best meet the future energy needs of its customers

2.2.4 Power Purchase Agreements (PPAs)

Lakeland Electric has secured a long-term (20-25 years) PPAs with various solar private developers in its territory. There are five different solar farms ranging from small installed capacity of 250 kW in Lakeland Center to 3.15 MW near the airport. The total installed capacity is about 14.4 MW which is available to Lakeland customers as of now. When energy is available during the daytime, Lakeland Electric obtains about 50% of the firm capacity from these solar farms during summer. Lakeland Electric entered into a power purchase agreement with Edge Solar to commence commercial operations of 74.8 MW solar no later than March 1, 2027. Site preparation is currently in progress, with Edge Solar finalizing the engineering plans for the project. Meanwhile, Lakeland Electric is conducting interconnection studies to ensure seamless integration with the existing grid. Once these evaluations are complete, construction will commence, marking a significant milestone in the project's development.

In addition to solar PPAs, LE has a firm PPA with OUC for up to 100 MW during the summer and 50 MW during the winter in 2025 and 2026. This agreement ensures that LE maintains a 15% minimum capacity reserve, meeting the reliability standards set by the Florida Reliability Coordinating Council (FRCC) and the Florida Public Service Commission. With a combination of existing and planned PPAs, along with LE’s current and future resources, the utility is projected to have sufficient capacity to meet reserve margin requirements through 2034 (see Table 6.2).

2.3 Service Area

Lakeland Electric's electric service area is shown on Figure 2-1 and is entirely located in Polk County. Lakeland Electric serves approximately 246 square miles, with approximately 174 square miles outside of Lakeland's city limits.

Figure 2.1: Lakeland Electric Service Area Map

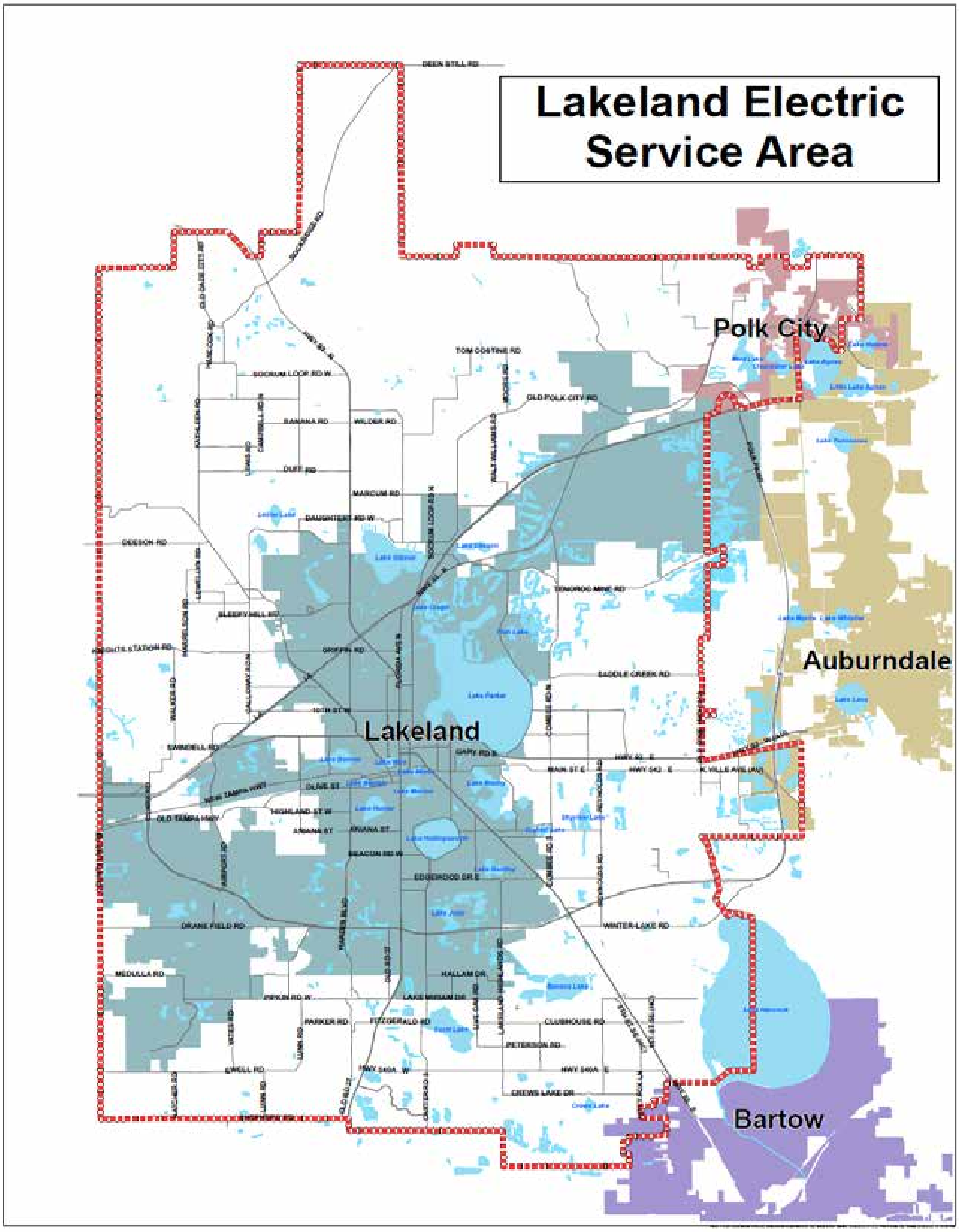

Table 2.1: Existing Generation Facilities

Table 2-1
Lakeland Electric Existing Generating Facilities

				Fuel[4]		Fuel Transport[5]						Net Capability[2]	
Plant Name	Unit No.	Location	Unit Type[3]	Pri	Alt	Pri	Alt	Alt Fuel Days Use[1]	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Summer MW	Winter MW
Charles Larsen Memorial	GT2*	16-17/28S/24E	GT	NG	DFO	PL	TK	NR	11/62	Unknown	11,250	10.0	14.0
	GT3*		GT	NG	DFO	PL	TK	NR	12/62	Unknown	11,250	9.0	13.0
	8		CA	WH	---	---	---	---	04/56	Unknown	30,000	29.7	29.7
	8		CT	NG	DFO	PL	TK	NR	07/92	Unknown	101,520	84.7	94.7
Plant Total												114.4	124.4

[1]LAK doesnot maintain records of the days the alternative fuel is avalable in reserve.[2]Net Normal, * on Long term scheduled maintenance

[2]Net Normal

Source: Lakeland Energy Supply Unit Rating Group

[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	WH Waste Heat	TK Truck
GT Combustion Gas Turbine	NG Natural Gas	
ST Steam Turbine		

Table 2.2: Existing Generation Facilities

Table 2-2

Lakeland Electric Existing Generating Facilities

				Fuel[4]		Fuel Transport[5]						Net Capability	
Plant Name	Unit No.	Location	Unit Type[3]	Pri	Alt	Pri	Alt	Alt Fuel Days Use[2]	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Summer MW	Winter MW
Winston Peaking Station	1-20	21/28S/23E	IC	DFO	---	TK	---	NR	12/01	Unknown	2,500 each	50.0	50.0
Plant Total												50.0	50.0
C.D. McIntosh, Jr.	D1	4-5/28S/24E	IC	DFO	---	TK	---	---	01/70	Unknown	2,600	2.5	2.5
	D2		IC	DFO	---	TK	---	---	01/70	Unknown	2,600	2.5	2.5
	GT1		GT	NG	DFO	PL	TK	NR	05/73	Unknown	26,640	17.0	19.0
	GT2		GT	NG	DFO	PL	TK	NR	06/20	Unknown	130,050	119.5	124.5
	5		CT	NG	---	PL	---	---	05/01	Unknown	292,950	234.0	280.0
	5		CA	WH	---	---	---	---	05/02	Unknown	135,000	118.0	118.0
	MREP 1-3		IC	NG	---	PL	---	---	01/25	Unknown	60,800	59.5	59.5
	MREP 4-6		IC	NG	---	PL	---	---	12/24	Unknown	60,800	59.5	59.5
Plant Total												612.5	665.5
System Total												**776.9**	**839.9**

[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	WH Waste Heat	TK Truck
GT Combustion Gas Turbine	NG Natural Gas	ST Steam
IC Internal Combustion		

3.0 Forecast of Electric Demand and Energy

Lakeland Electric (LE) prepares a comprehensive short-term (1-year) electric load and energy forecast annually for budgeting and operational studies. Additionally, a long-term (10-year) forecast is developed each year to support the Utility's strategic planning efforts, including LE's Ten-Year Site Plan (TYSP).

Energy Sales and customer forecasts of monthly data are prepared by rate classification. Separate forecast models are developed for inside and outside the City of Lakeland corporate limits for the Residential, Commercial, Industrial and other (municipal departments and outdoor lighting) rate classifications. Monthly forecasts are summarized annually using fiscal period ending September 30th for the short-term budget forecast and by calendar year for long-term studies and reporting.

Lakeland Electric uses MetrixND, an advanced statistical forecasting software tool, developed by Itron, to assist with the development of LE's number of customers, energy and demand forecasts. Lakeland Electric uses MetrixLT, another Itron software tool, which integrates with MetrixND to develop the long-term system hourly load forecast.

The modeling techniques used to generate the forecasts include multiple regression, study of historical relationships and growth rates, trend analysis, and exponential smoothing. Lakeland Electric utilizes Itron's Statistically Adjusted End-Use (SAE) econometric modeling approach for the residential and commercial sectors. The SAE approach is designed to capture the impact of changing end-use saturation and efficiency trends, by building type, as well as economic conditions on long-term residential and commercial energy sales and demand.

Many variables are evaluated for the development of the forecasts. The variables that have proven to be significant and are included in the forecasts are weather, gross regional product, disposable personal income per household, persons per household, number of households, local population, electricity price, building type, appliance saturation and efficiency. Binary variables are used to explain outliers in historical billing discrepancies, trend shifts, monthly seasonality, rate migration between classes and other issues that could affect the accuracy of forecast models.

Weather variables

Heating and cooling degree days are weather variables that attempt to explain a customer's usage behavior as influenced by either hot or cold weather. Heating Degree Days (HDD) occur when the average daily temperature is less than Lakeland Electric's established base temperature of 65 degrees Fahrenheit. Cooling Degree Days (CDD) occur when the average daily temperature is greater than 65 degrees. The formulas used to determine the number of degree days are:

HDD = Base Temperature (65) – Average Daily Temperature

CDD = Average Daily Temperature – Base Temperature (65)

These HDD and CDD variables are used in the forecasting process to correlate electric consumption with weather. The HDD and CDD variables are weighted to capture the impacts of weather on revenue from monthly billed consumption.

Lakeland Electric uses weather data from its own weather stations, which are strategically placed throughout the electric service territory to provide the best estimate of overall temperature for the Lakeland Electric service area.

The most recent 20 years of historical normal weather is used as an input into the sales forecast models.

Normal peak-producing weather is also developed using historical 20-years weather. A weighted average of temperatures on both the day of historical monthly peak and day prior to peak is used to create the HDD and CDD variables.

Economic and demographic variables

The economic and demographic projections used in the forecasts are purchased from Moody's Analytics.

Price variables

A real price forecast by month and rate class is created based on Lakeland Electric historical price data, projections from the Lakeland Electric Rates and Fuel teams, the U.S. Energy Information Administration (EIA) Annual Energy Outlook (AEO) forecasted price of electricity, historical and projected Net Energy for Load, and the projected Consumer Price Index. The 12-month moving average of projected real price of electricity is the price variable used in the sales and demand SAE models.

Structural Indices

The end-use saturation and efficiency indices used in the models are purchased from Itron. Itron's Energy Forecasting Group (EFG) offers end-use data services and forecasting support. EFG's projections are based on data derived from the EIA's AEO forecast for the South Atlantic Census Division. Itron is also contracted to further calibrate the indices based on Lakeland Electric's service area using average square feet by building type for the Commercial Sector and average use by dwelling type for the Residential Sector.

Lakeland Electric reviews the forecasts for reasonableness, compares projections to historical patterns, and modifies the results as needed using informed judgment.

Historical monthly data is available and is analyzed for the 20-year period. Careful evaluation of the data and model statistics is performed; this often results in most models being developed using less than a 10-year estimation period.

Lakeland Electric currently does not have any specific energy savings goals through Demand Side Management (DSM) programs; therefore, Lakeland Electric does not assume any deductions in peak load for the forecast period.

3.1 Service Territory Population Forecast

Electric Service Territory Population Estimate

Lakeland Electric's service area encompasses approximately 246 square miles, approximately 171 square miles of which are outside the City of Lakeland's corporate limits. The estimated electric service territory population for Lakeland Electric in 2024 was 315,830.

Population Forecast

Lakeland Electric's service territory population is projected to increase at an estimated 1.26% average annual growth rate (AAGR) for years 2025 – 2034.

Polk County's population (Lakeland / Winter Haven MSA) is expected to grow at 1.47% AAGR for the same 10-year period. Historically, Polk County's population has grown faster than LE's service territory population.

PEV Forecast

Lakeland Electric included Plug-In Electric Vehicles (PEV) loads in the demand and energy forecast for the current planning period. We used a load profile provided by Itron consultants (and verified with our known EV customer hourly loads) that assumed no incentives for charging. We estimated the number of electric vehicles in our service area based on Department of Motor Vehicles (DMV) data for Polk County and made projections based on historical trends and expected saturation rates for Electric Vehicles. The EV forecast was added to the total sales forecast. We scaled the hourly EV load profile to estimate the projected impact at time of peak demand.

3.2 Accounts Forecast

Lakeland Electric forecasts the number of monthly electric accounts for the following categories and subcategories:

- Residential, Inside and Outside City Limits
- Commercial, Inside and Outside City Limits
- Industrial, Inside and Outside City Limits
- Other, Inside and Outside City Limits

3.2.1 Residential Accounts

A regression model is used to develop the Residential account forecast using monthly customer data. Total Residential accounts are projected as a function of number of households in the Lakeland / Winter Haven Metropolitan Statistical Area (MSA). Binary variables are used to explain outliers in historical billing data and to account for seasonality.

3.2.2 Commercial Accounts

Commercial accounts consist of the General Service (GS), General Service Business Demand (GSBD) and General Service Demand (GSD) rate classes.

Due in large part to energy efficiency, Lakeland Electric is experiencing a long-term trend of General Service Large Demand (GSLD) customers migrating to Commercial rate classes. For this reason, a regression model combining both Commercial and GSLD rate classes is being used. The number of Commercial and GSLD accounts is projected as a function of the moving average of projected residential accounts.

A ratio of the Commercial and GSLD rate classes is then applied to generate the Commercial and GSLD account forecasts.

3.2.3 Industrial Accounts

Industrial accounts consist of General Service Large Demand (GSLD), Interruptible (INT) and Extra-Large Demand Customer (ELDC) rate classes.

The GSLD rate class consists of customers with a billing demand greater than 500 kW, at least three times, over the past 12 months. As noted in section 3.2.2, the GSLD account forecast is a ratio of the combined Commercial and GSLD account forecast.

The INT rate class consists of customers with a billing demand greater than 1000 kW, at least three times, over the past 12 months.

The ELDC rate class consists of customers with a billing demand greater than 5000 kW at least three times over the past 12 months.

Projections for INT and ELDC accounts are modeled independently of MetrixND. Special consideration is given to account for new major commercial and industrial development projects that may impact future demand and energy requirements.

3.2.4 Other Accounts

The Other account category consists of Municipal, Electric and Water Department accounts within the City of Lakeland, as well as private area lighting and roadway lighting.

Historical data for these classes is inconsistent and difficult to model. Therefore, account projections for this category are based on time trends and historical growth rates. Lakeland Electric also takes into consideration any future projects and potential developments. These forecasts are developed outside of MetrixND.

3.2.5 Total Accounts Forecast

The Total Account Forecast for Lakeland Electric is the sum of all the individual forecasts mentioned above.

3.3 Energy Sales Forecast

Lakeland Electric's Energy Sales Forecast is the sum of the following forecasts:

- Residential, Inside and Outside City Limits
- Commercial, Inside and Outside City Limits
- Industrial, Inside and Outside City Limits
- Other, Inside and Outside City Limits

3.3.1 Residential Energy Sales Forecast

The Residential energy sales forecast is developed using the Statistically Adjusted End-Use (SAE) econometric modeling approach.

The residential sales models are estimated with historical monthly energy sales data. They are average use models based on the following equation:

$$AvgUse_{y,m} = b_0 + b_1\, XCool_{y,m} + b_2\, XHeat_{y,m} + b_3\, XOther_{y,m} + \varepsilon_{y,m}$$

Where $XCool_{y,m}$, $XHeat_{y,m}$ and $XOther_{y,m}$ are explanatory variables constructed from weather data, end use equipment efficiency and saturation trends, economic and demographic data, dwelling type (single family, multi family or mobile home) and square footage.

For example, *XCool* incorporates cooling equipment saturation levels, cooling equipment efficiency, thermal efficiency, thermal integrity and square footage by dwelling type, household income, persons per household, price of electricity and CDDs.

This cooling variable is represented by the product of an end use equipment index and a monthly usage multiplier.

That is,

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

Where

$XCool_{y,m}$ is the estimated cooling energy use in year (y) and month (m)

$CoolIndex_y$ is the annual index of cooling equipment

$CoolUse_{y,m}$ is the monthly usage multiplier

The $CoolIndex_{y,m}$ is calculated as follows:

$$CoolIndex_y = Structural\ Index_y \times \sum_{Type} Weight^{Type} \times \frac{\left(\frac{Saturation_y^{Type}}{Efficiency_y^{Type}} \right)}{\left(\frac{Satataturation_Y^{Type}}{Efficiency_Y^{Type}} \right)}$$

Where

The *StructuralIndex* is constructed by combining the EIA's building shell efficiency index trends with surface area estimates, indexed to the base year value:

$$StructuralIndex_y = \frac{BuildingShellEfficiencyIndex_y \times SurfaceArea_y}{BuildingShellEfficiencyIndex_Y \times SurfaceArea_Y}$$

Type is the cooling equipment type (Room Air Conditioning, Central Air Conditioning, Air Source Heat Pump, Ground Source Heat pump). Currently, the base year *Y* in the EFG residential end use energy projections is 2015.

$CoolUse_{y,m}$ is defined as follows:

$$CoolUse_{y,m} = \left(\frac{CDD_{\ y,m}}{CDD_{\ Y}}\right) \times \left(\frac{HHSize_{\ y,m}}{HHSize_{\ Y}}\right)^{\alpha} \times \left(\frac{HHIncome_{\ y,m}}{HHIncome_{\ Y}}\right)^{\beta} \times \left(\frac{Price_{y,m}}{Price_{\ Y}}\right)^{\gamma}$$

Where

HHSize is average household size (persons per household)

HHIncome is average income per household

α , β , γ are the elasticities

Y is the Base Year

The *XHeat* variable is constructed in the same manner as the XCool variable, with cooling equipment replaced by heating equipment and CDDs replaced by HDDs. The heating equipment types used to construct the XHeat variable are furnace, air-source heat pump, ground-source heat pump, secondary heating and furnace fans.

The corresponding $HeatUse_{y,m}$ variable is defined as follows:

$$HeatUse_{y,m} = \left(\frac{HDD_{\ y,m}}{HDD_{\ Y}}\right) \times \left(\frac{HHSize_{\ y,m}}{HHSize_{\ Y}}\right)^{\alpha} \times \left(\frac{HHIncome_{\ y,m}}{HHIncome_{\ Y}}\right)^{\beta} \times \left(\frac{Price_{y,m}}{Price_{\ Y}}\right)^{\gamma}$$

The *XOther* variable includes the equipment types that are not influenced by weather and constitute the base load portion of residential energy consumption. The equipment types included are electric water heating, electric cooking, refrigerator, freezer, dishwasher, electric clothes washer, electric clothes dryer, television, lighting and miscellaneous electric appliances.

The corresponding $OtherUse_{y,m}$ variable is defined as follows:

$$OtherUse_{y,m} = \left(\frac{BDays_{y,m}}{30.44}\right) \times \left(\frac{HHSize_{\ y,m}}{HHSize_{\ Y}}\right)^{\alpha} \times \left(\frac{HHIncome_{\ y,m}}{HHIncome_{\ Y}}\right)^{\beta} \times \left(\frac{Price_{y,m}}{Price_{\ Y}}\right)^{\gamma}$$

Instead of a weather variable, the OtherUse formula contains a BDays variable, which represents the number of billing days in year (y) and month (m). These values are normalized by 30.44, the average number of days in a month.

The equation used to develop the total residential energy sales forecast is:

$$ResidentialSales_{y,m} = ResidentialCustomer_{y,m} \ ´ \ AverageUsePerCustomer_{y,m}$$

3.3.2 Commercial Energy Sales

As mentioned in section 3.2.2, there is an increase in rate migration between the GSLD and Commercial rate classes due to energy efficiency. Therefore, a combined Commercial and GSLD energy sales model is generated. This model is developed using the SAE modeling approach for Commercial building types using EFG projections derived from EIA data. The Commercial sales model is driven by Gross Regional Product, price of electricity, number of households, weather, commercial building type, appliance saturations and efficiencies. Binary variables are used to help explain fluctuations in historical billing data due to rate migrations, billing discrepancies, seasonality and other factors that may affect the accuracy of the forecast models.

The Commercial SAE model framework defines energy use in a year as the sum of energy used by the heating equipment, cooling equipment and other equipment. The formal model equation is:

$$USE_{y,m} = b_0 + b_1 \, x \, XCool_{y,m} + b_2 \, x \, XHeat_{y,m} + b_3 \, x \, XOther_{y,m} + \varepsilon_{y,m}$$

Where $XCool_{y,m}$, $XHeat_{y,m}$ and $XOther_{y,m}$ are explanatory variables constructed from weather data, end use equipment efficiency and saturation trends, economic projections, commercial building type and square footage.

The $XCool_{y,m}$ variable is the amount of energy used by cooling systems and is defined as:

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

Where

$XCool_{y,m}$ is the estimated cooling energy use in year (y) and month (m)

$CoolIndex_y$ is the annual index of cooling equipment

$CoolUse_{y,m}$ is the monthly usage multiplier

The cooling equipment index depends on equipment saturation levels (*CoolShare*) normalized by operating efficiency levels (*Efficiency*):

$$CoolIndex_y = CoolSales_Y \times \frac{\left({CoolShare_y}/{Efficiency_y} \right)}{\left({CoolShare_Y}/{Efficiency_Y} \right)}$$

Base year cooling sales are defined as:

$$CoolSales_Y = \left(\frac{kWh}{Sqft} \right)_{Cooling} \times \left(\frac{CommercialSales_Y}{\sum_e^{kWh} / Sqft_e} \right)$$

Base-year cooling sales are the product of the average space cooling intensity value and the ratio of the total commercial sales in the base year over the sum of the end use intensity values.

The monthly Commercial *CoolUse* variable is computed as:

$$CoolUse_{y,m} = \left(\frac{CDD_{\ y,m}}{CDD_{\ Y}}\right) \times \left(\frac{EconVar_{\ y,m}}{EconVar_{\ Y}}\right)^{\alpha} \times \left(\frac{Price_{\ y,m}}{Price_{\ Y}}\right)^{\beta}$$

Where

EconVar is a function of Household growth and Gross Regional Product
α, β are elasticities

The *XHeat* variable has the same structure as the *XCool* variable, with cooling equipment replaced by heating equipment, and CDDs replaced by HDDs. The corresponding monthly $HeatUse_{y,m}$ variable is defined as:

$$HeatUse_{y,m} = \left(\frac{HDD_{\ y,m}}{HDD_{\ Y}}\right) \times \left(\frac{EconVar_{\ y,m}}{EconVar_{\ Y}}\right)^{\alpha} \times \left(\frac{Price_{\ y,m}}{Price_{\ Y}}\right)^{\beta}$$

The *XOther* variable is also similar in structure to the XCool variable, and replaces cooling equipment with other equipment (ventilation, electric water heating, cooking equipment, refrigeration, lighting, office equipment and miscellaneous equipment). Instead of a weather variable there is a *BDays* variable, which represents the number billing days in year (y) and month (m), normalized by 30.44 days (the average number of billing days in a month.)

The corresponding $OtherUse_{y,m}$ variable is defined as:

$$OtherUse_{y,m} = \left(\frac{BDays_{\ y,m}}{30.44}\right) \times \left(\frac{EconVar_{\ y,m}}{EconVar_{\ Y}}\right)^{\alpha} \times \left(\frac{Price_{\ y,m}}{Price_{\ Y}}\right)^{\beta}$$

3.3.3 Industrial Energy Sales

While the GSLD demand and energy sales are forecast in combination with Commercial energy sales, the remainder of the Industrial class – the INT and ELDC rate classes - are modeled independently of the SAE methodology. Each INT and ELDC customer is evaluated individually to account for their expected future energy and demand consumption, using average historical growth rates, monthly demand and expected future changes to load based on information provided by various sources, including account managers, LE engineering, local news and informed judgement.

3.3.4 Other Sales Forecast

The Other energy sales forecast consists of sales for the City's Municipal, Electric and Water Departments, private area lighting, roadway lighting and unmetered street lighting rate classes. Models are difficult to develop for these rate classes due to the large fluctuations in the historical billing data. Therefore, the projections for this category are based on historical trends and growth rates. Special consideration is given to account for new projects and potential developments.

3.3.5 Total Sales Forecast

The results of the energy sales forecasts for all revenue classes are added together to create a total sales forecast.

Lakeland Electric currently does not have any adopted energy efficiency goals, therefore LE does not assume any deductions in peak load for the forecast period.

3.4 Net Energy for Load Forecast

A loss factor of approximately 3.4% is applied through 2034 to convert total energy sales to Net Energy for Load (NEL). The loss factor is developed using a historical average of the estimated amount of energy lost during the generation, transmission and distribution while delivering energy to the customers. The actual loss factor in 2024 was 4.4% for Lakeland Electric System.

3.5 Peak Demand Forecast

A regression model is estimated in MetrixND to forecast monthly peaks. The model is developed using Itron's SAE modeling approach to ensure that end-use appliance saturations and efficiencies that may affect peak are being accounted for. The models are driven by monthly energy coefficients and normal peak-producing weather conditions.

The winter peak forecast is developed under the assumption that its occurrence will be on a January weekday. Historical winter peaks have occurred between the months of December to March, between the hours of **7** a.m. and 9 a.m. Temperatures at time of winter peaks range from 19° F to 51° F.

The summer peak forecast is developed under the assumption that its occurrence will be on a July weekday. Historical summer peaks have occurred between the months of June to September, on weekdays, and between the hours of 3 p.m. and 6 p.m. Temperatures at time of summer peaks range from 90° F to 101° F.

We adjust our forecast to subtract out projected customer owned solar generation from total sales.

3.6 Hourly Load Forecast

Twenty-four hourly regression models are developed in MetrixND to generate the 20-year hourly load shape. Each of these models relates weather and calendar conditions (day-of-week, month, holidays, seasonal periods, etc.) to load. The uncalibrated 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 produced using MetrixND.

3.7 Sensitivity Cases

3.7.1 High and Low Load Forecast Scenarios

A forecast is generated based on projections of its drivers and assumptions at the time of forecast development. This base load forecast ("50^{th} percentile") which is the median of simulation values based on historical weather pattern is intended to represent "most likely" load to occur.

There may be some conditions arising that may cause variation from what is expected in the base forecast. For these reasons, high and low case scenario forecasts are developed for customers, energy sales, system net energy for load and peaks. The high and low forecasts are based on variations of the primary drivers including population and economic growth. The 90^{th} percentile forecast ("90/10") represents the high load scenario.

Model Evaluation and Statistics

The results of the Electric Load and Energy Forecast are reviewed by an outside consultant. Itron is contracted to review all sales, customer, peak and energy forecast models for reasonableness and statistical significance. Itron also evaluates and reviews all key forecast assumptions.

Additionally, the MetrixND software is used to calculate statistical tests for determining a significant model, including Adjusted R-Squared, Durbin-Watson Statistic, F-Statistic, Probability (F-Statistic), Mean Absolute Deviation (MAD) and Mean Absolute Percentage Error (MAPE).

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4.0 Energy Conservation & Management Programs

Lakeland Electric is committed to promoting the efficient use of electric energy and providing cost-effective energy conservation and demand reduction programs for its customers. Lakeland Electric is not subject to the Florida Energy Efficiency and Conservation Act (FEECA) rules but has in place several Energy Conservation & Management Programs and remains committed to utilize both supply- and demand-side options that will benefit its customers. Presented in this section are the currently active energy efficiency and solar incentive programs from Lakeland Electric.

4.1 Conservation Programs 2024

In keeping with Lakeland Electric's plan to promote retail energy conservation programs, the utility is continuing the following activities as of December31, 2024:

Residential

- Insulation rebate – Up to $300 rebate for adding attic insulation to achieve R30 total. Certificate issued to resident at energy audit/visit and redeemed to Insulation Contractor. Can be homeowner installed.
- HVAC Maintenance Incentive - $100 rebate for residential customers that have A/C maintenance done.
- Heat Pump Rebate - $300 rebate for installing a SEER 15 or higher heat pump.
- LED Lighting – giveaway at audits, up to 3 per resident.
- Free Energy Audit
- Energy Star Appliance Rebates

Estimated Demand and Energy Savings for FY 2025

- 2.0 MW demand reduction and over 3,500 MWhs

The same level of savings on demand and energy was in year 2024.

4.2 Solar Program Activities

Lakeland Electric considers solar residential roof-top photovoltaic (PV) system as distributed generators irrespective of their connection to the grid. Solar being available during the daytime, it contributes to reduce system peak demand and energy, thereby avoiding the need to generate or purchase at higher costs. This helps to reduce the average cost of electricity to LE Customers.

4.2.1 Utility Interactive Net Metered Photovoltaic Systems

As of December 2024, there were approximately 2028 PV residential customers in the Lakeland Electric service territory. These PV systems have about 20,872 KW (DC) of installed capacity. Lakeland Electric has allowed the interconnection of these systems in a "net meter" fashion. There are also 124 batteries + rooftop solar customers in LE Service Territory

4.2.2 Utility Scale Solar PV Program

During November 2007, LE issued a Request for Proposal seeking an investor to purchase and install investor-owned PV systems totaling 24 MW on customer owned sites as well as City of Lakeland properties. During December 2007, a successful bidder was identified, and installation of the following PV systems began:

- Lakeland Electric's first Solar Energy Purchase Agreement (SEPA) was signed on July 21, 2009 for an investor-owned 250 kW PV system for a twenty-year commitment. The roof top system began commercial operation at the RP Funding Center on April 4, 2010.
- Phase I solar array was installed at the Lakeland Linder Airport with a SEPA that was initiated on November 9, 2010. This 2.25 MW PV system began operation on December 22, 2011, for a twenty-five-year term.
- Phase II of the Lakeland Linder Airport site is located off Hamilton Road and began shortly after Phase I. The SEPA for Phase II was initiated on December 9, 2010. Phase II is a 2.75 MW PV system that began operation on September 16, 2012, for a twenty-five-year term.
- Phase III is the most recent solar array added to the Lakeland Linder Airport site and is located off Medulla Road. Lakeland Electric entered a SEPA on March 2, 2015, for 3.15 MW PV. This solar array operation began on December 21, 2016, for a twenty-five-years term.

- Lakeland entered a SEPA with a solar vendor on November 25, 2013, for a 6.0 MW PV system located adjacent to the Sutton substation. The facility is commonly referred to as Bird blue or by the road intersection Bellavista/Sutton. It began generating power on July 6, 2015
- LE has signed a long-term Power Purchase Agreement (PPA) with Edge Solar LLC to begin commercial operations by March 1, 2027, for a 74.8 MW utility-scale solar project. Site preparation is currently in progress, and Edge Solar is finalizing the project's engineering and construction activities. Meanwhile, Lakeland Electric is conducting interconnection studies ahead of construction.

Lakeland Electric has a total of 14.4 MW of utility-scale solar capacity, which can generate approximately 2% of the average daytime system-wide summer load. Currently, total solar production is around 20,000 MWh annually. Additionally, net-metered solar customers generate and contribute approximately 8,000 MWh of energy back to the LE system annually.

4.2.3 Utility Solar Water Heating Program

During November 2007, LE issued a Request for proposal (RFP) for the expansion of its Residential Solar Water Heating Program. In this solicitation, Lakeland sought the services of a venture capital investor who would purchase, install, own, operate and maintain 3,000 – 10,000 solar water heaters on LE customers' residences in return for a revenue sharing agreement. LE would provide customer service and marketing support, along with meter reading, billing and collections. During December 2007, a successful bidder was identified and notified. In August 2009, LE approved a contract with the vendor with plans to resume installations of solar water heaters. Annual projected energy savings from this project will range between 7,500 and 25,000 MWh. These solar generators will also produce Renewable Energy Credits that will contribute toward Florida's expected mandate for renewable energy as a part of the utility's energy portfolio.

During the summer of 2010, the "Solar for Lakeland" program began installing residential solar water heaters. Under this expanded program, the solar thermal energy was sold for the fixed monthly amount of $34.95. All solar heating systems continued to be metered for customers' verification of solar operation and for tracking green credits for the utility. Through the end of 2017, there were 259 solar heaters installed in Lakeland residences. There are about 179 customers left as of December 2023.

4.2.4 PHEV and Energy Storage Activities

There are presently eleven Level 2 charging stations supported by Lakeland Electric for the City of Lakeland, available to customers at different prime locations in the LE territory. Lakeland Electric is also supporting an Amazon EV fleet hub with 311 Level 2 chargers. At present Amazon is supporting 102 EV last mile delivery vans, however they are prepared for growth. Additionally, there are approximately 50 Level 2 and Level 3 chargers located within the Lakeland Electric service territory that are provided by businesses for their customers. Lakeland Electric has no plans to install additional EV chargers however, we will continue to support other entities looking to provide EV charging.

At present there are no definitive plans for an energy storage platform, however as the Solar resources continue to grow, Lakeland Electric is aware of the need for storage to ensure resiliency and to manage power supply vs load demand.

4.2.5 Renewable Energy Credit Trading

Lakeland Electric's Renewable Energy Credits (REC) are produced from its five solar energy purchases made through PPAs that have a combined name plate capacity of 14.4 MW.

In January of 2019, Lakeland Electric set up an account with the North American Renewable Registry to start trading its solar RECs classified as Green-e-Eligible. A REC is created for every (1) Megawatt-hour of renewable electricity generated and delivered to the utility grid.

The utility's 2025 fiscal year forecast for RECS is about 17,500 in Center for Resource Solutions (CRS) Listed RECS which can sell for $2.00 to $3.00 in the state of Florida and about 500 in non-CRS listed RECS which can sell for $1.00 to $1.50 in the state of Florida.

Lakeland Electric has one (1) Solar Energy PPA that has reached the 15 years post Commercial Operations Date (COD) which is no longer eligible for CRS Listed RECS but remains eligible for non-CRS listed RECS. The remaining four (4) Solar Energy PPAs are eligible for CRS Listed RECS.

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5.0 Forecasting Method and Procedures

This section describes Lakeland Electric's long-term Integrated Resource Planning (IRP) process in which economic and fuel parameters are the major drivers to develop a long-term plan that helps to develop a portfolio that focuses on a best forward path for Lakeland Electric. This chapter also shows Lakeland Electric's position in the economy energy purchase and sales, both within the Florida Municipal Power Pool (FMPP) and with external electric utilities. Also explained are fuel supply arrangement and fuel price projections to be used in the long-term resource planning process.

5.1 Integrated Resource Plan (IRP)

In addition to the Ten -Year Site Plan process, Lakeland Electric utilizes an IRP process for meeting up to 10 years of forecasted energy demand plus reserve capacity through a combination of supply and demand-side resources along with economy energy purchase from the Florida Municipal Power Pool (FMPP) while meeting the objectives of environmental responsibility, reliability, and affordability for its customers. The IRP evaluates the risks and uncertainties related to regulation, marketplace and technologies based on known information and assumptions.

5.2 Florida Municipal Power Pool

Lakeland Electric is a member of the FMPP with the Orlando Utilities Commission (OUC) and the Florida Municipal Power Agency (FMPA). These three utilities operate as a single Balancing Authority (BA). All FMPP generating units are jointly committed and dispatched to optimize economic efficiency and ensure reliability across the entire FMPP Balancing Authority (BA).

The FMPP is not a capacity pool meaning that each member must plan for and maintain sufficient capacity to meet their own individual electric demand and operating reserve obligations. Lakeland Electric, therefore, must ultimately plan to meet its own load and reserve requirements as reflected in this document. Each member participates in a day ahead market in purchases or sales activities and all units are dispatched in an economic order. The FMPP provides an opportunity for members to purchase economy energy when available from other members.

5.3 Economic Parameters

Subsections of 5.3 present the assumed values adopted for economic parameters used in Lakeland Electric's planning process. The assumptions stated in this section are applied consistently throughout this document.

5.3.1 Inflation Rate

The general inflation rate applied is assumed to be 3.1% in 2025, 2.6% in 2026 and 2.4% thereafter based on Moody's CPI forecast as of March 2025.

5.3.2 Bond Interest Rate

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

5.3.3 Present Worth Discount Rate

The present worth discount rate used in the analysis is set equal to Lakeland Electric's assumed bond interest rate of 5.0 percent.

5.3.4 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.

5.3.5 Fixed Charge Rate

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 fixed charged rate calculation is an assumed 0.7 percent issuance fee, a 0.0 percent annual insurance cost, and there is no 6 months' debt reserve for Lakeland Electric.

5.4 Fuel Parameters

Subsections of 5.4 below outline the basic fuel assumptions and fuel delivery arrangement for Lakeland.

5.4.1 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 industrial 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 transported through pipelines and delivered to the customer either directly from the pipeline or through a distribution company or utility.

5.4.1.1 Natural Gas Supply and Availability

Significant natural gas reserves exist, both in the United States and throughout the North American mainland and coastal regions. Natural gas reserves are mostly dependent on domestic production. Production of natural gas from the Marcellus and Haynesville areas has increased due to advanced drilling technology which has lowered cost contributing to increased supply which reduces price volatility seen in recent years. During 2024, natural gas trading averaged around $2.193 per MMBtu as the market reacted to increased natural gas production combined with a warmer than expected winter resulting in higher storage inventories. The five-year NYMEX Henry Hub Natural Gas forward curve is currently projected to average around $3.853 per MMBtu.

5.4.1.2 Natural Gas Transportation

There are three transportation companies serving Peninsular Florida. Florida Gas Transmission Company (FGT), Sabal Trail Transmission, and Gulfstream Natural Gas System (GNGS). Lakeland Electric has interconnections and service agreements with GNGS and FGT to provide diversification and flexibility in gas delivery.

5.4.1.2.1 Florida Gas Transmission Company

FGT is an open access interstate pipeline company transporting natural gas for third parties through its 5,000 miles 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

FGT's total receipt point capacity is in excess of 3.0 billion cubic feet per day and includes connections with 12 intrastate pipelines to facilitate transfers of natural gas into its pipeline system. FGT reports a current delivery capability to Peninsular Florida of approximately 3.1 billion cubic feet per day. Lakeland Electric currently has in excess of 33,000 MMBtu/day of firm transportation with FGT for natural gas delivery to its generation facilities.

5.4.1.2.2 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, and 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 include 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.

FGT's Phase VIII Expansion Project came into full operation April 1, 2011. It consists of approximately 483.2 miles of multi diameter pipeline in Alabama, Mississippi and Florida with approximately 365.8 miles built parallel to existing pipelines. The project added 213,600 horsepower (HP) of additional mainline compression. One new compressor station was built in Highlands County, Florida. The project provides an annual average of 820,000 MMBtu/day of additional firm transportation capacity.

5.4.1.2.3 Gulfstream pipeline

The Gulfstream pipeline is a 744mile pipeline originating in the Mobile Bay region and crossing the Gulf of Mexico to a landfall in Manatee County (south Tampa Bay). The pipeline supplies Florida with up to 1.1 billion cubic feet of gas per day serving existing and prospective electric generation and industrial projects in southern Florida. Phase I of the pipeline is complete and ends in Polk County, Florida. The pipeline extends to Florida Power & Light's Martin Plant. Construction for the Gulfstream pipeline began in 2001 and it was placed in service in May 2002. Phase II was completed in 2005. Lakeland Electric added an additional 10,000 MMBtus/day of Gulfstream Pipeline capacity during 2017, for a total of 50,000 MMBtus/day.

5.4.1.2.4 Sabal Trail Transmission

The Sabal Trail pipeline is a 515 miles interstate pipeline originating in Central Alabama and terminating in Central Florida. The pipeline's Phase 1 facilities began commercial service July 3, 2017. The Phase 1 capacity of the pipeline is 830,000 Dth/day. Lakeland Electric is not currently a customer of Sabal Trail Transmission.

5.4.1.2.5 Transcontinental Gas Pipeline (TRANSCO)

The Transco Pipeline is a 10,000-mile interstate pipeline extending from south Texas to New York City. Lakeland Electric acquired 5,800 MMBtus/day beginning January 26, 2022 as a risk mitigation strategy to flow additional natural gas to both FGT and Gulfstream pipelines. The City entered into long-term prepaid Natural Gas baseload agreements until October 31, 2026 with an option to extend another five years.

5.4.2 Fuel Oil

5.4.2.1 Fuel Oil supply and Availability

Lakeland Electric obtains all 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 Electric's Fuels Section continually monitors the cost effectiveness of spot market purchasing.

5.4.2.2 Fuel Oil Transportation

Although Lakeland Electric 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.

5.4.3 Fuel Price Projections

This section presents the long-term price projections for natural gas and fuel oil. The fuel price forecast for solid fuel oil and natural gas is prepared by Lakeland Electric's Fuels Department. The natural gas forecast uses a blended average from a consultant forecast and the New York Mercantile Exchange (NYMEX) natural gas forward curve along with transport rate, usage, and fuel to provide a total delivered price. The oil prices use the ten-year NYMEX crude oil forward curve. The diesel oil forecast is, with respect to the percentage of growth, based off the Energy Information Administration's Annual Energy Outlook 2024.

5.4.3.1 Natural Gas Price Forecast

The price forecast for natural gas is based on historical prices and future expectations for the market. The forecast takes into account the spot purchases of gas to meet its needs along with its risk management holdings intended to reduce price volatility. To address the historic volatility of the natural gas market, Lakeland Electric initiated a formal fuel hedging program in 2003. The Energy Authority (TEA), a company located in Jacksonville, FL, is Lakeland Electric's consultant assisting in the administration and adjustment of policies and procedures, as well as the oversight of the program.

Lakeland Electric purchases "seasonal" gas to supplement the base requirement and purchases "as needed" daily gas, known commonly as "spot gas", to round out its supply needs.

Natural gas transportation from FGT is currently supplied under two rates in FGT's tariff; FTS-1 and FTS-3. Rates in FTS-1 are based on FGT's Phase II, III, IV, V, VI and VII, expansion. Rates in FTS-3 are based on the Phase VIII expansion, which went in service April 1, 2011. Lakeland added FTS-3 capacity to increase its capacity for new generation. Lakeland diversified its capacity with 56% Gulfstream, 38% FGT and 6% Transco. Lakeland entered an agreement with FGT so they could take control of one section of pipe previously under the control of Lakeland. This change also resulted in Lakeland's Gulfstream capacity utilizing an FGT delivery point at Lakeland's facilities, meaning that all deliveries Lakeland receives are through the FGT system. The FTS usage and fuel rates for FGT, Gulfstream and Transco listed below are effective from April 2025.

Table 5-1
Natural Gas Tariff Transportation Rates

Rates And Schedules	Rate Schedules					
	FGT FTS-1 w/surcharges (cents/DTH)*	FGT FTS-3 w/surcharges (cents/DTH)*	FGT ITS-1	Transco FT	Gulfstream FTS-1	Gulfstream FTS-6%
Reservation	51.5	72.5	74.82	9.839	55.00	70.41
Usage	5.59	3.54	0.00	1.09	0.69	0.69
Total	57.09	76.04	74.82	10.93	55.69	71.1
Fuel Charge	2.01%	2.01%	2.01%	0.32%	1.50%	1.50%

* A DTH is equivalent to 1 MMBtu or 1 MCF

An average transportation rate of $0.54/MMBtu will be added for purposes of projecting delivered gas prices for existing gas units in Lakeland. This average rate is realized through a current mix of FGT, Gulfstream and Transco, including consideration of Lakeland Electric's ability to relinquish its FTS, Gulfstream and Transco transportation or acquire other firm and interruptible gas transportation on the market. The delivered natural gas price is projected to be volatile during the next twelve months with expectations of reduced production output and as LNG facilities gear up for increased exports. Volatility may be a factor in prices during 2025 due to storage inventories trending lower at the end of the 2025 season and the potential for more LNG shipments. The long-term average price is forecasted to remain around $4.491 during the next five years starting March 2025. The average delivered gas price forecast in Lakeland will be around $4.86/MMBtu for the year 2025.

5.4.4.3 Fuel Oil Price Forecast

Changes in production levels and methods are placing oil prices at a lower level in the world market. Lakeland adjusts its oil price forecast to reflect current market pricing and what the anticipated future price may be.

5.4.4 Fuel Forecast Sensitivities

Lakeland Electric is not conducting any specific forecasted fuel price sensitivity analysis at this moment. Lakeland baseloads larger volumes during the winter and summer seasons to mitigate fuel price risk and ensure reliability. In addition, the utility financially hedges natural gas to manage fuel price risk. Lakeland Electric acquired FTS-3 capacity on the Florida Gas Transmission Company pipeline to increase its volume by October 2023.

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6.0 Forecast of New Capacity Requirements

6.1 Assessment of the Need for Capacity/Energy

This section outlines Lakeland Electric's methodology for evaluating capacity requirements to ensure reliable service for its customers in the future. Assessing the need for future capacity involves considering Lakeland Electric's long-term load forecast, reserve margin requirements defined by the Florida Reliability Coordinating Council (FRCC) and FMPP, as well as the existing generation capacity of Lakeland Electric. To effectively serve customers within its territory, Lakeland Electric must maintain sufficient resources to meet peak-hour demand, including reserves, at any hour of the day throughout the year.

6.1.1 Load Forecast

The load forecast outlined in Section 3.0 serves as the basis for assessing future capacity requirements. Total electricity sales and peak hour demand forecasts for this TYSP were established considering future economic expectations and population growth. Lakeland Electric (LE) generates a range of load forecasts, including base-expected, high, and low scenarios, ensuring flexibility to accommodate various outcomes. Tables 6-1 and 6-2 provide a summary of the annual peak load forecasts for winter and summer, respectively, under the base case (reference) scenario.

6.1.2 Reserve Requirements

A 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 changes. This additional capacity (i.e., reserve capacity) should be large enough to cover the loss of any unit in the system and be able to respond adequately to cover the moment to moment change in system load. Total reserves should also be able to cover uncertainties such as planned outage, interruption on transmission system due to planned maintenance or weather events and load forecasting error. 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:

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

Lakeland Electric looked at probabilistic approaches to determine its reliability needs in the past. The study has looked at reliability indices such as Loss of Load Probability (LOLP) and Expected Unserved Energy (EUE). Lakeland Electric has found that due to the strength of its transmission system, and interconnection with neighboring utilities, operation within FMPP, LOLP and EUE values were so small in the past that reserve margin-based reliability measures would be sufficient at this time. Moreover, FRCC performs LOLP analysis every two years, and the reliability standards are adequate to operate the entire FRCC system reliably.

6.1.3 Existing Energy Supply

Availability factor on Generating Units is reviewed annually and is found to be within industry standards for the types of units that Lakeland Electric has in its generation fleet, indicating adequate and prudent maintenance is taking place.

Lakeland Electric is using a wide variety of resources (build and purchase) to meet its load and reserve obligations. Lakeland plans to add 74.8 MW of solar capacity in its territory to be available for generation in early 2027. LE uses a production cost model – PCI GenTrader - to obtain an optimal capacity plan to meet its energy need with minimal unserved energy over the next 10 years. Table 6-1 shows the combination of purchase and LE owned resources for existing and planned capacity requirements. In addition, LE has secured firm Power Purchases necessary to meet load and reserve obligations with the new resources installed and operational. Recently, LE added 120 MW (6 units) of RICE Engines which will avoid the amounts of existing long-term power purchase contracts from other entities. These new generating units are highly reliable, efficient, flexible, and cost effective. The high flexibility and modularity of these Reciprocating Internal Combustion Engines (RICE) can provide a low-cost energy solution to Lakeland supporting an optimized transition to additional solar energy in its energy portfolio. These new engines can quickly ramp up and down as needed to balance the variable nature of solar resources. This will help to improve the reliability in Lakeland System.

6.2 Seasonal Capacity and Reserve Margins

As discussed in Section 6.1.2 above, by comparing Lakeland Electric's load forecast plus reserves with firm supply, the Reserve Margins can be identified. Since electric supply and demand differ in summer and winter, planning based on seasonal reserve margin is critical. This TYSP study also considers capabilities and performance of solar resources in both summer and winter. Lakeland Electric's Reserve Margins presented in Tables 6-1 and 6-2 in both seasons are at or higher than 15% in both cases.

Tables 6-1 and 6-2 show that, based on the base winter and summer load forecasts, Lakeland Electric's Reserve Margins remain at or above 15% throughout the year. This is achieved through additional external firm power purchases, repairing existing out-of-service gas turbines, or developing new resources during the current ten-year planning period. This complies with the FRCC's minimum reserve margin criteria to meet its reliability requirements.

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

Year	Net Generating Capacity	Net System Purchases	Net System Sales	Net System Capacity	System Peak Demand		Reserve Margin		Excess(Deficit) to Maintain 15% Reserve Margin	
					Before Interruptible and Load Management	After Interruptible and Load Management	Before Interruptible and Load Management	After Interruptible and Load Management	Before Interruptible and Load Management	After Interruptible and Load Management
	MW	MW	MW	MW	MW	MW	%	%	%	MW
2025/26	840	50	0	890	676	676	32%	32%	113	113
2026/27	840	0	0	840	681	681	23%	23%	57	57
2027/28	840	0	0	840	687	687	22%	22%	50	50
2028/29	840	0	0	840	692	692	21%	21%	44	44
2029/30	840	0	0	840	696	696	21%	21%	40	40
2030/31	840	0	0	840	700	700	20%	20%	35	35
2031/32	840	0	0	840	705	705	19%	19%	29	29
2032/33	840	0	0	840	709	709	18%	18%	25	25
2033/34	840	0	0	840	712	712	18%	18%	21	21
2034/35	840	0	0	840	717	717	17%	17%	15	15

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

					System Peak Demand		Reserve Margin		Excess(Deficit) to Maintain 15% Reserve Margin	
Year	Net Generating Capacity MW	Net System Purchases MW	Net System Sales MW	Net System Capacity MW	Before Interruptible and Load Management MW	After Interruptible and Load Management MW	Before Interruptible and Load Management %	After Interruptible and Load Management %	Before Interruptible and Load Management %	After Interruptible and Load Management MW
2025	777	107	0	884	727	727	22%	22%	48	48
2026	777	144	0	921	733	733	26%	26%	78	78
2027	777	80	0	857	741	741	16%	16%	5	5
2028	777	85	0	862	748	748	15%	15%	2	2
2029	777	95	0	872	756	756	15%	15%	3	3
2030	777	100	0	877	763	763	15%	15%	0	0
2031	777	110	0	887	771	771	15%	15%	0	0
2032	777	120	0	897	778	778	15%	15%	2	2
2033	777	130	0	907	786	786	15%	15%	3	3
2034	777	140	0	917	794	794	15%	15%	4	4

Solar resources, unlike traditional dispatchable generators, are highly variable and depend on factors such as time of day, season, and cloud conditions. Consequently, in LE's resource plan, solar firm capacity is assumed to be 50% of the installed capacity during the summer and 0% in winter, aligning with industry best practices for planning purposes. Net system purchases include firm purchases from both thermal and solar resources.

As Lakeland Electric's needs and resource fleet evolve over time, reserve margin levels will be periodically reviewed and adjusted as necessary for each year.

6.3 Energy Resources Portfolio and Analysis

Table 6.3 summarizes the projected energy mix from different types of resources for Lakeland Electric over the next 10 years based on the Production Cost Analysis. It outlines the committed and planned resources needed to meet the future capacity and energy demands of LE customers.

This combination of resources is represented as a portfolio for Lakeland Electric under the base case assumptions and production cost analysis. The GenTrader software model provides the optimal energy generation from Lakeland units along with economy purchase from the FMPP members when Lakeland units are economically dispatched with the other Pool members. This portfolio is decided based on optimal optimization of cost, risk, and environmental factors. As can be seen in Table 6.3, natural gas-fired resources are dominant in LE's future energy mix as more than 50% of energy is expected to come from these resources. Solar mix is still low until 2027. It is anticipated to increase up to 5.0% range when new solar units are added in the portfolio. Lakeland expects to purchase certain percentage of economy energy from the FMPP members and fixed firm contract energy purchases from a bilateral agreement with the OUC even after adding new RICE engines. When LE's RICE engines and solar resources become available in 2027, LE can be a net seller or a buyer based upon relative dispatch costs of LE units compared to the other units in FMPP.

Table 6.3: Energy Resource Mix

			Calendar Year										
Energy Source	Type	Units	2024 - Actual	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Coal		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Distillate	Steam	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	CC	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	CT	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Total	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Natural Gas	Steam	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	CC	%	74%	58%	68%	64%	53%	64%	66%	61%	59%	58%	60%
	CT	%	1%	5%	7%	5%	4%	5%	4%	4%	3%	4%	3%
	Total	%	75%	63%	74%	68%	57%	68%	70%	66%	63%	62%	63%
Solar		%	1%	1%	1%	5%	6%	6%	6%	5%	5%	5%	5%
Other (Specify)[1]		%	24%	37%	25%	27%	37%	26%	25%	29%	32%	33%	31%
Net Energy for Load		%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

1 Other Purchases

6.4 Summary - Study Results

Tables 6-1 and 6-2 present the schedules of new planned resources and anticipated future purchases in addition to the existing resources and purchases. The planned portfolio provides adequate resource adequacy (i.e., reserve margin) during the summer period based on existing and planned supply and demand. While Lakeland anticipates more than 5% of installed capacity coming from solar by 2027, there is a need of additional capacity which may either come from external purchases or additional capacity from repairs from existing gas turbine units in 2027 and later. The capacity contribution from solar in meeting winter peak loads in the winter month's morning hours is assumed negligible. Table 6-3 presents the energy mix scenario for Lakeland Electric. LE starts to be more self-reliant in terms of energy after LE installed RICE engines in 2025. In the meantime, the firm power purchase contract with the OUC may continue until acceptable reserve margin is attained.

7.0 Environmental and Land Use Information

As discussed in Section 6, Lakeland Electric added a new 125 MW McIntosh Gas Turbine No. 2 in 2020 and retired its coal unit (219 MW – LE's net share) at Lakeland Electric's McIntosh Power Plant site (See Figure 7.1). LE has recently replaced its retired coal unit with 120 MW RICE engines in 2025 at McIntosh Plant site (Figure 7-3 and 7-4). Lakeland has recently established a long-term Power Purchase Agreement (PPA) with Edge Solar to install a 74.8 MW utility-scale photovoltaic solar system within Lakeland's territory (Refer to Figures 7.5 and 7.6). The anticipated availability of this solar system is projected to be March 2027.

To achieve LE's overall mission to provide affordable energy and environmental stewardship, LE has adopted different measures to maintain the environmental footprint of the new generating units, including air emissions, water, waste, and land use impacts within the state and federal standard.

Per the Ten-Year Site Plan definitions (rule 25-22-072), "Preferred Sites" include sites where a utility has taken action to site new generation. "Preferred Site" information of the Plant site for recently installed and planned units is presented from Figures 7-1 to 7-6.

Table 7-1 summarizes different control strategies adopted to comply with various environmental emission regulations in LE's existing major generating units. The air pollution control technologies installed at those generating units meet all the state and federal regulations for all pollutants.

The retirement of our coal burning unit has prompted the closure of our coal combustion (CCR) residuals landfill. We have obtained State permits to begin final closure of the CCR landfill. Closing the landfill will significantly limit the exposure of the materials into the environment. Closure is likely to be completed by early 2025.

The coal burning unit retirement has also significantly reduced LAK's emissions of pollutants such as carbon monoxide, sulfur dioxide, nitrogen oxides, particulate matter, hazardous air pollutants, as well as greenhouse gases.

In April 2024, EPA finalized the rules on greenhouse gas emissions from new natural gas combustion turbines as well as existing steam units. Additionally, EPA is considering altering regulations to regulate closed CCR landfills. But with the change in Administration, the future of these rules is uncertain.

LE has installed an epoxy coating on the once through cooling water tubes at Larsen Power Plant in 2022 to help reduce the amount of copper picked up by the water and returned to the lake. Independent Laboratory testing of the cooling water has shown that the project effectively reduces copper impacts to the lake.

Table 7-1: Emission Control Options in Major LE Units

Table 7-1
Lakeland Electric
Existing Generating Facilities
Environmental Emissions and Control Strategies for Major Existing Generating Units

Plant Name	Unit (Type)	Fuel		Air Pollutants and Control Strategies				Cooling Type
		Primary	Alt.	PM	SO2	NOx	CO	
Charles Larsen Memorial	8 (CC)	NG	DFO	None	LS	LNB WI	None	OTF
C.D. McIntosh, Jr.	GT2 (GT)	NG	DFO	None	LS	WI	None	N/A
	5 (CC)	NG	N/A	None	LS	LNB SCR	OC	WCTM
	MREP 1-6 (IC)	NG	N/A	None	LS	SCR	OC	N/A
Winston	1-20 (IC)	DFO	N/A	None	LS	SCR	OC	N/A

PM	Particulate matter	OTF	Once-through flow	FGD	Flue gas desulfurization
SO2	Sulfur dioxide	FGR	Flue gas recirculation	OFA	Overfire air
NOX	Nitrogen oxides	IC	Internal combustion	SCR	Selective catalytic reduction
CO	Carbon monoxide	NG	Natural Gas	N/A	Not Applicable
LS	Low sulfur fuel	WCTM	Water cooling tower mechanical	OC	Oxidation catalyst
LNB	Low NOx burners	ESP	Electrostatic precipitator	DFO	Distilate Fuel oil
WI	Water injection	CC	Combined Cycle	Alt	Alternate
GT	Gas Turbine				

Source: Lakeland Environmental Staff

Figure 7-1: C.D. McIntosh Power Plant Topographic Map

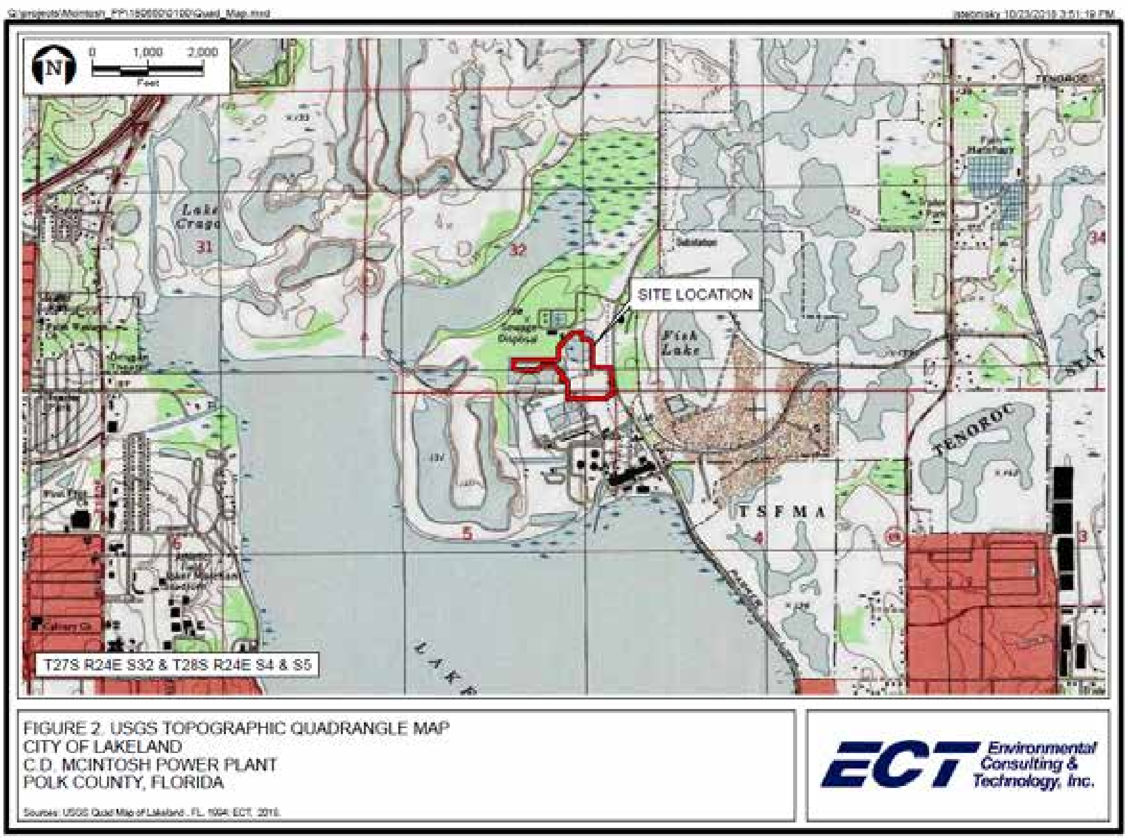


Figure 7-2: City of Lakeland – Zoning Map

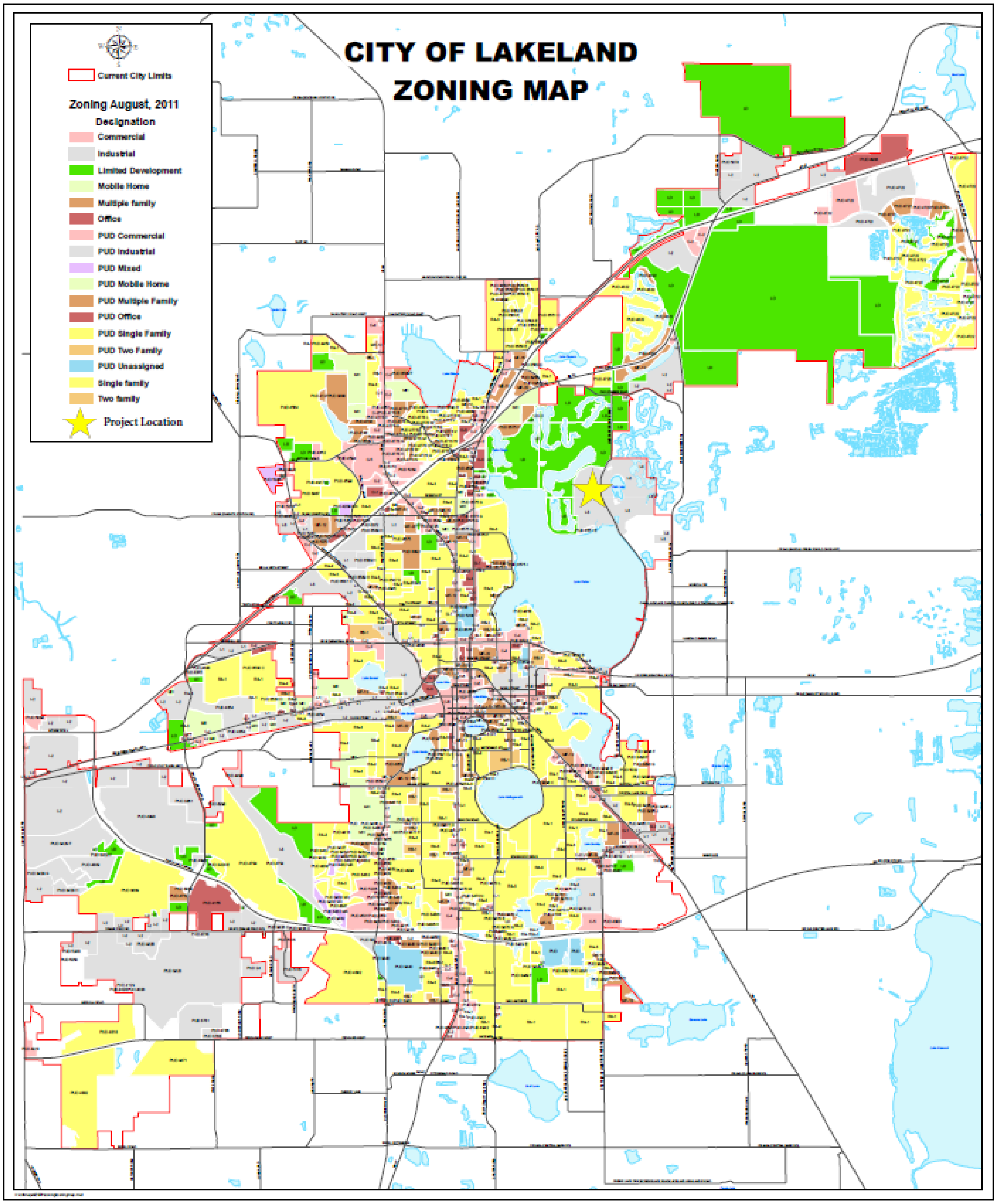


Figure 7-3: Site Location of 120 MW RICE Engines in McIntosh Plant

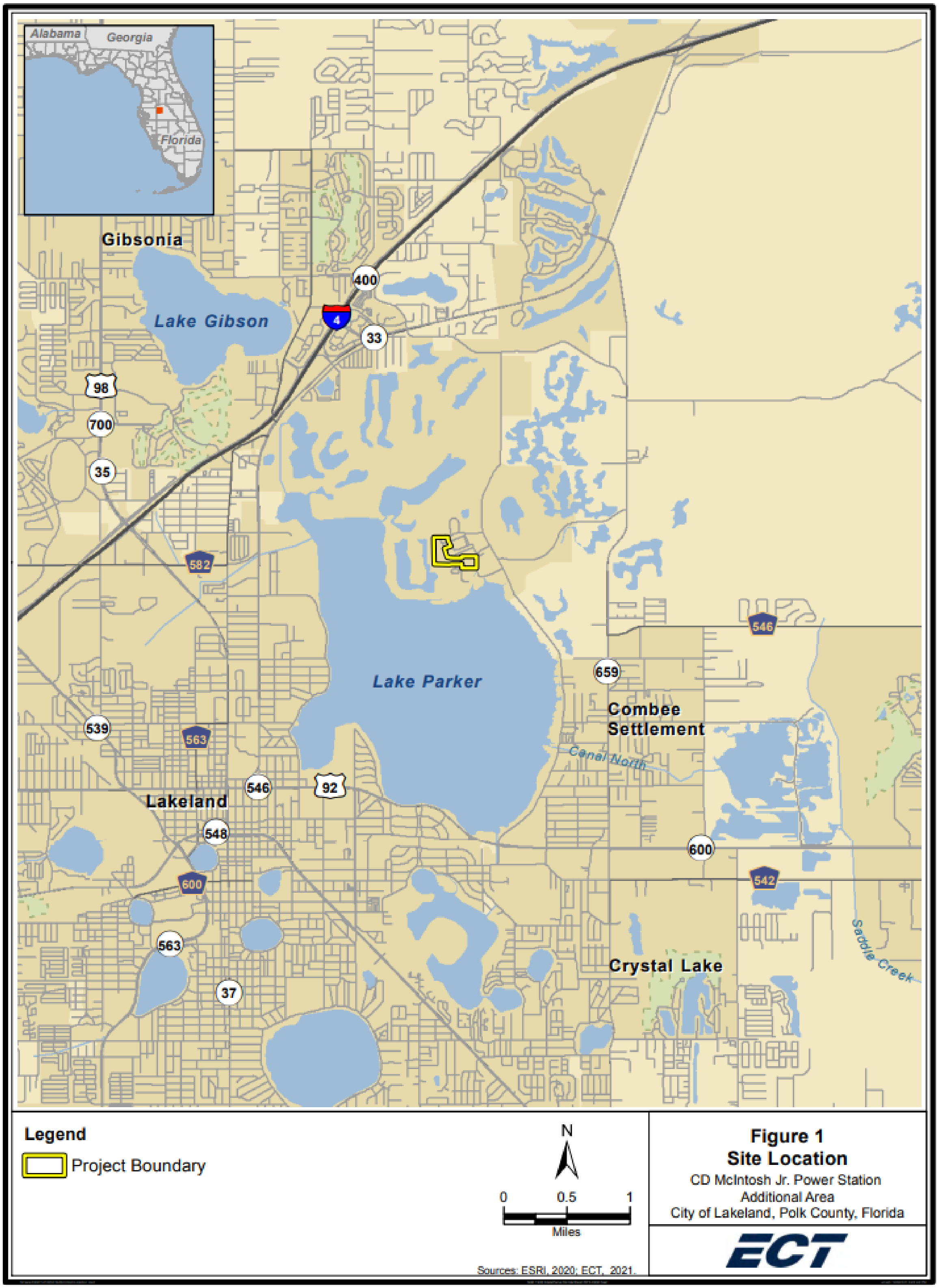


Figure 7-4: An enlarged View of Site Location of 120 MW RICE Engines in McIntosh Plant

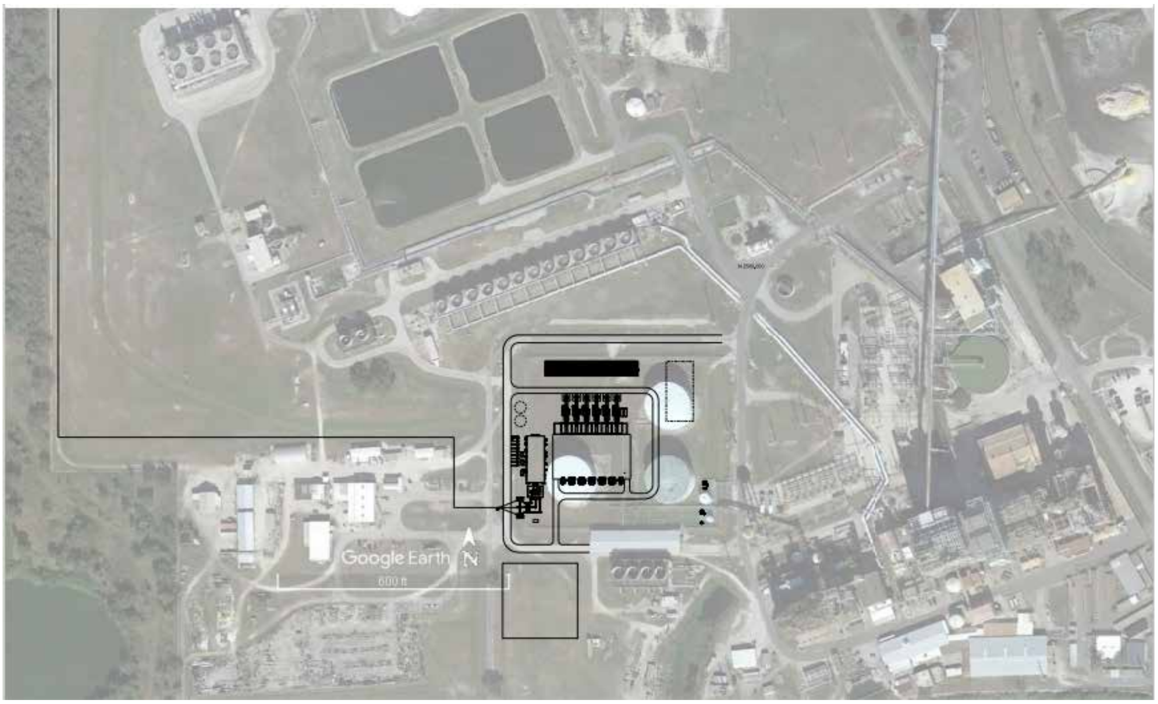


Figure 7-5: Edge Solar Site Topographic Map

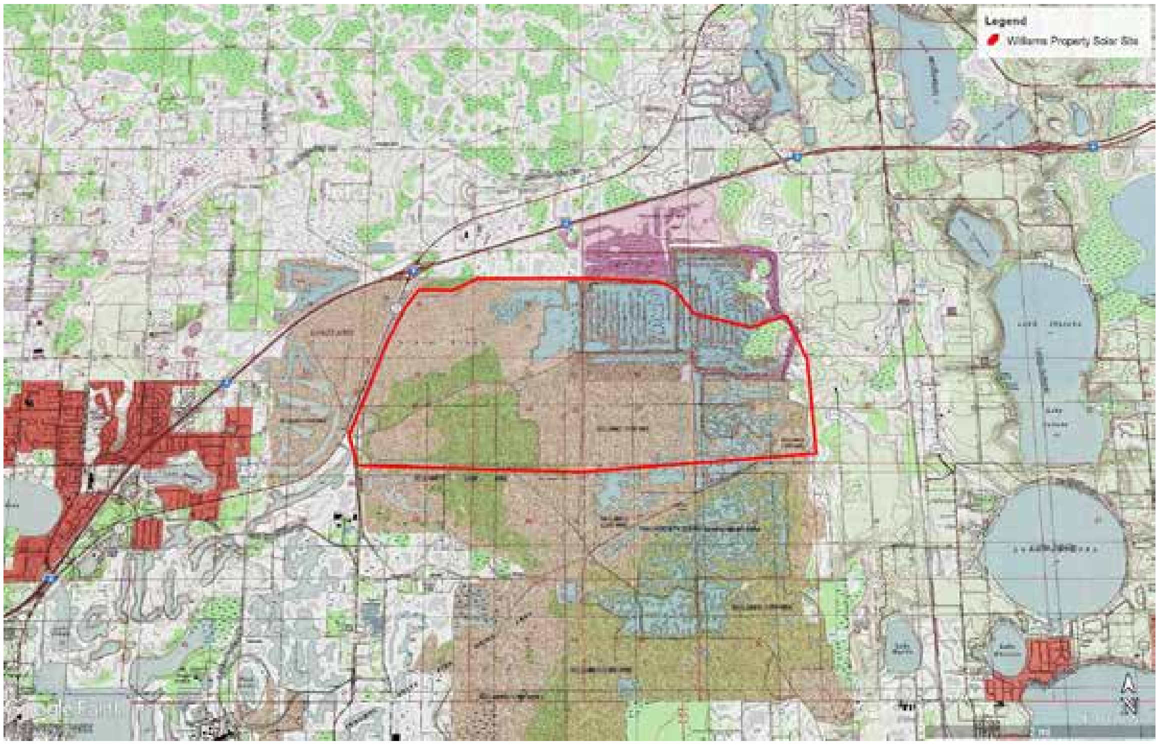
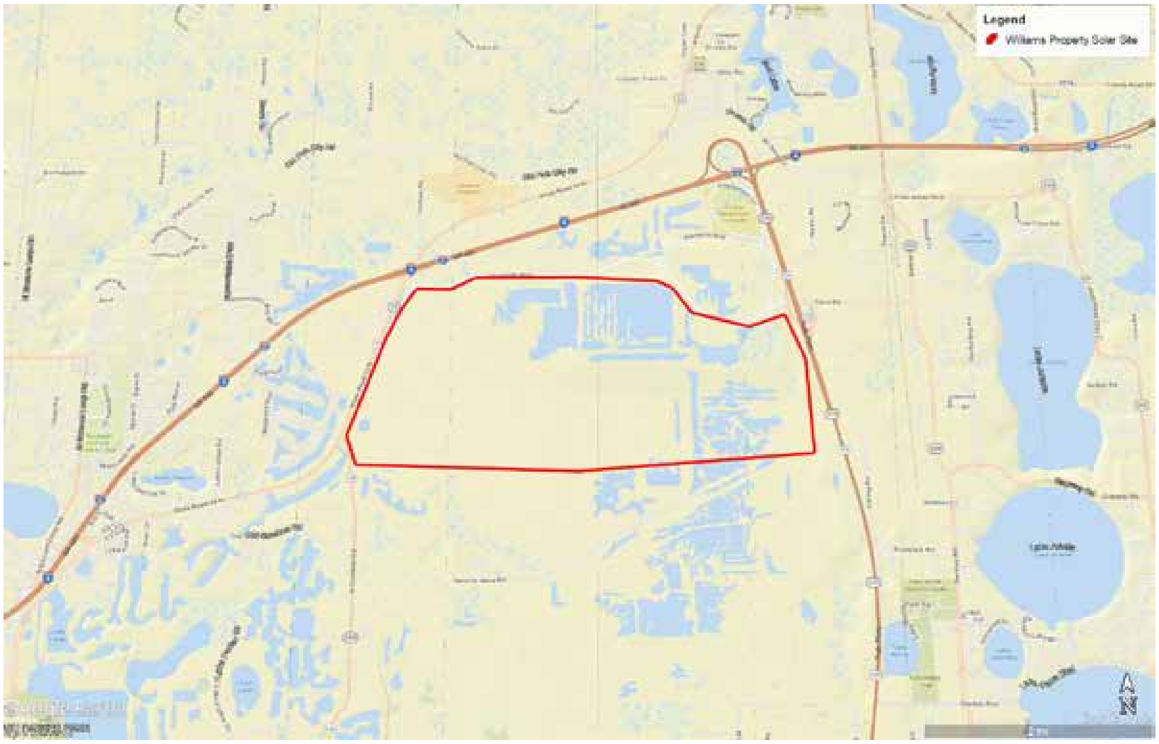


Figure 7-6: Edge Solar – Property Site Location



8.0 Ten-Year Site Plan Schedules

This section details the schedules mandated by the Ten-Year Site Plan for the Florida Public Service Commission. Each schedule provides monthly position on Lakeland Electric's capacity and load, highlighting reserve margin levels across seasons.

Tables 8-1 and 8-1a in Schedule 1 offer details of Lakeland Electric's current unit characteristics, categorized by fuel type (primary and secondary), fuel transportation method, and achievable net capacity across various seasons.

Tables 8-2 through 8-6 offer insights into the electric peak demand and energy usage patterns of diverse customers, spanning historical records and future projections. This comprehensive data is segmented by customer class, facilitating the assessment of future capacity and energy requirements for the entire customer base in Lakeland.

Table 8-7 in Schedule 3.3 provides a historical overview of energy consumption, detailing the breakdown between retail sales and utility uses and losses. Furthermore, this data includes the shape factor of energy consumption, which indicates the capacity factor of total energy usage. Table 8-8 compares the monthly peak electric demand and energy usage forecasts for the years 2025 and 2026 with the actual monthly figures from 2024.

Tables 8-9, 8-10, and 8-11 in Schedules 5 and 6 offer a comprehensive overview of fuel requirements by fuel type, the energy mix from different types of electric generators, and the percentage mix of various fuel types in the generation of electricity within the Lakeland Electric system, inclusive of purchases made for Lakeland Electric. These tables provide both historical data and forecasts, enabling a thorough analysis of fuel requirement trends and energy generation dynamics in next 10 years.

Tables 8-12 and 8-13 in Schedule 7 provide comparisons of Lakeland Electric resources to Lakeland Electric demand. This table demonstrates that Lakeland Electric's Reserve Margin forecast will be maintained at 15% or higher each year during this Ten-Year-Site Plan period.

Tables 8-14 in Schedule 8 provides information related to changes in the status of Lakeland Electric's existing and future units.

Tables 8-15 and 8-16 present the major technical and cost characteristics of newly installed RICE engines at McIntosh Plant including solar and main transmission line to be built in its Transmission System.

Table 8-1
Lakeland Electric Existing Generating Facilities

				[4]Fuel		[5]Fuel Transport						[2]Net Capability	
Plant Name	Unit No.	Location	[3]Unit Type	Pri	Alt	Pri	Alt	[1]Alt Fuel Days Use	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Summer MW	Winter MW
Charles Larsen Memorial	GT2*	16-17/28S/24E	GT	NG	DFO	PL	TK	NR	11/62	Unknown	11,250	10.0	14.0
	GT3*		GT	NG	DFO	PL	TK	NR	12/62	Unknown	11,250	9.0	13.0
	8		CA	WH	---	---	---	---	04/56	Unknown	30,000	29.7	29.7
	8		CT	NG	DFO	PL	TK	NR	07/92	Unknown	101,520	84.7	94.7
Plant Total												114.4	124.4

[1]LAK doesnot maintain records of the days the alternative fuel available in reserve. ,[2]Net Normal, * Long term scheduled maintenance - not included in available capacity.

[2]Net Normal

Source: Lakeland Production Department

[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	NG Natural Gas	TK Truck
GT Combustion Gas Turbine	WH Waste Heat	
ST Steam Turbine	NR Not recorded	

Table 8-1a

Schedule 1.0: Existing Generating Facilities as of December 31, 2024

				[4]Fuel		[5]Fuel Transport						[2]Net Capability	
Plant Name	Unit No.	Location	[3]Unit Type	Pri	Alt	Pri	Alt	[1]Alt Fuel Days Use	Commercial In-Service Month/Year	Expected Retirement Month/Year	Gen. Max. Nameplate kW	Summer MW	Winter MW
Winston Peaking Station	1-20	21/28S/23E	IC	DFO	---	TK	---	---	12/01	Unknown	2,500 each	50.0	50.0
Plant Total												50.0	50.0
C.D. McIntosh, Jr.	D1	4-5/28S/24E	IC	DFO	---	TK	---	---	01/70	Unknown	2,600	2.5	2.5
	D2		IC	DFO	---	TK	---	---	01/70	Unknown	2,600	2.5	2.5
	GT1		GT	NG	DFO	PL	TK	---	05/73	Unknown	26,640	17.0	19.0
	GT2		GT	NG	DFO	PL	TK	---	06/20	Unknown	130,050	119.5	124.5
	5		CT	NG	---	PL	---	---	05/01	Unknown	292,950	234.0	280.0
	5		CA	WH	---	---	---	---	05/02	Unknown	135,000	118.0	118.0
	MREP 4-6		IC	NG	---	PL	---	---	12/24	Unknown	60,800	59.5	59.5
Plant Total												553.0	606.0
System Total												**717.4**	**780.4**

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

[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	WH Waste Heat	TK Truck
GT Combustion Gas Turbine	NG Natural Gas	
IC Internal Combustion	NR Not Recorded	
ST Steam Turbine		

Table 8-2

Schedule 2.1: History and Forecast of Energy Consumption and Number of Customers by Customer Class

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Rural & Residential					Commercial		
Year	Population	Members per Household	GWh	Average No. of Customers	Average kWh Consumption per Customer	GWh	Average No. of Customers	Average kWh Consumption per Customer
2015	274,861	2.63	1,468	104,581	14,037	789	12,157	64,901
2016	279,331	2.64	1,473	105,932	13,905	795	12,225	65,031
2017	283,626	2.63	1,460	107,703	13,556	803	12,372	64,905
2018	288,157	2.64	1,524	109,043	13,976	813	12,543	64,817
2019	292,465	2.65	1,540	110,403	13,949	806	12,687	63,530
2020	295,899	2.64	1,612	112,175	14,370	789	12,889	61,215
2021	299,557	2.61	1,597	114,683	13,925	832	13,219	62,940
2022	303,910	2.60	1,637	116,907	14,003	843	13,452	62,667
2023	312,872	2.65	1,669	118,281	14,110	845	13,823	61,130
2024	315,830	2.62	1,714	120,371	14,239	866	14,230	60,857
Forecast								
2025	320,068	2.61	1,691	122,783	13,772	872	14,335	60,830
2026	323,827	2.60	1,709	124,423	13,735	880	14,553	60,469
2027	327,466	2.60	1,729	126,077	13,714	889	14,754	60,255
2028	331,162	2.59	1,750	127,738	13,700	898	14,959	60,031
2029	334,977	2.59	1,772	129,380	13,696	908	15,164	59,879
2030	339,037	2.59	1,794	131,000	13,695	917	15,367	59,673
2031	343,139	2.59	1,816	132,561	13,699	926	15,564	59,496
2032	347,198	2.59	1,836	134,085	13,693	934	15,755	59,283
2033	351,249	2.59	1,860	135,579	13,719	943	15,942	59,152
2034	355,287	2.59	1,882	137,028	13,734	952	16,124	59,042

Table 8-3
Schedule 2.2: History and Forecast of Energy Consumption and Number of Customers by Customer Class

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Industrial						
Year	GWh	Average No. of Customers	Average kWh Consumption per Customer	Railroads and Railways	Street & Highway Lighting GWh	Other Sales to Public Authorities GWh	Total Sales to Ultimate Consumers GWh
2015	670	76	8,815,789	0	34	73	3,034
2016	655	74	8,851,351	0	34	73	3,030
2017	648	72	9,000,000	0	35	72	3,018
2018	676	74	9,135,135	0	35	70	3,118
2019	667	76	8,776,316	0	35	69	3,117
2020	660	75	8,800,000	0	35	68	3,163
2021	679	71	9,563,380	0	35	67	3,210
2022	697	76	9,171,053	0	35	67	3,279
2023	696	73	9,534,247	0	34	67	3,311
2024	670	80	8,375,000	0	35	71	3,356
Forecast							
2025	697	80	8,712,500	0	34	66	3,360
2026	701	81	8,654,321	0	33	68	3,391
2027	706	82	8,609,756	0	33	68	3,425
2028	712	83	8,578,313	0	33	67	3,460
2029	716	84	8,523,810	0	33	67	3,496
2030	721	85	8,482,353	0	32	68	3,532
2031	726	86	8,441,860	0	32	66	3,566
2032	731	87	8,402,299	0	32	68	3,601
2033	735	87	8,448,276	0	32	67	3,637
2034	740	88	8,409,091	0	32	66	3,672

Table 8-4

Schedule 2.3: History and Forecast of Energy Consumption and Number of Customers by Customer Class

(1)	(2)	(3)	(4)	(5)	(6)
Year	Wholesale Purchases for Resale GWh	Wholesale Sales for Resale GWh	Net Energy for Load GWh	Other Customers (Average No.)	Total No. of Customers
2015	0	0	3,006	8,860	124,019
2016	0	0	3,126	8,921	125,674
2017	0	0	3,086	8,997	129,113
2018	0	0	3,180	9,051	130,658
2019	0	0	3,189	9,051	132,217
2020	0	0	3,273	9,182	134,320
2021	65	0	3,305	9,189	137,162
2022	71	0	3,406	9,200	139,635
2023	104	0	3,442	8,869	141,046
2024	67	0	3,509	9,109	143,790
Forecast					
2025	17	0	3,486	8,918	146,116
2026	18	0	3,517	8,908	147,965
2027	0	0	3,551	8,898	149,811
2028	0	0	3,586	8,888	151,668
2029	0	0	3,622	8,880	153,507
2030	0	0	3,657	8,871	155,322
2031	0	0	3,691	8,863	157,074
2032	0	0	3,724	8,855	158,782
2033	0	0	3,760	8,848	160,457
2034	0	0	3,794	8,842	162,082

Table 8-5

Schedule 3.1: History and Forecast of Summer Peak Demand Base Case (MW)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Residential		Commercial/Industrial		
Year	Total	Wholesale	Retail	Interrupt.	Load Management	Conservation	Load Management	Conservation	Net Firm Demand
2015	632	0	632	0	0	0	0	0	632
2016	649	0	649	0	0	0	0	0	649
2017	644	0	644	0	0	0	0	0	644
2018	639	0	639	0	0	0	0	0	639
2019	667	0	667	0	0	0	0	0	667
2020	678	0	678	0	0	0	0	0	678
2021	692	0	692	0	0	0	0	0	692
2022	704	0	704	0	0	0	0	0	704
2023	752	0	752	0	0	0	0	0	752
2024	722	0	722	0	0	0	0	0	722
Forecast									
2025	727	0	727	0	0	0	0	0	727
2026	733	0	733	0	0	0	0	0	733
2027	741	0	741	0	0	0	0	0	741
2028	748	0	748	0	0	0	0	0	748
2029	756	0	756	0	0	0	0	0	756
2030	763	0	763	0	0	0	0	0	763
2031	771	0	771	0	0	0	0	0	771
2032	778	0	778	0	0	0	0	0	778
2033	786	0	786	0	0	0	0	0	786
2034	794	0	794	0	0	0	0	0	794

Table 8-5a
Schedule 3.1a: History and Forecast of Summer Peak Demand Low Case (MW)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	Total	Wholesale	Retail	Interrupt.	Residential		Commercial/Industrial		Net Firm Demand
					Load Management	Conservation	Load Management	Conservation	
2015	632	0	632	0	0	0	0	0	632
2016	649	0	649	0	0	0	0	0	649
2017	644	0	644	0	0	0	0	0	644
2018	639	0	639	0	0	0	0	0	639
2019	667	0	667	0	0	0	0	0	667
2020	678	0	678	0	0	0	0	0	678
2021	692	0	692	0	0	0	0	0	692
2022	704	0	704	0	0	0	0	0	704
2023	752	0	752	0	0	0	0	0	752
2024	722	0	722	0	0	0	0	0	722
Forecast									
2025	723	0	723	0	0	0	0	0	723
2026	729	0	729	0	0	0	0	0	729
2027	736	0	736	0	0	0	0	0	736
2028	743	0	743	0	0	0	0	0	743
2029	751	0	751	0	0	0	0	0	751
2030	759	0	759	0	0	0	0	0	759
2031	766	0	766	0	0	0	0	0	766
2032	773	0	773	0	0	0	0	0	773
2033	781	0	781	0	0	0	0	0	781
2034	789	0	789	0	0	0	0	0	789

Table 8-5b

Schedule 3.1b: History and Forecast of Summer Peak Demand High Case (MW)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Residential		Commercial/Industrial		
Year	Total	Wholesale	Retail	Interrupt.	Load Management	Conservation	Load Management	Conservation	Net Firm Demand
2015	632	0	632	0	0	0	0	0	632
2016	649	0	649	0	0	0	0	0	649
2017	644	0	644	0	0	0	0	0	644
2018	639	0	639	0	0	0	0	0	639
2019	667	0	667	0	0	0	0	0	667
2020	678	0	678	0	0	0	0	0	678
2021	692	0	692	0	0	0	0	0	692
2022	704	0	704	0	0	0	0	0	704
2023	752	0	752	0	0	0	0	0	752
2024	722	0	722	0	0	0	0	0	722
Forecast									
2025	731	0	731	0	0	0	0	0	731
2026	738	0	738	0	0	0	0	0	738
2027	745	0	745	0	0	0	0	0	745
2028	752	0	752	0	0	0	0	0	752
2029	760	0	760	0	0	0	0	0	760
2030	768	0	768	0	0	0	0	0	768
2031	776	0	776	0	0	0	0	0	776
2032	782	0	782	0	0	0	0	0	782
2033	791	0	791	0	0	0	0	0	791
2034	799	0	799	0	0	0	0	0	799

Table 8-6

Schedule 3.2: History and Forecast of Winter Peak Demand Base Case (MW)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Residential		Comm./Ind.		
Year	Total	Wholesale	Retail	Interrupt.	Load Management	Conservation	Load Management	Conservation	Net Firm Demand
2015/16	583	0	583	0	0	0	0	0	583
2016/17	534	0	534	0	0	0	0	0	534
2017/18	701	0	701	0	0	0	0	0	701
2018/19	545	0	545	0	0	0	0	0	545
2019/20	600	0	600	0	0	0	0	0	600
2020/21	605	0	605	0	0	0	0	0	605
2021/22	663	0	663	0	0	0	0	0	663
2022/23	620	0	620	0	0	0	0	0	620
2023/24	537	0	537	0	0	0	0	0	537
2024/25	643	0	643	0	0	0	0	0	643
Forecast									
2025/26	676	0	676	0	0	0	0	0	676
2026/27	681	0	681	0	0	0	0	0	681
2027/28	687	0	687	0	0	0	0	0	687
2028/29	692	0	692	0	0	0	0	0	692
2029/30	696	0	696	0	0	0	0	0	696
2030/31	700	0	700	0	0	0	0	0	700
2031/32	705	0	705	0	0	0	0	0	705
2032/33	709	0	709	0	0	0	0	0	709
2033/34	712	0	712	0	0	0	0	0	712
2034/35	717	0	717	0	0	0	0	0	717

Table 8-6a
Schedule 3.2a: History and Forecast of Winter Peak Demand Low Case (MW)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	Total	Wholesale	Retail	Interrupt.	Residential		Comm./Ind.		Net Firm Demand
					Load Management	Conservation	Load Management	Conservation	
2015/16	583	0	583	0	0	0	0	0	583
2016/17	534	0	534	0	0	0	0	0	534
2017/18	701	0	701	0	0	0	0	0	701
2018/19	545	0	545	0	0	0	0	0	545
2019/20	600	0	600	0	0	0	0	0	600
2020/21	605	0	605	0	0	0	0	0	605
2021/22	663	0	663	0	0	0	0	0	663
2022/23	620	0	620	0	0	0	0	0	620
2023/24	537	0	537	0	0	0	0	0	537
2024/25	643	0	643	0	0	0	0	0	643
Forecast									
2025/26	673	0	673	0	0	0	0	0	673
2026/27	678	0	678	0	0	0	0	0	678
2027/28	683	0	683	0	0	0	0	0	683
2028/29	688	0	688	0	0	0	0	0	688
2029/30	692	0	692	0	0	0	0	0	692
2030/31	696	0	696	0	0	0	0	0	696
2031/32	701	0	701	0	0	0	0	0	701
2032/33	705	0	705	0	0	0	0	0	705
2033/34	708	0	708	0	0	0	0	0	708
2034/35	713	0	713	0	0	0	0	0	713

Table 8-6b

Schedule 3.2b: History and Forecast of Winter Peak Demand High Case (MW)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Residential		Comm./Ind.		
Year	Total	Wholesale	Retail	Interrupt.	Load Management	Conservation	Load Management	Conservation	Net Firm Demand
2015/16	583	0	583	0	0	0	0	0	583
2016/17	534	0	534	0	0	0	0	0	534
2017/18	701	0	701	0	0	0	0	0	701
2018/19	545	0	545	0	0	0	0	0	545
2019/20	600	0	600	0	0	0	0	0	600
2020/21	605	0	605	0	0	0	0	0	605
2021/22	663	0	663	0	0	0	0	0	663
2022/23	620	0	620	0	0	0	0	0	620
2023/24	537	0	537	0	0	0	0	0	537
2024/25	643	0	643	0	0	0	0	0	643
Forecast									
2025/26	680	0	680	0	0	0	0	0	680
2026/27	685	0	685	0	0	0	0	0	678
2027/28	691	0	691	0	0	0	0	0	691
2028/29	696	0	696	0	0	0	0	0	696
2029/30	700	0	700	0	0	0	0	0	700
2030/31	704	0	704	0	0	0	0	0	704
2031/32	709	0	709	0	0	0	0	0	709
2032/33	713	0	713	0	0	0	0	0	713
2033/34	716	0	716	0	0	0	0	0	716
2034/35	721	0	721	0	0	0	0	0	721

Table 8-7
Schedule 3.3: History and Forecast of Annual Net Energy for Load – GWh
Base Case

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	Total Sales	Residential Conservation	Comm./Ind. Conservation	Retail	Wholesale	Utility Use & Losses	Net Energy for Load	Load Factor %
2015	3,034	0	0	3,034	0	92	3,126	55%
2016	3,030	0	0	3,030	0	79	3,109	54%
2017	3,018	0	0	3,018	0	68	3,086	55%
2018	3,118	0	0	3,118	0	62	3,180	55%
2019	3,117	0	0	3,117	0	73	3,190	55%
2020	3,163	0	0	3,163	0	109	3,273	55%
2021	3,210	0	0	3,210	0	95	3,304	55%
2022	3,279	0	0	3,279	0	127	3,406	53%
2023	3,310	0	0	3,310	0	132	3,442	52%
2024	3,356	0	0	3,356	0	153	3,509	55%
Forecast								
2025	3361	0	0	3,361	0	126	3,486	55%
2026	3391	0	0	3,391	0	126	3,517	55%
2027	3425	0	0	3,425	0	126	3,551	55%
2028	3460	0	0	3,460	0	126	3,586	55%
2029	3496	0	0	3,496	0	126	3,622	55%
2030	3531	0	0	3,531	0	125	3,657	55%
2031	3567	0	0	3,567	0	125	3,691	55%
2032	3601	0	0	3,601	0	123	3,724	55%
2033	3637	0	0	3,637	0	123	3,760	55%
2034	3673	0	0	3,673	0	122	3,794	55%

Table 8-7a

Schedule 3.3a: History and Forecast of Annual Net Energy for Load – GWh

Low Case

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Year	Total Sales	Residential Conservation	Comm./Ind. Conservation	Retail	Wholesale	Utility Use & Losses	Net Energy for Load
2015	3,034	0	0	3,034	0	92	3,126
2016	3,030	0	0	3,030	0	79	3,109
2017	3,018	0	0	3,018	0	68	3,086
2018	3,118	0	0	3,118	0	62	3,180
2019	3,117	0	0	3,117	0	73	3,190
2020	3,163	0	0	3,163	0	109	3,273
2021	3,210	0	0	3,210	0	95	3,304
2022	3,279	0	0	3,279	0	127	3,406
2023	3,310	0	0	3,310	0	132	3,442
2024	3,356	0	0	3,356	0	153	3,509
Forecast							
2025	3,343	0	0	3,343	0	126	3,469
2026	3,372	0	0	3,372	0	126	3,498
2027	3,406	0	0	3,406	0	126	3,532
2028	3,441	0	0	3,441	0	126	3,567
2029	3,476	0	0	3,476	0	126	3,602
2030	3,511	0	0	3,511	0	125	3,636
2031	3,547	0	0	3,547	0	125	3,671
2032	3,580	0	0	3,580	0	123	3,703
2033	3,616	0	0	3,616	0	123	3,739
2034	3,652	0	0	3,652	0	122	3,773

Table 8-7b
Schedule 3.3b: History and Forecast of Annual Net Energy for Load – GWh
High Case

(1) Year	(2) Total Sales	(3) Residential Conservation	(4) Comm./Ind. Conservation	(5) Retail	(6) Wholesale	(7) Utility Use & Losses	(8) Net Energy for Load
2015	3,034	0	0	3,034	0	92	3,126
2016	3,030	0	0	3,030	0	79	3,109
2017	3,018	0	0	3,018	0	68	3,086
2018	3,118	0	0	3,118	0	62	3,180
2019	3,117	0	0	3,117	0	73	3,190
2020	3,163	0	0	3,163	0	109	3,273
2021	3,210	0	0	3,210	0	95	3,304
2022	3,279	0	0	3,279	0	127	3,406
2023	3,310	0	0	3,310	0	132	3,442
2024	3,356	0	0	3,356	0	153	3,509
Forecast							
2025	3,378	0	0	3,378	0	126	3,504
2026	3,410	0	0	3,410	0	126	3,536
2027	3,445	0	0	3,445	0	126	3,571
2028	3,479	0	0	3,479	0	126	3,606
2029	3,516	0	0	3,516	0	126	3,642
2030	3,551	0	0	3,551	0	125	3,677
2031	3,587	0	0	3,587	0	125	3,712
2032	3,623	0	0	3,623	0	123	3,746
2033	3,659	0	0	3,659	0	123	3,782
2034	3,695	0	0	3,695	0	122	3,817

Table 8-8

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	2024 Actual		2025 Forecast		2026 Forecast	
	[1]Peak Demand MW	NEL GWh	[1]Peak Demand MW	NEL GWh	[1]Peak Demand MW	NEL GWh
January	533	251	672	258	676	260
February	472	226	608	227	612	229
March	537	253	527	268	531	271
April	601	260	587	265	592	267
May	706	348	678	326	684	328
June	722	341	712	334	718	337
July	717	362	709	350	716	353
August	707	356	727	360	733	364
September	689	336	693	314	699	317
October	643	273	652	285	657	288
November	553	255	548	238	553	240
December	502	248	458	261	462	263

[1]Includes Conservation

Table 8-9

Schedule 5: Fuel Requirements

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
				Calendar Year										
	Fuel Requirements	Type	UNITS	2024-Actual	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
(1)	Nuclear		Trillion Btu	0	0	0	0	0	0	0	0	0	0	0
(2)	Coal		1000 Ton	0	0	0	0	0	0	0	0	0	0	0
	Residual	Steam	1000 BBL	0	0	0	0	0	0	0	0	0	0	0
(3)		CC	1000 BBL	0	0	0	0	0	0	0	0	0	0	0
(4)		CT	1000 BBL	0	0	0	0	0	0	0	0	0	0	0
(5)		Total	1000 BBL	0	0	0	0	0	0	0	0	0	0	0
(6)														
(7)	Distillate	Steam	1000 BBL	0	0	0	0	0	0	0	0	0	0	0
(8)		CC	1000 BBL	0	0	0	0	0	0	0	0	0	0	0
(9)		CT	1000 BBL	1	1	1	1	0	0	0	0	0	0	0
(10)		Total	1000 BBL	1	1	1	1	0	0	0	0	0	0	0
(11)	Natural Gas	Steam	1000 MCF	0	0	0	0	0	0	0	0	0	0	0
(12)		CC	1000 MCF	19,146	14,086	16,610	15,914	13,220	16,127	16,745	15,861	15,287	15,080	15,837
(13)		CT	1000 MCF	628	1,429	1,996	1,360	1,057	1,342	1,234	1,356	1,045	1,170	944
(14)		Total	1000 MCF	19,774	15,515	18,606	17,274	14,277	17,469	17,979	17,217	16,332	16,250	16,781
(15)	Other		Trillion Btu	0	0	0	0	0	0	0	0	0	0	0

Table 8-10
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										
	Inter-Regional Interchange			2024 - Actual	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
(1)	Nuclear		GWh	0	0	0	0	0	0	0	0	0	0	0
(2)	Coal		GWh	0	0	0	0	0	0	0	0	0	0	0
(3)														
	Residual	Steam		0	0	0	0	0	0	0	0	0	0	0
(4)		CC	GWh	0	0	0	0	0	0	0	0	0	0	0
(5)		CT	GWh	0	0	0	0	0	0	0	0	0	0	0
(6)		Total	GWh	0	0	0	0	0		0	0	0	0	0
(7)														
(8)	Distillate	Steam	GWh	0	0	0	0	0	0	0	0	0	0	0
(9)		CC	GWh	0	0	0	0	0	0	0	0	0	0	0
(10)		CT	GWh	0	1	1	0	0	0	0	0	0	0	0
(11)		Total	GWh	0	1	1	0	0	0	0	0	0	0	0
(12)	Natural Gas	Steam		0	0	0	0	0	0	0	0	0	0	0
(13)		CC	GWh	2,591	2,013	2,375	2,265	1,911	2,311	2,402	2,260	2,209	2,172	2,291
(14)		CT	GWh	52	171	244	165	127	164	150	166	129	143	117
(15)		Total	GWh	2,643	2,184	2,619	2,430	2,038	2,475	2,552	2,426	2,338	2,315	2408
(16)	NUG													
(17)	Solar#		GWh	28	23	23	177	204	203	203	203	203	194	194
(18)	[1]Other (Purchase/Sales)		GWh	838	1,278	874	944	1,344	944	902	1,062	1,183	1,251	1,192
(19)	Net Energy for Load		GWh	3,509	3,486	3,517	3,551	3,586	3,622	3,657	3,691	3,724	3,760	3,794

[1] Intra-Regional Purchase· # Includes net solar from customers for 2024

Table 8-11
Schedule 6.2: Energy Sources

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
				Calendar Year										
	Energy Source	Type	Units	2024-Actual	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
(1)	Inter-Regional Interchange		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(2)	Nuclear		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(3)	Coal		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(4)	Residual	Steam	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(5)		CC	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(6)		CT	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(7)		Total	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(8)	Distillate	Steam	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(9)		CC	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(10)		CT	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(11)		Total	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(12)	Natural Gas	Steam	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(13)		CC	%	74%	58%	68%	64%	53%	64%	66%	61%	59%	58%	60%
(14)		CT	%	1%	5%	7%	5%	4%	5%	4%	4%	3%	4%	3%
(15)		Total	%	75%	63%	74%	68%	57%	68%	70%	66%	63%	62%	63%
(16)	NUG		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
(17)	Solar[#]		%	1%	1%	1%	5%	6%	6%	6%	5%	5%	5%	5%
	[1]Other (Specify)		%	24%	37%	25%	27%	37%	26%	25%	29%	32%	33%	31%
(18)														
(19)	Net Energy for Load		%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

[1] Other = Purchase ,[#] Includes net solar from customers for 2024

Table 8-12

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)	(13)
Year	Total Installed Capacity	Firm Capacity Import	Firm Capacity Export	Projected Firm Net To Grid from NUG	Firm Contracts	Total Capacity Available	System Firm Peak Demand	Reserve Margin Before Maintenance[1]		Scheduled Maintenance	[1]Reserve Margin After Maintenance	
	MW	MW	MW	MW	MW	MW	MW	MW	%	MW	MW	%
2025	777	0	0	7	100	884	727	157	22%	0	157	22%
2026	777	0	0	44	100	921	733	188	26%	0	188	26%
2027	777	0	0	44	36	857	741	116	16%	0	116	16%
2028	777	0	0	44	41	862	748	114	15%	0	114	15%
2029	777	0	0	44	51	872	756	116	15%	0	116	15%
2030	777	0	0	44	56	877	763	114	15%	0	114	15%
2031	777	0	0	44	66	887	771	116	15%	0	116	15%
2032	777	0	0	44	76	897	778	119	15%	0	119	15%
2033	777	0	0	44	86	907	786	121	15%	0	121	15%
2034	777	0	0	44	96	917	794	123	15%	0	123	15%

[1] Includes conservation.

Table 8-13
Schedule 7.2: Forecast of Capacity, Demand, and Scheduled Maintenance at the time of Winter Peak

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Year	Total Installed Capacity	Firm Capacity Import	Firm Capacity Export	Projected Firm Net To Grid from NUG	Firm Contracts	Total Capacity Available	System Firm Peak Demand	[1]Reserve Margin Before Maintenance		Scheduled Maintenance	Reserve Margin After Maintenance[1]	
	MW	MW	MW	MW		MW	MW	MW	%	MW	MW	%
2025/26	840	0	0	0	50	890	676	214	32	0	214	32
2026/27	840	0	0	0	0	840	681	159	23	0	159	23
2027/28	840	0	0	0	0	840	687	153	22	0	153	22
2028/29	840	0	0	0	0	840	692	148	21	0	148	21
2029/30	840	0	0	0	0	840	696	144	21	0	144	21
2030/31	840	0	0	0	0	840	700	140	20	0	140	20
2031/32	840	0	0	0	0	840	705	135	19	0	135	19
2032/33	840	0	0	0	0	840	709	131	18	0	131	18
2033/34	840	0	0	0	0	840	712	128	18	0	128	18
2034/35	840	0	0	0	0	840	717	123	17	0	123	17

[1]Includes Conservation

Table 8-14
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		[1]Status
				Pri.	Alt.	Pri.	Alt.	Mo/Yr	Mo/Yr	Mo/Yr	MW	Sum MW	Win MW	
Charles Larsen Power Plant	Gas Turbine #2	Polk County	CT	NG	DFO	PL	TK	-	Nov-62	---	11.2	10	14	OS
Charles Larsen Power Plant	Gas Turbine #3	Polk County	PV	NG	-	PL	TK	-	Dec-62	---	11.2	9	13	OS
McIntosh Power Plant	MREP 1-6	Polk County	IC	NG	-	PL	-	-	Jan-25	---	121.6	119	119	OP
Edge Solar	-	Polk County	PV	SUN	-	-	-	-	Mar-27	---	74.8	74.5	74.8	P

[1]Notes: OS - On long-tem scheduled maintenance ; P - Planned for installation

Table 8-15

Schedule 9.1: Status Report and Specifications of newly installed Generating Facilities

(1)	Plant Name and Unit Number:			McIntosh, MREP 1-6
(2)	Nameplate Capacity:			120 MW (6 units)
(3)		Firm Summer MW		120 MW
(4)		Firm Winter MW		120 MW
(5)	Technology Type:			Reciprocating Internal Combustion Engine (RICE)
(6)	Anticipated Construction Timing:			
(7)		Field Construction Start-date:		2022
(8)		Commercial In-Service date:		Jan-25
(9)	Fuel			
(10)		Primary		Natural Gas
(11)		Alternate		N/A
(12)	Air Pollution Control Strategy:			Selectrive Catalytic Reduction (SCR) with anhydrous ammonia injection
(13)	Cooling Method:			Closed Cycle Radiator to Air
(14)	Total Site Area (Acres):			7.2
(15)	Construction Status:			Completed
(16)	Certification Status:			Air Construction permit, Environmental Resource and Operating Permit in place from FDEP.
(17)	Status with Federal Agencies:			NA
(18)	***Projected*** Unit Performance Data:			
(19)		Planned Outage Factor (POF):		2%
(20)		Forced Outage Factor (FOF):		2%
(21)		Equivalent Availability Factor (EAF):		98%
(22)		Resulting Capacity Factor (%):		15-30% (expected)
(23)		Average Net Operating Heat Rate (ANOHR):		8300 Btu/KWh
(24)	Unit Financial Data:			
(25)		Book Life:		25
(26)		Total Installed Cost (2024 $/kW):		1425
(27)			Direct Construction Cost *($/kW):	1371
(28)			[1]Finance Amount (2024$/kW):	54
(29)			[2]Escalation ($/kW):	N/A
(30)		Fixed O&M ($/kW-yr):		N/A
(31)		Variable O&M ($/MWh):		4
(32)		K-Factor		No Calculation

Note: *overnight cost without finance and escalation. , [1] Finance Cost

N/A = Not Available, NA = Not Applicable

Table 8-16
Schedule 10: Status Report and Specifications of Proposed Directly Associated Transmission Lines

(1)	Point of Origin and Termination:	Hamilton S/S to Dranefield S/S
(2)	Number of Lines:	1
(3)	Right of Way:	Lakeland Electric owned
(4)	Line Length:	5.5
(5)	Voltage:	69 KV
(6)	Anticipated Construction Time:	May-24
(7)	Anticipated Capital Investment in 2025	$5.6 Million
(8)	Substations:	Hamilton, Dranefield
(9)	Participation with Other Utilities:	None

8.1 Abbreviations and Descriptions

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

Abbreviation	Description
Unit Type	
CA	Combined Cycle Steam Part
GT	Combustion Gas Turbine
ST	Steam Turbine
CT	Combined Cycle Combustion Turbine
CC	Combined Cycle
IC	Internal Combustion Engine
RICE	Reciprocating 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
RT	To be Retired
SB	Cold Standby (Reserve)
TS	Construction Complete, not yet in commercial operation
U	Under Construction
P	Planned for installation
OP	Operating