# GAINESVILLE REGIONAL UTILITIES

# 2019 TEN-YEAR SITE PLAN

Submitted to:

The Florida Public Service Commission

April 1, 2019

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# INTRODUCTION

The 2019 Ten-Year Site Plan for Gainesville Regional Utilities (GRU) is submitted to the Florida Public Service Commission pursuant to Section 186.801, Florida Statutes. The contents of this report conform to information requirements listed in Form PSC/RAD 043-E, as specified by Rule 25-22.072, Florida Administrative Code. The four sections of the 2019 Ten-Year Site Plan are:

- Description of Existing Facilities
- Forecast of Electric Energy and Demand Requirements
- Forecast of Facilities Requirements
- Environmental and Land Use Information

Gainesville Regional Utilities (GRU) is a municipal electric, natural gas, water, wastewater, and telecommunications utility system, owned and operated by the City of Gainesville, Florida. The GRU retail electric system service area includes the City of Gainesville and the surrounding urban area. The highest net integrated peak demand recorded to date on GRU's electrical system was 481 Megawatts on August 8, 2007.

## 1. DESCRIPTION OF EXISTING FACILITIES

**Gainesville Regional Utilities** (GRU) operates a fully vertically-integrated electric power production, transmission, and distribution system (herein referred to as "the System"), and is wholly owned by the City of Gainesville. In addition to retail electric service, GRU also provides wholesale electric service to the City of Alachua (Alachua) and transmission service to Seminole Electric Cooperative (Seminole). GRU's distribution system serves its retail territory of approximately 124 square miles and an average of 97,681 customers during 2018. The general locations of GRU electric facilities and the electric system service area are shown in Figure 1.1.

### 1.1 GENERATION

The existing generating facilities operated by GRU are tabulated in Schedule 1 at the end of this section. The present Summer Net Continuous Capacity is 631.2 MW and the Winter Net Continuous Capacity is 660.5 MW. Currently, the System's energy is produced by three fossil fuel steam turbines[1], one of which is part of a combined cycle unit; a biomass steam turbine; five combustion turbines, three of which are simple cycle, one which can generate in either simple or combined cycle mode, and one which provides distributed generation; and an internal combustion engine which also provides distributed generation.

The System has three primary generating plant sites: Deerhaven (DH), Deerhaven Renewable (DHR), and John R. Kelly (JRK). These sites are shown on Figure 1.

1 One steam turbine, JRK steam turbine (ST) 8, operates only in combined cycle with JRK combustion turbine (CT) 4. As CT4 is fossil fueled, the steam created by the heat recovery steam generator (HRSG) into which it exhausts when in combined cycle mode is produced by fossil fuel. Therefore ST8 is indirectly driven by fossil fuel. No capability exists to directly burn fossil fuel to produce steam for ST8.

### 1.1.1 Generating Units[2]

**1.1.1.1 Simple Cycle Steam and Combined Cycle Units.** The System has two simple cycle steam turbines and one combined cycle steam turbine powered by fossil fuels[3]. The System also consists of a biomass-fueled simple cycle steam turbine. The two simple cycle fossil-fueled steam turbines comprise 48% of the System's Net Summer Continuous Capacity and produced 39% of the electric energy supplied by the System in 2018. The combined cycle unit, which includes a heat recovery steam generator (HRSG), steam turbine/generator, and combustion turbine/generator, comprises 17% of the System's Net Summer Continuous Capacity and produced 30% of the electric energy supplied by the System in 2018. DH 2 (228 MW) and JRK CC1 (108 MW) have historically been used for base load purposes, while DH 1 (75 MW) has more commonly been used for intermediate loading. The purchase of 103 MW of biomass power in 2017 has resulted in increased load cycling of DH 2, while the biomass unit has become a baseload unit for the System.

**1.1.1.2 Simple Cycle Combustion Gas Turbines.** The System's four industrial combustion turbines that operate only in simple cycle comprise 19.4% of the System's Summer Net generating capacity and produced approximately 2% of the electric energy supplied by the System in 2018. Three of these simple cycle combustion turbines are utilized for peaking purposes only as their energy conversion efficiencies are considerably lower than steam or combined cycle units. However, simple cycle combustion turbines are advantageous in that they can be started and placed online quickly. The fourth combustion turbine operates to serve load as part of a combined heat and power facility at the South Energy Center, further described in Section 1.5. The combustion turbine mentioned in 1.1.1.1 that is

2 All MW ratings are Summer Net continuous capacity unless otherwise stated.

3 One steam turbine, JRK steam turbine (ST) 8, operates only in combined cycle with JRK combustion turbine (CT) 4. As CT4 is fossil fueled, the steam created by the heat recovery steam generator (HRSG) into which it exhausts when in combined cycle mode is produced by fossil fuel. Therefore ST8 is indirectly driven by fossil fuel. No capability exists to directly burn fossil fuel to produce steam for ST8.

used the majority of the time in combined cycle can also be operated in simple cycle to provide for peaking power.

**1.1.1.3 Reciprocating Internal Combustion Engine.** The System operates a 7.4 MW natural gas-fired internal combustion engine at the South Energy Center. The engine is used in a combined heat and power application, where the engine's waste heat is captured to make steam and hot water for an academic medical campus.

**1.1.1.4 Environmental Considerations.** The System's steam turbines utilize recirculating cooling towers with a mechanical draft for the cooling of condensed steam. DH 2 has an Air Quality Control System (AQCS) consisting of a "hot-side" electrostatic precipitator for the removal of fly ash, a selective catalytic reduction system (SCR) (currently not in service) and low $NO_x$ burners to reduce $NO_x$, a dry recirculating flue gas desulfurization unit to reduce acid gases, sulfur dioxide ($SO_2$) and mercury (Hg), and a fabric filter baghouse to reduce particulates. The Deerhaven Renewable (biomass) unit uses a fabric filter baghouse to reduce particulates, an SCR to reduce $NO_x$, and wood fly ash augmented with a dry sorbent injection system (used when necessary) to reduce $SO_2$, acid gases, and mercury. The entire Deerhaven site operates with zero liquid discharge (ZLD) to surface waters.

### 1.1.2 Generating Plant Sites

The locations of the System's generating plant sites are shown on Figure 1.1.

**1.1.2.1 John R. Kelly Plant.** The Kelly Station is located in southeast Gainesville near the downtown business district, and consists of one combined cycle unit and the associated cooling facilities, fuel storage, pumping equipment, transmission and distribution equipment.

**1.1.2.2 Deerhaven Plant.** The Deerhaven Station is located six miles northwest of Gainesville. The facility consists of two steam turbines, three gas turbines, and the associated cooling facilities, fuel storage, pumping equipment and transmission equipment. DH 2 is coal-fired and the site includes the coal unloading and storage facilities.

**1.1.2.3 Deerhaven Renewable Plant.** The Deerhaven Renewable biomass-fueled generation facility is located northwest of the Deerhaven Generating Station. GRU purchased this 103 MW generating unit in November 2017. The facility consists of one steam turbine, the associated cooling facilities, and biomass unloading and storage facilities.

## 1.2 TRANSMISSION

### 1.2.1 The Transmission Network

GRU's bulk electric power transmission network (System) consists of a 230 kV radial and a 138 kV loop connecting the following:

1) GRU's three primary generating stations,
2) GRU's eleven distribution substations,
3) One 230 kV and two 138 kV interties with Duke Energy Florida (DEF),
4) A 138 kV intertie with Florida Power and Light Company (FPL),
5) A radial interconnection with Clay at Farnsworth Substation, and
6) A loop-fed interconnection with the City of Alachua at Alachua No. 1 Substation.

Refer to Figure 1.1 for geographical locations of the System's transmission lines.

### 1.2.2 Transmission Lines

The present transmission network consists of the following:

| Line | Circuit Miles | Conductor |
|---|---|---|
| 138 kV double circuit | 80.08 | 795 MCM ACSR 26/7 |
| 138 kV single circuit | 16.86 | 1192 MCM ACSR 45/7 |
| 138 kV single circuit | 20.61 | 795 MCM ACSR 26/7 |
| 230 kV single circuit | 2.53 | 795 MCM ACSR 26/7 |
| Total | 120.08 | |

GRU participates in Florida Reliability Coordinating Council, Inc. (FRCC) studies that analyze multi-level contingencies. Contingencies are occurrences that depend on changes or uncertain conditions and, as used here, represent various equipment failures that may occur.

### 1.2.3 State Interconnections

The System is currently interconnected with DEF and FPL at four separate points. The System interconnects with DEF's Archer Substation via a 230 kV transmission line to the System's Parker Road Substation with 224 MVA of transformation capacity from 230 kV to 138 kV. The addition of a third 112 MVA transformer at the Parker Substation is planned, and is expected to be in service by June 2020. The System also interconnects with DEF's Idylwild Substation with two separate circuits via their 168 MVA 138/69 kV transformer. The System interconnects with FPL via a 138 kV tie between FPL's Hampton Substation and the System's Deerhaven Substation. This interconnection has a transformation capacity at Bradford Substation of 224 MVA. All listed capacities are based on normal (Rating A) capacities.

The System is planned, operated, and maintained to be in compliance with all FERC, NERC, and FRCC requirements to assure the integrity and reliability of Florida's Bulk Electric System (BES).

## 1.3 DISTRIBUTION

The System has seven loop-fed and three radial distribution substations connected to the transmission network: Ft. Clarke, Kelly, McMichen, Millhopper, Serenola, Springhill, Sugarfoot, Ironwood, Kanapaha, and Rocky Point substations, respectively. Parker Road is GRU’s only 230 kV transmission voltage substation. The locations of these substations are shown on Figure 1.1.

The seven loop-fed distribution substations are connected to the 138 kV bulk power transmission network with feeds that prevent the outage of a single transmission line from causing any outages in the distribution system. Ironwood, Kanapaha and Rocky Point are served by a single tap to the 138 kV network which would require distribution switching to restore customer power if the single transmission line tapped experienced an outage. GRU serves its retail customers through a 12.47 kV distribution network. The System has three Power Delivery Substations (PDS) with single 33.6 MVA transformers that are directly radial-tapped to the looped 138 kV system. The Springhill Substation consists of one 33.3 MVA transformer served by a loop-fed SEECO pole-mounted switch. Ft. Clarke, Kelly, McMichen, and Serenola substations currently consist of two transformers of nearly equal size, allowing these stations to be loaded under normal conditions to 80 percent of their capabilities. Millhopper and Sugarfoot Substations currently consist of three transformers of equal size allowing both of these substations to be loaded under normal conditions to 100 percent of its capability. One of the two 22.4 MVA transformers at Ft. Clarke has been repaired with rewinding to a 28.0 MVA rating. This makes the normal rating for this substation 50.4 MVA.

## 1.4 WHOLESALE ENERGY

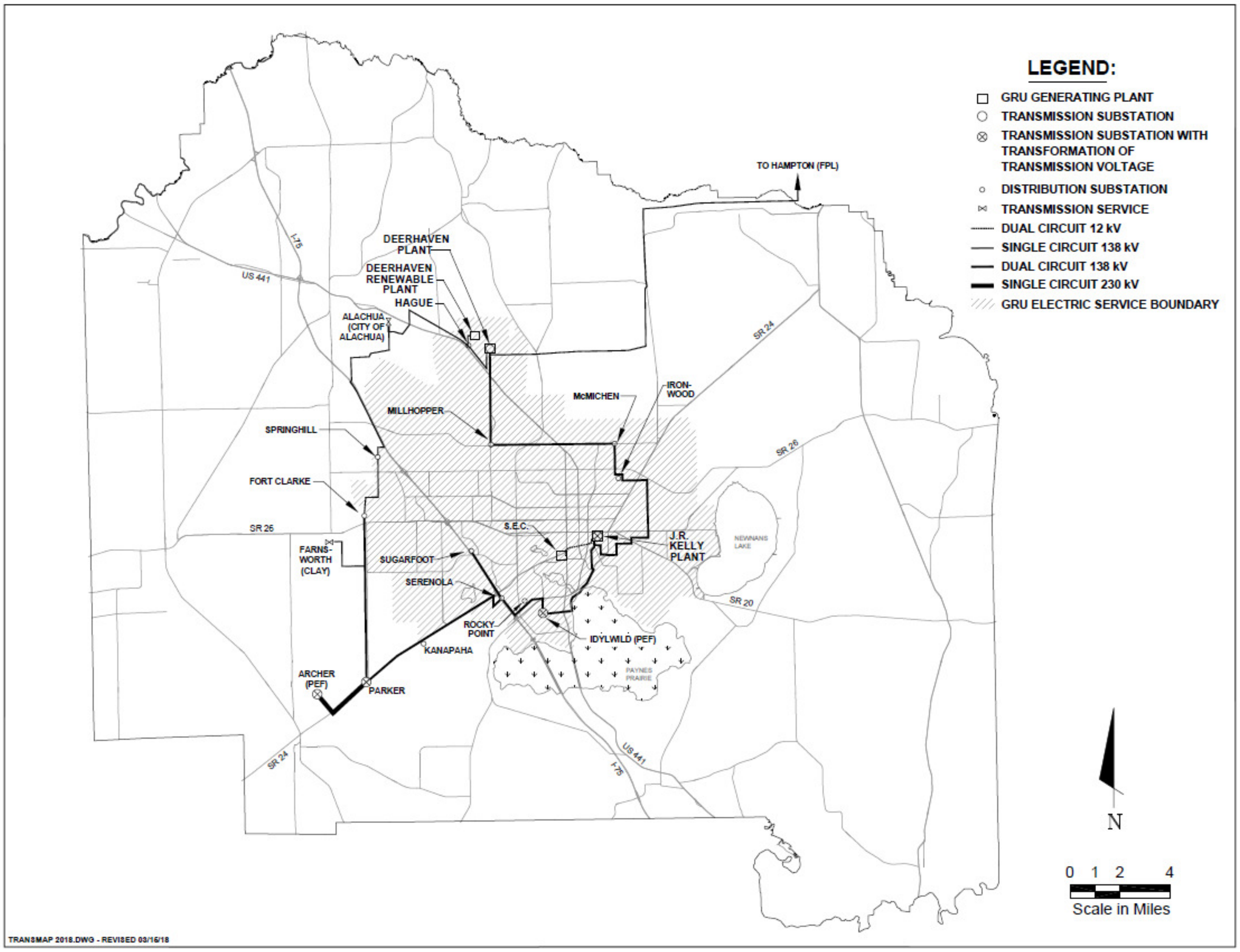
The System provides full-requirements wholesale electric service to the City of Alachua. The Alachua No. 1 Substation is supplied by GRU's looped 138 kV transmission system. The System provides approximately 98% of Alachua's energy requirements with the remainder being supplied by Alachua's generation entitlements from FPL’s St. Lucie nuclear units. Energy supplied to the City of Alachua by these nuclear units is wheeled over GRU's transmission network, with GRU providing generation backup in the event of an outage of these nuclear units. The System began serving the City of Alachua in July 1985 and has provided full-requirements wholesale electric service since January 1988. An agreement was made in 2016 to extend GRU’s service to the City of Alachua until March 2022. Wholesale sales to the City of Alachua have been included as native load for purposes of projecting GRU's needs for generating capacity and associated reserve margins through 2022.

## 1.5 DISTRIBUTED GENERATION

The South Energy Center (SEC), a combined heat and power plant, began providing services to the UF Health Shands South Campus in February 2009. The SEC houses a 3.5 MW natural gas-fired turbine and a 7.4 MW natural gas-fired reciprocating internal combustion engine which are capable of supplying 100% of the hospitals’ electric and thermal needs. The SEC provides electricity, chilled water, steam, heating hot water, and the storage and delivery of medical gases to the hospitals. The unique design is at least 75% efficient at primary fuel conversion to useful energy and greatly reduces emissions compared to traditional generation. The facility is designed to provide electric power into the GRU distribution system when its capacity is not totally utilized by the hospitals.

**Figure 1.1**

**Gainesville Regional Utilities Electric Facilities**



## Schedule 1
### EXISTING GENERATING FACILITIES (as of January 1, 2019)

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Alt. | | | | | | | |
| | | | | | | | | Fuel | Commercial | Expected | Gross Capability | | Net Capability | | |
| | Unit | | Unit | Primary Fuel | | Alternate Fuel | | Storage | In-Service | Retirement | Summer | Winter | Summer | Winter | |
| Plant Name | No. | Location | Type | Type | Trans. | Type | Trans. | (Days) | Month/Year | Month/Year | MW | MW | MW | MW | Status |
| **J. R. Kelly** | | Alachua County | | | | | | | | | **110.0** | **120.0** | **108.0** | **118.0** | |
| | FS08 | Sec. 4, T10S, R20E | CA | WH | PL | DFO | TK | | [ 4/65 ; 5/01 ] | 2035 | 37.5 | 38.0 | 36.0 | 37.0 | OP |
| | GT04 | (GRU) | CT | NG | PL | DFO | TK | | 5/01 | 2051 | 72.5 | 82.0 | 72.0 | 81.0 | OP |
| **Deerhaven** | | Alachua County | | | | | | | | | **438.5** | **459.0** | **409.0** | **428.0** | |
| | FS02 | Secs. 26,27,35 | ST | BIT | RR | | | | 10/81 | 2031 | 251.0 | 251.0 | 228.0 | 228.0 | OP |
| | FS01 | T8S, R19E | ST | NG | PL | RFO | TK | | 8/72 | 2022 | 80.0 | 80.0 | 75.0 | 75.0 | OP |
| | GT03 | (GRU) | GT | NG | PL | DFO | TK | | 1/96 | 2046 | 71.5 | 82.0 | 71.0 | 81.0 | OP |
| | GT02 | | GT | NG | PL | DFO | TK | | 8/76 | 2026 | 18.0 | 23.0 | 17.5 | 22.0 | OP |
| | GT01 | | GT | NG | PL | DFO | TK | | 7/76 | 2026 | 18.0 | 23.0 | 17.5 | 22.0 | OP |
| **South Energy Center** | | Alachua County | | | | | | | | | **12.3** | **12.3** | **11.2** | **11.5** | |
| | GT01 (*) | Sec. 10, T10S, R20E | GT | NG | PL | | | | 5/09 | 2039 | 4.5 | 4.5 | 3.8 | 4.1 | OP |
| | IC02 (*) | (GRU) | IC | NG | PL | | | | 12/17 | 2047 | 7.8 | 7.8 | 7.4 | 7.4 | OP |
| **Deerhaven Renewable** | | Alachua County | | | | | | | | | | | | | |
| | FS01 | Sec. 26, T08, R19 | ST | WDS | TK | | | | 12/13 | 2043 | **116.0** | **116.0** | **103.0** | **103.0** | OP |
| | | (GRU) | | | | | | | | | | | | | |
| **System Total** | | | | | | | | | | | | | **631.2** | **660.5** | |

Unit Type
CA = Combined Cycle - Steam Part
CT = Combined Cycle - CT Part
GT = Gas Turbine
ST = Steam Turbine
IC = Internal Combustion Engine

Fuel Type
BIT = Bituminous Coal
DFO = Distillate Fuel Oil
NG = Natural Gas
RFO = Residual Fuel Oil
WH = Waste Heat
WDS = Wood Waste Solids

Transportation Method
PL = Pipe Line
RR = Railroad
TK = Truck

Status
OP = Operational

## 2. FORECAST OF ELECTRIC ENERGY AND DEMAND REQUIREMENTS

Section 2 includes documentation of GRU's forecast of number of customers, energy sales and seasonal peak demands; a forecast of energy sources and fuel requirements; and an overview of GRU's involvement in demand-side management programs.

The accompanying tables provide historical and forecast information for calendar years 2009-2028. Energy sales and number of customers are tabulated in Schedules 2.1, 2.2, and 2.3. Schedule 3.1 gives the summer peak demand forecast by reporting category. Schedule 3.2 presents the winter peak demand forecast by reporting category. Schedule 3.3 presents net energy for load by reporting category. Short-term monthly load data is presented in Schedule 4. Projected sources of energy for the System, by method of generation, are shown in Schedule 6.1. The percentage breakdowns of energy sources shown in Schedule 6.1 are given in Schedule 6.2. The quantities of fuel expected to be used to generate the energy requirements shown in Schedule 6.1 are given by fuel type in Schedule 5.

### 2.1 FORECAST ASSUMPTIONS AND DATA SOURCES

(1) All regression analyses were based on annual data. Historical data was compiled for calendar years 1970 through 2018. System data, such as net energy for load, seasonal peak demands, customer counts and energy sales, was obtained from GRU records and sources.

(2) Estimates and projections of Alachua County population were based on population data published by The Bureau of Economic and Business Research at the University of Florida. Population projections used in GRU’s forecast were based on the average of projections from BEBR Bulletins 171, 174, and 180, and Florida Estimates of Population 2018.

(3) Historical weather data was used to fit regression models. The forecast assumes normal weather conditions. Normal heating degree days and cooling degree days equal the mean of data reported to NOAA by the Gainesville Municipal Airport station from 1984-2018.

(4) All income and price figures were adjusted for inflation, and indexed to a base year of 2018, using the U.S. Consumer Price Index for All Urban Consumers from the U.S. Department of Labor, Bureau of Labor Statistics. Inflation is assumed to average approximately 2.25% per year for each year of the forecast.

(5) The U.S. Department of Commerce, Bureau of Economic Analysis, provided historical estimates of total personal income. Forecast values of total personal income were obtained from IHS Markit.

(6) Historical estimates of household size were obtained from BEBR Bulletin 182 (December 2018), and projections were estimated from a logarithmic trend analysis of historical estimates.

(7) The U.S. Department of Labor, Bureau of Labor Statistics, provided historical estimates of non-farm employment. Forecast values of non-farm employment were obtained from IHS Markit.

(8) Retail electric prices for each billing rate category were assumed to increase at a nominal rate of approximately 2.5% per year. Prices are expressed in dollars per 1,000 kWh.

(9) Estimates of energy and demand reductions resulting from planned demand-side management programs (DSM) were subtracted from all retail forecasts. GRU has been involved in formal conservation efforts since 1980. The forecast reduces energy sales and seasonal demands by the projected conservation impacts, net of cumulative impacts from 1980-2018. GRU's involvement with DSM is described in more detail later in this section.

(10) Sales to The City of Alachua were included in this forecast through March 2022. Alachua’s ownership of FPL nuclear capacity supplied approximately 2.4% of its annual energy requirements in 2018.

## 2.2 FORECASTS OF NUMBER OF CUSTOMERS, ENERGY SALES AND SEASONAL PEAK DEMANDS

Number of customers, energy sales and seasonal peak demands were forecast from 2019 through 2028. Separate energy sales forecasts were developed for each of the following customer segments: residential, general service non-demand, general service demand, large power, outdoor lighting, and sales to the City of Alachua. Separate forecasts of number of customers were developed for residential, general service non-demand, general service demand and large power retail rate classifications. The basis for these independent forecasts originated with the development of least-squares regression models. All modeling was performed in-house using the Statistical Analysis System (SAS)[4]. The following text describes the regression equations utilized to forecast energy sales and number of customers.

### 2.2.1 Residential Sector

The equation of the model developed to project residential average annual energy use (kilowatt-hours per year) specifies average use as a function of residential price of electricity and heating degree days. The form of this equation is as follows:

*RESAVUSE =* 15343 – *47.98 (RESPR18) + 1.322 (HDD)*

Where:

RESAVUSE = Average Annual Residential Energy Use per Customer

RESPR18 = Residential Price, Dollars per 1000 kWh

HDD = Annual Heating Degree Days

[4] SAS is the registered trademark of SAS Institute, Inc., Cary, NC.

| | | |
|---|---|---|
| Adjusted $R^2$ | = | 0.7666 |
| DF (error) | = | 23 (period of study, 1993-2018) |
| t - statistics: | | |
| Intercept | = | 17.92 |
| RESPR18 | = | -8.42 |
| HDD | = | 3.63 |

Projections of the average annual number of residential customers were developed from a linear regression model stating the number of customers as a function of Alachua County population and the historical number of customers transferred from Clay Electric Cooperative Inc. to GRU. The residential customer model specifications are:

*RESCUS* = *710.39 + 282.23 (POP) + 2.491 (CLYRCUS)*

Where:

| | | |
|---|---|---|
| RESCUS | = | Number of Residential Customers |
| POP | = | Alachua County Population (thousands) |
| CLYRCUS | = | Clay Electric Transfer Customers |
| Adjusted $R^2$ | = | 0.9880 |
| DF (error) | = | 17 (period of study, 1999-2018) |
| t - statistics: | | |
| Intercept | = | 0.30 |
| POP | = | 18.23 |
| CLYRCUS | = | 5.36 |

The product of forecasted values of average use and number of customers yielded the projected energy sales for the residential sector.

### 2.2.2 General Service Non-Demand Sector

The general service non-demand (GSN) customer class includes non-residential customers with maximum billing demands less than 50 kilowatts (kW). In 1990, GRU began offering GSN customers the option to elect the General Service Demand (GSD) rate classification. This option offers potential benefit to GSN customers that use high amounts of energy relative to their billing demands. As a result, a significant proportion of current GSD customers have voluntarily elected this rate category. The forecast assumes that additional GSN customers will opt into the GSD classification, but at a more modest pace than has been observed historically. A regression model was developed to project average annual energy use by GSN customers. The model includes as independent variables, the cumulative number of optional demand customers, per capita income, and cooling degree days. The specifications of this model are as follows:

$$GSNAVUSE = 13.51 - 0.021\,(OPTDCUS) + 0.00029\,(MSAPCY18) + 0.00189\,(CDD)$$

Where:

| | | |
|---|---|---|
| GSNAVUSE | = | Average Annual Energy Usage per GSN Customer |
| OPTDCUS | = | Optional GSD Customers |
| MSAPCY18 | = | Per Capita Income |
| CDD | = | Annual Cooling Degree Days |
| Adjusted $R^2$ | = | 0.9721 |
| DF (error) | = | 22 (period of study, 1993-2018) |

t - statistics:

| | | |
|---|---|---|
| Intercept | = | 3.85 |
| OPTDCUS | = | -14.71 |
| MSAPCY18 | = | 3.32 |
| CDD | = | 3.16 |

The number of general service non-demand customers was projected using an equation specifying customers as a function of Alachua County population and the addition of a group of individually metered cable amplifiers that were previously bulk metered. The specifications of the general service non-demand customer model are as follows:

*GSNCUS* = *-2529 + 46.3 (POP) + 0.63 (COXTRAN)*

Where:

| | | |
|---|---|---|
| GSNCUS | = | Number of General Service Non-Demand Customers |
| POP | = | Alachua County Population (thousands) |
| COXTRAN | = | Cable TV Meters |
| Adjusted $R^2$ | = | 0.9965 |
| DF (error) | = | 22 (period of study, 1993-2018) |

t - statistics:

| | | |
|---|---|---|
| Intercept | = | -11.02 |
| POP | = | 43.61 |
| COXTRAN | = | 5.39 |

Forecasted energy sales to general service non-demand customers were derived from the product of projected number of customers and the projected average annual use per customer.

### 2.2.3 General Service Demand Sector

The general service demand customer class includes non-residential customers with average billing demands generally of at least 50 kW but less than 1,000 kW. Average annual energy use per customer was projected using an equation specifying average use as a function of the cumulative number of optional demand customers, non-farm employment, cooling degree days, and an indicator variable representing a change in eligibility criteria for the large power rate category. Average energy use projections for general service demand customers result from the following model:

*GSDAVUSE=* *3849 – 0.24 (OPTDCUS) + 0.87 (MSA_NF)*
*+ 0.030 (CDD) + 39.6 (POLICY)*

Where:

| | | |
|---|---|---|
| GSDAVUSE | = | Average Annual Energy Use by GSD Customers |
| OPTDCUS | = | Optional GSD Customers |
| MSA_NF | = | Non-Farm Employment |
| CDD | = | Cooling Degree Days |
| POLICY | = | Eligibility Indicator Variable |
| Adjusted $R^2$ | = | 0.9303 |
| DF (error) | = | 21 (period of study, 1993-2018) |
| t - statistics: | | |
| Intercept | = | 8.99 |
| OPTDCUS | = | -12.75 |
| MSA_NF | = | 2.76 |
| CDD | = | 3.49 |
| POLICY | = | 6.77 |

The annual average number of customers was projected using a regression model that includes Alachua County population. The specifications of the general service demand customer model are as follows:

| | | |
|---|---|---|
| *GSDCUS* | = | *-1068 + 9.14 (POP)* |
| Where: | | |
| GSDCUS | = | Number of General Service Demand Customers |
| POP | = | Alachua County Population (thousands) |
| Adjusted $R^2$ | = | 0.9515 |
| DF (error) | = | 24 (period of study, 1993-2018) |
| t - statistics: | | |
| Intercept | = | -11.18 |
| POP | = | 22.17 |

The forecast of energy sales to general service demand customers was the resultant product of projected number of customers and projected average annual use per customer.

### 2.2.4 Large Power Sector

The large power customer class currently includes twelve customers that maintain an average monthly billing demand of at least 1,000 kW. The forecast of large power energy sales was developed via analysis of each individual account. Recent historical energy sales were examined for the presence of any trends in usage patterns. This methodology has been described as an heuristic approach. The forecast of sales to large power customers is held constant through the forecast horizon.

The number of customers in the large power sector is expected to remain constant at 12 customers. Future forecasts will incorporate known, specific changes within this sector when and if they are identified.

### 2.2.5 Outdoor Lighting Sector

The outdoor lighting sector consists of streetlight, traffic light, and rental light accounts. Outdoor lighting energy sales account for approximately 1.4% of retail energy sales. Outdoor lighting energy sales were held constant at current levels in this forecast.

### 2.2.6 Wholesale Energy Sales

The System provides full requirements wholesale electric service to the City of Alachua. Approximately 2.4% of Alachua's 2018 energy requirements were met through generation entitlements of nuclear generating units operated by FPL. The agreement to provide wholesale power to Alachua is in effect through March 2022. Energy sales to the City of Alachua are considered part of the System's native load for facilities planning through the end of the current agreement.

Energy Sales to Alachua were estimated using a model including Alachua County population and heating degree days as the independent variables. The model used to develop projections of sales to the City of Alachua is of the following form:

$$ALAMWh = -236649 + 1390\,(POP) + 9.32\,(HDD)$$

Where:

| | | |
|---|---|---|
| ALAMWh | = | Energy Sales to the City of Alachua (MWh) |
| POP | = | Alachua County Population (000's) |
| HDD | = | Heating Degree Days |

| | | |
|---|---|---|
| Adjusted $R^2$ | = | 0.9784 |
| DF (error) | = | 22 (period of study, 1994-2018) |

t - statistics:

| | | |
|---|---|---|
| Intercept | = | -20.92 |
| POP | = | 32.89 |
| HDD | = | 2.37 |

### 2.2.7 Total System Sales, Net Energy for Load, Seasonal Peak Demands and Conservation Impacts

The forecast of total system energy sales was derived by summing energy sales projections for each customer class; residential, general service non-demand, general service demand, large power, outdoor lighting, and sales for resale. Net energy for load (NEL) was then forecast by applying a delivered efficiency factor for the System to total energy sales. The projected delivered efficiency factor used in this forecast is 0.9800. Historical delivered efficiencies were examined from the past 25 years to make this determination. The impact of energy savings from conservation programs was accounted for in energy sales to each customer class, prior to calculating NEL.

The forecasts of seasonal peak demands were derived from forecasts of annual NEL. Winter peak demands are expected to occur in January of each year, and summer peak demands are expected to occur in August. The average ratio of the most recent 25 years' monthly NEL for January and August, as a portion of annual NEL, was applied to projected annual NEL to obtain estimates of January and August NEL over the forecast horizon. The medians of the past 25 years' load factors for January and August were applied to January and August NEL projections, yielding seasonal peak demand projections. Forecast seasonal peak demands include the net impacts from planned conservation programs.

## 2.3 ENERGY SOURCES AND FUEL REQUIREMENTS

### 2.3.1 Fuels Used by the System

Presently, the System is capable of using coal, woody biomass, natural gas, residual oil, and distillate oil to satisfy its fuel requirements. The System has historically relied upon coal to fulfill much of its fuel requirements. However, with lower natural gas prices, and subsequent fuel switching, natural gas has become the largest portion of generation fuel. Because the System participates in interchange sales and purchases, and because fuel prices constantly change, actual consumption of these fuels will likely differ from the requirements indicated in Schedule 5.

### 2.3.2 Purchased Power Agreements

**2.3.2.1 G2 Energy Baseline Landfill Gas**. GRU entered a 15-year contract with G2 Energy Marion, LLC and began receiving 3 MW of landfill gas-fueled capacity in January 2009. G2 completed a capacity expansion of 0.8 MW in May 2010, bringing net output to 3.8 MW. G2 is located within DEF's distribution system, and GRU receives approximately 3.7 MW net of distribution and transmission losses.

**2.3.2.2 Solar Feed-In Tariff.** In March of 2009, GRU became the first utility in the United States to offer a European-style solar feed-in tariff (FIT). Under this program, GRU is purchasing solar energy from approximately 250 privately-owned systems distributed throughout GRU's service territory. Each FIT system has an individual contract with a 20-year term. Approximately 18.6 MW of solar generation were constructed under the Solar FIT program.

## 2.4 DEMAND-SIDE MANAGEMENT

### 2.4.1 Demand-Side Management Programs

Demand and energy forecasts outlined in this Ten-Year Site Plan include impacts from GRU's Demand-Side Management (DSM) programs. The System forecast reflects the incremental impacts of DSM measures, net of cumulative impacts from 1980 through 2018.

During 2014 budget deliberations, GRU management and the Gainesville City Commission agreed to eliminate the majority of programs offering financial incentives in an effort to cut costs and keep prices down for customers. The effectiveness of historical measures is reflected in usage data. Over the past 10 years, residential usage per customer has declined 0.17% per year and non-residential usage per customer has declined 0.49% per year.

DSM direct services currently available to the System's residential customers include energy and water surveys, allowances for whole house energy efficiency improvements under the Low-income Energy Efficiency Program Plus (LEEP$^{plus}$), and natural gas rebates for new construction and conversions in existing homes for water heating, central heating, clothes drying and cooking appliances. An on-line energy survey is available that allows customers to perform a self-survey using their actual usage data.

Energy and water surveys are available at no cost to the System's non-residential customers. Rebates for natural gas water heating are also available to GRU's non-residential customers.

The System continues to offer standardized interconnection procedures and net meter billing for both residential and non-residential customers who install photovoltaic solar systems on their homes or businesses.

GRU has also produced numerous factsheets, publications, and videos which are available at no charge to customers and which assist them in making informed decisions regarding their consumption.

### 2.4.2 Demand-Side Management Methodology and Results

Energy and demand savings resulting from DSM program implementation have been estimated using a combination of techniques, including engineering calculations, pre and post billing analysis, and measurement and verification for specific measures. Known interactions between measures and programs were accounted for where possible. From 1980 through 2018, GRU estimates that utility-sponsored DSM programs reduced energy sales by 220 GWh and lowered summer peak demand by 43 MW. In the forecast period, DSM related savings are projected to be very small relative to system load due to the scaling back of programs in this and future years' budgets.

### 2.4.3 Supply Side Programs

The System has undertaken several initiatives to improve the adequacy and reliability of the transmission and distribution systems. GRU purchases overhead and underground transformers that exceed the efficiency specified by the NEMA TP-1 Standard. GRU has improved the feeder system by reconductoring feeders from 4/0 Copper to 795 MCM aluminum overhead conductor. In specific areas the feeders have been installed underground using 1000 MCM underground cable. GRU adds capacitors on its distribution feeders where necessary to support a high system-wide power factor. GRU conducted a Cable Restoration Project, where direct-buried underground primary cables installed prior to 1980 were injected with a solution that restored the insulation of the cable and extends the cable's useful life. Efforts have been made to increase segmentation of feeders by adding more fusing stages, which reduces the number of customers behind any one device. This reduces the number of customers affected by any one outaged device. Efforts in distribution automation have included adding reclosers and automated switches, which decreases outage times by enabling GRU's system operators to remotely switch customers to adjacent feeders when outages occur.

## 2.5 FUEL PRICE FORECAST ASSUMPTIONS

Presently, the System is capable of using coal, woody biomass, natural gas, residual oil, and distillate oil to satisfy its fuel requirements. Since the completion of the Deerhaven 2 coal-fired unit, the System has relied upon coal to fulfill much of its fuel requirements. However, with lower natural gas prices, and subsequent fuel switching, natural gas has become the largest portion of generation fuel. Because the System participates in interchange sales and purchases, and because fuel prices constantly change, actual consumption of these fuels will likely differ from the base case requirements indicated in Schedule 5.

### 2.5.1 Coal

Coal was used to generate approximately 22.6% of the energy produced by the system in calendar year 2018. Thus far, GRU has purchased low sulfur and medium sulfur, high Btu eastern coal for use in Deerhaven Unit 2. In 2009, Deerhaven Unit 2 was retrofitted with an air quality control system, which was added as a means of complying with new environmental regulations. Following this retrofit, Deerhaven Unit 2 is able to utilize coals with up to approximately 2.9% sulfur content. Given the impact of impending environmental regulations on coal generating units, reduced demand, and depressed prompt prices for Central Appalachian (CAPP) coal, GRU has continued to purchase relatively high quality Eastern coals. Rates available under GRU's rail transport contract also provide an incentive for GRU to purchase and transport its coal supplies from the East Coast.

The forecast of coal prices is based on a blend of medium sulfur CAPP coal and High sulfur high Btu Illinois coal. GRU's forecast of coal pricing assumes that 2019 coal procurement will primarily consist of high quality CAPP coals. GRU expects the favorable economics of rail transported CAPP coal to be diminished in the near term. Pricing of these coals was sourced from Argus Coal Daily and CoalDesk publications. GRU has a contract with CSXT for delivery of coal to the Deerhaven plant site through 2019. Rates for coal transportation are based on the terms of GRU's existing rail contract and historical rates of escalation under the contract. A step increase in the delivered coal price is expected in 2020 resulting from higher transportation costs.

In addition to the commodity price of coal and rail transport expense, GRU's all-in price of coal also incorporates the cost of environmental commodities (pebble lime and urea) required for combustion of coal to comply with environmental regulations.

### 2.5.2 Natural Gas

GRU procures natural gas for power generation and for distribution by its Local Distribution Company (LDC). In 2018, GRU purchased approximately 12.8 million MMBtu for use by both systems. GRU power plants used 83% of the total purchased for GRU during 2018, while the LDC used the remaining 17%. Natural gas was used to produce approximately 49.3% of the energy produced by GRU's electric generating units during calendar year 2018.

GRU purchases natural gas via arrangements with producers and marketers connected with the FGT interstate pipeline. GRU's delivered cost of natural gas includes the commodity component, FGT's fuel charge, FGT's usage (transportation) charge, FGT's reservation (capacity) charge, and basis adjustments. Commodity fuel cost projections were based on closing NYMEX natural gas futures prices for the Henry Hub.

### 2.5.3 Biomass

On November 7, 2017, GRU procured a biomass plant from the owners with whom it held a 30-year Purchase Power Agreement (PPA). Biomass was used to generate approximately 28% of the total energy produced by the system in calendar year 2018.

GRU procures woody biomass consisting mainly of forest residue from logging operations and urban wood waste from within a 75-100-mile radius of the plant. The major portion of biomass fuel is secured by contracts of varying lengths with the remainder purchased on a spot basis to take advantage of opportunity fuel. The forecast of biomass prices is based on contract prices escalated by forecasts of the Producer Price Index for diesel and the Consumer Price Index.

**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) |
|---|---|---|---|---|---|---|---|---|
| | | | RESIDENTIAL | | | COMMERCIAL * | | |
| Year | Service Area Population | Persons per Household | GWh | Average Number of Customers | Average kWh per Customer | GWh | Average Number of Customers | Average kWh per Customer |
| 2009 | 191,809 | 2.32 | 808 | 82,605 | 9,781 | 778 | 10,428 | 74,607 |
| 2010 | 190,177 | 2.32 | 851 | 81,973 | 10,381 | 780 | 10,355 | 75,326 |
| 2011 | 189,759 | 2.32 | 805 | 81,881 | 9,831 | 772 | 10,373 | 74,424 |
| 2012 | 190,126 | 2.32 | 757 | 82,128 | 9,217 | 750 | 10,415 | 72,012 |
| 2013 | 191,100 | 2.31 | 753 | 82,638 | 9,112 | 757 | 10,484 | 72,205 |
| 2014 | 192,224 | 2.31 | 773 | 83,214 | 9,289 | 760 | 10,629 | 71,502 |
| 2015 | 193,722 | 2.31 | 799 | 83,953 | 9,517 | 784 | 10,663 | 73,525 |
| 2016 | 194,445 | 2.31 | 822 | 84,358 | 9,744 | 784 | 10,790 | 72,660 |
| 2017 | 198,245 | 2.30 | 806 | 86,100 | 9,361 | 775 | 11,132 | 69,619 |
| 2018 | 198,968 | 2.30 | 834 | 86,508 | 9,641 | 796 | 11,161 | 71,320 |
| 2019 | 200,367 | 2.30 | 836 | 87,151 | 9,593 | 785 | 11,287 | 69,547 |
| 2020 | 201,752 | 2.30 | 840 | 87,787 | 9,569 | 794 | 11,412 | 69,573 |
| 2021 | 203,125 | 2.30 | 844 | 88,417 | 9,546 | 803 | 11,536 | 69,607 |
| 2022 | 204,484 | 2.30 | 849 | 89,041 | 9,535 | 812 | 11,659 | 69,647 |
| 2023 | 205,830 | 2.30 | 853 | 89,659 | 9,514 | 821 | 11,780 | 69,693 |
| 2024 | 207,163 | 2.29 | 857 | 90,270 | 9,494 | 830 | 11,900 | 69,746 |
| 2025 | 208,483 | 2.29 | 861 | 90,875 | 9,475 | 838 | 12,019 | 69,721 |
| 2026 | 209,789 | 2.29 | 865 | 91,474 | 9,456 | 846 | 12,137 | 69,704 |
| 2027 | 211,082 | 2.29 | 868 | 92,067 | 9,428 | 854 | 12,253 | 69,695 |
| 2028 | 212,362 | 2.29 | 872 | 92,653 | 9,411 | 862 | 12,369 | 69,692 |

* Commercial includes General Service Non-Demand and General Service Demand Rate Classes

**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 ** | | | | Street and | Other Sales | Total Sales |
| | | Average | Average | Railroads | Highway | to Public | to Ultimate |
| | | Number of | MWh per | and Railways | Lighting | Authorities | Consumers |
| Year | GWh | Customers | Customer | GWh | GWh | GWh | GWh |
| 2009 | 168 | 12 | 13,808 | 0 | 26 | 0 | 1,780 |
| 2010 | 168 | 12 | 13,622 | 0 | 25 | 0 | 1,824 |
| 2011 | 164 | 11 | 14,578 | 0 | 29 | 0 | 1,770 |
| 2012 | 168 | 13 | 13,440 | 0 | 25 | 0 | 1,700 |
| 2013 | 159 | 12 | 13,342 | 0 | 25 | 0 | 1,694 |
| 2014 | 151 | 12 | 12,583 | 0 | 25 | 0 | 1,709 |
| 2015 | 157 | 12 | 12,904 | 0 | 25 | 0 | 1,765 |
| 2016 | 165 | 13 | 12,774 | 0 | 25 | 0 | 1,796 |
| 2017 | 168 | 13 | 12,759 | 0 | 25 | 0 | 1,774 |
| 2018 | 175 | 12 | 14,190 | 0 | 25 | 0 | 1,830 |
| 2019 | 170 | 12 | 14,167 | 0 | 25 | 0 | 1,816 |
| 2020 | 170 | 12 | 14,167 | 0 | 25 | 0 | 1,829 |
| 2021 | 170 | 12 | 14,167 | 0 | 25 | 0 | 1,842 |
| 2022 | 170 | 12 | 14,167 | 0 | 25 | 0 | 1,856 |
| 2023 | 170 | 12 | 14,167 | 0 | 25 | 0 | 1,869 |
| 2024 | 170 | 12 | 14,167 | 0 | 25 | 0 | 1,882 |
| 2025 | 170 | 12 | 14,167 | 0 | 25 | 0 | 1,894 |
| 2026 | 170 | 12 | 14,167 | 0 | 25 | 0 | 1,906 |
| 2027 | 170 | 12 | 14,167 | 0 | 25 | 0 | 1,917 |
| 2028 | 170 | 12 | 14,167 | 0 | 25 | 0 | 1,929 |

** Industrial includes Large Power Rate Class

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

| (1) Year | (2) Sales For Resale GWh | (3) Utility Use and Losses GWh | (4) Net Energy for Load GWh | (5) Other Customers | (6) Total Number of Customers |
|---|---|---|---|---|---|
| 2009 | 203 | 99 | 2,082 | 0 | 93,045 |
| 2010 | 217 | 98 | 2,139 | 0 | 92,340 |
| 2011 | 201 | 45 | 2,016 | 0 | 92,265 |
| 2012 | 195 | 57 | 1,952 | 0 | 92,556 |
| 2013 | 113 | 46 | 1,853 | 0 | 93,134 |
| 2014 | 121 | 45 | 1,875 | 0 | 93,855 |
| 2015 | 214 | 45 | 2,024 | 0 | 94,628 |
| 2016 | 221 | 37 | 2,054 | 0 | 95,161 |
| 2017 | 220 | 37 | 2,031 | 0 | 97,245 |
| 2018 | 222 | 27 | 2,079 | 0 | 97,681 |
| 2019 | 137 | 39 | 1,992 | 0 | 98,450 |
| 2020 | 140 | 40 | 2,009 | 0 | 99,212 |
| 2021 | 143 | 41 | 2,026 | 0 | 99,966 |
| 2022 | 32 | 38 | 1,926 | 0 | 100,712 |
| 2023 | 0 | 37 | 1,906 | 0 | 101,451 |
| 2024 | 0 | 37 | 1,919 | 0 | 102,183 |
| 2025 | 0 | 37 | 1,931 | 0 | 102,907 |
| 2026 | 0 | 38 | 1,944 | 0 | 103,623 |
| 2027 | 0 | 39 | 1,956 | 0 | 104,332 |
| 2028 | 0 | 39 | 1,968 | 0 | 105,034 |

## Schedule 3.1
## History and Forecast of Summer Peak Demand - MW

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|
| Year | Total | Wholesale | Retail | Interruptible | Residential Load Management | Residential Conservation | Comm./Ind. Load Management | Comm./Ind. Conservation | Net Firm Demand (1) |
| 2009 | 498 | 46 | 419 | 0 | 0 | 21 | 0 | 12 | 465 |
| 2010 | 505 | 48 | 422 | 0 | 0 | 22 | 0 | 13 | 470 |
| 2011 | 484 | 46 | 399 | 0 | 0 | 24 | 0 | 15 | 445 |
| 2012 | 456 | 43 | 372 | 0 | 0 | 26 | 0 | 15 | 415 |
| 2013 | 459 | 25 | 391 | 0 | 0 | 27 | 0 | 16 | 416 |
| 2014 | 452 | 26 | 383 | 0 | 0 | 27 | 0 | 16 | 409 |
| 2015 | 464 | 37 | 384 | 0 | 0 | 27 | 0 | 16 | 421 |
| 2016 | 471 | 38 | 390 | 0 | 0 | 27 | 0 | 16 | 428 |
| 2017 | 461 | 38 | 380 | 0 | 0 | 27 | 0 | 16 | 418 |
| 2018 | 452 | 37 | 371 | 0 | 0 | 28 | 0 | 16 | 408 |
| 2019 | 470 | 30 | 396 | 0 | 0 | 28 | 0 | 16 | 426 |
| 2020 | 474 | 30 | 400 | 0 | 0 | 28 | 0 | 16 | 430 |
| 2021 | 478 | 31 | 403 | 0 | 0 | 28 | 0 | 16 | 434 |
| 2022 | 449 | 0 | 405 | 0 | 0 | 28 | 0 | 16 | 405 |
| 2023 | 452 | 0 | 408 | 0 | 0 | 28 | 0 | 16 | 408 |
| 2024 | 455 | 0 | 411 | 0 | 0 | 28 | 0 | 16 | 411 |
| 2025 | 458 | 0 | 414 | 0 | 0 | 28 | 0 | 16 | 414 |
| 2026 | 460 | 0 | 416 | 0 | 0 | 28 | 0 | 16 | 416 |
| 2027 | 463 | 0 | 419 | 0 | 0 | 28 | 0 | 16 | 419 |
| 2028 | 465 | 0 | 421 | 0 | 0 | 28 | 0 | 16 | 421 |

(1) The System's decrease in Net Firm Demand in 2022 is due to the expiration of GRU's wholesale contract with the City of Alachua.

**Schedule 3.2**
**History and Forecast of Winter Peak Demand - MW**

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|
| Winter | Total | Wholesale | Retail | Interruptible | Residential Load Management | Residential Conservation | Comm./Ind. Load Management | Comm./Ind. Conservation | Net Firm Demand (1) |
| 2009 / 2010 | 522 | 55 | 409 | 0 | 0 | 47 | 0 | 11 | 464 |
| 2010 / 2011 | 470 | 51 | 358 | 0 | 0 | 49 | 0 | 12 | 409 |
| 2011 / 2012 | 434 | 47 | 324 | 0 | 0 | 50 | 0 | 13 | 371 |
| 2012 / 2013 | 412 | 22 | 326 | 0 | 0 | 51 | 0 | 13 | 348 |
| 2013 / 2014 | 412 | 23 | 325 | 0 | 0 | 51 | 0 | 13 | 348 |
| 2014 / 2015 | 424 | 36 | 324 | 0 | 0 | 51 | 0 | 13 | 360 |
| 2015 / 2016 | 412 | 35 | 313 | 0 | 0 | 51 | 0 | 13 | 348 |
| 2016 / 2017 | 397 | 33 | 300 | 0 | 0 | 51 | 0 | 13 | 333 |
| 2017 / 2018 | 475 | 38 | 372 | 0 | 0 | 52 | 0 | 13 | 410 |
| 2018 / 2019 | 415 | 28 | 322 | 0 | 0 | 52 | 0 | 13 | 350 |
| 2019 / 2020 | 418 | 29 | 324 | 0 | 0 | 52 | 0 | 13 | 353 |
| 2020 / 2021 | 421 | 30 | 326 | 0 | 0 | 52 | 0 | 13 | 356 |
| 2021 / 2022 | 424 | 30 | 329 | 0 | 0 | 52 | 0 | 13 | 359 |
| 2022 / 2023 | 400 | 0 | 335 | 0 | 0 | 52 | 0 | 13 | 335 |
| 2023 / 2024 | 402 | 0 | 337 | 0 | 0 | 52 | 0 | 13 | 337 |
| 2024 / 2025 | 405 | 0 | 339 | 0 | 0 | 53 | 0 | 13 | 339 |
| 2025 / 2026 | 407 | 0 | 341 | 0 | 0 | 53 | 0 | 13 | 341 |
| 2026 / 2027 | 409 | 0 | 343 | 0 | 0 | 53 | 0 | 13 | 343 |
| 2027 / 2028 | 412 | 0 | 346 | 0 | 0 | 53 | 0 | 13 | 346 |
| 2028 / 2029 | 414 | 0 | 348 | 0 | 0 | 53 | 0 | 13 | 348 |

(1) The System's decrease in Net Firm Demand in 2022/2023 is due to the expiration of GRU's wholesale contract with the City of Alachua.

**Schedule 3.3**
**History and Forecast of Net Energy for Load - GWH**

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|
| Year | Total | Residential Conservation | Comm./Ind. Conservation | Retail | Wholesale | Utility Use & Losses | Net Energy for Load | Load Factor % |
| 2009 | 2,248 | 117 | 49 | 1,781 | 203 | 98 | 2,082 | 51% |
| 2010 | 2,319 | 124 | 56 | 1,825 | 217 | 97 | 2,139 | 52% |
| 2011 | 2,212 | 133 | 63 | 1,770 | 201 | 45 | 2,016 | 52% |
| 2012 | 2,162 | 142 | 68 | 1,700 | 195 | 57 | 1,952 | 54% |
| 2013 | 2,068 | 145 | 70 | 1,695 | 113 | 45 | 1,853 | 51% |
| 2014 | 2,091 | 146 | 70 | 1,709 | 121 | 45 | 1,875 | 52% |
| 2015 | 2,241 | 147 | 70 | 1,765 | 214 | 45 | 2,024 | 55% |
| 2016 | 2,271 | 147 | 70 | 1,796 | 221 | 37 | 2,054 | 55% |
| 2017 | 2,249 | 148 | 70 | 1,773 | 220 | 38 | 2,031 | 55% |
| 2018 | 2,297 | 148 | 70 | 1,829 | 222 | 28 | 2,079 | 58% |
| 2019 | 2,211 | 149 | 70 | 1,815 | 137 | 40 | 1,992 | 53% |
| 2020 | 2,228 | 149 | 70 | 1,829 | 140 | 40 | 2,009 | 53% |
| 2021 | 2,246 | 150 | 70 | 1,842 | 143 | 41 | 2,026 | 53% |
| 2022 | 2,146 | 150 | 70 | 1,855 | 32 | 39 | 1,926 | 54% |
| 2023 | 2,127 | 151 | 70 | 1,868 | 0 | 38 | 1,906 | 53% |
| 2024 | 2,140 | 151 | 70 | 1,881 | 0 | 38 | 1,919 | 53% |
| 2025 | 2,153 | 152 | 70 | 1,893 | 0 | 38 | 1,931 | 53% |
| 2026 | 2,166 | 152 | 70 | 1,905 | 0 | 39 | 1,944 | 53% |
| 2027 | 2,179 | 153 | 70 | 1,917 | 0 | 39 | 1,956 | 53% |
| 2028 | 2,191 | 153 | 70 | 1,929 | 0 | 39 | 1,968 | 53% |

**Schedule 4**
**Previous Year and 2-Year Forecast of Peak Demand and Net Energy for Load**

| (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|
| | ACTUAL | | FORECAST | | | |
| | 2018 | | 2019 | | 2020 | |
| Month | Peak Demand (MW) | NEL (GWh) | Peak Demand (MW) | NEL (GWh) | Peak Demand (MW) | NEL (GWh) |
| JAN | 410 | 182 | 350 | 154 | 353 | 156 |
| FEB | 280 | 138 | 324 | 135 | 316 | 136 |
| MAR | 272 | 144 | 287 | 141 | 289 | 142 |
| APR | 275 | 145 | 319 | 146 | 322 | 147 |
| MAY | 343 | 174 | 380 | 175 | 383 | 176 |
| JUN | 402 | 195 | 415 | 189 | 419 | 191 |
| JUL | 398 | 201 | 420 | 204 | 423 | 206 |
| AUG | 407 | 209 | 426 | 208 | 430 | 210 |
| SEP | 408 | 208 | 396 | 189 | 400 | 191 |
| OCT | 380 | 182 | 349 | 162 | 352 | 163 |
| NOV | 299 | 149 | 285 | 139 | 288 | 140 |
| DEC | 319 | 152 | 309 | 150 | 311 | 151 |

**Schedule 5**
**FUEL REQUIREMENTS**

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FUEL REQUIREMENTS | | | UNITS | ACTUAL 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
| (1) | NUCLEAR | | TRILLION BTU | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (2) | COAL | | 1000 TON | 233 | 338 | 288 | 294 | 371 | 303 | 307 | 349 | 385 | 334 | 360 |
| | RESIDUAL | | | | | | | | | | | | | |
| (3) | | STEAM | 1000 BBL | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (4) | | CC | 1000 BBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (5) | | CT | 1000 BBL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (6) | | TOTAL: | 1000 BBL | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DISTILLATE | | | | | | | | | | | | | |
| (7) | | 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 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (10) | | TOTAL: | 1000 BBL | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | NATURAL GAS | | | | | | | | | | | | | |
| (11) | | STEAM | 1000 MCF | 4,940 | 67 | 165 | 218 | 137 | 0 | 0 | 0 | 0 | 0 | 0 |
| (12) | | CC | 1000 MCF | 5,183 | 5,760 | 5,899 | 7,437 | 6,190 | 6,664 | 7,462 | 6,858 | 6,038 | 7,478 | 6,844 |
| (13) | | CT | 1000 MCF | 737 | 525 | 538 | 529 | 525 | 530 | 596 | 561 | 531 | 664 | 575 |
| (14) | | TOTAL: | 1000 MCF | 10,860 | 6,352 | 6,602 | 8,184 | 6,852 | 7,194 | 8,058 | 7,419 | 6,569 | 8,142 | 7,419 |
| (15) | OTHER (specify) | | 1000 Tons Biomass | 778 | 501 | 607 | 386 | 271 | 391 | 318 | 304 | 349 | 336 | 378 |

**Schedule 6.1**
**ENERGY SOURCES (GWH)**

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ENERGY SOURCES | | UNITS | ACTUAL 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
| (1) | ANNUAL FIRM INTERCHANGE (INTER-REGION) | | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (2) | NUCLEAR Replacement Power | | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (3) | COAL | | GWh | 460 | 635 | 548 | 556 | 723 | 568 | 574 | 682 | 762 | 647 | 720 |
| | RESIDUAL | | | | | | | | | | | | | |
| (4) | | STEAM | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (5) | | CC | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (6) | | CT | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (7) | | TOTAL: | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | DISTILLATE | | | | | | | | | | | | | |
| (8) | | 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 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (11) | | TOTAL: | GWh | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | NATURAL GAS | | | | | | | | | | | | | |
| (12) | | STEAM | GWh | 328 | 5 | 13 | 17 | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| (13) | | CC | GWh | 614 | 711 | 729 | 920 | 764 | 823 | 923 | 848 | 747 | 926 | 848 |
| (14) | | CT | GWh | 74 | 53 | 53 | 53 | 53 | 53 | 57 | 55 | 53 | 62 | 55 |
| (15) | | TOTAL: | GWh | 1016 | 769 | 795 | 990 | 828 | 876 | 980 | 903 | 800 | 988 | 903 |
| (16) | NUG | | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (17) | BIOFUELS | | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (18) | BIOMASS | | GWh | 570 | 409 | 485 | 297 | 208 | 298 | 244 | 234 | 279 | 264 | 300 |
| (19) | GEOTHERMAL | | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (20) | HYDRO | | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (21) | LANDFILL GAS | PPA | GWh | 25 | 35 | 35 | 35 | 35 | 35 | 0 | 0 | 0 | 0 | 0 |
| (22) | MSW | | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (23) | SOLAR | | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (24) | WIND | | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (25) | OTHER RENEWABLE | | GWh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| (26) | Total Renewable | | GWh | 595 | 444 | 520 | 332 | 243 | 333 | 244 | 234 | 279 | 264 | 300 |
| (27) | Market Purchases | | GWh | 7 | 144 | 146 | 148 | 132 | 129 | 121 | 112 | 103 | 57 | 45 |
| (28) | NET ENERGY FOR LOAD | | GWh | 2079 | 1992 | 2009 | 2026 | 1926 | 1906 | 1919 | 1931 | 1944 | 1956 | 1968 |

**Schedule 6.2**
**ENERGY SOURCES (%)**

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ENERGY SOURCES | | UNITS | ACTUAL 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
| (1) | ANNUAL FIRM INTERCHANGE (INTER-REGION) | | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (2) | NUCLEAR Replacement Power | | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (3) | COAL | | GWh | 22.1% | 31.9% | 27.3% | 27.4% | 37.5% | 29.8% | 29.9% | 35.3% | 39.2% | 33.1% | 36.6% |
| | RESIDUAL | | | | | | | | | | | | | |
| (4) | | STEAM | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (5) | | CC | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (6) | | CT | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (7) | | TOTAL: | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | DISTILLATE | | | | | | | | | | | | | |
| (8) | | STEAM | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (9) | | CC | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (10) | | CT | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (11) | | TOTAL: | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | NATURAL GAS | | | | | | | | | | | | | |
| (12) | | STEAM | GWh | 15.8% | 0.3% | 0.6% | 0.8% | 0.6% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (13) | | CC | GWh | 29.5% | 35.7% | 36.3% | 45.4% | 39.7% | 43.2% | 48.1% | 43.9% | 38.4% | 47.3% | 43.1% |
| (14) | | CT | GWh | 3.6% | 2.7% | 2.6% | 2.6% | 2.8% | 2.8% | 3.0% | 2.8% | 2.7% | 3.2% | 2.8% |
| (15) | | TOTAL: | GWh | 48.9% | 38.6% | 39.6% | 48.9% | 43.0% | 46.0% | 51.1% | 46.8% | 41.2% | 50.5% | 45.9% |
| (16) | NUG | | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (17) | BIOFUELS | | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (18) | BIOMASS | | GWh | 27.4% | 20.5% | 24.1% | 14.7% | 10.8% | 15.6% | 12.7% | 12.1% | 14.4% | 13.5% | 15.2% |
| (19) | GEOTHERMAL | | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (20) | HYDRO | | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (21) | LANDFILL GAS | PPA | GWh | 1.2% | 1.8% | 1.7% | 1.7% | 1.8% | 1.8% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (22) | MSW | | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (23) | SOLAR | | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (24) | WIND | | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (25) | OTHER RENEWABLE | | GWh | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| (26) | Total Renewable | | GWh | 28.6% | 22.3% | 25.9% | 16.4% | 12.6% | 17.5% | 12.7% | 12.1% | 14.4% | 13.5% | 15.2% |
| (27) | Purchased Energy | | GWh | 0.3% | 7.2% | 7.3% | 7.3% | 6.9% | 6.8% | 6.3% | 5.8% | 5.3% | 2.9% | 2.3% |
| (28) | NET ENERGY FOR LOAD | | GWh | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

# 3. FORECAST OF FACILITIES REQUIREMENTS

## 3.1 GENERATION RETIREMENTS

Deerhaven fossil steam unit #1 and combustion turbines #1 and #2 are scheduled for retirement in 2022 and 2026, respectively. These planned changes to the System's generation mix are tabulated in Schedule 8.

The System's combined cycle unit is comprised of the gas-fired combustion turbine GT04 and the steam turbine FS08. GT04, and its associated heat recovery steam generator began operation in 2001 as part of a repowering of FS08, which began its original operation in 1965. Upon metallurgical investigation of FS08, the System has become aware that FS08 will likely not remain serviceable through its planned retirement date of 2035. The System is investigating the costs, logistics, and timeline of potentially replacing FS08 with a similar unit prior to 2035.

## 3.2 RESERVE MARGIN AND SCHEDULED MAINTENANCE

GRU uses a planning criterion of 15% capacity reserve margin (required for emergency power purposes by Florida Public Service Commission Rule 25-6.035). Available generating capacities are compared with System summer peak demands in Schedule 7.1 and System winter peak demands in Schedule 7.2. Higher peak demands in summer and lower unit operating capacities in summer result in lower reserve margins during the summer season than in winter. In consideration of existing resources, expected future purchases, and savings impacts from conservation programs, GRU expects to maintain a summer reserve margin in excess of 15% over the next 10 years.

## 3.3 GENERATION ADDITIONS

GRU has been issued a construction permit for the installation of a nominal 50 MW of peaking power. The need, timing and technology of this peaking power addition are under evaluation.

As outlined in Section 3.1, the System is investigating the costs, logistics, and timeline of potentially replacing steam turbine FS08 with a similar steam turbine prior to 2035. The combustion turbine GT04 and its associated heat recovery steam generator, which indirectly provide the steam for FS08, will remain in service and will provide steam for FS08's replacement, if it is replaced.

## 3.4 DISTRIBUTION SYSTEM ADDITIONS

Up to five new, compact power delivery systems (PDS) were planned for the GRU system in 1999. Three of the four - Rocky Point, Kanapaha, and Ironwood - were installed by 2003. A fourth PDS, Springhill, was brought on-line in January 2011; a third circuit from Springhill is anticipated as forecasted load develops in 2020. In addition, a second transformer is scheduled to be installed here in 2023. The fifth PDS, known at this time as the Northwest Sub, is planned for addition to the System in 2024. This PDS will be located in the 2000 block of NW 53rd Avenue. These new compact-power delivery systems have been planned to redistribute the load from the existing substations as new load centers grow and develop within the System.

The Rocky Point, Kanapaha, and Ironwood PDS utilize single 33 MVA class transformers that are radial-tapped to the System's looped 138 kV system. These three radial-tapped substations all have remote controlled motor operated tie reclosers to remotely switch distribution load in a matter of minutes. The Springhill Substation consists of one 33 MVA class transformer served by a loop-fed pole-mounted switch. Each PDS consists of one (or more) 138/12.47 kV, 33 MVA class, wye-wye substation transformer with a maximum of eight distribution circuits. The proximity of these new PDS's to existing area substations will allow for backup in the event of a substation transformer failure.

**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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Installed Capacity (2) | Firm Capacity Import | Firm Capacity Export | QF | Total Capacity Available | System Firm Summer Peak Demand (1) | Reserve Margin before Maintenance | | Scheduled Maintenance | Reserve Margin after Maintenance (1) | |
| Year | MW | MW | MW | MW | MW | MW | MW | % of Peak | MW | MW | % of Peak |
| 2009 | 608 | 101 | 0 | 0 | 708 | 465 | 243 | 52.4% | 0 | 243 | 52.4% |
| 2010 | 608 | 101 | 0 | 0 | 709 | 470 | 239 | 50.7% | 0 | 239 | 50.7% |
| 2011 | 608 | 52 | 0 | 0 | 660 | 445 | 215 | 48.3% | 0 | 215 | 48.3% |
| 2012 | 609 | 52 | 0 | 0 | 662 | 415 | 247 | 59.5% | 0 | 247 | 59.5% |
| 2013 | 598 | 53 | 0 | 0 | 650 | 416 | 234 | 56.3% | 0 | 234 | 56.3% |
| 2014 | 533 | 106 | 0 | 0 | 639 | 409 | 230 | 56.2% | 0 | 230 | 56.2% |
| 2015 | 533 | 106 | 0 | 0 | 639 | 421 | 218 | 51.7% | 0 | 218 | 51.7% |
| 2016 | 525 | 106 | 0 | 0 | 631 | 428 | 203 | 47.4% | 0 | 203 | 47.4% |
| 2017 | 521 | 106 | 0 | 0 | 627 | 418 | 209 | 49.9% | 0 | 209 | 49.9% |
| 2018 | 631 | 4 | 0 | 0 | 635 | 408 | 227 | 55.6% | 0 | 227 | 55.6% |
| 2019 | 631 | 4 | 0 | 0 | 635 | 426 | 209 | 49.0% | 0 | 209 | 49.0% |
| 2020 | 631 | 4 | 0 | 0 | 635 | 430 | 205 | 47.6% | 0 | 205 | 47.6% |
| 2021 | 631 | 4 | 0 | 0 | 635 | 434 | 201 | 46.3% | 0 | 201 | 46.3% |
| 2022 | 631 | 4 | 0 | 0 | 635 | 405 | 230 | 56.8% | 0 | 230 | 56.8% |
| 2023 | 556 | 4 | 0 | 0 | 560 | 408 | 152 | 37.2% | 0 | 152 | 37.2% |
| 2024 | 556 | 0 | 0 | 0 | 556 | 411 | 145 | 35.3% | 0 | 145 | 35.3% |
| 2025 | 556 | 0 | 0 | 0 | 556 | 414 | 142 | 34.3% | 0 | 142 | 34.3% |
| 2026 | 556 | 0 | 0 | 0 | 556 | 416 | 140 | 33.7% | 0 | 140 | 33.7% |
| 2027 | 521 | 0 | 0 | 0 | 521 | 419 | 102 | 24.4% | 0 | 102 | 24.4% |
| 2028 | 521 | 0 | 0 | 0 | 521 | 421 | 100 | 23.8% | 0 | 100 | 23.8% |

(1) System Peak demands shown in this table reflect service to partial and full requirements wholesale customers. The System's decrease in firm demand in 2022 is due to the expiration of GRU's wholesale contract with the City of Alachua.

(2) Details of planned changes to installed capacity from 2019-2028 are reflected in Schedule 8.

**Schedule 7.2**

**Forecast of Capacity, Demand, and Scheduled Maintenance at Time of Winter Peak**

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Installed Capacity (2) | Firm Capacity Import | Firm Capacity Export | QF | Total Capacity Available | System Firm Winter Peak Demand (1) | Reserve Margin before Maintenance | | Scheduled Maintenance | Reserve Margin after Maintenance (1) | |
| Year | MW | MW | MW | MW | MW | MW | MW | % of Peak | MW | MW | % of Peak |
| 2008/09 | 634 | 76 | 0 | 0 | 711 | 421 | 290 | 68.8% | 0 | 290 | 68.8% |
| 2009/10 | 628 | 76 | 0 | 0 | 704 | 464 | 240 | 51.8% | 0 | 240 | 51.8% |
| 2010/11 | 628 | 53 | 0 | 0 | 680 | 409 | 271 | 66.4% | 0 | 271 | 66.4% |
| 2011/12 | 630 | 52 | 0 | 0 | 682 | 371 | 311 | 83.8% | 0 | 311 | 83.8% |
| 2012/13 | 618 | 52 | 0 | 0 | 670 | 348 | 322 | 92.5% | 0 | 322 | 92.5% |
| 2013/14 | 550 | 106 | 0 | 0 | 656 | 348 | 308 | 88.4% | 0 | 308 | 88.4% |
| 2014/15 | 550 | 106 | 0 | 0 | 656 | 360 | 296 | 82.1% | 0 | 296 | 82.1% |
| 2015/16 | 550 | 106 | 0 | 0 | 656 | 348 | 308 | 88.4% | 0 | 308 | 88.4% |
| 2016/17 | 554 | 106 | 0 | 0 | 660 | 333 | 327 | 98.1% | 0 | 327 | 98.1% |
| 2017/18 | 659 | 4 | 0 | 0 | 663 | 410 | 253 | 61.7% | 0 | 253 | 61.7% |
| 2018/19 | 659 | 4 | 0 | 0 | 663 | 350 | 313 | 89.5% | 0 | 313 | 89.5% |
| 2019/20 | 661 | 4 | 0 | 0 | 664 | 353 | 311 | 88.2% | 0 | 311 | 88.2% |
| 2020/21 | 661 | 4 | 0 | 0 | 664 | 356 | 308 | 86.6% | 0 | 308 | 86.6% |
| 2021/22 | 661 | 4 | 0 | 0 | 664 | 359 | 305 | 85.0% | 0 | 305 | 85.0% |
| 2022/23 | 586 | 4 | 0 | 0 | 589 | 335 | 254 | 75.9% | 0 | 254 | 75.9% |
| 2023/24 | 586 | 0 | 0 | 0 | 586 | 337 | 249 | 73.7% | 0 | 249 | 73.7% |
| 2024/25 | 586 | 0 | 0 | 0 | 586 | 339 | 247 | 72.7% | 0 | 247 | 72.7% |
| 2025/26 | 586 | 0 | 0 | 0 | 586 | 341 | 245 | 71.7% | 0 | 245 | 71.7% |
| 2026/27 | 564 | 0 | 0 | 0 | 564 | 343 | 221 | 64.3% | 0 | 221 | 64.3% |
| 2027/28 | 542 | 0 | 0 | 0 | 542 | 346 | 196 | 56.5% | 0 | 196 | 56.5% |
| 2028/29 | 542 | 0 | 0 | 0 | 542 | 348 | 194 | 55.6% | 0 | 194 | 55.6% |

(1) System Peak demands shown in this table reflect service to partial and full requirements wholesale customers. The System's decrease in firm demand in 2022/2023 is due to the expiration of GRU's wholesale contract with the City of Alachua.

(2) Details of planned changes to installed capacity from 2019-2028 are reflected in Schedule 8.

**Schedule 8**

**PLANNED AND PROSPECTIVE GENERATING FACILITY ADDITIONS AND CHANGES**

| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Const. | Comm. | Expected | Gross Capability | | Net Capability | | |
| | Unit | | Unit | Fuel | | Fuel Transport | | Start | In-Service | Retire | Summer | Winter | Summer | Winter | |
| Plant Name | No. | Location | Type | Pri. | Alt. | Pri. | Alt. | Mo/Yr | Mo/Yr | Mo/Yr | (MW) | (MW) | (MW) | (MW) | Status |
| Deerhaven | FS01 | Alachua County | ST | NG | RFO | PL | TK | | 8/1972 | 8/2022 | -80.0 | -80.0 | -75.0 | -75.0 | RT |
| | GT01 | Secs. 26, 27,35, | GT | NG | PL | DFO | TK | | 7/76 | 10/2026 | -18.0 | -23.0 | -17.5 | -22.0 | RT |
| | GT02 | T8S, R19E | GT | NG | PL | DFO | TK | | 8/76 | 10/2026 | -18.0 | -23.0 | -17.5 | -22.0 | RT |
| | | (GRU) | | | | | | | | | | | | | |

**Unit Type**
ST = Steam Turbine

**Fuel Type**
NG = Natural Gas
RFO = Residual Fuel Oil
DFO = Distillate Fuel Oil

**Transportation Method**
PL = Pipeline
TK = Truck

**Status**
RT = Generating unit retired or scheduled for retirement

# 4. ENVIRONMENTAL AND LAND USE INFORMATION

## 4.1 DESCRIPTION OF POTENTIAL SITES FOR NEW GENERATING FACILITIES

Currently, there are no new potential generation sites planned. GRU has been issued a construction permit for up to approximately 50 MW of generation at the existing Deerhaven generation site, but GRU has not yet evaluated what type of generation, if any, will be added to the Deerhaven generating facility.

## 4.2 DESCRIPTION OF PREFERRED SITES FOR NEW GENERATING FACILITIES

Any additional system generation is expected to be sited at the existing Deerhaven site. Evaluation of the need for future generation is in progress.

### 4.2.1 Land Use and Environmental Features

The location of the site is indicated on Figures 1.1 (see Section 1) and 4.1. The existing land use of the certified portion of the Deerhaven site is industrial (i.e., electric power generation and transmission and ancillary uses such as fuel storage and conveyance, water withdrawal, combustion product handling and disposal, and forest management). The areas acquired since 2002 have been annexed into the City of Gainesville. The site is a PS, Public Services and Operations District, zoned property. Surrounding land uses are primarily rural or agricultural with some low-density residential development. The Deerhaven site encompasses approximately 3,474 acres.

The Deerhaven Generating Station plant site is located in the Suwannee River Water Management District. Water for potable use is supplied via the City's potable water system. Groundwater is extracted from the Floridian aquifer. Process wastewater is currently collected, treated and reused on-site. The site has zero discharge of process wastewater to surface and ground waters. GRU uses a brine concentrator/spray dryer and off-site disposal of solid wastewater treatment by-products.

### 4.2.2 Air Emissions

Any generation technology installed at the Deerhaven site will meet all applicable standards for all pollutants regulated for the category of emissions unit.

**Figure 4.1**

**Deerhaven Generating Site**