Electric & Gas Utility | 2602 Jackson Bluff Road | Tallahassee | FL | 32304 | 850-891-4968

March 30,2021

Clerk's Office
State of Florida Public Service Commission

Dear Sir/Madam:

The following pages are the City of Tallahassee Utilities' "Ten Year Site Plan: 2021-2030" report provided pursuant to Section 186.801, F.S. If you should have any questions regarding this report, please feel free to contact me at (850) 891-3130 or paul.clark@talgov.com. Thank you.

Sincerely,

Paul Clark

Paul D. Clark, II
Principal Engineer

Attachments

Photo: Hopkins IC Units 1-5

City of Tallahassee
Your Own Utilities[SM]

2021-2030

City of Tallahassee Utilities

Ten Year Site Plan

Report prepared by: City of Tallahassee Electric System Integrated Planning

CITY OF TALLAHASSEE
TEN YEAR SITE PLAN FOR ELECTRICAL GENERATING FACILITIES AND ASSOCIATED TRANSMISSION LINES
2021-2030
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Chapter I

Description of Existing Facilities

1.0 INTRODUCTION

The City of Tallahassee ("City") owns, operates, and maintains an electric generation, transmission, and distribution system that supplies electric power in and around the corporate limits of the City. The City was incorporated in 1825 and has operated since 1919 under the same charter. The City began generating its power requirements in 1902 and the City's Electric Utility presently serves approximately 125,500 customers located within a 221 square mile service territory (see Figure A). The Electric Utility operates three generating stations with a total summer season net generating capacity of 725 megawatts (MW).

The City has three fossil-fueled generating stations, which contain combined cycle (CC), combustion turbine (CT) and reciprocating internal combustion engine (RICE or IC) electric generating facilities. The Sam O. Purdom Generating Station, located in the City of St. Marks, Florida has been in operation since 1952; the Arvah B. Hopkins Generating Station, located on Geddie Road west of the City, has been in commercial operation since 1970; and the Substation 12 Distributed Generation Facility, located on Medical Drive, has been in operation since late 2018.

1.1 SYSTEM CAPABILITY

The City maintains four points of interconnection with Duke Energy Florida ("Duke", formerly Progress Energy Florida); one at 69 kV, two at 115 kV, and one at 230 kV; and a 230 kV interconnection with Georgia Power Company (a subsidiary of the Southern Company ("Southern")).

As shown in Table 1.1 (Schedule 1), 222 MW (net summer rating) of CC generation is located at the City's Sam O. Purdom Generating Station. The Arvah B. Hopkins Generating Station includes 300 MW (net summer rating) of CC generation, 92 MW (net summer rating) of CT generation and 92 MW (net summer rating) of RICE generation. The Substation 12 Distributed Generation Facility includes 18 MW (net summer rating) of RICE generation. The CC and CT units can be fired on either natural gas or diesel oil but cannot burn these fuels concurrently. The RICE generators can only be fired on natural gas.

As of December 31, 2020 the City's total net summer installed generating capability is 725 MW. The corresponding winter net peak installed generating capability is 795 MW. Table 1.1 contains the details of the individual generating units.

1.2 PURCHASED POWER AGREEMENTS (PPA)

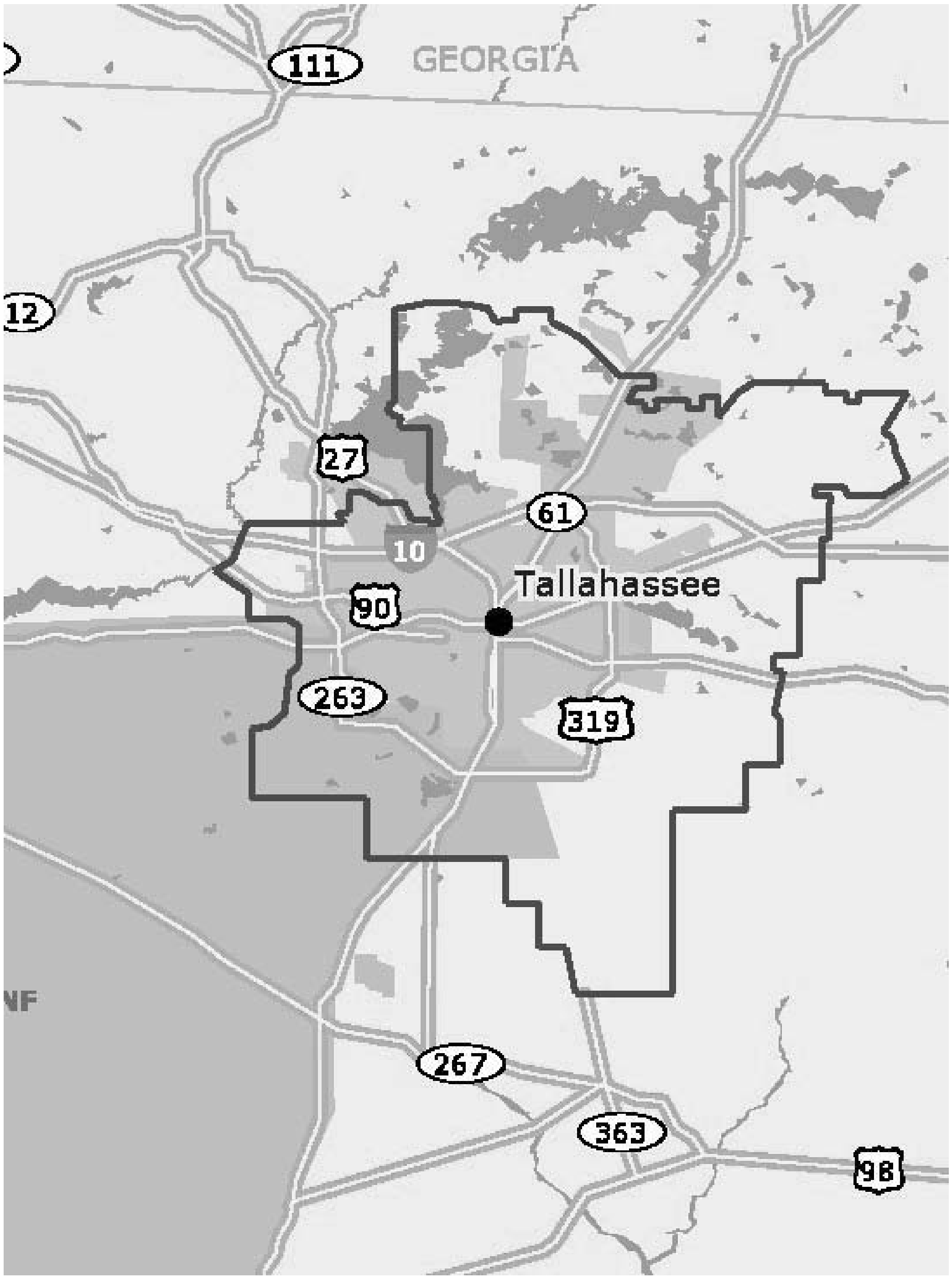
The City has no long-term firm wholesale capacity and energy purchase agreements. On July 24, 2016, the City executed a PPA for 20 MW_{ac} of non-firm solar PV with Origis Energy USA ("Origis"), doing business as FL Solar 1, LLC (Solar Farm 1). Solar Farm 1 is located adjacent to the Tallahassee International Airport and delivers power to City-owned distribution facility. The City declared commercial operations of the project on December 13, 2017. The City also entered into a second PPA with Origis (dba FL Solar 4, LLC) for a 42 MW_{ac} non-firm solar PV facility (Solar Farm 4). Solar Farm 4 is also located adjacent to the Tallahassee International Airport and interconnected with the City-owned 230 kV transmission system. Solar Farm 4, was placed into commercial operation on December 26, 2019. Together, Solar Farms 1 and 4 are the world's largest airport-based solar facility.

At the end of 2020, the City had three years of operating experience with Solar Farm 1 and one year with Solar Farm 4. An analysis of the output of the facilities revealed that neither contribute to meeting the winter peaks but do contribute towards meeting the summer peaks. Based on the operational data to date, an average of approximately 50% of the facilities' total installed capacity has been available during summer peak and near peak hours. However, given the limited operational experience with these resources, the City has elected to utilize a more conservative initial estimate of 20% of the combined capacity of the facilities as firm capacity available for the summer peak. The City intends to annually review and, if appropriate, revise the assumed firm contribution from its solar power supply resources as additional operational experience is gained.

Firm retail electric service is purchased from and provided by the Talquin Electric Cooperative ("Talquin") to City customers served by the Talquin electric system. Similarly, firm retail electric service is sold to and provided by the City to Talquin customers served by the City electric system. In accordance with their territorial agreement certain Talquin facilties within the geographic boundaries of the City electric system service territory will be transferred to the City over the coming years. It is anticipated that these transfers will soon be completed after which time some City customers will continue to be served via Talquin facilities. Reciprocal service will continue to be provided to all Talquin customers currently served by the City electric system and those served by the facilities to be transferred to the City who choose to retain Talquin as their electric service provider. Payments for electric service provided to and received from Talquin and the transfer of customers and electric facilities is governed by the territorial agreement between the City and Talquin.

City of Tallahassee, Electric Utility

Service Territory Map



City Of Tallahassee

Schedule 1
Existing Generating Facilities
As of December 31, 2020

(1) Plant	(2) Unit No.	(3) Location	(4) Unit Type	(5) Fuel Primary	(6) Fuel Alternate	(7) Fuel Transport Primary	(8) Fuel Transport Alternate	(9) Alt. Fuel Days Use	(10) Commercial In-Service Month/Year	(11) Expected Retirement Month/Year	(12) Gen. Max. Nameplate (kW)	(13) Net Capability Summer (MW)	(14) Net Capability Winter (MW)
S. O. Purdom	8	Wakulla	CC	NG	FO2	PL	TK	[1, 2]	7/00	12/40	270,100	222.0	258.0 [5]
											Plant Total	222.0	258.0
A. B. Hopkins	2	Leon	CC	NG	FO2	PL	TK	[2]	6/08 [3]	6/48	458,100 [4]	300.0	330.0 [5]
	GT-3		GT	NG	FO2	PL	TK	[2]	9/05	9/45	60,500	46.0	48.0
	GT-4		GT	NG	FO2	PL	TK	[2]	11/05	11/45	60,500	46.0	48.0
	IC-1		IC	NG	NA	PL	TK	[2]	3/19	3/49	18,800	18.5	18.5
	IC-2		IC	NG	NA	PL	TK	[2]	2/19	2/49	18,800	18.5	18.5
	IC-3		IC	NG	NA	PL	TK	[2]	2/19	2/49	18,800	18.5	18.5
	IC-4		IC	NG	NA	PL	TK	[2]	2/19	2/49	18,800	18.5	18.5
	IC-5		IC	NG	NA	PL	TK	[2]	4/20	4/50	18,800	18.5	18.5
											Plant Total	484.5	518.5
Substation 12	IC-1	Leon	IC	NG	NA	PL	TK	NA	10/18	10/48	9,300	9.2	9.2
	IC-2		IC	NG	NA	PL	TK	NA	10/18	10/48	9,300	9.2	9.2
											Plant Total	18.4	18.4
									Total System Capacity as of December 31, 2020			724.9	794.9

[1] Due to the Purdom facility-wide emissions caps, utilization of liquid fuel at this facility is limited.
[2] The City maintains a minimum distillate fuel oil storage capacity sufficient to operate the Purdom plant approximately 9 days and the Hopkins plant and approximately 3 days
[3] Reflects the commercial operations date of Hopkins 2 repowered to a combined cycle generating unit with a new General Electric Frame 7A combustion turbine. The original commercial operations date of the existing steam turbine generator was October 1977.
[4] Hopkins 2 nameplate rating is the sum of the combustion turbine generator (CTG) nameplate rating of 198.9 MW and steam turbine generator (STG) nameplate rating of 259.2 MW. However, in the current 1x1 combined cycle (CC) configuration with supplemental duct firing the repowered STG's maximum output is steam limited to about 150 MW.
[5] Summer and winter ratings are based on 95 ^{o}F and 29 ^{o}F ambient temperature, respectively.

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CHAPTER II

Forecast of Energy/Demand Requirements and Fuel Utilization

2.0 INTRODUCTION

Chapter II includes the City's forecasts of demand and energy requirements, energy sources and fuel requirements. This chapter also explains the impacts attributable to the City's current Demand Side Management (DSM) plan. The City is not subject to the requirements of the Florida Energy Efficiency and Conservation Act (FEECA) and, therefore, the Florida Public Service Commission (FPSC) does not set numeric conservation goals for the City. However, the City expects to continue its commitment to the DSM programs that prove beneficial to the City's ratepayers.

2.1 SYSTEM DEMAND AND ENERGY REQUIREMENTS

Historical and forecast energy consumption and customer information are presented in Tables 2.1, 2.2 and 2.3 (Schedules 2.1, 2.2, and 2.3). Figure B1 shows the historical total energy sales and forecast energy sales by customer class. Figure B2 shows the percentage of energy sales by customer class (excluding the impacts of DSM) for the base year of 2021 and the horizon year of 2030. Tables 2.4 through 2.12 (Schedules 3.1.1 - 3.3.3) contain historical and base, high, and low forecasts of seasonal peak demands and net energy for load. Table 2.13 (Schedule 4) compares actual and two-year forecast peak demand and energy values by month for the 2020-2022 period.

2.1.1 SYSTEM LOAD AND ENERGY FORECASTS

The peak demand and energy forecasts contained in this plan are the results of the load and energy forecasting study performed by the City and its forecast consultant, nFront Consulting LLC ("nFront"). The forecast is developed utilizing essentially the same methodology first employed in 1980 that has since been updated and revised every one or two years. The methodology consists of a combination of multi-variable regression models and other models that utilize subjective escalation assumptions and known incremental additions. All models are based on detailed examination of the system's historical growth, usage patterns and population statistics. Several key regression formulas utilize econometric variables.

Table 2.14 lists the econometric-based regression forecasting models that are used as predictors. Note that the City uses regression models with the capability of separately predicting commercial customers and consumption by rate sub-class: general service non-demand (GS), general service demand (GSD), and general service large demand (GSLD). These, along with the residential class, represent the major classes of the City's electric customers. In addition to these customer class models, the City's forecasting methodology also incorporates into the demand and energy projections estimated reductions from interruptible and curtailable customers. The key explanatory variables used in each of the models are indicated by an "X" on the table.

Table 2.15 documents the City's internal and external sources for historical and forecast economic, weather and demographic data. These tables summarize the details of the models used to generate the system customer, consumption and seasonal peak load forecasts. In addition to those explanatory variables listed, a component is also included in the models that reflect the transfers of certain City and Talquin Electric Cooperative (Talquin) customers over the study period consistent with the territorial agreement negotiated between the City and Talquin and approved by the FPSC.

The customer models are used to predict the number of customers by customer class, some of which in turn serve as input into their respective customer class consumption models. The customer class consumption models are aggregated to form a total base system sales forecast. The effects of DSM programs and system losses are incorporated in this base forecast to produce the system net energy for load (NEL) requirements.

The seasonal peak demand forecasts are developed first by forecasting expected system load factor. Table 2.14 also shows the key explanatory variables used in developing the monthly load factor model. Based on the historical relationship of seasonal peaks to annual NEL, system load factors are projected separately relative to both summer and winter peak demand. The projected monthly load factors for January and August (the typical winter and summer peak demand months, respectively) are then multiplied by the forecast of NEL to obtain the summer and winter peak demand forecasts.

Some of the most significant input assumptions for the forecast are the incremental load modifications at Florida State University (FSU), Florida A&M University (FAMU), Tallahassee Memorial Hospital (TMH) and the State Capitol Center. These four customers account for a significant percentage of the City's total annual energy sales. Their incremental additions are highly dependent upon annual economic and budget constraints, which would cause fluctuations in their demand projections if they were projected using a model. Therefore, each entity submits their proposed incremental additions/reductions to the City and these modifications are included as submitted in the load and energy forecast.

In the period following the onset of the coronavirus pandemic, significant impacts were observed in much of the Florida economy, particularly in regions dominated by tourism, universities, and service industries including the Tallahassee service area. During this period, the City has seen significant reductions in electricity consumption in its non-residential retail classes. Conversely, residential electric consumption increased considerably due to increased stay-at-home behavior and remote work. These impacts have lingered into 2021, albeit at lower levels than during the early months of the pandemic.

The City and nFront reviewed past and prospective new inputs to the forecast methodology in an effort to capture the changes in electric consumption patterns driven by the pandemic. Some of the economic data used as inputs to the City's forecast are only updated annually. Those were published in early 2020 and, therefore, did not reflect the significant impacts of the coronavirus pandemic. Other economic data inputs to the forecast are updated monthly and have shown some correlation with the changes in electricity consumption.

For the 2021 forecast, mobility data published by Google was introduced as a new input variable to help further explain 2020 electric consumption deviations in the residential and non-residential classes from pre-pandemic levels. The mobility data provides information regarding people's location and activity at home versus at commercial business and workplaces. It was found that the mobility data greatly helped explain the deviations in electric consumption by class observed through much of 2020.

These deviations have diminished somewhat over time but it is clear that a return to normal is not yet complete for much of the non-residential class. For its 2021 forecast, the City worked with nFront to develop reasonable, conservative assumptions regarding the extent and timing of an eventual return to normal. The forecast assumes a gradual recovery over 2021-2023 from the impacts of the coronavirus pandemic, with most of that occurring in the next 18-24 months. The City will review the actual extent of the recovery versus that reflected in its 2021 forecast in its next forecast cycle to determine whether further adjustments to the forecast inputs and models are needed.

The rate of growth in residential and commercial customers is driven by the projected growth in Leon County population. While population growth projections decreased in the years immediately following the Great Recession that occurred between 2007 and 2009, the current projection shows a slightly higher growth in population versus last year. Leon County population is projected to grow from 2021-2030 at an average annual growth rate (AAGR) of 0.81%. This growth rate is below that for the state of Florida (1.18%) but is slightly higher than that for the United States (~0.66%).

Prior to the pandemic, per customer demand and energy requirements had decreased in recent years. This trend is expected to continue in the near future even as the coronavirus pandemic-driven stay-at-home and work-from-home behavior gradually abates over the next few years. There are several reasons for this decrease including but not limited to the historical and expected future issuances of more stringent federal appliance and equipment efficiency standards and modifications to the State of Florida Energy Efficiency Code for Building Construction. It is also noteworthy that Florida has experienced a more pronounced decline in average usage than the rest of the U.S. during the 2005-2012 period and was one of the epicenters of the housing crisis during the Great Recession. Anecdotal evidence suggests that a significant portion of homes in the City's service area have yet to be fully occupied and that, as a result, there may be some potential upside to average consumption as those homes are taken up by full-time residents.

The City's energy efficiency and demand-side management (DSM) programs (discussed in Section 2.1.3) have also contributed to these decreases. The decreases in per customer residential and commercial demand and energy requirements are projected to somewhat offset the increased growth rate in residential and commercial customers. And the Clean Energy Plan resolution signed in 2019 (discussed later in this chapter and further in Chapter III) promotes electrification which may further offset the observed decrease in demand and energy per customer down the road. Therefore, it is not currently clear if/when expected that base demand and energy growth might return to pre-Great Recession levels in the near future.

The City believes that the routine update of forecast model inputs, coefficients and other minor model refinements continue to improve the accuracy of its forecast so that they are more consistent with the historical trend of growth in seasonal peak demand and energy consumption. The changes made to the forecast models for load and energy requirements have resulted in 2021 base forecasts for annual total retail sales/net energy for load and seasonal peak demand forecasts that are slightly lower than previously projected.

2.1.2 Load Forecast Uncertainty & Sensitivities

To provide a sound basis for planning, forecasts are derived from projections of the driving variables obtained from reputable sources. However, there is significant uncertainty in the future level of such variables. To the extent that economic, demographic, weather, or other conditions occur that are different from those assumed or provided, the actual load can be expected to vary from the forecast. For various purposes, it is important to understand the amount by which the forecast can be in error and the sources of error.

To capture this uncertainty, the City produces high and low range results that address potential variance in driving population and economic variables and severe and mild weather sensitivity cases that address the potential variance in driving weather variables from the values assumed in the base case. The base case forecast relies on a set of assumptions about future population, economic activity and weather in Leon County. However, such projections are unlikely to exactly match actual experience.

Population and economic uncertainty tends to result in a deviation from the trend over the long term. Accordingly, separate high and low forecast results were developed to address population and economic uncertainty. These ranges are intended to represent an 80% confidence interval, implying only a 10% chance each of being higher or lower than the resulting bounds. The high and low forecasts shown in this year's report were developed based on varied inputs of economic and demographic variables within the forecast models by nFront to capture approximately 80% of potential outcomes. These statistics were then applied to the base case to develop the high and low load forecasts presented in Tables 2.5, 2.6, 2.8, 2.9, 2.11 and 2.12 (Schedules 3.1.2, 3.1.3, 3.2.2, 3.2.3, 3.3.2 and 3.3.3).

Sensitivities on the peak demand forecasts are useful in planning for future power supply resource needs. The graph shown in Figure B3 compares summer peak demand (multiplied by 117% for reserve margin requirements) for the three forecast sensitivity cases with reductions from proposed DSM portfolio and the base forecast without proposed DSM reductions against the City's existing and planned power supply resources. This graph allows for the review of the effect of load growth and DSM performance variations on the timing of new resource additions. The highest probability weighting, of course, is placed on the base case assumptions, and the low and high cases are given a smaller likelihood of occurrence.

2.1.3 Energy Efficiency and Demand Side Management Programs

The City currently offers a variety of conservation and DSM measures to its residential and commercial customers, which are listed below:

Residential Measures	Commercial Measures
Energy Efficiency Loans	Energy Efficiency Loans
Gas New Construction Rebates	Demonstrations
Gas Appliance Conversion Rebates	Information and Energy Audits
Information and Energy Audits	Commercial Gas Conversion Rebates
Ceiling Insulation Grants	Ceiling Insulation Grants
Low Income Ceiling Insulation Grants	Solar Water Heater Rebates
Low Income HVAC/Water Heater Repair Grants	Solar PV Net Metering
Low Income Duct Leak Repair Grants	
Neighborhood REACH Weatherization Assistance	
Energy Star Appliance Rebates	
High Efficiency HVAC Rebates	
Energy Star New Home Rebates	
Solar Water Heater Rebates	
Solar PV Net Metering	
Variable Speed Pool Pump Rebates	
Nights & Weekends Pricing Plan	
Smart Thermostat Rebate	

The City has a goal to improve the efficiency of customers' end-use of energy resources when such improvements provide a measurable economic and/or environmental benefit to the customers and the City utilities. During the City's last Integrated Resource Planning (IRP) Study completed in 2006 potential DSM measures (conservation, energy efficiency, load management, and demand response) were tested for cost-effectiveness utilizing an integrated approach that is based on projections of total achievable load and energy reductions and their associated annual costs developed specifically for the City. The measures were combined into bundles affecting similar end uses and /or having similar costs per kWh saved.

In 2012 the City contracted with a consultant to review its efforts with DSM and renewable resources with a focus on adjusting resource costs for which additional investment and overall market changes impacted the estimates used in the IRP Study. DSM and renewable resource alternatives were evaluated on a levelized cost basis and prioritized on geographic and demographic suitability, demand savings potential and cost. From this prioritized list the consultant identified a combination of DSM and renewable resources that could be cost-effectively placed into service by 2016. The total demand savings potential for the resources identified compared well with that identified in the IRP Study providing some assurance that the City's ongoing DSM and renewable efforts remained cost-effective.

In 2017 the City contracted with an engineering consultant to build upon the 2006 and 2012 studies and recommend DSM opportunities that are cost-effective alternatives to the City's evolving supply-side resources. The study concluded that many of the existing measures in the City's DSM program are cost-effective and several new measures related to demand response (DR) appear to be promising based on the benefit-cost evaluation. Battery storage and thermal storage do not appear to be cost-effective at this time, based on the high capital cost, but may be in the future combined with time-of-use rates with a large differential between the on-peak cost and off-peak cost. Storage may also serve as a means for mitigating the intermittency of solar PV and/or its non-coincidence with load requirements, particularly on sunny days with mild weather.

As discussed in Section 2.1.1 the growth in customers and energy use has slowed in recent years due in part to the economic conditions observed during and following the Great Recession as well as due to changes in the federal appliance/equipment efficiency standards and state building efficiency code and, more recently, due to the coronavirus pandemic. It appears that many customers have taken steps on their own to reduce their energy use and costs in response to the changing economy - without taking advantage of the incentives provided through the City's DSM program – as well as in response to the aforementioned standards and code changes. These "free drivers" effectively reduce potential participation in the DSM program in the future. It is uncertain whether these customers' energy use reductions will persist beyond the economic recovery. In the meantime, however, demand and energy reductions achieved as a result of these voluntary customer actions as well as those achieved by customer participation in City-sponsored DSM measures appear to have had a considerable and lasting impact on forecasts of future demand and energy requirements.

Estimates of the actual demand and energy savings realized from 2007-2020 attributable to the City's DSM efforts are below those projected in the last IRP study. Due to reduced load and energy forecasts, the latest projections reflect a revised outlook for DSM needs over the coming years. Future DSM activities will be based in part on the recommendations in the 2017 DSM study. The City has adopted a Clean Energy Plan resolution with the goal to achieve 100% renewable by 2050. This will likely impact the City's DSM programs and offerings. The City will provide further updates regarding progress with and any changes in future expectations of its DSM program in subsequent TYSP reports.

Energy and demand reductions attributable to the DSM portfolio have been incorporated into the future load and energy forecasts. Tables 2.16 and 2.17 display, respectively, the cumulative potential impacts of the proposed DSM portfolio on system annual energy and seasonal peak demand requirements. Based on the anticipated limits on annual control events it is expected that DR/DLC will be predominantly utilized in the summer months. Therefore, Tables 2.7-2.9 and 2.17 reflect no expected utilization of DR/DLC capability to reduce winter peak demand.

2.2 ENERGY SOURCES AND FUEL REQUIREMENTS

Tables 2.18 (Schedule 5), 2.19 (Schedule 6.1), and 2.20 (Schedule 6.2) present the projections of fuel requirements, energy sources by resource/fuel type in gigawatt-hours, and energy sources by resource/fuel type in percent, respectively, for the period 2021-2030. Figure B4 displays the percentage of energy by fuel type in 2021 and 2030.

The City's generation portfolio includes combustion turbine/combined cycle (CC), combustion turbine/simple cycle (CT), and reciprocating internal combustion engine (RICE or IC) generators. The City's CC and CT units are capable of generating energy using natural gas or distillate fuel oil. The RICE units utilize natural gas only. This mix of generation types coupled with the contracted solar PPAs and opportunity purchases allows the City to satisfy total energy requirements while balancing the cost of power with the environmental quality of our community.

The projections of fuel requirements and energy sources are taken from the results of computer simulations using the Hitachi ABB Power Grids Portfolio Optimization production simulation model and are based on the resource plan described in Chapter III.

City Of Tallahassee

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

Base Load Forecast

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Rural & Residential					Commercial		
Year	Population [1]	Members Per Household	(GWh) [2]	Average No. of Customers	Average kWh Consumption Per Customer	(GWh) [2]	Average No. of Customers	Average kWh Consumption Per Customer
2011	278,300	-	1,113	95,794	11,619	1,598	18,418	86,772
2012	283,600	-	1,021	96,479	10,586	1,572	18,445	85,235
2013	281,900	-	1,014	97,145	10,442	1,544	18,558	83,183
2014	283,800	-	1,089	97,985	11,119	1,548	18,723	82,690
2015	286,000	-	1,088	99,007	10,989	1,567	18,820	83,263
2016	287,000	-	1,080	100,003	10,801	1,559	19,002	82,065
2017	291,200	-	1,059	100,921	10,497	1,558	19,130	81,439
2018	292,500	-	1,122	102,395	10,962	1,552	19,282	80,506
2019	294,200	-	1,152	104,104	11,063	1,565	19,434	80,505
2020	298,500	-	1,149	105,829	10,857	1,432	19,649	72,886
2021	301,200	-	1,146	105,836	10,826	1,523	19,779	77,003
2022	303,900	-	1,141	106,966	10,664	1,580	19,993	79,004
2023	306,600	-	1,141	108,035	10,562	1,604	20,188	79,454
2024	309,200	-	1,141	109,058	10,464	1,615	20,368	79,286
2025	311,900	-	1,142	110,069	10,376	1,625	20,540	79,097
2026	314,300	-	1,143	111,037	10,293	1,634	20,704	78,941
2027	316,700	-	1,143	111,953	10,213	1,643	20,863	78,751
2028	319,100	-	1,148	112,869	10,168	1,653	21,020	78,638
2029	321,500	-	1,152	113,786	10,123	1,663	21,176	78,511
2030	323,900	-	1,157	114,704	10,086	1,672	21,332	78,366

[1] Population data represents Leon County population.
[2] Values include DSM impacts.

City Of Tallahassee

Schedule 2.2
History and Forecast of Energy Consumption and Number of Customers by Customer Class

Base Load Forecast

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Industrial				Street & Highway Lighting (GWh)	Other Sales to Public Authorities (GWh)	Total Sales to Ultimate Consumers (GWh)
Year	(GWh)	Average No. of Customers [1]	Average kWh Consumption Per Customer	Railroads and Railways (GWh)	[2]	[3]	[4]
2011	-	-	-		0	(1)	2,710
2012	-	-	-		0	(7)	2,587
2013	-	-	-		0	(5)	2,553
2014	-	-	-		0	(7)	2,631
2015	-	-	-		0	1	2,656
2016	-	-	-		0	4	2,643
2017	-	-	-		0	17	2,634
2018	-	-	-		0	23	2,698
2019	-	-	-		0	22	2,739
2020	-	-	-		0	26	2,607
2021	-	-	-		0	27	2,696
2022	-	-	-		0	27	2,747
2023	-	-	-		0	27	2,772
2024	-	-	-		0	27	2,783
2025	-	-	-		0	27	2,794
2026	-	-	-		0	27	2,804
2027	-	-	-		0	27	2,813
2028	-	-	-		0	27	2,828
2029	-	-	-		0	27	2,841
2030	-	-	-		0	27	2,856

[1] Average end-of-month customers for the calendar year.
[2] As of 2007 Security Lights and Street & Highway Lighting use is included with Commercial on Schedule 2.1.
[3] Reflects net of Talquin sales (for Talquin customers served by the City) and Talquin purchases (for City customers served by Talquin).
[4] Values include DSM impacts.

City Of Tallahassee

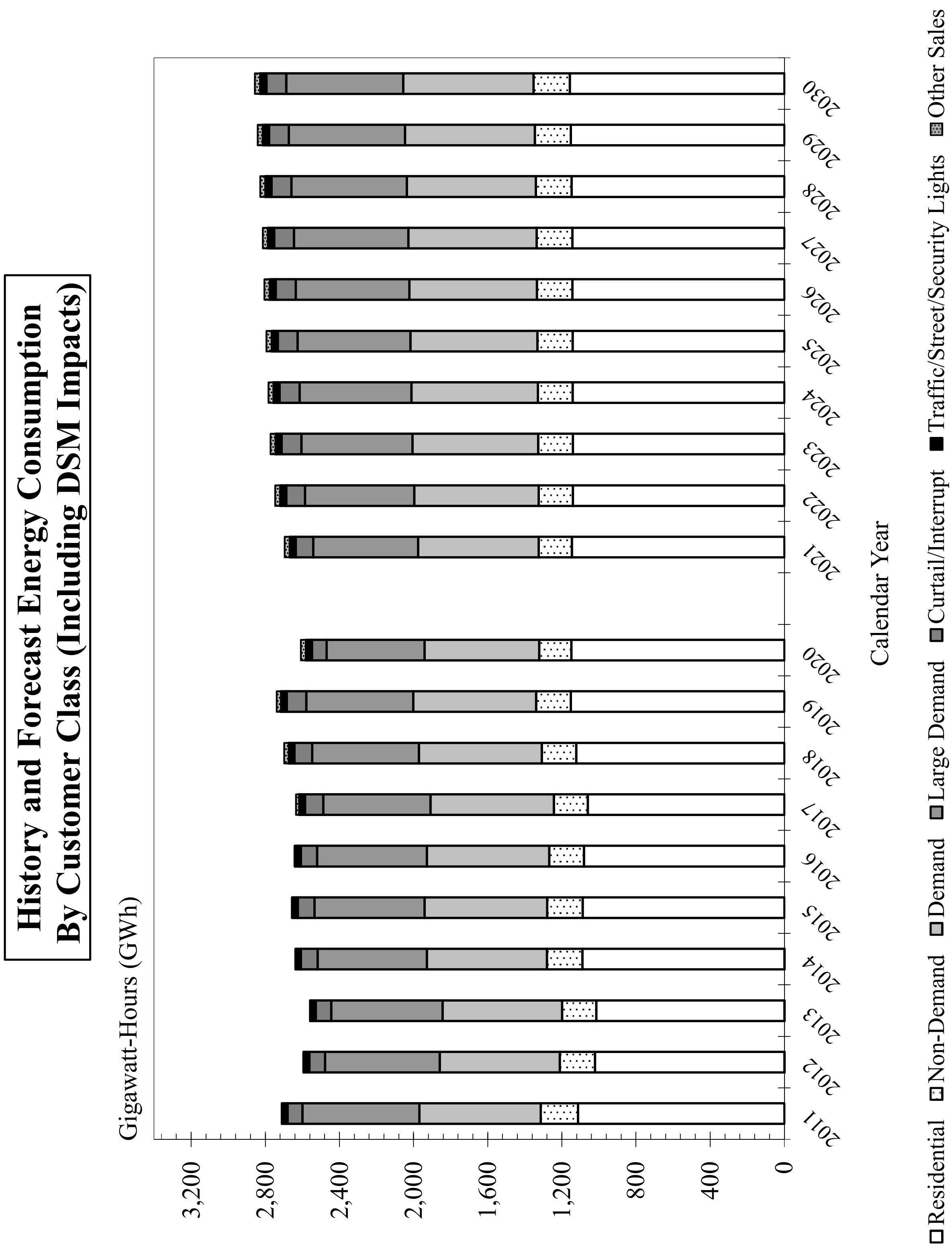
Schedule 2.3
History and Forecast of Energy Consumption and Number of Customers by Customer Class

Base Load Forecast

(1) Year	(2) Sales for Resale (GWh)	(3) Utility Use & Losses (GWh)	(4) Net Energy for Load (GWh) [1]	(5) Other Customers (Average No.)	(6) Total No. of Customers [2]
2011	0	89	2,799	0	114,212
2012	0	124	2,710	0	114,924
2013	0	131	2,684	0	115,703
2014	0	121	2,751	0	116,708
2015	0	120	2,776	0	117,827
2016	0	135	2,779	0	119,005
2017	0	124	2,758	0	120,051
2018	0	126	2,824	0	121,677
2019	0	112	2,851	0	123,538
2020	0	121	2,728	0	125,478
2021	0	121	2,817	0	125,614
2022	0	124	2,871	0	126,959
2023	0	125	2,897	0	128,223
2024	0	132	2,915	0	129,426
2025	0	126	2,920	0	130,609
2026	0	127	2,931	0	131,741
2027	0	127	2,941	0	132,816
2028	0	134	2,962	0	133,889
2029	0	129	2,970	0	134,963
2030	0	129	2,985	0	136,036

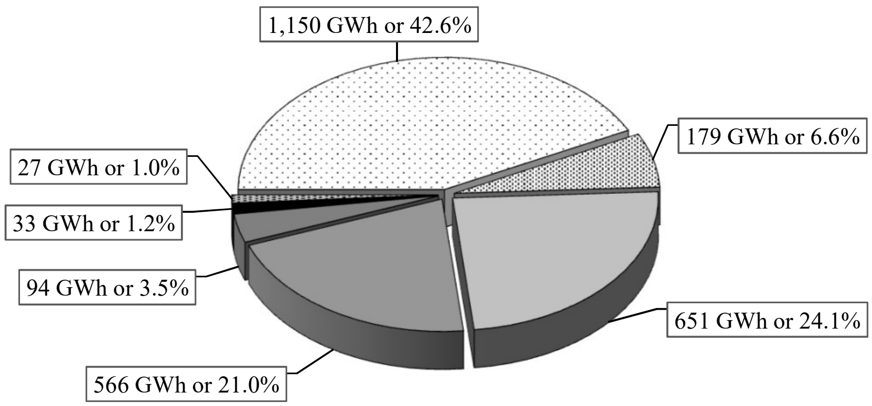
[1] Reflects NEL served by City electric system. Values include DSM Impacts.
[2] Average number of customers for the calendar year.

Figure B1


History and Forecast Energy Consumption
By Customer Class (Including DSM Impacts)
Gigawatt-Hours (GWh)
3,200
2,800
2,400
2,000
1,600
1,200
800
400
0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Calendar Year
Residential
Non-Demand
Demand
Large Demand
Curtail/Interrupt
Traffic/Street/Security Lights
Other Sales

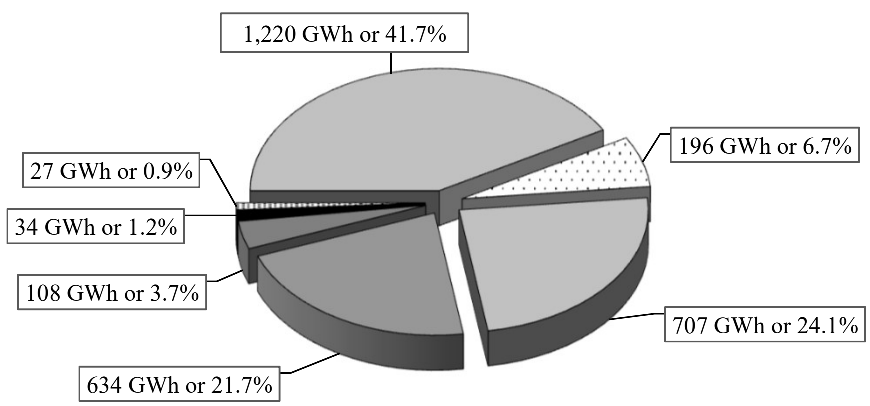
Energy Consumption By Customer Class (Excluding DSM Impacts)

Calendar Year 2021



2021 Total Sales = 2,701

Calendar Year 2030



2030 Total Sales = 2,926 GWh

Residential
Non-Demand
Demand
Large Demand
Curtail/Interrupt
Traffic/Street/Security Lights
Other Sales

City Of Tallahassee

Schedule 3.1.1
History and Forecast of Summer Peak Demand
Base Forecast
(MW)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	Total	Wholesale	Retail	Interruptible	Residential Load Management [2]	Residential Conservation [2], [3]	Comm./Ind Load Management [2]	Comm./Ind Conservation [2], [3]	Net Firm Demand [1]
2011	590		590						590
2012	557		557						557
2013	543		543						543
2014	565		565						565
2015	600		600						600
2016	597		597						597
2017	598		598						598
2018	596		596						596
2019	616		616						616
2020	576		576		0	1	0	0	576
2021	610		610		0	1	0	0	609
2022	623		623		0	2	0	0	621
2023	631		631		1	3	2	0	624
2024	636		636		2	4	4	1	624
2025	640		640		4	5	6	2	623
2026	645		645		5	7	8	2	623
2027	649		649		7	8	9	3	622
2028	653		653		7	9	9	4	625
2029	658		658		7	10	10	4	627
2030	662		662		7	11	10	5	629

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2020 DSM is actual at peak.
[3] 2020 values reflect incremental increase from 2019.

City Of Tallahassee

Schedule 3.1.2
History and Forecast of Summer Peak Demand
High Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2]	(7) Residential Conservation [2], [3]	(8) Comm./Ind Load Management [2]	(9) Comm./Ind Conservation [2], [3]	(10) Net Firm Demand [1]
2011	590		590						590
2012	557		557						557
2013	543		543						543
2014	565		565						565
2015	600		600						600
2016	597		597						597
2017	598		598						598
2018	596		596						596
2019	616		616						616
2020	576		576		0	1	0	0	576
2021	620		620		0	1	0	0	619
2022	643		643		0	2	0	0	641
2023	658		658		1	3	2	0	651
2024	668		668		2	4	4	1	657
2025	679		679		4	5	6	2	662
2026	688		688		5	7	8	2	666
2027	697		697		7	8	9	3	670
2028	706		706		7	9	9	4	677
2029	715		715		7	10	10	4	684
2030	724		724		7	11	10	5	691

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2020 DSM is actual at peak.
[3] 2020 values reflect incremental increase from 2019.

City Of Tallahassee

Schedule 3.1.3
History and Forecast of Summer Peak Demand
Low Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2]	(7) Residential Conservation [2], [3]	(8) Comm./Ind Load Management [2]	(9) Comm./Ind Conservation [2], [3]	(10) Net Firm Demand [1]
2011	590		590						590
2012	557		557						557
2013	543		543						543
2014	565		565						565
2015	600		600						600
2016	597		597						597
2017	598		598						598
2018	596		596						596
2019	616		616						616
2020	576		576		0	1	0	0	576
2021	601		601		0	1	0	0	600
2022	603		603		0	2	0	0	601
2023	604		604		1	3	2	0	597
2024	603		603		2	4	4	1	591
2025	602		602		4	5	6	2	585
2026	601		601		5	7	8	2	579
2027	601		601		7	8	9	3	574
2028	600		600		7	9	9	4	572
2029	600		600		7	10	10	4	569
2030	600		600		7	11	10	5	567

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2020 DSM is actual at peak.
[3] 2020 values reflect incremental increase from 2019.

City Of Tallahassee

Schedule 3.2.1
History and Forecast of Winter Peak Demand
Base Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2], [3]	(7) Residential Conservation [2], [4]	(8) Comm./Ind Load Management [2], [3]	(9) Comm./Ind Conservation [2], [4]	(10) Net Firm Demand [1]
2011 -2012	516		516						516
2012 -2013	480		480						480
2013 -2014	574		574						574
2014 -2015	556		556						556
2015 -2016	511		511						511
2016 -2017	533		533						533
2017 -2018	621		621						621
2018 -2019	508		508						508
2019 -2020	528		528						528
2020 -2021	505		505		0	1	0	0	504
2021 -2022	565		565		0	2	0	0	562
2022 -2023	572		572		0	4	0	1	567
2023 -2024	576		576		0	6	0	1	569
2024 -2025	580		580		0	7	0	1	571
2025 -2026	584		584		0	9	0	2	574
2026 -2027	588		588		0	10	0	2	576
2027 -2028	592		592		0	11	0	2	579
2028 -2029	596		596		0	12	0	3	582
2029 -2030	600		600		0	13	0	3	585
2030 -2031	604		604		0	13	0	3	588

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2020-2021 DSM is actual at peak.
[3] Reflects no expected utilization of demand response (DR) resources in winter.
[4] 2020-2021 values reflect incremental increase from 2019-2020.

City Of Tallahassee

Schedule 3.2.2
History and Forecast of Winter Peak Demand
High Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2], [3]	(7) Residential Conservation [2], [4]	(8) Comm./Ind Load Management [2], [3]	(9) Comm./Ind Conservation [2], [4]	(10) Net Firm Demand [1]
2011 -2012	516		516						516
2012 -2013	480		480						480
2013 -2014	574		574						574
2014 -2015	556		556						556
2015 -2016	511		511						511
2016 -2017	533		533						533
2017 -2018	621		621						621
2018 -2019	508		508						508
2019 -2020	528		528						528
2020 -2021	505		505		0	1	0	0	504
2021 -2022	579		579		0	2	0	0	577
2022 -2023	593		593		0	4	0	1	589
2023 -2024	603		603		0	6	0	1	597
2024 -2025	613		613		0	7	0	1	604
2025 -2026	622		622		0	9	0	2	612
2026 -2027	631		631		0	10	0	2	618
2027 -2028	639		639		0	11	0	2	626
2028 -2029	647		647		0	12	0	3	633
2029 -2030	656		656		0	13	0	3	640
2030 -2031	664		664		0	13	0	3	648

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2020-2021 DSM is actual at peak.
[3] Reflects no expected utilization of demand response (DR) resources in winter.
[4] 2020-2021 values reflect incremental increase from 2019-2020.

City Of Tallahassee

Schedule 3.2.3
History and Forecast of Winter Peak Demand
Low Forecast
(MW)

(1) Year	(2) Total	(3) Wholesale	(4) Retail	(5) Interruptible	(6) Residential Load Management [2], [3]	(7) Residential Conservation [2], [4]	(8) Comm./Ind Load Management [2], [3]	(9) Comm./Ind Conservation [2], [4]	(10) Net Firm Demand [1]
2011 -2012	516		516						516
2012 -2013	480		480						480
2013 -2014	574		574						574
2014 -2015	556		556						556
2015 -2016	511		511						511
2016 -2017	533		533						533
2017 -2018	621		621						621
2018 -2019	508		508						508
2019 -2020	528		528						528
2020 -2021	505		505		0	1	0	0	504
2021 -2022	550		550		0	2	0	0	548
2022 -2023	550		550		0	4	0	1	545
2023 -2024	548		548		0	6	0	1	541
2024 -2025	547		547		0	7	0	1	538
2025 -2026	546		546		0	9	0	2	536
2026 -2027	546		546		0	10	0	2	533
2027 -2028	545		545		0	11	0	2	532
2028 -2029	545		545		0	12	0	3	531
2029 -2030	545		545		0	13	0	3	529
2030 -2031	545		545		0	13	0	3	528

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2020-2021 DSM is actual at peak.
[3] Reflects no expected utilization of demand response (DR) resources in winter.
[4] 2020-2021 values reflect incremental increase from 2019-2020.

City Of Tallahassee

Schedule 3.3.1
History and Forecast of Annual Net Energy for Load
Base Forecast
(GWh)

(1) Year	(2) Total Sales	(3) Residential Conservation [1]	(4) Comm./Ind Conservation [1]	(5) Retail Sales [2], [3]	(6) Wholesale [4]	(7) Utility Use & Losses	(8) Net Energy for Load [3], [5]	(9) Load Factor % [3]
2011	2,711			2,711	(1)	89	2,799	54
2012	2,593			2,593	(7)	124	2,710	56
2013	2,558			2,558	(5)	131	2,684	56
2014	2,637			2,637	(7)	121	2,751	55
2015	2,655			2,655	1	120	2,776	53
2016	2,640			2,640	4	135	2,779	53
2017	2,617			2,617	17	124	2,758	53
2018	2,675			2,675	23	126	2,824	52
2019	2,716			2,716	22	112	2,851	53
2020	2,584	3	0	2,581	26	121	2,728	54
2021	2,674	5	0	2,669	27	121	2,817	53
2022	2,729	9	0	2,720	27	124	2,871	53
2023	2,761	16	1	2,745	27	125	2,897	53
2024	2,782	24	1	2,756	27	132	2,915	53
2025	2,802	33	3	2,767	27	126	2,920	53
2026	2,822	41	4	2,777	27	127	2,931	54
2027	2,841	50	5	2,786	27	127	2,941	54
2028	2,860	54	6	2,801	27	134	2,962	54
2029	2,880	59	6	2,814	27	129	2,970	54
2030	2,899	63	7	2,829	27	129	2,985	54

[1] Reduction estimated at customer meter. 2020 DSM is actual incremental increase from 2019.
[2] History is total sales to City customers. Forecast is sales served by City electric system.
[3] Values include DSM Impacts.
[4] Reflects net of Talquin sales (for Talquin customers served by the City) and Talquin purchases (for City customers served by Talquin).
[5] Reflects NEL served by City electric system.

City Of Tallahassee

Schedule 3.3.2
History and Forecast of Annual Net Energy for Load
High Forecast
(GWh)

(1) Year	(2) Total Sales	(3) Residential Conservation [1]	(4) Comm./Ind Conservation [1]	(5) Retail Sales [2], [3]	(6) Wholesale [4]	(7) Utility Use & Losses	(8) Net Energy for Load [3], [5]	(9) Load Factor % [3]
2011	2,711			2,711	(1)	89	2,799	54
2012	2,593			2,593	(7)	124	2,710	56
2013	2,558			2,558	(5)	131	2,684	56
2014	2,637			2,637	(7)	121	2,751	55
2015	2,655			2,655	1	120	2,776	53
2016	2,640			2,640	4	135	2,779	53
2017	2,617			2,617	17	124	2,758	53
2018	2,675			2,675	23	126	2,824	52
2019	2,716			2,716	22	112	2,851	53
2020	2,584	3	0	2,581	26	121	2,728	54
2021	2,710	5	0	2,705	27	123	2,855	53
2022	2,813	9	0	2,804	27	128	2,959	53
2023	2,877	16	1	2,860	27	130	3,018	53
2024	2,924	24	1	2,898	27	139	3,064	53
2025	2,969	33	3	2,933	27	134	3,094	53
2026	3,011	41	4	2,966	27	135	3,128	54
2027	3,050	50	5	2,995	27	137	3,159	54
2028	3,090	54	6	3,030	27	145	3,202	54
2029	3,129	59	6	3,064	27	140	3,231	54
2030	3,169	63	7	3,098	27	141	3,267	54

[1] Reduction estimated at customer meter. 2020 DSM is actual incremental increase from 2019.
[2] History is total sales to City customers. Forecast is sales served by City electric system.
[3] Values include DSM Impacts.
[4] Reflects net of Talquin sales (for Talquin customers served by the City) and Talquin purchases (for City customers served by Talquin).
[5] Reflects NEL served by City electric system.

City Of Tallahassee

Schedule 3.3.3
History and Forecast of Annual Net Energy for Load
Low Forecast
(GWh)

(1) Year	(2) Total Sales	(3) Residential Conservation [1]	(4) Comm./Ind Conservation [1]	(5) Retail Sales [2], [3]	(6) Wholesale [4]	(7) Utility Use & Losses	(8) Net Energy for Load [3], [5]	(9) Load Factor % [3]
2011	2,711			2,711	(1)	89	2,799	54
2012	2,593			2,593	(7)	124	2,710	56
2013	2,558			2,558	(5)	131	2,684	56
2014	2,637			2,637	(7)	121	2,751	55
2015	2,655			2,655	1	120	2,776	53
2016	2,640			2,640	4	135	2,779	53
2017	2,617			2,617	17	124	2,758	53
2018	2,675			2,675	23	126	2,824	52
2019	2,716			2,716	22	112	2,851	53
2020	2,584	3	0	2,581	26	121	2,728	54
2021	2,637	5	0	2,632	27	120	2,779	53
2022	2,645	9	0	2,636	27	120	2,783	53
2023	2,645	16	1	2,629	27	120	2,776	53
2024	2,639	24	1	2,613	27	126	2,766	53
2025	2,635	33	3	2,600	27	119	2,746	54
2026	2,633	41	4	2,588	27	118	2,733	54
2027	2,631	50	5	2,576	27	118	2,721	54
2028	2,630	54	6	2,570	27	124	2,721	54
2029	2,629	59	6	2,563	27	117	2,708	54
2030	2,627	63	7	2,557	27	117	2,701	54

[1] Reduction estimated at customer meter. 2020 DSM is actual incremental increase from 2019.
[2] History is total sales to City customers. Forecast is sales served by City electric system.
[3] Values include DSM Impacts.
[4] Reflects net of Talquin sales (for Talquin customers served by the City) and Talquin purchases (for City customers served by Talquin).
[5] Reflects NEL served by City electric system.

City Of Tallahassee

Schedule 4
Previous Year and 2-Year Forecast of Retail Peak Demand and Net Energy for Load by Month

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2020 Actual		**2021 Forecast [1][2]**		**2022 Forecast [1]**	
Month	Peak Demand (MW)	NEL (GWh)	Peak Demand (MW)	NEL (GWh)	Peak Demand (MW)	NEL (GWh)
January	528	215	553	230	562	234
February	471	199	487	195	496	199
March	433	210	444	203	454	208
April	453	185	439	208	451	213
May	481	218	526	244	538	249
June	559	248	563	261	575	267
July	576	279	578	280	590	286
August	567	282	609	292	621	298
September	575	249	557	260	567	265
October	484	228	484	225	492	228
November	432	191	452	203	459	206
December	489	223	471	216	476	219
TOTAL		2,728		2,817		2,871

[1] Peak Demand and NEL include DSM Impacts.
[2] Represents forecast values for 2020.

City of Tallahassee, Florida

2021 Electric System Load Forecast

Key Explanatory Variables

	Forecast Model								
Explanatory Variable	RS Customers	RS Consumption	GSND Customers	GSND Consumption	GSD Customers	GSD Consumption	GSLD Consumption	System Losses	Monthly Load Factor [3]
Leon County Population	X			X	X	X			
Leon County Personal Income			X				X		
Leon County Gross Product									
Leon County Non-Store Sales				X			X		
Tallahassee MSA Taxable Sales				X					
Tallahassee MSA Per Capita Taxable Sales		X							
Residential Customers		X							
Florida Mortgage Originations	X								
Florida Home Vacancies	X								
US Personal Spending			X				X		
Energy Efficiency Standards		X							
Price of Electricity		X							
Leon County Residential Location Prevalence		X							
Leon County Commercial Location Prevalence				X		X	X		X
Cooling Degree Days [1]		X		X		X	X	X	X
Heating Degree Days [1]		X		X				X	X
Prior Month Cooling Degree Days [1]								X	
Prior Month Heating Degree Days [1]								X	
Winter Peak and Prior Day HDD [1]									X
Summer Peak and Prior Day HDD [1]									X
Adjusted R-Squared [2]	0.999	0.930	0.998	0.929	0.991	0.951	0.882	0.881	0.714

[1] The base from which monthly heating and cooling degree days (HDD/CDD, respectively) are computed is 65 degrees Fahrenheit (dF). Peak day HDD and CDD reflect differing bases. For winter peak HDD the base is 55 degrees Fahrenheit (^{o}F); for summer peak CDD the base is 70^{o}F.

[2] R-Squared, sometimes called the coefficient of determination, is a commonly used measure of goodness of fit of a linear model. If all observations fall on the model regression line, R Squared is 1. If there is no linear relationship between the dependent and independent variable, R Squared is 0. Adjusted R-Squared reflects a downward adjustment to penalize R-squared for the addition of regressors that do not contribute to the explanatory power of the model.

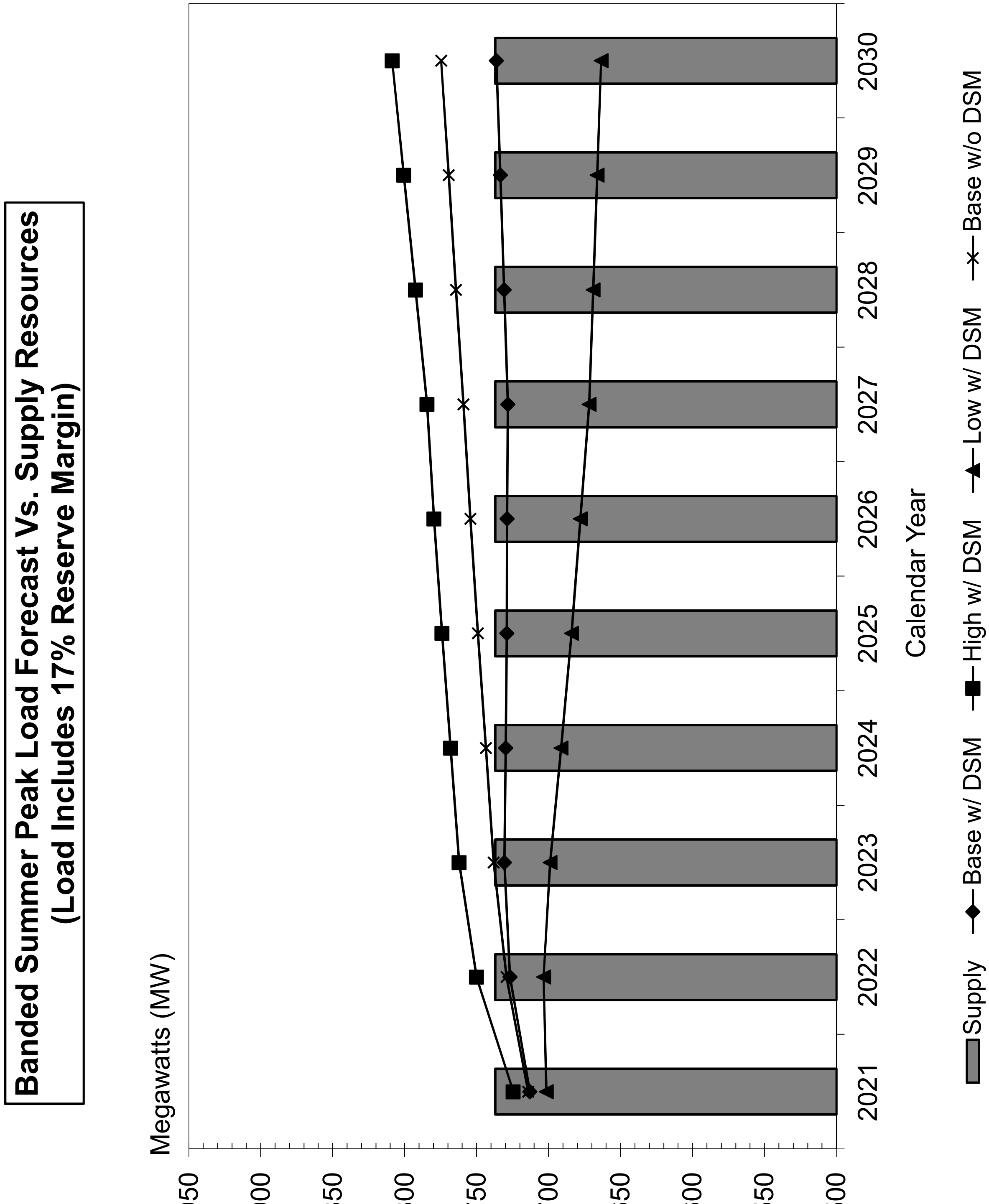
[3] As monthly load factor is essentially a stationary series, indicators of goodness of fit should be viewed differently. In combination with estimates of NEL, forecasted peak demands from this equation will have far better fit than the adjusted R-Squared here indicates. The equation also includes daytype variables.

City of Tallahassee

2021 Electric System Load Forecast

Sources of Forecast Model Input Information

Energy Model Input Data	Source
Leon County Population	Bureau of Economic and Business Research Woods and Poole Economics
Leon County Personal Income	Woods and Poole Economics
Leon County Gross Product	Woods and Poole Economics
Leon County Non-Store Sales	Woods and Poole Economics
Cooling Degree Days	NOAA
Heating Degree Days	NOAA
AC Saturation Rate	Appliance Saturation Study; EIA
Heating Saturation Rate	Appliance Saturation Study; EIA
Real Tallahassee Taxable Sales	Florida Department of Revenue, CPI Woods and Poole Economics
Real Tallahassee Taxable Sales Per Capita	Florida Department of Revenue, CPI Woods and Poole Economics
Florida Population	Bureau of Economic and Business Research Woods and Poole Economics
Florida Home Vacancy Rate	U.S. Bureau of the Census
Florida Mortgage Originations	IHS Global Insight (now IHS Markit)
State Capitol Incremental	Department of Management Services
FSU Incremental Additions	FSU Planning Department
FAMU Incremental Additions	FAMU Planning Department
GSLD Incremental Additions	City Utility Services
Other Commercial Customers	City Utility Services
Tall. Memorial Curtailable	City Utility Services
System Peak Historical Data	City System Planning
Historical Customer Projections by Class	City Utility Services
Historical Customer Class Energy	City Utility Services
Interruptible, Traffic Light Sales, & Security Light Additions	City Utility Services
Residential/Commercial Real Price of Electricity	Calculated from Revenues, kWh sold, CPI


Banded Summer Peak Load Forecast Vs. Supply Resources
(Load Includes 17% Reserve Margin)
Megawatts (MW)
950
900
850
800
750
700
650
600
550
500
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Calendar Year
Supply
Base w/ DSM
High w/ DSM
Low w/ DSM
Base w/o DSM

City Of Tallahassee

2021 Electric System Load Forecast

Projected Demand Side Management Energy Reductions [1]

Calendar Year	Residential Impact (MWh)	Commercial Impact (MWh)	Total Impact (MWh)
2021	4,951	104	5,055
2022	9,305	203	9,508
2023	16,326	611	16,937
2024	25,645	1,528	27,172
2025	34,333	2,781	37,114
2026	43,037	4,015	47,053
2027	51,741	5,249	56,991
2028	56,691	5,947	62,637
2029	61,399	6,619	68,018
2030	66,228	7,334	73,562

[1] Reductions estimated at generator busbar.

City Of Tallahassee

2021 Electric System Load Forecast

Projected Demand Side Management
Seasonal Demand Reductions [1]

Year		Residential Energy Efficiency Impact		Commercial Energy Efficiency Impact		Residential Demand Response Impact		Commercial Demand Response Impact		Demand Side Management Total	
Summer	Winter	Summer (MW)	Winter (MW)	Summer (MW)	Winter (MW)	Summer (MW)	Winter [2] (MW)	Summer (MW)	Winter [2] (MW)	Summer (MW)	Winter (MW)
2021	2021-2022	1	2	0	0	0	0	0	0	1	2
2022	2022-2023	2	4	0	1	0	0	0	0	2	4
2023	2023-2024	3	6	0	1	1	0	2	0	6	6
2024	2024-2025	4	7	1	1	2	0	4	0	12	8
2025	2025-2026	5	9	2	2	4	0	6	0	17	10
2026	2026-2027	7	10	2	2	5	0	8	0	22	12
2027	2027-2028	8	11	3	2	7	0	9	0	26	13
2028	2028-2029	9	12	4	3	7	0	9	0	29	14
2029	2029-2030	10	13	4	3	7	0	10	0	31	15
2030	2030-2031	11	13	5	3	7	0	10	0	33	16

[1] Reductions estimated at busbar.
[2] Reflects no expected utilization of demand response (DR) resources in winter.

City Of Tallahassee

Schedule 5
Fuel Requirements

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Fuel Requirements		Units	Actual 2019	Actual 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
(1)	Nuclear		Billion Btu	0	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	0
(3)	Residual	Total	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(4)		Steam	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(5)		CC	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(6)		CT	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(7)		Diesel	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(8)	Distillate	Total	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(9)		Steam	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(10)		CC	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(11)		CT	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(12)		Diesel	1000 BBL	0	0	0	0	0	0	0	0	0	0	0	0
(13)	Natural Gas	Total	1000 MCF	22,677	20,725	22,243	22,770	22,869	22,543	22,972	22,996	22,433	22,962	23,136	23,219
(14)		Steam	1000 MCF	0	0	0	0	0	0	0	0	0	0	0	0
(15)		CC	1000 MCF	20,185	17,975	20,724	21,691	21,702	20,757	21,772	21,826	20,462	21,388	21,891	21,928
(16)		CT	1000 MCF	2,492	2,749	1,519	1,079	1,167	1,787	1,200	1,170	1,971	1,575	1,245	1,292
(17)		Diesel	1000 MCF	0	0	0	0	0	0	0	0	0	0	0	0
(18)	Other (Specify)		Trillion Btu	0	0	0	0	0	0	0	0	0	0	0	0

City Of Tallahassee

Schedule 6.1
Energy Sources

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Energy Sources		Units	Actual 2019	Actual 2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
(1)	Annual Firm Interchange		GWh	0	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	0
(3)	Nuclear		GWh	0	0	0	0	0	0	0	0	0	0	0	0
(4)	Residual	Total	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(5)		Steam	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(6)		CC	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(7)		CT	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(8)		Diesel	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(9)	Distillate	Total	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(10)		Steam	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(11)		CC	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(12)		CT	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(13)		Diesel	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(14)	Natural Gas	Total	GWh	2900	2666	2,888	2,957	2,968	2,929	2,984	2,990	2,916	2,984	3,009	3,021
(15)		Steam	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(16)		CC	GWh	2,615	2,346	2,709	2,830	2,831	2,718	2,843	2,852	2,684	2,799	2,863	2,869
(17)		CT	GWh	285	320	180	127	137	211	141	137	232	185	146	152
(18)		Diesel	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(19)	Hydro		GWh	7	0	0	0	0	0	0	0	0	0	0	0
(20)	Economy Interchange[1]		GWh	(95)	(51)	(193)	(207)	(192)	(134)	(183)	(177)	(94)	(140)	(156)	(153)
(21)	Renewables		GWh	41	113	122	121	121	120	119	119	118	118	117	116
(22)	Net Energy for Load		GWh	2,852	2,728	2,817	2,871	2,897	2,915	2,920	2,931	2,941	2,962	2,970	2,985

[1] Negative values reflect expected need to sell off-peak power to satisfy generator minimum load requirements, primarily in winter and shoulder months.

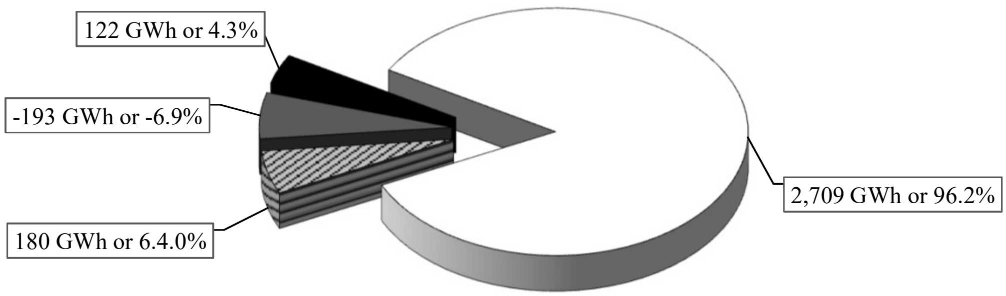
City Of Tallahassee

Schedule 6.2
Energy Sources

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Energy Sources		Units	Actual 2016	Actual 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
(1)	Annual Firm Interchange		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(2)	Coal		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(3)	Nuclear		%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(4)	Residual	Total	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(5)		Steam	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(6)		CC	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(7)		CT	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(8)		Diesel	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(9)	Distillate	Total	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(10)		Steam	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(11)		CC	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(12)		CT	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(13)		Diesel	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(14)	Natural Gas	Total	%	101.7	97.7	102.5	103.0	102.5	100.5	102.2	102.0	99.2	100.8	101.3	101.2
(15)		Steam	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(16)		CC	%	91.7	86.0	96.2	98.6	97.7	93.2	97.4	97.3	91.3	94.5	96.4	96.1
(17)		CT	%	10.0	11.7	6.4	4.4	4.7	7.2	4.8	4.7	7.9	6.2	4.9	5.1
(18)		Diesel	%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(19)	Hydro		%	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
(20)	Economy Interchange		%	(3.3)	(1.9)	(6.9)	(7.2)	(6.6)	(4.6)	(6.3)	(6.0)	(3.2)	(4.7)	(5.3)	(5.1)
(21)	Renewables		%	1.4	4.1	4.3	4.2	4.2	4.1	4.1	4.1	4.0	4.0	3.9	3.9
(22)	Net Energy for Load		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

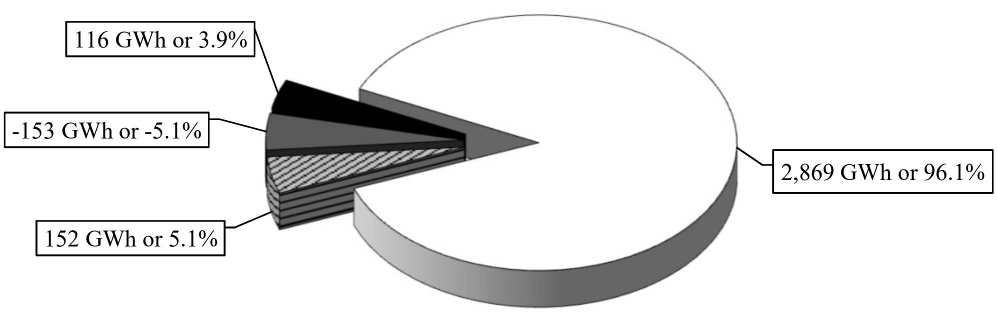
Generation By Resource/Fuel Type

Calendar Year 2021



2021 Total NEL = 2,817 GWh

Calendar Year 2030



2030 Total NEL = 2,985 GWh

CC-Gas CT/Diesel-Gas Net Interchange Renewables

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Chapter III

Projected Facility Requirements

3.1 Planning Process

The City periodically reviews future DSM and power supply options that are consistent with the City's policy objectives. Included in these reviews are analyses of how the DSM and power supply alternatives perform under base and alternative assumptions. Revisions to the City's resource plan will be discussed in this chapter.

3.2 Projected Resource Requirements

3.2.1 Transmission Limitations

The City's projected transmission import and export capability continues to be a major determinant of the type and timing of future power supply resource additions. The City's internal transmission studies have reflected a gradual deterioration of the system's transmission import and export capability into the future, due to the expected configuration and use, both scheduled and unscheduled, of the City's transmission system and the surrounding regional transmission system. The City has worked with its neighboring utilities, Duke and Southern, to plan and maintain, at minimum, sufficient transmission import capability to allow the City to make emergency power purchases in the event of the most severe single contingency, the loss of the system's largest generating unit, and sufficient export capability to allow for the sale of incidental and/or economic excess local generation.

The prospects for significant expansion of the regional transmission system around Tallahassee hinges on the City's ongoing discussions with Duke and Southern, the Florida Reliability Coordinating Council's (FRCC) regional transmission planning process, and the evolving set of mandatory reliability standards issued by the North American Electric Reliability Corporation (NERC). However, no substantive improvements to the City's transmission import/export capability are expected absent the City's prospective purchase of firm transmission service. In consideration of the City's limited transmission import capability the results internal analysis of options tend to favor local power supply alternatives as the means to satisfy future power supply requirements.

3.2.2 Reserve Requirements

For the purposes of this year's TYSP report the City uses a load reserve margin of 17% as its resource adequacy criterion. This margin was established in the 1990s then re-evaluated via a loss of load probability (LOLP) analysis of the City's system performed in 2002. The City periodically conducts probabilistic resource adequacy assessments to determine if conditions warrant a change to its resource adequacy criteria. The results of more recent analyses suggest that reserve margin may no longer be suitable as the City's sole resource adequacy criterion. This issue is discussed further in Section 3.2.4.

3.2.3 Recent and Near Term Resource Changes

Expected future resource additions are discussed in Section 3.2.6, "Future Power Supply Resources".

In 2018, the City placed two 9.2 MW (net) Wartsila natural gas-fired RICE generators into commercial operations at the its Substation 12. This substation has a single transmission feed. The addition of this generation at the substation will allow for back-up of critical community loads served from Substation 12 as well as provide additional generation resources to the system. Also in 2018, the City completed construction of four 18.5 MW (net) Wartsila natural gas-fired RICE generators located at its Hopkins Generating Station. Three of these units were placed into commercial operations in February 2019 and the fourth in March 2019. A fifth 18.5 MW RICE unit was placed into commercial operations in April 2020.

The RICE generators provide additional benefits including but not necessarily limited to:

- Multiple RICE generators provide greater dispatch flexibility.
- Additional RICE generators can be installed at either the City's Hopkins plant or split between the Hopkins plant and Purdom plant.

- The RICE generators are more efficient than the units that were retired providing significant potential fuel savings.
- The RICE generators can be started and reach full load within 5-10 minutes. In addition, their output level can be changed very rapidly. This, coupled with the number and size of each unit, makes them excellent for responding to the changes in output from intermittent resources such as solar energy systems and may enable the addition of more solar resources in the future.
- The CO_2 emissions from the RICE generators are much lower than the units that have been retired.
- The City's former Hopkins Unit 1 had a minimum up time requirement of 100 hours. This at times required the unit to remain on line during daily off-peak periods when the unit's generation was not needed and/or represented excess generation that had to be sold, sometimes at a loss. Replacing Hopkins Unit 1 with the smaller, "quick start" RICE generators allows the City to avoid this uneconomic operating practice.
- By retiring Hopkins Unit 1 earlier and advancing the in-service dates of these RICE generators analyses indicated that some of the associated debt service would be offset by the fuel savings from the efficiency gains achieved.

3.2.4 POWER SUPPLY DIVERSITY

Resource diversity, particularly with regard to fuels, has long been a priority concern for the City because of the system's heavy reliance on natural gas as its primary fuel source. This issue has received even greater emphasis due to the historical volatility in natural gas prices. The City has addressed this concern in part by implementing an Energy Risk Management (ERM) program to limit the City's exposure to energy price fluctuations. The ERM program established an organizational structure of interdepartmental committees and working groups and included the adoption of an Energy Risk Management Policy. This policy identifies acceptable risk mitigation products to prevent asset value losses, ensure price stability and provide protection against market volatility for fuels and energy to the City's electric and gas utilities and their customers.

Other important considerations in the City's planning process are the diversity of power supply resources in terms of their number, sizes and expected duty cycles as well as expected transmission import capabilities. To satisfy expected electric system requirements the City currently assesses the adequacy of its power supply resources versus the 17% load reserve margin criterion. But the evaluation of reserve margin is made only for the annual electric system peak demand and assuming all power supply resources are available. Resource adequacy must also be evaluated during other times of the year to determine if the City is maintaining the appropriate amount and mix of power supply resources. Further, consideration must be given to the adequacy of resources' ability to provide ancillary services (voltage control, frequency response, regulating/operating/contingency reserves, etc.). Because of the high variability of load requirements at the National High Magnetic Field Laboratory (NHMFL) and the increasing penetration of intermittent, utility-scale solar PV projects, ensuring ancillary service adequacy is becoming increasingly important.

Currently, over 70% of the City's power supply comes from two generating units, Purdom 8 and Hopkins 2. The outage of either of these units can present operational challenges especially when coupled with transmission limitations (as discussed in Section 3.2.1). Further, the replacement of older generating units has altered the number and sizes of power supply resources available to ensure resource adequacy throughout the reporting period. For these reasons the City has evaluated alternative and/or supplemental probabilistic metrics/criteria to its current load reserve margin criterion that may better balance resource and ancillary service adequacy with utility and customer costs. The results of this evaluation confirmed that the City's current capacity mix and limited transmission import capability are the biggest determinants of the City's resource adequacy and suggest that there are risks of potential resource shortfalls during periods other than at the time of the system peak demand. Therefore, the City's current deterministic load reserve margin criterion may need to be replaced with and/or supplemented by other criteria that takes these issues into consideration.

Purchase contracts can provide some of the diversity desired in the City's power supply resource portfolio. The City has evaluated both short and long-term purchased power options based on conventional sources as well as power offers based on renewable resources. The potential reliability and economic benefits of prospectively increasing the City's transmission import (and export) capabilities has also been evaluated. These evaluations indicate the potential for some electric reliability improvement resulting from the addition of facilities to achieve more transmission import capability. However, the study's model of the Southern and Florida markets reflects, as with the City's generation fleet, natural gas-fired generation on the margin the majority of the time. Therefore, the cost of increasing the City's transmission import capability would not likely be offset by the potential economic benefit from increased power purchase/sale opportunities.

As an additional strategy to address the City's lack of power supply diversity, planning staff has investigated options for a significantly enhanced DSM portfolio. Commitment to this expanded DSM effort (see Section 2.1.3) and an increase in customer-sited renewable energy projects (primarily solar photovoltaics) improve the City's overall resource diversity. However, due to limited availability and uncertain performance, past studies have indicated that traditional DSM and solar projects would not improve resource adequacy (as measured by loss of load expectation (LOLE)) as much as the addition of conventional generation resources.

3.2.5 RENEWABLE RESOURCES

The City believes that offering clean, renewable energy alternatives to its customers is a sound business strategy: it will provide for a measure of supply diversification, reduce dependence on fossil fuels, promote cleaner energy sources, and enhance the City's already strong commitment to protecting the environment and the quality of life in Tallahassee. The City continues to seek suitable projects that utilize the renewable fuels available within the Florida Big Bend and panhandle regions. As part of its continuing commitment to explore clean energy alternatives, the City has continued to invest in opportunities to develop viable solar photovoltaic (PV) projects as part of our efforts to offer "green power" to our customers.

On July 24, 2016, the City executed a PPA for 20 MW_{ac} of solar PV with Origis Energy USA ("Origis"), doing business as FL Solar 1 (Solar Farm 1). The project is located adjacent to the Tallahassee International Airport and delivers power to a City-owned distribution facility. The City declared commercial operations of the project on December 13, 2017. In an effort to increase the use of renewables, the City entered into a PPA with Origis, doing business as FL Solar 4 (Solar Farm 4) for a second project with an output of 42 MW_{ac}. The Solar Farm 4 project is sited on additional property adjacent to the Tallahassee International Airport and connected to the City's 230 kV transmission system. The commercial operations date for Solar Farm 4 was December 26, 2019 bringing the City's total utility-scale solar capacity to 62 MW_{ac}.

At the end of 2020, the City had three years of operating experience with Solar Farm 1 and one year with Solar Farm 4. An analysis of the output of the facilities revealed that neither contribute to meeting the winter peaks but do contribute towards meeting the summer peaks. Based on the operational data to date, an average of approximately 50% of the facilities' total installed capacity has been available during summer peak and near peak hours. However, given the limited operational experience with these resources, the City has elected to utilize a more conservative initial estimate of 20% of the combined capacity of the facilities as firm capacity available for the summer peak. The City intends to annually review and, if appropriate, revise the assumed firm contribution from its solar power supply resources as additional operational experience is gained.

One of the potential negatives of the having both projects located adjacent to each other is that both systems will likely experience cloud cover at the same time. The intermittent nature of solar PVcoupled with the high variability of FSU's National High Magnetic Field Laboratory (NHMFL) load could at times present challenges to the provision of sufficient regulating reserves. The City will continue to monitor the proliferation of PV and other intermittent resources and work to integrate them so that service reliability is not jeopardized. The "quick start" capability of the reciprocating engine/generators commissioned in 2019 and 2020 may help mitigate the intermittency of the solar resources the NHMFL load while contributing to the ongoing modernization of the City's generation fleet.

As of the end of calendar year 2020 the City has a portfolio of 223 kW_{ac} of solar PV operated and maintained by the Electric Utility and a cumulative total of 2,832 kW_{ac} of solar PV has been installed by customers. The City promotes and encourages environmental responsibility in our community through a variety of programs available to citizens. The commitment to renewable energy sources (and particularly to solar PV) by its customers is made possible through the Sustainability initiative, that includes many options related to becoming a greener community such as the City's Solar PV Net Metering offer. Solar PV Net Metering promotes customer investment in renewable energy generation by allowing residential and commercial customers with small to moderate sized PV installations to return excess generated power back to the City at the full retail value.

The City has commissioned a study to determine the impacts of additional intermittent renewable resources being added to the City's system. The study determined that the maximum expected intermittent resource penetration the system can handle without adversely impacting the reliability of the system from both a bulk power and distribution perspective to be 60 MW_{ac}. In addition, the study identified potential system modifications that may be available to increase the amount of intermittent resources that can be reliably added to the system.

On February 20, 2019, the City Commission adopted a Clean Energy Plan (CEP) resolution. The CEP resolution outlined the City's continued commitment to sustainability and established the following specific goals:

- All City facilities to be 100% renewable no later than 2035.
- All City main line buses to be 100% electric no later than 2035.
- All City light duty vehicles to be 100% electric no later than 2035
- All City medium and heavy duty vehicles converted to 100% electric as technology allows.
- No later than 2050, have the Tallahassee community at 100% renewable, including all forms of energy. This would include the electric utility, natural gas utility and transportation.

The City issued a Request for Proposals (RFP) for consulting services related to the Energy Integrated Resource Planning (EIRP) process and public engagement plan to identify the path forward to meet the 2050 100% clean, renewable energy goal. The City executed a contract with the top-ranked RFP respondent in June 2020. The resulting Clean Energy Plan is expected to be complete in early 2022.

3.2.6 Future Power Supply Resources

The City's 2021 Ten Year Site Plan identifies that no additional power supply resources will be needed through the 2030 horizon year. .

The suitability of this resource plan is dependent on the performance of the City's DSM portfolio (described in Section 2.1.3 of this report) and the City's projected transmission import capability. If only 50% of the projected annual DSM peak demand reductions are achieved, the City would require about 19 MW of additional power supply resources to meet its load and planning reserve requirements through the horizon year of 2030. The City continues to monitor closely the performance of the DSM portfolio and, as mentioned in Section 2.1.3, will be revisiting and, where appropriate, updating assumptions regarding and re-evaluating cost-effectiveness of our current and prospective DSM measures. This will also allow a reassessment of expected demand and energy savings attributable to DSM.

Tables 3.1 and 3.2 (Schedules 7.1 and 7.2) provide information on the resources and reserve margins during the next ten years for the City's system. The City has identified no planned capacity changes on Table 3.3 (Schedule 8). All existing capacity resources have been incorporated into the City's dispatch simulation model in order to provide information related to fuel consumption and energy mix (see Tables 2.18, 2.19 and 2.20). Figure C compares seasonal net peak load and the system reserve margin based on summer peak load requirements. Table 3.4 provides the City's generation expansion plan for the period from 2021 through 2030.

City Of Tallahassee

Schedule 7.1
Forecast of Capacity, Demand, and Scheduled Maintenance at Time of Summer Peak [1]

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total Installed Capacity	Firm Capacity Import	Firm Capacity Export	QF [2]	Total Capacity Available	System Firm Summer Peak Demand	Reserve Margin Before Maintenance		Scheduled Maintenance	Reserve Margin After Maintenance	
Year	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	% of Peak	(MW)	(MW)	% of Peak
2021	725	0	0	12	737	609	128	21	0	128	21
2022	725	0	0	12	737	621	116	19	0	116	19
2023	725	0	0	12	737	624	113	18	0	113	18
2024	725	0	0	12	737	624	113	18	0	113	18
2025	725	0	0	12	737	623	114	18	0	114	18
2026	725	0	0	12	737	623	114	18	0	114	18
2027	725	0	0	12	737	622	115	18	0	115	18
2028	725	0	0	12	737	625	112	18	0	112	18
2029	725	0	0	12	737	627	110	18	0	110	18
2030	725	0	0	12	737	629	108	17	0	108	17

[1] All installed and firm import capacity changes are identified in the proposed generation expansion plan (Table 3.4).

[2] Approximately 20% of Solar Farms 1 and 4 combined rated AC summer capacity.

City Of Tallahassee

Schedule 7.2
Forecast of Capacity, Demand, and Scheduled Maintenance at Time of Winter Peak [1]

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total Installed Capacity	Firm Capacity Import	Firm Capacity Export	QF	Total Capacity Available	System Firm Winter Peak Demand	Reserve Margin Before Maintenance		Scheduled Maintenance	Reserve Margin After Maintenance	
Year	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	% of Peak	(MW)	(MW)	% of Peak
2021/22	795	0	0	0	795	562	233	41	0	233	41
2022/23	795	0	0	0	795	567	228	40	0	228	40
2023/24	795	0	0	0	795	569	226	40	0	226	40
2024/25	795	0	0	0	795	571	224	39	0	224	39
2025/26	795	0	0	0	795	574	221	39	0	221	39
2026/27	795	0	0	0	795	576	219	38	0	219	38
2027/28	795	0	0	0	795	579	216	37	0	216	37
2028/29	795	0	0	0	795	582	213	37	0	213	37
2029/30	795	0	0	0	795	585	210	36	0	210	36
2030/31	795	0	0	0	795	588	207	35	0	207	35

[1] All installed and firm import capacity changes are identified in the proposed generation expansion plan (Table 3.4).

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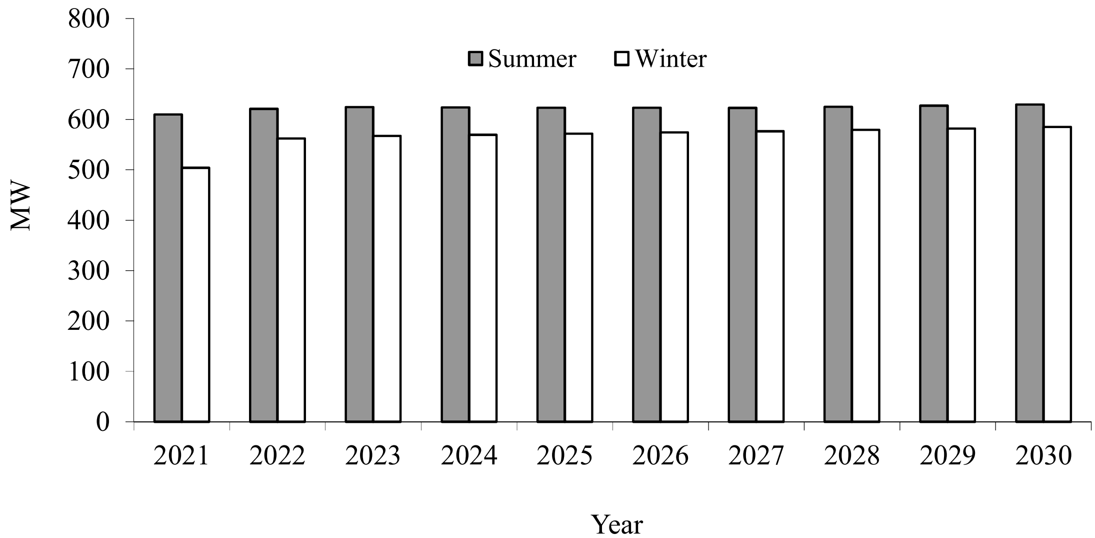
Schedule 8
Planned and Prospective Generating Facility Additions and Changes

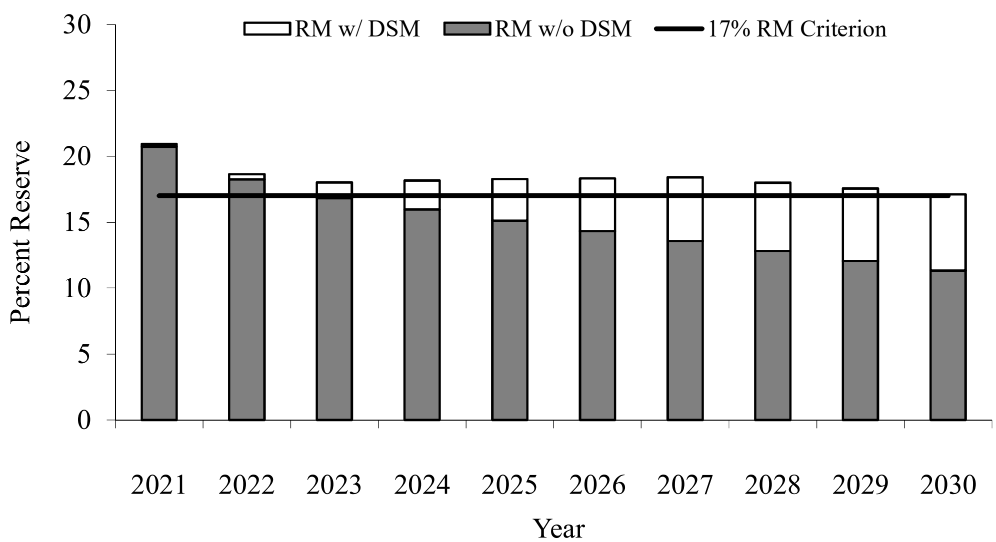
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
								Const.	Commercial	Expected	Gen. Max.	Net Capability [1]		
	Unit		Unit	Fuel		Fuel Transportation		Start	In-Service	Retirement	Nameplate	Summer	Winter	
Plant Name	No.	Location	Type	Pri	Alt	Pri	Alt	Mo/Yr	Mo/Yr	Mo/Yr	(kW)	(MW)	(MW)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

No Planned and Prospective Generating Facility Additions and Changes

System Peak Demands (Including DSM Impacts)



Summer Reserve Margin (RM)



City Of Tallahassee

Generation Expansion Plan

	Load Forecast & Adjustments								
Year	Forecast Peak Demand (MW)	DSM [1] (MW)	Net Peak Demand (MW)	Existing Capacity Net (MW)	Firm Imports (MW)	Firm Exports (MW)	Resource Additions (Cumulative) (MW)	Total Capacity (MW)	Res %
2021	610	1	609	737	0	0	0	737	21
2022	623	2	621	737	0	0	0	737	19
2023	631	6	624	737	0	0	0	737	18
2024	636	12	624	737	0	0	0	737	18
2025	640	17	623	737	0	0	0	737	18
2026	645	22	623	737	0	0	0	737	18
2027	649	26	622	737	0	0	0	737	18
2028	653	29	625	737	0	0	0	737	18
2029	658	31	627	737	0	0	0	737	18
2030	662	33	629	737	0	0	0	737	17

[1] Demand Side Management includes energy efficiency and demand response/control measures.

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Chapter IV

Proposed Plant Sites and Transmission Lines

4.1 PROPOSED PLANT SITE

As discussed in Chapter 3, the City has determined that no power supply resource additions are required to meet system needs in the 2021-2030 planning period. The timing, site, type and size of any additional power supply resource requirements may vary as the nature of future needs become better defined.

4.2 TRANSMISSION LINE ADDITIONS/UPGRADES

As discussed in Section 3.2, the City has been working with its neighboring utilities, Duke and Southern, to identify improvements to assure the continued reliability and commercial viability of the transmission systems in and around Tallahassee. At a minimum, the City attempts to plan for and maintain sufficient transmission import capability to allow for emergency power purchases in the event of the most severe single contingency, the loss of the system's largest generating unit. The City's internal transmission studies have reflected a gradual deterioration of the system's transmission import (and export) capability into the future. This reduction in capability is driven by the expected configuration and use, both scheduled and unscheduled, of facilities in the panhandle region as well as in the City's transmission system. The City is committed to continue to work with Duke and Southern as well as existing and prospective regulatory bodies in an effort to pursue improvements to the regional transmission systems that will allow the City to continue to provide reliable and affordable electric service to the citizens of Tallahassee in the future. The City will provide the FPSC with information regarding any such improvements as it becomes available.

On September 24, 2019, the City executed a co-location agreement with Gulf Power Company (Gulf) associated with a potential transmission line to directly connect the Gulf and Florida Power & Light (FPL) service territories. This 176-mile line, referred to as the "North Florida Resiliency Connection" (NFRC), is expected to run from Gulf's Sinai Cemetery Substation in Jackson County to FPL's Raven Substation in Columbia County and pass through the City of

Tallahassee's service territory. The NFRC will be co-located within the City's existing transmission corridors for fourteen (14) miles. The City, Gulf, FPL and neighboring electric systems Duke and Southern are currently studying the impacts the NFRC will have on their respective operations, including impacts on the ability to import and/or export power and access to the Southern/Florida interface, and developing prospective mitigation strategies.

Beyond assessing import and export capability, the City also conducts annual studies of its transmission system to identify further improvements and expansions to provide increased reliability and respond more effectively to certain critical contingencies both on the system and in the surrounding grid in the panhandle. These evaluations have indicated that additional infrastructure projects may be needed to address improvements in capability to deliver power from the Purdom Plant to the load center under certain contingencies.

The City's current transmission expansion plan includes a 115 kV line reconductoring to ensure continued reliable service through this Ten Year Site Plan reporting period consistent with current and anticipated FERC and NERC requirements. Table 4.2 summarizes this proposed improvement identified in the City's transmission planning study.

The City's budget planning cycle for FY 2022 is currently ongoing, and any revisions to project budgets in the electric utility will not be finalized until the summer of 2021. If any planned improvements do not remain on schedule the City will prepare operating solutions to mitigate adverse system conditions that might occur as a result of the delay in the in-service date of these improvements.

City Of Tallahassee

Schedule 9
Status Report and Specifications of Proposed Generating Facilities

(1)	Plant Name and Unit Number:	No Proposed Generating Facilities
(2)	Capacity a.) Summer: b.) Winter:	
(3)	Technology Type:	
(4)	Anticipated Construction Timing a.) Field Construction start - date: b.) Commercial in-service date:	
(5)	Fuel a.) Primary fuel: b.) Alternate fuel:	
(6)	Air Pollution Control Strategy:	
(7)	Cooling Status:	
(8)	Total Site Area:	
(9)	Construction Status:	
(10)	Certification Status:	
(11)	Status with Federal Agencies:	
(12)	Projected Unit Performance Data Planned Outage Factor (POF): Forced Outage Factor (FOF): Equivalent Availability Factor (EAF): Resulting Capacity Factor (%): Average Net Operating Heat Rate (ANOHR):	
(13)	Projected Unit Financial Data Book Life (Years) Total Installed Cost (In-Service Year $/kW) Direct Construction Cost ($/kW): AFUDC Amount ($/kW): Escalation ($/kW): Fixed O & M ($kW-Yr): Variable O & M ($/MWH): K Factor:	

City Of Tallahassee

Planned Transmission Projects, 2021-2030

		From Bus		To Bus		Expected		Line
						In-Service	Voltage	Length
Project Type	Project Name	Name	Number	Name	Number	Date	(kV)	(miles)
Substations	Sub 22 (Bus 7522)	NA	NA	NA	NA	[1]	115	NA

[1] The need for this project is dependent on the timing of new construction in the service area for the City's existing temporary Substation 16 for which Substation 22 is intended to serve as a replacement. It is not currently anticipated that Substation 22 will be placed into service within the next five years. The City will provide an update on the status of this project in its 2022 Ten Year Site

Figure D-1 – Hopkins Plant Site

Figure D-2 – Purdom Plant Site

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