May 1, 2024

Clerk's Office
State of Florida Public Service Commission

Dear Sir/Madam:

The following pages are the City of Tallahassee Electric & Gas Utilities' (TAL) responses to the "DN 20240000-OT (Undocketed filings for 2024) Ten-Year Site Plan Review - Staff's Data Request #1" pursuant to the request received from Florida Public Service Commission (FPSC) staff member Ms. Patti Zellner. Please note that copies of all narrative and non-narrative responses have been separately provided to Greg Davis and Phillip Ellis in the FPSC's Division of Engineering via e-mail per Ms. Zellner's request.

If you should have any questions regarding this report, please feel free to contact me at (850) 891-3127 or Caleb.Crow@talgov.com.

Thank You,

Caleb Crow
Principal Planner - Electric
City of Tallahassee Utilities

Instructions: Accompanying this data request is a Microsoft Excel (Excel) document titled "Data Request #1.Excel Tables," (Excel Tables File). For each question below that references the Excel Tables File, please complete the table and provide, in Excel Format, all data requested for those sheet(s)/tab(s) identified in parenthesis.

General Items

1. Please provide an electronic copy of the Company's Ten-Year Site Plan (TYSP) for the current planning period (2024-2033) in PDF format.

An electronic copy of the City of Tallahassee, Electric & Gas Utility's (TAL) TYSP was filed with the Commission Clerk and submitted to Florida Public Service Commission (FPSC) staff via e-mail on April 1, 2024.

The TAL Ten-Year Site Plan is appended to the end of this document for convenience as well.

2. Please provide an electronic copy of all schedules and tables in the Company's current planning period TYSP in Excel format.

An electronic copy in Excel format of all TAL's TYSP schedules and tables was submitted to FPSC staff via e-mail on April 1, 2024.

These tables are included in the Ten-Year Site Plan at the end of this document.

3. Please refer to the Excel Tables File (Financial Assumptions, Financial Escalation). Complete the tables by providing information on the financial assumptions and financial escalation assumptions used in developing the Company's TYSP. If any of the requested data is already included in the Company's current planning period TYSP, state so on the appropriate form.

TAL data requested by this question are provided on the "Financial Assumptions" and "Financial Escalation" tabs in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

Load & Demand Forecasting

Historic Load & Demand

4. **[Investor-Owned Utilities Only]** Please refer to the Excel Tables File (Hourly System Load). Complete the table by providing, on a system-wide basis, the hourly system load in megawatts (MW) for the period January 1 through December 31 of the year prior to the current planning period. For leap years, please include load values for February 29. Otherwise, leave that row blank.

Although TAL is not an investor-owned utility, TAL data requested by this question are provided on the "Hourly System Load" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

a. Please also describe how loads are calculated for those hours just prior to and following Daylight Savings Time (March 12, 2023, to November 5, 2023).

The load for 3/1/23 0200 EDT is calculated as the average of the preceding (3/1/23 0100 EST) and following (3/1/23 0300 EDT) hours. The load observed on 11/5/23 0200 EDT is simply replaced with the load observed on 11/5/23 0200 EST.

5. Please refer to the Excel Tables File (Historic Peak Demand). Complete the table by providing information on the monthly peak demand experienced during the three-year period prior to the current planning period, including the actual peak demand experienced, the amount of demand response activated during the peak, and the estimated total peak if demand response had not been activated. Please also provide the day, hour, and system-average temperature at the time of each monthly peak.

TAL data requested by this question are provided on the "Historic Peak Demand" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

<u>Forecasted Load & Demand</u>

6. Please identify the weather station(s) used for calculation of the system-wide temperature for the Company's service territory. If more than one weather station is utilized, please describe how a system-wide average is calculated.

System-wide temperature for TAL's service territory is obtained from the National Climatic Data Center and reflects the Tallahassee Regional Airport (KTLH) weather station.

7. Please explain, to the extent not addressed in the Company's current planning period TYSP, how the reported forecasts of the number of customers, demand, and total retail energy sales were developed. In your response, please include the following information:

- Methodology.
- Assumptions.
- Data sources.
- Third-party consultant(s) involved.
- Anticipated forecast accuracy.
- Any difference/improvement(s) made compared with those forecasts used in the Company's most recent prior TYSP.

TAL's Load Forecast was jointly prepared by TAL staff and nFront Consulting, LLC, ("nFront") using essentially the same methodology and data sources as the prior TYSP. The forecast relies upon an econometric forecast of monthly customer counts and sales by major customer classification, with the forecast for certain large loads reflecting a weather-normalized base adjusted in future years for expected changes due to new facilities or other factors. The total of these forecasts is adjusted for estimated losses to derive a forecast of system net energy for load (NEL). Similarly, monthly peak demand is derived from forecasted NEL and forecasted load factors, based on an econometric analysis of historical load factors and long-term averages of peak day weather and other conditions. Annual NEL and seasonal peak demands are calculated from the resulting monthly values.

Historical and projected economic and demographic data is obtained from Woods and Poole Economics (W&P); historical and projected population data is obtained from the University of Florida's Bureau of Economic Research (BEBR); historical taxable sales data is obtained from the Florida Department of Revenue, and housing market indicators are obtained from the Bureau of the Census and other sources. A consensus forecast of economic and demographic data is developed based on an average of the growth rates from the W&P and BEBR datasets. Taxable sales data are forecasted based on its estimated relationship with retail sales data reported and forecasted by W&P. Weather data is obtained from the National Climatic Data Center; future weather conditions are assumed to be equal to the most recent 30-year average weather conditions. Finally, the price of electricity is derived from TAL's billing records and forecasted based on projections published by the Energy Information Administration (EIA) in the Annual Energy Outlook (AEO).

TAL and nFront continually review past and prospective new inputs and forecast methodology enhancements in an effort to improve the accuracy of the resulting forecasts. TAL believes that the routine update of forecast model inputs, coefficients and other 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 resulting forecast models for load and energy requirements produced base forecasts for annual total retail sales/net energy for load and seasonal peak demand forecasts that are effectively equal, though slightly lower than, those previously projected.

8. Please identify all closed and open Florida Public Service Commission (FPSC) dockets and all non-docketed FPSC matters which were/are based on the same load forecast used in the Company's current planning period TYSP.

There are no open or closed FPSC dockets or non-docketed FPSC matters which were/are based on the same load forecast used in TAL's 2024 TYSP.

9. Please explain if your Company evaluates the accuracy of its forecasts of customer growth and annual retail energy sales presented in its past TYSPs by comparing the actual data for a given year to the data forecasted one, two, three, four, five, or six years prior.

As part of its forecast process TAL and nFront first prepare an analysis of the accuracy of its prior year forecast models for customer growth and annual retail energy sales for the most recent fiscal year. Forecasts older than the prior year forecast are not analyzed in detail, however TAL reviews the trending direction and magnitude of changing forecasts; the COVID and post-COVID years have consistently produced forecasts with lower load growth than the year before for TAL except for the immediate year coming out of COVID where a return to normal was expected that never fully materialized.

a. If your response is affirmative, please explain the method used in your evaluation, and provide the corresponding results, including work papers, in Excel format for the analysis of each forecast presented in the TYSPs filed with the Commission during the 20-year period prior to the current planning period. If your Company limits its analysis to a period shorter than 20 years prior to the current planning period, please provide what analysis you have and a narrative explaining why your Company limits its analysis period.

The detailed prior year analysis compares the forecasts of customer growth and annual retail energy sales for the most recent fiscal year both before and after updating assumed values of all explanatory variables for their most recent estimates/known values. In this way, errors that result from incorrect assumptions about the future (e.g., optimistic economic conditions, warmer or colder weather, etc.) are separated from remaining errors due to model error. The most recent example of forecast accuracy is provided in the file entitled "2024 TYSP - DR1 - TAL.xlsx" in tab "Table II-1".

b. If your response is negative, please explain.

Not applicable.

10. Please explain if your Company evaluates the accuracy of its forecasts of Summer/Winter Peak Energy Demand presented in its past TYSPs by comparing the actual data for a given year to the data forecasted one, two, three, four, five, or six years prior.

As part of its forecast process TAL and nFront first prepare an analysis of the accuracy of its prior year forecast models of Summer/Winter Peak Energy Demand for the most recent fiscal year. Summer/Winter peak actual data is reviewed going back to 2007 for the purposes of trend analysis and uncertainty bounds.

a. If your response is affirmative, please explain the method used in your evaluation, and provide the corresponding results, including work papers, in Excel format for the analysis of each forecast presented in the TYSPs filed with the Commission during the 20-year period prior to the current planning period. If your Company limits its analysis to a period shorter than 20 years prior to the current planning period, please provide what analysis you have and a narrative explaining why your Company limits its analysis period.

The results of the analysis of the accuracy of TAL's forecasts of Summer/Winter Peak Energy Demand are provided in the file entitled "2024 TYSP - DR1 - TAL.xlsx" in tab "Table II-4".

b. If your response is negative, please explain why.

Not Applicable.

11. Please explain any historic and forecasted trends or other information as requested below in each of the following:

    a. Growth of customers, by customer type (residential, commercial, industrial) as well as Total Customers, and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline of the trends.

Residential and commercial service point accounting methods were changed in 2023 based on the implementation of new customer management software. The new accounting of customer types moved some previously residential customers into commercial resulting in the appearance of residential reduction and commercial growth. A small percentage of service points were consolidated during the process. TAL does not serve any industrial customers.

Overall growth however for the decade from 2014-2023 was 0.5% and the forecasted growth for the next decade is 0.8%. This customer count growth correlates well to rates of change in Leon County population, household formation, and economic activity. The historic trend and ten year forecast predict steady growth in customers.

The 2024 Forecast incorporates economic and demographic projections for Leon County based on a blend of W&P and BEBR, reflecting projected CAGRs for household counts, employment, and average real income over 2024-2033. These growth rates are similar to those from the 2023 Ten Year Site Plan.

    b. Average KWh consumption per customer, by customer type (residential, commercial, industrial), and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline of the trends.

The billing methodology from new software implemented in 2023 reduced customer counts overall which resulted in increase in average kWh consumption per customer. Overall, sales increased 0.3% for the 2014-2023, slower growth than the customer counts as newer construction has proven to be higher efficiency.

    c. Total Sales (GWh) to Ultimate Customers, identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline of the trends.

The growth trend is the dominant factor in Total Sales Forecasts for the decade, but year to year weather impacts are more significant in determining sales outcomes and the seasonality of those sales. The counteracting trends of electric vehicle adoption and rooftop solar adoption have a balancing effect on Total Sales while presenting challenges with the timing and balancing of these sales.

    d. Provide a detailed discussion of how the Company's demand-side management program(s) for each customer type (residential, commercial, industrial) impact the observed trends in gigawatt hour sales (Schedule 3.3).

Historically, changes in the federal appliance/equipment efficiency standards, state building efficiency code and actions taken by customers on their own to reduce energy use have made greater contributions to the change in NEL than the customer participation in TAL's DSM/EE financial incentive programs. However, TAL remains committed to offering these DSM/EE programs to help improve the efficiency of customers' energy consumption when such improvements provide a measurable economic and/or environmental benefit to TAL's customers. TAL's forecast reflects that continued commitment. In addition, current and new DSM/EE program offerings will be considered in alignment with the Clean Energy Plan adopted in 2023.

12. Please explain any historic and forecasted trends in each of the following components of Summer/Winter Peak Demand:

    a. Demand Reduction due to the Company's demand-side management program(s) and Self Service, by customer type (residential, commercial, industrial) as well as Total Customers, and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline in the trends.

Estimates of the historical demand and energy savings from customer participation in TAL's DSM/EE programs are comparable to those projected in its last TYSP. Incremental DSM/EE activity and impacts are expected to increase over the next few years before leveling off after the 2030 timeframe. TAL plans to increase DSM/EE spending and activity to achieve this increase in impacts but expects that some measures will begin to reach saturation over time as a result of prior period measure activity, federal appliance/equipment efficiency standards, and the state building efficiency code, as well as many customers taking steps on their own to reduce their energy use and costs without taking advantage of the financial incentives provided through TAL's DSM/EE programs.

However, TAL remains committed to offering DSM/EE programs that provide measurable economic, reliability and/or environmental benefits to its customers. Consistent with its 2023 Clean Energy Plan, TAL's forecast reflects a community-wide annual energy reduction by at least 5 percent by 2030.

    b. Demand Reduction due to Demand Response, by customer type (residential, commercial, industrial), and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline of the trends.

In 2019, TAL launched the Smart Thermostat Rebate program, providing incentives for electric customers to purchase and install eligible WiFi-enabled thermostats. TAL envisions that the smart thermostats purchased through the rebate program will be used to expand TAL's DR capability over the 2030-2034 timeframe. TAL expects to have approximately 11 MW of DR capability on its system by summer 2034, with similar contributions from the residential and commercial classes.

Consistent with its 2023 Clean Energy Plan, TAL remains committed to developing a DR program to offer measurable economic, reliability and/or environmental benefit to its customers and TAL's utility services. TAL's forecast reflects that continued commitment.

c. Total Demand, and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline in the trends.

System peak demand is impacted by a variety of economic, customer behavior, and pricing trends in similar ways that energy consumption is impacted, as discussed above. However, peak demand is volatile, being impacted by weather and other conditions to a greater extent on a year-to-year basis than economic conditions and other long-term factors that impact energy consumption.

d. Net Firm Demand, by the sources of peak demand appearing in Schedule 3.1 and Schedule 3.2 of the current planning period TYSP, and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline in the trends.

Net firm demand has grown considerably over the last several years as a result of the same factors discussed above. TAL intends to utilize DSM/EE resources, including DR, to offset a significant portion of the anticipated growth in peak demand over the forecast horizon, resulting in only very modest growth. TAL does not expect that the impact of self-service due to distributed solar generation on peak demand will be significant over the next 10 years.

13. **[FEECA Utilities Only]** Do the Company's energy and demand savings amounts reflected on the DSM and Conservation-related portions of Schedules 3.1, 3.2, and 3.3 reflect the Company's proposed goals in the 2024 FEECA Goalsetting dockets? If not, please explain what assumptions are incorporated within those amounts, and why.

Not applicable. TAL is not a FEECA utility.

14. Please explain any anomalies caused by non-weather events with regard to annual historical data points for the period 10 years prior to the current planning period that have contributed to the following, respectively:

a. Summer Peak Demand.

TAL experienced no Summer Peak Demand non-weather anomalies in the prior 10-year period.

b. Winter Peak Demand.

TAL experienced no Winter Peak Demand non-weather anomalies in the prior 10-year period.

c. Annual Retail Energy Sales.

In 2023, TAL implemented new customer billing software, which changed the methodology of accounting for customer types and consolidated some service points. The resulting data anomaly shows an increase in avg residential consumption and a decrease in avg commercial consumption as well as an overall reduction in service points. 2023 data will remain in the data as a step change and TAL will continue to note this non-weather event in future reports.

15. Please provide responses to the following questions regarding the weather factors considered in the Company's retail energy sales and peak demand forecasts:

    a. Please identify, with corresponding explanations, all the weather-related input variables that were used in the respective Retail Energy Sales, Winter Peak Demand, and Summer Peak Demand models.

See table below for weather-related input variables used in the respective models, an "X" indicating that the variable represented in that column was used for the forecast equation represented in that row. HDD and CDD refer to heating and cooling degree days, with a base of 65 oF. Peak day min and max refer to minimum and maximum daily temperature.

			Summer		***Winter***	
Equation	***HDD***	***CDD***	***Peak Day Max °F***	***Peak Day Min °F***	***Peak Day Max °F***	***Peak Day Min °F***
Res Sales	*X*	*X*				
GSND Sales	*X*	*X*				
GSD Sales		*X*				
Large Demand Sales		*X*				
Peak Demand	*X*	*X*	*X*	*X*	*X*	*X*

    b. Please specify the source(s) of the weather data used in the aforementioned forecasting models.

Weather data for TAL's service territory is obtained from the National Climatic Data Center and reflects the Tallahassee Regional Airport (KTLH) weather station.

    c. Please explain in detail the process/procedure/method, if any, the Company utilized to convert the raw weather data into the values of the model input variables.

Historical data is based on the raw weather data. For summer and winter peak demand equations, weather variables are derived as differences from base temperatures, determined from analyses of daily energy versus temperature profiles. Energy sales equations include weather variables with a one-month lag to capture billing cycle lags. Peak demand equations include weather variables for days preceding the peak demand to capture build-up of ambient temperature conditions. Forecasted weather data is based on an average of the weather conditions over the most recent thirty years.

d. Please specify with corresponding explanations:
    i. How many years' historical weather data was used in developing each retail energy sales and peak demand model.

Residential Sales – 31 years (1993-2023)
GSND Sales – 28 years (1995-2023)
GSD Sales – 28 years (1995-2023)
Large Demand Sales – 28 years (1995-2023)
Peak Demand – 33 years (1990-2023)

    ii. How many years' historical weather data was used in the process of these models' calibration and/or validation.

Historical weather data – 33 years (1990-2023)

e. Please explain how the projected values of the input weather variables (that were used to forecast the future sales or demand outputs for each planning years 2024 – 2033) were derived/obtained for the respective retail sales and peak demand models.

Projected weather variables are based on an average of the weather conditions over the most recent ten years.

16. **[Investor-Owned Utilities Only]** If not included in the Company's current planning period TYSP, please provide load forecast sensitivities (high band, low band) to account for the uncertainty inherent in the base case forecasts in the following TYSP schedules, as well as the methodology used to prepare each forecast:

    a. Schedule 2.1 – History and Forecast of Energy Consumption and Number of Customers by Customer Class.
    b. Schedule 2.2 - History and Forecast of Energy Consumption and Number of Customers by Customer Class.
    c. Schedule 2.3 - History and Forecast of Energy Consumption and Number of Customers by Customer Class.
    d. Schedule 3.1 - History and Forecast of Summer Peak Demand.
    e. Schedule 3.2 - History and Forecast of Winter Peak Demand.
    f. Schedule 3.3 - History and Forecast of Annual Net Energy for Load.
    g. Schedule 4 - Previous Year and 2-Year Forecast of Peak Demand and Net Energy for Load by Month.

Although TAL is not an investor-owned utility, all the schedules requested above were provided in TAL's 2024 TYSP report and the file entitled "2024 TAL TYSP Tables and Schedules Share File.xls" submitted to FPSC Staff via e-mail on April 1, 2024.

17. Please address the following questions regarding the impact of all customer-owned/leased renewable generation (solar and otherwise) and/or energy storage devices on the Utility's forecasts.

    a. Please explain in detail how the Utility's load forecast accounts for the impact of customer's renewables and/or storage.

In the Load Forecast prepared by nFront for the 2024 planning cycle, behind the meter renewable energy was integrated into the forecast. The Forecast views customer solar as having Net energy for load and peak demand impacts. The Load Forecast for 2025 will use a different methodology to be decided later in 2024.

    b. Please provide the annual impact, if any, of customer's renewables and/or storage on the Utility's retail demand and energy forecasts, by class and in total, for 2024 through 2033.

Though indicators of renewable energy adoption were applied to the load forecast overall as part of predicting NEL and peak demand, customer class and total impacts were not disaggregated.

    c. If the Utility maintains a forecast for the planning horizon (2024-2033) of the number of customers with renewables and/or storage, by customer class, please provide.

TAL did not maintain a forecast for the number of customers with renewables or storage in 2024.

<u>Plug-in Electric Vehicles (PEVs)</u>

18. Please discuss whether the Company included plug-in electric vehicle (PEV) loads in its demand and energy forecasts for its current planning period TYSP. If so, how were these impacts accounted for in the modeling and forecasting process?

TAL developed estimates of the historical adoption of PEVs in its service area, trended adoption levels based on publicly available national forecasts of adoption and translated the resulting stock of PEVs into load impacts using charging profiles obtained from the National Renewable Energy Laboratory (NREL).

    a. Has the Company also included the impact of demand response and time of use rates for the PEV loads? If so, please provide the impact of these measures. If not, please explain why not.

TAL does not currently have a demand response program for PEVs nor a focused time of use rate, although TAL does have a Nights and Weekends rate that provides incentive for PEV owners to charge off-peak. The resulting load shape was considered in the load impacts forecast.

19. Please discuss with detail any changes or modifications from the Company's previous TYSP report regarding the following PEV related topics:

a. The major drivers of the Company's PEV growth.

TAL PEV forecasts are based on these major factors:

- Improving economics of PEV vs. internal combustion engine vehicles (ICEV)
- Increasing PEV range for typical models in service
- Greater public charging availability
- Improving public perception

b. The methodology and the assumptions (or, if applicable, the source(s) of the data) used to estimate the number of PEVs operating in the Company's service territory and the methodology used to estimate the cumulative impact on system demand and energy consumption.

Data sources are as follows:

- Historical PEV adoption – Atlas EV Hub
- Projected PEV adoption – Energy Information Administration's 2021 Annual Energy Outlook
- PEV charging profiles – NREL's EVi Pro Lite tool

c. The Company's process for monitoring the installation of PEV public charging stations in its service area.

TAL monitors public EV charging stations within the service territory via the electrical permitting process administered by the local jurisdiction building department.

d. The processes or technologies, if any, that are in place to allow the Company to be notified when a customer has installed a PEV charging station in their home.

TAL would only be notified of in-home PEV charging if an electrical permit is issued for the installation.

e. Any instances since January 1 of the year prior to the current planning period in which upgrades to the distribution system were made where PEVs were a contributing factor.

Since January 1, 2023, TAL has not upgraded its distribution system to accommodate PEVs.

20. Please refer to the Excel Tables File (Electric Vehicle Charging). Complete the table by providing estimates of the requested information within the Company's service territory for the current planning period. Direct current fast charger (DCFC) PEV charging stations are those that require a service drop greater than 240 volts and/or use three-phase power.

TAL data requested by this question are provided on the "Electric Vehicle Charging" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

a. Please describe all significant technological, market, regulatory, or other events or announcements since the filing of the Company's 2023 TYSP which have impacted the metrics reported.

TAL's metrics were not impacted by any significant technological, market, regulatory, or other events or announcements since the filing of the Company's 2023 TYSP.

b. Please explain if and how the tax incentives and grants for transportation electrification associated with the IRA, adopted in August 2022, has impacted the Company's PEV and PEV charging station adoption/installation, as well as the PEV energy/demand forecast(s). If the provisions of the IRA are not reflected in such forecasts, please explain why.

The TAL forecast for PEV adoption projects historical rates, including the adoption rates subsequent to August 2022, but does not directly adjust projections based on assumptions for future possible consumer reactions to market forces.

21. Please describe any Company programs or tariffs currently offered to customers relating to PEVs, and describe whether any new or additional programs or tariffs relating to PEVs will be offered to customers within the current planning period.

TAL currently offers a "Nights and Weekends" time-of-use rate that provides incentivizes to customers under the voluntary tariff program to defer consumption to off-peak periods.

a. Of these programs or tariffs, are any designed for or do they include educating customers on electricity as a transportation fuel?

TAL expects to develop such customer education or engagement consistent with its 2023 Clean Energy Plan.

b. Does the Company have any programs where customers can express their interest or expectations for electric vehicle infrastructure as provided for by the Utility, and if so, please describe in detail.

TAL does not currently offer such programs but does foresee the development of such programs as part of the 2023 Clean Energy Plan.

22. Has the Company conducted or contracted any research to determine demographic and regional factors that influence the adoption of PEVs applicable to its service territory? If so, please describe in detail the methodology and findings.

No, TAL has not conducted or contracted for any research as described above.

23. Please describe if and how Section 339.287, Florida Statutes, (Electric Vehicle Charging Stations; Infrastructure Plan Development) has impacted the Company's projection of PEV growth and related demand and energy growth.

TAL is not aware of any direct impacts, nor has it explicitly taken this initiative into account.

24. What has the Company learned about the impact of PEV ownership on the Company's actual and forecasted peak demand?

PEV charging load is projected to increase summer peak demand by approximately 1.0% by 2033.

25. If applicable, please list and briefly describe all PEV pilot programs the Company is currently implementing and the status of each program.

Not applicable. TAL does not currently have an EV pilot program.

26. If applicable, please describe any key findings and metrics of the Company's PEV pilot program(s) which reveal the PEV impact to the demand and energy requirements of the Company.

Not applicable. TAL does not currently have an EV pilot program.

Demand Response

27. **[FEECA Utilities Only]** Please refer to the Excel Tables File (DR Participation). Complete the table by providing for each source of demand response annual customer participation information for 10 years prior to the current planning period. Please also provide a summary of all sources of demand response using the table.

Not applicable. TAL is not a FEECA utility.

28. **[FEECA Utilities Only]** Please refer to the Excel Tables File (DR Annual Use). Complete the table by providing for each source of demand response annual usage information for 10 years prior to the current planning period. Please also provide a summary of all demand response using the table.

Not applicable. TAL is not a FEECA utility.

29. **[FEECA Utilities Only]** Please refer to the Excel Tables File (DR Peak Activation). Complete the table by providing for each source of demand response annual seasonal peak activation information for 10 years prior to the current planning period. Please also provide a summary of all demand response using the table.

Not applicable. TAL is not a FEECA utility.

30. Please refer to the Excel Tables File (LOLP). Complete the table by providing the loss of load probability, reserve margin, and expected unserved energy for each year of the planning period.

TAL data requested by this question are provided on the "LOLP" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

Generation & Transmission

Utility-Owned Generation

31. Please refer to the Excel Tables File (Unit Performance). Complete the table by providing information on each utility-owned generating resources' outage factors, availability factors, and average net operating heat rate (if applicable). For historical averages, use the past three years and for projected factors, use an average of the next ten-year period.

TAL data requested by this question are provided on the "Unit Performance" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

32. Please refer to the Excel Tables File (Utility Existing Traditional). Complete the table by providing information on each utility-owned traditional generation resource in service as of December 31 of the year prior to the current planning period. For multiple small (<250 kW per installation) distributed resources of the same type and fuel source, please include a single combined entry. For capacity factor, use the net capacity as a basis.

TAL data requested by this question are provided on the "Utility Existing Traditional" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

33. Please refer to the Excel Tables File (Utility Planned Traditional). Complete the table by providing information on each utility-owned traditional generation resource planned for in-service within the current planning period. For multiple small (<250 kW per installation) distributed resources of the same type and fuel source, please include a single combined entry. For projected capacity factor, use the net capacity as a basis.

TAL has no planned utility-owned traditional generation resource additions.

   a. For each planned utility-owned traditional generation resource in the table, provide a narrative response discussing the current status of the project.

Not applicable.

34. Please refer to the Excel Tables File (Utility Existing Renewable). Complete the table by providing information on each utility-owned renewable generation resource in service as of December 31 of the year prior to the current planning period. For multiple small (<250 kW per installation) distributed resources of the same type and fuel source, please include a single combined entry. For capacity factor, use the net capacity as a basis.

TAL data requested by this question are provided on the "Utility Existing Renewable" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

35. Please refer to the Excel Tables File (Utility Planned Renewable). Complete the table by providing information on each utility-owned renewable generation resource planned for in-service within the current planning period. For multiple small (<250 kW per installation) distributed resources of the same type and fuel source, please include a single combined entry. For projected capacity factor, use the net capacity as a basis.

TAL has no planned utility-owned renewable generation resource additions.

a. For each planned utility-owned renewable resource in the table, provide a narrative response discussing the current status of the project.

Not applicable.

36. Please list and discuss any planned utility-owned renewable resources that have, within the past year, been cancelled, delayed, or reduced in scope. What was the primary reason for the changes? What, if any, were the secondary reasons?

No TAL utility-owned renewable resources have been cancelled, delayed, or reduced in scope in the past year.

37. **[Investor-Owned Utilities Only]** Please refer to the Excel Tables File (As-Available Energy Rate). Complete the table by providing, on a system-wide basis, the historical annual average as-available energy rate in the Company's service territory for the 10-year period prior to the current planning period. Also, provide the projected annual average as-available energy rate in the Company's service territory for the current planning period. If the Company uses multiple areas for as-available energy rates, please provide a system-average rate as well.

Not applicable. TAL is a municipal utility.

38. Please refer to the Excel Tables File (Planned PPSA Units). Complete the table by providing information on all planned traditional units with an in-service date within the current planning period. For each planned unit, provide the date of the Commission's Determination of Need and Power Plant Siting Act certification, if applicable.

TAL has no utility-owned traditional generation resources planned for in-service within the current planning period.

39. For each of the planned generating units, both traditional and renewable, contained in the Company's current planning period TYSP, please discuss the "drop dead" date for a decision on whether or not to construct each unit. Provide a timeline for the construction of each unit, including regulatory approval, and final decision point.

TAL has no traditional or renewable generation resources planned for in-service within the current planning period.

40. Please refer to the Excel Tables File (Capacity Factors). Complete the table by providing the actual and projected capacity factors for each existing and planned unit on the Company's system for the 11-year period beginning one year prior to the current planning period.

TAL data requested by this question are provided on the "Capacity Factors" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

41. **[Investor-Owned Utilities Only]** For each existing unit on the Company's system, please provide the planned retirement date. If the Company does not have a planned retirement date for a unit, please provide an estimated lifespan for units of that type and a non-binding estimate of the retirement date for the unit.

Not applicable. TAL is a municipal utility.

42. Please refer to the Excel Tables File (Steam Unit CC Conversion). Complete the table by providing information on all of the Company's steam units that are potential candidates for repowering to operation as Combined Cycle units.

TAL data requested by this question are provided on the "Steam Unit CC Conversion" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

43. Please refer to the Excel Tables File (Steam Unit Fuel Switching). Complete the table by providing information on all of the Company's steam units that are potential candidates for fuel-switching.

TAL has no existing steam units that are potential candidates for fuel-switching.

44. Please refer to the Excel Tables File (Transmission Lines). Complete the table by providing a list of all proposed transmission lines for the current planning period that require certification

under the Transmission Line Siting Act. Please also include in the table transmission lines that have already been approved, but are not yet in-service.

TAL has no proposed transmission lines for the current planning period that require certification under the Transmission Line Siting Act.

Purchases and Sales

45. Please refer to the Excel Tables File (Firm Purchases). Complete the table by providing information on the Utility's firm capacity and energy purchases.

TAL has no existing or planned firm purchases.

46. Please refer to the Excel Tables File (PPA Existing Traditional). Complete the table by providing information on each purchased power agreement with a traditional generator still in effect by December 31 of the year prior to the current planning period pursuant to which energy was delivered to the Company during said year.

TAL has no existing traditional PPAs.

47. Please refer to the Excel Tables File (PPA Planned Traditional). Complete the table by providing information on each purchased power agreement with a traditional generator pursuant to which energy will begin to be delivered to the Company during the current planning period.

TAL has no planned traditional PPAs.

   a. For each purchased power agreement in the table, provide a narrative response discussing the current status of the project.

Not applicable.

48. Please refer to the Excel Tables File (PPA Existing Renewable). Complete the table by providing information on each purchased power agreement with a renewable generator still in effect by December 31 of the year prior to the current planning period pursuant to which energy was delivered to the Company during said year.

TAL data requested by this question are provided on the "PPA Existing Renewable" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

49. Please refer to the Excel Tables File (PPA Planned Renewable). Complete the table by providing information on each purchased power agreement with a renewable generator

pursuant to which energy will begin to be delivered to the Company during the current planning period.

TAL has no planned renewable PPAs.

a. For each purchased power agreement in the table, provide a narrative response discussing the current status of the project.

Not applicable.

50. Please list and discuss any purchased power agreements with a renewable generator that have, within the past year, been cancelled, delayed, or reduced in scope. What was the primary reason for the change? What, if any, were the secondary reasons?

TAL did not have any planned PPA renewable resources within the past year that were cancelled, delayed, or reduced in scope.

51. Please refer to the Excel Tables File (PSA Existing). Complete the table by providing information on each power sale agreement still in effect by December 31 of the year prior to the current planning period pursuant to which energy was delivered from the Company to a third-party during said year.

TAL has no existing PSAs.

52. Please refer to the Excel Tables File (PSA Planned). Complete the table by providing information on each power sale agreement pursuant to which energy will begin to be delivered from the Company to a third-party during the current planning period.

TAL has no planned PSAs.

a. For each power sale agreement in the table, provide a narrative response discussing the current status of the agreement.

Not applicable.

53. Please list and discuss any long-term power sale agreements within the past year that were cancelled, expired, or modified. What was the primary reason for the change? What, if any, were the secondary reasons?

TAL did not have any long-term PSAs within the past year that were cancelled, expired, or modified.

Renewable Generation

54. Please refer to the Excel Tables File (Annual Renewable Generation). Complete the table by providing the actual and projected annual energy output of all renewable resources on the

Company's system, by source, for the 11-year period beginning one year prior to the current planning period.

TAL data requested by this question are provided on the "Annual Renewable Generation" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

55. Please describe any actions the Company engages in to encourage production of renewable energy within its service territory.

TAL continues to promote solar PV through its Net Metering Program which offers customers kWh credits at the full retail rate for energy returned to the grid. Also, through its Energy Efficiency Loan program, TAL customers may borrow up to $20,000 for a 10-year term for the purchase and installation of a Solar PV system installed at the customer's service point.

56. **[Investor-Owned Utilities Only]** Please discuss whether the Company has been approached by renewable energy generators during the year prior to the current planning period regarding constructing new renewable energy resources. If so, please provide the number and a description of the type of renewable generation represented.

Not applicable. TAL is a municipal utility.

57. Does the Company consider solar PV to contribute to one or both seasonal peaks for reliability purposes? If so, please provide the percentage contribution and explain how the Company developed the value.

TAL has performed an effective load carrying capability (ELCC) analysis of the actual output of the Solar Farm 1 and Solar Farm 4 facilities that have revealed that neither contribute to meeting the winter peaks but do contribute towards meeting the summer peaks.

Based on the operational data, an average of approximately 50% of the facilities' nameplate capacity has been available during summer peak and near peak hours. However, TAL has elected to utilize a more conservative value of 20% of nameplate capacity for the summer peak firm contribution. TAL will revise the firm contribution assertion from its solar power supply resources if operational data supports a change. For example, the summer 2023 (April-October) solar contribution at the monthly peak hours was an average of 57% of nameplate. The minimum contributed power at any monthly peak hour was 29% of nameplate in May 2023.

58. Please identify and describe any programs the Company offers that allows its customers to contribute towards the funding of specific renewable projects, such as community solar programs.

TAL manages a community solar program called "Tallahassee Solar" in the form of a solar subscription program from both the 20 MWac and 42 MWac solar PV PPAs. The program offers the customer the choice to replace up to 100% of their Energy Cost Recovery Clause (ECRC) charge with a flat 5 cents/kwh charge for twenty years. This program is designed to pay for the PPA cost of both Solar Projects without subsidization by non-participating customers. Tallahassee Solar reached full enrollment in 2022 and is no longer accepting new enrollments.

a. Please describe any such programs in development with an anticipated launch date within the current planning period.

TAL does not currently anticipate the development of new customer participation programs.

Energy Storage

59. Briefly discuss any progress in the development and commercialization of non-lithium-ion based battery storage technology the Company has observed in recent years.

TAL's most recent Energy Integrated Research Plan (EIRP) evaluated various non-lithium-ion battery storage technologies for efficacy and affordability; TAL is not specifically pending adoption of energy storage based on emergent non-lithium-ion technological advancements.

60. If applicable, please describe the strategy of how the Company charges and discharges its energy storage facilities. As part of the response discuss if any recent legislation, including the IRA has changed how the Company dispatches its energy storage facilities.

TAL does not currently have energy storage on its system.

61. Briefly discuss any considerations reviewed in determining the optimal positioning of energy storage technology in the Company's system (e.g., Closer to/further from sources of load, generation, or transmission/distribution capabilities).

TAL conducted demand curve analysis for several potential energy storage locations to determine sizing, effectiveness, and economic advantage. Sites with potential microgrid, solar PV grid ties, critical infrastructure, and storm resilience benefits offer BESS services unavailable at all locations and are therefore prioritized.

62. Please explain whether customers have expressed interest in energy storage technologies. If so, describe the type of customer (residential, commercial industrial) and how have their interests been addressed.

To date, a small number of ratepayers have expressed a general interest in ES technologies for residential use. TAL has met with some groups to determine their level of interest and found that most ratepayers are not willing to invest in ES without subsidies. However, TAL does foresee the possibility of residential and commercial programs following the 2023 Clean Energy Plan's short-term priorities.

63. Please refer to the Excel Tables File (Existing Energy Storage). Complete the table by providing information on all energy storage technologies that are currently either part of the Company's system portfolio or are part of a pilot program sponsored by the Company.

TAL currently has no energy storage resources.

64. Please refer to the Excel Tables File (Planned Energy Storage). Complete the table by providing information on all energy storage technologies planned for in-service during the current planning period either as part of the Company's system portfolio or as part of a pilot program sponsored by the Company.

TAL has no planned energy storage resources.

65. Please identify and describe the objectives and methodologies of all energy storage pilot programs currently running or in development with an anticipated launch date within the current planning period. If the Company is not currently participating in or developing energy storage pilot programs, has it considered doing so? If not, please explain.

TAL is not currently participating in or developing ES pilot programs. However, TAL does foresee the possibility for further discussions of such programs consistent with its 2023 Clean Energy Plan.

Under a US Department of Energy grant, TAL has partnered with Florida State University's Center for Advanced Power Systems to study the integration of solar PV and ES into the distribution system. This will be a multi-year grant running concurrent to the current planning cycle.

a. Please discuss any pilot program results, addressing all anticipated benefits, risks, and operational limitations when such energy storage technology is applied on a utility scale (> 2 MW) to provide for either firm or non-firm capacity and energy.

TAL does not have any current plans for an ES pilot program of greater than 2 MW.

b. Please provide a brief assessment of how these benefits, risks, and operational limitations may change over the current planning period.

Not applicable.

c. Please identify and describe any plans to periodically update the Commission on the status of your energy storage pilot programs.

TAL will update the Commission on the status of pilot programs through the normal TYSP and Supplemental Data Request cycles.

66. If the Company utilizes non-firm generation sources in its system portfolio, please detail whether it currently utilizes or has considered utilizing energy storage technologies to provide firm capacity from such generation sources. If not, please explain.

TAL currently utilizes 62 MWac of solar PPAs, 50 MWac of which is considered a non-firm resource. TAL acknowledges that ES could potentially "firm up" additional capacity available from these resources and is seeking federal infrastructure funds for ES as part of two grid resiliency projects.

  a. Based on the Company's operational experience, please discuss to what extent energy storage technologies can be used to provide firm capacity from non-firm generation sources. As part of your response, please discuss any operational challenges faced and potential solutions to these challenges.

TAL has not yet had any operational experience with ES technologies.

<u>Other</u>

67. Please identify and discuss the Company's role in the research and development of utility power technologies, including, but not limited to research programs that are funded through the Energy Conservation Cost Recovery Clause. As part of this response, please describe any plans to implement the results of research and development into the Company's system portfolio and discuss how any anticipated benefits will affect your customers.

TAL does not fund research.

TAL has partnered on grant applications that include demonstration projects with research partners, such as Florida State University, Florida A&M University, and Georgia Institute of Technology.

TAL is a utility partner in a project awarded from the US Department of Energy (DOE) in partnership with Florida State University's Center for Advanced Power Systems to study the integration of solar PV and ES into the distribution system. This is a multi-year grant running concurrent with TAL's planning efforts.

TAL is a utility partner with Georgia Institute of Technology on a DOE funded project for research into IBR security and reliability. This is a multi-year grant running concurrent with TAL's planning efforts.

<u>Environmental</u>

68. Please explain if the Company assumes carbon dioxide (CO_2) compliance costs in the resource planning process used to generate the resource plan presented in the Company's current planning period TYSP. If the response is affirmative, answer the following questions:

    a. Please identify the year during the current planning period in which CO2 compliance costs are first assumed to have a non-zero value.

TAL did not include a non-zero assumption for CO2 compliance costs in the resource planning process used to generate the resource plan presented in its 2024 TYSP

    b. **[Investor-Owned Utilities Only]** Please explain if the exclusion of CO2 compliance costs would result in a different resource plan than that presented in the Company's current planning period TYSP.

Not applicable. TAL is a municipal utility.

    c. **[Investor-Owned Utilities Only]** Please provide a revised resource plan assuming no CO2 compliance costs.

Not applicable. TAL is a municipal utility.

69. Provide a narrative explaining the impact of any existing environmental regulations relating to air emissions and water quality or waste issues on the Company's system during the previous year. As part of your narrative, please discuss the potential for existing environmental regulations to impact unit dispatch, curtailments, or retirements during the current planning period.

TAL is subject to the requirements of the Acid Rain Program and had more than sufficient allowances of sulfur dioxide (SO2) to meet the needs of the 2023 calendar year. TAL should have enough allowances for the foreseeable future.

Hopkins' Industrial Wastewater NPDES permit was renewed on August 25, 2023. In accordance with the Lake Talquin, Total Maximum Daily Load rule, which became final on May 16, 2022, the permit incorporates waste load allocations (WLA) for Hopkins of 986 kilograms per year (kg/year) of total nitrogen and 2,409 kg/yr of total phosphorus. The renewed permit includes additional sampling, reporting, and limitations associated with the WLA for nutrients. The WLAs are within the operational range and additional treatment to the wastewater is not expected.

Field erected storage tank systems must be maintained and inspected according to the frequency established by American Petroleum Industry (API) Standard 653. Repairs must be made based on the recommendations in the inspection report, and in compliance with Rule 62-762.702, Florida Administrative Code (F.A.C.). Periodic API-653 inspections of the tanks located at both Hopkins and Purdom will be conducted as required. TAL is in the process of conducting demolition of FDEP Tank #11 (also known as Tank 4) at Hopkins. The location of FDEP Tank #11 is subject to a Declaration of Restrictive Covenant which, in part requires the maintenance of engineering controls. TAL will ensure maintenance of an engineering control over the impacted area to maintain compliance with the Site Rehabilitation Completion Order that was issued by FDEP in July 2018. Regulated tanks at the generation facilities maintain registration with the Florida Department of Environmental Protection (FDEP).

70. For the U.S. EPA's Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units Rule:

    a. Will your Company be materially affected by the rule?

TAL has no units that are subject to this rule.

    b. What compliance strategy does the Company anticipate employing for the rule?

Not applicable.

    c. If the strategy has not been completed, what is the Company's timeline for completing the compliance strategy?

Not applicable.

    d. Will there be any regulatory approvals needed for implementing this compliance strategy? How will this affect the timeline?

Not applicable.

    e. Does the Company anticipate asking for cost recovery for any expenses related to this rule? Refer to the Excel Tables File (Emissions Cost). Complete the table by providing information on the costs for the current planning period.

Not applicable.

    f. If the answer to any of the above questions is not available, please explain why.

TAL has no units that are subject to the rule. This rule applies to apply to any steam generating unit, IGCC, or stationary combustion turbine that commenced construction after January 8, 2014, or commenced reconstruction after June 18, 2014.

71. Explain any expected reliability impacts resulting from each of the EPA rules listed below. As part of your explanation, please discuss the impacts of transmission constraints and changes to units not modified by the rule that may be required to maintain reliability.

    a. Mercury and Air Toxics Standards (MATS) Rule.

Not applicable.

    b. Cross-State Air Pollution Rule (CSAPR).

The State of Florida is not subject to CSAPR.

    c. Cooling Water Intake Structures (CWIS) Rule.

The CWIS Rule does not apply to the Hopkins plant as water is supplied from wells and the plant has no CWIS. The CWIS Rule has no impact at the Purdom plant as the facility does not meet the established regulatory threshold under section 316(b) of the Clean Water Act for existing power generating facilities.

d. Coal Combustion Residuals (CCR) Rule.

Not applicable.

e. Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units.

Not applicable.

f. Affordable Clean Energy Rule or its replacement.

Not applicable. TAL operates no coal fired units.

g. Effluent Limitations Guidelines and Standards (ELGS) from the Steam Electric Power Generating Point Source Category.

Neither Purdom nor Hopkins use coal as a fuel and therefore no impacts are expected from the ELG revisions.

72. Please refer to the Excel Tables File (EPA Operational Effects). Complete the table by identifying, for each unit affected by one or more of EPA's rules, what the impact is for each rule, including; unit retirement, curtailment, installation of additional emissions controls, fuel switching, or other impacts identified by the Company.

TAL data requested by this question are provided on the "EPA Operational Effects" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

73. Please refer to the Excel Tables File (EPA Cost Effects). Complete the table by identifying, for each unit impacted by one or more of the EPA's rules, what the estimated cost is for implementing each rule over the course of the planning period.

TAL data requested by this question are provided on the "EPA Cost Effects" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

74. Please refer to the Excel Tables File (EPA Unit Availability). Complete the table by identifying, for each unit impacted by one or more of EPA's rules, when and for what duration units would be required to be offline due to retirements, curtailments, installation of additional controls, or additional maintenance related to emission controls. Include important dates relating to each rule.

TAL data requested by this question are provided on the "EPA Unit Availability" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

75. If applicable, identify any currently approved costs for environmental compliance investments made by your Company, including but not limited to renewable energy or energy efficiency measures, which would mitigate the need for future investments to comply with recently finalized or proposed EPA regulations. Briefly describe the nature of these investments and identify which rule(s) they are intended to address.

No known investments at this time.

Fuel Supply & Transportation

76. Please refer to the Excel Tables File (Fuel Usage & Price). Complete the table by providing, on a system-wide basis, the actual annual fuel usage (in GWh) and average fuel price (in nominal $/MMBTU) for each fuel type utilized by the Company in the 10-year period prior to the current planning period. Also, provide the forecasted annual fuel usage (in GWh) and forecasted annual average fuel price (in nominal $/MMBTU) for each fuel type forecasted to be used by the Company in the current planning period.

TAL data requested by this question are provided on the "Fuel Usage & Price" tab in the Microsoft Excel file entitled "2024 TYSP - DR1 - TAL.xlsx" accompanying this document's submission to FPSC staff.

77. Please discuss how the Company compares its fuel price forecasts to recognized, authoritative independent forecasts.

TAL based its fuel price forecasts for natural gas and distillate fuel oil on the Chicago Mercantile Exchange Group/New York Mercantile Exchange (CME/NYMEX) futures prices. Because TAL does not have a recent fuel forecast performed by a third party, the CME/NYMEX prices were relied on as the basis for the fuel forecasts submitted to the FPSC in the 2024 TYSP. At the time TAL prepared the TYSP forecast, the latest public fuel forecast available was from the Energy Information Administration's (EIA) Short Term Energy Outlook from April 2024. The EIA will not be publishing an Annual Energy Outlook in 2024 because of the changes in modeling required for hydrogen, carbon capture, and other emerging technologies.

2023 Annual Energy Outlook released in March 2023. TAL reviewed the EIA data after the TYSP forecast was prepared and found the EIA natural gas prices, for the ten-year period, to track 14% lower than TAL's CME/NYMEX based natural gas forecast. EIA's Distillate fuel oil forecast was over 57% higher than the TAL's CME/NYMEX distillate forecast. The large difference is primarily due to market volatility and timing of the forecast. Because market prices solicited from TAL suppliers mirror the CME/NYMEX, TAL used the CME/NYMEX as the basis for the TYSP fuel forecasts for natural gas and distillate fuel oil. Since suppliers specifically quote the CME/NYMEX as a basis for fixed-price term deals, TAL believes the CME/NYMEX provides a better basis for fuel forecasting than the EIA forecasts.

78. Please identify and discuss expected industry trends and factors for each fuel type listed below that may affect the Company during the current planning period.

a. Coal

TAL does not have or plan to add coal generating resources within the ten-year time horizon. Therefore, TAL has limited insight into expected industry trends for coal.

b. Natural Gas

Natural gas prices were much higher in FY 2022 due to stronger demand from the post-Covid economy and lagging natural gas production. Higher prices led to increased production, which in turn, led to lower prices in FY 2023. Due to a historically mild 2023/2024 winter, continued strong production, and well above-average storage natural gas prices have been below $2 since March 2024. Lower prices have led to a 30% drop in rig counts in a corresponding decrease in production. Lower production should increase prices and new LNG facilities in 2025 will add to the demand and pressure prices upward.

c. Nuclear

Not applicable.

d. Fuel Oil

Due to the higher price of distillate compared to natural gas and environmental permit limits, TAL uses distillate fuel oil primarily for reliability purposes and testing. Distillate and residual fuel oils are likely to remain volatile and subject to the forces of supply, demand, speculative interests, and geo-political influences.

e. Other (please specify each, if any)

Not applicable.

79. Please provide a comparison of the Utility's 2023 actual fuel price forecast and the actual 2023 delivered fuel prices.

TAL's projected cost of delivered natural gas for the 2023 calendar year was $3.67/MMBtu and the City's actual cost of delivered gas was $3.56/MMBtu.

80. Please explain any notable changes in the Utility's forecast of fuel prices used to prepare the Utility's current TYSP compared to the fuel process used to prepare the Utility's prior TYSP.

TAL is using the same CME/NYMEX based methodology for the 2024 forecast as prior years.

81. Please identify and discuss steps that the Company has taken to ensure natural gas supply availability and transportation over the current planning period.

Over the past several years, TAL has added pipeline capacity and levelized natural gas consumption through the addition of more efficient generating resources and retirement of less efficient units. In 2011, Florida Gas Transmission (FGT) expanded its natural gas pipeline system with the addition of 820,000 MMBtu/day of additional firm transportation capacity. TAL contracted for 6,000 MMBtu/day (year-round) of additional pipeline capacity from this expansion to enhance reliability. TAL also negotiated with FGT to acquire additional FTS-1 turn-back capacity during the summer and winter months as part of the 2015 rate case settlement. The additional pipeline capacity volumes will enable TAL to meet customer needs based on load growth forecasts for the ten-year planning horizon. Between 2017 and 2019 TAL added 62 MW of solar capacity which has displaced some natural gas generation and will ensure greater reliability with our existing FGT pipeline capacity.

82. Please identify and discuss any existing or planned natural gas pipeline expansion project(s), including new pipelines and those occurring or planned to occur outside of Florida that would affect the Company during the current planning period.

We are not aware of any new pipeline projects outside the State that would affect TAL.

83. Please identify and discuss expected liquefied natural gas (LNG) industry factors and trends that will impact the Company, including the potential impact on the price and availability of natural gas, during the current planning period.

The US LNG industry has grown significantly over the last several years, mostly centered in the Gulf of Mexico and exporting to countries all over the world. Since TAL sources most of its gas from the FGT pipeline which runs onshore along the Gulf of Mexico there appears to be ample supply for now and at least the next 10 years to keep TAL fully supplied with natural gas. TAL does not take LNG deliveries directly but benefits from additional feed gas supplies in the southeast region. Several new LNG projects are scheduled to come online in 2025 which will make the price of natural gas increasingly subject to the global forces of supply and demand similar to the oil markets.

84. Please identify and discuss the Company's plans for the use of firm natural gas storage during the current planning period.

TAL has contracts for firm underground storage capacity in Mississippi and Louisiana for a total of 70,781 MMBtus, located along the Southern Natural Gas pipeline which serves TAL's Gas Utility. TAL does not have any firm plans for additional underground natural gas storage but will continue to evaluate the economic viability of all storage options.

85. Please identify and discuss expected coal transportation industry trends and factors, for transportation by both rail and water that will impact the Company during the current planning period. Please include a discussion of actions taken by the Company to promote competition among coal transportation modes, as well as expected changes to terminals and port facilities that could affect coal transportation.

TAL does not have or plan to add coal generating resources within the ten-year time horizon. Therefore, TAL has limited insight into coal transportation trends.

86. Please identify and discuss any expected changes in coal handling, blending, unloading, and storage at coal generating units during the current planning period. Please discuss any planned construction projects that may be related to these changes.

TAL does not have or plan to add coal generating resources within the ten-year time horizon. Therefore, TAL has limited insight into coal handling or storage trends.

87. Please identify and discuss the Company's plans for the storage and disposal of spent nuclear fuel during the current planning period. As part of this discussion, please include the Company's expectation regarding short-term and long-term storage, dry cask storage, litigation involving spent nuclear fuel, and any relevant legislation.

Not applicable.

88. Please identify and discuss expected uranium production industry trends and factors that will affect the Company during the current planning period.

Not applicable.

89. **[FPL Only]** Please refer to FPL's Response to Staff's First Data Request (No. 90) for the 2023 Ten-Year Site Plan, received on May 1, 2023. Have FPL's plans to only self-consume the hydrogen produced at the Okeechobee Clean Energy Center changed? Please explain.

Not applicable. TAL is not FPL.

Extreme Weather

90. Please identify and discuss steps, if any, that the Company has taken to ensure continued energy generation in case of a severe cold weather event.

Both TAL's Hopkins and Purdom Generating Stations have annual preventative maintenance (PM) programs that are performed to prepare for winter operations. The PM program measures are implemented based on the time of the year and the expected severity of the weather.

Insulation and heat trace systems at both stations are inspected and maintained as needed. The combustion turbine and combined cycle units at both stations have dual fuel (natural gas and diesel) capability. The units are normally fired with natural gas but are periodically tested to ensure they are capable of firing with diesel fuel. The antifreeze coolant concentration in the simple cycle turbine and the reciprocating engines is examined to ensure that they meet the winter concentration level.

91. Please identify any future winterization plans, if any, the Company intends to implement over the current planning period.

In the future, TAL will continue to implement its winterization plan as identified in response to Question 90 above. TAL will adopt additional measures in its winterization plan as needed.

92. Please explain the Company's planning process for flood mitigation for current and proposed power plant sites and transmission/distribution substations.

TAL is required to follow the U.S. Environmental Protection Agency's (EPA) stormwater permit process as part of the NPDES program. This is also as a part of the Site Certification application process for proposed power plant sites. During the permitting process, TAL has an engineering firm design the site to address potential flooding conditions. After the permit is issued, TAL's flood mitigation plan is simply to build according to the engineering firm's final site design. Any subsequent change needed on the plant site that may require modification of the site's storm water system triggers a new design review.

The potential for flooding is also a consideration in the siting of new transmission and distribution substations. All TAL's new and most of its older transmission/distribution substations are constructed outside flood plains. TAL does have a few older stations within flood plains, but the equipment in the stations is constructed high enough that flood water cannot reach them.

93. Please address the following questions regarding the impact of all major storm events, such as Hurricane Ian, with associated flooding, destruction of utility facilities and customer buildings, and forced customer permanent migration.

    a. Based on actual data, please briefly summarize the impact that major storms have had on your utility's customer number, retail sales and peak load.

There was no impact with associated flooding on utility facilities for City of Tallahassee

    b. Please explain whether the above discussed impact is include in your company's customer/retail energy sales/demand forecasts.

Not applicable.

c. If your response to subpart (b) is affirmative, please explain how this impact is modeled.

Not applicable.

94. Has the Company had to make any upgrades to any generating units or changes to operations practices as a result of any FERC Orders addressing extreme weather planning within the last two years? If so, please describe.

TAL has made no upgrade or changes to operations.

95. **[FEECA Utilities Only]** Please refer to the Excel Tables File (Data Centers). As of today, there are 125 or more data centers located in the state of Florida. For the purpose of better understanding this recent load growth, please complete Tables I and II.

TAL is not a FEECA Utility.

96. **[FEECA Utilities Only]** With respect to the load forecast included in the Utility's 2024 Ten-Year Site Plan to be filed in April of this year, does the load forecast include projections of annual energy consumption and demand associated with data centers within your service area during the forecasting time horizon (2024-2033)?

TAL is not a FEECA Utility.

a. If any such projections have been made, please provide details of the projections including the type of data centers expected to contribute to such energy/demand, and what factors are driving such energy consumption and demand.
b. If no specific projections have been made, what does the Utility believe is the likely pattern of load growth associated with this industry within its service territory?

97. **[FEECA Utilities Only]** Please identify the Utility's issues and/or concerns, if any, that are expected to result from the growth in data centers in the Utility's service territory.

TAL is not a FEECA Utility.

a. Please specify how the Utility anticipates responding to such issues or concerns.
b. Please specify how the Utility responded to such issues or concerns in the past.

98. **[Non-FEECA Utilities Only]** For any data centers operating in the Utility's service territory and receiving electric service from the Utility, please describe the current number of the data centers, by type (e.g., colocation, enterprise, cloud, edge, and micro data, etc.) and, for each data center, the customer class served as well as the estimated load served (summer/winter demand and energy).

TAL is not a FEECA Utility.

99. **[Non-FEECA Utilities Only]** With respect to the load forecast included in the Utility's 2024 Ten-Year Site Plan to be filed in April this year, does the load forecast include projections of annual energy consumption and demand associated with data centers within your service area during the forecasting time horizon (2024-2033)?

TAL is not a FEECA Utility.

a. If any such projections have been made, please provide details of the projections including the type of data centers expected to contribute to such energy/demand, and what factors are driving such energy consumption and demand.
b. If no specific projections have been made, what does the Utility believe is the likely pattern of load growth associated with this industry within its service territory?

100. **[Non-FEECA Utilities Only]** Please identify the Utility's issues and/or concerns, if any, that are expected to result from the growth in data centers in your utility's service territory. Please also specify how has, and how does, your utility anticipate responding to such issues or concerns.

TAL is not a FEECA Utility.

CITY OF TALLAHASSEE

2024 TEN YEAR SITE PLAN

ELECTRICAL GENERATING FACILITIES
AND ASSOCIATED TRANSMISSION LINES

Planning Period: 2024-2033

CITY OF TALLAHASSEE
TEN YEAR SITE PLAN FOR ELECTRICAL GENERATING FACILITIES
AND ASSOCIATED TRANSMISSION LINES
2024-2033
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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 123,000 customers located within a 221 square mile service territory (see Figure A). The Electric Utility operates three generating stations and purchases power from two solar farms with a total summer season net generating capacity of 737 megawatts (MW).

The City has three primarily natural gas fueled generating stations, with 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.

The City contracted for 100% of the energy output from two solar farms through Power Purchase Agreements. Both farms are located on City property adjacent to the Tallahassee International Airport. Solar Farm 1 has been in operation since 2017, while Solar Farm 4 was brought online at the end of 2019.

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.

The solar farms consist of 62MW of total nameplate solar PV. Solar Farm 1 is 20MW of nameplate solar PV, while Solar Farm 4 has 42MW of nameplate solar PV. The City has conducted analyses of the output of the solar facilities and while an average of approximately 50% of the facilities' total rated capacity has been available during summer peak and near peak hours, the City has elected to utilize a conservative estimate of 20% of the rated capacity as firm capacity available for the summer peak. The City will continue to review and, if appropriate, revise the assumed firm contribution from its solar power supply resources.

As of December 31, 2023 the City's total net summer capability is 737 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)

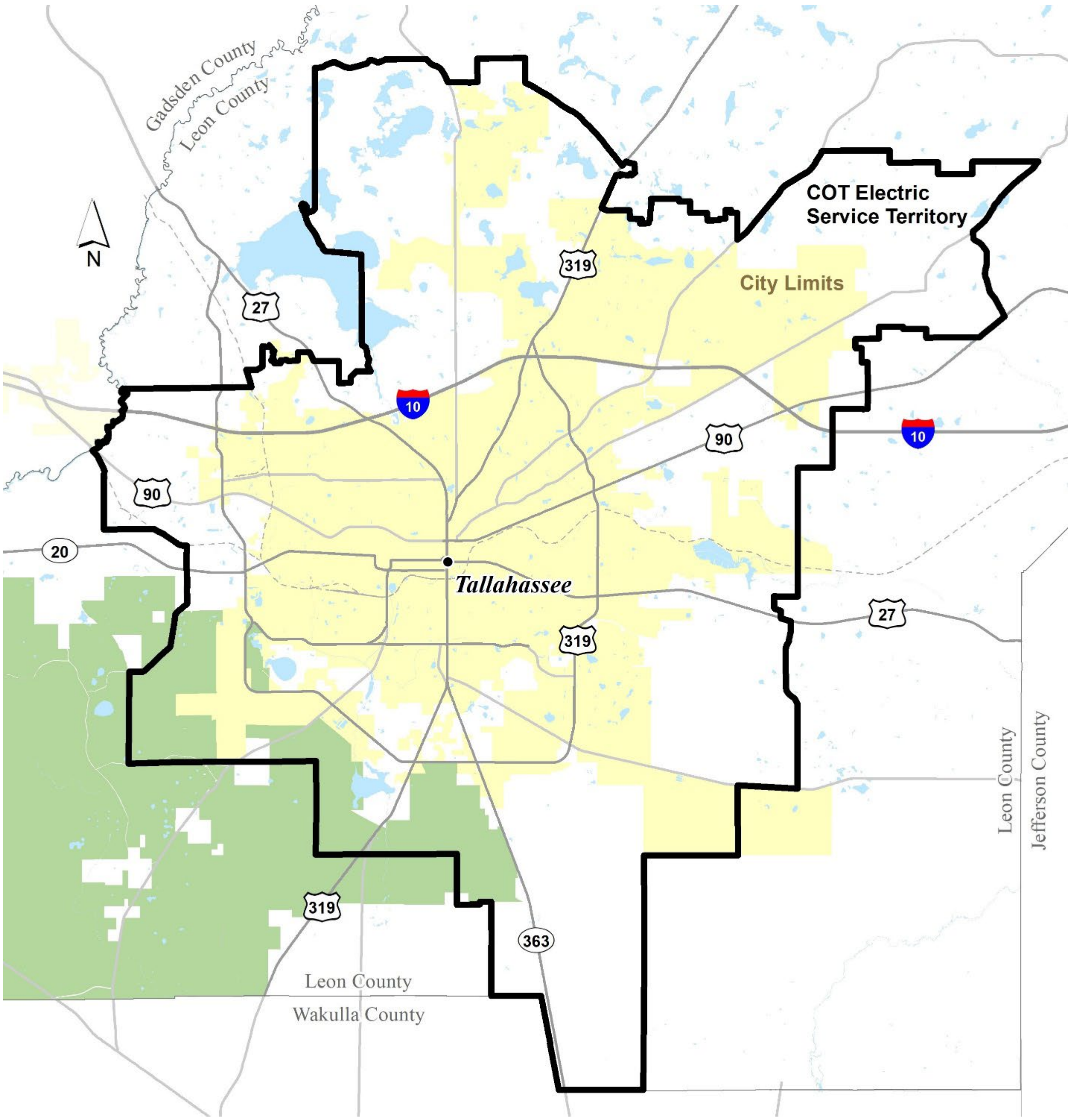
The City has no long-term firm wholesale capacity and energy purchase agreements other than its two solar farms.

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.

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. Reciprocal service will continue to be provided to all Talquin customers currently served by the City electric system. 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 Utilities

Electric Service Territory Map



City Of Tallahassee

Schedule 1
Existing Generating Facilities and Power Purchase Agreements
As of December 31, 2023

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
								Alt. Fuel	Commercial	Expected	Gen. Max.	Net Capability		
	Unit		Unit	Fuel		Fuel Transport		Days	In-Service	Retirement	Nameplate	Summer	Winter	
Plant	No.	Location	Type	Primary	Alternate	Primary	Alternate	Use	Month/Year	Month/Year	(kW)	(MW)	(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	484.50	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	
Airport Solar	SF1	Leon	PV	Solar	NA	NA	NA	NA	12/17	12/58	20,000	4.0	0.0	
	SF4		PV	Solar	NA	NA	NA	NA	12/19	12/59	42,000	8.4	0.0	
									Total System Capacity as of December 31, 2023			**737**	**795**	

[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.

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 2024 and the horizon year of 2033. 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 2022-2024 period.

In 2022, the City implemented new customer management software, and the transition resulted in a lower running average of service points as some service points were consolidated or reclassified. This data anomaly most severely impacts the 2022-2023 average number of residential and commercial customers and the associated average consumption for these customer classes seen in Table 2.1. Data prior to 2022 was not reconciled to match the same counting and classification methodology as with half of 2022 and all of 2023, therefore a step change exists that does not indicate a demographic trend.

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 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.

The rate of growth in residential and commercial customers is driven by the projected growth in Leon County population. Leon County population is projected to grow from 2024-2033 at an average annual growth rate (AAGR) of 0.73%. This growth rate is below that for the state of Florida (1.07%) but is slightly higher than that for the United States (~0.71%).

Starting in the 2022 forecast the City incorporated potential increases in the penetration of electric vehicles (EV). Since an increase in EV penetration has the potential to significantly increase the NEL and peak demand requirements for the City, the 2024 forecast produced explicit estimates of the potential impact on the City's load growth related to EV adoption. Historical data obtained from the Florida Department of Motor Vehicles indicates that EV penetration in Leon County (at approximately 0.6%) is lower than for Florida overall (approximately 0.7%). And the forecast results suggest that by 2040, the incremental amount of light duty EV energy sales is estimated to be 1.3 percent of NEL on a gross of DSM basis.

The City's energy efficiency and demand-side management (DSM) programs (discussed in Section 2.1.3) have decreased the average residential and commercial demand and energy requirements and are projected to somewhat offset the increased growth from population in residential and commercial customers. Additionally, the Clean Energy Plan (discussed in this chapter and further in Chapter III), which promotes accelerated installation of distributed solar PV and heightened energy efficiency investment through 2030 is also projected to somewhat offset increased load growth from emerging electrification efforts such as electric vehicle charging. The net effect is the average consumption for residential and commercial customers may be approaching its minimum and leveling out over time (Schedule 2.1).

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 2024 base forecasts for annual total retail sales/net energy for load and seasonal peak demand forecasts that are essentially equal to those previously projected. NEL growth rate of 0.25% year over year in the projected decade roughly matches the year over year NEL growth from the most recent historical decade.

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 tend 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).

In order to evaluate preparedness regarding weather uncertainty, extreme and mild forecast results were developed. In total, five forecasts, base case, high, low, extreme, and mild, are considered to ensure the City's electric system is well positioned to serve all of its customers for the coming decade and into perpetuity.

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

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 recent Energy Integrated Resource Planning (IRP) Study completed in 2023 and the subsequent DSM Assessment Study (due in early 2024), potential DSM measures (conservation, energy efficiency, net-metered solar, electrification, 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 total demand savings potential for the resources identified in the 2024 DSM Assessment Study appear to compare well with that identified in the 2023 IRP Study providing some assurance that the City's ongoing and planned DSM and renewable efforts remain cost-effective. The latest projections in the TYSP reflect an accelerated outlook for DSM over the coming years guided by analysis from both studies.

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 2022-2031. Figure B4 displays the percentage of energy by fuel type in 2024 and 2033.

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. Additional renewable energy sources (solar) identified in the Clean Energy Plan are not shown in the tables.

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
2014	282,471	-	1,089	97,985		11,119	1,548	18,723		82,690
2015	285,651	-	1,088	99,007		10,989	1,567	18,820		83,263
2016	288,972	-	1,080	100,003		10,801	1,559	19,002		82,065
2017	290,466	-	1,059	100,921		10,497	1,558	19,130		81,439
2018	292,700	-	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	293,800	-	1,149	105,829		10,857	1,432	19,649		72,886
2021	296,400	-	1,139	106,321		10,713	1,427	19,580		72,856
2022	299,130	-	1,149	107,358	[3]	10,703	1,474	19,830	[3]	74,332
2023	297,862	-	1,147	100,719	[3]	11,388	1,525	18,421	[3]	82,786
2024	304,162	-	1,148	101,427		11,318	1,521	18,821		80,814
2025	306,600	-	1,140	102,262		11,148	1,543	18,962		81,373
2026	308,720	-	1,134	103,069		11,002	1,564	19,089		81,932
2027	310,840	-	1,131	103,900		10,885	1,573	19,207		81,897
2028	312,960	-	1,129	104,739		10,779	1,579	19,321		81,725
2029	315,080	-	1,126	105,567		10,666	1,584	19,439		81,486
2030	317,200	-	1,123	106,397		10,555	1,589	19,561		81,233
2031	318,980	-	1,120	107,188		10,449	1,594	19,681		80,992
2032	320,760	-	1,119	107,946		10,366	1,599	19,797		80,770
2033	322,540	-	1,118	108,705		10,285	1,604	19,914		80,546

[1] Population data represents Leon County population.
[2] Values include DSM impacts.
[3] Methodology change in Customer Count occurred in February of 2022, also impacting 2023 customer counts.

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						
Year	(GWh)	Average No. of Customers [1]	Average kWh Consumption Per Customer	Railroads and Railways (GWh)	Street & Highway Lighting (GWh) [2]	Other Sales to Public Authorities (GWh) [3]	Total Sales to Ultimate Consumers (GWh) [4]
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	25	2,590
2022	-	-	-		0	24	2,647
2023	-	-	-		0	22	2,694
2024	-	-	-		0	22	2,669
2025	-	-	-		0	22	2,683
2026	-	-	-		0	22	2,697
2027	-	-	-		0	22	2,704
2028	-	-	-		0	22	2,708
2029	-	-	-		0	22	2,710
2030	-	-	-		0	22	2,712
2031	-	-	-		0	22	2,714
2032	-	-	-		0	22	2,718
2033	-	-	-		0	22	2,722

[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

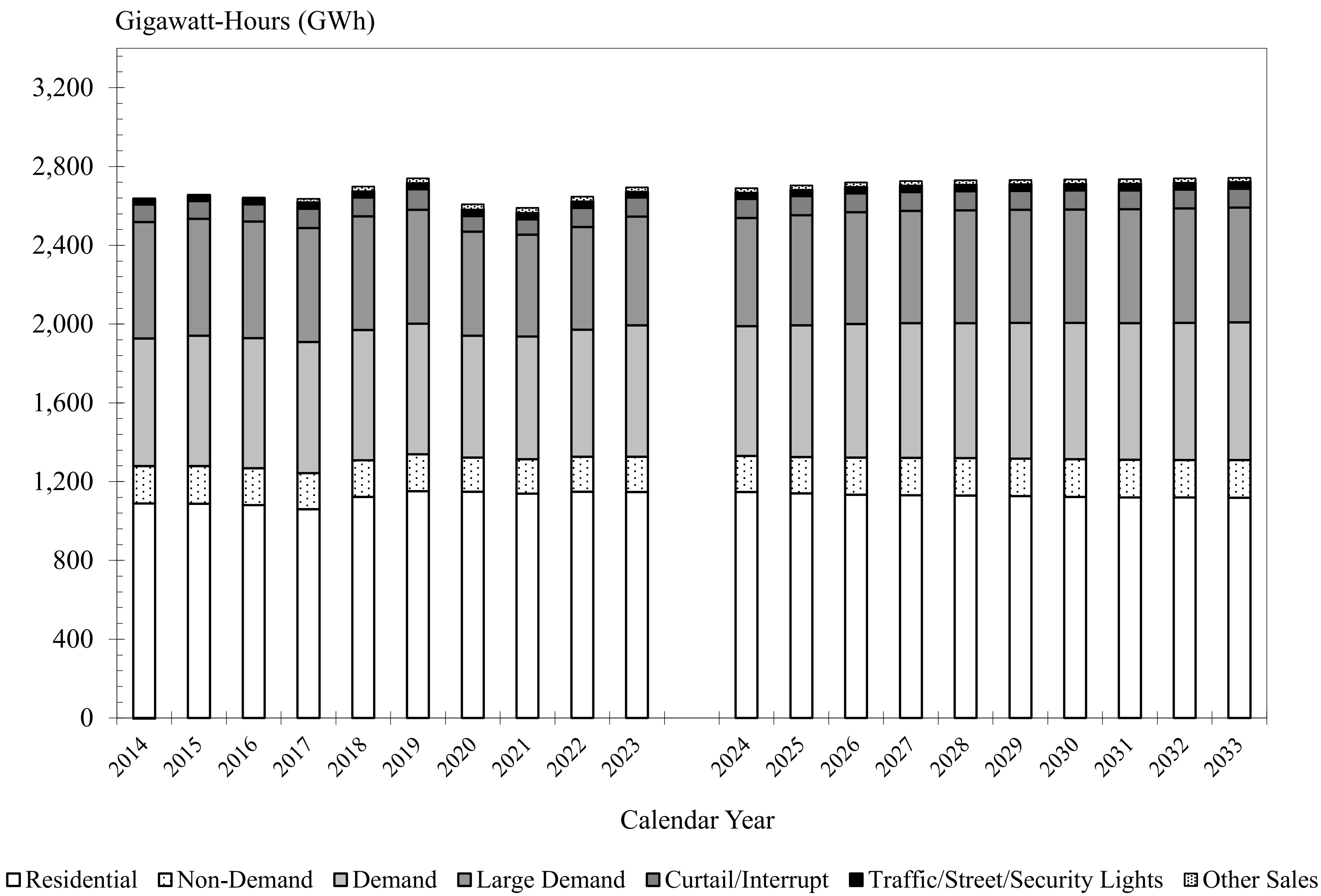
Schedule 2.3
History and Forecast of Energy Consumption and Number of Customers by Customer Class

Base Load Forecast

(1)	(2)	(3)	(4)	(5)	(6)
Year	Sales for Resale (GWh)	Utility Use & Losses (GWh)	Net Energy for Load (GWh) [1]	Other Customers (Average No.)	Total No. of Customers [2]
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	120	2,727	0	125,478
2021	0	111	2,701	0	125,901
2022	0	119	2,766	0	127,188
2023	0	60	2,754	0	119,140
2024	0	116	2,807	0	120,248
2025	0	111	2,816	0	121,224
2026	0	111	2,830	0	122,158
2027	0	112	2,838	0	123,107
2028	0	117	2,847	0	124,060
2029	0	112	2,844	0	125,006
2030	0	112	2,846	0	125,958
2031	0	112	2,848	0	126,869
2032	0	118	2,858	0	127,743
2033	0	112	2,856	0	128,619

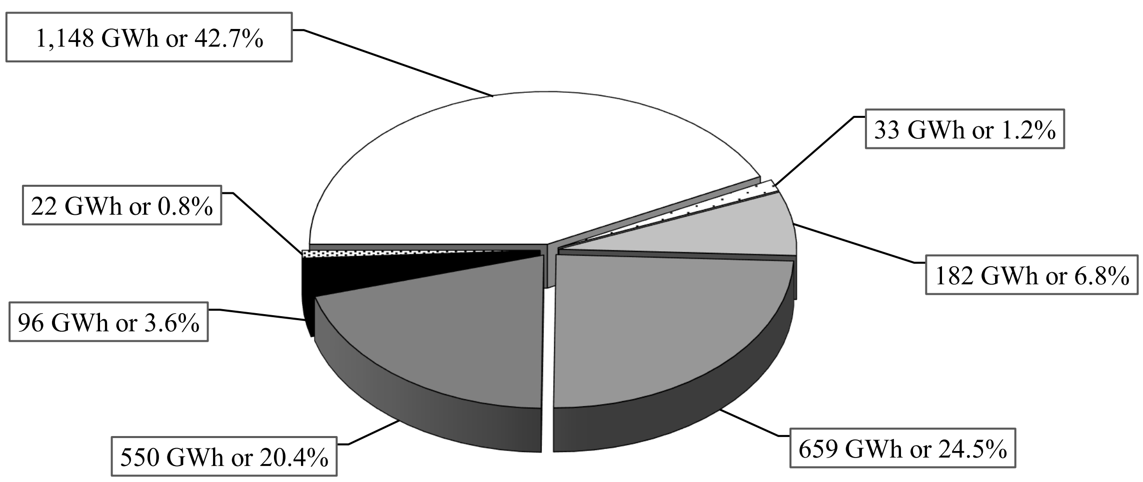
[1] Reflects NEL served by City electric system. Values include DSM Impacts.
[2] Average number of customers for the calendar year.

History and Forecast Energy Consumption By Customer Class (Including DSM Impacts)



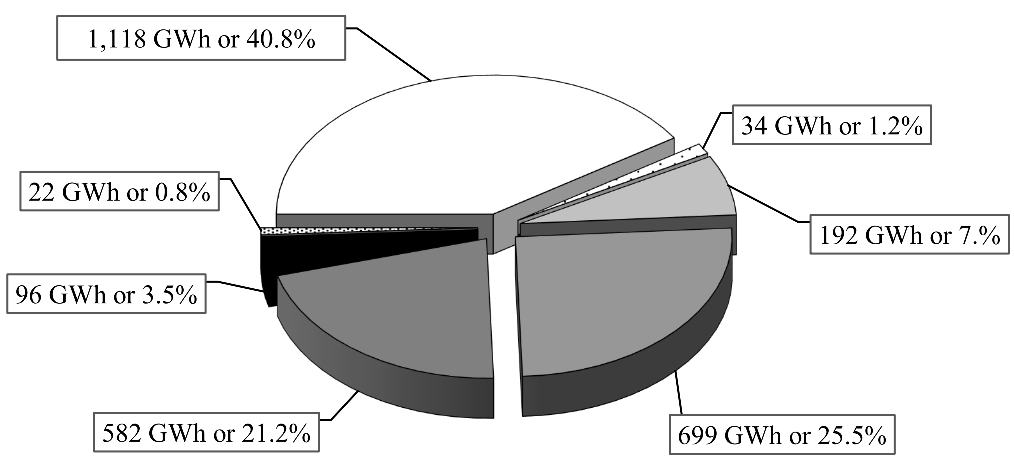
Energy Consumption By Customer Class
(Excluding DSM Impacts)

Calendar Year 2024



2024 Total Sales = 2,669 GWh

Calendar Year 2033



2033 Total Sales = 2,722 GWh

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

City Of Tallahassee

Schedule 3.1.1
History and Forecast of Summer Peak Demand
Base 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]
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						576
2021	573		573						573
2022	590		590						590
2023	616		616		0	1	0	0	615
2024	601		601		0	2	0	0	599
2025	606		606		0	4	0	0	602
2026	611		611		0	6	0	0	605
2027	613		613		0	7	0	0	606
2028	617		617		0	9	0	2	606
2029	621		621		0	11	0	4	606
2030	623		623		1	12	1	5	604
2031	627		627		2	14	3	6	602
2032	629		629		3	15	4	7	600
2033	630		630		4	15	6	7	598

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2023 DSM is actual at peak.
[3] 2023 values reflect incremental increase from 2022.

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]
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						576
2021	573		573						573
2022	590		590						590
2023	616		616		0	1	0	0	615
2024	609		609		0	2	0	0	607
2025	622		622		0	4	0	0	618
2026	634		634		0	6	0	0	628
2027	642		642		0	7	0	0	635
2028	651		651		0	9	0	2	640
2029	660		660		0	11	0	4	645
2030	668		668		1	12	1	5	649
2031	676		676		2	14	3	6	651
2032	683		683		3	15	4	7	654
2033	689		689		4	15	6	7	657

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2023 DSM is actual at peak.
[3] 2023 values reflect incremental increase from 2022.

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]
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						576
2021	573		573						573
2022	590		590						590
2023	616		616		0	1	0	0	615
2024	593		593		0	2	0	0	591
2025	591		591		0	4	0	0	587
2026	590		590		0	6	0	0	584
2027	587		587		0	7	0	0	580
2028	586		586		0	9	0	2	575
2029	585		585		0	11	0	4	570
2030	583		583		1	12	1	5	564
2031	582		582		2	14	3	6	557
2032	579		579		3	15	4	7	550
2033	576		576		4	15	6	7	544

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2023 DSM is actual at peak.
[3] 2023 values reflect incremental increase from 2022.

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]
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	504		504						504
2021 -2022	538		538						538
2022 -2023	561		561						561
2023 -2024	592		592		0	1	0	0	591
2024 -2025	567		567		0	3	0	0	564
2025 -2026	572		572		0	4	0	0	568
2026 -2027	576		576		0	6	0	0	570
2027 -2028	579		579		0	7	0	0	572
2028 -2029	582		582		0	9	0	1	572
2029 -2030	584		584		0	10	0	1	573
2030 -2031	585		585		0	10	0	1	574
2031 -2032	586		586		0	11	0	1	574
2032 -2033	589		589		0	12	0	2	575
2033 -2034	593		593		0	13	0	2	578

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2023-2024 DSM is actual at peak.
[3] Reflects no expected utilization of demand response (DR) resources in winter.
[4] 2023-2024 values reflect incremental increase from 2022-2023.

City Of Tallahassee

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

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	Total	Wholesale	Retail	Interruptible	Residential Load Management [2], [3]	Residential Conservation [2], [4]	Comm./Ind Load Management [2], [3]	Comm./Ind Conservation [2], [4]	Net Firm Demand [1]
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	504		504						504
2021 -2022	538		538						538
2022 -2023	561		561						561
2023 -2024	592		592		0	1	0	0	591
2024 -2025	579		579		0	3	0	0	576
2025 -2026	590		590		0	4	0	0	586
2026 -2027	600		600		0	6	0	0	594
2027 -2028	607		607		0	7	0	0	600
2028 -2029	616		616		0	9	0	1	606
2029 -2030	622		622		0	10	0	1	611
2030 -2031	627		627		0	10	0	1	616
2031 -2032	633		633		0	11	0	1	621
2032 -2033	641		641		0	12	0	2	627
2033 -2034	649		649		0	13	0	2	634

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2023-2024 DSM is actual at peak.
[3] Reflects no expected utilization of demand response (DR) resources in winter.
[4] 2023-2024 values reflect incremental increase from 2022-2023.

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]
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	504		504						504
2021 -2022	538		538						538
2022 -2023	561		561						561
2023 -2024	592		592		0	1	0	0	591
2024 -2025	556		556		0	3	0	0	553
2025 -2026	555		555		0	4	0	0	551
2026 -2027	554		554		0	6	0	0	548
2027 -2028	551		551		0	7	0	0	544
2028 -2029	551		551		0	9	0	1	541
2029 -2030	548		548		0	10	0	1	537
2030 -2031	545		545		0	10	0	1	534
2031 -2032	542		542		0	11	0	1	530
2032 -2033	541		541		0	12	0	2	527
2033 -2034	541		541		0	13	0	2	526

[1] Values include DSM Impacts.
[2] Reduction estimated at busbar. 2023-2024 DSM is actual at peak.
[3] Reflects no expected utilization of demand response (DR) resources in winter.
[4] 2023-2024 values reflect incremental increase from 2022-2023.

City Of Tallahassee

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

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	Total Sales	Residential Conservation [1]	Comm./Ind Conservation [1]	Retail Sales [2], [3]	Wholesale [4]	Utility Use & Losses	Net Energy for Load [3], [5]	Load Factor % [3]
2014	2,638			2,638	(7)	121	2,752	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	54
2019	2,716			2,716	22	112	2,851	53
2020	2,581			2,581	26	120	2,727	54
2021	2,566			2,566	25	111	2,702	54
2022	2,623			2,623	24	119	2,766	53
2023	2,676	4	0	2,672	22	60	2,754	51
2024	2,675	6	0	2,669	22	116	2,807	53
2025	2,697	14	0	2,683	22	111	2,816	53
2026	2,720	23	0	2,697	22	111	2,830	53
2027	2,736	32	0	2,704	22	112	2,838	53
2028	2,749	33	8	2,708	22	117	2,847	54
2029	2,759	33	16	2,710	22	112	2,844	54
2030	2,770	38	20	2,712	22	112	2,846	54
2031	2,781	43	24	2,714	22	112	2,848	54
2032	2,794	48	28	2,718	22	118	2,858	54
2033	2,807	57	28	2,722	22	112	2,856	55

[1] Reduction estimated at customer meter. 2023 DSM is actual incremental increase from 2022.
[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)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	Total Sales	Residential Conservation [1]	Comm./Ind Conservation [1]	Retail Sales [2], [3]	Wholesale [4]	Utility Use & Losses	Net Energy for Load [3], [5]	Load Factor % [3]
2014	2,638			2638	-7	121	2,752	55
2015	2,655			2655	1	120	2,776	53
2016	2,640			2640	4	135	2,779	53
2017	2,617			2617	17	124	2,758	53
2018	2,675			2675	23	126	2,824	54
2019	2,716			2716	22	112	2,851	53
2020	2,581			2581	26	120	2,727	54
2021	2,566			2566	25	111	2,702	54
2022	2,623			2623	24	119	2,766	53
2023	2,676	4	0	2672	22	60	2,754	51
2024	2,727	6	0	2,721	25	126	2,872	54
2025	2,790	14	0	2,776	25	132	2,933	54
2026	2,842	23	0	2,819	25	128	2,973	54
2027	2,884	32	0	2,852	25	130	3,008	54
2028	2,922	33	8	2,881	25	132	3,039	54
2029	2,955	33	16	2,906	25	140	3,072	54
2030	2,990	38	20	2,932	25	136	3,093	54
2031	3,024	43	24	2,957	25	138	3,120	55
2032	3,060	48	28	2,984	25	139	3,149	55
2033	3,094	57	28	3,009	25	148	3,182	55

[1] Reduction estimated at customer meter. 2023 DSM is actual incremental increase from 2022.
[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)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Year	Total Sales	Residential Conservation [1]	Comm./Ind Conservation [1]	Retail Sales [2], [3]	Wholesale [4]	Utility Use & Losses	Net Energy for Load [3], [5]	Load Factor % [3]
2014	2,638			2638	-7	121	2,752	55
2015	2,655			2655	1	120	2,776	53
2016	2,640			2640	4	135	2,779	53
2017	2,617			2617	17	124	2,758	53
2018	2,675			2675	23	126	2,824	54
2019	2,716			2716	22	112	2,851	53
2020	2,581			2581	26	120	2,727	54
2021	2,566			2566	25	111	2,702	54
2022	2,623			2623	24	119	2,766	53
2023	2,676	4	0	2672	22	60	2,754	51
2024	2,668	6	0	2,662	25	123	2,809	54
2025	2,653	14	0	2,639	25	124	2,788	54
2026	2,650	23	0	2,627	25	118	2,770	54
2027	2,642	32	0	2,610	25	118	2,753	54
2028	2,633	33	8	2,592	25	118	2,734	54
2029	2,622	33	16	2,573	25	123	2,720	54
2030	2,612	38	20	2,554	25	117	2,696	54
2031	2,604	43	24	2,537	25	117	2,678	55
2032	2,597	48	28	2,521	25	116	2,662	55
2033	2,590	57	28	2,505	25	121	2,651	56

[1] Reduction estimated at customer meter. 2023 DSM is actual incremental increase from 2022.
[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)
	2023 Actual		**2024 Forecast [1][2][3]**		**2025 Forecast [1]**	
Month	Peak Demand (MW)	NEL (GWh)	Peak Demand (MW)	NEL (GWh)	Peak Demand (MW)	NEL (GWh)
January	462	212	561	228	564	229
February	399	187	488	204	493	199
March	437	205	440	200	443	201
April	432	196	444	206	447	207
May	491	224	522	240	525	241
June	580	255	569	262	572	263
July	581	291	589	284	593	285
August	616	311	599	285	602	287
September	547	256	560	259	564	261
October	454	215	480	223	483	224
November	459	191	450	200	454	202
December	442	210	474	215	478	217
TOTAL		2,753		2,807		2,816

[1] Peak Demand and NEL include DSM Impacts.
[2] Represents forecast values for 2024.
[3] Rounding may show +/- 1 GWh Total

City of Tallahassee, Florida

2024 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	0.928	0.981	0.915	0.946	0.937	0.840	0.859	0.695

[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.

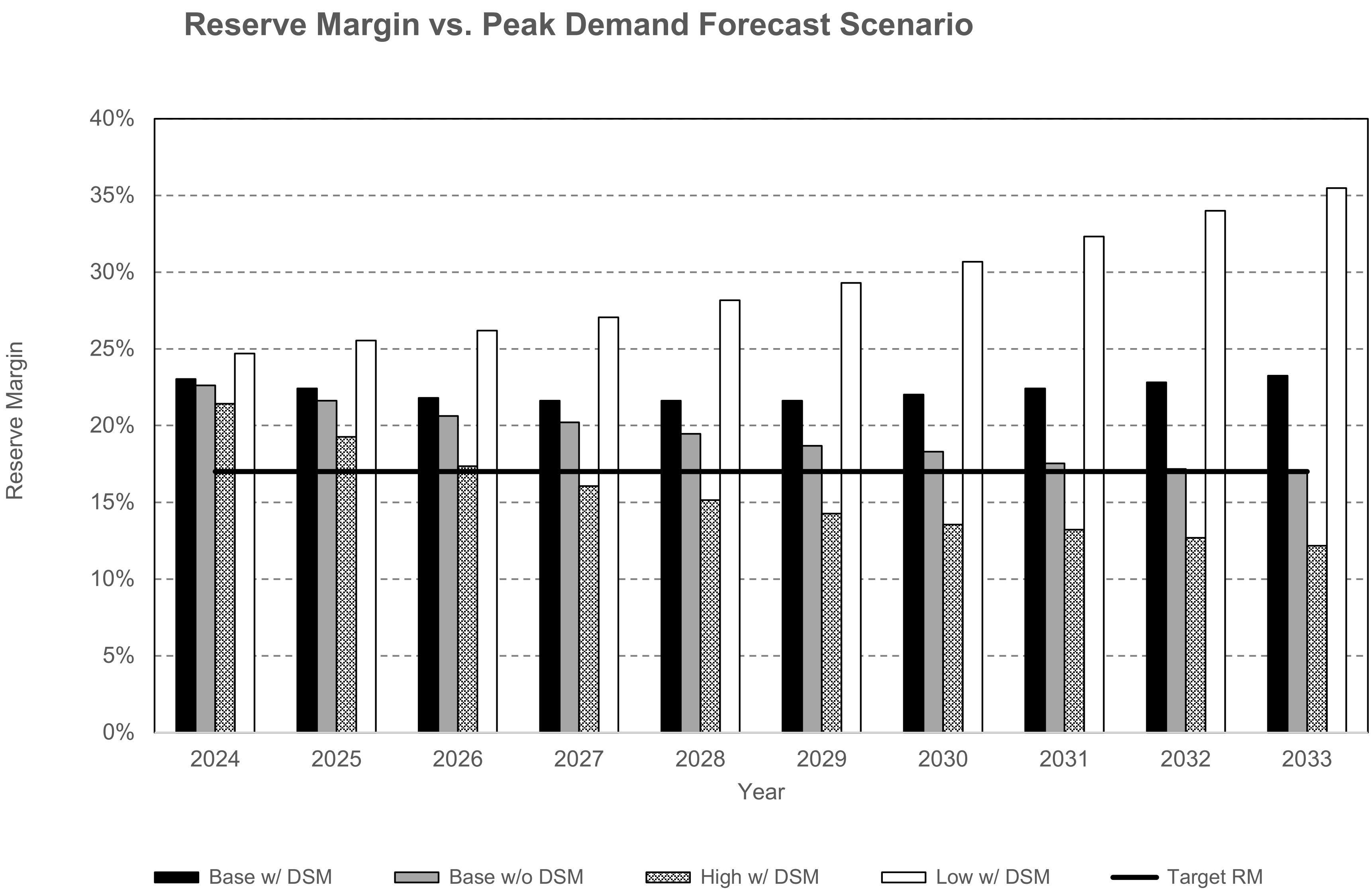
[3] As monthly load factor is essentially a stationary series, indicators of goodness of fit should be viewed differently. In combination with estimates of NEL, forecasted peak demands from this equation will have far better fit than the adjusted R-Squared here indicates. The equation also includes daytype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

City of Tallahassee

2024 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)
U.S. Personal Spending Rate	U.S. Bureau of Economic Analysis
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 2022 Annual Energy Outlook
Leon County Residential Location Prevalence	Published by Google
Leon County Commercial Location Prevalence	Published by Google


Reserve Margin vs. Peak Demand Forecast Scenario
Reserve Margin
40%
35%
30%
25%
20%
15%
10%
5%
0%
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
Year
Base w/ DSM
Base w/o DSM
High w/ DSM
Low w/ DSM
Target RM

City Of Tallahassee

2024 Electric System Load Forecast

Projected Demand Side Management Energy Reductions [1]

Calendar Year	Residential Impact (MWh)	Commercial Impact (MWh)	Total Impact (MWh)
2024	4,504	1,023	5,527
2025	9,055	5,023	14,078
2026	14,197	8,517	22,714
2027	19,479	12,135	31,614
2028	24,953	15,564	40,517
2029	30,524	18,906	49,430
2030	36,058	22,284	58,342
2031	41,644	25,602	67,246
2032	47,448	28,697	76,145
2033	53,581	31,455	85,036

[1] Reductions estimated at generator busbar.

City Of Tallahassee

2024 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)
2024	2024-2025	1	1	0	0	0	0	0	0	1	1
2025	2025-2026	2	2	0	0	0	0	0	0	2	2
2026	2026-2027	5	4	0	0	0	0	0	0	5	4
2027	2027-2028	7	7	0	0	0	0	0	0	7	7
2028	2028-2029	9	9	2	1	0	0	0	0	11	10
2029	2029-2030	10	9	3	1	0	0	0	0	13	10
2030	2030-2031	12	10	4	2	1	0	1	0	18	12
2031	2031-2032	14	12	5	2	2	0	3	0	24	14
2032	2032-2033	15	13	6	3	3	0	4	0	28	16
2033	2033-2034	17	14	7	4	4	0	5	0	33	18

[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 2022	Actual 2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
(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	3	1	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	3	1	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	22,529	22,934	23,099	22,863	22,805	23,439	23,164	22,921	23,485	23,155	23,029	23,609
(14)		Steam	1000 MCF	0	0	0	0	0	0	0	0	0	0	0	0
(15)		CC	1000 MCF	20,666	20,915	21,251	21,034	20,981	21,564	21,311	21,087	21,606	21,303	21,187	21,720
(16)		CT	1000 MCF	1,863	2,019	1,848	1,829	1,824	1,875	1,853	1,834	1,879	1,852	1,842	1,889
(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 2022	Actual 2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
(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	1	2	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	1	2	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	2,919	3,053	2,712	2,726	2,745	2,756	2,766	2,761	2,762	2,766	2,776	2,780
(15)		Steam	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(16)		CC	GWh	2,705	2,839	2,522	2,535	2,553	2,563	2,572	2,568	2,569	2,572	2,582	2,585
(17)		CT	GWh	214	214	190	191	192	193	194	193	193	194	194	195
(18)		Diesel	GWh	0	0	0	0	0	0	0	0	0	0	0	0
(19)	Hydro		GWh	0	0	0	0	0	0	0	0	0	0	0	0
(20)	Economy Interchange[1]		GWh	(269)	(409)	(21)	(26)	(29)	(33)	(32)	(31)	(29)	(30)	(30)	(35)
(21)	Renewables		GWh	114	107	116	116	115	115	114	114	113	112	112	111
(22)	Net Energy for Load		GWh	2,765	2,753	2,807	2,816	2,831	2,838	2,848	2,844	2,846	2,848	2,858	2,856

[1] Negative values reflect power sales to address generator minimum load thresholds.

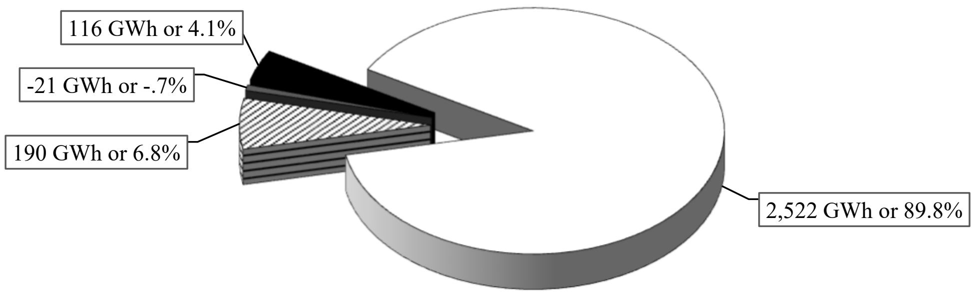
City Of Tallahassee

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 2022	Actual 2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
(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	0.1	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	0.1	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	%	105.6	110.9	96.6	96.8	97.0	97.1	97.1	97.1	97.0	97.1	97.1	97.3
(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	%	97.8	103.1	89.8	90.0	90.2	90.3	90.3	90.3	90.3	90.3	90.3	90.5
(17)		CT	%	7.7	7.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
(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		%	0.0	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		%	(9.7)	(14.9)	(0.7)	(0.9)	(1.0)	(1.2)	(1.1)	(1.1)	(1.0)	(1.1)	(1.0)	(1.2)
(21)	Renewables		%	4.1	3.9	4.1	4.1	4.1	4.1	4.0	4.0	4.0	3.9	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

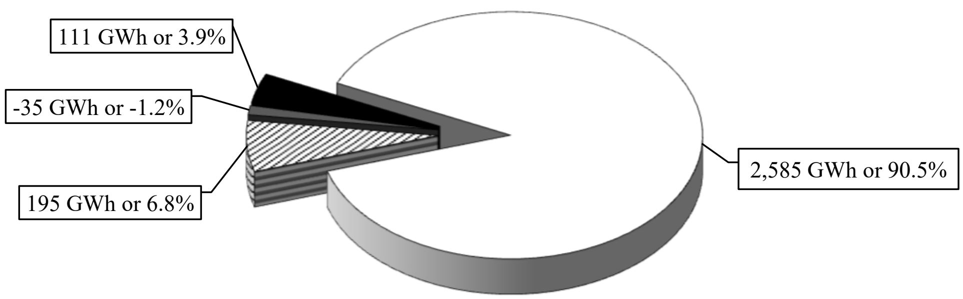
Generation By Resource/Fuel Type

Calendar Year 2024



2024 Total NEL = 2,807 GWh

Calendar Year 2033



2033 Total NEL = 2,856 GWh

CC-Gas CT/Diesel-Gas Net Interchange Renewables

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, including the City's Clean Energy Plan (CEP) published in 2023. 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 hinge 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 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 its Substation 12. This substation has a single transmission feed. The addition of this generation at the substation allows 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 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.
- The CO_2 emissions from the RICE generators are much lower than the units that have been retired.

3.2.4 POWER SUPPLY DIVERSITY

Resource diversity, and particularly fuel diversity, 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 historical and current 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 is also 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 is 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.

Variability of load and fuel diversity concerns both suggest battery energy storage systems (BESS) to be a viable planning resource. The City anticipates the addition of BESS within the 10-yr planning horizon, which among other things will contribute to net summer peak capability and therefore reserve margin.

The City's power supply primarily 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). The City has evaluated supplemental probabilistic metrics 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 indicate that there are risks of potential load and resource misalignment during periods other than at the time of the system peak demand. Occasionally, overnight and mid-morning loads are too low for both combined cycle generators to remain on, while the daily peak exceeds what a single unit can provide. Therefore, the City takes this additional issue into consideration.

Purchase contracts could 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 Florida market reflects, as with the City's generation fleet, natural gas-fired generation on the margin most 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 load and resource misalignment, planning staff investigated options for a significantly enhanced DSM portfolio to include an increase in load shifting or load shaping programs. However, as these programs rely on enrolling and sustaining significant customer participation, they may not suffice by themselves. Dispatchable battery energy storage is being evaluated to provide load shaping services for the overnight low load condition as well as peak day contribution in an N-1 event.

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 stated in Section 1.1, the City receives power from two solar farms under PPAs, the 20MW Solar Farm 1, and the 42MW Solar Farm 4, both located at the Tallahassee International Airport. One of the potential negatives of having both projects located adjacent to each other is lack of geographic diversity – with the potential that both systems will experience cloud cover at the same time. The intermittent nature of solar PV coupled with the high variability of FSU's National High Magnetic Field Laboratory 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. Reciprocating engine generators were commissioned in 2019 and 2020 to help mitigate the intermittency while contributing to the ongoing modernization of the City's generation fleet and providing summer peak capacity.

The City commissioned a study to determine the impacts of additional utility-scale renewable resources being added to the City's system. The study was completed in 2019 and 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. With the determined maximum amount of intermittent resources already installed on the system, the focus of the City will be on implementing battery energy storage to mitigate risks of current and near future expansions in the City's portfolio of solar PV. On August 23, 2023, the City Commission adopted a Clean Energy Plan (CEP) to transition the community to 100% net, clean, renewable energy in both buildings and transportation. The CEP reflects the City's continued commitment to sustainability and established a number of interim goals, including adding 120-200 MWs of renewable supply capacity by 2030, along with increased DSM and electrification efforts throughout the community. Other notable goals include:

- 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.

As of the end of calendar year 2023 the City has a portfolio of 223 kW_{ac} of solar PV and a cumulative total of 13MW_{ac} of solar PV has been installed by customers. The City's Solar PV Net Metering program promotes customer investment in renewable energy generation by allowing residential and commercial customers to return excess generated power to the City at the full retail value.

3.2.6 FUTURE POWER SUPPLY RESOURCES

The City's 2024 Ten Year Site Plan identifies that no additional power supply resources will be needed to meet forecasted capacity and reserve needs through the 2033 horizon year; however, the City will continue to consider the addition of renewable supply resources to offset fossil fuel use consistent with its 2023 Clean Energy Plan goals.

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. 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 for the sole sake of meeting forecasted capacity and reserve needs through 2033 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 2024 through 2033.

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
2024	725	0	0	12	737	599	138	23	0	138	23
2025	725	0	0	12	737	602	135	22	0	135	22
2026	725	0	0	12	737	605	132	22	0	132	22
2027	725	0	0	12	737	606	131	22	0	131	22
2028	725	0	0	12	737	606	131	22	0	131	22
2029	725	0	0	12	737	606	131	22	0	131	22
2030	725	0	0	12	737	604	133	22	0	133	22
2031	725	0	0	12	737	602	135	22	0	135	22
2032	725	0	0	12	737	600	137	23	0	137	23
2033	725	0	0	12	737	598	139	23	0	139	23

[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
2024/25	795	0	0	0	795	564	231	41	0	231	41
2025/26	795	0	0	0	795	568	227	40	0	227	40
2026/27	795	0	0	0	795	570	225	39	0	225	39
2027/28	795	0	0	0	795	572	223	39	0	223	39
2028/29	795	0	0	0	795	572	223	39	0	223	39
2029/30	795	0	0	0	795	573	222	39	0	222	39
2030/31	795	0	0	0	795	574	221	39	0	221	39
2031/32	795	0	0	0	795	574	221	39	0	221	39
2032/33	795	0	0	0	795	575	220	38	0	220	38
2033/34	795	0	0	0	795	578	217	38	0	217	38

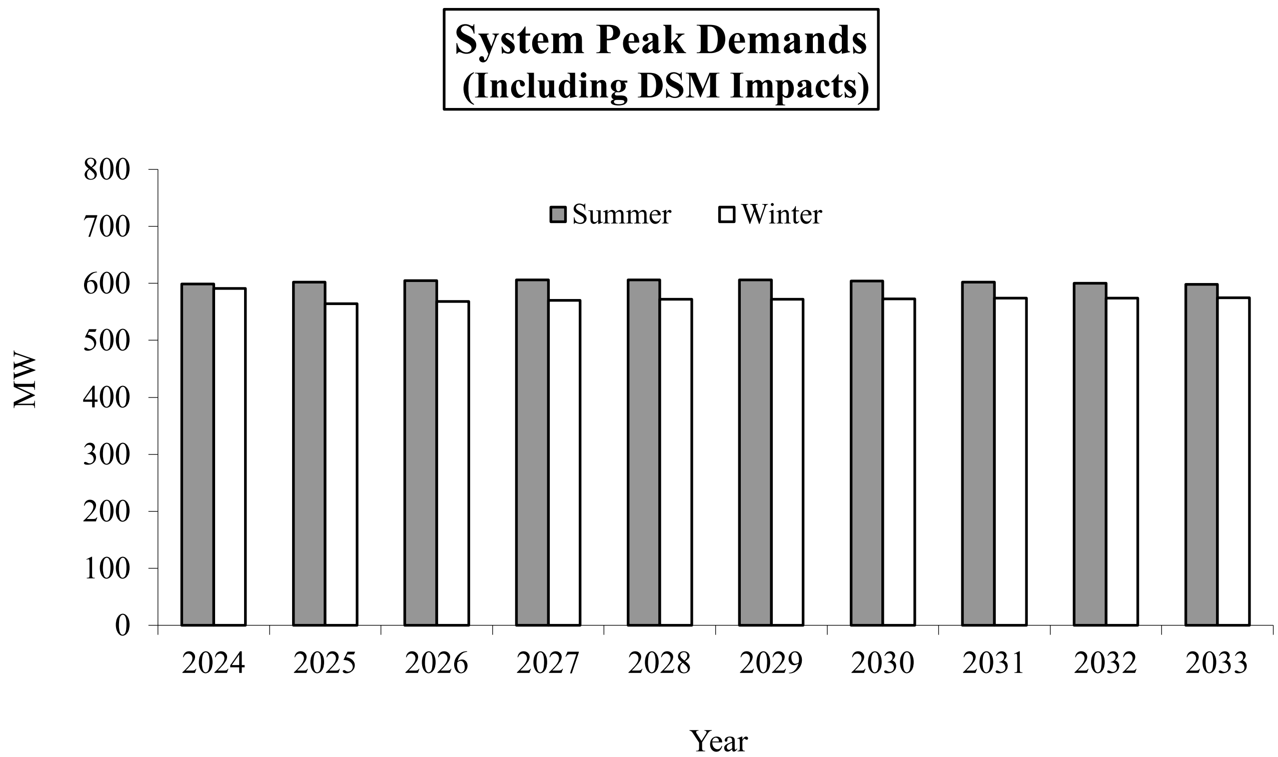
[1] All installed and firm import capacity changes are identified in the proposed generation expansion plan (Table 3.4).

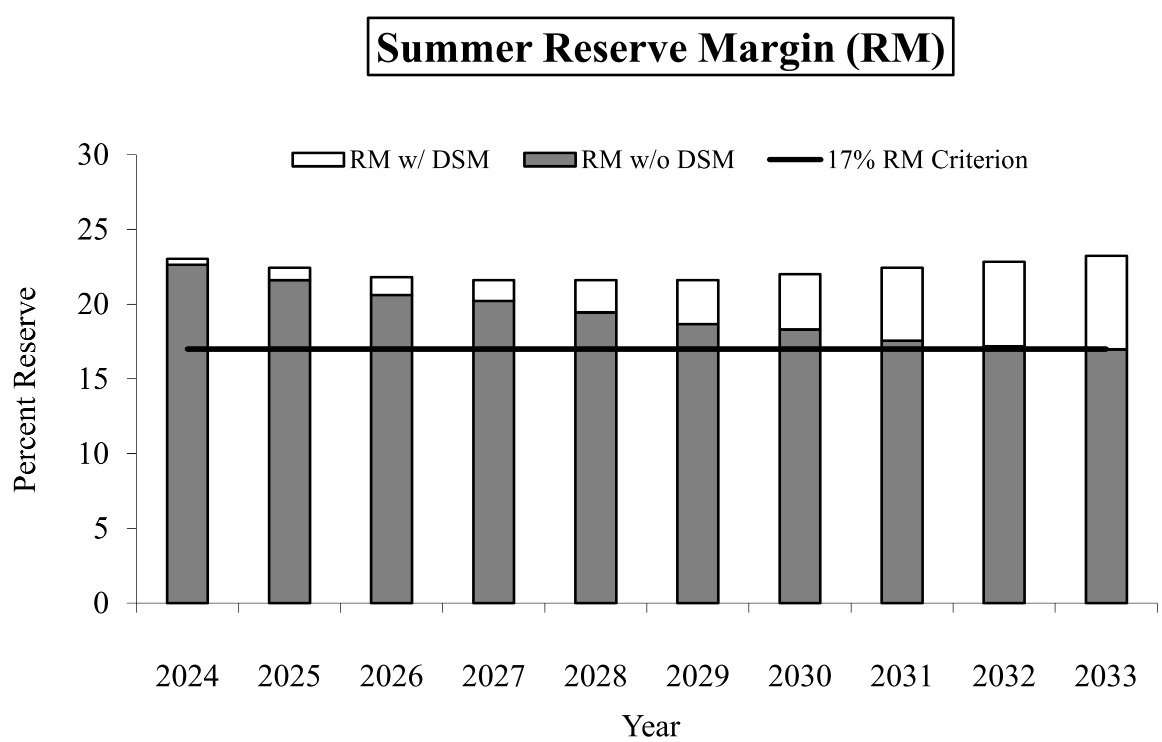
City Of Tallahassee

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)
800
700
600
500
400
300
200
100
0
MW
Summer
Winter
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
Year


Summer Reserve Margin (RM)
30
25
20
15
10
5
0
Percent Reserve
RM w/ DSM
RM w/o DSM
17% RM Criterion
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
Year

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 %
2024	601	1	599	737	0	0	0	737	23
2025	606	2	602	737	0	0	0	737	22
2026	611	5	605	737	0	0	0	737	22
2027	613	7	606	737	0	0	0	737	22
2028	617	11	606	737	0	0	0	737	22
2029	621	13	606	737	0	0	0	737	22
2030	623	18	604	737	0	0	0	737	22
2031	627	24	602	737	0	0	0	737	22
2032	629	28	600	737	0	0	0	737	23
2033	630	33	598	737	0	0	0	737	23

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

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 2024-2033 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, including the renewable energy needs identified in the 2023 Clean Energy Plan.

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.

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 2025 is currently ongoing, and any revisions to project budgets in the electric utility will not be finalized until the summer of 2024. 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, 2024-2033

Project Type	Project Name	From Bus Name	From Bus Number	To Bus Name	To Bus Number	Expected In-Service Date	Voltage (kV)	Line Length (miles)
Reconductor / Rebuild	Line 20A	Sub 7	7507	Sub 16	7516	12/2025	115	3.03
Reconductor / Rebuild	Line 20B	Sub 16	7516	Bradfordville W (DEF)	3105	12/2025	115	3.08
Reconductor / Rebuild	Line 5	Hopkins Plant (115 KV)	7550	Sub 3	7503	12/2026	115	6.7
Reconductor / Rebuild	Line 6A	Hopkins Plant (115 KV)	7550	Sub 23	7523	12/2026	115	3.49

Figure D-1 – Hopkins Plant Site

Figure D-2 – Purdom Plant Site