State of Florida

Public Service Commission

CAPITAL CIRCLE OFFICE CENTER • 2540 SHUMARD OAK BOULEVARD
TALLAHASSEE, FLORIDA 32399-0850

-M-E-M-O-R-A-N-D-U-M-

DATE: May 20, 2019

TO: Adam Teitzman, Commission Clerk, Office of Commission Clerk

FROM: Doug Wright, Engineering Specialist, Division of Engineering DW

RE: Docket No. 20190000-OT - Undocketed filings for 2019.

Please file the attached, "JEA Corrected Question #7 - Responses to Ten-Year Site Plan Supplemental Data Request #1," in the above mentioned docket file.

Thank you.

DW/pz

Attachment

Patti Zellner

From:	Landaeta Gutierrez, Stephany <landsg@jea.com>
Sent:	Monday, May 20, 2019 1:26 PM
To:	Patti Zellner
Cc:	Doug Wright; Moran, Mary L. - Mgr Electric Generation Planning
Subject:	RE: DN 20190000-OT (Undocketed filings for 2019) Ten-Year Site Plan - Response Deadline Change (May 15, 2019) - Staff's Supplemental Data Request #1
Attachments:	Data Request #1.pdf; Data Request #1 - FINAL 02-01-2019.doc

Patti,

Please see attached. I have corrected question #7 as I didn't include the FEECA Docket number in the previous submission. (DOCKET NO. 20190020-EG (JEA))

Thank you,
Stephany Landaeta

From: Landaeta Gutierrez, Stephany
Sent: Wednesday, May 15, 2019 2:13 PM
To: 'Patti Zellner' <PZELLNER@PSC.STATE.FL.US>
Cc: Doug Wright <dwright@psc.state.fl.us>; Moran, Mary L. - Mgr Electric Generation Planning <GuytML@jea.com>
Subject: RE: DN 20190000-OT (Undocketed filings for 2019) Ten-Year Site Plan - Response Deadline Change (May 15, 2019) - Staff's Supplemental Data Request #1

Attached please find the 2019 TYSP –Supplemental Data Request #1

Thank you,
Stephany Landaeta

From: Patti Zellner <PZELLNER@PSC.STATE.FL.US>
Sent: Wednesday, February 6, 2019 11:46 AM
To: Patti Zellner <PZELLNER@PSC.STATE.FL.US>
Cc: Doug Wright <dwright@psc.state.fl.us>; Phillip Ellis <PEllis@PSC.STATE.FL.US>; Laura King <LKing@PSC.STATE.FL.US>; Jeff Doehling <JDOEHLIN@psc.state.fl.us>
Subject: DN 20190000-OT (Undocketed filings for 2019) Ten-Year Site Plan - Response Deadline Change (May 15, 2019) - Staff's Supplemental Data Request #1
Importance: High

[External Email - Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email.]

Sent on behalf of Doug Wright, Engineering Specialist, Florida Public Service Commission, Division of Engineering:

Good Morning,

In response to feedback from Ten-Year Site Plan (TYSP) utilities, we have revised the response deadline for the **2019 TYSP - Supplemental Data Request #1** to **May 15, 2019**.

Thank you for your continued cooperation.

Douglas Wright
Florida Public Service Commission
Division of Engineering
2540 Shumard Oak Blvd.
Tallahassee, FL 32399
Office: (850) 413-6682
Fax: (850) 413-6683

Sincerely,

Patti Zellner
Administrative Assistant
Division of Engineering
Phone: (850) 413-6208
Fax: (850) 413-6209
Email: **pzellner@psc.state.fl.us**

General Items

1. **Please provide an electronic copy of the Company's 2019–2028 Ten-Year Site Plan (2019 TYSP) in PDF format and the accompanying Schedules 1–10 in Microsoft Excel format.**
   Provided in April 1, 2019 TYSP filing to the Commission Clerk.

2. **Please provide all data requested in the attached forms labeled "Appendix A." If any of the requested data is already included in the Company's 2019 TYSP, state so on the appropriate form.**

   Appendix A data included

Load & Demand Forecasting

3. **[Investor-Owned Utilities Only] Please provide, on a system-wide basis, the hourly system load for the period January 1, 2018, through December 31, 2018, in Microsoft Excel format.**

   N/A

4. Please provide the monthly peak demand experienced in the period 2016–2018, 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.

Historic Peak Demand Timing & Temperature

Year	Month	Actual Peak Demand (MW)	Demand Response Activated (MW)	Estimated Peak Demand (MW)	Day	Hour	System-Average Temperature (Degrees F)
2018	1	3,080	0	3,080	8	8:00	39
	2	1,956	0	1,956	1	8:00	55
	3	2,000	0	2,000	15	8:00	50
	4	1,819	0	1,819	3	17:00	73
	5	2,242	0	2,242	31	17:00	81
	6	2,511	0	2,511	4	17:00	84
	7	2,535	0	2,535	13	16:00	85
	8	2,557	0	2,557	8	15:00	87
	9	2,556	0	2,556	19	16:00	84
	10	2,354	0	2,354	17	17:00	85
	11	2,144	0	2,144	28	8:00	44
	12	2,367	0	2,367	12	8:00	47
2017	1	2,480	0	2,480	9	8:00	32
	2	1,770	0	1,770	17	8:00	38
	3	2,282	0	2,282	16	8:00	34
	4	2,325	0	2,325	28	17:00	88
	5	2,421	0	2,421	30	16:00	73
	6	2,507	0	2,507	23	17:00	90
	7	2,637	0	2,637	5	17:00	92
	8	2,682	0	2,682	16	17:00	95
	9	2,455	0	2,455	27	17:00	87
	10	2,386	0	2,386	10	16:00	87
	11	1,790	0	1,790	7	16:00	85
	12	2,378	0	2,378	11	8:00	34
2016	1	2,674	0	2,674	20	8:00	30
	2	2,575	0	2,575	11	8:00	31
	3	1,928	0	1,928	31	18:00	83
	4	2,192	0	2,192	29	17:00	85
	5	2,310	0	2,310	31	15:00	83
	6	2,743	0	2,743	14	17:00	86
	7	2,763	0	2,763	7	17:00	98
	8	2,672	0	2,672	22	17:00	92
	9	2,450	0	2,450	19	17:00	85
	10	2,137	0	2,137	3	17:00	80
	11	1,813	0	1,813	22	8:00	43
	12	1,891	0	1,891	31	8:00	34

Notes

*Temperature at time of Peak

5. **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.**

   JEA utilizes NOAA Weather Station: Jacksonville International Airport (13889/JAX).

6. **Please explain how the Company's load and demand forecasting used in its 2019 TYSP was developed. In your response please include the following information: methodology, assumptions, data sources, third-party consultant(s) involved, and any difference/improvement made compared with the load and demand forecasting used in the Company's 2018 Ten-Year Site Plan.**

   JEA uses National Oceanic and Atmospheric Administration (NOAA) Weather Station - Jacksonville International Airport for the weather parameters, Moody's Analytics (Moody) economic parameters for Duval County, JEA's Data Warehouse to determine the total number of Residential accounts and CBRE Jacksonville for Commercial and Industrial total inventory square footages. JEA develops its annual forecast using SAS and Microsoft Office Excel.

   JEA's Fiscal Year 2019 baseline forecast uses 10-years of historical data. Using the shorter periods allows JEA to capture the more recent trends in customer behavior, energy efficiency and conservation, where these trends are captured in the actual data and used to forecast projections.

   JEA begins this forecast process by weather normalizing energy for each customer class. JEA uses NOAA Weather Station - Jacksonville International Airport for historical weather data. JEA develops the normal weather using 10-year historical average heating/cooling degree days and maximum/minimum temperatures. Normal months, with heating/cooling degree days and maximum/minimum temperatures that are closest to the averages, are then selected. JEA updates its normal weather every 5 years or more frequently, if needed.

   The residential energy forecast was developed using multiple regression analysis of weather normalized historical residential energy, Total Population, Median Household Income, Total Housing Starts from Moody's Analytics, JEA's total residential accounts and JEA's residential electric rate.

   The commercial energy forecast was developed using multiple regression analysis of weather normalized historical commercial energy, commercial inventory square footage, total commercial employment, gross product and JEA's commercial electric rate.

   The industrial energy forecast was developed using multiple regression analysis of weather normalized historical industrial energy, total industrial employment, proprietors' profit and total retail sales product for existing industrial accounts. JEA then layers in the estimated energy for new industrial customers on the forecasted industrial energy.

The lighting energy forecast was developed using the historical actual energy, number of luminaries and JEA's estimated High Pressure Sodium (HPS) to Light-Emitting Diode (LED) street light conversion schedule. The LEDs are estimated to use 45% less energy than the HPS street lights. JEA developed the forecasted number of luminaries using regression analysis of the number of JEA customers. The forecasted lighting energy was calculated using the forecasted number of luminaries, applied with the remaining HPS to LED street light conversions with all new street light additions as LED only.

JEA's forecasted AAGR for net energy for load during the TYSP period is 0.57 percent,

JEA normalizes its historical seasonal peaks using historical maximum and minimum temperatures, 24°F as the normal temperature for the winter peak and 97°F for the summer peak. JEA then develops the seasonal peak forecasts using multiple regression analysis of normalized historical seasonal peaks, normalized historical and forecasted residential, commercial and industrial energy for Winter/Summer peak months, heating degree hour for the 72 hours leading to winter peak and cooling degree hours for the 48 hours leading to summer peak. JEA's forecasted Average Annual Growth Rate (AAGR) for total peak demand during the TYSP period is 0.55 percent for summer and 0.75 percent for winter.

7. **Please identify all closed and opened FPSC dockets and all non-docketed FPSC matters which were/are based on the same load forecast used in the Company's 2019 TYSP.**

FEECA docket number: DOCKET NO. 20190020-EG (JEA) is based on the load forecast used in JEA's 2019 TYSP.

8. **[Investor-Owned Utilities Only] Does your Company review the accuracy of its customer, load, and demand forecasts presented in its TYSP by comparing the actual data for a given year to the data forecasted one, two, three, four, five, or six years prior?**
    a. **If the response is affirmative, please explain the method used in such review.**
    b. **If the response is affirmative, please provide the results of such review for each forecast presented in the TYSPs filed, or to be filed, to the Commission from 2001 to 2019 with supporting work papers in Microsoft Excel format.**
    c. **If the response is negative, please explain why not.**

N/A

9. **Please explain any recent and forecasted trends in customer growth, by customer type (residential, commercial, industrial) and as a whole.**

JEA continues to witness housing market improvement as home vacancy rate continues to decline and vacant homes inventory continues to reduce as homes median sale price has fallen within affordable range ($135,000-$155,000) for first time homebuyers. However, Moody's Analytics forecast for new constructions of single-family and multi-family homes are lower as compared to previous forecasts. JEA's 2019 forecasted total consumption for Residential customers is 0.69% for 2019 compared to 0.59% for 2018 forecast for the ten year period.

JEA continues to witness improvement in vacancy rate for commercial offices and retail spaces. New constructions and re-occupancies of commercial offices and retails continue to increase around the newly completed or growing residential areas. JEA expects this trend to continue as Moody's Analytics continues to show strong forecast in gross product and commercial type employment. JEA's 2019 forecasted total consumption for Commercial customers is 0.68% for 2019 compared to 0.53% for 2018 forecast for the ten year period.

JEA's 2019 forecasted Net Energy for Load (NEL) annual average growth rate (AAGR) is 0.74% compared to 0.58% in the 2018 forecast.

10. Please explain any recent and forecasted trends in electricity use per customer, by customer type (residential, commercial, industrial) and as a whole.

JEA funded demand-side management programs are one of the contributors to the decrease in annual use per residential customer. JEA offers energy audit programs to audit customers' homes and provide them with education and recommendations on low-cost or no-cost energy-saving practices and measures. Financial incentives are offered to residential customers, builders and developers on energy efficient lightings, solar water heating technologies, solar net metering, energy efficient construction and other energy efficient products in homes. The amount of estimated energy savings annually can be found in JEA's TYSP, Schedules 3.1 - 3.3.

Several other factors contribute to the declining trend in average kWh/customer. Customer behavioral changes as result of the 2008 economic downturn and increasing electric rates contribute to the continuous decline. Although the economy is on a slow recovery and electric rates have remained the same for the last 5 years, JEA does not expect this behavior to change. Also, JEA continues to observe more multifamily housing constructions compared to single-family housing, which use less energy per customer. JEA expects this trend toward multifamily housing construction to continue throughout the TYSP forecast period.

JEA expects that the US Government's SEER Requirement Changes for 2015, that requires new split system central air conditioners to be a minimum 14 SEER, to continue to contribute to the decrease in use, as customers replace their old units with more energy efficient units that comply with or exceed the standard, and as new construction complies with the standard.

Similar to JEA's offerings to residential customers, JEA offers energy audit programs to audit commercial and industrial customers' businesses and provides education and recommendations on low-cost or no-cost energy-saving practices and measures. JEA offers financial incentives to commercial customers on energy efficient lighting, solar net metering and other energy efficient products.

JEA has worked with a few existing large industrial customers to consolidate multiple accounts into single or fewer accounts with special rates. Industrial customers, such as

Amazon, opened new facilities but attached them to their existing account. As a result of this, average industrial kWh/customer appeared to be increasing.

JEA is also working with a few large industrial customers to look into distributed generation (DG). However, JEA's 2019 TYSP forecast for industrial customers does not include the impact from DG. DG can have a significant impact on the average industrial kWh/customer in the future.

11. Please explain any recent and forecasted trends in peak demand by the sources of peak demand appearing in Schedule 3.1 of the 2019 TYSP.

JEA's peak forecast is developed by trending with the forecasted energy for summer/winter peak months. The forecast trend is discussed in question 9 above. JEA's 2019 summer total peak forecast AAGR is the same as 2018 at 0.55%. The 2019 winter total peak forecast AAGR is 0.75% compared with 0.78% in last year's forecasted AAGR.

12. [Investor-Owned Utilities Only] If not included in the Company's 2019 TYSP to be filed by April 1, 2019, 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.**

N/A

13. Please discuss whether the Company included plug-in electric vehicle (PEV) loads in its demand and energy forecasts for the 2019 TYSP. If so, how were these impacts accounted for in the modeling and forecasting process?

JEA included Plug-in Electric Vehicle (PEV) in the forecast used for this TYSP. JEA's forecasted PEV summer demand and energy by 2028 is 0.28% and 0.29%, respectively, of JEA total summer demand and net energy for load. JEA will continue to monitor PEV technology and its impact on JEA's load forecast.

14. **Please discuss 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.**

The PEVs demand and energy forecasts are developed using the historical number of PEVs in Duval County obtained from Florida Department of Highway Safety and Motor Vehicles (DHSMV) and the historical number of vehicles in Duval County from the U.S. Census Bureau.

JEA forecasted the numbers of vehicles in Duval County using multiple regression analysis of historical and forecasted Duval Population, Median Household Income and Number of Households from Moody's Analytics. The forecasted number of PEVs is modeled using multiple regression analysis of the number of vehicles and the average motor gasoline price from the U.S. Energy Information Administration (EIA) Annual Energy Outlook (AEO).

The usable battery capacity (70% of battery capacity) per vehicle was determined based on the current plug-in vehicle models in Duval County, such as BMW, General Motors' Chevrolet and Cadillac, Honda, Fisker, Ford, Mitsubishi, Nissan, Porsche, Tesla, Toyota and Volvo. The average usable battery capacity per PEV is calculated using the average usable battery capacity of each vehicle brand and then assumes the annual growth of usable battery capacity per PEV by using historical 5 years average growth of 0.69 kWh. Similarly, the peak capacity is determined based on the average on-board charging rate of each vehicle brand and the forecast peak capacity per PEV grows by 0.28 kW per year.

JEA developed the PEVs daily charge pattern based on the U.S. Census 2013 American Community Survey (ACS-13) for time of arrival to work and travel time to work for Duval County. The baseline forecast assumed that charging will be once every other day and uncontrolled; charging starts immediately upon arriving home.

The PEVs peak demand forecast is developed using the on-board charge rate for each model, the PEVs daily charge pattern and the total number of PEVs each year. The PEV energy forecast is developed simply by summing the hourly peak demand for each year.

15. **Please include the following information within the Utility's service territory: an estimate of the number of PEVs, an estimate of the number of public PEV charging stations, an estimate of the number of public "quick-charge" PEV charging stations (i.e., charging stations requiring a service drop greater than 240 volts and/or using three-phase power), and the estimated demand and energy impacts of the PEVs by year. As part of this response, please provide an electronic version of the table below in Microsoft Excel format.**

Electric Vehicle Charging Impacts

Year	Number of PEVs	Number of Public PEV Charging Stations	Number of Public "Quick-charge" PEV Charging Stations	Cumulative Impact of PEVs		
				Summer Demand	Winter Demand	Annual Energy
				(MW)	(MW)	(GWh)
2018	1,229	59	12			
2019	1,601	82		1	0	6.719
2020	2,029	101		2	0	8.580
2021	2,507	122		2	0	10.689
2022	3,037	145		2	1	13.049
2023	3,622	171		3	1	15.680
2024	4,262	199		4	1	18.579
2025	4,956	229		4	1	21.753
2026	5,707	261		5	1	25.215
2027	6,517	296		6	2	28.978
2028	7,390	333		7	2	33.058

Notes:
1) Number of public PEVs includes quick charge stations.
2) Number of EVs in Duval County from Florida Department of Highway Safety and Motor Vehicles (DHSMV).
3) Number of public charging stations from PlugShare.com for stations installed by Business and Government
4) Coincidental EVs Summer/Winter Peak Demand at time of JEA System Summer/Winter Peak.

16. 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 2019–2028 period.

JEA offers rebates for the purchase of plug-in electric vehicles, $500 for a battery less than 15 kWh and $1,000 for 15 kWh and higher. At this time, JEA does not have any new or additional programs or tariffs planned within the 2019–2028 period.

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

Not at this time.

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.

Not at this time.

17. Please describe how the Company monitors the installation of PEV public charging stations in its service area?

JEA monitors charging stations through application web sites such as DOE, PlugShare and Chargepoint. Per PlugShare, there are 69 public charging stations ranging between Level 1 to Supercharger within JEA's service area. Included are 19 "DC Fast" electric vehicle charging stations as shown in the table below.

Name	Address	Type
Fuccillo Nissan of Orange Park	7447 Blanding Blvd, Jax, FL 32244	CHAdeMO
BMW of North America	8558 Westside Industrial Dr, Jax, FL 32219	CCS/SAE
Coggin Nissan	10600 Atlantic Blvd, Jax, FL 32225	CHAdeMO
Coggin Nissan At The Avenues	10859 Philips Hwy, Jax, FL 32256	CHAdeMO
Community First Credit Union	13910 Village Lake Cir Jax, FL 32258	CHAdeMO, CCS/SAE
Doubletree Jacksonville Airport	2101 Dixie Clipper Dr, Jax, FL 32218	CHAdeMO, CCS/SAE
Dunkin' Donuts	741 Cassat Avenue, Jax, FL 32205	CHAdeMO, CCS/SAE
Gate Gas Station	4123 Town Center Pkwy Jax, FL 32246	CHAdeMO, CCS/SAE
JEA	21 West Church Street Jax, FL 32202	CHAdeMO, CCS/SAE
River City Marketplace	13000 City Station Dr, Jax, FL 32218	CHAdeMO, CCS/SAE
Tom Bush BMW	9875 Atlantic Blvd, Jax, FL 32225	CCS/SAE
Jacksonville Supercharge	4866 Gate Parkway, Jax, FL, 32466	8 Supercharger

18. Please describe any instances since January 1, 2018, in which upgrades to the distribution system were made where PEVs were a contributing factor.

At this time, no upgrades to the JEA's distribution system have been completed due to the PEVs. JEA does not foresee any significant impact on the distribution system based on current PEV projections. JEA's existing facilities are capable of handling the PEV demand within the TYSP period.

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

None to date.

20. What processes or technologies, if any, are in place that allow the Utility to be notified when a customer has established an electrical vehicle charging station in the home?

No processes or technologies are in place at this time

21. [FEECA Utilities Only] For each source of demand response, use the table below to provide the customer participation information listed on an annual basis. Please also provide a summary of all sources of demand response using the chart below. As part of this response, please provide an electronic version of the table below in Microsoft Excel format.

[Demand Response Source or All Demand Response Sources]										
Year	Beginning Year: Number of Customers	Available Capacity (MW)		New Customers Added	Added Capacity (MW)		Customers Lost	Lost Capacity (MW)		
		Sum	Win		Sum	Win		Sum	Win	
2009	Not Applicable (See Note)									
2010										
2011										
2012										
2013										
2014										
2015										
2016										
2017										
2018										
Notes										
JEA has no demand response programs; therefore, there was no participation.										

22. **[FEECA Utilities Only] For each source of demand response, use the table below to provide the usage information listed on an annual basis. Please also provide a summary of all demand response using the chart below. As part of this response, please provide an electronic version of the table below in Microsoft Excel format.**

[Demand Response Source or All Demand Response Sources]										
Year	Summer					Winter				
	Number of Events	Average Event Size		Maximum Event Size		Number of Events	Average Event Size		Maximum Event Size	
		(MW)	Number of Customers	(MW)	Number of Customers		(MW)	Number of Customers	(MW)	Number of Customers
2009	Not Applicable (See Note)									
2010										
2011										
2012										
2013										
2014										
2015										
2016										
2017										
2018										
Notes										
JEA has no demand response programs; therefore, there was no participation										

23. [FEECA Utilities Only] For each source of demand response, use the table below to provide the seasonal peak activation information listed on an annual basis. Please also provide a summary of all demand response using the chart below. As part of this response, please provide an electronic version of the table below in Microsoft Excel format.

[Demand Response Source or All Demand Response Sources]							
Year	Average Number of Customers	Summer Peak			Winter Peak		
		Activated During Peak? (Y/N)	Number of Customers Activated	Capacity Activated (MW)	Activated During Peak? (Y/N)	Number of Customers Activated	Capacity Activated (MW)
2009	Not Applicable (see Note)						
2010							
2011							
2012							
2013							
2014							
2015							
2016							
2017							
2018							
Notes							
JEA has no demand response programs; therefore, there was no participation.							

Generation & Transmission

24. Please identify and describe each existing utility-owned renewable resource as of December 31, 2018, that delivered energy during the year. Please include the facility's name, unit type, fuel type, its installed capacity (AC-rating for photovoltaic (PV) systems), its net firm capacity or contribution during peak demand (if any), capacity factor for 2018 based off of the installed capacity, and its in-service date. For multiple small distributed renewable resources (<250 kW per installation), such as rooftop solar panels, please include a single combined entry for the resources that share the same unit & fuel type. As part of this response, please provide an electronic version of the table below in Microsoft Excel format.

Existing Utility-Owned Renewable Resources

Facility Name	Unit Type	Fuel Type	Installed Capacity (MW)		Net Firm Capacity (MW)		Capacity Factor	In-Service Date
			Sum	Win	Sum	Win	(%)	(MM/YYYY)
NONE								
Notes								

25. Please identify and describe each planned utility-owned renewable resource for the period 2019–2028. Please include each proposed facility's name, unit type, fuel type, its installed capacity (AC-rating for PV systems), its net firm capacity or anticipated contribution during peak demand (if any), anticipated typical capacity factor, and projected in-service date. For multiple small distributed renewable resources (<250 kW per installation), such as rooftop solar panels, please include a single combined entry for the resources that share the same unit & fuel type. As part of this response, please provide an electronic version of the table below in Microsoft Excel format.

Planned Utility-Owned Renewable Resources

Facility Name	Unit Type	Fuel Type	Installed Capacity (MW)		Net Firm Capacity (MW)		Capacity Factor	In-Service Date
			Sum	Win	Sum	Win	(%)	(MM/YYYY)
NONE								
Notes								

26. Please refer to the list of planned utility-owned renewable resources for the period 2019–2028 above. Discuss the current status of each project.

JEA has no planned utility-owned renewable resources.

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

JEA has no planned utility-owned renewable resources.

28. Please identify and describe each purchased power agreement with a renewable generator that delivered energy during 2018. Provide the name of the seller, the name of the generation facility associated with the contract, the unit type of the facility, the fuel type, the facility's installed capacity (AC-rating for PV systems), the amount of contracted firm capacity (if any), and the start and end dates of the purchased power agreement.

Existing Renewable Purchased Power Agreements

Seller Name	Facility Name	Unit Type	Fuel Type	Installed [1,2] Capacity (MW)		Contract Capacity (MW)		In-Service Date	Contract Term (MM/YY)	
				Sum	Win	Sum	Win	(MM/YY)	Start	End
NPPD [3]	Ainsworth Wind Energy Facility	Wind	Wind	10	10	10	10		Jan-18	Dec-18
LES	Trail Ridge I	IC	Methane	9.1	9.1	9.1	9.1	Dec-18	Dec-18	Dec-18
LES	Trail Ridge II	IC	Methane	6	6	6	6		Feb-18	Dec-18
PSEG	Jacksonville Solar	Solar	SUN	12	12	0	0	Sep-18	Sep-18	Sep-40
Northwest Jacksonville Solar Partners, LLC	NW JAX Solar	Solar PV	SUN	7	7	0	0	May-18	May-18	May-42
Old Plank Road Solar Farm LLC	Old Plank Road Solar	Solar PV	SUN	3	3	0	0	Oct-18	Oct-18	Oct-37
Inman Solar Incorporated	Starratt Solar	Solar PV	SUN	5	5	0	0	Dec-18	Dec-18	Dec-37
Inman Solar Incorporated	Simmons Road Solar	Solar PV	SUN	2	2	0	0	Jan-18	Jan-18	Jan-38
Hecate Energy, LLC	Blair Site Solar	Solar PV	SUN	4	4	0	0	Jan-18	Jan-18	Jan-38
JAX Solar Developers, LLC	Old Kings Road Solar	Solar PV	SUN	1	1	0	0	Oct-18	Oct-18	Oct-38

Notes

(1) Installed Capacity: JEA contracted capacity.
(2) Solar Capacity is based on AC rating.
(3) Power not delivered to JEA; Sold to 3rd party.

29. Please identify and describe each purchased power agreement with a renewable generator that is anticipated to begin delivering renewable energy to the Company during the period 2019–2028. Provide the name of the seller, the name of the generation facility associated with the contract, the unit type of the facility, the fuel type, the facility's installed capacity (AC-rating for PV systems), the amount of contracted firm capacity (if any), and the start and end dates of the purchased power agreement.

Renewable Purchased Power Agreements

Seller Name	Facility Name	Unit Type	Fuel Type	Installed Capacity (MW)		Contracted Firm Capacity (MW)		In-Service Date	Contract Term (MM/YY)	
				Sum	Win	Sum	Win	(MM/YY)	Start	End
Imeson Solar Farm, LLC	SunPort Solar	Solar PV	SUN	5	5	0	0	Oct-19	Oct-19	Oct-39
Cecil Commerce Solar Partners, LLC	Cecil Commerce Solar Center	Solar PV	SUN	50	50	0	0	Feb-21	Feb-21	Feb-45
Forest Trail Solar Partners, LLC	Forest Trail Solar Center	Solar PV	SUN	50	50	0	0	May-21	May-21	May-46
Deep Creek Solar Partners, LLC	Deep Creek Solar Center	Solar PV	SUN	50	50	0	0	Aug-21	Aug-21	Aug-46
Westlake Solar Partners, LLC	Westlake Solar Center	Solar PV	SUN	50	50	0	0	Oct-21	Oct-21	Oct-46
Beaver Street Solar Partners, LLC	Beaver Street Solar Center	Solar PV	SUN	50	50	0	0	Jan-22	Jan-22	Jan-47
Notes										
(1) Solar Capacity is based on AC rating. (2) Dates are tentative.										

30. Please refer to the list of renewable purchased power agreements that are anticipated to begin delivering capacity and/or energy to the Company during the period 2019–2028. Discuss the current status of each project.

The SunPort Solar Project is in the early construction phase. Cecil Commerce, Forest Trail, Deep Creek, Westlake, and Beaver Street Solar Centers are undergoing preliminary site preparation, such as wetlands delineation and survey completion.

31. Please list and discuss any renewable purchased power agreements within the past year that were cancelled, expired, delayed, or modified. What was the primary reason for the changes? What, if any, were the secondary reasons?

The SunPort Solar Project has been delayed to an October 2019 expected commercial operation date due to permitting delays.

32. Please provide the actual and projected annual output for all renewable resources on the Company's system, including utility-owned resources (firm, non-firm, and co-firing), purchases (firm, non-firm, and co-firing), and customer-owned generation, for the period 2019–2028.

Renewable Generation by Source

Renewable Source	Annual Renewable Generation (GWh)										
	Actual	Projected									
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Utility - Firm	0	0	0	0	0	0	0	0	0	0	0
Utility - Non-Firm	0	0	0	0	0	0	0	0	0	0	0
Utility - Co-Firing	0	0	0	0	0	0	0	0	0	0	0
Purchase - Firm	149	210.9	547.9	815.4	812.7	809.7	809	804.1	801.5	668.7	667.5
Purchase - Non-Firm	0	0	0	0	0	0	0	0	0	0	0
Purchase - Co-Firing	0	0	0	0	0	0	0	0	0	0	0
Customer - Owned	0	0	0	0	0	0	0	0	0	0	0
Total	149	210.9	547.9	815.4	812.7	809.7	809	804.1	801.5	668.7	667.5
Notes											
(Include Notes Here)											

33. Please complete the table below, providing a list of all of the Company's plant sites that are potential candidates for utility-scale (>2 MW) solar installations. As part of this response, please provide the plant site's name, approximate land area available for solar installations, potential installed capacity rating of a PV installation, and a description of any major obstacles that could affect utility-scale solar installations at any of these sites, such as land devoted to other uses or other requirements.

Candidate Sites - Solar

Plant Name	Land Available (Acres)	Installed Capacity (MW)	Potential Issues
NONE			

34. Please complete the table below, providing a list of all of the Company's plant sites that are potential candidates for utility-scale wind installations. As part of this response, please provide the plant site's name, approximate land area available, potential

installed capacity rating of a wind farm installation, and a description of any major obstacles that could affect utility-scale wind installations at any of these sites, such as land devoted to other uses or other requirements.

Candidate Sites - Wind

Plant Name	Land Available (Acres)	Installed Capacity (MW)	Potential Issues
NONE			

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

JEA recognizes that renewables and storage, will be playing key roles in energy production and distribution in the near future. Resultantly, JEA formulated the Battery Incentive Program (BIP) to encourage renewable energy adoption and act in concert with our Distributed Generation Policy. A rebate is provided for the purchase of a qualified battery energy storage system to those customers with approved renewable generation systems. Excess renewable generation produced by the customer can be used to charge the battery, allowing them to use the power later. This stored energy can then be used to offset consumption. Any energy sent to JEA, beyond what is stored in the battery, is credited at fuel rate. The program encourages customers to become more independent and efficient energy consumers.

36. [Investor-Owned Utilities Only] Please discuss whether the Company has been approached by renewable energy generators during 2018 regarding constructing new renewable energy resources. If so, please provide the number and a description of the type of renewable generation represented.

N/A.

37. 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.

JEA does not consider solar PV to contribute to either seasonal peaks.

38. Please identify whether a declining trend in costs of energy storage technologies has been observed by the Company.

JEA has observed market trends showing energy storage costs steadily declining in the last five years. Trends show more than 50% cost reduction in the past 5 years, with an anticipated ~30% decline in the next 5 years, with lithium ion technology being the leader. The electric vehicle market appears to be the driver for much of the cost reduction in lithium ion technologies.

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

JEA monitors trends for all chemistries of battery storage and maintains contact with non-lithium battery storage vendors. The emergence of flow batteries is of particular interest, as these systems can maneuver energy (long storage duration) and power (short storage duration) applications without need to alter system design, whereas lithium ion systems are typically designed for either power or energy applications. Flow battery manufacturer, ViZn Energy, has embarked on commercializing its systems abroad under a new joint venture.

40. 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.)

JEA is still undergoing internal discussions regarding optimal placement of energy storage technology on the system.

41. Please provide whether ratepayers have expressed interest in energy storage technologies. If so, how have their interests been addressed?

From March to May 2017, community solar stakeholders representing ratepayers recommended JEA to perform additional study on battery storage and to consider a battery rebate. In October 2017, the JEA Board of Directors approved the JEA Battery Incentive Program that will began April 1, 2018. Since April 2018, 44 JEA residential ratepayers applied for interconnection of solar PV plus energy storage systems. As of April 30, 2019, 29 projects have been completed and 15 are in process.

42. Please complete the table below, identifying 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. As part of this response, please identify the project to which the energy storage technology is associated with, whether this project is a pilot program or not, the in-service date or pilot start date associated with the energy storage technology, and the maximum capacity output and maximum energy stored of/by the energy storage technology under normal operating conditions.

Project Name	Pilot Program (Y/N)	In-Service/ Pilot Start Date	Max Capacity Output	Max Energy Stored (MHh)

			(MW)	
Lift Station Resiliency Project	Y	TBD	TBD	TBD
JEA Battery Incentive Program	N	April 1, 2018	0.212	0.316 (MWh)
Notes				

43. 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 next 10 years. If the Company is not currently participating in or developing energy storage pilot programs, has it considered doing so? If not, please explain.

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.

b. Please provide a brief assessment of how these benefits, risks, and operational limitations may change over the next 10 years.

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

JEA is currently considering a storage pilot project to provide resiliency to the wastewater systems. JEA is investigating a solar plus storage system to be staged at a JEA lift station for backup power in the event of a grid outage. After severe weather events, when the grid is down, the system can power the lift station until grid power is restored. When not in use, the storage system can provide grid support, as needed.

Risks associated with pursuing this pilot project include possible corrosion of equipment in the event of chemical exposure, and potential fire hazard with the battery storage system in the event of failure. As battery technology matures and battery energy management systems continue to improve, JEA anticipates the risk of fire hazard to decrease in the next 10 years.

The project is still in the research phase, optimizing the size of the solar and storage systems. JEA is evaluating its options for equipment Procurement; a list of potential vendors is being compiled. Once JEA finalizes its plans for the pilot, the in-service date, max output and max energy stored will be available.

44. 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. If not, please explain.

JEA has considered using energy storage as a means to provide firm capacity for non-firm generation. JEA is undergoing internal discussions defining how the storage system would be used to determine the correct size, duration and capacity value assignment to energy storage. JEA currently does not assign a capacity value to solar PV. Storage systems solely charged by renewables are not guaranteed to be available due to the intermittent nature of solar PV.

45. Please identify and describe any programs you offer that allow your customers to contribute towards the funding of specific renewable projects, such as community solar programs.

a. Please describe any such programs in development with an anticipated launch date within the next 10 years.

Since 2017 JEA offers residential and small/mid-sized commercial customers the opportunity to purchase renewable energy through its JEA SolarSmart program and contribute to funding solar adoption. Participants pay a premium on the electric bill for solar energy. Customers can select any percent (1% to 100%) of their energy to come from solar. The SolarMax program is available for JEA's large commercial and industrial customers with a minimum consumption of 7 million kWh. It is planned to launch by 2021.

46. Please identify and discuss the Company's role in the research and development of utility power technologies. 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.

JEA has no utility power technology research underway at this time.

47. [Investor-Owned Utilities Only] Provide, on a system-wide basis, the historical annual average as-available energy rate in the Company's service territory for the period 2009–2018. If the Company uses multiple areas for as-available energy rates, please provide a system-average rate as well. Also, provide the projected annual average as-available energy rate in the Company's service territory for the period 2019–2028.

N/A

As-Available Energy Rates

Year		As-Available Energy ($/MWh)	On-Peak Average ($/MWh)	Off-Peak Average ($/MWh)
Actual	2009			
	2010			
	2011			
	2012			
	2013			
	2014			
	2015			
	2016			
	2017			
	2018			
Projected	2019			
	2020			
	2021			
	2022			
	2023			
	2024			
	2025			
	2026			
	2027			
	2028			
Notes				
(Include Notes Here)				

48. Please complete the following table detailing planned unit additions, including information on capacity and in-service dates. Please include only planned conventional units with an in-service date past January 1, 2018. For each planned unit, provide the date of the Commission's Determination of Need and Power Plant Siting Act certification (if applicable), and the anticipated in-service date.

JEA has no generating unit additions planned in this TYSP.

Planned Unit Additions

Generating Unit Name	Summer Capacity (MW)	Certification Dates (if Applicable)		In-Service Date
		Need Approved (Commission)	PPSA Certified	
Nuclear Unit Additions				
Combustion Turbine Unit Additions				
Combined Cycle Unit Additions				
Steam Turbine Unit Additions				
Notes				

49. For each of the planned generating units contained in the Company's 2019 TYSP, please discuss the "drop dead" date for a decision on whether or not to construct each unit. Provide a time line for the construction of each unit, including regulatory approval, and final decision point.

JEA has no generating unit additions planned in this TYSP.

50. Please provide an estimate of the revenue requirements of the Company based upon the 2019 TYSP's planned generating units.

JEA has no generating unit additions planned in this TYSP.

51. For each of the planned generating units contained in the Company's 2019 TYSP, please identify the next best alternative that was rejected for each unit. Provide information similar to Schedule 9 regarding each of the next best alternative unit(s). As part of this response, please also provide the additional revenue requirement that would have been associated with the next best alternative compared to the planned unit.

JEA has no generating unit additions planned in this TYSP.

52. For each existing and planned unit on the Company's system, provide the following data based upon historic data from 2018 and projected capacity factor values for the period 2019–2028. Please complete the tables below and provide an electronic copy in Microsoft Excel format.

Projected Unit Information – Capacity Factor (%)

Plant	Unit#	Unit Type	Fuel Type	Actual	Projected (%)									
				2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Brandy Branch	(2,3,4)	CC	NG	80	73	93	92	80	87	89	85	88	79	88
Brandy Branch	GT1	GT	NG	9	2	2	2	3	2	1	1	1	1	1
GEC	GT1	GT	NG	10	11	11	10	12	11	9	10	8	9	14
GEC	GT2	GT	NG	12	7	9	6	7	6	5	6	5	7	9
Kennedy	GT7	GT	NG	2	2	5	2	3	2	2	3	2	3	5
Kennedy	GT8	GT	NG	5	1	3	1	1	1	1	1	1	2	2
Northside	1	ST	PC	68	74	62	70	65	68	61	68	65	69	73
Northside	2	ST	PC	36	63	68	70	70	63	63	71	69	66	67
Northside	3	ST	NG	38	39	43	39	39	32	32	33	33	36	35
Northside	GT3	GT	DFO	0	0	1	0	0	0	0	0	0	0	0
Northside	GT4	GT	DFO	0	0	1	0	0	0	0	0	0	0	0
Northside	GT5	GT	DFO	0	0	1	0	0	0	0	0	0	0	0
Northside	GT6	GT	DFO	0	0	1	0	0	0	0	0	0	0	0
Scherer	4	ST	BIT	52	83	68	60	67	41	56	47	51	49	70
Notes														
(Include Notes Here)														

53. 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.

Plant	Unit #	Unit Type	Commercial In-Service	Projected Retirement Date/ Estimated Lifespan
Northside	1	ST	05/2003	40-60 Years
Northside	2	ST	04/2003	
Northside	3	ST	07/1977	40-60 Years
Northside	CT 33 - 36	GT	01/1975	
Kennedy	CT 7	GT	06/2000	20-25 Years
Kennedy	CT 8	GT	06/2009	
Greenland Energy Center	CT 1	GT	06/2011	
Greenland Energy Center	CT 2	GT	06/2011	
Brandy Branch	CT 1	GT	05/2001	20-25 Years
Brandy Branch	CT 2	CT	05/2001	
Brandy Branch	CT 3	CT	10/2001	
Brandy Branch	STM 4	CA	01/2005	
Scherer	4	ST	02/1989	40-60 Years

54. Please complete the table below, providing a list of all of the Company's steam units that are potential candidates for repowering to operation as Combined Cycle units. As part of this response, please provide the unit's current fuel type, summer capacity rating, in-service date, and what potential conversion, fuel-switching, or repowering would be most applicable. Also include a description of any potential issues that could affect repowering efforts at any of these sites, related to such things as unit age, land availability, or other requirements.

Repowering Candidate Units - Steam

Plant Name	Fuel Type	Summer Capacity (MW)	In-Service Date	Potential Conversion	Potential Issues
Northside 3	NG/FO6	524	Jul-1977	Combined Cycle	Resulting unit size too large
Kennedy CT 7	NG/FO2	150	Jun-2000	Combined Cycle	
Kennedy CT 8	NG/FO2	150	Jun-2009	Combined Cycle	
Brandy Branch CT 1	NG/FO2	150	May-2001	Combined Cycle	
GEC CT 1	NG	142	Jun-2011	Combined Cycle	
GEC CT 2	NG	142	Jun-2011	Combined Cycle	
Notes					

55. Please identify each of the Company's existing (as of December 31, 2018) and planned (between 2019–2028) power purchase contracts, including firm capacity imports reflected in Schedule 7 of the Company's 2019 TYSP. Provide the seller, the term of the contract, amount of seasonal capacity purchased, the primary fuel (if applicable, such as with a unit purchase), whether it is included in the Utility's firm peak capacity, and a description of the source of the purchase (such as the name of the unit in a unit purchase).

Existing Purchased Power Agreements

Seller	Contract Term		Contract [1,2] Capacity (MW)		Capacity Factor	Primary Fuel (if any)	Firm Capacity	Description
	Begins	Ends	Summer	Winter	%			
NPPD [3]	Jan-18	Dec-18	10	10		WIND	0	
LES - Trailridge	Dec-18	Dec-18	9.1	9.1	98%	METHANE	0	
LES - Sarasota	Feb-18	Dec-18	6	6	98%	METHANE	0	
PSEG	Sep-18	Sep-40	12	12	21%	SUN	0	
Northwest Jacksonville Solar Partners, LLC	May-17	May-42	7	7	22%	SUN	0	
Old Plank Road Solar Farm LLC	Oct-17	Oct-37	3	3	22%	SUN	0	
Inman Solar Incorporated - Starratt	Dec-18	Dec-37	5	5	27%	SUN	0	
Inman Solar Incorporated - Simmons	Jan-18	Jan-38	2	2	27%	SUN	0	
Hecate Energy, LLC - Blair	Jan-18	Jan-38	4	4	27%	SUN	0	
JAX Solar Developers, LLC – Old Kings Solar	Oct-18	Oct-38	1	1	8%	SUN	0	
Imeson Solar Farm, LLC - Sunport	Oct-19	Oct-39	5	5	24%	SUN	0	
Cecil Commerce Solar Partners, LLC	Feb-21	Feb-45	50	50	27%	SUN	0	
Forest Trail Solar Partners, LLC	May-21	May-46	50	50	27%	SUN	0	
Deep Creek Solar Partners, LLC	Aug-21	Aug-46	50	50	27%	SUN	0	
Westlake Solar Partners, LLC	Oct-21	Oct-46	50	50	27%	SUN	0	
Beaver Street Solar Partmers, LLC	Jan-22	Jan-47	50	50	27%	SUN	0	

Notes

(1) JEA contracted capacity.
(2) Solar Capacity is based on AC rating.
(3) Power not delivered to JEA; Sold to 3rd party.
(4) Capacity factor after commercial operation.

Planned Purchased Power Agreements

Seller	Contract Term		Contract Capacity (MW)		Capacity Factor	Primary Fuel	Firm Capacity	Description
	Begins	Ends	Summer	Winter	(%)	(if any)		
TEA	Jun-20	Sep-21	100	0	90%	TBD	100	Summer only
TEA	Jan-21	Mar-21	0	25	90%	TBD	25	Winter only
TEA	Jun-21	Sep-21	25	0	90%	TBD	25	Summer only
MEAG	Nov-21	Oct-41	100	100	95%	NUC	100	Vogtle 3
MEAG	Nov-22	Oct-42	100	100	95%	NUC	100	Vogtle 4
Notes								

56. Please identify each of the Company's existing (as of December 31, 2018) and planned (2019-2028) power sales, including firm capacity exports reflected in Schedule 7 of the Company's 2019 TYSP. Provide the purchaser, the term of the contract, amount of seasonal capacity sold, the primary fuel (if applicable, such as with a unit purchase), whether it is included in the Utility's firm peak demand, and a description of the sale (such as the name of the unit in a unit purchase).

Existing Power Sales

Purchaser	Contract Term		Contract Capacity (MW)		Capacity Factor	Primary Fuel	Firm Demand	Description
	Begins	Ends	Summer	Winter	%	(if any)		
NONE								
Notes								

Planned Power Sales

Purchaser	Contract Term		Contract Capacity (MW)		Capacity Factor	Primary Fuel	Firm Demand	Description
	Begins	Ends	Summer	Winter	%	(if any)		
NONE								
Notes								

57. Please list and discuss any long-term power sale or purchase agreements within the past year that were cancelled, expired, or modified.

None

58. Please provide a list of all proposed transmission lines in the planning period that require certification under the Transmission Line Siting Act. Please also include

those that have been approved, but are not yet in-service, when completing the table below.

Transmission Projects Requiring TLSA Approval

Transmission Line	Line Length (Miles)	Nominal Voltage (kV)	Date Need Approved	Date TLSA Certified	In-Service Date
NONE					
Notes					

Environmental

59. 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 2018 period. As part of your narrative, please discuss the potential for existing environmental regulations to impact unit dispatch, curtailments, or retirements during the 2019–2028 period.

CO_2 Emission Guidelines and State Standards for Existing Sources: On October 23, 2015, EPA published final Emission Guidelines for existing utility units [Clean Power Plan (CPP)], setting individual statewide emission rate goals, and directing states to submit initial plans to achieve the goal by September 6, 2016. On February 9, 2016 the Supreme Court stayed implementation of the rule. On April 4, 2017, pursuant to the Executive Order, EPA announced that it is reviewing this rule.

On October 16, 2017, EPA published a proposal to repeal the CPP. On August 31, 2018, EPA published a proposal to replace the CPP, called the Affordable Clean Energy (ACE) Rule. On December 21, 2018, EPA filed a status report with the court, where it states that it expected to finalize the ACE rule in the spring of 2019, and continues to argue that the CPP litigation should remain in abeyance. Once the ACE rule is final, the development of Florida's Plan will begin, which will also require rulemaking.

The ACE rule will regulate CO_2 emissions from electric generating units (EGUs) with a focus on coal-fired units. The Best System of Emission Reduction (BSER) for these units is proposed to be in terms of heat rate improvement (HRI). EPA also concluded that HRIs cannot constitute BSER for non-coal EGUs, such as natural gas combined-cycle (NGCC) and simple-cycle combustion turbines (CTs), and integrated gasification combined-cycle (IGCC).

Florida's electric utilities have been substantially reducing CO_2 emissions, in terms of both tons per year and lb/MWh, over the past several years, while at the same time substantially increasing generation. The proposed ACE rule provides a specific mandate that will reinforce these reductions, and ensure that additional measures are employed where appropriate. EPA will allow states with considerable flexibility to design their State Plan and set unit-specific standards.

The ACE rule will directly impact JEA, specifically Northside Generating Station's Units 1 and 2. As long as Florida considers unit-specific factors such as the remaining useful life of the unit and cost to comply, and incorporates compliance flexibility, Units 1 and 2 should be able to comply with the new standards.

New Source Review (NSR) Revisions: EPA is proposing to revise the NSR program on a separate track (rather than within the ACE rule). These reforms are not expected to impact JEA's existing EGUs at this time.

New Source Performance Standards (NSPS) Revisions: EPA is also revising the NSPS for new EGUs, i.e., 111(b) rules. This proposal revises Best System of Emission Reduction (BSER) for affected units as follows:

- For large units, the proposed emission rate would be 1,900 pounds of CO_2 per megawatt-hour on a gross output basis (lb CO_2/MWh-gross). For small units, the proposed emission rate would be 2,000 lb CO_2/MWh-gross.
- For large modifications of steam generating units, the standards are to be consistent with the standards for large and small newly constructed units. For the standards of performance for reconstructed fossil fuel-fired steam units, which are also based on the best available efficiency technology, the standards are to be consistent with the emission rates for newly constructed units.
- EPA is taking comments whether and how to address concerns raised by stakeholders regarding the increased use of simple cycle aero-derivative turbines, including as back-up generation for wind and solar resources, whose operation may exceed the non-base load threshold. EPA is also asking for the public's views on the proper interpretation of the phrase "causes, or contributes significantly to air pollution", the agency's historic approach to this requirement, and whether this requirement should apply differently in the context of greenhouse gases than for traditional pollutants.

These revisions are not expect to impact JEA's existing EGUs, unless they are significantly "modified or reconstructed" or when JEA decides to add new EGUs.

National Emission Standard for Hazardous Air Pollutants (NESHAP): 40 CFR 63 Subpart YYYY (for Combustion Turbines) has also been revised. As a result of the Residual Risk and Technical Review, EPA will not be imposing additional controls. The agency is however proposing revisions to Start-up, Shut-down and Malfunction (SSM) provisions, adding requirements for E-reporting, and lifting of the stay for new gas-fired CTs. These revisions are not expect to impact JEA's existing EGUs, unless they are significantly "modified or reconstructed" or if JEA constructs a new combustion turbine. As long as the potential to emit "formaldehyde" and hazardous air pollutants (HAPs) from the JEA's CT plants (esp. BBGS) are kept below the major source thresholds of 10 tpy for each single HAP and 25 tpy for total HAPs, they will not be subject to any additional controls or testing required by this rule.

40 CFR 63 Subpart UUUUU (a.k.a. Mercury Air Toxics Standard or MATS): On December 27, 2018, EPA signed a proposal regarding the MATS Supplemental Cost Finding and Residual Risk and Technology Review (RTR). It concluded as follows:

- Regulation of HAPs is not "appropriate or necessary," after reconsidering the cost analysis, because the costs "grossly outweigh the quantified HAP benefits."
- Coal- and oil-fired EGUs would not be delisted from 112 regulation, and the 2012 MATS rule would remain in place.
- Regarding the RTR, no revisions to MATS are warranted.
- EPA is considering creating a subcategory for acid gas HAP emissions from EGUs burning eastern bituminous coal refuse, which would affect 10 units in PA and WV.

See #61 for further discussions of the MATS rule with respect to JEA.

Startup, Shutdown and Malfunction (SSM) SIP Call: On May 2015, EPA issued a SSM SIP call, which is a notice of rulemaking that would require 36 states (including Florida) to revise provisions in their State Implementation Plans ("SIPs") related to air emissions from sources during times of startup, shutdown, and equipment malfunction ("SSM"). Numerous parties have challenged the SSM Action in these consolidated cases. On October 31, 2016, the parties completed merits briefing. Oral argument is scheduled for May 8, 2017 has been cancelled. On April 18, 2017, the DOJ filed a motion for the DC Circuit Court continue the oral argument currently as scheduled to allow the new Administration adequate time to review the SSM Action to determine whether it will be reconsidered. With this continuance, EPA officials in the new Administration are expected to scrutinize the SSM Action to determine whether it should be maintained, modified, or otherwise reconsidered. Regardless of the outcome of this reconsideration, FDEP is well-positioned to address the concerns with its existing regulations. Although JEA does not currently have a full assessment of the impact of this rule, its air permits have specific conditions (requirements) which may be sufficient as they are. Any additional work practice requirements that may be imposed on some of the JEA's emissions units to further address the SSM events are expected to be minimal at this time.

National Ambient Air Quality Standards (NAAQS): On June 2, 2010, EPA revised the primary NAAQS for sulfur dioxide (SO2) by implementing a new 1-hour standard of 75 parts per billion (ppb) (calculated as the three-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations). JEA's NGS Unit 3 is permitted to burn No. 6 fuel oil with sulfur content of greater than 1% by weight and could potentially cause or contribute to exceedance of this 1-hour SO_2 standard. Based on comprehensive dispersion modeling analyses, it was determined that probability of compliance with the 1-hour SO_2 standard is greater than 99.5 percent as long as the unit does not burn No. 6 fuel oil for more than 14 days in a calendar year. Greater number of days of oil operation is also possible with less confidence levels. This determination is conservative since it also assumed all other NGS steam generating units are operating at full load.

60. Please complete the table below, providing actual and projected amounts of regulated air pollutants and carbon dioxide emitted, on an annual and per megawatt-hour basis, by the Company's generation fleet. Please also provide an electronic copy of the completed table in Microsoft Excel format.

Emissions of Registered Air Pollutants & CO2

Year		SOX		NOX		Mercury		Particulates		CO2	
		lb/MWh	Tons	lb/MWh	Tons	lb/MWh	Tons	lb/MWh	Tons	lb/MWh	Tons
Actual	2009	2.12	12,132	1.27	7,293	6.8E-06	0.04	0.05	306	2,021	11,581,905
	2010	1.92	11,856	0.95	5,855	6.8E-06	0.04	0.06	346	1,972	12,187,011
	2011	2.24	12,971	1.05	6,077	6.8E-06	0.04	0.06	377	1,780	10,325,524
	2012	1.65	9,006	1.68	9,165	6.8E-06	0.04	0.05	259	1,631	8,881,266
	2013	1.66	9,484	1.47	8,400	6.8E-06	0.04	0.03	156	1,828	10,414,185
	2014	1.95	11,789	1.53	9,255	6.8E-06	0.04	0.03	162	1,851	11,194,212
	2015	0.85	5,129	1.42	8,558	4.0E-06	0.02	0.03	174	1,731	10,424,507
	2016	0.79	4,631	1.47	8,665	3.5E-06	0.02	0.03	155	1,799	10,609,013
	2017	0.61	3,402	1.58	8,873	3.3E-06	0.02	0.03	152	1,593	8,916,306
	2018	0.64	3,251	1.51	7,699	1.1E-06	0.01	0.02	97	1,516	7,731,037
Projected	2019	0.50	3,126	0.69	3,732	3.2E-06	0.02	0.12	223	1,389	8,815,718
	2020	0.46	2,967	0.59	3,789	3.1E-06	0.02	0.03	217	1,315	8,390,710
	2021	0.49	3,122	0.56	3,567	3.1E-06	0.02	0.03	204	1,280	8,213,930
	2022	0.47	3,051	0.56	3,597	3.1E-06	0.02	0.03	192	1,247	8,045,180
	2023	0.45	2,897	0.47	3,053	3.1E-06	0.02	0.03	188	1,139	7,394,930
	2024	0.43	2,778	0.48	3,160	3.1E-06	0.02	0.03	191	1,150	7,500,650
	2025	0.47	3,060	0.49	3,185	3.1E-06	0.02	0.03	187	1,168	7,661,620
	2026	0.45	2,968	0.48	3,179	3.0E-06	0.02	0.03	189	1,155	7,621,050
	2027	0.47	3,119	0.52	3,486	3.0E-06	0.02	0.03	192	1,226	7,773,510
	2028	0.45	3,026	0.50	3,342	3.0E-06	0.02	0.03	195	1,209	8,142,740

Notes

lb/MWh is on net MW basis. Tons are short tons (not metric tons).

61. For the U.S. Environmental Protection Agency's (EPA's) Mercury and Air Toxics Standards (MATS) Rule:

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

b. **What compliance strategy does the Company anticipate employing for the rule?**
   For NGS's CFB boilers, JEA used petcoke (which contains relatively low mercury) in addition to coal, and also achieved additional mercury reduction (co-benefits) with pollution control equipment; SNCR for NOx, SDA for SO_2, and baghouse for PM. The units are in full compliance. In the future, JEA anticipates that the CFB's at NGS will quality as Low Emitting EGU (LEE) sources for Hg, which will significant reduce compliance and monitoring burden and thus costs. The boilers are already considered LEE units for PM under the MATS rule, as demonstrated by twelve (12) quarterly stack tests.

c. **If the strategy has not been completed, what is the Company's timeline for completing the compliance strategy?**
The units are in full compliance

d. **Will there be any regulatory approvals needed for implementing this compliance strategy? How will this affect the timeline?**
No, In order to reduce monitoring costs, we are pursuing qualifying for Low emitter EGU status.
Twelve (12) quarterly PM stack tests to demonstrate LEE qualification for PM (successfully completed in 2018)
30-day Hg test to demonstrate LEE qualification for Hg

e. **Does the Company anticipate asking for cost recovery for any expenses related to this rule? Please complete the following chart regarding MATS-related costs:**

Capital costs for the sorbent trap monitoring equipment installed for Northside CFB Units 1 & 2 were approximately $200,000. The costs incurred in 2014. The O&M costs (purchasing the traps, changing the traps weekly, lab analyses of the traps, and data management) were about $50,000 per year for both affected units.

Year	Estimated Cost of Mercury and Air Toxics Standards (MATS) Rule Impacts (2019 $ millions)			
	Capital Costs	O&M Costs	Fuel Costs	Total Costs
2019				
2020				
2021				
2022				
2023				
2024				
2025				
2026				
2027				
2028				
Notes				

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

62. For the U.S. EPA's Cross-State Air Pollution Rule (CSAPR):

a. **Will your Company be materially affected by the rule?**
Florida is no longer subject to this rule (with respect to 2008 ozone standard). It is also unlikely that Florida will be pulled back into the rule with respect to the 2015 ozone standard.

b. **What compliance strategy does the Company anticipate employing for the rule?**
N/A. In the unlikely event that Florida becomes subject to this rule again in the future, either the use of existing NOX control equipment or purchasing of NOx

allowances, whichever is more economical and logistically convenient, can be implemented.

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

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

e. **Does the Company anticipate asking for cost recovery for any expenses related to this rule? Please complete the following chart regarding CSAPR-related costs:**
N/A

Year	Estimated Cross-State Air Pollution Rule (CSAPR) Rule Impacts (2019 $ millions)			
	Capital Costs	O&M Costs	Fuel Costs	Total Costs
2019				
2020				
2021				
2022				
2023				
2024				
2025				
2026				
2027				
2028				
Notes				
(Include Notes Here)				

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

63. For the U.S. EPA's Cooling Water Intake Structures (CWIS) Rule:

a. **Will your Company be materially affected by the rule?**
N/A

b. **What compliance strategy does the Company anticipate employing for the rule?**
N/A

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

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

e. **Does the Company anticipate asking for cost recovery for any expenses related to this rule? Please complete the following chart regarding CWIS-related costs:**
Cooling Water Intake Structures Rule (CWIS): CWIS has the potential to require upgrades to intake structures on NGS units depending on the final form of the rule. The final rule of Section 316(b) of the Federal Clean Water Act was published in the Federal Register on August 15, 2014. JEA does not believe that new standards in the final rule will affect any of its facilities other than NGS. NGS is one of more than 1,260 existing facilities that use large volumes of cooling water from lakes, rivers, estuaries or oceans to cool their plants. It is possible that new standards may prospectively require upgrades to the system, varying from establishment of existing facilities as the Best Technology Available (BTA), to improvements to the existing screening facilities, to the installation of other cooling technologies. A full two year study, currently underway, is required to evaluate site specific conditions and form a basis for assessing BTA. Specific costs for CWIS at NGS are unknown at this time.

Year	Estimated Cost of Cooling Water Intake Structures Rule (CWIS) Rule Impacts (2019 $ millions)			
	Capital Costs	O&M Costs	Fuel Costs	Total Costs
2019				
2020				
2021				
2022				
2023				
2024				
2025				
2026				
2027				
2028				
Notes				
(Include Notes Here)				

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

64. **For the U.S. EPA's Coal Combustion Residuals Rule (CCR), both for classification of coal ash as a "Non-Hazardous Waste" and as a "Special Waste."**
   a. **Will your Company be materially affected by the rule?**
   Yes.

   b. **What compliance strategy does the Company anticipate employing for the rule?**
   JEA has been complying with the rule requirements since its inception and will continue to do so after SJRPP is decommissioned and the regulated unit is closed.

   c. **If the strategy has not been completed, what is the Company's timeline for completing the compliance strategy?**
   Compliance will continue through the completion of the post-closure care period.

d. **Will there be any regulatory approvals needed for implementing this compliance strategy? How will this affect the timeline?**
No. The CCR rule is self-implementing

e. **Does the Company anticipate asking for cost recovery for any expenses related to this rule? Please complete the following chart regarding CCR-related costs:**
Once the SJRPP Area B Phase I cell closure design is finalized and any necessary corrective actions are developed for groundwater; the costs associated with closure, remediation, and the post-closure care period will be estimated. None of this information is currently available.

Year	Estimated Coal Combustion Residuals Rule (CCR) Impacts (2019 $ millions)			
	Capital Costs	O&M Costs	Fuel Costs	Total Costs
2019				
2020				
2021				
2022				
2023				
2024				
2025				
2026				
2027				
2028				
Notes				

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

65. 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?**
See #59, as it relates to the ACE rule. The NSPS for new units is being revised at this time, and will affect only new, modified or reconstructed EGUs.

b. **What compliance strategy does the Company anticipate employing for the rule?**
Not known yet.

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

d. **Will there be any regulatory approvals needed for implementing this compliance strategy? How will this affect the timeline?**
Not known yet.

e. **Does the Company anticipate asking for cost recovery for any expenses related to this rule? Please complete the following chart regarding costs:**
No

Year	Estimated Cost of Standards of Performance for Greenhouse Gas Emissions Rule for New Sources Impacts (2019 $ millions)			
	Capital Costs	O&M Costs	Fuel Costs	Total Costs
2019				
2020				
2021				
2022				
2023				
2024				
2025				
2026				
2027				
2028				
Notes				

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

66. **Please identify, 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. As part of this response, please also indicate the unit's name, type, fuel type, and net summer generating capacity. Please complete the table below and provide an electronic copy in Microsoft Excel format.**

Estimated Impacts of EPA's Rules on Generating Units

Unit	Unit Type	Fuel Type	Net Sum Capacity (MW)	Type of EPA Rule Impacts					Anticipated Impacts
							CCR		
				MATS	CSAPR/ CAIR	CWIS	Non-Hazardous Waste	Special Waste	
NGS1	ST	PC	293 MW	Continuous Monitoring	N/A	Possible additional equipment	N/A	N/A	TBD
NGS2	ST	PC	293 MW	Continuous Monitoring	N/A	Possible additional equipment	N/A	N/A	TBD
Scherer	ST	BIT	200 MW	Continuous Monitoring		Possible additional equipment	Possible additional equipment	Consult with Georgia Power	TBD
BBGS	CC	NG	501 MW	N/A	N/A			N/A	N/A
Notes									
Closure rules for SJRPP									

67. Please identify, 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. As part of this response, please indicate the unit's name, type, fuel type, and net summer generating capacity. Please complete the table below and provide an electronic copy in Microsoft Excel format.

Estimated Unit Cost of EPA's Rules

Unit	Unit Type	Fuel Type	Net Sum Capacity (MW)	Estimated Cost of EPA Rules Impacts (2019 $ millions)						
							CCR			
				MATS	CSAPR/ CAIR	CWIS	Non-Hazardous Waste	Special Waste	Anticipated Impacts	Total Cost
Notes										
Closure costs for SJRPP										

<u>**Air Rules:**</u> Close monitoring and reduction of No. 6 fuel oil usage at NGS Unit 3 is required in order to assure continuous compliance with the 1-hour SO2 NAAQS. No retirements, curtailments, or installation of additional controls are expected to be required as a results of currently proposed or finalized rules. The ACE rule may require operational changes but it is still too early to know at this time.

<u>**Water Rules:**</u> CWIS has the potential to require upgrades to intake structures on NGS units. The final rule of Section 316(b) of the Federal Clean Water Act was published in the Federal Register on August 15, 2014. JEA does not believe that new standards in the final rule will affect any of its facilities other than NGS. It is possible that new standards may prospectively require upgrades to the system, varying from establishment of existing facilities as the Best Technology Available (BTA), to improvements to the existing screening facilities, to the installation of other cooling technologies. A full two year study, currently underway, is required to evaluate site specific conditions and form a basis for assessing BTA. JEA's current estimate of compliance cost shows a one-time cost anywhere between $35 to 117 million.

<u>**Solid Waste Rules:**</u> Once the SJRPP Area B Phase I cell closure design is finalized and any necessary corrective actions are developed for groundwater; the costs associated with closure, remediation, and the post-closure care period will be estimated. None of this information is currently available.

68. Please identify, 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. Please complete the table below and provide an electronic copy in Microsoft Excel format.

Estimated Timing of Unit Impacts of EPA's Rules

Unit	Unit Type	Fuel Type	Net Sum Capacity (MW)	Estimated Timing of EPA Rule Impacts (Month/Year - Duration)				
				MATS	CSAPR/ CAIR	CWIS	CCR	
							Non-Hazardous Waste	Special Waste
Notes								

Water Rules: For CWIS, Cannot determine timing until BTA (compliance requirement) is determined

69. **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 units not modified by the rule, that may be required to maintain reliability if unit retirements, curtailments, additional emissions control upgrades, or longer outage times due to each of these EPA rules.**
    a. **Mercury and Air Toxics Standards (MATS) Rule.**
    b. **Cross-State Air Pollution Rule (CSAPR).**
    c. **Cooling Water Intake Structures (CWIS) Rule.**
    d. **Coal Combustion Residuals (CCR) Rule.**
    e. **Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units.**

None Anticipated

70. **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.**

N/A

71. **What steps has your Company taken, is currently taking, or is planning to take to address curbing carbon dioxide emissions for existing sources? How has your Company addressed the ruling by the U.S. Supreme Court that carbon dioxide is a pollutant under the Clean Air Act? How does your Company plan on addressing carbon dioxide emissions from existing sources during the 10-year site planning period?**

This is subject to re-evaluation after the ACE rule is finalized and evolves. In the interim, JEA is increasing its use of natural gas, solar portfolio, and energy efficiency measures to reduce its carbon footprint, regardless of whether CO2 remains a CAA pollutant or not. Its CO2 emissions have been reduced significantly with the decommissioning of SJRPP at the end of 2007.

Fuel Supply & Transportation

72. Please provide, 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 period 2009–2018. 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 period 2019–2028. As part of this response, please complete the table below and provide the completed table in Microsoft Excel format.

Average Fuel Price Comparison

Year		Uranium		Coal		Natural Gas		Residual Oil		Distillate Oil	
		GWh	$/MMBTU	GWh	$/MMBTU	GWh	$/MMBTU	GWh	$/MMBTU	GWh	$/MMBTU
Actual	2009	N\A	N\A	8954	2.22	2415	4.95	38	8.05	21	12.59
	2010	N\A	N\A	9287	3.19	2963	5.74	84	11.27	18	16.88
	2011	N\A	N\A	7009	4.04	4542	4.49	25	13.18	22	19.61
	2012	N\A	N\A	4980	3.39	5890	3.26	9	15.85	1	21.61
	2013	N\A	N\A	7428	3.14	3921	3.99	0	15.39	4	20.86
	2014	N\A	N\A	8039	2.91	4041	4.68	8	13.86	3	20.73
	2015	N\A	N\A	6512	2.32	5312	2.96	6	6.71	2	12.57
	2016	N\A	N\A	6733	2.42	4718	2.98	15	5.39	2	11.00
	2017	N\A	N\A	5360	3.05	5697	3.28	0	7.69	1	13.39
	2018	N\A	N\A	3557	3.01	6574	3.66	24	10.01	18	15.98
Projected	2019	N\A	N\A	4959	3.15	5938	3.30	0	10.41	0.7	16.11
	2020	N\A	N\A	4539	3.09	7350	3.18	0	12.84	10.2	16.43
	2021	N\A	N\A	4619	3.10	6954	3.17	0	13.89	1.1	16.3
	2022	N\A	N\A	4638	3.14	6408	3.26	0	14.32	0.6	16.88
	2023	N\A	N\A	4076	3.26	6424	3.43	0	14.64	0.7	17.43
	2024	N\A	N\A	4160	3.31	6460	3.58	0	15.00	0.4	18.05
	2025	N\A	N\A	4397	3.43	6307	3.76	0	15.39	0.5	18.62
	2026	N\A	N\A	4327	3.49	6402	3.87	0	15.96	0.5	19.08
	2027	N\A	N\A	4298	3.54	6700	3.99	0	16.47	1.9	19.7
	2028	N\A	N\A	4808	3.58	7681	4.08	0	16.99	1.2	20.37
Notes											

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

JEA compares its forecast to other independently produced forecasts at the commodity level excluding transportation, some commodity prices are compared with monthly granularity, while others are compared on an annual basis. Transportation forecasts tend to be too generic for JEA's specific circumstances, but JEA does consider rail, tanker, and dry bulk cargo freight rates and forecasts from various sources to judge general trends within the respective industries.

74. Please identify and discuss expected industry trends and factors for each fuel type (coal, natural gas, nuclear fuel, oil, etc.) that may affect the Company during the period 2019–2028.

a. **Coal:**
Coal prices in nominal dollars are expected to increase during the forecast period. Delivered Colombian coal is forecasted to be priced lower than delivered domestic coal during the study period. Over the long term, coal consumption in the electric power sector is forecasted to continue to decline as a result of increased competition with natural gas and renewable generation.
JEA has ownership in Scherer Unit 4 which burns Powder River Basin (PRB) coal. The competitive pricing of delivered coal from western mines supports continued operation of Scherer Unit 4 on PRB coal.

b. **Natural Gas:**
The price of natural gas is projected in nominal dollars to increase throughout the forecast period. The U.S. will continue to rely on onshore unconventional natural gas sources because of strong domestic production and storage. Natural gas is used as a primary fuel at four of JEA's existing electric generation facilities. Over the forecast period, JEA will benefit from the increasing contribution from unconventional gas supplies that will help insure sufficient availability of natural gas in the future.

c. **Nuclear (if applicable):**
N/A

d. **Fuel Oil:**
JEA maintains diesel inventory at Brandy Branch, Kennedy, Greenland, and Northside. Additional diesel supply is purchased from time to time in the open market as needed. The price of diesel fuel oil is projected in nominal dollars to increase throughout the forecast period and remain higher than the price of natural gas.

e. **Other (please specify each, if any):**
JEA uses circulating fluidized bed technology in Northside Generating Station Units 1 and 2. This technology allows JEA to use a blend of petroleum coke and bituminous coal in these units. During the 2019 through 2028 period, JEA expects the petroleum coke market to typically trade at a discount to coal.

75. Please identify and discuss steps that the Company has taken to ensure natural gas supply availability and transportation over the 2019–2028 planning period.

JEA utilizes firm transportation on Florida Gas Transmission, Southern Natural Gas, and SNG Elba Express/Cypress pipeline. In addition, JEA has a firm long term agreement for gas supply delivered to Jacksonville using Florida Gas Transmission and Southern Natural Gas pipelines. To deliver natural gas to JEA's Greenland Energy Center, JEA has a long-term contract with SeaCoast Gas Transmission, LLC. The various transportation contracts allow JEA the ability to access natural gas from diverse supply regions.

76. 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 for the period 2019–2028.

At this time, JEA does not foresee any existing or planned natural gas pipeline expansion projects having a direct substantial effect on the natural gas volumes that JEA is able to receive. With several natural gas pipeline projects planned in the United States in the next ten years, JEA may experience more favorable natural gas pricing as a result of some of those pipelines providing additional takeaway capacity from the supply regions. Natural gas transportation capacity into the Florida market is expected to increase in 2020 and 2021 with Sabal Trail project phase II and phase III

77. 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, for the period 2019–2028.

According to EIA's Annual Energy Outlook 2019, the United States transitioned to a net exporter of natural gas on an average annual basis in 2017, which is being driven by new LNG export capacity. The expected increase in LNG exports is supported by differences between international and domestic natural gas prices. An increase in U.S. LNG export volume could potentially reduce the quantity of natural gas available and as a result cause an increase in price. Despite projected increases in natural gas exports, JEA expects sufficient gas supply will be available to meet JEA's needs.
JEA has a long-term natural gas supply contract that allows the natural gas to be sourced from the LNG facilities of SNG at Elba Island in Savannah, GA. Given reduced LNG imports and physical changes at that facility, domestic supply will be utilized in support of the agreement

78. Please identify and discuss the Company's plans for the use of firm natural gas storage for the period 2019–2028.

At this time, JEA does not plan to utilize firm natural gas storage.

79. 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 period 2019–2028. 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.

JEA's fuel procurement process insures that potential fuel suppliers compete with one another for the opportunity to deliver coal to JEA facilities. The competitive process results in low delivered costs for JEA.

JEA's Northside Generating Station has water access to accommodate coal deliveries. Domestic coal suppliers using rail to barge logistics and international coal suppliers using ocean vessels compete to provide JEA with coal deliveries to NSGS. JEA currently has limited rail access at NSGS.

Scherer Unit 4 receives all coal deliveries by rail. As a co-owner of Scherer Unit 4, JEA's fuel is delivered from the Powder River Basin in Wyoming to Plant Scherer located near Macon, Georgia by two rail carriers – one in the west and one in the east. Georgia Power Company entered into contracts with the rail carriers on behalf of the Scherer co-owners. Competition between the major rail carriers was insured by including all in the negotiation process.

JEA has and will continue to solicit coal bids in a competitive process and will make fuel selections based on prudent utility evaluations.

80. **Please identify and discuss any expected changes in coal handling, blending, unloading, and storage for any planned changes and construction projects at coal generating units for the period 2019–2028.**

    At this time, JEA does not expect to make any changes in coal handling, blending, unloading, and storage for the coal generating units.

81. **[DEF & FPL Only] Please identify and discuss the Company's plans for the storage and disposal of spent nuclear fuel for the period 2019–2028. 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.**
    N/A

82. **[FPL Only] Please identify and discuss expected uranium production industry trends and factors that will affect the Company during the period 2019–2028.**
    N/A