

May 15, 2019

Florida Public Service Commission  
Office of Commission Clerk  
2540 Shumard Oak Boulevard  
Tallahassee, Florida 32399-0850

Re: 20190000-OT Undocketed Filings for 2019  
GRU's Response to TYSP Supplemental Data Request #1

Dear Sir/Madam,

Gainesville Regional Utilities hereby submits its electronic version of the Public Service Commission's Ten-Year Site Plan Supplemental Data Request #1. The Excel tables and other documents requested were emailed to Mr. Doug Wright, Engineering Specialist.

Please let me know if you have any questions regarding this document.

Sincerely,

/s/Jamie Verschage  
Managing Analyst  
Gainesville Regional Utilities

**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.

**Spreadsheet versions of the Ten Year Site Plan Schedules and a PDF version of GRU's TYSP are provided on accompanying file attachments via email.**

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.

**This data was provided on accompanying file attachments via email.**

**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.

**Not applicable.**

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.

**The requested information is shown in the table below.**

**Historic Peak Demand Timing & Temperature**

Year	Month	Actual Peak Demand	Demand Response Activated	Estimated Peak Demand	Day	Hour	System-Average Temperature
		(MW)	(MW)	(MW)			(Degrees F)
2018	1	410	0	410	18	8	21
	2	280	0	280	21	20	86
	3	272	0	272	15	8	29
	4	275	0	275	23	19	87
	5	343	0	343	11	18	87
	6	402	0	402	25	18	95
	7	398	0	398	2	18	96
	8	407	0	407	7	18	96
	9	408	0	408	19	18	96
	10	380	0	380	16	17	92
	11	299	0	299	7	19	87
	12	319	0	319	12	8	29
2017	1	333	0	333	9	8	25
	2	268	0	268	28	20	85
	3	304	0	304	16	8	25
	4	374	0	374	28	18	95
	5	385	0	385	29	18	94
	6	391	0	391	26	17	93
	7	409	0	409	5	17	95
	8	418	0	418	24	18	93
	9	394	0	394	29	17	92
	10	391	0	391	10	17	91
	11	271	0	271	8	19	83
	12	323	0	323	11	8	28
2016	1	348	0	348	20	8	25
	2	340	0	340	11	8	28
	3	302	0	302	16	18	89
	4	338	0	338	29	18	90
	5	377	0	377	31	18	88
	6	419	0	419	13	18	96
	7	421	0	421	8	17	96
	8	428	0	428	22	18	97
	9	380	0	380	18	18	92
	10	336	0	336	2	16	91
	11	279	0	279	2	20	86
	12	269	0	269	5	19	85
<b>Notes</b>							
(Include Notes Here)							

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.

**GRU utilizes climatological data from the weather station located at the Flight Service Station at the Gainesville Regional Airport. The National Weather Service call ID is GNV, and the WBAN number is 12816. The values reported in the table above represent the daily minimum temperature for peak loads deemed to be related to space heating, and the daily maximum temperature for peak loads deemed to be related to space cooling, respectively.**

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.

**GRU's forecast methodology is described in detail on pages 11-20 of our 2019 Ten Year Site Plan. The forecast is developed in-house, using least squares regression techniques against annual data for each customer billing class. This is sometimes referred to as a bottom-up approach. GRU has consistently used this methodology for more than 10 years.**

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.

**There are no matters before the FPSC that reference this forecast.**

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 workpapers in Microsoft Excel format.
  - c. If the response is negative, please explain why not.

**As GRU is not an investor-owned utility, these questions are not applicable.**

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

**Customer growth within GRU's service area can be characterized as slow to moderate, but steady. Over the past 10 years, residential customer has averaged 0.51% per year and non-residential customer growth has averaged 0.76% per year. These figures are tempered by the rebound period following the 2008 recession. Over the next ten years, we are projecting residential customer growth of 0.68% per year and non-residential customer growth of 1.02% per year.**

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

**Usage per customer in the short run is highly correlated to temperature fluctuations and the corresponding number of heating and cooling degree days. Over the past 10 years, residential usage per customer has declined at an average annual rate of 0.2% per year. Residential usage per customer is forecast to decline at a similar rate over the next ten years. In other words, residential usage per customer has stabilized on a very slow decline. Non-residential usage per customer declined at an average annual rate of 0.5% over the past ten years. Over the next 10 years, non-residential usage per customer is expected to decrease more slowly, at a rate of 0.2% per year.**

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.

**GRU is typically a summer peaking system, primarily due to the penetration of natural gas within our service area. Demand growth for GRU's retail customer base has declined a rate of 1.3% annually over the last 10 years. Retail summer peak demand is projected to increase roughly two-thirds of one percent per year over the next 10 years. GRU currently serves one wholesale customer and does not expect to add any new wholesale load over the next 10 years.**

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.

**As GRU is not an investor-owned utility, these questions are not applicable.**

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?

**GRU has not explicitly included energy or demand impacts associated with electric vehicles or electric vehicle charging stations in its 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.

**GRU has not estimated the number of electric vehicles in its service territory for purposes of including such results in its forecast of demand and energy.**

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.

**GRU has obtained data that there are approximately 335 electric vehicles in Alachua County. We estimate approximately 300 of these to be in GRU’s service area. The number of public charging stations is shown in the table below, but the impact of electric vehicles on GRU’s load is unknown at this time.**

**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	300	15	2	n/a	n/a	.960
2019	330	17	3	n/a	n/a	1.056
2020	363	19	4	n/a	n/a	1.162
2021	399	21	5	n/a	n/a	1.277
2022	439	23	6	n/a	n/a	1.405
2023	483	25	7	n/a	n/a	1.546
2024	531	28	8	n/a	n/a	1.699
2025	584	31	9	n/a	n/a	1.869
2026	642	34	10	n/a	n/a	2.054
2027	706	37	11	n/a	n/a	2.259
2028	777	41	16	n/a	n/a	2.486
<b>Notes</b>						
(Include Notes Here)						

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.

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

**GRU does not have incentives in place to encourage the purchase of electric vehicles. GRU has created a website page to inform customers about the benefits of EVs. Our webpage links to the DOE vehicle cost calculator where customers can educate**

**themselves about electricity as a transportation fuel. GRU is currently considering a Time of Demand rate for EV owners.**

- 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.

**GRU does not have a program that allows customers to formally express interest in EV infrastructure.**

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

**When a customer requests a new service installation for a charging station, GRU is made aware of the installation. If an existing customer adds a charging station behind a service installation, it is unlikely GRU will be made aware of the work.**

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

**To date, there have been no known instances where an upgrade to GRU's distribution system was required resulting from the use of electric vehicles.**

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.

**GRU is a member of Drive Electric Florida (DEF), a coalition of companies interested in supporting and accelerating the adoption of plug-in vehicles in Florida. DEF fosters collaboration and sharing demographics and developments in the electric vehicle market.**

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?

**GRU does not have any processes or technology in place to determine if a customer installs an electric vehicle charging station in their home.**

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.

**GRU is not a FEECA utility.**

<b>[Demand Response Source or All Demand Response Sources]</b>									
<b>Year</b>	<b>Beginning Year: Number of Customers</b>	<b>Available Capacity (MW)</b>		<b>New Customers Added</b>	<b>Added Capacity (MW)</b>		<b>Customers Lost</b>	<b>Lost Capacity (MW)</b>	
		Sum	Win		Sum	Win		Sum	Win
<b>2009</b>									
<b>2010</b>									
<b>2011</b>									
<b>2012</b>									
<b>2013</b>									
<b>2014</b>									
<b>2015</b>									
<b>2016</b>									
<b>2017</b>									
<b>2018</b>									
<b>Notes</b>									
(Include Notes Here)									

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.

**GRU is not a FEECA utility.**

<b>[Demand Response Source or All Demand Response Sources]</b>										
<b>Year</b>	<b>Summer</b>					<b>Winter</b>				
	<b>Number of Events</b>	<b>Average Event Size</b>		<b>Maximum Event Size</b>		<b>Number of Events</b>	<b>Average Event Size</b>		<b>Maximum Event Size</b>	
		<b>(MW)</b>	<b>Number of Customers</b>	<b>(MW)</b>	<b>Number of Customers</b>		<b>(MW)</b>	<b>Number of Customers</b>	<b>(MW)</b>	<b>Number of Customers</b>
<b>2009</b>										
<b>2010</b>										
<b>2011</b>										
<b>2012</b>										
<b>2013</b>										
<b>2014</b>										
<b>2015</b>										
<b>2016</b>										
<b>2017</b>										
<b>2018</b>										
<b>Notes</b>										
(Include Notes Here)										

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.

**GRU is not a FEECA utility.**

<b>[Demand Response Source or All Demand Response Sources]</b>							
<b>Year</b>	<b>Average Number of Customers</b>	<b>Summer Peak</b>			<b>Winter Peak</b>		
		<b>Activated During Peak?</b>	<b>Number of Customers Activated</b>	<b>Capacity Activated</b>	<b>Activated During Peak?</b>	<b>Number of Customers Activated</b>	<b>Capacity Activated</b>
		<b>(Y/N)</b>		<b>(MW)</b>	<b>(Y/N)</b>		<b>(MW)</b>
<b>2009</b>							
<b>2010</b>							
<b>2011</b>							
<b>2012</b>							
<b>2013</b>							
<b>2014</b>							
<b>2015</b>							
<b>2016</b>							
<b>2017</b>							
<b>2018</b>							

<b>Notes</b>
(Include Notes Here)

**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.

- **GRU owns three small photovoltaic systems, which are aggregated in the table below.**
- **GRU purchased a biomass facility in November 2017 with which it previously had a Power Purchase Agreement.**

**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)
varies	PV	SUN	0.008	0.008	0.003	0.003	14%	varies
Deerhaven Renewable	ST	WDS	103	103	103	103	63%	In-service w/ PPA 12/2013; purchased 11/2017
<b>Notes</b>								
(Include Notes Here)								

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	Net Firm Capacity	Capacity Factor	In-Service Date
---------------	-----------	-----------	--------------------	-------------------	-----------------	-----------------

			(MW)		(MW)		(%)	(MM/YYYY)
			Sum	Win	Sum	Win		
<b>Notes</b>								
(Include Notes Here)								

**There are no new planned utility-owned renewable resources.**

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.

**Since there are no planned renewable resources, this question is not applicable.**

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?

**There were no planned renewable resources that were cancelled or delayed.**

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 Capacity (MW)		Contracted Firm Capacity (MW)		In-Service Date (MM/YY)	Contract Term (MM/YY)	
				Sum	Win	Sum	Win		Start	End
G2 Energy	Baseline Landfill	IC	LFG	3.8	3.8	0	0	1/1/2009	1/1/2009	12/31/2023
Solar FIT	various installations	PV	SUN	18.6	18.6	0	0	3/1/2009	3/1/2009	12/31/2032
<b>Notes</b>										
While generally reliable, both G2 and Solar FIT are “as-available” and are not firm contracts with contractual mandates for replacement power if these generation sources are not available.										

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.

**No new renewable energy purchased power agreements are anticipated during the planning horizon.**

**Renewable Purchased Power Agreements**

Seller Name	Facility Name	Unit Type	Fuel Type	Installed Capacity (MW)		Contracted Firm Capacity (MW)		In-Service Date (MM/YY)	Contract Term (MM/YY)	
				Sum	Win	Sum	Win		Start	End
<b>Notes</b>										
(Include Notes Here)										

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.

**This question is not applicable.**

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?

**There were no renewable energy purchased power agreements that were cancelled, expired, delayed, or modified during the past year.**

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 resource energy output is shown in the table below.**

**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	570	409	485	297	208	298	244	234	279	264	300
Utility - Non-Firm											
Utility - Co-Firing											
Purchase - Firm											
Purchase - Non-Firm	46	56	56	56	56	56	21	21	21	21	21
Purchase - Co-Firing											
Customer - Owned	2	2	3	3	3	4	4	4	5	5	6
<b>Total</b>	619	468	544	356	268	358	269	260	305	291	327

<b>Notes</b>
(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
Deerhaven	TBD	TBD	Wetlands, existing infrastructure, access to transmission

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**

<b>Plant Name</b>	<b>Land Available (Acres)</b>	<b>Installed Capacity (MW)</b>	<b>Potential Issues</b>

**GRU has no potential sites that are suitable for utility-scale wind installations.**

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

**GRU encourages the installation of customer-owned PV systems. Customers have the ability to net meter. GRU customers accrue their excess kWh monthly and have an annual true up each year; the true up is a cash credit on their utility bill.**

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.

**GRU is not an investor-owned utility.**

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.

**GRU does not consider solar PV to contribute to seasonal peaks; instead, GRU views these systems as lowering GRU’s electric demand.**

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

**GRU has not tracked the cost of energy storage technologies.**



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.
- 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.
  - Please provide a brief assessment of how these benefits, risks, and operational limitations may change over the next 10 years.
  - Please identify and describe any plans to periodically update the Commission on the status of your energy storage pilot programs.

**GRU may consider energy storage as part of a utility-scale solar PV project within the next five years. The costs and benefits of this energy storage will be evaluated at the time the proposals for the PV project are evaluated.**

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.

**GRU has found the current cost of utility-scale energy storage to outweigh the benefits to the System.**

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

**GRU does not have any programs that allow customers to contribute towards a specific renewable project.**

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.

**While GRU evaluates the costs and benefits of new energy technologies that come to market, GRU does not participate in the research and development of utility power technologies.**

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.

**GRU is not an investor-owned utility.**

**As-Available Energy Rates**

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

**GRU does not have any planned generation units.**

**Planned Unit Additions**

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

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.

**GRU does not have any planned generation units.**

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

**GRU does not have any planned generation units.**

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.

**GRU does not have any planned generation units.**

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
J. R. Kelly	FS08	CA	WH	60%	70%	71%	95%	75%	81%	98%	83%	73%	91%	83%
J. R. Kelly	GT04	CT	NG	67%	78%	80%	98%	84%	90%	98%	99%	82%	99%	99%
Deerhaven	FS02	ST	BIT	30%	32%	27%	28%	36%	28%	29%	34%	38%	32%	36%
Deerhaven	FS01	ST	NG	27%	1%	2%	3%	2%	0%	0%	0%	0%	0%	0%
Deerhaven	GT03	GT	NG	1%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%
Deerhaven	GT02	GT	NG	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Deerhaven	GT01	GT	NG	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South Energy Center	GT01	GT	NG	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South Energy Center	IC02	IC	NG	62%	82%	82%	82%	82%	82%	82%	82%	82%	82%	82%
Deerhaven Renewable	FS01	ST	WDS	63%	45%	54%	33%	23%	33%	27%	26%	31%	29%	33%
<b>Notes</b>														
(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.

**This planned retirement date for GRU’s generation units are shown in the table below.**

Plant	Unit #	Expected Retirement (year)
J. R. Kelly	FS08	2035
J. R. Kelly	GT04	2051
Deerhaven	FS02	2031
Deerhaven	FS01	2022
Deerhaven	GT03	2046
Deerhaven	GT02	2026
Deerhaven	GT01	2026
South Energy Center	GT1	2038

South Energy Center	IC02	2047
Deerhaven Renewable	FS01	2043

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.

**GRU has no potential candidates for repowering.**

**Repowering Candidate Units - Steam**

Plant Name	Fuel Type	Summer Capacity (MW)	In-Service Date	Potential Conversion	Potential Issues
<b>Notes</b>					
(Include Notes Here)					

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 Capacity (MW)		Capacity Factor %	Primary Fuel (if any)	Firm Capacity	Description
	Begins	Ends	Summer	Winter				
G2 Energy	1/1/2009	12/31/2023	3.8	3.8		LFG	100% included in firm peak capacity	Energy Purchase through G2 PPA
Solar FIT	3/1/2009	12/31/2032	6.5	3.7		SUN	100% of energy produced	Solar Feed-In Tariff
<b>Notes</b>								
(Include Notes Here)								

**Planned Purchased Power Agreements**

Seller	Contract Term	Contract	Capacity	Primary	Firm	Description
--------	---------------	----------	----------	---------	------	-------------

	Capacity (MW)		Factor %	Fuel (if any)	Capacity
	Begins	Ends			
<b>Notes</b>					
(Include Notes Here)					

**There are no new planned purchase power agreements at this time.**

56. Please identify each of the Company’s existing (as of December 31, 2018) and planned (between 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 (if any)	Firm Demand	Description
	Begins	Ends	Summer	Winter				
City of Alachua	4/16	3/22	Full Req.	Full Req.	55%	System	Full Req.	Full requirements
<b>Notes</b>								
Alachua’s peak demand in 2018 was 29 MW; this is included in GRU’s peak demand.								

**Planned Power Sales**

Purchaser	Contract Term		Contract Capacity (MW)		Capacity Factor %	Primary Fuel (if any)	Firm Demand	Description
	Begins	Ends	Summer	Winter				
<b>Notes</b>								
There are no planned power sales at this time.								

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

**GRU did not have any cancelled, expired, or modified power sales within the last year.**

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	Nominal	Date	Date	In-Service
-------------------	------	---------	------	------	------------

	<b>Length</b> (Miles)	<b>Voltage</b> (kV)	<b>Need</b> <b>Approved</b>	<b>TLSA</b> <b>Certified</b>	<b>Date</b>
<b>Notes</b>					
(Include Notes Here)					

**There are no planned transmission projects.**

**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.

**Air:** With respect to the MATS rule on Deerhaven Unit 2, GRU installed a PM CEMS to measure and verify compliance with the filterable particulate limit and a Mercury CEMS to facilitate the operation of the Air Quality Control System (AQCS) for removal of mercury from the fluegas to assure compliance.

**Water:** The ever more restrictive copper WQS prompted the evaluation of the discharges from the J. R. Kelly Generating Station and resulted in a change in operations and the chemicals used at the facility. Additionally, the NNC rule caused a review of the discharges to Sweetwater Branch and ultimately resulted in the hiring of a consultant to perform data collection, analysis, and modelling to demonstrate compliance for nutrient discharges and a site specific limit.

**Waste:** The CCR rule has necessitated a review of the ash and scrubber product handling at the Deerhaven Generating Station. This involves geologic and hydrogeologic testing of the ash ponds and ash landfill structural integrity. Additionally, weekly, monthly and annual inspections have been performed as required.

The regulations discussed above are not expected to impact dispatch, curtailments, or retirements.

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

<b>Actual</b>	<b>2009</b>	6.46	5,822	1.65	1,485	0.000007	0.0063	0.21	189	1,941	1,749,116
	<b>2010</b>	3.56	3,217	0.72	653	0.000001	0.0013	0.21	194	1,988	1,796,760
	<b>2011</b>	2.54	2,043	0.71	567	0.000005	0.0042	0.20	163	1,896	1,524,484
	<b>2012</b>	1.43	1,183	0.55	455	0.000005	0.0045	0.15	126	1,620	1,339,082
	<b>2013</b>	1.61	1,134	0.93	653	0.000005	0.0033	0.16	112	1,676	1,177,703
	<b>2014</b>	1.99	1,144	1.83	1,052	0.000005	0.0031	0.22	126	2,080	1,192,647
	<b>2015</b>	0.74	532	0.85	608	0.000004	0.0027	0.06	43	1,756	1,260,423
	<b>2016</b>	0.46	355	1.28	995	0.000004	0.0029	0.07	57	1,592	1,239,222
	<b>2017</b>	0.59	389	1.94	1,275	0.000003	0.0023	0.12	81	1,575	1,035,541
	<b>2018</b>	0.54	549	1.74	1,776	0.000004	0.0044	0.09	94	2,050	2,095,624
<b>Projected</b>	<b>2019</b>	0.73	664	1.97	1,788	0.000004	0.0037	0.11	99	1,960	1,776,812
	<b>2020</b>	0.62	570	1.76	1,607	0.000004	0.0036	0.10	90	1,937	1,770,166
	<b>2021</b>	0.63	580	1.72	1,589	0.000003	0.0031	0.10	95	1,800	1,658,175
	<b>2022</b>	0.82	724	2.13	1,874	0.000004	0.0033	0.12	105	1,886	1,658,003
	<b>2023</b>	0.68	594	1.84	1,601	0.000004	0.0031	0.11	93	1,865	1,624,382
	<b>2024</b>	0.67	602	1.80	1,615	0.000003	0.0030	0.11	96	1,796	1,614,408
	<b>2025</b>	0.75	682	1.97	1,789	0.000004	0.0033	0.11	102	1,837	1,670,150
	<b>2026</b>	0.82	752	2.12	1,954	0.000004	0.0036	0.12	107	1,911	1,758,568
	<b>2027</b>	0.69	653	1.84	1,747	0.000003	0.0032	0.11	102	1,799	1,706,757
	<b>2028</b>	0.73	705	1.94	1,867	0.000004	0.0035	0.11	105	1,846	1,775,091
<b>Notes</b>											
(Include Notes Here)											

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?

**Operate the AQCS on Deerhaven Unit 2 (DH2) in a manner which assures compliance with the mercury, SO<sub>2</sub>, and filterable particulate standards of the MATS Rule.**

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?

**No.**

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:

**GRU is a municipal utility and is not entitled to cost recovery.**

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				
<b>Notes</b>				
(Include Notes Here)				

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

**N/A**

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

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

**No. Starting in 2017, for the ozone season, CSAPR does not apply to Florida.**

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 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				
<b>Notes</b>				
(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? **No**
  - b. What compliance strategy does the Company anticipate employing for the rule?  
**No strategy needed**
  - c. If the strategy has not been completed, what is the Company’s timeline for completing the compliance strategy? **No strategy needed**
  - d. Will there be any regulatory approvals needed for implementing this compliance strategy? How will this affect the timeline? **No strategy needed**
  - 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: **No strategy needed**

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				
<b>Notes</b>				
(Include Notes Here)				

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

**GRU has no CWIS.**

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?

**GRU reviewed of the ash and scrubber product handling at the Deerhaven Generating Station. This includes geologic and hydrogeologic testing of the ash ponds and ash landfill structural integrity. Procedures and processes are now in place to assure compliance with the rule. This includes periodic inspections of the CCR facilities.**

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

**Strategy has been completed.**

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

**No.**

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:

**No.**

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				
<b>Notes</b>				
(Include Notes Here)				

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?

**No impact at this time.**

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

**No impact at this time.**

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

**No impact at this time.**

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

**No impact at this time.**

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

**No, GRU is a municipal utility and is not entitled to cost recovery.**

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				
<b>Notes</b>				
(Include Notes Here)				

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
				MATS	CSAPR/CAIR	CWIS	CCR		
							Non-Hazardous Waste	Special Waste	
DH2	Steam	Coal	228	Installation of Hg and PM CEMS, AQCS Operation	N/A	N/A	Processes, Procedures, Geologic Studies	N/A	
JRKCC1	CC	NG	108	N/A	N/A	N/A	N/A	N/A	
DH1	Steam	NG	75	Burn NG only	N/A	N/A	N/A	N/A	
DHCT3	CT	NG	71	N/A	N/A	N/A	N/A	N/A	
<b>Notes</b>									
(Include Notes Here)									

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)						Anticipated Impacts	Total Cost
				MATS	CSAPR/CAIR	CWIS	CCR				
							Non-Hazardous Waste	Special Waste			
DH2	Steam	Coal	228	1.5	N/A	N/A	2	N/A		3.5	
<b>Notes</b>											
(Include Notes Here)											

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
<b>Notes</b>								
(Include Notes Here)								

**All needed controls have already been installed.**

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.

**None expected.**

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

**N/A**

- c. Cooling Water Intake Structures (CWIS) Rule.

**N/A**

- d. Coal Combustion Residuals (CCR) Rule.

**None Expected**

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

**None Expected**

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.

**Acquired a Biomass fired generating plant which could help when GHG regulations (ACE Rule) are finalized.**

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?

**Acquired a Biomass fired generating plant which could help if GHG regulations are finalized.**

**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		Biomass		Natural Gas		Residual Oil		Distillate Oil		
	GWh	\$/MMBTU	GWh	\$/MMBTU	GWh	\$/MMBTU	GWh	\$/MMBTU	GWh	\$/MMBTU	GWh	\$/MMBTU	
<b>Actual</b>	2009	87	0.59	1,287	4.08			422	5.74	4	6.14	1	18.36
	2010	0	0	1,293	3.45			420	6.39	2	10.94	4	17.07
	2011	0	0	1,085	3.74			414	5.40	3	10.93	1	17.58
	2012	0	0	696	4.02			849	4.13	0	22.97	0	22.97
	2013	0	0	626	3.97			696	4.15	0	0	0	21.25
	2014	0	0	797	3.41			352	5.05	1	6.32	0	8.35
	2015	0	0	663	3.30			770	3.39	1	5.57	0	7.28
	2016	0	0	413	3.20			1,144	3.21	0	4.85	0	8.97
	2017	0	0	401	3.25	102	2.78	901	3.70	1	4.32	1	9.86
2018	0	0	460	3.41	570	2.92	1002	3.67	0	6.18	1	10.70	
<b>Projected</b>	2019	0	0	635	3.90	409	2.83	769	3.16	0	0	0	0
	2020	0	0	548	3.88	485	2.83	795	3.14	0	0	0	0
	2021	0	0	556	3.88	297	2.89	990	2.92	0	0	0	0
	2022	0	0	723	3.86	208	3.35	827	2.99	0	0	0	0
	2023	0	0	568	3.91	298	3.41	876	3.16	0	0	0	0
	2024	0	0	574	3.98	244	3.48	980	3.30	0	0	0	0
	2025	0	0	682	4.05	234	3.54	903	3.48	0	0	0	0
	2026	0	0	762	4.11	279	3.60	800	3.75	0	0	0	0
	2027	0	0	647	4.18	264	3.67	987	4.00	0	0	0	0
	2028	0	0	720	4.25	300	3.73	903	4.24	0	0	0	0
<b>Notes</b>													
(Include Notes Here)													

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

**GRU fuel price forecasts are a hybrid of internal contract pricing terms and independent projections available from private and governmental agency sources. GRU constructs short term (1-5 years) pricing models with price/cost factors that are extracted from existing contracts. The historical price performance, escalation factors, and the historical delivered quality are used to project delivered cost for natural gas, coal, biomass and environmental commodities. Existing contracts for natural gas pipeline and rail transportation are also modelled using contract and tariff terms.**

**The short term forecast are then converted to long term forecasts by using escalation factors that are available from recognized, independent sources such as PIRA and the Energy Information Administration. This approach which accounts for the specific contract factors that affect GRU in the short term coupled with recognition of broad industry escalation factors over the long term yield what GRU believes to be a conservative, realistic platform for long term planning.**

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

**GRU has historically supplied most of its requirements using high quality bituminous coal from Central Appalachia. The transport distances and rail rates for moving Eastern coal into Florida have previously made this producing region the most competitive source for GRU. Recent declines in the price of natural gas and reduced coal demand due to coal plant closures have pushed eastern coal prices to historical lows. At these low prices, GRU expects to continue to see producer bankruptcies, mine closures and liquidation of smaller miners. The result of this environment in Central and Northern Appalachia may eventually result in reduced supply, reduction of certain qualities in the market and increased supply risk for utilities.**

**GRU expects that in the near and long term, GRU will have to diversify its sourcing with less reliance on Central Appalachia. While GRU will maintain some presence in Central Appalachia, increasing supply will be purchased in Northern Appalachia, Illinois Basin and offshore. In addition, the risk will also be mitigated by increased use of gas, biomass and purchased power.**

- b. Natural Gas

**The primary factors that will impact the price of natural gas for generation during the 2019-2028 timeframe are (1) shale gas production and supply (2) market perception of the adequacy of supply and level of demand (3) regulatory impact of environmental legislation on generation from coal**

**plants and (4) the impact of LNG exports on US supply and demand. In the near term, natural gas prices are expected to be in the range of \$3.00 - \$3.50/MMBtu.**

- c. Nuclear (if applicable)

**Not applicable**

- d. Fuel Oil

**Due to current and projected prices during the 2019-2028 time period, GRU does not project any significant use of heavy or light fuel oils for base load generation. Heavy and light fuels oils are maintained in inventory as emergency or backup fuels.**

- e. Other (please specify each, if any)

**Biomass --- In November 2017, GRU purchased the biomass plant from the company with which it held a 30-year PPA. GRU is currently contracted with the same subcontractor to procure fuel as under the PPA to assure a continuity of service and supply. The subcontractor historically contracts for short and long-term contracts of varying lengths to balance reliability of supply and to take advantage of favorable market prices. Academic studies from the University Of Florida, College Of Forestry, have determined that there is adequate supply of fuel for continuous operation of the plant. A recent closure of a nearby biomass plant has resulted in even more available fuel supply and lower prices.**

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.

**GRU has an existing contract with Florida Gas Transmission for FTS-1 pipeline transport capacity. GRU has also extended its contract for FTS-2 pipeline transport capacity service. Given projected system requirements for natural gas, GRU is confident that adequate firm pipeline capacity service is under contract in volumes sufficient to meet requirements during the 2019-2028 planning period.**

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.

**GRU has an existing contract with Florida Gas Transmission for FTS-1 pipeline transport capacity. GRU also recently extended its contract for FTS-2 pipeline transport capacity service. Given projected system requirements for natural gas, GRU is confident that adequate firm pipeline capacity service is under contract in volumes sufficient to meet requirements during the 2019-2028 planning period.**

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.

**Given the substantial increase in the resource base and production growth for the Lower 48 States as a result of shale gas fracking, GRU does not anticipate that the development and growth of LNG exports will significantly affect availability of natural gas. The primary potential effects that GRU expects to see in the market will be potential increases in the pricing of natural gas at the wellhead and the volatility of that price.**

**Various energy consulting firms and government agencies have modelled economic scenarios with assumptions on natural gas production, different levels of permitting and construction of LNG facilities in the US, production and retirement of coal capacity, growth of renewable fueled capacity, US economic activity and global demand for LNG in an effort to predict the impact on domestic natural gas prices. While there**

**is a range of projected prices, the bulk of such studies agree that there will be modest increased prices for gas users. The remaining question is the magnitude of price increases and the volatility of pricing.**

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

**While GRU continually evaluates available storage facilities, pipeline interconnection logistics and storage costs, GRU does not currently project the use of firm natural gas storage during the period. GRU does not exclude the possibility that firm natural gas storage may become economically and logistically feasible for GRU in the future.**

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.

**The primary factor that will impact the price of GRU coal transportation during the 2019-2028 time period will be the expiration of the existing long term rail transport contract with CSX in 2019. Prices for Deerhaven coal supplies have been stable and competitive under the terms of the contract. Expiration of the contract will result in substantial escalation from the current long-term rates to current market rates. However, the availability of alternative generation to coal and purchased power will also be factors that limit the cost impact of rail transportation.**

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.

**There are no significant changes anticipated to the current coal handling, blending, unloading, and storage processes currently in place. Since the addition of the Air Quality Control System for Deerhaven Unit 2 in 2009, GRU has been able to blend coals of different types and still meet all environmental requirements.**

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.

**Not applicable.**

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

**Not applicable.**