

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-**

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**DATE:** May 21, 2019  
**TO:** Adam Teitzman, Commission Clerk, Office of Commission Clerk  
**FROM:** Doug Wright, Engineering Specialist, Division of Engineering *DW PaE*  
**RE:** Docket No. 20190000-OT - Undocketed filings for 2019.

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

Thank you.

DW/pz

Attachment

**From:** [Doug Wright](#)  
**To:** [Patti Zellner](#)  
**Subject:** FW: DN 20190000-OT (Undocketed filings for 2019) Ten-Year Site Plan - Response Deadline Change (May 15, 2019) - Staff's Supplemental Data Request #1  
**Date:** Monday, May 20, 2019 4:17:49 PM  
**Attachments:** [image001.png](#)  
[OUC Responses to Staff 1st Data Request for 2019 TYSP.docx](#)  
[OUC Completed Data Request #1 \(2019\) - Excel Tables.xls](#)  
[OUC Completed Data Request #1 \(2019\) - Appendix A\\_PSC.xls](#)

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Hi Patti,

Please draft a memo to file the below e-mail and the attached Word document into Docket No. 20190000-OT. Thank you!

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

*Please note: Florida has a very broad public records law. Most written communications to or from state officials regarding state business are considered to be public records and will be made available to the public and the media upon request. Therefore, your e-mail message may be subject to public disclosure.*

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**From:** Bradley Kushner [mailto:BradKushner@nFrontConsulting.com]  
**Sent:** Monday, May 20, 2019 3:58 PM  
**To:** Doug Wright  
**Cc:** Phillip Ellis  
**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

Mr. Wright,

Please see attached for OUC's responses to the subject data request.

Can you please reply to this email to confirm receipt of all 3 of the documents included in the response?

Thank you for the additional time to complete and submit. and please let me know if there are any questions on the attached.

Brad

Bradley Kushner  
Executive Consultant  
nFront Consulting LLC

Phone: 785-200-8989

Cell: 816-547-1637  
Email: [BradKushner@nFrontConsulting.com](mailto:BradKushner@nFrontConsulting.com)

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**From:** Doug Wright <[dwright@psc.state.fl.us](mailto:dwright@psc.state.fl.us)>  
**Sent:** Tuesday, May 14, 2019 2:35 PM  
**To:** Bradley Kushner <[BradKushner@nFrontConsulting.com](mailto:BradKushner@nFrontConsulting.com)>  
**Cc:** Phillip Ellis <[PELLIS@PSC.STATE.FL.US](mailto:PELLIS@PSC.STATE.FL.US)>  
**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

Mr. Kushner,

Filing OUC's responses to the data request on Monday, May 20, 2019, is perfectly acceptable.

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

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**From:** Bradley Kushner [<mailto:BradKushner@nFrontConsulting.com>]  
**Sent:** Tuesday, May 14, 2019 3:00 PM  
**To:** Doug Wright  
**Cc:** Phillip Ellis  
**Subject:** FW: 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

Mr. Wright,

We are working to provide OUC's responses to the subject data request. I know you had requested responses be filed by May 15, but I'd like to know if you have any flexibility in your schedule to allow for a bit more time on our end. Based on where things are at now, I'd expect that we can file by close of business on Monday, May 20 (and possibly by close of business on Friday, May 17). Can you please let me know if an extension is possible?

Thank you.

Brad

Bradley Kushner  
Executive Consultant  
nFront Consulting LLC

Phone: 785-200-8989  
Cell: 816-547-1637  
Email: [BradKushner@nFrontConsulting.com](mailto:BradKushner@nFrontConsulting.com)

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**From:** Patti Zellner <[PZELLNER@PSC.STATE.FL.US](mailto:PZELLNER@PSC.STATE.FL.US)>  
**Sent:** Wednesday, February 6, 2019 10:46 AM  
**To:** Patti Zellner <[PZELLNER@PSC.STATE.FL.US](mailto:PZELLNER@PSC.STATE.FL.US)>  
**Cc:** Doug Wright <[dwright@psc.state.fl.us](mailto:dwright@psc.state.fl.us)>; Phillip Ellis <[PELLIS@PSC.STATE.FL.US](mailto:PELLIS@PSC.STATE.FL.US)>; Laura King <[LKing@PSC.STATE.FL.US](mailto:LKing@PSC.STATE.FL.US)>; Jeff Doehling <[JDOEHLIN@psc.state.fl.us](mailto: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

*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

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Sincerely,  
Patti Zellner

Administrative Assistant

Division of Engineering

Phone: (850) 413-6208

Fax: (850) 413-6209

Email: [pzellner@psc.state.fl.us](mailto:pzellner@psc.state.fl.us)



Please see below for the Orlando Utilities Commission (OUC) responses to the Florida Public Service Commission's Review of the 2019 Ten-Year Site Plans for Florida's Electric Utilities: Supplemental Data Request #1. As requested, tables have been provided in Microsoft Excel (.xlsx) format, unless otherwise specified in the response.

### **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.**

#### **OUC Response:**

The requested information was provided to the Florida Public Service Commission on April 1, 2019.

- 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.**

#### **OUC Response:**

Please see attached Appendix A (Excel .xlsx file).

### **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.**

#### **OUC Response:**

This question is not applicable as OUC is not an Investor-Owned Utility.

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	Demand Response Activated	Estimated Peak Demand	Day	Hour	System-Average Temperature
		(MW)	(MW)	(MW)			(Degrees F)
2018	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
2017	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
2016	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
<b>Notes</b>							
(Include Notes Here)							

OUC Response:

Please see the completed table below, which is also being provided in electronic (.xlsx) format. The table presents the monthly coincident peak demands for OUC and the City of St. Cloud combined; the date, day of the week and hour when these monthly peak demands occurred; and the temperature at the time of these peaks.

**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	1,239	0	1,239	01/18/18	800	28
	2	1,052	0	1,052	02/26/18	1600	87
	3	1,023	0	1,023	03/01/18	1600	84
	4	1,088	0	1,088	04/09/18	1900	85
	5	1,172	0	1,172	05/24/18	1700	86
	6	1,314	0	1,314	06/20/18	1700	94
	7	1,313	0	1,313	07/17/18	1600	91
	8	1,322	0	1,322	08/08/18	1700	95
	9	1,341	0	1,341	09/18/18	1700	94
	10	1,248	0	1,248	10/16/18	1700	91
	11	1,112	0	1,112	11/09/18	1600	87
	12	987	0	987	12/03/18	1500	85
2017	1	979	0	979	01/09/17	0800	43
	2	951	0	951	02/28/17	1700	84
	3	1,028	0	1,028	03/30/17	1800	87
	4	1,216	0	1,216	04/28/17	1700	93
	5	1,272	0	1,272	05/30/17	1700	93
	6	1,282	0	1,282	06/22/17	1700	93
	7	1,349	0	1,349	07/07/17	1800	97
	8	1,343	0	1,343	08/08/17	1700	97
	9	1,281	0	1,281	09/01/17	1700	93
	10	1,222	0	1,222	10/09/17	1700	89
	11	992	0	992	11/07/17	1700	82
	12	952	0	952	12/11/17	0800	39
2016	1	1,072	0	1,072	01/25/16	0800	42
	2	1,065	0	1,065	02/11/16	0800	41
	3	1,027	0	1,027	03/31/16	1700	88
	4	1,143	0	1,143	04/29/16	1800	91
	5	1,204	0	1,204	05/31/16	1700	92
	6	1,343	0	1,343	06/14/16	1700	96
	7	1,363	0	1,363	07/28/16	1700	98
	8	1,336	0	1,336	08/22/16	1700	96
	9	1,260	0	1,260	09/22/16	1700	94
	10	1,188	0	1,188	10/05/16	1600	87
	11	980	0	980	11/02/16	1700	82
	12	1,000	0	1,000	12/19/16	1600	88
<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.**

OUC Response:

System-wide temperature data for OUC's service territory is based on information obtained from the Orlando International Airport weather station, which was the only weather station used.

- 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 2019 Ten-Year Site Plan.**

OUC Response:

OUC prepares a set of sales, energy, and demand forecast models each year to support OUC's budgeting and financial planning process as well as long-term planning requirements.

In preparing the forecasts OUC uses:

- internal records
- company knowledge of the service territory and customers
- economic projections from IHS, Inc. (Global Insights)
- weather data from the National Oceanic and Atmospheric Administration (NOAA) collected at the Orlando International Airport weather station (Station #USW00012815)
- future "normal" weather was assumed to be equal to the annual 30 year median HDD and CDD calculated for the period January 1, 1986 thru December 31, 2015.
- OUC draws on outside expertise as needed:
  - economic projection data was provided by IHS, Inc. (Global Insights)
  - software, analysis of end-use equipment and efficiencies, and technical expertise was provided by Itron Analytics

A detailed explanation of OUC's forecasting methodology is included in Section 4 of OUC's 2019 Ten-Year Site Plan.

**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.**

OUC Response:

There are no closed or opened FPSC dockets or non-docketed FPSC matters based on the same load forecast used in OUC'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 workpapers in Microsoft Excel format.
  - c. If the response is negative, please explain why not.

OUC Response:

This question is not applicable as OUC is not an Investor-Owned Utility.

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

OUC Response:

From 2000 through 2018, OUC's combined residential and commercial customers grew at an average annual rate of 2.0%. For the years 2008-2012, the combined residential and commercial customer growth rate averaged only 0.7%. During the pre-recession years 1996-2008, annual customer growth averaged 2.6%.

For the 12 months ending in December 2015 and December 2016, OUC residential customers grew from 167,411 to 171,642, an increase of 2.5%. From December 2016 to December 2017, OUC's residential customers grew from 171,642 to 174,029, an increase of 1.4%. From December 2017 to December 2018, OUC's residential customers grew from 174,029 to 177,024, an increase of 1.4%. Based on household growth projections, residential customers are forecasted to grow 1.5% over the 2020 to 2028 period. Commercial Customers are projected to grow at an average annual rate of 1.1% over the 2020 to 2028 period.

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

OUC Response:

The average OUC residential customer weather normalized usage per month declined from approximately 1,011 kWh/month to approximately 981 kWh/month from 2009 through 2018, an

average annual decline of 0.9%. The decline in average use per residential customer is expected to continue through the end of the forecast period at approximately 0.3% per year. The declining use per customer is driven by the increasing efficiency of HVAC and other electrical devices as well as customer conservation efforts. Similarly, commercial sales also show a long term declining use per customer trend. The average OUC commercial customer weather normalized usage per customer declined approximately 0.2% annually from 2009 through 2018. The decline in average use per commercial customer is expected to continue through the end of the forecast period at approximately 0.1% 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.**

OUC Response:

Long term, the combined OUC & St. Cloud system peak is expected to grow along with the system net energy for load (NEL) at approximately the same rate. For 2019 – 2028, NEL is expected to average 1.6% growth annually while the system peak is expected to average 1.8% growth. The small difference in growth rates is attributable to a marginal decrease in the system load factor, from 59.2% in 2019 to 58.5% in 2028, occurring from large commercial projects expected within this period. Increasing customer conservation along with increasing HVAC and other appliance efficiency have the potential to increase the system load factor slightly across the planning horizon.

**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.

OUC Response:

This question is not applicable as OUC is not an Investor-Owned Utility.

**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?**

OUC Response:

The historical loads associated with existing PEVs are included in the historical load data by class and impact the demand and energy projections. The current demand and energy forecasts for the 2019 TYSP have included additional PEV load growth in the residential class forecast to capture increasing saturation of the vehicle market.

**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.**

OUC Response:

Florida's population was divided by the actual number of Florida registered vehicles, provided by IHS Global Insights, to obtain Florida vehicles per capita. The Florida vehicles per capita was assumed to be the same for OUC and St. Cloud service territories for the forecast period and was applied to the IHS Global Insights OUC and St. Cloud population

projections to project the number of total vehicles within OUC and St. Cloud over the forecast period. The vehicles were then assumed to turn over every ten years, given an average 10-year useful life for a vehicle regardless of fuel source.

Numerous PEV to internal combustion vehicle market share ranges were reviewed. Forbes’ (<https://www.forbes.com>) projection of approximately 20% market share by the end of the forecast period, was chosen as the most neutral of the projections reviewed. This market share, coupled with vehicle turnover, was applied to the year-over-year change in the service territory total vehicle forecast to capture the growth in PEVs.

Demand and energy impacts were then based on each PEV driving an assumed 12,000 miles per year and charging of 30 kWh per 100 miles driven, resulting in an annual 3,600 kWh per PEV. 30 kWh was based on the median of a sample of seven different models of PEVs. PEVs impact on demand was forecast to have an equal percentage impact as that on sales. As more information becomes available, OUC will incorporate into future forecasts.

- 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						
2019						
2020						
2021						
2022						
2023						
2024						
2025						
2026						

2027					
2028					
<b>Notes</b>					
(Include Notes Here)					

OUC Response:

Please see completed table below. The table is also being provided in Excel (.xlsx) format.

OUC has supported the installation of 140 public charging stations and has installed 4 DC fast charger EV charging stations in its service territory. At this time, public charging station deployment on the OUC system is expected to meet the public’s need for several years into the future. Given the changing technology and uncertainty of electric vehicle deployment, the number of additional charging stations that will be required by the public is considered speculative and no long-term projection has been made 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	2,100	140	4			
2019						
2020						
2021						
2022						
2023						
2024						
2025						
2026						
2027						
2028						
<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?**
- 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.**

OUC Response:

OUC currently offers a \$200 rebate to customers who purchase or lease a plug-in electric vehicle. OUC does not currently offer any tariffs specific to electric vehicle charging. OUC is in the process of re-developing its EV incentive program.

OUC has formed an educational subcommittee for electrification of transportation. In addition, OUC:

- conducts Ride and Drive events,
- maintains a web portal for information on purchasing PEVs, and
- has internal and external marketing campaigns

OUC does not yet have any programs for customers to express interest in PEV infrastructure provided by OUC.

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

OUC Response:

OUC provides support for the installation of PEV public charging stations upon notification by the installer or when permits are issued.

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

OUC Response:

OUC has had one instance where distribution upgrades were needed in order to accommodate the installation of two public charging stations.

- 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.**

OUC Response:

OUC has not conducted or contracted any research to determine demographic and regional factors that influence the adoption of electric vehicles applicable to its service territory.

**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?**

OUC Response:

OUC is notified if the customer applies for a PEV rebate. OUC also reviews meter data for a Level 2 charging signature.

**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									
2010									
2011									
2012									
2013									
2014									
2015									
2016									
2017									
2018									
<b>Notes</b>									
(Include Notes Here)									

OUC Response:

OUC does not currently offer demand response programs to its customers.

**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										
2010										
2011										
2012										
2013										
2014										
2015										
2016										
2017										
2018										
<b>Notes</b>										
(Include Notes Here)										

OUC Response:

OUC does not currently offer demand response programs to its customers.

- 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?	Number of Customers Activated	Capacity Activated	Activated During Peak?	Number of Customers Activated	Capacity Activated
		(Y/N)		(MW)	(Y/N)		(MW)
2009							
2010							
2011							
2012							
2013							
2014							
2015							
2016							
2017							
2018							
<b>Notes</b>							
(Include Notes Here)							

OUC Response:

OUC does not currently offer demand response programs to its customers.

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

OUC Response:

Please see the completed table below, which is also being provided in electronic (.xlsx) format. Annual capacity factors may vary and are not included in this response.

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 Y)
-	-	-	Sum	Win	Sum	Win	(%)	(MM/YYYY Y)
Co-Fired Stanton Energy Center Landfill Gas	ST	LFG	See Note (1)	See Note (1)	See Note (1)	See Note (1)		04/1998
OUC	Solar	Solar	0.0765	0.0765	0.0765	0.0765		10/2009 -

Distributed Solar (<250 kW)								07/2018
Note (1): LFG is co-fired in Stanton 1 and 2 and therefore not treated as incremental capacity.								

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

OUC Response:

OUC does not currently have plans for new utility-owned renewable resources over the 2019 through 2028 period.

**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.**

OUC Response:

This question is not applicable, as OUC does not currently have plans for new utility-owned renewable resources over the 2019 through 2028 period.

**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?**

OUC Response:

OUC has not had any planned utility-owned renewable resources within the past year that were cancelled, delayed, or reduced in scope.

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

OUC Response:

Please see completed table below, which is also being provided in electronic (.xlsx) format.

**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
	-	-	-							
Duke Energy	Stanton Solar Farm	Solar	SUN	5.1	5.1			11/2011	11/11	11/31
GES Port Charlotte	Port Charlotte	Landfill Gas	LFG	2.56	2.56	2.56	2.56	11/2011	11/11	11/31

ESA Renewables	Fleet Solar Project	Solar	SUN	0.335	0.335			02/2013	02/13	02/38
ESA Renewables	Gardenia Solar Project	Solar	SUN	0.268	0.268			10/2013	10/13	10/38
Waste Management	Monarch	Landfill Gas	LFG	6	6	6	6	03/2016	03/2016	12/2026
ACE	Ksionek Stanton Solar	Solar	SUN	9	9			9/2017	9/2017	8/2037
CBI	CBI	Landfill Gas	LFG	9	9	9	9	3/2017	3/2017	2/2037

**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 (MM/YY)	Contract Term (MM/YY)	
				Sum	Win	Sum	Win		Start	End
<b>Notes</b>										
(Include Notes Here)										

OUC Response:

Please see completed table below, which is also being provided in electronic (.xlsx) format.

**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
	-	-	-							
NextEra	Future Solar 1	Solar	SUN	37.25	0			7/2020	7/20	12/40
NextEra	Future Solar 2	Solar	SUN	74.5	0			7/2020	7/20	12/40

**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.**

OUC Response:

Florida Municipal Solar Project. New solar farms in Osceola and Orange counties are expected to begin commercial operations in late 2020.

**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?**

OUC Response:

No renewable purchased power agreements were cancelled, expired, delayed, or modified in 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 Generation by Source

Renewable Source	Annual Renewable Generation (GWh)											
	Actual	Projected										
	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	
Utility - Firm												
Utility - Non-Firm												
Utility - Co-Firing												
Purchase - Firm												
Purchase - Non-Firm												
Purchase - Co-Firing												
Customer - Owned												
<b>Total</b>												
<b>Notes</b>												
(Include Notes Here)												

OUC Response:

Please see completed table below, which is also being provided in electronic (.xlsx) format.

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											
Utility - Non-Firm											
Utility - Co-Firing	43	139	205	183	193	199	204	209	216	222	222
Purchase – Firm	140	205	214	540	550	560	575	587	597	610	610
Purchase - Non-Firm											
Purchase – Co-Firing											
Customer-Owned	18	27	41	51	64	75	87	98	110	122	134
<b>Total</b>	<b>201</b>	<b>371</b>	<b>460</b>	<b>774</b>	<b>807</b>	<b>834</b>	<b>866</b>	<b>894</b>	<b>923</b>	<b>954</b>	<b>966</b>
Notes											

**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

OUC Response:

OUC has not identified any plant sites that are potential candidates for utility-scale solar installations.

**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

OUC Response:

OUC has not identified any plant sites that are potential candidates for utility-scale wind installations.

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

OUC Response:

OUC offers Solar PV incentive programs to Residential and Commercial Customers. The Solar PV programs provide net-metering at OUC’s retail rate. Solar PV customers that were eligible under OUC’s tariff for its PV production credit incentive received a \$0.05/kWh credit for each kWh produced by the Customers’ Solar PV System. In return for the production credit, OUC owns the RECs. OUC ended the PV production credit incentive for new customers in 2016, while existing customers continue to receive production credits for another 5 years. OUC has developed a Residential Solar Aggregation Program (called OUCollective Solar) designed to offer Customers a more affordable option to install Solar PV on their homes. This program was made available to customers beginning in May, 2018.

**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.**

OUC Response:

This question is not applicable as OUC 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.**

OUC Response:

OUC assumes solar PV contributes 50% of total capacity to summer peak and zero to winter peak. These assumptions are based on historical observations.

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

OUC Response:

OUC currently does not own or operate any storage resources; however, OUC has observed declining costs in battery storage systems in marketplace.

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

OUC Response:

OUC notes with interest the rapidly declining cost and improved performance of lithium battery storage technology. Non-lithium battery storage technology does not seem to have increased at the same pace.

**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.)**

OUC Response:

OUC has not yet installed any energy storage technology in the Commission's system.

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

OUC Response:

OUC has received occasional inquiries from solar PV contractors on behalf of ratepayers regarding OUC's procedures pertaining to behind-the-meter batteries coupled with solar PV systems. Such systems are permitted by OUC and are subject to the same vetting process as solar systems without storage.

- 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.**



- 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.**

OUC Response:

OUC is currently evaluating opportunities with battery integration with solar PV systems.

- 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.**

OUC Response:

In January 2018, OUC introduced a Community Solar program that allows residential and commercial customers to obtain a selected percentage (in increments of 10%) of their monthly electric consumption from OUC's newest solar farm at Stanton Energy Center. The participating customer will be charged a solar rate in lieu of a fuel rate for the percentage of monthly consumption that they select.

- 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.**

OUC Response:

OUC has an emerging technologies group that evaluates and demonstrates the use of new generation, energy storage, and distributed energy technologies. Successful demonstration of such technologies may lead to their larger scale deployment.

Successful implementation of emerging technologies may lead to enhanced reliability and more sustainable production of energy.

**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.**

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)				

OUC Response:

OUC is not an Investor-Owned Utility and therefore this question is not applicable.

**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, 2019. 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.**

**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)				

OUC Response:

OUC does not have any planned conventional units with an in-service date past January 1, 2019.

- 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.**

OUC Response:

OUC does not have any planned conventional units with an in-service date past January 1, 2019. Therefore, there are no “drop dead” dates to discuss.

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

OUC Response:

Please see table below, which presents projected annual revenue requirements based on the base case expansion plan considered in the Ten-Year Site Plan. Annual revenue requirements are presented in nominal \$000s.

2019	\$261,556
2020	\$260,248
2021	\$254,795
2022	\$255,523
2023	\$270,456
2024	\$293,582
2025	\$307,413
2026	\$312,714
2027	\$330,657
2028	\$340,769

**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.**

OUC Response:

OUC does not have any planned conventional units with an in-service date past January 1, 2019. Therefore, there are no next best alternatives to discuss.

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

OUC Response:

OUC considers the requested information to be confidential and therefore has not provided it in response to this request.

**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.**

OUC Response:

The table below includes units in which OUC holds a majority interest. Based on historical performance and proactive maintenance, OUC expects OUC-operated units to last well beyond their original expected lifespans.

Plant Name	Unit Number	Unit Type	Fuel Type	In-Service Year	Estimated Lifespan	Non-binding Estimated Retirement Date
Stanton Energy Center	1	ST	BIT	1987	40	TBD
Stanton Energy Center	2	ST	BIT	1996	40	TBD
Stanton Energy Center	A	CC	NG	2003	30	TBD
Stanton Energy Center	B	CC	NG	2010	30	TBD
Indian River	A/B	GT	NG	1989	25	TBD
Indian River	C/D	GT	NG	1992	25	TBD

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



OUC Response:

Please see completed table below, which is also being provided in electronic (.xlsx) format.

**Repowering Candidate Units - Steam**

Plant Name	Fuel Type	Summer Capacity (MW)	In-Service Date	Potential Conversion	Potential Issues
Indian River 3	RFO/NG	325		Combined Cycle – Natural Gas	Unit age, cooling water structure, environmental regulations

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

**Planned Purchased Power Agreements**

Seller	Contract Term		Contract Capacity (MW)		Capacity Factor	Primary Fuel (if any)	Firm Capacity	Description
	Begins	Ends	Summer	Winter	%			
<b>Notes</b>								
(Include Notes Here)								

OUC Response:

Please see the completed table below, which is also being provided in electronic (.xlsx) format. OUC's only existing PPA is with NextEra Energy (formerly with Southern-Company Florida, LLC) for capacity and energy from Stanton Energy Center Unit A. OUC has no additional conventional PPAs planned during the 2019 through 2028 period. Information on renewable energy PPAs is presented in response to previous questions.

**Existing Purchased Power Agreements**

Seller	Contract Term		Contract Capacity (MW)		Primary Fuel (if any)	Firm Capacity	Description
	Begins	Ends	Summer	Winter			
NextEra Energy	10/1/2003	12/31/2031	342	350	NG	Same as Contract Capacity	Stanton A PPA

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

**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> (Include Notes Here)								

OUC Response:

OUC has existing contractual power sales to Lake Worth, Winter Park, Bartow, and Florida Power & Light. The table below (also being provided in .xlsx format) summarizes these sales. Annual capacity factor varies and is therefore not shown in the table. Refer to OUC’s 2019 10-Year Site Plan for additional information about OUC’s power sales.

**Existing Power Sales**

Purchaser	Contract Term		Contract Capacity (MW)		Primary Fuel (if any)	Firm Demand	Description
	Begins	Ends	Summer	Winter			
Lake Worth		2025	Varies	Varies		Yes	Partial Requirements
Winter Park		2019	17	17		Yes	Partial Requirements
Bartow		2020	40	40		Yes	Partial Requirements
FPL		2020	100	70		Yes	Partial Requirements

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

OUC Response:

- OUC’s PPA with Vero Beach has been terminated as of December 15, 2018.

**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	Nominal Voltage	Date Need Approved	Date TLSA Certified	In-Service Date
	(Miles)	(kV)			
<b>Notes</b>					
(Include Notes Here)					

OUC Response:

OUC does not have any proposed transmission lines in the planning period that require certification under the Transmission Line Siting Act.

### **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.**

OUC Response:

The recent State of Florida Startup, Shutdown, and Malfunction (SSM) State Implementation Plan (SIP) call by the US Environmental Protection Agency has the potential for large impacts on OUC's operations. The magnitude and specifics of the impacts, have not yet been determined as the Florida Department of Environmental Protection SIP is currently under review by USEPA.

The Clean Power Plan as proposed and as it pertains to existing units has the potential to reduce the viable life expectancy of the Stanton Energy Center Coal Units. However, presently the Clean Power Plan has been stayed by the US Supreme Court and the current administration proposed repeal of the rule on October 16, 2017. EPA announced its intention to issue a final rule in the 2<sup>nd</sup> quarter of 2019.

**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									
	2010									
	2011									
	2012									
	2013									
	2014									
	2015									
	2016									
	2017									
	2018									
Projected	2019									
	2020									
	2021									
	2022									
	2023									
	2024									
	2025									
	2026									
	2027									
	2028									
<b>Notes</b>										
(Include Notes Here)										

OUC Response:

Please refer to the table below, which is also being provided in electronic (.xlsx) format. Historical system-wide emissions information prior to 2012 is not available. Historical data includes Stanton Energy Center Units 1, 2, and B, and Indian River Units A through D. Projected system-wide emissions information for SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub> is presented and reflects OUC’s share of Stanton Energy Center Units 1, 2, A (OUC’s equity share only), and B; Indian River Units A through D; McIntosh 3, and St. Lucie 2.

Projected estimated emissions rates are based on the assumption that the current operating environment, fuel types and quality, and equipment configuration and condition are the same as in 2018. Changes to any of the aforementioned factors moving forward may impact future unit, and therefore generation fleet, emissions rates. Also, note that projected data for 2019 through 2028 represents system emissions related to energy required to serve OUC, St. Cloud, City of Bartow, City of Lake Worth, Winter Park, and Florida Power & Light load obligations as discussed in Section 2 of OUC’s 2019 TYSP.

Year	SOX		NOX		Mercury		Particulates		CO2		
	lb/M Wh	Tons	lb/M Wh	Tons	lb/MWh	Tons	lb/MWh	Tons	lb/M Wh	Tons	
Actual	2009	Data Not Available				Data Not Available				Data Not Available	
	2010	Data Not Available								Data Not Available	
	2011	Data Not Available								Data Not Available	
	2012	0.79	2,398	1.39	5,099					1,783	5,385,146
	2013	1.10	1,980	1.78	3,223					2,146	3,877,695
	2014	0.48	1,338	1.45	4,043					1,683	4,685,341
	2015	0.78	2,782	1.23	3,884					1,595	5,048,802
	2016	0.86	2,427	1.12	3,281					1,617	5,086,558
	2017	0.83	2,194	1.29	3,419					1,636	4,332,905
	2018	0.72	2,374	1.52	4,990					1,669	6,570,232
Projected	2019	1.04	2,813	1.00	2,801	1,331	3,615,970				
	2020	1.01	2,664	0.97	2,570	1,288	3,403,763				
	2021	1.03	2,610	0.84	2,123	1,212	3,062,549				
	2022	1.03	2,649	0.89	2,283	1,231	3,169,706				
	2023	1.09	2,907	0.94	2,517	1,267	3,393,513				
	2024	1.02	2,677	0.86	2,272	1,216	3,197,854				
	2025	0.96	2,443	0.84	2,147	1,221	3,115,652				
	2026	0.91	2,239	0.77	1,892	1,179	2,909,481				
	2027	0.91	2,283	0.78	1,970	1,172	2,945,488				
	2028	0.92	2,232	0.78	1,895	1,185	2,867,915				
<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?
- b. What compliance strategy does the Company anticipate employing for the rule?
- c. If the strategy has not been completed, what is the Company’s timeline for completing the compliance strategy?
- d. Will there be any regulatory approvals needed for implementing this compliance strategy? How will this affect the timeline?
- 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:

**Emissions of Registered Air Pollutants & CO2**

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.

OUC Response:

Please see responses below.

- a. Yes, OUC has been materially affected by MATS.
- b. OUC’s compliance strategy is as follows:
  - Based on annual compliance tests, Stanton Energy Center Units 1 and 2 meet the 0.3 lb/mmBtu emissions limit for particulate matter (PM) in the MATS. OUC currently performs quarterly stack testing to comply with PM Compliance of the MATS Rule.
  - The Stanton Energy Center Units 1 and 2 are in compliance with the Hg emissions limit of 1.0 lb/TBtu of the MATS using the 90-day averaging provision.
  - The Stanton Energy Center Units 1 and 2 are in compliance with the HCl emissions limit, using the surrogate limit of 0.2 lb/mmBtu of SO<sub>2</sub> in the MATS.
- c. Not applicable.
- d. Not applicable.
- e. As a municipal utility for which the Florida PSC does not regulate rates, OUC will not be asking for cost recovery. Estimated MATS-related costs have not been developed.

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

- a. Will your Company be materially affected by the rule?
- b. What compliance strategy does the Company anticipate employing for the rule?
- c. If the strategy has not been completed, what is the Company’s timeline for completing the compliance strategy?
- d. Will there be any regulatory approvals needed for implementing this compliance strategy? How will this affect the timeline?
- 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:

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.

OUC Response:

Please see responses below.

- a. No
- b. Not applicable
- c. Not applicable.
- d. Not applicable.
- e. Not applicable



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

- a. Will your Company be materially affected by the rule?
- b. What compliance strategy does the Company anticipate employing for the rule?
- c. If the strategy has not been completed, what is the Company’s timeline for completing the compliance strategy?
- d. Will there be any regulatory approvals needed for implementing this compliance strategy? How will this affect the timeline?
- 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:

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.

OUC Response:

Please see responses below.

- a. Yes, OUC’s Indian River steam units (currently in extended cold storage) will be materially affected by CWIS.
- b. OUC’s compliance strategy has not yet been determined as the affected units are in extended cold storage.
- c. OUC’s compliance strategy has not yet been determined as the affected units are in extended cold storage.
- d. OUC’s compliance strategy has not yet been determined as the affected units are in extended cold storage.
- e. As a municipal utility for which the Florida PSC does not regulate rates, OUC will not be asking for cost recovery. Estimated CWIS-related costs have not been developed.

**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?
- b. What compliance strategy does the Company anticipate employing for the rule?
- c. If the strategy has not been completed, what is the Company’s timeline for completing the compliance strategy?
- d. Will there be any regulatory approvals needed for implementing this compliance strategy? How will this affect the timeline?
- 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:

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.

OUC Response:

Please see responses below.

- a. Yes, OUC will be materially affected by CCR.
- b. OUC will be complying with the CCR as it applies under Subtitle D of the Resource Conservation and Recovery Act (RCRA) as published in the Federal Register on April 17, 2015.
- c. Not applicable.
- d. Not applicable.
- e. As a municipal utility for which the Florida PSC does not regulate rates, OUC will not be asking for cost recovery. Landfill Cell 2 incurred \$10M additional cost of fill dirt due to CCR Rule requiring the base of the liner to be located on average 5 feet above the upper limit of the uppermost aquifer, and \$3.5M for the additional 6 inches of clay.

**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?
- b. What compliance strategy does the Company anticipate employing for the rule?
- c. If the strategy has not been completed, what is the Company’s timeline for completing the compliance strategy?
- d. Will there be any regulatory approvals needed for implementing this compliance strategy? How will this affect the timeline?
- e. Does the Company anticipate asking for cost recovery for any expenses related to this rule? Please complete the following chart regarding costs:

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.

OUC Response:

Please see responses below.

- a. OUC does not currently have any firm plans related to the addition of new generating units that would be affected by this standard.
- b. Not applicable.
- c. Not applicable.
- d. Not applicable.
- e. Not applicable.

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

OUC Response:

Please refer to the table below, which is also being presented in electronic (.xlsx) 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	
Stanton 1	ST	BIT	441	Hg CEMS	N/A	N/A	Double Liner	N/A	Emissions monitoring (Hg CEMS), emissions control retrofits (FLGR installation), double-liner for leachate collection system (completed in 2012). For Landfill Cell 2 scheduled to start June 1, 2019 the CCR Rule requires the base of the liner to be located on average 5 feet above the upper limit of the uppermost aquifer and increased the thickness of clay composite liner from 6 to 12 inches.
Stanton 2	ST	BIT	453	Hg CEMS	N/A	N/A	Double Liner	N/A	Emissions monitoring (Hg CEMS), emission control retrofits - FLGR under consideration double-liner for leachate collection system (completed in 2012). For Landfill Cell 2 scheduled to start June 1, 2019 the CCR Rule requires the base of the liner to be located on average 5 feet above the upper limit of the uppermost aquifer and increased the thickness of clay composite liner from 6 to 12 inches.

**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)						
				MATS	CSAPR/CAIR	CWIS	CCR		Anticipated Impacts	Total Cost
							Non-Hazardous Waste	Special Waste		
<b>Notes</b>										
(Include Notes Here)										

OUC Response:

Please refer to the table below, which is also being presented in electronic (.xlsx) format.

Unit	Unit Type	Fuel Type	Net Sum Capacity (MW)	Estimated Cost of EPA Rules Impacts (2019 \$ millions)						
				MATS	CSAPR/ CAIR	CWIS	CCR		Anticipated Impacts	Total Cost
							Non-Hazardous Waste	Special Waste		
Stanton 1	PC	Coal	441	\$1M	N/A – Note that OUC has \$11 million in stranded costs associated with SCR, which has been postponed following vacature of CSAPR discussed previously.	N/A	\$6.5M + \$2.1M Landfill Cell 2 incurred \$10M additional cost of fill dirt due to CCR Rule requiring the base of the liner to be located on average 5 feet above the upper limit of the uppermost aquifer and \$3.5M for the additional 6 inches of clay.	N/A		\$16.35M
Stanton 2	PC	Coal	453	\$1M	N/A	N/A	\$6.5M + \$2.1M Landfill Cell 2 incurred \$10M additional cost of fill dirt due to CCR Rule requiring the base of the liner to be located on average 5 feet above the upper limit of the uppermost aquifer and \$3.5M for the additional 6 inches of clay.	N/A		\$16.35M

**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)								

OUC Response:

Please refer to the table below, which is also being presented in electronic (.xlsx) 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
Stanton 1	PC	Coal	441	NA	N/A	N/A	No outage req'd	N/A
Stanton 2	PC	Coal	453	NA	N/A	N/A	No outage req'd	N/A

**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.

OUC Response:

OUC does not anticipate reliability impacts due to any of the EPA rules listed above.



**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.**

OUC Response:

OUC evaluated an SCR retrofit for Stanton Energy Center Unit 1 following the upholding of CSAPR by the Supreme Court in April 2014. Prior to postponing the retrofit when CSAPR was vacated by the US 5th Circuit Court, OUC had invested approximately \$11 million in the project.

**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?**

OUC Response:

On March 28, 2017 President Trump signed the Executive Order on Energy Independence, which called for a review of the Clean Power Plan (CPP), and an April 2017 Court of Appeals ruling put a 26-state lawsuit challenging the CPP on hold for 60 days. The Clean Power Plan has been stayed by the US Supreme Court and the Trump administration proposed repeal of the rule on October 16, 2017. EPA proposed the Affordable Clean Energy (ACE) Rule in August 2018 to reduce greenhouse gas (GHG) emissions for existing coal fired electric utility generating units and power plants. It is intended to be a replacement for the Clean Power Plan (CCP). With all of this uncertainty OUC is not making any proposed changes to the ten-year site plan.

**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
<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)										

OUC Response:

Please refer to the table below, which is also being provided in electronic (.xlsx) format. Projected data for 2019 through 2028 reflects dispatch to serve energy required to serve OUC, St. Cloud, City of Bartow, City of Lake Worth, Winter Park, and Florida Power & Light load obligations as discussed in Section 2 of OUC’s 2019 TYSP, and does not reflect any additional economy energy sales or economy energy purchases. Projected data does not reflect any interaction with the Florida Municipal Power Pool. Fuel prices are not included in the table below as OUC considers fuel prices to be proprietary and confidential.

**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	313		4,791		1,082		0		4	
	2010	385		4,500		1,924		0		7	
	2011	385		3,850		2,682		0		0	
	2012	417		2,745		3,781		0		1	
	2013	569		3,030		3,376		0		0	
	2014	472		3,534		3,405		0		1	
	2015	461		3,157		3,475		0		0	
	2016	464		3,464		3,903		0		0	
	2017	467		3,955		3,326		0		0	
	2018	470		4,204		3,422		0		0	
Projected	2019	570		3709		3273		0		0	
	2020	560		3,367		3,067		0		0	
	2021	586		2,787		3,179		0		0	
	2022	566		2,863		3,345		0		0	
	2023	578		3,115		3,170		0		0	
	2024	575		2,826		4,442		0		0	
	2025	565		2,557		4,830		0		0	
	2026	566		2,275		4,958		0		0	
	2027	553		2,238		5,103		0		0	
	2028	554		2,165		5,000		0		0	
<b>Notes</b>											
(Include Notes Here)											

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

OUC Response:

The natural gas and fuel oil price forecasts used in OUC’s 2019 Ten-Year Site Plan were developed based on a combination of the NYMEX forward curve and projections provided by PIRA Energy Group (PIRA). PIRA Energy Group was founded in 1976 and is an international energy consulting firm specializing in global energy market analysis and intelligence. Among other services, PIRA offers consulting on a broad range of subjects in the international crude oil, petroleum products, natural gas, electricity, coal, biofuels and emissions markets. PIRA’s clients include international and national integrated oil and gas companies, independent producers, refiners, marketers, oil and gas pipelines, electric and gas utilities, industrials, trading companies, financial institutions and government agencies.

The coal price forecast used in OUC’s 2019 Ten-Year Site Plan was developed based on projections by Energy Ventures Analysis, Inc. (EVA) for use by OUC as well as recent offers from coal suppliers of Illinois Basin coal. EVA is a consulting firm that engages in a variety of projects for private and public sector clients related to energy and environmental issues. In the energy area, much of EVA’s work is related to analysis of the electric utility industry and fuel markets, particularly oil, natural gas, and coal. EVA’s clients in these areas include coal,

oil, and natural gas producers; electric utility and industrial energy consumers; and gas pipelines and railroads. EVA also works for a number of public agencies, such as state regulatory commissions, the US Environmental Protection Agency, and the US Department of Energy, as well as interveners in utility rate proceedings, such as consumer counsels and municipalities. Another group of clients include trade and industry associations, such as the Electric Power Research Institute, the Gas Research Institute, and the Center for Energy and Economic Development. EVA has provided testimony to numerous state public utility commissions, including the Florida Public Service Commission. Furthermore, the firm has filed testimony in a number of cases in both state and federal courts, as well as before the Federal Energy Regulatory Commission.

OUC believes that retaining independent entities such as PIRA and EVA to provide their fuel price forecasting expertise, provides authoritative, independent forecasts in and of themselves.

One fuel forecast that OUC typically compares its forecast to is the US Energy Information Administration (EIA) Annual Energy Outlook. The fuel price projections provided by PIRA and EVA differ from those presented in the US Energy Information Administration (EIA) Annual Energy Outlook. The forecasting approaches used by PIRA and EVA utilize more current information relative to the information relied upon by the EIA in developing its Annual Energy Outlook, as the scopes of the forecasts developed by PIRA and EVA specifically for OUC are far less broad than the scope of data provided by EIA. The relatively limited scope allows PIRA and EVA to make use of the most current data available and develop forecasts more specific to OUC, rather than a forecast intended to address the US as a whole, as the EIA provides in the Annual Energy Outlook.

OUC continuously reviews other publicly available forecasts and such reviews validate OUC's use of the independent forecasts provided by PIRA and EVA. Furthermore, OUC's generation planning activities include analysis of fuel price sensitivities, which provide an even more comprehensive analysis of fuel prices.

**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**
- b. Natural Gas**
- c. Nuclear (if applicable)**
- d. Fuel Oil**
- e. Other (please specify each, if any)**

OUC Response:

The following discussion addresses expected industry trends and factors for the 2019 through 2028 period for coal and natural gas, which are the primary fossil fuel types relied upon by the majority of OUC's generating units. The discussion is based on the US Energy Information Administration's Assumptions for Annual Energy Outlook 2019 (2019 AEO): 2019 Summer Fuels Outlook, Short-Term Energy Outlook (STEO), and Annual Energy Outlook 2019 1st Coal Working Group references, with comparisons to the Annual Energy Outlook 2018 (2018 AEO) Reference case. The overall effect of the trends relative to OUC cannot be determined, as the projections included in 2019 references do not take into account various market factors that may be specific to OUC (i.e. local weather, weather events across the US, the economy, the impact on demand resulting from possible future legislation related to carbon regulations and/or renewable energy standards, etc.).

According to the 2019 STEO, the residential natural gas prices average \$10.55 per thousand cubic feet in 2019, which is approximately one percent higher than in 2018. In the 2019 AEO, natural gas prices are projected to increase, while remaining relatively low compared to historical prices, as production expands into less prolific and more expensive production areas in order to satisfy the growing demand in natural gas. The relatively low natural gas prices lead to an increasing demand from most end-use sectors. Specifically, the increasing demand from industrial and electric power markets drive a rising domestic consumption of natural gas with comparatively little growth in the residential and commercial sectors. It should be noted that the natural gas prices are highly sensitive to the availability of new technology and resources. The EIA estimates that the End-of-March natural gas working inventories declined to 1,161 Bcf, 30 percent below the five-year average and the lowest level since 2014. However, the EIA anticipates deposits into storage to be more than normal, which will move inventories closer to the five-year average by the time heating season begins.

The U.S became a net exporter of natural gas on an average annual basis in 2017 and continued to that trend in 2018, according to the 2019 AEO. Furthermore, it is expected that the U.S. net exports of natural gas will continue to grow into the future as liquefied natural gas (LNG) become an increasingly significant export. The growth of natural gas exports, particularly from LNG, continues to increase until 2030 and then remains level through 2050. Natural gas production is projected to grow at an annual average rate of about 7.0 percent through 2020. After 2020, natural gas production grows at a less than 1.0% rate as net export growth moderates and natural gas prices slowly rise due to higher production costs.

U.S. dry natural gas production is forecast to average 83.4 Bcf per day in 2018, establishing a new record level. In 2019, natural gas production is forecast to be 7.6 Bcf per day more than

the 2018 level. Net natural gas export capabilities and growing domestic natural gas consumption contribute to the projected rise in Henry Hub spot pricing from an average of \$2.49/MMBtu in 2018 to \$2.82/MMBtu in 2019.

The global oil market is expected to be relatively uncertain in 2019, as economic indicators have recently sent mixed signals. Crude oil spot prices are forecast to average \$65 per barrel in 2019 and \$62 per barrel in 2020. Crude oil prices have been increasing since January 2019. The increases seen in prices may be driven by the reduced global inventories. Since the beginning of the crude oil production cut agreement between OPEC and non-OPEC countries, supply inventories have declined at an average of more than 0.7 million barrels per day. OPEC countries are now producing at their lowest levels since 2015. According to the 2019 STEO, inventories in are estimated to be below the five-year average.

In the Annual Energy Outlook 2019: 1st Coal Working Group, the amount of coal electricity generation is expected to remain relatively flat and is sensitive to the projection natural gas prices. Through 2022, coal generation is expected to slightly decline because of coal plant retirements, natural gas competition, and increasing competition with renewable generation. Coal-fired generation then stabilizes somewhat through 2030. Because of the projected decrease in coal generation, as well as a forecasted decline in coal exports, the EIA forecasts coal production will by decline 9 percent in 2019. Over the long term, the coal producers in the Appalachia and Western regions are projected to lose production while the Interior region will grow slightly. Coal prices are forecast to increase from an average of \$2.06/MMBtu in 2018 to \$2.11/MMBtu in 2019. The upward trend of coal prices primarily reflects an expectation that cost savings from technological improvements in coal mining will be outweighed by increases in production costs associated as productivity decreases over time.

**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.**

OUC Response:

The Stanton Energy Center and the Indian River site are both reliably served by the Florida Gas Transmission Company (FGT). These two sites are currently the only sites in which OUC owns natural gas fired generating units. OUC is confident in FGT's ability to continue to reliably serve both the Stanton Energy Center and Indian River units into the future. Historically, FGT has demonstrated an ability to provide reliable service and continues to make improvements to its existing natural gas transportation system as well as expand its natural gas transportation system to accommodate the growing need for natural gas across the State of Florida. A recent example is FGT's Phase VIII expansion.

The addition of Stanton Energy Center Unit B (Stanton B) necessitated additional firm natural gas capacity to the Stanton Energy Center. OUC has negotiated a contract with FGT for firm natural gas transportation to serve the needs of Stanton B. OUC’s Commission has approved the contract and the contract was signed in January 2010.

In addition, in 2017 OUC entered into a five-year contract for the storage of natural gas to manage price volatility and provide backup fuel for emergency situations. The contract provides up to 30,000 MMBtu/day to help ensure power reliability. It is OUC’s intent to keep a natural gas storage position in place through the 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.**

OUC Response:

The effect of natural gas pipeline expansion projects outside of the State of Florida on OUC cannot be directly quantified, but the following discussion is being presented for informational purposes. See the following table, which is based on information from FERC’s website (<http://www.ferc.gov/industries/gas/indus-act/pipelines/approved-projects.asp>.) and reflects major pipeline projects that received approval in 2018.

2018							
Docket No.	Company/Project	Capacity (MMcf/d)	Miles of Pipe	Compression (HP)	States	Filing Date	Issued Date
<a href="#">CP15-550-000</a> , <a href="#">CP15-551-000</a> , <a href="#">CP15-551-001</a> , <a href="#">PF15-02-000</a>	Venture Global Calcasieu Pass, LLC, TransCameron Pipeline, LLC; Venture Global Calcasieu Pass LNG Terminal and Pipeline Project, TransCameron Pipeline Project, Venture Global Calcasieu Pass LNG Terminal	2,125.00	42.70	0	LA	06/28/16	12/20/18
<a href="#">CP18-18-000</a>	Transcontinental Gas Pipe Line Company, Gateway Expansion Project	65	0	27,500	NJ	11/15/17	12/12/18
<a href="#">CP18-06-000</a>	RH energytrans, LLC, Risberg Line Project	55.00	59.90	1,862	PA, OH	10/16/17	12/07/18
<a href="#">CP18-26-000</a>	Texas Eastern Transmission, LP, Lambertville East Expansion Project	60.00	0.00	7,000	NJ	12/07/17	11/16/18
<a href="#">CP18-479-000</a>	Portland Natural Gas Transmission System, Phase II of the Portland XPress Project	11.32	0.00	0	MA, ME	05/07/18	11/13/18
<a href="#">CP18-251-000</a>	Portland Natural Gas Transmission System, Presidential Permit Amendment	39.84	0.00	0	NH, ME, MA	04/20/18	10/26/18
<a href="#">CP18-37-000</a> , <a href="#">CP18-38-000</a>	Sierrita Gas Pipeline LLC, Compressor Expansion Project, Presidential Permit Amendment	748.94	0.00	15,900	AZ	12/21/17	10/01/18

2018							
Docket No.	Company/Project	Capacity (MMcf/d)	Miles of Pipe	Compression (HP)	States	Filing Date	Issued Date
<a href="#">CP17-458-000</a> , <a href="#">PF17-03-000</a>	Cheniere Midstream Holdings, Inc., Midship Pipeline Company, LLC, Midcontinent Supply Header Interstate Pipeline Project	1,440.00	233.30	118,400	OK	11/09/16	08/13/18
<a href="#">CP17-490-000</a>	Transcontinental Gas Pipe Line Company, Rivervale South to Market Project	190.00	0.61	0	NJ	08/31/17	08/10/18
<a href="#">CP17-490-000</a>	Transcontinental Gas Pipe Line Company, Rivervale South to Market Project	190.00	0.61	0	NJ	08/31/17	08/10/18
<a href="#">CP18-108-000</a>	Florida Southeast Connection, LLC, Acquisition of Riviera Lateral	384.00	38.00	10,500	FL	03/09/18	08/06/18
<a href="#">CP18-24-000</a>	Steel Reef Pipelines US LLC Border Crossing	30.00	0.05	0	ND	12/8/17	08/06/18
<a href="#">CP18-108-000</a>	Florida Southeast Connection, LLC, Acquisition of Riviera Lateral	384.00	38.00	105.00	FL	03/09/18	08/06/18
<a href="#">CP17-40- 000</a> , <a href="#">CP17-40-001</a>	Spire STL Pipeline LLC, Spire STL Pipeline	400.00	65.00	0	IL, MO	04/21/17	08/03/18
<a href="#">CP17-80</a>	Columbia Gas Transmission, LLC, Eastern Panhandle Expansion Project	47.50	3.37	0	PA, WV	03/15/17	07/19/18
<a href="#">CP18-10-000</a>	Texas Eastern Transmission, LP TX-LA Markets Project	157.50	0.00	0	LA, TX	10/19/17	07/19/18
<a href="#">CP18-35-000</a>	Tennessee Gas Pipeline Company, L.L.C., Presidential Permit Amendment	283.00	0.00	0	TX	12/20/17	07/05/18
<a href="#">CP18-36-000</a>	Tennessee Gas Pipeline Company, L.L.C., Presidential Permit Amendment	100.0	0.00	0	TX	12/20/17	07/05/18
<a href="#">CP17-463-000</a>	Florida Southeast Connection, LLC Okeechobee Lateral	400.00	5.20	0.00	FL	06/14/17	05/30/18
<a href="#">CP17-476-000</a>	Gulf South Pipeline Company, LP Westlake Expansion Project	200.00	0.30	10,000	LA	07/20/17	05/17/18
<a href="#">CP17-471-000</a> , <a href="#">PF17-2-000</a>	Paiute Pipeline Company Paiute 2018 Expansion Project	5.64	8.46	0.00	NV	07/05/17	05/15/18
<a href="#">CP17-56</a> , <a href="#">CP17-57</a>	Brazoria Interconnector Gas Pipeline LLC, Texas Eastern Transmission, LP, Stratton Ridge Expansion Project	322.00	0.50	12,500	TX	02/03/17	04/06/18
<a href="#">CP17-8</a>	Florida Gas Transmission Company, LLC, East-West Project	275.00	24.70	0.00	LA, TX	10/31/16	04/05/18
<a href="#">CP17-409</a> , <a href="#">PF17-1</a>	DTE Midstream Appalachia, LLC, Birdsboro Pipeline Project	79.00	13.19	0.00	PA	05/01/17	03/15/18
<a href="#">CP15-499-000</a> <a href="#">CP15-499-001</a> <a href="#">CP17-26</a>	Texas Eastern Transmission, LP, South Texas Expansion,  Pomelo Connector, LLC, Pomelo Connector Pipeline	400.00  400	0.00  14.00	16,800  5,000	TX	05/21/15  12/22/16	02/15/18
<a href="#">CP17-46</a>	Southern Natural Gas Company, L.L.C., Fairburn Expansion Project	343.16	26.2	18,000	GA	02/3/17	02/15/18
<a href="#">CP17-257</a>	WBI Energy Transmission, Inc., Valley Expansion Project	40.9	37.3	3,000	MN, ND	04/26/17	02/15/18
<a href="#">CP17-15</a>	Dominion Energy Cove Point LNG, LP,	294	0.00	31,370	MD, VA	11/15/16	01/23/18



2018							
Docket No.	Company/Project	Capacity (MMcf/d)	Miles of Pipe	Compression (HP)	States	Filing Date	Issued Date
	Eastern Market Access						
<a href="#">CP15-558</a>	PennEast Pipeline Company, LLC , Penn East Pipeline	1,107	118.1	47,700	NJ, PA	09/25/15	01/19/18
<a href="#">CP17-58</a>	Transcontinental Gas Pipe Line Company, LLC, St. James Supply Project	161.5	0.72	0.00	LA	02/06/17	01/18/18

Specific to Florida, Sabal Trail Transmission LLC (Sabal Trail) originates in Alabama and is routed through Georgia with termination in Florida. Sabal Trail’s Phase I facilities were placed into service in July 2017. The Sabal Trail pipeline consists of approximately 517 miles of natural gas pipeline, with a capacity of 830,000 Dth/day. More information on Sabal Trail can be found at <http://www.sabaltrailtransmission.com/>

**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.**

OUC Response:

Natural gas production is expected to increase, in order to support higher levels of domestic consumption and natural gas exports. The increased production leads to higher natural gas prices over the projected period, as production expands into less productive and more expensive areas, thereby putting upward pressure on costs. According to the EIA, the U.S. is expected to continue being a net exporter of natural gas as pipeline exports to Mexico and LNG exports to the global market increase. LNG is projected to dominate U.S. natural gas exports by the early-2020s, to meet Mexico’s increased demand for natural gas from the electric power sector. Through 2030, export growth to Mexico slows as Mexican domestic natural gas production increases, and LNG exports grow rapidly as Asian demand grows and U.S. prices remain competitive. LNG exports then begin to remain level as U.S. sourced LNG become less competitive in global energy markets. U.S. imports of natural gas from Canada continue the decline from the historically high levels, while U.S. exports to Canada continue to increase because of Eastern Canada’s proximity to abundant U.S. natural gas resources in the Marcellus and Utica plays.

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

OUC Response:

In 2017 OUC entered into a five-year contract for the storage of natural gas to manage price volatility and provide backup fuel for emergency situations. The contract provides up to 30,000 MMBtu/day to help ensure power reliability. It is OUC's intent to keep a natural gas storage position in place through the planning period.

**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.**

OUC Response:

OUC has established the ability to deliver coal to Stanton through the Port of Tampa, as it has included a freight rate and service capability to deliver coal from Tampa to the plant in its rail contract with CSX Transportation. OUC does not currently expect to use this method of delivery because of the relative economics of delivering coal by region of origin and freight mode.

Coal imports are forecasted to decrease through 2021 due to better market opportunities for global seaborne coals in other markets thereby reducing demand on an already limited supply of coal vessels and in return deflating waterborne rates.

Barges and ships are losing ground to rail deliveries as railroads see increased productivity gains via increased hauling capacity, larger train consists and a more efficient coal nomination process which in turn results in faster cycle times of equipment.

OUC's source of coal supply is the Western Kentucky/Illinois Basin (IB) supply region, but OUC can also receive coal from the Central Appalachia supply region, and the Northern Appalachia supply region delivered by rail to Stanton. In the last quarter of 2014, OUC transitioned to 100 percent IB coal to take advantage of its economic benefits over Central Appalachia coal. OUC continues to monitor the markets in each supply region to ensure OUC is receiving the most economical and reliable coal supply. It is OUC's expectation that world markets for coal and vessel freight will fluctuate over the 10-year plan and that OUC will evaluate these markets and purchase coal by water through Tampa when economical.

**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.**

OUC Response:

OUC has considered modifications to the coal handling facilities at the Stanton Energy Center, including modifications to the layout to allow for isolated storage of different coal types. However, OUC has not made any decisions in this regard.

**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.**

OUC Response:

This question is directed to DEF and FPL only, and therefore not applicable to OUC.

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

OUC Response:

This question is directed to FPL only, and therefore not applicable to OUC.