Dianne M. Triplett
DEPUTY GENERAL COUNSEL

May 18, 2020

VIA ELECTRONIC FILING

Adam J. Teitzman, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: *2020 TYSP Supplemental Data Request; Undocketed*

Dear Mr. Teitzman:

Please find enclosed for electronic filing on behalf of Duke Energy Florida, LLC (DEF), its response to Staff's Supplemental Data Request (Nos. 3-82) of the 2020 TYSP Supplemental Data Request issued on March 6, 2020.

Thank you for your assistance in this matter. Please feel free to call me at (727) 820-5041 should you have any questions concerning this matter.

Respectfully,

/s/ Dianne M. Triplett

Dianne M. Triplett

DMT/cmk
Enclosures

cc: Doug Wright and Donald Phillips, Division of Engineering, FPSC

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Duke Energy Florida, LLC's
Response to Staff's Supplemental Data Request (Nos. 3-82)
re. Review of 2020 Ten-Year Site Plans for Florida's Electric Utilities

General Items

3. Please refer to the Microsoft Excel document accompanying this data request titled "Data Request #1 – Excel Tables," (Excel Tables Spreadsheet). Please provide, in Microsoft Excel format, all data requested in the Excel Tables Spreadsheet for those sheets/tabs identified as associated with this question. If any of the requested data is already included in the Company's current planning period TYSP, state so on the appropriate form.

Response:

Please see following tabs of the attached Excel File *Data Request #1 – Excel Tables:*
Q3-Unit Performance
Q3-Firm Purchases
Q3-Financial Assumptions
Q3-Financial Escalation
Q3-LOLP.

Environmental Compliance Costs

4. Please explain if the Company assumes CO_2 compliance costs in the resource planning process used to generate the resource plan presented in the Company's current planning period TYSP. If the response is affirmative:

   a. Please identify the year during the current planning period in which CO_2 compliance costs are first assumed to have a non-zero value.

   b. **[Investor-Owned Utilities Only]** Please explain if the exclusion of CO_2 compliance costs would result in a different resource plan than that presented in the Company's current planning period TYSP.

   c. **[Investor-Owned Utilities Only]** Please provide a revised resource plan assuming no CO_2 compliance costs.

Response:

DEF assumes CO_2 compliance costs in the resource planning process used to generate the resource plan presented in the current TYSP.

a. The year during the current planning period in which CO_2 compliance costs are first assumed to have a non-zero value is 2025.

b. While DEF has not done an in-depth planning study to determine the resource plan without a CO2 compliance cost, any impacts would be to the quantity of solar PV selected. Project based evaluations, however, indicate that DEF solar provides cost-effective emission-free resources producing customer savings over the useful life of the solar power plants. These cost-effective emission-free resources are thoughtfully phased in over time so that DEF can continue to learn and further optimize its total resource mix while also being able to address future climate policies with consideration given to all emissions in general, (e.g. SO2, NOx, CO2, CH4, etc.) if needed. DEF does not expect a significant change to the TYSP resource plan.

c. DEF has not performed an in-depth planning exercise to determine the resource plan assuming no CO2 compliance costs.

Flood Mitigation

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

Response:

Power Plants - Each of Duke Energy Florida's (DEF) existing generating facilities have a Natural Disaster Emergency Response Plan that details the actions the facility will execute in the event of a forecasted or impending natural disaster. This includes attempts to mitigate the impacts of coastal floods, flash floods and high-water events.

DEF's fossil engineering new power plant design criteria require all sites to have a grade level above the 100-year flood level. In some cases, this is addressed by raising the site elevation. DEF solar sites are typically located above the 100-year flood level.

Transmission/Distribution Substations - DEF's Substation Flood Mitigation program builds in protection for substations most vulnerable to flood damage using flood plain and storm surge data. It includes a systematic review and prioritization of substations at risk of flooding to determine the proper mitigation solution, which may include elevating or modifying equipment, or relocating substations altogether.

Flood mitigation is a targeted application of mitigation measures for the 69kV to 12kV substations. New assets could include control houses, relays, or total station rebuilds to increase elevation, etc.

Load & Demand Forecasting

6. **[Investor-Owned Utilities Only]** Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing, on a system-wide basis, the hourly system load in megawatts (MW) for the

period January 1 through December 31 of the year prior to the current planning period. For leap years, please include load values for February 29. Otherwise, leave that row blank. Please also describe how loads are calculated for those hours just prior to and following Daylight Savings Time.

Response:

Please see tab *Q6-Hourly System load* of the attached Excel File *Data Request #1 – Excel Tables*.

7. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on the monthly peak demand experienced during the three-year period prior to the current planning period, including the actual peak demand experienced, the amount of demand response activated during the peak, and the estimated total peak if demand response had not been activated. Please also provide the day, hour, and system-average temperature at the time of each monthly peak.

Response:

Please see table below and tab *Q7-Historic Peak Demand* of the attached Excel File *Data Request #1 – Excel Tables*.

Year	Month	Actual Peak Demand (MW)	Demand Response Activated (MW)	Estimated Peak Demand (MW)	Day	Hour	System-Average Temperature (Degrees F)
2019	1	7248	0	7248	29	8	40 75
	2	6784	0	6784	22	17	85 95
	3	6632	0	6632	11	18	84 15
	4	7521	0	7521	30	17	88 80
	5	9175	0	9175	28	17	95 95
	6	9970	0	9970	25	17	95 65
	7	9585	0	9585	16	17	94 30
	8	9190	0	9190	21	17	92 70
	9	9273	0	9273	9	17	94 65
	10	8393	0	8393	4	17	92 95
	11	6918	0	6918	7	16	87 35
	12	5895	0	5895	19	8	46 00
2018	1	10320	0	10320	18	8	27 40
	2	6980	0	6980	26	16	83 75
	3	6462	0	6462	1	16	83 35
	4	6524	0	6524	9	18	85 45
	5	8094	0	8094	24	17	88 65
	6	8894	0	8894	22	16	91 15
	7	8740	0	8740	27	16	88 55
	8	9271	0	9271	8	17	92 55
	9	9147	0	9147	17	17	91 40
	10	8656	0	8656	16	17	90 80
	11	7361	0	7361	9	15	84 15
	12	7621	0	7621	12	8	40 40
2017	1	7538	0	7538	9	8	40 45
	2	6199	0	6199	28	17	84 70
	3	6969	0	6969	29	18	86 00
	4	8521	0	8521	28	17	92 05
	5	8724	0	8724	30	17	91 95
	6	8809	0	8809	22	17	90 25
	7	9293	0	9293	26	17	92 10
	8	9139	0	9139	7	17	91 40
	9	8795	0	8795	28	17	90 75
	10	8353	0	8353	9	16	89 05
	11	6509	0	6509	7	16	83 10
	12	7248	0	7248	11	8	41 30
Notes							
Temperatures are at hour ended peak hour System weighted St Pete (45%), Orlando (45%), and Tallahassee (10%)							

8. 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.

Response:

DEF uses three weather stations - St Petersburg (45%), Orlando (45%) and Tallahassee (10%), weight included in parenthesis.
Weather station weightings are developed using energy sales by customer building types reported by eighteen individual Operation Centers located around the service area. Energy sales by Operation Centers are grouped to its closest weather station to determine weather station weights.

9. Please explain, to the extent not addressed in the Company's current planning period TYSP, how the reported forecasts of the number of customers, demand, and total retail energy sales were developed. In your response, please include the following information: methodology, assumptions, data sources, third-party consultant(s) involved, anticipated forecast accuracy, and any difference/improvement made compared with those forecasts used in the Company's most recent prior TYSP.

Response:

The 2020 TYSP document describes the methodology, assumptions, data sources, third-party consultant(s) involved and anticipated forecast accuracy. As in every published DEF Load Forecast, the use of "most recently available" economic projections from a most-reliable source has been employed. Also, every TYSP Base Case planning projection is designed to result in a 50/50 probability of outcome.

Differences from the previous TYSP projection include an updated 30-Year normal weather assumption. The company applied a 30-Year average using 1989-2018. Updated EIA survey data for the South Atlantic EIA region involving end-use appliance saturation rates and average efficiency levels were incorporated as well.

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

Response:

- DEF Standard Offer Contract (Docket 20200111-EI).

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

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

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

Response:

DEF maintains annual Forecast Evaluation Tables reflecting projection accuracy for all previous TYSP projections from 2002 to 2019 for Net Energy for Load (NEL), System Customers, System MW and Retail MW. Each previous projection's ten year forecast horizon is compared to all existing comparable historical data-to date. For NEL and Customer data, reported actual company data is compared to projection. For System and Retail MW, both actual and forecast Summer and Winter MW peaks are evaluated on a comparable basis assuming no activated demand response. See attached file *TYSP Error Fan_2020.xlsx*.

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

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

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

Response:

Please refer to Response Q11 and the corresponding excel file.

13. Please explain any historic and forecasted trends in:

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

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

    c. **Total Billed Retail Energy Sales** (GWh) **[for FPL]**, or **Net Energy for Load** (GWh) **[for other companies]**, identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline of the trends. Please include a detailed discussion of how the Company's demand management program(s) and conservation/energy-efficiency program(s) impact the growth/decline of the trends

Response:

a. **Growth of customers**. Customer growth trends are driven by broad economic and demographic trends. These generic trends are typically covered in each year's assumptions section of the DEF's TYSP. Items like population growth, population migration, retirement demographic trends determine customer growth. Housing market issues like affordability, mortgage rates and job growth have always applied a significant influence on customer growth dynamics as well. The severe financial crisis in the 2008-2010 timeframe caused many homeowners to lose substantial equity and in some cases their homes. This severely limited both retirees and other movers from migrating to Florida for a period. Limited homeowner equity trapped many in their homes and stifled new household formations as well. More recent site plans reflect a return to the long-term trend of population migration into Florida as more members of the "Baby-Boom" generation have reached retirement age and a significant increase in Florida population growth has resumed driving a projected increase in DEF customers.

b. **Average KWh consumption per customer**. Non-weather trends in usage per customer can differ by class. Residential and commercial class per customer usage are driven, primarily, by fluctuations in electric price, end use appliance saturation, changing (improving) end use appliance efficiency, improved building codes, housing type/building size, and space conditioning equipment fuel type. More recently, the ability to self-generate has begun to make an impact. A small percentage of industrial/commercial customers have chosen to install their own natural gas generation, reducing KWh consumption from the power grid. Similarly, residential and some commercial accounts have reduced their utility requirements by installing solar panels behind their meter. Contrarily, the penetration of plug-in electric vehicles has grown, leading to an increase in residential use per customer, all else being equal. Each of these stated items are handled either implicitly in the economic scenario presented by Moody's Analytics or explicitly in the internal DEF projections of UEE, Solar PV and plug-in Electric Vehicles.

c. **Total Billed Retail Energy Sales** (GWh) **[for FPL]**, or **Net Energy for Load** (GWh) **[for other companies].** This series is defined as the aggregation of all retail, wholesale, "company use" energy consumption. The resulting sum is grossed up to "generation level requirements" by applying a line-loss factor which estimates transmission line-losses. This category of energy sales is always presented on a calendar month/year basis and is a major input into the corporate IRP and Fuel Forecast. Non-weather trends and variation in this series include all items listed in parts "a." and "b." above. A very significant item included in NEL is "Sales for Resale" MWh. Sales for Resale or Wholesale energy sales are bulk transactions to sell power through contractual obligations that typically include a maximum MW capacity. Details may include or specify a "stratified" type of capacity (base, intermediate or peaking) and (sometimes) a load factor. These contracts can allow the purchasing utility a portfolio of generation resources that best fits their load curve expectations. A wholesale power sale involves the purchaser of power (not the

producer of the power) to service the "ultimate customer". Details involving the ultimate customer are rarely identified to the power producer. Wholesale purchasers of power can contract with any power producer with excess generation and, more specifically, the lowest cost power producer. Historically, DEF served a significant percentage of company NEL to wholesale customers. Developments in the State's utility regulatory environment and changes in amount of competitive capacity resulted in a drop in DEF wholesale sales. Company Use MWH, kept separate from Retail and Wholesale for jurisdictional separation studies, is the smallest piece of NEL. It is a stable figure that doesn't change much from year-to-year. This energy usage comes from company-owned properties including offices, operation centers and generation sites. "Line losses" are estimated via an energy accounting reconciliation procedure using "generation bus-bar" output, and amount of "current" (load levels) at many metering locations. The amount of power flowing on a line will mathematically determine the amount of transmission line losses.

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

a. **Demand Reduction due to Conservation and Self Service**, by customer type (residential, commercial, industrial) as well as Total Customers, and identify the major factors (historically, currently, and in the forecasted period) that contribute to the growth/decline in the trends.

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

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

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

Response:

a. There have been demand (and energy) reductions due to conservation and self-service generation. Any conservation or self-service activity that reduces energy consumption can potentially reduce energy at time of peak. If an energy conservation program reduces energy during the "peak hour", or a self-service activity operates during the peak hour, then the DEF recorded peak will be lower. The level of savings is driven by the number of participants (customers) who choose to participate in company-sponsored programs. Self-service generation decisions have taken place in the DEF service territory. They usually are driven by customer cost-benefit (economic) decisions.

b. DEF residential customers continue to allow the company to control their designated home appliances. The number of billed accounts on residential DR tariffs went from 396,000 in 2010 to 433,000 in 2019. It can be expected to continue trending upward in the projection period.

c. Please see response to Q13. Most factors that impact levels of "energy" have similar affects for energy at time of peak.

d. Please see response to Q13. Most factors that impact levels of "energy" have similar affects for energy at time of peak.

15. Please explain any anomalies caused by non-weather events with regard to annual historical data points for the period 10 years prior to the current planning period that have contributed to the Company's Summer/Winter Peak Energy Demand.

Response:

In the 10-year period beginning in 2010 there have been significant non-weather anomalies impacting DEF's Summer/Winter Peak MW demand. One such "anomaly" involves served wholesale customers. Prior to 2010, DEF's service to wholesale jurisdictional demand and energy was a greater share of total company Summer Peak, Winter Peak and NEL. In 2019 the level of wholesale peak demand and energy requirements reduced to lower levels. (See table below.) The table reflects these changes as Coops and Municipalities chose to be served by self-generation or other sources.

DEF Recorded Seasonal Peak MW by Jurisdiction

	Winter			Summer		
Year	System	Retail	Wholesale	System	Retail	Wholesale
2010	11,644	9,470	2,174	9,600	8,328	1,272
2011	10,381	8,756	1,625	9,277	8,343	934
2012	8,722	7,817	905	9,026	7,946	1,080
2013	8,032	7,201	831	8,776	8,195	581
2014	8,329	7,671	658	9,218	8,404	814
*	*	*	*	*	*	*
2018	10,320	9,284	1,071	9,271	8,492	812
2019	7,248	6,707	572	9,970	8,985	1,021

Secondly, seasonal peak demand has been affected by more efficient end-use appliances and lighting. Surely, all end uses drawing power on-peak will reflect the improved level of efficiency improvement mandated by the Federal governments "Codes & Standards" via previous national energy policy acts. Finally, other technological events impacting seasonal peak must include the broader saturation of self-generation like natural gas generators by manufacturers and universities and rooftop solar PV.

16. Please refer to the Company's respective Utility Perspective section in the Commission's "Review of the 2019 Ten-Year Site Plans of Florida's Electric Utilities." Please answer your Company's respective questions below regarding the growth of customers and retail energy sales, of which the associated figure in the Utility Perspective section is based on the values reported on Schedule 2 of your respective Company's 2019 TYSP:

DEF:

a. Please explain, in general, why the Company's growth rate of retail energy sales lags the growth rate of customers starting in 2011.

b. Please explain why the divergence in the growth rates of customers and retail energy sales increases during the forecast period.

c. Please identify the drivers which contribute to the sharp fall in the growth rate of retail energy sales in the period 2011-2013, the decline in the growth rate in 2017, and the projected decline in the growth rate in 2019, respectively.

Response:

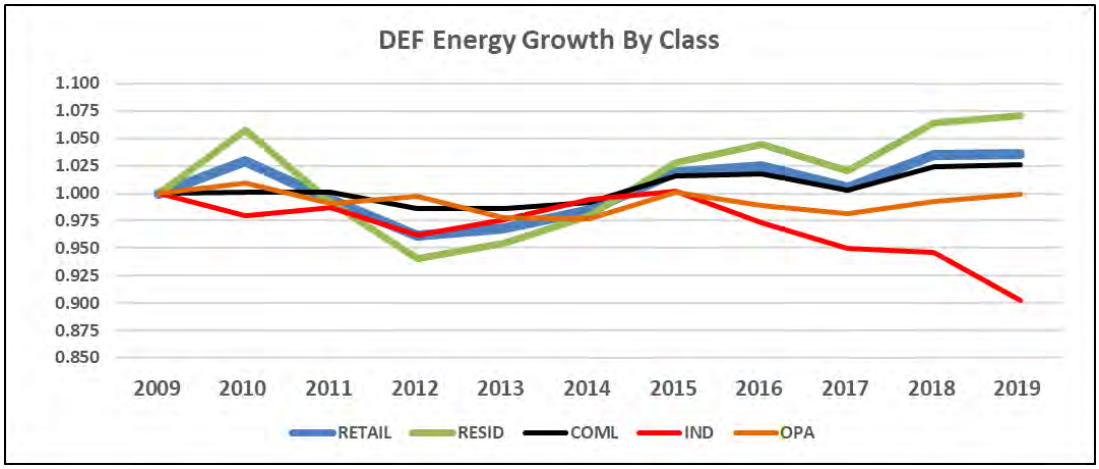
a. Although the customer growth rate has increased due to the desire of many Americans to move to the State of Florida, the time period in the question perfectly aligns with the beginning of the U.S. baby-boom generation reaching retirement age. This phenomenon was widely expected by Florida load forecasters for many years. The lower cost of living and absence of a State income tax has always pulled in retirees from other States. In addition, it was approximately 2011 when the Florida housing sector returned to life after the devastation incurred from the national financial crisis. The divergence between increasing customer numbers and load growth can be explained by first, the United States' efforts through National Energy Policy Acts which mandated energy efficiency "Codes & Standards" to help America reduce energy consumption. Second, DEF's efforts to offer its customers incentives to participate in "cost-effective" conservation programs and, third, efforts taken by customers themselves to reduce their energy costs, or to reduce the level of Greenhouse gases including the addition of customer owned generation such as rooftop solar.

b. The forecast period will reflect a continuation of the trends reflected since 2011. Florida's population growth is continuing at an impressive rate. However, it will also reflect greater effects of increased self-generation (solar, etc.) by all customer types which began during the ten-year historical period. Other reasons for this trend continuing involve economic impacts surrounding income disparity and housing costs, which can be expected to increase the share of smaller housing units (multi-family) over larger single-family units.

c. In each situation pointed out in the question, the main driver behind the sharp volatility in the growth rate for retail energy sales turns out to be weather conditions. A review of annual system weighted HDDs & CDDs (Base 65) reflects a rise and fall of either hot and/or cold weather conditions corresponding to movements in sales. Also, embedded in the retail change is a 10% drop in industrial energy sales, specifically 31% from the phosphate mining sector, between 2015 and 2019. (See table and chart below.)

DEF Service Area Degree Days

Year	CDD_65	HDD_65
2009	**1.00**	**1.00**
2010	0.93	2.09
2011	0.98	0.75
2012	0.98	0.66
2013	0.98	0.66
2014	0.94	1.02
2015	1.13	0.64
2016	1.04	0.78
2017	1.03	0.51
2018	1.04	0.91
2019	1.10	0.59



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

a. Schedule 2.1 – History and Forecast of Energy Consumption and Number of Customers by Customer Class.
b. Schedule 2.2 - History and Forecast of Energy Consumption and Number of Customers by Customer Class.

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

Response:

Please refer to the DEF 2020 TYSP.

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

Response:

Yes, PEV loads were included in the Company's demand and energy forecasts for the 2020 TYSP. Load from existing PEVs was captured in the historical dataset used for load forecast modeling. Projected load from future PEVs was added to the base load forecast as a positive modifier.

19. 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.

Response:

The Company used a PEV market adoption dataset from the Electric Power Research Institute (EPRI) which estimates future scenarios of PEV penetration in DEF's service territory. EPRI published a public report titled "Transportation Electrification: A Technology Overview" that contains a high-level summary of its prediction model at a national level along with the assumptions related to the low, medium and high scenarios. The Company's projection of PEVs in operation was based on EPRI's medium scenario. This projection was combined with assumptions for energy consumption and load profiles to estimate the cumulative impact on system demand and energy. The Company developed estimates for average energy consumption per vehicle and load profiles based on PEV charging data collected from its ChargeFL program.

20. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing estimates of the requested

information within the Company's service territory for the current planning period. "Quick-charge" PEV charging stations are those that require a service drop greater than 240 volts and/or use three-phase power.

Response:

Please see table below and tab *Q20-Electric Vehicle Charging* of the attached Excel File *Data Request #1 – Excel Tables.*

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)
2020	15,300	NA	NA	0.8	0.0	5.7
2021	21,860	NA	NA	2.9	0.9	23.1
2022	30,491	NA	NA	6.1	2.5	49.6
2023	41,025	NA	NA	10.1	4.6	83.4
2024	53,666	NA	NA	15.0	7.1	125.2
2025	69,019	NA	NA	21.0	10.2	175.6
2026	86,038	NA	NA	27.9	14.0	234.8
2027	104,722	NA	NA	35.8	18.2	300.5
2028	125,363	NA	NA	44.3	22.9	373.8
2029	148,071	NA	NA	53.8	28.1	453.5

Notes

1. Number of PEVs includes total cumulative vehicles
2. Cumulative Impact of PEVs includes only net-new vehicles beginning January 2020 as used in Load Forecast
3. Summer Demand: July HE 17, Winter Demand: January HE 08
4. DEF does not forecast the number of public PEV charging stations
5. Source: July 2019 EV Forecast

The Company used a PEV market adoption dataset from the Electric Power Research Institute (EPRI) which estimates future scenarios of PEV penetration in DEF's service territory. EPRI published a public report titled "Transportation Electrification: A Technology Overview" that contains a high-level summary of its prediction model at a national level along with the assumptions related to the low, medium and high scenarios. The Company's projection of PEVs in operation was based on EPRI's medium scenario. This projection was combined with assumptions for energy consumption and load profiles to estimate the cumulative impact on system demand and energy. The Company developed estimates for average energy consumption per vehicle and load profiles based on PEV charging data collected from its ChargeFL program. DEF does not directly monitor or project the number of public or commercial charging stations.

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

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.

Response:

a. The Company's Florida Pilot will spend up to $400,000 over the pilot period through December 2022 on general electric vehicle education and awareness. The Company has also updated its website to enhance web pages for consumer information of electric vehicles.

b. The Company launched its ChargeFL program in 2019. Customers who volunteer for the program install devices in their PEVs that collect data on charging behavior. Data will be collected over a three-year period for analysis of energy consumption and load profiles. The Company will also install 530 smart charging ports to collect and analyze PEV charging infrastructure data.

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

Response:

The Company monitors PEV public charging stations through the U.S. Department of Energy Alternative Fuels Data Center (https://afdc.energy.gov).

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

Response:

The Company is not aware of any upgrades to the distribution system since 1/1/2019 that would be specifically attributable to PEV loads. Distribution system upgrades often result from a combination of factors and determining the existence and contribution of a single source such as PEV loads would be challenging.

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

Response:

The Company has not studied demographic characteristics. The Company launched its ChargeFL program in 2019 to better understand PEV charging behaviors, and data collected from the program may provide insights into PEV adoption.

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

Response:

At this time the Company does not have processes or technologies in place to be notified when a customer installs a PEV charging station. The deployment of advanced metering infrastructure (AMI) will potentially enable the Company to identify PEV loads in the future.

26. **[FEECA Utilities Only]** For each source of demand response, please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing annual customer participation information for 10 years prior to the current planning period. Please also provide a summary of all sources of demand response using the table.

Response:

Please see tables below and tab *Q26-DSM Customer Participation* of the attached Excel File *Data Request #1 – Excel Tables*.

All Demand Response Sources Combined									
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
2010	393,410	679	977	8,384	24	31	3,946	DNA	DNA
2011	397,864	647	1,026	7,874	15	23	3,206	DNA	DNA
2012	402,379	696	920	5,582	11	16	1,953	DNA	DNA
2013	406,194	681	1,035	4,337	16	20	838	DNA	DNA
2014	409,689	724	1,014	3,156	23	27	1,977	DNA	DNA
2015	410,855	752	1,055	6,372	29	35	1,376	DNA	DNA
2016	415,838	714	1,014	8,782	79	88	1,569	DNA	DNA
2017	424,246	756	1,065	9,592	34	43	2,559	DNA	DNA
2018	429,750	783	1,090	6,478	42	51	2,545	DNA	DNA
2019	432,277	786	1,098	6,862	69	76	2,054	DNA	DNA
Notes									

Residential Load Management									
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
2010	392,763	304	651	8,357	11	18	3,886	6.4	6.4
2011	397,234	317	661	7,858	9	17	3,163	6.2	5.2
2012	401,929	326	639	5,570	6	12	1,762	4.5	2.8
2013	405,737	341	652	4,321	5	9	831	1.0	3.8
2014	409,227	355	654	3,145	3	7	1,976	2.2	4.1
2015	410,396	357	656	6,345	7	13	1,372	1.5	2.8
2016	415,369	366	669	8,634	10	19	1,300	1.2	6.0
2017	423,900	382	694	9,561	11	20	2,553	2.9	4.2
2018	429,403	388	698	6,424	7	13	2,542	2.8	4.2
2019	431,862	396	711	6,847	7	14	2,046	2.3	4.3
Notes									

Commercial Load Management									
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
2010	262	8	0	0	0	0	54	0	0
2011	250	6	0	0	0	0	12	2	0
2012	65	4	0	0	0	0	185	2	0
2013	65	4	0	0	0	0	0	0	0
2014	65	4	0	0	0	0	0	0	0
2015	64	4	0	0	0	0	1	0	0
2016	63	4	0	0	0	0	0	0	0
2017	63	4	0	0	0	0	0	0	0
2018	63	4	0	0	0	0	0	0	0
2019	63	4	0	0	0	0	0	0	0
Notes									

Standby Generation [4]									
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
2010	237	96	80	27	13.6	13.6	2	DNA	DNA
2011	234	97	94	16	5.8	5.8	19	DNA	DNA
2012	247	100	96	11	4.0	4.0	0	DNA	DNA
2013	253	98	98	12	4.7	4.7	4	DNA	DNA
2014	259	103	104	10	5.0	5.0	1	DNA	DNA
2015	260	108	109	25	19.5	19.5	2	DNA	DNA
2016	269	68	68	147	68	68	269	DNA	DNA
2017	145	77	77	28	7	7	5	DNA	DNA
2018	147	82	82	12.0	3.2	3.2	1	DNA	DNA
2019	178	83	83	1.0	0.2	0.2	3	DNA	DNA
Notes									

Interruptible Service									
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
2010	143	254	233	0	0.0	0.0	3	DNA	DNA
2011	142	221	264	0	0.0	0.0	11	DNA	DNA
2012	134	262	179	1	0.6	0.6	6	DNA	DNA
2013	135	233	278	4	6.6	6.6	3	DNA	DNA
2014	134	256	249	1	15.0	15.0	0	DNA	DNA
2015	131	277	283	2	2.6	2.6	1	DNA	DNA
2016	133	270	270	1	1	1	0	DNA	DNA
2017	134	287	287	3	16	16	1	DNA	DNA
2018	133	303	303	42	32	34	2	DNA	DNA
2019	170	297	297	14	62	62	5	DNA	DNA
Notes									

Curtailable Service									
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
2010	5	17	13	0	0	0	1	DNA	DNA
2011	4	6	7	0	0	0	1	DNA	DNA
2012	4	5	7	0	0	0	0	DNA	DNA
2013	4	5	7	0	0	0	0	DNA	DNA
2014	4	6	7	0	0	0	0	DNA	DNA
2015	4	6	7	0	0	0	0	DNA	DNA
2016	4	6	7	0	0	0	0	DNA	DNA
2017	4	6	7	0	0	0	0	DNA	DNA
2018	4	6	7	0	0	0	0	DNA	DNA
2019	4	6	7	0	0	0	0	DNA	DNA
Notes									

Table Footnotes:
(1) Total available capacity may change as a result of multiple factors including changes in participation, changes in contribution from existing participants, and periodic evaluation of system response. Thus, changes in total available capacity do not directly correlate to changes in participation.
(2) Added capacity corresponds to the addition of new participants and those converted from suspended accounts.
(3) Data is Not Available (DNA) on lost capacity for certain source programs and therefore is listed as DNA in their specific table and for the aggregated ALL Source Table.
(4) During 2016 the Emergency Stand-by Tariff was closed and the customers were removed from the program. Customers whose generators met new EPS requirements were added to the non-emergency program.

27. **[FEECA Utilities Only]** For each source of demand response, please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing annual usage information for 10 years prior to the current planning period. Please also provide a summary of all demand response using the table.

Response:

Please see tables below and tab *Q27-DSM Annual Use* of the attached Excel File *Data Request #1 – Excel Tables*.

All Sources of Demand Response Combined										
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
2010	6	52	395,236	68	395,236	16	514	395,384	943	395,384
2011	4	136	399,816	252	399,816	1	101	399,582	101	399,582
2012	2	16	404,080	16	404,080	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
Notes										

Residential Load Management										
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
2010	4	48	394,999	64	394,999	7	308	394,999	651	394,999
2011	2	101	399,582	188	399,582	1	101	399,582	101	399,582
2012	1	15	403,833	15	403,833	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
Notes										
* Activations shown are limited to reliability events for capacity shortages										

Commercial Load Management										
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
2010	*	*	*	*	*	*	*	*	*	*
2011	*	*	*	*	*	*	*	*	*	*
2012	*	*	*	*	*	*	*	*	*	*
2013	*	*	*	*	*	*	*	*	*	*
2014	*	*	*	*	*	*	*	*	*	*
2015	*	*	*	*	*	*	*	*	*	*
2016	*	*	*	*	*	*	*	*	*	*
2017	*	*	*	*	*	*	*	*	*	*
2018	*	*	*	*	*	*	*	*	*	*
2019	*	*	*	*	*	*	*	*	*	*
Notes										
Commercial Demand Response is included in Residential Table Above										
Commercial Demand Response is a Summer-only program										

Standby Generation										
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
2010	2	4	237	4	237	5	63	237	70	237
2011	2	35	234	64	234	0	0	0	0	0
2012	1	1	247	1	247	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
Notes										

Interruptible Service										
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
2010	0	0	0	0	0	2	122	143	201	143
2011	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
Notes										

Curtailable Service										
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
2010	0	0	0	0	0	2	21	5	21	5
2011	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
Notes										

28. **[FEECA Utilities Only]** For each source of demand response, please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing annual seasonal peak activation information for 10 years prior to the current planning period. Please also provide a summary of all demand response using the table.

Response:

Please see tables below and tab *Q28-DSM Season Peak Activation* of the attached Excel File *Data Request #1 – Excel Tables*.

All Sources of Demand Response Combined							
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)
2010	395,649	N	0	0	Y	397,621	1,105
2011	400,220	N	0	0	N	0	0
2012	404,286	N	0	0	N	0	0
2013	407,929	N	0	0	N	0	0
2014	410,267	N	0	0	N	0	0
2015	413,339	N	0	0	N	0	0
2016	419,444	N	0	0	N	0	0
2017	427,023	N	0	0	N	0	0
2018	431,007	N	0	0	N	0	0
2019	433,746	N	0	0	N	0	0
Notes							

Commercial Load Management							
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)
2010	262	*	*	*	*	*	*
2011	250	*	*	*	*	*	*
2012	65	*	*	*	*	*	*
2013	65	*	*	*	*	*	*
2014	65	*	*	*	*	*	*
2015	64	*	*	*	*	*	*
2016	64	*	*	*	*	*	*
2017	63	*	*	*	*	*	*
2018	63	*	*	*	*	*	*
2019	63	*	*	*	*	*	*
Notes							
* Commercial Demand Response is included in Residential Table above							
* Commercial Demand Response is a Summer-only program							

Standby Generation							
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)
2010	240	N	0	0	Y	240	56
2011	242	N	0	0	N	0	0
2012	249	N	0	0	N	0	0
2013	253	N	0	0	N	0	0
2014	259	N	0	0	N	0	0
2015	259	N	0	0	N	0	0
2016	208	N	0	0	N	0	0
2017	172	N	0	0	N	0	0
2018	153	N	0	0	N	0	0
2019	176	N	0	0	N	0	0
Notes							

Interruptible Service							
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)
2010	143	N	0	0	Y	143	208
2011	142	N	0	0	N	0	0
2012	135	N	0	0	N	0	0
2013	125	N	0	0	N	0	0
2014	127	N	0	0	N	0	0
2015	129	N	0	0	N	0	0
2016	132	N	0	0	N	0	0
2017	133	N	0	0	N	0	0
2018	154	N	0	0	N	0	0
2019	169	N	0	0	N	0	0
Notes							

Curtailable Service							
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)
2010	5	N	0	0	Y	4	10
2011	4	N	0	0	N	0	0
2012	4	N	0	0	N	0	0
2013	4	N	0	0	N	0	0
2014	4	N	0	0	N	0	0
2015	4	N	0	0	N	0	0
2016	4	N	0	0	N	0	0
2017	4	N	0	0	N	0	0
2018	4	N	0	0	N	0	0
2019	4	N	0	0	N	0	0
Notes							

Generation &Transmission

29. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on each utility-owned traditional generation resource in service as of December 31 of the year prior to the current planning period. For multiple small (<250 kW per installation) distributed resources of the same type and fuel source, please include a single combined entry. For capacity factor, use the net capacity as a basis.

Response:

Please see table below and tab *Q29-Utility Existing Tradition* of the attached Excel File *Data Request #1 – Excel Tables*.

Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Commercial In-Service		Gross Capacity (MW)		Net Capacity (MW)		Firm Capacity (MW)		Capacity Factor
					Mo	Yr	Sum	Win	Sum	Win	Sum	Win	(%)
ANCLOTE	1	PASCO	ST	NG	October	1974	512	524	498	511	498	511	22 2
ANCLOTE	2	PASCO	ST	NG	October	1978	520	527	505	514	505	514	28 5
CRYSTAL RIVER	4	CITRUS	ST	BIT	December	1982	769	778	712	721	712	721	41 5
CRYSTAL RIVER	5	CITRUS	ST	BIT	October	1984	767	778	710	721	710	721	26 9
P L BARTOW	4	PINELLAS	CC	NG	June	2009			1144	1227	1144	1227	55 0
CITRUS COUNTY COMBINED CYCLE	PB1	CITRUS	CC	NG	October	2018	839	951	816	931	816	931	66 8
CITRUS COUNTY COMBINED CYCLE	PB2	CITRUS	CC	NG	November	2018	839	951	816	931	816	931	64 5
HINES ENERGY COMPLEX	1	POLK	CC	NG	April	1999	495	534	490	528	490	528	60 0
HINES ENERGY COMPLEX	2	POLK	CC	NG	December	2003	529	569	524	563	524	563	69 3
HINES ENERGY COMPLEX	3	POLK	CC	NG	November	2005	522	559	515	553	515	553	62 1
HINES ENERGY COMPLEX	4	POLK	CC	NG	December	2007	524	552	516	544	516	544	68 0
OSPREY ENERGY CENTER POWER PLANT	1	POLK	CC	NG	May	2004	597	612	519	600	245	245	42 2
TIGER BAY	1	POLK	CC	NG	August	1997	203	234	200	231	200	231	35 2
AVON PARK	P1	HIGHLANDS	GT	NG	December	1968	24	25	24	25	24	25	1 0
AVON PARK	P2	HIGHLANDS	GT	DFO	December	1968	24	25	24	25	24	25	0 3
BARTOW	P1	PINELLAS	GT	DFO	May	1972	41	52	41	52	41	52	0 4
BARTOW	P2	PINELLAS	GT	NG	June	1972	41	57	41	57	41	57	2 0
BARTOW	P3	PINELLAS	GT	DFO	June	1972	41	53	41	53	41	53	0 3
BARTOW	P4	PINELLAS	GT	NG	June	1972	45	61	45	61	45	61	1 9
BAYBORO	P1	PINELLAS	GT	DFO	April	1973	44	61	44	61	44	61	0 1
BAYBORO	P2	PINELLAS	GT	DFO	April	1973	41	58	41	58	41	58	0 2
BAYBORO	P3	PINELLAS	GT	DFO	April	1973	43	60	43	60	43	60	0 1
BAYBORO	P4	PINELLAS	GT	DFO	April	1973	43	59	43	59	43	59	0 2
DEBARY	P2	VOLUSIA	GT	DFO	December	1975	48	64	48	64	48	64	0 4
DEBARY	P3	VOLUSIA	GT	DFO	December	1975	50	65	50	65	50	65	0 2
DEBARY	P4	VOLUSIA	GT	DFO	December	1975	50	65	50	65	50	65	0 2
DEBARY	P5	VOLUSIA	GT	DFO	December	1975	50	65	50	65	50	65	0 1
DEBARY	P6	VOLUSIA	GT	DFO	December	1975	51	65	51	65	51	65	0 2
DEBARY	P7	VOLUSIA	GT	NG	October	1992	79	99	79	99	79	99	4 5
DEBARY	P8	VOLUSIA	GT	NG	October	1992	78	96	78	96	78	96	4 8
DEBARY	P9	VOLUSIA	GT	NG	October	1992	80	98	80	98	80	98	5 5
DEBARY	P10	VOLUSIA	GT	DFO	October	1992	75	95	75	95	75	95	0 3
INTERCESSION CITY	P1	OSCEOLA	GT	DFO	May	1974	47	64	47	64	47	64	0 2
INTERCESSION CITY	P2	OSCEOLA	GT	DFO	May	1974	46	63	46	63	46	63	0 3
INTERCESSION CITY	P3	OSCEOLA	GT	DFO	May	1974	46	63	46	63	46	63	0 3
INTERCESSION CITY	P4	OSCEOLA	GT	DFO	May	1974	46	63	46	63	46	63	0 2
INTERCESSION CITY	P5	OSCEOLA	GT	DFO	May	1974	45	62	45	62	45	62	0 2
INTERCESSION CITY	P6	OSCEOLA	GT	DFO	May	1974	47	64	47	64	47	64	0 2
INTERCESSION CITY	P7	OSCEOLA	GT	NG	October	1993	78	95	78	95	78	95	1 7
INTERCESSION CITY	P8	OSCEOLA	GT	NG	October	1993	79	96	79	96	79	96	5 0
INTERCESSION CITY	P9	OSCEOLA	GT	NG	October	1993	79	96	79	96	79	96	3 9
INTERCESSION CITY	P10	OSCEOLA	GT	NG	October	1993	78	96	78	96	78	96	4 6
INTERCESSION CITY	P11	OSCEOLA	GT	DFO	January	1997	140	161	140	161	140	161	0 3
INTERCESSION CITY	P12	OSCEOLA	GT	NG	December	2000	73	94	73	94	73	94	8 8
INTERCESSION CITY	P13	OSCEOLA	GT	NG	December	2000	75	93	75	93	75	93	8 2
INTERCESSION CITY	P14	OSCEOLA	GT	NG	December	2000	72	92	72	92	72	92	10 1
SUWANNEE RIVER	P1	SUWANNEE	GT	NG	October	1980	49	68	49	68	49	68	5 1
SUWANNEE RIVER	P2	SUWANNEE	GT	DFO	October	1980	50	67	50	67	50	67	0 2
SUWANNEE RIVER	P3	SUWANNEE	GT	NG	November	1980	50	68	50	68	50	68	5 5
UNIVERSITY OF FLORIDA	P1	ALACHUA	GT	NG	January	1994	44	46	44	46	44	46	81 2
Notes													

30. Please provide an electronic copy of the Company's Ten-Year Site Plan (TYSP) for the period 2020-2029 (current planning period) in PDF form. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on each utility-owned traditional generation resource planned for in-service within the current planning period. For multiple small (<250 kW per installation) distributed resources of the same type and fuel source, please include a single combined entry. For projected capacity factor, use the net capacity as a basis.

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

Response:

Please see table below and tab *Q30-Utility Planned Traditional* of the attached Excel File *Data Request #1 – Excel Tables*.

Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Commercial In-Service		Gross Capacity (MW)		Net Capacity (MW)		Firm Capacity (MW)		Projected Capacity Factor
					Mo	Yr	Sum	Win	Sum	Win	Sum	Win	(%)
Undesignated CT	P1	Unknown	GT	NG	June	2027	225.8	239.5	225.8	239.5	225.8	239.5	18.6
Undesignated CT	P2	Unknown	GT	NG	June	2029	225.8	239.5	225.8	239.5	225.8	239.5	18.6
Notes													

a. Both projects are still in the planning status. They are not committed units yet, since DEF's TYSP Resource Plan might change depending on future year assumptions. It will take around 3 years to complete each project (siting, permitting, procurement, construction and testing), which means that we will start the process for the 2027 Combustion Turbine around 2024 and for the 2029 Combustion Turbine around 2026.

31. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on each utility-owned renewable generation resource in service as of December 31 of the year prior to the current planning period. For multiple small (<250 kW per installation) distributed resources of the same type and fuel source, please include a single combined entry. For capacity factor, use the net capacity as a basis.

Response:

Please see table below and tab *Q31-Utility Existing Renewable* of the attached Excel File *Data Request #1 – Excel Tables*.

Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Commercial In-Service		Gross Capacity (MW)		Net Capacity (MW)		Firm Capacity (MW)		Capacity Factor
					Mo	Yr	Sum	Win	Sum	Win	Sum	Win	(%)
Econolockhatchee Photovoltaic Array	1	Volusia	PV	SO	1	1989	0 007	0 007	0 007	0 007	0	0	17
Osceola	1	Osceola	PV	SO	4	2016	3 8	3 8	3 8	3 8	1 7	0	15
Perry	1	Taylor	PV	SO	8	2016	5 1	5 1	5 1	5 1	2 3	0	26
Suwannee	1	Suwannee	PV	SO	11	2017	8 8	8 8	8 8	8 8	4 0	0	24
Hamilton	1	Hamilton	PV	SO	12	2018	74 9	74 9	74 9	74 9	42 7	0	28
Lake Placid	1	Highlands	PV	SO	12	2019	45	45	45	45	25 7	0	12
Trenton	1	Gilchrist	PV	SO	12	2019	74 9	74 9	74 9	74 9	42 7	0	6
St Petersburg Pier	1	Pinellas	PV	SO	12	2019	0 35	0 35	0 35	0 35	0 2	0	N/A
Notes													

32. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on each utility-owned renewable generation resource planned for in-service within the current planning period. For multiple small (<250 kW per installation) distributed resources of the same type and fuel source, please include a single combined entry. For projected capacity factor, use the net capacity as a basis.

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

Response:

Please see table below and tab *Q32-Utility Planned Renewable* of the attached Excel File *Data Request #1 – Excel Tables*.

Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Commercial In-Service		Gross Capacity (MW)		Net Capacity (MW)		Firm Capacity (MW)		Projected Capacity Factor
					Mo	Yr	Sum	Win	Sum	Win	Sum	Win	(%)
Columbia	1	Columbia	PV	SO	3	2020	74.9	74.9	74.9	74.9	42.7	0	~31%
Debary	1	Volusia	PV	SO	5	2020	74.5	74.5	74.5	74.5	33.5	0	~24%
Twin Rivers	1	Hamilton	PV	SO	12	2020	74.9	74.9	74.9	74.9	42.7	0	~27%
Santa Fe	1	Columbia	PV	SO	12	2020	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #12	1	Unknown	PV	SO	12	2021	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #13	1	Unknown	PV	SO	12	2021	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #14	1	Unknown	PV	SO	12	2021	56	56	56	56	31.9	0	~28%
Solar #15	1	Unknown	PV	SO	1	2022	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #16	1	Unknown	PV	SO	1	2022	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #17	1	Unknown	PV	SO	5	2023	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #18	1	Unknown	PV	SO	5	2023	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #19	1	Unknown	PV	SO	5	2024	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #20	1	Unknown	PV	SO	5	2024	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #21	1	Unknown	PV	SO	12	2025	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #22	1	Unknown	PV	SO	12	2025	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #23	1	Unknown	PV	SO	12	2026	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #24	1	Unknown	PV	SO	12	2027	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #25	1	Unknown	PV	SO	12	2028	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #26	1	Unknown	PV	SO	12	2029	74.9	74.9	74.9	74.9	42.7	0	~28%
Notes													

a. Columbia was placed in service on March 17th, 2020. DeBary is expected to be in service in May 2020. Santa Fe and Twin Rivers are under construction. The rest of the units are still in the planning stage.

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

Response:

There have been no utility owned renewable resource projects cancelled, delayed or reduced in scope within the past year.

34. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on each purchased power agreement with a traditional generator still in effect by December 31 of the year prior to the current planning period pursuant to which energy was delivered to the Company during said year.

Response:

Please see table below and tab *Q34-PPA Existing Traditional* of the attached Excel File *Data Request #1 – Excel Tables*.

Seller Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)	
						Sum	Win	Sum	Win	Sum	Win	Start	End
Northern Star Generation	Mulberry	1	Polk	CC	NG	115	115	115	115	115	115	Jul-94	Aug-24
Northern Star Generation	Orange Cogen	1	Polk	CC	NG	104	104	104	104	104	104	Jun-95	Dec-25
Northern Star Generation	Orlando Cogen	1	Orange	CC	NG	115	115	115	115	115	115	Sep-93	Dec-23
General Electric Financial Services	Shady Hills	1-3	Pasco	GT	NG	480	522	480	522	480	522	Apr-07	Apr-24
Southern Power	Franklin	1	Lee, AL	CC	NG	424	424	424	424	424	424	Jun-16	May-21
Northern Star Generation	Vandolah Power	1-4	Hardee	GT	NG	640	681	640	681	640	681	Jun-12	May-27
Notes													

35. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on each purchased power agreement with a traditional generator pursuant to which energy will begin to be delivered to the Company during the current planning period.

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

Response:

Please see table below and Tab *Q35-PPA Planned Traditional* of the attached Excel File *Data Request #1 – Excel Tables*.

Seller Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)	
						Sum	Win	Sum	Win	Sum	Win	Start	End
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Notes													

36. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on each purchased power agreement with a renewable generator still in effect by December 31 of the year prior to the current planning period pursuant to which energy was delivered to the Company during said year.

Response:

Please see table below and tab *Q36-PPA Existing Renewable* of the attached Excel File *Data Request #1 – Excel Tables.*

Seller Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)	
						Sum	Win	Sum	Win	Sum	Win	Start	End
Pasco County	Pasco County Resource Recovery	1	Pasco	MSW	Waste	23	23	23	23	23	23	Jan-95	Dec-24
Pinellas County	Pinellas County Resource Recovery	1	Pinellas	MSW	Waste	54.8	54.8	54.8	54.8	54.8	54.8	Jan-95	Dec-24
Miami-Dade County	Miami-Dade Resource Recovery	1	Dade	MSW	Waste	43	43	43	43	NA	NA	NA	NA
Lee County	Lee County Resource Recovery	1	Lee	MSW	Waste	40	40	40	40	NA	NA	NA	NA
Lake County	Lake County Resource Recovery	1	Lake	MSW	Waste	23	23	23	23	NA	NA	NA	NA
Citrus World	Citrus World	1	Polk	WH	WH	0.1	0.1	0.1	0.1	0.1	0.1	Jan-91	NA
PCS Phosphate	PCS Phosphate	1	Hamilton	WH	WH	0.2	0.2	0.2	0.2	0.2	0.2	Nov-80	NA
Notes													

37. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on each purchased power agreement with a renewable generator pursuant to which energy will begin to be delivered to the Company during the current planning period.

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

Response:

Please see table below and tab *Q37-PPA Planned Renewable* of the attached Excel File *Data Request #1 – Excel Tables.*

Seller Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)	
						Sum	Win	Sum	Win	Sum	Win	Start	End
National Solar	National Solar Gadsden	1	Gadsden	PV	SO	50	50	50	50	NA	NA	NA	NA
National Solar	National Solar Hardee	1	Hardee	PV	SO	50	50	50	50	NA	NA	NA	NA
National Solar	National Solar Suwannee	1	Suwannee	PV	SO	50	50	50	50	NA	NA	NA	NA
National Solar	National Solar Highlands	1	Highlands	PV	SO	50	50	50	50	NA	NA	NA	NA
National Solar	National Solar Osceola	1	Osceola	PV	SO	50	50	50	50	NA	NA	NA	NA
Notes													

National Solar signed As-Available Contracts (listed above) with DEF several years ago and have had discussions with various landowners in each of the counties. DEF considers all of these projects in very early-stage development and continue to review their viability.

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

Response:

The US EcoGen Polk biomass QF contract was terminated on October 3, 2018 by DEF due to default by US EcoGen Polk. On March 28, 2019, US EcoGen Polk filed for arbitration per its terminated QF Agreement and the arbitration process is underway administered by the American Arbitration Association. The project impact is undetermined at this time.

39. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on each power sale agreement still in effect by December 31 of the year prior to the current planning period pursuant to which energy was delivered from the Company to a third-party during said year.

Response:

Please see table below and tab *Q39-PSA Existing* of the attached Excel File *Data Request #1 – Excel Tables*.

Buyer Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)		Description
						Sum	Win	Sum	Win	Sum	Win	Start	End	
Homestead	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	25	25	1/1/2007	12/31/2019	Partial Req'ts
Homestead	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	15	15	1/1/2007	12/31/2019	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	100	0	6/1/2019	8/31/2019	Partial Req'ts
Reedy Creek	N/A	N/A	N/A	N/A	Nat Gas	N/A	N/A	N/A	N/A	53	53	1/27/2017	6/30/2019	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	Nat Gas	N/A	N/A	N/A	N/A	200-500	200-500	6/1/2016	12/31/2024	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	150	150	1/1/2014	12/31/2020	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	100	0	6/1/2017	12/31/2020	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	0	600	1/1/2014	12/31/2020	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	0.014	0.014	6/1/1987	Evergreen	Partial Req'ts
Reedy Creek	N/A	N/A	N/A	N/A	Nat Gas	N/A	N/A	N/A	N/A	141	81	1/1/2016	12/31/2021	Partial Req'ts
Reedy Creek	N/A	N/A	N/A	N/A	Solar	N/A	N/A	N/A	N/A	2-10	2-10	8/1/2019	12/31/2020	Partial Req'ts
Tampa Electric	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	0-515	0-515	1/26/2019	2/28/2021	Partial Req'ts
Chattahoochee	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	6	4	1/1/2016	12/31/2020	Full Req'ts
Mount Dora	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	21	23	1/1/2013	12/31/2020	Full Req'ts
Williston	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	8	9	1/1/2013	12/31/2020	Full Req'ts
Notes														
The Seminole 2019 agreement above was not executed until May 2019, so it was not included in last year's report														

40. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on each power sale agreement pursuant to which energy will begin to be delivered from the Company to a third-party during the current planning period.

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

Response:

Please see table below and tab *Q40-PSA Planned* of the attached Excel File *Data Request #1 – Excel Tables*.

Buyer Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)		Description
						Sum	Win	Sum	Win	Sum	Win	Start	End	
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	0	50	1/1/2021	3/31/2027	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	50-400	50-400	1/1/2021	12/31/2030	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	50-400	50-400	1/1/2021	12/31/2035	Partial Req'ts
Notes														
The two Seminole agreements directly above have optionality. The combined maximum is 450 MW through 2030.														

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

Response:

No long-term power sale agreements within the past year were cancelled.
The first 4 contracts listed on the response to question 39 expired in 2019.
The second and third Reedy Creek contracts were modified in 2019.

42. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing the actual and projected annual energy output of all renewable resources on the Company's system, by source, for the 11-year period beginning one year prior to the current planning period.

Response:

Please see table below and tab *Q42-Annual Renewable Generation* of the attached Excel File *Data Request #1 – Excel Tables*.

Renewable Source	Annual Renewable Generation (GWh)										
	Actual	Projected									
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Utility - Firm	222	825	1284	2133	2370	2732	2854	3205	3376	3556	3717
Utility - Non-Firm	0	0	0	0	0	0	0	0	0	0	0
Utility - Co-Firing	0	0	0	0	0	0	0	0	0	0	0
Purchase - Firm	654	609	605	620	620	622	620	620	620	622	620
Purchase - Non-Firm	32	348	512	824	1133	1442	1741	2036	2183	2336	2474
Purchase - Co-Firing	0	0	1	2	3	4	5	6	7	8	9
Customer - Owned	221	347	482	648	845	1054	1262	1467	1605	1681	1754
Total	907	2128	2884	4227	4971	5854	6482	7334	7792	8203	8575
Notes											
(Include Notes Here)											

43. **[Investor-Owned Utilities Only]** Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on all of the Company's plant sites that are potential candidates for utility-scale (>2 MW) solar installations.

Response:

Please see table below and tab *Q43-Potential Solar Sites* of the attached Excel File *Data Request #1 – Excel Tables*.

Plant Name	Land Available (Acres)	Potential Installed Net Capacity (MW)	Potential Obstacles to Installation
Anclote	50	9	Wetlands, geotechnical problems, power grid interconnection costs, coastal area
Avon Park	60	10	Wetlands, geotechnical problems, species impacts
Crystal River	150	25	Wetlands, geotechnical problems, non-contiguous land, power grid interconnection not studied, impact to existing power plant, coastal area, species impacts
DeBary	400	67	Wetlands, native species habitat, existing solar footprint, geotechnical problems, non-contiguous land for solar
Hines	150	25	Wetlands, geotechnical problems, native species habitat, non-contiguous land for solar, power grid interconnection not studied, impact to existing power plant, species impacts
Suwannee	60	10	Wetlands, geotechnical problems, archeological finds, native species habitat
Turner	15	2	Small site, non-contiguous land for solar, native species habitat
Higgins	75	12.7	Wetlands, geotechnical problems, power grid interconnection not studied and not in our territory, coastal area
Bartow	50	9	Wetlands, geotechnical problems, archeological finds, non-contiguous land for solar power grid interconnection not studied, impact to existing power plant, coastal area

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

Response:

DEF encourages renewable energy development as it has continued to educate, engage, and discuss Florida renewable policy and the need for reliable, dependable, and renewable energy including fuel diversity in Florida. Since 2006, DEF has received over 550 inquiries about developing renewable energy projects or initiatives in the state. DEF continues to explore renewable energy production through these good faith discussions. In addition, DEF continues to educate audiences at various industry conferences, local community events, and via our web site on renewable energy resources and technologies. Using Company assets, displays, devices, and employees at these events, we are able to engage individual participants interested in encouraging the production of renewable energy within the state.

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

Response:

DEF has officially recorded over 21 formal requests in 2019 from potential renewable energy providers and DEF has undertaken many more informal email and phone conversations. As the cost of solar PV technology continues to decline, there has been more interest from various solar companies trying to utilize this technology. This interest can be seen in the dramatic increase in generator interconnection requests that DEF has received from solar PV projects. DEF, as of December 31, 2019 had over 5,700 MW in its interconnection queues. DEF continues to educate renewable energy generators on the potential QF structure, pricing and obligations of a renewable power purchase agreement.

Most of the inquiries during 2019 were for solar photovoltaic projects, but there was also an inquiry about a waste facility and another inquiry about ocean energy.

46. 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.

Response:

DEF has assigned a 57% equivalent summer capacity value to the DEF owned solar PV facilities in operation and for planned sites with the presumption that it will be designed with single axis tracking technology. Other technologies may result in other values such as DEF's DeBary Solar Plant in a fixed tilt configuration has been assigned a 45% equivalent summer capacity value. DEF assigns no winter peak capacity value to solar PV. These values were derived and based on an analysis of data from industry models of anticipated PV performance correlated to DEF's load forecast. DEF recognizes that actual performance will differ from year to year; and, may differ from the model and that the correlation to peak load may change due to the amount of solar installed and changes in the load behavior. As a result, DEF expects that this value may be revised once the additional solar PV power plants are in service and there is longer-term demonstrated operating data.

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

Response:

Yes, Duke Energy has observed a declining trend in costs of energy storage, specifically the battery pack portion of the project cost.

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

Response:

While many non-lithium battery companies exist and have promising technologies, few have been successful at scaling to commercial size or produced to prove theoretical performance. Duke Energy continues to monitor several non-lithium battery storage technologies, such as flow batteries, but is currently focused on deploying proven, safe, and cost-effective lithium-ion technology. Duke Energy participates in development and testing of battery technologies through its partnerships with entities such as EPRI and the National Renewable Energy Laboratory (NREL) as well as research and pilot projects across the Duke Energy regulated and non-regulated companies.

49. 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).

Response:

Duke Energy considers energy storage to be another power grid operator tool or resource for distribution, transmission, and generation solutions. The optimal positioning is very project specific and is dependent upon the problem being solved. Ultimately, energy storage projects are compared to traditional tools or methods to determine if energy storage is in fact a low cost and optimal solution. For example, Duke Energy is evaluating solar power plants with adjacent battery storage as well as investigating solutions to distribution reliability closer to the customer loads.

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

Response:

Customers (mainly commercial/industrial) have inquired about using energy storage in various forms. Usually it is for business continuity whether post-hurricane or temporary interruptions. Some customers have developed their own back up strategy and few have found battery storage external to their business as the best, economical solution to date. The customer is often looking for days of backup power which presently prices Li-ion technology out of consideration.

51. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on all energy storage technologies that are currently either part of the Company's system portfolio or are part of a pilot program sponsored by the Company.

Response:

Please see the table below and tab *Q51-Existing Energy Storage* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Project Name	Pilot Program (Y/N)	In-Service/ Pilot Start Date (MM/YY)	Max Capacity Output (MW)	Max Energy Stored (MHh)	Conversion Efficiency (%)
USF Microgrid Energy Storage Pilot	Y	7/8/2018	0.25	0.475	88%
Notes					

52. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on all energy storage technologies planned for in-service during the current planning period either as part of the Company's system portfolio or as part of a pilot program sponsored by the Company.

Response:

Please see the table below and tab *Q52-Planned Energy Storage* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Project Name	Pilot Program (Y/N)	In-Service/ Pilot Start Date (MM/YY)	Projected Max Capacity Output (MW)	Projected Max Energy Stored (MHh)	Projected Conversion Efficiency (%)
Cape San Blas	Y	1Q 2021	5.5	20.5	83.5%
Trenton	Y	1Q 2021	11	16.7	83.2%
Jennings	Y	1Q 2021	5.5	8.5	84.0%
Notes					

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

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

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

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

Response:

a. Duke Energy is currently developing energy storage projects as part of the 50 MW battery energy storage pilot program identified in the DEF Settlement Agreement. The pilot program is studying how energy storage is a cost-effective tool to improve customer reliability, defer or eliminate traditional distribution investment, and improve system operations at universal solar assets. As of this filing, three DEF pilot sites have been announced for energy storage projects. Current pilot

development remains underway and therefore the total program results have not yet been realized.

b. DEF expects the current pilot program as well as future energy storage projects will help to better optimize the best blend of multiple use battery locations which may provide frequency management, capacity, and energy arbitrage values. These will include projects to mitigate intermittency from solar power and improve the coincidence between renewable generation and load. DEF also expects to better understand the benefits of energy storage as a key component of localized resiliency for locations as well as future uses of batteries to harden the local grids for counties and municipalities. As costs continue to decline on Li-ion batteries and perhaps other technologies provide additional paths to energy storage, storage will become a part of the myriad of tools DEF deploys to optimize grid resiliency and reduce certain transmission or distribution congestion/redundancy needs.

c. Duke Energy plans to update the Commission on the status of our energy storage pilot programs during future Ten Year Site Plan filings and during any ad hoc requests made by the Commission.

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

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

Response:

To date, Duke Energy has not utilized energy storage to provide firm capacity as it does not have such capacity installed. We will continue to review best fit locations for combining solar with storage to potentially develop site specific firm capacity.

a. Duke Energy does not have operational experience using energy storage as firm capacity.

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

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

Response:

DEF is currently offering a community solar program through its Shared Solar Rider. This Rider is available to all Customers throughout the entire service area served by the Company on a first come first served basis subject. Customers can voluntarily subscribe to 50-kWh blocks of energy per month from a few solar photovoltaic (PV) facilities owned and operated by Duke Energy Florida. The subscription fee per 50 kWh-energy block is $7.75 per month and the customer receives an as-available energy-based bill credit. Multiple blocks may be subscribed qualifying customers up to a maximum of 25 blocks per month for residential, 150 blocks for commercial, and 2,000 blocks for industrial customers under this experimental pilot tariff. DEF reserves the right to close the program to new applicants at any time during the 5-year availability period.
DEF is researching and studying new tariff structures that will offer customers a choice to voluntary participate in Florida solar technology advancement. One tariff structure is simply accepting voluntary support from customers that wish to see more small-scale local community-based solar projects in Florida. This type of donation-based program is intended to grow renewable energy interest, educate customers about solar technology, or meet customer requests for such projects. Another community solar tariff structure is offering customers a voluntary way to participate in the development and operation of DEF's future large-scale cost-effective solar projects in Florida. Similar to DEF's Shared Solar Rider it may be subscription based, however each subscription may come in units of power, (kW) versus energy, (kWh). In return for a customer's subscription, they would receive electric bill credits. More research on tariff structures, and customer interest and participation are still needed to determine an exact launch date.

56. 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.

Response:

Duke Energy engages in research and development activities through many channels. The Company's Emerging Technology Office scans, monitors, and assesses technology trends to inform the Company's strategy on how these technologies may enable the Company to meet evolving customer needs more efficiently. A few technologies that the Company is studying, modeling, and forecasting include microgrids, hydrogen, biofuels, longer-duration storage, and IoT-connected devices. The Company remains active in industry groups such as the Electric Power Research Institute (EPRI), national labs (NREL, ORNL, PNNL, etc.) and the U.S. Department of Energy (DOE), where we collaborate with government, other utilities, and industry experts on emerging technologies. Finally, DEF continues to advance its tactical and near-term Florida R&D efforts by the study and review of microgrid technologies through its research at the USFSP Parking Garage, and its design applications associated with the projects in its 50 MW Battery Pilot.

57. **[Investor-Owned Utilities Only]** Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing, on a system-wide basis, the historical annual average as-available energy rate in the Company's service territory for the 10-year period prior to the current planning period. Also, provide the projected annual average as-available energy rate in the Company's service territory for the current planning period. If the Company uses multiple areas for as-available energy rates, please provide a system-average rate as well.

Response:

Year		As-Available Energy ($/MWh)	On-Peak Average ($/MWh)	Off-Peak Average ($/MWh)
Actual	2010	42.92	49.48	37.89
	2011	38.51	43.72	34.58
	2012	30.09	34.41	26.43
	2013	34.35	38.29	31.01
	2014	37.68	42.97	33.21
	2015	26.03	28.73	23.73
	2016	25.96	29.79	22.73
	2017	28.97	32.45	26.04
	2018	30.84	34.80	27.49
	2019	23.71	27.22	20.73
Projected	2020	19.87	21.18	18.77
	2021	19.25	20.45	18.24
	2022	17.50	18.12	16.97
	2023	17.16	17.71	16.70
	2024	17.97	18.50	17.52
	2025	19.96	20.64	19.39
	2026	22.18	22.92	21.55
	2027	25.55	26.77	24.52
	2028	29.89	31.62	28.43
	2029	32.14	33.44	31.05

Notes

This year's response for both historic and projected values have been adjusted to align with DEF's as-available energy tariff and rule 25-17.0825(2) F.A.C. Historic values have been adjusted from a fuel only basis to include tariffed components found in Appendix A, (starting on Tariff Sheet 9.30) which are also incorporated in the table's projected values. Historically, DEF has used its system marginal costs as a reasonable proxy of its QF as-available energy payment rates. However, this practice has been supplanted to align with 25-17.0825(2)(a) where a reasonable amount of potential QFs in DEF interconnection queues are considered in the MW block size. Please note that current estimates are only valid for a limited time and effective as of May 1, 2020 due to the steady potential QF interconnection activity. Finally, as DEF's estimated as-available MW block size continues to grow, DEF anticipates that it will experience hours when required DEF system generation along with potential QF generation will exceed DEF's forecasted hourly loads and the cost to manage unavoidable excess energy may not be fully captured in the projected values herein.

58. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on all planned traditional units with an in-service date within the current planning period. For each

planned unit, provide the date of the Commission's Determination of Need and Power Plant Siting Act certification, if applicable.

Response:

Please see the table below and tab *Q58-Planned Trad Units PPSA* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Generating Unit Name	Summer Capacity (MW)	Certification Dates (if Applicable)		In-Service Date (MM/YY)
		Need Approved (Commission)	PPSA Certified	
Nuclear Unit Additions				
Combustion Turbine Unit Additions				
Undesignated CT	225.8	Not Required	Not Required	6/1/2027
Undesignated CT	225.8	Not Required	Not Required	6/1/2029
Combined Cycle Unit Additions				
Steam Turbine Unit Additions				
Notes				
(Include Notes Here)				

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

Response:

In the DEF 2020 Ten-Year Site Plan, the in-service date for the two future simple cycle units were projected for 6/2027 and 6/2029. A "drop dead" decision date to proceed with the 6/2027 or later simple cycle units would typically occur 24-30 months prior to the in-service date. Therefore, the "drop dead" date will be year 2024 for the first unit and year 2026 for the second one. The major components of the "drop dead" date for the simple cycles' schedule is shown below:

6/2027 Simple Cycle Unit	2024				2025				2026				2027				2028				2029			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Evaluations																								
Regulatory/Licensing/Permitting																								
Engineer/Procure/Construct																								

6/2029 Simple Cycle Unit	2024	2024	2024	2024	2025	2025	2025	2025	2026	2026	2026	2026	2027	2027	2027	2027	2028	2028	2028	2028	2029	2029	2029	2029
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Evaluations																								
Regulatory/Licensing/Permitting																								
Engineer/Procure/Construct																								

60. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing the actual and projected capacity factors for each existing and planned unit on the Company's system for the 11-year period beginning one year prior to the current planning period.

Response:

Please see the table below and tab *Q60-Capacity Factors* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Plant	Unit No.	Unit Type	Fuel Type	Capacity Factor (%)										
				Actual	Projected									
				2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Anclote	1	Steam	Gas	22 2	6 7	7 8	9 4	8 5	9 5	9 8	11 2	10 9	11 2	11 4
Anclote	2	Steam	Gas	28 5	7 4	8 7	8 3	8 7	8 5	10 8	10 4	11 2	12 9	11 0
Crystal River	4	Steam	Coal	41 5	28 9	31 9	23 8	20 3	25 2	24 2	22 0	25 2	25 4	27 7
Crystal River	5	Steam	Coal	26 9	29 3	28 1	32 3	27 3	18 2	23 1	25 1	24 2	31 1	28 7
Bartow CC	4	Combined Cycle	Gas	55 0	68 2	67 4	68 1	66 1	62 2	61 6	61 5	62 2	58 5	62 1
Citrus CC	1-2	Combined Cycle	Gas	65 7	84 1	84 2	77 3	83 2	86 4	80 9	82 6	82 1	77 4	81 1
Hines Energy Complex	1-4	Combined Cycle	Gas	64 9	60 2	60 7	64 3	60 0	58 3	56 2	54 5	57 3	60 1	58 7
Osprey CC	1	Combined Cycle	Gas	42 2	19 7	18 0	19 5	15 7	52 0	61 9	62 1	56 6	63 4	58 6
Tiger Bay	1	Combined Cycle	Gas	35 2	67 2	76 3	83 1	80 9	56 3	64 8	70 2	73 3	75 6	66 0
Avon Park	1-2	Gas Turbine	Gas/Oil	0 7	1 7	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
Bartow Peaker	1-4	Gas Turbine	Gas/Oil	1 2	0 3	0 3	0 2	0 1	0 8	0 5	0 9	1 8	3 2	2 4
Bayboro	1-4	Gas Turbine	Oil	0 2	0 3	0 4	0 2	0 1	0 9	0 7	1 7	2 4	3 3	2 3
DeBary	1-10	Gas Turbine	Gas/Oil	2 2	0 5	0 4	0 4	0 2	1 1	0 9	1 2	2 3	4 0	2 9
Generic CTs	1-3	Gas Turbine	Gas									25 8	20 3	17 5
Intercession City	1-14	Gas Turbine	Gas/Oil	3 4	1 0	0 9	0 8	0 6	2 0	1 5	2 0	3 4	4 3	3 3
Suwannee Peaker	1-3	Gas Turbine	Gas/Oil	3 6	0 5	0 5	0 3	0 2	1 0	0 8	0 9	1 6	2 4	1 9
University of Florida	1	Gas Turbine	Gas	81 2	84 0	80 4	91 5	83 3	87 9	80 9	88 7	90 5	0 0	0 0
Solar		PV		24 7	28 1	27 8	28 2	28 2	28 2	28 1	28 2	28 2	28 2	28 2
Notes														

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

Response:

DEF does not strictly maintain a retirement schedule for each unit on the DEF system, but periodically evaluates each unit on a case by case basis, taking into account changes in many factors including unit dispatch (history and projections of starts and capacity factor), changes in upcoming maintenance, the anticipated impact of final or proposed environmental regulations, potential transmission impacts, and availability of parts and vendor maintenance support. DEF uses the most recently approved depreciation schedules as a guideline. The table below presents the current depreciation schedules.

	UNIT DATA				CURRENT APPROVED	
					CAPITAL	
	UNIT	UNIT	FUEL	IN-SERVICE	RECOVERY	LIFESPAN
PLANT NAME	NO.	TYPE	PRI.	YEAR	DATE	IN YEARS
STEAM UNITS						
CRYSTAL RIVER - NORTH	4, 5	ST	BIT	1982	2042	60
ANCLOTE	1, 2	ST	NG	1974	2024	50
COMBINED-CYCLE UNITS						
BARTOW	4	CC	NG	2009	2044	35
HINES ENERGY COMPLEX	1	CC	NG	1999	2034	35
HINES ENERGY COMPLEX	2	CC	NG	2003	2038	35
HINES ENERGY COMPLEX	3	CC	NG	2005	2040	35
HINES ENERGY COMPLEX	4	CC	NG	2007	2042	35
TIGER BAY	1	CC	NG	1995	2038	43
OSPREY ENERGY CENTER	1	CC	NG	2004	2042	38
SIMPLE CYCLE COMBUSTION TURBINES						
AERODERIVATIVE UNITS						
AVON PARK	P1	GT	NG	1968	2016	48
AVON PARK	P2	CT	DFO	1968	2016	48
BAYBORO	P1-P4	CT	DFO	1973	2029	56
INTERCESSION CITY	P1-P6	CT	DFO	1974	2020	46
SUWANNEE RIVER	P1, P3	GT	NG	1980	2024	44
SUWANNEE RIVER	P2	CT	DFO	1980	2024	44
FRAME UNITS						
BARTOW	P1, P3	CT	DFO	1972	2027	55
BARTOW	P2, P4	GT	NG	1972	2027	55
DEBARY	P2-P6	CT	DFO	1975	2020	45
DEBARY	P7-P9	GT	NG	1992	2023	31
DEBARY	P10	CT	DFO	1992	2023	31
INTERCESSION CITY	P11	CT	DFO	1997	2022	25
INTERCESSION CITY	P7-P10	GT	NG	1993	2031	38
INTERCESSION CITY	P12-P14	GT	NG	2000	2036	36
UNIV. OF FLA.	P1	GT	NG	1993	2033	40

62. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on all of the Company's steam units that are potential candidates for repowering to operation as Combined Cycle units.

Response:

Please see the table below and tab *Q62-Steam Unit CC Conversion* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Plant Name	Fuel Type	Summer Capacity (MW)	In-Service Date (MM/YYY)	Potential Conversion	Potential Issues
Anclote	NG	498	10/74	CC	Project Development
Anclote	NG	505	10/78	CC	Project Development
Crystal River	BIT	712	12/82	CC/IGCC	Project Development
Crystal River	BIT	710	10/84	CC/IGCC	Project Development
Notes					

63. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on all of the Company's steam units that are potential candidates for fuel-switching.

Response:

Please see the table below and tab *Q63-Steam Unit Fuel Switching* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Plant Name	Fuel Type	Summer Capacity (MW)	In-Service Date (MM/YYY)	Potential Conversion	Potential Issues
Crystal River	BIT	712	12/82	CC/IGCC	Project Development
Crystal River	BIT	710	10/84	CC/IGCC	Project Development
Notes					

64. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing a list of all proposed transmission lines for the current planning period that require certification under the Transmission Line Siting Act. Please also include in the table transmission lines that have already been approved, but are not yet in-service.

Response:

Please see the table below and tab *Q64-Transmission Lines* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Transmission Line	Line Length (Miles)	Nominal Voltage (kV)	Date Need Approved	Date TLSA Certified	In-Service Date
N/A	N/A	N/A	N/A	N/A	N/A
Notes					
DEF has no proposed transmission lines for the current planning period that require certification under the Transmission Line Siting Act, nor are there any that have already been approved, but are not yet in-service.					

Environmental

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

Response:

Between October 18, 2019 and October 25, 2019, the Citrus County Combined Cycle units were derated on several occasions to comply with a NOx emission limit that is determined based on a blended weighted average of two separate emission limits – one at loads above 75% (15 ppmvd), and the other at loads below 75% (96 ppmvd). This was an expected part of the tuning and commissioning process for the new units. Occasional periods of reduced operation (<75% load) may be necessary to provide sufficient compliance margin with the blended NOx emission standard.

66. 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 and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on the costs for the current planning period.

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

Response:

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

The EPA combined several standards and issued the final rule as the "Standards of Performance for Greenhouse Gas Emissions from New, Modified and Reconstructed Stationary Sources: Electric Utility Generating Units" (CO2 NSPS). The new units affected by these standards will meet the compliance requirements outlined in the rule and DEF has not identified any units potentially affected as "Modified" or "Reconstructed" stationary sources. As such, DEF does not anticipate any reliability impacts of this rule. On March 27, 2017 President Trump signed an Executive Order (EO) entitled "Promoting Energy Independence and Economic Growth." The EO directs federal agencies to "immediately review existing regulations that potentially burden the development or use of domestically produced energy resources and appropriately suspend, revise, or rescind those that unduly burden the development of domestic energy resources."

The EO specifically directs the EPA to review the Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units Rule (among other rules) and determine whether to suspend, revise, or rescind the rule.

In response to the EO, the Department of Justice filed motions with the D.C. Circuit Court to stay the litigation of the CO2 NSPS rules, along with the Clean Power Plan for existing sources, while each is reviewed by EPA. The CO2 NSPS will remain in effect pending the outcome of EPA's review.

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

DEF will ensure that all new generating facilities comply with new standards and will monitor maintenance and compliance activities related to existing facilities that could potentially result in the facilities being identified as "Modified" or "Reconstructed" stationary sources under the rule.

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

N/A

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

There are no specific regulatory approvals identified as associated with compliance with this rule.

e. Does the Company anticipate asking for cost recovery for any expenses related to this rule? Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing information on the costs for the current planning period.

Please see the table below and tab *Q66e-Emissions* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Year	Estimated Cost of Standards of Performance for Greenhouse Gas Emissions Rule for New Sources Impacts (Present-Year $ millions)			
	Capital Costs	O&M Costs	Fuel Costs	Total Costs
2020	0	0	0	0
2021	0	0	0	0
2022	0	0	0	0
2023	0	0	0	0
2024	0	0	0	0
2025	0	0	0	0
2026	0	0	0	0
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
Notes				

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

N/A

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

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

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

c. Cooling Water Intake Structures (CWIS) Rule.

d. Coal Combustion Residuals (CCR) Rule.

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

f. Affordable Clean Energy Rule.

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

Response:

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

DEF has provided its compliance strategy for MATS in the Integrated Clean Air Compliance Plan submitted to the Commission on March 29, 2019 in Docket 20190007-EI and updated in Docket 20200007-EI, and this compliance strategy has been implemented and there are no reliability impacts from this regulation.

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

DEF sources are not subject to CSAPR and therefore there are no reliability impacts from this regulation.

c. Cooling Water Intake Structures (CWIS) Rule.

Units impacted by this rule are still in the process of determining the compliance requirements with the regulating agencies, therefore any potential reliability impacts are yet to be determined.

d. Coal Combustion Residuals (CCR) Rule.

Units impacted by this rule are still in the process of determining the compliance requirements with the regulating agencies, therefore any potential reliability impacts are yet to be determined.

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

N/A

f. Affordable Clean Energy Rule.

Units impacted by this rule are still in the process of determining the compliance requirements with the regulating agencies, therefore any potential reliability impacts are yet to be determined.

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

Units impacted by this rule are still in the process of determining the compliance requirements with the regulating agencies, therefore any potential reliability impacts are yet to be determined.

68. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by identifying, for each unit affected by one or more of EPA's rules, what the impact is for each rule, including; unit retirement, curtailment, installation of additional emissions controls, fuel switching, or other impacts identified by the Company.

Response:

Please see the table below and tab *Q68-EPA Operational Effects* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Unit	Unit Type	Fuel Type	Net Summer Capacity (MW)	Estimated EPA Rule Impacts: Operational Effects						
				ELGS	ACE	MATS	CSAPR/ CAIR	CWIS	CCR	
									Non-Hazardous Waste	Special Waste
Anclote 1	Steam	NG	498	NA	NA	Convert to NG	Convert to NG	Impacted	NA	NA
Anclote 2	Steam	NG	505							
Bartow PB4	CC	NG	1144	NA	NA	NA	Dispatch Changes	Impacted	NA	NA
Citrus Combined Cycle	CC	NG	1632	NA	NA	NA	NA	Compliant as Constructed	NA	NA
Crystal River 4	Steam	Coal	712	Impacted	Impacted	Reagent, CEMS	FGD, SCR, Dispatch	Impacted	Impacted	NA
Crystal River 5	Steam	Coal	710							
Osprey	CC	NG	245	NA	NA	NA	NA	NA	NA	NA
Hines PB1-4	CC	NG	2045	NA	NA	NA	Dispatch Changes	NA	NA	NA
Notes										

69. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by identifying, for each unit impacted by one or more of the EPA's rules, what the estimated cost is for implementing each rule over the course of the planning period.

Response:

Please see the table below and tab *Q69-EPA Cost Effects* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Unit	Unit Type	Fuel Type	Net Summer Capacity (MW)	Estimated EPA Rule Impacts: Cost Effects (CPVRR $ millions)						
				ELGS	ACE	MATS	CSAPR/ CAIR	CWIS	CCR	
									Non-Hazardous Waste	Special Waste
Anclote 1	Steam	NG	498	NA	NA	0	0	15-130	NA	NA
Anclote 2	Steam	NG	505			0	0		NA	NA
Bartow PB4	CC	NG	1144	NA	NA	0	0	10-170	NA	NA
Crystal River 4	Steam	Coal	712	TBD	TBD	0	0	10-20	TBD	0
Crystal River 5	Steam	Coal	710			0	0			
Notes										

The compliance strategies for the MATS and CASPR/CAIR rules have been implemented. DEF anticipates costs for implementation of the CWIS and CCR Rules, but all specific compliance measures and associated costs have not been identified for all sites at this time. DEF has initiated studies and monitoring plans to develop the compliance strategies for these Rules.

70. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by identifying, for each unit impacted by one or more of EPA's rules, when and for what duration units would be required to be offline due to retirements, curtailments, installation of additional controls, or additional maintenance related to emission controls. Include important dates relating to each rule.

Response:

Please see the table below and tab *Q70-EPA Unit Availability* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Unit	Unit Type	Fuel Type	Net Summer Capacity (MW)	Estimated EPA Rule Impacts: Unit Availability (Month/Year - Duration)						
				ELGS	ACE	MATS	CSAPR/ CAIR	CWIS	CCR	
									Non-Hazardous Waste	Special Waste
Anclote 1	Steam	NG	498	NA	NA	NA	NA	TBD	NA	NA
Anclote 2	Steam	NG	505	NA	NA	NA	NA	TBD	NA	NA
Bartow PB4	CC	NG	1144	NA	NA	NA	NA	TBD	NA	NA
Citrus Combined Cycle	CC	NG	1632	NA	NA	NA	NA	TBD	NA	NA
Crystal River 4	Steam	Coal	712	TBD	TBD	NA	NA	NA	TBD	NA
Crystal River 5	Steam	Coal	710	TBD	TBD	NA	NA	NA	TBD	NA
Osprey	CC	NG	245	NA	NA	NA	NA	NA	NA	NA
Hines PB1-4	CC	NG	2045	NA	NA	NA	NA	NA	NA	NA
Notes										

71. 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.

Response:

DEF's currently approved costs for environmental compliance investments which may be considered in the EPA's future CO2 regulations include plant conversions to natural gas, coal resource retirements, and utilizing advanced natural gas technologies as discussed in detail in question # 67. These plans were undertaken to address the requirements of various new or forthcoming rules. The retirement of Crystal River units 1 and 2 in response to MATS and the Regional Haze rule also reduced the impacts of the CCR rule, the CWIS rule and updates to the State Implementation Plan to achieve attainment with SO2 and Ozone National Ambient Air Quality Standards (NAAQS). This retirement reduced DEF's CO2 footprint. The conversion of the two units at Anclote to natural gas firing in response to MATS similarly reduced priority pollutant emissions and the resultant risk around future updates to the NAAQS as well as CO2 emissions.

Until the EPA's CO2 emission reduction regulation regulations is are clearly defined, DEF can only estimate which investments would contribute to compliance and to what degree. DEF does, however, have some approved renewable energy and energy efficiency investments, recovered or administered under the energy conservation cost recovery clause that may mitigate the need for some limited future investments that may be contemplated in the EPA's future CO2 regulations; and, finally, DEF continues to evaluate clean energy technologies and prudently prepare now for a CO2 constrained future.

Fuel Supply & Transportation

72. Please complete and return, in Microsoft Excel format, the table associated with this question found in the Excel Tables Spreadsheet by providing, on a system-wide basis, the actual annual fuel usage (in GWh) and average fuel price (in nominal $/MMBTU) for each fuel type utilized by the Company in the 10-year period prior to the current planning period. Also, provide the forecasted annual fuel usage (in GWh) and forecasted annual average fuel price (in nominal $/MMBTU) for each fuel type forecasted to be used by the Company in the current planning period.

Response:

Please see the table below and tab *Q72-Fuel Usage & Price* of the Excel file DEF 2020 SDR1 - Tables.xlsx.

Year		Uranium		Coal		Natural Gas		Residual Oil		Distillate Oil	
		GWh	$/MMBTU	GWh	$/MMBTU	GWh	$/MMBTU	GWh	$/MMBTU	GWh	$/MMBTU
Actual	2010	0	0	12,115	4.05	23,692	6.27	683	10.95	381	16.19
	2011	0	0	10,809	3.83	23,571	5.43	187	10.97	81	18.31
	2012	0	0	10,003	3.83	23,997	5.56	46	12.12	104	20.35
	2013	0	0	10,577	3.94	23,061	5.63	127	12.93	93	21.13
	2014	0	0	11,729	3.98	22,953	5.66	0	0.00	76	21.97
	2015	0	0	9,718	3.72	25,227	4.67	0	0.00	73	22.30
	2016	0	0	8,885	3.62	24,807	4.09	0	0.00	77	18.66
	2017	0	0	8,722	3.44	27,307	4.26	0	0.00	62	16.43
	2018	0	0	8,422	3.20	28,687	4.52	0	0.00	90	19.80
	2019	0	0	4,322	3.66	35,170	3.93	0	0.00	33	20.36
Projected	2020	0	0	3,661	2.12	34,078	2.46	0	0.00	17	14.20
	2021	0	0	3,763	2.18	34,189	2.49	0	0.00	20	13.99
	2022	0	0	3,522	2.26	34,109	2.56	0	0.00	13	14.22
	2023	0	0	2,985	2.43	33,770	2.64	0	0.00	6	14.44
	2024	0	0	2,735	2.52	35,311	2.80	0	0.00	41	14.67
	2025	0	0	2,963	2.72	34,780	3.05	0	0.00	32	15.04
	2026	0	0	2,952	2.88	34,955	3.35	0	0.00	39	15.65
	2027	0	0	3,099	3.09	35,684	3.77	0	0.00	55	16.28
	2028	0	0	3,551	3.33	35,587	4.29	0	0.00	86	17.02
	2029	0	0	3,540	3.43	35,671	4.67	0	0.00	65	17.71
Notes											

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

Response:

DEF's fuel price forecasts are developed based on the forward market price for the first five years, followed by the long-term fundamental forecast beyond year five. The fundamental forecast is a long-term proprietary forecast prepared by a nationally recognized third-party consulting company.

As part of its forecast comparison process, Duke Energy compares its own fundamental commodity price outlooks to both public forecasts like EIA, and proprietary outlooks from other leading energy consultants. Duke Energy also compares supply and demand fundamentals where they are available to review the underlying drivers. Natural gas and distillate fuel oil are widely traded commodities with multiple forecasts although these forecasts are influenced by views of not only domestic supply and demand effects, but also international market trends. Coal price forecast comparisons are more tenuous given the limited number of qualified outlooks, the significance of transportation cost and the non- homogeneous nature of the commodity itself. Duke Energy utilizes direct comparisons for select coal product qualities widely available in the market. Since the objective of Duke Energy fundamental forecasting process is to produce a comprehensive internally consistent forecast, Duke Energy also performs checks that the final price forecast is intuitively aligned with the supply/demand balances across the various commodities.

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

a. Coal

b. Natural Gas

c. Nuclear

d. Fuel Oil

e. Other (please specify each, if any)

Response:

a. With respect to coal, in the first half of the period the high-sulfur Illinois basin coal prices generally are in the low $30's per ton escalating to low $40's in the back half of the period; Central Appalachia coal prices are in the low $50's per ton in the first half of the period escalating to the low $70's in the back half of the period; Northern Appalachia coal prices are in the low $40's per ton in the first half of the period escalating to upper $50's in the back half of the period; Powder River Basin coal prices are in the low teens escalating to upper teens; and Colorado coal prices are in the low $30's per ton escalating to low $40's in the back half of the curve. Coal demand is expected to fluctuate based on weather driven demand and changes in natural gas pricing, purchase power costs and increasing availability of renewable generation. Looking forward, Coal markets continue to be distressed and there has been increased market volatility due to a number of factors, including: (1) deteriorated financial health of coal suppliers; (2) continued abundant natural gas supply and storage resulting in lower natural gas prices, which has lowered overall domestic coal demand; (3) uncertainty around proposed, imposed, and stayed U.S. Environmental Protection Agency ("EPA") regulations for power plants; (4) changing demand in global markets for both steam and metallurgical coal; (5) uncertainty surrounding regulations for mining operations; (6) tightening supply as bankruptcies, consolidations and company reorganizations have allowed coal suppliers to restructure and settle into new, lower on-going production levels.

b. Over the planning horizon there are a number of trends that could have an impact on natural gas prices, and the overall supply and demand for domestic natural gas. First, is the level of production of domestic natural gas, particularly from unconventional resources. Second, is the forecasted growth in the use of natural gas from electric power generation, and the industrial sector. Third, is the level of natural gas exports via pipelines to Mexico, and LNG to the global natural gas market from U.S. export facilities.

Each year, the U.S. Energy Information Agency ("EIA") publishes a long-term forecast of energy market fundamentals, and for their 2020 outlook published

January 29, 2020, in most scenarios, they forecast onshore shale gas production continues to grow in the lower-48 states, even in the current low-price environment. According to the EIA, net dry domestic production has increased from January 2016 to December 2019 rising from approximately 73 Bcf/day to approximately 96 Bcf/day, with some variation. In their reference case, the EIA projects total U.S. natural gas supply to grow to approximately 112 Bcf/day on average for 2029, a slower rate of growth going forward. This growth will be primarily driven by horizontal drilling in shale formations which will continue to more than offset expected declines in traditional vertical drilling and offshore production. Although most of the projected production growth comes from the Marcellus and Utica plays in the Appalachian region, associated natural gas from the Permian region in Texas and New Mexico is also projected to be a significant contributor. In 2029, the EIA forecasts domestic natural gas consumption will be approximately 90 Bcf/day, with an incremental volume of exports at approximately 27 Bcf/day. Power generation is expected to be approximately 30 Bcf/day of the domestic natural gas demand in 2029. According to the EIA, U.S. exports of LNG reached 4 Bcf/d in 2019 and are expected to grow to an average of 15 Bcf/d in 2029.

Demand growth for natural gas from electric generation, industrial, and exports could result in additional upward pressure on prices over the planning horizon from 2020 through 2029. According to the EIA, spot prices at the Henry Hub averaged $2.57 per MMBtu in 2019 and could increase to $3.33/MMBtu by 2029 (in real terms).

c. Nuclear

DEF has retired the Crystal River 3 Nuclear plant and does not expect to be significantly impacted by trends and factors of nuclear fuel.

d. Fuel Oil

With respect to industry trends, high levels of crude oil inventories and lower-cost drilling technology advancements have continued to increase production levels and place downward pressure on the oil market. In 2019, U.S. crude oil production surpassed the record of 9.6 million barrels per day (b/d) set in 1970 and per the EIA's AEO 2020 Reference Case continues to grow to approximately 14.0 million barrels per day (b/d) by 2022 before leveling off as development moves into less productive areas. The growth occurs mainly in the Permian Basin in the Southwest Texas region. Per the EIA's AEO 2020 Reference Case published in January 2020, spot WTI (U.S. Midcontinent area) crude is expected to be approximately $53.00 a barrel in 2020, rising to approximately $58.00 in 2021. However, due to significantly lower levels of U.S. liquid fuels consumption now being forecasted for much of 2020 as a result of the disruptions to economic and business activity because of COVID-19, EIA is, as of its April STEO, forecasting spot WTI crude for 2020 to be approximately $29.34 a barrel, rising to approximately $41.12 in 2021. After 2021, the EIA AEO forecasts growth in demand from non-Organization for Economic Co-operation and Development ("OECD") countries to result in a return to higher world oil prices with WTI area crude reaching

approximately $70.00 a barrel in 2028 and approximately $101.00 a barrel in 2050. Price estimates are in real 2019 dollars.

DEF will continue to monitor oil prices, trends and its fuel forecast over time and will procure needed fuel oil supply and transportation services to meet its generation fleet needs over the planning horizon. As new information becomes available, DEF will monitor this information for potential developments.

e. Other (please specify each, if any)
DEF is developing an increasing portfolio of solar PV generation projects. While these do not have a fuel source per se, DEF evaluates the price of solar generating equipment and the energy value that it delivers in relation to the overall dispatch value of conventional generation, which is primarily driven by fuel price. DEF engages a nationally recognized consultant to provide a ten-year forecast of expected solar installation prices. This forecast indicates a slowing of the precipitous downward price change that solar PV has experienced in the last 5-10 years, but still a continuing trend in the range 3-5% annual decreases. These will be offset on a case by case basis by increases in transmission, land and other non-solar equipment costs. Nevertheless, DEF expects increasing cost effectiveness for solar PV in the ten-year period.

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

Response:

DEF has broad contacts and relationships with natural gas suppliers and pipeline transportation providers. DEF performs short-term and long-term fuel forecasts to project estimated fuel usage for future periods. The short-term forecasts typically cover a period of five years, and the long-term forecasts cover years six through year twenty. Fuel forecasts includes items such as, but not limited to, load forecasts, fuel and emission prices, operational specifics of owned generation and contracted generation resources, wholesale power sales agreements, and unit maintenance schedules. The short-term forecast is performed approximately four times per year for a five-year period and currently covers years 2020 through 2025. The long-term forecast is performed two times per year and currently covers years 2026 through 2039.

To ensure that DEF has the needed natural gas supply to meets its generation needs over the planning horizon, DEF performs periodic competitive natural gas supply Request for Proposals (“RFP’s”) and market solicitations to procure the needed competitive natural gas supply consistent with its procurement approach. In addition, DEF also monitors potential pipeline expansion projects that can access competitively priced and secure natural gas for delivery to DEF’s facilities. DEF monitors potential pipeline expansions through on-going discussions and periodic meetings with gas suppliers and pipeline providers, open seasons issued by pipelines, industry events, and publications.

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 during the current planning period.

Response:

The project descriptions outlined below are not intended to be an all-inclusive or exhaustive list of all the upstream pipeline projects that are in-service or proposed in the Gulf Coast and Southeast region, but those that DEF believes could have an impact on the natural gas supply available for DEF and the State of Florida.

Callahan Pipeline

Status: Under Construction with projected in-service targeted for September 2020
Peoples Gas will expand its natural gas service in Jacksonville, Fla., with the construction of a new pipeline, The Callahan Pipeline project. The pipeline will start at the Southern Natural Gas Cypress Interstate Pipeline in Callahan and travel east to Highway 17 in Yulee. The initiative will be done through a partnership with Florida Public Utilities Co (FPU). TECO's affiliate, SeaCoast Gas Transmission, and FPU's affiliate, Peninsula Pipeline Co. Inc., are jointly developing the Callahan Pipeline. This will help the company meet current and future natural gas demand in the Jacksonville area, including the planned Eagle LNG export terminal. The Eagle LNG project is not yet under construction but targeting completion June 2021. It would be capable of exporting up to 49.8 Bcf of LNG per year.

Columbia Gulf Transmission – Gulf Xpress

Status: In-Service
Columbia Gulf put into service on March 15, 2019 a reversal project that involved the construction of seven new midpoint compressor stations in Kentucky, Tennessee and Mississippi to allow an additional 875,000 MMBtu/day of Marcellus and Utica gas to reach the Gulf Coast. DEF currently receives gas into SESH from Columbia Gulf.

Florida Gas Transmission – Putnam Expansion Project

Status: Under Construction with projected in-service targeted for April 2022
FGT has proposed a 21-mile, 169,000 MMBtu/d, pipeline project to increase Seminole Electric Cooperative volumes at the SeaCoast Gas Transmission delivery point in Putnam County, Florida. The project would allow previously unsubscribed firm capacity available on FGT's West Leg system to be moved to FGT's East Leg mainline, according to an application filed with FERC (CP19-474). This would be accomplished through loop extensions on the East Leg mainline to meet SECI's contractual firm volumes at the SeaCoast Gas Transmission delivery point in Putnam County. Downstream of the delivery point, SeaCoast plans to build a roughly 21.3-mile pipeline to ship gas to an existing SECI power plant, which will be replaced by a gas-fired, combined-cycle unit. The project entails about 13.7 miles of 30-inch-diameter loop extension in Columbia and Union counties, along with seven miles of 30-inch-diameter loop extension in Clay and Putnam counties and other modifications in Orange County to FGT's existing

Compressor Station 18 to allow for bi-directional flows. According to the application at FERC, CS-18 will be able to discharge and flow from south to north to accommodate the total deliveries at the FGT/SeaCoast interconnection.

Gulfstream Natural Gas – Phase VI Expansion

Status: Under Construction with projected in-service targeted for December 2022

GNGS proposed the Phase VI Expansion project, designed to add about 78,000 Dt/d of mainline capacity from receipt points in Mississippi and Alabama, to a delivery point in Manatee County, Florida. Tampa Electric, which is transforming one unit at a coal-fired station in Hillsborough County, Florida, into a combined-cycle gas generating unit, has a 25-year Precedent Agreement for the full capacity. The project facilities entail one 16,000 hp compressor unit at an existing station in Mobile County, Alabama; four miles of 36-inch-diameter pipeline onshore in Mobile County; abandonment of a four-mile segment; uprating the MAOP of the 55-mile segment in offshore in Mobile County; metering equipment; and other facilities.

Sabal Trail Transmission

Status: Phase I In-Service

Sabal Trail Transmission, LLC is a joint venture of Spectra Energy Corp (an Enbridge subsidiary), NextEra Energy, and Duke Energy. Sabal Trail is an approximately 515-mile interstate pipeline extending from Transco Station 85 in Choctaw County, Alabama to the Central Florida Hub. It interconnects with FGT, Gulfstream, and the Florida Southeast Connection in Osceola County, Florida. Sabal Trail's Phase I facilities were placed into full commercial service on July 3, 2017. The full Phase I capacity of the Sabal Trail pipeline is 830,000 Dth/day with the ability to scale-up its design capacity of 1.1 Bcf/day beyond 2020. Adding this additional pipeline into the State will increase overall direct onshore supply access to the State of Florida. Sabal Trail has two foundation shippers, Florida Power & Light and DEF. Sabal began construction on Phase II in May of 2019 and has requested to place into service on or about April 30, 2020.

Transco - Hillabee Expansion Project

Status: Phase I and II In-Service

The Transco Hillabee Expansion Project will provide 1,131,730 MMBtu/day of incremental firm capacity in three phases. It originates at Transco Station 85 in Choctaw County, Alabama to a proposed interconnection between Transco and Sabal Trail in Tallapoosa County, Alabama. Sabal Trail acquired 100% of the project capacity via a long-term lease to provide Sabal Trail shippers gas supply access at Transco Station 85. Construction for Phase 1 began in 2016 and was placed in-service in July 2017. Phase II began construction in May of 2019 and was placed in-service on April 13, 2020.

Transco - Atlantic Sunrise Project

Status: In-Service

The Atlantic Sunrise Project provides an incremental 1,700,000 MMBtu/day of capacity from Transco's Leidy Line Receipts in Northeast Pennsylvania to points south and east. 850,000 MMBtu/day of this volume could deliver as far South as Transco's mainline Station 85 Zone 4 Pooling Point. The Atlantic Sunrise Project moves growing Marcellus shale gas production North-to-South to various markets on the Transco mainline. DEF is not a shipper in this project but may benefit from incremental Marcellus shale gas supply that could be available at Transco Station 85 where DEF could access this supply to transport into Florida on downstream capacity on Sabal Trail and/or Transco's Mobile Bay South Lateral. The mainline portion of the pipeline went into service in September 2017, while the reminder of the project went into full service in October 2018.

Transco – Southeastern Trails Project

Status: Under Construction with projected in-service targeted for November 2020

The Southeastern Trail Expansion (SET) is a 296,375 MMBtu/day expansion of the Transco pipeline system designed to provide additional pipeline capacity to serve markets in the Mid-Atlantic and Southeastern states by November 2020. It is an expansion from the existing Zone 5 Pleasant Valley Interconnect between Transco and Dominion Cove Point in Virginia to Transco's existing Zone 3 Pooling Point at Station 65 in Louisiana. The project has been designed to provide additional reliable service to utility and local distribution companies located in Virginia, North Carolina, South Carolina and Georgia. The Southeastern Trails Project moves gas from north-to-south to various markets on the Transco mainline. DEF is not a shipper in this project but may benefit from incremental gas supply that could be available at Transco Station 85 where DEF could access this supply to transport into Florida on downstream capacity on Sabal Trail and/or Transco's Mobile Bay South Lateral.

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, during the current planning period.

Response:

Projections of LNG exports vary widely and will be influenced by global pricing and production. According to the Federal Energy Regulatory Commission, there are currently seven licensed and operational facilities in the United States, with a combined capacity of approximately 8.955 Bcf/day. There is another 10.528 Bcf/day approved and under construction, and another 20.292 Bcf/day approved, but not yet under construction.

The growth in U.S. LNG exports are supported by differences between domestic and international natural gas prices. However, according to the EIA, the difference between domestic and international natural gas prices is assumed to tighten later in the projection period as a result of growth in U.S. LNG export capacity. U.S. natural gas prices are

currently determined primarily by the availability and cost of domestic natural gas resources.

The future trends of U.S. LNG exports are difficult to predict as it can be impacted by both domestic and global developments over the long-term period. These factors include, but are not limited to, global natural gas prices, fundamentals of supply and demand, storage levels, economic cycles, and government regulations. As the global LNG supply grows, U.S. gas supply will compete with other global LNG exporters. DEF will continue to monitor LNG infrastructure projects and exports from these facilities.

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

Response:

DEF utilizes firm natural gas storage as part of its overall gas fuel contract portfolio. DEF has agreements with Bay Gas Storage Company LTD ("Bay Gas") and SG Resources Mississippi LLC ("Southern Pines") for firm storage capacity. Both gas storage facilities are directly connected to interstate pipelines (FGT, Gulfstream, SESH and Transco) on which DEF currently holds firm transportation. Bay Gas and Southern Pines both provide DEF with greater supply reliability, operational flexibility, and price protection during severe weather events and pipeline operational flow orders. DEF expects high deliverability storage to continue to be a critical key component of its overall natural gas contract portfolio throughout the planning period. DEF will continue to evaluate any additional needs or changes in firm gas storage capacity throughout 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 current planning period. Please include a discussion of actions taken by the Company to promote competition among coal transportation modes, as well as expected changes to terminals and port facilities that could affect coal transportation.

Response:

With respect to transportation by rail, increased mining costs, declining productivity combined with decreased demand as a result of low natural gas pricing continues to apply pressure for coal transported by rail to be cost competitive. Additionally, any increased demand for coal in foreign countries could put pressure on the railroads infrastructure to transport coal to the ports for export shipments. DEF expects the coal market will remain volatile and that varying modes of transportation will provide valuable flexibility.

With respect to water transportation, because of the addition of scrubbers to many coal generation plants in the Midwest and Southeast, use of higher sulfur coal originating from the Illinois Basin has increased with the main mode of transportation from this region being via water. Here again, decreased demand as a result of low natural gas prices

continues to apply pressure for waterborne coal deliveries to be cost competitive. DEF monitors this trend and continues to explore opportunities to increase waterborne coal delivery. DEF expects the coal market will remain volatile and that access to varying modes of transportation will continue to provide valuable flexibility. Terminal services in the Gulf will be critical to enable DEF to continue purchasing waterborne coals.

DEF has a long-term contract with a Gulf terminal for storage capacity along with a contract to load coal directly from a river barge to an ocean barge which allows DEF to mitigate unfavorable weather and operational impacts while ensuring reliable loading operations. DEF continuously communicates with barge companies, terminal facilities and Gulf barge companies to manage its coal transportation via water. DEF continuously seeks opportunities to diversify its water transportation and terminal portfolio to ensure a reliable fuel supply.

Having the ability to transport coal via waterborne barge and rail transportation creates opportunities for competition between transportation modes. Additionally, the ability to take coal from various coal basins promotes competition between the different modes of transportation as well as the competition of coal pricing between coal basins. DEF continues to monitor and explore opportunities to maintain competition between water and rail delivery of coal.

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

Response:

Coal handling, blending, unloading, and storage requirements for coals from different basins are a consideration when determining coals to purchase. Decreased demand as a result of low natural gas prices are expected to reduce coal handling, blending, and unloading activities at its coal generating units. However, the Company will continue to require station resources to manage its contractual obligations. Continuous communications with the station, terminal facilities, river and gulf barge companies, and railroads are critical for DEF's coal transportation strategy in the future.

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

Response:

The United States Federal Government is legally obligated to take title and possession of all spent nuclear fuel. DEF will utilize on-site dry storage until the government fulfills its

contractual obligations. All fuel at Crystal River #3 has been moved into dry cask storage. Reimbursement for costs incurred to store fuel on site is expected if the storage is as a result of the DOE's breach of the standard contract for disposal of spent nuclear fuel. DEF cannot predict what future actions the government will take to fulfill its contractual obligations. The Nuclear Waste Policy Act of 1982, as amended cannot be changed except by an act of Congress.

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

Response:

DEF has retired the Crystal River 3 Nuclear plant and will not be affected by uranium production industry trends.

Existing Generating Unit Operating Performance									
		Planned Outage Factor		Forced Outage Factor		Equivalent Availability Factor		Average Net Operating	
		(POF)		(FOF)		(EAF)		Heat Rate (ANOHR)	
Plant Name	Unit No.	Historical	Projected	Historical	Projected	Historical	Projected	Historical	Projected
ANCLOTE	1	6.46	6.46	1.62	1.62	86.61	86.61	10,975	10,975
	2	3.47	3.47	0.73	0.73	89.92	89.92	11,169	11,169
AVON PARK	P1	1.78	1.78	3.40	3.40	89.67	89.67	18,109	18,109
	P2	2.46	2.46	9.82	9.82	86.93	86.93	19,678	19,678
BARTOW	P1	7.78	7.78	18.39	18.39	66.65	66.65	19,618	19,618
	P2	7.447	7.45	6.45	6.45	82.78	82.78	17,517	17,517
	P3	11.62	11.62	3.85	3.85	79.76	79.76	15,950	15,950
	P4	3.24	3.24	14.10	14.10	78.63	78.63	15,212	15,212
BARTOW CC	4A	7.31	7.31	0.49	0.49	91.08	91.08	11,288	11,288
	4B	9.70	9.70	2.05	2.05	86.29	86.29	11,242	11,242
	4C	1.24	1.24	8.27	8.27	87.58	87.58	11,149	11,149
	4D	5.29	5.29	0.46	0.46	93.18	93.18	11,051	11,051
	4S	7.29	7.29	6.48	6.48	78.51	78.51	562	562
BAYBORO	P1	0.89	0.89	0.75	0.75	89.89	89.89	14,292	14,292

TYSP Year	2020
Staff's Data Request #	1
Question No.	3

Nominal, Firm Purchases

Year	Firm Purchases $/MWh	Escalation %
HISTORY:		
2017	43.78 (1)	
2018	46.91 (1)	7.1%
2019	127.45	171.7%
FORECAST:		
2020	125.43	
2021	136.04	8%
2022	141.38	4%
2023	139.40	-1%
2024	137.27	-2%
2025	92.68	-32%
2026	65.04	-30%
2027	61.65	-5%
2028	55.75	-10%
2029	60.74	9%

Financial Assumptions
Base Case

AFUDC RATE		7.1	%
CAPITALIZATION RATIOS:			
	DEBT	47	%
	PREFERRED	0	%
	EQUITY	53	%
RATE OF RETURN			
	DEBT	4.35	%
	PREFERRED		%
	EQUITY	10.5	%
INCOME TAX RATE:			
	STATE	5.5	%
	FEDERAL	21	%
	EFFECTIVE	25.35	%
OTHER TAX RATE:		N/A	%
DISCOUNT RATE:		7.1	%
TAX			
DEPRECIATION RATE:			%

Financial Escalation Assumptions

Year	General Inflation %	Plant Construction Cost [1] %	Fixed O&M Cost %	Variable O&M Cost %
2020	2.50%		2.50%	2.50%
2021	2.50%		2.50%	2.50%
2022	2.50%		2.50%	2.50%
2023	2.50%		2.50%	2.50%
2024	2.50%		2.50%	2.50%
2025	2.50%		2.50%	2.50%
2026	2.50%		2.50%	2.50%
2027	2.50%		2.50%	2.50%
2028	2.50%		2.50%	2.50%
2029	2.50%		2.50%	2.50%

Loss of Load Probability, Reserve Margin, and Expected Unserved Energy
Base Case Load Forecast

Year	Annual Isolated Loss of Load Probability (Days/Yr)	Annual Isolated Reserve Margin (%) (Including Firm Purchases)	Annual Isolated Expected Unserved Energy (MWh)	Annual Assisted Loss of Load Probability (Days/Yr)	Annual Assisted Reserve Margin (%) (Including Firm Purchases)	Annual Assisted Expected Unserved Energy (MWh)
2020						
2021						
2022						
2023						
2024	DUKE Energy Florida is required to maintain a 20% Reserve Margin, therefore no LOLP study was conducted.					
2025						
2026						
2027						
2028						
2029						

TYSP Year 2020
Staff's Data Request # 1
Question No. 6

Date	Hourly System Load (MW)																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1/1/2019	3394	3204	2965	2806	2717	2710	2811	2868	3183	3658	4118	4491	4773	4979	5096	5122	5036	4936	5006	4776	4474	4166	3806	3420
1/2/2019	3079	2848	2728	2650	2695	2883	3231	3472	3713	3990	4276	4530	4766	4937	5065	5158	5170	5099	5209	4952	4657	4324	3929	3538
1/3/2019	3215	2970	2819	2747	2779	2943	3281	3527	3815	4117	4449	4673	4902	5018	5152	5217	5205	5164	5280	5052	4783	4465	4076	3661
1/4/2019	3323	3062	2936	2877	2912	3100	3435	3753	4018	4260	4547	4778	4980	5086	5112	4989	4845	4740	4660	4457	4272	4044	3734	3405
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2/5/2019	3039	2899	2853	2852	2987	3364	4021	4371	4281	4129	4031	4039	4082	4160	4201	4266	4406	4473	4703	4741	4451	4095	3634	3204
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Leave Row Blank																								
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3/15/2019	3343	3017	2834	2746	2781	2959	3322	3648	3837	4090	4469	4790	5193	5689	5983	6358	6609	6624	6331	5889	5642	5081	4638	4108
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3/31/2019	3137	2864	2698	2597	2568	2620	2754	2979	3348	3748	4060	4340	4618	4884	5213	5546	5761	5761	5529	5317	5214	4782	4293	3676
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4/5/2019	3308	3035	2878	2778	2802	3013	3420	3789	3970	4158	4348	4588	4816	5068	5389	5757	5970	6006	5773	5410	5237	4871	4467	3933
4/6/2019	3516	3206	2966	2865	2817	2836	2982	3242	3662	4150	4567	5031	5448	5912	6330	6666	6741	6698	6389	5947	5618	5058	4547	4015
4/7/2019	3569	3249	3019	2894	2813	2815	2931	3142	3570	4062	4554	5073	5674	6145	6479	6816	6866	6726	6452	6123	5945	5425	4706	4006
4/8/2019	3549	3250	3071	2971	2987	3190	3642	4019	4257	4584	5021	5536	6130	6492	6882	7084	7149	6944	6618	6099	5839	5310	4632	3933
4/9/2019	3523	3277	3099	3025	3052	3291	3815	4174	4330	4529	4853	5154	5635	6124	6244	6162	6043	5925	5717	5558	5386	4923	4347	3744
4/10/2019	3379	3117	2975	2896	2916	3118	3551	3859	4099	4367	4705	5010	5259	5523	5741	5964	6267	6330	6157	5840	5735	5282	4519	3764
4/11/2019	3319	3021	2870	2768	2802	3015	3451	3727	3877	4142	4506	4912	5314	5784	6164	6586	6789	6788	6625	6275	6117	5571	4801	4090
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4/13/2019	3955	3606	3342	3228	3156	3188	3324	3608	4078	4608	5130	5572	5997	6516	6941	7163	7215	7123	6846	6359	6006	5576	5124	4584
4/14/2019	4195	3881	3649	3503	3416	3420	3500	3727	4155	4678	5183	5631	5997	6338	6495	6632	6585	6559	6318	6035	5823	5353	4791	4095
4/15/2019	3657	3333	3171	3053	3033	3200	3567	3805	3936	4141	4277	4421	4580	4719	4909	5094	5259	5348	5279	5019	4889	4524	3986	3376
4/16/2019	3072	2782	2628	2540	2622	2832	3302	3574	3675	3787	3951	4099	4300	4545	4885	5253	5663	5916	5864	5519	5353	4882	4311	3630
4/17/2019	3216	2952	2792	2728	2733	2947	3378	3663	3818	4045	4307	4549	4837	5176	5535	5872	6204	6374	6239	5849	5675	5243	4530	3875
4/18/2019	3438	3109	2944	2868	2881	3084	3521	3803	4031	4286	4612	4980	5376	5828	6312	6778	7097	7323	7137	6675	6423	6039	5344	4700
4/19/2019	4171	3828	3591	3455	3463	3656	4061	4395	4697	5152	5588	5902	6040	5833	5449	5061	4858	4718	4543	4335	4292	4099	3775	3351
4/20/2019	3039	2823	2658	2590	2577	2635	2798	3049	3399	3677	3871	3903	3932	3934	3968	4014	4095	4132	4093	3987	4063	3916	3630	3265
4/21/2019	2957	2753	2591	2497	2503	2572	2714	2944	3293	3567	3732	3839	3897	4013	4136	4317	4491	4619	4591	4417	4394	4067	3622	3132
4/22/2019	2822	2593	2489	2455	2552	2799	3261	3559	3665	3769	3916	4055	4214	4400	4648	5018	5397	5628	5592	5313	5151	4712	4044	3490

4/23/2019	3061	2823	2692	2639	2683	2908	3345	3650	3804	3935	4134	4371	4645	4910	5370	5811	6258	6455	6353	5982	5693	5081	4407	3724
4/24/2019	3223	2937	2759	2687	2707	2933	3365	3671	3878	4105	4364	4653	5026	5504	6004	6403	6793	6936	6702	6188	5899	5331	4623	3957
4/25/2019	3490	3143	2948	2851	2852	3057	3474	3772	3979	4255	4597	4904	5288	5730	6133	6409	6607	6696	6486	6187	5898	5396	4740	4127
4/26/2019	3670	3350	3160	3061	3052	3281	3697	4031	4295	4499	4644	4778	5138	5514	5868	6215	6469	6461	6188	5689	5452	5031	4486	3940
4/27/2019	3489	3186	2969	2810	2724	2754	2846	3081	3437	3786	4097	4318	4591	4915	5262	5661	5967	6017	5851	5339	5062	4678	4220	3685
4/28/2019	3280	2971	2778	2676	2623	2643	2731	2952	3375	3877	4276	4743	5175	5558	5913	6336	6706	6738	6505	5937	5582	5161	4598	3978
4/29/2019	3479	3158	2976	2839	2837	3052	3475	3782	4079	4391	4803	5206	5632	6000	6390	6780	7113	7168	6978	6451	6099	5586	4910	4232
4/30/2019	3760	3432	3228	3106	3109	3299	3751	4040	4343	4735	5190	5617	6032	6374	6841	7217	7521	7465	7250	6607	6280	5852	5221	4543
5/1/2019	3992	3645	3428	3287	3287	3471	3881	4154	4459	4802	5173	5515	5962	6474	6910	7164	7305	7248	6985	6380	6117	5672	5079	4451
5/2/2019	3984	3662	3470	3372	3385	3562	4023	4300	4592	4945	5244	5538	5885	6199	6442	6550	6488	6313	6025	5707	5610	5305	4789	4229
5/3/2019	3816	3533	3347	3243	3275	3499	3937	4249	4519	4852	5212	5622	5965	6374	6734	6912	7051	7002	6727	6321	6017	5610	5088	4459
5/4/2019	3998	3635	3393	3229	3159	3185	3281	3547	4124	4704	5316	5938	6548	6995	7180	6884	6562	6566	6453	5966	5769	5392	4956	4448
5/5/2019	4022	3728	3492	3368	3307	3310	3427	3685	4249	4803	5400	5849	6015	5694	5254	5042	5144	5334	5304	5157	5189	4933	4513	3985
5/6/2019	3628	3355	3190	3083	3090	3324	3795	4117	4409	4811	5233	5641	6023	6426	6780	7143	7387	7417	7203	6647	6283	5795	5139	4426
5/7/2019	3940	3545	3324	3194	3168	3349	3775	4106	4411	4870	5293	5812	6367	6946	7401	7678	7820	7691	7445	6892	6520	5925	5302	4612
5/8/2019	4094	3713	3485	3361	3325	3528	3907	4216	4535	4921	5387	5807	6222	6676	7110	7462	7598	7527	7212	6705	6295	5723	5125	4390
5/9/2019	3927	3556	3374	3252	3241	3440	3890	4163	4451	4879	5362	5791	6217	6697	7044	7124	7158	7160	6857	6511	6344	5836	5160	4541
5/10/2019	4065	3744	3558	3406	3388	3551	3919	4168	4583	5027	5555	6143	6687	7104	7434	7639	7567	7422	7132	6637	6341	6013	5290	4657
5/11/2019	4129	3786	3522	3366	3280	3306	3391	3689	4282	5016	5636	6169	6638	7126	7446	7691	7808	7754	7447	7037	6739	6325	5702	4791
5/12/2019	4253	3893	3619	3466	3367	3363	3440	3699	4287	5065	5745	6248	6697	6933	7018	7131	7119	6972	6790	6365	6248	5868	5324	4642
5/13/2019	4209	3901	3670	3572	3581	3808	4276	4621	4968	5414	5851	5951	5847	5537	5328	5151	5171	5374	5390	5325	5221	4944	4496	3900
5/14/2019	3524	3257	3090	2995	3039	3277	3744	4052	4283	4548	4900	5135	5341	5352	5461	5573	5762	5797	5609	5370	5283	4945	4480	3902
5/15/2019	3502	3240	3079	2982	3016	3221	3670	3910	4107	4351	4709	5089	5443	5924	6292	6613	6899	6897	6724	6163	5801	5323	4727	4071
5/16/2019	3645	3302	3114	2994	3002	3191	3564	3872	4185	4546	4999	5525	6091	6445	6768	7093	7255	7225	7012	6669	6299	5824	5146	4418
5/17/2019	3807	3424	3169	3009	3005	3161	3534	3851	4191	4665	5308	5703	6227	6690	7001	7248	7424	7385	7155	6694	6177	5763	5124	4423
5/18/2019	3926	3545	3271	3104	3028	3028	3098	3361	3881	4417	4998	5686	6156	6584	6932	7121	7221	7244	7028	6546	6092	5621	5039	4324
5/19/2019	3858	3453	3217	3064	2993	2971	3003	3270	3844	4452	5140	5743	6315	6911	7257	7518	7684	7698	7497	7090	6649	6143	5393	4627
5/20/2019	4096	3727	3491	3356	3335	3538	3892	4294	4673	5172	5861	6519	6967	7456	7801	8041	8249	8249	8007	7589	7226	6647	5904	4981
5/21/2019	4379	3999	3722	3586	3531	3704	4053	4427	4796	5273	5888	6580	7160	7696	8072	8324	8495	8517	8305	7830	7359	6872	5931	5206
5/22/2019	4555	4182	3919	3737	3704	3811	4108	4464	4897	5433	6073	6603	7205	7683	7987	8253	8369	8311	8005	7522	7009	6544	5827	5064
5/23/2019	4271	3889	3628	3441	3417	3575	3888	4198	4631	5105	5782	6407	6894	7339	7801	8030	8117	8041	7706	7149	6765	6348	5671	4993
5/24/2019	4221	3780	3499	3305	3239	3382	3699	4182	4673	5141	5616	6077	6567	7035	7490	7896	8093	8077	7827	7337	6894	6345	5702	5011
5/25/2019	4308	3900	3611	3419	3311	3270	3344	3569	4256	5023	5599	6212	6794	7323	7688	8007	8143	8109	7847	7317	6968	6536	5922	5330
5/26/2019	4665	4133	3823	3591	3476	3427	3430	3823	4467	5230	5843	6464	7082	7586	7965	8334	8486	8446	8185	7728	7263	6766	6138	5468
5/27/2019	4869	4304	3990	3763	3638	3619	3644	3989	4689	5461	6185	6843	7507	7997	8372	8627	8763	8723	8459	7991	7564	7213	6528	5697
5/28/2019	5061	4501	4195	3994	3925	4059	4363	4823	5352	5959	6622	7230	7852	8467	8838	9091	9175	9065	8762	8341	7918	7392	6712	5850
5/29/2019	5082	4531	4240	3975	3875	3957	4208	4520	4987	5583	6275	6896	7594	8123	8489	8752	8924	8865	8661	8175	7632	7170	6356	5353
5/30/2019	4714	4312	4052	3870	3811	3946	4222	4529	5014	5766	6530	7172	7873	8399	8714	8954	9069	8987	8789	8243	7842	7407	6686	5786
5/31/2019	5080	4623	4325	4116	4045	4157	4406	4773	5311	6064	6809	7333	7996	8453	8726	8915	8968	8693	8207	7769	7395	7025	6476	5641
6/1/2019	5050	4639	4349	4107	4030	4023	4068	4390	5104	5968	6758	7346	7934	8299	8598	8797	8749	8447	7937	7445	7173	6794	6007	5299

6/2/2019	4700	4309	4027	3836	3718	3698	3716	4024	4687	5474	6374	7090	7660	8021	8252	8580	8787	8813	8612	8059	7590	7205	6413	5465
6/3/2019	4867	4457	4165	3992	3943	4095	4396	4764	5299	5983	6818	7610	8173	8316	8540	8767	8807	8748	8697	8215	7798	7361	6510	5539
6/4/2019	4888	4498	4186	3982	3945	4059	4332	4692	5241	5965	6895	7821	8435	8841	9086	9212	9123	8939	8634	8053	7587	7140	6343	5437
6/5/2019	4817	4443	4145	3967	3934	4059	4314	4674	5148	5797	6520	7307	8175	8646	8932	9032	9035	8938	8591	8097	7486	6932	6166	5282
6/6/2019	4714	4358	4088	3906	3878	4015	4290	4677	5154	5761	6534	7296	7929	8422	8662	8534	8161	7771	7407	7067	6840	6379	5642	4946
6/7/2019	4560	4244	4038	3936	3938	4055	4385	4695	5007	5460	6306	7078	7601	7812	8046	8202	8135	7821	7431	7089	6780	6483	5856	5091
6/8/2019	4697	4383	4156	4028	3951	3992	4094	4356	4686	5007	5311	5812	6244	6436	6584	7043	7261	7317	6974	6493	6091	5570	5031	4534
6/9/2019	4182	3931	3709	3595	3557	3598	3672	4003	4495	4986	5650	6417	7008	7256	7218	6915	6703	6551	6225	5724	5286	5019	4641	4128
6/10/2019	3782	3507	3357	3302	3318	3489	3817	4212	4524	4921	5292	5721	6367	6859	7005	6812	6799	6815	6832	6615	6218	5826	5127	4532
6/11/2019	4171	3849	3632	3550	3533	3684	3995	4376	4804	5307	5906	6571	7167	7326	7434	7513	7680	7683	7519	7074	6545	6307	5759	4913
6/12/2019	4295	3983	3789	3691	3721	3840	4169	4717	5266	5961	6694	7176	7418	7199	6789	6645	7037	7406	7511	7302	6886	6605	6100	5260
6/13/2019	4638	4194	4008	3876	3869	4025	4330	4778	5215	5858	6285	6603	6924	6985	6615	6308	6131	6040	5951	5832	5788	5636	5210	4404
6/14/2019	4031	3600	3402	3279	3277	3398	3659	4071	4537	5121	5839	6335	6671	6944	7030	7173	7160	6988	6732	6421	6205	5930	5287	4515
6/15/2019	4077	3748	3504	3383	3325	3331	3402	3768	4369	5089	5745	6287	6849	7145	7456	7612	7717	7599	7317	6809	6496	6047	5433	4807
6/16/2019	4399	4051	3815	3629	3542	3522	3534	3872	4535	5189	5701	6257	6944	7323	7302	6811	6389	6045	5550	5316	5116	5063	4704	4157
6/17/2019	3792	3551	3393	3284	3302	3476	3782	4190	4611	5097	5683	6199	6714	7037	7107	7029	6921	6750	6455	6122	5719	5484	5061	4468
6/18/2019	4075	3844	3656	3584	3594	3765	4073	4473	4880	5380	5963	6435	6847	6969	6736	6840	7086	7284	7092	6675	6358	6054	5556	4815
6/19/2019	4342	4031	3756	3609	3598	3736	4053	4397	4717	5171	5564	6072	6580	7115	7185	6999	6625	6253	5994	5789	5658	5455	5066	4497
6/20/2019	4095	3861	3687	3588	3631	3797	4159	4565	5065	5611	6239	6855	7561	8056	8358	8610	8772	8852	8681	8184	7662	7165	6382	5639
6/21/2019	5064	4648	4383	4222	4213	4286	4517	4906	5424	5987	6681	7460	8179	8663	9032	9328	9425	9346	9108	8540	7836	7289	6501	5774
6/22/2019	5231	4784	4474	4237	4106	4066	4065	4379	5048	5680	6522	7387	7878	8024	8373	8668	8912	8934	8657	8077	7658	7072	6238	5484
6/23/2019	5066	4670	4355	4109	3980	3959	3953	4257	4935	5674	6558	7499	8148	8662	8924	9015	8979	8894	8695	8241	7826	7151	6366	5428
6/24/2019	4882	4459	4159	3932	3879	4000	4292	4669	5244	5869	6584	7515	8384	8796	9249	9566	9740	9639	9363	8890	8352	7732	6742	5767
6/25/2019	5161	4753	4453	4265	4198	4286	4548	4909	5440	6107	6908	7854	8618	9102	9539	9845	9970	9854	9467	8621	8027	7540	6628	5652
6/26/2019	5115	4697	4395	4214	4149	4269	4550	4920	5423	6066	6868	7835	8590	9070	9428	9639	9717	9559	9335	8850	8375	7753	6883	5862
6/27/2019	5154	4628	4279	4062	3982	4076	4330	4675	5120	5714	6397	7213	7970	8510	8900	9096	9154	9059	8728	8249	7779	7142	6299	5558
6/28/2019	4998	4595	4260	4059	3997	4098	4294	4670	5224	5824	6480	7272	8066	8547	8865	8842	8707	8186	7520	6939	6477	6044	5412	4839
6/29/2019	4427	4115	3877	3717	3654	3678	3745	4024	4527	5106	5650	6234	6775	7160	7403	7260	6975	6580	6149	5726	5576	5401	5028	4530
6/30/2019	4184	3873	3685	3545	3488	3467	3508	3815	4432	5098	5761	6306	6979	7467	7817	8088	8262	8403	8293	8326	7685	7202	6454	5647
7/1/2019	4674	4269	4014	3884	3846	3985	4241	4668	5339	6194	7018	7712	8353	8732	9049	9253	9389	9293	8995	8595	8226	7858	7033	6015
7/2/2019	5529	5006	4663	4332	4271	4366	4544	5051	5671	6438	7284	8087	8636	9030	9416	9540	9509	9141	8735	8235	7868	7488	6912	5979
7/3/2019	5279	4843	4569	4411	4379	4532	4749	5210	5786	6461	7331	7906	8498	8829	8951	8905	8980	8689	7952	7314	6907	6551	5890	5292
7/4/2019	4936	4572	4299	4112	4042	4031	4067	4302	4876	5601	6668	7559	8121	8612	8849	8490	7971	7241	6746	6183	5946	5518	5261	4833
7/5/2019	4498	4196	3949	3850	3792	3849	4090	4409	4944	5556	6323	7197	8020	8536	8833	8887	8423	7944	7260	6541	6186	5854	5410	4866
7/6/2019	4478	4114	3838	3709	3652	3696	3764	4095	4671	5383	6112	6763	7425	7737	7780	7618	7213	6611	6079	5725	5481	5262	4867	4411
7/7/2019	4110	3846	3654	3493	3425	3436	3500	3770	4330	4989	5561	6059	6672	7012	7156	7019	6746	6566	6432	6122	5734	5561	5108	4537
7/8/2019	4139	3872	3674	3563	3566	3720	4030	4405	4751	5177	5655	6097	6764	7286	7717	7943	8056	7885	7518	7066	6566	6137	5545	4871
7/9/2019	4492	4179	3967	3823	3805	3937	4232	4568	4914	5498	6063	6517	7066	7373	7469	7338	7154	6808	6543	6185	5821	5543	5087	4555
7/10/2019	4144	3885	3719	3608	3620	3752	4046	4435	4783	5294	5979	6507	7058	7435	7584	7736	7812	7761	7465	7093	6673	6328	5578	4837
7/11/2019	4384	4080	3860	3740	3707	3820	4114	4479	4923	5435	5984	6732	7278	7714	7688	7410	7183	7086	6805	6327	6010	5682	5179	4600

7/12/2019	4187	3939	3757	3639	3617	3733	3976	4342	4739	5202	5678	6304	6727	7263	7541	7674	7684	7373	6696	6141	5617	5325	4901	4363
7/13/2019	4010	3699	3520	3406	3370	3377	3486	3777	4166	4677	5154	5803	6531	7069	7453	7707	7853	7904	7843	7499	6995	6463	5852	5239
7/14/2019	4802	4460	4202	3994	3875	3823	3835	4079	4640	5350	6163	7006	7834	8398	8846	9098	9211	9149	8879	8299	7768	7101	6223	5497
7/15/2019	4961	4579	4293	4116	4046	4124	4367	4708	5172	5890	6706	7551	8362	8903	9181	9268	8863	8512	8248	7693	7255	6680	5895	5194
7/16/2019	4671	4313	4100	3959	3941	4060	4332	4750	5212	5850	6672	7364	8169	8799	9227	9423	9585	9432	9034	8454	7897	7148	6317	5510
7/17/2019	5008	4618	4318	4142	4082	4165	4412	4783	5270	5867	6674	7491	8299	8816	9116	9110	8871	8440	7747	7162	6709	6084	5432	4784
7/18/2019	4344	4022	3793	3668	3649	3769	4047	4444	4867	5427	6225	7138	7803	8398	8666	8659	8339	8003	7623	7203	6753	6308	5637	4988
7/19/2019	4524	4153	3914	3755	3741	3856	4080	4452	4936	5536	6211	7100	7915	8308	8492	8540	8554	8332	7730	7070	6560	5981	5452	4843
7/20/2019	4442	4123	3866	3727	3659	3632	3714	4051	4620	5286	5976	6757	7519	8093	8477	8386	8106	7650	7150	6498	6101	5616	5240	4706
7/21/2019	4360	4073	3843	3679	3585	3547	3609	3894	4480	5197	5877	6714	7596	7998	8063	7594	7319	6817	6380	6116	5864	5495	4885	4247
7/22/2019	3853	3592	3415	3304	3310	3492	3817	4224	4712	5234	5977	6823	7592	8107	8429	8554	8515	8376	8142	7791	7364	6703	5808	4978
7/23/2019	4459	4095	3857	3704	3658	3812	4119	4443	4846	5348	5914	6656	7293	7649	7839	8027	7760	7463	7265	7054	6689	6287	5703	5070
7/24/2019	4656	4266	4009	3866	3869	4000	4286	4635	5000	5460	5896	6082	6000	5819	5860	5989	6069	5976	5888	5731	5562	5371	4934	4366
7/25/2019	3993	3762	3610	3513	3515	3664	3925	4255	4487	4771	4955	5063	5129	5230	5327	5545	5879	6041	6007	5797	5597	5369	4910	4334
7/26/2019	3917	3640	3466	3378	3350	3472	3720	4071	4451	4885	5385	5824	6132	6192	5922	5884	5799	5798	5736	5661	5490	5317	4957	4402
7/27/2019	4008	3696	3455	3312	3271	3291	3372	3642	4106	4682	5260	5778	6323	6781	7174	7362	7496	7583	7455	7027	6588	6036	5518	4932
7/28/2019	4505	4128	3873	3686	3601	3579	3650	3836	4406	5095	5753	6572	7252	7763	8078	8283	8422	8356	8080	7557	7069	6617	5969	5142
7/29/2019	4440	4134	3867	3741	3708	3852	4128	4435	4855	5606	6409	7241	7905	8381	8689	8947	9037	8857	8381	7947	7559	6951	6227	5350
7/30/2019	4687	4307	4077	3904	3846	3968	4235	4582	4981	5646	6533	7324	7938	8441	8809	8829	8797	8606	8260	7938	7525	7164	6393	5441
7/31/2019	4861	4518	4262	4085	4016	4102	4377	4714	5134	5732	6442	7295	7943	8499	8901	8920	8497	7867	7270	6548	6200	5635	5160	4556
8/1/2019	4182	3883	3664	3539	3537	3639	3925	4274	4681	5145	5719	6398	7149	7789	8110	7924	7365	6750	6340	5936	5648	5390	4961	4420
8/2/2019	4050	3756	3586	3488	3510	3673	4002	4291	4608	4983	5440	6031	6577	7009	7140	7028	6684	6205	5812	5592	5464	5294	4950	4532
8/3/2019	4116	3842	3656	3520	3464	3483	3603	3873	4313	4784	5202	5464	5848	6462	7066	7529	7772	7767	7662	7248	6753	6249	5698	5096
8/4/2019	4672	4287	4016	3836	3723	3713	3765	4025	4574	5279	5926	6698	7441	8069	8300	8386	8438	8283	8134	7666	7231	6698	5945	5273
8/5/2019	4814	4449	4171	4014	3968	4102	4382	4730	5106	5518	6059	6737	7378	7895	8186	8257	8104	7769	7390	6970	6559	6087	5473	4839
8/6/2019	4383	4081	3894	3768	3736	3839	4150	4514	4885	5510	6097	6724	7415	7804	7932	7899	7921	7818	7550	7115	6742	6280	5633	4981
8/7/2019	4566	4259	4016	3903	3900	4049	4388	4706	5022	5415	5895	6419	6887	7479	7926	7902	7510	7160	6772	6456	6164	5799	5318	4716
8/8/2019	4301	4043	3852	3729	3743	3912	4242	4583	5049	5648	6386	7083	7820	8275	8647	8895	8886	8665	8223	7712	7312	6735	5954	5318
8/9/2019	4823	4485	4239	4081	4045	4172	4470	4838	5327	5929	6624	7422	8266	8860	9023	9148	8991	8413	7875	7414	7144	6690	6123	5440
8/10/2019	5013	4639	4385	4209	4129	4118	4208	4492	5105	5785	6592	7490	8226	8572	8750	8661	8533	8147	7812	7442	7243	6790	6133	5505
8/11/2019	5009	4654	4402	4250	4171	4169	4228	4496	5099	5888	6765	7516	8129	8438	8811	8962	8964	8873	8498	7837	7579	6905	6190	5500
8/12/2019	4971	4610	4413	4293	4266	4468	4870	5187	5536	6101	6790	7503	8230	8580	8718	8611	8433	8082	7603	7172	6968	6510	5886	5083
8/13/2019	4641	4318	4186	4044	4049	4237	4648	4969	5249	5800	6496	7005	7450	7641	7836	7985	8133	8060	7913	7412	7233	6866	6258	5476
8/14/2019	4753	4456	4237	4170	4158	4458	4749	5059	5284	5912	6649	7131	7460	7752	7972	7775	7641	7354	7184	6994	6898	6547	5889	4966
8/15/2019	4468	4156	3934	3797	3792	4027	4407	4745	4986	5561	6280	6928	7566	7919	7722	7056	6916	6887	6752	6447	6298	5813	5272	4651
8/16/2019	4283	4004	3850	3727	3710	3877	4271	4585	4770	4940	5293	5737	6100	6265	6211	6114	6033	5868	5694	5488	5495	5338	4964	4454
8/17/2019	4124	3860	3658	3565	3526	3576	3627	3868	4274	4810	5238	5538	5923	5912	5844	6008	6104	6034	5871	5672	5606	5349	4979	4471
8/18/2019	4105	3856	3640	3506	3427	3412	3471	3730	4170	4724	5248	5688	6190	6658	7057	7412	7601	7574	7414	7040	6641	6029	5431	4727
8/19/2019	4161	3938	3740	3626	3635	3837	4231	4528	4787	5224	5786	6376	6997	7509	7974	8271	8190	7870	7605	7231	6847	6292	5598	4943
8/20/2019	4465	4143	3933	3783	3767	3916	4293	4627	4949	5438	6044	6668	7456	7964	8328	8383	8195	7804	7508	7024	6724	6231	5583	4909

8/21/2019	4468	4161	3951	3803	3801	3971	4309	4659	5051	5536	6084	6858	7550	8140	8588	8966	9190	9183	8822	8305	7819	6997	6097	5251
8/22/2019	4763	4406	4160	4002	3955	4117	4450	4771	5123	5646	6243	7000	7712	8291	8692	8922	9028	8970	8603	8055	7719	7012	6133	5368
8/23/2019	4807	4431	4181	4005	3983	4129	4493	4798	5171	5684	6432	7070	7555	7694	7866	8054	8241	8190	8041	7539	7210	6631	6001	5207
8/24/2019	4773	4426	4170	3976	3888	3892	4000	4224	4689	5403	6129	7005	7733	8190	8596	8815	8907	8780	8385	7857	7416	6786	6058	5453
8/25/2019	4990	4566	4317	4112	3979	3920	3948	4175	4701	5409	6110	6968	7787	8311	8620	8832	8953	8880	8639	8139	7690	6972	6224	5487
8/26/2019	4985	4643	4369	4208	4183	4371	4724	5002	5295	5811	6526	7353	8121	8617	8818	8911	8933	8645	8083	7331	6809	6134	5508	4879
8/27/2019	4467	4186	3970	3831	3790	4000	4372	4675	4991	5504	6071	6692	7378	7881	7902	7762	7607	7351	7150	6869	6680	6136	5608	4990
8/28/2019	4581	4281	4076	3944	3944	4141	4513	4774	5090	5523	6009	6428	6980	7492	7897	8260	8616	8555	8255	7784	7392	6762	6013	5195
8/29/2019	4780	4433	4169	4026	3973	4100	4506	4822	5149	5629	6334	7162	7925	8426	8856	9099	9196	9078	8781	8288	7891	7133	6303	5515
8/30/2019	4950	4567	4323	4146	4126	4275	4622	4928	5257	5754	6334	6913	7454	7932	8113	7942	7565	7076	6641	6248	6035	5729	5352	4822
8/31/2019	4459	4138	3911	3770	3721	3726	3855	4143	4674	5372	5934	6552	7090	7506	7875	8003	7960	7630	7114	6660	6403	5902	5468	4895
9/1/2019	4506	4213	3994	3845	3773	3747	3822	4034	4564	5297	5937	6701	7380	7737	7845	7619	7325	7001	6582	6155	5950	5609	5338	4792
9/2/2019	4381	4106	3908	3802	3738	3768	3875	4097	4589	5489	6346	7039	7345	7478	7390	7189	7147	7214	7151	6878	6771	6320	5665	4958
9/3/2019	4348	4024	3831	3716	3698	3813	3993	4226	4525	5115	5838	6537	6875	7140	7318	7442	7500	7245	7143	6897	6701	6250	5741	5131
9/4/2019	4585	4179	3939	3791	3824	4056	4463	4657	4863	5312	5871	6068	6392	6901	7389	7657	7726	7735	7596	7412	7298	6928	6267	5751
9/5/2019	5083	4732	4510	4388	4403	4685	5186	5545	5913	6496	7142	7745	8273	8715	9073	9142	9173	9003	8597	8302	8052	7522	6736	6065
9/6/2019	5636	5162	4862	4635	4604	4859	5344	5485	5770	6487	7136	7754	8355	8779	8918	9097	9122	8878	8456	7825	7452	6921	6284	5701
9/7/2019	4936	4230	3850	3623	3517	3473	3530	3712	4220	5048	5784	6523	7256	7913	8297	8535	8668	8657	8409	7702	7259	6589	5823	5089
9/8/2019	4588	4214	3931	3734	3638	3588	3594	3823	4293	5039	5775	6571	7360	8062	8473	8778	8926	8864	8610	8114	7632	6882	6068	5210
9/9/2019	4738	4386	4166	4024	4017	4207	4557	4838	5165	5746	6426	7288	8006	8551	8927	9140	9273	9122	8646	8056	7592	6843	6166	5425
9/10/2019	4948	4591	4307	4095	4050	4190	4548	4838	5125	5653	6221	6984	7731	8254	8735	8939	9075	8977	8623	8204	7930	7369	6524	5618
9/11/2019	4871	4345	4052	3905	3883	4050	4482	4939	5217	5807	6552	7097	7613	7995	8271	8318	8492	8270	7829	7281	6994	6451	5767	5071
9/12/2019	4668	4316	4094	3976	3946	4105	4485	4781	5054	5548	6115	6734	7515	8053	8279	8369	8450	8323	7925	7456	7123	6456	5797	5143
9/13/2019	4715	4400	4180	4057	4027	4203	4579	4883	5086	5495	6075	6691	7222	7587	7682	7654	7664	7500	7105	6679	6372	5958	5461	4874
9/14/2019	4500	4202	3970	3831	3767	3796	3911	4161	4653	5254	5962	6448	6986	7423	7619	7771	7698	7406	6969	6510	6249	5819	5343	4831
9/15/2019	4467	4186	3972	3851	3781	3776	3858	4065	4482	5082	5718	6341	7059	7549	7807	7878	7867	7582	7133	6808	6492	5914	5366	4712
9/16/2019	4323	4054	3864	3743	3782	4008	4404	4719	4939	5400	5990	6753	7591	8103	8478	8732	8944	8816	8435	7936	7529	6697	5860	4974
9/17/2019	4457	4082	3849	3702	3678	3861	4246	4528	4792	5299	6003	6894	7657	8135	8531	8863	9058	8915	8578	7932	7546	6719	5778	4944
9/18/2019	4510	4115	3889	3708	3684	3868	4236	4524	4711	5118	5655	6338	7054	7862	8271	8329	8186	7874	7543	7137	6810	6154	5430	4779
9/19/2019	4399	4097	3893	3714	3680	3812	4169	4457	4619	4910	5308	5774	6304	6731	7010	7270	7310	7140	6729	6330	6066	5493	4943	4279
9/20/2019	3905	3636	3451	3327	3334	3531	3936	4260	4454	4811	5130	5539	5906	6279	6569	6780	6925	6857	6476	5976	5688	5240	4780	4240
9/21/2019	3913	3593	3393	3262	3194	3235	3330	3527	3938	4464	5011	5500	6009	6449	6775	6993	7014	6907	6420	5952	5721	5276	4851	4320
9/22/2019	3940	3613	3421	3285	3195	3188	3246	3450	3870	4426	4981	5437	5972	6467	6882	7213	7346	7311	6873	6338	6001	5414	4826	4181
9/23/2019	3781	3465	3271	3163	3148	3360	3737	4010	4229	4535	4976	5402	5934	6460	6886	7278	7480	7454	7176	6730	6312	5563	4902	4222
9/24/2019	3912	3555	3339	3187	3141	3334	3668	3942	4134	4504	4960	5464	6030	6630	7204	7748	8085	8061	7667	7190	6635	5879	5076	4363
9/25/2019	3942	3611	3400	3271	3278	3488	3873	4127	4334	4719	5278	5921	6644	7422	7879	8242	8552	8512	8101	7640	7114	6262	5519	4785
9/26/2019	4288	3952	3672	3527	3506	3709	4081	4382	4577	4951	5426	6087	6798	7458	7955	8294	8532	8456	8047	7551	7021	6359	5598	4889
9/27/2019	4461	4104	3864	3689	3662	3822	4136	4409	4601	5030	5560	6213	6929	7609	7952	8295	8429	8194	7761	7148	6634	6004	5451	4885
9/28/2019	4493	4096	3874	3679	3619	3611	3716	3937	4409	5051	5637	6238	6837	7404	7805	7969	7971	7826	7322	6856	6385	5903	5395	4830
9/29/2019	4409	4022	3788	3592	3516	3468	3547	3744	4214	4822	5439	6001	6574	7216	7717	7968	8078	8018	7649	7228	6757	6176	5538	4829

9/30/2019	4435	4054	3828	3703	3700	3913	4242	4577	4832	5286	6003	6796	7497	7901	8222	8442	8476	8380	8077	7591	7217	6484	5606	4842
10/1/2019	4456	4122	3921	3779	3761	3975	4286	4631	4808	5222	5819	6497	7066	7427	7640	7754	7943	7850	7513	7198	6889	6258	5407	4572
10/2/2019	4217	3849	3666	3515	3527	3720	4107	4426	4566	5057	5677	6335	7011	7465	7914	8148	8265	8163	7816	7587	7227	6670	5873	5078
10/3/2019	4500	3955	3640	3506	3479	3659	4056	4497	4731	5310	5990	6596	7101	7436	7851	8079	8226	8154	7801	7512	6980	6425	5802	4910
10/4/2019	4204	3774	3530	3363	3334	3518	3877	4159	4392	4832	5449	6151	6808	7492	7879	8275	8393	8287	7800	7358	6967	6453	5725	5095
10/5/2019	4709	4172	3874	3685	3603	3613	3724	3930	4396	5072	5864	6442	7002	7430	7729	7884	7844	7522	6965	6595	6358	5880	5449	4713
10/6/2019	4360	3930	3715	3560	3479	3484	3587	3813	4169	4776	5364	6033	6657	6881	7032	7171	7247	7143	6931	6725	6364	5932	5236	4525
10/7/2019	4206	3873	3693	3607	3667	3893	4312	4542	4680	4978	5310	5547	5932	6133	6263	6655	6731	6496	6042	6014	5805	5270	4814	4294
10/8/2019	3987	3666	3489	3429	3453	3704	4140	4425	4604	4885	5236	5746	6303	6649	6805	6818	6797	6625	6408	6259	6025	5440	4818	4264
10/9/2019	3978	3685	3522	3464	3488	3709	4130	4489	4556	4840	5034	5336	5626	5779	5863	5833	5868	5822	5716	5741	5468	5034	4506	3949
10/10/2019	3690	3401	3260	3174	3204	3440	3856	4198	4296	4710	5144	5655	6098	6601	6922	7099	7186	7059	6719	6490	6116	5549	4910	4286
10/11/2019	3934	3583	3385	3243	3230	3432	3809	4035	4280	4630	5082	5547	6103	6611	7015	7246	7299	7157	6645	6194	5711	5199	4698	4151
10/12/2019	3818	3450	3269	3133	3076	3097	3234	3388	3797	4263	4715	5214	5804	6275	6671	6833	6917	6826	6468	6098	5654	5076	4605	4079
10/13/2019	3765	3434	3229	3096	3011	3014	3108	3248	3669	4230	4734	5266	5915	6480	6930	7226	7351	7325	6935	6621	6113	5489	4808	4176
10/14/2019	3794	3492	3278	3184	3199	3395	3743	3978	4272	4727	5260	5876	6655	7174	7491	7804	7944	7855	7421	7150	6642	5951	5130	4381
10/15/2019	4016	3691	3485	3358	3370	3594	3906	4258	4457	4834	5278	5908	6538	6998	7397	7657	7679	7498	7156	6975	6614	5986	5223	4525
10/16/2019	4195	3878	3695	3569	3577	3804	4207	4481	4686	5147	5772	6347	7019	7480	7645	7654	7500	7200	6800	6597	6404	5876	5188	4474
10/17/2019	4156	3821	3627	3514	3499	3674	4073	4303	4447	4687	4993	5310	5699	6137	6441	6688	6782	6547	6143	5976	5615	5204	4697	4053
10/18/2019	3703	3369	3165	3050	3066	3244	3585	3932	4061	4221	4438	4688	4805	4816	5084	5155	4933	4923	4891	4945	4794	4621	4353	3921
10/19/2019	3739	3529	3417	3341	3308	3399	3492	3784	4179	4697	5103	5437	5371	5325	5570	5812	5944	5887	5699	5642	5444	5177	4876	4425
10/20/2019	4147	3848	3627	3514	3428	3428	3508	3712	4125	4681	5202	5643	6193	6653	7005	7241	7332	7180	6712	6373	5873	5282	4736	4100
10/21/2019	3737	3439	3278	3214	3237	3510	3953	4274	4446	4633	4965	5385	5932	6372	6446	6382	6495	6608	6386	6361	5988	5600	5087	4458
10/22/2019	4106	3797	3611	3550	3577	3820	4275	4597	4792	5133	5543	6289	6941	7543	7931	8075	8114	7900	7434	7140	6610	5866	5197	4508
10/23/2019	4140	3806	3573	3390	3309	3438	3751	3933	4012	4136	4383	4635	4942	5266	5632	5913	6065	5981	5735	5660	5372	4959	4447	3789
10/24/2019	3479	3201	3053	2991	3025	3266	3738	4073	4227	4602	5127	5676	6066	6598	7020	7266	7405	7271	6949	6824	6385	5821	5132	4534
10/25/2019	4236	3873	3676	3584	3571	3751	4172	4484	4689	5109	5539	6100	6544	6833	6989	6942	6882	6687	6326	6026	5732	5322	4865	4365
10/26/2019	4112	3790	3610	3482	3434	3469	3644	3853	4281	4851	5487	6126	6607	6916	6956	6861	6892	6683	6384	6170	5766	5315	4795	4365
10/27/2019	4104	3808	3601	3483	3442	3466	3559	3744	4166	4757	5370	5965	6539	7037	7410	7494	7456	7329	7048	6916	6555	6108	5466	4827
10/28/2019	4320	3929	3649	3485	3470	3708	4226	4585	4711	5170	5809	6601	7196	7747	8034	8180	8185	8058	7758	7553	7125	6521	5727	5030
10/29/2019	4582	4178	3902	3781	3767	3946	4394	4697	4822	5167	5729	6401	7072	7643	8007	8186	8261	7998	7502	7300	6896	6264	5475	4869
10/30/2019	4574	4177	3949	3778	3775	3968	4380	4634	4779	5172	5804	6437	7027	7484	7915	8164	8206	8024	7576	7401	6961	6429	5691	4988
10/31/2019	4559	4133	3841	3664	3651	3852	4368	4672	4765	5266	5858	6596	7112	7683	7960	8140	8243	8063	7453	6999	6646	6300	5591	4923
11/1/2019	4426	3992	3713	3580	3527	3639	4041	4259	4183	4321	4560	4782	5045	5396	5692	5918	5939	5765	5454	5313	5169	4795	4290	3792
11/2/2019	3464	3187	3033	2941	2930	2993	3159	3402	3695	4114	4267	4964	5480	5842	6117	6169	6131	5924	5610	5339	5007	4574	4157	3710
11/3/2019	3391	6081	2835	2759	2718	2756	2905	3223	3640	3965	4333	4645	4958	5101	5168	5221	5204	5241	5330	5069	4742	4284	3788	3341
11/4/2019	3068	2901	2819	2790	2863	3151	3588	3934	4184	4560	5072	5493	5852	6147	6255	6174	6119	6168	6235	6102	5695	5152	4516	3965
11/5/2019	3675	3437	3293	3212	3231	3468	3881	4204	4614	5158	5714	6238	6624	6773	6679	6537	6407	6445	6577	6258	5900	5308	4604	4049
11/6/2019	3584	3399	3258	3193	3216	3478	3943	4246	4573	4919	5307	5778	6184	6455	6693	6809	6691	6597	6498	6167	5752	5171	4443	3919
11/7/2019	3081	2872	2719	2639	2670	2896	3332	3745	4043	4597	5267	5898	6446	6770	6916	6918	6807	6498	6377	6073	5636	5199	4254	3605
11/8/2019	3722	3451	3321	3219	3230	3445	3852	4294	4584	4991	5477	5824	5889	5761	5505	5332	5172	5147	5147	4834	4531	4264	3913	3499

11/9/2019	3228	3033	2882	2781	2771	2828	2999	3313	3655	3937	4123	4281	4410	4516	4607	4549	4466	4374	4391	4170	3946	3713	3438	3100
11/10/2019	2860	2692	2590	2545	2528	2582	2708	3026	3405	3737	3924	4074	4280	4458	4645	4831	4866	4839	4887	4606	4299	3905	3542	3107
11/11/2019	2816	2641	2552	2536	2596	2826	3209	3586	3811	4082	4357	4624	4974	5248	5541	5679	5696	5682	5750	5476	5036	4517	3943	3394
11/12/2019	3077	2868	2746	2705	2762	2979	3394	3690	3934	4228	4634	5077	5440	5751	5936	5996	5943	5835	5910	5568	5194	4685	4090	3471
11/13/2019	3104	2845	2735	2716	2818	3159	3820	4074	4157	4231	4229	4241	4193	4191	4137	4173	4289	4566	4815	4762	4599	4255	3723	3193
11/14/2019	2904	2762	2694	2676	2747	3113	3672	3923	4065	4192	4338	4455	4561	4490	4529	4561	4681	4952	5144	5079	4836	4425	3919	3515
11/15/2019	3199	3011	2920	2889	2940	3195	3759	4002	4175	4302	4460	4517	4531	4498	4447	4364	4395	4567	4652	4431	4205	3909	3533	3184
11/16/2019	2959	2807	2701	2648	2631	2724	2939	3274	3629	3966	4045	4039	4011	3908	3900	3943	3992	4232	4544	4384	4208	3956	3674	3366
11/17/2019	3166	3011	2918	2899	2941	3023	3262	3708	4217	4567	4610	4698	4626	4495	4448	4379	4484	4789	5037	4935	4728	4337	3863	3505
11/18/2019	3267	3125	3072	3050	3154	3668	4415	4724	4574	4365	4131	3974	3938	3931	3918	3949	4070	4292	4570	4509	4256	3888	3540	3195
11/19/2019	2930	2794	2743	2755	2986	3514	4266	4590	4505	4347	4187	4080	4016	3967	3955	4047	4092	4407	4722	4665	4561	4080	3664	3310
11/20/2019	3257	3197	3003	3048	3365	4018	4663	5123	4932	4582	4300	4113	3999	3935	3887	3974	4034	4195	4129	4370	4147	3900	3586	3215
11/21/2019	2993	2910	2911	2960	3099	3678	4435	4725	4523	4202	3994	3952	3994	4106	4189	4216	4351	4612	4868	4761	4501	4137	3677	3196
11/22/2019	2905	2783	2708	2710	2791	3130	3705	4042	3999	3948	4004	4021	4138	4245	4316	4340	4349	4363	4395	4203	4018	3812	3510	3157
11/23/2019	2946	2779	2678	2651	2675	2793	2979	3216	3539	3739	3882	4020	4219	4379	4476	4507	4411	4439	4447	4205	3956	3759	3516	3255
11/24/2019	3046	2889	2767	2675	2633	2663	2819	3004	3387	3685	3810	3877	3962	3966	3966	4028	4003	4127	4365	4227	4101	3760	3487	3165
11/25/2019	2964	2842	2792	2821	2947	3481	4130	4688	4583	4342	4163	3992	3957	3904	3910	3934	3981	4156	4387	4299	4146	3993	3757	3420
11/26/2019	3249	3143	3115	3156	3264	3639	4236	4610	4508	4241	4090	3920	3896	3900	3919	3939	3972	4169	4362	4291	4136	3921	3620	3306
11/27/2019	3029	2925	2885	2913	3046	3295	3674	3997	4086	4039	4056	4081	4125	4226	4335	4407	4417	4477	4557	4352	4168	3932	3645	3257
11/28/2019	2958	2756	2617	2581	2601	2686	2860	3174	3624	4155	4579	5043	5300	5366	5353	5230	4963	4546	4241	3830	3536	3422	3247	2996
11/29/2019	2787	2618	2541	2521	2567	2700	2944	3167	3413	3585	3703	3813	3885	3990	4072	4134	4141	4154	4210	4048	3849	3649	3399	3112
11/30/2019	2870	2700	2594	2565	2595	2687	2847	3072	3396	3650	3820	3957	4061	4206	4328	4450	4411	4353	4386	4139	3938	3743	3478	3167
12/1/2019	2929	2722	2603	2567	2574	2635	2766	2961	3300	3654	3913	4141	4382	4566	4740	4820	4829	4948	5101	4944	4637	4340	3974	3546
12/2/2019	3238	3031	2896	2800	2789	2977	3375	3622	3758	3805	3870	3869	3872	3868	3867	3876	3954	4327	4712	4787	4688	4423	4062	3658
12/3/2019	3459	3397	3429	3594	3942	4577	5593	6080	5790	5427	4890	4462	4176	4059	3995	4002	4152	4726	5381	5529	5441	5164	4705	4211
12/4/2019	3795	3668	3601	3650	3836	4394	5158	5452	5194	4757	4360	4135	4003	3939	3845	3878	3997	4322	4792	4914	4829	4662	4235	3865
12/5/2019	3685	3582	3576	3622	3841	4416	5355	5770	5423	4797	4367	4103	4008	3941	3896	3877	3963	4240	4656	4752	4711	4493	4126	3810
12/6/2019	3586	3500	3502	3547	3771	4321	5233	5624	5325	4762	4316	4091	4018	3971	3915	3928	4076	4287	4548	4440	4296	4123	3862	3457
12/7/2019	3260	3242	3213	3230	3342	3622	4034	4456	4544	4492	4244	4027	3920	3899	3916	3943	4037	4159	4372	4211	4041	3779	3551	3225
12/8/2019	2983	2812	2723	2678	2668	2762	2934	3205	3522	3764	3958	4080	4189	4269	4374	4510	4564	4698	4933	4882	4535	4101	3644	3192
12/9/2019	2889	2682	2596	2559	2647	2934	3408	3853	3981	4114	4191	4278	4388	4651	4839	4934	4906	5028	5287	5091	4762	4304	3797	3260
12/10/2019	2980	2725	2647	2593	2655	2897	3359	3677	3816	4089	4354	4557	4842	5149	5316	5439	5443	5533	5754	5528	5171	4705	4157	3617
12/11/2019	3269	3040	2900	2853	2877	3099	3526	3972	4299	4505	4818	5020	5105	5284	5357	5270	5197	5336	5565	5376	5013	4599	4084	3389
12/12/2019	2960	2776	2703	2674	2748	3007	3492	3839	3961	4074	4241	4585	4551	4559	4486	4487	4513	4822	5165	5013	4787	4392	3967	3471
12/13/2019	3153	2951	2823	2783	2824	3047	3509	3862	4036	4172	4291	4380	4366	4398	4352	4321	4366	4648	4719	4440	4302	4074	3803	3437
12/14/2019	3157	2981	2837	2808	2816	2892	3068	3411	3869	4099	4313	4486	4629	4472	4504	4487	4388	4288	4251	4100	3937	3762	3529	3246
12/15/2019	3002	2853	2794	2761	2832	2956	3146	3507	3816	3918	3916	3901	3888	3912	3963	4019	4064	4201	4441	4360	4206	3967	3603	3220
12/16/2019	2918	2757	2692	2706	2798	3109	3609	3915	3984	3989	4104	4233	4366	4536	4644	4746	4796	4903	4989	4985	4759	4404	3999	3507
12/17/2019	3134	2893	2794	2742	2809	3070	3530	3845	4084	4247	4497	4704	4905	5080	5171	5123	5055	5257	5522	5287	4829	4393	3990	3503
12/18/2019	3123	2938	2813	2771	2800	3076	3533	3902	4016	4129	4224	4166	4107	4021	3963	4001	4111	4463	5014	5134	5117	4897	4511	4188

12/19/2019	3944	3873	3873	3948	4114	4662	5453	5895	5758	5242	4828	4469	4261	4121	4057	4047	4127	4435	4754	4711	4587	4394	4101	3784
12/20/2019	3497	3345	3281	3292	3354	3625	4130	4457	4504	4375	4259	4180	4132	4077	4049	4038	4081	4277	4399	4294	4149	3984	3723	3369
12/21/2019	3085	2899	2774	2720	2760	2847	3054	3336	3694	3961	4111	4101	4105	4069	4047	4015	4083	4281	4366	4266	4129	3945	3713	3306
12/22/2019	3031	2840	2707	2617	2635	2709	2870	3176	3574	3893	4070	4164	4189	4174	4144	4130	4180	4385	4552	4418	4275	4052	3731	3337
12/23/2019	3046	2825	2746	2689	2737	2892	3169	3529	3765	3971	4090	4159	4199	4214	4248	4197	4232	4406	4617	4554	4382	4128	3818	3416
12/24/2019	3146	2962	2830	2784	2853	3000	3309	3634	3961	4246	4353	4343	4281	4249	4175	4168	4245	4377	4527	4298	4092	3934	3685	3387
12/25/2019	3140	2923	2788	2714	2667	2759	2933	3209	3535	3799	3958	4112	4258	4334	4312	4261	4218	4219	4313	4144	4030	3882	3524	3184
12/26/2019	2908	2721	2590	2568	2599	2767	3017	3288	3562	3836	3978	4158	4321	4404	4416	4395	4442	4619	4928	4807	4534	4244	3844	3484
12/27/2019	3161	2909	2755	2681	2657	2789	3078	3402	3672	3966	4214	4370	4468	4476	4536	4557	4544	4642	4772	4657	4448	4255	3969	3564
12/28/2019	3248	3028	2878	2798	2778	2843	2973	3191	3546	3922	4180	4377	4467	4494	4519	4546	4548	4673	4814	4708	4484	4271	4014	3656
12/29/2019	3390	3120	2938	2842	2828	2892	3037	3240	3597	4032	4291	4516	4786	4963	5047	5074	5062	5138	5301	5049	4735	4455	4095	3747
12/30/2019	3426	3179	3021	2965	2981	3125	3396	3635	3923	4223	4518	4741	4889	4987	4998	4988	4999	5186	5398	5194	4831	4423	3999	3560
12/31/2019	3171	2892	2716	2649	2658	2800	3082	3402	3678	3893	3992	3997	4019	3988	3992	3987	4103	4292	4590	4449	4135	3875	3666	3421

TYSP Year 2020
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Year	Month	Actual Peak Demand (MW)	Demand Response Activated (MW)	Estimated Peak Demand (MW)	Day	Hour	System-Average Temperature (Degrees F)
2019	1	7248	0	7248	29	8	40.75
	2	6784	0	6784	22	17	85.95
	3	6632	0	6632	11	18	84.15
	4	7521	0	7521	30	17	88.80
	5	9175	0	9175	28	17	95.95
	6	9970	0	9970	25	17	95.65
	7	9585	0	9585	16	17	94.30
	8	9190	0	9190	21	17	92.70
	9	9273	0	9273	9	17	94.65
	10	8393	0	8393	4	17	92.95
	11	6918	0	6918	7	16	87.35
	12	5895	0	5895	19	8	46.00
2018	1	10320	0	10320	18	8	27.40
	2	6980	0	6980	26	16	83.75
	3	6462	0	6462	1	16	83.35
	4	6524	0	6524	9	18	85.45
	5	8094	0	8094	24	17	88.65
	6	8894	0	8894	22	16	91.15
	7	8740	0	8740	27	16	88.55
	8	9271	0	9271	8	17	92.55
	9	9147	0	9147	17	17	91.40
	10	8656	0	8656	16	17	90.80
	11	7361	0	7361	9	15	84.15
	12	7621	0	7621	12	8	40.40
2017	1	7538	0	7538	9	8	40.45
	2	6199	0	6199	28	17	84.70
	3	6969	0	6969	29	18	86.00
	4	8521	0	8521	28	17	92.05
	5	8724	0	8724	30	17	91.95
	6	8809	0	8809	22	17	90.25
	7	9293	0	9293	26	17	92.10
	8	9139	0	9139	7	17	91.40
	9	8795	0	8795	28	17	90.75
	10	8353	0	8353	9	16	89.05
	11	6509	0	6509	7	16	83.10
	12	7248	0	7248	11	8	41.30

Notes

Temperatures are at hour ended peak hour. System weighted St Pete (45%), Orlando (45%), and Tallahassee (10%).

TYSP Year	2020
Staff's Data Request #	1
Question No.	20

Year	Number of PEVs	Number of Public PEV Charging Stations	Number of Public "Quick-charge" PEV Charging Stations	Cumulative Impact of PEVs		
				Summer Demand (MW)	Winter Demand (MW)	Annual Energy (GWh)
2020	15,300	NA	NA	0.8	0.0	5.7
2021	21,860	NA	NA	2.9	0.9	23.1
2022	30,491	NA	NA	6.1	2.5	49.6
2023	41,025	NA	NA	10.1	4.6	83.4
2024	53,666	NA	NA	15.0	7.1	125.2
2025	69,019	NA	NA	21.0	10.2	175.6
2026	86,038	NA	NA	27.9	14.0	234.8
2027	104,722	NA	NA	35.8	18.2	300.5
2028	125,363	NA	NA	44.3	22.9	373.8
2029	148,071	NA	NA	53.8	28.1	453.5

Notes

1. Number of PEVs includes total cumulative vehicles
2. Cumulative Impact of PEVs includes only net-new vehicles beginning January 2020 as used in Load Forecast
3. Summer Demand: July HE 17, Winter Demand: January HE 08
4. DEF does not forecast the number of public PEV charging stations
5. Source: July 2019 EV Forecast

TYSP Year 2020
Staff's Data Re 1
Question No. 26

All Demand Response Sources Combined									
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
2010	393,410	679	977	8,384	24	31	3,946	DNA	DNA
2011	397,864	647	1,026	7,874	15	23	3,206	DNA	DNA
2012	402,379	696	920	5,582	11	16	1,953	DNA	DNA
2013	406,194	681	1,035	4,337	16	20	838	DNA	DNA
2014	409,689	724	1,014	3,156	23	27	1,977	DNA	DNA
2015	410,855	752	1,055	6,372	29	35	1,376	DNA	DNA
2016	415,838	714	1,014	8,782	79	88	1,569	DNA	DNA
2017	424,246	756	1,065	9,592	34	43	2,559	DNA	DNA
2018	429,750	783	1,090	6,478	42	51	2,545	DNA	DNA
2019	432,277	786	1,098	6,862	69	76	2,054	DNA	DNA
Notes									
See note below									

Residential Load Management									
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
2010	392,763	304	651	8,357	11	18	3,886	6.4	6.4
2011	397,234	317	661	7,858	9	17	3,163	6.2	5.2
2012	401,929	326	639	5,570	6	12	1,762	4.5	2.8
2013	405,737	341	652	4,321	5	9	831	1.0	3.8
2014	409,227	355	654	3,145	3	7	1,976	2.2	4.1
2015	410,396	357	656	6,345	7	13	1,372	1.5	2.8
2016	415,369	366	669	8,634	10	19	1,300	1.2	6.0
2017	423,900	382	694	9,561	11	20	2,553	2.9	4.2
2018	429,403	388	698	6,424	7	13	2,542	2.8	4.2
2019	431,862	396	711	6,847	7	14	2,046	2.3	4.3
Notes									

Commercial Load Management									
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
2010	262	8	0	0	0	0	54	0	0
2011	250	6	0	0	0	0	12	2	0
2012	65	4	0	0	0	0	185	2	0
2013	65	4	0	0	0	0	0	0	0

2014	65	4	0	0	0	0	0	0	0
2015	64	4	0	0	0	0	1	0	0
2016	63	4	0	0	0	0	0	0	0
2017	63	4	0	0	0	0	0	0	0
2018	63	4	0	0	0	0	0	0	0
2019	63	4	0	0	0	0	0	0	0
Notes									
See note below									

Standby Generation [4]									
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
2010	237	96	80	27	13.6	13.6	2	DNA	DNA
2011	234	97	94	16	5.8	5.8	19	DNA	DNA
2012	247	100	96	11	4.0	4.0	0	DNA	DNA
2013	253	98	98	12	4.7	4.7	4	DNA	DNA
2014	259	103	104	10	5.0	5.0	1	DNA	DNA
2015	260	108	109	25	19.5	19.5	2	DNA	DNA
2016	269	68	68	147	68	68	269	DNA	DNA
2017	145	77	77	28	7	7	5	DNA	DNA
2018	147	82	82	12.0	3.2	3.2	1	DNA	DNA
2019	178	83	83	1.0	0.2	0.2	3	DNA	DNA
Notes									
See note below									

Interruptible Service									
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
2010	143	254	233	0	0.0	0.0	3	DNA	DNA
2011	142	221	264	0	0.0	0.0	11	DNA	DNA
2012	134	262	179	1	0.6	0.6	6	DNA	DNA
2013	135	233	278	4	6.6	6.6	3	DNA	DNA
2014	134	256	249	1	15.0	15.0	0	DNA	DNA
2015	131	277	283	2	2.6	2.6	1	DNA	DNA
2016	133	270	270	1	1	1	0	DNA	DNA
2017	134	287	287	3	16	16	1	DNA	DNA
2018	133	303	303	42	32	34	2	DNA	DNA
2019	170	297	297	14	62	62	5	DNA	DNA
Notes									
See note below									

Curtailable Service									
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

2010	5	17	13	0	0	0	1	DNA	DNA
2011	4	6	7	0	0	0	1	DNA	DNA
2012	4	5	7	0	0	0	0	DNA	DNA
2013	4	5	7	0	0	0	0	DNA	DNA
2014	4	6	7	0	0	0	0	DNA	DNA
2015	4	6	7	0	0	0	0	DNA	DNA
2016	4	6	7	0	0	0	0	DNA	DNA
2017	4	6	7	0	0	0	0	DNA	DNA
2018	4	6	7	0	0	0	0	DNA	DNA
2019	4	6	7	0	0	0	0	DNA	DNA
Notes									
See note below									

Table Footnotes:

(1) Total available capacity may change as a result of multiple factors including changes in participation, changes in contribution from existing participants, and periodic evaluation of system response. Thus, changes in total available capacity do not directly correlate to changes in participation.

(2) Added capacity corresponds to the addition of new participants and those converted from suspended accounts.

(3) Data is Not Available (DNA) on lost capacity for certain source programs and therefore is listed as DNA in their specific table and for the aggregated ALL Source Table.

(4) During 2016 the Emergency Stand-by Tariff was closed and the customers were removed from the program. Customers whose generators met new EPS requirements were added to the non-emergency program.

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Staff's Data Reques 1
Question No. 27

All Sources of Demand Response Combined										
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
2010	6	52	395,236	68	395,236	16	514	395,384	943	395,384
2011	4	136	399,816	252	399,816	1	101	399,582	101	399,582
2012	2	16	404,080	16	404,080	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
Notes										

Residential Load Management										
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
2010	4	48	394,999	64	394,999	7	308	394,999	651	394,999
2011	2	101	399,582	188	399,582	1	101	399,582	101	399,582
2012	1	15	403,833	15	403,833	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
Notes										
* Activations shown are limited to reliability events for capacity shortages.										

Commercial Load Management										
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
2010	*	*	*	*	*	*	*	*	*	*
2011	*	*	*	*	*	*	*	*	*	*
2012	*	*	*	*	*	*	*	*	*	*
2013	*	*	*	*	*	*	*	*	*	*
2014	*	*	*	*	*	*	*	*	*	*
2015	*	*	*	*	*	*	*	*	*	*
2016	*	*	*	*	*	*	*	*	*	*
2017	*	*	*	*	*	*	*	*	*	*
2018	*	*	*	*	*	*	*	*	*	*
2019	*	*	*	*	*	*	*	*	*	*
Notes										
Commercial Demand Response is included in Residential Table Above										
Commercial Demand Response is a Summer-only program										

Standby Generation										
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
2010	2	4	237	4	237	5	63	237	70	237
2011	2	35	234	64	234	0	0	0	0	0
2012	1	1	247	1	247	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0

Notes

Interruptible Service										
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
2010	0	0	0	0	0	2	122	143	201	143
2011	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
Notes										

Curtailable Service										
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
2010	0	0	0	0	0	2	21	5	21	5
2011	0	0	0	0	0	0	0	0	0	0
2012	0	0	0	0	0	0	0	0	0	0
2013	0	0	0	0	0	0	0	0	0	0
2014	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0	0
Notes										

TYSP Year 2020
Staff's Data Request # 1
Question No. 28

All Sources of Demand Response Combined							
Year	Average Number of Customers	Summer Peak			Winter Peak		
		Activated During Peak? (Y/N)	Number of Customers Activated	Capacity Activated (MW)	Activated During Peak? (Y/N)	Number of Customers Activated	Capacity Activated (MW)
2010	395,649	N	0	0	Y	397,621	1,105
2011	400,220	N	0	0	N	0	0
2012	404,286	N	0	0	N	0	0
2013	407,929	N	0	0	N	0	0
2014	410,267	N	0	0	N	0	0
2015	413,339	N	0	0	N	0	0
2016	419,444	N	0	0	N	0	0
2017	427,023	N	0	0	N	0	0
2018	431,007	N	0	0	N	0	0
2019	433,746	N	0	0	N	0	0
Notes							

Residential Load Management							
Year	Average Number of Customers	Summer Peak			Winter Peak		
		Activated During Peak? (Y/N)	Number of Customers Activated	Capacity Activated (MW)	Activated During Peak? (Y/N)	Number of Customers Activated	Capacity Activated (MW)
2010	394,999	N	0	0	Y	397,234	831
2011	399,582	N	0	0	N	0	0
2012	403,833	N	0	0	N	0	0
2013	407,482	N	0	0	N	0	0
2014	409,812	N	0	0	N	0	0
2015	412,883	N	0	0	N	0	0
2016	419,036	N	0	0	N	0	0
2017	426,651	N	0	0	N	0	0
2018	430,633	N	0	0	N	0	0
2019	433,334	N	0	0	N	0	0
Notes							

Commercial Load Management							
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)
2010	262	*	*	*	*	*	*
2011	250	*	*	*	*	*	*
2012	65	*	*	*	*	*	*
2013	65	*	*	*	*	*	*
2014	65	*	*	*	*	*	*
2015	64	*	*	*	*	*	*
2016	64	*	*	*	*	*	*
2017	63	*	*	*	*	*	*
2018	63	*	*	*	*	*	*
2019	63	*	*	*	*	*	*
Notes							
* Commercial Demand Response is included in Residential Table above							
* Commercial Demand Response is a Summer-only program							

Standby Generation							
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)
2010	240	N	0	0	Y	240	56
2011	242	N	0	0	N	0	0
2012	249	N	0	0	N	0	0
2013	253	N	0	0	N	0	0
2014	259	N	0	0	N	0	0
2015	259	N	0	0	N	0	0
2016	208	N	0	0	N	0	0
2017	172	N	0	0	N	0	0
2018	153	N	0	0	N	0	0
2019	176	N	0	0	N	0	0
Notes							

Interruptible Service							
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)
2010	143	N	0	0	Y	143	208
2011	142	N	0	0	N	0	0
2012	135	N	0	0	N	0	0
2013	125	N	0	0	N	0	0
2014	127	N	0	0	N	0	0
2015	129	N	0	0	N	0	0
2016	132	N	0	0	N	0	0
2017	133	N	0	0	N	0	0

2018	154	N	0	0	N	0	0
2019	169	N	0	0	N	0	0
Notes							

Curtailable Service							
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)
2010	5	N	0	0	Y	4	10
2011	4	N	0	0	N	0	0
2012	4	N	0	0	N	0	0
2013	4	N	0	0	N	0	0
2014	4	N	0	0	N	0	0
2015	4	N	0	0	N	0	0
2016	4	N	0	0	N	0	0
2017	4	N	0	0	N	0	0
2018	4	N	0	0	N	0	0
2019	4	N	0	0	N	0	0
Notes							

TYSP Year 2020
Staff's Data Request # 1
Question No. 29

Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Commercial In-Service		Gross Capacity (MW)		Net Capacity (MW)		Firm Capacity (MW)		Capacity Factor
					Mo	Yr	Sum	Win	Sum	Win	Sum	Win	(%)
ANCLOTE	1	PASCO	ST	NG	October	1974	512	524	498	511	498	511	22.2
ANCLOTE	2	PASCO	ST	NG	October	1978	520	527	505	514	505	514	28.5
CRYSTAL RIVER	4	CITRUS	ST	BIT	December	1982	769	778	712	721	712	721	41.5
CRYSTAL RIVER	5	CITRUS	ST	BIT	October	1984	767	778	710	721	710	721	26.9
P L BARTOW	4	PINELLAS	CC	NG	June	2009			1144	1227	1144	1227	55.0
CITRUS COUNTY COMBINED CYCLE	PB1	CITRUS	CC	NG	October	2018	839	951	816	931	816	931	66.8
CITRUS COUNTY COMBINED CYCLE	PB2	CITRUS	CC	NG	November	2018	839	951	816	931	816	931	64.5
HINES ENERGY COMPLEX	1	POLK	CC	NG	April	1999	495	534	490	528	490	528	60.0
HINES ENERGY COMPLEX	2	POLK	CC	NG	December	2003	529	569	524	563	524	563	69.3
HINES ENERGY COMPLEX	3	POLK	CC	NG	November	2005	522	559	515	553	515	553	62.1
HINES ENERGY COMPLEX	4	POLK	CC	NG	December	2007	524	552	516	544	516	544	68.0
OSPREY ENERGY CENTER POWER PLANT	1	POLK	CC	NG	May	2004	597	612	519	600	245	245	42.2
TIGER BAY	1	POLK	CC	NG	August	1997	203	234	200	231	200	231	35.2
AVON PARK	P1	HIGHLANDS	GT	NG	December	1968	24	25	24	25	24	25	1.0
AVON PARK	P2	HIGHLANDS	GT	DFO	December	1968	24	25	24	25	24	25	0.3
BARTOW	P1	PINELLAS	GT	DFO	May	1972	41	52	41	52	41	52	0.4
BARTOW	P2	PINELLAS	GT	NG	June	1972	41	57	41	57	41	57	2.0
BARTOW	P3	PINELLAS	GT	DFO	June	1972	41	53	41	53	41	53	0.3
BARTOW	P4	PINELLAS	GT	NG	June	1972	45	61	45	61	45	61	1.9
BAYBORO	P1	PINELLAS	GT	DFO	April	1973	44	61	44	61	44	61	0.1
BAYBORO	P2	PINELLAS	GT	DFO	April	1973	41	58	41	58	41	58	0.2
BAYBORO	P3	PINELLAS	GT	DFO	April	1973	43	60	43	60	43	60	0.1
BAYBORO	P4	PINELLAS	GT	DFO	April	1973	43	59	43	59	43	59	0.2
DEBARY	P2	VOLUSIA	GT	DFO	December	1975	48	64	48	64	48	64	0.4
DEBARY	P3	VOLUSIA	GT	DFO	December	1975	50	65	50	65	50	65	0.2
DEBARY	P4	VOLUSIA	GT	DFO	December	1975	50	65	50	65	50	65	0.2
DEBARY	P5	VOLUSIA	GT	DFO	December	1975	50	65	50	65	50	65	0.1
DEBARY	P6	VOLUSIA	GT	DFO	December	1975	51	65	51	65	51	65	0.2
DEBARY	P7	VOLUSIA	GT	NG	October	1992	79	99	79	99	79	99	4.5
DEBARY	P8	VOLUSIA	GT	NG	October	1992	78	96	78	96	78	96	4.8
DEBARY	P9	VOLUSIA	GT	NG	October	1992	80	98	80	98	80	98	5.5
DEBARY	P10	VOLUSIA	GT	DFO	October	1992	75	95	75	95	75	95	0.3

INTERCESSION CITY	P1	OSCEOLA	GT	DFO	May	1974	47	64	47	64	47	64	0.2
INTERCESSION CITY	P2	OSCEOLA	GT	DFO	May	1974	46	63	46	63	46	63	0.3
INTERCESSION CITY	P3	OSCEOLA	GT	DFO	May	1974	46	63	46	63	46	63	0.3
INTERCESSION CITY	P4	OSCEOLA	GT	DFO	May	1974	46	63	46	63	46	63	0.2
INTERCESSION CITY	P5	OSCEOLA	GT	DFO	May	1974	45	62	45	62	45	62	0.2
INTERCESSION CITY	P6	OSCEOLA	GT	DFO	May	1974	47	64	47	64	47	64	0.2
INTERCESSION CITY	P7	OSCEOLA	GT	NG	October	1993	78	95	78	95	78	95	1.7
INTERCESSION CITY	P8	OSCEOLA	GT	NG	October	1993	79	96	79	96	79	96	5.0
INTERCESSION CITY	P9	OSCEOLA	GT	NG	October	1993	79	96	79	96	79	96	3.9
INTERCESSION CITY	P10	OSCEOLA	GT	NG	October	1993	78	96	78	96	78	96	4.6
INTERCESSION CITY	P11	OSCEOLA	GT	DFO	January	1997	140	161	140	161	140	161	0.3
INTERCESSION CITY	P12	OSCEOLA	GT	NG	December	2000	73	94	73	94	73	94	8.8
INTERCESSION CITY	P13	OSCEOLA	GT	NG	December	2000	75	93	75	93	75	93	8.2
INTERCESSION CITY	P14	OSCEOLA	GT	NG	December	2000	72	92	72	92	72	92	10.1
SUWANNEE RIVER	P1	SUWANNEE	GT	NG	October	1980	49	68	49	68	49	68	5.1
SUWANNEE RIVER	P2	SUWANNEE	GT	DFO	October	1980	50	67	50	67	50	67	0.2
SUWANNEE RIVER	P3	SUWANNEE	GT	NG	November	1980	50	68	50	68	50	68	5.5
UNIVERSITY OF FLORIDA	P1	ALACHUA	GT	NG	January	1994	44	46	44	46	44	46	81.2
Notes													
(Include Notes Here)													

TYSP Year 2020
Staff's Data Request # 1
Question No. 30

Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Commercial In-Service		Gross Capacity (MW)		Net Capacity (MW)		Firm Capacity (MW)		Projected Capacity Factor
					Mo	Yr	Sum	Win	Sum	Win	Sum	Win	(%)
Undesignated CT	P1	Unknown	GT	NG	June	2027	225.8	239.5	225.8	239.5	225.8	239.5	18.6
Undesignated CT	P2	Unknown	GT	NG	June	2029	225.8	239.5	225.8	239.5	225.8	239.5	18.6
Notes													
(Include Notes Here)													

TYSP Year 2020
Staff's Data Request # 1
Question No. 31

Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Commercial In-Service		Gross Capacity (MW)		Net Capacity (MW)		Firm Capacity (MW)		Capacity Factor
					Mo	Yr	Sum	Win	Sum	Win	Sum	Win	(%)
Econolockhatchee Photovoltaic Array	1	Volusia	PV	SO	1	1989	0.007	0.007	0.007	0.007	0	0	17
Osceola	1	Osceola	PV	SO	4	2016	3.8	3.8	3.8	3.8	1.7	0	15
Perry	1	Taylor	PV	SO	8	2016	5.1	5.1	5.1	5.1	2.3	0	26
Suwannee	1	Suwannee	PV	SO	11	2017	8.8	8.8	8.8	8.8	4.0	0	24
Hamilton	1	Hamilton	PV	SO	12	2018	74.9	74.9	74.9	74.9	42.7	0	28
Lake Placid	1	Highlands	PV	SO	12	2019	45	45	45	45	25.7	0	12
Trenton	1	Gilchrist	PV	SO	12	2019	74.9	74.9	74.9	74.9	42.7	0	6
St. Petersburg Pier	1	Pinellas	PV	SO	12	2019	0.35	0.35	0.35	0.35	0.2	0	N/A
Notes													
(Include Notes Here)													

TYSP Year 2020
Staff's Data 1
Question N 32

Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Commercial In-Service		Gross Capacity (MW)		Net Capacity (MW)		Firm Capacity (MW)		Projected Capacity Factor
					Mo	Yr	Sum	Win	Sum	Win	Sum	Win	(%)
Columbia	1	Columbia	PV	SO	3	2020	74.9	74.9	74.9	74.9	42.7	0	~31%
Debary	1	Volusia	PV	SO	5	2020	74.5	74.5	74.5	74.5	33.5	0	~24%
Twin Rivers	1	Hamilton	PV	SO	12	2020	74.9	74.9	74.9	74.9	42.7	0	~27%
Santa Fe	1	Columbia	PV	SO	12	2020	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #12	1	Unknown	PV	SO	12	2021	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #13	1	Unknown	PV	SO	12	2021	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #14	1	Unknown	PV	SO	12	2021	56	56	56	56	31.9	0	~28%
Solar #15	1	Unknown	PV	SO	1	2022	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #16	1	Unknown	PV	SO	1	2022	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #17	1	Unknown	PV	SO	5	2023	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #18	1	Unknown	PV	SO	5	2023	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #19	1	Unknown	PV	SO	5	2024	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #20	1	Unknown	PV	SO	5	2024	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #21	1	Unknown	PV	SO	12	2025	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #22	1	Unknown	PV	SO	12	2025	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #23	1	Unknown	PV	SO	12	2026	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #24	1	Unknown	PV	SO	12	2027	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #25	1	Unknown	PV	SO	12	2028	74.9	74.9	74.9	74.9	42.7	0	~28%
Solar #26	1	Unknown	PV	SO	12	2029	74.9	74.9	74.9	74.9	42.7	0	~28%
Notes													
(Include Notes Here)													

TYSP Year 2020
Staff's Data Request # 1
Question No. 34

Seller Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)	
						Sum	Win	Sum	Win	Sum	Win	Start	End
Northern Star Generation	Mulberry	1	Polk	CC	NG	115	115	115	115	115	115	Jul-94	Aug-24
Northern Star Generation	Orange Cogen	1	Polk	CC	NG	104	104	104	104	104	104	Jun-95	Dec-25
Northern Star Generation	Orlando Cogen	1	Orange	CC	NG	115	115	115	115	115	115	Sep-93	Dec-23
General Electric Financial Services	Shady Hills	1-3	Pasco	GT	NG	480	522	480	522	480	522	Apr-07	Apr-24
Southern Power	Franklin	1	Lee, AL	CC	NG	424	424	424	424	424	424	Jun-16	May-21
Northern Star Generation	Vandolah Power	1-4	Hardee	GT	NG	640	681	640	681	640	681	Jun-12	May-27
Notes													
(Include Notes Here)													

TYSP Year 2020
Staff's Data Request # 1
Question No. 35

Seller Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)	
						Sum	Win	Sum	Win	Sum	Win	Start	End
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Notes													
(Include Notes Here)													

TYSP Year 2020
Staff's Data Request # 1
Question No. 36

Seller Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)	
						Sum	Win	Sum	Win	Sum	Win	Start	End
Pasco County	Pasco County Resource Recovery	1	Pasco	MSW	Waste	23	23	23	23	23	23	Jan-95	Dec-24
Pinellas County	Pinellas County Resource Recovery	1	Pinellas	MSW	Waste	54.8	54.8	54.8	54.8	54.8	54.8	Jan-95	Dec-24
Miami-Dade County	Miami-Dade Resource Recovery	1	Dade	MSW	Waste	43	43	43	43	NA	NA	NA	NA
Lee County	Lee County Resource Recovery	1	Lee	MSW	Waste	40	40	40	40	NA	NA	NA	NA
Lake County	Lake County Resource Recovery	1	Lake	MSW	Waste	23	23	23	23	NA	NA	NA	NA
Citrus World	Citrus World	1	Polk	WH	WH	0.1	0.1	0.1	0.1	0.1	0.1	Jan-91	NA
PCS Phosphate	PCS Phosphate	1	Hamilton	WH	WH	0.2	0.2	0.2	0.2	0.2	0.2	Nov-80	NA
Notes													
(Include Notes Here)													

TYSP Year 2020
Staff's Data Request # 1
Question No. 37

Seller Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)	
						Sum	Win	Sum	Win	Sum	Win	Start	End
National Solar	National Solar Gadsden	1	Gadsden	PV	SO	50	50	50	50	NA	NA	NA	NA
National Solar	National Solar Hardee	1	Hardee	PV	SO	50	50	50	50	NA	NA	NA	NA
National Solar	National Solar Suwannee	1	Suwannee	PV	SO	50	50	50	50	NA	NA	NA	NA
National Solar	National Solar Highlands	1	Highlands	PV	SO	50	50	50	50	NA	NA	NA	NA
National Solar	National Solar Osceola	1	Osceola	PV	SO	50	50	50	50	NA	NA	NA	NA
Notes													
(Include Notes Here)													

TYSP Year 2020
Staff's Data Req 1
Question No. 39

Buyer Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity (MW)		Contract Term Dates (MM/YY)		Description
						Sum	Win	Sum	Win	Sum	Win	Start	End	
Homestead	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	25	25	1/1/2007	12/31/2019	Partial Req'ts
Homestead	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	15	15	1/1/2007	12/31/2019	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	100	0	6/1/2019	8/31/2019	Partial Req'ts
Reedy Creek	N/A	N/A	N/A	N/A	Nat Gas	N/A	N/A	N/A	N/A	53	53	1/27/2017	6/30/2019	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	Nat Gas	N/A	N/A	N/A	N/A	200-500	200-500	6/1/2016	12/31/2024	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	150	150	1/1/2014	12/31/2020	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	100	0	6/1/2017	12/31/2020	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	0	600	1/1/2014	12/31/2020	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	0.014	0.014	6/1/1987	Evergreen	Partial Req'ts
Reedy Creek	N/A	N/A	N/A	N/A	Nat Gas	N/A	N/A	N/A	N/A	141	81	1/1/2016	12/31/2021	Partial Req'ts
Reedy Creek	N/A	N/A	N/A	N/A	Solar	N/A	N/A	N/A	N/A	2-10	2-10	8/1/2019	12/31/2020	Partial Req'ts
Tampa Electric	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	0-515	0-515	1/26/2019	2/28/2021	Partial Req'ts
Chattahoochee	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	6	4	1/1/2016	12/31/2020	Full Req'ts
Mount Dora	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	21	23	1/1/2013	12/31/2020	Full Req'ts
Williston	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	8	9	1/1/2013	12/31/2020	Full Req'ts

Notes

The Seminole 2019 agreement above was not executed until May 2019, so it was not included in last year's report.

TYSP Year 2020
Staff's Data Request # 1
Question No. 40

Buyer Name	Facility Name	Unit No.	County Location	Unit Type	Primary Fuel	Gross Capacity (MW)		Net Capacity (MW)		Contracted Firm Capacity		Contract Term Dates (MM/YY)		Description
						Sum	Win	Sum	Win	Sum	Win	Start	End	
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	0	50	1/1/2021	3/31/2027	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	50-400	50-400	1/1/2021	12/31/2030	Partial Req'ts
Seminole	N/A	N/A	N/A	N/A	System	N/A	N/A	N/A	N/A	50-400	50-400	1/1/2021	12/31/2035	Partial Req'ts
Notes														
The two Seminole agreements directly above have optionality. The combined maximum is 450 MW through 2030.														

TYSP Year 2020
Staff's Data Request # 1
Question No. 42

Renewable Source	Annual Renewable Generation (GWh)										
	Actual	Projected									
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Utility - Firm	222	825	1284	2133	2370	2732	2854	3205	3376	3556	3717
Utility - Non-Firm	0	0	0	0	0	0	0	0	0	0	0
Utility - Co-Firing	0	0	0	0	0	0	0	0	0	0	0
Purchase - Firm	654	609	605	620	620	622	620	620	620	622	620
Purchase - Non-Firm	32	348	512	824	1133	1442	1741	2036	2183	2336	2474
Purchase - Co-Firing	0	0	1	2	3	4	5	6	7	8	9
Customer - Owned	221	347	482	648	845	1054	1262	1467	1605	1681	1754
Total	907	2128	2884	4227	4971	5854	6482	7334	7792	8203	8575
Notes											
(Include Notes Here)											

TYSP Year 2020
Staff's Data Request # 1
Question No. 43

Plant Name	Land Available (Acres)	Potential Installed Net Capacity (MW)	Potential Obstacles to Installation
Anclote	50	9	Wetlands, geotechnical problems, power grid interconnection costs, coastal area
Avon Park	60	10	Wetlands, geotechnical problems, species impacts
Crystal River	150	25	Wetlands, geotechnical problems, non-contiguous land, power grid interconnection not studied, impact to existing power plant, coastal area, species impacts
DeBary	400	67	Wetlands, native species habitat, existing solar footprint, geotechnical problems, non-contiguous land for solar
Hines	150	25	Wetlands, geotechnical problems, native species habitat, non-contiguous land for solar, power grid interconnection not studied, impact to existing power plant, species impacts
Suwannee	60	10	Wetlands, geotechnical problems, archeological finds, native species habitat
Turner	15	2	Small site, non-contiguous land for solar, native species habitat
Higgins	75	12.7	Wetlands, geotechnical problems, power grid interconnection not studied and not in our territory, coastal area
Bartow	50	9	Wetlands, geotechnical problems, archeological finds, non-contiguous land for solar power grid interconnection not studied, impact to existing power plant, coastal area

TYSP Year 2020
Staff's Data Request # 1
Question No. 51

Project Name	Pilot Program (Y/N)	In-Service/ Pilot Start Date (MM/YY)	Max Capacity Output (MW)	Max Energy Stored (MHh)	Conversion Efficiency (%)
USF Microgrid Energy Storage Pilot	Y	7/8/2018	0.25	0.475	88%

Notes

(Include Notes Here)

TYSP Year 2020
Staff's Data Request # 1
Question No. 52

Project Name	Pilot Program (Y/N)	In-Service/ Pilot Start Date (MM/YY)	Projected Max Capacity Output (MW)	Projected Max Energy Stored (MHh)	Projected Conversion Efficiency (%)
Cape San Blas	Y	1Q 2021	5.5	20.5	83.5%
Trenton	Y	1Q 2021	11	16.7	83.2%
Jennings	Y	1Q 2021	5.5	8.5	84.0%

Notes

(Include Notes Here)

TYSP Year 2020
Staff's Data Request # 1
Question No. 57
Jenny Camp

Year		As-Available Energy ($/MWh)	On-Peak Average ($/MWh)	Off-Peak Average ($/MWh)
Actual	2010	42.92	49.48	37.89
	2011	38.51	43.72	34.58
	2012	30.09	34.41	26.43
	2013	34.35	38.29	31.01
	2014	37.68	42.97	33.21
	2015	26.03	28.73	23.73
	2016	25.96	29.79	22.73
	2017	28.97	32.45	26.04
	2018	30.84	34.80	27.49
	2019	23.71	27.22	20.73
Projected	2020	19.87	21.18	18.77
	2021	19.25	20.45	18.24
	2022	17.50	18.12	16.97
	2023	17.16	17.71	16.70
	2024	17.97	18.50	17.52
	2025	19.96	20.64	19.39
	2026	22.18	22.92	21.55
	2027	25.55	26.77	24.52
	2028	29.89	31.62	28.43
	2029	32.14	33.44	31.05

Notes

This year's response for both historic and projected values have been adjusted to align with DEF's as-available energy tariff and rule 25-17.0825(2) F.A.C. Historic values have been adjusted from a fuel only basis to include tariffed components found in Appendix A, (starting on Tariff Sheet 9.30) which are also incorporated in the table's projected values. Historically, DEF has used its system marginal costs as a reasonable proxy of its QF as-available energy payment rates. However, this practice has been supplanted to align with 25-17.0825(2)(a) where a reasonable amount of potential QFs in DEF interconnection queues are considered in the MW block size. Please note that current estimates are only valid for a limited time and effective as of May 1, 2020 due to the steady potential QF interconnection activity. Finally, as DEF's estimated as-available MW block size continues to grow, DEF anticipates that it will experience hours when required DEF system generation along with potential QF generation will exceed DEF's forecasted hourly loads and the cost to manage unavoidable excess energy may not be fully captured in the projected values herein.

TYSP Year 2020
Staff's Data Request # 1
Question No. 58

Generating Unit Name	Summer Capacity (MW)	Certification Dates (if Applicable)		In-Service Date (MM/YY)
		Need Approved (Commission)	PPSA Certified	
Nuclear Unit Additions				
Combustion Turbine Unit Additions				
Undesignated CT	225.8	Not Required	Not Required	6/1/2027
Undesignated CT	225.8	Not Required	Not Required	6/1/2029
Combined Cycle Unit Additions				
Steam Turbine Unit Additions				
Notes				
(Include Notes Here)				

TYSP Year 2020
Staff's Data Request # 1
Question No. 60

Plant	Unit No.	Unit Type	Fuel Type	Capacity Factor (%)										
				Actual	Projected									
				2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Anclote	1	Steam	Gas	22.2	6.7	7.8	9.4	8.5	9.5	9.8	11.2	10.9	11.2	11.4
Anclote	2	Steam	Gas	28.5	7.4	8.7	8.3	8.7	8.5	10.8	10.4	11.2	12.9	11.0
Crystal River	4	Steam	Coal	41.5	28.9	31.9	23.8	20.3	25.2	24.2	22.0	25.2	25.4	27.7
Crystal River	5	Steam	Coal	26.9	29.3	28.1	32.3	27.3	18.2	23.1	25.1	24.2	31.1	28.7
Bartow CC	4	Combined Cycle	Gas	55.0	68.2	67.4	68.1	66.1	62.2	61.6	61.5	62.2	58.5	62.1
Citrus CC	1-2	Combined Cycle	Gas	65.7	84.1	84.2	77.3	83.2	86.4	80.9	82.6	82.1	77.4	81.1
Hines Energy Complex	1-4	Combined Cycle	Gas	64.9	60.2	60.7	64.3	60.0	58.3	56.2	54.5	57.3	60.1	58.7
Osprey CC	1	Combined Cycle	Gas	42.2	19.7	18.0	19.5	15.7	52.0	61.9	62.1	56.6	63.4	58.6
Tiger Bay	1	Combined Cycle	Gas	35.2	67.2	76.3	83.1	80.9	56.3	64.8	70.2	73.3	75.6	66.0
Avon Park	1-2	Gas Turbine	Gas/Oil	0.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bartow Peaker	1-4	Gas Turbine	Gas/Oil	1.2	0.3	0.3	0.2	0.1	0.8	0.5	0.9	1.8	3.2	2.4
Bayboro	1-4	Gas Turbine	Oil	0.2	0.3	0.4	0.2	0.1	0.9	0.7	1.7	2.4	3.3	2.3
DeBary	1-10	Gas Turbine	Gas/Oil	2.2	0.5	0.4	0.4	0.2	1.1	0.9	1.2	2.3	4.0	2.9
Generic CTs	1-3	Gas Turbine	Gas									25.8	20.3	17.5
Intercession City	1-14	Gas Turbine	Gas/Oil	3.4	1.0	0.9	0.8	0.6	2.0	1.5	2.0	3.4	4.3	3.3
Suwannee Peaker	1-3	Gas Turbine	Gas/Oil	3.6	0.5	0.5	0.3	0.2	1.0	0.8	0.9	1.6	2.4	1.9
University of Florida	1	Gas Turbine	Gas	81.2	84.0	80.4	91.5	83.3	87.9	80.9	88.7	90.5	0.0	0.0
Solar		PV		24.7	28.1	27.8	28.2	28.2	28.2	28.1	28.2	28.2	28.2	28.2
Notes														
(Include Notes Here)														

TYSP Year 2020
Staff's Data Request # 1
Question No. 62

Plant Name	Fuel Type	Summer Capacity (MW)	In-Service Date (MM/YYY)	Potential Conversion	Potential Issues
Anclote	NG	498	10/74	CC	Project Development
Anclote	NG	505	10/78	CC	Project Development
Crystal River	BIT	712	12/82	CC/IGCC	Project Development
Crystal River	BIT	710	10/84	CC/IGCC	Project Development
Notes					
(Include Notes Here)					

TYSP Year 2020
Staff's Data Request # 1
Question No. 63

Plant Name	Fuel Type	Summer Capacity (MW)	In-Service Date (MM/YYY)	Potential Conversion	Potential Issues
Crystal River	BIT	712	12/82	CC/IGCC	Project Development
Crystal River	BIT	710	10/84	CC/IGCC	Project Development
Notes					
(Include Notes Here)					

TYSP Year 2020
Staff's Data Request # 1
Question No. 64

Transmission Line	Line Length (Miles)	Nominal Voltage (kV)	Date Need Approved	Date TLSA Certified	In-Service Date
N/A	N/A	N/A	N/A	N/A	N/A
Notes					

DEF has no proposed transmission lines for the current planning period that require certification under the Transmission Line Siting Act, nor are there any that have already been approved, but are not yet in-service.

TYSP Year 2020
Staff's Data Request # 1
Question No. 66 e

Year	Estimated Cost of Standards of Performance for Greenhouse Gas Emissions Rule for New Sources Impacts (Present-Year $ millions)			
	Capital Costs	O&M Costs	Fuel Costs	Total Costs
2020	0	0	0	0
2021	0	0	0	0
2022	0	0	0	0
2023	0	0	0	0
2024	0	0	0	0
2025	0	0	0	0
2026	0	0	0	0
2027	0	0	0	0
2028	0	0	0	0
2029	0	0	0	0
Notes				
(Include Notes Here)				

TYSP Year 2020
Staff's Data Request # 1
Question No. 68

Unit	Unit Type	Fuel Type	Net Summer Capacity (MW)	Estimated EPA Rule Impacts: Operational Effects						
				ELGS	ACE	MATS	CSAPR/ CAIR	CWIS	CCR	
									Non-Hazardous Waste	Special Waste
Anclote 1	Steam	NG	498	NA	NA	Convert to NG	Convert to NG	Impacted	NA	NA
Anclote 2	Steam	NG	505							
Bartow PB4	CC	NG	1144	NA	NA	NA	Dispatch Changes	Impacted	NA	NA
Citrus Combined Cycle	CC	NG	1632	NA	NA	NA	NA	Compliant as Constructed	NA	NA
Crystal River 4	Steam	Coal	712	Impacted	Impacted	Reagent, CEMS	FGD, SCR, Dispatch	Impacted	Impacted	NA
Crystal River 5	Steam	Coal	710							
Osprey	CC	NG	245	NA	NA	NA	NA	NA	NA	NA
Hines PB1-4	CC	NG	2045	NA	NA	NA	Dispatch Changes	NA	NA	NA
Notes										
(Include Notes Here)										

TYSP Year 2020
Staff's Data Request # 1
Question No. 69

Unit	Unit Type	Fuel Type	Net Summer Capacity (MW)	Estimated EPA Rule Impacts: Cost Effects (CPVRR $ millions)						
				ELGS	ACE	MATS	CSAPR/ CAIR	CWIS	CCR	
									Non-Hazardous Waste	Special Waste
Anclote 1	Steam	NG	498	NA	NA	0	0	**15-130**	NA	NA
Anclote 2	Steam	NG	505			0	0		NA	NA
Bartow PB4	CC	NG	1144	NA	NA	0	0	**10-170**	NA	NA
Crystal River 4	Steam	Coal	712	TBD	TBD	0	0	**10-20**	TBD	0
Crystal River 5	Steam	Coal	710			0	0			
Notes										
(Include Notes Here)										

TYSP Year 2020
Staff's Data Request # 1
Question No. 70

Unit	Unit Type	Fuel Type	Net Summer Capacity (MW)	Estimated EPA Rule Impacts: Unit Availability (Month/Year - Duration)						
				ELGS	ACE	MATS	CSAPR/ CAIR	CWIS	CCR	
									Non-Hazardous Waste	Special Waste
Anclote 1	Steam	NG	498	NA	NA	NA	NA	TBD	NA	NA
Anclote 2	Steam	NG	505	NA	NA	NA	NA	TBD	NA	NA
Bartow PB4	CC	NG	1144	NA	NA	NA	NA	TBD	NA	NA
Citrus Combined Cycle	CC	NG	1632	NA	NA	NA	NA	TBD	NA	NA
Crystal River 4	Steam	Coal	712	TBD	TBD	NA	NA	NA	TBD	NA
Crystal River 5	Steam	Coal	710	TBD	TBD	NA	NA	NA	TBD	NA
Osprey	CC	NG	245	NA	NA	NA	NA	NA	NA	NA
Hines PB1-4	CC	NG	2045	NA	NA	NA	NA	NA	NA	NA
Notes										
(Include Notes Here)										

TYSP Year 2020
Staff's Data Request # 1
Question No. 72

Year		Uranium		Coal		Natural Gas		Residual Oil		Distillate Oil	
		GWh	$/MMBTU	GWh	$/MMBTU	GWh	$/MMBTU	GWh	$/MMBTU	GWh	$/MMBTU
Actual	2010	0	0	12,115	4.05	23,692	6.27	683	10.95	381	16.19
	2011	0	0	10,809	3.83	23,571	5.43	187	10.97	81	18.31
	2012	0	0	10,003	3.83	23,997	5.56	46	12.12	104	20.35
	2013	0	0	10,577	3.94	23,061	5.63	127	12.93	93	21.13
	2014	0	0	11,729	3.98	22,953	5.66	0	0.00	76	21.97
	2015	0	0	9,718	3.72	25,227	4.67	0	0.00	73	22.30
	2016	0	0	8,885	3.62	24,807	4.09	0	0.00	77	18.66
	2017	0	0	8,722	3.44	27,307	4.26	0	0.00	62	16.43
	2018	0	0	8,422	3.20	28,687	4.52	0	0.00	90	19.80
	2019	0	0	4,322	3.66	35,170	3.93	0	0.00	33	20.36
Projected	2020	0	0	3,661	2.12	34,078	2.46	0	0.00	17	14.20
	2021	0	0	3,763	2.18	34,189	2.49	0	0.00	20	13.99
	2022	0	0	3,522	2.26	34,109	2.56	0	0.00	13	14.22
	2023	0	0	2,985	2.43	33,770	2.64	0	0.00	6	14.44
	2024	0	0	2,735	2.52	35,311	2.80	0	0.00	41	14.67
	2025	0	0	2,963	2.72	34,780	3.05	0	0.00	32	15.04
	2026	0	0	2,952	2.88	34,955	3.35	0	0.00	39	15.65
	2027	0	0	3,099	3.09	35,684	3.77	0	0.00	55	16.28
	2028	0	0	3,551	3.33	35,587	4.29	0	0.00	86	17.02
	2029	0	0	3,540	3.43	35,671	4.67	0	0.00	65	17.71
Notes											
(Include Notes Here)											