In re: Commission Review of Numeric Conservation Goals (Duke Energy Florida, LLC).	Docket No. 20190018-EG Filed: May 16, 2019

DUKE ENERGY FLORIDA, LLC'S RESPONSE TO
STAFF'S FIRST SET OF INTERROGATORIES (NOS. 1-33)

Duke Energy Florida, LLC ("DEF") responds to the Staff of the Florida Public Service Commission's ("Staff") First Set of Interrogatories to DEF (Nos. 1-33) as follows:

INTERROGATORIES

1. Please refer to witness Cross' Exhibit No. LC-5. Please compare DEF's annual DSM program achievements with each of the Commission's annual FEECA goals for the period 2010-2018. As part of this response, please complete the table below and provide an electronic version of the table in Microsoft Excel format with formulas intact.

	Historic DSM Achievements and Goals											
	Residential						Commercial / Industrial					
	Achievements			Goals			Achievements			Goals		
Year	Sum	Win	Energy	Sum	Win	Energy	Sum	Win	Energy	Sum	Win	Energy
	MW	MW	GWh	MW	MW	GWh	MW	MW	GWh	MW	MW	GWh

   Answer:
   Please see the attached document bearing bates numbers 20190018-DEF-0039282 through 20190018-DEF-0039284.

2. Please refer to witness Cross' Exhibit No. LC-5. Please identify the financial impact of DSM programs for each year for the period 2010-2018, including the Company's annual expenditures for DSM programs, the monthly bill impact from DSM program expenditures for a residential customer (1,000 kWh/month), the typical monthly bill for a residential customer (1,000 kWh/month), and the percent of the total monthly bill dedicated to DSM programs. As part of your response, please complete the table below and provide an electronic version of the table information in Excel format with your response.

	Historic DSM Expenditures			
Year	Total DSM Costs	Monthly DSM Cost	Total Bill	DSM Portion of Bill
	($)	($/mo)	($/mo)	(%)

Answer:

Please see the attached document bearing bates number 20190018-DEF-0039285.

3. Please refer to witness Cross' Direct testimony, page 23, line 20, through page 25, line 9. Please provide the information requested in 3.a. and 3.b. below, for DEF's filings in the 2014 FEECA goal setting proceeding and for DEF's filings in the current docket. Please explain whether changes between the 2014 filing and the current filing would increase, reduce, or have no effect upon the cost-effectiveness of conservation measures and load management.

    a. The avoided generating unit(s) used for cost-effectiveness evaluations, including associated technical and cost information, such as the unit's capacity, projected in-service date, capital cost, and O&M estimates.

    b. The Company's discount rate applied for cost-effectiveness evaluations.

    Answer:

    a. DEF has provided data showing the comparison between several key data inputs including the natural gas and coal costs, the projected CO_2 cost, the load forecast, and the projected capital costs (2019 NNDSM Goals - Avoided Units Costs.xlsx; 2019 vs 2014 goals assumptions.xlsx). DEF has also provided the table of avoided units for the 2014 filing (Exhibit 6-avoided costs032514.xlsx), bearing bates numbers 20190018-DEF-0039286 through 20190018-DEF-0039339. In all categories, the projected costs for avoided energy and capital have declined, in some cases by significant percentages. In addition, the forecast of projected load growth has significantly decreased resulting in fewer avoided units further out in time in the current case compared to 2014. Each of these factors contributes to a reduction in the cost effectiveness of all proposed DSM measures under both RIM and TRC.

    b. The current filing uses a higher discount rate (7.10%) than the one used in the 2014 filing (6.46%), which has the effect of reducing the cost-effectiveness of both conservation measures and load management.

4. Please refer to witness Herndon's Exhibit No. JH-4, pages 88-104. Please identify each of the unique measures not considered in the Technical Potential analysis that were included in DEF's 2014 Technical Potential study and explain the reason for exclusion of each measure. As part of this response, please complete the table below and provide an electronic version of the table in Microsoft Excel format.

Technical Potential – Excluded Measures			
Customer Class	Measure Type	Measure Name	Reason for Exclusion

    Answer:

Technical Potential – Excluded Measures			
Customer Class	Measure Type	Measure Name	Reason for Exclusion
HVAC	Unit	AC Heat Recovery Units	Applies mostly to lower than current code SEERs
HVAC	Ancillary	HVAC Proper Sizing	Code requirement
Motor	Pump	High Efficiency One Speed Pool Pump (1.5 hp)	Code/standard practice, and more efficient measures included in study (two-speed and variable speed pool pumps)
Lighting-Exterior	LED	LED Exit Sign	Code/standard practice
Lighting-Interior	Other	High Pressure Sodium 250W Lamp	More efficient measure (LED) included in study
Lighting-Interior	Other	PSMH, 250W, magnetic ballast	More efficient measure (LED) included in study
Compressed Air	Optimization	Compressed Air-O&M	Behavioral measure
Fans	Optimization	Fans - O&M	Behavioral measure
Pumps	Optimization	Pumps - O&M	Behavioral measure
Process Other	Optimization	Bakery - Process (Mixing) - O&M	Behavioral measure
Process Other	Optimization	O&M/drives spinning machines	Behavioral measure
Process Other	Optimization	O&M - Extruders/Injection Moulding	Behavioral measure

This table is also provided in tab "Staff-ROG4" the attached Microsoft Excel file bearing bates number 20190018-DEF-0039340.

Please see Appendix A-13 for a list of 2014 EE measures eliminated from the current study.

No DR measures (see note on Appendix B-3) or DRSE measures (see note on Appendix C-1) from the 2014 study were eliminated from the current study.

5.   Please refer to witness Herndon's Direct testimony, page 13, lines 12-13. Please explain what is meant by "no measure breakout was necessary because all measures targeted the end-uses estimated for TP."

Answer:
As described in Section 5.1.2 of Nexant's Market Potential Study of Demand Side Management in Duke Energy Florida's Service Territory, demand response technical potential was based on the magnitude of available customer load that can be curtailed at

peak, rather than the load that can be curtailed by a particular demand response control technology. Therefore, technical potential was not dependent on individual measures but identified the total technically feasible load available for curtailment.

6. Please refer to witness Herndon's Direct testimony, pages 16, line 7 through page 7, line 6. Was the impact of rebound effects evaluated in the Technical Potential analysis? If so, what methodology was used? If not, why not?

    Answer:
    Nexant defined technical potential for demand response as the magnitude of loads that can be managed during conditions when utilities need peak capacity. Nexant defined peaking conditions for the demand response technical potential analysis as a single peak hour in each season. Rebound effects were assumed to occur outside the peak period analyzed, i.e., when utilities no longer need peak capacity, and therefore the effects of demand response on subsequent, non-peak hours, were not analyzed. From an energy savings perspective, the rebound effect was considered to offset the energy savings achieved in the hours when load was curtailed, resulting in no estimated energy savings for demand response. For energy efficiency, to the extent that the measure savings were developed from secondary sources that included actual verified program savings (from FEECA utilities or other utility data available), it was assumed that the savings were inclusive of any rebound effects that may occur. No additional adjustments were made to the measure savings due to the lack of reliable information identifying a quantifiable impact of a rebound effect.

7. Please refer to witness Herndon's Exhibit No. JH-4, page 31. Please explain what is meant by "Energy savings were applied in Nexant's TEA-POT model as a percentage of total baseline consumption."

    Answer:
    As described in Section 5.1.1. of Nexant's MPS Report for DEF, energy savings for individual measures were applied to the disaggregated utility electricity sales forecast to estimate the impacts on the utility baseline forecast. As shown in Equation 5-1, the energy savings were applied as a "savings factor", which is the percentage reduction in electricity consumption in order to accurately account for the impacts of the measure relative to the baseline forecast.

8. Please refer to witness Cross' Direct testimony, page 5, line 7, through page 6, line 10.

    a. Please identify each stage of the analysis for the Economic Potential and the Achievable Potential including, but not limited to, Economic Potential screening, Economic Potential savings analysis, Achievable Potential screening, and

Achievable Potential savings analysis, identifying who performed the analysis at each stage.

b.   Did different entities perform the Economic Potential screening and the Economic Potential savings analysis? If yes, how was the Economic Potential screening performed without an associated, parallel Economic Potential savings analysis?

c.   Did different entities perform the Achievable Potential screening and the Achievable Potential savings analysis? If yes, how was the Achievable Potential screening performed without an associated, parallel Achievable Potential savings analysis?

Answer:

a.   The Economic Potential screening analysis described in the MPS report Section 6.1.2 was performed by DEF.   Section 6.1.2 describes each stage in this process along with the cost components included in each stage for both the RIM and TRC evaluation. DEF provided the results of this analysis to Nexant. Nexant then evaluated the application of the cost-effective measures to DEF's customers to develop the Economic Potential.

The process to develop the Achievable Potential described in Section 7.1.1 of the MPS report was performed by Nexant. Nexant incorporated the estimated program costs and incentives into the analysis for each measure that passed the Economic Potential and rescreened each measure under the RIM and TRC scenarios to determine the measures to include in the Achievable Potential.

b.   Yes, the Economic Potential screening was performed by DEF and the Economic Potential savings analysis was performed by Nexant. The Economic Potential screening process determined which measures were cost effective under the RIM and TRC scenarios. Nexant then evaluated the application of the measures to DEF's customers to determine the Economic Potential savings.

c.   No. The Achievable Potential screening and the Achievable Potential savings analysis were both performed by Nexant.

9.   Please refer to witness Cross' Direct testimony, page 5, line 12 through page 6, line 3, and witness Herndon's Direct testimony, page 5, lines 3-5.

a.   Please reconcile witness Herndon's account of the Economic and Achievable Potential methodology, which indicates that DEF conducted an Economic Potential

and Achievable Potential screening, with witness Cross' account of that same methodology, which only indicates that DEF performed an Economic Potential screening.

b.   Please identify each step within the screening process for each cost-effectiveness test pathway (RIM and TRC) at which measures could be removed from consideration for the Economic Potential and the Achievable Potential.

c.   Please identify each factor added to the calculation between each screening step, and the criteria used to determine pass or failure.

Answer:

a. To clarify the process of the measure screening, DEF performed an Economic Potential screening, but did not perform the Achievable Potential screening. The following describes the process and interactions that occurred between DEF and Nexant:

- Nexant provided DEF with a complete list of a measures included in the study that included the following measure parameters: energy savings, summer peak demand savings, winter peak demand savings, and measure useful life.
- DEF analyzed these measure impacts in their DSMore economic modeling software that produced NPV avoided costs, lost revenues, and bill savings for each measure.
- DEF provided Nexant with output files for the base scenario and each economic sensitivity that included these measure parameters as well as calculations of measure payback, RIM, TRC, and PCT, and whether each measure passed or failed the various screening criteria.
- The passing measures from this file were used for the EP analysis.
- DEF provided Nexant with a supplemental version of output files from the economic modeling that included the calculation of NPV program costs, with the same NPV avoided costs, lost revenues, and bill savings for each measure as was used for the EP analysis.
- Nexant added calculations for the measure incentives and updated RIM and TRC screening calculations that incorporated program and incentive costs to identify measures to include in the AP for RIM and TRC scenarios.

b. As described in Section 6.1.2 of Nexant's MPS Report for DEF, the following steps were taken for measure cost-effectiveness screening:

- RIM Scenario Steps:
    1. Measures were analyzed from the RIM perspective. Measures with a RIM cost-benefit ratio of less than 1.0 were removed from consideration for the EP and AP (Note: EP analysis did not include program costs or incentives, while AP analysis did include these costs).
    2. Measures were analyzed from the PCT perspective. Measures with a PCT cost-benefit ratio of less than 1.0 were removed from consideration for the EP and AP (Note: EP analysis did not include incentives, while AP analysis did include this benefit).
    3. Measure simple payback was analyzed. Measures with a simple payback of less than two years were removed from consideration for the EP and AP

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(Note: EP analysis did not include incentives, while AP analysis included a calculation of the incentive available to buy down the payback to two years).

- TRC Scenario Steps:
    1. Measures were analyzed from the TRC perspective. Measures with a TRC cost-benefit ratio of less than 1.0 were removed from consideration for the EP and AP (Note: EP analysis did not include program costs, while AP analysis did include this cost).
    2. Measures were analyzed from the PCT perspective. Measures with a PCT cost-benefit ratio of less than 1.0 were removed from consideration for the EP and AP (Note: EP analysis did not include incentives, while AP analysis did include this benefit).
    3. Measure simple payback was analyzed. Measures with a simple payback of less than two years were removed from consideration for the EP and AP (Note: EP analysis did not include incentives, while AP analysis included a calculation of the incentive available to buy down the payback to two years).

c. The factors added to the calculation between each screening step, and the criteria used to determine pass or failure in each step were as follows:

- RIM Scenario Steps:
    1. Factors were RIM benefits and RIM costs. For the economic potential, the RIM benefits included avoided electric utility supply costs, while RIM costs include decreases in utility electric revenues. For the achievable potential, the RIM benefits included avoided electric utility supply costs, while RIM costs include decreases in utility electric revenues plus program costs and incentives. Criteria used to determine pass or failure was the ratio of RIM benefits to RIM costs had to be 1.0 or greater.
    2. Factors were PCT benefits and PCT costs. For economic potential, the PCT benefits are decreases in electric bills and costs are customer incremental cost to implement the measure. For achievable potential, the PCT benefits are decreases in electric bills plus utility incentives and costs are customer incremental cost to implement the measure. Criteria used to determine pass or failure was the ratio of PCT benefits to PCT costs had to be 1.0 or greater.
    3. Factors were customer bill savings and customer incremental cost. To determine simple payback for the economic potential and achievable potential analysis, total customer incremental cost to implement the measure was compared with decreases in electric bills. Criteria used to determine pass or failure was the simple payback had to be two years or greater.

10. Please refer to witness Cross' Direct testimony, page 5, line 12 through page 6, line 3, and witness Herndon's Direct testimony, page 5, lines 3-5.

    a. Please describe the methodology used to determine measure administrative costs (all program costs excluding incentives) used in cost-effectiveness evaluations.

b.   Please provide the per participant measure administrative cost for each unique measure discussed in your response to 10.a. above.

Answer:
a.   The assumption for administrative costs in the cost effectiveness evaluations was based on an estimated cost per kwh. DEF developed a residential and commercial kwh rate based on the sum of the 2016 and 2017 actual administrative costs for the residential and commercial programs divided by the sum of the 2016 and 2017 kwh achievements for each respective program.

b.   As explained in question 10a, the administrative costs were based on a cost per kwh not a cost per participant. The cost per kwh applied to residential measures was $.049 and the cost per kwh applied to commercial measures was $.039.

11.   Please refer to witness Cross' Direct testimony, page 11, lines 12-16, and Exhibit No. LC-3.

a.   Does the "portfolio of potential units required to meet future capacity requirements" include any solar generation units with in-service dates earlier than the in-service date of "the next combustion turbine unit?"

b.   Please provide the "portfolio of potential units required to meet future capacity requirements" including all renewable and traditional generating and non-generating resources, in Microsoft Excel with formulas intact, in a format similar to that of Schedule 8 of DEF's 2019 Ten-Year Site Plan.

c.   Please identify which of the avoided units found in Exhibit LC-3 "was identified as the avoided unit for purposes of evaluating the cost effectiveness of potential DSM measures."

d.   Please explain why DEF has provided information for multiple, discrete generation units in Exhibit LC-3.

e.   Has DEF performed avoided costs analyses using multiple avoided generation units? If yes, please explain why and what steps the Company took to determine the economic benefit of each avoided generating unit.

Answer:
a.   DEF included all existing and committed units to the portfolio of units assumed to meet current and future capacity requirements. This includes existing solar power plants and solar power plants committed under DEF's current rate settlement, a total of 718 MW. No uncommitted solar units were included in the portfolio.

b.   Please see the attached document bearing bates numbers 20190018-DEF-0039341 through 20190018-DEF-0039344.

c. The testimony refers specifically to the first unit listed in Exhibit LC-3, the peaking unit in 2027. DEF's analysis ascribes the deferred capacity cost to the next unit to be avoided in any given year. Up until the in-service date of the 2027 unit, the deferred capacity value is based on that peaking unit. Starting in 2027 at the in-service date of that peaker, avoided capacity value is calculated based on the capacity value of the next planned unit which may be avoided, in this case the 2029 combined cycle. Similarly, as the in-service date of that combined cycle unit passes, the avoided cost value for subsequent years moves to the next potential unit (2032 peaker) and so on. This is consistent with the methodology DEF and its predecessor companies have employed in previous FEECA goals filings.

d. See the response to Question 11.c. The information on multiple units is provided to allow the calculation of the changing value over the measures in response to the avoided generation capacity value in any given future year. As in the response to Question 11.c, this is consistent with the methodology used in past FEECA goals filings.

e. Yes. Consistent with DEF's practice in previous FEECA goals filings, DEF creates a portfolio of units using the same process for selecting the most cost- effective future units as is used in the development of the Ten-Year Site Plan with the assumptions incorporated for the FEECA filing (no new DSM, confirmed solar only, no carbon price in the base plan). Then, the avoided cost values are calculated on an annual basis using the costs developed for this plan. As described in the response to Question 11.c, the avoided capacity benefit for a given program or measure in any given year is based on the annual carrying cost value of the next avoided unit in that year. The total avoided capacity benefit of a measure is the net present value of the sum of these values across the life of the measure.

12. Please refer to witness Cross' Direct testimony, page 11, lines 5-12. Please identify DEF's avoided transmission & distribution facilities used for cost-effectiveness calculations. As part of this response, please provide information similar to Schedule 10 of the Ten-Year Site Plan. If the Company used more than one set of avoided transmission & distribution facilities, please identify and provide information about each.

Answer:
DEF includes estimated costs for transmission interconnection and associated network upgrades associated with each future generating unit. These costs are generic and do not represent estimation of the costs of any specific transmission projects since the locations of the unsited units have not been determined and therefore specific transmission projects cannot be determined. These costs become part of the avoided capacity value of the generating unit since they represent facilities that may be avoided if/when that generating unit is avoided.

DEF also included avoided T&D costs related to DSM impacts of reduced system peak demand. Please see the attached file bearing bates numbers 20190018-DSM-0039345 through 20190018-DSM-0039354.

13. Please refer to witness Herndon's Exhibit No. JH-4, pages 35-43. Please identify the values of the following factors included in the determination of demand savings and explain how DEF developed each of the factors. If the value varies between measures, such as due to customer classes, please explain why.

    a.   Summer, Winter, and Annual Loss of Load Probabilities
    b.   Forced Outage Rate
    c.   kW and kWh Line Losses

Answer:
    a. Summer, Winter and Annual Loss of load Probabilities were not included in the determination of Technical Potential demand savings.
    b. b. The Forced Outage Rate was not included in the determination of Technical Potential demand savings.
    c. The loss of load probability (kW and kWh Lines Losses) was not included in the determination of Technical Potential demand savings.

14. Please refer to witness Cross' Direct testimony, page 11, lines 5-12. Please provide each escalation rate used in the cost-effectiveness test evaluations of measures and explain how each rate was developed.

Answer:
An Inflation Rate and Non-Fuel O & M Escalation Rate of 2.50%, for both short and long term, as well as a New Plant Construction Escalation Rate of 2.50%, for both short and long term, came from DEF Integrated Resource Planning.

15. Please refer to witness Herndon's Exhibit No. JH-4, pages 88-104. For each of the unique measures considered in the Technical Potential analysis, please provide the estimated reduction (or increase) in summer peak demand, winter peak demand, and annual energy consumption. As part of this response, please complete the table below and provide an electronic version of the table in Microsoft Excel format.

Technical Potential – Measure Savings					
Customer Class	Measure Type	Measure Name	Summer Peak (MW)	Winter Peak (MW)	Annual Energy (GWh)

Answer:
Please see the attached document bearing bates number bearing bates numbers 20190018-DEF-0039355 through 20190018-DEF-0039358. This table is provided in tab "Staff-ROG15" the attached Microsoft Excel file.

Please note that as described in Nexant's MPS Report for DEF in Sections 4.3 and 5.1.2, and as described in response to Staff ROG 5, Nexant did not break out results by measure in the analysis because all of the identified measures target the end-uses estimated for

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technical potential. In the attached Microsoft Excel file, the DR TP is provided by customer class.

16. Please refer to witness Herndon's Exhibit No. JH-4, pages 11 and 13. Please identify the changes between DEF's last Technical Potential Study and its current Technical Potential analysis by demand/energy savings and by customer class. As part of this response, please complete the table below and provide an electronic version of the table in Microsoft Excel format with formulas intact.

TPS	Technical Potential – Change Since Last Goalsetting Proceeding								
	Summer Peak (MW)			Winter Peak (MW)			Annual Energy (GWh)		
	Res	Com & Ind	Total	Res	Com & Ind	Total	Res	Com & Ind	Total
2014									
2019									
Delta									

Answer:
Please see the attached document bearing bates number bearing bates number 20190018-DEF-0039359. This table is provided in tab "Staff-ROG16" the attached Microsoft Excel file, with individual tables for EE results, DR results, and DSRE results.

For DSRE results, the 2019 PV TP was included as a direct comparison to 2014 results as PV was the only DSRE technology considered in 2014. Storage from PV Systems and CHP are included as separate rows below the comparison table.

Additionally, please note that Nexant defined DR TP differently from Itron in the 2009 TPS. Itron limited TP based on available DR technology, Nexant assumed all curtailable load not currently enrolled in DR was eligible for TP. For the Large C&I customers this included all load for each customer.

17. Please refer to witness Cross' Direct testimony, page 5, line 12 through page 6, line 3, and witness Herndon's Direct testimony, page 5, lines 3-5. Using the table below, please identify the total number of unique measures that fit each scenario reflected in the table.

Customer Class	Number of Unique Measures Passing / Failing							
	Economic Potential				Achievable Potential			
	RIM		TRC		RIM		TRC	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
Residential								
Commercial								
Industrial								

Answer:

Number of Unique Measures Passing / Failing								
Customer Class	Economic Potential				Achievable Potential			
	RIM		TRC		RIM		TRC	
	Pass	Fail	Pass	Fail	Pass	Fail	Pass	Fail
Residential	23	80	30	73	21	82	27	76
Commercial	25	120	50	84	23	122	47	98
Industrial	0	35	16	19	0	35	15	20

This table is also provided in tab "Staff-ROG17" the attached Microsoft Excel file bearing bates number bearing bates number 20190018-DEF-003960.

18. Please refer to witness Cross' Direct testimony, page 5, line 12 through page 6, line 3, and witness Herndon's Direct testimony, page 5, lines 3-5. For each of the unique measures considered in the Economic Potential and Achievable Potential screenings by cost-effectiveness test, provide the following information: customer class of the measure, the measure's name, the cost-effectiveness test results, estimated seasonal peak demand and annual energy savings and reason for failure (if applicable). As part of this response, please complete the tables below.

Passing Measures Results							
[Economic Potential or Achievable Potential] – [TRC or RIM]							
Customer Class	Measure Name	TRC	RIM	PCT	Summer (MW)	Winter (MW)	Energy (GWh)

Failing Measures Results								
[Economic Potential or Achievable Potential] – [TRC or RIM]								
Customer Class	Measure Name	TRC	RIM	PCT	Summer (MW)	Winter (MW)	Energy (GWh)	Reason For Failure

Answer:
These tables are provided in tab "Staff-ROG18_EP" for the Economic Potential results and tab "Staff-ROG18_AP" for the Achievable Potential results in the attached Microsoft Excel file bearing bates number bearing bates numbers 20190018-DEF-0039361 through 20190018-DEF-0039400.

Because each unique measure was split into measure permutations by segment and vintage for the analysis, and some segments and vintages had varying savings or costs, the measure results provided are for the individual permutations of each measure.

19. Please refer to witness Cross' Direct testimony, page 5, line 12 through page 6, line 3, and witness Herndon's Direct testimony, page 5, lines 3-5. For each passing measure for the Economic Potential and the Achievable Potential screenings by each cost-effectiveness test, please provide the estimated benefits and costs (in nominal dollars and net present value 2019$), including: avoided generation, avoided transmission and distribution, avoided operations and maintenance, avoided fuel, administrative costs, incentive costs, lost revenues, utility equipment cost, and customer equipment costs. As part of this response, please complete the table below.

Passing Measures Savings & Costs										
[Economic Potential or Achievable Potential] – [TRC or RIM] – [Nominal or NPV]										
Customer Class	Measure Name	Avoided Generation	Avoided T&D	Avoided O&M	Avoided Fuel	Admin Costs	Incentives	Lost Revenues	Utility Equipment	Customer Equipment

Answer:

These tables are provided in tab "Staff-ROG19" in the attached Microsoft Excel file bearing bates number bearing bates numbers 20190018-DEF-0039401 through 20190018-DEF-0039406. The first row below the column names in each table indicates whether the cost provided in that column is in nominal dollars or net present value dollars.

Because each unique measure was split into measure permutations by segment and vintage for the analysis, and some segments and vintages had varying savings or costs, the measure results provided are for the individual permutations of each measure.

20. Please refer to witness Herndon's Direct testimony, page 5, lines 3-5. Please identify the unique measures that pass the Achievable Potential screening for both cost-effectiveness tests. Include the customer class of the measure, the measure's name, and the cost-effectiveness results by test, and the measure savings by test. As part of this response, please complete the tables below.

Shared Passing Measure Cost-Effectiveness Test Results							
Customer Class	Measure Name	TRC AP			RIM AP		
		TRC	RIM	PCT	TRC	RIM	PCT

Shared Measure Savings							
Customer Class	Measure Name	TRC AP			RIM AP		
		Summer (MW)	Winter (MW)	Energy (GWh)	Summer (MW)	Winter (MW)	Energy (GWh)

Answer:
These tables are provided in tab "Staff-ROG20" in the attached Microsoft Excel file bearing bates number bearing bates numbers 20190018-DEF-0039407 through 20190018-DEF-0039411.

Because each unique measure was split into measure permutations by segment and vintage for the analysis, and some segments and vintages had varying savings or costs, the measure results provided are for the individual permutations of each measure.

21.   Please refer to witness Cross' Direct testimony, page 5, line 12 through page 6, line 3, and witness Herndon's Direct testimony, page 5, lines 3-5. Please identify the unique measures considered in DEF's Technical Potential analysis that are components of DEF's existing Demand-Side Management Plans and the status of these measures at the Economic and Achievable Potential levels for each of the cost-effectiveness tests. Include the customer class of the measure, the program name, the measure's name, the cost-effectiveness test results, estimated seasonal peak demand and annual energy savings, and reason for failure (if applicable). As part of this response, please complete the table below.

Existing DSM Program Measures									
[Economic Potential or Achievable Potential] – [TRC or RIM]									
Customer Class	Program Name	Measure Name	TRC	RIM	PCT	Summer (MW)	Winter (MW)	Energy (GWh)	Reason For Failure

Answer:
Please see attached file, Q21.xlxs, bearing bates numbers 20190018-DEF-0039412 through 20190018-DEF-0039415, for the requested tables for existing DEF Neighborhood Energy Saver (NES), Low Income Weatherization (LIWAP), Home Energy Improvement/Residential Incentive Program (HEI) and Better Business (BB) Commercial Industrial programs. Note that potential savings where not evaluated for measures that did not pass cost-effectiveness screening.

22.   Please refer to witness Cross' Direct testimony, page 5, line 12 through page 6, line 3, and witness Herndon's Direct testimony, page 5, lines 3-5. For all measures combined in the Economic Potential and Achievable Potential for each cost-effectiveness test, please identify and quantify the estimated benefits and costs (in nominal dollars and net present value 2019$), including: avoided generation, avoided transmission and distribution, avoided operations and maintenance, avoided fuel, administrative costs, incentive costs,

lost revenues, utility equipment cost, and customer equipment costs. As part of this response, please complete the table below.

Combined Measures Savings & Costs				
Category	Economic Potential		Achievable Potential	
($ Nominal / $ NPV)	RIM	TRC	RIM	TRC
Avoided Generation				
Avoided T&D				
Avoided O&M				
Avoided Fuel				
Administrative Costs				
Incentive Costs				
Lost Revenues				
Utility Equipment				
Customer Equipment				

Answer:
These tables are provided in tab "Staff-ROG22" in the attached Microsoft Excel file bearing bates number 20190018-DEF-0039416. Costs provided in nominal dollars are shaded in gray. These costs only include customer equipment costs for Economic Potential. All other costs provided are in net present value dollars

23. Please refer to witness Cross' Direct testimony, page 5, line 12 through page 6, line 3, and witness Herndon's Direct testimony, page 5, lines 3-5. For all measures combined in the Economic Potential and Achievable Potential for each cost effectiveness test, provide an estimate of the annual lost revenue and basis point impact for the period 2020 through 2029. As part of this response, please complete the table below.

Combined Measures Utility Impact								
	Economic Potential				Achievable Potential			
	RIM		TRC		RIM		TRC	
Year	Lost Revenue	Basis Points	Lost Revenue	Basis Points	Lost Revenue	Basis Points	Lost Revenue	Basis Points
	($)	(-)	($)	(-)	($)	(-)	($)	(-)

Answer:

COMBINED MEASURES UTILITY IMPACT								
	Economic Potential				Achievable Potential			
	RIM		TRC		RIM		TRC	
Year	Annual Lost Revenue $	Basis Points (-)	Annual Lost Revenue $	Basis Points (-)	Annual Lost Revenue $	Basis Points (-)	Annual Lost Revenue $	Basis Points (-)
2020	16,443,293	(23.3)	36,916,407	(52.4)	1,347,696	(1.9)	3,559,889	(5.1)
2021	31,159,032	(44.2)	68,961,431	(97.9)	2,575,816	(3.7)	6,660,876	(9.5)
2022	45,747,051	(65.0)	99,809,634	(141.7)	3,816,434	(5.4)	9,682,412	(13.7)
2023	58,799,871	(83.5)	128,315,224	(182.2)	4,953,598	(7.0)	12,474,296	(17.7)
2024	71,853,061	(102.0)	153,934,840	(218.6)	6,067,683	(8.6)	14,972,551	(21.3)
2025	83,648,873	(118.8)	176,260,398	(250.3)	7,037,470	(10.0)	17,099,165	(24.3)
2026	94,181,102	(133.7)	195,082,058	(277.0)	7,865,412	(11.2)	18,855,527	(26.8)
2027	103,620,829	(147.1)	211,225,712	(299.9)	8,585,233	(12.2)	20,343,319	(28.9)
2028	112,074,056	(159.1)	225,064,990	(319.6)	9,219,333	(13.1)	21,610,767	(30.7)
2029	119,654,539	(169.9)	236,528,901	(335.9)	9,791,591	(13.9)	22,654,404	(32.2)
Notes:	Annual lost revenue represents the annual cumulative impact of GWH savings on base revenues.							
	$1M change in revenue =		1.42	Basis Points on Retail ROE				

24. Please refer to witness Cross' Direct testimony, page 5, line 12 through page 6, line 3, and witness Herndon's Direct testimony, page 5, lines 3-5. For all measures combined in the Economic Potential and Achievable Potential for each cost-effectiveness test, provide an estimate of the annual system net firm summer peak demand, net firm winter peak demand, and net energy for load, along with the system values without additional DSM (but retaining existing DSM and DR), and the amount estimated in the utility's 2019 Ten-Year Site Plan, for the period 2020 through 2029. As part of this response, please complete the tables below.

Net Firm Summer Peak Demand						
Year	No New DSM (MW)	2019 TYSP (MW)	Economic Potential		Achievable Potential	
			RIM (MW)	TRC (MW)	RIM (MW)	TRC (MW)

Net Firm Winter Peak Demand						
Year	No New DSM (MW)	2019 TYSP (MW)	Economic Potential		Achievable Potential	
			RIM (MW)	TRC (MW)	RIM (MW)	TRC (MW)

Net Energy for Load						
Year	No New DSM (GWh)	2019 TYSP (GWh)	Economic Potential		Achievable Potential	
			RIM (GWh)	TRC (GWh)	RIM (GWh)	TRC (GWh)

Answer:
Please see the attached document bearing bates number 20190018-DSM-0039417 through 20190018-DSM-0039419

25.   Please refer to witness Cross' Exhibit No. LC-1. Please explain why residential and non-residential RIM Annual Goals trend down from 2020-2029, identifying any relevant driving factors.

Answer:
The RIM Annual Goals are based on the annual incremental Achievable Potential estimated in Nexant's MPS Report for DEF. Two of the primary contributors to changes in annual incremental potential are the adoption rates applied to each measure to estimate the achievable potential for each year in the study period (2020-2029), and the forecasted unit energy consumption (UEC) and end-use intensity (EUI) for baseline technologies and end-uses.

As described in Section 7.1.2 and Appendix F of Nexant's MPS Report for DEF, the market adoption curves were developed using the Bass diffusion model that estimates how new products are adopted over time. For measures that are currently offered by DEF, which were the majority of measures passing the achievable potential screening, the historical program performance, including the number of years the measure has been offered and the participation trends over time, were used to customize the adoption curves to DEF's territory. This customization typically resulted in the measure starting at a more mature point along the overall adoption curve, with relatively flat or even declining annual adoption trends, as the majority adopters and late adopters participate in the program.

Baseline UECs and EUIs provide annual estimates of energy consumption by technology or end-use. Several end-use categories are experiencing declining values over the study period, indicating an overall decline in the energy consumption of an end-use. This decline is due to factors such as naturally occurring adoption, increasing stringency in codes and standards, and updated technologies. The result of declining UECs and EUIs is a smaller available baseline energy and demand for the application of DSM measures, resulting in a smaller per-measure savings value in future years.

26.   Please refer to witness Cross' Exhibit No. LC-2. Please explain why residential and non-residential TRC Annual Goals trend down from 2020-2029, identifying any relevant driving factors.

Answer:
The TRC Annual Goals are based on the annual incremental Achievable Potential estimated in Nexant's MPS Report for DEF. Two of the primary contributors to changes in annual incremental potential are the adoption rates applied to each measure to estimate the achievable potential for each year in the study period (2020-2029), and the forecasted

unit energy consumption (UEC) and end-use intensity (EUI) for baseline technologies and end-uses.

As described in Section 7.1.2 and Appendix F of Nexant's MPS Report for DEF, the market adoption curves were developed using the Bass diffusion model that estimates how new products are adopted over time. For measures that are currently offered by DEF, which were the majority of measures passing the achievable potential screening, the historical program performance, including the number of years the measure has been offered and the participation trends over time, were used to customize the adoption curves to DEF's territory. This customization typically resulted in the measure starting at a more mature point along the overall adoption curve, with relatively flat or even declining annual adoption trends, as the majority adopters and late adopters participate in the program.

Baseline UECs and EUIs provide annual estimates of energy consumption by technology or end-use. Several end-use categories are experiencing declining values over the study period, indicating an overall decline in the energy consumption of an end-use. This decline is due to factors such as naturally occurring adoption, increasing stringency in codes and standards, and updated technologies. The result of declining UECs and EUIs is a smaller available baseline energy and demand for the application of DSM measures, resulting in a smaller per-measure savings value in future years.

27. Please refer to witness Cross' Direct testimony, page 5, line 12 through page 6, line 3, and witness Herndon's Direct testimony, page 5, lines 3-5. Please refer to the sensitivities conducted on the Company's Economic Potential for each cost-effectiveness test and the base case for the Achievable Potential.

   a.   Would a reasonable method of converting these values from economic potential to achievable potential be to apply the ratio between the base Economic Potential and base Achievable Potential? If not, why not?

   b.   Would a percent modifier be appropriate to apply to the method described in question 27.a. and, if yes, what should that modifier be?

   c.   If the use of a ratio or a modified ratio is not reasonable, what method is most appropriate to determine the achievable potential of the sensitivities conducted on the Economic Potential?

   Answer:
   a. Yes.
   b. No, it would not be necessary to apply a percent modifier.
   c. Please see DEF's response to 27a.

28. Please refer to witness Cross' Exhibit No. LC-6. For each Economic Potential sensitivity, how many unique measures are there that, when compared to the base case Economic

Potentials for each cost-effectiveness test, change from failing to passing, or passing to failing? As part of this response, please complete the table below.

Number of Unique Measures Impacted by Sensitivity				
Sensitivity Name	RIM		TRC	
	Now Passing	Now Failing	Now Passing	Now Failing

Answer:

Number of Unique Measures Impacted by Sensitivity				
Sensitivity Name	RIM		TRC	
	Now Passing	Now Failing	Now Passing	Now Failing
High Fuel	2	1	16	0
Low Fuel	0	0	0	3
1-year payback	2	0	31	0
3-year payback	0	0	0	20
Carbon	0	0	3	0

29. Please refer to witness Cross' Exhibit No. LC-6. Please identify the unique measures, that when compared to the base case Economic Potential for each cost-effectiveness test, change from failing to passing, or passing to failing, for each Economic Potential sensitivity. Include the new cost-effectiveness values for each measure, the estimated demand and energy savings, and identify the reason for failure (if applicable). As part of this response, please complete the tables.

Measures Changing from Failing to Passing							
[Sensitivity Name] Economic Potential – [TRC or RIM]							
Customer Class	Measure Name	TRC	RIM	PCT	Summer (MW)	Winter (MW)	Energy (GWh)

Measures Changing from Passing to Failing							
[Sensitivity Name] Economic Potential – [TRC or RIM]								
Customer Class	Measure Name	TRC	RIM	PCT	Summer (MW)	Winter (MW)	Energy (GWh)	Reason For Failure

Answer:
DEF is gathering information and will provide a Response at a later date.

30.	Please refer to witness Cross' Direct testimony, page 11, lines 1-3.

    a.	Do the dollar values in columns 2-11 of Table 3 and columns 2-11 of Table 4 represent projected annual residential bills?

    b.	What are the projected monthly residential bills that correspond to those projected annual residential bills seen in Tables 3 and 4. Please provide your response in Microsoft Excel format.

Answer:
  a.	Yes.
  b.	Please see the attached document bearing bates number 20190018-DSM-0039420.

31.	Referring to your response to Staff's First Request for Production of Documents, Number 2. Please identify all inputs to the model(s), providing the respective values thereof, and the source of such values.

Answer:

Please see the redacted documents provided in response to SACE's First Request for Production of documents, number 16 and the attached documents bearing numbers 20190018-DSM-0039421through 20190018-DSM-0039422.

32.	Referring to your response to Staff's First Request for Production of Documents, Number 3. Please identify all inputs to the model, providing the respective values thereof, and the source of such values.

Answer:
Nexant's TEA-POT Model inputs include the following:
- Utility Load and Sales Forecast Data. Sources used, which were provided in response to SACE POD 1:
    - DEF 2017 Ten-Year Site Plan
    - Supportive data for DEF 2017 Ten-Year Site Plan
    - DEF customer billing data
- Utility Customer Segmentation Data. Sources used, which were provided in response to SACE POD 1:
    - Sector level details on energy consumption, end-use details, customer industry classification, appliance saturation studies, load shape data, and housing data
- Utility DSM program performance data, which were provided in response to SACE POD 1
- Utility economic data, including avoided cost, lost revenue, and retail rate forecasts. Measure economic screening details and results were provided in response to SACE POD 2.
- Secondary energy consumption data. Sources used were:

- o   Energy Information Administration regional energy use data, which was provided in response to SACE POD 1.
- DSM Measure Data, including peak demand, energy savings, incremental cost, measure life. Measure data files were provided in response to SACE POD 10. Sources used were:
  - o   FEECA utility program data including EM&V reports
  - o   EM&V reports and utility studies from other regional and national DSM programs
  - o   Manufacturer or retailer specifications
  - o   U.S. Department of Energy's Industrial Assessment Center database
  - o   ENERGY STAR calculators
  - o   DSM Technical Reference Manuals
  - o   Online retailer cost data

33.   Referring to your response to Staff's First Request for Production of Documents, Number 4. Please identify all inputs to the model(s), providing the respective values thereof, and the source of such values.

Answer:
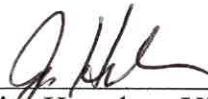Nexant's DR and DSRE models include the following inputs:
- Utility Load and Sales Forecast Data. Sources used, which were provided in response to SACE POD 1 and SACE POD 4:
  - o   DEF 2017 Ten-Year Site Plan
  - o   Supportive data for DEF 2017 Ten-Year Site Plan
  - o   DEF customer billing data
  - o   DEF load research sample interval data
- Utility Customer Segmentation Data. Sources used, which were provided in response to SACE POD 1 and SACE POD 4:
  - o   Sector level details on energy consumption, end-use details, customer industry classification, appliance saturation studies, load shape data
- Utility DSM program performance data, which were provided in response to SACE POD 6.
- Utility economic data, including avoided cost, lost revenue, and retail rate forecasts, which were provided in response to SACE POD 6.
- Secondary energy consumption data. Sources used were:
  - o   Energy Information Administration regional energy use data, which was provided in response to SACE POD 1.
- DSM Measure Data, including peak demand, energy savings, incremental cost (to the customer or the utility), measure life. Measure data files were provided in response to SACE POD 10. Sources used were:
  - o   FEECA utility program data including EM&V reports
  - o   EM&V reports and utility studies from other regional and national DSM programs
  - o   Manufacturer or retailer specifications
  - o   U.S. Department of Energy's Industrial Assessment Center database
  - o   PVWatts calculator
  - o   DSM Technical Reference Manuals

- o Online retailer cost data

DECLARATION

I sponsored the answers to Interrogatory Nos. 4-7, 9, 13(a)-(c), 15-20, 22, 24-26, 32-33 from Staff's First Set of Interrogatories to Duke Energy Florida, LLC in Docket No. 20190018-EG, and the responses are true and correct based on my personal knowledge.

Under penalties of perjury, I declare that I have read the foregoing declaration and the interrogatory answers identified above, and that the facts stated therein are true.

Jim Herndon, Vice President, Strategic & Planning Consulting, Nexant
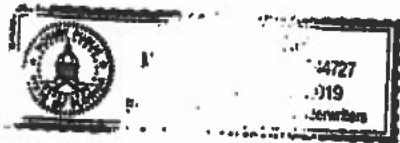
Date: 5/17/19

AFFIDAVIT

STATE OF FLORIDA

COUNTY OF PINELLAS

I hereby certify that on this _____16th_____ day of May, 2019, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared BENJAMIN BORSCH, who is personally known to me, and he acknowledged before me that he provided the answers to interrogatory numbers 11 from STAFF'S FIRST SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC (NOS. 1-33) in Docket No. 20190018-EG, and that the responses are true and correct based on his personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this _____16th_____ day of _____May_____, 2019.

_____
Benjamin Borsch

_____
Notary Public
State of Florida, at Large

My Commission Expires:

June 28, 2019

MONIQUE WEST
MY COMMISSION # FF 244727
EXPIRES: June 28, 2019
Bonded Thru Notary Public Underwriters

AFFIDAVIT

STATE OF FLORIDA

COUNTY OF PINELLAS

I hereby certify that on this _____ day of May, 2019, before me, an officer duly authorized in the State and County aforesaid to take acknowledgments, personally appeared LORI CROSS, who is personally known to me, and she acknowledged before me that she provided the answers to interrogatory numbers 1-3, 8, 10, 12, 14, 21, 23, and 27-31 from STAFF'S FIRST SET OF INTERROGATORIES TO DUKE ENERGY FLORIDA, LLC (NOS. 1-33) in Docket No. 20190018-EG, and that the responses are true and correct based on her personal knowledge.

In Witness Whereof, I have hereunto set my hand and seal in the State and County aforesaid as of this _____ day of _____, 2019.

_____
Lori Cross

_____
Notary Public
State of Florida, at Large

My Commission Expires:

_____