DUKE ENERGY FLORIDA

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April 12, 2019

VIA ELECTRONIC FILING

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

Re: *Commission Review of Numeric Conservation Goals (Duke Energy Florida, LLC)*; Docket 20190018-EG

Dear Mr. Teitzman:

Enclosed please find Duke Energy Florida, LLC's Petition for Approval of Conservation Goals, along with the Direct Testimony and Exhibits LC-1 through LC-7 of Ms. Lori Cross, to be filed in the above-referenced Docket. This filing is in compliance with the Order Establishing Procedure dated February 26, 2019.

Thank you for your assistance in this matter. If you have any questions, please feel free to contact me at (850) 521-1428.

Sincerely,

/s/ Matthew R. Bernier

Matthew R. Bernier

MRB/cmk
Enclosure

cc: J.R. Kelly, Esq.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Commission Review of Numeric Conservation Goals (Duke Energy Florida, LLC).	Docket No. 20190018-EG Filed: April 12, 2019

DUKE ENERGY FLORIDA, LLC'S
PETITION FOR APPROVAL OF CONSERVATION GOALS

Pursuant to Sections 366.81 and 366.82, Florida Statutes, and Rule 25-17.0021, Florida Administrative Code ("F.A.C."), Duke Energy Florida, LLC ("DEF") petitions the Florida Public Service Commission ("Commission") for approval of DEF's proposed conservation goals for the period 2020-2029. In support of this petition, DEF states:

1. The name and address of the affected agency is:

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

2. The name and address of the petitioner is:

   Duke Energy Florida, LLC
   299 First Avenue North
   St. Petersburg, Florida 33701

3. Notices, orders, pleadings and correspondence to be served upon DEF in this proceeding should be directed to:

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4. Pursuant to Section 366.81, Florida Statutes, the Commission requires each utility to develop plans and implement programs for increasing energy efficiency and conservation and demand-side renewable energy systems within its service area, subject to the approval of the Commission. DEF is a public utility within the meaning of Section 366.02(1), Florida Statutes, and is subject to the Commission's jurisdiction under Chapter 366, Florida Statutes. The establishment of DEF's conservation goals will affect the need for and selection of resource alternatives by DEF, and the goals will be the target for DEF to meet in its filing of a demand side management plan; therefore, DEF's substantial interests will be determined in this proceeding.

5. This docket and separate dockets for each of the other six FEECA utilities in Florida were established for the purpose of developing and prescribing numeric conservation or DSM goals for each of the seven Florida FEECA utilities to be applicable during the period 2020-2029. The seven separate dockets were consolidated in Order No. PSC-2019-0062-PCO-EG for the purpose of conducting Staff workshops and for hearing.

6. DEF is not aware of any disputed issues of material fact. DEF's programs, assumptions, and evaluation methodology in the proposed conservation goals are reasonable and are developed based upon the criteria set forth in Rule 25-17.0021, F.A.C. The Commission should approve the DSM goals proposed by DEF for the 2020 through 2029 time period.

7. For this DSM goal-setting proceeding, the FEECA utilities formed a collaborative and worked with an independent company, Nexant, Inc., to develop a comprehensive evaluation

to assess the technical potential for reducing electricity use and peak demand by implementing a wide range of end-use energy efficiency and demand response measures, as well as customer-scale solar photovoltaic and solar thermal installations in the service territories of the seven collaborative utilities. Nexant's Technical Potential Study served as the foundation for estimating economic and achievable potential for each collaborative utility, i.e., the Market Potential Study, as described in the testimony of Mr. Herndon and as shown for DEF in Exhibit No. __ (JH-4). The Technical Potential Study developed by Nexant identified the theoretical limit of electric peak demand and energy reductions in Florida. Mr. Herndon's testimony and exhibits (to the extent they pertain to DEF)[1] are incorporated herein by reference.

8. DEF is simultaneously filing the prepared direct testimony and exhibits of Lori Cross. Ms. Cross' testimony, along with the exhibits contained therein, set forth proposed conservation goals for the ten-year period 2020-2029 and summarize DEF's ten-year projections based upon DEF's most recent planning process of the total, cost-effective, winter and summer peak demand (MW) and annual energy (GWH) savings reasonable achievable in the residential and commercial/industrial classes through demand side management. DEF's goals are delineated in Ms. Cross' direct testimony.

9. Projections of summer and winter demand savings and annual energy savings are identified in Ms. Cross' testimony and presented in Exhibit No. __ (LC-1), also appended to Ms. Cross' testimony filed together with this Petition. DEF's projections reflect consideration of overlapping measures, rebound effects, free riders, interactions with building codes and appliance efficiency standards, and DEF's latest monitoring and evaluation of conservation programs and

[1] Mr. Herndon's exhibits pertaining to DEF and incorporated by reference are: Exhibit No. __ (JH-1); Exhibit No. __ (JH-4); Exhibit No. __ (JH-9); and Exhibit No. __ (JH-10).

measures. The Commission should approve DEF's overall Residential MW and GWH goals and overall Commercial/Industrial MW and GWH goals set forth in this filing. These goals reflect the reasonably achievable demand side management potential in DEF's service territory over the ten-year period 2020-2029 developed in DEF's planning process.

10. DEF is entitled to relief pursuant to Sections 366.81 and 366.82, Florida Statutes and Rule 25-17.0021, F.A.C. DEF's proposed goals reflect the reasonably achievable demand side management potential in DEF's service territory over the ten-year period 2020-2029 developed in DEF's planning process. The Commission should approve the goals set forth in DEF's RIM scenario as set forth in this filing.

WHEREFORE, DEF respectfully requests that the Commission enter an order approving and establishing DEF's proposed numeric conservation goals pursuant to Rule 25-17.0021, F.A.C., as set forth in this filing.

Respectfully submitted,

/s/ Matthew R. Bernier

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished to the following by electronic mail this 12th day of April, 2019, to all parties of record as indicated below.

/s/ Matthew R. Bernier
Attorney

Charles Murphy / Margo DuVal / Andrew King Office of General Counsel Florida Public Service Commission 2540 Shumard Oak Blvd. Tallahassee, FL 32399-0850 cmurphy@psc.state.fl.us mduval@psc.state.fl.us aking@psc.state.fl.us J. R. Kelly / P. Christensen / T. David / A. Fall-Fry Office of Public Counsel c/o The Florida Legislature 111 West Madison St., Rm. 812 Tallahassee, FL 32399 kelly.jr@leg.state.fl.us christensen.patty@leg.state.fl.us david.tad@leg.state.fl.us fall-fry.mireille@leg.state.fl.us	Bradley Marshall / Bonnie Malloy Earthjustice 111 S. Martin Luther King Blvd. Tallahassee, FL 32301 bmarshall@earthjustice.org bmalloy@earthjustice.org George Cavros SACE 120 E. Oakland Park Blvd., Ste. 105 Fort Lauderdale, FL 33334 george@cleanenergy.org Erik Sayler / Joan Matthews / Allan Charles FDACS – Office of General Counsel 407 S. Calhoun St., Ste. 520 Tallahassee, FL 32399-0800 erik.sayler@freshfromflorida.com joan.matthews@freshfromflorida.com allan.charles@freshfromflorida.com

DUKE ENERGY FLORIDA

DOCKET NO. 20190018-EG

DIRECT TESTIMONY OF

LORI CROSS

INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Lori Cross. My business address is 299 First Avenue North, St. Petersburg, Florida 33701.

Q. By whom are you employed and in what capacity?

A. I am employed by Duke Energy Florida, LLC ("Duke Energy Florida," "DEF," or "the Company") as Strategy and Collaboration Director in the Customer Planning and Analytics Department.

Q. Please describe the duties and responsibilities of your position with the Company.

A. My responsibilities include the regulatory planning, support and compliance of the Company's Demand-Side Management ("DSM") programs. This includes support for development, implementation and training, budgeting, and accounting functions related to these programs. By DSM, I mean both

dispatchable (demand response or direct load control) and non-dispatchable (energy efficiency) types of programs.

Q. Please summarize your educational background and professional experience.

A. I have a Bachelor of Science degree in Business from the University of South Florida. I have over thirty (30) years of experience in the electric industry. My experiences include roles in DSM Program Support, Rates, Regulatory Planning, Financial Planning, Accounting, and Treasury.

Q. Have you previously testified before the Florida Public Service Commission?

A. Yes. I have provided testimony to the Florida Public Service Commission ("FPSC" or the "Commission") on behalf of the Company on numerous occasions in support of the Company's DSM programs and Energy Conservation Cost Recovery clause filings.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to present Duke Energy Florida's proposed numerical DSM goals for 2020-2029 for Commission review and approval. DEF's proposed goals are based upon the analysis completed by the Company in accordance with the requirements set forth by Staff in the Order Establishing

Procedure in this docket. Additionally, the goals proposed in this proceeding are supported by the results of a new Technical Potential (TP) study completed by Nexant, Inc.

Q. Are you sponsoring any Exhibits to your testimony?

A. Yes, I have prepared or supervised the preparation of the following exhibits to my direct testimony:

1. Exhibit No. __ (LC-1): Duke Energy Florida's Residential and Non-Residential Annual Potential RIM Evaluation for 2020-2029 at the generator.
2. Exhibit No. __ (LC-2): Duke Energy Florida's Residential and Non-Residential Annual Potential TRC Evaluation for 2020-2029 at the generator.
3. Exhibit No. __ (LC-3): Duke Energy Florida's Avoided Cost Assumptions.
4. Exhibit No. __ (LC-4): Duke Energy Florida's Fuel and Carbon Price Sensitivities.
5. Exhibit No. __ (LC-5): Summary of Achievements of Existing DSM Programs.
6. Exhibit No. __ (LC-6): Measures Included in Economic Potential Based on RIM and TRC Evaluations.
7. Exhibit No. __ (LC-7): Projected RIM and TRC Portfolio Costs and Residential Customer Rate Impacts

Q. Please summarize your testimony.

A. My testimony presents the Company's proposed goals for the 2020-2029 period for Commission review. I describe the process that was used to develop the proposed DSM goals and provide a summary of those results. My testimony includes the estimated average residential customer bill impacts based on both the Rate Impact Measure ("RIM") evaluation and the Total Resource Cost ("TRC") evaluation. I also discuss the current DSM programs and provide an explanation for the differences in the proposed goals and the current goal levels.

Q. What was the process used to determine DEF's proposed goals?

A. DEF, along with the other FEECA utilities, contracted with Nexant, Inc., to develop a new comprehensive Technical Potential ("TP") study of all available demand-side conservation and energy efficiency measures, including renewable energy systems, to support this goals setting process. To maintain modeling consistency, DEF also contracted with Nexant to develop the economic and achievable potential.

The FEECA utilities worked collaboratively with Nexant and interested parties to develop a list of measures and assumptions for potential demand and energy impacts for each of the measures included in the TP. The results of that effort

and a discussion of that process are included in the Market Potential Study Report ("MPS") presented in Exhibit No. __ (JH-4) to Mr. Herndon's testimony. This report includes a summary of the measures eliminated or added compared to the 2014 TP study and discusses changes associated with building codes and standards.

DEF then developed the avoided cost assumptions for the base case (no CO2 pricing) and the high and low fuel sensitivities and carbon sensitivity as requested by Staff. The assumptions that support each of these cases are provided in Exhibit No. __ (LC-3) and Exhibit No.___ (LC-4).

DEF then determined the cost effectiveness of each measure included in the TP study based on both a RIM and TRC evaluation. DEF evaluated the cost effectiveness for the base case, the fuel and carbon sensitivities, and the 1- and 3-year payback sensitivities for free ridership. DEF provided the list of passing measures for the base case and each sensitivity for the both the RIM and TRC scenarios to Nexant for the Economic Potential ("EP") analysis. The list of passing measures for the base case and each sensitivity are provided in Exhibit No. __ (LC-6).

Nexant then developed the EP for the base case and each of the sensitivities utilizing the results of the RIM and TRC scenarios. Nexant then developed the

Achievable Potential ("AP") for the base case for both a RIM and TRC portfolio. A detailed discussion of the process to develop the EP and AP is included in Nexant's MPS report.

DEF reviewed the results of the AP analysis for reasonableness by comparing the results to historical actual achievements and analyzing the potential impacts of changes in savings and incentive levels on future participation for similar measures. Consistent with the methodology used to develop the currently approved goals, DEF's proposed goals are based on the results of the RIM AP.

Q. What are Duke Energy Florida's proposed residential and non-residential DSM goals for the 2020 through 2029 time period?

A. DEF requests the Commission approve the proposed cumulative numeric goals for 2020-2029 presented in Table 1 below. The annual goals that comprise the proposed cumulative goals are provided on Exhibit No. __ (LC-1). This Exhibit also provides a breakdown of the RIM annual goals into the energy efficiency and demand response components that reconcile to the EE achievable potential and DR achievable potential presented in the MPS. These proposed DSM goals have been developed in accordance with the requirements of Commission Rule 25-17.0021(3), Florida Administrative Code, which directs utilities to propose goals "… based upon the utility's most recent

planning process, of the total, cost effective, winter and summer peak demand (KW) and annual energy (KWH) savings reasonably achievable in the residential and commercial/industrial classes through demand-side management." These goals are based on measures that are cost effective based on both the RIM and Participant cost effectiveness tests. The conjunction of these tests captures all of the relevant costs and benefits that should be evaluated when considering an efficiency or load reduction program. RIM ensures that non-participating customers will not subsidize participating customers and reasonably limits overall rate impacts to customers. The Participant test ensures that the energy efficiency measures provide benefits to participants. Goals based on the both the RIM and Participant tests ensure that the benefits and costs are considered from the perspective of participants as well as ratepayers to ensure the rate impact for non-participants is appropriately considered.

Table 1

DUKE ENERGY FLORIDA - PROPOSED RIM GOALS 2020-2029			
	Winter Peak MWs	Summer Peak MWs	GWH's
Residential	78	108	115
Non-Residential	121	135	51
Total	199	243	166

Q. What would the goals for 2020-2029 period be if the goals were based on a TRC evaluation?

A. The residential and non-residential goals based on a TRC evaluation are provided in Table 2 below. The annual goals that comprise the cumulative TRC goals are provided in Exhibit No. __ (LC-2). This Exhibit also provides a breakdown of the RIM annual goals into the energy efficiency and demand response components that reconcile to the EE achievable potential and DR achievable potential presented in the MPS.

Table 2

DUKE ENERGY FLORIDA - PROPOSED TRC GOALS 2020-2029			
	Winter Peak MWs	Summer Peak MWs	GWH's
Residential	89	122	194
Non-Residential	131	172	238
Total	220	294	432

Q. Are the Company's proposed goals based on an adequate assessment of the full technical potential of all available demand-side conservation and efficiency measures, including demand-side renewable energy systems, pursuant to Section 366.82(3), F.S.?

A. Yes, the TP, that is the basis for the proposed goals, includes an evaluation of all potential demand-side conservation and efficiency measures and demand-side renewable energy systems. Demand-side renewable energy systems were evaluated based on the same cost effectiveness standards that were used to evaluate other energy efficiency measures. No renewable measures

were found to be cost-effective and therefore, none are included in the AP results.

Q. Do the proposed goals adequately reflect the costs and benefits to customers participating in the measure, pursuant to Section 366.82(3)(a), F.S.?

A. Yes. The proposed goals are based on measures that pass the Participant Cost Test. This test compares the incremental cost to participants to the participant benefits (bill savings). This ensures that the measures provide net benefits to participants.

Q. Do the proposed goals adequately reflect the costs and benefits to the general body of ratepayers, including utility incentives and participant contributions, pursuant to Section 366.82(3) (b), F. S.

A. Yes, the proposed goals do adequately reflect the costs and benefits to the general body of ratepayers as a whole because the goals are based on measures that pass both the Rate Impact Measure (RIM) and Participant tests. The Participant and RIM tests, in tandem with each other, effectively ensure both participants and non-participants benefit.

Q. What are the projected 2020-2029 annual bill impacts for residential customers assuming usage of 1200 kWh/month for both the RIM achievable and the TRC achievable portfolio?

A. The residential bill impacts for both the RIM achievable and TRC achievable portfolio are presented in Tables 3 and 4 below. These impacts include all of the normal components that comprise a residential bill, namely, base rates, recovery clauses, customer charges, and gross receipts taxes. These costs also include the costs for maintaining the existing level of load management on the system as well as the costs of the residential and commercial energy audits. The results of these analyses show an estimated total cost for a 1200 kWh/month residential bill for the ten year period for the RIM portfolio of $20,622 and $20,656 for the TRC portfolio. This difference is due entirely to the differences in incentives and program management costs for the energy efficiency programs. The assumptions for incentives and program management costs for the demand response programs are the same in both the RIM and TRC analysis. The TRC portfolio costs are 9% higher on average on an annual basis than the RIM portfolio costs. The projected annual RIM and TRC portfolio costs along with the projected energy conservation clause recovery rate for a residential 1200 kwh bill are provided on Exhibit No. ___ (LC-7).

TABLE 3
RIM PORTFOLIO
PROJECTED ANNUAL RESIDENTIAL BILL - MONTHLY USAGE OF 1200 KWH'S

Total	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
$20,622	$1,882	$1,891	$1,941	$1,985	$2,031	$2,078	$2,127	$2,178	$2,227	$2,279

TABLE 4
TRC PORTFOLIO
PROJECTED ANNUAL RESIDENTIAL BILL - MONTHLY USAGE OF 1200 KWH'S

Total	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
$ 20,656	$ 1,887	$ 1,896	$ 1,945	$ 1,990	$ 2,035	$ 2,082	$ 2,130	$ 2,181	$ 2,229	$ 2,281

Q. Please describe how the Base Case for the avoided costs was developed.

A. The Base Case was developed using the same integrated resource planning model and assumptions for customer winter and summer demand, annual energy for load and fuel prices that were the basis for the 2019 Ten Year Site Plan filing with two exceptions. The first exception is that the Base Case assumes no new DSM after 2018 and the second exception is that, in accordance with the directions in the Order Establishing Procedure, the Base Case also excludes any costs for carbon dioxide emissions. This process identified a portfolio of potential units required to meet future capacity requirements. The next combustion turbine unit in the resource plan was identified as the avoided unit for purposes of evaluating the cost effectiveness of potential DSM measures. Please see Exhibit No.___ (LC-3) for a summary of the avoided cost assumptions resulting from this process.

Q. Provide a detailed description of how the sensitivities were developed and compared to the Base Case, including forecasts for fuel prices.

A. The assumptions for projected fuel prices for the high and low fuel sensitivities were based on the NYMEX forward price curves and data published by the U.S. Energy Information Administration ("EIA") in the 2018 Annual Energy Outlook report. DEF used the NYMEX high and low forward price curves for the near term projections. The projected fuel prices for the high and low cases for the out years assumed the same relative spread above and below the base case as between the EIA high and low fuel cases and the EIA base case.

DEF also analyzed the impact of the cost of carbon emissions on the RIM and TRC economic potential. As directed in the Minimum Filing Requirements (Order No. PSC-2019-0062-PCO-EG), DEF worked with Florida Power and Light ("FPL") to develop a consistent assumption for the projected cost of carbon emissions. The carbon cost used in the carbon sensitivity represents the average of DEF's and FPL's projected cost of carbon emissions. DEF's carbon cost used to calculate the average is consistent with the carbon assumption included in DEF's 2019 TYSP.

Q. How are supply-side efficiencies incorporated into DEF's planning process?

A. DEF evaluates supply-side alternatives and develops the optimal plan as an integral part of its Integrated Resource Planning ("IRP") process. DEF employs the IRP process to determine the most cost effective mix of supply and demand-side alternatives that will reliably satisfy customers' future demand and energy needs. DEF's IRP process evaluates a wide range of future generation alternatives and cost effective conservation and dispatchable demand-side management programs on a consistent and integrated basis.

Q. How do supply-side efficiencies impact DEF's DSM Programs?

A. DEF develops projects that will contribute to the overall fleet efficiency and screens these projects in the IRP process. DEF's IRP process includes modeling for both capital optimization as well as detailed modeling of production cost impacts. The selected plans are identified based on the lowest overall life cycle costs including operational efficiencies. The cost of demand-side projects are measured against the avoided supply-side costs in determining program measures that will achieve the most cost effective integrated demand and supply-side portfolio.

Q. Should the Commission establish supply-side efficiency goals in this proceeding?

A. No. DEF continuously identifies and evaluates conservation and efficiency improvement opportunities for generation, transmission, and distribution in its

planning processes (including TYSP and need determinations). Accordingly, there is no need to set goals for such supply-side efficiencies in this proceeding.

Q. Do the proposed goals adequately reflect consideration of free riders?

A. Yes, the proposed goals are based on measures that have greater than a two-year payback period. A two-year payback period is a reasonable time period in which to limit measures and assume that customers will adopt them absent a utility incentive. This time period has been recognized by the Commission in past proceedings as a reasonable proxy to eliminate free riders. Since 1991, a payback of two years or less has been recognized by the Commission as an appropriate threshold to reduce free ridership and maximize cost effectiveness.

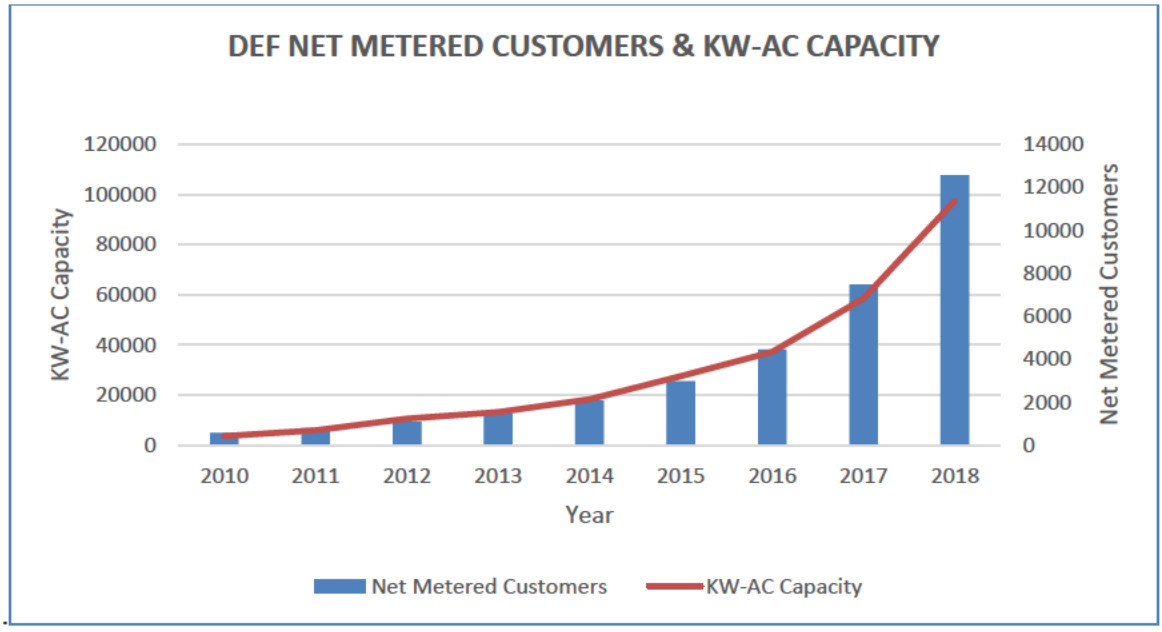
Q. Do DEF's proposed goals adequately reflect the costs imposed by state and federal regulations on the emissions of greenhouse gases?

A. Yes. Given the uncertainty of future carbon regulation, it is reasonable to exclude the cost of carbon emissions in this goals setting process.

Q. Do the Company's proposed goals adequately reflect the need for incentives to promote both customer-owned and utility-owned energy efficiency and demand-side renewable energy systems, pursuant to Section 366.82(3)(c), F.S.?

A. Yes. DEF does not believe there is currently a need for incentives to promote

demand-side renewable energy systems as the demand-side renewable market has continued to mature and there has been significant growth in customer sited demand-side renewable energy systems. Florida currently ranks among the top ten states based on the cumulative amount of solar electric capacity installed. The cost to install solar has dropped significantly in recent years, and with that, DEF is seeing continued growth in the number of customers installing demand-side renewable systems on their own, without incentives from the utility. In 2018, DEF added an average of 400 net metered customers each month. The chart below shows the growth in the number of net metered customers and installed capacity for 2010 through 2018.



Q. What goals, if any, should be established for increasing the development

of demand-side renewable energy systems, pursuant to Section 366.82(2), F.S.?

A. Given that renewable systems were not deemed cost effective under the RIM test, it would not be appropriate to establish goals for demand-side renewable systems in this goals setting proceeding. Demand-side renewable systems were evaluated using the same criteria as were used for other energy efficiency measures. Programs that provide incentives to customers who install renewable systems would result in cross subsidies between participants and non-participants and increase rates to all customers.

Q. Describe the demand-side management programs DEF currently offers to residential customers?

A. DEF's residential programs currently include the home energy audit program, a residential energy efficiency program, and a residential demand response program, and two programs targeted to low income customers. A brief summary of each of these programs is provided below and the actual winter kW, summer kW, and gWh achievements for 2015 through 2018 are provided in Exhibit No. ___ (LC-5):

- **Home Energy Check –** DEF provides walk-through audits, online audits, phone-assisted audits and Home Energy Rating audits to residential customers. DEF performs approximately 30,000 audits each

year. These audits provide the opportunity for DEF to inform customers about energy saving opportunities and encourage customers to install energy saving measures in their homes.

- **Residential Incentive Program -** This program provides incentives to customers who install energy efficient measures that are above the baseline requirements of codes and standards. DEF currently provides incentives for high efficiency heat pumps, duct repair, ceiling insulation, energy efficient windows, and energy star qualifying new homes through this program.

- **Neighborhood Energy Saver Program -** This program is designed to benefit low income customers. DEF targets approximately 4500 residential customer homes annually and directly installs energy efficiency measures and equipment at no cost to the customer. These measures include energy efficient lighting, ceiling insulation, duct repair, HVAC tune-ups, water heater wraps, refrigerator thermometers, wall plate thermometers, HVAC filters, weather stripping, door sweeps, caulking, and foam insulation.

- **Low Income Weatherization Assistance Program –** This program is also designed to benefit low income customers. DEF partners with local

low income weatherization providers and other agencies to provide energy saving measures in homes of qualifying customers. DEF provides incentives for water heater insulation and pipe wrap, faucet aerators, low flow showerheads, HVAC tune-ups, high efficiency heat pumps, duct repair, ceiling insulation, weather stripping, door sweeps, caulking, and foam insulation and energy star refrigerators.

- **Energy Wise** – This is a residential demand response program. This program provides bill credits to residential customers who allow DEF to control their heat pumps, water heaters, and pool pumps in periods of peak demand. Currently approximately 435,000 residential customers participate in this program.

Q. Describe the demand side management programs DEF currently offers to commercial customers.

A. DEF currently offers a commercial audit program, a prescriptive commercial energy efficiency program, a custom energy efficiency program, and demand response programs to commercial customers. A brief summary of each of these programs is provided below and the actual participation rates, winter kW, summer kW, and gWh achievements for 2015 through 2018 are included in Exhibit No. ___ (LC-5).

- **Business Energy Check** – DEF provides energy assessments to commercial customers through this program. DEF analyzes energy usage and provides recommendations on measures that can be implemented to improve energy efficiency of the facilities and operations.

- **Better Business Program** – DEF provides incentives to customers for energy efficiency measures through this program. These measures currently include:
    - Building Envelope Improvements – Cool Roof, Ceiling Insulation, Roof Insulation
    - Heating and Cooling Measures – HVAC Equipment Replacements, Demand Control Ventilation, Duct Test, Duct Repair, Energy Recovery Ventilation, HVAC Coil Cleaning, Roof Top Unit Recommissioning, HVAC Tune-ups

- **Custom Incentive Program** – This program is designed to provide incentives to commercial customers for cost effective energy efficiency measures not covered by the prescriptive measures included in the Better Business Program. DEF works directly with customers to evaluate the potential savings and cost effectiveness of energy efficiency improvements. Projects that are cost effective based on the RIM cost effectiveness evaluation are eligible for incentives.

- **Stand-by Generation** – This is a demand response program. DEF provides bill credits to customers who allow DEF to control their on-site generation facilities in periods of peak demand. The stand-by generation capacity must be at least 50 kW to qualify for this program.

- **Interruptible Program** – This is a demand response program. DEF provides bill credits to customers who allow them to interrupt their service during periods of peak demand.

- **Curtailable Program** – This is a demand response program. Customers receive bill credits for agreeing to curtail their load during periods of peak demand.

Q. Has DEF made any modifications to these programs since the last goals setting proceeding?

A. Yes. DEF reviews its processes and procedures and looks for opportunities to improve customer satisfaction and cost effectiveness of its programs on an ongoing basis. DEF has made a number of changes since the last goals setting proceeding to encourage participation, provide additional savings to customers, and ensure alignment with building codes and standards. These

changes include modifications to its low income programs, commercial custom program, and commercial energy efficiency program.

Specifically, beginning in 2016, DEF increased the targeted participation for its Neighborhood Energy Saver low income program from 3,000 to 4,500 homes annually and added measures for duct repair, ceiling insulation, heat pumps tune-ups, and home energy reports. Then in 2018, DEF further modified the program to begin providing LED lightbulbs instead of CFL's and increased the number of lightbulbs provided to customers. These changes significantly increased the savings opportunity for low income customers at no cost to program participants.

Additionally, DEF made modifications to the commercial custom incentive program to streamline the application process and encourage participation. DEF modified the customer application and approval process by providing information to customers through its external website about the types of projects that typically qualify for incentives and streamlined the application process by allowing customers to submit applications online. DEF also changed the program standards to align the eligibility requirements with the prescriptive commercial incentive program. These changes have resulted in an increase in program applications and incentives to customers.

DEF also made several changes to its commercial energy efficiency program to ensure that the eligibility requirements and reported impacts aligned with building codes and standards.

Q. Describe how DEF informs customers about low-cost and no-cost energy efficiency measures that will provide bill savings?

A. DEF informs customers about low cost and no cost energy efficiency measures in a number of ways, including through residential and commercial energy audits, community meetings, home shows, bill stuffers, emails, direct mail, home energy reports, and through its website.

DEF provides information to customers about low cost and no cost measures during the residential and commercial audits. These audits provide opportunities to help customers understand their specific energy usage, inform customers about programs and rebates that are available for energy efficiency measures, and educate customers about behavioral changes and low cost and no cost measures that will provide energy savings. DEF tracks customer satisfaction for its home energy audit program and these results show that in 2018 97% of customers surveyed ranked the home energy audit program between an 8 and 10, on a scale of 1 to 10.

DEF also provides educational material about energy savings and low cost and no cost measures to customers through both of its low income programs. DEF actually installs several low cost measures in customer homes through the Neighborhood Energy Saver (NES) program. DEF invites all of the customers who live in the targeted low income neighborhoods to a community kick-off event to explain the benefits of the NES program and to share information about low cost and no cost steps the customers can take to reduce their energy usage. DEF also provides Home Energy Reports to these customers. These reports provide customers with information about their own specific energy usage and compares their use to peer homes that are similar in size, age, and geography. The reports provide recommendations and tips about low cost and no cost measures and behavioral changes that will provide bill savings and seasonal reminders about how to save energy.

DEF also provides educational material about energy efficiency and low cost measures and behavioral changes that will provide bill savings to customers through the agencies that it partners with for the Low Income Weatherization Assistance Program.

Q. How do the proposed residential goals for the 2020-2029 period compare to the goals established in the previous goals setting proceeding?

A. Although the proposed RIM GWH goal for the residential sector for 2020-2029 is relatively close to the goal established in the previous goals setting period, the proposed winter and summer RIM MW goals for the residential sector are significantly lower than the goals established in the previous goals setting proceeding. The decrease in the MW goals is primarily due to a decrease in projected achievements for the residential demand response program. The residential demand response program was implemented in 1981 and currently approximately 435,000 residential customers, representing 27% of DEF's total residential customers, already participate in the program. Despite significant marketing efforts over the past few years, DEF has not been able to achieve the level of participation anticipated in the last goals setting proceeding. DEF believes this is primarily due to market saturation issues. Nexant factored the impact of the existing level of residential demand response into their determination of the achievable potential for the 2020-2029 period which resulted in reduced goals. Based on actual recent experience, DEF believes that this adjustment is appropriate and that the proposed residential demand response goals for the 2020-2029 period represent a reasonable assessment of the achievable potential.

Q. How do the proposed commercial goals for the 2020-2029 period compare to the goals established in the previous goals setting proceeding?

The summer and winter MW goals are higher than the goals established in the last goals setting proceeding, however the GWH goal is actually lower than the goal from the previous proceeding. This is due to a combination of factors. The increase in summer and winter MW goals is primarily due to an increase in the achievable potential for the commercial demand response programs. The decrease in the GWH goal is primarily due to the fact that the next avoided unit is farther out in the future than during the last proceeding which has influenced the cost effectiveness of commercial measures causing a change in the mix of measures included in the RIM portfolio.

Q. How are the measures included in the proposed RIM goals expected to impact program offerings to customers?

A. The demand and energy efficiency savings included in the RIM goals are primarily comprised of measures that reduce heating and cooling load which is reasonable as the TP for heating and cooling end uses makes up 59% of the total TP for residential and 35% of the total TP for commercial. Programs that target heating and cooling end uses can reduce peak demand requirements while providing significant bill savings for customers. Similar to the programs currently offered to residential and commercial customers today, DEF expects to continue to offer programs that impact heating and cooling such as, high efficiency heating and cooling, insulation, duct repair, and efficient windows.

The details of the exact measures and the appropriate level of incentive are yet to be determined and will be addressed in the program design phase.

DEF also plans to continue to support the low income programs. Here, again, the exact program offerings are yet to be determined. DEF will consider overall program costs and value to customers as we work this process.

DEF also plans to continue to provide opportunities for residential and commercial customers to participate in load management programs. These programs provide bill credits to customers who allow DEF to shut off or curtail a portion of their load during peak times. These programs provide savings as they can defer the need for additional generating resources.

CONCLUSION

Q. What is the proposed DSM goal that is reasonably achievable during the 2020-2029 period?

DUKE ENERGY FLORIDA - PROPOSED RIM GOALS 2020-2029			
	Winter Peak MWs	Summer Peak MWs	GWH's
Residential	78	108	115
Non-Residential	121	135	51
Total	199	243	166

Q. Have these goals been determined through a sound and reasonable process?

A. Yes. These goals were determined after a comprehensive analysis of the technical potential of all available demand-side and supply-side conservation and efficiency measures, including demand-side renewable energy systems, pursuant to Section 366.82.

Q. Do the Company's proposed goals adequately reflect the costs and benefits to customers participating in the measure, pursuant to Section 366.82(3)(a), F.S.?

A. Yes. These goals are based on measures that are cost effective under the Participants test. This test considers the costs and benefits to customers participating in the measure.

Q. Do the Company's proposed goals adequately reflect the costs and benefits to the general body of ratepayers, including utility incentives and participant contributions, pursuant to Section 366.82(3)(b), F. S.?

A. Yes. The proposed goals appropriately consider the effects of free ridership and are based on measures that are cost effective under the RIM test. Application of the RIM test ensures that the measures provide benefits to the

general body of ratepayers, to ensure the rate impact of non-participating customers is appropriately considered.

Q. Should Duke Energy Florida's proposed goals for 2020-2019 be approved?

A. Yes. Duke Energy Florida's proposed goals meet the requirements of both the rules and the statute, are cost effective, and are reasonably achievable.

Q. Does this conclude your testimony?

A. Yes, this concludes my testimony.

Exhibit No. __ (LC-1) DUKE ENERGY FLORIDA'S RESIDENTIAL AND NON-RESIDENTIAL ANNUAL POTENTIAL RIM EVALUATION FOR 2020-2029 (at the Generator)

2020-2029 Annual Goals RIM Annual Goals (values at the generator)									
	Residential			Non-Residential			Total		
	WMW	SMW	GWH'S	WMW	SMW	GWH'S	WMW	SMW	GWH'S
2020	10	14	17	14	16	8	24	30	25
2021	9	13	15	13	13	8	22	26	23
2022	8	12	14	11	11	8	19	23	22
2023	8	11	12	12	12	8	20	23	20
2024	8	11	12	13	14	7	21	25	19
2025	8	10	11	13	14	5	21	24	16
2026	7	10	10	11	13	3	18	23	13
2027	7	9	9	11	13	2	18	22	11
2028	7	9	8	12	14	1	19	23	9
2029	6	9	7	11	15	1	17	24	8
TOTAL	78	108	115	121	135	51	199	243	166

RIM ANNUAL GOALS EE AND DR																		
	RES EE			RES DR			RES TOTAL			NON-RES EE			NON-RES DR			NON-RES TOTAL		
	WMW	SMW	GWH'S	WMW	SMW	GWH'S	WMW	SMW	GWH'S	WMW	SMW	GWH'S	WMW	SMW	GWH'S	WMW	SMW	GWH'S
2020	6	10	17	4	4	0	10	14	17	2	4	7	12	12	0	14	16	7
2021	5	9	15	4	4	0	9	13	15	3	4	8	10	10	0	13	13	8
2022	5	8	14	4	4	0	8	12	14	4	3	8	8	9	0	11	11	8
2023	4	7	12	4	4	0	8	11	12	4	2	8	8	10	0	12	12	8
2024	4	7	12	4	4	0	8	11	12	3	2	7	10	12	0	13	14	7
2025	4	6	11	4	4	0	8	10	11	2	1	5	11	14	0	13	14	5
2026	3	6	10	4	4	0	7	10	10	1	0	3	10	13	0	11	13	3
2027	3	5	9	4	4	0	7	9	9	0	0	2	11	13	0	11	13	2
2028	3	5	8	4	4	0	7	9	8	1	0	1	11	14	0	12	14	1
2029	3	4	7	4	4	0	6	8	7	0	0	1	11	14	0	11	14	1
TOTAL	**39**	**66**	**115**	**39**	**42**	**0**	**78**	**108**	**115**	**20**	**16**	**51**	**101**	**119**	**0**	**121**	**135**	**51**

Note 1 Totals tie to Nexant Report Table 1-3: EE R M Achievable Poten ial and Table 1-6 DR Achievable Potential

Exhibit No. __ (LC-2) DUKE ENERGY FLORIDA'S RESIDENTIAL AND NON-RESIDENTIAL ANNUAL POTENTIAL TRC EVALUATION FOR 2020-2029 (at the Generator)

2020-2029 Annual Goals									
TRC Annual Goals (values at the generator)									
	Residential			Non-Residential			Total		
	WMW	SMW	GWH'S	WMW	SMW	GWH'S	WMW	SMW	GWH'S
2020	12	16	33	16	22	39	28	38	72
2021	10	14	27	14	19	37	24	33	64
2022	10	13	24	13	17	37	23	30	61
2023	9	13	21	14	17	34	23	30	55
2024	9	12	19	14	18	29	23	30	48
2025	9	12	18	14	18	22	23	30	40
2026	8	12	16	12	16	15	20	28	31
2027	8	11	14	11	15	11	19	26	25
2028	7	10	12	12	15	8	19	25	20
2029	7	9	10	11	15	6	18	24	16
TOTAL	89	122	194	131	172	238	220	294	432

TRC ANNUAL GOALS EE AND DR																		
	RES EE			RES DR			RES TOTAL			NON-RES EE			NON-RES DR			NON-RES TOTAL		
	WMW	SMW	GWH'S	WMW	SMW	GWH'S	WMW	SMW	GWH'S	WMW	SMW	GWH'S	WMW	SMW	GWH'S	WKW	SKW	GWH'S
2020	8	11	33	4	4	0	12	16	33	4	10	39	12	12	0	16	22	39
2021	7	10	27	4	4	0	10	14	27	5	10	37	10	10	0	14	19	37
2022	6	9	24	4	4	0	10	13	24	5	9	37	8	9	0	13	17	37
2023	5	9	21	4	4	0	9	13	21	5	7	34	8	10	0	14	17	34
2024	5	8	19	4	4	0	9	12	19	4	6	29	10	12	0	14	18	29
2025	5	8	18	4	4	0	9	12	18	3	4	22	11	14	0	14	18	22
2026	4	7	16	4	4	0	8	12	16	2	3	15	10	13	0	12	16	15
2027	4	7	14	4	4	0	8	11	14	1	2	11	11	13	0	11	15	11
2028	4	6	12	4	4	0	7	10	12	1	1	8	11	14	0	12	15	8
2029	3	5	10	4	4	0	7	9	10	0	1	6	11	14	0	11	15	6
TOTAL	**50**	**81**	**194**	**39**	**42**	**0**	**89**	**122**	**194**	**30**	**53**	**238**	**101**	**119**	**0**	**131**	**172**	**238**

Note 1 Totals tie to Nexant Report Table 1-3: EE R M Achievable Poten ial and Table 1-6 DR Achievable Potential

Exhibit No. __ (LC-3)
DUKE ENERGY FLORIDA'S
AVOIDED GENERATION ASSUMPTIONS

GT Brownfield- SIMPLE CYCLE COMBUSTION TURBINE		**units 1 - 5**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2027
(3) Winter Capacity	MW	233.30
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	549.40
(5) Generator Cost Escalation Rate		1.27%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	80.79
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	0.87
(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		1% winter 9% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	5.02
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

CC2X1 J Greenfield Combined Cycle - COMBINED CYCLE		**unit 6**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2029
(3) Winter Capacity	MW	1,366.00
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	909.70
(5) Generator Cost Escalation Rate		1.47%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	84.39
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	0.58
(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		74% winter 87% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	3.61
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

GT Brownfield- SIMPLE CYCLE COMBUSTION TURBINE		**unit 7**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2032
(3) Winter Capacity	MW	233.30

(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	549.40
(5) Generator Cost Escalation Rate		1.27%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	91.41
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	0.99
(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		1% winter 9% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	7.18
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

GT Avg- SIMPLE CYCLE COMBUSTION TURBINE		**unit 8**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2033
(3) Winter Capacity	MW	233.30
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	619.14
(5) Generator Cost Escalation Rate		1.27%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	96.13
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	1.01
(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		1% winter 9% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	7.54
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

GT Avg- SIMPLE CYCLE COMBUSTION TURBINE		**units 9 and 10**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2034
(3) Winter Capacity	MW	233.30
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	619.14
(5) Generator Cost Escalation Rate		1.27%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	98.53
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	1.04
(9) Generator Variable O&M Cost Escalation Rate		2.50%

(10) Generator Capacity Factor		1% winter 9% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	7.79
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

CC2X1 J Greenfield Combined Cycle - COMBINED CYCLE		**unit 11**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2035
(3) Winter Capacity	MW	1,366.00
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	909.70
(5) Generator Cost Escalation Rate		1.47%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	97.86
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	0.67
(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		74% winter 87% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	4.51
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

GT Avg- SIMPLE CYCLE COMBUSTION TURBINE		**units 12 and 13**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2035
(3) Winter Capacity	MW	233.30
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	619.14
(5) Generator Cost Escalation Rate		1.27%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	101.00
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	1.06
(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		1% winter 9% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	7.40
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

GT Avg- SIMPLE CYCLE COMBUSTION TURBINE		**unit 14**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2037

(3) Winter Capacity	MW	233.30
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	619.14
(5) Generator Cost Escalation Rate		1.27%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	106.11
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	1.12
(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		1% winter 9% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	7.86
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

GT Avg- SIMPLE CYCLE COMBUSTION TURBINE		**units 15 and 16**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2038
(3) Winter Capacity	MW	233.30
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	619.14
(5) Generator Cost Escalation Rate		1.27%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	108.76
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	1.14
(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		1% winter 9% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	8.47
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

GT Avg- SIMPLE CYCLE COMBUSTION TURBINE		**unit 17**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2040
(3) Winter Capacity	MW	233.30
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	619.14
(5) Generator Cost Escalation Rate		1.27%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	114.27
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	1.20

(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		1% winter 9% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	9.32
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

GT Avg- SIMPLE CYCLE COMBUSTION TURBINE		**unit 18**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2041
(3) Winter Capacity	MW	233.30
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	619.14
(5) Generator Cost Escalation Rate		1.27%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	117.13
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	1.23
(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		1% winter 9% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	9.55
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

GT Avg- SIMPLE CYCLE COMBUSTION TURBINE		**unit 19**
(1) Base Year		2019
(2) In Service Year for Avoided Generation Unit		1-Jun-2043
(3) Winter Capacity	MW	233.30
(4) Base Year Avoided Generating Unit Cost (including transmission upgrade cost)	$/KW	619.14
(5) Generator Cost Escalation Rate		1.27%
(6) Generator Fixed O&M Cost (including non-escalating gas pipeline reservation cost)	$/kw-year	123.06
(7) Generator Fixed O&M Cost Escalation Rate		2.50%
(8) Avoided Gen Unit Variable O&M Cost	¢/Kwh	1.30
(9) Generator Variable O&M Cost Escalation Rate		2.50%
(10) Generator Capacity Factor		1% winter 9% summer
(11) Avoided Generating Unit Fuel Cost	¢/Kwh	10.03
(12) Avoided Generating Unit Fuel Escalation Rate		4.65%

Note: all the fixed cost, variable and fuel costs are nominal dollar value in the first year when unit is in service

Exhibit No. __ (LC-4)
DUKE ENERGY FLORIDA'S
FUEL AND CARBON PRICE SENSITIVITIES

Fuel and CO2 Price Forecasts

Fuel Base Price Forecast (2019 TYSP)				Fuel High Price Forecast (2019 TYSP)				Fuel Low Price Forecast (2019 TYSP)				CO2 Price Forecast	
Year	Natural Gas Base Cost Regular Supply Z3	CRN Coal	Distillate Oil	Year	Natural Gas Base Cost Regular Supply Z3	CRN Coal	Distillate Oil	Year	Natural Gas Base Cost Regular Supply Z3	CRN Coal	Distillate Oil	Year	DEF-FPL Average CO2 Price
	$/MMBTU				$/MMBTU				$/MMBTU				$/Ton
2019	2.91	2.44	15.79	2019	2.91	2.44	15.79	2019	2.91	2.44	15.79	2019	-
2020	2.72	2.45	15.89	2020	2.72	2.45	15.89	2020	2.72	2.45	15.89	2020	-
2021	2.65	2.51	16.17	2021	2.82	2 51	16.17	2021	2.65	2.51	16.17	2021	-
2022	2.65	2.57	16.31	2022	3.52	2 57	16.31	2022	2.65	2.57	16.31	2022	-
2023	2.70	2.59	15.72	2023	4.74	2 59	15.72	2023	2.70	2.59	15.72	2023	-
2024	2.99	2.76	15.26	2024	5.89	2.76	15.26	2024	2.85	2.76	15.26	2024	-
2025	3.44	2.86	14.93	2025	6.42	2 88	14.93	2025	3.09	2.86	14.93	2025	2.50
2026	3.95	2.97	15.02	2026	6.84	2 99	15.02	2026	3.40	2.95	15.02	2026	4.26
2027	4.34	3.09	15.37	2027	6.88	3.12	15.37	2027	3.61	3.07	15.37	2027	5.92
2028	4.65	3.13	15.79	2028	6.89	3.14	15.79	2028	3.76	3.06	15.79	2028	7.88
2029	5.12	3.17	16.49	2029	7.42	3 20	16.49	2029	4.03	3.11	16.49	2029	9.60
2030	5.68	3.25	17.00	2030	8.17	3 28	17.00	2030	4.43	3.17	17.00	2030	11.66
2031	5.91	3.66	17.32	2031	8.50	3.70	17.32	2031	4.60	3.58	17.32	2031	13.63
2032	6.21	3.76	17.64	2032	8.97	3 80	17.64	2032	4.78	3.66	17.64	2032	15.64
2033	6.53	3.86	17.98	2033	9.47	3 90	17.98	2033	4.95	3.75	17.98	2033	17.72
2034	6.74	3.95	18.34	2034	9.94	4 01	18.34	2034	5.05	3.84	18.34	2034	19.86
2035	6.41	3.98	18.68	2035	9.58	4 03	18.68	2035	4.78	3.85	18.68	2035	22.08
2036	6.44	4.06	19.15	2036	9.65	4.12	19.15	2036	4.71	3.92	19.15	2036	24.07
2037	6.81	4.14	19.63	2037	10.26	4 21	19.63	2037	4.92	3.99	19.63	2037	26.12
2038	7.33	4.25	20.12	2038	11.04	4 31	20.12	2038	5.24	4.08	20.12	2038	28.22
2039	7.83	4.36	20.62	2039	11.75	4.42	20.62	2039	5.59	4.16	20.62	2039	30.39
2040	8.07	4.47	21.14	2040	12.16	4 55	21.14	2040	5.73	4.28	21.14	2040	32.62
2041	8.27	4.59	21.67	2041	12.46	4.67	21.67	2041	5.88	4.38	21.67	2041	34.99
2042	8.48	4.70	22.21	2042	12.77	4.78	22.21	2042	6.02	4.49	22.21	2042	37.47
2043	8.69	4.82	22.76	2043	13.09	4 90	22.76	2043	6.17	4.60	22.76	2043	40.06
2044	8.91	4.94	23.33	2044	13.42	5 03	23.33	2044	6.33	4.72	23.33	2044	42.80
2045	9.13	5.06	23.92	2045	13.75	5.15	23.92	2045	6.49	4.84	23.92	2045	45.68
2046	9.36	5.19	24.52	2046	14.10	5 28	24.52	2046	6.65	4.96	24.52	2046	48.74
2047	9.59	5.32	25.13	2047	14.45	5.41	25.13	2047	6.81	5.08	25.13	2047	51.99
2048	9.83	5.45	25.76	2048	14.81	5 55	25.76	2048	6.98	5.21	25.76	2048	55.45
2049	10.08	5.59	26.40	2049	15.18	5.69	26.40	2049	7.16	5.34	26.40	2049	59.16
2050	10.33	5.73	27.06	2050	15.56	5 83	27.06	2050	7.34	5.47	27.06	2050	63.15

Exhibit No. __ (LC-5) DUKE ENERGY FLORIDA'S SUMMARY OF HISTORICAL ACHIEVEMENTS

Residential Programs – Actual Achievements 2015 - 2018

		2015				2016				2017				2018				TOTAL			
	PROGRAM	Measures	WMW	SMW	GWH	Measures	WMW	SMW	GWH	Measures	WMW	SMW	GWH	Measures	WMW	SMW	GWH	Measures	WMW	SMW	GWH
A	Home Energy Check	30,901	2	3	5	32,172	9	6	23	37,059	10	7	24	34,900	9	6	22	135,032	31	22	74
B	Residential Incentive Program	53,179	26	15	25	33,128	19	10	16	26,190	16	8	12	26,201	16	8	12	138,698	77	41	64
C	Neighborhood Energy Saver	3,420	1	1	4	19,786	4	3	8	21,171	6	4	10	20,906	5	4	9	65,283	16	12	32
D	Low Income Weatherization	337	0	0	0	392	1	0	1	320	0	0	0	204	0	0	0	1,253	2	1	2
E	Residential Demand Response	5,025	11	6	0	8,634	18	9	-	9,561	21	11	-	6,426	14	7	-	29,646	65	34	0
F	Other	374	1	1	4		1	1										374	2	2	4
	Total Residential	**92,862**	**42**	**25**	**39**	**94,112**	**52**	**30**	**47**	**94,301**	**54**	**31**	**46**	**88,637**	**45**	**26**	**43**	**369,912**	**193**	**112**	**176**

A	Home Energy Check - walk-through, online, and phone assisted audits for residential customers. Energy efficiency kits are provided to participants which include items like energy efficient light bulbs, low flow showerheads, faucet aerators, and weather stripping
B	Residential Incentive Program - provides incentives to customers for energy efficient HVAC measures, duct repair, ceiling insulation, and energy efficient windows.
C	Neighborhood Energy Saver - direct installation of energy efficient measures in homes of income qualified customers at no cost to customer. Measures include energy efficient light bulbs, low flow showerheads, AC Filters, Ceiling Insulation, Weatherstripping, Faucet Aerators, Foam Insulation, Caulking, Pipe Wrap, Refrigerator Thermometers, Switch Plate Thermometers, Water Heater Blankets, Duct Repair, HVAC Tune-up, and Home Energy Reports
D	Low Income Weatherization Program - DEF partners with weatherization agencies and other organizations to provide funding for energy efficiency measures for income eligible customers. These measures include ceiling insulation, duct repair, light bulbs, faucet aerators, refrigerator replacement, HVAC Tune-up, infiltration reduction, low flow showerheads, water heater blankets.
E	Residential Demand Response - provides monthly bill credits to customers who allow DEF to shut off heating and cooling, water heaters, and pool pumps in periods of peak demand.
F	Primarily solar pilot programs that ended after 2015.

Commercial Programs – Actual Achievements 2015 – 2018

		2015				2016				2017				2018				TOTAL			
	PROGRAM	Measures	WMW	SMW	GWH	Measures	WMW	SMW	GWH	Measures	WMW	SMW	GWH	Measures	WMW	SMW	GWH	Measures	WMW	SMW	GWH
A	Business Energy Check	1,486	0	0	0	699	0	0	1	640.0	0	0	1	668	0	0	1	3,493	0	1	2
B	Better Business	1,030	4	11	34	760	3	16	27	635.0	2	29	34	550	2	18	27	2,975	11	75	121
C	Custom Incentive	7	0	0	0	4	0	0	0	4.0	0	0	1	29	2	4	12	44	2	5	13
D	Stand-By Generation	25	21	21	0	147	68	68	-	28.0	16	16	-	12	3	3	-	212	108	108	0
E	Interruptible	2	3	3	0	1	1	1	-	3.0	7	7	-	42	36	34	-	48	46	45	0
F	Curtailable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G	Other	29	1	0	2													29	1	0	2
	Total Commercial	**2,579**	**29**	**35**	**36**	**1,611**	**72**	**85**	**27**	**1,310**	**25**	**53**	**35**	**1,301**	**43**	**60**	**39**	**6,801**	**169**	**233**	**138**

A	Business Energy Check - Commercial walk through audits; customers receive energy efficiency kits which contain faucet aerators and light bulbs.
B	Better Business - Commercial energy efficiency program; provides incentives to customers for Chillers, HVAC Systems, Heat Pumps, Cool Roof, Ceiling and Roof Insulation, DX Systems, HVAC Tune-ups, Duct Test and Duct Repair.
C	Custom Incentive - Provides incentives for energy efficiency measures that are cost effective under RIM but are not included in prescriptive Better Business program.
D	Stand-by Generation - Provides monthly bill credits to customers with back up generation that allow service to be interrupted in periods of peak demand
E	Interruptible - Provides monthly bill credits customers who allow service to be interrupted in periods of peak demand
F	Curtailable - Provides monthly bill credits to customers who agree to curtail usage in periods of peak demand
G	Other - Primarily solar pilot programs that ended after 2015

Exhibit No. __ (LC-6) DUKE ENERGY FLORIDA'S
Measures Included in Economic Potential Based on RIM and TRC Evaluations

BASE CASE RESIDENTIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
14 SEER ASHP from base electric resistance heating	High Efficiency Induction Cooktop
15 SEER Air Source Heat Pump	14 SEER ASHP from base electric resistance heating
15 SEER Central AC	15 SEER Air Source Heat Pump
16 SEER Central AC	15 SEER Central AC
Air Sealing-Infiltration Control	16 SEER Central AC
Ceiling Insulation(R12 to R38)	CFL-13W
Ceiling Insulation(R19 to R38)	LED - 9W Flood
Ceiling Insulation(R2 to R38)	LED Specialty Lamps-5W Chandelier
Duct Repair	Two Speed Pool Pump
Energy Star Windows	Variable Speed Pool Pump
Home Energy Management System	Thermostatic Shower Restriction Valve
Spray Foam Insulation(Base R2)	Air Sealing-Infiltration Control
Wall Insulation	Ceiling Insulation(R12 to R38)
	Ceiling Insulation(R19 to R38)
	Ceiling Insulation(R2 to R38)
	Duct Repair
	Energy Star Windows
	Home Energy Management System
	Spray Foam Insulation(Base R2)
	Wall Insulation

BASE CASE COMMERCIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
High Efficiency Chiller (Water cooled-centrifugal,	Efficient Exhaust Hood
High Efficiency Chiller (Water cooled-positive dis	Energy Star Hot Food Holding Cabinet
High Efficiency DX 135k- less than 240k BTU	Heat Pump Water Heater
High Efficiency PTAC	Solar Water Heater
High Efficiency PTHP	High Efficiency Chiller (Air Cooled, 50 tons)
Efficient Battery Charger	High Efficiency Chiller (Water cooled-centrifugal,
Ceiling Insulation(R2 to R38)	High Efficiency Chiller (Water cooled-positive dis
Duct Sealing Repair	High Efficiency DX 135k- less than 240k BTU
Low U-Value Windows	High Efficiency PTAC
Programmable Thermostat	High Efficiency PTHP
Smart Thermostat	Variable Refrigerant Flow (VRF) HVAC Systems
Thermal Energy Storage	High Bay Fluorescent (T5)
Wall Insulation	High Bay LED
Demand Controlled Ventilation	Premium T8 - Fixture Replacement
	Efficient Battery Charger
	Solar Pool Heater
	Variable Speed Pool Pump
	Energy Star Uninterruptable Power Supply
	Energy Star Commercial Solid Door Refrigerator
	Ceiling Insulation(R2 to R38)
	Chilled Water System - Variable Speed Drives
	Dedicated Outdoor Air System on VRF unit
	Duct Sealing Repair
	ECM Motors on Furnaces
	Facility Commissioning
	Facility Energy Management System
	HVAC tune-up
	HVAC tune-up_RTU
	Low U-Value Windows
	Programmable Thermostat
	Smart Thermostat
	Thermal Energy Storage
	Wall Insulation
	Water Cooled Refrigeration Heat Recovery
	VSD Controlled Compressor
	PSC to ECM Evaporator Fan Motor (Reach-In)
	PSC to ECM Evaporator Fan Motor (Walk-In, Refriger
	Demand Controlled Ventilation
	Retro-Commissioning

BASE CASE INDUSTRIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
No Measures passed RIM	Process Refrig Controls Pump Equipment Upgrade Fan Equipment Upgrades Efficient Lighting - Other Interior Lighting Efficient Lighting - High Bay Compressed Air Controls Compressed Air Equipment Process Heat Improved Controls Process Heat Equipment Upgrade Motor Equipment Upgrades Process Refrig Equipment Upgrade HVAC Recommissioning Pump System Optimization HVAC Equipment Upgrades Motor Optimization Building Envelope Improvements

HIGH FUEL RESIDENTIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
14 SEER ASHP from base electric resistan	High Efficiency Induction Cooktop
15 SEER Air Source Heat Pump	Heat Pump Water Heater
15 SEER Central AC	14 SEER ASHP from base electric resistan
16 SEER Central AC	15 SEER Air Source Heat Pump
Air Sealing-Infiltration Control	15 SEER Central AC
Ceiling Insulation(R12 to R38)	16 SEER Central AC
Ceiling Insulation(R19 to R38)	CFL-13W
Ceiling Insulation(R2 to R38)	LED - 9W Flood
Duct Repair	LED Specialty Lamps-5W Chandelier
Energy Star Door	Solar Pool Heater
Energy Star Windows	Two Speed Pool Pump
Home Energy Management System	Variable Speed Pool Pump
Radiant Barrier	Thermostatic Shower Restriction Valve
Spray Foam Insulation(Base R2)	Air Sealing-Infiltration Control
Wall Insulation	Ceiling Insulation(R12 to R38)
	Ceiling Insulation(R19 to R38)
	Ceiling Insulation(R2 to R38)
	Duct Repair
	Energy Star Door
	Energy Star Windows
	Home Energy Management System
	Programmable Thermostat
	Radiant Barrier
	Spray Foam Insulation(Base R2)
	Wall Insulation

HIGH FUEL COMMERCIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
High Efficiency Chiller (Water cooled-centrifugal, 200 tons)	Efficient Exhaust Hood
High Efficiency Chiller (Water cooled-positive displacement, 100 tons)	Energy Star Hot Food Holding Cabinet
High Efficiency DX 135k- less than 240k BTU	Heat Pump Water Heater
High Efficiency PTAC	Solar Water Heater
High Efficiency PTHP	LED Exterior Lighting
Ceiling Insulation(R2 to R38)	High Efficiency Chiller (Air Cooled, 50 tons)
Duct Sealing Repair	High Efficiency Chiller (Water cooled-centrifugal, 200 tons)
Low U-Value Windows	High Efficiency Chiller (Water cooled-positive displacement, 100 tons)
Programmable Thermostat	High Efficiency DX 135k- less than 240k BTU
Smart Thermostat	High Efficiency PTAC
Thermal Energy Storage	High Efficiency PTHP
Wall Insulation	Variable Refrigerant Flow (VRF) HVAC Systems
Demand Controlled Ventilation	High Bay Fluorescent (T5)
	High Bay LED
	Premium T8 - Fixture Replacement
	Efficient Battery Charger
	Solar Pool Heater
	Solar Powered Pool Pump
	Variable Speed Pool Pump
	Energy Star Uninterruptable Power Supply
	Energy Star Commercial Solid Door Refrigerator
	Refrigerated Display Case LED Lighting
	High Speed Fans
	Hot Water Circulation Pump Control
	Outdoor Lighting Controls
	Ceiling Insulation(R2 to R38)
	Chilled Water System - Variable Speed Drives
	Dedicated Outdoor Air System on VRF unit
	Duct Sealing Repair
	ECM Motors on Furnaces
	Facility Commissioning
	Facility Energy Management System
	Hotel Card Energy Control Systems
	HVAC tune-up
	HVAC tune-up_RTU
	Low U-Value Windows
	Programmable Thermostat
	Smart Thermostat
	Thermal Energy Storage
	Wall Insulation
	Warehouse Loading Dock Seals
	Water Cooled Refrigeration Heat Recovery
	Interior Lighting Controls
	VSD Controlled Compressor
	PSC to ECM Evaporator Fan Motor (Reach-In)
	PSC to ECM Evaporator Fan Motor (Walk-In, Refrigerator)
	Demand Controlled Ventilation
	Retro-Commissioning

HIGH FUEL INDUSTRIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
No Measures Passed RIM	Process Refrig System Optimization
	Process Refrig Controls
	Pump Equipment Upgrade
	Fan Equipment Upgrades
	Efficient Lighting - Other Interior Lighting
	Efficient Lighting - High Bay
	Compressed Air Controls
	Compressed Air Equipment
	Process Heat Improved Controls
	Process Heat Equipment Upgrade
	Motor Equipment Upgrades
	Process Refrig Equipment Upgrade
	Motor Optimization
	HVAC Recommissioning
	Pump System Optimization
	HVAC Equipment Upgrades
	Process Other Systems Optimization
	Building Envelope Improvements

LOW FUEL RESIDENTIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
14 SEER ASHP from base electric resistance heating	High Efficiency Induction Cooktop
15 SEER Air Source Heat Pump	14 SEER ASHP from base electric resistance heating
15 SEER Central AC	15 SEER Air Source Heat Pump
16 SEER Central AC	15 SEER Central AC
Air Sealing-Infiltration Control	16 SEER Central AC
Ceiling Insulation(R12 to R38)	CFL-13W
Ceiling Insulation(R19 to R38)	LED - 9W Flood
Ceiling Insulation(R2 to R38)	LED Specialty Lamps-5W Chandelier
Duct Repair	Two Speed Pool Pump
Energy Star Windows	Variable Speed Pool Pump
Home Energy Management System	Thermostatic Shower Restriction Valve
Spray Foam Insulation(Base R2)	Air Sealing-Infiltration Control
Wall Insulation	Ceiling Insulation(R12 to R38)
	Ceiling Insulation(R19 to R38)
	Ceiling Insulation(R2 to R38)
	Duct Repair
	Energy Star Windows
	Home Energy Management System
	Spray Foam Insulation(Base R2)
	Wall Insulation

LOW FUEL COMMERCIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
High Efficiency Chiller (Water cooled-centrifugal,	Efficient Exhaust Hood
High Efficiency Chiller (Water cooled-positive dis	Energy Star Hot Food Holding Cabinet
High Efficiency DX 135k- less than 240k BTU	Heat Pump Water Heater
High Efficiency PTAC	Solar Water Heater
High Efficiency PTHP	High Efficiency Chiller (Air Cooled, 50 tons)
Efficient Battery Charger	High Efficiency Chiller (Water cooled-centrifugal,
Ceiling Insulation(R2 to R38)	High Efficiency Chiller (Water cooled-positive dis
Duct Sealing Repair	High Efficiency DX 135k- less than 240k BTU
Low U-Value Windows	High Efficiency PTAC
Programmable Thermostat	High Efficiency PTHP
Smart Thermostat	Variable Refrigerant Flow (VRF) HVAC Systems
Thermal Energy Storage	High Bay Fluorescent (T5)
Wall Insulation	High Bay LED
Demand Controlled Ventilation	Premium T8 - Fixture Replacement
	Efficient Battery Charger
	Variable Speed Pool Pump
	Energy Star Uninterruptable Power Supply
	Energy Star Commercial Solid Door Refrigerator
	Ceiling Insulation(R2 to R38)
	Chilled Water System - Variable Speed Drives
	Dedicated Outdoor Air System on VRF unit
	Duct Sealing Repair
	ECM Motors on Furnaces
	Facility Commissioning
	Facility Energy Management System
	HVAC tune-up
	HVAC tune-up_RTU
	Low U-Value Windows
	Programmable Thermostat
	Smart Thermostat
	Thermal Energy Storage
	Wall Insulation
	VSD Controlled Compressor
	PSC to ECM Evaporator Fan Motor (Reach-In)
	PSC to ECM Evaporator Fan Motor (Walk-In, Refriger
	Demand Controlled Ventilation
	Retro-Commissioning

LOW FUEL INDUSTRIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
No Measures Passed RIM	Process Refrig Controls
	Pump Equipment Upgrade
	Fan Equipment Upgrades
	Efficient Lighting - Other Interior Lighting
	Efficient Lighting - High Bay
	Compressed Air Controls
	Compressed Air Equipment
	Process Heat Equipment Upgrade
	Motor Equipment Upgrades
	Process Refrig Equipment Upgrade
	HVAC Recommissioning
	Pump System Optimization
	HVAC Equipment Upgrades
	Motor Optimization
	Building Envelope Improvements

CARBON RESIDENTIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
14 SEER ASHP from base electric resistance heating	High Efficiency Induction Cooktop
15 SEER Air Source Heat Pump	14 SEER ASHP from base electric resistance heating
15 SEER Central AC	15 SEER Air Source Heat Pump
16 SEER Central AC	15 SEER Central AC
Air Sealing-Infiltration Control	16 SEER Central AC
Ceiling Insulation(R12 to R38)	CFL-13W
Ceiling Insulation(R19 to R38)	LED - 9W Flood
Ceiling Insulation(R2 to R38)	LED Specialty Lamps-5W Chandelier
Duct Repair	Solar Pool Heater
Energy Star Windows	Two Speed Pool Pump
Home Energy Management System	Variable Speed Pool Pump
Spray Foam Insulation(Base R2)	Thermostatic Shower Restriction Valve
Wall Insulation	Air Sealing-Infiltration Control
	Ceiling Insulation(R12 to R38)
	Ceiling Insulation(R19 to R38)
	Ceiling Insulation(R2 to R38)
	Duct Repair
	Energy Star Windows
	Home Energy Management System
	Programmable Thermostat
	Spray Foam Insulation(Base R2)
	Wall Insulation

CARBON COMMERCIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
High Efficiency Chiller (Water cooled-centrifugal,	Efficient Exhaust Hood
High Efficiency Chiller (Water cooled-positive dis	Energy Star Hot Food Holding Cabinet
High Efficiency DX 135k- less than 240k BTU	Heat Pump Water Heater
High Efficiency PTAC	Solar Water Heater
High Efficiency PTHP	High Efficiency Chiller (Air Cooled, 50 tons)
Efficient Battery Charger	High Efficiency Chiller (Water cooled-centrifugal,
Ceiling Insulation(R2 to R38)	High Efficiency Chiller (Water cooled-positive dis
Duct Sealing Repair	High Efficiency DX 135k- less than 240k BTU
Low U-Value Windows	High Efficiency PTAC
Programmable Thermostat	High Efficiency PTHP
Smart Thermostat	Variable Refrigerant Flow (VRF) HVAC Systems
Thermal Energy Storage	High Bay Fluorescent (T5)
Wall Insulation	High Bay LED
Demand Controlled Ventilation	Premium T8 - Fixture Replacement
	Efficient Battery Charger
	Solar Pool Heater
	Solar Powered Pool Pump
	Variable Speed Pool Pump
	Energy Star Uninterruptable Power Supply
	Energy Star Commercial Solid Door Refrigerator
	Ceiling Insulation(R2 to R38)
	Chilled Water System - Variable Speed Drives
	Dedicated Outdoor Air System on VRF unit
	Duct Sealing Repair
	ECM Motors on Furnaces
	Facility Commissioning
	Facility Energy Management System
	HVAC tune-up
	HVAC tune-up_RTU
	Low U-Value Windows
	Programmable Thermostat
	Smart Thermostat
	Thermal Energy Storage
	Wall Insulation
	Water Cooled Refrigeration Heat Recovery
	VSD Controlled Compressor
	PSC to ECM Evaporator Fan Motor (Reach-In)
	PSC to ECM Evaporator Fan Motor (Walk-In, Refriger
	Demand Controlled Ventilation
	Retro-Commissioning

CARBON INDUSTRIAL - RIM AND TRC MEASURES	
RIM Measures	**TRC Measures**
No Measures Passed RIM	Process Refrig Controls
	Pump Equipment Upgrade
	Fan Equipment Upgrades
	Efficient Lighting - Other Interior Lighting
	Efficient Lighting - High Bay
	Compressed Air Controls
	Compressed Air Equipment
	Process Heat Improved Controls
	Process Heat Equipment Upgrade
	Motor Equipment Upgrades
	Process Refrig Equipment Upgrade
	HVAC Recommissioning
	Pump System Optimization
	HVAC Equipment Upgrades
	Motor Optimization
	Building Envelope Improvements

PAYBACK OF LESS THAN 1 YEAR - RESIDENTIAL	
RIM Measures	**TRC Measures**
14 SEER ASHP from base electric resistance heating	High Efficiency Induction Cooktop
15 SEER Air Source Heat Pump	14 SEER ASHP from base electric resistance heating
15 SEER Central AC	15 SEER Air Source Heat Pump
16 SEER Central AC	15 SEER Central AC
Air Sealing-Infiltration Control	16 SEER Central AC
Ceiling Insulation(R12 to R38)	Energy Star Room AC
Ceiling Insulation(R19 to R38)	CFL-13W
Ceiling Insulation(R2 to R38)	LED - 9W Flood
Duct Repair	LED - 9W
Energy Star Windows	LED Specialty Lamps-5W Chandelier
Home Energy Management System	Linear LED
Spray Foam Insulation(Base R2)	Two Speed Pool Pump
Wall Insulation	Variable Speed Pool Pump
	Faucet Aerator
	Hot Water Pipe Insulation
	Thermostatic Shower Restriction Valve
	Smart Power Strip
	Air Sealing-Infiltration Control
	Ceiling Insulation(R12 to R38)
	Ceiling Insulation(R19 to R38)
	Ceiling Insulation(R2 to R38)
	Duct Repair
	Energy Star Windows
	Home Energy Management System
	Spray Foam Insulation(Base R2)
	Wall Insulation

PAYBACK OF LESS THAN 3 YEARS - RESIDENTIAL	
RIM Measures	**TRC Measures**
14 SEER ASHP from base electric resistance heating	High Efficiency Induction Cooktop
15 SEER Air Source Heat Pump	14 SEER ASHP from base electric resistance heating
15 SEER Central AC	15 SEER Air Source Heat Pump
16 SEER Central AC	15 SEER Central AC
Air Sealing-Infiltration Control	16 SEER Central AC
Ceiling Insulation(R12 to R38)	Thermostatic Shower Restriction Valve
Ceiling Insulation(R19 to R38)	Air Sealing-Infiltration Control
Ceiling Insulation(R2 to R38)	Ceiling Insulation(R12 to R38)
Duct Repair	Ceiling Insulation(R19 to R38)
Energy Star Windows	Ceiling Insulation(R2 to R38)
Home Energy Management System	Duct Repair
Spray Foam Insulation(Base R2)	Energy Star Windows
Wall Insulation	Home Energy Management System
	Spray Foam Insulation(Base R2)
	Wall Insulation

PAYBACK OF LESS THAN 1 YEAR - COMMERCIAL	
RIM Measures	**TRC Measures**
High Efficiency Chiller (Water cooled-centrifugal,	Efficient Exhaust Hood
High Efficiency Chiller (Water cooled-positive dis	Energy Star Commercial Oven
High Efficiency DX 135k- less than 240k BTU	Energy Star Hot Food Holding Cabinet
High Efficiency PTAC	Heat Pump Water Heater
High Efficiency PTHP	Solar Water Heater
Efficient Battery Charger	LED Street Lights
Ceiling Insulation(R2 to R38)	High Efficiency Chiller (Air Cooled, 50 tons)
Chilled Water Controls Optimization	High Efficiency Chiller (Water cooled-centrifugal,
Duct Sealing Repair	High Efficiency Chiller (Water cooled-positive dis
Low U-Value Windows	High Efficiency DX 135k- less than 240k BTU
Programmable Thermostat	High Efficiency PTAC
Smart Thermostat	High Efficiency PTHP
Thermal Energy Storage	Variable Refrigerant Flow (VRF) HVAC Systems
Wall Insulation	High Bay Fluorescent (T5)
Demand Controlled Ventilation	High Bay LED
Retro-Commissioning	LED Display Lighting (Interior)
	LED Linear - Fixture Replacement
	LED Linear - Lamp Replacement
	Premium T8 - Fixture Replacement
	Efficient Battery Charger
	ENERGY STAR Water Cooler
	Heat Pump Pool Heater
	Solar Pool Heater
	Two Speed Pool Pump
	Variable Speed Pool Pump
	Energy Star PCs
	Energy Star Uninterruptable Power Supply
	Energy Star Commercial Glass Door Refrigerator
	Energy Star Commercial Solid Door Refrigerator
	Hot Water Pipe Insulation
	Ceiling Insulation(R2 to R38)
	Chilled Water Controls Optimization
	Chilled Water System - Variable Speed Drives
	Dedicated Outdoor Air System on VRF unit
	Duct Sealing Repair
	ECM Motors on Furnaces
	Facility Commissioning
	Facility Energy Management System
	HVAC tune-up
	HVAC tune-up_RTU
	Low U-Value Windows
	Programmable Thermostat
	Smart Thermostat
	Thermal Energy Storage
	Wall Insulation
	Water Cooled Refrigeration Heat Recovery
	Interior Lighting Controls
	VSD Controlled Compressor
	Smart Strip Plug Outlet
	Anti-Sweat Controls
	Floating Head Pressure Controls
	PSC to ECM Evaporator Fan Motor (Reach-In)
	PSC to ECM Evaporator Fan Motor (Walk-In, Refriger
	CO Sensors for Parking Garage Exhaust
	Demand Controlled Ventilation
	Retro-Commissioning

PAYBACK OF LESS THAN 3 YEARS - COMMERCIAL	
RIM Measures	**TRC Measures**
High Efficiency Chiller (Water cooled-centrifugal,	Energy Star Hot Food Holding Cabinet
High Efficiency Chiller (Water cooled-positive dis	Solar Water Heater
High Efficiency DX 135k- less than 240k BTU	High Efficiency Chiller (Air Cooled, 50 tons)
High Efficiency PTAC	High Efficiency Chiller (Water cooled-centrifugal,
High Efficiency PTHP	High Efficiency Chiller (Water cooled-positive dis
Efficient Battery Charger	High Efficiency DX 135k- less than 240k BTU
Ceiling Insulation(R2 to R38)	High Efficiency PTAC
Duct Sealing Repair	High Efficiency PTHP
Low U-Value Windows	Variable Refrigerant Flow (VRF) HVAC Systems
Programmable Thermostat	High Bay LED
Smart Thermostat	Premium T8 - Fixture Replacement
Thermal Energy Storage	Efficient Battery Charger
Wall Insulation	Solar Pool Heater
Demand Controlled Ventilation	Variable Speed Pool Pump
	Energy Star Uninterruptable Power Supply
	Ceiling Insulation(R2 to R38)
	Dedicated Outdoor Air System on VRF unit
	Duct Sealing Repair
	ECM Motors on Furnaces
	Facility Commissioning
	Facility Energy Management System
	HVAC tune-up
	HVAC tune-up_RTU
	Low U-Value Windows
	Programmable Thermostat
	Smart Thermostat
	Thermal Energy Storage
	Wall Insulation
	Water Cooled Refrigeration Heat Recovery
	VSD Controlled Compressor
	PSC to ECM Evaporator Fan Motor (Reach-In)
	PSC to ECM Evaporator Fan Motor (Walk-In, Refriger
	Demand Controlled Ventilation
	Retro-Commissioning

PAYBACK OF LESS THAN 1 YEAR - INDUSTRIAL	
RIM Measures	**TRC Measures**
No Measures Passed RIM	Plant Energy Management Process Refrig Controls Process Refrig Equipment Upgrade Motor Optimization Pump Equipment Upgrade Motor Equipment Upgrades Fan Equipment Upgrades Lighting Controls Efficient Lighting - Other Interior Lighting Efficient Lighting - High Bay Building Envelope Improvements HVAC Equipment Upgrades Lighting Controls - Exterior Efficient Lighting - Exterior Compressed Air Controls Compressed Air Equipment Process Heat Improved Controls Process Heat Equipment Upgrade Pump System Optimization Motor Improved Controls Process Refrig System Optimization HVAC Recommissioning Process Other Systems Optimization HVAC Improved Controls

PAYBACK OF LESS THAN 3 YEARS - INDUSTRIAL	
RIM Measures	**TRC Measures**
No Measures Passed RIM	Process Refrig Controls Pump Equipment Upgrade Efficient Lighting - Other Interior Lighting Process Heat Improved Controls HVAC Equipment Upgrades Motor Optimization

Exhibit No. __ (LC-7) DUKE ENERGY FLORIDA'S PROJECTED RIM AND TRC PORTFOLIO COSTS AND RESIDENTIAL CUSTOMER RATE IMPACTS

	$/Millions									
	TOTAL	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**
RIM Projected Total Costs	$ 960.4	$ 106.7	$ 105.5	$ 90.7	$ 91.4	$ 92 0	$ 92.7	$ 93.5	$ 94.7	$ 95.9	$ 97.3
Residential Rate $/1200 kWh's	-	$ 3.62	$ 3.54	$ 3.01	$ 3.01	$ 3 00	$ 2.98	$ 2.99	$ 3.13	$ 2.98	$ 2 97
TRC Projected Total Costs	$ 1,048.1	$ 118 9	$ 116.5	$ 101.5	$ 101 8	$ 101 8	$ 101.4	$ 101.1	$ 101.3	$ 101.7	$ 102.1
Residential Rate $/1200 kWh's	-	$ 4.03	$ 3.90	$ 3.37	$ 3.35	$ 3 32	$ 3.26	$ 3.23	$ 3.35	$ 3.15	$ 3.12
Difference in Total Costs	$ 87.7	$ 12 2	$ 11.0	$ 10.8	$ 10.4	$ 9 8	$ 8.7	$ 7.5	$ 6.6	$ 5.8	$ 4.8
Difference in Res Rate $/1200 kWh's		0.41	0.37	0.36	0.34	0 32	0.28	0.24	0.22	0.18	0.15
Percent Difference TRC vs R M	*9%*	*11%*	*10%*	*12%*	*11%*	*11%*	*9%*	*8%*	*7%*	*6%*	*5%*