DUKE ENERGY
FLORIDA

Dianne M. Triplett
DEPUTY GENERAL COUNSEL

April 2, 2024

VIA ELECTRONIC FILING

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

Re: Docket 20240025-EI, Petition for Rate Increase by Duke Energy Florida, LLC

Dear Mr. Teitzman,

Attached for filing on behalf of Duke Energy Florida, LLC's ("DEF") in the above-referenced docket is the Direct Testimony of Reggie Anderson and RDA-1 through RDA-4.

Thank you for your assistance in this matter. Please feel free to call me at (727) 820-4692 should you have any questions concerning this filing.

(Document 5 of 40)

Respectfully,

/s/ Dianne M. Triplett

Dianne M. Triplett

DMT/mw

Attachments

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CERTIFICATE OF SERVICE
Docket No. 20240025-EI

I HEREBY CERTIFY that a true and correct copy of the foregoing has been furnished by electronic mail this 2nd day of April, 2024, to the following:

/s/ Dianne M. Triplett
Dianne M. Triplett

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for Rate Increase by Duke Energy Florida, LLC

Docket No. 2024025-EI

Submitted for filing: April 2, 2024

DIRECT TESTIMONY

OF

REGINALD D. ANDERSON

On Behalf of Duke Energy Florida, LLC

I. Introduction

Q. Please state your name and business address.

A. My name is Reginald D. Anderson, and my business address is 299 First Avenue North, St. Petersburg, FL 33701.

Q. By whom are you employed, and what is your position?

A. I am employed by Duke Energy Florida, LLC ("DEF" or the "Company") as Vice President of DEF's Power Generation organization.

Q. Please describe your duties and responsibilities as Vice President of DEF's Power Generation organization.

A. I am responsible for providing overall leadership and strategic and tactical planning over employees in DEF's Power Generation organization. In this role, I oversee generation projects, major maintenance programs, outage and project management, fleet retirement strategy, and workforce planning (including departmental staffing and long-term strategies such as organizational alignment, design, retention, and inclusion). I am responsible for billions of dollars in assets including capital and operating and maintenance ("O&M") budgets, and I lead the development of regional succession planning.

Q. Please describe your educational background and professional experience.

A. I earned a Bachelor of Science degree in Electrical Engineering Technology and a Master of Business from the University of Central Florida. I have 25 years of power plant production experience at DEF in various operational, managerial and leadership positions in fossil steam and combustion turbine plant operations. My experience includes managing new construction, O&M projects and teams and negotiating contracts. Prior to joining DEF, I held various leadership roles with municipal utilities, manufacturing companies, and the United States Marine Corps.

Q. Have you testified before this Commission in any prior proceeding?

A. Yes, I have testified on behalf of DEF in connection with the Environmental Cost Recovery Clause ("ECRC") proceeding, most recently in Docket No. 20230007-EI, which provided estimates of ECRC-recoverable costs that will be incurred in 2024.

II. <u>Purpose and Testimony Summary</u>

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to provide an overview of DEF's generation fleet and its evolution in the last five years. I present DEF's positive fleet reliability and performance metrics and describe the Company's fleet operating and management philosophy. My testimony also supports the reasonableness of DEF's non-fuel O&M and capital expenditures ("Capex") and provides the Capex and O&M production expenditures for the rate case test period (2025 – 2027). Lastly, I discuss historical O&M expenses and future O&M forecasts, and I describe DEF's cost-saving initiatives and productivity improvements that have been or will be implemented and their corresponding reduction on costs.

Q. Do you have any exhibits to your testimony?

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

- Exhibit RDA-1 is a list of the Minimum Filing Requirements ("MFRs") I am sponsoring or co-sponsoring.
- Exhibit RDA-2 lists the facilities that comprise DEF's current generation fleet.
- Exhibit RDA-3 provides DEF's Heat Rate & Unit Flexibility metrics.
- Exhibit RDA-4 lists and provides an overview of each of the major DEF Generation projects that make up the Company's capital request included in the MFRs for the years 2025-2027.

These exhibits are true and accurate, subject to being updated during the course of this proceeding.

Q. Please summarize your testimony.

A. Since the 2021 Settlement Agreement,[1] DEF's generation fleet has continued to grow and evolve with Florida's changing energy landscape. The Company has a history of making investments that provide customers with more reliable, resilient, and cleaner power. DEF's generation fleet is an integral part of the Company's progress. As I explain further below, DEF Generation has invested in solar generation, increasing output by approximately 1,170 MWs in the last five years, while also maintaining an efficient and reliable resource mix. The Company has made targeted investments to increase generating efficiency, which has reduced

[1] Approved by the Commission in Order No. PSC-2021-0202-AS-EI.

fuel costs and emissions all the while improving upon already above-average reliability and performance metrics. Throughout all of this, safety has remained at the forefront, and the Duke Energy and DEF generating fleets have attained industry top decile results for five consecutive years. As the Company looks to future needs, non-fuel O&M and Capex funding will be essential to the continued evolution, flexibility, and positive performance of DEF's generation fleet.

III. Generation Fleet Overview

Q. Please provide an overview of DEF's generation fleet.

A. DEF's generation fleet employs less than 500 people and, as of January 1, 2024, provides more than 12,000 nominal megawatts ("MWs") of total winter generation for DEF customers. The Company's generation portfolio consists of nine combined cycle ("CC") power blocks, two coal-fired steam units, two gas-fired steam units, one cogeneration facility, thirty-four simple cycle combustion turbines ("CTs") and nineteen solar sites. The CC and simple cycle CTs are comprised of units that are dual-fuel, natural gas only, and distillate fuel oil only. Exhibit RDA-2 provides an overview of facilities that comprise DEF's generation fleet.

Q. Has DEF's generation fleet undergone any changes over the last five years?

A. Yes. The DEF generation fleet has undergone a significant transformation over the last five years as it has evolved into a cleaner, more efficient, and more capable fleet. During this timeframe, decisions involving the generation fleet have been guided by the following overarching commitments: (1) providing safe, reliable, efficient, and cost-effective generation; and (2) reducing environmental impacts and ensuring compliance with state and federal regulations. Consistent with, and building upon these commitments, DEF has been active and diligent in advancing solar energy and modernizing its fleet.

For example, from 2018 to 2023, DEF increased generation by constructing and placing into operation 16 solar sites totaling approximately 1,170 MWs of capacity. In addition, DEF expects to place into service another four solar sites in 2024 and 14 solar sites from 2025 through 2027, bringing the total sites in our solar fleet to 34,[2] and providing more than 2,500 MWs of solar capacity. DEF also retired two coal-fired plants in 2018. The table below illustrates the retirements, additions, and unit configuration changes the DEF generation fleet has experienced from 2018 through 2023.

DEF Generation Fleet
Fleet Resource Additions/Retirements
For the Period 2018-2023

			MW Changes	
Year	**Unit**	**Type**	**Retirements**	**Additions**
2018	Citrus 1 and 2	Combined Cycle Natural Gas		1,640
2018	Crystal River 1 and 2	Coal	925	
2018	Hamilton	Solar		75
2019	Lake Placid	Solar		45
2019	Trenton	Solar		75
2019	Higgins	Oil/Gas Combustion Turbine	200	
2020	Columbia	Solar		75
2020	DeBary	Solar		75
2020	Avon Park	Oil/Gas Combustion Turbine	50	
2021	Santa Fe	Solar		75

[2] Excludes several small solar sites on DEF's system ranging from 0.25 MW to 9 MW.

2021	Twin Rivers	Solar		75
2021	Duette	Solar		75
2022	Sandy Creek	Solar		75
2022	Fort Green	Solar		75
2022	Charlie Creek	Solar		75
2022	Bay Trail	Solar		75
2022	Lake Placid	Battery Storage		18
2022	DeBary CT 1	Oil/Gas Combustion Turbine	50	
2023	Bayboro CT 4B	Oil/Gas Combustion Turbine	25	
2023	Hildreth	Solar		75
2023	High Springs	Solar		75
2023	Hardeetown	Solar		75
2023	Bay Ranch	Solar		75
2023	Osprey	GTOP 7 Upgrade		55
	Total		**325**	**2,883**

During this same period, DEF's generation fleet capacity has increased from approximately 10,000 MWs to over 12,000 nominal MWs of total winter generation.

Q. How has DEF's generating capacity changed since the 2021 Settlement Agreement?

A. As a part of the 2021 Settlement Agreement, DEF received a base rate increase that allowed for the continued investment in all aspects of its business, including generation, to improve the provision of safe and reliable electric service to its customers. Specific to the DEF Power Generation organization, the 2021 Settlement Agreement provided for the construction and recovery of cost-effective solar generating units, and an annual capital expenditure program ranging from approximately $125 million to $140 million from 2022 through 2024 to maintain and improve the integrity of the existing DEF generation fleet.

Consistent with the 2021 Settlement Agreement, DEF placed in service eight solar sites during 2022 and 2023, resulting in 600 MWs of additional solar generation, bringing DEF's solar capacity to 1,170 MWs.

In addition to the increased generation provided by the new solar sites, DEF completed a heat rate improvement project at the Osprey plant, which involved installing an innovative technology combustion system and increasing unit capacity by approximately 55 MWs, bringing the Osprey plant's total output to approximately 625 MWs.

IV. <u>DeBary Hydrogen Project</u>

Q. Please provide a brief overview of the DeBary Hydrogen Project.

A. The Commission approved the Vision Florida Program in the 2021 Settlement Agreement.[3] One of the projects DEF pursued as part of the Vision Florida Program is the DeBary Hydrogen Project. The DeBary Hydrogen Project is an innovative, clean energy hydrogen production and storage system that will be used to produce hydrogen under numerous real and simulated conditions, including solar following simulated future grid conditions and grid voltage support.

[3] The 2021 Settlement Agreement authorized the Company to pursue pilot projects through the Vision Florida Program. The Vision Florida Program is discussed in greater detail in the direct testimonies of Company witnesses Brian Lloyd and Hans Jacob. My testimony is focused on the DeBary Hydrogen Project, which is a part of Vision Florida.

The project consists of two (2) 1 MW Polymer Electrolyte Membrane electrolyzers and incorporates the existing 74.5 MW DeBary Solar Plant to provide clean energy for the electrolyzer units that will separate water molecules into oxygen and hydrogen atoms, generating truly green hydrogen. The resulting oxygen will be released into the atmosphere, while the hydrogen will be delivered to reinforced containers for safe storage. The system will ultimately deliver the stored hydrogen to a CT that has the ability to run on blended fuel as well as 100% hydrogen. In addition to the DeBary Solar Plant, the project site also includes peaking gas CTs that will allow the Company to provide additional power to accommodate changes in demand and technological growth. The DeBary Solar Plant is an ideal location for the DeBary Hydrogen Project because it has diverse generation sources available to power the electrolyzers.

Q. What is the estimated project cost and projected in-service date for the Debary Hydrogen Project?

A. The estimated project cost included in this filing is $25 million, and the projected in-service date for the DeBary Hydrogen Project is Q4 2024.

Q. How does the Debary Hydrogen Project benefit customers?

A. The DeBary Hydrogen Project is one example of how DEF is maximizing customer benefits while providing technological and geographic diversity through state-of-the-art technology that will help DEF transition to cleaner energy. The Debary Hydrogen Project will benefit customers through the early demonstration of an integrated technology capable of providing increased energy storage, fuel agility, and grid reliability. In addition, this project will allow DEF to gain valuable learnings in the following areas:

- Determining the variable cost of hydrogen production, resulting energy production, and how hydrogen best complements increased renewable energy growth.
- Procedures for integrated operation and control, material selection, safety, emissions, operation, and maintenance.
- Assistance with future designs and scale-up evaluations, which will help guide DEF's continued transition to renewable energy.

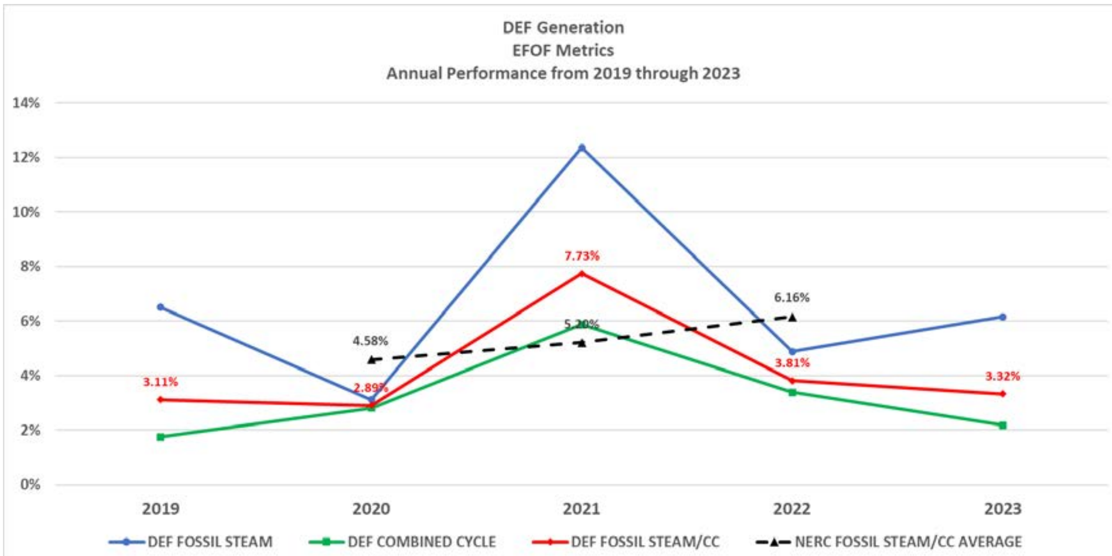
V. <u>Reliability</u>

Q. How does DEF measure and evaluate the reliability of its steam and combined cycle units?

A. DEF evaluates the reliability, or the operating performance, of its generation fleet by comparing the Equivalent Forced Outage Factor ("EFOF") for the Company's steam and combined cycle units with EFOF data reported for the North American Electric Reliability Corporation ("NAERC") steam and combined cycle units over the same period.[4] A generating unit's EFOF is equal to the hours of unit forced unavailability (unplanned outage hours and equivalent unplanned derated hours) given as a percentage of the total hours of service, plus the unavailability of that unit (unplanned outage, unplanned derate, and service hours). The chart below

[4] NAERC EFOF data is available beginning in 2020. Prior to 2020, NAERC tracked the Equivalent Forced Outage Rate ("EFOR"). DEF anticipates that 2023 data will be available mid-2024.

provides a summary of DEF's steam and combined cycle performance for the previous five years. As the chart demonstrates, the operating performance for DEF's generation fleet has improved over the last three years and is outperforming the NAERC average.



Q. Does the Company use EFOF to measure reliability at its simple cycle generating units?

A. No, the Company utilizes starting reliability as a more informative metric to measure the reliability of its simple cycle fleet. Starting reliability is the ratio of successful startups to attempted startups. A startup is successful if the unit synchronizes to the grid within a certain, pre-defined time limit. If the unit is unable to start — a "failed start" — or the startup is delayed, it would fail in its peaking duty. Therefore, a high starting reliability is desirable. DEF's simple cycle fleet has consistently averaged over 99% starting reliability each year. For example, of 2,124 starts in 2023, DEF only had 11 failed starts, resulting in a starting reliability of 99.48%.

Q. How does DEF measure reliability for its solar generating facilities?

A. For solar generating facilities, the Company uses energy yield and inverter availability to measure reliability. Energy yield is the percentage of energy produced as compared to the maximum energy that could have been produced, considering the actual available solar conditions (daylight hours, sun position, degree of cloudiness, etc.). Inverter availability is the proportion of time that a system is in an operable and usable state over a specified period that includes any necessary corrective maintenance, preventative maintenance, or any other downtime required for the system to remain operable.

Q. How reliable are DEF's solar facilities?

A. In 2023, DEF's solar facilities operated with an average net capacity factor of 27%.[5] Typical solar facilities have a net capacity factor of 23-25%.[6] DEF's solar facilities provide approximately 6% of DEF's total generation.

Q. How do DEF's reliability metrics translate into benefits for customers?

A. DEF's positive operating and reliability metrics translate into better reliability for customers and provide an opportunity for the Company's most efficient operating units to minimize fuel costs. These positive metrics also increase the probability

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[5] Adjusted to exclude events outside management control ("OMC").

[6] *See* U.S. Energy Information Administration, *Table 6.07.B. Capacity Factors for Utility Scale Generators Primarily Using Non-Fossil Fuels*, (Last visited: Feb. 7, 2024), https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_6_07_b (showing the average capacity for photovoltaic solar in 2022 to be 24.4%).

that generation is available during times of lower customer demand to enter the off-system sales market and further offset customer fuel costs.

VI. Performance and Safety

Q. Has the Company achieved and sustained a favorable safety record while improving performance over the past five years?

A. Yes. Safety is the highest priority in every task that the Company performs and is an integral part of our daily decision-making process. Duke Energy is committed to a healthy and injury-free workplace and is committed to the safety of our employees, families, customers, contractors, visitors, and the communities in which we operate. Duke Energy's focus on safety has resulted in consistently outstanding performance in this area over the past several years, with Duke Energy's Generating Fleet attaining industry top decile results for five consecutive years. The table below shows the total incident case rate ("TICR") specifically for DEF's Generating Fleet. TICR is the number of work-related injuries per total number of work hours in a year; the result is a percentage that reflects the frequency of injuries. A TICR less than 0.5 is considered top decile performance in the industry, and DEF's TICR has been below that threshold since 2018.

Year	Recordables	Work Hours	TICR
2018	16	10,566,766	0.30
2019	17	10,126,610	0.34
2020	17	9,698,928	0.35
2021	14	9,442,310	0.30
2022	18	9,722,439	0.37
2023	23	10,605,610	0.43
Grand Total	**123**	**70,365,684**	**0.35**

Q. How does DEF measure the operating performance of its generation fleet?

A. In addition to EFOF, discussed above, DEF measures the operating performance and efficiency of its fleet through the "heat rate" – or the measurement of the amount of fuel used to produce a kilowatt hour ("kWh") of power. Heat rate is expressed as a British Thermal Unit ("BTU") per kWh. The lower the fleet's heat rate, the more efficient it is because it requires less fuel to generate the same amount of power.

Q. Has the Company undertaken initiatives to improve the operating performance of its generation fleet?

A. Yes, the Company has undertaken several initiatives to improve the generation fleet's performance. First, DEF's Power Generation organization has embarked on a generation fleet heat rate and capacity initiative that is focused on reducing the generation fleet's operating fuel costs through greater fuel efficiency. Second, by adopting new technologies, DEF's combined cycle units are capable of being more flexible as solar generation is developed and added within DEF's service territory. Third, DEF is installing newer, more efficient combustion turbine hardware systems at the Hine Energy Complex, Tiger Bay, Bartow, and Citrus CC plants.

Q. Please describe some of the benefits of DEF's heat rate and capacity initiatives.

A. DEF's heat rate improvement project will integrate some of the newest combustion technology into DEF's combined cycle units and will increase overall system capacity by 428 MWs after all projects are completed in 2026. Once completed, these projects, along with increased generation, will reduce fuel costs to customers by an estimated $150 to $200 million dollars per year due to an increase in reliability ramp rates and low load operations, which I discuss below. These uprate improvement projects are planned for the eligible units during the unit's next routine maintenance outage cycle, which will allow for long lead time equipment to be manufactured and delivered and will reduce the need for out of cycle maintenance outages. Exhibit RDA-3 summarizes the CC units that are part of the heat rate improvement project and their corresponding heat rate improvements.

Q. Please explain how making combined cycle units more flexible as solar generation is added to the electric grid improves the generation fleet's performance.

A. As additional solar generation is developed and added within DEF's service territory, DEF's combined cycle units must become more flexible because solar energy is intermittent due to variables such as the time of day and the weather, and these variables contribute to the unpredictability and variation of solar generation. The unpredictability of solar impacts grid frequency and voltage, which may result in the electric grid becoming unstable due to an erratic energy supply, which in turn, could cause equipment damage, interruptions, and power outages. Therefore, as solar generation continues to be added to the electric grid, the Company's generating units need to be increasingly agile in responding to load changes.

For example, since cloud coverage can cause rapid changes to the energy output of solar generation, online steam and CC operating plants need to be able to adapt quickly and adjust output to maintain reliability and grid stability, DEF has implemented an innovative combustion technology at the Osprey plant that allows the units to operate at lower loads and use faster ramp rates, all while complying with environmental regulations.

Q. What is low load operation and how does it benefit DEF's customers?

A. Low load operation is the ability to keep affected units online during periods of lower system demand that would normally require units to be removed from service. Improving low load capability, or turndown, allows DEF to reduce unit cycles on its CTs, thereby reducing costs and reducing the impact on equipment life. Since low load operations are restricted by environmental compliance regulations and rules, improving a unit's low load operation enables DEF to keep its most efficient units online to serve our customers.

Cycling a unit on and off also adds to the cost of operation. A unit cycle removes what we call "parts life" from the unit, so fewer cycles on a unit results in lower operating costs, and a reduction in maintenance cycle costs that otherwise would be borne by DEF's customers.

Q. Has the generating efficiency of DEF's generation fleet improved over time?

A. Yes. The efficiency of DEF's generation fleet has improved over time, due primarily to three factors: heat rate improvements, the retirement of less efficient units, and employing economic dispatch. I previously discussed DEF's heat rate improvement project and how these improvements will (in addition to increasing capacity) improve reliability ramp rates and low load operations, thereby reducing fuel costs. With the introduction of new heat rate improvement technology, DEF expects that the fleet's heat rate will be reduced by an additional 1,000 BTU by the end of 2026—an estimated one to two percent improvement. As shown in Exhibit RDA-3, the heat rate of DEF's generation fleet has continued to improve since 2018.

Second, and also since 2018, DEF has retired some higher heat rate coal units and improved the efficiency of its gas units. And third, DEF (and Duke Energy's entire generation fleet) uses economic dispatch to reduce the operating heat rate of the generation fleet. Economic dispatch is a continuous and dynamic process that Duke Energy uses to create the most economical power on the grid. This process allows the entire enterprise to deliver the lowest cost source of electric generation to the grid by dispatching units with the lowest costs before calling upon less efficient units that result in higher fuel costs. Combined with the heat rate improvements and the use of innovative technologies, power will be dispatched utilizing more accurate inputs for economic dispatch, allowing DEF's most efficient units to be the first to respond to load demand.

Q. How do DEF customers benefit from a positive operating performance of DEF's generation fleet?

A. Positive fleet operating performance minimizes forced and unplanned outages and results in lower electric bills. Since fuel costs are passed on to customers as part of their total electric bill, customers benefit from positive operating performance when the most efficient units remain online and are dispatched first. By utilizing economic dispatch, DEF is ensuring that it is delivering the lowest cost power to the grid, and that it only calls upon less efficient (and more costly) units as demand increases.

Q. Has the positive operating performance of the Company's generation fleet impacted O&M costs?

A. Yes. Using the economic dispatch model for unit loading and normal operations provides DEF a tool for maintaining, or even reducing, variable O&M costs that are associated with more reliable and efficient units. From time to time, DEF relies on purchased power when reserves are insufficient to serve the system load. Purchasing power at an equal to or lower cost than the Company can generate based on market conditions allows older, less efficient units to be called upon less frequently, thereby reducing maintenance and startup costs.

VII. <u>DEF Generation Non-Fuel O&M and Capex</u>

Q. What is the budget and approval process for the non-fuel O&M and Capex for DEF's generation fleet?

A. Long-range planning for DEF's Power Generation organization is a structured process that balances risk with financial constraints that consists of five (5) years of projected capital and outage O&M costs for maintenance projects at DEF's generation stations. Station and subject matter experts identify projects for future years and group them among the following categories:

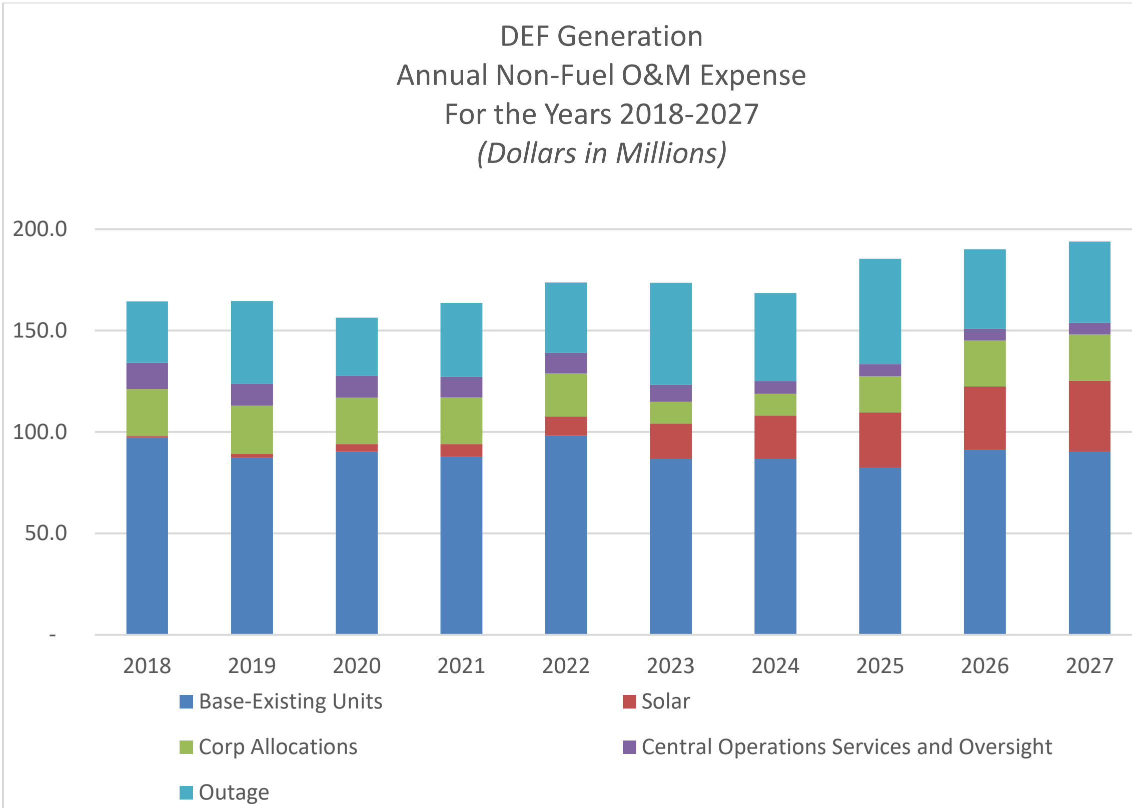
- Regulatory requirements
- Safety and environmental risks
- Long-term service agreements
- Growth and strategic initiatives
- Optimized routine reliability maintenance
- Economical reliability maintenance
- Facility infrastructure needs

DEF evaluates and prioritizes capital and outage O&M projects according to fleet procedures, which include condition-based equipment inspections. This process allows DEF to invest Capex and O&M in the fleet's most efficient and responsive units first, thereby prioritizing the needs of the remaining units as Capex and O&M is available and resulted in the Company identifying several power generation projects to include in the 2025, 2026, and 2027 test years.

Q. Please describe the non-fuel O&M performance experience of DEF's generation fleet.

A. The transformation of DEF's generation fleet has been underway since 2016. During this time, DEF has invested in technology and facility upgrades, and undertaken strategic unit and station retirements. This effort focuses on maintaining and minimizing fuel and non-fuel costs. As shown in the chart below, DEF's non-fuel costs attributable to base operations for existing generating units (the dark blue bar) have remained fairly constant and have even decreased for several years over a ten (10) year period. In fact, the forecasted amount for non-fuel costs for 2027 is less than the comparable actual amount in 2018.

Outage O&M (the light blue bar) exhibits slight fluctuations over the years due to equipment run-times but generally has held constant despite increasing fleet capacity and maturing generating sites. As expected, the addition of new generation facilities, including the Citrus CC, the Osprey Energy Center, and the addition of thirty-four (34) new major solar sites since 2018, has added incrementally to non-fuel O&M costs. However, it is important to note that despite the addition of considerable new generating capacity since 2016, the Company has been able to safely and reliably operate and maintain its fleet with fewer resources.



Q. Please differentiate between the two primary O&M cost categories – Base Existing Units and Outage as shown in the chart above.

A. Base Existing Unit costs include costs associated with day-to-day routine activities and basic utility services. Some examples of these costs include labor (straight time and overtime), materials required for routine activities, outside contracting services, and environmental permits. Outage costs include all major maintenance activities and non-routine activities that improve a unit's operating reliability or efficiency. Examples of Outage costs include CT major maintenance, steam turbine outage work, generator major maintenance work, and other similar projects.

While Base Existing Unit costs have declined over the 2018-2027 period as the generation fleet has transformed into a cleaner, more efficient portfolio and as the Company has implemented improvements, Outage costs have fluctuated based on major equipment maintenance requirements, which are in turn driven by hours of operation. With major maintenance requirements driven by usage-based metrics, outage budgets experience more variation than base budgets.

Q. Has the Company taken steps to reduce fossil fleet O&M and Capex associated with operating and maintaining DEF's generation fleet?

A. Yes. DEF continually works to reduce costs for both O&M and Capex, and the Company has implemented various initiatives to reduce costs through efficiencies in business transformation and planning. For example, the Business Transformation effort is intended to identify where process and financial efficiencies can be realized within DEF Generation. These changes are intended to be long-term to achieve sustainable cost savings. In addition, DEF employees are encouraged to find new ways to work more efficiently and reduce costs. Ideas are solicited from every individual in the company to consider day-to-day activities and determine if there are opportunities to make our business more efficient resulting in sustainable cost savings.

Q. Please summarize the generation fleet's capital requests for the years 2025-2027 that are included in the MFRs.

A. Please refer to Exhibit RDA-4 attached to my testimony. This exhibit summarizes the major maintenance projects (grouped by similar work scopes) and associated budget costs included in DEF's rate case for each of the three test period years.

Q. Please briefly describe the Commission's "O&M Benchmark Test" and how the requested test year O&M for DEF Generation compares to the Benchmark O&M.

A. The Commission's O&M benchmark test originated in the early 1980's as a metric used by the Commission and its staff to evaluate the reasonableness and prudency of a company's request for O&M in its test year cost of service. The Commission's O&M Benchmark Test escalates the O&M by function approved in a company's last rate proceeding by the consumer price index and customer growth for those O&M functions whose costs are impacted by customer growth. The resulting, escalated O&M is then compared to the test year O&M requested by a company. If the test year O&M exceeds the Benchmark O&M, the company is required to provide justification for the increase in order to obtain recovery of its requested O&M amount. If the company's test year O&M is less than the Benchmark O&M, the company has met the reasonableness test for the O&M to be approved.

Please refer to MFR Schedule C-41, which shows the Commission's O&M Benchmark analysis for test years 2025, 2026, and 2027, and the DEF's justification statement for test year O&M that exceeds the benchmark amount. For example, in the calendar year 2025, Steam Production O&M exceeds the

Benchmark O&M by $2.9 million. However, the test year O&M for Other Power Production is $7.9 million less than the Benchmark O&M, resulting in an O&M amount of approximately $5.0 million less than the Benchmark Test for the two functions I oversee. In addition, I note that DEF's requested test year O&M for the years 2026 and 2027 are less than their respective benchmark amounts by $4.4 million and $4.5 million, respectively. This analysis provides a quantified demonstration of the efforts DEF has employed to control and reduce Generation O&M costs.

Q. Does this conclude your direct testimony?

A. Yes, it does.

List of MFRs Sponsored or Co-Sponsored

MFR	TITLE
B-7	Plant Balances By Account And Sub-Account
B-8	Monthly Balances Test Year - 13 Months
B-9	Depreciation Reserve Balances By Account And Sub-Account
B-10	Monthly Reserve Balances Test Year - 13 Months
B-11	Capital Additions And Retirements
B-12	Production Plant Additions
B-13	Construction Work In Progress
B-18	Fuel Inventory By Plant
B-24	Leasing Arrangements
C-6	Budgeted Versus Actual Operating Income And Expenses
C-8	Detail Of Changes In Expenses
C-9	Five Year Analysis - Change In Cost
C-15	Industry Association Dues
C-16	Outside Professional Services
C-33	Performance Indices
C-35	Payroll & Fringe Benefit Increases Compared To CPI
C-36	Non-Fuel Operation And Maintenance Expense Compared To CPI
C-37	O&M Benchmark Comparison By Function
C-41	O&M Benchmark Comparison By Function
C-43	Security Costs

Duke Energy Florida Generation Fleet Overview					
DEF Generation 12/31/2023	**# of Units**	**Summer Capacity MW**	**% of Summer Capacity**	**Winter Capacity MW**	**% of Winter Capacity**
CC-Combined Cycle	**29**	**6134**	**49.0%**	**6236**	**48.9%**
Bartow CC	5	1207	9.6%	1227	9.6%
Citrus County CC	6	1862	14.9%	1902	14.9%
Hines Energy Complex	12	2188	17.5%	2214	17.4%
Osprey Energy Center	3	600	4.8%	612	4.8%
Tiger Bay	2	231	1.8%	234	1.8%
University of Florida	1	46	0.4%	47	0.4%
CT-Combustion Turbine	**34**	**2578**	**20.6%**	**2580**	**20.2%**
Bartow Peaker	4	223	1.8%	223	1.7%
Bayboro	4	238	1.9%	238	1.9%
DeBary	9	712	5.7%	712	5.6%
Intercession City	14	1202	9.6%	1204	9.4%
Suwannee River Peaker	3	203	1.6%	203	1.6%
SO-Solar	**19**	**1334**	**10.7%**	**1334**	**10.5%**
Bay Ranch Solar Facility	1	75	0.6%	75	0.6%
Bay Trail Solar Facility	1	75	0.6%	75	0.6%
Charlie Creek Solar Facility	1	75	0.6%	75	0.6%
Columbia Solar Facility	1	75	0.6%	75	0.6%
DeBary Solar Facility	1	75	0.6%	75	0.6%
Duette Solar Facility	1	75	0.6%	75	0.6%
Fort Green Solar Facility	1	75	0.6%	75	0.6%
Hamilton Solar Facility	1	75	0.6%	75	0.6%
Hardeetown Solar Facility	1	75	0.6%	75	0.6%
High Springs Solar Facility	1	75	0.6%	75	0.6%
Hildreth Solar Facility	1	75	0.6%	75	0.6%
Lake Placid Solar Facility	1	45	0.4%	45	0.4%
Osceola Solar Facility	1	4	0.03%	4	0.0%
Perry Solar Facility	1	5	0.04%	5	0.0%
Sandy Creek Solar Facility	1	75	0.6%	75	0.6%
Santa Fe Solar Facility	1	75	0.6%	75	0.6%
Suwannee Solar Facility	1	9	0.1%	9	0.1%
Trenton Solar Facility	1	75	0.6%	75	0.6%
Twin Rivers Solar Facility	1	75	0.6%	75	0.6%

Duke Energy Florida Generation Fleet Overview					
DEF Generation 12/31/2023	**# of Units**	**Summer Capacity MW**	**% of Summer Capacity**	**Winter Capacity MW**	**% of Winter Capacity**
ST-Fossil Steam	**4**	**2467**	**19.7%**	**2607**	**20.4%**
Anclote	2	1025	8.2%	1051	8.2%
Crystal River	2	1442	11.5%	1556	12.2%
Grand Total	**88**	**12513**	**100.0%**	**12757**	**100.0%**

Station	OEM Cost	Total Cost	Heat Rate Improvement	Increased Output
	$M	***$M***	***Btu/kWh***	***MW***
Bartow	20	24	-100	100
Citrus PB1	12	13.2	-132	22
Citrus PB2	12	13.2	-132	22
Hines PB2	14	16.8	-125	65
Hines PB3	14	16.8	-125	65
Hines PB4	36.6	48.6	-140	80
Osprey CC	7	7.5	-144	52
Tiger Bay CC	13.5	14.8	-128	22
Totals	129.1	154.9	-1026	428

Florida Production Cost Additions

Florida Production Cost Addition Summary (in millions)

Projects	2025	2026	2027	total	%
Total	**220.6**	**221.0**	**220.0**	**661.6**	**100%**
Citrus LTSAs	46.2	55.5			
Hines LTSAs	5.0	9.2			
LTSA Total	51.2	64.7		**115.9**	**18%**
Combustion Turbine Efficiency Improvements	32.1	30.8	6.7	**69.6**	**11%**
Unit Flexibility			56.7	**56.7**	**9%**
UF CHP Project			30.0	**30.0**	**5%**
Anclote & Bartow 316B (ECRC Capital)	4.6	11.1	7.1	**22.8**	**3%**
DCS and Controls	11.1	2.7	1.5	**15.3**	**2%**
Debary & Intercession Rotor Overhauls	6.0	8.1	5.5	**19.6**	**3%**
Generator Rewinds		6.3		**6.3**	**1%**
GR 91 Valve Replacements	2.0	1.3		**3.3**	**0%**
Crystal River Precipitator Parts Replacement	1.0			**1.0**	**0%**
Intercession Wing Cowl Plenum			3.2	**3.2**	**0%**
SmartGen Generator Monitoring	0.5			**0.5**	**0%**
Regularly Scheduled Maintenance	42.2	39.2	32.3	**113.7**	**17%**
Unplanned Reliability Work	30.0	30.0	50.7	**110.7**	**17%**
Routine Reliability, General Managed Accounts & Station Sponsored Projects	11.8	12.2	11.1	**35.1**	**5%**
Other	28.1	14.6	15.2	**57.9**	**9%**

Please note that the Anclote and Bartow 316B projects are recovered through the Environmental Cost Recovery Clause.

Project Details

LTSA Projects

- Duke Energy has Long-Term Service Agreements ("LTSAs") with the turbine Original Equipment Manufacturers ("OEMs") at Citrus and Hines. The LTSAs cover gas turbine major maintenance, which manages part life and minimizes risk to the operating unit. Per the OEM prescribed maintenance intervals, Citrus will perform major turbine maintenance on Unit 1 in 2025 and Unit 2 in 2026, and Hines will perform turbine maintenance on Unit 2 in 2025 and Units 1 and 3 in 2026.

Combustion Turbine Efficiency Improvements

- These projects are the heat rate and capacity efficiency projects I explain in greater detail in my direct testimony. These projects improve efficiencies and heat rates at the Company's combined cycle units and result in fuel savings for customers.

Unit Flexibility

- With an ever-growing solar generation fleet, the traditional gas fleet will need to progressively become more flexible. These unit flexibility projects improve minimum load, unit ramp rates, and the ability to operate effectively to accommodate solar fluctuations and maintain system load stability.

UF (University of Florida) CHP Project

- In May 2023, UF and Duke Energy Florida executed a term sheet such that the cogeneration station will remain in service. As a result, the station must install new boilers in 2027 to meet extended operation requirements with 100% reliable steam supply to the University and Shands Hospital.

DCS (Distributive Control Systems) and Controls

- Anclote's DCS and Operations and Control Network will be replaced in 2025, as it is no longer being supported or updated by Microsoft. DEF will upgrade the existing Ovation Distributed Control System (DCS) at Citrus and will install the Mitsubishi TOMONI Controls to improve O&M optimization, performance, and operation flexibility and to maintain cybersecurity compliance.

Debary and Intercession Turbine Rotor Overhauls

- The CT rotors for Debary CT10 (2026 ISD) and Intercession CT12-CT14 (2025-2027 ISDs) are scheduled for replacement based on GE maintenance guidelines and contract obligations. These maintenance intervals are required to maintain high starting reliability for the CT fleet, and these units see, on average, 500 or more starts each year.

Generator Rewinds

- Debary CT8 (2026 ISD), Intercession CT10 (2026 ISD), Hines Unit 1B (2026 ISD), and Suwannee CT2 (2026 ISD) are planning to rewind their generator stator and/or rotor coils.

GR 91 Valve Replacements

- The DEF fleet encountered multiple cases of dis-bonding of Grade 91 alloy materials in isolating steam valves, located upstream of the turbines. Dislodged debris can break through the screens and damage the steam turbines. This fleet effort will replace these valves with new valves that prevent this occurrence. In 2025 and 2026, Hines Units 3 and 4 will replace their Hot Reheat Valves, which will complete the initiative.

Crystal River Precipitator Parts Replacement

- The Crystal River Unit 4 precipitator controls air pollution and has degraded over time due to age and use of equipment. These parts and controls replacements are necessary to prevent failure and unit shutdown prior to exceeding the air permit.

Intercession Wing Cowl Plenum

- DEF will replace the turbine wing cowl plenum exhausts as Intercession for CTs 12 through 14 in 2027. The replacements will avoid further cracking and separation leading to equipment damage and forced outages for repairs or replacements.

SmartGen Generator Monitoring

- This fleet strategy upgrade will enhance turbine generator monitoring and convert from time-based maintenance to condition-based maintenance. SmartGen is designed to improve fleet standardization and reduce outage costs as well as generator failures and associated costs.

Regularly Scheduled Maintenance

- This category includes certain types of maintenance that is regularly scheduled based on runtime, number of starts, OEM recommendations and guidelines, and performance history. This includes gas turbine work (Combustion, Hot Gas Path, and major outages) and steam turbine work (Boiler Feed-pump Turbines, Main Steam/Auxiliary Valves, and major outages). Work is scheduled per the Optimized Planning and Tracking of Interval Based Maintenance process.

Unplanned Reliability Work

- These costs are designed to lower operational and financial risk for emergent reliability work in the years 2025 through 2027. Areas of concern include maintaining the reliability of an aging fleet, impacts of combined cycle plant operations and industry operational changes on balance of plant equipment, and additional expected costs to maintain the UF CHP.

Routine Reliability, General Managed Accounts & Station Sponsored Projects

- The primary objective of these projects is to maintain the operational reliability of a site. These projects include one of the following:

  Approved General Managed Accounts
  1. Station Small Capital (<$50K per project)
  2. Coal/Process Conveyor Belts (level of funding allocated based on historical costs)
  3. Regional Capital (established to accommodate emergent projects such as major pump or major motor failures)

  Approved Station Sponsored Projects
  1. General Equipment (<$50K per project)
  2. Tools (material cost only, no labor)
  3. Miscellaneous Valves (<$50K per project)

Costs are based on historical spending plus any anticipated additional needs.

Other

- Other costs consist of various reliability projects with an average cost of $0.6 million per project. Project scoring and ranking for inclusion in the 5-year plan follows the RRE prioritization process.