DUKE ENERGY FLORIDA

Dianne M. Triplett
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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 Hans Jacob.

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 13 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. 20240025-EI Submitted for filing: April 2, 2024** |

# DIRECT TESTIMONY

# OF

# HANS JACOB

**On Behalf of Duke Energy Florida, LLC**

## I. Introduction

**Q. Please state your name and business address.**

A. My name is Hans Jacob. My business address is 299 1st Avenue North, St. Petersburg, Florida, 33701.

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

A. I am employed by Duke Energy Corporation ("Duke Energy") as a Director of Renewable Business Development.

**Q. Please describe your duties and responsibilities in that position.**

A. As a Director of Renewable Business Development, I am responsible for the development of battery energy storage systems ("BESS") projects in Florida on behalf of Duke Energy Florida, LLC ("DEF" or the "Company"). I lead a team of project developers responsible for the initiation and deployment of regulated battery energy storage and microgrid systems.

**Q. Please describe your educational background and professional experience.**

A. I received a Bachelor of Science in Mechanical Engineering from the University of Florida, and I began my career at Duke Energy in 2012. Since my employment with Duke Energy, I have held various Engineering positions in Nuclear Power generation and Transmission System Operations. For the past four years I have worked in the Energy Storage Development team. I am a licensed Professional Engineer in the State of Florida.

**Q. Have you testified before this Commission?**

A. No.

**Q. What is the purpose of your testimony?**

A. My testimony supports the BESS projects that DEF will place in service during the rate case test period: the Powerline BESS Project and the Suwannee Long-Duration Energy Storage Project ("Suwannee").[1] My testimony provides an overview of BESS investments included in this proceeding and DEF's development process for ensuring that BESS investments are cost-effective solutions that benefit DEF customers. I support the reasonableness of the proposed project costs and highlight the benefits associated with the proposed BESS projects.

**Q. Do you sponsor or co-sponsor any schedules of the Company's minimum filing requirements?**

A. Yes. I sponsor or co-sponsor the following Minimum Filing Requirements ("MFRs"): B-7, B-8, B-9, B-10, B-11, and B-13. These are true and accurate, subject to being updated during the course of this proceeding.

**Q. Have you included any exhibits to your testimony?**

A. No, I have not.

[1] The 2021 Settlement Agreement, approved by the Commission in Order No. PSC-2021-0202-AS-EI, 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 Mr. Brian Lloyd and Mr. Reginald Anderson. My testimony focuses on and supports the Suwannee Project.

**Q. Please summarize your testimony.**

A. My testimony addresses the storage projects for which DEF requests cost recovery approval in this proceeding. I outline the project scope, costs, benefits, and anticipated timeline for completion. In addition, I highlight the critical importance of battery energy storage as DEF and the industry transition to renewable energy resources. Storage is critical to balancing a grid and maintaining reliability with the addition of low-cost renewables. DEF and its customers benefit from the addition of flexible resources that can serve multiple grid functions across generation, transmission, and the distribution system. To that end, DEF requests cost recovery of these near-term, prudent proposed BESS solutions investments.

## II. Battery Energy Storage Projects

**Q. Please provide an overview of DEF's proposed BESS projects.**

A. DEF has included two BESS projects in this proceeding: (1) the Powerline BESS Project and (2) the Suwannee Project. The Powerline BESS project was developed following the identified need for a 100 MW two-hour duration BESS by the DEF Ten Year Site Plan. The Suwannee Project is a 5 MW, eight-hour duration BESS that was included as a part of the Company's Vision Florida pilot program.

**Q. Please discuss how BESS capabilities are vital to enabling DEF's transition to renewable energy generation.**

A. Utility-scale battery storage systems support the continued and increasing pace of connecting carbon-free intermittent resources to the grid by storing energy during times of

excess generation and shifting this energy to periods of greater customer demand. Battery storage systems can also rapidly change output, allowing the company to respond to rapid changes in intermittent resource output or loss of generation events. Real time balancing between load and generation is essential to maintain adequate system reliability.

DEF can schedule the discharge of energy storage during peak demand periods to provide system capacity and facilitate optimal dispatch of the other utility generation resources. Energy storage also provides other ancillary service benefits to the bulk power system through local frequency response and transmission voltage support.

As discussed throughout my testimony, the proposed BESS solutions included in this case are important tools that will help DEF navigate the renewable energy transition, while continuing to provide customers with safe and reliable service.

**Q. Please describe the Powerline BESS Project.**

A. The Powerline BESS Project is a 100-MW lithium-ion energy storage project with a 2-hour duration maintained over the asset life. The Powerline BESS is located adjacent to the existing Powerline substation in Citrus County, Florida, where it will interconnect.

**Q. How do customers benefit from the proposed Powerline BESS Project?**

A. The Powerline BESS Project will serve DEF and its customers by providing bulk system benefits, including energy arbitrage, ancillary services, and bulk storage. The Powerline project will be dispatched to provide production cost benefits across the asset's life. The

project provides the system with a fast-ramping resource that can supplement the response of other fleet generation assets. The energy storage provided by this project can respond immediately and does not have start times or minimum run times like thermal generation facilities. The Powerline battery can also be utilized to shift energy from periods of lower system cost to higher system cost providing fuel savings to customers.

Importantly, DEF developed the Powerline BESS Project in a manner that minimizes costs and maximizes economies of scale. The Powerline BESS Project leverages existing infrastructure such as the existing utility land, the adjacent substations and road, and potentially stormwater retention facilities.

**Q. What is the estimated project cost and projected in-service date for the Powerline BESS Project?**

A. The estimated project cost is $164.5 million, and the projected in-service date is March 1, 2027, as shown on MFR Schedule B-13.

**Q. How did DEF develop cost estimates for the Powerline BESS Project?**

A. For the Powerline BESS Project, DEF first conducted an engineering study to determine the project requirements. This study calculated the required energy storage asset size to meet the system needs including capacity, duration, and asset life. The engineering analysis calculated the beginning of life energy storage capacity required to sustain the asset life. DEF then utilized the results of this study to estimate the total cost of the project in an industry benchmarked cost estimating tool. DEF benchmarked inputs to this tool against

previous projects. In addition, DEF plans to competitively bid the major components and construction of the projects for the benefit of customers.

**Q. Please describe how DEF identified and selected the Powerline BESS Projects.**

A. DEF considers several factors during project evaluation, such as cost-effective interconnection to the grid, environmental impacts, constructability of the site, development status and schedule, overall costs, quality/type of materials, project location, zoning entitlements, experience and competencies of the developer, and construction schedule. As explained more fully in Company witness Mr. Benjamin Borsch's testimony, the DEF Ten Year Site Plan identified the need for a 100 MW/200 MWH battery storage system. DEF reviewed its system for cost-effective siting locations for the energy storage. DEF identified the Powerline location, because it is one of the few locations within the DEF service territory eligible for the Inflation Reduction Act's ("IRA") Energy Community tax credit. The substation had spare capacity to accommodate interconnection of the energy storage facility. The Powerline location is also located near DEF's Citrus and Crystal River generation stations.

**Q. Please describe the Suwannee Project.**

A. The Suwannee Project is a non-lithium electrochemical battery. This asset will deploy a Sodium Sulfur ("NaS") technology to create a long-duration (8 hour) energy storage asset. The equipment capacity will be 5 MW/40 MWh. This system will interconnect at the existing Suwannee Combustion Turbine generating site in Suwannee County, Florida.

**Q. How do customers benefit from this project?**

A. This asset will serve DEF customers by providing system benefits, including energy arbitrage, ancillary services (i.e., system ramping, load following, contingency reserves), and bulk storage. The Suwannee Project will test the capability for battery technology to provide a future long-duration storage solution to better integrate and enable a renewable energy transition in a cost-effective and reliable manner. This project will provide opportunities to test flexibility, reliability, and integration with existing Duke Energy systems, including plant controls, Energy Management Systems, protection and controls systems, and metering. This pilot testing will enable the Company to better select required storage assets in the future.

**Q. What is the estimated project cost and what is the projected in-service date?**

A. The estimated project cost is $29.8 million, and the projected in-service date is first quarter 2025.

**Q. How did DEF develop cost estimates for the Suwannee Project?**

A. For the Suwannee Project, DEF conducted an RFP to receive firm quotes from a variety of non-Lithium long-duration energy storage technologies. Following selection of the NaS technology, the Company solicited bids from multiple engineering and construction firms to build the project. DEF has also estimated internal costs based on experience from previous projects and utilized the interconnection study cost estimates. DEF developed the cost estimate based on these combined project costs.

**Q. Please describe how DEF identified and selected the Suwanee Project.**

A. DEF considered several factors during project evaluation, such as cost-effective interconnection to the grid, environmental impacts, constructability of the site, development status and schedule, overall costs, quality/type of materials, project location, zoning entitlements, experience and competencies of the developer, and construction schedule. The existing Suwannee Generation station contains maintenance facilities and Company personnel. The location is also in a region of DEF's service territory experiencing a large growth of transmission-connected solar generation facilities, allowing the facility to support the integration of intermittent solar energy using long duration energy storage.

## III. Project Cost Savings

**Q. Does DEF include assumed benefits from the IRA in its pricing models?**

A. Yes. As discussed in further detail in the direct testimony of Company witness Mr. John Panizza, DEF is evaluating ways to leverage tax credits from the IRA to maximize the benefits to customers. The project is also strategically sited within an Energy Community, which increases the total Investment Tax Credit the project will be eligible for.

**Q. Has DEF explored or adopted strategies to improve efficiencies and reduce development costs to customers?**

A. Yes. As described above, DEF is leveraging benefits from the IRA in order to maximize cost savings for customers. Additionally, Duke Energy identified existing utility owned land adjacent to substations as part of the project siting.

**Q. Does DEF believe that its battery energy storage development and procurement strategies are appropriate and reasonable?**

A. Yes.

## IV. Conclusion

**Q. Does this conclude your testimony?**

A. Yes.