DUKE ENERGY® FLORIDA

Dianne M. Triplett
Deputy General Counsel

July 31, 2018

**VIA ELECTRONIC FILING**

Ms. Carlotta Stauffer, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: *Duke Energy Florida, LLC's Petition for Limited Proceeding to Approve First Solar Base Rate Adjustment*; Docket No. _____

Dear Ms. Stauffer:

Enclosed for filing on behalf of Duke Energy Florida, LLC ("DEF") is DEF's Petition for Limited Proceeding to Approve First Solar Base Rate Adjustment, along with the following:

- Direct Testimony of Matthew G. Stout with Exhibit No. ___(MGS-1), redacted Exhibit No. ___(MGS-2), Exhibit No. ___(MGS-3), redacted Exhibit No. __(MGS-4), and Exhibit No. ___(MGS-5);
- Direct Testimony of Benjamin M. H. Borsch with Exhibit No. ___(BMHB-1), Exhibit No. ___(BMHB-2), Exhibit No. ___(BMHB-3) and Exhibit No. ___(BMHB-4); and
- Direct Testimony of Marcia Olivier with Exhibit No. ___(MO-1).

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.

Sincerely,

*/s/ Dianne M. Triplett*

Dianne M. Triplett

DMT/cmk
Enclosures

299 First Avenue North (33701) ▪ Post Office Box 14042 (33733) ▪ St. Petersburg, Florida
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**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

| | |
|---|---|
| In re: Duke Energy Florida, LLC's Petition for a limited proceeding to approve first solar base rate adjustment | Docket No.<br><br>Filed: July 31, 2018 |

**DUKE ENERGY FLORIDA, LLC'S PETITION FOR A LIMITED PROCEEDING TO APPROVE FIRST SOLAR BASE RATE ADJUSTMENT**

Duke Energy Florida, LLC ("DEF"), pursuant to Sections 366.076(1) and 366.06(3), Florida Statutes ("F.S."), Rule 28-106.201, Florida Administrative Code ("F.A.C."), and the 2017 Second Revised and Restated Settlement Agreement approved by the Florida Public Service Commission ("Commission") in Order No. PSC-2017-0451-AS-EU[1] (the "2017 Settlement"), hereby petitions the Florida Public Service Commission ("FPSC" or the "Commission") for a limited proceeding to approve DEF's first solar base rate adjustment. Specifically, pursuant to Paragraph 15 of the 2017 Settlement, DEF is authorized to request approval from the Commission, for cost recovery, up to 700 MW of solar generation during the term of the 2017 Settlement, and specifically up to 350 MW in 2019.

DEF presents two solar projects, the Hamilton Solar Power Plant ("Hamilton Project") and the Columbia Solar Power Plant ("Columbia Project"), for approval in this first group of projects filed pursuant to Paragraph 15. The Hamilton Project is expected to go into service in late 2018, and the Columbia Project will come into service in early 2020. As explained further below and in the supporting testimony filed with this Petition, DEF's solar projects meet the requirements set forth in the 2017 Settlement; namely, they are under the $1,650/kWac cap, they are cost effective, and their costs meet the reasonableness requirements set forth in the Paragraph 15(a). Accordingly, DEF respectively requests that its solar projects be approved for rate

[1] Docket No. 20170183-EI, issued on November 20, 2017.

recovery. At this time, DEF is not including tariff sheets to reflect the rate increase for the Hamilton Project, but as explained below, it will file tariff sheets in August 2018 to reflect both the Hamilton Project and the multi-year rate increase authorized by Paragraph 12(b) of the 2017 Settlement.

In support of this Petition, DEF states:

**Introduction**

1. DEF is a Florida limited liability company with headquarters at 299 1st Avenue North, St. Petersburg, Florida 33701. DEF is an investor-owned utility operating under the jurisdiction of this Commission pursuant to the provisions of Chapter 366, Florida Statutes, and is a wholly-owned subsidiary of Duke Energy Corporation. DEF provides generation, transmission, and distribution service to approximately 1.8 million retail customers in Florida.

2. Any pleading, motion, notice, order, or other document required to be served upon DEF or filed by any party to this proceeding should be served upon the following individuals:


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3. This Petition is being filed consistent with Rule 28-106.201, Florida Administrative Code. The agency affected is the Florida Public Service Commission, located at 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399. This case does not involve reversal or modification of an agency decision or an agency's proposed action. Therefore, subparagraph (c) and portions of subparagraphs (b), (e), (f), and (g) of subsection (2) of that rule are not applicable to this Petition. In compliance with subparagraph (d), DEF states that it is not known

at this time which, if any, of the issues of material fact set forth in the body of this Petition may be disputed by any others who may plan to participate in this proceeding.

**2017 Settlement Requirements and DEF's Proposed Solar Facilities**

4. Paragraph 15(a) of the 2017 Settlement authorizes the Company to seek Commission approval of up to 700 MW of solar projects during the term of the 2017 Settlement Agreement, provided that no rate adjustment for solar projects be implemented in 2018. The cost of the solar projects subject to Paragraph 15(a) of the 2017 Settlement shall be reasonable and cost effective, and the average cost of all projects submitted in a particular filing shall not exceed $1,650 per kilowatt alternating current ("kWac").

5. For projects not subject to the Power Plant Siting Act (i.e. less than 75 MW), Paragraph 15(c) of the 2017 Settlement obligates DEF to file a separate proceeding for approval of the solar projects and determination of the following issues: (a) the reasonableness and cost effectiveness of the solar generation projects (i.e., will the projects lower the projected system cumulative present value revenue requirement "CPVRR" as compared to such CPVRR without the solar projects); (b) the amount of revenue requirements; (c) and whether, when considering all relevant factors, DEF needs the solar project(s). DEF has filed this Petition for the purpose of resolving these three issues.

6. As explained further in the testimony of Matthew G. Stout, filed simultaneously with and incorporated by reference into this Petition, DEF is proposing two new solar facilities for approval in this first group. The first, the Hamilton Project, is a 74.9 MW facility located in Hamilton County, Florida, expected to go into commercial service in December 2018 at a cost of $113,143,609 or $1,511/kWac. The second project (Columbia) is a 74.9 MW facility located in Columbia County, Florida, expected to come online by early 2020. This facility is projected to

cost $109,463,984 or $1,461/kWac. The total MW for the first group of DEF's solar generation base rate adjustment is 149.8 MW.

7. The weighted average cost for the facilities in this filing is $1,486/kWac, which is below the $1,650/kWac cap set forth in the 2017 Settlement. Mr. Stout explains in his testimony the process the Company undertook to ensure that the project costs are reasonable. He also explains how DEF met the requirements in Paragraph 15(a) of the 2017 Settlement, that the selection of contractors and the procurement of equipment were obtained using a reasonable competitive solicitation process. Mr. Stout further explains how DEF considered buying out existing potential projects.

8. As explained in the testimony of Benjamin M. H. Borsch, filed simultaneously with and incorporated by reference into this Petition, the proposed solar projects in DEF's first group are cost-effective and needed. Specifically, the projects, when considered together, will lower DEF's CPVRR when compared to the CPVRR without the projects. Mr. Borsch also explains the benefits of fuel diversity and other attributes that contribute to the Company's need for the facilities.

9. The 2017 Settlement, specifically Paragraphs 15(e) and (f) contain detailed requirements as to the calculation of revenue requirements to implement the solar base rate adjustment. DEF's request complies with these requirements, as demonstrated in the testimony of Marcia Olivier, filed simultaneously with and incorporated by reference into this Petition. Applying the 2017 Settlement, DEF requests approval of $29.2 million in total annual revenue requirements associated with this first group of solar projects.

**Effective Date of Requested Changes**

10. The solar projects in the first group have differing commercial in-service dates. The revenue requirement for the Hamilton Project is $15.2 million. This would result in an estimated residential base rate impact of approximately $0.46 on a 1,000 kWh bill. DEF would request that it be allowed to increase base rates by this amount with the first billing cycle of January 2019, so that rates will increase after the December 2018 in-service date for the Hamilton Project. DEF is not filing tariff sheets with this Petition. DEF will be filing tariff sheets later in August 2018 to reflect both the rate increase for the Hamilton Project and the multi-year rate increase authorized by Paragraph 12(b) of the 2017 Settlement. DEF notes that the tariff sheets will also reflect the rate increases for the Citrus Combined Cycle Project approved by the Commission in Docket No. 20180084-EI. DEF is combining these rate increases into one tariff sheet filing to smooth the rate impact to customers and avoid the potential confusion of competing/multiple tariff sheets.

11. Given that the Commission's schedule may not permit the hearing in this matter to be set before the requested effective date of the tariff changes, DEF respectfully requests that the Commission treat its subsequent tariff filing under Section 366.06(3), Florida Statute's "file and suspend" provisions and allow the rates for the Hamilton Project to go into effect with the first billing cycle of January 2019, subject to refund, pending the outcome of the final hearing. If the commercial in-service date of the Hamilton Project is delayed, then the tariff would become effective with the first billing cycle after the Hamilton Project is placed in commercial service.

12. The revenue requirement for the Columbia Project is $14 million. The Columbia Project will not become commercially in-service until early 2020. DEF requests that the

Commission give its Staff authority to administratively approve those tariffs at a later date, before the expected in-service date.

**Conclusion**

WHEREFORE, DEF respectfully requests that the Commission enter an order approving the revenue requirements associated with the first group of its solar projects, as presented in this filing, accept its tariff filing regarding the Hamilton Project and the multi-year rate increase to be made later in August 2018, and provide its Staff authority to administratively approve the tariff sheets for the Columbia Project at the appropriate time.

Respectfully submitted,

*s/Dianne M. Triplett*

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**IN RE: DUKE ENERGY FLORIDA, LLC'S PETITION FOR A LIMITED PROCEEDING TO APPROVE FIRST SOLAR BASE RATE ADJUSTMENT**

**FPSC DOCKET NO. _____**

# DIRECT TESTIMONY OF MATTHEW G. STOUT

**JULY 31, 2018**

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

A. My name is Matthew G. Stout. My business address is Mail Code ST-14A, 400 South Tryon Street, Charlotte, NC 28202.

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

A. I am employed by Duke Energy as a Managing Director of Business Development for Wind and Solar Development.

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

A. I am responsible for the development of new solar facilities in Florida on behalf of Duke Energy Florida, LLC ("DEF" or the "Company"). I lead a team that conducts solar development activities including project siting, land acquisition, resource assessment, permitting, obtaining interconnection rights, project layout and design, and arranging contracts for engineering, procurement and construction services, as well as originating, structuring, and executing transactions to acquire rights to existing solar development projects.

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

A. I received a BA degree in Economics from Connecticut College in 1998. I began my career as a management consultant for PricewaterhouseCoopers and later worked as an investment banking associate for Morgan Joseph. In 2007, I earned an MBA from the Ross School of Business and an MS in Environmental Policy from the School of Natural Resources at the University of Michigan with a focus on renewable energy. During graduate school, I managed business development at STM Power, Inc., a start-up manufacturer of renewable power generation equipment. Upon finishing graduate school, I joined Catamount Energy Corporation, a renewable energy development company, where I helped site new wind energy facilities across the United Sates. I joined Duke Energy in 2008 and have had several positions focused on renewable energy development, including Manager of Business Development for Solar and Wind, Managing Director of Project Acquisitions, and most recently Managing Director of Wind and Solar Development for the regulated utilities. In total, I have over 20 years of professional work experience, including 12 years of renewable energy business development.

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

A. My testimony is provided to support DEF's request for cost recovery approval of the first group of its solar power plants or projects authorized under the approved 2017 Second Revised and Restated Stipulation and Settlement Agreement ("2017 Settlement"), under Docket Number 20170183-EI. My testimony describes the solar power plants that DEF plans to build to serve its customers and includes an overview

of the process DEF has used to ensure that the project costs meet the requirements of the 2017 Settlement. My testimony supports the reasonableness of the proposed project costs.

**Q. Are you presenting exhibits in this proceeding?**

A. Yes. They consist of the following exhibits:

Exhibit No. ___ (MGS-1) Hamilton Solar Power Plant Site Plan;

Exhibit No. ___ (MGS-2) Hamilton Solar Power Plant Costs;

Exhibit No. ___ (MGS-3) Columbia Solar Power Plant Site Plan;

Exhibit No. ___ (MGS-4) Columbia Solar Power Plant Costs; and

Exhibit No. ___ (MGS-5) Cost Comparison To Other Utilities.

These exhibits are true and accurate.

**Q. Please describe DEF's methodology for selecting and evaluating potential projects.**

A. DEF is dedicated to providing solar energy in a cost-effective, reliable, and sustainable way. The 2017 Settlement paves the way for a smarter energy future. Pursuant to that settlement, DEF has committed to build or acquire up to 700 MW over the next four years (2018-2021). To meet this goal, DEF began a comprehensive review of greenfield sites (including sites that it already owns) and projects already in development in DEF's service territory. To date, we have screened over 120 properties for greenfield development and over 50 projects for acquisition that are already in development in DEF's service territory. We have selected sites that will

provide cost effective solar generation by screening on several key criteria such as, but not limited to: close proximity to DEF's transmission system; land holdings large enough to support utility scale solar projects; land that is disturbed or otherwise in agricultural use to minimize the need and costs for site clearing; land that avoids wetlands, flood zones and any environmentally sensitive habitat for plant and animal species of concern; contiguous property that is minimally divided by roads, streams, and easements; land that is not within heavily populated areas or that can be visually blend into the surrounding area through vegetative buffers; flat property with less than 5% slope in any area; land that has a suitable soil map with minimal to no known sink holes; local planning, zoning, and building authorities supportive of sustainable economic development, and for projects already under development, in addition to the criteria above, we look for projects with: favorable geotechnical studies showing soils capable of accepting steel pilings with minimal rejects; favorable environmental site assessments demonstrating minimal need for environmental mitigation; and advanced transmission interconnection studies demonstrating reasonable costs and system upgrades to connect the project to the grid. Ultimately, sites are selected that reasonably balance costs and risks to DEF's customers based on our experience while optimizing the 1) site specific solar generation forecasts; 2) the estimated total costs to acquire the land, to develop the site, and to construct the facility given the land conditions, permitting requirements, and interconnection costs; and 3) the costs to operate the system based on the quality of design, technology, and construction.

**Q. What solar projects is DEF proposing for approval in this filing?**

A. DEF is proposing the following projects: (a) the Hamilton Solar Power Plant ("Hamilton Project") and (b) the Columbia Solar Power Plant ("Columbia Project"). DEF notes that it will be making another filing in 2019 to present additional future projects.

**Q. Please describe the Hamilton Project.**

A. The Hamilton Project is a 74.9 MWac / 109.9 MWdc solar photovoltaic ("PV") facility located in Hamilton County, Florida. The project will utilize high-efficiency monocrystalline solar modules fixed to a single axis tracking racking system, yielding an expected capacity factor of approximately 30%. The project will use a mixture of 360-watt and 365-watt modules, procured from JA Solar (a top five ranked manufacturer by global shipping volume) and the single axis tracking racking system will be procured from Array Technologies, Inc., one of the leading tracker manufacturers. Inverters will be sourced from Toshiba Mitsubishi Electric Industries Corporation ("TMEIC"), a 50-50 joint venture between Toshiba and Mitsubishi Electric. TMEIC is a $2.1B company with installed solar inverter capacity in excess of 11 GW, including approximately 200 MW installed in the Carolinas. The facility will be constructed upon 565 acres of agricultural fields, where minimal site preparation is required (i.e. timbering, clearing, or grading). M. A. Mortenson Company ("Mortenson") was selected to perform final facility engineering, design and construction. Mortenson has proven to be a reliable Engineering, Procurement, and Construction ("EPC") partner, having constructed over 3,200 MW of solar energy facilities. The project anticipates receiving back-feed from the

transmission system by December 11, 2018 in order to start commissioning inverters to achieve placed in service by December 2018. My Exhibit No. __ (MGS-1) shows the location of the Hamilton Project and the general site plan.

**Q. What is the projected installed cost for the Hamilton Project?**

A. The projected cost of the Hamilton Project is $113,143,609 or $1,511/kWac. My Exhibit No. __ (MGS-2) shows the categories that make up the total installed cost.

**Q. Will the Hamilton Project qualify for the statewide property tax exemption for solar generation?**

A. No. The project applied for development zoning in Hamilton County in 2017 in order to meet the schedule for 2018 in-service. The property tax exemption is not available to projects that applied for comprehensive plan amendments or zoning permits on or before December 31, 2017.

**Q. Please describe the Columbia Project.**

A. The Columbia Project is a 74.9 MWac / 105.6 MWdc solar single-axis tracking PV project, yielding an expected capacity factor of approximately 31%, located in Columbia County, Florida. DEF entered into an agreement on November 20, 2017 with First Solar Development, LLC to purchase the project. The project is currently under development with the expectation to start engineering in Q2 2019 and construction in Q3 2019 with an expected placed in-service date in March 2020. Following an RFP, DEF executed a panel supply agreement with First Solar, Inc. for

competitively priced Series 6 (435W) thin film solar modules. These panels will be exempt from the recently passed solar tariff, but due to a backlog in orders will not be made available for shipment in time to support a 2019 in-service date for the Columbia Project. First Solar, Inc. is a vertically integrated solar PV manufacturer with over 17GW of solar panels installed worldwide. The project expects to purchase 25 3.36 MVA TMEIC inverters and 25 step up transformers. The Columbia Project will be constructed on approximately 580 acres that are under a long term lease. The site is bisected by a 69kV DEF transmission line that will allow the interconnection facilities to be co-located on the project site next to the generation substation. The site is relatively flat with minimal sloping that will allow for the use of a tracking system. The project has received the following grid interconnection studies: a Feasibility Study, a System Impact Study, and a Facilities Study, which is the final study before receiving a Large Generator Interconnection Agreement. The interconnection will include the installation of a 69 kV Columbia Switching Station with a 4- terminal configuration and associated transmission line work. A constraints analysis, habitat assessment, Phase 1 Environmental Site Assessment ("ESA") and wetlands delineation have been completed for the project. A full Phase II Cultural Resources Assessment Survey ("CRAS") was completed for the project in June 2018 with no findings of concern and is being sent to the State Historic Preservation Office for concurrence. All required pre-construction permits will be obtained prior to the start of construction; a Conditional Use permit was approved by the Columbia County Commissioners on July 26, 2018. My Exhibit No. __ (MGS-3) shows the location of the Columbia Project and the general site plan.

**Q. What is the projected installed cost for the Columbia Project?**

A. The projected cost of the Columbia Project is $109,463,984 or $1,461/kWac. My Exhibit No. __ (MGS-4) shows the categories that make up the total installed cost.

**Q. Will the Columbia Project qualify for the statewide property tax exemption?**

A. Yes.

**Q. Please describe the process DEF used to select the Hamilton and Columbia sites for development.**

A. DEF began a comprehensive review of greenfield sites (including sites that it already owns) and projects already in development in DEF's service territory. DEF identified projects already in the interconnection queue with favorable queue positions. DEF is willing to purchase solar projects in various stages of completion from third-party developers but projects must meet our standards of development and construction and fit into our strategic build plan. The primary factors when considering the purchase of a third-party developed site are interconnection queue position for transmission connection to the grid and expected grid upgrades, environmental impacts, constructability of the site, development status and schedule, overall cost, quality/type of materials (such as panel, inverter and racking, manufacturers), project location, zoning entitlements, experience and competencies of developer, and construction schedule. The Hamilton Project and the Columbia Project were selected from among over 50 projects that have been reviewed for acquisition of existing projects in DEF's

service territory. The projects were identified from publicly available information. Additional project details were submitted to DEF by the project developers upon execution of a confidentiality agreement. Projects that met first round screening criteria were asked to submit non-binding indicative proposals for the sale of the development assets to DEF. DEF developed a shortlist of proposals to advance into further negotiations, including those for the Hamilton Project and the Columbia Project. Additional projects for future development remain under consideration and new projects are frequently presented by third party developers to my team for review.

The Hamilton Project was acquired from a third-party developer due to its senior queue position, agricultural land with transmission access, and mid stage development status. DEF acquired the project from Tradewind Energy while it was still being developed and completed the remaining development tasks, including permitting, design, final interconnection rights, and contracting for engineering, procurement, and construction services.

DEF selected the Columbia Project due to its senior queue position, land holding with transmission access, and mid stage development status. DEF agreed to acquire the project from First Solar, that is being developed by Core Solar, LLC, once all project development milestones are achieved and, separately, agreed to acquire First Solar thin film solar panels for the project. The site has no sensitive habitat or cultural concerns and all consultations with the appropriate agencies have occurred. The Columbia project has a finalized Facilities Study with a draft LGIA, as well as a Conditional Use Permit approved by Columbia County's Board of Commissioners.

**Q. Please describe the process DEF used to contract for the construction of the Hamilton Project and the Columbia Project.**

A. DEF conducted a competitive RFP (Request For Proposals) process to select the EPC contractor for the Hamilton Project and the Columbia Project. DEF administered each RFP to ensure a fair and transparent process was used for all communication, evaluation and selection. After qualification of EPC contractors, four high quality EPC contractors were invited to provide bids to provide engineering, design, procurement and construction services for the Hamilton Project, and five high quality EPC contractors were invited to bid for the Columbia Project. Bidders were provided with all relevant site investigation and design criteria documents applicable to the project. Bidders were instructed to comply with all company design and construction policies. Bids were evaluated on bidder experience, price, schedule, design, risk and ability to deliver the project in a safe, reliable and cost-effective manner.

As a result of these evaluations, for the Hamilton Project, Mortenson was selected as the most cost-effective and highest value supplier, and the parties executed an EPC Agreement.

For the Columbia Project, based on the evaluation results, DEF created a shortlist of final bidders. These finalists were asked to provide updated bids in June 2018 for the final costs estimates for this filing. DEF will begin contract negotiations with these bidders this year and select a final EPC company before the start of construction in 2019.

**Q. Why did DEF enter long-term leases for the Hamilton Project and the Columbia Project, rather than purchasing the property?**

A. More generally, when there is an option to purchase versus enter into a long-term lease, DEF evaluates the net present value ("NPV") of the costs of each option over the life of the project and chooses the least cost option on a present value basis. With respect to the Hamilton Project and the Columbia Project, the developers had already signed long term leases with the landowners with rents priced in line with the current market (at terms that match or exceed the useful life of the facilities), so DEF had no ability to purchase those properties. Given the overall value of these projects to DEF's customers, DEF believes it is prudent to move forward with long term leases for these projects.

**Q. What is the weighted average cost for the two projects described above?**

A. The weighted average cost for the two projects is $1,486 $/kWac.

**Q. Your costs are different from recent costs filed by other utilities in Florida. Can you explain the reasonableness of the differences?**

A. Yes. As required by Paragraph 15(a) of the 2017 Settlement, DEF has reviewed publicly available information from Florida Power & Light Company's ("FPL") solar base rate adjustment filing in their 2017 and 2018 fuel docket and Tampa Electric Company's ("Tampa Electric") solar base rate adjustment filing in Docket Number 20170260-EI and Docket Number 20180133-EI. My Exhibit No. __ (MGS-5) shows how the Hamilton Project and Columbia Project compare to costs filed by other

utilities, where such information was publicly available to DEF. Generally, the costs for Hamilton Project and Columbia Projects are in line with those filed by other utilities while being designed to achieve higher Net Capacity Factors[1] than those reported by other utilities in Florida. DEF also notes that, as explained above, it competitively solicited all aspects of the projects and therefore its costs are reasonable, cost effective, and at market.

**Q. Please describe the impacts of the solar tariff/steel tariff on the solar panels or other equipment used in these projects.**

A. The solar tariff added 30% to the cost of manufacturing of the JA Solar panels that will be used at the Hamilton Project. The First Solar panels to be used at the Columbia Project are exempt from the solar tariff due to their thin film design. The steel tariff added 25% to cost of steel used in the racking system for the Hamilton Project. However, based on our negotiations with the project's EPC provider some of this added cost will be borne by its suppliers and therefore not included in the agreed-to EPC contract price. The pricing we received from EPC firms for the Columbia Project included a similar cost sharing element due to the steel tariff. While the solar and steel tariffs have negatively impacted pricing, overall the project cost for the Hamilton Project and Columbia Project are reasonable and within the cap set forth in the 2017 Settlement.

[1] Net Capacity Factor is the ratio of the net electricity generated, for the time considered, to the energy that could have been generated at continuous full-power operation during the same period. For solar plants, higher Net Capacity Factors are most often obtained by: increasing the DC/AC ratio, use of tracking systems in place of fixed-tilt racking, and locating plants in areas with greater solar resource.

**Q. Are the projected costs for the solar projects described in your testimony eligible for cost recovery under the 2017 Settlement?**

**A.** Yes. As demonstrated above, DEF utilized a reasonable competitive process to select its contractors and to procure equipment and material. Its costs are reasonable and within the strict $1,650/kWac cap set forth in the 2017 Settlement. DEF reasonably considered buying out projects in various stages of development. Mr. Borsch will demonstrate the cost effectiveness of, and the need for, these solar projects, as required by the 2017 Settlement.

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

A. Yes.

**Hamilton Project**
**Hamilton County, Florida**
**Drawing Title: General Arrangement Detail**

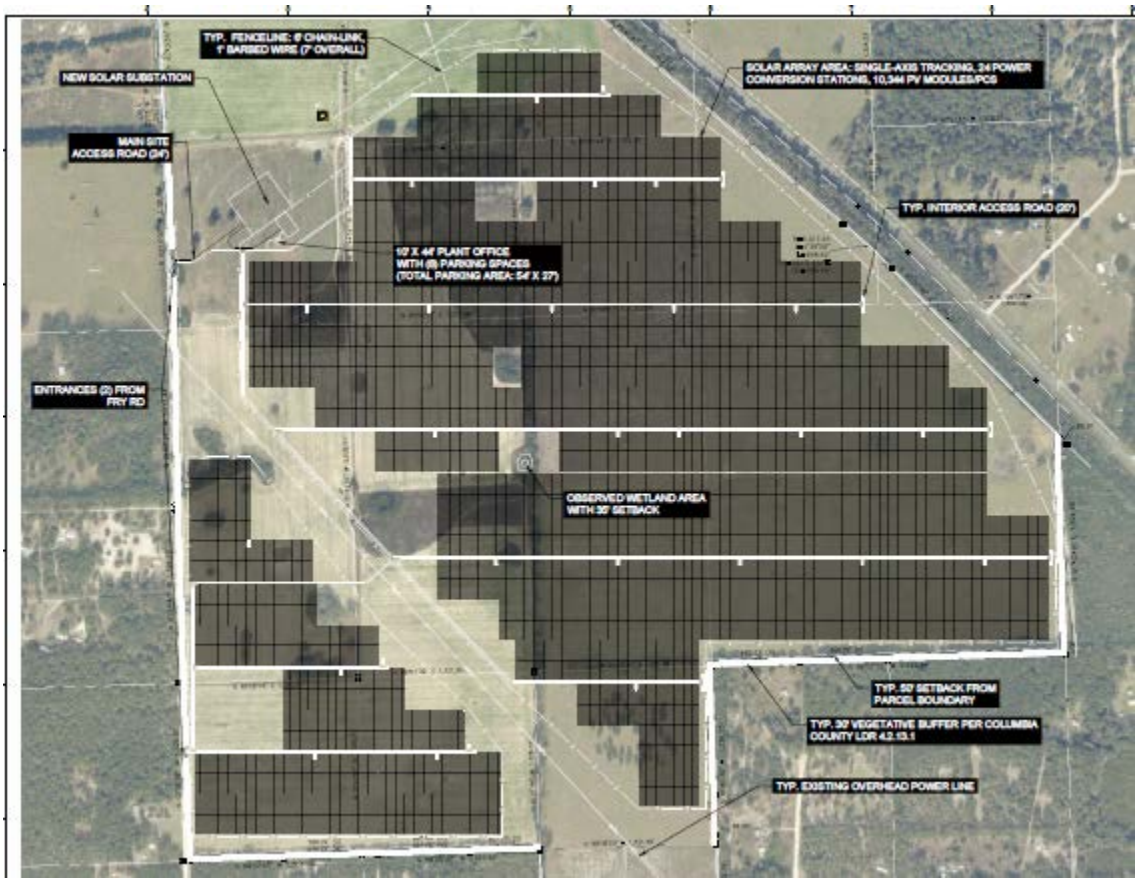
**REDACTED**

# Hamilton Project Estimated Installed Cost by Category

| Estimated Costs ($MM) | |
|---|---|
| Project Output (MW-ac) | 74.9 |
| Major Equipment[1] | [redacted] |
| Balance of System[2] | [redacted] |
| Construction Management | 1.1 |
| Development and Permitting[3] | 5.9 |
| Transmission Interconnect[4] | 0.1 |
| Total Installed Cost | $113.1 |
| AFUDC | 0.0 |
| Total with AFUDC | $113.1 |
| Total ($kW-ac) | 1511 |

1. Includes equipment such as solar panels and project transformer, and any other equipment that was not included in EPC contract.
2. Includes remaining equipment such as racking, posts, inverters, and collection cables and EPC services.
3. Includes items such as lease rental payments during construction, legal fees, development costs, development fees, and title insurance.
4. Interconnection Customer charges identified in the Large Generator Interconnection Agreement.

**Columbia Project**
**Columbia County, Florida**
**Drawing Title: General Arrangement Detail**

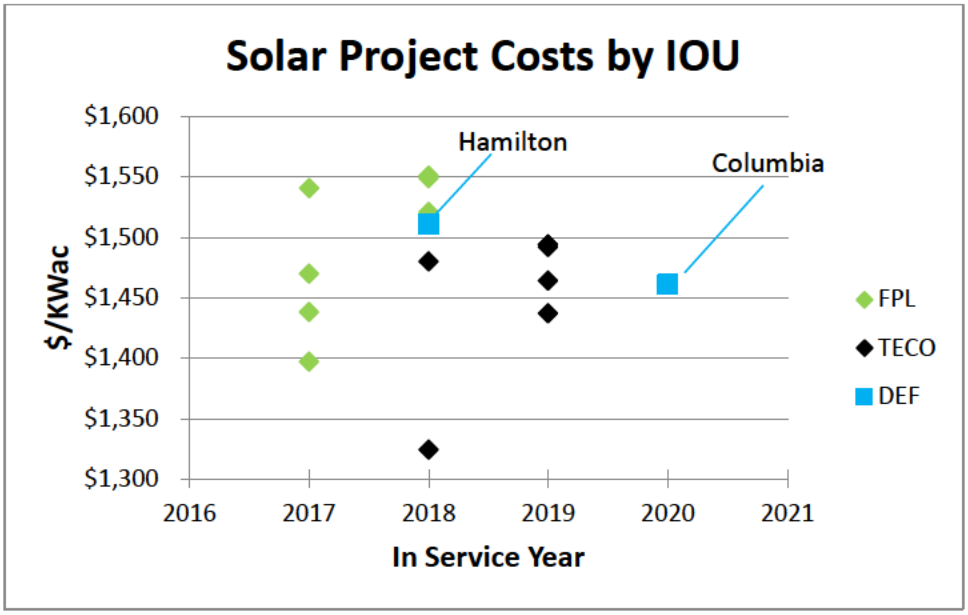


**REDACTED**

# Columbia Solar Project Estimated Installed Cost by Category

| Estimated Costs ($MM) | |
|---|---|
| Project Output (MW-ac) | 74.9 |
| Major Equipment[1] | [redacted] |
| Balance of System[2] | [redacted] |
| Construction Management | 1.1 |
| Development and Permitting[3] | 5.8 |
| Transmission Interconnect[4] | 0.1 |
| Total Installed Cost | $105.6 |
| AFUDC | 3.9 |
| Total with AFUDC | $109.4 |
| Total ($kW-ac) | 1461 |

1. Includes equipment such as solar panels and project transformer, and any other equipment that was not included in EPC contract.
2. Includes remaining equipment such as racking, posts, inverters, and collection cables and EPC services.
3. Includes items such as lease rental payments during construction, legal fees, development costs, development fees, and title insurance.
4. Interconnection Customer charges identified in the Large Generator Interconnection Agreement.




| IOU | Filing Year | Project | In Service Year | $/kWac[1] |
|---|---|---|---|---|
| FPL | 2017 | Coral Farms | 2017 | $1,438 |
| | 2017 | Horizon | 2017 | $1,470 |
| | 2017 | Wildflower | 2017 | $1,397 |
| | 2017 | Indian River | 2017 | $1,541 |
| | 2018 | Loggerhead | 2018 | $1,513 |
| | 2018 | Barefoot Bay | 2018 | $1,551 |
| | 2018 | Hammock | 2018 | $1,521 |
| | 2018 | Blue Cypress | 2018 | $1,549 |
| TECO | 2017 | Payne Creek | 2018 | $1,324 |
| | 2017 | Balm | 2018 | $1,480 |
| | 2018 | Lithia Sola | 2019 | $1,494 |
| | 2018 | Grange Hall | 2019 | $1,437 |
| | 2018 | Peace Creek | 2019 | $1,492 |
| | 2018 | Bonnie Mine | 2019 | $1,464 |
| | 2018 | Lake Hancock | 2019 | $1,494 |
| DEF | 2018 | Hamilton | 2018 | $1,511 |
| | 2018 | Colombia | 2020 | $1,461 |

[1] $/kWac is not a perfect metric due to the fact that not all utilities report what costs are included in this figure and each project will have a different system design (DC and AC sizing). A higher DC to AC ratio will result in higher costs on a $KW/ac basis but will produce more energy over the life of the project. In addition, installed costs for FPL's 2019 projects (filed in the 2018 fuel docket) were not individually reported, thus those projects are not included in the table.

**IN RE: DUKE ENERGY FLORIDA, LLC'S PETITION FOR A LIMITED PROCEEDING TO APPROVE FIRST SOLAR BASE RATE ADJUSTMENT**

**FPSC DOCKET NO. _____**

# DIRECT TESTIMONY OF BENJAMIN M. H. BORSCH

**JULY 31, 2018**

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

A. My name is Benjamin M. H. Borsch. My business address is Duke Energy Florida, LLC, 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 Florida, LLC ("DEF" or the "Company") as the Director, IRP & Analytics.

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

A. I am responsible for resource planning for DEF. I am responsible for directing the resource planning process in an integrated approach in order to find the most cost-effective alternatives to meet the Company's obligation to serve its customers in Florida. I oversee the completion of the Company's Ten-Year Site Plan ("TYSP") filed each April.

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

A. I received a Bachelor's of Science and Engineering degree in Chemical Engineering from Princeton University in 1984. I joined Progress Energy in 2008 supporting the project management and construction department in the development of power plant projects. In 2009, I became Manager of Generation Resource Planning for Progress Energy Florida, and following the 2012 merger with Duke Energy Corporation, I accepted my current position. Prior to joining Progress Energy, I was employed for more than five years by Calpine Corporation where I was Manager (later Director) of Environmental Health and Safety for Calpine's Southeastern Region. In this capacity, I supported development and operations and oversaw permitting and compliance for several gas-fired power plant projects in nine states. I was also employed for more than eight years as an environmental consultant with projects including development, permitting, and compliance of power plants and transmission facilities. I am a professional engineer licensed in Florida and North Carolina.

**Q.**

A. **Please give an overview of the Company's presentation in this filing.**

The Company is presenting testimony from three witnesses. My testimony will focus on the Company's demonstration of cost effectiveness for the proposed projects and their compliance with the terms set forth in DEF's 2017 Second Revised and Restated Settlement (the "2017 Settlement"). Two other witnesses will be presenting testimony. The testimony of Mr. Matthew G. Stout focuses on the characteristics of the solar projects presented for approval in this filing. It also provides details as to the Company's competitive solicitation processes, as well as the costs for the solar

projects. The testimony of Ms. Marcia Olivier presents the revenue requirements for the solar projects.

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

A. The purpose of my testimony is to present the results of the economic analysis which shows that DEF's proposed two solar projects presented in this filing are cost effective and consistent with the terms of the 2017 Settlement. My testimony covers several areas. First, I discuss details of the two specific solar projects covered by this filing. Second, I discuss the major assumptions and methodology used to perform the economic analysis. Third, I present the results of the economic analysis, demonstrating that the addition of the proposed solar projects is cost effective and consistent with the terms of the 2017 Settlement.

**Q. Are you presenting exhibits in this proceeding?**

A. Yes. They consist of the following exhibits which are attached to my testimony:

Exhibit No. __ (BMHB-1), "Solar Power Plant Assumptions;"

Exhibit No. __ (BMHB-2), "Load Forecast;"

Exhibit No. __ (BMHB-3), "Fuel Forecasts;" and

Exhibit No. __ (BMHB-4), "Cost Effectiveness (CPVRR) Analysis Results."

These exhibits are true and accurate.

**Q. Please summarize your testimony.**

A. In the 2017 Settlement, DEF is authorized to request cost recovery up to 700 MW of solar generation over the course of the 2017 Settlement period including one year following the expiration of the Term of the 2017 Settlement subject to the demonstration of cost effectiveness and other provisions. In this filing, DEF is proposing the construction and operation of 149.8 $MW_{ac}$ of solar PV generation, consisting of two separate projects of 74.9 $MW_{ac}$ each with in-service dates of late 2018 and early 2020, respectively. DEF performed an economic analysis and determined that these projects result in a reduction in the Cumulative Present Value Revenue Requirements ("CPVRR") to DEF customers for a total savings of approximately $130 million.

**Q. Please describe the solar projects DEF is presenting for approval.**

A. In this filing, DEF proposes two solar facilities. The first is a 74.9 MW facility in Hamilton County, called the Hamilton Solar Power Plant ("Hamilton Project") which will come into service in late 2018. Next is a 74.9 MW facility located in Columbia County which will be called the Columbia Solar Power Plant ("Columbia Project") and which will come into service in early 2020. Each project will generate approximately 195,000 MWhs per year. Key data regarding these projects are provided in Exhibit No. __ (BMHB-1). The projects are described in greater detail in Mr. Stout's testimony.

**Q. What will these proposed solar projects cost?**

A. DEF anticipates that the Hamilton Project will cost approximately $113.1 million to construct while the Columbia Project will cost approximately $109.5 million. These costs translate to a per kW cost of $1,511/kW$_{ac}$ for Hamilton and $1,461/kW$_{ac}$ for Columbia. This results in an average per kW cost of $1,486/kW$_{ac}$. The costs are described in more detail in Mr. Stout's testimony.

**Q. What does the 2017 Settlement require DEF to demonstrate to obtain cost recovery for the solar projects?**

A. DEF must demonstrate that the projected solar projects in each filing meet several required elements. The first demonstrates that the costs are reasonable and beneath a threshold cost of $1,650/kW$_{ac}$ for the weighted average construction cost of the projects in an individual filing. These elements are met, as described in Mr. Stout's testimony. DEF must also calculate the annual revenue requirements, as explained in Ms. Olivier's testimony. Finally, the solar projects must be limited to certain total MW size through one year following the Term of the 2017 Settlement, be cost effective on DEF's system, and DEF must demonstrate a need for the solar projects. The remainder of my testimony will focus on these last three requirements.

**Q. Do the proposed solar projects meet the MW limitations set forth in the 2017 Settlement?**

A. Yes. Paragraph 15(a) of the 2017 Settlement states that DEF may install up to 700 MW of solar generation over the term of the 2017 Settlement. Paragraph 15(d) provides cost recovery limitations on those projects such that the installations can be

spread across the term in a particular manner, at a rate of up to 175 MW per year except that unused portions of the total may carryover from year to year. Thus, up to a cumulative total of 175 MW may come online by the end of 2018, a cumulative total of up to 350 MW may come online by the end of 2019, a cumulative total of up to 525 MW may come online by the end of 2020, and the full 700 MW of solar projects may come online by the end of 2021 or within one year following the Term of the 2017 Settlement. The solar projects proposed here contribute 74.9 MW in 2018 and an additional 74.9 MW in 2020, so DEF is within the limitations set forth in the 2017 Settlement.

**Q. Why is DEF proposing projects in different years, and one in 2020 in this filing?**

A. In accordance with the terms of the 2017 Settlement, DEF has considered solar projects available both through DEF greenfield project development and through the acquisition of projects proposed by other developers. In this filing, DEF is proposing two projects acquired from other developers with various stages of project development already underway. DEF was able to acquire projects with advanced positions in the transmission interconnection queue and which DEF believes have good community acceptance and a straightforward path to receiving the necessary permits. In the case of the Columbia Project, DEF accepted a later in-service date in order to secure solar panels to be used in the project that are exempt from the import tariff.

**Q. Will DEF be proposing projects to come into service in 2019?**

A. Yes. DEF expects that in a future filing, DEF will propose additional solar projects to come into service in 2019.

**Q. Are the proposed solar projects cost effective?**

A. Yes. As explained below, DEF analyzed the total system cost of the DEF system with the projects as compared to the total DEF system costs without the projects, and found that the solar projects as proposed reduce the total system cost and are thus cost effective for DEF's customers.

**Q. How did DEF evaluate the cost effectiveness of the solar projects?**

**A.** DEF calculated the cost effectiveness in the same manner that it performs cost effectiveness evaluations of numerous projects including the development of the Ten-Year Site Plan. DEF calculates the total system cost projected over the life of the solar projects for a scenario with the solar projects and compares it to the total system cost calculated for a scenario without the solar projects. Lower total system costs for the scenario with the solar projects represents savings to DEF's customers. As with our Ten-Year Site Plan, this analysis is performed using the Planning and Risk suite of modeling tools to evaluate the production cost results. Project specific capital costs come from the project development teams and revenue requirements are then developed. Finally, project specific solar performance projections are developed using the PVSyst model and provided to the production cost model. This data becomes inputs to derive the system costs for the two cases developed with and without the solar projects in service.

In addition to the reference case assuming the base case fuel price projection and a carbon emission cost beginning in 2025, DEF also performed sensitivities based on low and high fuel price projections. Results of these differential CPVRR analyses, the difference between with and without the solar projects are shown below and in Exhibit No. __ (BMBH-4). The fuel price forecasts are shown in Exhibit No. __ (BMHB-3) attached to this testimony.

**Q. Please describe the major assumptions used in developing the CPVRR analyses.**

A.

- Load Forecast – The analysis uses DEF's most recent official load forecast developed in the fall of 2017 and presented as the base case load forecast in the DEF 2018 Ten-Year Site Plan ("TYSP") filed with the commission in April 2018. This load forecast is attached as Exhibit No. __ (BMHB-2).
- Fuel Price Forecast – The reference case analyses use DEF's most recent published fuel price forecast also utilized in DEF's 2018 TYSP. The base case fuel price forecast was developed using short-term and long-term spot market price projections from industry-recognized sources. The base cost for coal is based on the existing contracts and spot market coal prices and transportation arrangements between DEF and its various suppliers. For the longer term, the prices are based on spot market forecasts reflective of expected market conditions. Oil and natural gas prices are estimated based on current and expected contracts and spot purchase arrangements as well as near-term and long-term market forecasts. Oil and natural gas commodity prices are driven primarily by open market forces of supply and demand. Natural gas firm transportation cost is

determined primarily by pipeline tariff rates. For the low and high fuel price scenarios, DEF developed ranges of natural gas and coal prices around the reference forecast based on the range of prices seen in the Energy Information Administration's high price (Low Oil and Gas Resource and Technology Case) and low price (High Oil and Gas Resource and Technology Case) forecasts.

- $CO_2$ Emissions Price Forecast – The $CO_2$ allowance price projections used in this filing are also DEF's latest projections used in the development of the 2018 TYSP. DEF's price projections are a proxy for regulations consistent with a goal to reduce $CO_2$ emissions 40% by 2030.

**Q. Are there differences between the load and resource plan presented here and that presented in the DEF 2018 Ten-Year Site Plan?**

**A.** Yes. Some updates which have occurred in the period since the development of the Ten-Year Site Plan are captured in the modeling for this filing. Specifically, these include the termination of certain contracts to purchase power from qualifying facilities. As I discussed earlier, the fundamental assumptions including the load forecast, fuel, commodity, emissions and electricity price forecasts are all those used in the Ten-Year Site Plan.

**Q. What are the results of DEF's cost effectiveness evaluation for these projects?**

A. DEF has found that the projects are cost effective for its customers. The total system costs calculated over the project lives when including the projects in the DEF resource plan are lower when compared to the total system costs excluding the

projects. The net results of this analysis (system costs with the projects minus system costs without the projects) are summarized in the table below and in Exhibit No. __ (BMHB-4).

CPVRR Net Cost / (Savings) of Proposed Solar Projects
$ Millions (2018)

| Low Fuel Sensitivity | Base Case Fuel | High Fuel Sensitivity |
|---|---|---|
| (98) | (130) | (205) |

**Q. What benefits do the proposed solar facilities bring to DEF's system and customers?**

A. The primary purpose of the proposed DEF solar projects is to provide customers with cost-effective, clean, renewable energy. These large scale solar projects and additional future projects to be filed under the 2017 Settlement will diversify DEF's fuel mix with dependable energy, and provide firm summer capacity, helping to meet DEF's needs for future capacity and satisfy DEF's need for future generation capacity.

**Q. Given all these benefits, does DEF have a need for these solar projects?**

A. Yes. DEF has a need for cost-effective clean generation that will diversify its fuel mix, and defer the need for future gas-fired generation.

**Q. Should the Commission approve DEF's request for approval of this first group of solar projects?**

A. Yes. As demonstrated above, these solar projects are cost effective and will provide DEF's customers with additional 149.8 MW of clean, reliable, renewable energy to meet its needs.

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

A. Yes.

Solar Power Plant Assumptions

| Solar Energy Centers | In-service date | Name Plate Capacity (Mwac) | Projected 1st Year Net Capacity Factor | Capital Cost ($M) | Capital Cost ($/KWac) |
|---|---|---|---|---|---|
| Hamilton | Dec-18 | 74.9 | 29.7% | $113.14 | $1,511 |
| Columbia | Mar-20 | 74.9 | 30.8% | $109.46 | $1,461 |

Load Forecast

| Year | Summer Firm Peak MW | Winter Firm Peak MW | Net Energy for Load Mwh |
|---|---|---|---|
| 2018 | 8,757 | 9,089 | 43,060,362 |
| 2019 | 9,043 | 9,131 | 43,331,445 |
| 2020 | 9,057 | 9,390 | 44,063,184 |
| 2021 | 8,990 | 8,905 | 44,555,346 |
| 2022 | 9,065 | 9,043 | 45,087,702 |
| 2023 | 9,150 | 9,119 | 45,514,909 |
| 2024 | 9,254 | 9,197 | 46,057,439 |
| 2025 | 9,336 | 9,212 | 46,475,294 |
| 2026 | 9,419 | 9,332 | 46,889,894 |
| 2027 | 9,505 | 9,394 | 47,315,866 |
| 2028 | 9,603 | 9,429 | 47,859,625 |
| 2029 | 9,694 | 9,485 | 48,259,977 |
| 2030 | 9,758 | 9,540 | 48,638,963 |
| 2031 | 9,738 | 9,435 | 48,910,969 |
| 2032 | 9,829 | 9,566 | 49,390,290 |
| 2033 | 9,914 | 9,629 | 49,749,798 |
| 2034 | 9,993 | 9,685 | 50,119,774 |
| 2035 | 10,069 | 9,741 | 50,486,350 |
| 2036 | 10,154 | 9,819 | 50,982,843 |
| 2037 | 10,233 | 9,870 | 51,318,031 |
| 2038 | 10,307 | 9,928 | 51,682,750 |
| 2039 | 10,384 | 9,991 | 52,066,591 |
| 2040 | 10,477 | 10,075 | 52,619,534 |
| 2041 | 10,567 | 10,150 | 53,024,619 |
| 2042 | 10,652 | 10,153 | 53,470,350 |

# Fuel Forecasts

| Fuel Mid Price Forecast (2018 TYSP) | | | |
|---|---|---|---|
| Year | Base Cost Regular Supply Z3 ($/MMBTU) | CRN Coal ($/MMBTU) | Distillate Oil ($/MMBTU) |
| 2018 | 3.11 | 1.99 | 12.03 |
| 2019 | 2.94 | 2.04 | 11.90 |
| 2020 | 2.88 | 2.10 | 11.88 |
| 2021 | 2.87 | 2.11 | 12.14 |
| 2022 | 2.89 | 2.25 | 12.46 |
| 2023 | 3.02 | 2.47 | 13.22 |
| 2024 | 3.35 | 2.67 | 14.29 |
| 2025 | 3.66 | 2.91 | 15.46 |
| 2026 | 3.91 | 3.17 | 16.68 |
| 2027 | 4.25 | 3.34 | 17.98 |
| 2028 | 4.49 | 3.37 | 18.79 |
| 2029 | 4.79 | 3.47 | 19.48 |
| 2030 | 5.07 | 3.56 | 20.06 |
| 2031 | 5.30 | 3.66 | 20.48 |
| 2032 | 5.46 | 3.76 | 20.90 |
| 2033 | 5.72 | 3.87 | 21.33 |
| 2034 | 6.01 | 3.97 | 21.77 |
| 2035 | 6.21 | 3.91 | 22.22 |
| 2036 | 6.58 | 3.99 | 22.77 |
| 2037 | 6.77 | 4.08 | 23.34 |
| 2038 | 7.08 | 4.19 | 23.92 |
| 2039 | 7.23 | 4.31 | 24.52 |
| 2040 | 7.44 | 4.43 | 25.14 |
| 2041 | 7.63 | 4.54 | 25.76 |
| 2042 | 7.82 | 4.66 | 26.41 |
| 2043 | 8.01 | 4.77 | 27.07 |
| 2044 | 8.21 | 4.89 | 27.75 |
| 2045 | 8.42 | 5.02 | 28.44 |
| 2046 | 8.63 | 5.14 | 29.15 |
| 2047 | 8.84 | 5.27 | 29.88 |
| 2048 | 9.07 | 5.40 | 30.63 |
| 2049 | 9.29 | 5.54 | 31.39 |
| 2050 | 9.52 | 5.67 | 32.18 |

| Fuel High Price Forecast (2018 TYSP) | | | |
|---|---|---|---|
| Year | Base Cost Regular Supply Z3 ($/MMBTU) | CRN Coal ($/MMBTU) | Distillate Oil ($/MMBTU) |
| 2018 | 3.11 | 1.99 | 12.03 |
| 2019 | 2.94 | 2.04 | 11.90 |
| 2020 | 3.01 | 2.29 | 11.88 |
| 2021 | 3.44 | 2.62 | 12.14 |
| 2022 | 4.11 | 3.02 | 12.46 |
| 2023 | 4.88 | 3.28 | 13.22 |
| 2024 | 5.59 | 3.34 | 14.29 |
| 2025 | 5.84 | 3.41 | 15.46 |
| 2026 | 5.92 | 3.50 | 16.68 |
| 2027 | 6.15 | 3.60 | 17.98 |
| 2028 | 6.48 | 3.63 | 18.79 |
| 2029 | 6.94 | 3.74 | 19.48 |
| 2030 | 7.29 | 3.85 | 20.06 |
| 2031 | 7.63 | 3.97 | 20.48 |
| 2032 | 7.88 | 4.08 | 20.90 |
| 2033 | 8.29 | 4.21 | 21.33 |
| 2034 | 8.83 | 4.33 | 21.77 |
| 2035 | 9.25 | 4.25 | 22.22 |
| 2036 | 9.83 | 4.34 | 22.77 |
| 2037 | 10.18 | 4.43 | 23.34 |
| 2038 | 10.64 | 4.55 | 23.92 |
| 2039 | 10.84 | 4.67 | 24.52 |
| 2040 | 11.20 | 4.81 | 25.14 |
| 2041 | 11.48 | 4.93 | 25.76 |
| 2042 | 11.76 | 5.05 | 26.41 |
| 2043 | 12.06 | 5.18 | 27.07 |
| 2044 | 12.36 | 5.31 | 27.75 |
| 2045 | 12.67 | 5.44 | 28.44 |
| 2046 | 12.98 | 5.58 | 29.15 |
| 2047 | 13.31 | 5.71 | 29.88 |
| 2048 | 13.64 | 5.86 | 30.63 |
| 2049 | 13.98 | 6.00 | 31.39 |
| 2050 | 14.33 | 6.15 | 32.18 |

| Fuel Low Price Forecast (2018 TYSP) | | | |
|---|---|---|---|
| Year | Base Cost Regular Supply Z3 ($/MMBTU) | CRN Coal ($/MMBTU) | Distillate Oil ($/MMBTU) |
| 2018 | 3.11 | 1.99 | 12.03 |
| 2019 | 2.94 | 2.04 | 11.90 |
| 2020 | 2.88 | 2.10 | 11.88 |
| 2021 | 2.87 | 2.11 | 12.14 |
| 2022 | 2.88 | 2.23 | 12.46 |
| 2023 | 2.91 | 2.42 | 13.22 |
| 2024 | 3.03 | 2.58 | 14.29 |
| 2025 | 3.13 | 2.77 | 15.46 |
| 2026 | 3.23 | 2.99 | 16.68 |
| 2027 | 3.41 | 3.14 | 17.98 |
| 2028 | 3.59 | 3.16 | 18.79 |
| 2029 | 3.77 | 3.24 | 19.48 |
| 2030 | 3.96 | 3.31 | 20.06 |
| 2031 | 4.12 | 3.39 | 20.48 |
| 2032 | 4.20 | 3.46 | 20.90 |
| 2033 | 4.34 | 3.55 | 21.33 |
| 2034 | 4.50 | 3.63 | 21.77 |
| 2035 | 4.63 | 3.58 | 22.22 |
| 2036 | 4.80 | 3.64 | 22.77 |
| 2037 | 4.89 | 3.71 | 23.34 |
| 2038 | 5.06 | 3.81 | 23.92 |
| 2039 | 5.17 | 3.90 | 24.52 |
| 2040 | 5.30 | 4.00 | 25.14 |
| 2041 | 5.43 | 4.10 | 25.76 |
| 2042 | 5.56 | 4.21 | 26.41 |
| 2043 | 5.70 | 4.31 | 27.07 |
| 2044 | 5.85 | 4.42 | 27.75 |
| 2045 | 5.99 | 4.53 | 28.44 |
| 2046 | 6.14 | 4.64 | 29.15 |
| 2047 | 6.30 | 4.76 | 29.88 |
| 2048 | 6.45 | 4.88 | 30.63 |
| 2049 | 6.61 | 5.00 | 31.39 |
| 2050 | 6.78 | 5.13 | 32.18 |

Cost Effectiveness (CPVRR) Analysis Results

| CPVRR Through Year 2050 2018$M | With Solar Cases - Without Solar Cases | | |
|---|---|---|---|
| | Low Fuel Prices | Mid Fuel Prices | High Fuel Prices |
| Hamilton | 153 | 153 | 153 |
| Columbia | 131 | 131 | 131 |
| Conventional Generation | (165) | (165) | (165) |
| Fuel Cost | (145) | (176) | (249) |
| Variable Costs | (30) | (29) | (29) |
| Environmental Costs without Carbon | (0) | (1) | (1) |
| **Total Solar Savings before CO2 Costs** | **(56)** | **(87)** | **(161)** |
| CO2 Cost | (41) | (44) | (45) |
| **CPVRR (Savings)** | **(98)** | **(130)** | **(205)** |

**IN RE: DUKE ENERGY FLORIDA, LLC'S PETITION FOR A LIMITED PROCEEDING TO APPROVE FIRST SOLAR BASE RATE ADJUSTMENT**

**FPSC DOCKET NO. _____**

# DIRECT TESTIMONY OF MARCIA OLIVIER

**JULY 31, 2018**

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

A. My name is Marcia Olivier. My business address is Duke Energy Florida, LLC, 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 Florida, LLC ("DEF" or the "Company") as Director of Rates and Regulatory Planning.

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

A. I am currently responsible for overseeing rate cases, reporting earnings surveillance results, and supporting various regulatory filings and initiatives, including the Company's filing for recovery of its investments in solar projects.

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

A. I hold a Bachelor of Science degree in Accounting and a Bachelor of Science degree in Finance from the University of South Florida and have almost 20 years of utility experience, primarily in the regulatory area.

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

A. Paragraph 15 of the 2017 Revised and Restated Settlement Agreement ("2017 Settlement") provides for solar base rate adjustments. Specifically, Paragraph 15.c. states:

> Solar generation projects not subject to the Florida Electrical Power Plant Siting Act (i.e., fewer than 75 MW), also will be subject to approval by the Commission as follows: (i) DEF will file a request for approval of the solar generation project in a separate docket; and (ii) the issues for determination are limited to: the reasonableness and cost effectiveness of the solar generation projects (i.e., will the projects lower the projected system cumulative present value revenue requirement "CPVRR" as compared to such CPVRR without the solar projects); the amount of revenue requirements; and whether, when considering all relevant factors, DEF needs the solar project(s). Any Party may challenge the reasonableness of DEF's actual or projected solar project costs. If approved, DEF will calculate and submit for Commission confirmation the base rate adjustment for each such solar project, consistent with Subparagraphs 15.e. and 15.f.

Matthew Stout will present direct testimony describing the solar projects and the reasonableness of the costs, and Benjamin Borsch will present direct testimony demonstrating the cost effectiveness of the solar projects. My testimony will provide

the annualized revenue requirements for these first solar projects. I will also present the process for submitting the customer rate impacts in a subsequent filing.

**Q. Have you prepared, or caused to be prepared under your direction, supervision, or control, exhibits in this proceeding?**

A. Yes. I am sponsoring the following exhibit:

Exhibit No. ___ (MO-1), "SoBRA First Year Annualized Revenue Requirement." This exhibit is true and accurate.

**Q. Has DEF calculated the revenue requirements for the solar projects consistent with the 2017 Settlement?**

A. Yes. Based on the cost information provided in Mr. Stout's testimony, I have calculated the annualized revenue requirements of the Hamilton Solar Power Plant ("Hamilton Project") to be $15.2 million and the Columbia Solar Power Plant ("Columbia Project") to be $14.0 million as shown in my Exhibit No. __ (MO-1). These amounts have been calculated in accordance with Paragraph 15.f. of the 2017 Settlement, which requires that the revenue requirements be "calculated using a 10.5% ROE and DEF's projected 13-month average capital structure for the first 12 months of operation, including all specific adjustments consistent with DEF's most recently filed December earnings surveillance report, and excluding the treatment of common equity and rate base (working capital) allowed in Paragraph 18 of the 2013 Settlement Agreement, and adjusted to include an ADIT proration adjustment consistent with 26 C.F.R. Section 1.167(l)-1(h)(6) and adjusted to reflect the

inclusion of investment tax credits on a normalized basis." Further, as required by Paragraph 12.c. of the 2017 Settlement, DEF has calculated the revenue requirements using the lower 21% federal income tax rate as a result of the 2017 Tax Cuts and Jobs Act. Given that the solar projects included in the first group have different in-service dates, DEF has calculated the revenue requirements separately. The Hamilton Project has an expected in-service date of December 2018 and a rate effective date of January 2019. The Columbia Project has an expected in-service date of March 2020 and a rate effective date of April 2020.

Q. **Does the 2017 Settlement provide for a true-up mechanism to be applied to SoBRA rates?**

A. Yes. Paragraph 15.g. of the 2017 Settlement states, "In the event that the actual capital expenditures are less than the approved projected costs, included in the petition for cost recovery and used to develop the initial base rate adjustment, the lower figure shall be the basis for the full revenue requirements and a one-time credit will be made through the CCR Clause. In order to determine the amount of this credit, a revised base rate adjustment will be computed using the same data and methodology incorporated in the initial base rate adjustment, with the exception that the actual capital expenditures will be used in lieu of the capital expenditures on which the Annualized Base Revenue Requirement was based. On a going-forward basis, base rates will be adjusted to reflect the revised base rate adjustment. The difference between the cumulative base revenues since the implementation of the initial base rate adjustment and the cumulative base revenues that would have resulted

if the revised base rate adjustment had been in-place during the same time period will be credited to customers through the CCR Clause with interest at the 30-day commercial paper rate as specified in Rule 25-6.109, F.A.C." Once the capital expenditures are final, if they are less than the amount approved by the Commission, then DEF will make a true-up filing to reduce base rates going forward and provide a refund through the CCR clause consistent with the provisions in Paragraph 15.g. of the 2017 Settlement.

**Q. Has DEF calculated the solar base rate adjustment factor consistent with the 2017 Settlement?**

A. Not at this time. DEF has other expected base rate increases at the same time as Hamilton Project's January 2019 base rate increase. DEF has tariff changes currently pending for the Citrus County combined cycle units approved in Docket No. 20180084-EI. DEF will also be filing tariff changes for the multi-year rate increase effective January 2019 pursuant to Paragraph 12.b. and 12.c. of the 2017 Settlement. DEF will calculate and submit for Commission confirmation the uniform percentage increase, base rate customer, demand and energy factors, and the tariff sheets, for the Hamilton Project upon filing the base rate factors for the multi-year increase, but no later than August 31, 2018. Since the Columbia Project will not be completed until early 2020, DEF will submit the uniform percentage increase, solar base rate customer, demand and energy factors, and tariff sheets for the Columbia Project at the earliest appropriate date considering other expected base rate filings prior to the Columbia Project's in-service date.

**Q. What is the estimated residential base rate impact of the Hamilton Project?**

A. The estimated residential base rate impact is approximately $0.46 on a 1,000 kWh bill. The tariff sheet reflecting the residential base rate impact will be updated and submitted for Commission confirmation with the uniform percentage increase, base rate customer, demand and energy factors, and the tariff sheets, for the Hamilton Project upon filing the base rate factors for the multi-year increase, but no later than August 31, 2018.

Q. **How will DEF notify the Commission of the commercial operation date of each solar facility?**

A. DEF will submit to the Commission a letter that declares the commercial operation date of each solar facility prior to any Solar base rate changes.

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

A. Yes.

**Duke Energy Florida, LLC**
**SoBRA First Year Annualized Revenue Requirement**
**($000)**



| | Description | Reference | Hamilton Project | Columbia Project |
|---|---|---|---|---|
| 1 | Jurisdictional Adjusted Rate Base | Page 2 | $ 107,820 | $ 104,314 |
| 2 | Rate of Return on Rate Base | Pages 3 & 4 | 6.450% | 6.570% |
| 3 | Net Operating Income Required | Line 1 x Line 2 | 6,954 | 6,853 |
| 4 | Net Operating Income Achieved | Page 2 | (4,377) | (3,532) |
| 5 | Net Operating Income Deficiency/(Excess) | Line 3 - Line 4 | 11,331 | 10,386 |
| 6 | Net Operating Income Multiplier | Note 1 | 1.344 | 1.344 |
| 7 | Revenue Requirement | Line 5 x Line 6 | $ 15,232 | $ 13,961 |

8 Note 1: Net Operating Income Multiplier is based on MFR C-44 in Docket No. 20090079, except federal tax rate changed to 21%.

**Duke Energy Florida, LLC**
**SoBRA First Year Annualized Revenue Requirement**
**($000)**



| | | Hamilton Project | | Columbia Project | | Jurisd. |
|---|---|---|---|---|---|---|
| | **Net Plant (13 month average):** | **Total Company** | **FPSC Jurisd.** | **Total Company** | **FPSC Jurisd.** | **Factor** |
| 1 | Solar Production Plant | $ 112,379 | $ 108,901 | $ 108,714 | $ 105,349 | 96.905% |
| 2 | Accumulated Reserve - Solar Production Plant | (1,873) | (1,815) | (1,812) | (1,756) | 96.905% |
| 3 | Transmission GSU | 765 | 741 | 750 | 727 | 96.905% |
| 4 | Accumulated Reserve - Transmission GSU | (7) | (7) | (7) | (7) | 96.905% |
| 5 | Net Plant | $ 111,264 | $ 107,820 | $ 107,645 | $ 104,314 | |
| | **Operating Expenses:** | **Total Company** | **FPSC Jurisd.** | **Total Company** | **FPSC Jurisd.** | |
| 6 | O&M | $ 1,427 | $ 1,383 | $ 1,195 | $ 1,158 | 96.905% |
| 7 | Depreciation Expense - Solar Production Plant | 3,746 | 3,630 | 3,624 | 3,512 | 96.905% |
| 8 | Depreciation Expense - Transmission GSU | 14 | 13 | 14 | 13 | 96.905% |
| 9 | Dismantlement | 197 | 191 | 212 | 205 | 96.905% |
| 10 | Property Insurance | 154 | 149 | 146 | 141 | 96.905% |
| 11 | Property Tax | 1,234 | 1,196 | 343 | 332 | 96.905% |
| 12 | Total Operating Expenses | $ 6,771 | $ 6,562 | $ 5,533 | $ 5,362 | |
| 13 | Jurisdictional Interest Expense | | 2,059 | | 1,857 | |
| | | | **FPSC Jurisd.** | | **FPSC Jurisd.** | |
| 14 | Operating Expenses | | $ (6,562) | | $ (5,362) | |
| 15 | Income Tax - Operating Expenses (Line 12 x tax rate) | | 1,663 | | 1,359 | |
| 16 | Income Tax - Interest Expense (Line 13 x tax rate) | | 522 | | 471 | |
| 17 | Jurisdictional Net Operating Income | | $ (4,377) | | $ (3,532) | |

($000)

# Hamilton Project

| | | System Per Sys Per Book | Proration Adjustment | System Per Books Adj'd | Retail Per Books | Pro Rata Adj | Specific Adj | Adjusted Retail | Cap Ratio | Cost Rate | Weighted Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Common Equity | $ 6,497,802 | $ 1,297 | $ 6,499,099 | $ 5,843,553 | $ (344,186) | $ (13,541) | $ 5,485,826 | 42.81% | 10.50% | 4.50% |
| 2 | Long Term Debt | 5,923,048 | 1,182 | 5,924,230 | 5,326,670 | (313,742) | | 5,012,928 | 39.12% | 4.78% | 1.87% |
| 3 | Short Term Debt | (25,016) | (5) | (25,021) | (22,497) | 1,325 | | (21,172) | -0.17% | 0.37% | 0.00% |
| 4 | Cust Dep Active | 207,911 | 41 | 207,952 | 207,952 | (12,248) | | 195,704 | 1.53% | 2.35% | 0.04% |
| 5 | Cust Dep InActive | 1,871 | 0 | 1,871 | 1,871 | (110) | | 1,761 | 0.01% | | |
| 6 | Invest Tax Cr | 72,692 | 15 | 72,706 | 65,372 | (3,850) | | 61,522 | 0.48% | 7.77% | 0.04% |
| 7 | Deferred Inc Tax | 2,790,966 | (2,530) | 2,788,436 | 2,507,174 | (147,673) | (281,529) | 2,077,973 | 16.22% | | |
| 8 | **Total** | $ 15,469,274 | $ - | $ 15,469,274 | $ 13,930,097 | $ (820,485) | $ (295,070) | $ 12,814,542 | 100.00% | | 6.45% |

**Proration Adjustment to Reflect Projected ADFIT Consistent with Projection Year**

| | | Month | ADIT Bal. | Deprec-Related ADFIT Bal. | Deprec-Related ADFIT Activity | Days to Prorate | Future Days in Period | Prorated Deprec-Related ADFIT Activity | Prorated Deprec-Related ADFIT Bal. |
|---|---|---|---|---|---|---|---|---|---|
| 9 | | Jan-19 | $ 2,808,835 | $ 1,439,242 | | | | | $ 1,439,242 |
| 10 | projected | Feb-19 | 2,807,224 | 1,447,358 | $ 8,116 | 31 | 335 | $ 7,449 | 1,446,691 |
| 11 | projected | Mar-19 | 2,807,464 | 1,455,183 | 7,824 | 28 | 307 | 6,581 | 1,453,272 |
| 12 | projected | Apr-19 | 2,811,149 | 1,462,752 | 7,569 | 31 | 276 | 5,724 | 1,458,996 |
| 13 | projected | May-19 | 2,807,580 | 1,469,922 | 7,170 | 30 | 246 | 4,832 | 1,463,828 |
| 14 | projected | Jun-19 | 2,803,672 | 1,476,641 | 6,719 | 31 | 215 | 3,958 | 1,467,786 |
| 15 | projected | Jul-19 | 2,799,048 | 1,483,498 | 6,857 | 30 | 185 | 3,476 | 1,471,262 |
| 16 | projected | Aug-19 | 2,793,718 | 1,489,622 | 6,124 | 31 | 154 | 2,584 | 1,473,845 |
| 17 | projected | Sep-19 | 2,788,484 | 1,495,512 | 5,890 | 31 | 123 | 1,985 | 1,475,830 |
| 18 | projected | Oct-19 | 2,783,384 | 1,501,153 | 5,641 | 30 | 93 | 1,437 | 1,477,267 |
| 19 | projected | Nov-19 | 2,779,367 | 1,506,468 | 5,316 | 31 | 62 | 903 | 1,478,170 |
| 20 | projected | Dec-19 | 2,778,055 | 1,511,250 | 4,781 | 30 | 32 | 419 | 1,478,589 |
| 21 | projected | Jan-20 | 2,714,575 | 1,516,124 | 4,874 | 31 | 1 | 13 | 1,478,603 |
| 22 | 13 Mo Avg Bal | | $ 2,790,966 | $ 1,481,133 | | 365 | | $ 39,361 | $ 1,478,603 |
| 23 | | | | | | | | 13 Mo Avg Bal | 1,481,133 |
| 24 | | | | | | | | Proration Adj. | $ (2,530) |

($000)

# Columbia Project

| | | System Per Sys Per Book | Proration Adjustment | System Per Books Adj'd | Retail Per Books | Pro Rata Adj | Specific Adj | Adjusted Retail | Cap Ratio | Cost Rate | Weighted Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Common Equity | $ 7,392,821 | $ 3,624 | $ 7,396,445 | $ 6,620,722 | $ (308,431) | $ (13,481) | $ 6,298,810 | 44.75% | 10.50% | 4.70% |
| 2 | Long Term Debt | 5,861,977 | 2,873 | 5,864,850 | 5,249,758 | (244,563) | | 5,005,194 | 35.55% | 4.91% | 1.74% |
| 3 | Short Term Debt | 453,865 | 222 | 454,087 | 406,463 | (18,935) | | 387,528 | 2.75% | 0.37% | 0.01% |
| 4 | Cust Dep Active | 207,911 | 102 | 208,013 | 208,013 | (9,690) | | 198,322 | 1.41% | 2.35% | 0.03% |
| 5 | Cust Dep InActive | 1,871 | 1 | 1,872 | 1,872 | (87) | | 1,785 | 0.01% | | |
| 6 | Invest Tax Cr | 178,168 | 87 | 178,256 | 159,560 | (7,433) | | 152,127 | 1.08% | 8.02% | 0.09% |
| 7 | Deferred Inc Tax | 2,696,823 | (6,910) | 2,689,913 | 2,407,801 | (112,169) | (261,695) | 2,033,937 | 14.45% | | |
| 8 | **Total** | $ 16,793,436 | $ - | $ 16,793,436 | $ 15,054,190 | $ (701,310) | $ (275,176) | $ 14,077,705 | 100.00% | | 6.57% |

**Proration Adjustment to Reflect Projected ADFIT Consistent with Projection Year:**

| | | Month | ADIT Bal. | Deprec-Related ADFIT Bal. | Deprec-Related ADFIT Activity | Days to Prorate | Future Days in Period | Prorated Deprec-Related ADFIT Activity | Prorated Deprec-Related ADFIT Bal |
|---|---|---|---|---|---|---|---|---|---|
| 9 | | Apr-20 | $ 2,722,879 | $ 1,559,767 | | | | | $ 1,559,767 |
| 10 | projected | May-20 | 2,724,152 | 1,573,532 | $ 13,765 | 30 | 336 | $ 12,671 | 1,572,438 |
| 11 | projected | Jun-20 | 2,724,257 | 1,587,142 | 13,611 | 31 | 305 | 11,373 | 1,583,811 |
| 12 | projected | Jul-20 | 2,723,539 | 1,600,707 | 13,565 | 30 | 275 | 10,220 | 1,594,031 |
| 13 | projected | Aug-20 | 2,722,387 | 1,613,417 | 12,711 | 31 | 244 | 8,497 | 1,602,528 |
| 14 | projected | Sep-20 | 2,721,421 | 1,625,842 | 12,425 | 31 | 213 | 7,251 | 1,609,779 |
| 15 | projected | Oct-20 | 2,720,591 | 1,637,948 | 12,106 | 30 | 183 | 6,070 | 1,615,848 |
| 16 | projected | Nov-20 | 2,720,516 | 1,649,561 | 11,613 | 31 | 152 | 4,836 | 1,620,684 |
| 17 | projected | Dec-20 | 2,722,831 | 1,660,803 | 11,242 | 30 | 122 | 3,758 | 1,624,442 |
| 18 | projected | Jan-21 | 2,631,943 | 1,672,421 | 11,617 | 31 | 91 | 2,896 | 1,627,338 |
| 19 | projected | Feb-21 | 2,635,598 | 1,690,053 | 17,633 | 31 | 60 | 2,898 | 1,630,237 |
| 20 | projected | Mar-21 | 2,640,427 | 1,707,453 | 17,400 | 28 | 32 | 1,525 | 1,631,762 |
| 21 | projected | Apr-21 | 2,648,160 | 1,724,709 | 17,257 | 31 | 1 | 47 | 1,631,810 |
| 22 | 13 Mo Avg Bal | | $ 2,696,823 | $ 1,638,720 | | 365 | | $ 72,043 | $ 1,631,810 |
| 23 | | | | | | | | 13 Mo Avg Bal | 1,638,720 |
| 24 | | | | | | | | Proration Adj. | $ (6,910) |