

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

In re: Petition for Determination )  
of Need for Citrus County Combined )  
Cycle Power Plant, by Duke Energy )  
Florida, Inc. )  
\_\_\_\_\_)

DOCKET NO. 140110-EI

FILED: August 4, 2014

**REDACTED**

**CALPINE CONSTRUCTION FINANCE COMPANY, L.P.'S  
FIRST REQUEST FOR CONFIDENTIAL CLASSIFICATION**

Calpine Construction Finance Company, L.P. ("Calpine"), by and through undersigned counsel and, pursuant to Rule 25-22.006, Florida Administrative Code ("F.A.C."), and Section 366.093, Florida Statutes ("F.S."), hereby requests confidential classification of certain portions of the pre-filed testimony of Calpine witness Todd Thornton and certain portions of the pre-filed testimony and exhibits of Calpine witness Paul Hibbard. In support of its request, Calpine states as follows:

1. On July 15, 2014, Calpine filed a Notice of Intent to Request Confidential Classification related to certain portions of the pre-filed testimony of Todd Thornton; and certain portions of the pre-filed testimony of Paul Hibbard and certain portions of Exhibits PJH-2, PJH-3, PJH-4, PJH-6, PJH-7a, PJH7b, and PJH-8 to Mr. Hibbard's testimony (collectively referred to as the "Confidential Testimony and Exhibits"). Accordingly, pursuant to Rule 25-22.006(3), F.A.C., this request is hereby

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2. The following exhibits are included and made a part of this request:

- a. Exhibit A includes a copy of the Confidential Testimony and Exhibits, on which all information that is entitled to confidential treatment under Florida law has been highlighted. Exhibit A is submitted separately in a sealed folder marked "CONFIDENTIAL."
- b. All information for which confidential treatment is sought has been redacted in Exhibit B, which is an edited and publicly available version of the Confidential Testimony and Exhibits.
- c. Exhibit C is a table containing the specific line and page reference of the selected items or sections of the Confidential Testimony and Exhibits for which confidential treatment is sought and, with regard to each document or discrete subsections thereof, references to the specific statutory basis or bases for the claim of confidentiality.
- d. Exhibit D is the affidavit of Todd Thornton, Senior Vice President, Origination and Development, of Calpine Corporation.

3. Section 366.093(1), F.S., provides that "any records received by the Commission which are shown to be proprietary confidential business information shall be kept confidential and shall be exempt from s. 119.07(1)." Section 366.093(3), F.S., defines proprietary confidential business information to mean information that (i) is intended to be and is treated as private confidential information by the company, (ii) because disclosure of the information would cause harm, (iii) to the company's business operations, and (iv) that has not been voluntarily disclosed to the public. Section 366.093(3)(d), F.S., further defines proprietary confidential business information as "information concerning bids or other contractual data, the disclosure of which would impair the efforts of the public utility or its affiliates to contract for goods or services on favorable terms." Additionally, section 366.093(3)(e) defines "information relating to competitive interests, the disclosure of which would impair the competitive business of the provider of the information" as proprietary confidential business information.

4. Calpine is requesting confidential classification of the Confidential Testimony and Exhibits because the Confidential Testimony and Exhibits contain proprietary and confidential competitive business information, including information concerning contractual data and competitively

sensitive commercial information and bidding data, the disclosure of which would harm or otherwise adversely impact Calpine's competitive business interests. Calpine has treated the Confidential Testimony and Exhibits as confidential and Calpine has not voluntarily disclosed the Confidential Testimony and Exhibits to the public.

5. Upon a finding by the Commission that the material in Exhibit A for which Calpine seeks confidential treatment is proprietary confidential business information within the meaning of Section 366.093(3), F.S., such information should not be declassified for a period of at least eighteen (18) months. Additionally, the material provided should be returned to Calpine as soon as the information is no longer necessary for the Commission to conduct its business, pursuant to Section 366.093(4), F.S.

WHEREFORE, for the above and foregoing reasons, as more fully set forth in the supporting materials and affidavit included herewith, Calpine Construction Finance Company, L.P. respectfully requests that its Request for Confidential Classification be granted.



Respectfully submitted this 4th day of August, 2014.



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I HEREBY CERTIFY that a true and correct copy of the foregoing was furnished to the following, by electronic delivery, on this 4th day of August, 2014.

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DOCKET 140110-EI

IN RE: PETITION FOR DETERMINATION OF  
NEED OF CITRUS COUNTY COMBINED CYCLE  
POWER PLANT, BY DUKE ENERGY FLORIDA,  
INC.

CALPINE'S FIRST REQUEST FOR  
CONFIDENTIAL CLASSIFICATION

EXHIBIT A

**EXHIBIT  
B**

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

**In re: Petition for Determination  
Of Need for Citrus County  
Combined Cycle Power Plant, by  
Duke Energy Florida, Inc.**

**DOCKET NO. 140110-EI  
Submitted for filing:  
July 14, 2014**

REDACTED

**DIRECT TESTIMONY**

**OF**

**TODD THORNTON**

**ON BEHALF OF**

**CALPINE CONSTRUCTION FINANCE COMPANY, L.P.**

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**IN RE: PETITION FOR DETERMINATION OF NEED FOR THE  
CITRUS COUNTY COMBINED CYCLE POWER PLANT,  
BY DUKE ENERGY FLORIDA, INC.  
FPSC DOCKET NO. 140110-EI**

**DIRECT TESTIMONY OF TODD THORNTON**

1   **I.   Introduction**

2   **Q: Please state your name, business address, and occupation.**

3   A: My name is Todd Thornton. My business address is 717 Texas Avenue, Houston,  
4       Texas 77002. I am Senior Vice President, Origination and Development for Calpine  
5       Corporation (“Calpine”).

6

7   **Q: On whose behalf are you testifying in this proceeding?**

8   A: I am testifying on behalf of Calpine Construction Finance Company, L.P., a  
9       subsidiary of Calpine Corporation (collectively “Calpine”), in support of its  
10      intervention in Duke Energy Florida’s (“Duke”) Petition for Determination of Need  
11      for Citrus County Combined Cycle Power Plant (“Petition”). Calpine owns and  
12      operates the Osprey Energy Center, which is located in Auburndale, Florida.

13

14   **Q: Please summarize your education and experience.**

15   A: I earned a Bachelor of Science degree in Finance from Northern Illinois University  
16      and hold the Chartered Financial Analyst designation. I joined Calpine in October  
17      2000 and have held positions of increasing responsibility within the organization,  
18      including being named Vice President of Finance in 2007 and Treasurer in 2009. I

1 was named Vice President of Commercial Development in 2013 before recently  
2 being promoted to Senior Vice President, with the responsibility for Calpine's  
3 origination activities and the development of electric generation resources  
4 throughout the U.S. and Canada.  
5

6 **II. Purpose of Testimony**

7 **Q: What is the purpose of your testimony?**

8 A: The purpose of my testimony is to describe Calpine and the Osprey Energy Center  
9 ("Osprey"), discuss Calpine's participation in Duke's Request for Proposal for Long-  
10 term Power Supply Resources with an In-Service Date of 2018 ("Long-Term RFP")  
11 and Calpine's recent offer to Duke, which includes a 5-year power purchase  
12 agreement ("PPA") for Osprey, with a purchase option. The Osprey offer is  
13 described in more detail in Section V of my testimony. In addition, I will briefly  
14 discuss the many advantages of Osprey as part of a portfolio of resources that may  
15 include Duke's proposed 1,640 MW Citrus County combined cycle power plant (the  
16 "Citrus County Project") and a transmission concern raised by Duke. As I stated in  
17 my testimony in Docket No. 140111-EI, addressing Duke's proposed Suwannee and  
18 Hines Projects, relying on Mr. Hibbard's testimony, I conclude that Osprey has many  
19 advantages compared to Duke's self-build options, including:

- 20 • Osprey has a *lower* levelized *cost* of electricity than Duke's Suwannee project,  
21 \$85.30 compared to \$168.70 and
- 22 • Osprey shows a *benefit* to Duke's customers of \$133 million *more* than Duke's  
23 option (based on a cumulative present value revenue requirement).

1 I also briefly address Duke's concerns about transmission and market power.

2

3 **III. Calpine Corporation and Osprey Energy Center**

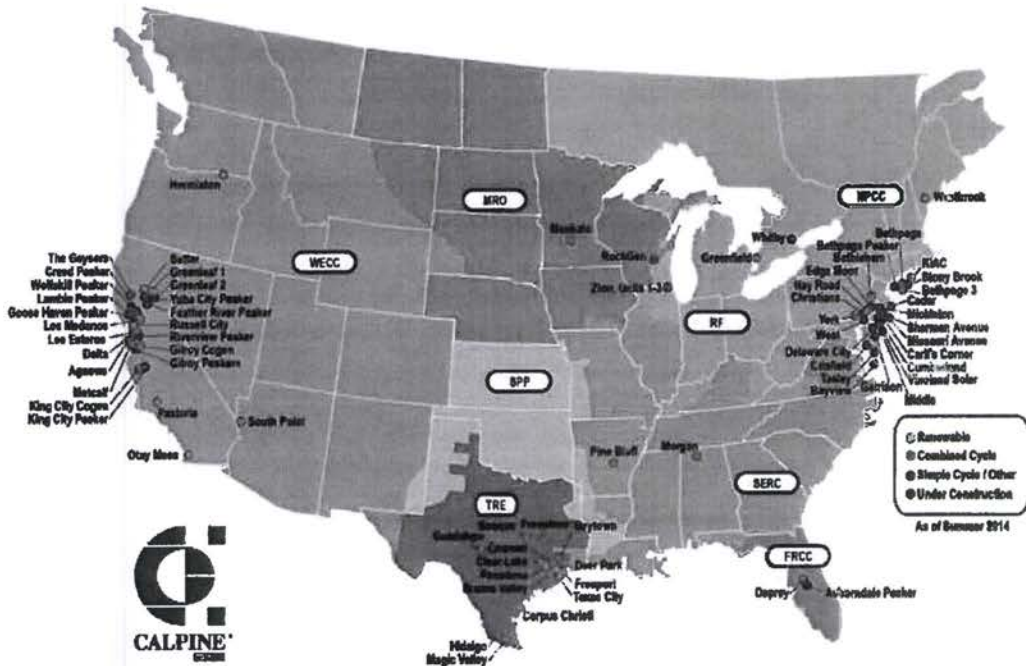
4 **Q: Please briefly describe Calpine Corporation.**

5 A: Calpine is an independent power producer founded in 1984 that specializes in the  
6 development, construction, ownership, and operation of wholesale electric  
7 generating facilities. Calpine owns and operates the largest and most modern fleet of  
8 clean, reliable and fuel-efficient gas-fired and geothermal power plants in North  
9 America, with a portfolio of 87 power plants in operation or under construction  
10 located throughout the U.S. and Canada with a combined total of approximately  
11 26,000 MW of electric generating capacity. Calpine currently has three new electric  
12 generation projects under construction and its existing fleet produced more than 100  
13 billion kilowatt-hours of electric energy during 2013. Calpine is a leader in gas-fired  
14 power plant development and construction in the United States.

15 Calpine owns and operates two power plants in Florida, Osprey and the  
16 Auburndale Peaking Energy Center, which total approximately 700 MW of electric  
17 generating capacity. Both projects are in Auburndale, Florida, within the Tampa  
18 Electric Company's ("TECO") service area and are identified on the map of  
19 Calpine's existing North American generation fleet shown below:



**CALPINE - A GENERATION AHEAD, TODAY**



1

2

3 **Q: Please briefly describe the Osprey Energy Center.**

4 **A:** Osprey is a nominal 599 MW, 2x1 natural gas fired combined-cycle facility located  
 5 in Auburndale, Florida, that began commercial operation in 2004. The facility  
 6 consists of two Siemens 501FD combustion turbine generators connected to two  
 7 Nooter-Erikson heat recovery steam generators and one Siemens steam turbine  
 8 generator. Osprey can provide 515 MW of electricity in the summer and 545 MW at  
 9 winter reference conditions, plus an additional 55 MW using its duct firing  
 10 capability. Osprey is a highly efficient combined cycle facility.

1 Osprey is interconnected to the Florida transmission grid at TECO's 230 kV  
2 electrical transmission system at the Recker substation. In addition, Calpine holds  
3 the rights to 249 MW of Firm point-to-point transmission for Osprey to deliver  
4 power to Duke's system, which includes roll-over rights. Calpine also has firm gas  
5 transportation rights on the Gulfstream interstate pipeline system ("Gulfstream"),  
6 which are assignable by Calpine.

7 Osprey represents a very competitive, highly efficient and environmentally  
8 advantageous resource, with full dispatch flexibility to meet Duke's need for supply-  
9 side resources.

10

11 **IV. Calpine's Participation in Duke's 2018 Long-Term RFP**

12 **Q: Did Calpine participate in Duke's effort to solicit long-term supply-side**  
13 **resources to meet its needs in 2018?**

14 A: Yes. Duke originally issued the Long-Term RFP on October 8, 2013. Calpine timely  
15 submitted a proposed power purchase agreement to Duke, which would have  
16 provided Duke 515 MW of capacity and energy at the busbar, for a term of 23-years  
17 (May 1, 2018 through December 31, 2041) ("Osprey PPA"). The capacity charge  
18 was \$72.24/kW-year, escalating at 2.3%, delivered to Duke. Calpine would assign to  
19 Duke its firm natural gas transportation rights on the Gulfstream system, at its cost,  
20 and Duke would provide the physical fuel for the toll.

21

22 **Q: Did Calpine submit a purchase option to Duke?**

1 A: Yes. Calpine submitted an offer to sell Osprey to Duke after the response date in the  
2 Long-Term RFP. Duke notified Calpine it would not consider or otherwise evaluate  
3 the offer to sell. Specifically, after being notified by Duke on April 29, 2014 that  
4 Duke intended to proceed with its Suwannee Peak and Hines Chillers Projects  
5 instead of Osprey, on May 1, 2014, Calpine submitted its offer to sell the Osprey  
6 Facility to Duke for \$300 million.

7

8 **Q: What were the results of the Long-Term RFP?**

9 A: Although Duke evaluated the Osprey PPA, Duke rejected Calpine's offer as well as  
10 the other responses and instead is seeking Commission approval of the Citrus County  
11 Project.

12

13 **V. Calpine's July 2014 Offer**

14 **Q: Did Calpine submit an offer to Duke after being notified Duke was proceeding  
15 with the Citrus County Project?**

16 A: Yes. Calpine submitted an offer to Duke dated June 16, 2014, and, in response to  
17 issues identified by Duke, Calpine prepared and submitted an updated offer to Duke  
18 on July 3, 2014 ("the July Offer").

19

20 **Q: Please describe Calpine's July Offer.**

21 A: Calpine's July Offer includes a 5-year PPA for 515MW of capacity and energy  
22 (summer and winter reference), with a guaranteed heat rate of [REDACTED], with a +/-2%  
23 dead band. Duke has the option to purchase the plant on January 1, 2020, subject to



1 certain conditions described below. The PPA would start on January 1, 2015 and  
2 terminate on December 31, 2019. During the term of the PPA, the annual capacity  
3 payment for each of the years 2015-2019, respectively, is [REDACTED]  
4 [REDACTED]/kW-month. The capacity payments in the July Offer are significantly  
5 lower than Calpine's September 6, 2013 offer of \$5.75/kWh, escalating at 2.3%.  
6 Calpine included its 249 MW of firm, point-to-point transmission capacity on  
7 TECO's transmission system and Calpine's firm natural gas transportation rights on  
8 the Gulfstream pipeline system and Duke would provide the fuel.

9 The July Offer includes an option for Duke to purchase the plant for [REDACTED] million,  
10 subject to certain adjustments the terms of which would be negotiated by Calpine  
11 and Duke as part of a definitive agreement. The acquisition cost in the July Offer is  
12 significantly lower than Calpine's May 1, 2014 offer to sell Duke the plant for \$300  
13 million.

14 Under the terms of the July Offer, Duke would buy Osprey subject only to  
15 FERC's review for market power and its approval of the transaction. To address  
16 Duke's concern about both whether FERC would approve the proposed transaction  
17 and the timing of its decision Calpine has offered the following:

- 18 • Pay Duke a one-time breakage cost of [REDACTED] million, which is intended to cover  
19 the Suwanee Peakers cost increase and carrying cost for one year; and
- 20 • Include a provision, subject to terms to be negotiated, that the PPA would  
21 terminate after two years (through December 31, 2016), unless the parties  
22 agree to a reasonable extension.

23



1 **VI. Osprey's Option Value**

2 **Q: What is the value of Osprey relative to the Citrus County Project?**

3 A: Osprey represents an option the Commission should consider to determine the best  
4 set of operating and/or new resources to meet the need identified by Duke in this  
5 docket and in the companion docket addressing Duke's petition for approval of its  
6 proposed Suwannee Peakers and Hines Chillers. In re: Petition for Determination of  
7 Cost Effective Generation Alternative to Meet Need Prior to 2018, by Duke Energy  
8 Florida, Florida Public Service Commission Docket No. 140111-EI. Although  
9 Osprey cannot serve the entire need claimed by Duke in this Petition, at 515MW,  
10 Osprey is large enough to meet Duke's needs through 2017 and depending on  
11 circumstances and Duke's actual need, Osprey can serve needs beyond 2017 as  
12 proposed by Calpine's July Offer. The direct testimony of Paul Hibbard, of the  
13 Analysis Group, Inc., describes and provides analysis to support an alternative  
14 scenario to the Citrus County Project in 2018: Contracting with Osprey and  
15 proceeding with Duke's inlet chiller project at the Hines facility may support  
16 delaying the Citrus County Project and still serve Duke's near term need, timely and  
17 reliably. In addition, Osprey can provide the needed power to reliably meet the  
18 peaking requirements and long-term need to serve demand that Duke proposes to be  
19 served by the Suwannee Peaker project.

20

21 **VII. Osprey's Advantages**

22 **Q: Please describe Osprey's operational track record.**

23 A: The Commission should recognize the advantages of Osprey as an operating facility

1 as compared to a proposed new self-build project. Osprey has an outstanding track  
2 record of delivering wholesale power to utilities in Florida and meeting the plant's  
3 contractual obligations. Since 2006, Osprey has delivered more than 14 million  
4 MWh of electricity to Florida customers. Duke, TECO and Seminole Electric  
5 Cooperative are some of the utility customers Osprey has served during the last eight  
6 years.

7 Osprey is a very reliable unit with a low equivalent forced outage rate of 1.43% in  
8 2013. During January-March 2014, Osprey's forced outage rate was 0.13%.  
9 Osprey had a forced outage rate of only 0.27% in January 2014, the month when  
10 Florida experienced the "Polar Vortex."

11

12 **Q: Please describe Osprey's construction risk advantages.**

13 A: As with all construction projects, including the proposed Citrus County Project, there  
14 is construction and permit risk, which cannot be dismissed simply as  
15 inconsequential. A delay in commercial operation of the proposed project due to  
16 construction delays would be costly and could result in Duke not meeting its 20%  
17 planning reserve margin. Such a delay could result in additional costs to Duke's  
18 customers in the form of project cost overruns and for the purchase of replacement  
19 power. Duke can avoid the immediate construction risks by contracting for Osprey,  
20 an operating facility with a great operational track record.

21

22 **VIII. Transmission and Market Power Issues**

1 **Q: Did Duke's evaluation of Calpine's Osprey proposals raise other concerns you**  
2 **would like to address?**

3 **A:** Yes. Duke's Petition and the testimony of two of its witnesses, Ed Scott and Julie  
4 Solomon, expressed concerns about the impact of transmission on deliverability and  
5 costs and market power, respectively.

6

7

8 **Q: What is Calpine's position on transmission for Osprey?**

9 **A:** As stated in the terms of a PPA in the July Offer, Osprey will be contracted to  
10 deliver 515 MW to Duke's system. Duke has expressed a concern that the delivered  
11 output will be limited because Calpine only holds 249 MW of firm point-to-point  
12 transmission service on the TECO system. Based on the direct testimony of John  
13 Simpson, however, it appears likely that Duke and TECO can use operating  
14 procedures and redispatch measures to ensure that Duke is able to reliably access the  
15 515 MW of contracted capacity through the 5-year term of the PPA, and avoid the  
16 cost of previously identified transmission upgrades. For the longer term, Duke's  
17 transmission witness, Ed Scott, and Mr. Simpson appear to agree that a direct  
18 connection line between Osprey and Duke will ensure delivery of Osprey's full  
19 output. The estimated cost of the direct connection is \$150 million. Mr. Hibbard's  
20 analysis discusses the cost impact of the direct connection and still concludes Osprey  
21 is a superior choice to serve Duke's need for capacity and energy.

22

23 **Q: Does the July Offer take into consideration Duke's concerns about market**



1       **power or otherwise protect Duke's interests?**

2       A: Yes. Duke expressed concern that the near term acquisition or option to acquire  
3       Osprey might trigger an adverse finding of market power by FERC, which might  
4       result in FERC's denial of the acquisition, or an approval conditioned on Duke  
5       incurring excessive mitigation costs. Calpine, however, addresses this concern  
6       through the testimony of its witness, David Hunger, who worked on hundreds of  
7       market power evaluations in his 14-year career at FERC. Moreover, Calpine has  
8       proposed to mitigate the potential for Duke to incur either financial or operational  
9       risk (i.e., a delay in building the Suwannee Peakers) even if FERC were to make an  
10      adverse finding of market power due to the acquisition of Osprey.

11  
12

13      **Q: Please summarize your testimony.**

14      A: Although Duke has requested the Commission to consider the Citrus County Project  
15      and the Suwannee Peakers and Hines Chillers Project in separate dockets, the  
16      Commission should review Duke's proposed projects as a portfolio, as well as on a  
17      project-specific basis. Calpine's offer includes a 5-year PPA with extremely low  
18      capacity charges and the opportunity to buy the Osprey Facility for [REDACTED] million, or  
19      about [REDACTED] per kilowatt of capacity. Even when adding in the \$150 million cost to  
20      provide a direct interconnection of Osprey to Duke's transmission system, the  
21      Osprey Facility, as made available to Duke by Calpine's July Offer, provides  
22      superior value to Duke and its customers. I conclude that, in the best interests of its  
23      customers, Duke should contract with Osprey as an operating, more cost efficient  
24      resource that can timely and reliably meet part of the need to be served by Duke's



1 proposed three self-build projects, including the option value of Osprey in  
2 connection with a possible decision to delay moving forward with the Citrus County  
3 Project.

4

5 **Q: Does this conclude your testimony?**

6 A: Yes, it does.

**EXHIBIT**

**B**

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

**In re: Petition for Determination  
Of Need for Citrus County  
Combined Cycle Power Plant, by  
Duke Energy Florida, Inc.**

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**DIRECT TESTIMONY**

**OF**

**PAUL J. HIBBARD**

**ON BEHALF OF**

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1 **Q: Please describe your background and experience.**

2 A: I have been with AGI for a total of almost seven years, first from 2003 to  
3 April 2007, and most recently, from August 2010 to the present. In between,  
4 from April 2007 to June 2010, I served as Chairman of the Massachusetts  
5 Department of Public Utilities (“DPU”). While Chairman, I also served as a  
6 member of the Massachusetts Energy Facilities Siting Board, the New England  
7 Governors’ Conference Power Planning Committee, and the NARUC Electricity  
8 Committee and Procurement Work Group. I also served as State Manager for the  
9 New England States Committee on Electricity and as Treasurer to the Executive  
10 Committee of the 41-state Eastern Interconnect States’ Planning Council.

11 From 2000 to 2003 I worked in energy and environmental consulting with  
12 Lexecon, Inc. Prior to working with Lexecon, I worked in state energy and  
13 environmental agencies for almost ten years. From 1998 to 2000, I worked for  
14 the Massachusetts Department of Environmental Protection on the development  
15 and administration of air quality regulations, State Implementation Plans and  
16 emission control programs for the electric industry, with a focus on criteria  
17 pollutants and carbon dioxide (“CO<sub>2</sub>”), as well as various policy issues related to  
18 controlling pollutants from electric power generators within the Commonwealth.  
19 From 1991 to 1998 I worked in the Electric Power Division of the DPU on  
20 matters related to utility integrated resource planning and procurement, utility  
21 ratemaking, restructuring of the electric industry in Massachusetts, the  
22 quantification of environmental externalities, energy efficiency, utility  
23 compliance with state and federal emission control requirements, regional

1 electricity market structure development, and coordination with other states on  
2 electricity and gas policy issues through the staff subcommittee of the New  
3 England Conference of Public Utility Commissioners.

4 As a consultant, I have worked on numerous engagements related to  
5 power sector production cost modeling; resource planning and procurement;  
6 macroeconomic analyses; wholesale power market design, operations, and  
7 impacts; generation/storage optimization modeling; natural gas infrastructure  
8 development and evaluation; and energy and environmental policy design and  
9 analysis. I hold an M.S. in Energy and Resources from the University of  
10 California, Berkeley, and a B.S. in Physics from the University of Massachusetts  
11 at Amherst. My curriculum vitae is attached as Exhibit No. \_\_\_(PJH-1).

12

13 **II. PURPOSE AND SUMMARY OF TESTIMONY**

14 **Q: What is the purpose of your testimony?**

15 **A:** The purpose of my testimony is to provide a quantitative and qualitative  
16 comparative evaluation of proposals currently before Duke Energy Florida  
17 (“DEF,” or the “Company”) and the Florida Public Service Commission  
18 (“Commission”) to meet the estimated 470 megawatts of DEF’s forecasted  
19 capacity and energy needs in the pre-2018 timeframe. Petition for Determination  
20 of Cost Effective Generation Alternative to Meet Need Prior to 2018, by Duke  
21 Energy Florida, Inc., Docket No. 140111-EI, Filed May 27, 2014 (hereafter  
22 “Petition”), at 11, ¶ 24. In particular, I have been asked by Calpine to compare  
23 the self-build proposal put forward by DEF – with a focus on DEF’s proposed

1 Suwannee combustion turbines (“Suwannee CTs”) – with the offer by Calpine to  
2 provide DEF a power purchase agreement (“PPA”) followed by facility  
3 acquisition from Calpine’s Osprey Energy Center (“Osprey” or “Osprey Facility”)  
4 in Auburndale, Florida. I compare these proposals from the perspectives of  
5 (1) ratepayer impacts in terms of equivalent levelized cost of electricity  
6 (“LCOE”), cumulative present value revenue requirements (“CPVRR”), and  
7 considerations tied to risks borne by ratepayers; and (2) policy considerations  
8 related to power system reliability, investment and operational flexibility, and  
9 human health and environmental impacts.

10

11 **Q: Please summarize your testimony.**

12 **A:** In its Petition, DEF asserts that the Suwannee Simple Cycle and the Hines  
13 Chillers Power Uprate projects are “...the most cost effective options to fulfill  
14 DEF’s capacity and energy needs prior to 2018.” Petition at 1. I disagree. Based  
15 on my review of cost and risk factors, I find that from a ratepayer perspective the  
16 best option for DEF is to accept Calpine’s offer of a five-year PPA and  
17 acquisition (in year six) of the Osprey Facility. DEF’s modeling and analysis  
18 occur largely within a black box, appear to be oversimplified and structurally  
19 biased, and inherently – and inappropriately – favor the Company’s self-build  
20 alternatives. A more careful, common-sense review of the customer impacts  
21 associated with the various options reveals that by moving forward as proposed  
22 by DEF, DEF’s ratepayers will likely incur significantly greater costs and be  
23 exposed to significantly greater risks than they would if instead of building the



1 Suwannee CTs, Calpine's offer is accepted. I conclude that selecting Osprey is  
2 the best outcome for ratepayers based on (1) a fully transparent comparison of the  
3 levelized costs of various alternatives; (2) a recalculation of cumulative present  
4 value revenue requirements starting from DEF's own calculations, with only a  
5 few reasoned adjustments reflecting current conditions and correcting for  
6 mistakes in DEF's original analysis; (3) a critique of the lack of transparency and  
7 apparent flaws in DEF's modeling approach and documentation; and (4)  
8 consideration of the nature, characteristics, and magnitudes of risks born by  
9 ratepayers under DEF's self-build proposal, compared with selecting Calpine's  
10 offer. Specifically, I find that Calpine's offer:

- 11 • has a levelized cost of electricity equal to \$85.30 compared to \$168.70 for  
12 the Suwannee CTs, and
- 13 • represents a cumulative present value revenue requirement *benefit* of \$133  
14 million compared to DEF's self-build proposal.

15 In short, Calpine has made an offer to DEF that represents a low-cost,  
16 low-risk, reliable, efficient, and environmentally responsible resource choice.  
17 DEF's analysis of alternatives fails to appropriately capture these many value  
18 streams, overstates the value of their own self-build alternative (in particular the  
19 Suwannee CTs), and understates the value of the Calpine offer. A reasonable  
20 evaluation of these alternatives, a common-sense comparison of facilities'  
21 levelized costs, and a review of important reliability, health, environmental and  
22 policy factors suggests that the best – and most prudent – option for DEF's  
23 ratepayers would be for DEF to accept Calpine's offer. Based on my review of all



1 of these factors, I conclude that, in the interest of ratepayers and the energy policy  
2 and economic interests of the State of Florida, the Commission should deny  
3 DEF's Petition because it does not represent the most cost-effective alternative  
4 and because it is not in the best interests of DEF's customers.

5  
6 **Q: Are costs and cost-related risks the only benefit of the Osprey Facility**  
7 **compared to the Company's self-build alternative?**

8 A: No. DEF's self-build alternative – when compared to the purchase of  
9 power and subsequent acquisition of Calpine's Osprey Facility – suffers from a  
10 number of additional flaws from the perspectives of power system reliability,  
11 flexibility, and environmental impacts. These are fundamentally important  
12 considerations for the Commission, particularly during this time of significant  
13 uncertainty and change in the electric sector. These changes are tied to highly  
14 uncertain growth forecasts for peak load and energy consumption, pending and  
15 emerging federal requirements related to the air, water, and solid waste impacts of  
16 electric generating facilities, and significant developments in the pricing and  
17 transportation of natural gas (for heating, process needs, and power generation).  
18 As discussed further below, an acquisition of the Osprey Facility helps address  
19 these uncertainties and reduces ratepayer risk, through a set of benefits which  
20 include: (1) the relative value of more efficient combined cycle ("CC") capacity  
21 (like the Osprey Facility) – compared to combustion turbine-only capacity – to  
22 meet DEF's changing resource needs and system conditions across multiple  
23 operating modes (baseload, intermediate, and peaking); (2) the option value

1 provided by the higher capacity of the Osprey Facility compared to the Suwannee  
2 CTs, which would allow for greater flexibility for DEF to alter the timing of  
3 major new capital investments in future years (such as the proposed Citrus County  
4 facility) should load growth and/or resource availability deviate from current  
5 expectations; and (3) the wide-ranging human health and environmental benefits  
6 that flow from using the already-built and operational, efficient, and low-emitting  
7 (in terms of emissions per megawatt-hour (“MWh”)) Osprey capacity instead of  
8 the new-construction, relatively inefficient, and higher-emitting Suwannee CTs.

9  
10 **Q: Are you sponsoring any exhibits with your testimony?**

11 **A:** Yes. I am sponsoring the following exhibits:

12	PJH-1	Curriculum vitae of Paul J. Hibbard
13	PJH-2	Calpine LCOE Model Sources and Assumptions
14	PJH-3	Levelized Cost of Electricity (\$2014/MWh)
15	PJH-4	Levelized Cost (\$2014/MWh) by Capacity Factor 2015-2043
16	PJH-5	Growth in Total Energy Demand and Potential Energy Generation
17		from Generic Combined Cycle Units
18	PJH-6	Comparison of Osprey Capacity Factor and Starts, by Year, DEF
19		Production Simulation Results, Scenario 5 Acquisition
20	PJH-7a, 7b	Adjustments to Cumulative Present Value Revenue Requirements
21	PJH-8	Emission Rates by Technology, Carbon Dioxide (CO <sub>2</sub> ) and
22		Nitrogen Oxides (NO <sub>x</sub> )

23  
24 **Q: How is your testimony organized?**

1 A: In Section III, I present my ratepayer impact analysis, including a  
2 transparent analysis of the levelized costs for each of the Calpine and DEF  
3 facilities in the pre-2018 resource procurement, an evaluation and recalculation of  
4 DEF's own conclusions with respect to CPVRR, a discussion of the shortcomings  
5 associated with DEF's analytic method and modeling effort, and a review of the  
6 significant risks ultimately borne by ratepayers under different scenarios. In  
7 Section IV, I address important considerations related to system reliability,  
8 planning and procurement flexibility, and human health and environmental  
9 impacts. Finally, in Section V, I summarize the conclusions I draw from my  
10 review of these factors.

11

12 **III. CALPINE'S OFFER IS HIGHLY BENEFICIAL FROM THE**  
13 **PERSPECTIVE OF DEF'S RATEPAYERS**

14 ***III.A OVERVIEW***

15 **Q: How is this Section organized?**

16 A: In this Section, I address factors related to DEF's analysis of the value of  
17 competing resource options, from the perspective of DEF's ratepayers.  
18 Specifically, in Section III.B, I compare Calpine's proposal and DEF's proposed  
19 self-build projects on the basis of LCOE, presenting the analytic method,  
20 assumptions, underlying data, and results. The LCOE analysis – when presented  
21 clearly with the assumptions that go into the calculations – provides a fully  
22 transparent and straight-up comparison of the capital and operating costs of  
23 resources in the most relevant and understandable metric from a ratepayer's



1 perspective – dollars per MWh of electricity generated over the life of the facility.  
2 The results demonstrate the clear and compelling benefit to ratepayers of the  
3 Osprey PPA/acquisition in comparison to DEF’s self-build proposal, the  
4 Suwannee CTs.

5 In Section III.C, I first discuss various flaws of construction and execution  
6 that exist in the modeling and analysis that DEF used in its evaluation of  
7 resources in this docket. Despite these flaws, I demonstrate that even accepting  
8 DEF’s analysis as the starting point, the Osprey Facility is the best from a  
9 CPVRR perspective when DEF’s results are adjusted to correct certain mistakes  
10 and misrepresentations in the original calculations.

11 Finally, in Section III.D, I highlight the need for heightened attention in  
12 this docket to the different ratepayer risk factors and discuss differences in the  
13 risks borne by ratepayers between the options of moving forward with  
14 development, permitting and construction of the Suwannee CTs versus selecting  
15 the Osprey PPA/acquisition proposal offered by Calpine.

16  
17 ***III.B. LEVELIZED COST OF ELECTRICITY***

18 **Q: Is it possible to construct an analysis that provides a clear and transparent**  
19 **comparison of proposals from the perspective of electric ratepayers?**

20 **A:** Yes. One of the challenges in understanding DEF’s analyses of resources  
21 proposed in this proceeding is the substantial level of opacity – or, put differently,  
22 the substantial lack of transparency -- in the way in which DEF has assembled  
23 competing resource portfolios, forecasted the build-out of its system over a very-



1 long modeling time frame, and evaluated bids using a proprietary “black box”  
2 model. This does not mean that DEF’s analysis is not valuable – it is. However,  
3 it is critically important that the Commission and stakeholders also have access to  
4 a robust *and transparent* quantitative analysis of bids considered by the Company  
5 and the Commission; one that allows for a more clear and objective understanding  
6 of the relative value of each proposal. One way to do this is through a clearly  
7 documented levelized cost of electricity analysis, in which the capacity, energy,  
8 and other cost elements in project proposals are translated into an equivalent  
9 dollars-per-megawatt-hour (\$/MWh) metric, using consistent financial, market,  
10 and temporal assumptions across all proposals.

11

12 **Q: What is the value of carrying out a LCOE calculation, and how have you**  
13 **approached the LCOE analysis in this instance?**

14 A: In this docket, the Commission is being asked to determine whether DEF’s  
15 selection of its self-build proposals, from among multiple proposals and resources  
16 with different terms, cost elements, technologies, and operational utilization  
17 factors, is in the best interests of its customers. Most importantly, the projects in  
18 this solicitation differ in at least two fundamental ways. First, they include, on the  
19 one hand, firm PPA and acquisition proposals from merchant generators (with  
20 multiple-year terms, pre-set power purchase and acquisition price points, and  
21 various operational and financial guarantees), and, on the other hand, self-build  
22 project cost estimates from the incumbent utility (with no term or cost guarantees  
23 from the ratepayer perspective). A comparison of bids under these circumstances

1 must include a clear and transparent demonstration of how assumptions related to  
2 the different terms and payment structures affect the expected cost and value of  
3 different bids.

4 Second, the proposals in this solicitation include projects whose use in  
5 daily operations is fundamentally different from the standpoint of frequency,  
6 duration, and timing of commitment and dispatch. The Suwannee CTs will have  
7 a very different operational profile (infrequent, short-duration operations) than  
8 that of the Osprey and/or other CCs (more frequent operations and longer run  
9 times). A comparison of bids under these circumstances should create a  
10 transparent demonstration of how expectations or assumptions regarding resource  
11 use affect the expected cost and value of different bids.

12 LCOE analysis is able to capture these fundamental differences in a  
13 transparent manner, and enables a relatively straightforward and consistent  
14 comparison of bids. Below, I present a LCOE analysis of the DEF self-build  
15 projects and Calpine's proposal – the Osprey Facility – that are available to meet  
16 the needs of DEF's customers. My purpose for, and approach to, the LCOE  
17 analysis was to construct a fully independent, objective, and transparent analysis  
18 that treats all offers on an equal and fair basis.

19 The LCOE metric for each proposal represents the net present value of the  
20 expected annual revenue requirement – including the sum of variable and fixed  
21 operation and maintenance costs, capital costs, and the return on investment –  
22 divided by the estimated annual generation over the terms of the proposals. The  
23 LCOE calculation establishes annual costs in accordance with contract terms (in

1 the case of PPAs), or using traditional calculations of annual revenue  
2 requirements (in the case of utility self-build or acquired units that would go into  
3 the utility's rate base), in order to create comparability across structural  
4 differences in proposal pricing and asset lives. In addition, the LCOE analysis  
5 accounts for differences in utilization between resource types through variable  
6 capacity factor inputs that determine average annual generation.

7 The LCOE analysis compares ratepayer impacts of each proposal under a  
8 user-specified set of capacity factor assumptions. While an LCOE analysis does  
9 not include dispatch simulation, and thus it does not quantify the economic and  
10 environmental benefits of displacing generation, ignoring such benefits would  
11 tend to underestimate the value of CC capacity relative to CT capacity, since the  
12 more efficient and more highly-utilized CC capacity would likely generate greater  
13 price and emission displacement than CT capacity. Thus the value of the Calpine  
14 proposal may be substantially better than indicated by its LCOE relative to the  
15 LCOE for the Suwannee CTs.

16 In short, and as discussed further below, the Strategist model is fairly  
17 impenetrable to most of those who are not actually running the model, generates  
18 results that are strongly dependent on assumptions and on how resources are  
19 configured in model runs, and thus in a sense provides the Commission with "take  
20 it or leave it" results. LCOE analysis, on the other hand, is a highly accessible,  
21 transparent and useful representation of the ultimate impacts on ratepayers, and  
22 thus provides an extremely valuable and important sanity check on the results  
23 emerging from black-box models.



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**Q: Please describe Calpine’s proposal to Duke for power supply from the Osprey Facility as you have modeled it in your analysis.**

A: For the purposes of my analysis, I have used Calpine’s most recent offer, which is summarized in the direct testimony of Mr. Todd Thornton, Senior Vice President, Origination and Development for Calpine (hereafter, “Thornton Direct”). Specifically, I understand Calpine’s most recent offer to include:

- A five-year PPA, starting January 1, 2015 and extending through December 31, 2019, with an initial capacity payment of [REDACTED] in 2015 escalating to \$ [REDACTED] in 2019. This price applies to the full 515 MW of Osprey’s contracted capacity under the PPA; and
- An option for Duke to purchase the plant on January 1, 2020 for [REDACTED] in nominal 2020 dollars).

From the direct testimony of John Simpson (hereafter “Simpson Direct”), I understand that due to transmission system limitations, Osprey may not be able to provide the full capacity benefits of the facility (i.e., the 515 MW of contracted capacity under the PPA, and the 599 MW of total capacity available after Duke acquires Osprey) in every single hour of the year until construction of related transmission infrastructure upgrades are completed, even though it is likely to be able to provide up to full capacity *in the vast majority of the* hours of the year. In any event, the quantity of capacity that *can be* supplied on a firm basis prior to new transmission infrastructure – 249 MW – is sufficient to meet DEF’s



1 reliability need in the interim period. Nevertheless, for the purposes of the LCOE  
2 analysis, during the 5-year PPA period, I assumed annual capacity payments  
3 equal to the product of the proposed capacity payment and the contracted capacity  
4 (515 MW) to be provided under the PPA, as specified in the offer. This  
5 represents the maximum possible capacity payment obligation for DEF under  
6 Calpine's offer. Following an acquisition in 2020, I continue to calculate the  
7 LCOE using 515 MW of capacity. This is a conservative assumption that tends to  
8 undervalue the peaking capabilities of the Osprey Facility. I discuss – but do not  
9 quantify – the value of this additional duct-fired capacity for DEF ratepayers in  
10 Section IV below.

11

12 **Q: Please summarize your understanding of DEF's self-build proposals.**

13 **A:** DEF has proposed two separate projects to meet its generation supply  
14 needs before 2018. The Suwannee CTs are two combustion turbines with  
15 summer capacity of approximately 316 MW of summer capacity and 375 MW of  
16 winter capacity with an estimated in-service cost of \$197 million. The Suwannee  
17 CTs would have an annual net operating heat rate of 10,197 Btu per kilowatt-  
18 hour. The Hines Chillers would add approximately 220 MW of capacity during  
19 summer conditions with little degradation of the heat rates of the Hines combined  
20 cycle units. The Hines Chillers would not add any capacity to DEF's system  
21 during winter peaking conditions. The estimated cost of the Hines Chillers is  
22 approximately \$160 million.

23

1 **Q: Please provide a summary of the results of the LCOE analysis you**  
2 **conducted.**

3 A: I estimated the LCOE for the Osprey PPA/acquisition proposal, the  
4 Suwannee CT, the Hines Chillers, and the combinations of Suwannee/Hines and  
5 Osprey/Hines. I used information on capital costs, operating costs, financing  
6 costs, fuel costs, and pollutant emission costs that were provided in Mr. Borsch's  
7 testimony and responses to Calpine's interrogatories. For Osprey, I used the  
8 updated pricing offer details provided above. A summary of my assumptions is  
9 included as Exhibit No. \_\_ (PJH-2) and described below.

10 Key results presented in Exhibit No. \_\_ (PJH-3) include the following:

- 11 • Calpine's Osprey Facility PPA/acquisition offer has the lowest LCOE  
12 across all of the options after considering total capacity costs,  
13 transmission costs, and energy costs. Osprey's LCOE is 19 percent  
14 lower than the Hines Chillers and 49 percent lower than the Suwannee  
15 CTs.
- 16 • A combination of Osprey plus the Hines Chillers offers a lower LCOE  
17 than either the Hines Chillers alone or in combination with the  
18 Suwannee CTs.
- 19 • The Suwannee CTs have the highest LCOE of all three units, which is  
20 driven by the lower expected utilization and higher heat rate of a  
21 combustion turbine as compared to a highly efficient combined cycle  
22 unit.

23

1 **Q: Please summarize the key assumptions in the LCOE analysis.**

2 A: I relied on three key documents for the data used in this analysis. First, I  
3 obtained capital cost, operational data/heat rates for the self-build units, and  
4 capacity factors from Mr. Borsch's testimony. Second, I used pricing information  
5 for the Calpine PPA/acquisition from the updated terms offered on July 3, 2014 as  
6 described in the Thornton Direct. Third, I used data from the Strategist inputs and  
7 outputs provided to me as part of DEF's responses to Calpine's discovery  
8 requests. This included fixed O&M, variable O&M, start costs, natural gas  
9 transportation costs, and environmental costs for both the Osprey acquisition and  
10 the DEF self-build units.

11 For financial assumptions, I used DEF's current weighted average cost of  
12 capital ("WACC") for both return on rate base and the discount rate, and where  
13 appropriate, made conservative assumptions about asset lives and depreciation  
14 that would tend to increase the cost of the Osprey PPA/acquisition proposal  
15 relative to the Suwannee CTs. For income accounting, I assumed that assets  
16 followed a modified accelerated cost recovery ("MACR") schedule. I used a 20-  
17 year schedule for combined cycle and transmission assets and a 15-year schedule  
18 for combustion turbines, consistent with guidance found in IRS Publication 946.

19

20 **Q: Please summarize key financial assumptions in the LCOE analysis.**

21 A: Whenever possible, I used assumptions that would tend to disadvantage  
22 the Calpine offer relative to the DEF self-build proposals, and I have tried to  
23 present an analysis that accounts for the applicable regulatory accounting



1 standards. For example, I assumed that all assets (including transmission) would  
2 be depreciated on a straight-line basis from the in service year to 2043, and that  
3 the return on rate base would be collected on the non-depreciated portion in each  
4 year. For the transmission direct connect, this period is likely too short, which  
5 will tend to increase the cost to ratepayers for this project in my analysis and  
6 disadvantage the Osprey bid as compared to the Suwannee CTs. In addition, I  
7 assumed a 35-year asset life, which means that not all costs are recovered within  
8 the 2043 study period. Again, this tends to underestimate the cost of the  
9 Suwannee CTs to ratepayers in my analysis.

10 For Osprey and Hines, I assumed useful lives through the end of the study  
11 period, which is equivalent to a total useful life of 40 years. I believe this is a  
12 reasonable assumption based on the operational longevity of DEF's generating  
13 assets. *See, e.g.*, Florida Public Service Commission Order No. PSC-10-0131-  
14 FOF-EI issued March 5, 2010, at 17, 19 (stating that "several of PEF's steam  
15 units and combustion turbines on its system have been in service for more than 40  
16 years, and all are projected to be in service longer than 40 years," and concluding  
17 that "on balance, we find a minimum life span of 35 years shall be used in this  
18 proceeding for PEF's combined cycle units... PEF should likely experience life  
19 spans of 40 years or more...").

20 Finally, for AFUDC, I have made a simplifying assumption that all funds  
21 are placed in rate base at the weighted average cost of capital. This tends to  
22 underestimate the amount of monies that will be collected, since I understand that  
23 the AFUDC weighted average cost of capital is 7.44 percent. 14LGBRA-



1 NRGROG1-79-000005 – 000007 AFUDC Rate Change Schedules A-C\_March  
2 2010\_Final.xlsx.

3

4 **Q: Please describe your approach to assigning capacity factors to resources for**  
5 **the purpose of the LCOE analysis.**

6 A: For the Suwannee CTs, I used the 9.3 percent capacity factor presented in  
7 Exhibit BMHB-2. For the combined cycle units, I used a [REDACTED]  
8 [REDACTED] I also tested my results against a wide range of capacity factors. The  
9 conclusions I draw are robust to changes in expected output, even including  
10 unrealistic combinations of low capacity factors for CCs and high capacity factors  
11 for CTs. *See* Exhibit No. \_\_ (PJH-4).

12

13 **Q: How can you determine whether the LCOE results are robust to changes in**  
14 **expected capacity factors for the different resource options?**

15 A: The LCOE model determines the levelized cost of electricity for a given  
16 resource at an assumed annual average level of utilization. That is, in calculating  
17 the LCOE of \$85.30/MWh for the Osprey PPA/acquisition (shown in Exhibit No.  
18 \_\_ PJH-3), I assumed an annual average capacity factor [REDACTED] p [REDACTED]. This  
19 determines in each year the total MWh of generation over which to spread the  
20 combined investment, fixed, and variable costs to arrive at the levelized cost on a  
21 per MWh generated basis. Appropriately, since future years are discounted, the  
22 capacity factor outcomes in early years weigh more heavily than later years in the  
23 lifetime LCOE calculation.

1           It is reasonable to ask whether the LCOE benefit of the Osprey Facility  
2 remains at lower capacity factors, and/or at higher capacity factors for competing  
3 proposals. Exhibit No. \_\_ (PJH-4) provides insight into this question by showing  
4 the LCOE in \$/MWh for both Osprey and the Suwannee CTs as a function of  
5 annual average capacity factors (assumed or projected). For example, at the  
6 intersection of the horizontal and vertical dashed lines in Exhibit No. \_\_ (PJH-4),  
7 you see that at a [REDACTED] the LCOE for the Osprey  
8 PPA/acquisition is \$85.30/MWh. On the other hand, the dashed line higher on the  
9 curves, and to the left, shows that with the Suwannee CTs operating at an annual  
10 average capacity factor of 9.3 percent, the Osprey proposal has an equivalent  
11 LCOE at an annual average capacity factor of approximately [REDACTED]; further,  
12 at *any capacity factor greater than* [REDACTED] the Osprey proposal has a lower  
13 LCOE than the Suwannee CTs. Finally, as long as Osprey is expected to operate  
14 at an annual average capacity factor of about [REDACTED] or more, it will be better  
15 from an LCOE perspective than the Suwannee CTs operating at *any capacity*  
16 *factor*.

17  
18       ***III.C. THE COMPANY'S EVALUATION OF COMPETING PROPOSALS***

19   **Q: DEF has used the Strategist optimization model to compare proposals in this**  
20   **proceeding. Should the Commission rely only on the Company's Strategist**  
21   **analysis?**

22   **A:**           Absolutely not. The decision made in this proceeding will affect ratepayer  
23 costs, risks, and system operations and reliability for decades. Given the

1 importance of this decision, the Commission should carefully understand and  
2 consider the Strategist results. Given modeling limitations (discussed below), the  
3 Commission also needs to view the results within the totality of the evidence from  
4 all of the modeling and analyses presented by parties in this proceeding. This is  
5 particularly important given that Strategist is a proprietary “black box” model,  
6 one whose unit commitment and dispatch module is opaque and admittedly  
7 simplistic, in ways that are clearly of heightened importance in comparing  
8 technologies offered in this procurement. One value of the LCOE analysis I  
9 present is that it provides a fully transparent and straightforward assessment of the  
10 cost of proposals to ratepayers in a manner that provides the Commission with an  
11 additional analytical tool to inform its decision.

12  
13 **Q: Did you review the Strategist results and CPVRR estimates that DEF**  
14 **presented in this docket?**

15 A: Yes. In particular, I reviewed the Strategist inputs and outputs that were  
16 provided to me in DEF’s responses to Calpine Interrogatories 6 and 7, and that I  
17 understand to be associated with the Calpine Osprey Facility, known as PPA1 and  
18 Acquisition 2 in Exhibits BMHB-8,-9, and -10. Company witness Borsch asserts  
19 that Acquisition 2 had a \$193 million CPVRR deficit compared to the DEF self-  
20 build option and that a PPA modeled from 2016-2021 and replaced by generic  
21 back-fill CC and CT units had a \$129 million CPVRR deficit compared to the  
22 DEF self-build option. Mr. Borsch noted that the negative CPVRR in the  
23 acquisition case was “largely due to transmission system upgrades” required to



1 incorporate the facility into the DEF system. Borsch Direct at 46. Notably, in  
2 Exhibit BMHB-9, Mr. Borsch also presented a range of CPVRR values for each  
3 bid. In this scenario, Acquisition 2 was modeled with a positive CPVRR of \$39  
4 million, under assumptions that are much closer in detail to the current Calpine  
5 offer being considered by DEF. (For example, this included a [REDACTED]  
6 [REDACTED] P [REDACTED] "14LGBRA-  
7 NRGROG1-28-000001 – 000008 CONFIDENTIAL  
8 Results\_Sensitivities\_01212014A.xlsx") In Exhibit BMHB-10, Mr. Borsch  
9 presented a final, detailed economic analysis.

10

11 **Q: What is your opinion on the Strategist results presented in this docket?**

12 A: The key difference between a LCOE analysis and the Strategist model's  
13 CPVRR estimates is the incorporation of a production cost calculation in the  
14 Strategist analysis. LCOE analyses do provide insights into production cost  
15 impacts, in the sense that levelized costs are a function in part of the assumed  
16 capacity factors in the analysis. (As described above, in Exhibit No. PJH-\_\_4, I  
17 present a chart that allows the Commission to see *explicitly* how different capacity  
18 factor assumptions or outcomes affect LCOE results.) Configured appropriately,  
19 production cost modeling can provide important insights and perspectives on  
20 resource operations and utilization over time, and on the likely value of resources  
21 on the system from an energy benefit perspective. However, in this instance, and  
22 based on the review of the information DEF has provided in this proceeding  
23 related to its Strategist analysis, I believe there are a number of questionable



1 elements of the production cost component of that analysis that may seriously  
2 compromise the value of its results.

3 **Q: Are you familiar with production cost modeling?**

4 A: Yes. I have led or participated in numerous engagements as a consultant  
5 involving the use of production cost modeling to explore asset values and assess  
6 the cost or environmental impacts of various public policy choices. Specifically,  
7 in these projects we have used either Ventyx's Promod production cost modeling  
8 tool, or General Electric's GE MAPS tool. Both are transmission-constrained,  
9 hourly production cost modeling programs.

10

11 **Q: Please explain your concerns with respect to the production cost elements of**  
12 **DEF's Strategist analysis in this case.**

13 A: First, my understanding is that, in the interest of modeling time and  
14 integration with the other Strategist modules, the production cost modeling  
15 algorithm within Strategist is far more simplistic than standard production cost  
16 models – such as Promod and GE MAPS – that are more often used for  
17 investigative system dispatch simulation analyses. In particular, the Strategist  
18 model does not require an hourly dispatch approach (instead allowing the user to  
19 rely on a limited set of load representations, with results extrapolated into full-  
20 year calculations), nor does it dispatch the system with attention to constraints  
21 that may exist on individual transmission elements. Further, its representation of  
22 unit operational capabilities and the logic by which units are committed (or  
23 “turned on”) and kept on in consideration of multi-hour variations in system load

1 - may fail to capture operational details that could be important in understanding  
2 the relative value of CC versus CT technologies on the Company's system.

3 In short, the quality or value of the Strategist production cost modeling  
4 results – in terms of unit capacity factors and unit production cost benefits –  
5 should be taken with a healthy degree of skepticism. In addition, the logic behind  
6 how units or resource portfolios are configured in the model, and how generic  
7 units are added over time, can obfuscate or wash out insights into the relative  
8 value of competing resource alternatives added today. Based on my review of the  
9 Strategist inputs and outputs provided to me in the course of this proceeding, I  
10 believe this is likely to be the case in this instance, and I have a number of serious  
11 reservations about other specific and key modeling choices – and thus the  
12 production cost modeling results – that affect CPVRR outcomes in this case.

13 For example, between 2018 and 2043, DEF included over 4,000 MW of  
14 generic combined cycle capacity in its Strategist modeling analysis, presumably  
15 to meet its 20 percent reliability margin and satisfy growth in retail peak load.  
16 However, this may represent an unwarranted and costly overbuilding of the  
17 system. While these generic CC additions meet the *peak load* requirements, their  
18 potential incremental contribution of energy vastly exceeds DEF's annual energy  
19 growth needs, as shown in Exhibit No. \_\_ (PJH-5). The compound annual growth  
20 rate in the potential energy generation from these units, starting from the 2018  
21 Citrus County addition, is 4.5 percent. This far exceeds the total energy demand  
22 growth rate of 1.0 percent over the 2014-2043 period. From a production cost  
23 perspective, this modeling choice has little or no impact on the value of the self-

1 build Suwannee CTs, but tends to wash out the production cost value of Calpine's  
2 efficient CC capacity.

3           However, within the Strategist model, these generic units operate at a  
4 relatively high efficiency, with capacity factors between 60 and 80 percent,  
5 dramatically – and artificially – (1) reducing the utilization of Osprey (and other  
6 CC capacity on the system) and thus the positive energy benefit of that resource  
7 option, and (2) increasing the number of starts at Osprey by over 100 percent,  
8 increasing the cost of that resource option as shown in Exhibit No. \_\_ (PJH-6).

9           In reality, the more prudent choice of resource additions from a ratepayer  
10 perspective would likely better utilize the energy capacity of the existing  
11 combined cycle fleet to meet growth in total energy requirements, probably using  
12 an optimized combination of more targeted CT and/or CC duct firing technology  
13 to meet future peak demand needs.

14

15 **Q: Are you suggesting that DEF is committing to an over-build of expensive CC**  
16 **capacity in the future?**

17 **A:**           No. The addition of generic CC capacity is a modeling artifact. I would  
18 expect that over time as DEF's actual resource needs materialize, the Commission  
19 will expect DEF to select the best set of resources to meet growth in peak load  
20 and annual energy, in consideration of the load, resource, and cost expectations in  
21 place *at that time*. My point in raising this concern is to illustrate the way in  
22 which I believe future changes in infrastructure have been modeled in Strategist  
23 for this evaluation inappropriately and artificially discount the value of Osprey



1 relative to the self-build option, and skew the CPVRR results in favor of the  
2 Company's proposed outcome.

3

4 **Q: You have concluded that the production cost modeling component of**  
5 **Strategist likely understates the production cost benefit of Osprey relative to**  
6 **the competing self-build proposals. Can this be corrected without**  
7 **reconfiguration and re-running of the Strategist model at this time?**

8 A: No, I do not believe it is possible to accurately "adjust" Strategist results  
9 after the fact for assumed differences in production cost modeling configurations.  
10 The only way to do this would be to re-run Strategist or – ideally – an alternative  
11 production cost modeling tool, under different scenarios and resource portfolios to  
12 develop a more accurate representation of the likely benefits and costs of  
13 competing proposals from a production cost perspective.

14

15 **Q: Are there other elements of the Strategist modeling that may influence the**  
16 **results, and that can be adjusted after the fact?**

17 A: Yes. There are a number of factors in the Company's CPVRR results tied  
18 to financial assumptions and the underlying capital and fixed costs of proposals  
19 that incorrectly represent the proposals before the Company and the Commission  
20 at this time. These factors can – and should – be corrected for the Commission to  
21 have an accurate portrayal of the impact of competing proposals on ratepayers.  
22 For example, the estimate of costs associated with transmission upgrades to fully  
23 capture the capacity value of the Osprey Facility is vastly overstated in the



1 original CPVRR calculations. As described in the testimony of John Simpson, the  
2 actual cost to accomplish this – through a direct connect transmission upgrade that  
3 not only would allow integration of Osprey’s full capacity to serve DEF’s  
4 customers, but would also provide meaningful reliability benefits to the DEF and  
5 FRCC systems – is likely no more than \$150 million, and could be less. Simpson  
6 Direct at 12. In addition, as described in the testimony of Todd Thornton, Calpine  
7 has reduced its acquisition sale price from \$300 million to \$ [REDACTED] in 2020,  
8 accompanied by reduced capacity payments on a PPA from 2015 through 2019.  
9 Thornton Direct at 7-8. Since these factors only affect fixed costs and  
10 investments, they would not affect production cost modeling outcomes (which are  
11 a function of variable costs only). Thus, adjusted CPVRR results may be  
12 approximated by adjusting for different fixed cost and financial assumptions,  
13 holding all else equal.

14  
15 **Q: Have you evaluated the impact of these updated pricing changes on the**  
16 **CPVRR?**

17 **A:** Yes, I have. Exhibit No. \_\_ (PJH-7) highlights the results of these  
18 adjustments. In order to do this, I had to start with CPVRR results that DEF has  
19 already generated in this docket. Specifically, I start with DEF’s CPVRR  
20 estimate of negative \$193 million (compared with the self-build proposal)  
21 calculated for the acquisition of the Osprey Facility in 2014. After accounting for  
22 new estimates for the direct connect transmission upgrades, and including the  
23 CPVRR impacts of the acquisition and PPA costs of Calpine’s current offer, and

1 adjustments for gas reservation charges, I find that the CPVRR of an Osprey  
2 PPA/acquisition relative to the DEF self-build option is, at a bare minimum,  
3 positive \$133 million.

4

5 **Q: Do you believe this accurately captures the value to DEF's customers of the**  
6 **Osprey PPA/acquisition relative to DEF's proposed self-build projects?**

7 A: No, I do not. In this recalculation, I only considered the impact of the  
8 timing and magnitude of capital costs on the total CPVRR. As described above, I  
9 believe that the way in which DEF structured its evaluation of proposals and  
10 calculated production cost costs and benefits likely understates the value of the  
11 Osprey Facility. This means that the negative \$193 million starting point is, in  
12 my view, significantly overstated (i.e., more negative than it should be). Thus, if  
13 adjusted and corrected for the true dispatch value of the Osprey Facility, the  
14 positive recalculated CPVRR value for the Osprey PPA/acquisition would start at  
15 a less negative CPVRR number, and thus should significantly exceed the \$133  
16 million customer CPVRR benefit calculated for changes in generation and  
17 transmission capital costs and gas reservation adjustments presented in Exhibit  
18 No. \_\_ (PJH\_7).

19

20 **Q: Please describe your capital cost adjustments to the CPVRR in greater detail.**

21 A: In Exhibit No. \_\_ (PJH-7), I made two adjustments to the capital costs for  
22 generation and transmission that I understand to have been included in Mr.  
23 Borsch's CPVRR estimates.

1 First, I estimated the impact of the new and lower acquisition price offered  
2 for the Osprey Facility. As noted in the testimony of Todd Thornton, Calpine  
3 provided DEF an updated offer including an acquisition price of [REDACTED]  
4 a closing on January 1, 2020. Accounting for the new PPA/acquisition offer  
5 required three steps.

6 The [REDACTED] sale price offers a significant value to ratepayers  
7 compared to the \$300 million original sale price. In adjusting the CPVRR  
8 estimate for this new acquisition price, I first accounted for the impact on revenue  
9 requirements, including depreciation, return on rate base, and income taxes. I  
10 estimate that the impact of a \$ [REDACTED] reduction in sale price is equal to a net  
11 positive of [REDACTED] in CPVRR value.

12 Second, based on the information I reviewed, it appears that DEF  
13 originally modeled the acquisition purchase investment as happening in 2014.  
14 Duke Energy Florida, Inc., response to Calpine Construction Finance Company,  
15 L.P.'s First Set of Interrogatories to Duke Energy Florida, Inc. (Nos. 1-9),  
16 Competitively Sensitive Confidential Response 6a and 6l. (hereafter, "DEF IR").  
17 However, pursuant to Calpine's offer, the asset purchase would be booked in  
18 2020. Adjusting for this difference in terms of the time value of money, I  
19 estimated that an asset sale booked in 2020 instead of 2014 would result in an  
20 additional [REDACTED] benefit from a CPVRR perspective.

21 Calpine's current proposal also contains an initial five-year PPA prior to  
22 the acquisition starting at [REDACTED] in 2015, escalating to [REDACTED]  
23 [REDACTED] in 2019. Thornton Direct at 7-8. Because I accounted for the acquisition in



1 2020, I added back into the CPVRR estimate the net present value of capacity  
2 payments under the updated PPA agreement. Pursuant to the terms of Calpine's  
3 offer, the capacity payments are based on the 515 MW of Osprey's contracted  
4 capacity under the PPA, even if prior to construction of the direct connect  
5 transmission upgrade DEF may not have access to the full capacity in certain  
6 hours of the year. The resulting total PPA capacity payments over this period are  
7 equal to approximately [REDACTED].

8 The net impact of these three adjustments is [REDACTED] in positive  
9 CPVRR benefits for ratepayers, as shown in Exhibit PJH-7A and PJH-7B.

10 Next, I also accounted for the lower estimates for transmission upgrades.  
11 Mr. Borsch included [REDACTED] in transmission costs for an acquisition  
12 scenario. DEF IR2. However, DEF's transmission expert Edward Scott noted that  
13 the best approach to integrating Osprey within DEF's system would be to  
14 establish a direct connection of Osprey to the DEF balancing authority area  
15 ("BAA") (the "direct connect" project), and that that could be completed with two  
16 new 230 kV transmission lines from Tampa Electric Company's Recker  
17 Substation to both the Kathleen and Haines City East substations at a total cost of  
18 approximately \$150 million. Florida Public Service Commission, Docket No.  
19 140111-EI, Direct Testimony of Ed Scott (hereafter "Scott Direct"), at ES-3, 2 of  
20 4. Calpine's transmission expert John M. Simpson has confirmed that the cost of  
21 such a project is not likely to exceed this amount (and could be meaningfully  
22 less), and that in addition to addressing any DEF or third-party  
23 interconnection/upgrade requirements, such a direct connection would also



1 provide a number of ancillary benefits to the DEF and Tampa Electric Company  
2 balancing authority areas. Simpson Direct at 15. I apply the same method as in  
3 the acquisition price adjustment above to estimate corrections to CPVRR for this  
4 lower transmission upgrade cost. In short, this improves the CPVRR of Osprey  
5 relative to the DEF self-build proposal by approximately [REDACTED].

6 The net impact of only these two adjustments for Calpine's updated  
7 PPA/acquisition offer and updated transmission cost estimates — is that an  
8 Osprey PPA/acquisition mix results in CPVRR benefits to ratepayers – relative to  
9 the DEF self-build proposal, of approximately [REDACTED].

10

11 **Q: Are there other fixed costs in Strategist that the Commission should**  
12 **consider?**

13 A: Yes, it appears that DEF has modeled Osprey with firm gas transport but  
14 failed to include a similar or comparable cost for the firm gas transportation  
15 service available to serve the Suwannee CT units. DEF IR6g and 10a. This  
16 creates issues of comparability, and puts Osprey at a cost disadvantage relative to  
17 the Suwannee CTs.

18

19 **Q: What is the financial impact of including the costs for firm gas**  
20 **transportation service for some units but not for others?**

21 A: The cost difference on a CPVRR basis is substantial. DEF modeled  
22 annual firm gas service for Osprey at [REDACTED] per year. DEF IR6g. On a net  
23 present value basis, this is equal to [REDACTED], assuming firm gas transportation

1 costs are passed directly on to ratepayers. This single fact alone accounts for  
2 almost the full difference ascribed to an Osprey acquisition in this docket. DEF  
3 also included firm gas transportation service for an Osprey PPA scenario and the  
4 generic CT units that replace it in 2022.

5 However, I understand that DEF maintains long-term firm transportation  
6 agreements that support its existing plants and that DEF already has sufficient  
7 firm transportation for gas to the Suwannee location. Duke Energy Florida, Inc.'s  
8 Responses to NRG Florida LP's First Interrogatories Nos. 1-108 to Duke Energy  
9 Florida, Inc., Response 36. If this is indeed the case, then a true apples-to-apples  
10 comparison would allocate a portion of the existing firm fuel gas costs that would  
11 otherwise go to serve the new Suwannee CTs. That is, presumably DEF manages  
12 fuel commodity and transportation on a fleet-wide basis to minimize the overall  
13 cost of electricity generation to ratepayers, and optimizes existing commodity and  
14 transportation contracts across its fleet with this objective in mind. Yet in the  
15 analysis, DEF has existing natural gas transportation rights that are reserved to  
16 benefit their self-build unit in CPVRR calculations, but are not comparably  
17 credited to a *competing resource* that, if selected, would eliminate the need to  
18 assign such rights to the self-build resource.

19 In my view, this compromises the fairness of the resource evaluation,  
20 creates an unlevel playing field, and could contribute to solutions that are  
21 imprudent or not optimal from a ratepayer perspective. Because gas  
22 transportation contracts – are to some degree – transferrable products, DEF should  
23 be able to accommodate 320 MW of generation from *any* proposal in this docket

1 under its existing gas transportation contracts. Therefore, in Exhibits PJH-\_\_ 7a  
2 and 7b, I include an additional CPVRR adjustment of [REDACTED], which is  
3 equal to [REDACTED] [REDACTED] [REDACTED]  
4 [REDACTED] [REDACTED] [REDACTED]  
5 [REDACTED]

7 **Q: What do you conclude based on your analysis?**

8 A: Based on my review of a relatively simple set of adjustments to CPVRR  
9 results, I conclude that – even assuming that in all other ways DEF has  
10 appropriately modeled the resources compared in this procurement (which, as  
11 discussed above, I do not believe) – the Osprey PPA/acquisition is the best deal  
12 for ratepayers in terms of CPVRR.

13 The net effect of the adjustments I have described above – accounting  
14 solely for changes in capital costs for generation and transmission and fixed  
15 expenses related to gas reservation charges – has a total CPVRR benefit of \$133  
16 million. My adjustments reflect current conditions and a comparison of the two  
17 units that I believe is not only more appropriate, but is supported by DEF’s own  
18 analysis in this docket. As I described above, Mr. Borsch also found that  
19 Acquisition 2 had a positive CPVRR of \$39 million, under a scenario with a [REDACTED]  
20 million purchase price and [REDACTED] million in transmission costs, both of which are  
21 much closer in detail to the current Calpine offer being considered by DEF.

22 “14LGBRA-NRGROG1-28-000001 – 000008 CONFIDENTIAL  
23 Results\_Sensitivities\_01212014A.xlsx”



1           Furthermore, as I describe below, Mr. Borsch also tested the sensitivity of  
2           his results to “construction cost[s]..., gas transportation contract risks, plant  
3           condition and maintenance risks, and transmission cost risks” among other things.  
4           The difference between the high and low sensitivity cases for the DEF self-build  
5           proposals was negative \$176 million. To the extent that any of the DEF self-build  
6           proposals experience cost over-runs consistent with Mr. Borsch’s assumptions,  
7           some portion of his negative \$167 million and my positive \$133 million CPVRR  
8           adjustments may be additive, suggesting even greater value to DEF ratepayers.  
9

10           ***III.D.     RATEPAYER RISKS***

11           **Q:     In light of the fact that the proposals being reviewed by the Commission in  
12           this proceeding result from a competitive process, why do you think it is  
13           important to comment on ratepayer risks as part of your testimony?**

14           **A:**           In any competitive procurement involving utility and non-utility  
15           alternatives, it is vitally important that the Commission give due consideration to  
16           the different risks that procurement options have from the perspective of the  
17           utility’s ratepayers. For decades, many public utility commissions – including  
18           this Commission – have required that utilities test self-build options through  
19           competitive solicitations in order to impose the discipline of competition on utility  
20           self-build project design and pricing. The goal of obtaining the best result for  
21           customers relies not only on competition to allow for discovery of the best offer  
22           prices from suppliers, but it also depends upon discovering and weighing any  
23           differences in the risk profile of the competitive offers. Price is certainly one



1 aspect of getting the best deal for ratepayers; the development status and the terms  
2 and conditions under which a product is proposed at a particular price also affects  
3 the relative value of different competitive offers to consumers.

4  
5 **Q: Please explain further what you mean by the impact on consumers of the**  
6 **terms and conditions under which a product is supplied.**

7 A: We see this relative “risk” principle at work often in the electric industry.  
8 Utilities must make decisions at one point in time about investments and other  
9 commitments that could be greatly affected by events that will occur much later,  
10 and which may or may not comport with the original expectations. Development  
11 uncertainty can lead to delays, changes in costs, and unexpected outcomes. Labor  
12 and material costs change. Fuel prices change. Public policy will change.  
13 Consumer habits change. Countless things can change, so that – after the fact –  
14 the original decision to select a particular power plant may end up looking like a  
15 very good deal or a very bad failure. Many of these conditions – variations in  
16 development status and permitting requirements, open versus guaranteed pricing,  
17 and uncertain versus guaranteed performance – are before the Commission in this  
18 case.

19  
20 **Q: In your view, does Calpine’s proposal appropriately manage the risks related**  
21 **to new resource acquisition?**

22 A: Yes. From a customer’s perspective, the risk profiles of the various  
23 options available to DEF are significantly different. DEF, for example, seeks to

1 pass through to ratepayers a return of and on the actual dollars of power plant  
2 investment (into utility rate base), including any cost overruns, provided the  
3 Company can demonstrate that any cost overruns "...were prudently incurred and  
4 due to extraordinary circumstances." DEF IR9, Docket No. 140110-EI. In other  
5 words, while DEF has provided an estimate of the costs to develop, permit and  
6 construct the Suwannee CTs – and that estimate is the basis for evaluating its  
7 proposal relative to other proposals – if the actual costs come in much higher,  
8 DEF surely expects to recover the additional costs unless the cost overruns could  
9 be proven to be due to incompetence or imprudence in project management. For  
10 the purposes of my analysis, I have assumed a \$197 million total cost for the  
11 Suwannee CTs, even though there may still be uncertainty in DEF's expectation  
12 of ultimate costs. For example, as included in Exhibit BMHB-2, Schedule 9, as  
13 recently as January 2014 DEF estimated a total installed cost of \$661.57/kW.  
14 Based on 316 MW of summer capacity, this equates to an installed cost of \$209  
15 million. In addition, it is not possible to know with certainty how reliably and  
16 efficiently the facility will operate when needed until it has been constructed and  
17 operated under normal and peak system conditions.

18 By contrast, the cost to ratepayers of accepting Calpine's offer of the PPA  
19 and acquisition for the Osprey Facility are fully known at this time. The  
20 acquisition price is set; the annual costs of the PPA are set; the operational heat  
21 rate and performance of the facility through the term of the PPA is guaranteed;  
22 additional variable costs associated with fuel transportation and operations and  
23 maintenance are known; and the condition of the plant – and its ability to operate

1 reliably and at a high level of availability – have been demonstrated and  
2 established through operating experience.

3 This difference in risk profiles is an important consideration both from the  
4 perspective of risks borne by ratepayers, and from the perspective of how fairly  
5 resources have been compared in this docket. In effect, the Commission knows  
6 now with certainty what ratepayers will pay over time for power from the Osprey  
7 Facility, what performance Calpine is obligated to provide from the perspectives  
8 of capacity availability and operational performance over the term of the PPA,  
9 and what to expect in terms of plant operations and performance once the Osprey  
10 Facility is acquired by DEF. Also, as discussed in Section IV below, CC  
11 generation is a less risky proposition from a long-term market perspective because  
12 it more effectively hedges against uncertainty related to environmental policy,  
13 fuel price forecasts and longer-term market trends due to the fundamental  
14 difference between CC and CT units in terms of unit efficiency; that is, CC units  
15 like Osprey simply burn less fuel and emit lower quantities of pollutants per unit  
16 of energy generated.

17 In short, compared to DEF’s proposal to construct the Suwannee CTs,  
18 from the perspective of ratepayers, Calpine’s Osprey proposal can be viewed as a  
19 low-risk proposition that hedges ratepayer risk, via the terms of a binding,  
20 guaranteed contract with a firm acquisition price, to the maximum extent possible.  
21 In my view, this constitutes a meaningful difference in proposal attributes and  
22 allocation of risk, which should be factored into the Commission’s decisions  
23 about which offers provide the best “price” and “value” to ratepayers.



1 **Q: Did DEF evaluate any risks in its analysis?**

2 A: DEF did not incorporate any consideration of self-build risks in its  
3 baseline evaluation of proposals in this procurement. Consequently, DEF's  
4 presentation of best-estimate CPVRR results of competing proposals – and its  
5 conclusion that the best option for ratepayers is the self-build proposal – are based  
6 on an evaluation process that does not factor in ratepayer risks. However, DEF  
7 does evaluate the potential impact of various risks in a modeling sensitivity. In  
8 Exhibit BMHB-9, Mr. Borsch presents the results of a sensitivity analysis related  
9 to construction cost risks, gas transportation contract risks, plant condition and  
10 maintenance risks, and transmission cost risks tied to the Suwannee and Hines  
11 projects. The result shows the self-build option incorporating potential downside  
12 project development and construction risks has a negative CPVRR of \$167  
13 million, relative to the base case. As I discussed in Section III.C above, this  
14 assessment is independent of the CPVRR adjustments I have made for the Osprey  
15 PPA/acquisition, which accounts for the current and known value of the Osprey  
16 acquisition price, updated transmission cost estimates, and sensitivity to gas  
17 transportation costs.

18

19 **IV. CALPINE'S OFFER PROVIDES SUBSTANTIAL BENEFITS RELATIVE**  
20 **TO ALTERNATIVES FROM RELIABILITY, FLEXIBILITY, AND**  
21 **ENVIRONMENTAL PERSPECTIVES**

22 **Q: Are lower costs and reduced cost-related risks the only benefits of the Osprey**  
23 **Facility compared to the Company's self-build alternative?**



1 A: No. Calpine's Osprey Facility – when compared to DEF's self-build  
2 alternative – provides a number of additional benefits not fully captured in LCOE  
3 or CPVRR analyses from the perspectives of power system reliability, flexibility,  
4 and environmental impacts. These are important considerations for the  
5 Commission at a time of significant uncertainty and change in the electric sector,  
6 with highly uncertain growth in peak load and energy consumption, pending and  
7 emerging federal requirements related to the air, water, and solid waste impacts of  
8 electric generating facilities, and significant developments in the pricing and  
9 transportation of natural gas (for heating, process needs, and power generation).

10

11 **Q: Please describe the benefits of Osprey's more efficient CC capability relative**  
12 **to the CT capability of Suwannee.**

13 A: To a certain extent, the LCOE and CPVRR analyses described above can  
14 reveal how the greater efficiency of CC technology (compared to CT technology)  
15 can provide benefits to DEF's system from a total production cost perspective.  
16 Yet there are a number of additional benefits of CC technology that flow from the  
17 greater efficiency of CC technology (compared to CT technology) tied to the roles  
18 that such facilities play in system operations. CT capacity is effective in  
19 providing capacity at times of system peak or otherwise when stressed system  
20 conditions require operation of peaking capacity. When committed, CT units can  
21 also provide load-following services to help the system operator meet  
22 instantaneous and longer-term variations in system load.

1           However, the contribution of CTs to load following and to otherwise  
2 helping manage variations in system conditions is restricted by the limited hours  
3 in the year that it is efficient to commit and operate these units. More efficient  
4 CC capacity is simply available far more to help meet system needs across a  
5 wider range of hours and system load conditions. As an efficient CC unit, Osprey  
6 would be able to help DEF meet customer demands in baseload, cycling and  
7 peaking modes. Further, Osprey would be available to provide load-following or  
8 reserve services across many more hours of the year, and under a greater variety  
9 of system load/generation configurations. For example, Osprey would likely be  
10 operating for well over 6,000 hours at various levels of output in the year to help  
11 meet system needs, compared to on the order of 1,000 hours or less for the  
12 Suwannee CTs operating at 10 percent capacity factor.

13  
14 **Q: Are there ancillary system benefits for DEF associated with the Osprey**  
15 **PPA/acquisition?**

16 **A:**           Yes. As noted earlier, and described in the testimony of John Simpson,  
17 the acquisition of the Osprey Facility will involve the construction of the “direct  
18 connect” transmission project, which will allow access to and availability of the  
19 full capability of the Osprey Facility in all hours of the year, and will address all  
20 system upgrade needs on DEF or third-party systems to ensure continued reliable  
21 operations. In addition, the direct connect transmission infrastructure will provide  
22 additional reliability benefits to the systems of DEF and the broader FRCC.  
23 Simpson Direct at 15. In contrast, selecting the Suwannee CTs will not involve

1 any beneficial transmission system upgrades and will, in fact, require the  
2 retirement of existing generating capacity at the Suwannee location in order to  
3 accommodate interconnection of the new peaking facilities. Simpson Direct at 16-  
4 17.

5 Thus, by selecting Calpine's offer for the Osprey PPA/acquisition, DEF  
6 will (a) obtain a resource and system upgrades that can meet its stated resource  
7 needs at a cost that is in the best interest of ratepayers, (b) will do so in a way that  
8 will improve system reliability through strengthening transmission infrastructure,  
9 and c) access available efficient CC capability that can operate and contribute to  
10 system operations in far more hours of the year than the Suwannee CTs.

11

12 **Q: Would acquisition of Osprey help DEF manage load and resource**  
13 **uncertainty in the coming years?**

14 A: Yes. In Section III above, I describe my findings with respect to the  
15 relative cost benefits of DEF accepting Calpine's PPA/acquisition offer for the  
16 Osprey Facility. However, in addition to being a better deal for ratepayers at the  
17 outset, the Osprey PPA/acquisition would offer DEF important option value with  
18 respect to major future capital investments to meet customer needs over the next  
19 several years.

20

21 **Q: Please explain what you mean by "option value."**

22 A: Yes. In my view, there is a relatively high degree of uncertainty with  
23 respect to growth in DEF's system peak load and annual energy requirements in



1 the coming years. While the coming retirements on DEF's system do appear to  
2 create a need for new capacity in the latter half of this decade, the magnitude and  
3 timing of that need are strongly dependent on (1) the quantity of capacity added in  
4 early years, (2) the actual level of peak load and annual energy growth compared  
5 to forecast quantities, and (3) the timing of retirement additions and resource  
6 additions. In this context, there is a potentially high "option value" in actions or  
7 decisions that can delay major capital investments.

8 By way of example, it is my understanding that the current air permits at  
9 Crystal River 1 and 2 allow the units to remain in operation through 2020, under  
10 the Mercury and Air Toxics Standard ("MATS") compliance limit using the site-  
11 wide averaging provision and activated carbon injection systems at CR4 and 5.  
12 Order No. PSC-14-0173-PAA-EI, Docket No. 130301-EI at 3. Delaying  
13 investment in (and recovery in rates of) the Citrus County CC units by just one  
14 year could mean \$59 million in CPVRR benefits for ratepayers, even while  
15 accounting for the increased O&M expenses necessary to operate Crystal River  
16 with new pollution controls in place. (In this estimate, I did not, however, include  
17 any additional costs for changes in the 1-hour National Ambient Air Quality  
18 Standard ("NAAQS") for sulfur dioxide ("SO<sub>2</sub>") emissions or 316(b) mitigation,  
19 as discussed in DEF responses to the Office of Public Counsel First Set of  
20 Interrogatories, Served July 1, 2014. In my view it remains unclear whether an  
21 additional year of operation would require additional significant costs beyond  
22 operational changes). Furthermore, the reliability concerns associated with  
23 outages or reductions related to CR4 and 5 that might impact the site-wide

1 emissions averages may be reduced under a scenario with the full energy output  
2 of both Osprey and Hines available in 2019.

3 While this exercise means little if demand growth, retirement, and the  
4 timing of resource additions are known with certainty at this time, it can mean a  
5 great deal for ratepayers when, as now, the Company is proceeding with a major  
6 infrastructure turnover over a relatively short period of time.

7

8 **Q: Why do you believe the Osprey PPA/acquisition could provide some option  
9 value for DEF and its ratepayers?**

10 A: The Osprey PPA/acquisition may provide option value in the context of a  
11 combined view of both the pre-2018 procurement and post-2018 (i.e., the Citrus  
12 County CC units), in that it represents a resource (1) that is in operation, with no  
13 uncertainty regarding commercial operations, capabilities, or ability to contribute  
14 to system operations; (2) that is large enough to meet system needs through 2017  
15 and possibly longer depending on how load and resource outcomes compare to  
16 current projections and plans; and (3) in combination with the construction of the  
17 Hines Chillers, could allow for some period of delay in the construction of the  
18 Citrus County CC capacity if peak load and annual energy requirements do not  
19 grow as fast as currently forecast by DEF.

20

21 **Q: Have you concluded that the Company's forecasts of load/energy growth or  
22 the timing of resource addition and attrition are wrong?**

1     A:           No, I have not. The Company, the Commission, and stakeholders have all  
2           worked over the past several years to understand the potential timing of resource  
3           changes and the potential that changing economic factors will lead to rates of  
4           growth in peak load and energy requirements that depart from recent experience.  
5           I am not suggesting that the Commission second-guess those planning efforts.  
6           However, based on my experience over decades as a utility regulator and  
7           consultant, I recognize that the type of resource and forecast assumptions that go  
8           into the Company's determination of resource needs are just that – assumptions –  
9           and are almost certain to deviate from what actually transpires in the coming  
10          years. The Commission has recognized this fact in its ten-year site plan reviews,  
11          finding that in recent years, the absolute average error in retail energy sales  
12          forecasts has increased to almost 20 percent, and that even the best forecast errors  
13          have ranged between 1 and 3 percent. Review of the 2013 Ten-Year Site Plans,  
14          For Florida's Electric Utilities, Florida Public Service Commission, October 2013  
15          at 20. Compounded over several years, these deviations can lead to significant  
16          variations in actual demand.

17                 In consideration of this, any resource decision that has the potential to  
18                 delay major investments can save ratepayers money in the long run, and thus  
19                 provide an option value that should be considered in resource decision making. In  
20                 the context of the pre-2018 resource need, Osprey provides some flexibility  
21                 around the timing of commercial operation of the Hines Chillers projects. In the  
22                 context of the post-2018 resource need, Osprey provides some flexibility around  
23                 the timing of the Citrus County CC units.



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**Q: What do you conclude based on your consideration of these factors in the context of this procurement?**

A: Based on my review of these factors, I believe that a decision by the Commission to require that DEF accept Calpine’s offer for the Osprey PPA/acquisition could provide substantial option value benefits for DEF’s ratepayers, and introduces a key element of flexibility for DEF as it embarks on a major period of infrastructure turnover over the next several years. As noted above, I do not believe that considering this benefit is necessary to conclude that the Osprey proposal is the best deal for ratepayers. However, the potential for option value benefits increases the advantage of selecting the Calpine proposal in the pre-2018 procurement.

**Q: Do you believe acquisition of the Osprey Facility – compared to the Suwannee CTs – can provide other benefits from a public policy perspective?**

A: Yes. I believe that selecting Osprey in this acquisition would allow DEF and the State of Florida to capitalize on the wide-ranging human health, climate risk mitigation, and environmental benefits that flow from using an already-built and operational, efficient, and low-emitting (in terms of emissions per megawatt-hour) resource instead of a (by comparison) relatively inefficient and higher-emitting Suwannee CT project – one that while on an existing site, would still involve new construction activities. The relative impact of CT versus CC technologies from an emission perspective is presented in Exhibit No. \_\_ (PJH-8).

1 This exhibit shows emission rates from each unit proposed in this solicitation on a  
2 pounds per MWh (“lb/MWh”) basis. In other words, the exhibit provides a true  
3 apples-to-apples environmental comparison of the projects with respect to the  
4 level of emissions that result from production of an equivalent amount of energy.  
5 The emission rates for the Osprey Facility are lower than the Suwannee CTs by  
6 ██████ b/MWh, or 33 percent for nitrogen oxides (NO<sub>x</sub>), and ██████/MWh or 42  
7 percent for CO<sub>2</sub>. These emission rates are primarily a direct function of the  
8 relative energy efficiency (i.e., heat rates) of the respective projects; in simple  
9 terms, using less fuel per MWh results in less air pollution per MWh generated.  
10 In addition, by adding the Osprey CC resource at this time, DEF may realize  
11 additional emission reduction benefits to the extent that Osprey displaces output  
12 from less-efficient existing fossil-fueled resources on the DEF system.

#### 14 V. CONCLUSIONS

15 **Q: In your opinion, does DEF’s self-build plan, i.e., constructing the Suwannee**  
16 **CTs and the Hines Chillers, represent the most cost-effective alternative for**  
17 **Duke’s customers?**

18 **A:** No, DEF’s self-build projects are not the most cost-effective alternatives  
19 for DEF and its customers. I come to this conclusion because I find that DEF’s  
20 modeling and analysis occur largely within a black box, appear to be  
21 oversimplified and structurally biased from a production cost benefit perspective,  
22 and inherently – and inappropriately – favor the Company’s self-build alternative.  
23 A more careful, common-sense review of the drivers of ratepayer impact

1 associated with the various options reveals that by moving forward as proposed  
2 by DEF, DEF's ratepayers will likely incur significant additional costs and risks  
3 than they would if instead of building the Suwannee CTs, Calpine's offer is  
4 accepted. Based on my estimates presented above, Calpine's value from a  
5 ratepayer perspective is at least a \$133 million benefit relative to DEF's self-build  
6 proposal, it and could be significantly greater to the extent that the Company's  
7 self-build alternative ends up more expensive than current estimates.

8

9 **Q: In your opinion, is the acquisition of the capacity of the Osprey Facility,**  
10 **through the combination of a 5-year PPA followed by direct acquisition of**  
11 **Osprey by DEF, as proposed to DEF by Calpine, a more cost-effective**  
12 **alternative for Duke's customers?**

13 A: Yes, it is. I come to the conclusion that selecting Osprey is the best  
14 outcome for ratepayers based on (1) a fully transparent comparison of the  
15 levelized costs of various alternatives; (2) a recalculation of cumulative present  
16 value revenue requirements starting from DEF's own calculations, with just a few  
17 reasoned adjustments reflecting current conditions and correcting for mistakes in  
18 the original analysis; (3) a review of the lack of transparency and apparent flaws  
19 in DEF's modeling approach and documentation; and (4) consideration of the  
20 nature and characteristics of risks born by ratepayers under DEF's self-build  
21 proposal, compared with selecting Calpine's offer.

22



1    **Q:    In your opinion, did the Company adequately consider the relevant and**  
2           **significant non-cost factors associated with an acquisition of the Osprey**  
3           **Facility?**

4    A:           No, they did not. I find that selection of Calpine’s proposed  
5           PPA/acquisition of the Osprey Facility would provide a number of additional  
6           benefits from the perspectives of power system reliability, flexibility, and  
7           environmental impacts. Specifically, I identify additional benefits that include (1)  
8           the relative value of more efficient combined cycle capacity (like the Osprey  
9           Facility) – compared to combustion turbine-only capacity – to meet DEF’s  
10          changing resource needs and system conditions across multiple operating modes  
11          (baseload, intermediate, and peaking); (2) the option value provided by the higher  
12          capacity of the Osprey Facility compared to the Suwannee CTs, which would  
13          allow for greater flexibility for DEF to alter the timing of major new capital  
14          investments in future years (such as the proposed Citrus County facility) should  
15          load growth and/or resource availability deviate from current expectations; and  
16          (3) the wide-ranging human health and environmental benefits that flow from  
17          using the already-built and operational, efficient, low-emitting (in terms of  
18          emissions per megawatt-hour) Osprey capacity instead of the new-construction,  
19          relatively inefficient, and higher-emitting Suwannee CTs.

20  
21   **Q:    Considering the results of the LCOE analysis, CPVRR analysis, and**  
22           **additional non-cost factors that you have identified in your testimony, what**  
23           **should DEF have done with respect to Calpine’s proposals?**

1 A: Considering both the economic results and the numerous additional factors  
2 that are not directly related to costs and cost-effectiveness, I believe DEF should  
3 have accepted – and should now accept – Calpine’s offer.

4  
5 Q: **In your opinion, what action should the Commission take with respect to**  
6 **DEF’s Petition?**

7 A: The Commission should deny DEF’s Petition. Calpine has made an offer  
8 to DEF that represents a low-cost, low-risk, reliable, efficient, and  
9 environmentally-responsible resource choice. DEF’s analysis of alternatives fails  
10 to appropriately capture these many value streams, overstates the value of their  
11 own self-build alternative (in particular the Suwannee CTs), and understates the  
12 value of the Calpine offer. A reasonable evaluation of these alternatives, a  
13 common-sense comparison of facilities’ levelized costs, and a review of important  
14 reliability, health, environmental and policy factors suggests that the best option  
15 for DEF’s ratepayers would be for DEF to accept Calpine’s offer.

16  
17 Q: **Does this conclude your testimony?**

18 A: Yes.

**Exhibit PJH-1  
Curriculum Vitae**

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**EDUCATION**

Ph.D. program (coursework), Nuclear Engineering, University of California, Berkeley

M.S. in Energy and Resources, University of California, Berkeley  
*Thesis: Safety and Environmental Hazards of Nuclear Reactor Designs*

B.S. in Physics, University of Massachusetts, Amherst

**PROFESSIONAL EXPERIENCE**

2010 - Present Analysis Group, Inc., Boston, MA  
*Vice President*

2007 - 2010 MA Department of Public Utilities, Boston, MA  
*Chairman*  
*Member, Energy Facilities Siting Board*  
*Manager, New England States Committee on Electricity*  
*Treasurer, Executive Committee, Eastern Interconnect States' Planning Council*  
*Representative, New England Governors' Conference Power Planning Committee*  
*Member, NARUC Electricity Committee, Procurement Work Group*

2003 - 2007 Analysis Group, Inc., Boston, MA  
*Vice President*  
*Manager ('03 - '05)*

2000 - 2003 Lexecon Inc., Cambridge, MA  
*Senior Consultant*  
*Consultant ('00 - '02)*

1998 - 2000 Massachusetts Department of Environmental Protection, Boston, MA  
*Environmental Analyst*

1991 - 1998 Massachusetts Department of Public Utilities, Boston, MA  
*Senior Analyst, Electric Power Division*

1988 - 1991 University of California, Berkeley, CA  
*Research Assistant, Safety/Environmental Factors in Nuclear Designs*

**OTHER PROFESSIONAL ACTIVITIES**

Advisory Board, Advanced Energy Economy (2011).



## SELECTED REPORTS, TESTIMONY AND PRESENTATIONS

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Paul J. Hibbard

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Paul J. Hibbard

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*Paul J. Hibbard*

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“Conversation With Chairman Hibbard,” presentation to New England Energy Alliance, Boston MA, September, 2008.

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*Before the Federal Energy Regulatory Commission, New England Power Pool and ISO New England, Inc., Docket No. ER01-2329, Joint Affidavit* (with J. Besser) on behalf of the New England Renewable Power Producers Association, July 3, 2001.

“Output-Based Emission Control Programs – U.S. Experience” (with N. Seidman, B. Finamore, and D. Moskovitz), prepared for the China Sustainable Energy Program, May 2000.

“P2 and Power Plants: The Massachusetts Allowance Trading Program,” in *Proceedings of the National Pollution Prevention Roundtable*, March 2000.

“Safety and Environmental Comparisons of Stainless Steel with Alternative Structural Materials for Fusion Reactors” (with A.P. Kinzig and J.P. Holdren), *Fusion Technology*, August 1994.

“Utility Environmental Impacts: Incentives and Opportunities for Policy Coordination in the New England Region,” US EPA CX817494-01-0, RCEE Core Group, June 1994.

“Final Report: Code Development Incorporating Environmental, Safety, and Economic Aspects of Fusion Reactors,” UC-BFE-027, Fusion Environmental and Safety Group, University of California, Berkeley, 1991.

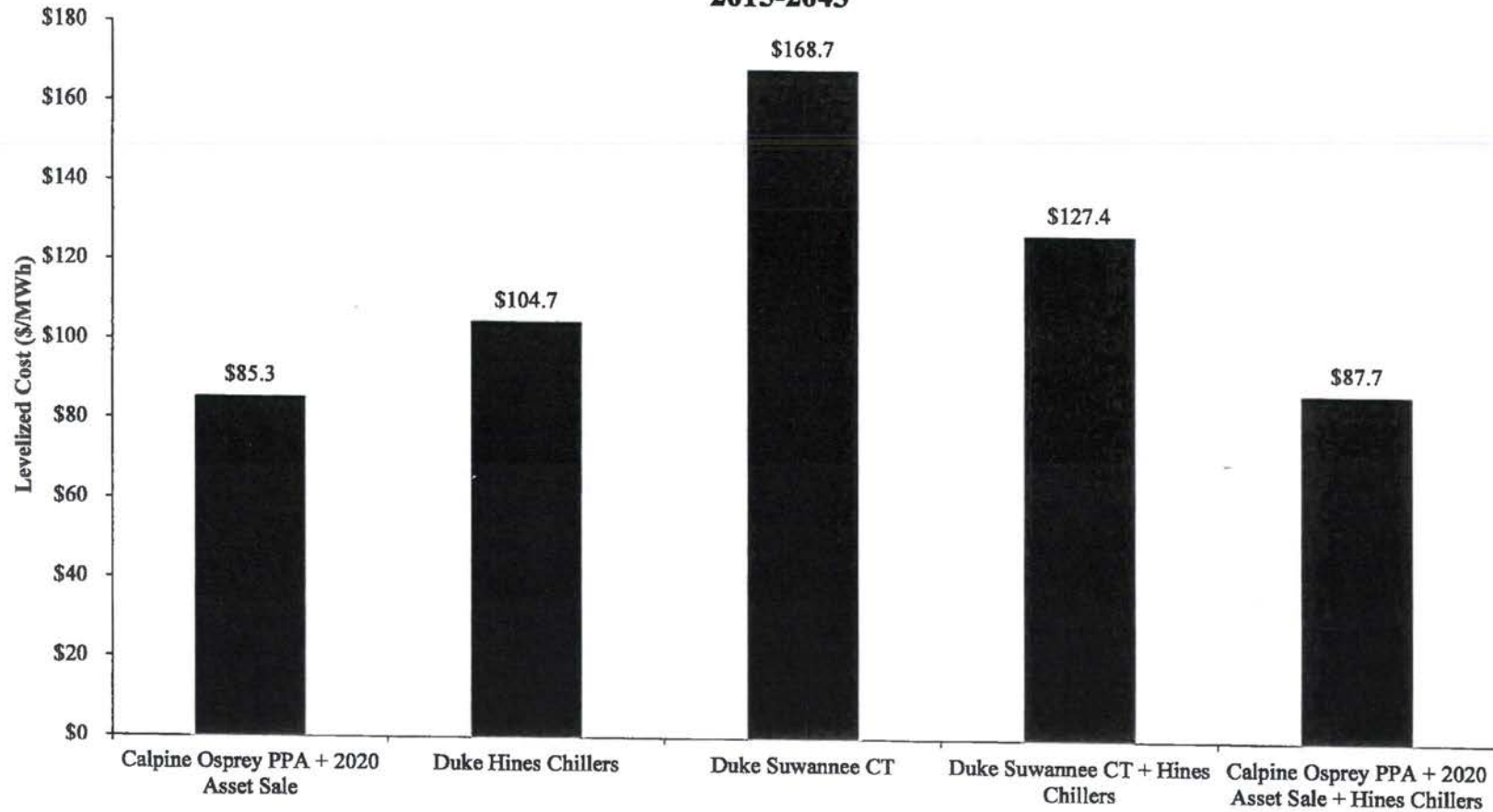
Exhibit PJH-2  
Calpine LCOE Model Sources and Assumptions

Variable	Unit(s)	Assumption	Source
Timing	Osprey	2015-2019 (PPA) 2020 - 2043 (Sale)	Calpine Bid
	Suwannee	Built 2016, 2043 End Date	
	Hines Chillers	Built 2017, 2043 End Date	Duke Proposal
Capacity	Osprey	515 MW	Calpine Bid
	Suwannee	316 MW	BMHB-2 (Summer Capacity)
	Hines Chillers	165 MW	Strategist Input, IR7
Capacity Factor	Osprey	[REDACTED]	[REDACTED]
	Suwannee	9.3%	BMHB-2
Capital Costs/ Capacity Price (\$2016)	Osprey	\$175 Million (\$2020, Sale)	[REDACTED]
	Suwannee	\$197 Million	[REDACTED]
	Hines Chillers	\$160 Million	Borsch Direct Testimony, Docket No. 140111-EI
Heat Rate	Osprey	[REDACTED]	Calpine Bids (PPA) Thornton Direct Testimony, Docket No. 140111-EI (Sale)
	Suwannee	10,197 Btu/kWh	BMHB-2
Financial Assumptions	Hines Chillers	7,222 Btu/kWh	SNL Financial
	Return on Equity	18.5%	
	Return on Debt	3.75%	
	WACC	6.46%	BMHB-1, p.48
	Tax rate	35.26%	
MACRS Schedule	Osprey	20 year from IRS	
	Suwannee	15 year from IRS	IRS - Publication 946
	Hines Chillers	20 year from IRS	
Transmission Capital Costs	Osprey	\$150 Million	Scott Direct Testimony, Docket No. 140111-EI
Fixed O&M Costs (\$)	Osprey (Sale only)		
	Suwannee	Forecasted 2015 - 2043	Strategist Input, Response to IR6
	Hines Chillers		
Variable O&M Costs (\$)	Osprey PPA	From Bid, escalated	Calpine Bid
	Osprey Sale, Suwannee	Forecasted 2015 - 2043	Strategist Input, Response to IR6
	Hines Chillers	Forecasted 2015 - 2043	Strategist Output, IR7
Start Cost (\$/start)	Osprey	[REDACTED]	Calpine Bid
	Suwannee	Forecasted 2015 - 2043	Strategist Output, IR7
Number of Starts	Osprey	[REDACTED]	[REDACTED]
Natural Gas Price (\$/MMBtu)	All	Forecasted 2015 - 2043	Strategist Input, Response to IR5
Gas Transportation Costs (\$/MMBtu)	Osprey	\$0.55 per MMBtu	Calpine Bid
CO2 Emissions Intensity (lbs / MMBtu)	All	117.08 lbs/MMBtu	Strategist Input, Response to IR10
NOx Emissions Intensity (lbs / MMBtu)	Osprey	0.0115 lbs/MMBtu	SNL
	Suwannee	0.0106 lbs/MMBtu	DEF Response to NRG, No. 27
	Hines Chillers	0.0100 lbs/MMBtu	Strategist Input, Response to IR10, Hines 2
Environmental Costs	All	Forecasted 2015 - 2043	Strategist Input, Response to IR4 and IR11

Sources:

- [1] Response to Question 4, Schedule from DEF's Response to Calpine's 1st Interrogatories, Docket No. 140111, June 16, 2014, 14LGBRA-CALPINE1-4-DOC 1 Docket\_140111-EI\_Q4.xlsx.
- [2] Response to Question 5, Corrected Schedule from DEF's Response to Calpine's 1st Interrogatories, Docket No. 140111, June 20, 2014, 14LGBRA-CALPINE1-5-DOC 1 CONFIDENTIAL Docket\_140111-EI\_Q5 (2).xlsx.
- [3] Response to Question 6, Corrected Schedule from DEF's Response to Calpine's 1st Interrogatories, Docket No. 140111, June 20, 2014, 14LGBRA-CALPINE1-6-DOC 1 CONFIDENTIAL Docket\_140111-EI\_Q6.xlsx.
- [4] Response to Question 7, Corrected Schedule from DEF's Response to Calpine's 1st Interrogatories, Docket No. 140111, June 20, 2014, 14LGBRA-CALPINE1-7-DOC 4 CONFIDENTIAL Docket\_140111-EI-Q7- Self Build P5.xlsx.
- [5] Response to Question 10, Schedule from DEF's Response to Calpine's 2nd Interrogatories, Docket No. 140111, June 24, 2014, 14LGBRA-CALPINE2-Q10-000001 - 000004 Emission Rates 2013\_0927.xlsx.
- [6] Response to Question 11, Schedule from DEF's Response to Calpine's 2nd Interrogatories, Docket No. 140111, June 24, 2014, 14LGBRA-CALPINE2-Q11-000005 - 000006 Allowance Pricing 2013\_0929 (2).xlsx.
- [7] Direct Testimony of Benjamin M.H. Borsch, on Behalf of Duke Energy Florida, Inc., in re: Petition for Determination of Cost Effective Generation Alternative to Meet Need Prior to 2018. Florida Public Service Commission Docket No. 140111-EI, May 27, 2014, Exhibit BMHB-1 and 2.
- [8] Direct Testimony of Edward Scott, on Behalf of Duke Energy Florida, Inc., in re: Petition for Determination of Cost Effective Generation Alternative to Meet Need Prior to 2018. Florida Public Service Commission Docket No. 140111-EI, May 27, 2014, Exhibit ES-3.
- [9] SNL Financial.
- [10] Duke Energy Florida, Inc.'s responses to NRG Florida LP's First Interrogatories Nos. 1-108 to Duke Energy Florida, Inc., No. 27.

**Exhibit PJH-3**  
**Levelized Cost of Electricity (\$2014/MWh)**  
**2015-2043**



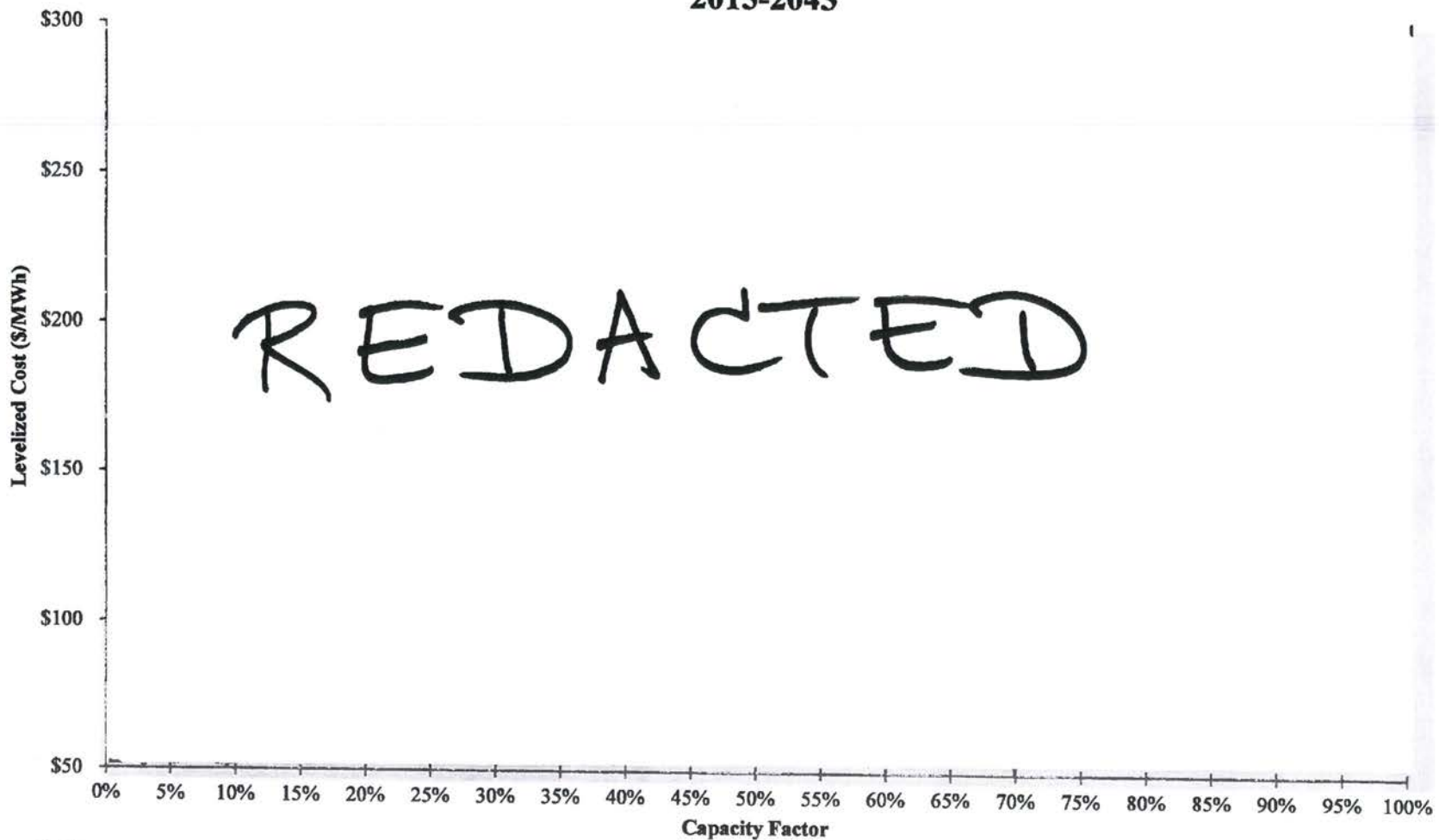
**Notes:**

Annual average capacity factors are assumed to be [redacted] for Osprey, 9.3% for Suwannee, and [redacted] for the Hines Chillers.

The Osprey LCOE includes \$150 in transmission costs.



**Exhibit PJH-4**  
**Levelized Cost (\$2014/MWh) by Capacity Factor**  
**2015-2043**

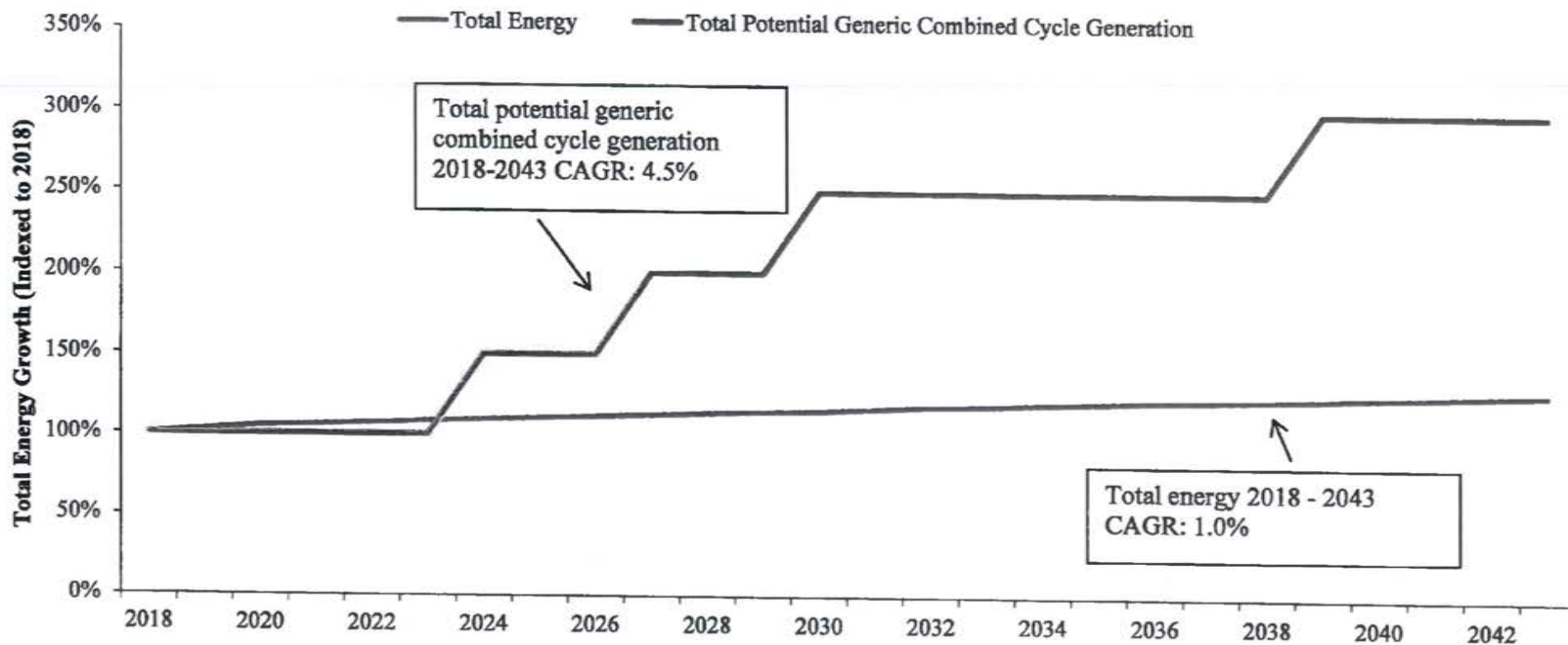


**Notes:**

The Osprey LCOE estimate includes a PPA starting in 2015 for 515 MW, with an acquisition in 2020 at [REDACTED]  
The Osprey LCOE estimate includes \$150 million in transmission costs.

## Exhibit PJH-5

### Growth in Total Energy Demand and Potential Energy Generation from Generic Combined Cycle Units



**Notes:**

Total energy demand and potential energy generation are indexed to 2018 values.

Between 2018 and 2043, 4,758 MW of generic combined cycle capacity is added, assuming 793 MW summer capacity per unit.

**Sources:**

[1] Direct Testimony of Benjamin M.H. Borsch, on Behalf of Duke Energy Florida, Inc., In re: Petition for Determination of Cost Effective Generation Alternative to Meet Need Prior to 2018. Florida Public Service Commission Docket No. 140111-EI, May 27, 2014, Exhibit BMHB-2.

[2] Duke Energy Florida, Inc., response to Calpine Construction Finance Company, L.P.'s First Set of Interrogatories. (Nos. 1-9), Competitively Sensitive Confidential Response 7.

**Exhibit PJH-6**  
**Comparison of Osprey Capacity Factor and Starts, by Year**  
**DEF Production Simulation Results, Scenario 5 Acquisition**



**Notes:**

Data is from Scenario 5, Acquisition 2, modeled as -\$193 m CPVRR relative to the DEF self-build proposal.

**Source:**

[1] Duke Energy Florida, Inc., Response to Calpine Construction Finance Company, L.P.'s First Set of Interrogatories. (Nos. 1-9), Competitively Sensitive Confidential Response 6b and 7.



Competitively Sensitive Confidential Information

**Exhibit PJH-7a**  
**Adjustments to Cumulative Present Value Revenue Requirement**  
*\$2014 millions*

	<u>Original Value</u>	<u>Updated Value</u>	<u>CPVRR Impact</u>
Duke Energy Florida Estimate			(\$193)
<i>Fixed Cost Adjustment</i>			
Updated PPA/acquisition offer	\$300	[REDACTED]	[REDACTED]
Updated Estimate for Direct Connect Transmission Costs	[REDACTED]	\$150	[REDACTED]
Gas Reservation Charge Adjustment			[REDACTED]
<b>Net Adjusted CPVRR:</b>			<b>\$133</b>

**Notes:**

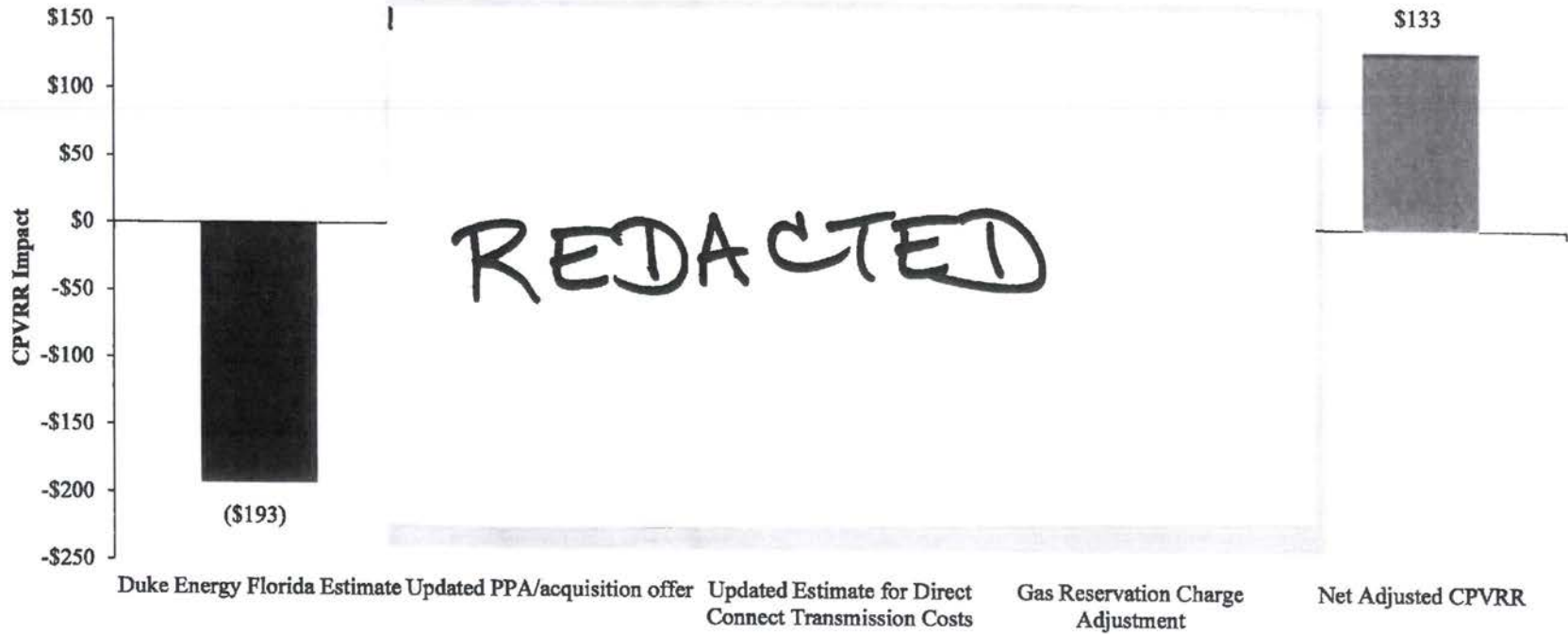
These adjustments include updates to fixed costs and other financial transactions, which are not expected to impact production cost modeling and energy dispatch outcomes.

CPVRR impact is -\$193 m relative to DEF's self-build proposal. Adjustments are estimated assuming a 6.46% weighted average cost of capital with all assets fully depreciated by 2044. CPVRR adjusted impact includes estimated adjustments to rate base, depreciation, and deferred income taxes for capital expenses. Estimate assumes a 5-year PPA for 515 MW, with capacity price payments starting at \$ [REDACTED] 2015 escalating to [REDACTED] in 2019.

**Sources:**

- [1] Exhibit BMHB-8, Acquisition 2.
- [2] Direct Testimony of Todd Thornton, In re: Petition for Determination of Cost Effective Generation Alternative to Meet Need Prior to 2018 for Duke Energy Florida, Inc., Docket No. 140111-EI, submitted July 14, 2014, at 8.
- [3] Duke Energy Florida, Inc.'s Responses to Calpine Construction Finance Company, L.P.'s First Set of Interrogatories. (Nos.1-9), Submitted June 16, 2014. Response 6a and g.

**Exhibit PJH-7b**  
**Adjustments to Cumulative Present Value Revenue Requirement**  
**\$2014 millions**



**Notes:**

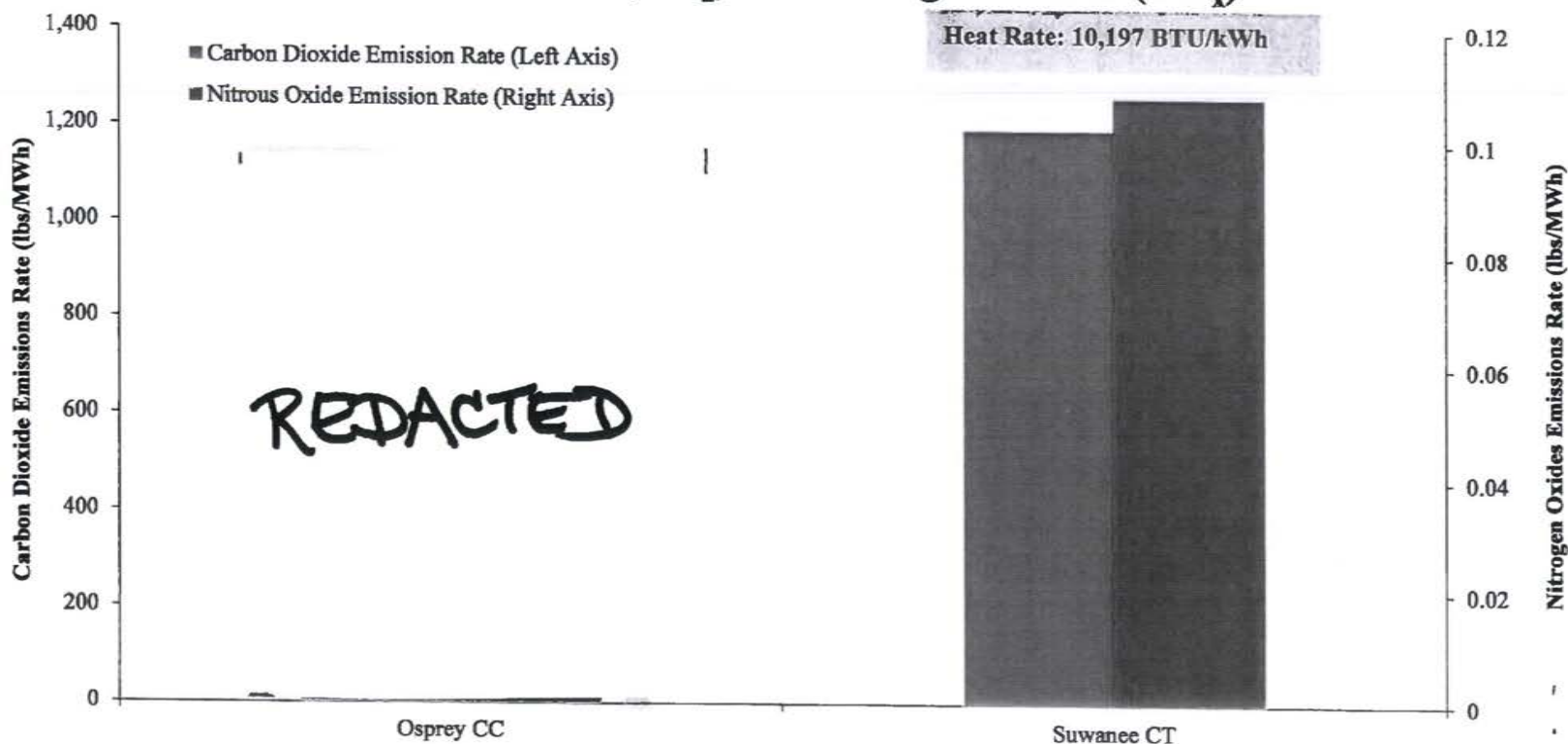
These adjustments include updates to fixed costs and other financial transactions, which are not expected to impact production cost modeling and energy dispatch outcomes. CPVRR impact is -\$193 m relative to DEF's self-build proposal. Adjustments are estimated assuming a 6.46% weighted average cost of capital with all assets fully depreciated by 2044. CPVRR adjusted impact includes estimated adjustments to rate base, depreciation, and deferred income taxes for capital expenses. Estimate assumes a 5-year PPA for 515 MW, with capacity price payments starting at [REDACTED] in 2015 escalating to [REDACTED] in 2019.

**Sources:**

- [1] Exhibit BMHB-8, Acquisition 2.
- [2] Direct Testimony of Todd Thornton, In re: Petition for Determination of Cost Effective Generation Alternative to Meet Need Prior to 2018 for Duke Energy Florida, Inc., Docket No. 140111-EI, submitted July 14, 2014, at 8.
- [3] Duke Energy Florida, Inc.'s Responses to Calpine Construction Finance Company, L.P.'s First Set of Interrogatories (Nos.1-9), Submitted June 16, 2014. Response 6a and g.

Docket No. 140110-EI  
Adjustments to Cumulative Present  
Value Revenue Requirements  
PJH-7b, Page 1 of 1

## Exhibit PJH-8 Emission Rates by Technology Carbon Dioxide (CO<sub>2</sub>) and Nitrogen Oxides (NO<sub>x</sub>)



**Note:**

Emission rate is calculated as emission factor (lbs/MMBTU) multiplied by assumed heat rate (BTU/kWh).

**Sources:**

[1] Duke Energy Florida, Inc., response to Calpine Construction Finance Company, L.P.'s Second Set of Interrogatories (Nos. 110-11), 10QB. "14LGBRA-CALPINE2-Q10b-000001 - 000004 Emission Rates 2013\_0927.xlsx."

[2] Duke Energy Florida, Inc.'s responses to NRG Florida LP's First Interrogatories Nos. 1-108 to Duke Energy Florida, Inc., No. 27.

[3] SNL Financial.



**EXHIBIT C**

**CALPINE CONSTRUCTION FINANCE COMPANY, L.P.  
DOCKET NO. 140110-EI  
First Request for Confidential Classification  
Confidentiality Justification Matrix**

<b>DOCUMENT</b>	<b>PAGE/LINE/COLUMN</b>	<b>JUSTIFICATION</b>
<b>Direct Testimony of Todd Thornton</b>	Page 6, Line 22	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 7, Lines 3-4, 9 and 18	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 11, Lines 18 and 19	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
<b>Direct Testimony of Paul J. Hibbard</b>	Page 13, Lines 9-10 and 13-14	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 18, Lines 7-8 and 18	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 19, Lines 7, 11, 12, and 14	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 21, Lines 5-6	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 26, Line 7	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 28, Line 3, 6, 10, 11, 20, and 22-23	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 29, Line 7, 8, and 11	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 30, Line 5, 9, 22, and 23	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 32, Lines 2, 3-5, 19, and 20	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
	Page 45, Line 6	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.

DOCUMENT	PAGE/LINE/COLUMN	JUSTIFICATION
Direct Testimony of Paul J. Hibbard ( <b>Exhibit No. PJH-2</b> )	Page 1 of 1: Portions of Lines 8, 10, 11, 14, 15, 32, 34, 35	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
Direct Testimony of Paul J. Hibbard ( <b>Exhibit No. PJH-3</b> )	Page 1 of 1: Portions of Line 1 and all of Line 2 in the "Notes" at the bottom of the Exhibit	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
Direct Testimony of Paul J. Hibbard ( <b>Exhibit No. PJH-4</b> )	Page 1 of 1: All of the graph and a portion of Line 1 of the "Notes" at the bottom of the Exhibit	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
Direct Testimony of Paul J. Hibbard ( <b>Exhibit No. PJH-6</b> )	Page 1 of 1: All of the graph and all of Lines 2 and 3 in the "Notes" at the bottom of the Exhibit	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
Direct Testimony of Paul J. Hibbard ( <b>Exhibit No. PJH-7a</b> )	Page 1 of 1: Parts of Lines 1, 2 and 3 of the "Fixed Cost Adjustment" portion of the table and portions of Line 5 in the "Notes" at the bottom of the Exhibit	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
Direct Testimony of Paul J. Hibbard ( <b>Exhibit No. PJH-7b</b> )	Page 1 of 1: The center portion of the graph and portions of Line 4 in the "Notes" at the bottom of the Exhibit	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.
Direct Testimony of Paul J. Hibbard ( <b>Exhibit No. PJH-8</b> )	Page 1 of 1: The graph information above the words "Osprey CC"	§ 366.093(3)(d), Fla. Stat. § 366.093(3)(e), Fla. Stat.

**EXHIBIT D**

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

In re: Petition for Determination )  
of Need for Citrus County Combined ) DOCKET NO. 140110-EI  
Cycle Power Plant, by Duke Energy )  
Florida, Inc. ) FILED: August 4, 2014  
\_\_\_\_\_ )

**AFFIDAVIT OF TODD THORNTON IN SUPPORT OF  
CALPINE CONSTRUCTION FINANCE COMPANY, L.P.'S  
FIRST REQUEST FOR CONFIDENTIAL CLASSIFICATION**

STATE OF TEXAS

COUNTY OF HARRIS

BEFORE ME, the undersigned authority duly authorized to administer oaths, personally appeared Todd Thornton, who being first duly sworn, on oath deposes and says that:

1. My name is Todd Thornton. I am over the age of 18 years and I have been authorized by Calpine Construction Finance Company, L.P. ("Calpine") to give this affidavit in the above-styled proceeding on Calpine's behalf and in support of Calpine's First Request for Confidential Classification. I have personal knowledge of the matters stated in this affidavit.

2. I am Senior Vice President, Origination and Development, for Calpine Corporation. Calpine is a subsidiary of Calpine Corporation. My business address is 717 Texas Avenue, Houston, Texas 77002. I am responsible for Calpine Corporation's origination activities and the development of electric generation resources throughout the United States and Canada.

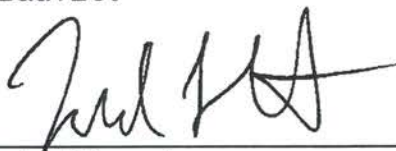


3. Calpine is seeking confidential classification for portions of my pre-filed testimony and for portions of the pre-filed testimony and exhibits of Paul Hibbard, as more specifically identified in Exhibits A and C of Calpine's First Request for Confidential Classification.

4. Calpine is requesting confidential classification of this information because it is competitively sensitive confidential business information, it contains information concerning Calpine's confidential bids and other contractual data, and it contains Calpine's confidential and proprietary internal pricing and project development strategies. This information would adversely impact Calpine's competitive business interests and otherwise harm Calpine if disclosed to third parties.

5. The information identified in Exhibit A and Exhibit C is intended to be and is treated as confidential by Calpine and has not been disclosed to the public.

6. This concludes my affidavit.



---

Todd Thornton  
Senior Vice President, Origination  
and Development  
Calpine Corporation  
717 Texas Avenue  
Houston, Texas 77002

SWORN TO AND SUBSCRIBED before me this 15<sup>th</sup> day of August, 2014, by Todd Thornton, who is personally known to me or who has produced N/A (type of identification) as identification and who did take an oath.

*Regina Kaye Ellis*  
Notary Public, State of Texas

My Commission Expires: 7-11-15

