

BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

FILED 1/22/2018
DOCUMENT NO. 00552-2018
FPSC - COMMISSION CLERK

In the Matter of:

DOCKET NO. 20170225-EI

PETITION FOR DETERMINATION
OF NEED FOR DANIA BEACH
CLEAN ENERGY CENTER UNIT
7, BY FLORIDA POWER &
LIGHT COMPANY.

_____ /

VOLUME 2
PAGES 223 through 423

PROCEEDINGS: HEARING

COMMISSIONERS
PARTICIPATING: CHAIRMAN ART GRAHAM
COMMISSIONER JULIE I. BROWN
COMMISSIONER GARY F. CLARK

DATE: Wednesday, January 17, 2018

TIME: Commenced: 2:05 p.m.
Concluded: 7:33 p.m.

PLACE: Betty Easley Conference Center
Room 148
4075 Esplanade Way
Tallahassee, Florida

REPORTED BY: ANDREA KOMARIDIS
Court Reporter

APPEARANCES: (As heretofore noted.)

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66 - Sierra Club task order	330	
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1 P R O C E E D I N G

2 (Transcript follows in sequence from
3 Volume 1.)

4 CHAIRMAN GRAHAM: Okay. I have five after
5 12:00. So, we will reconvene -- sorry -- five
6 after 2:00. So, we will reconvene.

7 And I believe OPC has got the floor.

8 MS. CHRISTENSEN: Yes. And Commissioner, we
9 have no questions for this witness.

10 CHAIRMAN GRAHAM: Okay. Fantastic.
11 Staff.

12 MR. MURPHY: Staff has no questions.

13 CHAIRMAN GRAHAM: Okay. Commissioners -- no
14 questions?

15 Redirect.

16 MR. COX: Just a few redirect questions.

17 EXAMINATION

18 BY MR. COX:

19 Q Mr. Feldman, on Exhi- -- what was marked as
20 Exhibit 64 -- in your discussion with counsel for Sierra
21 Club, Mr. Lenoff, there was Staff Interrogatory No. 45.
22 And the response to that was discussed -- actually,
23 strike that question. Take that one out. We don't need
24 that one.

25 Earlier in the -- actually, in a discussion

1 with Mr. Lenoff, you were asked about the -- the
2 information for the load forecast that was used in this
3 case for the 2017 analysis.

4 A That's correct.

5 Q And you said that it was analysis that had
6 been put together towards the end of 2016; is that
7 right?

8 A Yes. It included a population forecast of
9 August 2014.

10 Q And he asked you also about, isn't there more-
11 current information that you could use. And I believe
12 you answered that, no, that was -- that was the most-
13 current load forecast for the company?

14 A At the time a forecast was done, correct.

15 Q So, can you explain why the forecast is -- is
16 updated once a year, typically, for FPL?

17 A Sure. The forecast is -- is updated once a
18 year, and it goes into the IRP process, the planning
19 process. If you were to update the forecast more
20 frequently, it would be -- it wouldn't be optimal for
21 developing an IRP -- IRP plan. You would be changing it
22 every month or every six months, whenever the forecasts
23 were updated.

24 So, our planning process calls for doing a
25 forecast, a new load forecast, once a year.

1 Q And then my -- my last question -- I would
2 like to turn to Exhibit No. 65. This was an excerpt
3 from the Okeechobee need-determination order from this
4 Commission. And there was a discussion of a table,
5 Table 1 on Page 8.

6 Do you see that?

7 A Yes, I do.

8 Q Okay. You were asked some questions about
9 forecast error rates in this document, and you mentioned
10 the impact of the Great Recession.

11 When was the Great Recession?

12 A The recession started in December of 2007. I
13 believe it went through the middle of 2009, June or so.

14 Q And what was the impact of the recession on
15 these forecast-accuracy percentages?

16 A Well, FPL, like most utilities, did not
17 anticipate the recession, nor incorporate it into the
18 forecasts. So, as the recession hit, our forecasts were
19 typically -- we were typically over-forecasting, as were
20 most utilities.

21 Beginning in 2009, we saw what the impact was
22 going to be of the Great Recession and, with the 2009
23 site plan, we began lowering forecasts to account for
24 the Great Recession.

25 So, during the Great Recession, you saw

1 fairly-large, positive forecast errors. Following the
2 Great Recession, those forecast errors have since been
3 reduced. And in fact, if you look at our last four ten-
4 year site plans, the average summer-peak forecast error
5 is 1 percent, five or six years out.

6 MR. COX: Thank you. No further questions.

7 CHAIRMAN GRAHAM: Okay. Exhibits.

8 Sierra Club.

9 MR. LENOFF: Yes, Mr. Chairman, Sierra Club
10 would like to move for -- Exhibit 64 and 65 be
11 moved into the record.

12 CHAIRMAN GRAHAM: 64 -- any objections to 64?

13 MR. COX: No objections.

14 (Whereupon, Exhibit No. 64 was received into
15 evidence.)

16 CHAIRMAN GRAHAM: 65 -- I don't think it's
17 necessary because it's one of our orders, even
18 though it's just an excerpt.

19 That's it.

20 Sir, thank you very much for your testimony.

21 MR. COX: The witness may be excused, yes?

22 CHAIRMAN GRAHAM: Yes.

23 MR. COX: Thank you.

24 CHAIRMAN GRAHAM: Okay. Florida Power &
25 Light, your next witness, please.

1 MR. DONALDSON: Good afternoon, Chairman
2 Graham. At this time, FPL calls Jacquelyn
3 Kingston.

4 EXAMINATION

5 BY MR. DONALDSON:

6 Q Good afternoon, Ms. Kingston.

7 A Good afternoon.

8 Q You've been previously sworn; is that correct?

9 A Yes.

10 Q Please state your name and business address
11 for the record.

12 A Jacquelyn Kingston, 700 Universe Boulevard,
13 Juno Beach, Florida 33408.

14 Q And by whom are you employed and in what
15 capacity?

16 A I'm employed by Florida Power & Light. And I
17 am a manager of project development for fossil
18 generation.

19 Q Have you prepared and caused to be filed 23
20 pages of direct prefiled testimony in this proceeding on
21 October 20th of 2017?

22 A Yes, I have.

23 Q And did you also file an errata to your direct
24 prefiled testimony on January 9th of 2018?

25 A Yes.

1 Q Do you have any further changes or revisions
2 to your direct prefiled testimony?

3 A No, I do not.

4 Q If I were to ask you the questions contained
5 in your direct prefiled testimony, including your
6 errata, would your answers be the same?

7 A Yes, they would be.

8 MR. DONALDSON: Chairman Graham, I would ask
9 that Ms. Kingston's direct prefiled testimony and
10 errata be inserted into the record as though read.

11 CHAIRMAN GRAHAM: We will insert
12 Ms. Kingston's direct prefiled testimony with the
13 errata sheet into the record as though read.

14 MR. DONALDSON: Thank you.

15 (Prefiled direct testimony inserted into the
16 record as though read.)

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ERRATA SHEET OF JACQUELYN K. KINGSTON**October 20, 2017 Direct Testimony**

<u>PAGE #</u>	<u>LINE #</u>	<u>CORRECTION</u>
10	13	Add "one of" before "the fastest ramp"
10	13	Change "rate" to "rates"

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I. INTRODUCTION

Q. Please state your name and business address.

A. My name is Jacquelyn K. Kingston. My business address is Florida Power & Light Company, 700 Universe Boulevard, Juno Beach, Florida, 33408.

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

A. I am employed by Florida Power & Light Company (FPL or the Company) as a Manager of Project Development for gas-fired generation, including the proposed Dania Beach Clean Energy Center Unit 7 (DBEC Unit 7 or the Project).

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

A. I manage the development of new gas-fired generation projects. I am responsible for overseeing the activities of the project team that collectively make the project successful, including early stage due diligence, permitting, and engineering. Ultimately, my goal is to ensure that the development project is transitioned to construction on schedule to support the required commercial operation date. I have overall responsibility for the development of DBEC Unit 7.

Q. Please describe your education and professional experience.

A. I received a Bachelor of Science in Biological Sciences from Florida Institute of Technology in 2004 and a Master of Science from Florida Atlantic University in 2006. Additionally, I am a certified Project Management Institute (PMI) Project Management Professional (PMP). PMI's PMP

1 credential is the most important industry-recognized certification for project
2 managers. Globally recognized and demanded, the PMP demonstrates that
3 one has the experience, education, and competency to lead and direct projects.

4
5 Throughout my eleven year career with FPL, I have been involved in the
6 development, permitting, and construction of multiple gas-fired power plants.
7 In addition to the development of DBEC Unit 7, I have been responsible for
8 the permitting of three (3) combined cycle (CC) projects, construction
9 compliance (ensuring projects were constructed in accordance with
10 environmental permits and applicable regulations) for two (2) CC projects,
11 development of two (2) gas turbine peaker replacement projects (replacement
12 of gas turbines with combustion turbines (CTs) for peaking capacity), and
13 development of a combined cycle power plant project totaling over 6,800
14 megawatts (MW) of electrical generating capacity. These projects include
15 FPL's Cape Canaveral Next Generation Clean Energy Center, Riviera Beach
16 Next Generation Clean Energy Center, West County Energy Center Unit 3,
17 Lauderdale Gas Turbine Power Park Unit 6, Ft. Myers Gas Turbine Power
18 Park, and the Okeechobee Clean Energy Center Unit 1.

19
20 I have also held responsibilities with Power Delivery, specifically
21 environmental permitting, construction compliance, and environmental
22 operations support for the FPL transmission system. This included overseeing
23 completion of over 840 environmental assessments, obtaining over 130

1 environmental permits for transmission projects, and providing daily
2 environmental support to transmission operations, construction, and
3 engineering.

4

5 I have also held responsibilities with FPL's parent company, NextEra Energy
6 Inc. (NextEra Energy), providing oversight in obtaining environmental
7 permits to construct two new natural gas pipelines in the United States under
8 joint ventures with other companies. These two projects totaled over 800
9 miles in length.

10 **Q. Have you previously testified on project development issues before the**
11 **FPSC?**

12 A. Yes. I testified in a 2015 need determination proceeding before the FPSC for
13 another gas-fired generation project.

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

15 A. The purpose of my Direct Testimony is two-fold. First, I discuss FPL's
16 experience building and operating CC generating units. Second, I describe the
17 proposed Project in detail, including a description of the site, the technology,
18 engineering design parameters, operating characteristics, and overall project
19 cost and schedule. I will demonstrate that the performance standards assumed
20 for the DBEC Unit 7 are both reasonable and achievable.

21 **Q. Please summarize your testimony.**

22 A. FPL plans to construct and operate DBEC Unit 7, a 2-on-1 (2x1) advanced CC
23 unit at an existing power generation site in Broward County. The Project will

1 consist of two advanced technology CTs, two heat recovery steam generators
2 (HRSGs), and one steam turbine/electric generator. A significant amount of
3 infrastructure that was used to support the operation of Lauderdale Units 4 &
4 5 will be reused for Unit 7 including the existing natural gas pipeline and gas
5 yard, the existing fuel oil tanks, existing intake and discharge structures for
6 the once-through cooling water system, the existing site entrances, the existing
7 cooling pond, the existing switchyard, existing offsite transmission lines, the
8 existing Broward County water supply line, the existing City of Hollywood
9 potable water line, and the existing City of Hollywood sanitary sewer
10 connection.

11
12 Natural gas will be the primary fuel for DBEC Unit 7 and will be delivered to
13 the site by an existing pipeline. Ultra low-sulfur distillate (light fuel oil) will
14 be used as a back-up fuel for the CTs. The cooling water source for the
15 Project will continue to be the Dania Cutoff Canal with an auxiliary cooling
16 system to help limit the temperature rise of the water. Process and potable
17 water will continue to be obtained from existing county and city suppliers. By
18 using natural gas as the primary fuel for DBEC Unit 7 and technology that is
19 recognized by the Florida Department of Environmental Protection (FDEP) as
20 the Best Available Control Technology (BACT) for minimizing air emissions,
21 DBEC Unit 7 is projected to be one of the most fuel-efficient CC units of its
22 kind in the state of Florida and among the cleanest and most efficient gas-
23 fired, electric-power generating units of its kind in the world.

1 DBEC Unit 7 is expected to have an in-service date of June 1, 2022. The
 2 projected total cost of the DBEC Unit 7 is approximately \$888 million (\$764
 3 per kW installed cost).

4

5 The Project is estimated to generate approximately \$297 million in tax
 6 revenue over the life of the project, and it is expected to provide a number of
 7 significant public welfare benefits, including the creation of an estimated 650
 8 direct jobs at its peak during construction.

9

10 FPL has significant experience building and operating CC plants to achieve
 11 the best possible efficiencies. Accordingly, FPL is confident of the accuracy
 12 of its construction cost estimates and projected unit capabilities.

13

14 **Q. Are you sponsoring any exhibits in this case?**

15 A. Yes. I am sponsoring Exhibits JKK-1 through JKK-11. The titles to each
 16 exhibit are shown below, and they are all attached to my direct testimony.

17	Exhibit JKK-1	Typical 2x1 Combined Cycle Unit Schematic
18	Exhibit JKK-2	FPL Combined Cycle Power Plants
19	Exhibit JKK-3	History of FPL Combined Cycle Capital Construction
20		Costs
21	Exhibit JKK-4	DBEC Unit 7 Site Regional Map
22	Exhibit JKK-5	DBEC Unit 7 Site Property Delineation
23	Exhibit JKK-6	Rendering of Existing FPL Power Plant Site

- 1 Exhibit JKK-7 DBEC Unit 7 Proposed Site Plan Rendering
- 2 Exhibit JKK-8 DBEC Unit 7 Plant Specifications
- 3 Exhibit JKK-9 Emissions Comparison of Lauderdale Units 4 & 5
- 4 versus Dania Beach Unit 7
- 5 Exhibit JKK-10 DBEC Unit 7 Expected Construction Schedule
- 6 Exhibit JKK-11 DBEC Unit 7 Plant Construction Cost Components
- 7

8 II. OVERVIEW OF COMBINED CYCLE TECHNOLOGY

9

10 A. Description of Technology

11 **Q. Please describe the combined cycle technology that will be used for the**

12 **DBEC Unit 7 Project.**

13 A. The CC technology generates electric power in two cycles. As shown on

14 Exhibit JKK-1, a CC unit is comprised of electric generators, CTs, HRSGs,

15 and a steam turbine generator (STG). During the first cycle of energy

16 production, each of the CTs compresses outside air into a combustion area

17 where fuel, typically natural gas or light fuel oil (back-up), is burned. The hot

18 gases from the burning fuel-air mixture cause the turbine to rotate, which, in

19 turn, directly rotates a generator to produce electricity. The exhaust gas

20 produced by each turbine is passed through a HRSG where heat is extracted

21 before exiting the stack. During the second cycle of energy production, the

22 energy extracted by the HRSG converts water into steam, which then drives

23

1 an STG. The residual steam is then cooled into water in a condenser and
2 returned to the HRSG, beginning its cycle all over again.

3

4 The recovery of exhaust heat from the CTs for utilization in an STG improves
5 the overall plant efficiency beyond that of just CTs or conventional steam
6 electric generating units, because additional power is produced without
7 burning additional fuel.

8

9 Each CT/HRSG combination is called a “train.” The size and number of
10 CT/HRSG trains used establishes the general size of the STG. For the
11 proposed DBEC Unit 7 Project, two CT/HRSG trains will be connected to one
12 STG, giving rise to the characterization of the Project as a 2x1 CC unit.

13

14 **B. Operating Advantages**

15 **Q. What level of operating efficiency is anticipated for the DBEC Unit 7**
16 **Project?**

17 A. In general, modern CC plants can be expected to achieve a fuel-to-electrical
18 energy conversion rate (heat rate) of less than 7,000 British thermal units
19 (Btu) per kilowatt hour (kWh). The existing Lauderdale Units 4 & 5 have a
20 heat rate of approximately 7,800 Btu/kWh. FPL anticipates that DBEC Unit 7
21 will have an average base load heat rate as low as 6,119 Btu/kWh (based on
22 an average ambient air temperature of 75°F) over the life of this Project,
23 which is a 22% improvement compared to the existing Units 4 & 5. The

1 addition of this highly efficient unit to the FPL system is projected to improve
2 the overall system heat rate. The lower the heat rate, the more efficient the
3 generating fleet is and the greater the fuel savings are to the benefit of FPL's
4 customers. In addition, a CC plant can operate in variable weather conditions
5 on an around-the-clock basis.

6 **Q. What is the difference in ramp rates between the existing Units 4 & 5 and**
7 **the proposed Unit 7?**

8 A. One of the major measures of a generating unit's flexibility is the ramp rate of
9 generators: how many MW can be ramped up or down over a given time
10 period. The existing Lauderdale Units 4 & 5 have ramp rates of
11 approximately 6 MW/minute which are the slowest ramp rates of any
12 generator in FPL's system. In comparison, DBEC Unit 7's ramp rate is
13 projected to be as high as 60 MW/minute which would be the fastest ramp rate
14 of any generating unit on FPL's system.

15 **Q. Are there other operational advantages to combined cycle technology?**

16 A. Yes. An advantage of the multi-train CC arrangement is that it allows for
17 greater flexibility in matching unit output to generation requirements over
18 time. This is possible because each of the CTs can be cycled independent of
19 the steam turbine, allowing the unit greater flexibility in matching the load
20 requirements at any given point in time.

21

22

23

1 **C. FPL’s History of Building and Operating Combined Cycle Plants**

2 **Q. Does FPL have experience in building combined cycle plants?**

3 A. Yes. FPL has extensive experience in building CC plants on time and within
4 budget. FPL’s first CC plant (Putnam Units 1 & 2) went into service in 1976.
5 More recently, FPL successfully constructed three new CC “greenfield” units
6 at its West County Energy Center and three new CC modernizations at its
7 Cape Canaveral, Riviera Beach, and Port Everglades sites. Currently, FPL is
8 constructing a new greenfield CC unit at its Okeechobee site.

9 **Q. Please describe FPL’s history of operating combined cycle plants.**

10 A. Currently, there are 16 CC units in operation in FPL’s service territory as
11 shown in Exhibit JKK-2. These 16 existing CC units comprise 16,054 MW
12 (net summer) of capacity in service, with an additional 1,748 MW currently
13 under construction, for a total of over 17,800 MW.

14 **Q. Please describe FPL’s track record in building and operating combined
15 cycle units.**

16 A. FPL has consistently demonstrated its ability to cost-effectively construct
17 reliable and efficient plants that save money for customers over the project
18 lives. In December 2014, *Power Engineering* and *Renewable Energy World*
19 magazines honored FPL’s Riviera Beach Clean Energy Center with its
20 "Project of the Year" award in the "Best Gas-Fired Project" category. The
21 “Project of the Year” award recognizes the world’s best power projects,
22 honoring excellence in design, construction, and operation of power
23 generation facilities. Most recently, in 2016, *Engineering News and Record*

1 honored FPL's Port Everglades Energy Center with its "Best Project" award.
2 The "Best Project" award recognizes the best construction projects and the
3 companies that design and build them in the U.S. and Puerto Rico. Examples
4 of other FPL CC plants that have received similar recognitions include Martin
5 Units 3 and 4, Sanford Units 4 and 5, Fort Myers Unit 2, Turkey Point Unit 5,
6 West County Energy Center Units 1, 2, & 3, and Cape Canaveral Clean
7 Energy Center.

8
9 FPL's generation fleet performance has consistently exceeded industry
10 performance averages and is frequently ranked "Top Decile" or "Best in
11 Class" among FPL's large electric utility peers. Since 1990, as FPL
12 transformed its generating fleet, FPL has substantially improved its operating
13 performance across key factors integral to generating electricity for the benefit
14 of its customers. These performance factor improvements include the
15 reduction of system heat rate, forced outage rate, total non-fuel O&M costs,
16 and air emissions.

17
18 With world-class operational skills, FPL maximizes the value of its existing
19 and new assets to the benefit of its customers. FPL's employment of
20 operational best practices has resulted in its industry leading positions. FPL's
21 gas-fired fleet has achieved an Equivalent Availability Factor (EAF) of 91.7%
22 averaged over the past 10 years. This compares very favorably to the latest
23 available U.S. gas-fired industry average EAF of 86.4%. EAF represents

1 plant availability and is a measure of the percentage of time within a given
2 period that a generating unit is available to provide electricity, regardless of
3 whether the generating unit is actually called upon to operate.

4 **Q. Please describe how FPL monitors the operational performance and**
5 **reliability of its power plants.**

6 A. FPL uses technology to optimize plant operations, gain process efficiencies,
7 and leverage the deployment of technical skills as demand for services
8 increases. For example, the Company's Fleet Performance and Diagnostics
9 Center (FPDC) in Juno Beach, Florida, provides FPL with the capability to
10 monitor every plant in its system. The FPDC uses advanced monitoring
11 technology and predictive analytics to identify potential issues and take action
12 before they occur. FPL can compare the performance of like components on
13 similar generating units, determine how it can make improvements, and often
14 avoid problems, ultimately saving customers money. Live video links can be
15 established between the FPDC and plant control rooms to immediately discuss
16 challenges that may arise, thus enabling FPL to prevent, mitigate, and/or solve
17 problems.

18 **Q. Please address FPL's record in constructing CC units at or below**
19 **estimated budgets.**

20 A. FPL has a proven track record of constructing CC power plants within budget.
21 Since 2005, FPL has placed nine CC units in service and all were completed
22 on or below budget. Exhibit JKK-3 lists the CC projects constructed by FPL
23 and the approved/projected and actual construction costs. On average, the

1 actual construction costs for the combined cycle projects placed in service
2 since 2005 have been approximately 5.4% lower than the projected costs.
3 This includes power plants built at new sites as well as modernizations of
4 power plants at existing sites. Based on this track record, the construction
5 costs for DBEC can be projected with a very high level of certainty.

6

7 III. DBEC UNIT 7 COMBINED CYCLE PROJECT

8

9 A. Site Description

10 **Q. Please describe the DBEC Plant site.**

11 A. DBEC Unit 7 will be located on approximately 392 acres of FPL-owned land
12 within the Cities of Dania Beach and Hollywood in Broward County, Florida
13 (Exhibits JKK-4 and JKK-5). The existing Lauderdale Site has been used for
14 power generation since 1927 and currently includes two nominal 440 MW
15 combined cycle units (Units 4 & 5), five nominal 200 MW combustion
16 turbines (Units 6A through 6E) and two 1970's vintage nominal 35 MW gas
17 turbines. Units 6A through 6E began commercial operation in 2016 and these
18 units replaced 22 gas turbines at the Lauderdale Site and 12 gas turbines at the
19 nearby Port Everglades Plant. Units 4 & 5 began operation in May 1993 and
20 June 1993, respectively. Lauderdale Units 4 & 5 were repowered using the
21 existing steam turbines and condensers from the original units built in the
22 1950's. The Lauderdale Site also includes 138 kV and 230 kV transmission

1 facilities (system substation) as well as an existing natural gas pipeline and
2 fuel oil storage facilities. Exhibit JKK-6 includes a rendering of the Site.

3

4 **B. Project Description**

5 **Q. Please describe the proposed DBEC Unit 7 project in more detail.**

6 A. A rendering of DBEC Unit 7 is shown on Exhibit JKK-7. Unit 7 will be a 2x1
7 CC unit consisting of two nominal 400-MW advanced CTs, with dry low-NO_x
8 combustors, inlet evaporative cooling, wet compression, and two HRSGs,
9 which will use the exhaust heat from the CTs to produce steam to be utilized
10 in a new steam turbine generator.

11

12 Each CT is projected to utilize inlet air evaporative cooling. Evaporative
13 coolers achieve cooling using water evaporation to remove heat from the inlet
14 air. This increases the density of air flowing through the turbine, allowing
15 additional power to be produced during periods of high ambient air
16 temperature. The evaporative coolers normally would be utilized when the
17 ambient air temperature is greater than 60°F. The base unit capacity at 95°F is
18 1,117 MW with the evaporative coolers in service. For additional power
19 production at peak periods, wet compression, which sprays additional water in
20 a fine mist into the gas turbine inlet air, can be turned on. Wet compression
21 can be utilized during peak demand periods to add about 46 MW of capacity
22 to the unit, totaling 1,163 MW summer capacity. The projected winter
23 capacity is approximately 1,173 MW.

1 With its anticipated average heat rate of 6,119 Btu/kWh during baseload
2 operation (based on an average ambient air temperature of 75°F), DBEC Unit
3 7 is projected to be one of the most fuel-efficient CC units of its kind in the
4 state of Florida. The unit will have an estimated EAF of approximately
5 95.5%, based on an estimated average forced outage factor of approximately
6 1.0%, and a planned outage factor of 3.5%. Plant specifications are shown in
7 Exhibit JKK-8.

8
9 The performance level of CC plants continues to evolve and advance in the
10 marketplace. As a result, FPL will competitively procure the DBEC Unit 7's
11 CTs, HRSGs, and steam turbine (collectively, the "Power Train
12 Components") and other related equipment necessary for operation of the unit,
13 and optimize the design as a part of FPL's continuing efforts to determine
14 which technology will provide the greatest benefits to FPL's customers.

15
16 For example, FPL is continuing to evaluate the optimal steam cycle equipment
17 configuration, which may potentially increase capital costs but provide an
18 overall system cumulative present value of revenue requirements (CPVRR)
19 cost savings benefit to FPL's customers, based on increased output and a
20 lower heat rate resulting from the optimization. Similarly, if an enhanced
21 design or model emerges as a result of continued evaluation, FPL will
22 optimize the condenser and auxiliary cooling system needed for DBEC Unit 7

1 as a part of FPL's continuing efforts to provide the greatest benefits to its
2 customers.

3

4 In the event that FPL selects an enhanced design or model for the Power Train
5 Components and other related equipment other than the analyzed technology
6 subsequent to the Florida Public Service Commission (FPSC or the
7 Commission) having granted a determination of need for DBEC Unit 7, FPL
8 would make an informational filing to the Commission, as also discussed in
9 the Direct Testimony of FPL witness Sim.

10 **Q. Please describe the potential air emissions of the DBEC Unit 7 project.**

11 A. The use of natural gas as a primary fuel source, with light fuel oil as a back-up
12 fuel, combined with combustion control technologies, will minimize
13 emissions from the unit and ensure compliance with applicable emission
14 limiting standards. Maximum total air quality impacts for DBEC Unit 7 are
15 predicted to be below and in compliance with the National Ambient Air
16 Quality Standards (NAAQS) and Prevention of Significant Deterioration
17 (PSD) increments. The NAAQS are standards required by the Clean Air Act
18 and established by the Environmental Protection Agency (EPA) that protect
19 the public health of the most sensitive populations as well as public welfare.
20 The PSD increments are levels of air pollutants established by the Clean Air
21 Act and EPA that make sure "clean air remains clean." The low impacts to air
22 quality, well below these standards, are achieved by meeting best available
23 control technology (BACT) for regulated air pollutants that include particulate

1 matter (PM), sulfur oxides (SO_x), nitrogen oxides (NO_x), carbon monoxide
2 (CO), volatile organic compounds (VOCs), and sulfuric acid mist. The use of
3 natural gas and light fuel oil (with maximum sulfur content of 0.0015%)
4 minimizes emissions of SO_x, PM, and other fuel-bound contaminants.
5 Combustion design and emission controls similarly minimize the formation of
6 NO_x, CO, and VOCs. When firing natural gas, NO_x emissions will be
7 controlled using dry-low NO_x combustion technology and Selective Catalytic
8 Reduction (SCR). Water injection and SCR will be used to reduce NO_x
9 emissions during operations when using light fuel oil as back-up fuel. This
10 emission control design is accepted by the FDEP and EPA as BACT for air
11 emissions.

12
13 The NO_x emission rate for the new unit (2 parts per million (ppm) when firing
14 natural gas) will be 95% lower than the existing units (42 ppm), with
15 significant reductions in the Carbon Dioxide (CO₂) emission rate as well as
16 total air emissions. Exhibit JKK-9 includes the NO_x and Total Emissions
17 (tons/year and lb/MWh) and CO₂ Emissions (lb/MWh) comparisons between
18 the existing Lauderdale Units 4 & 5 and DBEC Unit 7.

19
20 **Q. What types of fuel will DBEC Unit 7 be capable of burning?**

21 A. The Project will use the same fuel sources as Lauderdale Units 4 & 5. Natural
22 gas will be used as the primary fuel source. The existing natural gas pipeline
23 will be used with no new pipeline or offsite modifications needed to serve

1 Unit 7. DBEC Unit 7 also will be capable of using light fuel oil, more
2 specifically a distillate fuel oil with a maximum sulfur content of 0.0015%, as
3 a back-up fuel. The site design allows for operation at full capacity for
4 seventy-two (72) hours of continuous operation using back-up fuel which will
5 be delivered to the site by truck and stored in two existing light distillate fuel
6 oil storage tanks.

7

8 **C. Water Supply - Access and Availability**

9 **Q. What are the water requirements for the DBEC Unit 7 project, and how**
10 **will they be met?**

11 A. There will be no additional water sources required as a result of this Project.
12 The primary water source for cooling will continue to be the Dania Cutoff
13 Canal, with process and potable water coming from Broward County and City
14 of Hollywood, respectively. The modernization will result in an improvement
15 in technology allowing the reduction of the allocation of process water for
16 power generation from 1.69 million gallons per day (MGD) for the existing
17 Units 4 and 5 to 1.0 MGD for Unit 7 (based on a 12-month rolling average).
18 Primary water uses will be for condenser cooling, combustion turbine
19 evaporative coolers, steam cycle makeup, and service water. Water will also
20 be used on a limited basis for NO_x control when using light fuel oil.
21 Condenser cooling for the steam cycle portion will be accomplished using an
22 auxiliary cooling system.

23

1 **D. Electric Transmission Interconnection Facilities**

2 **Q. How will the DBEC Unit 7 project be interconnected to FPL's**
3 **transmission network?**

4 A. DBEC Unit 7 will connect into the existing onsite Lauderdale Plant
5 230kV/138kV transmission switchyard. No new offsite transmission lines or
6 network upgrades are required as a result of the Project.

7

8 FPL has completed its System Impact Study and found no reliability concerns.

9 The Florida Reliability Coordinating Council (FRCC) is currently reviewing
10 the interconnection and integration plan for the Project to confirm that it will
11 be reliable and adequate and will not adversely impact the reliability of the
12 FRCC transmission system.

13

14 **E. Proposed Construction Schedule**

15 **Q. What is the proposed construction schedule for the DBEC Unit 7?**

16 A. A summary of estimated construction milestone dates is shown on Exhibit
17 JKK-10. FPL will commence construction upon receipt of the necessary
18 regulatory approvals, which FPL anticipates will occur by late 2018.
19 Following the retirement and subsequent dismantlement of Units 4 and 5,
20 construction of Unit 7 will require approximately 27 months, and the Project
21 is expected to start commercial operations on June 1, 2022.

22

23

1 **Q. What is the current status of the certifications and permits required to**
2 **begin construction of DBEC Unit 7?**

3 A. Several local, state, and federal approvals are required prior to start of
4 construction for DBEC Unit 7. FPL filed for FDEP site certification under the
5 Florida Electrical Power Plant Siting Act in July 2017. Concurrently, FPL
6 filed for a Prevention of Signification Deterioration air construction permit,
7 Industrial Wastewater Facility permit, and a U.S. Army Corps of Engineers
8 (USACE) Section 404, Clean Water Act, Dredge & Fill Permit application for
9 impacts to onsite wetlands. Local approval processes are in progress.

10

11 **F. Estimated Construction Costs**

12 **Q. What does FPL estimate that the DBEC Unit 7 will cost?**

13 A. A summary of estimated costs is shown on Exhibit JKK-11. FPL estimates
14 that the total cost will be approximately \$888 million. Principal components
15 include the power block and generator transformers at \$764 million,
16 transmission interconnection and integration at \$21 million, and Allowance
17 for Funds Used During Construction (AFUDC) at \$103 million. FPL will
18 annually report to the FPSC Director of Economic Regulation updates to the
19 budgeted and actual cost of DBEC Unit 7, compared to the estimated total in-
20 service cost.

21

22

23

1 **G. Other Benefits**

2 **Q. What other benefits are associated with DBEC Unit 7?**

3 A. Several additional benefits come to mind. First, the Lauderdale Site provides
4 the infrastructure and land for a new combined cycle unit that includes an
5 existing developed site dedicated to generation of electricity, existing cooling
6 water intake and discharge structures, cooling pond, existing gas delivery
7 infrastructure, and access to the FPL transmission system. Second, the Project
8 will result in additional property tax revenues to governmental agencies of
9 some \$297 million over the projected life of the unit, assuming current
10 millage rates continue into the future. This will be a significant benefit to the
11 local economy. Third, during construction of the unit there will be, at the
12 peak of construction, some 650 additional jobs brought into the local
13 economy. Fourth, beyond the significant payroll and tax impacts on the local
14 economy, there will be indirect economic effects on the local economy
15 through additional demands for goods and services. These are significant
16 economic benefits of the Project beyond system fuel savings and system
17 reliability improvements for the FPL system and southeastern Florida region
18 as discussed in FPL witness Sim's Direct Testimony.

19

20

21

22

23

1 IV. CONCLUSION

2

3 **Q. What level of confidence does FPL have in the cost, projection and**
4 **construction schedule for the unit discussed herein?**

5 A. As previously discussed, FPL has a proven track record of constructing
6 combined cycle power plants within budget and on schedule. Based on this
7 experience, I am confident that the project will be completed on time and
8 within the projected budget.

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

10 A. Yes.

1 BY MR. DONALDSON:

2 Q Ms. Kingston, do you have exhibits that were
3 identified as JKK-1 through JKK-11 attached to your
4 prefiled direct testimony?

5 A Yes, I do.

6 Q All right. And were these prepared under your
7 direction and supervision?

8 A Yes, they were.

9 MR. DONALDSON: All right. Chairman Graham, I
10 would note that these exhibits have already been
11 entered into the record in staff's comprehensive
12 list as Exhibits 9 through 19.

13 CHAIRMAN GRAHAM: Okay.

14 BY MR. DONALDSON:

15 Q Would you please provide the summary of your
16 direct prefiled testimony to the Commission.

17 A Yes. Chairman Graham, Commissioners, let me
18 tell you the basic facts about the Dania Beach Energy
19 Center Unit 7, which I will refer to as the Dania unit.
20 This unit is a two-on-one, approximately 1200-megawatt
21 gas-fired combined cycle unit with an in-service date of
22 June 2022, and a projected cost of \$888 million.

23 The proposed unit will be replacing Lauderdale
24 Units 4 and 5, which went into service in the nineties,
25 but contain major equipment from the 1950s. The new

1 unit will use the same existing power-generation site,
2 which is located in the heart of Broward County.

3 FPL is proposing this project because it is
4 the right thing to do for our customers at the right
5 time. And I will focus three main reasons why in my
6 testimony: Cost, reliability, and clean energy.

7 Starting with cost, with a total estimated
8 capital cost of \$888 million, which equates to \$764 per
9 kilowatt, Unit 7 will have a cost-per-kilowatt value
10 that is 20-percent lower than any of FPL's three most-
11 recent power-plant modernizations.

12 The proposed construction schedule lasts
13 approximately four years, beginning with the retirement
14 of Units 4 and 5, demolition, then construction, and
15 operation of Unit 7 by June 2022.

16 FPL has a proven track record of constructing
17 combined cycle power plants on budget. In fact, since
18 2005, we've completed construction of nine combined
19 cycle power plants, and all were completed on or below
20 budget.

21 The Dania unit is also projected to have an
22 average base heat rate over the life of the project that
23 is 22-percent lower than the existing Units 4 and 5.
24 This will result in significant fuel savings to FPL's
25 customers and lower gas usage on a system-wide basis.

1 The Dania unit will also be reusing a
2 significant amount of infrastructure on site that was
3 used to support the operation of Units 4 and 5. This
4 includes an existing natural-gas pipeline, existing off-
5 site transmission lines, and existing city and county
6 water lines.

7 Let's look at reliability. Unit 7 is
8 projected to provide power around the clock. Its
9 estimated equivalent availability factor is
10 95.5 percent. This is significantly better than the
11 U.S. industry average of 86.4 percent.

12 The Dania unit's ramp rate is projected to be
13 as high as 60 megawatts a minute, compared to Units 4
14 and 5, which have the lowest ramp rate of any generator
15 on our entire system. Having a highly-reliable unit,
16 though, is not enough. The reliability of the
17 interconnection of the Dania unit to our transmission
18 system is critical.

19 In December of 2017, the Florida Reliability
20 Coordinating Council concluded, and I quote, "The
21 proposed interconnection and integration plan for Dania
22 Beach Energy Center will be reliable and adequate, and
23 will not adversely impact the reliability of the
24 transmission system within the FRCC region."

25 Let's look at clean energy. As an energy

1 company, we are committed to constructing and operating
2 power plants consistent with our clean-energy portfolio.
3 The Dania unit is projected to be one of the cleanest
4 and most-efficient fossil-fuel-fired generating units of
5 its type in the state of Florida.

6 Being one of the cleanest means it will be
7 using the cleanest of the fossil fuels, natural gas, as
8 its primary fuel source. The NOx emission rate for the
9 Dania Unit will be 95-percent lower than the existing
10 units. The CO2 emission rate will be 22-percent lower.

11 In addition, no additional water sources are
12 required as a result of this project. And in fact,
13 there will be a 41-percent reduction in the amount of
14 processed water needed on a daily basis to operate the
15 plant.

16 Finally, the Dania unit will provide other
17 real benefits to Florida. It will provide approximately
18 \$297 -- million dollars in tax revenues to local
19 governmental agencies and the school district. It will
20 also provide, at peak, approximately 650 construction
21 jobs in the City of Dania Beach.

22 Given the cost, reliability, and clean energy
23 associated with Unit 7, now is the right time for FPL to
24 pursue this project.

25 This concludes my summary.

1 MR. DONALDSON: Thank you, Ms. Kingston.

2 I tender the witness for cross.

3 CHAIRMAN GRAHAM: Thank you.

4 Sierra Club.

5 MS. CSANK: No questions, Mr. Chairman.

6 CHAIRMAN GRAHAM: Thank you.

7 OPC?

8 MS. CHRISTENSEN: Just a brief couple of
9 questions.

10 EXAMINATION

11 BY MS. CHRISTENSEN:

12 Q You talk about the Dania unit project in --
13 and Fort Lauderdale Units 4 and 5. Is there any issues
14 with maintaining Units 4 and 5 in inactive reserve on
15 the Dania site, if you were to delay the project one or
16 two years?

17 A Can you clarify what you mean by "issues"?
18 Are you talking about retiring the units now and --

19 Q Would there be any issues with -- as far as
20 additional costs, if the units were placed on inactive
21 reserve for a period of two years? Would there be any
22 additional cost for having those units on inactive
23 reserve?

24 A I actually would not be the appropriate
25 witness to answer that question since I wasn't

1 responsible for any of those projections, for that
2 resource-planning scenario.

3 That should be directed to Dr. Sim.

4 MS. CHRISTENSEN: Okay. All right. Well,
5 then, I have no further questions.

6 CHAIRMAN GRAHAM: Thank you.

7 MR. MURPHY: Staff has no questions.

8 CHAIRMAN GRAHAM: Commissioners?
9 Redirect?

10 MR. DONALDSON: No redirect. Thank you.

11 CHAIRMAN GRAHAM: Okay.

12 MR. DONALDSON: May she be excused?

13 CHAIRMAN GRAHAM: She may be excused.

14 THE WITNESS: Thank you.

15 CHAIRMAN GRAHAM: Have a safe trip.

16 Florida Power & Light.

17 MR. DONALDSON: Yes, at this time, FPL calls
18 Ms. Heather Stubblefield.

19 EXAMINATION

20 BY MR. DONALDSON:

21 Q Good afternoon, Ms. Stubblefield.

22 A Good afternoon.

23 Q You've been sworn previously; is that correct?

24 A Yes, that's correct.

25 Q All right. Please state your name and

1 **business address for the record.**

2 A Heather Stubblefield, 700 Universe Boulevard,
3 Juno Beach, Florida.

4 Q **By whom are you employed and in what capacity?**

5 A Florida Power & Light as a senior manager,
6 project development.

7 Q **Have you prepared and caused to be filed eight
8 pages of direct prefiled testimony in this proceeding on
9 October 20th of 2017?**

10 A Yes, I have.

11 Q **Do you have any further changes or revisions
12 on your direct prefiled testimony?**

13 A No, I do not.

14 Q **If I were to ask you the questions contained
15 in your direct prefiled testimony today, would your
16 answers be the same?**

17 A Yes, they would.

18 MR. DONALDSON: Chairman Graham, I would ask
19 that Ms. Stubblefield's direct prefiled testimony
20 be inserted into the record as though read.

21 CHAIRMAN GRAHAM: We will insert
22 Ms. Stubblefield's prefiled direct testimony into
23 the record as though read.

24 (Prefiled direct testimony inserted into the
25 record as though read.)

1 **I. INTRODUCTION AND CREDENTIALS**

2

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

4 A. My name is Heather C. Stubblefield. My business address is 700 Universe
5 Boulevard, Juno Beach, Florida 33408.

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

7 A. I am employed by Florida Power & Light Company (FPL) as Senior Manager
8 of Project Development in the Energy Marketing and Trading (EMT)
9 Business Unit.

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

11 A. I am responsible for managing existing gas transportation contracts and
12 evaluating gas transportation alternatives for FPL's gas-fired generation units.
13 This includes evaluating proposals from pipeline companies, negotiating
14 terms and conditions, and executing transportation agreements which are in
15 the best interest of FPL's customers.

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

18 A. I graduated from Auburn University with a Bachelor of Arts degree in
19 Business Administration in 1986. I joined Sonat, Inc. (NKA Kinder Morgan,
20 Inc.) in 1988, where I held various positions in Human Resources, Internal
21 Auditing, and the Sonat Marketing Company. In 2003, I joined FPL Group
22 Resources (now called NextEra Energy Resources) as the Director of
23 Marketing for liquefied natural gas initiatives. In 2005, I transferred to the

1 EMT Business Unit of FPL, where my duties include evaluating gas
2 transportation alternatives for FPL's gas-fired generation units. This includes
3 evaluating proposals from pipeline companies, negotiating terms and
4 conditions, and executing gas transportation agreements that are in the best
5 interest of FPL's customers.

6 **Q. Have you previously served as a witness for FPL?**

7 A. Yes. I have sponsored testimony in numerous dockets before the Florida
8 Public Service Commission, including many Need Determination cases.

9 **Q. Are you sponsoring any exhibits in this case?**

10 A. Yes. I am sponsoring Exhibit HCS-1, FPL's November 7, 2016 Fuel Price
11 Forecast, which is attached to my Direct Testimony.

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

13 A. The purpose of my testimony is to present and explain (1) the fossil fuel price
14 forecast used in the evaluation of FPL's Dania Beach Clean Energy Center
15 Unit 7 (DBEC Unit 7); and (2) the proposed fuel and fuel transportation plan
16 for DBEC Unit 7.

17 **Q. Please summarize your testimony.**

18 A. FPL's fuel price forecast reflects the projected commodity and transportation
19 costs for fuel oil, natural gas, and coal. The November 2016 Fuel Price
20 Forecast is the same fuel price forecast that was used in FPL's 2017 Ten Year
21 Site Plan (TYSP) and which is used in the analyses of DBEC Unit 7 and
22 alternatives to that project. In addition, the fuel price forecast was developed
23 using the same methodology that was presented in my testimony for the

1 Determination of Need filings for the Okeechobee Clean Energy Center, West
2 County Energy Center Unit 3, and the modernizations of the Cape Canaveral,
3 Riviera, and Port Everglades Plants. Therefore, the November 2016 forecast
4 methodology is consistent with the methodology previously used for approved
5 projects and is reasonable for the evaluation of DBEC Unit 7.

6
7 DBEC Unit 7 will burn natural gas as its primary fuel. Because DBEC Unit 7
8 is replacing an existing gas-fired unit, FPL will serve DBEC Unit 7 using the
9 existing Florida Gas Transmission Company (FGT) gas transportation
10 infrastructure currently serving the site.

11
12 Finally, DBEC Unit 7 will utilize a form of light fuel oil known as ultra-low
13 sulfur distillate as a backup fuel source in the event of a natural gas supply
14 disruption. Light fuel oil storage is currently located onsite to serve the
15 existing units. Light fuel oil will be stored in sufficient quantities to allow
16 both DBEC Unit 7 and the existing simple-cycle combustion turbines to
17 operate at full capacity for approximately seventy-two (72) hours of
18 continuous operation and can be resupplied with truck deliveries.

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II. FUEL FORECAST

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Q. What was FPL’s methodology for developing the November 2016 forecast for fuel oil, natural gas, and coal presented in Exhibit HCS-1?

A. For natural gas and fuel oil commodity prices, FPL’s forecast applied the following methodology: (1) for 2016 through 2018, the methodology uses the November 2016 forward curve for Henry Hub natural gas, New York Harbor 0.7% sulfur heavy oil, and ultra-low sulfur distillate fuel oil commodity prices; (2) for the next two years (2019 and 2020), FPL uses a 50/50 blend of the November 2016 forward curve and the most current projections from The PIRA Energy Group; (3) for years 2021 through 2035, FPL uses the annual projections from The PIRA Energy Group; and (4) for the period beginning in 2036, FPL used the real rate of escalation from the Energy Information Administration.

In addition to the development of oil and natural gas commodity prices, price forecasts were also prepared for fuel oil transportation and natural gas transportation costs. These transportation costs, when added to the projected commodity prices, resulted in the delivered price forecasts used to evaluate the economics of DBEC Unit 7. Coal prices were based on mine-mouth, and transportation costs were provided by JD Energy, Inc. This methodology is consistent with the approach to fuel forecasting used in previous filings, including FPL’s 2017 TYSP.

1 **Q. Please identify the key drivers that affect the future prices of fossil fuels.**

2 A. These drivers include worldwide demand, production capacity, economic
3 growth, environmental legislation, and politics.

4 **Q. Is FPL's long-term fossil fuel price forecast reasonable for the evaluation
5 of capacity options such as DBEC Unit 7?**

6 A. Yes. The FPL long-term fossil fuel price forecast is reasonable for the
7 evaluation of DBEC Unit 7 and is consistent with the methodology used in
8 evaluating previous Determination of Need filings. FPL's fuel price forecast
9 reflects the projected supply, demand, and price for fuel oil, natural gas, and
10 coal, as well as the transportation of these fuels to the FPL's existing sites and
11 DBEC Unit 7.

12

13 **III. FUEL TYPE AND FUEL TRANSPORTATION**

14

15 **Q. What is the primary fuel type that will be utilized in DBEC Unit 7?**

16 A. DBEC Unit 7 will burn natural gas as the primary fuel source.

17 **Q. Does FPL currently have natural gas delivery to the DBEC Unit 7 site?**

18 A. Yes. No new gas pipeline or pipeline expansion is needed for DBEC Unit 7.

19 **Q. Does FPL have sufficient gas transportation capacity to serve DBEC Unit
20 7?**

21 A. Yes. Because DBEC Unit 7 is replacing two existing gas-fired units, FPL will
22 use the existing FGT gas transportation infrastructure to serve DBEC Unit 7.

1 The existing gas transportation capacity is sufficient to meet the expected
2 DBEC Unit 7 requirements.

3 **Q. Will DBEC Unit 7 have a backup fuel source in the event of a natural gas**
4 **supply disruption?**

5 A. Yes. As is the case with the existing generating units that will be replaced by
6 DBEC Unit 7, the new unit will be capable of burning light fuel oil in the
7 event of a natural gas supply disruption. Light fuel oil will be trucked to the
8 existing fuel oil facilities located at the site and stored on-site in sufficient
9 quantities to allow the site to operate at full capacity for approximately
10 seventy-two (72) hours of continuous operation.

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

12 A. Yes.

1 BY MR. DONALDSON:

2 Q Ms. Stubblefield, do you also have an exhibit
3 that's been identified as HCS-1 attached to your
4 prefiled direct testimony?

5 A Yes, I do.

6 Q All right. And was that prepared under your
7 direction or supervision?

8 A Yes.

9 MR. DONALDSON: Chairman Graham, I will note
10 that this is one of the stipulated exhibits that
11 has been pre-identified Exhibit No. 20 and has been
12 entered into the record as Exhibit No. 20.

13 CHAIRMAN GRAHAM: Duly noted.

14 BY MR. DONALDSON:

15 Q Would you please provide your summary of your
16 direct prefiled testimony to the Commission.

17 A Yes.

18 Good afternoon, Chairman Graham and
19 Commissioners. The purpose of my testimony is to
20 explain the fuel-transportation plan for Dania Beach
21 Clean Energy Center Unit 7, and present the fossil-fuel
22 price forecast used by FPL in its economic evaluation of
23 the project.

24 The proposed plant will burn natural gas as
25 the primary fuel source and will utilize light fuel oil

1 as a back-up fuel source. If the Dania Be- -- Dania
2 Beach unit is approved, natural gas will be supplied via
3 the existing Florida Gas Transmission pipeline that
4 currently supplies Lauderdale Units 4 and 5. FPL has
5 sufficient natural-gas-transportation rights on the
6 Florida Gas Transmission to meet the requirements of the
7 Dania Beach unit.

8 FPL's fossil-fuel price forecast reflects the
9 projected supply, demand, and price for fuel oil,
10 natural gas, and coal, as well as the transportation of
11 these fuels to existing plant sites and the proposed
12 Dania Beach plant site.

13 FPL relies on leading industry fuel
14 forecasting providers for the fossil-fuel price
15 forecast; therefore, FPL's fossil-fuel price forecast is
16 reasonable for the evaluation of the Dania Beach unit.

17 This concludes my summary.

18 MR. DONALDSON: Thank you, Ms. Stubblefield.

19 I tender the witness for cross.

20 CHAIRMAN GRAHAM: Thank you.

21 Sierra Club.

22 MR. LENOFF: Thank you, Mr. Chairman.

23 EXAMINATION

24 BY MR. LENOFF:

25 Q Ms. Stubblefield, have you been in the hearing

1 room all -- since the hearing began this morning?

2 A I have been in the hearing room for most of
3 the hearing.

4 Q Okay. Did you hear the question from
5 Commissioner Clark directed towards Dr. Sim asking
6 whether FPL can sell capacity from generation owned by
7 FPL to other parties?

8 A Yes, I did.

9 Q And you heard Dr. Sim state that you would be
10 the best person to answer that question?

11 A Yes.

12 Q If FPL were to sell capacity from its
13 generators to another party, would that capac- -- would
14 FPL, then, be able to use that capacity towards meeting
15 its reserve margin?

16 A As far as questions about the reserve margin,
17 you would have to ask Dr. Sim.

18 Q Dr. Sim directed this question towards you as
19 the best person to answer.

20 A I don't think that's -- question, when it was
21 asked, was referring to the reserve margin. It was
22 asking, if we were not using all the capacity at a plant
23 because we were using more -- burning more gas at Dania
24 Beach or generating more electricity at Dania Beach --

25 Q Right. The --

1 A -- and using another plant less, could we sell
2 that firm.

3 **Q Right. So, what's your answer to that**
4 **question?**

5 A That is something -- yes, that is something
6 that we could evaluate, but it would depend on a lot of
7 factors, including --

8 **Q Okay. Have you -- have you been --**

9 MR. DONALDSON: Can -- I'm sorry. Can she at
10 least finish her answer, please?

11 CHAIRMAN GRAHAM: Yes. When you ask a
12 question, you allow her to answer yes or no and
13 then give a brief explanation. So, give her that
14 sentence or two. I mean, you don't have to let her
15 go on and explain dark matter, but you've got to
16 allow her to -- give her -- give her a little time.

17 MR. LENOFF: Thank you, Mr. Chairman.

18 THE WITNESS: So, I think it -- we would have
19 to evaluate every specific case to see if, you
20 know, it would be a benefit to FPL's customers --
21 or at least would not harm FPL's customers.

22 BY MR. LENOFF:

23 **Q Have you been involved in similar transactions**
24 **in the past?**

25 A No. I believe, as Dr. Sim stated, I am not an

1 expert on the power side. I work in the natural-gas
2 side. That is done in my department. So, he referred
3 to it to me because I have a general knowledge, but I
4 could not answer any specific questions on power sales.

5 MR. LENOFF: Okay. Thank you. No further
6 questions.

7 CHAIRMAN GRAHAM: I'm a little lost because I
8 think Dr. Sim says that you would be the person to
9 answer those questions.

10 THE WITNESS: I believe he said that I could
11 be -- I would be the best person to answer those
12 questions, but that I was not an expert. And
13 again, that's done within my group, Energy
14 Marketing and Trading, but I do not work on the
15 power side. So, I would hesitate to go too deep
16 beyond what I know.

17 CHAIRMAN GRAHAM: Well, we're not encouraging
18 go any deeper than you know, but I just -- I guess
19 I'm a little perplexed, from the question, because
20 I thought that it was deferred to you.

21 THE WITNESS: Yeah, it's -- it was, but I do
22 think he qualified that with that I was not the
23 expert, but again, that I was the -- the best
24 person, since it's done within my department.

25 And I don't think he was aware of the extent

1 of my knowledge or lack of knowledge on that area.

2 CHAIRMAN GRAHAM: Well, I'm not going to make
3 a big deal about this because it was Commissioner
4 Clark that asked that question. So, I'll let --
5 I'll let him beat that dead horse.

6 OPC.

7 EXAMINATION

8 BY MS. CHRISTENSEN:

9 Q Yes, I had just a few questions, assuming you
10 can answer them.

11 You were the one that did the fuel forecast on
12 FPL's system; is that correct?

13 A I -- my group provides the fuel forecast. FPL
14 does not forecast fuel prices. We rely on outside
15 sources for that, but yes, our group provides the fuel
16 forecast.

17 Q Okay. And I believe you said you've been here
18 for at least Dr. Sim's testimony today; is that correct?

19 A Yes.

20 Q Okay. And you heard Dr. Sim speak about a
21 fuel penalty. Do you recall that testimony?

22 A I don't recall testimony on a fuel penalty.

23 Q Okay. Well, my question goes to this -- have
24 you done any analysis to determine what type of fuel
25 penalty, if any, would occur if the Dania Unit 7 was

1 **delayed by a year or two?**

2 A Again, I'm not sure what you mean by "fuel
3 penalty." So, I'm not sure --

4 **Q Have you made any determination about the**
5 **differential in the cost of running the Units 4 and 5**
6 **versus running Dania Unit 7?**

7 A Now, all the analysis is done by Dr. Sim's
8 group. So, all we do is provide the input -- the fuel-
9 price forecast that's used in the analysis, but his
10 group runs all the analysis.

11 So, if you have questions about what-if
12 scenarios, those all need to be directed to Dr. Sim.

13 MS. CHRISTENSEN: Okay. Thank you.

14 MR. MURPHY: Staff has no questions.

15 CHAIRMAN GRAHAM: Okay. I have my adviser/
16 counselor, who wants to read something into the
17 record.

18 MS. HELTON: Thank you, Mr. Chairman.

19 Back, I guess, several months ago, we added
20 some language to the order establishing procedure
21 to address the problem that we saw in certain
22 hearings where a witness would be asked a
23 question -- the witness would say, oh, I'm not the
24 correct witness to answer that question; the
25 correct witness is so-and-so.

1 And our attempt at the language was to ensure
2 that everyone is on common ground that they know
3 that the witness to whom the question has been
4 referred is the correct witness.

5 And the language contemplates that, if the
6 counsel to the party whose witness has referred the
7 question will ensure that the correct witness is --
8 let -- let everyone know that there is no witness
9 available to answer the question or ensure that the
10 question has been referred to the correct witness.

11 So, on Page 9 of the order establishing
12 procedure, it says that: During cross-examination,
13 if a witness or their counsel responds or objects
14 to a relevant question by referring the question to
15 another party witness, the counsel who is
16 sponsoring the current witness shall confirm the
17 identity of the appropriate party witness who can
18 more-fully address the question.

19 So, as I heard the question that was referred,
20 I thought that Witness Sim had referred it to this
21 particular witness.

22 CHAIRMAN GRAHAM: That's the way I heard it,
23 but as you just said, that it's -- the counsel for
24 that witness should have designated and said, yes
25 or no, that person could be the person to answer

1 that question.

2 And it was just Dr. Sim's deflection that it
3 went to this current witness; is that correct?

4 MR. COX: And if I could clarify just for a
5 moment, for FPL, what I heard Dr. Sim say is
6 consistent with what I heard our witness here say,
7 which is basically, of any of our witnesses, she
8 was the most-likely to be able to answer the
9 question. He wasn't sure if she could answer the
10 question. And I thought that was an accurate
11 response. So, I didn't have any reason to dispute
12 that.

13 CHAIRMAN GRAHAM: Well, and that's fine. I
14 mean, I think we all live and learn here. I think
15 the next time something like that happens, I -- be
16 duty upon me, or whoever is Chair, to bring it to
17 the counsel; make sure that everybody is nodding
18 their head that that witness would be the person to
19 answer that question. So, I take fault for that.

20 MR. COX: Thank you.

21 CHAIRMAN GRAHAM: Okay. Staff, you said no
22 questions?

23 MR. MURPHY: (Nodding head affirmatively.)

24 CHAIRMAN GRAHAM: Commissioners, no questions?

25 COMMISSIONER CLARK: I'm not sure if I have a

1 question or not, now. I'm going to -- I'll try to
2 go back to this and see if you can answer any part
3 of it in terms of trying to understand what happens
4 to excess capacity and -- and maybe not so specific
5 to this unit, but in general.

6 If you have an abundance of excess capacity --
7 which, apparently, there would be in 2022, for at
8 least a period of time -- could you sell that under
9 a purchase power agreement to another utility in
10 Florida for a two-year period of time to fill a
11 block that they need for two or three years?

12 THE WITNESS: And I think I can answer that
13 question.

14 COMMISSIONER CLARK: Okay.

15 THE WITNESS: I -- I think, again, it would
16 require an evaluation to determine, again, the size
17 of the sale, the term of the sale. We would have
18 to make sure that we can secure a gas supply or
19 whatever would be needed because, as we reallocate
20 our gas supply to -- to different, more-efficient
21 units -- now, I don't have -- I may have excess
22 generation capacity, but I don't have excess gas-
23 transportation capacity.

24 So, it would require an evaluation to look at
25 that, at that specific time.

1 I will tell you, though, that FPL, on a daily
2 and hourly basis, optimizes those assets, both
3 electric and gas, for the benefit of the customers.
4 So, we are always looking at any excess capacity
5 that we have, again, both on the gas and electric
6 side, to ensure that we're getting, you know, as
7 much, you know, payback for the customer as
8 possible on those assets, which are the assets of
9 the customer.

10 COMMISSIONER CLARK: So, if you were to
11 determine that that was possible and you were able
12 to sell that power, what would happen to the
13 dollars that were earned off of that? Would they
14 go into earnings? And would that ultimately lower
15 customer rates?

16 THE WITNESS: Now you're starting to get a
17 little bit off my knowledge. So, I -- I would
18 hesitate to respond to that because I don't want to
19 give you incorrect information.

20 COMMISSIONER CLARK: Okay. Thanks.

21 CHAIRMAN GRAHAM: Okay. No other
22 Commissioners?

23 Redirect.

24 MR. DONALDSON: No redirect.

25 CHAIRMAN GRAHAM: Okay.

1 MR. DONALDSON: And her exhibit has already
2 been entered into the record.

3 So, can she be released, please?

4 CHAIRMAN GRAHAM: Yes, she can.

5 MR. DONALDSON: Thank you.

6 CHAIRMAN GRAHAM: Thank you. And travel safe.

7 THE WITNESS: Thank you.

8 CHAIRMAN GRAHAM: Okay. Sierra Club, your
9 witness.

10 MS. KAPLAN: Sierra Club cites its witness,
11 Dr. Hausman -- calls its witness.

12 EXAMINATION

13 BY MS. KAPLAN:

14 Q Good afternoon, Dr. Hausman.

15 A Good afternoon.

16 Q Have you been sworn in?

17 A Yes, I have.

18 Q Please state your name and business address
19 for the record.

20 A My name is Ezra D. Hausman. I work at 77
21 Kaposia Street in Auburndale, Massachusetts.

22 Q Did you cause to be prefiled in this case your
23 testimony consisting of 44 pages?

24 A Yes, I did.

25 Q Did you also cause to be prefiled with your

1 **testimony -- testimony Exhibits EDH-1 to EDH-23?**

2 A Yes.

3 MS. KAPLAN: Mr. Chairman, Dr. Hausman's
4 exhibits, attached to his prefiled testimony, have
5 been identified as hearing Exhibits 21 through 43.

6 CHAIRMAN GRAHAM: Duly noted.

7 BY MS. KAPLAN:

8 **Q Dr. Hausman, did Sierra Club file an errata to**
9 **your prefiled testimony dated January 9th, 2018?**

10 A Yes.

11 **Q And do you have any additional errata to**
12 **identify at this point?**

13 A I have a -- a change -- a small change to my
14 testimony. I wouldn't --

15 **Q And can you identify that?**

16 A Yes. It's pursuant to some of the late-filed
17 discovery responses from the company.

18 On Page 22 of my testimony, at the top of the
19 page, I refer to, "All of the additional costs found in
20 Plans 4 and 5 relative to Plan 2 stem from FPL's choice
21 to delay the retirement," et cetera.

22 The word "all" should be "most." So, my
23 testimony is no longer that it's all of the costs, but
24 it is most of the costs.

25 **Q If I were to ask you today the questions in**

1 your prefiled testimony, as corrected, would your
2 answers, with the filed errata and what you just stated,
3 be the same?

4 A Yes.

5 Q Dr. Hausman, is the information contained in
6 your prefiled exhibits, as corrected by the errata
7 sheet, true and correct to the best of your knowledge
8 and belief?

9 A Yes.

10 MS. KAPLAN: Mr. Chairman, we ask that
11 Dr. Sim's [sic] testimony and errata be inserted in
12 the record --

13 THE WITNESS: I --

14 MS. KAPLAN: -- as though read.

15 CHAIRMAN GRAHAM: You mean Dr. Hausman's
16 direct testimony and errata sheet into the record
17 as though read?

18 MS. KAPLAN: Yes. Yes. I -- I apologize.

19 CHAIRMAN GRAHAM: Sure.

20 MS. KAPLAN: Mr. Chairman, we ask that
21 Dr. Hausman's testimony and errata be inserted --

22 CHAIRMAN GRAHAM: I gotcha.

23 MS. KAPLAN: Okay.

24 (Prefiled direct testimony inserted into the
25 record as though read.)

ERRATA SHEET

Witness: Dr. Ezra D. Hausman – Direct

Section of Testimony	Change to be made
Page 14, Line 19	Insert: quotation mark at the end of “just combined cycles and combustion turbines.”
Page 19, Line 8	Replace: “0.01” with: “0.1”
Page 28, Line 14	Replace: “before any reliability arises” with: “before any reliability need arises”
Page 35, Table 1	Remove: heading “Unit” from the top row, first column of Table 1
Page 37, Lines 3-4	Replace: “demand response (DR) in 2025” with: “demand response (DR) through 2025”
Exhibit Headers	Replace: “EDH - # Page #” with: “Docket No. 0225-EI Petition for determination of need for Dania Beach Clean Energy Center Unit 7, by Florida Power & Light Company Exhibit EDH - #, Page # of n”

Under penalties of perjury, I declare that I have read the foregoing document and that the facts stated in it are true.



Ezra D. Hausman, Sierra Club Expert Witness

1/9/2018

Date

1 **I. Professional Qualifications**

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

3 A. My name is Ezra D. Hausman, Ph.D. I am an independent consultant
4 doing business as Ezra Hausman Consulting, operating from offices at 77 Kaposia
5 Street, Auburndale, Massachusetts 02466.

6 **Q. Are you providing any exhibits with your testimony?**

7 A. Yes. I am sponsoring the following exhibits.¹

Exh. No.	Description
EDH-1	Resume of Ezra D. Hausman, Ph.D.
EDH-2	Gavin Bade & Peter Maloney, Utility Dive, <i>Updated: Tucson Electric Signs Solar + Storage PPA for 'Less Than 4.5¢/kWh'</i> (May 2017), available at https://www.utilitydive.com/news/updated-tucson-electric-signs-solar-storage-ppa-for-less-than-45kwh/443293/
EDH-3	JEA, <i>Agenda Item Summary: Universal Solar Expansion and Land Acquisition</i> (Oct. 2017)
EDH-4	Pierce Schuessler, Solar Energy Industries Association, <i>Comment on Proposed 2017 Second Revised and Restated Stipulation and Settlement Agreement in Docket No. 20170183</i> (Oct. 2017)
EDH-5	EnerNOC, Inc., <i>ISO-New England Awards EnerNOC Landmark Contract to Improve Grid Reliability in Southwest Connecticut</i> (Apr. 2004)
EDH-6	Moody's, <i>Global Renewables Focus</i> (Sep. 2017)
EDH-7	Mark Bolinger et al., Lawrence Berkeley National Laboratory, <i>Utility-Scale Solar 2016: An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States</i> (Sep. 2017), available at https://emp.lbl.gov/sites/default/files/utility-scale_solar_2016_report.pdf
EDH-8	Chris Neme & Jim Grevatt, Energy Futures Group, <i>Energy Efficiency as a T&D Resource: Lessons from Recent U.S. Efforts to Use Geographically Targeted Efficiency Programs to Defer T&D Investments</i> (Jan. 2015), available at http://www.neep.org/sites/default/files/products/EMV-Forum-

¹ As I cite to certain discovery responses and deposition testimony, the relevant pages are being provided as exhibits as well.

	Geo-Targeting_Final_2015-01-20.pdf
EDH-9	Rachel Wilson & Bruce Biewald, Synapse Energy Economics, <i>Best Practices in Electric Utility Integrated Resource Planning: Examples of State Regulations and Recent Utility Plans</i> (June 2013), available at http://www.raponline.org/wp-content/uploads/2016/05/rapsynapse-wilsonbiewald-bestpracticesinirp-2013-jun-21.pdf
EDH-10	Navigant Consulting, Inc., for Eastern Interconnection States' Planning Council and National Association of Regulatory Utility Commissioners, <i>Transmission Planning White Paper</i> (2014), available at https://pubs.naruc.org/pub.cfm?id=53A151F2-2354-D714-519F-53E0785A966A
EDH-11	New England Power Pool, <i>Order on Rehearing and Accepting Compliance Filing</i> , FERC Docket Nos. ER04-335-001 and ER04-335-002 (May 2004), available at https://www.ferc.gov/eventcalendar/Files/20040528153559-er04-335-001.pdf
EDH-12	PJM Interconnection, LLC, <i>Load Management Performance Report 2015/2016</i> (Aug. 2016), available at http://www.pjm.com/~media/markets-ops/dsr/2015-2016-dsr-activity-report-20151221.ashx
EDH-13	PJM Interconnection, LLC, <i>RPM 101: Overview of Reliability Pricing Model</i> (Apr. 2017), available at http://pjm.com/~media/training/nerc-certifications/markets-exam-materials/rpm/rpm-101-overview-of-reliability-pricing-model.ashx

1

2 **Q. What is your educational and professional background?**

3 A. I hold a BA in Psychology from Wesleyan University, an MS in
4 Environmental Engineering from Tufts University, an SM in Applied Physics
5 from Harvard University, and a PhD in Atmospheric Chemistry from Harvard
6 University. I have been involved in analysis of both regulated and restructured
7 electricity markets for approximately 20 years.

8 I have worked as an independent consultant and expert based on my
9 expertise and experience in energy economics and environmental science since
10 2014. From 2005 until early 2014, I was employed at Synapse Energy Economics,

1 Inc., a research and consulting company located in Cambridge, Massachusetts,
2 where I served most recently as Vice President and Chief Operating Officer. From
3 1998 through 2004 I served as a Senior Associate at Tabors Caramanis and
4 Associates (TCA) of Cambridge, Massachusetts. In 2004, TCA was acquired by
5 Charles River Associates (CRA), where I remained until 2005.

6 I provide expert consulting services in several areas relating to energy
7 markets and energy market regulation on the state, regional, and federal levels;
8 energy dispatch and planning modeling, quantification of the economic and
9 environmental benefits of displaced emissions; and treatment of energy efficiency
10 and renewable energy in electricity and capacity markets. I have provided
11 testimony and/or appeared before public utility commissions or legislative
12 committees in Arizona, Idaho, Illinois, Iowa, Kansas, Louisiana, Maryland,
13 Massachusetts, Minnesota, Mississippi, Missouri, New Hampshire, New Jersey,
14 Nevada, South Dakota, Vermont, and Washington State, as well as at the federal
15 level. I have also provided expert representation for stakeholders at the PJM ISO,
16 the California ISO, the Midwest ISO, and at the FERC. While most of my
17 testimony and analytical work has centered on issues concerning electricity
18 market economics, I have also brought my expertise as a scientist to bear on cases
19 involving energy efficiency programs and greenhouse gas regulation and
20 mitigation in the electric sector.

21 I have provided a detailed resume including a detailed list of my
22 testimony, publications, presentations, and reports, as Hausman Exhibit 1.

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

2 A. No.

3 **II. Purpose of Testimony, Summary of Findings, and Recommendations**

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

5 A. I address Florida Power & Light Company's (hereafter, "FPL" or
6 "Company") request that the Florida Public Service Commission (hereafter,
7 "Commission") grant an affirmative determination of need for a 1,163 megawatt
8 (hereafter MW) gas combined cycle (hereafter, "CC") unit in June 2022. FPL
9 plans to build what it calls the Dania Beach Clean Energy Center Unit 7
10 (hereafter, DBEC) at FPL's Lauderdale plant site in Broward County, Florida,
11 four years after retiring two existing Lauderdale units (hereafter, Units 4 and 5) at
12 that site in 2018.

13 My testimony assesses FPL's stated reasons for its request under the
14 factors this Commission uses to assess the need for new power plants.

15 **Q. Please summarize your findings.**

16 A. I find that FPL failed to perform a comprehensive and rigorous analysis of
17 alternatives for meeting its reliability requirements. Had it done so, it would have
18 found lower-cost, lower-risk, and lower-emissions options, relative to DBEC, that
19 meet reliability requirements and promote fuel diversity. FPL did not identify
20 these options because its analyses of alternatives were inadequate, based on
21 flawed assumptions, and inconsistent with industry best practices, and were thus
22 too flawed to serve as justification for the proposed investment of \$888 million of
23 customer funds on DBEC.

24 I further find that the Company's request is premature, given its own

1 projection of sufficient resources at least through 2024, and the availability of
2 abundant lower cost and lower risk resources for meeting the Company's needs in
3 the ensuing years. Although FPL contends that building DBEC several years in
4 advance of any reliability need will save customers money, I find that this
5 conclusion is based on a flawed and misleading analysis, and that in fact it costs
6 less to delay DBEC.

7 **Q. What are your recommendations for the Commission in this proceeding?**

8 A. I recommend that the Commission deny FPL's petition for an affirmative
9 determination of need for DBEC in June 2022. Based on my review of the
10 information provided to date and relevant industry information, it is clear that
11 DBEC is not needed at that time, and may never be needed under the factors this
12 Commission uses to determine need in this context.

13 First, 2024, not 2022, is the first year in which FPL has identified a
14 projected, unmet system reliability need—and that need is for 54 MW,² as
15 opposed to the 1,163 MW proposed by FPL. Second, given the unmet system
16 need identified by FPL, FPL has not shown that DBEC is the most cost-effective
17 alternative available to meet that need, because FPL did not credibly perform the
18 routine review of all available alternatives, including low-cost, straightforward
19 alternatives such as incremental additions of solar and demand-side resources.³ As
20 I will explain, FPL's exceedingly narrow review of just two delay scenarios

² Under FPL's 20% reserve margin requirement. See Exhibit SRS-2 to the direct testimony of Dr. Steven Sim. FPL's reserve margin criteria are discussed in detail in my testimony.

³ I will use the term "demand-side resources" to refer to the measures that are currently included in FPL's demand-side management programs (DSM) as well as other distributed, customer-sited resources such as energy efficiency, demand response, conservation, and customer-owned rooftop solar photovoltaics (PV).

1 reveals that FPL's plan to build DBEC in 2022 would cost *more* than simply
 2 delaying DBEC by one or two years. Nor has FPL shown that DBEC promotes
 3 fuel diversity in Florida or in FPL's generation fleet, whereas alternatives could
 4 substantially reduce customers' exposure to the wide-ranging costs and risks of
 5 FPL's heavy reliance on gas. Finally, FPL has not shown that it has adequately
 6 explored or developed either renewable generation options or conservation
 7 measures as alternatives to DBEC.

8 **III. Structure of My Testimony**

9 **Q. How is your testimony organized?**

10 A. My testimony is organized around the factors that this Commission uses to
 11 review the need for new power plants, which are set out in Section 403.519,
 12 Florida, Statutes. Specifically, I address these factors:

- 13 ● Whether FPL has established a need for DBEC in 2022 for system reliability
 14 purposes;
- 15 ● Whether FPL has established that DBEC is the most cost-effective alternative
 16 available;
- 17 ● Whether FPL has established a need for DBEC for fuel diversity purposes;
 18 and
- 19 ● Whether FPL has established that renewables and conservation measures are
 20 utilized to the extent reasonably available under its plan to build DBEC in
 21 2022.

22 Finally, I offer my recommendations for Commission action on this
 23 matter.

24 **IV. Need for System Reliability**

25 **Q. What reliability need(s) has FPL identified?**

26 A. FPL identified two future reliability needs. One is a projected regional

1 imbalance in Southeast Florida (Broward and Miami-Dade counties) after 2030;
2 or as early 2025, if Units 4 and 5 retire in 2018.⁴ The other is a projected shortfall
3 in system-wide reserves as early as 2024, again if Units 4 and 5 retire in 2018.⁵

4 **Q. Please elaborate on the regional imbalance in Southeast Florida.**

5 A. FPL identified a balance between the need for capacity to serve peak load
6 in the Southeast Florida region of its service area (in Broward and Miami-Dade
7 counties) net of capacity located in this region, versus available firm transmission
8 capacity to deliver out-of-region energy to customers. Put simply, this is a balance
9 between the import *requirement* under peak load conditions, and the import
10 *capability* of the system under the same conditions. If the projected import
11 requirement exceeds the import capability, there is an imbalance, which can be
12 resolved one of three ways: (1) reducing load in the Southeast Florida area; (2)
13 increasing generation that can serve the area; or (3) relieving a transmission
14 constraint through transmission enhancements or other technical or operational
15 means.

16 **Q. You said FPL projected an imbalance in Southeast Florida in 2030 or as**
17 **early as 2025. Briefly elaborate on these two timeframes.**

18 A. Any imbalance in Southeast Florida has been significantly forestalled by
19 the construction of the Corbett-Sugar-Quarry (CSQ) line, which FPL anticipates
20 to be in service by mid-2019.⁶ According to FPL's witness Dr. Sim, the CSQ line
21 "can address the regional need from mid-2019 through the year 2030 (assuming

⁴ Direct Testimony of Dr. Steven R. Sim, page 18 at lines 5-7.

⁵ Ibid. at lines 1-2.

⁶ Ibid., page 29 at line 5.

1 no other changes in projected load, generation, and/or transmission capability).”⁷

2 Alternatively, if Units 4 & 5 retire in 2018, FPL projects imbalance conditions
3 may arise in Southeast Florida as early as 2025.⁸

4 **Q. Please briefly elaborate on the other reliability need identified by FPL.**

5 A. FPL projects this need based on two system-wide reliability criteria. The
6 first criterion is that the combined accredited capacity of all resources on FPL’s
7 system, including its demand-side management programs (hereafter, DSM), must
8 equal or exceed 120% of projected peak load (hereafter, 20% reserve margin).

9 The second criterion is that the accredited capacity of generation resources alone,
10 excluding DSM, must equal or exceed 110% of forecasted peak load. FPL refers
11 to this second criterion as its “generation-only reserve margin” (hereafter, GRM).

12 **Q. Has FPL explained its use of GRM as an additional reliability criterion?**

13 A. No, FPL has not. But FPL’s move to adopt GRM only a few years ago⁹ is
14 unprecedented in Florida, unprecedented in other jurisdictions where I have
15 worked, and inconsistent with the record of demand-side resources providing
16 excellent reliability services.¹⁰ By nonetheless using GRM, FPL arbitrarily
17 discounts the reliability attributes of demand-side resources, thereby skewing
18 FPL’s analysis toward additional supply-side resources even when those
19 resources may provide little to no incremental reliability benefit.

⁷ Ibid., at lines 9-11.

⁸ Ibid., at lines 16-17.

⁹ Deposition of Dr. Steven R. Sim on November 29, 2017, page 154 at lines 9-11 (“[The GRM] is one that FPL uses and that the Commission is aware of, and we’ve been using it now for, ballpark, three, four years.”).

¹⁰ For example, performance of DSM capacity resources in PJM is reported in the PJM Annual Load Management Performance Report. See PJM Interconnection, LLC, *Load Management Performance Report 2015/2016* (Aug. 2016), available at <http://www.pjm.com/~media/markets-ops/dsr/2015-2016-dsr-activity-report-20151221.ashx>.

1 **Q. You said FPL projects a shortfall in its reserves as early as 2024. Please**
2 **elaborate on the timing and magnitude of this shortfall.**

3 A. Under a 20% reserve margin criterion and FPL's load forecast, FPL
4 anticipates a shortfall of 20MW in 2026, if Units 4 and 5 are operating, and 54
5 MW in 2024, if Units 4 and 5 retire in 2018. FPL projects that the shortfall will
6 grow in subsequent years, as shown in Exhibit SRS-2 sponsored by FPL witness
7 Dr. Sim.

8 **Q. What is your opinion of FPL's reliability criteria?**

9 A. FPL uses extremely conservative reliability criteria. The industry standard
10 for reliability is to have sufficient reserves to achieve a loss of load probability
11 (hereafter, LOLP) of one day in ten years.¹¹ Beyond this level the marginal
12 increased reliability benefit diminishes rapidly, as the risk of capacity-related
13 failure becomes vanishingly small.¹² While FPL also considers the one-day-in-
14 ten-years LOLP standard, the Company's two reserve margin criteria discussed
15 above are more stringent – they mislead FPL to over-procure capacity that is not

¹¹ For example, see Navigant Consulting, Inc., for Eastern Interconnection States' Planning Council and National Association of Regulatory Utility Commissioners, *Transmission Planning White Paper* 24 (2014), available at <https://pubs.naruc.org/pub.cfm?id=53A151F2-2354-D714-519F-53E0785A966A> ("The utility industry, for decades, has used a LOLE of one day in ten years as the primary means for setting target reserve margins and capacity requirements in resource adequacy analyses.").

¹² This may be seen, at least conceptually, in the "Variable Resource Requirement" (VRR) curves used by some capacity market operators to represent the decreasing marginal value of increased reserve margins over the standard requirement. See PJM Interconnection, LLC, *RPM 101: Overview of Reliability Pricing Model* 25-30 (Apr. 2017), available at <http://pjm.com/~media/training/nerc-certifications/markets-exam-materials/rpm/rpm-101-overview-of-reliability-pricing-model.ashx>; see also Deposition of Steven R. Sim on November 29, 2017, page 156 at lines 12-13 (stating that, at least in theory, there are diminishing returns on reliability improvements from increases to generation reserves).

1 needed to meet the industry LOLP standard.¹³

2 *1. There Is No System Reliability Need for the Project*

3 **Q. Do you agree that DBEC is needed in 2022 to meet a regional imbalance in**
4 **Southeast Florida and FPL’s reserve shortfalls?**

5 A. No. DBEC is not needed in 2022 for regional balance or system reliability
6 because FPL expects its existing resources to be more than adequate to meet both
7 of these needs at least until 2024.¹⁴

8 **Q. Is the potential for either a shortfall in reserves before 2024 or a regional**
9 **imbalance in Southeast Florida earlier than 2025, due to unexpected**
10 **circumstances, a sufficient justification for placing DBEC in service in 2022?**

11 A. No. As FPL has acknowledged,¹⁵ load forecasts and other expectations
12 about the future are inherently uncertain, and the date at which a shortfall in
13 reserves or a regional imbalance could arise could be earlier or later than the
14 Company anticipates. However, this uncertainty does not justify placing DBEC in
15 service in 2022, two to three years earlier than any anticipated need. FPL has not

¹³ Florida Public Service Commission, *Review of the 2017 Ten-Year Site Plans of Florida’s Electric Utilities* 51 (Nov. 2017), available at <http://www.psc.state.fl.us/Files/PDF/Utilities/Electricgas/TenYearSitePlans/2017/Review.pdf> (“Between the two reliability indices, LOLP and reserve margin, the reserve margin requirement is typically the controlling factor for the addition of capacity.”); see also Deposition of Dr. Steven R. Sim on November 29, 2017, page 155 at line 25 through page 156 at line 1 (“Loss of load probability is not driving our resource needs, it is the other two.”).

¹⁴ Deposition of Steven R. Sim on November 29, 2017, page 161 at lines 11-24.

¹⁵ Florida Power & Light Company, *Response to Sierra Club Interrogatory Number 16 in Docket No. 20170225-EI* (Nov. 2017) (“The window of opportunity could potentially extend past 2025, e.g., due to either Summer peak load being lower than forecasted and/or to greater than forecasted available capacity in the region.”); see also Deposition of Steven R. Sim on November 29, 2017, page 78 at lines 9-10 (“I don’t need to do analysis to postulate that the load forecast could change.”).

1 even analyzed or assigned a probability for those occurrences.¹⁶ In fact, in its
 2 review of 2017 Ten Year Site Plans (hereafter “TYSP”), the Commission found
 3 that Florida utilities have consistently and often dramatically *over* predicted load
 4 with a five- to six-year lead time.¹⁷ The inevitable uncertainty around load
 5 forecasts is one of the primary reasons that resource planning is performed using a
 6 reserve margin – as a contingency against load forecast errors. FPL’s 20%
 7 planning reserve margin more than adequately accommodates this type of
 8 uncertainty. Further, there are a number of less costly and readily available
 9 alternatives to meet FPL’s system reliability needs on a short-term basis should
 10 those needs arise earlier than currently projected, as discussed in the next section
 11 of my testimony.

12 *2. There Are Lower Cost Alternatives that Meet Future System Reliability*
 13 *Needs as They Arise*

14 **Q. What can FPL do to resolve or forestall its projected system reserve shortfall**
 15 **and projected imbalance in Southeast Florida?**

16 A. FPL has many options, such as incremental additions of large-scale solar
 17 and demand-side resources, as well as short-term power purchase agreements.
 18 Various energy storage technologies, including batteries, can also help meet
 19 reserve margins because they can be used to store energy during off-peak periods
 20 and make it available to the system during peak times. All of these resources can
 21 help resolve regional imbalance, too, if they are sited in, or electrically connected

¹⁶ Deposition of Steven R. Sim on November 29, 2017, page 162, lines 6-10.

¹⁷ Florida Public Service Commission, *Review of the 2017 Ten-Year Site Plans of Florida’s Electric Utilities 25-35* (Nov. 2017), available at <http://www.psc.state.fl.us/Files/PDF/Utilities/Electricgas/TenYearSitePlans/2017/Review.pdf>.

1 to, the Southeast Florida region. FPL can even meet its reliability needs via
 2 additional transmission, as it has with the CSQ line now under construction, or
 3 possibly through operational changes that enhance import capability under peak
 4 load conditions. As I will explain further below, these alternatives to DBEC likely
 5 could meet FPL’s reliability needs at a lower cost than placing DBEC in service
 6 in 2022.

7 **Q. What are the benefits of meeting reliability needs incrementally as they**
 8 **arise?**

9 A. There are many benefits to taking an incremental approach. This would
 10 allow FPL and the Commission additional time to use updated load projections,
 11 rather than committing to large expenditures on supply side generation years
 12 before it is needed to meet uncertain long-term forecasts of growth.¹⁸ This
 13 approach would benefit customers by deferring, reducing, or even avoiding
 14 expensive supply-side generation additions, protecting them from overpaying now
 15 for excess capacity with little to no marginal reliability benefit that is not needed
 16 until a later date. Delaying or avoiding DBEC also benefits customers by allowing
 17 FPL and its customers to benefit from improvements in performance and costs for
 18 solar, storage, and even CC units in the future.

19 **V. Most Cost-Effective Alternative**

20 **Q. Why does FPL claim the proposed DBEC project is cost-effective?**

21 A. FPL claims that, over the life of the project, building and operating DBEC

¹⁸ This is an issue often referred to as “lumpy” generation additions – the fact that economies of scale for large fossil generators force utilities to over-procure capacity and customers to bear unnecessary costs until load growth restores appropriate reserve margins. Lumpiness is not a significant factor for clean energy and DSM resources that are typically procured in smaller increments.

1 is cheaper than continuing to operate Units 4 and 5. FPL also claims that, relative
2 to DBEC, it would cost more to place solar (PV) and storage in service on the
3 same time frame, with the same firm capacity, and in similar locations.¹⁹ Finally,
4 FPL claims that placing DBEC in service in 2022 is cheaper than doing so one or
5 two years later.²⁰

6 **Q. Do you agree that placing DBEC in service in 2022 is the most cost-effective**
7 **way to meet FPL's reliability requirements?**

8 A. No. For reasons that I will explain, I conclude that FPL's own analyses
9 show that placing DBEC in service in 2022 is not the most cost-effective
10 alternative available. I further identify additional alternatives to DBEC that FPL
11 failed to consider, but that could serve customers with less cost, less risk, and
12 lower emissions of pollutants to the environment.

13 *1. FPL Has Failed to Show that the Project is the Most Cost-Effective*
14 *Alternative*

15 **Q. What flaws have you identified in FPL's analyses of alternatives to its**
16 **proposed project?**

17 A. Based on my review of FPL's filings, discovery responses, and deposition
18 testimony to date, I find that FPL's analyses are fundamentally flawed in the
19 following ways: (i) FPL did not use a resource planning model in any meaningful
20 way to evaluate the economics of alternate resource plans; (ii) FPL did not issue a
21 request for proposals or conduct any other comparable, rigorous investigation of
22 alternatives on the market that could meet its reliability needs; (iii) FPL

¹⁹ Direct Testimony of Dr. Steven R. Sim, page 35 at lines 22-23 through page 36 at lines 1-11.

²⁰ Direct Testimony of Dr. Steven R. Sim, page 36 at lines 19-23 through page 37 at lines 1-12.

1 considered overly and unnecessarily constrained options; (iv) FPL imposed
 2 irrational and costly assumptions on its two “delay” scenarios; and (v) FPL failed
 3 to meaningfully consider demand-side resources.

4 **Q. Please describe the purpose of a resource planning model.**

5 A. Very briefly, a resource planning model is a computer simulation used to
 6 find the least-cost mix of resources that will meet the user’s needs for energy and
 7 capacity over the duration of a predefined study period. The model and its use
 8 should be flexible enough to test a wide range of resource combinations. Users
 9 routinely run the model under a range of possible future conditions, such as higher
 10 or lower load growth, higher or lower fuel prices, and so forth. In this way a least-
 11 cost plan can be found that meets the utility’s needs under a range of possible
 12 future conditions.

13 **Q. Did FPL engage in the type of modeling analysis you describe? Why or why
 14 not?**

15 A. No. While FPL has routinely used the EGEAS model to develop its ten-
 16 year site plans,²¹ it did not use this model in its 2017 analysis. Moreover, in its
 17 2016 analysis, FPL only applied the EGEAS model in the first of four iterations.²²
 18 Yet even in that first iteration, FPL restricted the resource options in the model to
 19 “just combined cycles and combustion turbines.”²³ FPL explains its abandonment
 20 of the model by claiming that “[t]he need to simultaneously solve for both FPL

²¹ Florida Power & Light Company, Ten Year Power Plant Site Plan 2017-2026 at 57 (Apr. 2017) (“FPL utilized the UPLAN production cost model and a Fixed Cost Spreadsheet, and/or the EGEAS optimization model, to perform the system economic analyses of the resource plans.”).

²² Deposition of Dr. Steven R. Sim on November 29, 2017, page 86 at lines 4-25 through page 89 at lines 1-17.

²³ *Ibid.*, page 88 at lines 4-5.

1 system and SE Florida region requires a new analysis approach.”²⁴ However, it is
2 best practice to use a modeling study as a component of any analyses aimed at
3 least-cost resource planning.²⁵

4 Here, for example, FPL could fix imports into Southeast Florida as a
5 boundary condition, and use EGEAS or a similar model, but allow the model to
6 select from a wide range of resources, to find candidate plans within the region.
7 This would be a standard use of the model. Had FPL used this approach, it could
8 have identified lower-cost resource plans, likely including demand-side resources,
9 large- and small-scale solar, and storage, to meet its regional and system-wide
10 needs.

11 **Q. You said use of a resource planning model is one component of least-cost**
12 **planning. What are other strategies that help utilities ensure they are**
13 **procuring least-cost resources for their customers?**

14 A. Another important strategy for least-cost procurement is the investigation
15 of market conditions. This is particularly critical today because conditions are
16 changing so rapidly and dramatically throughout the industry. One of the best
17 ways to investigate current market conditions is to issue resource-neutral requests
18 for proposals (RFPs), and to allow independent market participants the
19 opportunity to propose solutions to reliability needs at lower cost than utility-

²⁴ Florida Power & Light Company, *2016 Southeastern Florida Study: Results To-Date 6* (Dec. 2016); see also Deposition of Dr. Steven R. Sim on November 29, 2017, page 86 at lines 10-21.

²⁵ Rachel Wilson & Bruce Biewald, Synapse Energy Economics, *Best Practices in Electric Utility Integrated Resource Planning: Examples of State Regulations and Recent Utility Plans* (June 2013), available at <http://www.raponline.org/wp-content/uploads/2016/05/rapsynapse-wilsonbiewald-bestpracticesinirp-2013-jun-21.pdf>.

1 identified and implemented solutions.²⁶

2 A classic example of this, derived from a situation that is similar in many
3 respects to FPL's situation, was the 2004 Southwest Connecticut "Gap RFP" to
4 find solutions to an import constraint into a congested and high-cost region of
5 Connecticut. The solution ultimately accepted by both the market operator and the
6 Federal Energy Regulatory Commission (FERC) was a third-party contract to
7 provide demand response services, which delayed the need for any transmission
8 or generation solution for several years.²⁷

9 **Q. Do you have reason to believe that an RFP process might have yielded lower-**
10 **cost options than FPL considered in its 2017 analyses?**

11 A. Yes. As FPL must be aware, its unregulated affiliate, NextEra Energy
12 Resources (NEER), is an industry leader in providing low-cost solar solutions in
13 the form of power purchase agreements (hereafter, "PPA") to utilities. For
14 example, NEER recently announced a PPA with Tucson Electric Power
15 delivering a combined solar and storage solution for under \$0.045 per kWh, with
16 solar portions priced at under \$0.03 per kWh.²⁸ This would be cost competitive
17 with or superior to new gas-fired resources on a levelized cost basis, and provides

²⁶ Chris Neme & Jim Grevatt, Energy Futures Group, *Energy Efficiency as a T&D Resource: Lessons from Recent U.S. Efforts to Use Geographically Targeted Efficiency Programs to Defer T&D Investments* (Jan. 2015), available at http://www.neep.org/sites/default/files/products/EMV-Forum-Geo-Targeting_Final_2015-01-20.pdf.

²⁷ New England Power Pool, *Order on Rehearing and Accepting Compliance Filing*, FERC Docket Nos. ER04-335-001 and ER04-335-002 (May 2004), available at <https://www.ferc.gov/eventcalendar/Files/20040528153559-er04-335-001.pdf>; EnerNOC, Inc., *ISO-New England Awards EnerNOC Landmark Contract to Improve Grid Reliability in Southwest Connecticut* (Apr. 2004).

²⁸ Gavin Bade & Peter Maloney, Utility Dive, *Updated: Tucson Electric Signs Solar + Storage PPA for 'Less Than 4.5¢/kWh'* (May 2017), available at <https://www.utilitydive.com/news/updated-tucson-electric-signs-solar-storage-ppa-for-less-than-45kwh/443293/>.

1 far greater fuel diversity benefits. These low costs are consistent with the findings
2 of a 2017 nationwide survey of solar PPA process published by the US
3 Department of Energy (DOE).²⁹

4 **Q. Have you found evidence of solar PPAs with similar pricing available in**
5 **Florida?**

6 A. Yes. For example, JEA recently completed three rounds of solar RFPs.
7 JEA's Managing Director and CEO, Mr. Paul E. McElroy, found that "the price
8 of utility-scale solar PPAs has declined from \$75/MWh on average in 2016 to
9 near JEA's current fuel charge of \$32.50/MWh today."³⁰ In other words, below
10 the cost of fuel for gas-fired generation, indicating that solar PPAs are already
11 competitive with new and even existing gas-fired generation. Mr. McElroy
12 subsequently recommended to his Board of Directors that "JEA pursue new
13 universal solar PPAs at or below JEA's current fuel rate to take advantage of
14 lower universal solar prices. Universal solar allows JEA to lock in current,
15 competitive low energy prices for a portion of our generation requirements,
16 reducing JEA's reliance on fossil fuels and providing some protection to JEA
17 customers against future changes in volatile fuel and purchase power."³¹

18 Based on JEA's successful experience with solar PPAs, it seems likely
19 that FPL would have similarly found low-cost solar PPA opportunities had it

²⁹ Mark Bolinger et al., Lawrence Berkeley National Laboratory, *Utility-Scale Solar 2016: An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States* § 2.3 (Sep. 2017), available at https://emp.lbl.gov/sites/default/files/utility-scale_solar_2016_report.pdf.

³⁰ JEA, Agenda Item Summary: Universal Solar Expansion and Land Acquisition (Oct. 2017).

³¹ *Ibid.*

1 issued a solicitation to the market.³² However, the Company does not appear to
 2 have even considered this alternative.

3 **Q. Can market solicitations be used to acquire DSM resources, such as demand**
 4 **response, to meet reliability needs?**

5 A. Yes. Several examples of this are discussed in a recent paper by the
 6 Northeast Energy Efficiency Partnership.³³ The flourishing of demand-side
 7 resources is also one of the great success stories of the organized capacity
 8 markets, where demand resource participation by independent, third-party
 9 aggregators far exceeded initial expectations - reducing fuel use, saving
 10 consumers billions of dollars, and averting the need for many power plants.³⁴ FPL
 11 itself has a history of using DSM to meet reliability needs, having reduced
 12 cumulative summer peak by approximately 4,843 MW and eliminated the need to
 13 construct the equivalent of approximately 15 new 400 MW generating units
 14 between 1978 and 2016.³⁵ Until FPL conducts such a market solicitation itself, or

³² Further evidence of this is found in Pierce Schuessler, Solar Energy Industries Association, *Comment on Proposed 2017 Second Revised and Restated Stipulation and Settlement Agreement in Docket No. 20170183* (Oct. 2017). The comment asserts that, as compared to the cost cap on solar applicable to the solar to which DEF commits -- on a weighted average cost of all project basis, no greater than \$1,650 per kilowatt alternating current ("kWac"), "ratepayers would be better served if, instead of building its own solar facilities, Duke were to procure this additional generation through third party power purchase agreements, or by the purchase of completed projects developed by third parties. We believe that either option would allow for the addition of solar capacity at a lower cost than generation developed and constructed by Duke." Ibid.

³³ Chris Neme & Jim Grevatt, Energy Futures Group, *Energy Efficiency as a T&D Resource: Lessons from Recent U.S. Efforts to Use Geographically Targeted Efficiency Programs to Defer T&D Investments* (Jan. 2015), available at http://www.neep.org/sites/default/files/products/EMV-Forum-Geo-Targeting_Final_2015-01-20.pdf.

³⁴ See generally PJM Interconnection, LLC, *Reliability Pricing Model Base Residual Auction Reports*, available at <http://www.pjm.com/markets-and-operations/rpm.aspx>. For example, the 2019/2020 auction yielded 10,348 MW of demand response resources.

³⁵ Florida Power & Light Company, Ten Year Power Plant Site Plan 2017-2026 at 24 (Apr. 2017).

1 performs a comparably rigorous investigation of the market for demand-side
2 resources, there is no reason to believe the Company's assertions that incremental
3 cost-effective demand-side resources are unavailable.

4 **Q. In summary, what is your recommendation for how FPL should devise,
5 analyze, and implement the most cost-effective alternative available?**

6 A. I recommend that FPL take the following steps:

- 7 ● Determine appropriate reserve margin criterion and regional resource needs
8 using a loss-of-load probability of 0.01.
- 9 ● Use market solicitations to ascertain availability and cost of additional
10 resource options.
- 11 ● Use a resource planning model to devise and test cost-effective plans for
12 meeting both its system-level reliability constraint and resource needs in sub-
13 regions, allowing the model to select the optimal resources from a full range
14 of options, and using multiple runs of the model to test alternative resource
15 plans under a range of future conditions.
- 16 ● Schedule resource development, including demand-side resources, to address
17 resource needs at the time they are projected to materialize, and do not subject
18 customers to unnecessary costs for resources long before they are needed for
19 reliability purposes. One crucial means of achieving this is to rely on smaller,
20 incremental resources to meet incremental needs. This approach helps match
21 resource procurement to the actual timing and magnitude of resource needs,
22 thereby avoiding the costs of over-supply and capturing the savings associated
23 with the continuous cost and performance improvements across resource
24 options.
- 25 ● Use RFPs in the final procurement process to try to reduce the cost of
26 resources when they are ultimately procured.

1 2. *To Identify the Most Cost-Effective Alternative, FPL Should Have, But Did*
2 *Not, Evaluate Numerous Alternatives Available to FPL*

3 **Q. What alternatives to DBEC did FPL consider in its 2017 analyses?**

4 A. FPL considered just one realistic alternative to its plan to build DBEC by
5 2022. Under the alternative that FPL calls “Plan 1,” Units 4 and 5 would operate
6 until at least 2061 and FPL would enter into a new PPA in 2026, add a new
7 combined cycle unit outside of Southeast Florida in 2027, and add other resources
8 in later years. Plan 1 may be seen as a “base case” scenario under which existing
9 units are supplemented by new resources as the need for them arises.

10 In addition to Plan 1, FPL presented its proposed plan (Plan 2); a plan that
11 purported to test the option of relying on clean energy resources (Plan 3); and two
12 plans that purported to test the option of delaying DBEC by one or two years
13 (Plan 4 and Plan 5, respectively.)

14 **Q. Do you have concerns with how FPL designed its proposed Plan 2?**

15 A. Yes. Under FPL’s proposed plan, Plan 2, Units 4 and 5 would be retired in
16 2018 and DBEC would be constructed at the same site and brought into operation
17 in 2022. Plan 2 is suboptimal because the new unit would be brought on line two
18 to three years prior to any reliability requirement for this unit at all, and five years
19 before FPL projects a need for its full capacity. FPL also failed to explore whether
20 other resources, such as higher levels of DSM, solar, or batteries, could defer,
21 reduce, or avoid its projected need for DBEC. Indeed, FPL did not even seek to
22 take advantage of improvements it expects in both the cost and performance of
23 CC units. As attested to by Dr. Sim, “we see combined cycle costs dropping. In
24 fact, we think that in the next few years we’re going to see the very first combined

1 cycle with a heat rate below 6,000. That's on the horizon."³⁶ Yet FPL would
 2 needlessly place DBEC in service without waiting for those efficiency benefits,
 3 even though there is no reliability or cost benefit to doing so.

4 **Q. Please describe FPL's additional analyses of delaying construction of DBEC**
 5 **for one or two years.**

6 A. These plans, denoted Plan 4 and Plan 5 in materials provided in
 7 Discovery,³⁷ purported to test the impact of bringing DBEC on line one and two
 8 years later, in 2023 and 2024, respectively. However, in constructing these plans
 9 FPL also assumed a delay in the retirement of Units 4 and 5 by the same amount
 10 of time, incurring substantial additional capital and maintenance costs³⁸ for units
 11 that it had already determined were not needed for any reliability reason once the
 12 CSQ line is in place.³⁹ Referring to these two plans, Dr. Sim reported that "the
 13 delays were projected to increase CPVRR costs to FPL's customers by
 14 approximately \$12 million for a one-year delay, and by approximately \$38
 15 million for a two-year delay."⁴⁰ FPL did not examine a plan in which the Units 4
 16 and 5 retire in 2018 as planned, while DBEC or other capacity additions are
 17 delayed beyond 2022.⁴¹

18 My own review of FPL's analyses of Plans 4 and 5 shows that a different

³⁶ Deposition of Dr. Steven R. Sim on November 29, 2017, page 56 at lines 12-16.

³⁷ FPL provided spreadsheet calculations for its plans and sensitivity tests in response to Sierra Club Production Request No. 18.

³⁸ Direct Testimony of Dr. Steven R. Sim, page 27 at 1-2 ("[C]ontinued operation of the existing Lauderdale Units 4 & 5 is projected to incur significant costs both in the near-term and in later years.").

³⁹ Ibid., page 29 at lines 11-14 and Exhibit SRS-2.

⁴⁰ Ibid., page 37 at lines 8-11.

⁴¹ Deposition of Dr. Steven R. Sim on November 29, 2017, page 197 at lines 24-25 through page 198 at lines 1-5.

Most - AK

1 conclusion is warranted. ~~All~~ of the additional costs found in Plans 4 and 5,
 2 relative to Plan 2, stem from FPL's choice to delay the retirement of Units 4 and 5
 3 by one or two years, and not from any delay in DBEC's in-service date. In fact,
 4 by FPL's own calculations, delaying DBEC by one or two years while retiring
 5 Units 4 and 5 in 2018 (just like in Plan 2) would cost less than Plan 2. FPL's
 6 contention that delaying DBEC imposes additional costs is therefore
 7 unsubstantiated.

8 **Q. Why did FPL choose to delay the retirement of Units 4 and 5 in Plans 4 and**
 9 **5, if the continued operation of those units is not needed for reliability**
 10 **purposes?**

11 A. Dr. Sim merely notes that FPL designed Plans 4 and 5 "to maintain the
 12 same roughly 4-year period in which a major Southeastern Florida generation
 13 component would be missing as is assumed in Plan 2."⁴² However, Dr. Sim makes
 14 clear that with the CSQ line in place, Units 4 and 5 can be retired in 2018 without
 15 any projected imbalance or reserve margin issues arising until 2024 and 2025,
 16 respectively,⁴³ and thus the four-year window is not needed to address the
 17 reliability needs raised by FPL. Nonetheless, FPL's Plans 4 and 5 assume this
 18 four-year window would extend the operation of Units 4 and 5 until 2019 or 2020,
 19 independent of a reliability need. Moreover, there is no apparent reason why four
 20 years is any kind of "magic number," except that it is the amount of time that
 21 would occur under FPL's proposed plan.⁴⁴ It appears that FPL has arbitrarily and

⁴² Direct Testimony of Dr. Steven R. Sim, page 37 at lines 1-3.

⁴³ *Ibid.*, page 29 at lines 7-17.

⁴⁴ See Deposition of Dr. Steven R. Sim on November 29, 2017, page 178 at lines 6-12.

1 superficially tried to make its plans as similar as possible, but in so doing has
2 forgone the opportunity for more rigorous and meaningful analysis of what is
3 most cost effective for customers. In my experience, I have never seen a resource
4 planning exercise where alternative plans were constrained to have such an
5 arbitrary similarity to each other that is independent of any established reliability
6 constraint.

7 **Q. Please describe Plan 3.**

8 A. Plan 3 appears to have been an exercise to determine the cost of
9 replicating Plan 2 as closely as possible, but using large-scale solar,⁴⁵ small-scale
10 solar, and energy storage to replicate DBEC. This plan is unrealistic and illogical
11 for many reasons. First, there is no need to match two plans “megawatt for
12 megawatt” to have a meaningful economic comparison. As indicated below, FPL
13 itself implicitly admits this. Second, FPL should structure its plans to meet
14 exogenous goals, not to match FPL’s proposed DBEC plan. Third, Plan 3 would
15 fail to take advantage of the inherent flexibility of using smaller, incremental
16 resources to cost-effectively meet reliability requirements. Fourth, Plan 3
17 illogically schedules these resources in ways that would be both unrealistic and
18 unduly expensive, front-loading large quantities of the most expensive resources
19 as early as 2018.⁴⁶

⁴⁵ FPL refers to utility-scale solar projects as “universal” solar, and I adopt that convention here.

⁴⁶ For example, Exhibit SRS-3 of Direct Testimony of Dr. Steven R. Sim shows that under Plan 3, FPL would build 100 MW of storage in 2018 and an additional 200 MW in 2019. This is far beyond the Company’s current experience with storage, as described in Direct Testimony of Dr. Steven R. Sim, page 23: “FPL is currently evaluating battery performance with its work in its smaller scale storage testing (several MW) and under its larger 50 MW Storage Pilot Program.”

1 **Q. Did Dr. Sim explain the design of Plan 3?**

2 A. Dr. Sim describes Plan 3 as assuming that “a sufficient amount of PV and
3 batteries [are] added in the Southeastern Florida region by 2022 to approximate
4 the incremental 1,163 MW of firm capacity that is added in the region in Plan 2
5 by the new 2x1 CC unit.”

6 In response to Sierra Club Interrogatory No. 13, FPL explained that:

7 Plan 3 was designed to provide an equivalent amount of firm capacity from a
8 combination of solar and storage in the Southeastern Florida region with the same
9 timing, which would result in an equivalent level of system and regional reliability
10 with the two plans, notwithstanding any practical limitations of siting and operating
11 an unprecedented level of universal and distributed generation solar PV and energy
12 storage in this region.

13 In response to Commission Staff Interrogatory No. 19, FPL further noted
14 that:

15 Because DBEC Unit 7 will contribute 1,163 MW of firm capacity in Southeastern
16 Florida by mid-2022 in Plan 2, FPL selected an equivalent amount of firm capacity
17 from a combination of solar and storage sited in Southeastern Florida by mid-2022
18 for Plan 3. The objective was to have an “apples to apples” comparison in which Plan
19 3, at least in theory, would be identical to Plan 2 in regard to both system and
20 regional reliability.

21 **Q. Does this explanation make sense to you?**

22 A. No. Not only does this make no sense from a resource planning
23 perspective, it is inconsistent with FPL’s other analyses. Plans 1, 4, and 5 are not
24 “identical” to Plan 2 in regard to annual reserve margins or regional balance, and
25 FPL had no problem presenting an economic comparison between these plans and
26 Plan 2.⁴⁷ In my extensive experience participating in and reviewing resource
27 planning processes, I do not believe I have ever seen a plan devised to use solar

⁴⁷ See, e.g., Deposition of Dr. Steven R. Sim on November 29, 2017, page 119 at lines 7-13 (stating that FPL believes it conducted a meaningful economic comparison between Plans 1 and 2 in its 2017 analysis).

1 and storage to replicate the location, timing, and capacity characteristics of a gas
2 unit, and I can see no purpose that it serves, other than as an example of how a
3 poorly-conceived plan can be unduly costly for customers. As discussed above,
4 FPL's plans should be designed to meet identified reliability or other needs
5 exogenous to its preferred plan design, and not to replicate that plan.

6 **Q. How did FPL explain the sequence in which resources would be added under**
7 **Plan 3?**

8 A. In response to Sierra Club Interrogatory No. 4, FPL claimed that “[a]n
9 estimated maximum projected amount of universal PV that could be sited in
10 Southeastern Florida was selected first. This selection is based on the fact that
11 universal solar is the most cost-effective way to utilize solar energy on FPL's
12 system.” However, this is not how the resource plan is presented in Exhibit SRS-
13 3, nor is it the sequence represented in the model files supplied in response to
14 Sierra Club Production Request No. 18. These files make clear that, in fact, Plan 3
15 calls for the more costly small-scale solar resources (referred to by FPL as
16 distributed generation solar) constructed first, while the less costly universal solar
17 is installed no earlier than the last year of resource builds in 2022.⁴⁸ This
18 sequencing is illogical because it would impose unnecessary costs on FPL's
19 customers.

20 **Q. Do you have any other concerns about FPL's design of Plan 3?**

21 A. Yes. FPL chose not only to limit large-scale solar to a few sites identified

⁴⁸ See Florida Power & Light Company, *2017 FCSS 3- DBEC - Plan 3 - Solar+Batt - Worksheet “Gen”* (provided in response to Sierra Club Production Request No. 18) (showing that battery storage and DG solar are placed in service beginning in 2018, while universal solar is placed in service beginning in 2022).

1 by FPL, but also limited the size of each site to no more than 74.5 MW of solar.
2 In his deposition, Dr. Sim explained that FPL defines universal solar as solar PV
3 installations with capacity of either 74.5 MW or 60 MW.⁴⁹ Dr. Sim further stated
4 that FPL does not look to universal solar beyond 74.5 MW--the “sweet spot”--
5 because (i) “if you go to 75 megawatts or greater, you’re subject to the Florida bid
6 rule, and you would be required to put the project out for bid,” and (ii) 74.5 MW
7 “falls within this window . . . [in which] you’re gaining the economies of scale.”⁵⁰
8 The first reason proffered by Dr. Sim for FPL’s focus on 74.5 MW--Florida’s
9 bidding rule--is an inappropriate consideration in a resource planning process, and
10 suggests that FPL may not be seeking least-cost resources or sufficiently
11 protecting customer interests in either its self-build or its market-based resource
12 options. Dr. Sim acknowledged that it is possible that there are sites that can
13 accommodate more than 74.5 MW of universal solar, but that 74.5 MW “is the
14 maximum amount that our company is interested in pursuing for universal
15 solar.”⁵¹

16 The second reason proffered by Dr. Sim also confirms that FPL may not
17 be seeking least-cost resources. If 74.5 MW is within a window for economies of
18 scale, FPL should examine other parts of that window too, rather than focusing its
19 gaze on one point that may be financially profitable for the Company, but not
20 yield least-cost service to customers.

⁴⁹ Deposition of Dr. Steven R. Sim on November 29, 2017, page 64 at lines 4-11.

⁵⁰ Ibid., page 122 at lines 14-16 and page 179 at lines 14-25 through page 180 at lines 1-4.

⁵¹ Ibid., page 123 at lines 14-16.

1 **Q. Do you have any further concerns about FPL’s design of Plan 3?**

2 A. Yes. FPL also arbitrarily limited the incremental demand-side resources in
3 Plan 3 to the level set by the Commission in a prior docket.⁵² This is yet another
4 unreasonable and illogical constraint that is tailor-made to make FPL’s purported
5 “clean energy” alternative appear unduly costly, when in fact a well-designed
6 clean energy alternative could save customers money.

7 Likewise, FPL failed to assess alternate plans including solar without
8 storage, even though such a plan was among the four most economic plans in
9 FPL’s 2016 analysis.⁵³ FPL further affirmed that the only reason that the
10 Company added storage to Plan 3 was an attempt to mimic the characteristics of
11 DBEC⁵⁴ - and not to address any identified reliability need.

12 Given this unconventional, uneconomic, and illogical design, it is not
13 surprising that Plan 3 turned out to be the most expensive of the plans considered
14 by FPL.⁵⁵ Moreover, this plan was not designed based on FPL’s reliability
15 requirements, and does not serve any resource planning or evaluation of
16 alternatives purpose that I can see.

17 **Q. Is there a better way to examine the feasibility of clean energy resources to**
18 **meet FPL’s reliability needs?**

19 A. Yes. Instead of Plan 3, FPL should devise a plan that meets its reliability

⁵² Ibid., page 164 at lines 1-11.

⁵³ Deposition of Dr. Steven R. Sim on December 4, 2017, page 26 at lines 21-25 through page 27 at lines 1-5.

⁵⁴ Deposition of Dr. Steven R. Sim on November 29, 2017, page 100 at lines 11-24.

⁵⁵ Exhibit SRS-4 to Direct Testimony of Dr. Steven R. Sim shows FPL’s conclusion that Plan 3 would cost approximately \$1.29 billion more than Plan 2 on Cumulative Present Value of Revenue Requirements (CPVRR) basis between 2017 and 2061.

1 needs at the lowest possible cost, including clean-energy resources such solar,
 2 storage, and DSM, integrated into its existing portfolio. FPL should test these
 3 options using a resource planning model such as EGEAS. FPL itself recognizes
 4 the validity of this reasoning, even though it failed to adhere to it here. Dr. Sim,
 5 FPL's expert on resource planning, explains that FPL's integrated resource
 6 planning process "*first*, determine[s] our resource needs," then "[w]e look at
 7 available resource options that could meet those resource needs" ⁵⁶

8 **Q. In summary, what is the difference between your recommended strategy of**
 9 **using clean energy resources to delay or avoid DBEC, versus the plan**
 10 **analyzed by FPL which replaced DBEC with a combination of solar energy**
 11 **and storage?**

12 A. FPL's Plan 3, evaluated as part of its 2017 analyses, would use a
 13 combination of solar and storage, both installed beginning as early as 2018 (long
 14 before any reliability arises), to try to fully replicate the operations and impact of
 15 DBEC. Further, the Company made the plan appear even more costly by building
 16 the most expensive resources early, thereby both frontloading unduly high costs
 17 and foregoing the opportunity to take advantage of declining resource prices. Plan
 18 3 included no additional demand-side resources beyond the level currently
 19 required, and, as discussed earlier, was not designed to respond optimally to
 20 FPL's actual reliability needs.

21 The approach I am suggesting is to start with FPL's projected reliability
 22 needs, *i.e.*, a reserve shortfall and a regional imbalance projected to occur in 2024

⁵⁶ Deposition of Dr. Steven R. Sim on November 29, 2017, page 43 at lines 13-15 (emphasis added).

1 and 2025, respectively, and to find the least-cost combination of resources such as
 2 demand-response, small-scale solar, large-scale solar, and perhaps storage, to
 3 forestall those reliability shortfalls one or two years at a time. Because such
 4 resources are inherently constructed in smaller increments, there is no need or
 5 reason to construct the equivalent of 1,163 MW of firm capacity when the
 6 reliability need is far smaller. Where FPL's Plan 3 is high-cost, high-risk and
 7 inconsistent with good utility resource planning practice, the approach I
 8 recommend is low-cost and low-risk, and would allow the Company to get the
 9 maximum benefit of technology and cost improvements over time.

10 *3. Declining Cost of Solar and Storage Resources*

11 **Q. Earlier you discussed the low cost of solar and solar+storage PPAs, and**
 12 **stated that you expect the prices for solar and storage resources to continue**
 13 **to decline. What is your evidence in support of this expectation?**

14 A. Numerous observers in the energy industry, the financial industry, and
 15 government have noted the precipitous decline in costs for these resources, and
 16 the likelihood that they will continue to fall in the future. For example, a
 17 September 18, 2017 publication from Moody's Investor Service⁵⁷ stated the
 18 following:

19 **Renewable energy costs have fallen dramatically and will continue to do so.**

20 Economies of scale and improving efficiencies have caused steep falls in capital
 21 costs, and hence levelized cost of energy (LCOE), from solar and wind. And those
 22 declines are continuing, especially for solar, where panel prices have fallen over 20%
 23 since late 2016.

24 **Energy storage and offshore wind costs are declining faster than expected.** Most
 25 forecasts have historically underestimated the pace of declines in renewable energy
 26

⁵⁷ Moody's, *Global Renewables Focus* (Sep. 2017).

1 capital costs and appear to be doing so now for offshore wind and energy storage.
2 Both technologies have already reached prices predicted for 2020. They are just
3 beginning their global spread, and greater economies of scale will spur further price
4 reductions.

5 Further, the Lawrence Berkeley National Laboratory (LBNL) study
6 referenced above⁵⁸ quantified the rapid growth of solar installations throughout
7 the United States, including the dominance of this resource in many
8 interconnection queues, along with improving performance and falling prices. The
9 LBNL study reports that “[m]edian installed PV project prices within a sizable
10 sample have steadily fallen by two-thirds since the 2007-2009 period, to
11 \$2.2/WAC (or \$1.7/WDC) for projects completed in 2016. The lowest 20th
12 percentile of projects within our 2016 sample (of 88 PV projects totaling 5,497
13 MWAC) were priced at or below \$2.0/WAC, with the lowest-priced projects
14 around \$1.5/WAC.”⁵⁹

15 Figure 18 from the LBNL report, reproduced here as Figure 1, shows this
16 dramatic trend reflected in solar PPA prices over the last decade.
17

⁵⁸ Mark Bolinger et al., Lawrence Berkeley National Laboratory, *Utility-Scale Solar 2016: An Empirical Analysis of Project Cost, Performance, and Pricing Trends in the United States* (Sep. 2017), available at https://emp.lbl.gov/sites/default/files/utility-scale_solar_2016_report.pdf.

⁵⁹ *Ibid.* at ii.

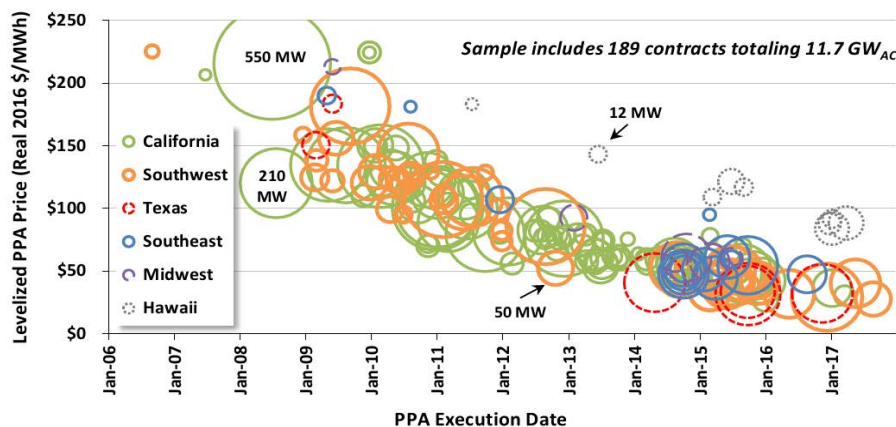


Figure 18. Levelized PPA Prices by Region, Contract Size, and PPA Execution Date: Full Sample

Figure 1. Declining solar PPA prices throughout the United States. Size of circles reflects size of PPA (MW)

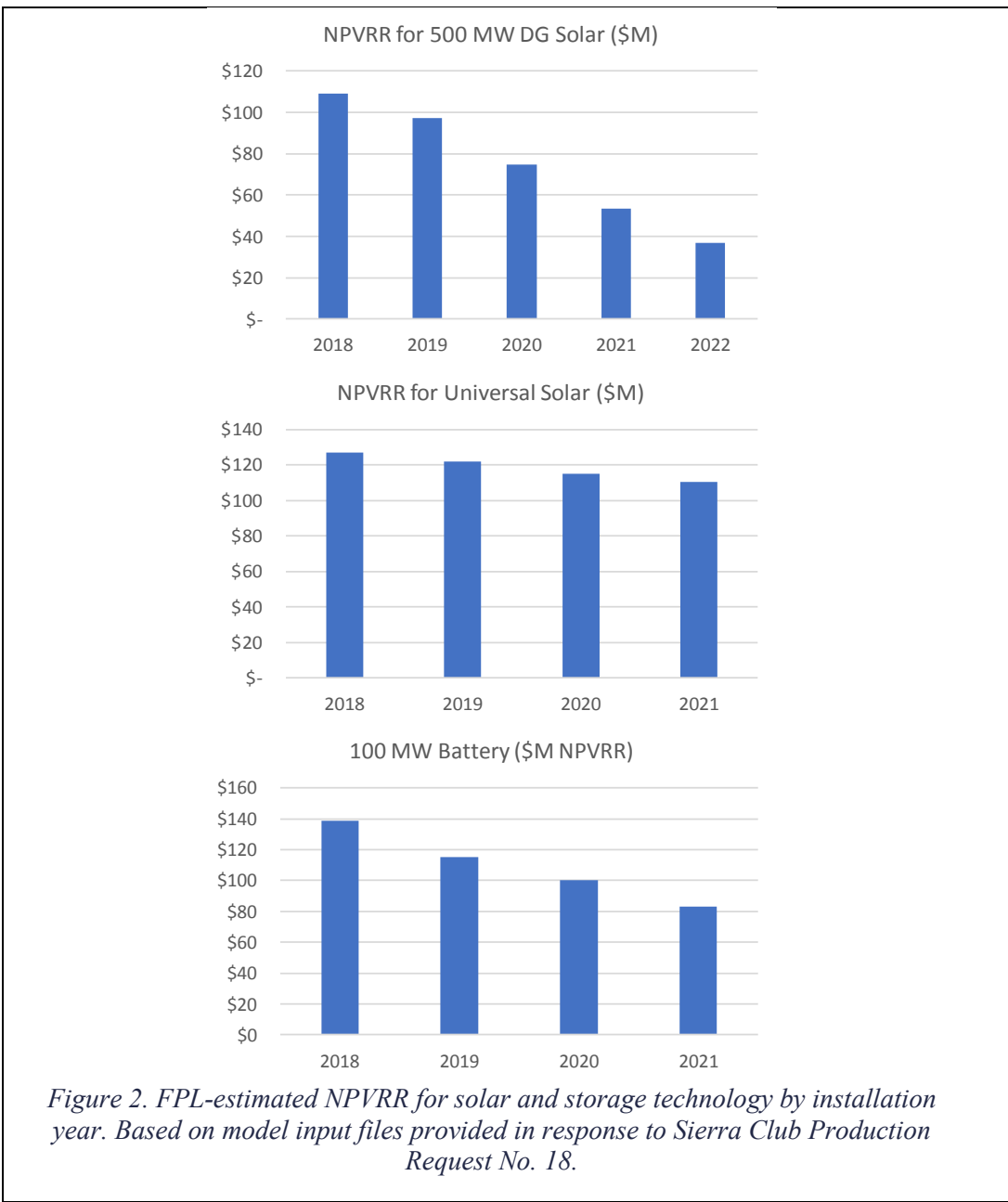
1 **Q. In addition to the industry expectations of decreasing costs for solar and**
 2 **storage resources described above, have you seen evidence that FPL itself**
 3 **anticipates lower costs for solar and storage resources in the future?**

4 A. Yes. The Company's scenario valuation files for its 2017 analyses,
 5 provided in response to Sierra Club Production Request No. 18, show the
 6 Company's expectations for declining capital costs for small-scale solar and
 7 storage resources. I have summarized these costs in Figure 2 below on a 2017
 8 NPVRR basis. (I have not provided the quantity of MW for the universal solar
 9 resource because it was not specified in the referenced file.) These expectations
 10 are corroborated by Dr. Sim, who explained that "we see costs for supply options
 11 and for other key aspects generally declining over time."⁶⁰ Indeed, according to
 12 Dr. Sim, "there will be plenty of opportunities in the future for emerging
 13 technologies as they prove themselves to be integrated into the resource plan."⁶¹

⁶⁰ Deposition of Dr. Steven R. Sim on November 29, 2017, page 54 at lines 15-17.

⁶¹ Ibid. at lines 18-21.

1 Yet by seeking to place DBEC in service before it is needed, FPL would subvert
 2 those opportunities.



3
 4

1 *4. There Is No Benefit To Building the Plant Before It Is Needed*

2 **Q. If there is no identified reliability need until 2024 or 2025, why is FPL proposing to**
 3 **bring the Dania Beach project on line in 2022?**

4 A. According to Dr. Sim, “The result of the 2017 analyses was that retiring
 5 existing Lauderdale Units 4 & 5 in late 2018, followed by a modernization of the
 6 site by June 1, 2022 with a 2x1 CC unit (DBEC Unit 7), was projected to be the
 7 most economic option for FPL’s customers.”⁶² As noted above, FPL further
 8 performed two model runs that Dr. Sim claims tested whether a one- or two-year
 9 delay in the project would benefit customers. Dr. Sim concluded that “a delay of
 10 the mid-2022 in-service date of DBEC Unit 7 is projected to be uneconomic for
 11 FPL’s customers.”⁶³

12 **Q. Did you analyze the cost impacts produced by these analyses?**

13 A. Yes. As described by Dr. Sim, in addition to delaying DBEC by either one
 14 or two years from FPL’s proposed mid-2022 operational date, “[i]n both
 15 scenarios, the retirement of Lauderdale Units 4 & 5 was also assumed to be
 16 delayed by either one year or two years, respectively, to maintain the same
 17 roughly 4-year period in which a major Southeastern Florida generation
 18 component would be missing as is assumed in Plan 2.”⁶⁴ FPL found that both of
 19 these plans were modestly more costly (\$12 million and \$38 million total,
 20 respectively, over a 44-year planning horizon) than Plan 2. However, FPL did not
 21 disaggregate these CPVRR differences into costs associated with delaying the
 22 retirements of Units 1 and 2, as compared to other costs or savings associated

⁶² Direct Testimony of Dr. Steven R. Sim, page 8 at lines 5-8.

⁶³ Ibid., page 37 at lines 11-12.

⁶⁴ Ibid., page 36 at lines 22-23 through page 37 at lines 1-3.

1 with the timing of DBEC, so its conclusion that these costs are due to delaying
2 DBEC is unfounded..

3 **Q. Are you able to disaggregate these costs, based on materials provided by the**
4 **Company?**

5 A. I can disaggregate the relative costs and savings of each plan sufficiently
6 to address this question based on FPL's response to Sierra Club's Production
7 Request No. 18. Specifically, FPL's response, consisting of numerous
8 spreadsheets, allows me to determine the share of certain "fixed" (non-
9 volumetric) costs that are associated with the Units 4 and 5 vs. DBEC under each
10 plan. I have summarized these costs in Table 1.

11 While I am not able to assign all cost differences to either the delay in
12 DBEC operations or the delayed retirement of Units 4 and 5 (note "non-Unit
13 Specific" costs in Table 1), this much is clear: according to FPL's own analysis,
14 the costly part of Plans 4 and 5 is that they delay the retirement of the Units 4 and
15 5. Delaying this retirement by one year will cost customers at least \$33 million on
16 a CPVRR basis, and delaying retirement by two years will cost at least \$74
17 million on a CPVRR basis. These numbers are twice as high or more compared to
18 the \$12 million and \$38 million FPL claims it will cost customers for its
19 composite plans including on a one- or two-year delay, respectively. This means
20 that delaying DBEC without also delaying Units 4 and 5 *reduces* the calculated
21 costs of these plans and, consequently, produces customer savings. Table 1 also
22 shows that, contrary to Dr. Sim's assertion, FPL's analysis finds that delaying
23 DBEC by one or two years would actually *save* customers \$33 million or \$63

1 million dollars, respectively.

2 *Table 1. Costs/(Savings) associated with Plans 4 (1-year delay) and 5 (2-year delay) Relative to*
3 *Plan 2.*

Unit	Cost Category	Plan 2	Plan 4	Plan 5	Cost of 1- Year Delay (Plan 4 vs. Plan 2)	Cost of 2- Year Delay (Plan 5 vs. Plan 2)
Delay Construction of Dania Beach Unit 7						
	Generation Capital	\$960	\$942	\$926	(\$18)	(\$34)
	Generation Fixed O&M	\$91	\$86	\$82	(\$5)	(\$9)
	Capital Replacement Charges	\$162	\$152	\$142	(\$10)	(\$20)
	Dania Beach Total	\$1,213	\$1,180	\$1,150	(\$33)	(\$63)
Delay Retirement of Lauderdale Units 4 and 5						
	Generation Capital	\$0	\$0	\$0	\$0	\$0
	Generation Fixed O&M	\$7	\$15	\$24	\$8	\$17
	Capital Replacement Charges	(\$25)	(\$8)	\$17	\$17	\$42
	Lauderdale Units NBV	(\$52)	(\$44)	(\$37)	\$8	\$15
	Lauderdale Units Total	(\$70)	(\$37)	\$4	\$33	\$74
Non-Unit Specific						
	Firm Gas Transport	\$944	\$944	\$944	\$0	\$0
	System Net Fuel	\$47,561	\$47,573	\$47,588	\$12	\$27
	Startup + VOM	\$652	\$651	\$652	(\$1)	\$0
	Emissions Costs	\$9,577	\$9,577	\$9,577	\$0	\$0
	Non-Unit Specific Costs Total	\$58,734	\$58,745	\$58,761	\$11	\$27

4
5 **Q. What are the implications of your finding that delaying DBEC actually saves**
6 **money for customers?**

7 A. This finding is important not only because it suggests that FPL can save
8 customers tens of millions of dollars by delaying DBEC. This result also strongly
9 suggests that the longer FPL can delay constructing the plant, the more customers
10 will save, suggesting that delaying the plant is consistent with least-cost resource
11 planning principles. To the extent that FPL can develop the resource options I
12 have discussed earlier in my testimony – demand-side resources, large- and small-
13 scale solar, and storage – to forestall the need for DBEC, the better customers will
14 be served. As I noted earlier, and as is reflected in FPL’s model files, the cost and

1 performance of solar generation and storage have been improving rapidly and are
2 expected to continue to improve for some time to come. It is certainly possible
3 that were FPL to start down the road of relying on low-cost clean energy
4 resources and DSM, it could indefinitely delay expenditure of customer resources
5 on an unneeded gas plant, and truly enhance its fuel diversity.

6 Finally, were rigorous planning and modeling eventually to demonstrate
7 that FPL needs a new gas unit, it is likely that the delay would allow FPL to
8 procure an even more efficient technology than DBEC. As Dr. Sim noted, “we
9 think that in the next few years we're going to see the very first combined cycle
10 with a heat rate below 6,000.”⁶⁵ Yet by seeking to place DBEC in service before it
11 is needed, FPL would disrupt that opportunity.

12 *5. Illustrative Alternative Plan*

13 **Q. Have you created an alternative plan to FPL’s Plan 3 that demonstrates a**
14 **lower-cost way to use clean energy resources to meet FPL’s reliability needs?**

15 A. Yes. However, let me say at the outset that this is intended only as an
16 illustrative example, and I do not claim to have thoroughly analyzed all of the
17 reliability and feasibility aspects of this plan. My point is to illustrate that FPL can
18 maintain its 20% reserve margin by deploying clean energy resources when they
19 are needed to meet reliability requirements, and not in a way that imposes
20 spurious costs by attempting to mimic a resource with very different practical,
21 operational, and financial characteristics such as a gas-fired CC.

22 The illustrative plan I have prepared is presented and compared to FPL’s

⁶⁵ Deposition of Dr. Steven R. Sim on November 29, 2017, page 56 at lines 13-15.

1 Plan 3 in Table 2. As may be seen in the table, my alternative plan relies on a
2 smaller amount of solar and storage resources, implemented years later than under
3 FPL's Plan 3. I have also included a modest amount of demand response (DR) in
4 2025, although as suggested above, I believe that if FPL were to issue an RFP for
5 demand response resources it would find a much greater volume available at a
6 reasonable cost. To calculate reserve margins, I have made the same assumptions
7 FPL made regarding the capacity value of solar - 54% for the first 265 MW, and
8 35% thereafter – although I do not endorse what seems to me to be a very
9 conservative assumption in this area.⁶⁶ Unlike FPL's plan, the alternative plan
10 does not maintain up to 1,550 MW of unneeded and costly capacity above and
11 beyond FPL's already conservative 20% reserve margin.

12

⁶⁶ After 5 p.m. on December 7, 2017, the day before this testimony was due to be filed, FPL provided as a late supplemental response to Sierra Club Production Request No. 18 a workbook purporting to support its declining capacity credit assumptions. As noted in the text, I have applied these assumptions but I do not endorse them.

Table 2. FPL's Plan 3 Compared to Illustrative Alternative Plan.

	Plan 3				Alternative Plan				
Year	DG Solar	Universal Solar	Storage	MW Above 20% Reserve Margin	DG Solar	Universal Solar	Storage	DR	MW Above 20% Reserve Margin
2018	150		100	494				0	313
2019	150		200	524				0	69
2020	125		200	998				0	299
2021	100		200	1,311				50	427
2022	75	433	55	1,546				0	429
2023				1,399				50	332
2024				1,113		149		0	127
2025				707	300	284	150	50	147
2026				263	300		150	50	8

1 **Q. Can you analyze what this illustrative plan would cost, relative to FPL's**
2 **Plans 2 and 3?**

3 A. I cannot. I do not have access to FPL's UPLAN model to calculate
4 operational costs, nor do I know what resource costs might be available to FPL
5 for either self-build or PPA offers for these resources in the indicated years. I do
6 know that the capital costs would be many hundreds of millions of dollars less
7 than under FPL's Plan 3 in an NPVRR basis, and could be cost competitive with
8 Plan 2. It is also certainly possible that, should FPL issue a market solicitation for
9 additional DR, they would yield even more of this low-cost resource than I have
10 included in the plan shown in Table 2. I provide this example to illustrate that
11 FPL's Plan 3 was not designed to yield the lowest cost scenario for relying on
12 clean energy resources, and cannot be used to disqualify the cost effectiveness of
13 a clean energy plan without substantial additional analysis.

14 **Q. What factors could make a plan like the one you have proposed less costly**
15 **than FPL's Plan 2?**

16 A. A number of factors would strongly affect the costs of an alternative, clean
17 energy plan that FPL should evaluate to determine the ultimate costs of this
18 alternative. None of these factors appear to have been evaluated in developing
19 FPL's clean energy alternative, Plan 3, but rigorous consideration of these factors
20 could yield an alternative that costs less than, or is at least competitive with,
21 DBEC. Unfortunately, because I do not have access to the models and
22 information held by FPL, I am unable to quantify these factors for the
23 Commission. These factors include:

- 1 ● Using the minimum amount of new storage required each year to ensure both
2 adequate reserve margins and regional balance under such a plan. Storage
3 should be used incrementally, and FPL should take as much advantage as
4 possible of ongoing rapid improvements in cost and performance. FPL should
5 not, as it did in Plan 3 of its 2017 analysis, add storage to mimic resources
6 from another plan being evaluated.⁶⁷
- 7 ● Using the maximum amount of universal solar, as opposed to DG solar, that
8 FPL could include in its plan. This inquiry should be informed by RFPs to
9 allow third-party providers to propose universal solar options that the
10 Company has not considered. It should not involve consideration of size limits
11 in Florida's bidding rules.⁶⁸
- 12 ● Using other approaches to meet its regional balance needs, beyond siting
13 additional generation and storage in Southeast Florida. I have already
14 discussed the value of DSM in this regard, including DR that could be
15 procured from third-party aggregators through an RFP process. FPL should
16 also consider operational and transmission upgrade options that could increase
17 its import capability into the region.

18 **VI. Need for Fuel Diversity and other Concerns**

19 *1. The Project Exacerbates FPL's Reliance on Gas*

20 **Q. What fuel diversity need does FPL propose to address in its Petition?**

21 A. FPL argues that the proposed DBEC will enhance the Company's fuel
22 diversity because of the unit's "high level of fuel efficiency."⁶⁹

23 **Q. Do you find that DBEC will enhance FPL's fuel diversity?**

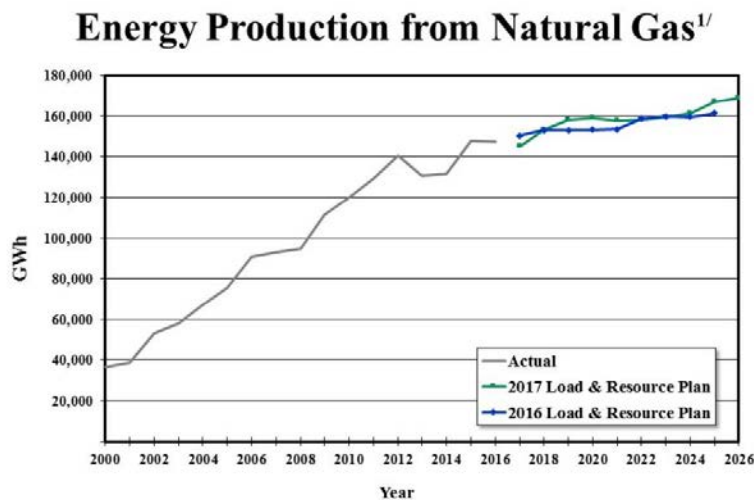
24 A. I do not agree that DBEC is an effective way to enhance FPL's fuel
25 diversity and supply reliability relative to alternative solutions available to the
26 company. In fact, DBEC would extend FPL's reliance on gas into the indefinite

⁶⁷ See Deposition of Dr. Steven R. Sim on November 29, 2017, page 100 at lines 11-24.

⁶⁸ See *ibid.*, page 122 at lines 14-16 and page 179 at lines 14-25 through page 180 at lines 1-4.

⁶⁹ Direct Testimony of Dr. Steven R. Sim, page 12 at 6.

1 future. As seen in Figure 3, use of gas in Florida has increased by approximately a
 2 factor of four since 2000, and it is currently projected to increase through the next
 3 decade; this single fuel “remains the dominant fuel over the planning horizon,
 4 with usage in 2016 at approximately 63 percent of the state’s net energy for load
 5 (NEL).”⁷⁰ For FPL, the situation is even more extreme: gas currently accounts for
 6 71% of its generation, a figure that the proposed project would aggravate and
 7 perpetuate into the future.⁷¹



8

9

Figure 3. From Florida PSC review of utility 2017 TYSPs, page 3.

10

The DBEC project would be larger than the existing Lauderdale units, run
 11 many more hours per year, and produce more Megawatt Hours (MWh) from
 12 gas.⁷² Further extending the Company’s reliance on a single, CO₂-intensive fuel
 13 with high levels of historic volatility does not effectively advance the cost-

⁷⁰ Florida Public Service Commission, *Review of the 2017 Ten-Year Site Plans of Florida’s Electric Utilities* 3 (Nov. 2017), available at <http://www.psc.state.fl.us/Files/PDF/Utilities/Electricgas/TenYearSitePlans/2017/Review.pdf>.

⁷¹ *Ibid.* at 51.

⁷² See Deposition of Dr. Steven R. Sim on November 29, 2017, page 140 at lines 19-24.

1 hedging benefits of reducing the Company's exposure to fuel availability and
2 cost. Conversely, any plan that relied more heavily on fuel-free resources such as
3 solar generation and DSM would far more effectively reduce FPL's exposure to
4 the higher fuel and emissions costs associated with gas.

5 *2. Alternatives Can Help Reduce FPL's Reliance on Gas and Promote FPL's*
6 *Fuel Diversity*

7 **Q. Have you seen evidence that FPL recognizes zero-fuel cost resources as an**
8 **effective way to promote fuel diversity?**

9 A. Yes. In his direct testimony, Dr. Sim describes how FPL is "pursuing cost-
10 effective solar energy as a means to enhance fuel diversity on its system."⁷³ This
11 is a far more reasonable and effective way to reduce FPL's exposure to future fuel
12 and emissions costs than extending its reliance on natural gas.

13 **VII. Conclusion**

14 **Q. What are your conclusions regarding the need for DBEC for system**
15 **reliability purposes?**

16 A. DBEC is not needed for system reliability purposes in 2022, when the
17 Company proposes to bring it on line; nor has the company demonstrated that the
18 project meets any reliability need that could not be equally well met, at lower
19 cost, with alternative, incremental clean energy resources.

20 **Q. What are your conclusions regarding whether DBEC is the most cost-**
21 **effective alternative available?**

22 A. Building DBEC in 2022 is clearly not the most cost-effective alternative,
23 as the Company's own analysis establishes that delaying DBEC by one or two

⁷³ Direct Testimony of Dr. Steven R. Sim, page 12 at lines 12-13.

1 years (while retiring Units 4 and 5 in 2018) would cost less than bringing DBEC
2 on line in 2022. Further, customer interests would be better served if the FPL
3 delayed the project not only for the one or two years that FPL's analysis shows
4 would save customers money, but for as long as possible, and perhaps
5 indefinitely, through the strategic, incremental use of clean energy resources. FPL
6 has not followed rigorous analytical techniques or good utility practice in its
7 development and analysis of alternatives, so the Commission cannot reasonably
8 conclude that FPL's proposal is the most cost-effective option.

9 **Q. What are your conclusions regarding whether DBEC comports with the need**
10 **for fuel diversity?**

11 A. Extending FPL's, and Florida's, already disproportionate reliance on
12 natural gas is not an effective or reasonable way to promote fuel diversity and
13 supply reliability. These goals could be much more effectively advanced through
14 reliance on technology that is not reliant on imported fuel and that is immune to
15 any future emission-related costs.

16 **Q. What are your conclusions regarding utilizing renewable and conservation**
17 **measures to the extent reasonably available under the Company's proposal?**

18 A. I have demonstrated that FPL's purported analysis of renewable and
19 conservation measures was fatally flawed because it was limited to a single
20 alternative plan that was illogical, hobbled by artificial constraints, and almost
21 tailor-made to appear unduly costly for FPL's customers. I have also
22 demonstrated how low-cost renewables could be used to further delay, or perhaps
23 eliminate, the need for DBEC. Based on this analysis, I conclude that FPL has

1 made no serious effort to use renewables and conservation measures to the extent
2 reasonably available as part of its plan.

3 **Q. What are your recommendations for the Commission in this matter?**

4 A. I recommend that the Commission deny FPL's request for an affirmative
5 determination of need in this matter.

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

7 A. Yes.

1 BY MS. KAPLAN:

2 Q Okay. Dr. Hausman, have you prepared a
3 summary of your testimony?

4 A Yes.

5 Q Please provide that summary.

6 A Chairman Graham, members of the Commission,
7 good afternoon.

8 In my testimony, I review whether FPL has
9 shown that there's a system-reliability need for the
10 project as proposed; whether it is the most cost-
11 effective alternative, whether FPL has meaningfully
12 evaluated renewable and demand-side options, and whether
13 the project promotes fuel diversity.

14 I show that the company has failed to meet its
15 burden of proof under each of these requirements. The
16 project is not needed for reliability purposes at least
17 until 2024, as shown by Dr. Sim's testimony and
18 exhibits. This is so, even given FPL's very-
19 conservative reserve criteria -- reliability criteria,
20 which exceeds the requirements of the Regional
21 Reliability Council, the FRCC.

22 FPL's reserve margins provide more-than-
23 sufficient protections from supply shortfalls in FPL's
24 service territory and in southeast Florida. There is no
25 reason to subject customers to excessive costs for

1 additional capacity beyond these ample margins.

2 Bringing DBEC online in 2022 cannot be the
3 most cost-effective alternative because there is no
4 identified reliability need at that time. The company's
5 own analysis makes clear that it is less-costly to delay
6 the project until it is needed for reliability purposes,
7 absent its artificial, what I called magical four-year
8 window constraint between retirement of the Lauderdale
9 units and DBEC.

10 This constraint has no basis in known or
11 established reliability criteria. No one asked for
12 rigorous analysis to establish this constraint, despite
13 the substantial additional cost it represents to
14 consumers.

15 In fact, FPL has confirmed that delaying the
16 project is less-costly, in response to Staff
17 Interrogatory 58. Delaying the project would also allow
18 FPL to take advantage of expected improvements in
19 resource performance and cost.

20 FPL's sole consideration of renewable
21 alternatives was fundamentally flawed. This analysis,
22 known as Plan 3, was burdened by artificial
23 constraints -- artificial constraints, sorry -- that
24 have -- also have no basis in known or meaningful
25 reliability criteria.

1 Specifically, FPL devised a plan under which
2 renewable and storage resources would be built, not to
3 optimally meet reliability needs, but to mimic the
4 properties of the company's preferred gas plant,
5 providing more capacity than would be needed for at
6 least five years after the resources were in place.

7 Plan 3 was also made artificially costly by
8 restricting the size of universal solar to avoid certain
9 competitive bidding rules and by front-loading the most-
10 expensive components year before -- years before they
11 would be needed, and by FPL's failure to include any
12 demand-side elements. FPL has not market-tested whether
13 third parties could provide these resources at lower
14 cost than the company assumed.

15 FPL's consideration of alternatives was also
16 inadequate because the company failed to consider a wide
17 range of other resource options, such as, FPL did not
18 consider citing solar resources in southeast Florida
19 later than 2022, nor did it consider citing these
20 resources outside Florida -- outside southeast Florida,
21 and using incremental renewable, storage, transmission,
22 or other resources to meet incremental southeast Florida
23 requirements.

24 FPL did not consider using demand-side
25 management, including energy-efficiency and demand

1 response. FPL's plan does not promote fuel diversity.
2 To the contrary, this plan perpetuates for decades the
3 company's already-heavy reliance on gas for electricity
4 generation, further exposing ratepayers to the long-term
5 risks and costs of this fuel, including the risks and
6 costs of greenhouse gas emissions that so endanger
7 Florida and the rest of the planet.

8 For all these reasons, I find that the company
9 has not met its burden of proof, and the Commission
10 cannot reasonably grant its requested determination of
11 need.

12 I thank you for your attention.

13 CHAIRMAN GRAHAM: Do you tender this witness?

14 MS. KAPLAN: Yes.

15 CHAIRMAN GRAHAM: OPC, do you have any
16 questions of this witness?

17 MS. CHRISTENSEN: No, we do not.

18 CHAIRMAN GRAHAM: Florida Power & Light?

19 MR. MARCIL: Thank you, Mr. Chairman. Michael
20 Marcil for Gunster, on behalf of Florida Power &
21 Light.

22 I do have two exhibits for these -- for this
23 witness.

24 CHAIRMAN GRAHAM: Sure. Staff will pass it
25 out for you.

1 MR. MARCIL: Out of the two exhibits,
2 Mr. Chairman, the one in the red folders has been
3 designated confidential by the Sierra Club.

4 CHAIRMAN GRAHAM: Okay. And which of the two
5 would you like to label 66 and which would you like
6 to label 67?

7 MR. MARCIL: The confidential exhibit will be
8 66, Mr. Chairman, and then the second exhibit will
9 be No. 68.

10 THE WITNESS: Thank you.

11 CHAIRMAN GRAHAM: Will be 67.

12 MR. MARCIL: 67, right.

13 THE WITNESS: Thank you.

14 CHAIRMAN GRAHAM: And the description, I take
15 it, is not confidential?

16 MR. MARCIL: Correct.

17 CHAIRMAN GRAHAM: Okay. So, we'll call it the
18 Sierra Club task order for 66 and for 67, Sierra
19 Club website?

20 MR. MARCIL: Yes, Mr. Chairman.

21 (Whereupon, Exhibit Nos. 66 and 67 were marked
22 for identification.)

23 CHAIRMAN GRAHAM: Okay. Dr. Hausman, do you
24 have copies of both?

25 THE WITNESS: Yes, I do.

1 CHAIRMAN GRAHAM: Okay. Your witness.

2 MR. MARCIL: Thank you, Mr. Chairman.

3 EXAMINATION

4 BY MR. MARCIL:

5 Q Good to see you, Dr. Hausman.

6 A Nice to see you.

7 Q It looks like you brought some of your cold
8 weather down from Boston since we last saw each other.

9 A I apologize.

10 (Laughter.)

11 Q All right. We're going to look first at
12 Exhibit 66. Do you have that before you?

13 [REDACTED]

14 [REDACTED]

15 [REDACTED]

16 [REDACTED]

17 [REDACTED]

18 [REDACTED]

19 [REDACTED]

20 [REDACTED]

21 [REDACTED]

22 [REDACTED]

23 [REDACTED]

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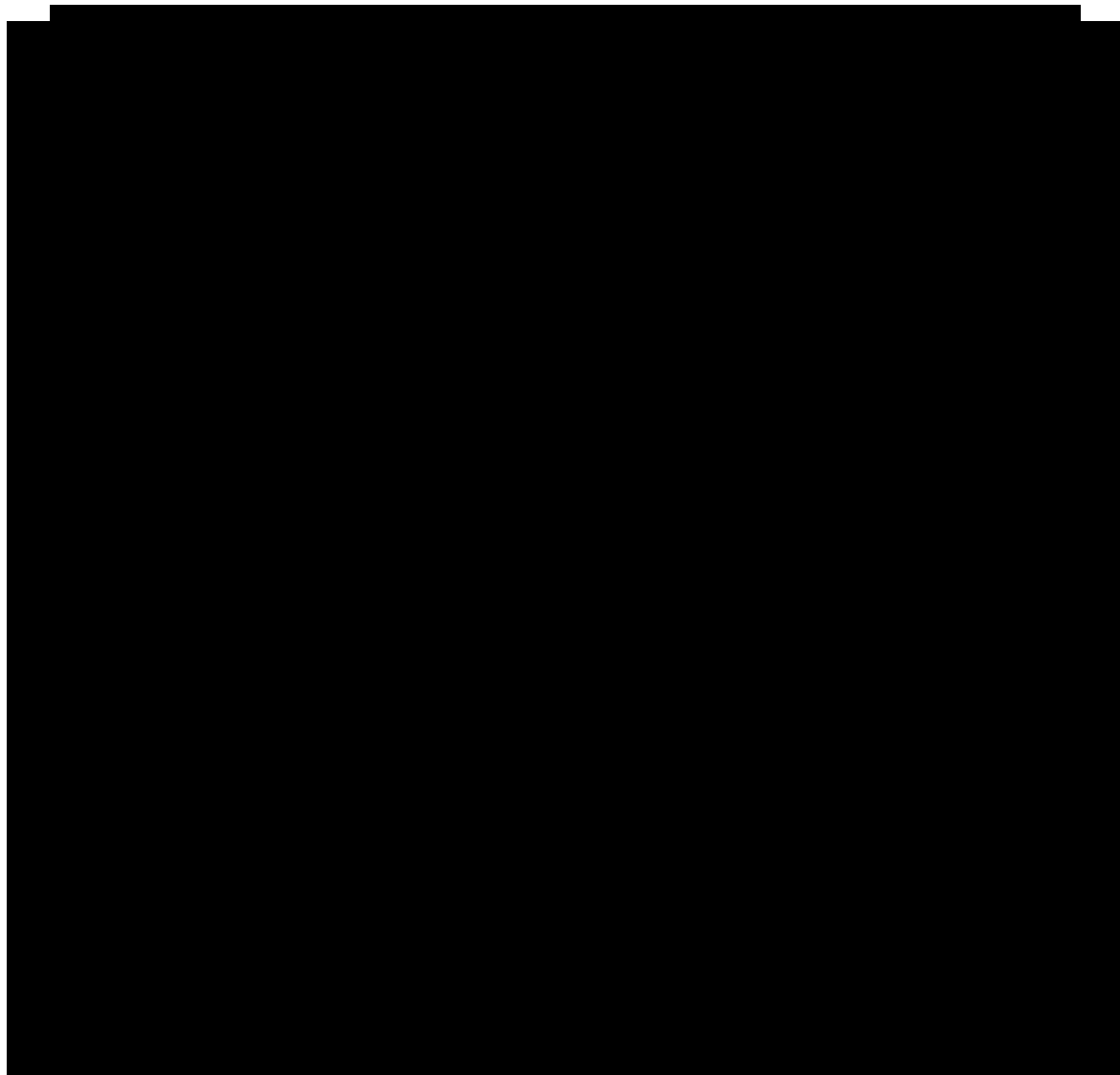
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MS. CSANK: Mr. Chairman, if I may, Sierra Club also moves to strike the prior questions that FPL counsel asked regarding this confidential exhibit, including the question where he was reading from the confidential information.

CHAIRMAN GRAHAM: I have no problem with striking all the comments of Exhibit 66 as far.

If you would, just please start over again --

MR. MARCIL: That would be fine.

1 CHAIRMAN GRAHAM: -- and we'll go from there.

2 BY MR. MARCIL:

3 Q Dr. Hausman, good to see you again.

4 A Good to be back.

5 (Laughter.)

6 Q Yeah, didn't mean to cause a tempest in a
7 teapot there, but --

8 CHAIRMAN GRAHAM: All right. I'm sorry.
9 Hold on a second.

10 Court reporter, did you get that -- where
11 we're going to strike from?

12 THE COURT REPORTER: (Nodding head
13 affirmatively.)

14 CHAIRMAN GRAHAM: Okay. Thanks.
15 I apologize.

16 BY MR. MARCIL:

17 Q What I'm asking is, essentially, what were you
18 hired to do, sir?

19 A I was hired to review the materials in this
20 case, to provide my expert opinion, based on those
21 materials, which includes assisting with the
22 promulgation of discovery, reviewing discovery
23 responses, preparing expert testimony, responding to
24 discovery requests on my testimony.

25 There were a -- there was an updated -- maybe

1 it was even in my -- anyway, I was also asked to listen
2 to depositions, review deposition transcripts --
3 basically, review all of the materials in this case and
4 provide testimony, based on my analysis of those
5 materials.

6 **Q And you do understand you were hired to**
7 **support the Sierra Club's position.**

8 A Oh, yes -- well, I understand that I'm hired
9 to do all the things I said I would do; that I review
10 all the materials and provide my independent testimony
11 in this case, yes. But that's my job in all of my -- in
12 all of my professional engagements.

13 **Q So -- so, here, it was to support the Sierra**
14 **Club's position.**

15 **CHAIRMAN GRAHAM: Asked and answered.**

16 A As -- as you pointed out --

17 **CHAIRMAN GRAHAM: Sir, you've already answered**
18 **the question.**

19 BY MR. MARCIL:

20 **Q Did you know what the Sierra Club's position**
21 **was in this case?**

22 A This --

23 **MS. CSANK: Objection. Ambiguous.**

24 **MR. MARCIL: I -- I don't think that's**
25 **ambiguous.**

1 CHAIRMAN GRAHAM: I don't think it is either.

2 MS. CSANK: He has -- terms Sierra Club's
3 position -- there are numerous issues that this
4 Commission has established for this proceeding, and
5 he hasn't specified which of Sierra Club's
6 positions on those issues he's asking about.

7 CHAIRMAN GRAHAM: Well, he said, do you know
8 what Sierra Club's position is in this case. So,
9 he can answer what positions he knows.

10 MS. CSANK: The question also didn't specify a
11 time frame, and the order establishing procedure
12 designated the time by which Sierra Club had to
13 identify its position in this proceeding.

14 CHAIRMAN GRAHAM: Mary Anne?

15 MS. HELTON: I think it's a fair question to
16 ask him, to the extent that he knows, and if he --
17 if he understands the question and he has an
18 answer, I think it -- that is a question that could
19 be answered.

20 CHAIRMAN GRAHAM: Thank you.

21 Doctor?

22 THE WITNESS: It is -- it is a complicated
23 question. I mean, I was contacted by Sierra Club;
24 asked to review materials; provided my initial
25 assessment of the materials and of shortcomings in

1 the case presented by Florida Power & Light; and
2 identified the issues that I felt I would be able
3 to offer expert testimony with regard to that
4 filing.

5 Sierra Club, apparently, felt that that would
6 be appropriate for their case and hired me on the
7 basis of my -- my own independent analysis.

8 BY MR. MARCIL:

9 Q You understood that the Sierra Club was
10 opposing a determination of need in this case, correct?

11 A It doesn't surprise me to hear that, no.

12 Q Is this the first time you're hearing that?

13 A That Sierra Club is opposing the determ- --
14 Sierra Club is a large and multi-faceted organization.
15 I work with the legal counsel. And le- -- legal counsel
16 generally takes more of a, you know, specifically-legal
17 position on issues.

18 I know that Sierra Club's position has been
19 informed by my analysis and my testimony in this case.
20 So, they have taken the position, as you heard in
21 Ms. Kaplan's opening statement, that reflects what I
22 found in my testimony. So, I believe that they are
23 consistent.

24 Does that answer your question?

25 Q No, sir, my question was: Was today the first

1 **time you've heard that the Sierra Club was opposing a**
2 **determination of need?**

3 A No, I'm -- I am aware -- I was previously
4 aware that -- that, certainly, parts of the Sierra Club
5 are opposing the determination of need, yes.

6 Q **And you were aware of that when you were**
7 **hired.**

8 A Again --

9 MS. CSANK: Mr. Chairman, I'm going to launch
10 an objection as to relevance.

11 CHAIRMAN GRAHAM: Overruled. I'll let him
12 answer the question.

13 THE WITNESS: It -- it doesn't surprise me. I
14 don't believe that Ms. Kaplan said to me, we're
15 opposing the determination of need. Ms. Kaplan
16 specifically said to me, would you please review
17 this filing and identify if there are any
18 shortcomings or issues that you feel should be
19 addressed.

20 Now, why Sierra Club did that -- you know, I'm
21 a smart-enough guy to know that, you know, Sierra
22 Club probably wouldn't have hired me or wouldn't
23 have bothered participating if I felt like, yeah, I
24 find no shortcomings -- because why would they do
25 that?

1 But I identified specific issues and I said I
2 would provide an expert opinion on those because I
3 identified those shortcomings. And they hired me
4 on that basis.

5 BY MR. MARCIL:

6 **Q You've testified for the Sierra Club previous**
7 **to this docket, correct?**

8 A Yes.

9 **Q And during your deposition, I think we**
10 **identified that 13 of your 26 total engagements since**
11 **August 2008 have been on behalf of the Sierra Club,**
12 **correct?**

13 MS. CSANK: Objection. Relevance grounds.

14 CHAIRMAN GRAHAM: I'll allow the question.

15 THE WITNESS: Do you mean 26 professional
16 engagements in total?

17 BY MR. MARCIL:

18 **Q Correct.**

19 A I don't agree with that, no.

20 **Q Well, listed on your CV, I believe we had**
21 **counted that you had done 26 items on your expert-**
22 **services portion of your CV, from Pages 5 to 8. You**
23 **remember us counting that? We took about a half an hour**
24 **to do that?**

25 A Yes, but I also recall, Mr. Marcil, that I

1 explained to you at that time that I don't list
2 everything individually on my CV. For example, it lists
3 expert services for the New Jersey Consumer Advocate,
4 whom I've worked for, for many years, and I have not
5 actually listed every individual case that I've worked
6 on for them.

7 So, perhaps, I've been inconsistent in how I
8 put together my CV, but I don't really agree with
9 your -- with the way you're representing that.

10 Q Well, let's look at your CV, then, if you can
11 take it out, and we'll break this down a little bit.

12 If you look on Pages 5 through 8 of your CV,
13 which is EF- -- or EH-1 -- or EDH-1.

14 A Yes, sir.

15 Q You list your expert testimony in services,
16 correct?

17 A Yes.

18 Q And you're the one who drafted this CV,
19 correct?

20 A Yes.

21 Q And during your deposition, we identified 26
22 of these items that you wrote on your CV from August
23 2008 forward, correct?

24 A Again, I agree that there are -- well, I
25 accept that there are 26 bolded headlines; however, as

1 I've explained to you, those don't each necessarily
2 reflect a single engagement.

3 **Q I'm only going by what you wrote here.**
4 **There's 26 that you wrote down in bolded headlines --**

5 A And I'm trying to give you context for what I
6 wrote there. I -- I don't know what the disagreement
7 is. I'm just explaining that, yes, that's what's
8 written there, but you should understand what they
9 represent.

10 **Q And out of those 26, 13 of those were for the**
11 **Sierra Club, correct?**

12 A Out of the 26 items that I wrote on my resume,
13 yes, I think we counted 13 for Sierra Club.

14 **Q And we also counted, since August 2008, that**
15 **you had drafted eight white papers that you list on your**
16 **CV for the Sierra Club.**

17 A Again, I take your word for it. I didn't
18 memorize the numbers.

19 **Q And so, that would be 21 different work**
20 **products, as you called them, in your deposition, that**
21 **you've done for the Sierra Club since August 2008,**
22 **correct?**

23 A That's -- doesn't surprise me.

24 **Q And you've been paid well over a hundred-**
25 **thousand-dollars for all your work for the Sierra Club**

1 **over those ten years.**

2 MS. CSANK: Objection --

3 A Since --

4 MS. CSANK: -- as to relevance.

5 MR. MARCIL: Bias.

6 CHAIRMAN GRAHAM: I'll allow it.

7 THE WITNESS: Since 2008?

8 BY MR. MARCIL:

9 **Q Yes.**

10 A I hope so.

11 MR. LENOFF: Can I object to the -- to the
12 question about the 2008? The Supreme Court's
13 dec- -- the Florida Supreme Court's decision in
14 Elkins v. Syken allows for probing this kind of
15 information up to a reasonable time, which is
16 normally three years.

17 2008 is much longer than three years ago.

18 MR. MARCIL: I -- there's no bright-line rule
19 on three years.

20 CHAIRMAN GRAHAM: Hold on.

21 MR. MARCIL: Ten years is reasonable.

22 CHAIRMAN GRAHAM: Mary Anne?

23 MS. HELTON: I don't know the answer to that
24 question. I don't know if there is a bright-line
25 rule or not.

1 Let me ask Ms. Cibula.

2 I'm happy to look at a -- the case that
3 counsel for Sierra Club has mentioned, if you want
4 me to, but I'm not familiar with that case,
5 Mr. Chairman.

6 CHAIRMAN GRAHAM: Do you have the case?

7 MR. LENOFF: I do have the -- the citation.
8 It is 672 So.2d, 517. If you give me -- if you
9 give me a moment, I can give you the pin site in
10 that case.

11 It is at pin cite -- Page -- it is at --

12 MS. HELTON: If you'll -- hold on one -- okay.
13 The pin cite is what?

14 MR. LENOFF: 521.

15 And if I may, these criteria have been adopted
16 by the Florida Supreme Court into the official
17 rules. I -- I can pull that cite for you as well.

18 MR. MURPHY: Chairman, is there an issue that
19 he's done a lot of work for them and that they've
20 paid him? I mean, could this be stipulated?

21 BY MR. MARCIL:

22 **Q I would think even the last three years, I**
23 **believe, you've done a hundred-thousand-dollars worth of**
24 **work for them, haven't you?**

25 A I don't know the exact number, but that --

1 I -- I've done a number of engagements.

2 MR. MARCIL: That -- that should solve it.

3 Okay. So, may I proceed?

4 CHAIRMAN GRAHAM: Hold on a second.

5 MS. HELTON: I'm spinning.

6 (Laughter.)

7 CHAIRMAN GRAHAM: Go ahead and proceed.

8 MR. MARCIL: Okay. Thank you.

9 BY MR. MARCIL:

10 Q Okay. So, in that same time period, August
11 2008 to the present, you've never been hired to testify
12 on behalf of any electric utility, correct?

13 MS. CSANK: I'll, again, launch an objection
14 as to the relevance --

15 CHAIRMAN GRAHAM: I'll allow it.

16 MS. CSANK: -- of this question.

17 THE WITNESS: That's correct.

18 BY MR. MARCIL:

19 Q Okay. So, in this case, you understand that
20 you're here in a matter involving a petition for
21 determination of need for a natural-gas-fired power
22 plant, correct?

23 A Yes.

24 Q And there's nothing, at least, listed on your
25 CV that involved any testimony that you've provided in

1 any proceeding involving a certificate of a public
2 convenience and necessity for a gas-fired power plant,
3 correct?

4 A I believe that's correct.

5 Q And you've never testified in support of the
6 purchase by a utility of a gas-fired power plant?

7 A I believe that is correct.

8 Q You've never testified before the Florida
9 Public Service Commission before today.

10 A That's correct.

11 Q You've never testified in any matters dealing
12 with a regulated Florida electric utility, right?

13 MS. KAPLAN: Asked and answered.

14 CHAIRMAN GRAHAM: No, the first question was:
15 Have you been before the Florida Public Service
16 Commission. The other one was: Have you ever been
17 against -- have you ever testified for any
18 regulated utility. It doesn't nec- --

19 MS. KAPLAN: I thought it was in Florida,
20 so --

21 CHAIRMAN GRAHAM: In Florida. It doesn't mean
22 in front of us. It could have been in front of
23 some other local case.

24 MS. KAPLAN: -- okay.

25 CHAIRMAN GRAHAM: Some other local court.

1 MS. KAPLAN: Okay. Thank you.

2 CHAIRMAN GRAHAM: That's the way I heard the
3 question.

4 THE WITNESS: Would you repeat the question,
5 please?

6 BY MR. MARCIL:

7 Q Yes, sir. You've never testified in any
8 matters dealing with a regulated Florida electric
9 utility, correct?

10 A That's correct.

11 Q And you've never testified relating to any
12 Florida Power plant, correct?

13 A I -- that is correct.

14 Q You've never testified at any time in the
15 state of Florida, correct?

16 MS. CSANK: Objection as to the relevance.

17 CHAIRMAN GRAHAM: I'll allow it.

18 THE WITNESS: That's correct.

19 BY MR. MARCIL:

20 Q Let's look at Page 36, Line 11 of your
21 prefiled testimony. The question on Line -- actually,
22 13 of Page 36 states, "Have you created an alternative
23 plan to FPL's Plan 3 that demonstrates a lower-cost way
24 to use clean energy resources to meet FPL's reliability
25 needs?"

1 Do you see that question?

2 A Yes.

3 Q And the first two sentences of the answer
4 state: Yes, however, let me state -- or let me say at
5 the outset that this is intended only as an illustrative
6 example. And I do not claim to have thoroughly analyzed
7 all of the reliability and feasibility aspects of this
8 plan.

9 Do you see that?

10 A Yes.

11 Q So, this illustrative alternative plan that
12 you've referenced, starting on Page 36 of your prefiled
13 testimony, was not a fully-analyzed plan, correct?

14 A It -- as I say, I have not thoroughly analyzed
15 all the reliability and feasibility aspects of this
16 plan. So, I would say the answer to your question is
17 yes, it is not a fully-analyzed plan.

18 Q And for instance, you did not analyze any of
19 the capital costs in this illustrative alternative plan,
20 right?

21 A That's correct. My intention was not to have
22 a plan in which I had analyzed any of those aspects. It
23 was to illustrate a specific point that I'm pretty clear
24 about in my testimony.

25 Q And you did not do any analysis of operation

1 and maintenance costs in your illustrative alternative
2 plan, correct?

3 A That is correct.

4 Q You did not do any analysis of any variable
5 costs in your illustrative alternative plan.

6 A That's correct.

7 Q In fact, you did not do any cost analysis
8 whatsoever in your illustrative alternative plan.

9 A That's correct; however, the general tenor was
10 later supported by a plan that FPL produced in response
11 to a staff request. So, there was some related cost
12 analysis done. I did not perform that analysis on this
13 plan.

14 Q And you did not use any independent
15 information on capital costs for solar and storage in
16 looking at your illustrative alternative plan, correct?

17 MS. CSANK: Objection. Ambiguous.

18 CHAIRMAN GRAHAM: Can you restate the question
19 or --

20 MR. MARCIL: Yes.

21 BY MR. MARCIL:

22 Q Outside of what you may have gotten from
23 Florida Power & Light or looked at in discovery, you
24 didn't look at any independent information of capital
25 costs for solar and storage, correct?

1 A That's not correct, no.

2 Q Did you feel like you did a thorough analysis
3 of capital costs for solar and storage?

4 MS. CSANK: Objection. Ambiguous.

5 A What I'm trying to understand --

6 CHAIRMAN GRAHAM: I don't think it was --

7 A -- about your question --

8 CHAIRMAN GRAHAM: I don't think it was
9 ambiguous.

10 Go ahead and answer the question.

11 THE WITNESS: I'm not sure if you're asking me
12 in general about my analysis of the cost of solar
13 and storage or if you're asking me specifically
14 with respect to this illustrative alternative plan.

15 BY MR. MARCIL:

16 Q Specifically.

17 A Specifically, with respect to the plan?

18 Q Yes, sir.

19 A In that case, I did not look at any specific
20 cost information in putting this plan together.

21 Q And you did not do a thorough analysis about
22 whether the illustrative alternative plan is technically
23 feasible, correct?

24 A That's correct.

25 Q And in this particular case, you've done no

1 **specific calculations of the bill impacts of the Dania**
2 **Beach Clean Energy Center, correct?**

3 MR. LENOFF: Objection. Ambiguous.

4 CHAIRMAN GRAHAM: Can you -- I was a little
5 lost on that question, too.

6 BY MR. MARCIL:

7 **Q Yeah. So, you -- you've performed no specific**
8 **calculations on what the impacts would be on customer**
9 **bills from the Dania Beach Clean Energy Center, correct?**

10 MS. CSANK: Ambiguous, still.

11 CHAIRMAN GRAHAM: I'll allow that question.

12 MS. CSANK: The time period is unclear.

13 CHAIRMAN GRAHAM: Can you narrow down time
14 frame?

15 BY MR. MARCIL:

16 **Q At any time.**

17 A Are you referring to revenue requirements or,
18 specifically, what the impact would be on the bills of
19 individual customers?

20 **Q Revenue requirements.**

21 A I did review information on revenue
22 requirements, but I did not perform independent analysis
23 of what are the revenue-requirements impact of this
24 plan, no.

25 **Q And you've not done any independent analysis**

1 of the load-generation balance information presented in
2 FPL's petition for determination of need, correct?

3 A Are you still referring to the specific plan?

4 Q Yes.

5 A So, I'm -- I think you're taking this plan for
6 much more than I intended it to be. It was merely an
7 illustration. And no, I have not done any -- any
8 technical or feasibility analysis of this plan.

9 Q And you've not independently conducted
10 investigation of locations within Miami-Dade and Broward
11 Counties that could support the location of an 880 --
12 884-megawatt-generation plant, have you?

13 A No, I have not.

14 Q Now, sir, you've never, yourself, been
15 responsible for developing a resource plan for a
16 utility, correct?

17 A As I explained in my deposition, I have
18 participated in that process, but I have not
19 independently created or led that process, no.

20 Q And you've never -- it's never been your role
21 to fully draft and analyze a resource plan, correct?

22 A That's correct.

23 Q And you've never developed a full resource
24 plan as part of your expert testimony in any matter,
25 correct?

1 MR. LENOFF: Objection. Asked and answered.

2 CHAIRMAN GRAHAM: I agree. Let's move on.

3 BY MR. MARCIL:

4 Q You've never been responsible for developing a
5 transmission plan for a utility, correct?

6 A That's correct.

7 Q You've never been hired by a utility as a
8 resource planner?

9 A That's correct.

10 Q You've never been hired by a utility as a
11 transmission planner?

12 MS. CSANK: Objection as to relevance.

13 MR. MARCIL: Goes to his lack of experience.

14 CHAIRMAN GRAHAM: Let's move on. I think
15 you're -- you've made your point.

16 BY MR. MARCIL:

17 Q Just one more. You've never been a systems-
18 operation employee for a utility.

19 A That is correct.

20 Q Now, you've never been a Project Management
21 Institute project-management professional in your
22 experience, correct?

23 MS. CSANK: Objection, again, as to relevance.

24 CHAIRMAN GRAHAM: I'll allow it.

25 THE WITNESS: I'm afraid I don't -- I don't

1 understand your question.

2 BY MR. MARCIL:

3 Q Do you know what a Project Management
4 Institute project-management professional is?

5 A No.

6 Q You've never had any responsibilities for the
7 Florida Reliability Coordinating Council?

8 MS. CSANK: Objection. Ambiguous.

9 CHAIRMAN GRAHAM: I don't know if that's
10 ambiguous. Have you done any work for the Florida
11 Reliability -- the FRCC -- that's yes or no.

12 THE WITNESS: No.

13 CHAIRMAN GRAHAM: Thank you.

14 BY MR. MARCIL:

15 Q All right. Now, in this particular docket,
16 sir, you believe that you did not have the tools or
17 information available to provide a fully-analyzed
18 resource plan, correct?

19 A I was not hired to produce a fully-analyzed
20 resource plan, nor would it be the burden on Sierra Club
21 or its experts to do that. So, I never even considered
22 it until we discussed it at length in my deposition, but
23 I agree that I do not have the tools or resources to do
24 that.

25 Q Because that requires personnel and staffing

1 that wouldn't be available to you, as somebody who works
2 for himself, correct?

3 CHAIRMAN GRAHAM: I think that was asked and
4 answered.

5 BY MR. MARCIL:

6 Q And developing a full resource plan requires
7 great expense, sir, correct?

8 MS. CSANK: Objection as to relevance.

9 CHAIRMAN GRAHAM: Let's move on.

10 BY MR. MARCIL:

11 Q In this case, sir, you were only paid \$25,000
12 for your time spent prior to filing your prefiled
13 testimony, correct?

14 MS. CSANK: Again, objection to relevance.

15 CHAIRMAN GRAHAM: I agree.

16 BY MR. MARCIL:

17 Q In this particular case, you did not review
18 any information involving the Siemens transmission
19 model, correct?

20 A That's correct.

21 Q And you did not review any information
22 involving the UPLAN dispatch model.

23 A That is not correct.

24 Q You did not use that information in order to
25 come to your conclusions in your prefiled testimony.

1 A I don't entirely agree with that. It was
2 information -- the information that was provided from
3 the UPLAN model, I reviewed. The correction to my
4 testimony that I just made, actually, was based on
5 information from the UPLAN model. So, I don't -- I
6 don't really agree with your -- with that assertion.

7 **Q Do you know what the Siemens model is used**
8 **for?**

9 A Yes.

10 **Q What?**

11 A Are you referring to specifically in this
12 case?

13 **Q Or -- this case or in general. What is a**
14 **Siemens model used for, generally?**

15 A You're asking me about what a load-flow model
16 is?

17 **Q Sure.**

18 A Shall I go on to explain dark matter as well
19 as -- for the Chairman?

20 A load-flow model is used to test the ability
21 of a transmission system or gener- -- a -- an electric
22 system, including transmission, generation, load, other
23 technical elements of the system to deliver power to
24 load under a range different circumstances. It's used
25 for a number of different purposes.

1 Mr. Sim has discuss- -- described contingency
2 analysis. That's a very important part of the use of
3 load-flow models to ensure that, under a range of
4 circumstances, the system is robust in -- and can
5 maintain reliability, even in the case of outages of
6 re- -- of generation or transmission.

7 I can talk about them at great length. I love
8 talking about load-flow models.

9 **Q And in this case, you did not review any**
10 **information involving the Siemens model because the**
11 **Sierra Club did not sign a confidentiality agreement to**
12 **get that information, correct?**

13 MR. LENOFF: Objection. Asked and answered.

14 He's already asked if he used the Siemens model.

15 CHAIRMAN GRAHAM: He was asked, but he didn't
16 ask the reason why. I'll allow it.

17 THE WITNESS: I think there were two elements
18 of that; one was that the -- there was an issue, as
19 I understand it, in terms of the confidentiality
20 agreement; and second was that Florida Power &
21 Light only made the model available for review at
22 the company's designated site and in a form that I
23 felt would not be useful for me.

24 So, I was asked -- Sierra Club asked me if I
25 felt that issue was worth pursuing. And I felt,

1 just given the time available in this proceeding,
2 that it -- there wouldn't be a lot of benefit to my
3 being able to do that. I wouldn't be able to
4 actually run the model. I wouldn't be able to
5 fully analyze the results if I didn't have them in
6 electronic format on my computer.

7 So, my judgment, which Sierra Club accepted,
8 was that I would be willing to go forward without
9 actually directly reviewing that. And as a result,
10 I did not testify as to the validity or any
11 shortcomings, in the conclusions, based on that
12 model.

13 BY MR. MARCIL:

14 **Q Could you turn to Page 29, Line 11 of your**
15 **prefiled testimony, sir?**

16 A Yes.

17 **Q Okay. I'll -- I'll read the question into the**
18 **record. It says, "Earlier, you discussed the low cost**
19 **of solar and solar-plus-storage PPAs and stated that you**
20 **expect the prices for solar and storage resources to**
21 **continue to decline. What is your evidence in support**
22 **of this expectation?"**

23 **Do you see that?**

24 A Yes.

25 **Q And you write: Numerous observers in the**

1 energy industry, the financial industry, and government
2 have noticed the precipitous decline in costs for these
3 resources and the likelihood that they will continue to
4 fall in the future.

5 Do you see that answer?

6 A I used the word "noted," not "noticed," but
7 subject to that, I agree with your representation.

8 Q The numerous observers you refer to, you --
9 you cite to a couple of opinion publications that are
10 appended to your prefiled testimony, correct?

11 A Yes, I provide them as examples -- not an
12 exhaustive list, but they were some examples.

13 Q Neither of them written by you, correct?

14 A That's correct. I was citing outside sources.

15 Q And in terms of economics, sir, you don't have
16 a degree in economics, correct?

17 A That's correct.

18 Q You've never taken a course in macroeconomics,
19 microeconomics, or econometrics?

20 A I have taken a couple of classes in economics.
21 I don't think I took a class -- I've been out of school
22 for a while. I -- I worked closely with a -- an
23 econometrics professor on my Master's thesis. And so, I
24 feel I had a sort of a tutorial in econometrics, but I
25 don't believe I ever took a class specifically called

1 microeconomics or macroeconomics.

2 Q Or econometrics.

3 A Right.

4 Q And you've never been a professor at any
5 college or university or held that title, at least,
6 correct?

7 A That's correct.

8 MS. CSANK: Objection as to relevance.

9 THE WITNESS: I'm sorry.

10 CHAIRMAN GRAHAM: Go on.

11 BY MR. MARCIL:

12 Q And sir, your degree was -- your Bachelor's
13 Degree was not in economics, but in psychology, correct?

14 A That's correct.

15 Q And your Master's Degree from --

16 MR. MURPHY: Chairman, we -- we're supposed
17 to -- if we're going to voir dire the witness on
18 his expertise -- this was supposed to have been
19 identified long ago.

20 CHAIRMAN GRAHAM: I agree.

21 MR. MARCIL: I -- I'll move on. I just had
22 one -- one last question on that.

23 Your Master's Degree from Tufts --

24 MR. MURPHY: I object to the last question.

25 CHAIRMAN GRAHAM: Move on.

1 MR. MARCIL: Okay.

2 BY MR. MARCIL:

3 Q Instead, sir, what you do for a living,
4 essentially -- 62 percent of all your billed hours have
5 been to provide expert testimony and services, correct,
6 since the year 2014?

7 A I would say that -- I know the number you're
8 referring to. And the way I characterized that was the
9 percent of my hours, which were for cases, which could
10 potentially lead to providing expert serv- -- testimony
11 is one of the services I provide.

12 I would say that a hundred percent of my hours
13 are related to providing expert services.

14 Q Now, the citations you make in that particular
15 section on Page 29 and Page 30 of your prefiled
16 testimony -- both of those publications you cite have
17 disclaimers in them, correct?

18 A I believe that's correct, yes.

19 Q In fact, the Moody's disclaimer says that the
20 opinions included in that publication were not
21 statements of current or historical fact?

22 A I would have to look at it.

23 Q And then the -- the other citation to the
24 Lawrence Berkeley National Labs study states that the
25 views and opinions of the authors are not -- do not

1 necessarily state or reflect those of the United States
2 Government or any agency of the United States
3 Government, correct?

4 A I'm familiar with these disclaimers, in
5 general. I've looked at them in these particular
6 papers; although, I did not memorize them. And I felt
7 that I used the papers consistent with the disclaimers.

8 Q And in terms of the -- the pricing information
9 that you provide on Page 29 and Page 30 -- could you
10 take a look at Exhibit No. 67, I believe it was, that we
11 marked as an exhibit?

12 A This would be the non-confidential?

13 CHAIRMAN GRAHAM: Yes. This is the one that
14 says "Sierra Club website" on the title page.

15 THE WITNESS: Okay.

16 BY MR. MARCIL:

17 Q Okay. And sir, this is printed from the
18 Sierra Club website, currently on their website. And on
19 the third paragraph of Exhibit 67, it states, if you
20 follow with me, "The low current market price of natural
21 gas creates a risk that new natural-gas-powered plants
22 will out-compete emerging forms of renewable energy in
23 the electricity sector."

24 Do you see that?

25 A I do.

1 Q And then it says, "The Sierra Club continues
2 to legally challenge new natural-gas plants and demand
3 requirements that limit their emissions of greenhouse
4 gasses."

5 Do you see that?

6 A I do.

7 Q And do you understand that to be Sierra Club's
8 position in this docket; that they're concerned that the
9 low current market price of natural gas creates the risk
10 that new natural-gas power plants will out-compete
11 emerging forms of renewable energy in the electric
12 sector?

13 MS. CSANK: Objection. That's compound,
14 argumentative, and narrative.

15 COMMISSIONER GRAHAM: Mary Anne?

16 MS. HELTON: Perhaps counsel for Power & Light
17 could restate the question?

18 MR. MARCIL: Yes, sir. Yeah -- yes.

19 BY MR. MARCIL:

20 Q So, that first sentence that we read into the
21 record from the third paragraph of Exhibit 67 -- do you
22 see that?

23 A Yes.

24 Q You understood that Sierra Club had a concern
25 about the low current market price of natural gas,

1 correct?

2 A I have never seen this before. I don't
3 regularly check Sierra Club's website. And I certainly
4 don't use Sierra Club's materials as the basis of my
5 testimony.

6 Q But you're not familiar with the fact that
7 Sierra Club does have that concern about the low current
8 market price of natural gas?

9 A No, I was not aware of that.

10 MR. MARCIL: Just a couple more questions.

11 If I could just have a moment.

12 CHAIRMAN GRAHAM: Sure.

13 MR. MARCIL: All right. Thank you,

14 Mr. Chairman.

15 BY MR. MARCIL:

16 Q Page 22, Line 19 of your prefiled testimony,
17 sir --

18 A Yes.

19 Q And this is, at least in part, answering the
20 question starting on Line 8, "Why did FPL choose to
21 delay the retirement of Units 4 and 5 in Plans 4 and 5,
22 if the continued operation of those units is not needed
23 for reliability purposes?"

24 And on Line 19 through 21, you write,

25 "Moreover, there is no apparent reason why four years is

1 any kind of magic number except that is the amount of
2 time that would occur under FPL's proposed plan."

3 Do you see that?

4 A Yes.

5 Q And did you read anybody else's testimony in
6 this case, other than Dr. Sim, dealing with that issue
7 of the four years?

8 MR. LENOFF: Objection. Ambiguous.

9 CHAIRMAN GRAHAM: I don't think so. He can
10 answer the question.

11 MR. LENOFF: Okay.

12 CHAIRMAN GRAHAM: He asked him a simple
13 question -- if you've read anybody else's testimony
14 in this case, other than Dr. Sim's --

15 MR. LENOFF: Is he referring --

16 CHAIRMAN GRAHAM: -- that issue.

17 MR. LENOFF: Can I -- is he referring to
18 before this -- and to inform this test- --
19 Dr. Hausman's testimony or at any time during the
20 proceeding?

21 MR. MARCIL: Any time.

22 THE WITNESS: I have read both Dr. Sim's
23 testimony and the rebuttal testimony of both
24 Dr. Sim and Mr. Sanchez, all of which, in some way,
25 at least, address this issue.

1 BY MR. MARCIL:

2 Q And then, prior to the -- filing your prefiled
3 testimony, the only testimony you had obviously read was
4 Dr. Sim's, correct?

5 A That's the only testimony on this issue, yes.

6 Q And were you familiar with -- before today --
7 of the testimony that we've heard that it would take
8 four years to demolish the Lauderdale Units 4 and 5 and
9 then construct the new Dania Beach Clean Energy Center?

10 A May I -- may I amend my last response?

11 Q Sure.

12 A I had also listened to Dr. Sim's deposition
13 and reviewed his deposition transcripts. So, that
14 also -- those were other materials that I had reviewed
15 in preparing this opinion.

16 And I apologize. I was thinking about that,
17 so I don't -- I didn't catch your last question.

18 Q So, you did not read anybody else's testimony
19 or Ms. Kingston's prefiled testimony?

20 CHAIRMAN GRAHAM: That was asked and answered.

21 MR. MARCIL: But Ms. Kingston, specifically, I
22 want to ask about.

23 CHAIRMAN GRAHAM: That was asked and answered.

24 MR. MARCIL: Okay. All right. Well, I have
25 no further questions, then.

1 CHAIRMAN GRAHAM: Thank you.

2 Staff?

3 MR. MURPHY: Staff has just a few questions.

4 CHAIRMAN GRAHAM: Sure.

5 EXAMINATION

6 BY MR. MURPHY:

7 Q Hey, Dr. Hausman. I'm Charles Murphy with
8 staff.

9 A Good afternoon.

10 Q Good afternoon.

11 You've testified that placing the Dania Beach
12 plant in service in 2022 is not the most cost-effective
13 approach; is that correct?

14 A Yes.

15 Q Does FPL placing Dania Beach in service in
16 2022 provide additional reliability to FPL compared to a
17 year or two wait?

18 A Marginally, yes.

19 Q Could you explain "marginally"?

20 A As I described in my testimony, FPL has very-
21 conservative reliability criteria. Those reliability
22 criteria include a minimum 20-percent reserve margin.
23 That reserve margin would give ample room for
24 contingencies, for load-growth uncertainty.

25 If you add additional reliability, you have

1 diminishing returns -- I'm sorry. If you add additional
2 capacity, you have diminishing marginal returns in terms
3 of reliability.

4 It could be that there is some additional
5 extreme event, a very-unlikely event that, you know, at
6 any level, you can imagine a scenario where there would
7 be some additional reliability benefit, but it would be
8 extremely small because FPL already has robust
9 reliability standards.

10 It's far more likely that a loss of load would
11 be due to -- due to events that have absolutely nothing
12 to do with available capacity such as loss of
13 distribution lines or loss of -- I don't know -- some --
14 something on the distribution system is the most likely.

15 So, they -- the additional benefit of shoring
16 up what's already an extremely-strong link in the chain
17 is -- is quite marginal.

18 **Q Okay. Is there a value to FPL's customers**
19 **resulting from this marginal additional reliability --**
20 **or take -- strike "marginal" -- additional**
21 **reliability -- whether it's marginal or not, whatever it**
22 **is, what -- is there a value to FPL's customers?**

23 **A** I don't believe there's a net benefit because
24 I believe the costs exceed -- exceed any small
25 reliability benefit.

1 Q Well, I guess that's -- that's the question:
2 How do we weigh the additional costs, which --
3 \$20 million between the FPL 2 and the sensitivity run --
4 how do we weigh that against the additional reliability?
5 I mean, that seems to be where those ideas intersect.

6 That's a complicated question. Are you with
7 me?

8 A Well, I -- I understand your question. And I
9 think the answer is actually relatively straightforward.
10 The way you weigh it is through proceedings where you
11 set the reliability standards for the company. And
12 that's -- that is the appropriate forum. And that's
13 been done here in Florida.

14 I believe that it's actually come out with
15 conservative reliability standards, but those are the
16 standards that have been tested by the company, that are
17 used in operations by Mr. Sanchez and his team every
18 day, that have been approved by this Commission as being
19 an appropriate balance between costs to customers and --
20 and reliability.

21 If FPL, then, goes and exceeds those
22 standards, then FPL is erring on the side of charging
23 customers more than that appropriate level of balance,
24 in my opinion.

25 MR. MURPHY: That's all I have. Thank you.

1 CHAIRMAN GRAHAM: Before I go to the
2 Commissioners, Mary Anne, do you have an answer to
3 that question about time frame, three years or the
4 2008, as he said before, ten years?

5 MS. HELTON: Ms. Cibula and I did a very-
6 cursory review of the case he cited, and we didn't
7 see a time frame in there.

8 The case dealt with a medical mal- --
9 malpractice issue, which is obviously not the type
10 of issue that we have here. And he said that that
11 case was cited in the comments for a civil-
12 procedure rule, but when I look at the comments --
13 best I can figure, the part of the rule that it
14 addressed is no longer in existence.

15 So, based on a very-cursory review, I'm not
16 sure that I agree there's a bright line that he
17 suggested.

18 CHAIRMAN GRAHAM: Mr. Lenoff?

19 MR. LENOFF: So, I would just maybe just seek
20 to ask Mary Anne or just point to Section 1. -- or
21 Rule -- Florida Rule of Civil Procedure, 1.280 --
22 or zero -- (B)(5) three -- like, three little "i"s,
23 and then the number three.

24 MS. HELTON: If I'm going --

25 CHAIRMAN GRAHAM: Sure.

1 MS. HELTON: -- to the correct place that he's
2 citing me to, it says that -- that says, "The
3 identity of other cases within a reasonable time
4 period in which the expert has testified by
5 deposition or at trial."

6 So, I would say, as the tribunal, you have a
7 discretion to determine what a reasonable time
8 period is. I don't know that there's a bright line
9 designated in the rule.

10 CHAIRMAN GRAHAM: Okay. So, we'll let the
11 question stand.

12 Commissioners.

13 Commissioner Brown.

14 COMMISSIONER BROWN: I just have one question.
15 Thank you and welcome, Dr. Hausman --

16 THE WITNESS: Thank you.

17 COMMISSIONER BROWN: -- to the Florida Public
18 Service Commission.

19 Question for you. During your opening
20 statements, you said that delaying the unit would
21 be less-costly; however, Dr. Sim earlier stated
22 that delaying the unit one year, two year would
23 bring about additional costs.

24 Could you explain a little bit more why
25 delaying the unit, you believe, would be more-

1 costly to the customers?

2 THE WITNESS: Yes. Delaying the unit, per
3 se -- so, just building the unit later -- Dr. Sim,
4 I think, would agree -- has -- as he has -- he was
5 describing in his testimony, the discounting
6 issue -- in other words, just delaying that cost
7 for customers overwhelms any small increase in the
8 cost of the project due to inflation. So, by not
9 making customers pay for this resource two years
10 before they need it, that, in itself, saves them
11 money.

12 So, the question is what else happens at the
13 same time. A few things happen. One of them is
14 the fuel penalty that the company has described.
15 And that is why I changed my testimony at the -- I
16 didn't -- I don't like to say I changed my
17 testimony, but I offered a small change at the
18 beginning of my -- of my time here today -- because
19 I was recognizing that, indeed, there is a fuel
20 penalty associated with waiting, and that is an
21 additional cost to customers.

22 However, the bulk of the additional cost
23 that's identified by FPL has to do with delaying
24 the retirement of Lauderdale 4 and 5. There's a
25 lot of costs associated with keeping those units in

1 operations that can be avoided by retiring them on
2 the current schedule.

3 My position is -- and what I have seen in the
4 record, including the rebuttal of Mr. Sim and
5 Mr. Sanchez, is that there is no rationale provided
6 why that four-year window makes any sense. It's
7 not like the reliability situation in 2022 is
8 affected by whether you happen to have Lauderdale
9 online in 2019 or not. It just doesn't make any
10 sense. And there was no testimony provided that
11 explained why that might make any difference.

12 Now, Mr. Sanchez -- well, I won't keep going
13 on that, but --

14 COMMISSIONER BROWN: So, do you think that
15 delaying Dania Beach by a year or two would be
16 less-costly, based on all of the circumstances
17 provided here and presented here today?

18 THE WITNESS: Yes, I believe that it would
19 and -- and that is confirmed by FPL's response to
20 a -- a recent staff interrogatory.

21 COMMISSIONER BROWN: Which one?

22 THE WITNESS: I believe it was No. 58, which
23 was the interrogatory which -- if that's --
24 that's -- is that -- can somebody confirm that for
25 me?

1 COMMISSIONER BROWN: Can you elaborate what
2 the interrogatory is?

3 THE WITNESS: It was basically asking for a
4 delay scenario; asking for FPL to run a scenario
5 that would delay the Dania Beach unit until 2024,
6 but not delay the retirement of Lauderdale. And
7 that showed a savings relative to the company's
8 plan -- preferred plan.

9 MR. LENOFF: Commissioner Brown, can I let you
10 know, that is marked as Exhibit 52 on staff's
11 comprehensive exhibit list, the interrogatory that
12 Dr. Hausman --

13 COMMISSIONER BROWN: Thank -- thank you.

14 And what are the savings, in that exhibit? Do
15 you have that in front of you?

16 THE WITNESS: No. I don't have the numbers in
17 front of me, no. But it was -- it was calculated
18 by the company. It was something on the order of
19 \$27 million, but I'm -- I'm not sure exactly what
20 the number was.

21 COMMISSIONER BROWN: Okay. Thank you.

22 CHAIRMAN GRAHAM: Commissioner Clark, do you
23 have any question?

24 COMMISSIONER CLARK: No, thank you.

25 CHAIRMAN GRAHAM: Okay. Redirect.

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EXAMINATION

BY MS. KAPLAN:

Q Can you identify what makes you qualified to offer the opinion you offered in this case, in your prefiled testimony, please?

A I have been working on issues related to this for about 20 years. I have used many of the kinds of models that are used by FPL in this case, including load-flow models, planning models, dispatch models, cash-flow models. I have participated in a number of planning studies as an expert participant. I've reviewed -- you know, I -- I've just been working in this area in -- in a number of -- for a wide range of clients for 20 years.

I've even performed expert services for FPL Energy, for the unregulated affiliate of Florida Power & Light, resulting in a peer-reviewed paper that I co-authored with staff from FPL Energy.

I've worked for the -- I've been hired by the U.S. Department of Justice to apply my skills at modeling and interpreting electric utility systems.

So, this is just an area that I've worked on for a long time in a number of different -- in a number of different parts of the U.S.

Q You mentioned your illustrative plan and that

1 **it was for a specific purpose. Can you describe the**
2 **purpose of providing that in your testimony?**

3 A The purpose of that plan was just to provide a
4 contrast to the plan that was provided by FPL as Plan 3.
5 I had certain criticisms of Plan 3 because I felt that
6 it was designed not to meet specific reliability
7 criteria, but to mimic the -- the Plan 2, the Dania
8 Beach center.

9 And I wanted to illustrate that the company's
10 reliability criteria could be met with a very different
11 plan that only built resources close to the time they're
12 needed and closer to the amount that's needed and that
13 that would be far-less costly.

14 As it turns out, staff requested that FPL
15 produce a similar plan and analyze it, at least for cost
16 in discovery. The plan that FPL produced, similarly to
17 mine, is not what I would call a fully-analyzed plan.
18 It's not an optimal plan because it was just, you know,
19 the specific resource mix that staff asked for.

20 But it -- I was happy to see, because it
21 confirmed my opinion, that once they did do the
22 analysis, the cost analysis of that plan, in fact, it
23 showed -- it showed that it met the reliability criteria
24 at far-less cost than the company's Plan 3; many
25 hundreds-of-millions of dollars, which is exactly the

1 term that I had used to describe how much could be saved
2 by designing a renewable-energy plan that was meant to
3 meet reliability criteria instead of to mimic a gas
4 plant.

5 **Q You mentioned that you also provided export --**
6 **expert services to the Department of Justice.**

7 **Are there any other government entities that**
8 **have been clients of yours?**

9 A Yes. I've worked for the -- the Vermont State
10 Legislature. I've worked for consumer advocates in a
11 number of different states. I work for the New Jersey
12 Consumer Advocate on an ongoing basis. I've worked for
13 the Iowa Consumer Advocate. I've worked for the
14 Illinois EPA -- I don't know if that's exactly what it's
15 called, but I've worked for a number of State and
16 Federal Government agencies.

17 **Q How would you have approached the resource**
18 **planning differently than FPL did, for purposes of this**
19 **docket?**

20 A I would have reviewed a -- a very different
21 set of plans. I think that Plan 1 that FPL reviewed
22 made sense. That's sort of the status-quo plan.

23 Plan 2 made sense, but even that was not based
24 on the use of a -- a planning model such as the EGEAS
25 model, E-G-E-A-S, which is a model that is commonly used

1 by utilities throughout the country and, in fact, is
2 used regularly by FPL in its ten-year site-plan-
3 development process. So, I would have looked at a range
4 of different possible resource options using that model.

5 I would have considered a wider range of
6 possible future scenarios than the company considered.
7 So, I think there are a number of shortcomings, most of
8 which I've talked about -- or at least, the ones that I
9 could sort of identify and clearly illustrate based on
10 the information the company provided, I described in my
11 testimony.

12 Q Can you clarify --

13 CHAIRMAN GRAHAM: Ms. -- Ms. Kaplan, I -- I
14 hate to interrupt your redirect. Commissioner
15 Clark has got a question. And since he's the new
16 guy, I'll give him a little deference here.

17 (Laughter.)

18 MS. KAPLAN: Okay.

19 COMMISSIONER CLARK: Thank you.

20 Dr. Hausman, in your -- your testimony -- in
21 the times that you have been an expert witness, is
22 there any point in time where you've been asked to
23 make the recommendation as to the fuel source for
24 some other generation -- for generation for a
25 company?

1 Do you -- do you do that final analysis to
2 decide what type of generation a company should
3 use? You get to that level?

4 THE WITNESS: I'm trying to think. I've
5 worked on a wide range of different cases, but I
6 don't think that specific question, as you phrase
7 it, what fuel source should we use --

8 COMMISSIONER CLARK: Or what generating
9 source, not necessarily fuel source. What gen- --
10 what type of generation should be used.

11 THE WITNESS: Again, that's -- that's sort of
12 not the way planning is done. It's -- you take a
13 number of different generation options and you put
14 them in a model. They might include demand
15 response, renewable energy, gas, coal -- whatever
16 the different options are, and then generate -- and
17 then let the model identify an optimal plan.

18 I've used those models. I've reviewed
19 modeling studies using them, but I wouldn't say
20 that I've made specific recommendations of what
21 fuel source should be used, no.

22 COMMISSIONER CLARK: If the model showed that
23 the fossil-fuel generation was the best asset to
24 choose, would you be an advocate for that?

25 THE WITNESS: If the model -- I mean -- so, my

1 area of expertise is on the process. And if a
2 modeling study were properly conducted with
3 reasonable assumptions, and that were the outcome,
4 then, I guess I would endorse that outcome.

5 In general, in my experience, there are a
6 number of costs that are not included in that kind
7 of a study. So, I haven't really encountered that
8 situation, but I -- certainly, if that were based
9 on reasonable assumptions, yes, I would endorse
10 that outcome.

11 COMMISSIONER CLARK: Okay. Thank you.

12 CHAIRMAN GRAHAM: Ms. Kaplan, again, I
13 apologize, but I wanted you to have a chance to
14 redirect if you had to address his question.

15 Continue, please.

16 BY MS. KAPLAN:

17 **Q Yeah, can you just clarify -- prior to**
18 **Commissioner Clark's question, you had said that Plans 1**
19 **and 2 made sense in the context of the question. Can**
20 **you clarify what you mean by that?**

21 A I mean that they were reasonable options to
22 consider as part of an overall study. Plan 1 is the
23 status quo; basically, we're not going to change
24 anything.

25 And Plan 2 is looking at resource as -- at a

1 resource -- excuse me -- resource option based on
2 available technology -- I presume, based on reasonable
3 cost assumptions; although, I have not independently
4 reviewed the cost assumptions.

5 So, it seems like, you know, a reasonable
6 option to include in a resource-planning -- overall
7 resource-planning analysis.

8 **Q Would you have considered more plans than the**
9 **three plans that FPL did in 2017?**

10 A Yes.

11 MS. KAPLAN: No further questions.

12 CHAIRMAN GRAHAM: Okay. We have two
13 documents. And you said we are not going to do
14 with anything with the red -- the confidentiality
15 one, 66?

16 MR. MARCIL: Yeah, that's correct.

17 CHAIRMAN GRAHAM: Okay. So, you have 67. And
18 you want to enter that into the record?

19 MR. MARCIL: Yes, Mr. Chairman.

20 CHAIRMAN GRAHAM: Is there any objection to
21 that?

22 MR. LENOFF: Yes, Mr. Chairman. First off,
23 can we clarify whether -- are they withdrawing
24 No. 66 --

25 CHAIRMAN GRAHAM: Yes.

1 MR. LENOFF: -- as an exhibit?

2 Okay. For No. 67, we do object. There's no
3 foundation for that exhibit. Mr. Marcil did not
4 have -- did not establish that the witness was --
5 you know, had any kind of familiarity with the
6 exhibit. And you know, we don't know where it came
7 from -- like, didn't -- based on, you know,
8 Mr. Marcil's presentation.

9 CHAIRMAN GRAHAM: You don't know that this is
10 the Sierra Club's website?

11 MR. LENOFF: I mean, Mr. Marcil, I don't
12 think, has established that.

13 CHAIRMAN GRAHAM: Okay.

14 MR. MARCIL: All right. Yeah. It was
15 actually identified in the response to
16 interrogatory -- supplemental response,
17 Interrogatory No. 29. They referred us to Sierra
18 Club's website on natural gas. And I clicked on
19 it, and that's how I found it.

20 So, y'all identified it from your website.

21 MS. CSANK: But respectfully, the copy that's
22 present in this hearing room has not been
23 authenticated any way. He had his opportunity to
24 examine the witness and establish its authenticity.
25 He failed to do so and, therefore, we object to its

1 admission.

2 CHAIRMAN GRAHAM: The witness was not familiar
3 at all with it, the website, as from what I was
4 told.

5 MS. CSANK: My understanding is the practice
6 of this Commission is when there is a copy of a
7 website --

8 CHAIRMAN GRAHAM: I -- I understand.

9 MS. CSANK: -- that -- that --

10 CHAIRMAN GRAHAM: I'm just saying the witness
11 says he's not familiar with it, so he could not
12 auth- -- authenticate it.

13 MS. CSANK: Respectfully, Mr. Chairman, I've
14 participated in a number of hearings --

15 CHAIRMAN GRAHAM: I'm agreeing with you.

16 MS. CSANK: Okay.

17 (Laughter.)

18 CHAIRMAN GRAHAM: So, only if you have
19 anything else -- this is not going to be in, 67.

20 MR. MARCIL: Yeah, all I can say is I -- it
21 was referenced to us in their answers to
22 interrogatories. I clicked on it. They're not
23 denying it came from their website. So, I don't
24 see what the fight it.

25 CHAIRMAN GRAHAM: My understanding is -- and

1 I'll go to Mary Anne -- that it has to be
2 authenticated by a witness.

3 Mary Anne? Mary Anne?

4 MS. CSANK: Sorry. This was --

5 MS. HELTON: Mr. Chairman, can -- can I say
6 one thing --

7 CHAIRMAN GRAHAM: Sure.

8 MS. HELTON: -- before we even address whether
9 this particular exhibit should be admitted or not?

10 CHAIRMAN GRAHAM: Uh-huh.

11 MS. HELTON: And that is, I think the much-
12 better practice when an exhibit is being used for
13 cross-examination purposes -- and if one of the
14 parties has an objection to that exhibit that they
15 plan to raise at the end when we're admitting
16 exhibits, then they need to raise the objection at
17 the time the exhibit is being used so that all
18 parties are on notice and so that the party who is
19 trying to use the exhibit can have some opportunity
20 to try to do what he or she needs to do to get the
21 exhibit admitted. And I don't recall the Sierra
22 Club raising an objection at the time that counsel
23 for Florida Power & Light was using the exhibit.

24 And it's also very confusing to have three
25 different attorneys make objections when we're

1 dealing with one witness.

2 CHAIRMAN GRAHAM: My question is, because the
3 witness that's on the stand could not authenticate
4 the website, does that mean that we do not allow it
5 in?

6 MS. CHRISTENSEN: Should not.

7 MS. HELTON: Typically, I would say yes, but
8 if there was an interrogatory question that directs
9 the answer to this website, then, seems to me that
10 the website in question is fair game.

11 MR. DONALDSON: And if I can --

12 CHAIRMAN GRAHAM: Hold on a second.

13 So, if the website in question is fair game,
14 how do they go about entering the website in
15 question into the record?

16 MS. HELTON: Let me ask this question: Is the
17 interrogatory that directs us to this particular
18 website -- is that one of the interrogatories that
19 was stipulated to by all of the parties?

20 MR. DONALDSON: No, I don't believe so.

21 MS. HELTON: No?

22 MR. DONALDSON: No.

23 MS. HELTON: Okay.

24 MR. DONALDSON: It's not in the record yet,
25 but what we have is discovery that we sent out to

1 Sierra Club. This was one of the responses which
2 directs us to the website. And there's an affiant
3 that signed the response and affirmed the response
4 to this interrogatory, along with other
5 interrogatories that we sent.

6 So, this was actually a supplemental response
7 that Sierra Club provided to FPL, which directed us
8 to this website. And their affiant, Mr. Nachy
9 Kanfer, who was also -- Nach- -- Na-Kee -- I
10 apologize -- Kanfer, which was their corporate rep,
11 who we deposed, is the one who signed the affidavit
12 for the supplemental response. So, it's been
13 authenticated by Sierra Club.

14 And for Sierra Club to say now, that this
15 website that they pointed us to is not an authentic
16 representation of what we are presenting here
17 today -- I don't see the objection.

18 It wasn't made contemporaneous to when it was
19 being used, as -- as counsel -- your counsel has
20 said -- and I believe it's proper for the
21 Commission to give it the weight that it's due,
22 based on the questions that were asked of the
23 witness.

24 CHAIRMAN GRAHAM: Ms. Christensen?

25 MS. CHRISTENSEN: Thank you. Since it has --

1 the Commission has not been consistent on its
2 practice of whether or not you need to make an
3 objection contemporaneous with the use of the
4 document.

5 I think it's clear from the record that this
6 witness could not authenticate that this printout
7 was, in fact, a printout from a website. He has
8 no -- he's not provided the foundation for this
9 document. And it's irrelevant whether or not there
10 was information provided in discovery that has not
11 been admitted into the record.

12 So, I would object to something that's not --
13 has a lack of foundation being admitted into the
14 record at this time.

15 MS. CSANK: And furthermore, perhaps,
16 clumsily, Mr. Chairman, what I was trying to
17 articulate earlier was that I had raised an
18 objection while the witness was being examined on
19 this particular exhibit. I raised the objection at
20 the time. He said he wasn't familiar with it. I
21 didn't pursue further objections, but I did object
22 contemporaneously.

23 And moreover, the issue is this is not, in
24 fact -- the copy that's in the hearing room today,
25 was not enclosed -- there was a URL to which we

1 pointed to FPL, but FPL's counsel failed to
2 authenticate this particular copy, this particular
3 exhibit that's in the hearing room. That's a
4 source of confusion, I think, in the argument that
5 FPL's counsel has presented to you.

6 MS. HELTON: Mr. Chairman --

7 CHAIRMAN GRAHAM: Hold on.

8 No, I am not -- I don't see me letting this
9 Exhibit 67 in, but my question to you is: How did
10 they go about getting the Sierra Club website into
11 the record? Did what he say earlier get the Sierra
12 Club's website into the record or how does -- I'm
13 asking you for some feedback on that.

14 MS. HELTON: I -- can I first say I forgot
15 that Ms. Csank had objected. So, that eases part
16 of my problem.

17 They would have to authenticate the exhibit.
18 And I had forgotten that he had said that he was
19 not familiar with that particular page. So, if he
20 has -- if he's not familiar with the page and
21 cannot authenticate it -- and perhaps, this is a
22 lesson to all of us that linking an answer to a
23 particular URL is not necessarily the best way to
24 answer an interrogatory question; that, if you have
25 a particular document, that that document should be

1 attached.

2 CHAIRMAN GRAHAM: Back to my question, though.
3 I don't have a prob- -- I don't have a problem not
4 letting 67 in, but how do they go about getting the
5 Sierra Club website in or can they go about getting
6 that done?

7 MS. HELTON: Well, they would have to find a
8 witness who could authenticate the particular
9 document. And I don't think that that's happened
10 here.

11 MR. COX: Chairman, could I just say that it's
12 a difficult situation here when they have no
13 company representative as a witness in the case.
14 That's why we went out to Cincinnati, Ohio, to
15 depose a corporate representative.

16 When we asked for discovery on these types of
17 questions, this is what they provided. They
18 provided an affidavit attached to the response, a
19 sworn affidavit that this is from their company.
20 That's what we're providing today. I don't -- I
21 don't know what else we could have done, I guess,
22 is what I'm trying to say.

23 CHAIRMAN GRAHAM: Let's take a five-minute
24 break, and I'll let my staff mill on this before I
25 make a decision.

1 (Brief recess.)

2 CHAIRMAN GRAHAM: Mary Anne, you have the
3 floor.

4 MS. HELTON: Yes, sir. I think there are ways
5 to get websites into the record here at the
6 Commission. And I think we have allowed copies of
7 website pages to -- to be admitted into the record
8 here.

9 When counsel for Florida Power & Light asked
10 the witness if he was familiar with this particular
11 website page, the witness said, no, he was not
12 familiar. So, I think, at that point in time, we
13 probably should have just moved on.

14 CHAIRMAN GRAHAM: Okay. Like I said, I've
15 already said that we're not going to bring 67 in,
16 but do you have a resolution as far as the
17 affidavit that they have or -- because they had an
18 affidavit -- af- -- whatever that word is.

19 MS. HELTON: Affidavit?

20 CHAIRMAN GRAHAM: Thank you -- from the Sierra
21 Club with one of the interrogatories.

22 Now, my question is to you: Is there
23 something that they can do -- and I guess I'm not
24 trying to -- am I -- if I'm getting into their
25 strategy, then I'll leave this one alone, but I

1 guess I'm trying to ask a question: How does one
2 go about doing that, if you cannot get a witness to
3 authenticate it?

4 MS. HELTON: Well, I guess he could have asked
5 the witness to pull up the website as he was
6 sitting on the -- on the -- on the stand and look
7 at it, then. That would, perhaps, be one approach.

8 He could have -- Florida Power & Light could
9 have offered up a witness that actually -- of their
10 own that looked at the website and said, this is
11 what the website says.

12 Or they could have subpoenaed the official
13 from Sierra Club to talk to the person who, I'm
14 assuming, was -- is -- was responsible for the
15 website or language on the website and ask them
16 about that.

17 CHAIRMAN GRAHAM: But -- so, that affidavit
18 that they have does not do -- I mean, because you
19 could subpoena somebody to come here or -- and I'm
20 asking because I don't know the legal answer to
21 this -- or you -- you send an affidavit saying,
22 okay, we declare whatever I -- I include in this
23 affidavit.

24 MS. HELTON: Well, the -- the affidavit was
25 part of the discovery response. So, I guess,

1 there's -- in my mind, there's a distinction
2 between answers to discovery and then relevant
3 information that's admitted in the hearing.

4 And as I understand it, that particular
5 discovery response -- and please correct me if I'm
6 wrong, but the particular discovery response
7 where -- to which that affidavit was attached was
8 not part of the stipulated discovery that was
9 admitted at the beginning of the proceeding.

10 CHAIRMAN GRAHAM: That's correct.

11 MS. HELTON: So, the parties could have asked
12 for that to be stipulated to, to be admitted, or,
13 if they had some other relevant question about that
14 particular discovery response, they could have
15 asked in the cross-examination que- -- question of
16 the Sierra Club witness that maybe would have led
17 them down that line.

18 CHAIRMAN GRAHAM: Okay. All right. Well, we
19 already said that 66 and 67 are not in.

20 And we are done with Dr. Hausman.

21 Dr. Hausman, I see that you're from
22 Auburndale, Massachusetts.

23 THE WITNESS: Auburndale, yes.

24 CHAIRMAN GRAHAM: Does that mean that you're a
25 New England Patriots fan?

1 THE WITNESS: Can I take the Fifth Amendment
2 in this venue?

3 COMMISSIONER BROWN: Yes.

4 CHAIRMAN GRAHAM: Well, I mean --

5 COMMISSIONER BROWN: Good answer.

6 CHAIRMAN GRAHAM: There's one way you can
7 answer it. And there's the other way -- we strike
8 your entire testimony, so --

9 (Laughter.)

10 CHAIRMAN GRAHAM: Sir --

11 THE WITNESS: I think you already said you
12 were done with me. So, I'm just going to stand
13 down.

14 CHAIRMAN GRAHAM: Sir, travel safe.

15 Okay. We're on rebuttal.

16 MS. CSANK: Mr. Chairman, just to confirm, may
17 he be excused?

18 CHAIRMAN GRAHAM: Yes.

19 MS. CSANK: Thank you.

20 CHAIRMAN GRAHAM: I think I'm going to hold
21 him here until Monday, but we'll let him go.

22 FP&L, Sanchez?

23 MR. DONALDSON: Yes, at this time, FPL calls
24 Mr. Hector Sanchez.

25 CHAIRMAN GRAHAM: And before we continue -- I

1 Q 34.

2 By whom are you employed and in what capacity?

3 A I am employed by Florida Power & Light. And
4 I'm the director of system operations.

5 Q Have you prepared and caused to be filed 16
6 pages of rebuttal prefiled testimony in this proceeding
7 on December 22nd of 2017?

8 A Yes, I have.

9 Q Do you have any further changes or revisions
10 to your rebuttal prefiled testimony?

11 A No, I do not.

12 Q If I asked you the same questions contained
13 within your rebuttal prefiled testimony, would your
14 answers be the same?

15 A Yes, they would.

16 MR. DONALDSON: Chairman Graham, I would ask
17 that Mr. Sanchez's rebuttal prefiled testimony be
18 entered into the record as though read.

19 CHAIRMAN GRAHAM: We will enter Mr. Sanchez's
20 prefiled rebuttal testimony into the record as
21 though read.

22 (Prefiled rebuttal testimony inserted into the
23 record as though read.)

24

25

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

2 A. My name is Hector J. Sanchez. My business address is Florida Power & Light
3 Company, 4200 West Flagler Street, Miami, FL 33134.

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

5 A. I am employed by Florida Power & Light Company (“FPL” or the
6 “Company”) as the Director of System Operations.

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

8 A. I am responsible for the real time operation of FPL’s Bulk Electric System
9 (“BES” or “FPL System”). I also serve as the Florida Reliability
10 Coordinating Council (“FRCC”) Reliability Coordinator, in an agent capacity
11 for the FRCC. The FRCC is one of the eight regions in the United States
12 (U.S.) under the jurisdiction of the North American Electric Reliability
13 Corporation (“NERC”) for reliable operations of the BES.

14 **Q. Please discuss the real time operation of the FPL system and the role of
15 the FRCC Reliability Coordinator.**

16 A. The real time operation of FPL’s BES requires coordinating, directing and
17 controlling in a reliable and efficient manner the operations, planning, and real
18 time dispatching of FPL’s generation, transmission, and substation facilities
19 from FPL’s System Control Center to serve over 4.9 million FPL retail
20 customer accounts, as well as its wholesale customers and its transmission
21 service obligations. The FPL system, which is one of the largest in the U.S.,
22 is comprised of approximately 600 substations and almost 7,000 miles of

1 transmission lines ranging in voltage level from 69,000 to 500,000 volts and
2 over 26,000 MW of generation resources.

3
4 As the FRCC Reliability Coordinator, I coordinate and ensure the reliable real
5 time operation of over fifty utilities in the FRCC region as well as the
6 coordinated operations with other regions, including the Southeast Electric
7 Reliability Council to which the FRCC connects to. In essence, I keep track
8 of how every utility in the FRCC will be and is operating its BES and making
9 sure that the reliability of their system and the FRCC is not compromised, and
10 in the event that I determine it is, I have the authority to modify the operations
11 as I deem necessary.

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

14 A. I received a Bachelor of Science degree in Electrical Engineering from the
15 University of Miami in December, 1985. In 1990, I completed the
16 Southeastern Electric Exchange's Course in Modern Power Systems Analysis
17 held at Auburn University. In 1991, I received a Master of Business
18 Administration degree from Florida International University. Additionally, I
19 have completed various other power system courses offered by Power
20 Technology Incorporated ("PTI"), courses offered internally at FPL, and
21 business and management courses at Columbia University.

22

1 Since joining FPL in 1986, I have held positions of increasing responsibility.
2 My first positions at FPL were as an Applications Engineer in the Power
3 Systems Control group and as an Engineer in the Protection and Control
4 department. In 1989, I joined the System Operations group in the area of
5 operations planning where I was responsible for performing technical analyses
6 associated with short-term planning and operation of the FPL system. In
7 1994, I became a Transmission Business Manager where I was responsible for
8 issues associated with the provision of transmission service. Subsequent to
9 that assignment, in March 2000, I held the position responsible for the
10 planning of the bulk transmission system and interconnections. In January of
11 2006, I became responsible for the operation and dispatch on a real time basis
12 of the FPL system. Later that same year, I became the Director of
13 Transmission Planning and Services in which I was responsible for matters
14 relating to the provision of transmission services on the FPL system and for
15 planning the expansion of the FPL transmission system to meet the
16 requirements of FPL's retail customers, wholesale customers, and its
17 transmission service obligations. In 2009, I assumed my current position as
18 Director of System Operations.

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

20 A. The purpose of my testimony is to rebut Sierra Club's witness Dr. Hausman's
21 claim on Page 22 of his direct testimony that "...there is no apparent reason
22 why four years is any kind of 'magic number,'..." for the time period from
23 retirement and demolition of Lauderdale Units 4 and 5 to the commercial

1 operation date of the Dania Beach Clean Energy Center (“DBEC Unit 7”) and
2 to explain how he fails with this contention to take into account important
3 operational considerations for the FPL system. My testimony provides an
4 operations and reliability perspective backed by 31 years of experience for a
5 critical dense urban region of Florida. Specifically, Dr. Hausman does not
6 consider a “real life” operations perspective on why it is critical that the
7 DBEC Unit 7 be constructed and commissioned within the demolition and
8 construction period of four years following the retirement of Lauderdale Units
9 4 and 5 beginning by late-2018. In regards to the resource planning analysis,
10 and in particular to the delay scenario proposed by Dr. Hausman, I provided
11 FPL Witness Sim specific guidance regarding the importance of constructing
12 the DBEC Unit 7 with the present proposed schedule. Constructing and
13 commissioning the DBEC Unit 7 within this four-year schedule minimizes the
14 operational risk to the FPL System in providing reliable service to customers
15 in Miami-Dade and Broward Counties (the “Southeastern Florida region”),
16 one of the largest metropolitan areas in the U.S.

17 **Q. Please summarize your testimony.**

18 A. My testimony provides a discussion of the operational realities and risks that
19 are faced in the Southeastern Florida region. These operational realities
20 require a robust area reliability margin that will be greatly assisted by placing
21 in- service the DBEC Unit 7 by the soonest practicable date, following the
22 CSQ facilities going in-service and the retirement of the existing Lauderdale

1 Units 4 and 5, such that the risk of being unable to provide reliable service to
2 FPL's customers is minimized.

3 **Q. Please describe the Southeastern Florida region that is a focus of this**
4 **docket and how FPL's customers in this area are served.**

5 A. The Southeastern Florida region is comprised of Miami-Dade and Broward
6 Counties. It is essentially an "electrical peninsula" where over 40% of FPL's
7 total 4.9 million customer accounts are served from a combination of
8 generation resources within this region and by finite transfer capability
9 through transmission and substation facilities from outside this region. The
10 amount of generation in the Southeastern Florida region is also finite, totaling
11 approximately 5,280 MW, after the Lauderdale Units 4 and 5 are retired in
12 late 2018¹. The capability to import power into the area via transmission and
13 substation facilities is also finite; this capability is forecasted to be 7,200 MW
14 when the CSQ transmission facilities are placed in-service and the Lauderdale
15 Units are retired. As such, the load serving capability, presuming all
16 generation resources, transmission, and substation facilities are in-service and
17 performing as designed, is approximately 12,480 MW.

18
19 FPL's service obligations in the Southeastern Florida region include not only
20 FPL's retail load, but also Transmission Service obligations (City of
21 Homestead, Florida Keys Electric Cooperative, and the City of Key West)

¹ 5,280 MW is the sum of the output of the following generation units: Turkey Point (TP) 3 and 4 totaling 1,672 MW; TP 5 totaling 1,147 MW; Lauderdale 6 CTs totaling 1,155 MW; Port Everglades (PE) totaling 1,237 MW; and GTs totaling 69 MW.

1 which are forecasted in year 2022 to be approximately 10,789 MW². But in
2 reality, high loads or loads that exceed 90% of the annual forecasted summer
3 peak, do not occur on just one day for one hour in August as is typically seen
4 in a planning reserve margin calculations. For the past three summers from
5 May 15th through September 15th (124 days which is considered the high load
6 season for real time operations), FPL's load exceeded 90% of the annual
7 summer forecasted peak on 37 to 56 days of the total days within this time
8 frame. Furthermore, FPL's loads exceeded 90% of the peak load forecast on
9 each of those days for an average of almost six hours from approximately 1
10 PM to 7 PM. As such, FPL is exposed to prolonged periods of high loads,
11 where operational risk is much higher, for approximately one third of the year,
12 and during those days when the load exceeded 90% of the annual summer
13 forecasted peak for one quarter of the day, as evidenced by the up to 354
14 hours (product of 56 days and 6 hours per day) per year in each of the years
15 from 2015 through 2017.

16 **Q. What do you consider when managing the real time operations of the load**
17 **servicing capability and service obligations that you discuss?**

18 A. I take into account the forecasted load, available transmission, substation, and
19 generation resources. Additionally, I consider operational situations that may
20 be applicable based on my years of experience operating the system and

² FPL uses for Transmission Planning and Operations purposes a "P80" load forecast instead of the "P50" that is used by Resource Planning in assessments. The P80 for the Southeastern Florida region is approximately 200 MW higher than the P50. The rationale for using the P80 is to account for non-coincidence of loads (e.g., hotter temperatures in the Southeastern Florida region as compared to the rest of the state) and the need to have facilities in place that can meet such higher load. Note that a P80 still provides a 20% risk that the loads will be even higher.

1 mitigation measures. To help clarify my thinking, as part of this process with
2 respect to Southeastern Florida region, I make use of what I term an “area”
3 reliability margin calculation, which combines aspects of a reserve margin
4 calculation and load flow analysis. For example, based on the projected load
5 serving capability and service obligations for 2022, without DBEC Unit 7,
6 FPL will have an area reliability margin at the forecasted peak load of
7 approximately 1,691 MW for the Southeastern Florida region. The area
8 reliability margin calculation, as it is used in the context for the specifics
9 associated with the Southeastern Florida region, is different from a planning
10 reserve margin calculation or a load flow analysis. Maintaining a robust area
11 reliability margin for this area is important since it provides the critical
12 support for the combination of unexpected situations that are common in the
13 operations timeframe and more extreme situations such as hurricanes and wild
14 fires.

15 **Q. Please discuss potential events occurring in isolation or combination that**
16 **can occur during the operations time frame.**

17 A. On any given day, and sometimes for multiple days, during the high load
18 season (May 15th to September 15th), generation resources such as Turkey
19 Point (TP) Units 3, 4, or 5, or Port Everglades (PE) Unit 5 (or a combination
20 thereof) may be unavailable. In accordance with NERC Reliability Standards,
21 FPL must be prepared to sustain the sudden loss of any generation resource or
22 transmission or substation facility at any time, while continuing to serve load
23 reliably with all facilities within applicable ratings and voltages within limits.

1 Moreover, within 30 minutes after the loss of a generation resource or
2 transmission or substation facility, FPL must replace this amount of
3 generation and posture the system for the next contingency, such that if it
4 were to occur, customers would continue to be served reliably. Additionally,
5 there are strict voltage limits at the Turkey Point Nuclear Switchyard that are
6 Nuclear Regulatory Commission requirements that must be adhered to on a
7 pre-contingency basis. The bottom line is that as the operator of one of the
8 largest electric systems in the U.S., comprised of one of the largest
9 metropolitan areas in the U.S., FPL must have the resources needed to be able
10 to reliably serve FPL's customers. This includes serving customers reliably
11 with the potential for multiple resources - generation, transmission, and
12 substation facilities - being unavailable on an unplanned and prolonged basis,
13 while always being ready to have any other generation resource or
14 transmission or substation facility trip out of service and continue to serve
15 customers reliably.

16
17 For example, in 2022 when the area reliability margin for the Southeastern
18 Florida region is projected to be 1,691 MW with all generation resources
19 (without DBEC Unit 7) and import capability available, if PE5 (with a
20 generation capacity of 1,237 MW) was to experience an unplanned outage
21 during peak load summer conditions, the real time area reliability margin for
22 this area would be 454 MW. A margin of 454 MW for the Southeastern
23 Florida region would entail operating the FPL system without sufficient load

1 serving capability to absorb the contingency of TP3, TP4, and/or TP5 also
2 failing, and potentially, depending on the specific system conditions, possibly
3 certain 500,000 volts equipment, also becoming unavailable. Multiple
4 variations of the scenario described above are possible, which is indicative of
5 the need for a more robust area reliability margin for the Southeastern Florida
6 region, which will be greatly assisted by DBEC Unit 7.

7 **Q. How will the area reliability margin change if the DBEC Unit 7 is not**
8 **placed in service as you move forward in time?**

9 A. By 2025, the area reliability margin for the Southeastern Florida region will
10 decrease to 1,282 MW as the load continues to increase. This amount of area
11 reliability margin is barely enough to cover the loss of PE5, let alone, any
12 multiple unit outages. Regardless of which of the units in the Southeastern
13 Florida region are unavailable, any multiple unit outages would result in FPL
14 being unable to supply the entire load required by customers. This does not
15 even account for the potential unavailability of transmission and/or substation
16 facilities. This 2025 scenario is not a good situation to be in operationally
17 because the risk of shedding firm load (*i.e.*, turning lights off) greatly
18 increases in a scenario where more than one event occurs due to the reduced
19 area reliability margin. I do not see where Dr. Hausman appreciates or
20 recognizes this risk.

21

22

23

1 **Q. Is it possible to have multiple units experience an unplanned outage at the**
2 **same time?**

3 A. Yes, absolutely. Not only is it possible, but unfortunately it sometimes occurs
4 at the most inopportune time. For example, during the cold weather condition
5 in the early morning hours in January, 2010, during which FPL's peak load
6 was more than 6,000 MW higher than forecasted, FPL experienced 1,980 MW
7 of unplanned generation outages. Additionally, just two hours after
8 experiencing that winter peak, a TP nuclear unit at full output of
9 approximately 750 MW experienced a sudden and unplanned outage that, if it
10 were to have occurred just 2-3 hours prior, FPL would have likely been
11 shedding firm customer load.

12 **Q. Please provide more details on the more extreme situations that you**
13 **previously mentioned?**

14 A. Extreme and unexpected situations such as wild fires and hurricanes can pose
15 a significant risk to serving customers in the Southeastern Florida region.
16 Such occurrences cannot be addressed with traditional planning reserve
17 margin calculations. On multiple occasions during my tenure leading System
18 Operations, wild fires have occurred in the vicinity of the corridors that
19 contain multiple transmission lines that bring power into this region. During
20 these situations, FPL must posture its system for the loss of one or more of
21 these multiple transmission facilities while continuing to serve its customers.
22 This includes operating at full output all available generation resources in the
23 Southeastern Florida region, such that if multiple transmission facilities trip

1 due to the wild fire resulting in reduced load serving capability, FPL would
2 reduce the chances of shedding firm customer load.

3
4 In fact, and as evidence of the criticality of this scenario, FPL's 2017 Annual
5 Capacity Dry Run held last month simulated a fire in one of the corridors
6 containing transmission lines that import power into the Southeastern Florida
7 region. In this particular scenario, because the time frame simulated was
8 during a high load period, the projected area reliability margin was
9 insufficient, and FPL would have needed to shed tens of thousands of firm
10 load customers for multiple hours to avoid a cascading instability situation or
11 blackout in the region. I note that this result was projected even with the full
12 884 MW capacity of Lauderdale Units 4 and 5 in-service. Undoubtedly, the
13 DBEC Unit 7 being brought in-service as soon as possible after the retirement
14 of Lauderdale 4 and 5 would mitigate much of the need to perform firm load
15 shedding in a future similar scenario and demonstrates that, all else being
16 equal, it is better to have generation resources in the region where
17 transmission import capability is heavily relied upon.

18
19 Hurricanes pose a similar threat to Southeastern Florida. For example, during
20 Hurricane Matthew last year, FPL prepared for a scenario in which that storm
21 would have impacted the area of Palm Beach County and northward. This
22 scenario would have left the Southeastern Florida region unscathed, but could
23 have resulted in damage to generation resources and transmission facilities

1 that contribute to the import of power into the Southeastern Florida region. In
2 such a scenario, having additional generation resources in Southeastern
3 Florida would obviously be advantageous in mitigating the risk.

4 **Q. Is there any other point you would like to discuss regarding the area**
5 **reliability margin?**

6 A. Yes. When DBEC Unit 7 comes on line, it improves the area reliability
7 margin for the Southeastern Florida region in two ways. Specifically, DBEC
8 Unit 7 provides an additional 1,563 MW of area reliability margin comprised
9 of 1,163 MW from the DBEC Unit 7 and approximately 400 MW more
10 import transfer capability. The 400 MW of import transfer capability results
11 from where and how the DBEC is connected to the FPL system and the
12 resulting impacts on power flows on the transmission and substation system.³
13 This increase in 2022, when the DBEC Unit 7 is placed in service, results in
14 an area reliability margin for the Southeastern Florida region of 3,254 MW.
15 This is the magnitude of area reliability margin that I consider sufficient for
16 one of the major metropolitan areas of the U.S.

17 **Q. Why are you concerned with Dr. Hausman's delay discussion on pp. 21-**
18 **23 of his testimony in this proceeding?**

19 A. Dr. Hausman implies that delaying the in-service date of the DBEC Unit 7 by
20 several years should be considered while keeping the 2018 retirement date as
21 planned for Lauderdale Units 4 and 5. I disagree. Delaying the in-service

³ The CSQ line will provide an increase in import capability into the Southeastern Florida region of approximately 1,200 MW assuming that either Lauderdale 4 & 5 or DBEC Unit 7 is in operation. With the retirement of the Lauderdale units, and no DBEC Unit 7, this increase in import capability is only about 800 MW. The import capability returns to 1,200 MW as soon as DBEC Unit 7 goes into service.

1 date of DBEC Unit 7 after retiring Lauderdale Units 4 and 5 would increase
2 operational and reliability risk to Southeast Florida at a time when we are
3 focused on reducing risk to the region. As I discuss above, it is imperative that
4 a robust area reliability margin be maintained for the Southeastern Florida
5 region. This region is one of the major metropolitan centers of the U.S. which
6 continues to grow at a relatively fast pace as seen by the sky line from
7 downtown Miami northward. Additionally, the delaying of the DBEC Unit 7
8 to after 2022 and, after retiring the 884 MW from the existing Lauderdale
9 Units in 2018, not only reduces the area reliability margin by the 884 MW that
10 would be unavailable from the existing Lauderdale generation resources, and
11 delays the additional 400 MW of transmission import capability that will
12 occur once DBEC Unit 7 goes in-service, but does so in the face of projected
13 load growth during the years 2023 to 2025 in the Southeastern Florida region.
14 This projected load growth further reduces the area reliability margin by 409
15 MW. As such, the sooner the DBEC Unit 7 project is placed in service the
16 less the risk there is to the Southeastern Florida region, especially in the latter
17 years. Combinations of the high loads during prolonged periods of the year,
18 unplanned generation, transmission, and/or substation outages, exacerbated by
19 any delay with the in service date of the DBEC Unit 7, will result in increased
20 operational challenges and risks to serving customers in the Southeastern
21 Florida region. Constructing DBEC Unit 7 as soon as practicable decreases
22 this risk to the Southeastern Florida region.

1 **Q. Dr. Hausman suggests that additional demand response (“DR”)**
2 **resources, at least in part, could be substituted for DBEC Unit 7. Please**
3 **discuss how you consider FPL’s residential and commercial/industrial**
4 **load management capabilities in Southeastern Florida region in your**
5 **analysis of the available area reliability margin.**

6 A. In the event that the area reliability margin for Southeastern Florida region is
7 exhausted, FPL would use its DR capabilities to reduce the load in this area.
8 It is important to note that DR is not utilized for economic purposes, but
9 solely for reliability as a resource when all other generation resources and
10 transmission imports have been exhausted. However, using DR for reliability
11 reasons is different than using operating generation for reliability reasons for
12 at least two reasons. First, the seriousness of using DR for reliability is
13 evidenced by the fact that NERC Reliability Standard EOP-002 requires that
14 in the event that FPL utilizes DR in such a context, it must declare itself to the
15 FRCC Reliability Coordinator an Energy Deficient Entity, and in turn, the
16 FRCC Reliability Coordinator would declare an Energy Emergency Alert
17 Level 2, the second highest of three levels. Such declarations must not be
18 taken lightly since they are indicative of serious operational reliability issues.
19 It is clearly within the realm of possibilities that repeated use of such
20 declarations would not be viewed favorably.

21
22 Second, there is the issue of how long FPL’s system operators may need relief
23 from extreme loads and/or problems with generation, transmission, and

1 substation facilities. In the January 2010 situation previously discussed, FPL
2 was operating all available generation, including its peaking units, around the
3 clock for approximately 24 hours. DBEC Unit 7 will be capable of operating
4 around the clock in such a circumstance. Conversely, as FPL witness Sim has
5 discussed with me previously, there is a risk of losing DR capability after DR
6 is operated repeatedly, and for multiple hours in each instance, due to
7 participating DR customers dropping out of the programs as a result of
8 experiencing the effects of their load being controlled repeatedly and for
9 prolonged periods of time.

10 **Q. Does the January 2010 situation offer other insight into Dr. Hausman's**
11 **preference for solar and storage instead of DBEC Unit 7?**

12 A. Yes. Of the resource options discussed in this docket, DBEC Unit 7 is
13 uniquely capable of: (i) providing capacity and energy at FPL's winter peak
14 hour of 6 AM to 7 AM, and (ii) operating continuously around the clock for
15 24 hours.

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

17 A. Yes.

1 BY MR. DONALDSON:

2 Q And am I correct, Mr. Sanchez, that you do not
3 have any exhibits attached to your rebuttal prefiled
4 testimony?

5 A That is correct.

6 Q All right. Would you please provide a summary
7 of your rebuttal prefiled testimony to the Commission.

8 A Yes, I will.

9 Good afternoon, Chairman Graham and
10 Commissioners. My name is Hector Sanchez. I am -- I am
11 the director of system operations for Florida Power &
12 Light, one of the major utilities in the United States.
13 I am responsible for the real-time operations of the FPL
14 system.

15 I also serve as Florida Reliability
16 Coordinating Council, or typically referred to as the
17 FRCC, reliability coordinator in an agent capacity for
18 the FRCC. The FRCC is one of the eight regions in the
19 United States under the jurisdiction of the North
20 American Reliability Corporation, typically referred to
21 as the -- as NERC, or N-E-R-C, for reliable operations
22 of the bulk electric system.

23 The real-time operation of the FPL system
24 requires coordination of the operations, planning, and
25 minute-to-minute real-time dispatching of FPL's

1 generation, transmission, substation facilities from
2 FPL's system-control centers to serve over 4.9 million
3 FPL customers.

4 As the FRCC reliability coordinator, I ensure
5 the reliable operations of over 50 utilities in the
6 FRCC, as well as the coordinated operations with other
7 regions, including the Southeast Electric Reliability
8 Council, to which the FRCC connects to. My team and I
9 have the privilege of having the job to keep the lights
10 on in Florida.

11 I have been in my current role as director of
12 system operations for over seven years and, as of two
13 weeks ago, celebrated 32 years of my career with FPL.
14 In addition to my formal education and continuing
15 education, during the course of my career, during these
16 32 years, I have done just about everything you can do
17 in my field and have learned much in the process.

18 Altogether, this experience situates me in a
19 position to provide guidance as to how FPL plans to
20 serve its customers since I must then operate what is
21 planned, and manage operational reliability risks for
22 over 4.9 million customers.

23 I am here today to refute Witness Hausman's
24 assertion regarding the four-year delay and support,
25 from an operational perspective, the decision to

1 modernize the existing Fort Lauderdale plant, with the
2 construction of the Dania Beach Energy Center as soon as
3 practical.

4 The southeastern-Florida region -- one of the
5 largest metropolitan areas in the United States, with a
6 load that is almost as large as that of New -- of the
7 New York City area, is an area where a regional
8 imbalance is being enhanced by implementation of this
9 project, in short order.

10 Unlike other regions in the United States,
11 Florida is a peninsula, with the southeastern region of
12 Florida being at the end of that peninsula. Florida,
13 and especially the southeastern region, doesn't have the
14 benefit of multiple transmission connections to other
15 parts of the country as others -- areas do to provide
16 energy assistance during times of need.

17 This unique geography of the southeastern-
18 Florida region peninsula with one of the largest
19 metropolitan areas in the United States, at the end of a
20 300-mile peninsula, make it a very-challenging area to
21 provide reliable service.

22 During FPL's proposed four-year construction
23 period of time between 2018 and 2022, prior to the Dania
24 Beach Energy Center being placed in service, the
25 Corbett-Sugar-Quarry line provides for a limited amount

1 of time to import additional power to the southeastern-
2 Florida region to bridge the retirement of Lauderdale
3 and the construction of the Dania Beach Energy Center,
4 even as the load in southeast Florida continues to
5 increase.

6 Delaying the in-service date beyond 2022 of
7 the Dania Beach Energy Center increases the risk of a
8 reliability issue in the southeast-Florida area,
9 specifically the ability to serve customers.

10 The risk that I refer to includes many
11 possibilities such as unplanned generation and/or
12 transmission issues, or extreme events such as wildfires
13 and hurricanes. All of these types of events have
14 occurred in the past.

15 The Dania Beach Energy Center is unique in
16 that it enhances the ability to address these risks by
17 providing an operational tool to manage the type of
18 events that occur on the system.

19 Based on the retirement date of 2018, it is
20 imperative that the Dania Beach Energy Center go in
21 service by 2022 to mitigate the risk to the
22 southeastern-Florida region.

23 The Dania Beach Energy Center is an investment
24 that will provide operational benefits to the
25 southeastern-Florida region -- one of the largest

1 metropolitan areas in the -- in the United States -- the
2 level of robust reliability that it merits for many
3 years to come after 2022.

4 Thank you.

5 CHAIRMAN GRAHAM: Thank you, sir.

6 MR. DONALDSON: Thank you, Mr. Sanchez.

7 I tender the witness for cross.

8 CHAIRMAN GRAHAM: Sierra Club?

9 MR. LENOFF: Thank you, Mr. Chairman.

10 EXAMINATION

11 BY MR. LENOFF:

12 Q Mr. Sanchez, this will not be the first time
13 that you've given a statement about this proceeding,
14 correct?

15 A That's correct.

16 Q You -- your deposition was taken on
17 January 8th, 2018?

18 A Yes, it has.

19 Q And you're also aware that Dr. Sim has been
20 deposed for this proceeding, correct?

21 A Yes, I am.

22 Q And -- but you are not familiar with the
23 statutory factors for a need determination that are set
24 out in Section 403.519, Florida Statutes; is that
25 correct?

1 A That is correct.

2 Q Nor are you familiar with the order
3 **establishing issues for this docket; isn't that correct?**

4 A That is correct.

5 Q And you were not familiar with the order
6 **establishing procedure during your deposition on**
7 **January 8th.**

8 A That is correct.

9 Q And regarding the subjects on which you
10 **testify in this proceeding, you have never authored or**
11 **co-authored any publication in a peer-reviewed journal.**

12 A That is correct.

13 Q And you've never testified against the need
14 **for generation proposed by FPL?**

15 A I have never testified against the need of --
16 by -- proposed by FPL.

17 Q Nor have you testified against the need for
18 **generation proposed by any utility.**

19 A No, I have not.

20 Q And you are familiar with -- or you have a
21 **familiarity with solar PV resources, yes?**

22 A Yes, I am.

23 Q And you've never testified that there is an
24 **affirmative need for solar resources; is that correct?**

25 A That is correct.

1 Q And in fact, for this docket, you never
2 considered the potential to increase the generation
3 within southeast Florida using solar PV resources; is
4 that correct?

5 A That is correct.

6 Q Nor did you consider for this docket the
7 reliability functions of additional or existing energy
8 efficiency in southeast Florida; is that correct?

9 A That is correct.

10 Q And the only resource you considered for this
11 docket is the Dania Beach Energy Center, correct?

12 A I wouldn't say that. My job is to consider
13 the resources. I'm here to testify why it's important
14 to get the Dania Beach Energy Center --

15 Q It --

16 A -- online by 2022, not to determine which
17 resources should be included.

18 Q So, as part of your analysis, the only -- or
19 in your analysis, the only resource that you considered
20 was the Dania Beach Energy Center? Is --

21 A The only energy resource at issue for me to
22 consider was the Dania Beach Energy Center.

23 Q So, the answer to my question is yes; is that
24 correct?

25 A I guess I don't understand your question.

1 Q In your analysis, you considered a -- a
2 **generation resource; is that correct?**

3 A In my analysis, I considered the effect of
4 Dania Beach Energy Center -- of whether it would come in
5 in 2022 or at a later date.

6 Q **Did you consider any other resources?**

7 A No. I was not asked to consider any other
8 resource.

9 Q **And it would have been FPL that would have
10 asked you to consider other resources?**

11 A That is correct.

12 Q **Okay. And just so we're clear on some terms,
13 when I refer to southeast Florida, I'm using that term
14 in the same way that it's used in your testimony; and
15 that is to refer to Miami-Dade and Broward County.
16 Okay?**

17 A That's correct.

18 Q **And when I say, DBEC, I'm referring to the
19 Dania Beach Energy Center that FPL proposes to place in
20 service. Okay?**

21 A Understood.

22 Q **And did the data used for your analysis come
23 from FPL's legal counsel?**

24 A I'm sorry. If you could, repeat the question,
25 please.

1 Q Did the data used for your analysis come from
2 FPL's legal counsel?

3 A No, it did not.

4 MR. LENOFF: So, I would like to use an
5 exhibit, please.

6 Mr. Chairman, can I mark this exhibit for
7 identification as, I believe, No. 68?

8 CHAIRMAN GRAHAM: Yes, that's correct.

9 MR. LENOFF: Thank you.

10 THE WITNESS: Thank you.

11 CHAIRMAN GRAHAM: The title of this would be
12 Florida Power & Light's response to Sierra Club's
13 Interrogatory No. 60.

14 MR. LENOFF: I think -- could we say
15 Attachment 1 of FPL's response to Sierra --

16 CHAIRMAN GRAHAM: Sounds good. We'll add
17 that.

18 MR. LENOFF: Thank you, Mr. Chairman.

19 (Whereupon, Exhibit No. 68 was marked for
20 identification.)

21 (Transcript continues in sequence in Volume
22 3.)

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CERTIFICATE OF REPORTER

STATE OF FLORIDA)
COUNTY OF LEON)

I, ANDREA KOMARIDIS, Court Reporter, do hereby
certify that the foregoing proceeding was heard at the
time and place herein stated.

IT IS FURTHER CERTIFIED that I
stenographically reported the said proceedings; that the
same has been transcribed under my direct supervision;
and that this transcript constitutes a true
transcription of my notes of said proceedings.

I FURTHER CERTIFY that I am not a relative,
employee, attorney or counsel of any of the parties, nor
am I a relative or employee of any of the parties'
attorney or counsel connected with the action, nor am I
financially interested in the action.

DATED THIS 22nd day of January, 2018.



ANDREA KOMARIDIS
NOTARY PUBLIC
COMMISSION #GG060963
EXPIRES February 9, 2021