

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

**DOCKET NO. 150009-EI  
FLORIDA POWER & LIGHT COMPANY**

**MAY 1, 2015**

**IN RE: NUCLEAR POWER PLANT COST RECOVERY  
FOR THE YEAR ENDING  
DECEMBER 2016**

**TESTIMONY & EXHIBITS OF:**

**RICHARD O. BROWN**

1                                   **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2                                   **FLORIDA POWER & LIGHT COMPANY**

3                                   **DIRECT TESTIMONY OF RICHARD O. BROWN**

4                                   **DOCKET NO. 150009-EI**

5                                   **May 1, 2015**

6  
7           **Q.     Please state your name and business addresses.**

8           A.     My name is Richard O. Brown, and my business address is 9250 West Flagler  
9                   Street, Miami, Florida 33174.

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

11          A.     I am employed by Florida Power & Light Company (FPL) as a Principal  
12                 Engineer in the Resource Assessment & Planning Department.

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

14          A.     My duties and responsibilities include performing a variety of analyses  
15                 associated with determining the timing and magnitude of resources needed for  
16                 FPL to maintain reliable electric service to its customers, then conducting  
17                 economic and non-economic analyses to determine what the integrated  
18                 resource plan is that will best meet those resource needs.

19          **Q.     Please describe your education and professional experience.**

20          A.     I graduated from the University of Miami (Florida) with a Bachelor of Science  
21                 degree in Mechanical Engineering in 1999. I have worked on various projects  
22                 such as demand side management (DSM) programs, new gas-fired generation  
23                 alternatives, upgrades to FPL's existing nuclear power plants (FPL's Extended

1 Power Uprate), and various analyses involving system reliability issues. Most  
2 relevant to this docket, I have performed the economic analysis portion of the  
3 annual Turkey Point 6 & 7 feasibility analyses since 2011.

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

5 A. The purpose of my testimony is to present the results of FPL's 2015 economic  
6 analyses for the new FPL nuclear units, Turkey Point 6 & 7, which analyzed  
7 14 different future fuel cost and environmental compliance cost scenarios.  
8 Non-economic analyses of Turkey Point 6 & 7 were also performed. The  
9 results of these analyses support the continued development of Turkey Point 6  
10 & 7.

11  
12 I briefly discuss FPL's portfolio approach in resource planning and the role of  
13 additional nuclear energy in that portfolio approach. I discuss the assumptions  
14 used in the 2015 feasibility analyses. I also present the results of additional  
15 analyses that further quantify the projected benefits of the Turkey Point 6 & 7  
16 project.

17  
18 The 2015 feasibility analyses of the Turkey Point 6 & 7 project are presented  
19 to satisfy the requirement of Subsection 6(c)5 of the Florida Administrative  
20 Code Rule 25-6.0423, Nuclear Power Plant Cost Recovery, which states  
21 *"Along with the filings required by this paragraph, each year a utility shall*  
22 *submit for Commission review and approval a detailed analysis of the long-*  
23 *term feasibility of completing the power plant."* Other feasibility-related

1 topics for the Turkey Point 6 & 7 project are discussed by FPL Witness  
2 Scroggs.

3 **Q. Please summarize your testimony.**

4 A. In 2015, FPL performed new feasibility analyses using updated assumptions  
5 and forecasts. Each year's analysis is a snapshot of various assumptions such  
6 as load forecast, fuel cost forecast, environmental compliance cost forecast,  
7 operating life of Turkey Point 6 & 7, etc. The feasibility analyses utilized 3  
8 fuel cost forecasts, 3 environmental compliance cost forecasts, and two  
9 different operating lives for the proposed units. In total, 14 scenarios were  
10 analyzed. The results of FPL's 2015 feasibility analyses indicate that  
11 completing the project is projected to be clearly economic for FPL's  
12 customers in 8 of these 14 scenarios because the projected breakeven capital  
13 costs for the two new nuclear units were above the high end of FPL's non-  
14 binding capital cost estimate range. In each of the remaining 6 scenarios, the  
15 breakeven capital costs fell within the range of the non-binding capital cost  
16 estimate.

17  
18 The results of the 2015 feasibility analyses are summarized in Exhibit ROB-1.  
19 This exhibit presents a number of results from FPL's 2015 analyses of the  
20 Turkey Point 6 & 7 project including, but not limited to: (i) the number of  
21 future fuel cost and environmental compliance cost scenarios in which the  
22 project is projected to be clearly economic; (ii) projected fuel cost savings for  
23 FPL's customers; (iii) reduced reliance upon fossil fuels (i.e., fuel diversity);

1 and (iv) projected carbon dioxide (CO<sub>2</sub>) reductions. These results, and results  
2 of other analyses and calculations, are discussed later in my testimony.

3  
4 These results, whether examined individually or as a whole, present a strong  
5 case for continuing the Turkey Point 6 & 7 project. In all scenarios, the  
6 proposed new units greatly reduce fuel costs and reduce emissions. For  
7 example, based on the Medium Fuel Cost forecast, customers are projected to  
8 save at least \$47 billion (nominal) in fuel costs over the life of Turkey Point 6  
9 & 7. Additionally, the project will produce energy that otherwise would have  
10 required the consumption of substantial amounts of natural gas or millions of  
11 barrels of oil annually, and will reduce system CO<sub>2</sub> emissions by millions of  
12 tons. In short, completing the Turkey Point 6 & 7 project continues to be  
13 projected as a valuable resource addition for FPL's customers as part of FPL's  
14 portfolio approach to resource planning.

15 **Q. Would you please briefly explain what you mean by FPL's portfolio**  
16 **approach to resource planning and what part additional nuclear capacity**  
17 **such as Turkey Point 6 & 7 plays in that portfolio approach?**

18 A. Yes. As with all economic analyses, FPL's 2015 economic analyses of the  
19 Turkey Point 6 & 7 project provides a "snapshot" of the projected customer  
20 benefits associated with Turkey Point 6 & 7 based on current project  
21 assumptions, forecasts of numerous costs, and resource planning assumptions.  
22 The 2015 feasibility analyses examine potential future scenarios that result  
23 from combining various fossil fuel price forecasts, environmental compliance

1 cost forecasts, and operating lives. The actual economic performance of  
2 FPL's system, including the impacts of future fuel prices, etc., cannot be  
3 known until after the fact. That is why FPL examines the projected impacts of  
4 certain resource additions, such as new nuclear capacity, over a wide range of  
5 potential future scenarios.

6  
7 The inability to be able to predict with confidence future fuel and  
8 environmental compliance costs is a key reason why FPL not only performs  
9 these analyses based on multiple forecasts and scenarios, but also why FPL  
10 strives for diversity in regard to system resources and fuels in its portfolio  
11 approach to resource planning. Because the price of nuclear fuel is unrelated  
12 to fossil fuel prices, and because nuclear power plants produce no emissions  
13 such as sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), or carbon dioxide (CO<sub>2</sub>)  
14 in the process of generating electricity, additional nuclear capacity is a great  
15 hedge against fossil fuel price volatility and increases in environmental  
16 compliance costs. Diversification also improves system reliability.

17  
18 The current low cost of natural gas is a great thing for FPL's customers  
19 because it allows FPL to produce electricity with relatively low fuel costs.  
20 The current forecasted low cost of natural gas is also a primary reason that  
21 highly efficient gas-fired combined cycle (CC) units have been determined to  
22 be the most economic type of fossil fueled generation resource for FPL's  
23 system when FPL has needed to add new generation resources. As a result of

1           these factors, FPL has been increasing its use of natural gas to benefit its  
2           customers and now supplies approximately 2/3 of the total electricity it  
3           provides to customers by burning natural gas.

4  
5           However, this increased use of natural gas also represents a growing reliance  
6           on natural gas. In turn, this growing reliance on natural gas results in  
7           increased risk in regard to potential future changes in natural gas cost and  
8           availability.

9  
10          Consequently, FPL's resource planning takes a balanced portfolio approach to  
11          maximize the benefits to customers of using currently low cost natural gas  
12          while also taking steps to minimize the risks inherent in having a high reliance  
13          on natural gas. Among the steps being taken to minimize this risk are: (i)  
14          utilizing high-efficiency CC generating units, which burn natural gas as  
15          efficiently as possible, when FPL's resource needs dictate that new generating  
16          units should be added and a CC unit is projected to be the cost effective  
17          option; (ii) enhancing the availability of natural gas by the construction of a  
18          third natural gas pipeline into Florida (which may also put downward pressure  
19          on delivered natural gas prices); (iii) maintaining the ability to continue to  
20          burn fuel oil in existing steam generating units by installing electrostatic  
21          precipitators at these units; (iv) diversifying FPL's fuel mix by adding  
22          renewable energy in specific cases in which renewables are cost-competitive

1 and (v) significantly diversifying FPL's fuel mix by adding additional nuclear  
2 capacity through the Turkey Point 6 & 7 project.

3  
4 Additional nuclear capacity is an important aspect of this balanced portfolio  
5 approach because it is the only resource option available that can provide  
6 baseload, firm capacity at even lower fuel costs than natural gas and which  
7 does so using no fossil fuels and producing zero air emissions. Because of  
8 these attributes, nuclear capacity serves as an excellent hedge against  
9 increasing natural gas costs and increasing environmental compliance costs as  
10 previously mentioned. These hedge aspects of nuclear capacity are especially  
11 valuable in a balanced portfolio approach to serving FPL's customers both  
12 today and in the future.

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

14 **A.** Yes. I am sponsoring the following 6 exhibits:

- 15 - Exhibit ROB-1: Summary of Results from FPL's 2015 Feasibility  
16 Analyses of the Turkey Point 6 & 7 Project (Plus Results from  
17 Additional Analyses);
- 18 - Exhibit ROB-2: Comparison of Key Assumptions Utilized in the 2014  
19 and 2015 Feasibility Analyses of the Turkey Point 6 & 7 Project;
- 20 - Exhibit ROB-3: Projection of FPL's Resource Needs Through 2030;
- 21 - Exhibit ROB-4: The Two Resource Plans Utilized in FPL's 2015  
22 Feasibility Analyses of the Turkey Point 6 & 7 Project;



- 1 - Exhibit ROB-5: 2015 Feasibility Analyses Results for the Turkey  
2 Point 6 & 7 Project: Case #1 Analysis – 40-Year Operating Life; Total  
3 Costs, Total Cost Differentials, and Breakeven Costs for All Fuel and  
4 Environmental Compliance Cost Scenarios in 2015\$ (millions,  
5 CPVRR, 2015-2068); and,  
6 - Exhibit ROB-6: 2015 Feasibility Analyses Results for the Turkey  
7 Point 6 & 7 Project: Case #2 Analysis – 60-Year Operating Life; Total  
8 Costs, Total Cost Differentials, and Breakeven Costs for All Fuel and  
9 Environmental Compliance Cost Scenarios in 2015\$ (millions,  
10 CPVRR, 2015-2088).

11

12 **I. 2015 Feasibility Analyses – Analytical Approach**

13

14 **Q. Please provide an overview of the basic analytical approach used for**  
15 **evaluating the Turkey Point 6 & 7 project.**

16 A. The basic analytical approach in the feasibility analyses of Turkey Point 6 & 7  
17 is to compare competing resource plans. FPL utilizes resource plans in its  
18 analyses in order to ensure that all relevant impacts to the FPL system are  
19 accounted for.

20

21 The analysis of each resource plan is a complex undertaking. For each  
22 resource plan, annual projections of system fuel costs and emission profiles  
23 are developed for various scenarios of fuel cost/environmental compliance

1 costs using a sophisticated production costing model. This model, the  
2 UPLAN model, simulates the FPL system and dispatches all of the generating  
3 units on an annual, monthly, and hour-by-hour basis. The resulting fuel cost  
4 and emission profile information is then combined with projected annual  
5 capital costs, plus other fixed and variable costs for each resource plan. In this  
6 way, a comprehensive set of projected annual costs, for each year of the  
7 analysis, is developed for each resource plan.

8  
9 One resource plan includes the Turkey Point 6 & 7 units. The other resource  
10 plan includes an alternate resource option that competes with these two  
11 nuclear units. The competing alternate resource option is a new highly fuel-  
12 efficient CC generating capacity similar to the CC capacity that has recently  
13 been installed at FPL's Cape Canaveral and Riviera Beach sites, and which is  
14 currently being installed at FPL's Port Everglades site, through FPL's  
15 modernization projects at these sites.

16  
17 The competing resource plans are then analyzed over a multi-year period.  
18 This approach allows FPL's analyses to account for long-term economic  
19 impacts of the resource options being evaluated. FPL's 2015 feasibility  
20 analyses address these economic impacts. In addition, my testimony provides  
21 a discussion of three non-economic impacts to the FPL system: reduction of  
22 fossil fuel usage, increased system fuel diversity, and system emission  
23 reductions, which will result from the Turkey Point 6 & 7 project.

1       **Q.    Has the Florida Public Service Commission (FPSC) provided guidance**  
2       **regarding what is required in the feasibility analyses?**

3       A.    Yes.  The FPSC first provided guidance in its affirmative determination of  
4       need order for Turkey Point 6 & 7 (Order No.  PSC-08-0237-FOF-EI, page  
5       29), when it stated:

6                       *“FPL shall provide a long-term feasibility analysis as part of its*  
7                       *annual cost recovery process which, in this case, shall also include*  
8                       *updated fuel costs, environmental forecasts, break-even costs, and*  
9                       *capital cost estimates.  In addition, FPL should account for sunk costs.*  
10                      *Providing this information on an annual basis will allow us to monitor*  
11                      *the feasibility regarding the continued construction of Turkey Point*  
12                      *6 and 7.”*

13  
14       In the FPSC’s 2009 Nuclear Cost Recovery (NCR) order (Order No. PSC-09-  
15       0783-FOF-EI, page 14), the FPSC quoted its need determination order and  
16       reiterated that these elements are necessary to satisfy the NCR Rule.

17  
18       This guidance from the FPSC distinguishes “sunk costs” from “updated  
19       capital cost estimates” in regard to feasibility analyses of nuclear projects.  
20       Consequently, FPL has removed sunk costs in its calculation of breakeven  
21       costs for the feasibility analyses of Turkey Point 6 & 7.  FPL’s approach to  
22       sunk costs complies with the above mentioned Rule, which directs FPL to  
23       evaluate “completing” the project.  FPL’s approach to sunk costs also follows

1 the guidance provided by the FPSC, and was expressly approved for the  
2 Turkey Point 6 & 7 analyses by the FPSC in its 2011 NCR order (Order No.  
3 PSC-11-0547-FOF-EI, pages 17-18 and 38).

4 **Q. Was the analytical approach used in FPL's 2015 feasibility analyses of**  
5 **Turkey Point 6 & 7 similar to the approach used in the Determination of**  
6 **Need filing for this project, and in the feasibility analyses of this project**  
7 **that were presented in previous NCR filings?**

8 A. Yes. The analytical approach that was used in the 2015 feasibility analyses  
9 for the Turkey Point 6 & 7 project is very similar to the approach used in the  
10 2007 Determination of Need filing and in the annual feasibility analyses  
11 presented in the 2008 through 2014 NCR filings.

12 **Q. Please describe the economic perspective used in the analytical approach**  
13 **for the Turkey Point 6 & 7 project.**

14 A. This perspective is the calculation of breakeven capital costs, in terms of both  
15 cumulative present value of revenue requirements (CPVRR) and overnight  
16 construction costs in \$/kW, for the new nuclear units. This same perspective  
17 was utilized in the 2007 Determination of Need filing, and in the 2008 through  
18 2014 NCR filings, for the Turkey Point 6 & 7 project. In later years, as more  
19 information becomes available regarding the cost and other aspects of the new  
20 nuclear units, another perspective may emerge as more appropriate.

21  
22  
23

1                   **II. 2015 Feasibility Analyses – Updated Assumptions**

2

3           **Q. Do FPL’s 2015 feasibility analyses utilize updated assumptions for the**  
4           **specific information referred to in the previously mentioned FPSC**  
5           **Order?**

6           A. Yes. FPL typically seeks to utilize a set of updated assumptions in its  
7           resource planning work. FPL updated these assumptions in late 2014/early  
8           2015 and is using them in its 2015 resource planning work including the  
9           nuclear analyses presented in this docket.

10

11           Five informational items were listed in Order No. PSC-08-0237 that should be  
12           updated and included in FPL’s annual long-term feasibility analyses of Turkey  
13           Point 6 & 7. These five items are:

- 14                   1) fuel forecasts;
- 15                   2) environmental compliance cost forecasts;
- 16                   3) breakeven costs;
- 17                   4) capital cost estimates; and,
- 18                   5) sunk costs.

19

20           FPL’s 2015 feasibility analyses for the Turkey Point 6 & 7 project included  
21           current assumptions for items 1), 2), 4), and 5). The remaining item, item 3)  
22           breakeven costs, is a result of the analyses (as opposed to an assumption).  
23           The results of FPL’s 2015 feasibility analyses present updated breakeven costs

1 for the Turkey Point 6 & 7 project in terms of CPVRR costs and in terms of  
2 overnight construction costs in \$/kW.

3 **Q. Do FPL's feasibility analyses include FPL's updated assumptions for**  
4 **information other than these 5 items?**

5 A. Yes. FPL also updated a number of other assumptions in late 2014/early 2015  
6 in preparation for all of its 2015 resource planning work. Consequently, these  
7 other updated assumptions are also included in FPL's 2015 feasibility  
8 analyses of the Turkey Point 6 & 7 project. A partial listing of these other  
9 assumptions include: FPL's load forecast and cost and performance  
10 assumptions for new CC capacity.

11 **Q. Please discuss any changes in the forecasted values for fuel costs and**  
12 **environmental compliance costs between the forecasts utilized in the 2015**  
13 **feasibility analyses and those that were used in the 2014 feasibility**  
14 **analyses.**

15 A. Exhibit ROB-2 provides these comparisons. Exhibit ROB-2, Page 1 of 4,  
16 provides 2014 and 2015 forecasted Medium Fuel Cost values for selected  
17 years for natural gas, oil, and nuclear fuel costs. As shown on this page, the  
18 2015 Medium Fuel Cost forecast for natural gas is lower than the respective  
19 2014 forecast throughout all years. The 2015 forecast for 1% sulfur oil is  
20 higher than the respective 2014 forecast throughout all years. In regard to  
21 forecasted nuclear fuel costs, the 2015 forecasted prices are slightly lower in  
22 most years than the 2014 forecasted prices.

23

1 Exhibit ROB-2, Page 2 of 4, presents similar 2014 and 2015 comparative  
2 information for forecasted Env II (i.e., mid-band) environmental compliance  
3 costs for three types of air emissions: SO<sub>2</sub>, NO<sub>x</sub>, and CO<sub>2</sub>. As shown on this  
4 page, the SO<sub>2</sub> and NO<sub>x</sub> air emissions have been updated from what was  
5 assumed in FPL's 2014 feasibility analyses, based on the most current market  
6 and price projections. The cost of CO<sub>2</sub> air emissions has also been updated.  
7 The Env II CO<sub>2</sub> forecast is essentially the same as the previously used forecast  
8 in the 2014 feasibility analysis, with the exception that CO<sub>2</sub> prices are now  
9 assumed to start in 2020 instead of 2023, consistent with EPA's proposed  
10 Clean Power Plan (CPP). The low and high band forecasts (Env I and Env III,  
11 respectively) of CO<sub>2</sub> prices have also been updated accordingly.

12 **Q. Are any of the fuel cost forecasts or environmental compliance cost**  
13 **forecasts considered the “most likely” forecast?**

14 A. FPL does not consider any fuel cost forecast or environmental compliance  
15 cost forecast as the “most likely” cost forecast. FPL's scenario approach is  
16 designed to provide a range of possible future fuel and environmental  
17 compliance costs.

18 **Q. Did FPL consider the EPA's proposed CPP regulations in its 2015**  
19 **feasibility analyses?**

20 A. Yes. However, at the time the feasibility analyses were performed only  
21 proposed rules existed. Final rules are due later this year and Florida's state  
22 implementation plan is not scheduled to be complete until 2016. Due to this  
23 uncertainty, FPL decided to continue using its previous CO<sub>2</sub> cost forecast with

1 costs advanced to begin in 2020, which coincides with the year of the first  
2 CO<sub>2</sub> emission rate target in the proposed CPP regulation.

3 **Q. Please discuss FPL's 2015 load forecast and how it compares to FPL's**  
4 **2014 load forecast.**

5 A. Exhibit ROB-2, Page 3 of 4, presents the 2014 and 2015 summer peak load  
6 forecasts. As shown in Column (3) on this page, the 2015 forecast of summer  
7 peak load is generally lower than the 2014 forecast. In addition, this page also  
8 provides a projection of the annual and cumulative growth in summer peak  
9 loads associated with the 2015 peak load forecast. As shown in column (5) of  
10 this exhibit, FPL projects a cumulative growth in summer peak load of  
11 approximately 5,166 MW by 2027 which increases to 7,041 MW by the year  
12 2030.

13 **Q. Based on this projected growth in summer peak load, what is FPL's**  
14 **projected need for new resources?**

15 A. FPL's projected need for new resources, assuming that the resource need is  
16 met by new generating capacity, is presented in Exhibit ROB-3. This exhibit  
17 shows that, without the incremental capacity from Turkey Point 6 & 7 and  
18 with no other generating additions from 2027- on, FPL has a need for new  
19 resources starting in 2027 and this need increases every year thereafter. As  
20 shown in Column 12, the projected resource need in 2027 is 536 MW of new  
21 generating capacity and this projected resource need increases to 2,598 MW  
22 by 2030.



1       **Q.    What other assumptions changed from the 2014 analyses to the 2015**  
2       **analyses?**

3       A.    Exhibit ROB-2, Page 4 of 4, presents the 2014 and 2015 projections for 9  
4       other assumptions that were utilized in the feasibility analyses of the Turkey  
5       Point 6 & 7 project.

6       **Q.    Please discuss the first four assumptions.**

7       A.    These four assumptions are:

- 8               1)    financial/economic assumptions;
- 9               2)    the projected capital cost of competing CC capacity;
- 10              3)    the projected heat rate of competing CC capacity; and,
- 11              4)    the projected cost of firm gas transportation.

12

13       FPL's financial/economic assumptions used in the 2015 feasibility analyses  
14       have changed only in regard to the cost of debt and the discount rate from  
15       those used in the 2014 feasibility analyses. The financial/economic  
16       assumptions include the following: return on equity (ROE) is 10.5%, the cost  
17       of debt is 5.05%, the debt-to-equity ratio is 40.38%/59.62%, and the  
18       associated discount rate is 7.51%.

19

20       The remaining three assumptions involve the costs and performance of the  
21       competing new CC capacity used in the feasibility analyses. FPL's current  
22       projected (generator only) capital cost of the un-sited CC capacity is \$842/kW  
23       in 2027\$. The current projected heat rate of this CC capacity is 6,307

1           BTU/kWh. The projected firm gas transportation cost is \$1.37/mmBTU for  
2           the year 2027.

3           **Q. Please discuss the remaining five assumptions.**

4           A. These five assumptions are:

- 5                     5) assumed in-service dates for Turkey Point 6 & 7;
- 6                     6) assumed operating lives of Turkey Point 6 & 7;
- 7                     7) non-binding capital cost estimate for the new nuclear units;
- 8                     8) previously spent capital costs that are excluded from the 2015
- 9                             feasibility analyses; and,
- 10                    9) the cumulative annual capital expenditure percentages for Turkey
- 11                             Point 6 & 7.

12

13           The first of these five assumptions, the in-service dates of Turkey Point 6 & 7  
14           utilized in the 2015 feasibility analyses are changed from 2022 and 2023 to  
15           2027 and 2028. These dates represent the earliest practical deployment date  
16           for Turkey Point 6 & 7. FPL Witness Scroggs' direct testimony filed on  
17           March 1, 2015 addressed these new dates for Turkey Point 6 & 7.

18

19           The second of these assumptions is the assumed operating lives of the two  
20           new nuclear units. In its 2015 feasibility analyses, FPL again is using two  
21           operating life assumptions: a 40-year operating life and a 60-year operating  
22           life.

23

1 Two of FPL's four existing nuclear units, Turkey Point 3 & 4, have been  
2 operating for more than 40 years. Furthermore, all four of FPL's nuclear units  
3 have received a license extension from the Nuclear Regulatory Commission  
4 (NRC) enabling each unit to operate for a total of 60 years. In addition, FPL's  
5 parent company, NextEra Energy (NEE), owns and operates two other nuclear  
6 units, Point Beach 1 & 2, that have operated for more than 40 years. These  
7 two nuclear units, plus a third nuclear unit owned and operated by NEE  
8 (Duane Arnold), have also been granted a license extension from the NRC  
9 enabling each unit to operate for a total of 60 years. Therefore, FPL believes  
10 that a 40-year operating life assumption for Turkey Point 6 & 7 is increasingly  
11 conservative and therefore also uses an assumption of a 60-year operating life  
12 in the feasibility analyses. This is the same approach FPL utilized in last  
13 year's feasibility analyses.

14  
15 The third of these assumptions is the non-binding cost estimate for  
16 constructing Turkey Point 6 & 7. The range of costs used in the 2015  
17 feasibility analyses is \$3,844/kW to \$5,589/kW in 2015\$. This reflects an  
18 updating of the projected cost estimate range. FPL Witness Scroggs' direct  
19 testimony discusses the updating of this assumption.

20  
21 The fourth of these assumptions is the previously spent capital costs that are  
22 excluded in the 2015 feasibility analysis. In order to account for "sunk"  
23 capital costs for the Turkey Point 6 & 7 project, FPL is excluding

1 approximately \$254 million of sunk costs that have already been spent  
2 through December 31, 2014. FPL Witness Grant-Keene provides the sunk  
3 cost value of the Turkey Point 6 & 7 project in her direct testimony.

4  
5 The fifth assumption is the cumulative annual capital expenditure percentages  
6 for the construction of Turkey Point 6 & 7. These annual percentages  
7 represent the cumulative of the total nominal cost of the two units. The  
8 annual cumulative expenditure percentage values used in the 2015 feasibility  
9 analyses are different from the values used in the 2014 feasibility analyses due  
10 to the change of the in-service dates of the units.

11 **Q. It is clear that a number of changes in assumptions were made between**  
12 **those used in the 2014 feasibility analyses and those used in the 2015**  
13 **feasibility analyses. Were all of these assumption changes favorable to the**  
14 **projected economics of the Turkey Point 6 & 7 project?**

15 A. No. Assumption changes are made on a regular basis by FPL in order to  
16 utilize the best and most current information available in its resource planning  
17 analyses. Typically, updates to some assumptions are favorable, and changes  
18 to other assumptions are unfavorable, for any specific resource option or  
19 project.

20  
21 This was indeed the case for the Turkey Point 6 & 7 project in regard to the  
22 changes in assumptions from those used in the 2014 feasibility analyses to  
23 those used in the 2015 feasibility analyses. For the Turkey Point 6 & 7

1 project, some updated assumptions, such as the lower natural gas cost  
2 forecasts, are unfavorable for the project (although favorable overall for FPL's  
3 customers).

4  
5 All of FPL's updated assumptions, whether favorable or unfavorable for the  
6 Turkey Point 6 & 7 project, were included in FPL's 2015 feasibility analyses  
7 of the project.

### 8 9 **III. Analysis of the Turkey Point 6 & 7 Project**

10  
11 **Q. What resource plans were used to perform the 2015 feasibility analyses of**  
12 **Turkey Point 6 & 7?**

13 A. The resource plans that were utilized in the 2015 feasibility analyses of  
14 Turkey Point 6 & 7 are presented in Exhibit ROB-4. One resource plan with  
15 Turkey Point 6 & 7, and another resource plan without Turkey Point 6 & 7,  
16 are presented in this exhibit. As shown in this exhibit, the two resource plans  
17 are identical through the year 2026. The resource plans differ starting in  
18 2027. The Resource Plan with Turkey Point 6 & 7 adds the two 1,100 MW  
19 nuclear units, one in 2027 and one in 2028. The Resource Plan without  
20 Turkey Point 6 & 7 adds two 1,317 MW CC units, one in 2027 and one in  
21 2029. Both resource plans then add the necessary amount of capacity through  
22 the rest of the analysis periods to meet FPL's reliability criteria. The timing  
23 of these later capacity additions varies between the two resource plans.

1       **Q.    What were the results of the 2015 feasibility analyses for Turkey Point**  
2       **6 & 7?**

3       A.    The results of the 2015 feasibility analyses for Turkey Point 6 & 7 are  
4       presented in Exhibits ROB-5 and ROB-6. Exhibit ROB-5 presents the results  
5       for Case #1 that assumes a 40-year operating life. Exhibit ROB-6 presents the  
6       results for Case #2 that assumes a 60-year operating life.

7  
8       The calculated breakeven nuclear capital costs in overnight construction costs  
9       in terms of \$/kW in 2015\$ are presented in Column (6) of these exhibits. The  
10      results in Column (6), when compared to FPL's non-binding estimated range  
11      of capital costs in 2015\$ of \$3,844/kW to \$5,589/kW, show that the projected  
12      breakeven capital costs for Turkey Point 6 & 7 are above this range in 2 of 7  
13      scenarios in Exhibit ROB-5 (Case #1) and in 6 of 7 scenarios in Exhibit ROB-  
14      6 (Case # 2). Thus Turkey Point 6 & 7 is projected to clearly be the economic  
15      choice in 8, or more than half, of the 14 scenarios. In the remaining 6  
16      scenarios, the breakeven cost is within the non-binding cost estimate range,  
17      which indicates that this project may be economic in each of these scenarios.

18      **Q.    In addition to the results of these economic analyses, did FPL's 2015**  
19      **feasibility analyses identify any additional advantages for FPL's**  
20      **customers that are projected to be derived from the Turkey Point 6 & 7**  
21      **project?**

22      A.    Yes. There are three other advantages to FPL's customers that are projected  
23      to result from the Turkey Point 6 & 7 project:

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- 1) system fuel savings;
- 2) system fuel diversity; and,
- 3) system CO<sub>2</sub> emission reductions.

I use the results from the 2015 feasibility analyses for the Case #1 Medium Fuel Cost, Env II scenario to discuss these three advantages. Comparable results also occur using the same fuel cost and environmental compliance cost forecast scenario in the Case #2 analyses.

The CPVRR values for the system fuel savings for each scenario of fuel cost and environmental compliance cost is accounted for in the respective total CPVRR savings value for that scenario. As shown in Exhibit ROB-5, these CPVRR savings values represent CPVRR breakeven capital costs. In addition, these CPVRR breakeven costs are translated into overnight construction \$/kW breakeven costs in 2015\$. Consequently, the system fuel savings have already been accounted for in the breakeven cost values. However, it is informative to also look at the annual nominal fuel savings projections for Turkey Point 6 & 7.

In 2029, the first year in which both of the new nuclear units are in service for a full year, Turkey Point 6 & 7 are projected to save FPL's customers approximately \$570 million (nominal) in fuel costs for that year.

1       **Q.     What are the projected fuel savings over the operating life of the Turkey**  
2       **Point 6 & 7 units and how do those projections compare with FPL's**  
3       **current total system annual fuel cost?**

4       A.     The total fuel savings for FPL's customers is projected to be approximately  
5       \$47 billion (nominal) assuming a 40 year life of the Turkey Point 6 & 7 units.  
6       FPL's 2014 annual total system fuel cost was approximately \$3.5 billion.  
7       Therefore, the projected fuel savings over the life of the Turkey Point 6 & 7  
8       units is equivalent to serving FPL's more than 4.7 million customer accounts  
9       (representing approximately 9 million people) for approximately 13 years at  
10      zero fuel costs, based on last year's annual fuel costs.

11      **Q.     Please discuss the projected fuel diversity benefits for Turkey Point 6 &**  
12      **7.**

13      A.     Regarding system fuel diversity, in 2029 the relative percentages of the total  
14      energy supplied by FPL that is projected to be generated by natural gas and  
15      nuclear, without Turkey Point 6 & 7, are approximately 75% and 20%,  
16      respectively. With Turkey Point 6 & 7, these projected percentages change to  
17      approximately 62% for natural gas and 33% for nuclear. Thus FPL is  
18      projected to be far less reliant on natural gas, and more reliant upon nuclear  
19      energy, by approximately 13% each.

20  
21      These percentage changes in system fuel use for a system the size of FPL's  
22      are significant. This can be demonstrated by looking at the projected amount  
23      of energy that will be supplied by the two new nuclear units in 2029. That



1 amount of energy is projected to be approximately 18.4 million MWh. The  
2 current forecasted average annual energy use per residential customer in 2029  
3 is 14,706 kWh. Therefore, the projected output from Turkey Point 6 & 7 in  
4 2029 will serve the equivalent of the total annual electrical usage of  
5 approximately 1,251,000 residential customers in that year.

6  
7 The improvement in system fuel diversity from Turkey Point 6 & 7 can also  
8 be demonstrated, for illustrative purposes, by looking at the amount of natural  
9 gas or oil that would have been needed to produce this same number of  
10 approximately 18.4 million MWh in 2029 if that energy had been produced by  
11 a conventional steam generating unit with a heat rate of 10,000 BTU/kWh. In  
12 such a case, Turkey Point 6 & 7 can be thought of as saving approximately  
13 184,000,000 mmBTU of natural gas (if all of this energy had been produced  
14 by natural gas), or approximately 28,800,000 barrels of oil (if all of this  
15 energy had been produced by oil), in 2029.

16 **Q. In regard to fuel diversity, is there another aspect of FPL's projected fuel**  
17 **mix that should be kept in mind when considering the addition of Turkey**  
18 **Point 6 & 7?**

19 A. Yes. FPL's fuel mix currently consists of coal-based energy contributions  
20 from several sources including FPL's partial ownership of coal units at the  
21 Scherer and St. John's sites, plus coal-based power purchase agreements  
22 (PPAs) with Cedar Bay, Indiantown, and St. John's. A substantial amount of

1 this coal-based capacity and energy is projected to end between 2016 and  
2 2025.

3  
4 FPL anticipates terminating its existing power purchase agreement for 250  
5 MW of coal-fired capacity from the Cedar Bay generating facility at the end  
6 of August 2015 as a result of a Purchase and Sale Agreement between FPL  
7 and Cedar Bay Generating Company, L.P. FPL would then own the unit  
8 starting on September 1, 2015. FPL currently anticipates that it will not need  
9 the unit for economic purposes after 2016 and, if that proves to be the case,  
10 would retire the unit at that time. FPL filed for FPSC approval of the Purchase  
11 and Sale Agreement in the first quarter of 2015.

12  
13 The St. John's 382 MW PPA is currently projected to effectively end well  
14 before the nuclear units come online, due to the cumulative amount of energy  
15 that FPL can receive under this agreement. In addition, the current agreement  
16 with Indiantown (330 MW) is scheduled to terminate in 2025. It is unknown  
17 if future agreements with this facility could be reached, particularly given the  
18 current economics of coal versus natural gas and the possibility of new  
19 environmental regulations that presumably will be unfavorable to coal energy  
20 production. For the same reasons, it is unlikely that any new coal-fired  
21 generation will be added in Florida for the foreseeable future.

22

1 The projected loss of this coal-based capacity is accounted for in the  
2 previously mentioned gas versus nuclear fuel mix percentage values. The  
3 important point regarding gas and coal usage is that the contribution of coal  
4 generation will decline; not that projected gas usage is increasing while coal  
5 usage remains constant. Instead, gas usage is projected to increase, in part,  
6 because the usage of one non-gas fuel (coal) is expected to substantially  
7 decline in the near future. The role of additional nuclear energy in regard to  
8 fuel diversity thus becomes even more important than in the gas vs. nuclear  
9 percentage values previously discussed when one recognizes that coal usage  
10 will actually be significantly declining in absolute terms.

11 **Q. What is the projected impact of Turkey Point 6 & 7 on FPL's system CO<sub>2</sub>**  
12 **emissions?**

13 A. Turkey Point 6 & 7 is projected to result in a cumulative reduction over the  
14 expected life of the two units of approximately 290 million tons of CO<sub>2</sub>. This  
15 will be a significant reduction in CO<sub>2</sub> emissions, representing approximately  
16 714% of the total CO<sub>2</sub> emissions from all FPL-owned generating units in 2014  
17 (which was approximately 41 million tons). Stated another way, this  
18 projected cumulative CO<sub>2</sub> emission reduction from Turkey Point 6 & 7 is the  
19 equivalent of operating FPL's very large system of more than 25,000 MW of  
20 generation for approximately 86 months, or approximately 7.2 years, with  
21 zero CO<sub>2</sub> emissions.

1       **Q.    In regard to the projected fuel cost savings and emission reductions**  
2       **discussed above, does Turkey Point 6 & 7 provide other benefits for**  
3       **FPL’s customers?**

4       A.    Yes. Nuclear power provides an important hedge for customers against the  
5       potential for future natural gas prices to be higher than forecasted and the  
6       potential for costly future environmental (including CO<sub>2</sub>) regulations.  
7       Because the price of nuclear fuel is unrelated to fossil fuel prices, and because  
8       it produces no SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub>, etc., emissions in producing electricity, it is a  
9       superb hedge against higher fossil fuel costs and environmental compliance  
10      costs.

11      **Q.    Are there any other benefits from the addition of Turkey Point 6 & 7 that**  
12      **you would like to discuss?**

13      A.    Yes. The addition of 2,200 MW of capacity from Turkey Point 6 & 7 in  
14      Miami-Dade County is projected to achieve significant transmission cost  
15      savings by avoiding the construction of transmission facilities that would  
16      otherwise need to be built to import power from outside the Southeastern  
17      Florida region (Miami-Dade and Broward Counties) into that region. These  
18      savings are currently projected to be approximately \$1.7 billion CPVRR. This  
19      savings value is accounted for in FPL’s 2015 feasibility analyses of the  
20      Turkey Point 6 & 7 project as an additional cost incurred in the Without  
21      Turkey Point 6 & 7 resource plan.

22      **Q.    Please briefly explain how the Nuclear Cost Recovery process saves**  
23      **money for FPL’s customers.**

1       A.     The Nuclear Cost Recovery process allows for annual recovery of interest  
2             costs incurred during construction, rather than through long-term recovery  
3             under the normal Allowance for Funds Used During Construction (AFUDC)  
4             approach. This enables FPL's customers to avoid paying significant  
5             compounded interest charges they would otherwise incur.

6       **Q.     Was an analysis performed regarding the projected capital cost savings**  
7             **for FPL's customers from Florida's Nuclear Cost Recovery process?**

8       A.     Yes. Analyses of the projected Turkey Point 6 & 7 capital cost savings for  
9             FPL's customers that results from Florida's Nuclear Cost Recovery process  
10            were performed. The results of one of these analyses, assuming the high-end  
11            of the non-binding capital cost range and a conservative 40-year operating  
12            life, are presented in FPL witness Scroggs' Exhibit SDS-11. The result of this  
13            analysis is that Florida's Nuclear Cost Recovery process is projected to save  
14            FPL's customers approximately \$12.3 billion (nominal), or \$584 million  
15            (CPVRR), in capital cost savings. Another analysis that was performed,  
16            assuming the low-end of the non-binding capital cost estimate range, and a  
17            40-year operating life for the units, resulted in a projection that Florida's  
18            Nuclear Cost Recovery process will save FPL's customers approximately \$8.6  
19            billion (nominal), or \$435 million (CPVRR), in capital cost savings.

20       **Q.     What conclusions do you draw from the results of the 2015 feasibility**  
21             **analyses of Turkey Point 6 & 7?**

22       A.     The Turkey Point 6 & 7 project is projected to be the economic choice in 8 of  
23             the 14 scenarios analyzed and the projected breakeven costs were within the

1 non-binding cost estimate range for Turkey Point 6 & 7 in each of the  
2 remaining 6 scenarios. Turkey Point 6 & 7 is also projected to be beneficial  
3 for FPL's customers in terms of increased system fuel diversity, reduced  
4 system emissions, and as a significant hedge against higher fuel and  
5 environmental compliance costs.

6

7 Thus, the results of the 2015 feasibility analyses strongly support the  
8 feasibility of continuing the Turkey Point 6 & 7 project.

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

10 A. Yes.

**Docket No. 150009-EI**  
**Summary of Results from FPL's 2015**  
**Feasibility Analyses of the**  
**Turkey Point 6 & 7 Project**  
**(Plus Results from Additional Analyses)**  
**Exhibit ROB-1 , Page 1 of 1**

**Summary of Results from FPL's 2015 Feasibility Analyses**  
**of the Turkey Point 6 & 7 Project**  
**(Plus Results from Additional Analyses)**

	Case # 1 Analyses (40-Year Life)	Case # 2 Analyses (60-Year Life)
1) Number of fuel cost/environmental compliance cost scenarios in which the break-even cost is projected to be above the high-end of the non-binding cost estimate range for Turkey Point 6 & 7:	2 of 7	6 of 7
2) Projected fuel savings for FPL's customers in first full year of operation (approximate nominal \$):*	570 million	570 million
3) Projected fuel savings for FPL's customers over the life of Turkey Point 6 & 7 (approximate nominal \$):	47 billion	101 billion
4) Number of years of equivalent zero system fuel cost for FPL's customers based on projected nominal fuel savings over the life of Turkey Point 6 & 7 compared to FPL's 2014 annual system fuel cost (approximate years):	13 years	29 years
5) Projected percentage of total FPL energy produced from natural gas and nuclear in first full year of operation of the nuclear units (approximate %):*		
- without Turkey Point 6 & 7	75% Gas & 20% Nuclear	75% Gas & 20% Nuclear
- with Turkey Point 6 & 7	62% Gas & 33% Nuclear	62% Gas & 33% Nuclear
6) Equivalent approximate number of residential customers' annual energy use supplied by Turkey Point 6 & 7 in the first full year of operation*	1,251,000	1,251,000
7) Equivalent annual amount of fossil fuel saved by Turkey Point 6 & 7 beginning in the first full year of operation (approximate):*		
- Equivalent mMBTU of natural gas	184 million	184 million
- Equivalent barrels of oil	29 million	29 million
8) Projected amount of CO <sub>2</sub> emissions reduced by Turkey Point 6 & 7 over the life of the units:	290 million tons	481 million tons
9) Number of months in which FPL's generating system would operate with the equivalent of zero CO <sub>2</sub> emissions based on projected CO <sub>2</sub> emission reduction compared to FPL's 2014 system CO <sub>2</sub> emissions (approximate):	86 (or 7.2 years)	142 (or 11.8 years)

\* The first full year of operation for both Turkey Point 6 & 7 units is assumed to be 2029 in both cases.

Docket No. 150009-EI  
**Comparison of Key Assumptions Utilized in the 2014 and 2015  
 Feasibility Analyses of the Turkey Point 6 & 7 Project**  
 Exhibit ROB-2 , Page 1 of 4

**Comparison of Key Assumptions Utilized in the 2014 and 2015  
 Feasibility Analyses of the Turkey Point 6 & 7 Project:  
 Projected Fuel Costs (Medium Fuel Cost Forecast)**  
 (all \$ values shown are in Nominal \$)

(1)                      (2)                      (3) = (2) - (1)

Selected Years	Forecasted Natural Gas Cost (\$/mmBTU)		
	2014 Feasibility Analysis	2015 Feasibility Analysis	Change in 2015 Forecast
-----	-----	-----	-----
2027	\$8.26	\$6.89	(\$1.37)
2030	\$9.19	\$7.53	(\$1.66)
2040	\$13.32	\$9.63	(\$3.69)
2050	\$19.31	\$12.21	(\$7.10)
2060	\$27.99	\$15.47	(\$12.51)
2070	\$40.58	\$19.62	(\$20.96)
2080	\$58.85	\$24.87	(\$33.97)

(1)                      (2)                      (3) = (2) - (1)

Selected Years	Forecasted 1% S Oil Cost (\$/mmBTU)		
	2014 Feasibility Analysis	2015 Feasibility Analysis	Change in 2015 Forecast
-----	-----	-----	-----
2027	\$21.78	\$22.29	\$0.51
2030	\$23.08	\$25.05	\$1.97
2040	\$27.07	\$31.14	\$4.07
2050	\$31.78	\$36.27	\$4.50
2060	\$37.31	\$42.27	\$4.96
2070	\$43.82	\$49.27	\$5.46
2080	\$51.47	\$57.46	\$5.99

(1)                      (2)                      (3) = (2) - (1)

Selected Years	Forecasted Nuclear Fuel Cost (\$/mmBTU)		
	2014 Feasibility Analysis	2015 Feasibility Analysis	Change in 2015 Forecast
-----	-----	-----	-----
2027	\$1.01	\$0.99	(\$0.01)
2030	\$1.08	\$1.11	\$0.02
2040	\$1.39	\$1.28	(\$0.11)
2050	\$1.77	\$1.63	(\$0.14)
2060	\$2.27	\$2.09	(\$0.18)
2070	\$2.84	\$2.61	(\$0.23)
2080	\$3.63	\$3.34	(\$0.29)



Docket No. 150009-EI  
**Comparison of Key Assumptions Utilized in the 2014 and 2015  
 Feasibility Analyses of the Turkey Point 6 & 7 Project**  
 Exhibit ROB-2, Page 2 of 4

**Comparison of Key Assumptions Utilized in the 2014 and 2015  
 Feasibility Analyses of the Turkey Point 6 & 7 Project:  
 Projected Environmental Compliance Costs (Env II Forecast)**  
 (all \$ values shown are in Nominal \$)

(1)                      (2)                      (3) = (2) - (1)

Selected Years	Forecasted SO <sub>2</sub> Compliance Cost (\$/ton)		
	2014 Feasibility Analysis	2015 Feasibility Analysis	Change in 2015 Forecast
2027	\$76	\$0	(\$76)
2030	\$82	\$0	(\$82)
2040	\$105	\$0	(\$105)
2050	\$134	\$0	(\$134)
2060	\$172	\$0	(\$172)
2070	\$220	\$0	(\$220)
2080	\$282	\$0	(\$282)

(1)                      (2)                      (3) = (2) - (1)

Selected Years	Forecasted NO <sub>x</sub> Compliance Cost (\$/ton)		
	2014 Feasibility Analysis	2015 Feasibility Analysis	Change in 2015 Forecast
2027	\$685	\$125	(\$560)
2030	\$737	\$125	(\$612)
2040	\$944	\$125	(\$819)
2050	\$1,208	\$125	(\$1,083)
2060	\$1,547	\$125	(\$1,422)
2070	\$1,980	\$125	(\$1,855)
2080	\$2,534	\$125	(\$2,409)

(1)                      (2)                      (3) = (2) - (1)

Selected Years	Forecasted CO <sub>2</sub> Compliance Cost (\$/ton)		
	2014 Feasibility Analysis	2015 Feasibility Analysis	Change in 2015 Forecast
2027	\$15	\$21	\$7
2030	\$21	\$31	\$9
2040	\$64	\$85	\$21
2050	\$154	\$195	\$40
2060	\$321	\$377	\$55
2070	\$448	\$482	\$34
2080	\$573	\$617	\$44

**Comparison of Key Assumptions Utilized in the 2014 and 2015  
 Feasibility Analyses of the Turkey Point 6 & 7 Project:  
 Summer Peak Demand Load Forecast  
 (Summer MW)**

Selected Years	(1)	(2)	(3) = (2) - (1)	(4)	(5)
-----	2014 Feasibility Analysis -----	2015 Feasibility Analysis -----	Change in 2015 Forecast -----	Annual Growth with 2015 Peak Demand Forecast -----	Cumulative Growth with 2015 Peak Demand Forecast -----
2015	23,356	23,286	(70)	---	---
2016	23,778	23,778	1	493	493
2017	24,190	24,252	62	474	967
2018	24,544	24,648	104	395	1,362
2019	24,896	25,045	149	397	1,759
2020	25,239	25,369	130	324	2,083
2021	25,439	25,497	58	128	2,211
2022	25,908	25,833	(75)	336	2,547
2023	26,528	26,286	(242)	453	3,000
2024	27,214	26,771	(444)	485	3,485
2025	27,877	27,272	(605)	501	3,986
2026	28,505	27,825	(680)	553	4,539
2027	29,135	28,451	(683)	627	5,166
2028	29,731	29,070	(661)	619	5,784
2029	30,261	29,695	(565)	625	6,410
2030	30,786	30,327	(459)	631	7,041
2035	33,444	33,041	(403)	*	*
2040	35,957	35,646	(311)	*	*

\* Annual and cumulative growth values not shown due to load forecast projections in this exhibit changing from year-to-year values to 5-year intervals.

Docket No. 150009-EI  
**Comparison of Key Assumptions Utilized in the 2014 and 2015  
Feasibility Analyses of the Turkey Point 6 & 7 Project**  
Exhibit ROB-2, Page 4 of 4

**Comparison of Key Assumptions Utilized in the 2014 and 2015  
Feasibility Analyses of the Turkey Point 6 & 7 Project: Other Assumptions**

Assumption -----	(1) Value for 2014 Feasibility Analysis -----	(2) Value for 2015 Feasibility Analysis -----	(3) = (2) - (1) Change in 2015 Forecast -----
1) Financial/Economic Assumptions (Base Case):			
- Capital Structure (debt/equity)	40.38%/59.62%	40.38%/59.62%	---
- Cost of Debt	5.14%	5.05%	(0.09%)
- Return on Equity	10.50%	10.50%	---
- Discount Rate (after tax)	7.54%	7.51%	(0.03%)
2) CC Generator Capital (\$/kW in 2022, w/o AFUDC) for 2014 Analysis ; CC Generator Capital (\$/kW in 2027, w/o AFUDC) for 2015 Analysis	\$883	\$842	---
3) CC Heat Rate (Base 100%, BTU/kWh)	6,334	6,307	(27)
4) Firm Gas Transportation Cost (\$/mmBTU in 2023) for 2014 Analysis ; Firm Gas Transportation Cost (\$/mmBTU in 2027) for 2015 Analysis	\$1.20	\$1.37	---
5) Assumed In-Service Dates for Turkey Point Units 6 & 7	2022 & 2023	2027 & 2028	5 years
6) Assumed Operating Lives of Turkey Point Units 6 & 7	40 years or 60 years	40 years or 60 years	---
7) Non-Binding Overnight Cost Estimate for New Nuclear Units (\$/kW)	\$3,750 to \$5,453 in 2014\$	\$3,844 to \$5,589 in 2015\$	Change
8) Previously Spent Capital Costs Now Excluded (\$ millions, approx.)	\$228	\$254	\$26
9) Cumulative Annual Capital Expenditure Percentage for TP 6 & 7 (assuming 2022 & 2023 in-service dates for the 2014 Analysis; assuming 2027 & 2028 in-service dates for the 2015 Analysis):			
2014	1.6%	1.4%	---
2015	1.7%	1.6%	---
2016	13.6%	1.7%	---
2017	27.1%	1.8%	---
2018	41.9%	2.3%	---
2019	57.6%	2.7%	---
2020	72.1%	6.4%	---
2021	85.4%	14.7%	---
2022	97.2%	26.9%	---
2023	100.0%	41.7%	---
2024	---	57.5%	---
2025	---	72.0%	---
2026	---	85.4%	---
2027	---	97.2%	---
2028	---	100.0%	---

**Projection of FPL's Resource Needs Through 2030**  
**(Assuming No Turkey Point 6 & 7 and No Other Generation Additions from 2027 - On)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
				= (1) + (2) - (3)			= (5) - (6)	= (4) - (7)	= (8) / (7)	= ((7)*1.20)-(4)	= ((4)-(5)) / (5)	= ((5)*1.10)-(4)
August of the Year	Projected FPL Unit Capability * (MW)	Projected Firm Capacity Purchases (MW)	Projected Scheduled Maintenance (MW)	Projected Total Capacity (MW)	Projected Peak Load (MW)	Projected Summer DSM Capability ** (MW)	Projected Firm Peak Load (MW)	Projected Summer Reserves (MW)	Projected Summer Total Reserve Margin w/o Additions (%)	Projected MW Needed to Meet 20% Total Reserve Margin*** (MW)	Projected Generation-Only Reserve Margin (GRM) w/o Additions (%)	Projected MW Needed to Meet 10% GRM**** (MW)
2015	25,008	2,015	0	27,022	23,286	1,951	21,335	5,688	26.7%	(1,421)	16.0%	(1,408)
2016	25,585	837	0	26,421	23,778	2,000	21,779	4,643	21.3%	(287)	11.1%	(265)
2017	26,002	837	0	26,838	24,252	2,046	22,207	4,632	20.9%	(190)	10.7%	(161)
2018	26,230	837	0	27,067	24,648	2,092	22,555	4,512	20.0%	(1)	9.8%	45
2019	27,666	455	0	28,120	25,045	2,140	22,905	5,216	22.8%	(635)	12.3%	(571)
2020	27,666	455	0	28,120	25,369	2,188	23,181	4,939	21.3%	(303)	10.8%	(214)
2021	27,753	635	0	28,388	25,497	2,237	23,260	5,128	22.0%	(476)	11.3%	(341)
2022	27,839	635	0	28,473	25,833	2,287	23,546	4,927	20.9%	(218)	10.2%	(57)
2023	29,155	635	0	29,790	26,286	2,338	23,948	5,841	24.4%	(1,052)	13.3%	(875)
2024	29,155	635	0	29,789	26,771	2,389	24,381	5,408	22.2%	(532)	11.3%	(342)
2025	30,471	635	0	31,106	27,272	2,440	24,832	6,274	25.3%	(1,308)	14.1%	(1,107)
2026	30,471	305	0	30,775	27,825	2,490	25,335	5,441	21.5%	(374)	10.6%	(168)
2027	30,471	290	0	30,761	28,451	2,540	25,911	4,849	18.7%	333	8.1%	536
2028	30,471	290	0	30,761	29,070	2,590	26,480	4,281	16.2%	1,015	5.8%	1,216
2029	30,471	290	0	30,761	29,695	2,640	27,055	3,706	13.7%	1,706	3.6%	1,904
2030	30,471	290	0	30,761	30,327	2,690	27,637	3,124	11.3%	2,403	1.4%	2,598

\* MW values shown in Column (1) include: the completion of the Port Everglades modernization project in 2016, the retirement of 44 of the 48 existing GTs in Broward County in late 2016 & the addition of 5 new CTs at the Lauderdale site and 2 CTs at the Ft. Myers site in late 2016, the upgraded capacity of Ft. Myers 3A&3B, the addition of a new Okeechobee CC unit in 2019, the addition of firm capacity from the Eco-Gen PPA in 2021, the addition of a one-year 207 MW PPA in 2018, and 116 MW of firm PV in late 2016, and the addition of a new unsited CC in 2023 and 2025. (Note that the 2019 Okeechobee CC addition is a placeholder until a decision regarding FPL's capacity RFP is made.)

\*\* The DSM values shown in Column (6) account for incremental DSM additions as per the 2014 DSM Goals docket for 2015 through 2024, for projected annual participant attrition in FPL's existing residential load management program, and for assumed 50 MW/year of new DSM for 2025 through 2030.

\*\*\* MW values shown in Column (10) represent new generating capacity needed to meet the 20% total reserve margin criterion.

\*\*\*\* MW values shown in Column (12) represent new generating capacity needed to meet the 10% generation-only reserve margin criterion (GRM).

**The Two Resource Plans Utilized in FPL's 2015 Feasibility Analyses of the Turkey Point 6 & 7 Project**

Resource Plan with TP 6&7	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030 - on
Unit(s)/capacity added	---	Port Everglades Modernization	223 MWs of Solar; 5 new CTs @ Lauderdale; 2 new CTs @ Ft.Myers	---	Okeechobee 3x1 CC Unit	---	---	---	(1) Greenfield 3x1 CC Unit	---	(1) Greenfield 3x1 CC Unit	---	Turkey Point 6	Turkey Point 7	---	*
Projected Summer Total Reserve Margin	26.7%	21.3%	20.9%	20.0%	22.8%	21.3%	22.0%	20.9%	24.4%	22.2%	25.3%	21.5%	23.0%	24.5%	21.8%	(meets criterion in all yrs)
Projected Summer Generation Only Reserve Margin	16.0%	11.1%	10.7%	9.8%	12.3%	10.8%	11.3%	10.2%	13.3%	11.3%	14.1%	10.6%	12.0%	13.4%	11.0%	(meets criterion in all yrs)
Resource Plan without TP 6&7	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030 - on
Unit(s)/capacity added	---	Port Everglades Modernization	223 MWs of Solar; 5 new CTs @ Lauderdale; 2 new CTs @ Ft.Myers	---	Okeechobee 3x1 CC Unit	---	---	---	(1) Greenfield 3x1 CC Unit	---	(1) Greenfield 3x1 CC Unit	---	(1) Greenfield 3x1 CC Unit	---	(1) Greenfield 3x1 CC Unit	*
Projected Summer Total Reserve Margin	26.7%	21.3%	20.9%	20.0%	22.8%	21.3%	22.0%	20.9%	24.4%	22.2%	25.3%	21.5%	23.8%	21.1%	23.4%	(meets criterion in all yrs)
Projected Summer Generation Only Reserve Margin	16.0%	11.1%	10.7%	9.8%	12.3%	10.8%	11.3%	10.2%	13.3%	11.3%	14.1%	10.6%	12.7%	10.3%	12.5%	(meets criterion in all yrs)

Notes: - FPL's total reserve margin criterion is a minimum of 20.0% and its generation-only reserve margin is a minimum of 10%.

- Reserve margin values shown account for : the completion of the Port Everglades modernization project in 2016, the retirement of 44 of 48 existing GTs in Broward County in late 2016 & the addition of 5 new CTs at the Lauderdale site and 2 CTs at the Ft.Myers site in late 2016, the upgraded capacity of Ft.Myers 3A&3B, the the addition of a new Okeechobee CC unit in 2019, the addition of firm capacity from the Eco-Gen PPA in 2021, the addition of a one-year 206 MW PPA in 2018, and 223 MW of PV capacity in late 2016 (which equates to 116 MW of firm capacity), and the addition of a new unsited CC in 2023 and 2025. (Note that the 2019 Okeechobee CC addition is a place holder until a final decision regarding FPL's capacity RFP is made.)

\* The remaining unit additions starting in the year 2030 are 660 MW Filler Unit additions.

Docket No. 150009-EI  
**2015 Feasibility Analyses Results for the Turkey Point 6 & 7 Project:**  
**Case # 1 Analysis - 40-Year Operating Life; Total Costs,**  
**Total Cost Differentials, and Breakeven Costs for All Fuel**  
**and Environmental Compliance Cost Scenarios in 2015\$**  
(millions, CPVRR, 2015 - 2068)  
Exhibit ROB-5, Page 1 of 1

**2015 Feasibility Analyses Results for the Turkey Point 6 & 7 Project:**  
**Case # 1 Analysis - 40-Year Operating Life; Total Costs,**  
**Total Cost Differentials, and Breakeven Costs for All Fuel**  
**and Environmental Compliance Cost Scenarios in 2015\$**  
(millions, CPVRR, 2015 - 2068)

(1)	(2)	(3)	(4)	(5) = (3) - (4)	(6)
Fuel Cost Forecast -----	Environmental Compliance Cost Forecast -----	Total Costs for Plans -----		Total Cost Difference Plan with TP 6 & 7 minus Plan without TP 6 & 7 *	Breakeven Nuclear Capital Costs (\$/kW in 2015\$) -----
		Resource Plan w/ TP 6 & 7 -----	Resource Plan w/o TP 6 & 7 -----		
High Fuel Cost	Env I	140,810	151,571	(10,762)	5,254
High Fuel Cost	Env II	148,047	159,595	(11,548)	5,639
High Fuel Cost	Env III	155,298	167,645	(12,348)	6,031
Medium Fuel Cost	Env I	125,989	135,525	(9,536)	4,654
Medium Fuel Cost	Env II	133,186	143,498	(10,312)	5,034
Medium Fuel Cost	Env III	140,393	151,496	(11,103)	5,421
Low Fuel Cost	Env I	110,950	119,248	(8,298)	4,049

\*The TP 6 & 7 savings values in Column (5) also represent CPVRR breakeven capital costs for each scenario.

Note: The TP 6 & 7 non-binding cost estimate range to which the breakeven cost is compared is \$3,844/kW to \$5,589/kW in 2015\$.

Docket No. 150009-EI  
**2015 Feasibility Analyses Results for the Turkey Point 6 & 7 Project:**  
**Case # 2 Analysis - 60-Year Operating Life; Total Costs,**  
**Total Cost Differentials, and Breakeven Costs for All Fuel**  
**and Environmental Compliance Cost Scenarios in 2015\$**  
(millions, CPVRR, 2015 - 2088)  
Exhibit ROB-6, Page 1 of 1

**2015 Feasibility Analyses Results for the Turkey Point 6 & 7 Project:**  
**Case # 2 Analysis - 60-Year Operating Life; Total Costs,**  
**Total Cost Differentials, and Breakeven Costs for All Fuel**  
**and Environmental Compliance Cost Scenarios in 2015\$**  
(millions, CPVRR, 2015 - 2088)

(1)	(2)	(3)	(4)	(5)	(6)
		Total Costs for Plans		Total Cost Difference	Breakeven
Fuel Cost Forecast	Environmental Compliance Cost Forecast	Resource Plan w/ TP 6 & 7	Resource Plan w/o TP 6 & 7	Plan with TP 6 & 7 minus Plan without TP 6 & 7 *	Nuclear Capital Costs (\$/kW in 2015\$)
-----	-----	-----	-----	-----	-----
High Fuel Cost	Env I	165,666	178,785	(13,119)	6,408
High Fuel Cost	Env II	177,061	191,427	(14,366)	7,018
High Fuel Cost	Env III	188,470	204,108	(15,638)	7,640
Medium Fuel Cost	Env I	149,624	161,367	(11,743)	5,734
Medium Fuel Cost	Env II	160,969	173,950	(12,982)	6,341
Medium Fuel Cost	Env III	172,319	186,565	(14,246)	6,959
Low Fuel Cost	Env I	133,349	143,709	(10,360)	5,058

\*The TP 6 & 7 savings values in Column (5) also represent CPVRR breakeven capital costs for each scenario.

Note: The TP 6 & 7 non-binding cost estimate range to which the breakeven cost is compared is \$3,844/kW to \$5,589/kW in 2015\$.

**CERTIFICATE OF SERVICE  
DOCKET NO. 150009-EI**

I HEREBY CERTIFY that a true and correct copy of the foregoing testimony and exhibits was served by electronic mail this 1st day of May, 2015 to the following:

Keino Young, Esq.  
Kyesha Mapp, Esq.  
Division of Legal Services  
Florida Public Service Commission  
2540 Shumard Oak Blvd.  
Tallahassee, Florida 32399-0850  
kyoung@psc.state.fl.us  
kmapp@psc.state.fl.us

J. Michael Walls, Esq.  
Blaise N. Gamba, Esq.  
Carlton Fields Jordan Burt, P.A.  
P.O. Box 3239  
Tampa, Florida 33601-3239  
mwalls@cfjblaw.com  
bgamba@cfjblaw.com  
*Attorneys for Duke Energy Florida, Inc.*

Matthew Bernier, Esq., Sr. Counsel  
106 East College Ave., Suite 800  
Tallahassee, Florida 32301-7740  
Matthew.bernier@duke-energy.com  
*Attorney for Duke Energy Florida, Inc.*

Jon C. Moyle, Jr., Esq.  
Moyle Law Firm, P.A.  
118 North Gadsden Street  
Tallahassee, Florida 32301  
jmoyle@moylelaw.com  
*Attorney for Fla. Industrial Power Users Group*

Patricia A. Christensen, Esq.  
Associate Public Counsel  
Office of Public Counsel  
The Florida Legislature  
111 West Madison Street, Room 812  
Tallahassee, Florida 32399  
christensen.patty@leg.state.fl.us  
*Attorney for the Citizens of the State of Fla.*

Dianne M. Triplett, Esq.  
299 First Avenue North  
St. Petersburg, Florida 33701  
dianne.triplett@duke-energy.com  
*Attorney for Duke Energy Florida, Inc.*

James W. Brew, Esq.  
Owen J. Kopon, Esq.  
Laura A. Wynn, Esq.  
Brickfield, Burchette, Ritts & Stone, P.C.  
1025 Thomas Jefferson Street, N.W.  
8<sup>th</sup> Floor, West Tower  
Washington, D.C. 20007  
jbrew@bbrslaw.com  
owen.kopon@bbrslaw.com  
laura.wynn@bbrslaw.com  
*Attorneys for White Springs Agricultural  
Chemicals, Inc., d/b/a PCS Phosphate-White  
Springs*



Robert Scheffel Wright, Esq.  
John T. LaVia, III, Esq.  
Gardner Bist Bowden Bush Dee  
LaVia & Wright, P.A.  
1300 Thomaswood Drive  
Tallahassee, FL 32308  
Schef@gbwlegal.com  
Jlavia@gbwlegal.com  
*Attorneys for the Florida Retail Federation*

George Cavros, Esq.  
120 E. Oakland Park Blvd., Suite 105  
Fort Lauderdale, FL 33334  
george@cavros-law.com  
*Attorney for Southern Alliance for Clean Energy*

Victoria Méndez, City Attorney  
Matthew Haber, Assistant City Attorney  
City of Miami  
444 Southwest 2nd Avenue  
Miami, FL 33130  
vmendez@miamigov.com  
mshaber@miamigov.com  
yillescas@miamigov.com (secondary e-mail)  
*Attorneys for City of Miami*

By: *s/ Jessica A. Cano*  
Jessica A. Cano  
Fla. Bar No. 0037372