

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 120009-EI
FLORIDA POWER & LIGHT COMPANY

APRIL 27, 2012

IN RE: NUCLEAR POWER PLANT COST RECOVERY
FOR THE YEARS ENDING
DECEMBER 2012 AND 2013

TESTIMONY & EXHIBITS OF:

STEVEN R. SIM

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1 **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2 **FLORIDA POWER & LIGHT COMPANY**

3 **DIRECT TESTIMONY OF STEVEN R. SIM**

4 **DOCKET NO. 120009- EI**

5 **April 27, 2012**

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

8 A. My name is Steven R. Sim, 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 Senior Manager
12 of Integrated Resource Planning in the Resource Assessment & Planning
13 department.

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

15 A. I supervise and coordinate analyses that are designed to determine the
16 magnitude and timing of FPL's resource needs and then develop the
17 integrated resource plan with which FPL will meet those resource needs.

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

19 A. I graduated from the University of Miami (Florida) with a Bachelor's degree
20 in Mathematics in 1973. I subsequently earned a Master's degree in
21 Mathematics from the University of Miami (Florida) in 1975 and a Doctorate
22 in Environmental Science and Engineering from the University of California
23 at Los Angeles (UCLA) in 1979.

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While completing my degree program at UCLA, I was also employed full-time as a Research Associate at the Florida Solar Energy Center during 1977 - 1979. My responsibilities at the Florida Solar Energy Center included an evaluation of Florida consumers' experiences with solar water heaters and an analysis of potential renewable energy resources including photovoltaics, biomass, wind power, etc., applicable in the Southeastern United States.

In 1979 I joined FPL. From 1979 until 1991 I worked in various departments including Marketing, Energy Management Research, and Load Management, where my responsibilities concerned the development, monitoring, and cost-effectiveness of demand side management (DSM) programs. In 1991 I joined my current department, then named the System Planning Department, where I held different supervisory positions dealing with integrated resource planning. In late 2007 I assumed my present position.

Q. What is the purpose of your testimony?

A. My testimony provides the results of the 2012 economic analyses for the extended power uprates (EPU) project for FPL's existing nuclear units, and for the new FPL nuclear units, Turkey Point 6 & 7, using current assumptions. In my testimony I will refer to these analyses as the 2012 feasibility analyses for both projects. In addition, I discuss the assumptions used in the 2012 feasibility analyses, which include lower than previously projected forecasts of costs for natural gas and environmental compliance. (Nonetheless, as

1 discussed below, both projects continue to be projected as solidly cost-
2 effective for FPL's customers.) I also present the results of additional
3 analyses that further quantify the projected benefits of the two nuclear projects.
4

5 The 2012 feasibility analyses are presented to satisfy the requirement of
6 Subsection 5(c)5 of the Florida Administrative Code Rule 25-6.0423, Nuclear
7 Power Plant Cost Recovery which states "By May 1 of each year, along with
8 the filings required by this paragraph, a utility shall submit for Commission
9 review and approval a detailed analysis of the long-term feasibility of
10 completing the power plant." Other feasibility-related topics for the EPU
11 project are discussed by FPL Witness Jones. Additionally, other feasibility-
12 related topics for the Turkey Point 6 & 7 project are discussed by FPL
13 Witness Scroggs.

14 **Q. Please summarize your testimony.**

15 A. Completion of each of FPL's nuclear projects continues to be projected as the
16 economic choice for FPL's customers. The results of FPL's 2012 feasibility
17 analyses indicate that completing the two projects, even using lower than
18 previously projected forecasts of costs for natural gas and environmental
19 compliance, is projected to be economic for FPL's customers.
20

21 As with all economic analyses, FPL's 2012 economic analyses of these two
22 nuclear projects provides a "snapshot" of the projected customer benefits
23 associated with the EPU project and Turkey Point 6 & 7 based on current

1 project assumptions, forecasts of numerous costs, and resource planning
2 assumptions. The 2012 feasibility analyses, as with prior feasibility analyses,
3 examine potential future scenarios that result from combining various fossil
4 fuel price forecasts and environmental compliance cost forecasts. Of course,
5 the actual economic performance of FPL's system, including the impacts of
6 future fuel prices, etc., cannot be known until after the fact. But that is why
7 FPL examines the projected impacts of these resource additions over a wide
8 range of potential future scenarios.

9
10 The inability to be able to predict with confidence future fuel and
11 environmental compliance costs is a key reason why FPL not only performs
12 these analyses based on multiple forecasts and scenarios, but also why FPL
13 strives for diversity in regard to system resources and fuels. Because the price
14 of nuclear fuel is unrelated to fossil fuel prices, and because nuclear power
15 plants produce no emissions such as sulfur dioxide (SO₂), nitrogen oxides
16 (NO_x), or carbon dioxide (CO₂) in the process of generating electricity,
17 additional nuclear capacity is a superb hedge against fossil fuel price volatility
18 and increases in environmental compliance costs. Diversification also
19 improves system reliability. The two nuclear projects will help reduce FPL's
20 reliance on natural gas that is currently delivered into the state of Florida by
21 only two natural gas pipelines. In addition, the two nuclear projects will also
22 help further reduce the usage of oil, including foreign oil, by FPL's system.
23 Through diversification generally, and the addition of the EPU and Turkey

1 Point 6 & 7 specifically, FPL is working to keep its electric rates, and thus the
2 resulting bills for its customers, low over the long term and keep providing
3 highly reliable electric service.

4
5 Finally, the two nuclear projects provide substantial customer benefits,
6 including billions of dollars of fuel cost savings. Over the life of the uprated
7 nuclear power plants, customers are projected to save \$3.8 billion (nominal) in
8 fuel costs, and over the life of Turkey Point 6 & 7, customers are projected to
9 save \$58 billion (nominal) in fuel costs, both based on a Medium Fuel Cost
10 forecast. Additionally, each project will produce energy that otherwise would
11 have required the consumption of substantial amounts of natural gas or
12 millions of barrels of oil annually, and will reduce system CO₂ emissions by
13 millions of tons. In short, completing the EPU project and Turkey Point 6 & 7
14 continue to be projected as solidly cost-effective and valuable generation
15 additions for FPL's customers.

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

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

- 18 - Exhibit SRS – 1: Summary of Results from FPL's 2012 Feasibility
19 Analyses of the EPU and Turkey Point 6 & 7 Projects (Plus Results
20 from Additional Analyses);
- 21 - Exhibit SRS – 2: Comparison of Key Assumptions Utilized in the
22 2011 and 2012 Feasibility Analyses of FPL Nuclear Projects:
23 Projected Fuel Costs (Medium Fuel Cost Forecast);

- 1 - Exhibit SRS – 3: Comparison of Key Assumptions Utilized in the
- 2 2011 and 2012 Feasibility Analyses of FPL Nuclear Projects:
- 3 Projected Environmental Compliance Costs (Env II Forecast);
- 4 - Exhibit SRS – 4: Comparison of Key Assumptions Utilized in the
- 5 2011 and 2012 Feasibility Analyses of FPL Nuclear Projects: Summer
- 6 Peak Demand Load Forecast;
- 7 - Exhibit SRS – 5: Projection of FPL’s Resource Needs Through 2025;
- 8 - Exhibit SRS – 6: Comparison of Key Assumptions Utilized in the
- 9 2011 and 2012 Feasibility Analyses of FPL Nuclear Projects: Other
- 10 Assumptions;
- 11 - Exhibit SRS – 7: The Two Resource Plans Utilized in the 2012
- 12 Feasibility Analyses of the EPU Project;
- 13 - Exhibit SRS – 8: 2012 Feasibility Analyses Results for the EPU
- 14 Project: Total Costs and Total Cost Differentials for All Fuel and
- 15 Environmental Compliance Cost Scenarios in 2012\$;
- 16 - Exhibit SRS – 9: 2011 Feasibility Analyses Results for the EPU
- 17 Project: Percentage of FPL’s Fuel Mix from Nuclear, 2011 – 2020;
- 18 - Exhibit SRS – 10: The Two Resource Plans Utilized in the 2012
- 19 Feasibility Analyses of Turkey Point 6 & 7; and,
- 20 - Exhibit SRS - 11: 2012 Feasibility Analyses Results for Turkey Point 6
- 21 & 7: Total Costs, Total Cost Differentials, and Breakeven Costs for
- 22 All Fuel and Environmental Compliance Cost Scenarios in 2012\$.

23 **Q. Please summarize the results of your analyses.**

1 A. In its 2012 feasibility analyses, FPL utilized analytical approaches that it
2 believes are currently the best approaches with which to evaluate the two
3 nuclear projects. FPL also utilized an updated set of assumptions in its 2012
4 feasibility analyses, which, as previously stated, include forecasts of costs for
5 natural gas and environmental compliance that are lower than the forecasted
6 costs used in previous feasibility analyses.

7
8 The results of the 2012 feasibility analyses for both projects, plus the results
9 of additional analyses, are summarized in Exhibit SRS – 1. This exhibit
10 presents the following information:

- 11
12 1) Both nuclear projects overall are projected to be solidly cost-effective
13 for FPL's customers. Completing the EPU project is projected to be
14 cost-effective in 6 of 7 scenarios of fuel costs and environmental
15 compliance costs. Turkey Point 6 & 7 is projected to be cost-effective
16 in the majority (5 of 7) of the scenarios. In the remaining 2 scenarios,
17 the projected breakeven costs for Turkey Point 6 & 7 are within FPL's
18 non-binding cost estimate range for Turkey Point 6 & 7.

19
20 It should be noted that in the 3 scenarios in which the nuclear projects
21 are not projected to be the clear economic choice, one scenario for the
22 EPU project and two scenarios for Turkey Point 6 & 7, each of these 3
23 scenarios assumes that either environmental compliance costs, or both

1 environmental compliance and natural gas costs, remain low each year
2 for at least 30 years.

3 2) The projected nominal fuel savings for FPL’s customers from the two
4 nuclear projects are significant. For example, based on analysis results
5 using a Medium Fuel Cost/Medium environmental compliance cost
6 (Env II) scenario, the total EPU project (i.e., its total 490 MW of
7 incremental capacity) is projected to save approximately \$114 million
8 (nominal) in system fuel costs in the first full year (2014) of operation
9 of the uprated nuclear units. Turkey Point 6 & 7 is projected to save
10 approximately \$892 million (nominal) in system fuel costs in the first
11 full year (2024) of operation for both units.

12 3) Based on analysis results using this same fuel cost/environmental
13 compliance cost scenario, the total EPU project is projected to save
14 approximately \$3.8 billion (nominal) in system fuel costs over the life
15 of the project, and Turkey Point 6 & 7 are projected to save
16 approximately \$58 billion (nominal) in system fuel costs over the life
17 of the units.

18 4) The two nuclear projects will also significantly improve the fuel
19 diversity of the FPL system. In their first full year of operation, the
20 total EPU project is projected to reduce FPL’s dependence upon
21 natural gas by approximately 3%, and to allow FPL to increase nuclear
22 energy’s contribution to system fuel mix above the current (for the
23 year 2011) 19% contribution to approximately 22%-to-23% for the

1 remainder of this decade. The Turkey Point 6 & 7 project is projected
2 to reduce FPL's dependence upon natural gas by approximately
3 another 13%. Nuclear energy from both of these projects will supply
4 energy that would otherwise have been supplied primarily by natural
5 gas. Reduction in natural gas usage is important because it will help
6 mitigate the growing reliance on natural gas supplied by Florida's two
7 natural gas pipelines.

8 5) The amounts of increased nuclear energy projected to be supplied in
9 the first full year of operation (and in subsequent years) from the two
10 nuclear projects is equivalent to the total annual energy usage of
11 approximately 311,578 residential customers for the total EPU project,
12 and of approximately 1,247,000 residential customers for Turkey Point
13 6 & 7.

14 6) Stated another way, these amounts of increased nuclear energy
15 projected to be supplied respectively by the two projects will save
16 enormous amounts of fossil fuel. For illustrative purposes, if the same
17 amounts of energy projected to be provided by the increased nuclear
18 capacity from the two projects were to be supplied by conventional
19 steam generating units, then the amount of annual energy projected for
20 the total EPU project would require the consumption of approximately
21 41 million mmBTU of natural gas, or 6 million barrels of oil, annually.
22 Likewise, the amount of annual energy projected for Turkey Point 6 &

1 7 would require the consumption of approximately 177 million
2 mmBTU of natural gas, or 28 million barrels of oil, annually.

3 7) The projected reductions in CO₂ emissions are also very large. Over
4 their lives, the total EPU project and Turkey Point 6 & 7 are projected
5 to reduce CO₂ emissions by approximately 32 million tons and 255
6 million tons, respectively.

7 8) Stated another way, these projected amounts of total CO₂ reductions
8 are equivalent to currently operating all of FPL’s very large system of
9 more than 22,000 MW of generation with zero CO₂ emissions for
10 approximately 9 months in the case of the EPU, and for approximately
11 6 years in the case of Turkey Point 6 & 7.

12

13 Therefore, the results of FPL’s 2012 feasibility analyses are that both the EPU
14 and Turkey Point 6 & 7 are projected to be solidly cost-effective and to
15 provide valuable firm capacity, energy, and fuel diversity for FPL’s
16 customers. These results fully support the feasibility of continuing both
17 nuclear projects.

18

19 **I. 2012 Feasibility Analyses – Analytical Approaches**

20

21 **Q. Please provide an overview of the basic analytical approach used for both**
22 **projects.**

1 A. The basic analytical approach in the feasibility analyses is to compare
2 competing resource plans. FPL utilizes resource plans in its analyses in order
3 to ensure that all relevant impacts to the FPL system are accounted for.

4
5 The analysis of each resource plan is a complex undertaking. For each
6 resource plan, annual projections of system fuel costs and emission profiles
7 are developed, for each scenario of fuel cost/environmental compliance cost,
8 using a sophisticated production costing model. This model, the P-MArea
9 model, simulates the FPL system and dispatches all of the generating units on
10 an hour-by-hour basis for each year in the analysis. The resulting fuel cost
11 and emission profile information is then combined with projected annual
12 capital, operation and maintenance (O&M), etc., costs for each resource plan.
13 In this way, a comprehensive set of projected annual costs, for each year of
14 the analysis, is developed for each resource plan.

15
16 One resource plan contains the projected full output of the nuclear resource
17 option that is being evaluated in a specific feasibility analysis; i.e., either the
18 EPU or the Turkey Point 6 & 7 units. The other resource plan contains
19 instead an alternate resource option that competes with the nuclear resource
20 option. The competing alternate resource option is a new highly fuel-efficient
21 combined cycle (CC) generating unit of the type that FPL assumed in its
22 analyses of the Port Everglades Modernization project.

23

1 The competing resource plans are then analyzed over a multi-year period.
2 This approach allows FPL's analyses to account for both short-term and long-
3 term economic impacts of the resource options being evaluated. FPL's 2012
4 feasibility analyses address these economic impacts. In addition, my
5 testimony provides a discussion of two non-economic impacts, increased
6 system fuel diversity and system emission reductions, which will result from
7 the two nuclear projects.

8 **Q. Has the Florida Public Service Commission provided guidance regarding**
9 **what is required in these feasibility analyses?**

10 A. Yes. The Florida Public Service Commission (FPSC) first provided guidance
11 in its affirmative determination of need order for Turkey Point 6 & 7 (Order
12 No. PSC-08-0237-FOF-EI, page 29), when it stated:

13
14 "FPL shall provide a long-term feasibility analysis as part of its annual
15 cost recovery process which, in this case, shall also include updated
16 fuel costs, environmental forecasts, break-even costs, and capital cost
17 estimates. In addition, FPL should account for sunk costs. Providing
18 this information on an annual basis will allow us to monitor the
19 feasibility regarding the continued construction of Turkey Point 6 and
20 7."

21

1 In the FPSC's 2009 NCRC order (Order No. PSC-09-0783-FOF-EI, page 14),
2 the FPSC quoted its need determination order and reiterated that these
3 elements are "necessary to satisfy Rule 25-6.0423(5)(c)5, F.A.C."

4
5 This guidance from the FPSC clearly distinguishes "sunk costs" from
6 "updated capital cost estimates" in regard to feasibility analyses.
7 Consequently, FPL has effectively separated sunk costs from its updated
8 capital cost estimate to derive a "going forward" capital cost estimate for use
9 in its feasibility analysis. FPL's approach to sunk costs complies with the
10 above mentioned Rule, which directs FPL to evaluate "completing" the
11 project. FPL's approach to sunk costs also follows the guidance provided by
12 the FPSC, and was expressly approved for both the Turkey Point 6 & 7 and
13 EPU analyses by the FPSC in its 2011 NCRC order (Order No. PSC-11-0547-
14 FOF-EI, pages 17-18 and 38).

15 **Q. Were the respective analytical approaches used in FPL's 2012 feasibility**
16 **analyses of the EPU and Turkey Point 6 & 7 similar to the approaches**
17 **used in the Determination of Need filings for these projects, and in the**
18 **feasibility analyses of these projects that were presented in previous**
19 **NCRC filings?**

20 **A.** Yes. The respective analytical approaches that were used in the 2012
21 feasibility analyses for the EPU and Turkey Point 6 & 7 projects were very
22 similar to the approaches used for each of the projects in the 2007
23 Determination of Need filings and in the feasibility analyses presented in the

1 2008 through 2011 NCRC filings. However, the 2012 analyses incorporated
2 two refinements to FPL's basic analytical approach.

3 **Q. Please describe the analytical approaches for both projects.**

4 A. In regard to the EPU project, the basic analytical approach that has been used
5 since the 2007 Determination of Need filing, and with the 2008 through 2011
6 NCRC filings, remains unchanged. This approach is the direct comparison of
7 the cumulative present value of revenue requirements (CPVRR) for two
8 resource plans.

9
10 In regard to the Turkey Point 6 & 7 project, the basic analytical approach also
11 remains unchanged. This approach is the calculation of breakeven overnight
12 capital costs (in terms of both CPVRR costs and overnight \$/kW) for the new
13 nuclear units. This same analytical approach was utilized in the 2007
14 Determination of Need filing, and in the 2008 through 2011 NCRC filings, for
15 the Turkey Point 6 & 7 project. In later years, as more information becomes
16 available regarding the cost and other aspects of the new nuclear units,
17 another analytical approach may emerge as more appropriate.

18 **Q. Please describe the two refinements incorporated into the feasibility
19 analyses this year.**

20 A. In all prior filings regarding the EPU project, one resource plan was assumed
21 to have the projected full uprated capacity (MW) at FPL's four existing
22 nuclear units, and the other resource plan was assumed to have no uprated
23 capacity. In FPL's 2012 feasibility analyses of the EPU project, one of the

1 two refinements accounts for the fact that 31 MW of uprated capacity at St.
2 Lucie Unit 2 have been accomplished and are already benefiting FPL's
3 customers. Therefore, instead of comparing one resource plan with 0 MW of
4 uprated capacity versus a second plan with the total MW of uprated capacity,
5 as has been the case in previous years, the 2012 feasibility analyses of the
6 EPU project compares one resource plan with 31 MW of uprated capacity
7 versus a second resource plan with the total MW (490 MW) of uprated
8 capacity.

9
10 It is worthwhile to note that this refinement has the effect of making the total
11 EPU project appear less cost-effective than it would if FPL had continued to
12 utilize a resource plan with 0 MW of EPU capacity. For example, in the
13 Medium Fuel Cost, Env II scenario, with the refinement, the projected net
14 benefits of completing the EPU project are \$296 million CPVRR. Without
15 this refinement, the projected net benefits value would have been
16 approximately \$392 million CPVRR, or roughly \$100 million CPVRR higher.
17 This demonstrates that this particular refinement resulted in the appearance of
18 a significant reduction in the projected net benefits of completing the EPU
19 project because some of the EPU project's benefits, those associated with the
20 31 MW already achieved, are also accounted for in the alternate resource plan.
21 Nonetheless, FPL made this refinement to accurately reflect the current state
22 of FPL's system that is already benefitting from these 31 MW of nuclear
23 capacity from the EPU project and to be consistent with the 'going forward'

1 perspective of the feasibility analyses. The two resource plans being
2 compared continue to be labeled as the Resource Plan with EPU (denoting the
3 plan with 490 MW of uprated capacity) and the Resource Plan without EPU
4 (denoting the plan with only 31 MW of uprated capacity). This second
5 resource plan can also be considered as the Resource Plan without 'Further'
6 EPU.

7
8 The second refinement incorporated in FPL's 2012 feasibility analyses for
9 both the EPU and Turkey Point 6 & 7 projects concerns a quantification of
10 transmission cost benefits that would be realized due to the projects resulting
11 in additional generating capacity in Southeastern Florida. As referenced in
12 numerous FPL filings with the FPSC, including recent Ten Year Site Plans
13 and the recent Port Everglades Modernization Determination of Need filing,
14 FPL faces a future imbalance between continued growing load in the
15 Southeastern Florida region (specifically, Miami-Dade and Broward counties)
16 and generation in that region. Unless additional generation is added in the
17 region to keep pace with the growing load, FPL will have to build additional
18 transmission facilities in the future to import power from outside the region.

19
20 In a previous NCRC filing, FPL has discussed that the addition of capacity at
21 the Turkey Point site, both through the portion of the EPU project that will
22 increase capacity at existing Turkey Point Units 3 and 4, and through the
23 Turkey Point 6 & 7 project, will help address this imbalance. However, no

1 quantification of those benefits has been included in FPL's previous feasibility
2 analyses. In FPL's 2012 feasibility analyses for both the EPU and Turkey
3 Point 6 & 7 projects, using a similar approach to that used to quantify
4 transmission-related benefits for the Port Everglades Modernization project,
5 FPL is now accounting for the projected transmission-related benefits from
6 the two nuclear projects.

7 8 **II. 2012 Feasibility Analyses – Updated Assumptions**

9
10 **Q. Do FPL's 2012 feasibility analyses utilize updated assumptions for the**
11 **specific information referred to in the previously mentioned FPSC**
12 **Order?**

13 **A.** Yes. FPL typically seeks to utilize a set of updated assumptions in its
14 resource planning work. By early 2012, FPL updated these assumptions and
15 is using them in its 2012 resource planning work including the analyses
16 presented in this docket.

17
18 Five informational items were listed in Order No. PSC-08-0237 that should be
19 updated and included in FPL's annual long-term feasibility analyses of Turkey
20 Point 6 & 7. These five items are:

- 21 (1) fuel forecasts;
- 22 (2) environmental forecasts;
- 23 (3) breakeven costs;

- 1 (4) capital cost estimates; and,
- 2 (5) sunk costs.

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FPL's 2012 feasibility analyses for both the EPU and Turkey Point 6 & 7 projects utilized FPL's current assumptions for four of these five items and calculated the current projected value for the fifth item. FPL's 2012 feasibility analyses for both projects included current assumptions for the following four items: items (1), (2), (4), and (5). The remaining item, item (3) breakeven costs, is a result of the analyses (as opposed to an assumption). The results of FPL's 2012 feasibility analyses present breakeven costs for both projects in terms of CPVRR costs. (For the Turkey Point 6 & 7 projects, breakeven costs are also provided in terms of overnight \$/kW construction costs to provide another perspective that is frequently used when discussing long-term construction projects such as Turkey Point 6 & 7.)

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

A. Yes. FPL also updated a number of other assumptions by early 2012 in preparation for all of its 2012 resource planning work. Consequently, these other updated assumptions are also included in FPL's 2012 feasibility analyses of the two nuclear projects. A partial listing of these other assumptions include: FPL's load forecast, projected incremental capacity by year from the EPU project, and cost and performance assumptions for new combined cycle capacity.

1 **Q. Please discuss the changes in the forecasted values for fuel costs,**
2 **environmental compliance costs, and peak load between the forecasts**
3 **utilized in the 2012 feasibility analyses and those that were used in the**
4 **2011 feasibility analyses.**

5 A. Exhibits SRS – 2 through SRS - 4 provide these comparisons. Exhibit SRS - 2
6 provides 2011 and 2012 forecasted Medium Fuel Cost values for selected
7 years for natural gas, oil, and nuclear fuel costs. As shown in this exhibit, the
8 2012 Medium Fuel Cost forecast for natural gas is lower compared to the
9 2011 forecast. A comparison of the forecasted prices for 1% sulfur oil shows
10 that the 2012 forecasted values are higher than in the 2011 forecast. In regard
11 to forecasted nuclear fuel costs, the 2012 forecasted prices are essentially
12 unchanged from the 2011 forecasted prices.

13
14 Exhibit SRS – 3 presents similar 2011 and 2012 comparative information for
15 forecasted Env II (i.e., mid-level) environmental compliance costs for three
16 types of air emissions: SO₂, NO_x, and CO₂. As shown in the exhibit, the
17 current forecasted compliance costs for SO₂ are higher in 2015, then slightly
18 lower for all other years, compared to the 2011 forecast. The current
19 forecasted compliance costs for NO_x are slightly lower for all years compared
20 to the 2011 forecast. In regard to forecasted CO₂ compliance costs, the 2012
21 forecasted annual cost values are lower than in the 2011 forecast and are
22 assumed to have a later “start” date (i.e., 2023 for the Env II scenario versus
23 2018 assumed in the 2011 forecast).

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Exhibit SRS – 4 presents the 2011 and 2012 Summer peak load forecasts. As shown in Column (3) of this exhibit, the 2012 forecast of Summer peak load is lower than the 2011 forecast.

In addition, Exhibit SRS – 4 also provides a projection of the annual and cumulative growth in Summer peak loads associated with the 2012 peak load forecast. As shown in column (5) of this exhibit, FPL projects a cumulative growth in Summer peak load of approximately 4,869 MW by 2022, and 5,502 MW by 2023 i.e., the year in which the two new nuclear units, Turkey Point 6 & 7, are projected to go in-service.

Q. Based on this projected growth in Summer peak load, what is FPL’s projected need for new resources?

A. FPL’s projected need for new resources, assuming that the resource need is met by new generating capacity, is presented in Exhibit SRS – 5. This projection assumes that FPL is implementing DSM through the year 2019 at a level consistent with the FPSC’s 2011 DSM Plan order (Order No. PSC-11-0346-PAA-EG) and also assumes an additional 100 MW per year of DSM are implemented in 2020 through 2025. This exhibit shows that, without the incremental capacity from EPU and Turkey Point 6 & 7, and with no new generating resources added after the modernization of Port Everglades in 2016, FPL has a need for new resources starting in 2020 and this need

1 increases every year thereafter. The need in 2020 is for 267 MW of new
2 generating capacity and this need increases to 3,240 MW by 2025.

3 **Q. What other assumptions changed from the 2011 analyses to the 2012**
4 **analyses?**

5 A. Exhibit SRS – 6 presents the 2011 and 2012 projections for 14 other
6 assumptions that were utilized in the feasibility analyses. These other
7 assumptions are grouped into three categories of either four or five
8 assumptions each: (i) assumptions used in the feasibility analyses of both
9 projects; (ii) assumptions primarily used only in the feasibility analyses of
10 completing the EPU project; and (iii) assumptions primarily used only in the
11 feasibility analyses of the Turkey Point 6 & 7 project. (Note that some of the
12 assumptions included in the second and third groupings do have an impact in
13 the feasibility analyses of both projects. One example of such an assumption
14 is the incremental capacity of the EPU project. The grouping of assumptions
15 such as these into either the second or third groupings is done solely to
16 facilitate discussion in this testimony of changes in assumptions.)

17 **Q. Please discuss the first grouping of these other assumptions; i.e., those**
18 **assumptions that are applicable in the feasibility analyses for both**
19 **projects.**

20 A. The five assumptions included in this grouping are:

- 21 1) the number of environmental compliance cost scenarios;
- 22 2) financial/economic assumptions;
- 23 3) the capital cost of competing CC capacity;

- 1 4) the heat rate of competing CC capacity; and,
- 2 5) the projected cost of firm gas transportation.

3

4 In regard to the number of environmental compliance cost scenarios utilized

5 in FPL's 2012 feasibility analyses, FPL is again using three scenarios in its

6 2012 resource planning work: Env I (representing low CO₂ compliance costs),

7 Env II (representing medium CO₂ compliance costs), and Env III

8 (representing high CO₂ compliance costs).

9

10 FPL's financial/economic assumptions used in the 2012 feasibility analyses

11 have not changed from those used in the 2011 feasibility analyses: return on

12 equity (ROE) of 10.0%; the allowed cost of debt of 5.50%; the debt-to-equity

13 ratio of 40.88%/59.12%.; and the associated discount rate of 7.29%.

14

15 The remaining three assumptions that are included in this first grouping of

16 assumptions involve the costs of the competing new CC capacity used in the

17 feasibility analyses. FPL's current projected (generator only) capital cost of

18 CC capacity is \$913/kw in 2018\$. The current projected heat rate of this CC

19 capacity is 6,369 BTU/kwh, and the projected firm gas transportation cost is

20 \$1.98/mmBTU in 2018. The projected capital cost of the CC unit is higher

21 than projected in 2011, and the projected heat rate value is lower than

22 projected in 2011. These are due to a change in the assumed type of new CC

23 unit from an H machine in 2011 to a J machine in 2012. (FPL utilized a J

1 machine in its analyses of the Port Everglades modernization project.) There
2 is no change in the projected firm gas transportation cost.

3 **Q. Please discuss the second grouping of other assumptions that primarily**
4 **address the analysis of completing the EPU project.**

5 A. The five assumptions included in this second grouping are:

- 6 6) total incremental capacity from the EPU project;
- 7 7) already achieved incremental capacity from the EPU project;
- 8 8) non-binding capital cost estimate of the EPU project;
- 9 9) previously spent capital costs for the EPU project that are excluded
10 from the 2012 feasibility analyses; and,
- 11 10) the resulting “going forward” capital costs utilized in the 2012
12 feasibility analyses.

13

14 The assumptions for incremental MW and costs are for FPL’s share of the
15 EPU project.

16

17 In regard to the first of these five assumptions, the projected total incremental
18 capacity that FPL’s customers will receive from the EPU project, this value
19 has changed from the 450 MW used in the 2011 feasibility analyses to 490
20 MW as discussed in FPL witness Jones’ testimony. In regard to the second
21 assumption, FPL has achieved a 31 MW increase at St. Lucie Unit 2 which is
22 already benefitting FPL’s customers.

23

1 The combination of the next three assumptions provides the projected
2 incremental capital cost to FPL's customers of completing the EPU project.
3 The projected non-binding capital cost range for the EPU project is discussed
4 in FPL Witness Jones' testimony. In the 2011 feasibility analysis, FPL used a
5 non-binding cost estimate of \$2.48 billion. For the 2012 feasibility analyses,
6 FPL is using a non-binding cost estimate of \$3.05 billion.

7
8 FPL Witness Powers provides the sunk cost value for the EPU project in her
9 testimony. In the 2011 feasibility analysis, FPL excluded approximately
10 \$0.70 billion of costs that were spent through December 31, 2010, resulting in
11 a "going forward" capital cost projection for completing the EPU project of
12 approximately \$1.78 billion (= \$2.48 billion - \$0.70 billion). In the 2012
13 feasibility analyses, FPL is excluding approximately \$1.46 billion of sunk
14 costs that have been spent through December 31, 2011, resulting in a "going
15 forward" capital cost projection for completing the EPU project of
16 approximately \$1.59 billion (= \$3.05 billion - \$1.46 billion). This does not
17 account for sunk costs incurred during 2012.

18 **Q. Does the increase of 40 MW in incremental capacity from the EPU**
19 **project represent the second time the projected capacity from the EPU**
20 **project has increased?**

21 **A.** Yes. In FPL's 2007 need filing for the EPU project, the total amount of
22 capacity that the EPU project would deliver to FPL's customers was projected
23 to be 399 MW. Several years later in a subsequent NCRC filing, this

1 projection increased by 51 MW (or 13%) to 450 MW. In 2012, the 450 MW
2 capacity projection has again increased, this time by 40 MW (or by another
3 9%) to a current projection of 490 MW. These increases demonstrate that
4 FPL began its analyses of the EPU project with a conservative assumption
5 regarding the EPU project's incremental capacity and associated benefits.

6 **Q. Please discuss the third grouping of other assumptions that primarily**
7 **address the Turkey Point 6 & 7 project.**

8 A. The four assumptions included in this third grouping are:

9 11) assumed in-service dates for Turkey Point 6 & 7;

10 12) non-binding capital cost estimate for the new nuclear units;

11 13) previously spent capital costs that are excluded from the 2012
12 feasibility analyses; and,

13 14) the cumulative annual capital expenditure percentages for Turkey
14 Point 6 & 7.

15
16 The first of these four assumptions, the projected in-service dates, for
17 planning purposes, of Turkey Point 6 & 7 are unchanged from the 2022 and
18 2023 in-service dates used in the 2011 feasibility analyses. FPL Witness
19 Scroggs' testimony addresses these dates which represent the earliest practical
20 deployment dates for these new units.

21
22 The second of these assumptions is the non-binding cost estimate for
23 constructing Turkey Point 6 & 7. The updated range of costs used in the 2012

1 feasibility analyses is \$3,570/kw to \$5,190/kw in 2012\$. FPL Witness
2 Scroggs' testimony discusses the updating of this assumption.

3
4 The third of the assumptions included in this grouping is the previously spent
5 capital costs that are excluded in the 2012 feasibility analysis. In order to
6 account for "sunk" capital costs for the Turkey Point 6 & 7 project, FPL is
7 excluding approximately \$157 million of sunk costs that have already been
8 spent through December 31, 2011. This represents an increase of
9 approximately \$28 million compared to the approximately \$129 million sunk
10 cost value utilized in FPL's 2011 feasibility analyses. FPL Witness Powers
11 provides the sunk cost value of the Turkey Point 6 & 7 project in her
12 testimony.

13
14 The fourth assumption in this grouping is the cumulative annual capital
15 expenditure percentages for the construction of Turkey Point 6 & 7. The
16 annual expenditure percentage values used in the 2012 feasibility analyses are
17 largely unchanged from the values used in the 2011 feasibility analyses.

18 **Q. It is clear that a number of changes in assumptions were made between**
19 **those used in the 2011 feasibility analyses and those used in the 2012**
20 **feasibility analyses. Were all of these assumption changes favorable to**
21 **the economics of the EPU and Turkey Point 6 & 7 projects?**

22 **A.** No. Assumption changes are made on a regular basis by FPL in order to
23 utilize the best and most current information available in its resource planning

1 analyses. Typically, updates to some assumptions are favorable, and changes
2 to other assumptions are unfavorable, for any specific resource option or
3 project.

4
5 This was indeed the case for the two nuclear projects in regard to the changes
6 in assumptions from those used in the 2011 feasibility analyses to those used
7 in the 2012 feasibility analyses. Using the EPU project as an example, some
8 updated assumptions (such as the lower fuel cost projections) are unfavorable
9 for the project (although favorable overall for FPL's customers) while other
10 updated assumptions (such as the 40 MW increase in projected total
11 incremental capacity) are favorable for the project (and for FPL's customers).

12
13 All of FPL's updated assumptions, whether favorable or unfavorable for the
14 two nuclear projects, were included in FPL's 2012 feasibility analyses.

15
16 **III. 2012 Feasibility Analyses Results for the EPU Project**

17
18 **Q. What resource plans were used to perform the 2012 feasibility analyses of**
19 **the nuclear uprates project?**

20 **A.** The two resource plans that were utilized in the 2012 feasibility analyses for
21 the EPU project are presented in Exhibit SRS – 7. As shown in this exhibit,
22 the new generating unit additions in the two resource plans are identical
23 through 2019 except for the addition of the incremental MW from the EPU

1 project in the years 2012 - 2013. The two resource plans begin to differ
2 starting in 2020. In the Resource Plan without EPU, a new CC unit is added
3 in 2020. Due to the 490 MW of additional capacity projected to be supplied
4 by the EPU project, the Resource Plan with EPU needs no additional
5 generation in 2020. A new 250 MW Purchase Power Agreement (PPA) is
6 added for 2021, and a CC unit is added in 2025. Finally, the same amount of
7 “filler unit” capacity is added from 2026 – on in both resource plans although
8 there are differences between the two resource plans in regard to the timing of
9 when those filler units are added.

10 **Q. What were the results of the 2012 feasibility analyses for the EPU**
11 **project?**

12 **A.** The results of the 2012 feasibility analyses are presented in Exhibit SRS – 8.
13 As shown in Column (5) of this exhibit, the Resource Plan with the EPU
14 Project is projected to have a lower CPVRR cost in 2012\$, compared to the
15 Resource Plan without the EPU Project, in 6 of 7 scenarios of fuel cost and
16 environmental compliance cost forecasts utilized in the analyses.

17
18 In the remaining scenario, which assumes continued low costs for both natural
19 gas and environmental compliance every year for the next 30 years, the
20 Resource Plan with EPU is projected to have a slightly higher CPVRR cost.
21 However, as evidenced by the CPVRR values for this scenario, compared to
22 the CPVRR values for all other scenarios, FPL’s customers would still benefit
23 greatly if the assumed low costs for natural gas and environmental compliance

1 were to materialize. For example, when examining just projected fuel cost
2 forecasts in column (3) of Exhibit SRS-8, the projected CPVRR value for the
3 Medium Fuel Cost, Env I scenario is \$109,733 million or \$109.733 billion.
4 The projected CPVRR value for the Low Fuel Cost, Env I scenario is \$95.917
5 billion. Therefore, the projected total cost savings for FPL's customers if the
6 actual fuel costs follow the Low Fuel Cost forecast instead of the Medium
7 Fuel Cost forecast are approximately \$14 billion CPVRR.

8 **Q. In addition to the results of these CPVRR-based analyses, did FPL's 2012**
9 **feasibility analyses identify any additional advantages for FPL's**
10 **customers that are projected to be derived from the EPU project?**

11 **A. Yes. I will discuss three other advantages to FPL's customers that are**
12 **projected to result from completing the EPU project:**

- 13 1) system fuel savings;
- 14 2) system fuel diversity; and,
- 15 3) system CO₂ emission reductions.

16
17 These advantages will be discussed using the results from the 2012 feasibility
18 analyses for the Medium Fuel Cost, Env II scenario and accounting for the full
19 490 MW of incremental capacity from the EPU project.

20
21 In regard to system fuel savings, the CPVRR values for the system fuel
22 savings for each scenario of fuel cost and environmental compliance cost is
23 accounted for in the respective total CPVRR savings number for that scenario.

1 However, it is informative to also look at the annual nominal fuel savings
2 projections.

3
4 In 2014, the first year in which the uprated capacity at all four existing nuclear
5 units will be in operation for an entire year, the nuclear uprates are projected
6 to save FPL's customers approximately \$114 million (nominal) in fuel costs.
7 Over the life of the current operating license terms of the four uprated nuclear
8 units, the total nominal fuel savings for FPL's customers is projected to be
9 approximately \$3.8 billion.

10
11 Regarding system fuel diversity, in 2014 the relative percentages of the total
12 energy supplied by FPL that is generated by natural gas and nuclear, without
13 the EPU project, are projected to be approximately 69% and 20%,
14 respectively. With the EPU project, these projected percentages change to
15 approximately 66% for natural gas and 24% for nuclear. Thus FPL is
16 projected to be less reliant on natural gas, and more reliant upon nuclear
17 energy, by approximately 3-to-4% due to the EPU project.

18
19 These percentage changes in system fuel use for a system the size of FPL are
20 significant. This can be demonstrated by looking at the projected amount of
21 increased nuclear energy that will be supplied by the nuclear uprates in 2014.
22 That value is approximately 4.1 million MWh. The current forecasted average
23 annual energy use per residential customer in 2014 is 13,146 kwh. Therefore,

1 the projected output from the nuclear uprates in 2014 will serve the equivalent
2 of the total annual electrical usage of approximately 311,578 residential
3 customers that year.

4
5 The improvement in system fuel diversity from the EPU project can also be
6 demonstrated, for illustrative purposes, by looking at the amount of natural
7 gas or oil that would have been needed to produce this same number of
8 approximately 4.1 million MWh in 2014 if that energy had been produced by
9 a conventional steam generating unit with a heat rate of 10,000 BTU/kwh. In
10 such a case, the EPU can be thought of as saving approximately 41,000,000
11 mmBTU of natural gas (if all of this energy had been produced by natural
12 gas), or 6,400,000 barrels of oil (if all of this energy had been produced by
13 oil), in 2014. Similar fossil fuel savings would also occur in each succeeding
14 year.

15
16 Finally, in regard to the reduction of system CO₂ emissions, the EPU is
17 projected to result in a cumulative reduction over the current license terms of
18 the nuclear units of approximately 32 million tons of CO₂. This will be a
19 significant reduction in CO₂ emissions, representing approximately 78% of
20 the total CO₂ emissions from all FPL-owned generating units in 2011. Stated
21 another way, this projected cumulative CO₂ emission reduction from the EPU
22 project is the equivalent of operating FPL's very large system of more than

1 22,000 MW of generation for approximately 9.4 months with zero CO₂
2 emissions.

3 **Q. Why is diversity in generating resources and system fuels important?**

4 A. It is important to keep in mind that FPL uses a portfolio of resources,
5 including generation and fuels, to provide reliable, low-cost service to its
6 customers. Maintaining or improving diversity within FPL's generation and
7 fuel portfolios has the same purpose and effect as maintaining or improving
8 diversification in a financial investment portfolio – over the long term, one
9 expects to do better, with lower volatility and less risk, because the various
10 assets, if diversified, help mitigate each others' upward and downward
11 swings.

12
13 One of the reasons FPL strives for a diversified portfolio of system resources
14 and fuels is because no one can predict with certainty what future fuel prices
15 and/or environmental compliance costs will be. Currently, natural gas prices
16 are quite low by recent historical standards and the fuel cost forecasts utilized
17 in FPL's 2012 feasibility analyses of the two nuclear projects reflect this fact.
18 But it would be unwise to assume natural gas prices will remain low in
19 perpetuity.

20
21 In regard to forecasted environmental compliance costs, the forecasted
22 compliance costs utilized in FPL's 2012 feasibility analyses are also lower
23 than the forecasts used in previous feasibility analyses. It would also be

1 unwise to assume that environmental compliance costs will remain low in
2 perpetuity.

3

4 To the extent future natural gas prices are higher than forecasted, or
5 environmental regulations (particularly in regard to CO₂) are enacted earlier
6 or in a more costly fashion than forecasted, nuclear energy will provide an
7 important hedge against these higher costs. Because the price of nuclear fuel
8 is unrelated to fossil fuel prices, and because nuclear plant generation
9 produces no SO₂, NO_x, CO₂, etc., emissions, additional nuclear capacity is a
10 superb hedge against these types of costs. By achieving diversification of
11 system resources and fuels through additional nuclear capacity, FPL is
12 preparing for all potential future scenarios, and working to keep its customers'
13 electric rates, and thus their corresponding bills, low over the long term.

14

15 It is also important to keep in mind that when fossil fuel costs are low,
16 customers will continue to benefit from those low fuel prices in the form of
17 lower electric rates and bills regardless of the addition of the EPU project. As
18 previously mentioned, this can be seen by the simple example of comparing
19 the projected system CPVRR costs between two scenarios examined in
20 Exhibit SRS-8.

21

22 For example, looking at Column (3) of that exhibit shows that for the High
23 Fuel Cost, Env. II scenario, the projected CPVRR cost for the Plan with the

1 EPU Project, is \$127.390 billion. The corresponding cost for the same plan
2 with the Medium Fuel Cost, Env. II scenario is \$113.225 billion CPVRR.
3 Therefore, a change from the High Fuel Cost forecast to the Medium Fuel
4 Cost forecast results in a projected lower CPVRR cost for FPL's customers of
5 more than \$14 billion. In this comparison, the \$14 billion CPVRR value not
6 only demonstrates how much FPL's customers might benefit with lower
7 natural gas costs, but also demonstrates, by considering the "reverse direction"
8 where actual future gas costs are higher than forecasted, the rationale for
9 seeking out valuable hedges against possible higher future fuel costs, such as
10 the EPU and Turkey Point 6 & 7 projects.

11 **Q. You previously mentioned that the EPU project would result in nuclear**
12 **energy's contribution to FPL's system fuel mix being approximately 24%**
13 **in 2014. What is nuclear energy's current contribution to FPL's system**
14 **fuel mix and what is the projected effect of the EPU for the rest of this**
15 **decade?**

16 **A.** This information is presented in Exhibit SRS – 9. As shown on the exhibit,
17 nuclear energy's actual contribution to FPL's system fuel mix in 2011 was
18 approximately 19%. Once the EPU project is completed, following increased
19 scheduled outages prior to 2014 in order to perform the work necessary for the
20 capacity uprates, nuclear energy's contribution to FPL's system fuel mix is
21 projected to remain above 22% through the rest of the decade.

1 **Q. Earlier you mentioned that the projected fuel savings over the life of the**
2 **EPU project was approximately \$3.8 billion (nominal). Please compare**
3 **that projection with FPL’s current annual system fuel cost.**

4 A. FPL’s current annual system fuel cost is approximately \$4.2 billion.
5 Therefore, the projected fuel savings over the life of the EPU project is
6 equivalent to serving FPL’s more than 4.5 million customer accounts
7 (representing approximately 8.8 million people) for almost a full year with
8 zero fuel costs calculated at today’s fuel costs.

9 **Q. You stated earlier that FPL’s 2012 feasibility analyses incorporated a**
10 **refinement that accounted for future transmission capital costs that,**
11 **absent additional generation being added in Southeastern Florida, would**
12 **need to be added in the future in order to import additional power into**
13 **the Southeastern Florida region. What is the projected magnitude of the**
14 **transmission capital cost savings that are accounted for in the 2012**
15 **feasibility analyses of the EPU project?**

16 A. The 246 MW of incremental capacity that will be added at Turkey Point Units
17 3 and 4 as part of the EPU project will definitely help address the
18 Southeastern Florida regional imbalance issue by adding this significant
19 amount of generation in the region. However, due to the timing of when new
20 transmission facilities would be needed (or avoided) absent additional
21 generation in the region, FPL is not assigning a projected transmission cost
22 savings amount to the EPU project at this time. This is because, after the Port
23 Everglades modernization is completed in 2016, and assuming that if neither

1 the EPU nor Turkey Point 6 & 7 projects' capacity (nor any other generating
2 capacity after 2016) is added in Southeastern Florida, the earliest projected
3 date at which new transmission facilities would be needed to import more
4 power into the region is 2024.

5
6 However, the 2,200 MW of Turkey Point 6 & 7 capacity are projected to be
7 added by mid-2023 (1,100 MW from Turkey Point 6 by mid-2022 and 1,100
8 MW from Turkey Point 7 by mid-2023). Thus the additional capacity from
9 Turkey Point 6 & 7 will fully address the need to add new transmission
10 facilities in 2024. Furthermore, after the addition of the 2,200 MW of
11 generating capacity from Turkey Point 6 & 7, the next projected date by
12 which additional transmission facilities to import power into the region would
13 be needed is 2032. Yet in 2032, the current operating license for Turkey Point
14 Unit 3 is set to expire and the current operating license for Turkey Point Unit
15 4 set to expire in 2033.

16
17 Therefore, for purposes of the 2012 feasibility analyses based on current
18 assumptions, FPL assigns no value to the transmission-related benefits of the
19 EPU project at this time. This decision is, perhaps, a conservative one. A
20 number of factors, including an increase in FPL's load forecast, environmental
21 regulations/operating considerations requiring a derating or retirement of other
22 existing generators in Southeastern Florida, extension of operating licenses for
23 Turkey Point Units 3 & 4, etc., could contribute to the EPU's increased MW

1 at the Turkey Point site deferring or avoiding such transmission expenditures.
2 Such factors, should they materialize, would result in an increase in the net
3 benefits of the EPU project from what is shown in FPL's 2012 feasibility
4 analyses based on current assumptions.

5 **Q. What conclusions do you draw from the results of the 2012 feasibility**
6 **analyses of the EPU project?**

7 A. In regard to these economic feasibility analyses, completing the EPU project
8 is projected to be the economic choice in 6 of the 7 scenarios examined – even
9 utilizing lower than previously projected forecasts of costs for natural gas and
10 environmental compliance. In addition, the results of FPL's 2012 analyses
11 show that FPL's customers are projected to significantly benefit from the EPU
12 in regard to system fuel savings, system fuel diversity, and system CO₂
13 emission reductions once the EPU project is completed in early 2013. And, as
14 previously discussed, there may be transmission-related cost benefits, not
15 accounted for in the 2012 feasibility analyses, that occur from the EPU project
16 in the future from the additional 246 MW of increased capacity at the Turkey
17 Point site, if current assumptions change.

18
19 Furthermore, the EPU project is truly a unique opportunity to offer additional
20 nuclear capacity and energy to FPL's customers. No new sites were required
21 for this additional nuclear capacity, and the construction and permitting times
22 are much shorter than for a new nuclear unit. Therefore, additional nuclear
23 energy contributions that benefit FPL's customers will be accomplished years

1 earlier through the EPU project than would have been possible with new
2 nuclear generating units. In fact, FPL's customers are already benefitting
3 from the 31 MW of additional capacity from the uprate at St. Lucie Unit 2.
4 FPL's customers are projected to receive the full fuel and environmental
5 compliance cost savings, plus the emission reduction and fuel diversity
6 benefits, in less than one year from the filing date of this testimony with the
7 completion of the EPU work at the last of the four nuclear units (Turkey Point
8 Unit 4) in March 2013.

9
10 Therefore, completing the EPU project continues to be projected as a solidly
11 cost-effective and valuable choice for FPL's customers. The results of the
12 2012 feasibility analyses fully support the continuation of the soon-to-be-
13 completed EPU project.

14 15 **IV. 2012 Feasibility Analyses Results for Turkey Point 6 & 7**

16
17 **Q. What resource plans were used to perform the 2012 feasibility analyses of**
18 **Turkey Point 6 & 7?**

19 **A.** The two resource plans that were utilized in the 2012 feasibility analyses of
20 Turkey Point 6 & 7 are presented in Exhibit SRS – 10. As shown in this
21 exhibit, the two resource plans are identical through 2021. The resource plans
22 differ starting in 2022 and 2023 with the Resource Plan with Turkey Point 6 &
23 7 adding the two 1,100 MW nuclear units, one in 2022 and one in 2023. The

1 Resource Plan without Turkey Point 6 & 7 adds two 1,262 MW CC units, one
2 in 2022 and one in 2023. Both resource plans then add the same amount of
3 CC filler unit capacity through 2063 although the timing of the filler unit
4 additions will vary between the two resource plans.

5 **Q. What were the results of the 2012 feasibility analyses for Turkey Point 6**
6 **& 7?**

7 A. The results of the 2012 feasibility analyses for Turkey Point 6 & 7 are
8 presented in Exhibit SRS – 11. The breakeven nuclear capital costs in \$/kW
9 in 2012\$ are presented in Column (6) of this exhibit. The results in Column
10 (6), when compared to FPL’s non-binding estimated range of capital costs in
11 2012\$ of \$3,570/kW to \$5,190/kW, show that the projected breakeven capital
12 costs for Turkey Point 6 & 7 are above this range in 5 of 7 scenarios of fuel
13 cost and environmental compliance cost. In the remaining 2 scenarios, the
14 projected breakeven capital cost is within the non-binding estimated capital
15 cost range. Thus Turkey Point 6 & 7 is projected to be the economic choice in
16 the majority (5 of 7) of the cases.

17
18 It is informative to note that both of the remaining 2 scenarios in which the
19 projected breakeven costs for Turkey Point 6 & 7 are projected to be within
20 the non-binding cost estimate range are based on an assumption of low
21 environmental compliance costs continuing every year for the next 50 years.
22 In addition, one of these 2 remaining scenarios also assumes low natural gas
23 costs continuing every year for the next 50 years.

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Also, as evidenced by the CPVRR values for these 2 remaining scenarios, compared to the CPVRR values for all other scenarios, FPL's customers would still benefit greatly if the assumed low costs for natural gas and/or environmental compliance were to materialize.

Q. In addition to the results of these economic analyses, did FPL's 2012 feasibility analyses identify any additional advantages for FPL's customers that are projected to be derived from the Turkey Point 6 & 7 project?

A. Yes. Just as was done in discussing the EPU project, I will discuss three other advantages to FPL's customers that are projected to result from the Turkey Point 6 & 7 project:

- 1) system fuel savings;
- 2) system fuel diversity; and,
- 3) system CO₂ emission reductions.

Similar to the EPU project discussion, these advantages for the Turkey Point 6 & 7 project will be discussed by using the results from the 2012 feasibility analyses for the Medium Fuel Cost, Env II scenario.

In regard to system fuel savings, 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 number for that scenario.

1 As shown in the Exhibit SRS – 11, these CPVRR savings values are then
2 translated into breakeven costs. Consequently, the system fuel savings have
3 already been accounted for in the breakeven cost values. However, as was the
4 case with the EPU project, it is informative to also look at the annual nominal
5 fuel savings projections for Turkey Point 6 & 7.

6
7 In 2024, the first year in which both of the new nuclear units are in service for
8 a full year, Turkey Point 6 & 7 are projected to save FPL’s customers
9 approximately \$892 million (nominal) in fuel costs. Over the 40-year life of
10 the two new nuclear units assumed (conservatively) for these analyses, the
11 total nominal fuel savings for FPL’s customers is projected to be
12 approximately \$58 billion (nominal).

13
14 Regarding system fuel diversity, in 2024 the relative percentages of the total
15 energy supplied by FPL that is generated by natural gas and nuclear, without
16 Turkey Point 6 & 7, are approximately 71% and 20%, respectively. With
17 Turkey Point 6 & 7, these percentages change to approximately 58% for
18 natural gas and 33% for nuclear. Thus FPL is projected to be far less reliant
19 on natural gas, and more reliant upon nuclear energy, by approximately 13%
20 each.

21
22 These percentage changes in system fuel use for a system the size of FPL are
23 significant. This can be demonstrated by looking at the projected amount of

1 energy that will be supplied by the two new nuclear units in 2024. That value
2 is approximately 17.7 million MWh. The forecasted average annual energy
3 use per residential customer in 2024 is 14,185 kWh. Therefore, the projected
4 output from Turkey Point 6 & 7 in 2024 will serve the equivalent of the total
5 annual electrical usage of approximately 1,247,000 residential customers in
6 that year.

7
8 The improvement in system fuel diversity from Turkey Point 6 & 7 can also
9 be demonstrated, for illustrative purposes, by looking at the amount of natural
10 gas or oil that would have been needed to produce this same number of
11 approximately 17.7 million MWh in 2024 if that energy had been produced by
12 a conventional steam generating unit with a heat rate of 10,000 BTU/kwh. In
13 such a case, Turkey Point 6 & 7 can be thought of as saving approximately
14 177,000,000 mmBTU of natural gas (if all of this energy had been produced
15 by natural gas), or approximately 27,600,000 barrels of oil (if all of this
16 energy had been produced by oil), in 2024.

17
18 Finally, in regard to the reduction of system CO₂ emissions, the Turkey Point
19 6 & 7 project is projected to result in a cumulative reduction over the expected
20 life of the two units of approximately 255 million tons of CO₂. This will be a
21 significant reduction in CO₂ emissions, representing approximately 628% of
22 the total CO₂ emissions from all FPL-owned generating units in 2011. Stated
23 another way, this projected cumulative CO₂ emission reduction from Turkey

1 Point 6 & 7 is the equivalent of operating FPL's very large system of more
2 than 22,000 MW of generation for approximately 6.3 years with zero CO₂
3 emissions.

4 **Q. Are the fuel diversity benefits discussed above in regard to the EPU**
5 **project also important in regard to Turkey Point 6 & 7?**

6 A. Yes. As discussed in the EPU section, nuclear power provides an important
7 hedge for customers against the potential for future natural gas prices to be
8 higher than forecasted and costly environmental (especially CO₂) regulations.
9 Because the price of nuclear fuel is unrelated to fossil fuel prices, and because
10 it produces no SO₂, NO_x, CO₂, etc., emissions to generate electricity, it is a
11 superb hedge against higher fossil fuel and environmental compliance costs.

12 **Q. Earlier you mentioned that the projected fuel savings over the life of the**
13 **Turkey Point 6 & 7 project was approximately \$58 billion (nominal).**
14 **Please compare that projection with FPL's current annual system fuel**
15 **costs.**

16 A. FPL's current annual system fuel cost is approximately \$4.2 billion.
17 Therefore, the projected fuel savings over the life of the Turkey Point 6 & 7
18 project is equivalent to serving FPL's more than 4.5 million customer
19 accounts (representing approximately 8.8 million people) for more than 14
20 years at zero fuel costs for FPL's customers calculated at today's fuel costs.

21 **Q. What was the result of the refinement in the 2012 analyses in regard to**
22 **transmission-related benefits of Turkey Point 6 & 7 deferring/avoiding**

1 **the cost of transmission facilities that would otherwise be needed to**
2 **import power into the Southeastern Florida region?**

3 A. The addition of 2,200 MW of capacity from Turkey Point 6 & 7 in Miami-
4 Dade County is projected to achieve significant transmission cost savings by
5 avoiding the construction of transmission facilities that would otherwise need
6 to be built to import power from outside the Southeastern Florida region into
7 that region. These savings are currently projected to be approximately \$870
8 million CPVRR. That savings value is accounted for in FPL's 2012
9 feasibility analyses of the Turkey Point 6 & 7 project.

10 **Q. What conclusions do you draw from the results of the 2012 feasibility**
11 **analyses of Turkey Point 6 & 7?**

12 A. In regard to these economic feasibility analyses, the Turkey Point 6 & 7
13 project is clearly projected to be the economic choice in the majority (5 of 7)
14 of scenarios examined. In the 2 remaining scenarios (which are based on
15 assumptions of either low environmental compliance costs, or low
16 environmental compliance and natural gas costs, each year for the next 50
17 years), the projected breakeven capital costs are within the non-binding
18 estimated capital cost range for the new nuclear units. Therefore, Turkey
19 Point 6 & 7 is projected to be the economic choice in the majority of cases;
20 i.e., in 5 of 7 scenarios, and will nonetheless be beneficial in terms of
21 increased fuel diversity and reduced emissions in all scenarios.

22

1 Thus, the results of the 2012 feasibility analyses show that Turkey Point 6 & 7
2 continues to be projected as a solidly cost-effective capacity and energy
3 choice for FPL and its customers. In addition, the results of FPL's 2012
4 feasibility analyses show that FPL's customers are projected to significantly
5 benefit from Turkey Point 6 & 7 in regard to system fuel savings, system fuel
6 diversity, and system CO₂ emission reductions once the Turkey Point 6 & 7
7 units go in-service. These conclusions fully support the feasibility of
8 continuing the Turkey Point 6 & 7 project.

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

10 A. Yes.

**Summary of Results from FPL's 2012 Feasibility Analyses
of the EPU and Turkey Point 6 & 7 Projects
(Plus Results from Additional Analyses)**

	EPU Project	Turkey Point 6 & 7 Project
1) Number of fuel cost/environmental compliance cost scenarios in which the nuclear project is projected to be cost-effective:	6 of 7	5 of 7
2) Projected Fuel Savings for FPL's Customers in First Full Year of Operation (Approx. Nominal \$): *	\$114 million	\$892 million
3) Projected Fuel Savings for FPL's Customers Over the Life of the Project (Approx. Nominal \$)	\$3.8 Billion	\$58 Billion
4) Projected Percentage of Total FPL Energy Produced from Natural Gas and Nuclear in First Full Year of Operation of Nuclear Project (Approx. %):		
- without the Nuclear Project	69% Gas & 20% Nuclear	71% Gas & 20% Nuclear
- with the Nuclear Project	66% Gas & 24% Nuclear	58% Gas & 33% Nuclear
5) Equivalent Approximate Number of Residential Customers' Annual Energy Use Supplied by Nuclear Project in the First Year of the Project	311,578	1,247,000
6) Equivalent Annual Amount of Fossil Fuel Saved by the Nuclear Project Beginning in the First Year of Operation (Approx.):		
- Equivalent mMBTU of Natural Gas	41 million	177 million
- Equivalent Barrels of Oil	6 million	28 million
7) Projected Amount of CO ₂ Emissions Reduced by Nuclear Project Over the Life of the Project	32 million tons	255 million tons
8) Equivalent Number of Months at Which FPL's Generating System Would Operate with Zero CO ₂ Emissions (approx.)	9.4	75 (or 6.3 years)

* The first full year of operation for the EPU project is assumed to be 2014, because the last uprated unit enters service in 2013.
The first full year of operation for the Turkey Point 6 & 7 project is assumed to be 2024, because the last unit enters service in 2023.

**Comparison of Key Assumptions Utilized in the 2011 and 2012
 Feasibility Analyses of FPL Nuclear Projects:
 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)		
	2011 Feasibility Analysis	2012 Feasibility Analysis	Change in 2012 Forecast
2012	\$5.32	\$3.89	(\$1.43)
2015	\$6.01	\$5.26	(\$0.75)
2020	\$8.62	\$7.93	(\$0.70)
2025	\$11.86	\$11.18	(\$0.68)
2030	\$13.07	\$12.26	(\$0.81)
2035	\$14.35	\$13.40	(\$0.95)
2040	\$15.76	\$14.64	(\$1.12)

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

Selected Years	Forecasted 1% S Oil Cost (\$/mmBTU)		
	2011 Feasibility Analysis	2012 Feasibility Analysis	Change in 2012 Forecast
2012	\$13.82	\$16.23	\$2.42
2015	\$14.33	\$17.75	\$3.42
2020	\$19.65	\$23.85	\$4.20
2025	\$22.26	\$25.85	\$3.59
2030	\$22.62	\$26.30	\$3.68
2035	\$22.91	\$26.67	\$3.75
2040	\$23.21	\$27.04	\$3.83

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

Selected Years	Forecasted Nuclear Fuel Cost (\$/mmBTU) *		
	2011 Feasibility Analysis	2012 Feasibility Analysis	Change in 2012 Forecast
2012	\$0.65	\$0.64	(\$0.01)
2015	\$0.78	\$0.78	\$0.01
2020	\$0.88	\$0.91	\$0.03
2025	\$1.07	\$1.07	(\$0.00)
2030	\$1.08	\$1.08	(\$0.00)
2035	\$1.22	\$1.22	\$0.00
2040	\$1.39	\$1.39	(\$0.00)

* For the Resource Plan with EPU for 2011 and 2012.

Docket No. 120009-EI
**Comparison of Key Assumptions Utilized in 2011 and 2012
 Feasibility Analyses of FPL Nuclear Projects:
 Projected Environmental Compliance Costs (Env II Forecast)**
 Exhibit SRS - 3, Page 1 of 1

**Comparison of Key Assumptions Utilized in the 2011 and 2012
 Feasibility Analyses of FPL Nuclear Projects:
 Projected Environmental Compliance Costs: (Env II Forecast)**
 (all \$ values shown are in Nominal \$)

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

Forecasted SO ₂ Compliance Cost (\$/ton)			
Selected Years	2011 Feasibility Analysis	2012 Feasibility Analysis	Change in 2012 Forecast
2015	\$58	\$246	\$188
2020	\$66	\$64	(\$2)
2025	\$74	\$72	(\$2)
2030	\$84	\$82	(\$2)
2035	\$95	\$93	(\$2)
2040	\$108	\$105	(\$3)

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

Forecasted NO _x Compliance Cost (\$/ton)			
Selected Years	2011 Feasibility Analysis	2012 Feasibility Analysis	Change in 2012 Forecast
2015	\$522	\$509	(\$13)
2020	\$590	\$576	(\$14)
2025	\$668	\$652	(\$16)
2030	\$756	\$737	(\$19)
2035	\$855	\$834	(\$21)
2040	\$968	\$944	(\$24)

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

Forecasted CO ₂ Compliance Cost (\$/ton)			
Selected Years	2011 Feasibility Analysis	2012 Feasibility Analysis	Change in 2012 Forecast
2015	\$0	\$0	\$0
2020	\$32	\$0	(\$32)
2025	\$47	\$11	(\$36)
2030	\$68	\$21	(\$47)
2035	\$98	\$38	(\$60)
2040	\$141	\$64	(\$77)

**Comparison of Key Assumptions Utilized in the 2011 and 2012
Feasibility Analyses of FPL Nuclear Projects:
Summer Peak Demand Load Forecast
(Summer MW)**

(1) (2) (3) = (2) - (1) (4) (5)

Selected Years	2011 Feasibility Analysis	2012 Feasibility Analysis	Change in 2012 Forecast	Annual Growth with 2012 Peak Demand Forecast	Cumulative Growth with 2012 Peak Demand Forecast
2012	21,853	21,623	(230)	---	---
2013	22,155	21,931	(224)	308	308
2014	23,452	23,243	(209)	1,312	1,620
2015	24,172	23,786	(386)	543	2,163
2016	24,605	24,315	(290)	529	2,692
2017	25,025	24,529	(496)	214	2,906
2018	25,266	24,674	(592)	145	3,051
2019	25,690	25,041	(649)	367	3,418
2020	26,193	25,499	(694)	458	3,876
2021	26,830	25,960	(870)	461	4,337
2022	27,523	26,492	(1,031)	532	4,869
2023	28,208	27,125	(1,083)	633	5,502
2024	28,849	27,680	(1,169)	555	6,057
2025	29,525	28,268	(1,257)	588	6,645
2030	32,957	31,164	(1,793)	*	*
2035	35,643	34,211	(1,432)	*	*
2040	38,508	37,555	(953)	*	*

* 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.

SRS – 5

Projection of FPL's Resource Needs through 2025

(Assuming 31 MW of EPU Only, No Turkey Point 6 & 7, and No Other Capacity Additions after Port Everglades Modernization in 2016)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
				= (1) + (2) - (3)			= (5) - (6)	= (4) - (7)	= (8) / (7)	= ((7)*1.20)-(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 Reserve Margin w/o Additions (%)	Projected MW Needed to Meet 20% Reserve Margin *** (MW)
2012	23,250	2,368	745	24,873	21,623	1,991	19,632	5,241	26.7%	(1,314)
2013	23,749	1,938	826	24,861	21,931	2,114	19,817	5,044	25.5%	(1,080)
2014	25,023	1,938	826	26,135	23,243	2,277	20,966	5,168	24.7%	(975)
2015	25,094	1,938	0	27,032	23,786	2,408	21,378	5,654	26.4%	(1,378)
2016	25,975	1,080	0	27,055	24,315	2,540	21,775	5,279	24.2%	(924)
2017	25,975	705	0	26,680	24,529	2,671	21,858	4,822	22.1%	(450)
2018	25,975	705	0	26,680	24,674	2,802	21,872	4,808	22.0%	(434)
2019	25,975	705	0	26,680	25,041	2,934	22,107	4,572	20.7%	(151)
2020	25,975	705	0	26,680	25,499	3,043	22,456	4,224	18.8%	267
2021	25,975	705	0	26,680	25,960	3,143	22,817	3,863	16.9%	700
2022	25,975	705	0	26,680	26,492	3,243	23,249	3,431	14.8%	1,219
2023	25,975	705	0	26,680	27,125	3,343	23,782	2,898	12.2%	1,858
2024	25,975	705	0	26,680	27,680	3,443	24,237	2,443	10.1%	2,404
2025	25,975	455	0	26,430	28,268	3,543	24,725	1,705	6.9%	3,240

* The projected FPL unit capability values for 2016-on account for the projected conversion of Turkey Point Unit 1 (396 MW) from a generating unit to a synchronous condenser facility.

** MW values shown in Column (3) represent 745 MW out-of-service during the Summer of 2012 (St. Lucie 2), and 826 MW out-of-service during the Summer of 2013 and 2014 due to the installation of electrostatic precipitators at FPL's 800 MW generating units.

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

**Comparison of Key Assumptions Utilized in the 2011 and 2012
Feasibility Analyses of FPL Nuclear Projects: Other Assumptions**

Assumption -----	(1) Value for 2011 Feasibility Analysis -----	(2) Value for 2012 Feasibility Analysis -----	(3) = (2) - (1) Change in 2012 Forecast -----
Assumptions for Feasibility Analyses of Both Projects:			
1) Number of Environmental Compliance Cost Scenarios	3	3	---
2) Financial/Economic Assumptions (Base Case):			
- Capital Structure (debt/equity)	40.88%/59.12%	40.88%/59.12%	---
- Cost of Debt	5.50%	5.50%	---
- Return on Equity	10.00%	10.00%	---
- Discount Rate (after tax)	7.29%	7.29%	---
3) CC Generator Capital (\$/kw in 2018, w/o AFUDC)	\$832	\$913	\$82
4) CC Heat Rate (Base 100%, BTU/kwh)	6,607	6,369	(238)
5) Firm Gas Transportation Cost (\$/mmBTU in 2018)	\$1.98	\$1.98	---
Assumptions for Feasibility Analyses of completing the EPU Project: *			
6) Nuclear Uprates Total Incremental Capacity from Project (MW)	450	490	40
7) Already Achieved Incremental Capacity from Project (MW)	0	31	31
8) Total Capital Cost of Uprates Assumed in Analyses (\$ billions, approx.)	\$2.48	\$3.05	\$0.57
9) Previously Spent Capital Costs Now Excluded (approx.\$ billions, approx.)	\$0.70	\$1.46	\$0.76
10) "Going Forward" Capital Costs Included in Analyses (\$ billions, approx.)	\$1.78	\$1.59	(\$0.19)
Assumptions for Feasibility Analyses of Turkey Point 6 & 7:			
11) Assumed In-Service Dates for Turkey Point Units 6 & 7	2022 & 2023	2022 & 2023	---
12) Non-Binding Overnight Cost Estimate for New Nuclear Units (\$/kw)	\$3,483 to \$5,063 in 2011\$	\$3,570 to \$5,190 in 2012\$	---
13) Previously Spent Capital Costs Now Excluded (\$ millions, approx.)	\$129	\$157	\$28
14) Cumulative Annual Capital Expenditure Percentage for TP 6 & 7			
2012	1.4%	1.3%	(0.1) %
2013	1.9%	1.5%	(0.4) %
2014	4.1%	3.3%	(0.9) %
2015	9.6%	11.4%	1.8 %
2016	18.1%	20.0%	1.9 %
2017	29.7%	30.4%	0.7 %
2018	44.5%	44.9%	0.4 %
2019	62.8%	59.6%	(3.2) %
2020	78.6%	73.6%	(5.0) %
2021	91.2%	86.2%	(5.0) %
2022	95.5%	96.9%	1.4 %
2023	100.0%	100.0%	0.0 %

* The EPU project values shown reflect FPL's share of incremental MW and costs.

The Two Resource Plans Utilized in the 2012 Feasibility Analyses of the EPU Project

Resource Plan with EPU	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026 - 2043
- unit(s)/capacity added	EPU (3 units) *	Cape Canaveral Modernization; EPU (all units)*	Riviera Modernization	---	Port Everglades Modernization	---	---	---	---	250 MW PPA (1 Year)	Turkey Point 6	Turkey Point 7	---	Greenfield 3x1 CC	17,037 MW of CC Filler Unit Capacity
- Projected Summer Full Reserve Margin	28.0%	27.8%	26.8%	28.6%	26.4%	24.2%	24.1%	22.8%	20.9%	20.0%	21.5%	23.4%	21.1%	22.8%	(meets criterion in all yrs)
- Projected Summer Generation Only Reserve Margin	16.2%	15.5%	14.4%	15.6%	13.2%	10.6%	10.0%	8.4%	6.4%	5.5%	6.6%	8.2%	6.0%	7.4%	

Resource Plan without EPU	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026 - 2043
- unit(s)/capacity added	---	Cape Canaveral Modernization	Riviera Modernization	---	Port Everglades Modernization	---	---	---	Greenfield 3x1 CC	---	Turkey Point 6	Turkey Point 7	---	---	17,037 MW of CC Filler Unit Capacity
- Projected Summer Full Reserve Margin	26.7%	25.5%	24.7%	26.4%	24.2%	22.1%	22.0%	20.7%	24.4%	22.5%	24.9%	26.7%	24.4%	20.9%	(meets criterion in all yrs)
- Projected Summer Generation Only Reserve Margin	15.0%	13.4%	12.4%	13.6%	11.3%	8.8%	8.1%	6.5%	9.6%	7.6%	9.6%	11.1%	8.9%	5.7%	

- Notes: - Assumes DSM implementation to match FPSC's DSM Plan order through 2019, then 100 MW/Year of additional DSM through 2025.
 - FPL's reserve margin criterion is 20.0%.
 - 31 MW of additional nuclear capacity already achieved at St. Lucie 2 are accounted for in both resource plans.
 - The generation only reserve margin examines FPL's projected reserves based on generation resources only.

* One of the four nuclear uprates (SL 2) is projected to provide the full uprate amount beginning by December 2012. Two other uprates (SL 1 and TP 3) are projected to be completed by July 2012 and August 2012, respectively. The fourth unit (TP 4) is projected to be completed by March 2013. For reserve margin calculation purposes, all of SL 2's capacity is projected to be out of service during the Summer of 2012 due to the uprate outage schedule. The capacity increases for SL 1 and TP 3 are accounted for in Summer 2012. The capacity increase for TP 4 is accounted for in 2013.

SRS - 8

2012 Feasibility Analyses Results for the EPU Project:

**Total Costs and Total Cost Differentials for All Fuel
 and Environmental Compliance Cost Scenarios in 2012\$
 (millions, CPVRR, 2012 - 2043)**

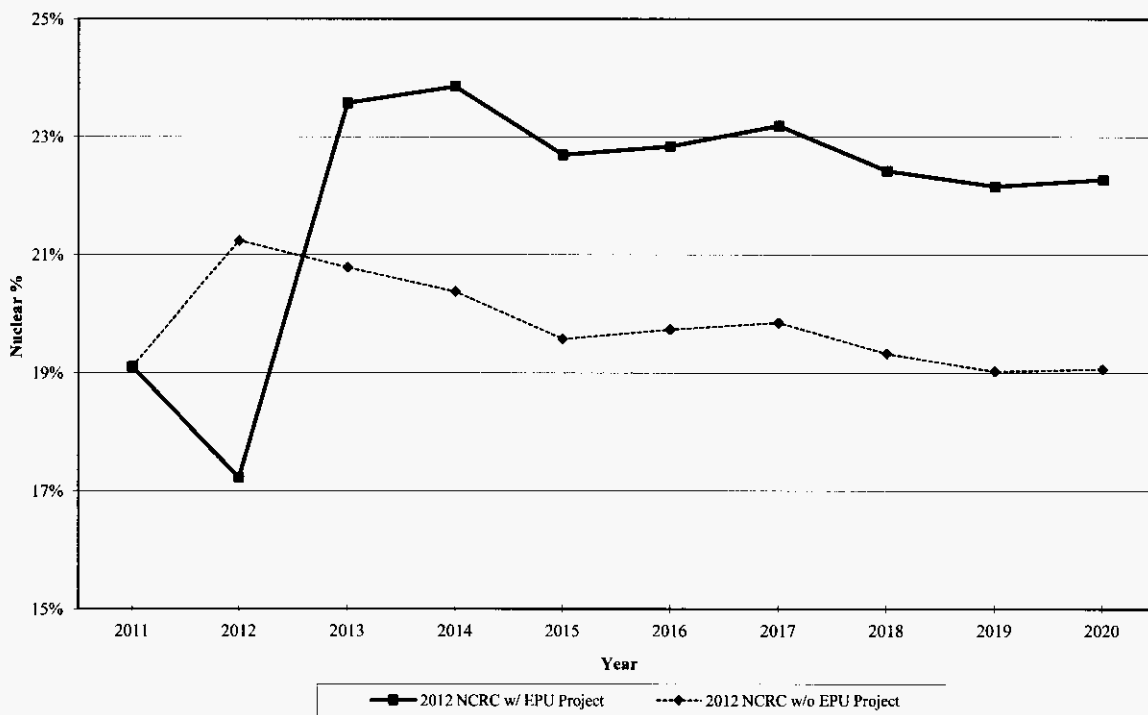
	(1)	(2)	(3)	(4)	(5) = (3) - (4)
Fuel Cost Forecast -----	Environmental Compliance Cost Forecast -----	Total Costs for Plans -----		Total Cost Difference Plan with the EPU Project minus Plan without the EPU Project ** -----	
		Plan with the EPU Project -----	Plan without the EPU Project * -----		
High Fuel Cost	Env I	123,791	124,409		(619)
High Fuel Cost	Env II	127,390	128,061		(671)
High Fuel Cost	Env III	132,723	133,483		(760)
Medium Fuel Cost	Env I	109,733	109,976		(243)
Medium Fuel Cost	Env II	113,225	113,521		(296)
Medium Fuel Cost	Env III	118,394	118,775		(381)
Low Fuel Cost	Env I	95,917	95,835		82

* Accounts for 31 MW of uprated capacity already achieved at St. Lucie 2.

** The EPU savings values in Column (5) also represent CPVRR breakeven capital costs for each scenario.

Note: A negative value in Column (5) indicates that the Plan with the EPU Project is less expensive than the Plan without the EPU Project. Conversely, a positive value in Column (5) indicates that the Plan with the EPU Project is more expensive than the Plan without the EPU Project.

2012 Feasibility Analyses Results for the EPU Project:
Percentage of FPL's Fuel Mix from Nuclear, 2011 - 2020
(2011 Actual and 2012 - 2020 Projections, assuming 0 MW of EPU in the Without EPU Case)



The Two Resource Plans Utilized in the 2012 Feasibility Analyses of Turkey Point 6 & 7

Resource Plan with TP 6&7	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026 - 2063
- unit(s)/capacity added	EPU (3 units) *	Cape Canaveral Modernization, EPU (all units)*	Riviera Modernization	---	Port Everglades Modernization	---	---	---	---	250 MW PPA	Turkey Point 6	Turkey Point 7	---	Greenfield 3x1 CC	38,491 MW of CC Filler Unit Capacity
- Projected Summer Full Reserve Margin	28.0%	27.8%	26.8%	28.6%	26.4%	24.2%	24.1%	22.8%	20.9%	20.0%	21.5%	23.4%	21.1%	22.8%	(meets criterion in all yrs)
- Projected Summer Generation Only Reserve Margin	16.2%	15.5%	14.4%	15.6%	13.2%	10.6%	10.0%	8.4%	6.4%	5.5%	6.6%	8.2%	6.0%	7.4%	

Resource Plan without TP 6&7	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026 - 2063
- unit(s)/capacity added	EPU (3 units) *	Cape Canaveral Modernization, EPU (all units)*	Riviera Modernization	---	Port Everglades Modernization	---	---	---	---	250 MW PPA	Greenfield 3x1 CC	Greenfield 3x1 CC	---	Greenfield 3x1 CC	38,491 MW of CC Filler Unit Capacity
- Projected Summer Full Reserve Margin	28.0%	27.8%	26.8%	28.6%	26.4%	24.2%	24.1%	22.8%	20.9%	20.0%	22.2%	24.7%	22.4%	24.1%	(meets criterion in all yrs)
- Projected Summer Generation Only Reserve Margin	16.2%	15.5%	14.4%	15.6%	13.2%	10.6%	10.0%	8.4%	6.4%	5.5%	7.2%	9.4%	7.2%	8.5%	

- Notes:
- Assumes DSM implementation to match FPSC's DSM Plan order through 2019, then 100 MW/Year of additional DSM through 2025.
 - FPL's reserve margin criterion is 20.0%.
 - 31 MW of additional nuclear capacity already achieved at St. Lucie 2 are accounted for in both resource plans.
 - The generation only reserve margin examines FPL's projected reserves based on generation resources only.

- * One of the four nuclear uprates (SL 2) is projected to provide the full uprate amount beginning by December 2012. Two other uprates (SL 1 and TP 3) are projected to be completed by July 2012 and August 2012, respectively. The fourth unit (TP 4) is projected to be completed by March 2013. For reserve margin calculation purposes, all of SL 2's capacity is projected to be out of service during the Summer of 2012 due to the uprate outage schedule. The capacity increases for SL 1 and TP 3 are accounted for in Summer 2012. The capacity increase for TP 4 is accounted for in 2013.

**2012 Feasibility Analyses Results for Turkey Point 6 & 7:
Total Costs, Total Cost Differentials, and Breakeven Costs
for All Fuel and Environmental Compliance Cost Scenarios
in 2012\$**

Exhibit SRS - 11, Page 1 of 1

2012 Feasibility Analyses Results for Turkey Point 6 & 7:

**Total Costs, Total Cost Differentials, and Breakeven Costs for All
Fuel and Environmental Compliance Cost Scenarios in 2012\$
(millions, CPVRR, 2012 - 2063)**

(1)	(2)	(3)	(4)	(5) = (3) - (4)	(6)
Fuel Cost Forecast -----	Environmental Compliance Cost Forecast -----	Total Costs for Plans ----- Plan with TP 6 & 7 -----	Plan without TP 6 & 7 -----	Total Cost Difference Plan with TP 6 & 7 minus Plan without TP 6 & 7 * -----	Breakeven Nuclear Capital Costs (\$/kw in 2012\$) -----
High Fuel Cost	Env I	181,107	194,742	(13,635)	5,669
High Fuel Cost	Env II	188,659	203,031	(14,372)	5,975
High Fuel Cost	Env III	198,505	213,719	(15,214)	6,326
Medium Fuel Cost	Env I	161,938	173,815	(11,877)	4,938
Medium Fuel Cost	Env II	169,304	181,917	(12,613)	5,244
Medium Fuel Cost	Env III	178,909	192,361	(13,452)	5,593
Low Fuel Cost	Env I	143,246	153,354	(10,108)	4,202

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

Note: A negative value in Column (5) indicates that the Plan with TP 6 & 7 is less expensive than the Plan without TP 6 & 7.

Conversely, a positive value in Column (5) indicates that the Plan with TP 6 & 7 is more expensive than the Plan without TP 6 & 7.