

**BEFORE THE FLORIDA
PUBLIC SERVICE COMMISSION**

080203

**DOCKET NO. 08____-EI
FLORIDA POWER & LIGHT COMPANY**

**IN RE: FLORIDA POWER & LIGHT COMPANY'S
PETITION TO DETERMINE NEED FOR
WEST COUNTY ENERGY CENTER UNIT 3
ELECTRICAL POWER PLANT**

DIRECT TESTIMONY & EXHIBITS OF:

RENE SILVA

DOCUMENT NUMBER-DATE

02695 APR-88

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DIRECT TESTIMONY OF RENE SILVA

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APRIL 8, 2008

INTRODUCTION AND CREDENTIALS

Q. Please state your name and business address.

A. My name is Rene Silva. My business address is 9250 West Flagler Street, Miami, Florida 33174.

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

A. I am employed by Florida Power & Light Company (FPL or the Company) as Senior Director, Resource Assessment and Planning (RAP).

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

A. I manage the RAP group, the department that is responsible for developing FPL's integrated resource plan (IRP) and other related activities, such as developing system production cost projections for various generation capacity alternatives, analyzing demand side management (DSM) programs, and negotiating and administering wholesale power purchase agreements (PPAs).

Q. Please describe your educational background business experience.

A. I graduated from the University of Michigan with a Bachelor of Science Degree in Engineering Science in 1974. From 1974 until 1978, I was

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1 employed by the Nuclear Energy Division of the General Electric Company in
2 the area of nuclear fuel design. While employed by General Electric, I earned
3 a Masters Degree in Mechanical Engineering from San Jose State University
4 in 1978.

5
6 I joined the Fuel Resources Department of FPL in 1978, as a fuel engineer,
7 responsible for purchasing nuclear fuel. While employed by FPL, I earned a
8 Masters Degree in Business Administration from the University of Miami in
9 1986. In 1987 I became Manager of Fossil Fuel, responsible for FPL's
10 purchases of fuel oil, natural gas and coal. In 1990, I assumed the position of
11 Director, Fuel Resources Department, and in 1991 became Manager of Fuel
12 Services, responsible for coordinating the development and implementation of
13 FPL's fossil fuel procurement strategy. In 1998, I was named Manager of
14 Business Services in the Power Generation Division (PGD). In that capacity,
15 I managed the group that is responsible for coordinating (a) the development
16 of PGD's long-term plan for the effective and efficient construction, operation
17 and maintenance of FPL's fossil generating plants, (b) the preparation of PGD
18 annual budgets and tracking of expenditures, and (c) the preparation of reports
19 related to fossil generating plant performance. On May 1, 2002, I was
20 appointed to my current position.

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

22 A. Yes. I am sponsoring Exhibits RS-1 and RS-2, which are attached to my
23 direct testimony.

1 of proposals received in response to FPL's Request for Proposals (RFP),
2 compared to FPL's WCEC 3, which culminated in FPL's selection of WCEC
3 3 in 2011 as the best, most cost-effective resource to meet our customers'
4 needs. Section 5 discusses the projected benefits associated with the possible
5 future conversion of existing conventional plants in 2013 and 2014 to new,
6 advanced, cleaner generating technology that will produce and deliver energy
7 much more efficiently, and explains why the addition of WCEC 3 in 2011 is
8 necessary to preserve this important option. Section 6 presents the significant
9 adverse consequences FPL and its customers would face if the determination
10 of need for WCEC 3 in 2011 is not granted.

11

12 **I. FPL's Request for an Affirmative Determination of Need**

13

14 **Q. Please explain the relief FPL seeks in this proceeding.**

15 A. FPL seeks from the Commission an affirmative determination of need for
16 WCEC 3, a combined cycle unit with a summer capacity rating of 1,219 MW
17 and a projected commercial operation date of June 1, 2011. WCEC 3 will be
18 the third unit at the West County Energy Center (WCEC), located in Palm
19 Beach County, Florida. The unit's primary fuel will be natural gas, and it will
20 have the capability to use light oil as backup fuel.

21

22 FPL's request for an affirmative determination of need is the culmination of
23 its extensive investigation and analyses designed to identify the best, most

1 cost-effective alternative available as the first step in FPL's strategy to meet
2 FPL's forecasted need for about 4,844 MW of new generating capacity
3 through 2017. That work included not only FPL's assessment of its
4 customers' capacity needs and analysis of various self-build options to select
5 the most cost-effective self-build option, but also the preparation and
6 management of an RFP for alternatives to FPL's self-build option, and the
7 evaluation of proposals submitted in response to the RFP.

8
9 The addition of WCEC 3 in 2011 is an integral part of FPL's strategy to meet
10 the growing resource needs of its customers and reduce the emission of carbon
11 dioxide (CO₂) and other substances through 2017 in the most cost-effective
12 manner and thereby continue to deliver electricity at a reasonable cost, while
13 complying with anticipated environmental requirements.

14 **Q. How much generating capacity will be needed to meet FPL customers'**
15 **needs in 2011 through 2017?**

16 A. Based on FPL's load forecast revised in 2008, FPL projects that between 2011
17 and 2017 FPL will have to add about 4,844 MW of new generation capacity,
18 equivalent to four generating units of the size of WCEC 3.

19 **Q. Why is FPL requesting to add WCEC 3 in June of 2011?**

20 A. Because the resource plan that includes the addition of WCEC 3 in June of
21 2011 will result in significantly greater benefits to FPL's customers than the
22 other seven resource plans that FPL has evaluated. These benefits fall in six
23 categories:

1 First, as shown in Exhibit SRS-14 attached the testimony of FPL witness Sim,
2 adding WCEC 3 in 2011 will result in customer savings of about \$460
3 million, cumulative present value of revenue requirements in 2008 dollars
4 (CPVRR) compared to adding a similar unit in 2013, and about \$137 million
5 (CPVRR) compared to adding WCEC 3 in 2012. In addition, the selected
6 resource plan that includes WCEC 3 in 2011 will result in customer savings of
7 between \$600 million and \$1 billion (CPVRR) compared to the five other
8 resource plans that include the proposals received in response to FPL's RFP.

9
10 Second, by adding the clean, highly efficient, gas burning WCEC 3 in 2011,
11 cumulative system air emissions will be reduced as follows: CO₂ by 2.2
12 million tons, sulfur dioxide (SO₂) by 6,500 tons, and nitrogen oxide (NO_x) by
13 10,750 tons, compared to delaying until 2013 the amount of new generation
14 capacity provided by WCEC 3. These emission reductions in 2011 through
15 2013 help offset, in part, the projected higher cost of air emissions in the
16 future.

17
18 Third, between June of 2011 and May of 2013, FPL's system average heat
19 rate, the measure of system fuel efficiency, will improve from 8,311 Btu/kWh
20 before the addition of WCEC 3, to 8,194 Btu/kWh, a 1.4% improvement,
21 because of the addition of WCEC 3 in 2011, compared to delaying the
22 generation capacity addition until 2013, thus reducing FPL's use of natural
23 gas by about 18 million MMBtu and fuel oil by about 1.2 million barrels

1 between June of 2011 and June of 2013. This fuel efficiency gain in 2011
2 through 2013 helps offset, in part, the effects of projected rising fuel prices in
3 the future.

4
5 Fourth, adding WCEC 3 in 2011 enables FPL and its customers to have far
6 less uncertainty regarding the actual cost of that generating unit than would be
7 the case if WCEC 3 were to be delayed, or if another similar generating unit
8 were to be built at another site at a later date. The economic analysis results of
9 WCEC 3 in 2011 reflect the fact that the costs of equipment, materials and
10 labor for the addition of WCEC 3 in 2011 are significantly lower than they
11 would be for a later addition at WCEC or elsewhere. But what is not reflected
12 in the results is the fact that the rate of escalation beyond 2011 for all of these
13 cost components is highly uncertain and may well be significantly higher than
14 currently projected. Therefore, the cost penalty to FPL's customers of
15 delaying the addition of WCEC 3 beyond 2011 could be significantly greater
16 than the \$137 million, or the \$460 million (CPVRR), referred to above.

17
18 Fifth, adding WCEC 3 in 2011 would create for FPL the option of converting
19 some of its existing conventional generating plants into new, advanced,
20 cleaner generation that will produce energy much more efficiently, by 2013
21 and 2014. The aim of this project is to transform more than 1,200 megawatts
22 (MW) of much less efficient oil and gas-fueled steam generation into more
23 than 2,400 MW of highly efficient, state-of-the-art, environmentally sensitive

1 advanced combined cycle units. FPL's preliminary analysis indicates that such
2 cleaner, high efficiency conversions would result in significant additional
3 savings to FPL's customers; above those that would result from the addition
4 of WCEC 3 in 2011, and that they would further improve system fuel
5 efficiency and reduce air emissions, including CO₂. However, as explained
6 later in my testimony, because converting existing conventional steam plants
7 would initially require removing more than 1,200 MW of capacity from FPL's
8 system beginning in 2011, adding WCEC 3 in 2011 would be necessary in
9 order for FPL to be able to accomplish these cleaner, high efficiency
10 conversions and still maintain system reliability in 2011 and 2012.

11 .
12 FPL has initiated an effort to thoroughly evaluate every aspect of this cleaner,
13 high efficiency conversion plan in order to confirm the magnitude of the
14 benefits that such conversions would provide to FPL's customers. Upon
15 completion of this evaluation, FPL will file with the Commission a request for
16 approval of the proposed conversion project.

17
18 Sixth, the addition of WCEC 3 will continue to mitigate what would
19 otherwise, in time, become a growing imbalance between the Southeast
20 Florida load and generation capacity in that region. As a result, this generation
21 addition will help reduce transmission-related costs.

1 The benefits of adding WCEC 3 in 2011 listed above are summarized in
2 Exhibit RS-1, attached to my testimony.

3 **Q. Do new DSM and renewable resources diminish the beneficial effects of**
4 **adding WCEC 3 in 2011?**

5 A. No. There is no currently identified additional cost-effective DSM not already
6 reflected in FPL's resource plan for the period through 2017. Therefore,
7 additional cost-effective DSM cannot be relied on to contribute to system
8 reliability, and there is no evidence to suggest that additional DSM could
9 provide economic benefits to FPL's customers that could in any way diminish
10 the unquestionable benefits provided by the addition of WCEC 3 in 2011.

11
12 Similarly, there are no significant cost-effective renewable resources
13 identified that could provide any significant amount of firm generating
14 capacity in the period through 2017. Therefore, renewable capacity cannot be
15 counted on to contribute to system reliability as does the addition of WCEC 3
16 in 2011. Furthermore, any future renewable resources that could cost-
17 effectively provide energy (but not firm capacity) would not compete with the
18 benefits described above that will be provided by the addition of WCEC 3 in
19 2011, but rather would complement those benefits.

20 **Q. Is FPL proposing the addition of WCEC 3 in 2011 in order to maintain a**
21 **20% reserve margin in that year?**

22 A. No, FPL's recommendation is based on the benefits described above. Taking
23 these benefits into consideration, FPL believes that its customers' interests are

1 best served by placing WCEC 3 in commercial operation in June of 2011. It is
2 also important to note that in the period 2011 through 2017 FPL will need to
3 add 4,844 MW of new generation capacity. WCEC 3 would provide 1,219
4 MW or about one fourth of that total, to meet its customers' demand for
5 electricity. Therefore, there is no question that WCEC 3 or equivalent
6 generating capacity will have to be added to FPL's system; rather, the
7 operative question concerns the identity and timing of the capacity addition
8 that would be most beneficial to FPL's customers. For the reasons I discuss in
9 my testimony, FPL believes that the addition of WCEC 3 in 2011 is the right
10 choice for our customers.

11
12 FPL evaluated other resource plans that would add capacity in 2012 or 2013,
13 as alternatives to adding WCEC 3 in 2011. But, as noted above, FPL's
14 comparative analysis clearly shows that the addition of WCEC 3 in 2011, as
15 proposed in this proceeding, would provide far greater benefits to its
16 customers than any other alternative.

17
18 In summary, without the addition of WCEC 3 in 2011, FPL's customers
19 would be served by a less efficient, more costly and less environmentally
20 sensitive system. Also, without the addition of WCEC 3 in 2011 FPL would
21 not have the option to proceed with cleaner, high efficiency conversions of
22 existing plants. These factors lead to the conclusion that the addition of

1 WCEC 3 in 2011 is needed to provide adequate electricity at a reasonable cost
2 to FPL's customers.

3 **Q. Does the 2008 load forecast used by FPL in this proceeding include the**
4 **Lee County load?**

5 A. Yes. As explained by FPL witness Morley, about 200 MW of Lee County
6 load is included in 2010 through 2013. The full Lee County load is included
7 beginning in 2014.

8 **Q. How will the addition of the Lee County load affect the timing of FPL's**
9 **resource needs?**

10 A. The addition of the Lee County load does not affect the timing of FPL's
11 resource needs until 2014. This is because in 2010 through 2013 FPL's
12 incremental capacity commitment related to the Lee County load adds only
13 about 200 MW to FPL's peak load, which can be met with the new resource
14 additions that have already been approved by the Commission and have been
15 reflected in FPL's resource plan. Consequently, this Lee County load addition
16 does not require any adjustment in FPL's resource plan until 2014.

17 **Q. Does FPL's recommendation to add WCEC 3 in 2011 depend on the**
18 **addition of the Lee County load?**

19 A. No. Adding WCEC 3 in 2011 will still provide the significant benefits listed
20 above, regardless of the Lee County load addition. The precise amounts of
21 savings to customers, emission reductions, efficiency gain, and oil and gas
22 use reductions would be slightly different if FPL were not serving the Lee
23 County load, but these benefits would still be equally compelling. The

1 addition of WCEC 3 in 2011 would also still be needed in order to preserve
2 the option to implement the cleaner, high efficiency conversion of existing
3 conventional FPL plants by 2013 and 2014. Therefore, FPL would be
4 requesting from the Commission an affirmative determination of need for
5 WCEC 3 in 2011 even without the Lee County load.

6 **Q. Is it reasonable to reflect the Lee County load in FPL's resource planning**
7 **process?**

8 A. Yes. FPL has entered into an obligation to serve the Lee County load and,
9 subject only to regulatory approval, the Company is committed to meet that
10 future need. Therefore, FPL has reflected the Lee County load in its resource
11 planning process, especially because of the very long lead time required to
12 complete the process from identifying a future capacity need to cost-
13 effectively placing new generation capacity in service to meet that need.

14 **Q. What would FPL's cumulative projected resource need through 2017**
15 **have been absent the Lee County load?**

16 A. Without the Lee County load, in the period through 2017 FPL would still need
17 to add 3,665 MW of new generation capacity instead of the 4,844 MW
18 reported above. Therefore, WCEC 3 would be needed to provide about one
19 third of the total new generation capacity requirement to meet its customers'
20 demand for electricity through 2017 even in this reduced load situation. More
21 importantly, the addition of WCEC 3 in 2011 would still be needed to provide
22 the many significant customer benefits described above.

1 Q. Is the addition of WCEC 3 in 2011 the most cost-effective alternative to
2 meet FPL's customers' needs for new resources?

3 A. Yes. As explained in FPL witness Sim's testimony, the addition of WCEC 3
4 in 2011 is the best, most cost-effective option available to meet the needs of
5 FPL's customers. WCEC 3 was selected as FPL's next planned generating
6 unit (NPGU) to meet FPL's needs beginning in 2011 because it was
7 determined to be the best, most cost-effective alternative from among all the
8 self-build options identified and evaluated by FPL. As explained by FPL
9 witness Sim, of all the self-build alternatives available to FPL, the two with
10 costs that were closest to WCEC 3 in 2011 were WCEC 3 in 2012 and a
11 similar unit added in 2013. FPL's analysis determined that delaying WCEC 3
12 to 2012 would needlessly increase the cost of electricity to customers by \$137
13 million (CPVRR), while delaying the addition of a similar unit further to 2013
14 would increase customers' costs by \$460 million (CPVRR).

15
16 The addition of WCEC 3 in 2011 was also evaluated against five other
17 alternative portfolios which were constructed using the proposals received in
18 response to FPL's RFP. All of these alternative portfolios were much more
19 costly than the addition of WCEC 3 in 2011. As FPL witness Sim explains in
20 his testimony, the alternative portfolio with the lowest cost was more than
21 \$600 million (CPVRR) more costly to FPL's customers than the addition of
22 WCEC 3 in 2011. This conclusion was confirmed by FPL witness Alan
23 Taylor of Sedway Consulting, the Independent Evaluator, whose analysis also

1 determined that among the alternative portfolios that included the proposals,
2 the one with the lowest cost would be more than \$530 million (CPVRR) more
3 costly than adding WCEC 3 in 2011.

4
5 Furthermore, none of the alternative portfolios offered any non-economic
6 advantages over WCEC 3. Therefore, FPL has established that the addition of
7 WCEC 3 in 2011 is by far the best, most cost-effective alternative to meet
8 FPL customers' needs for additional resources.

9

10 **II. Introduction of FPL Witnesses**

11

12 **Q. How many witnesses are supporting FPL's petition through direct pre-**
13 **filed testimony?**

14 A. Six other witnesses are submitting direct testimony.

15 **Q. Please summarize the topics addressed in the testimony of each of these**
16 **witnesses.**

17 A. FPL witness Dr. Rosemary Morley presents FPL's load forecasting process,
18 discusses the methodologies and assumptions used in that process, and
19 presents FPL's resulting load forecasts, which have been used in FPL's IRP
20 process, and were used in analyses performed related to the addition of
21 WCEC 3. She also discusses the effect of the Lee County load on retail
22 customers.

1 FPL witness Dr. Steven R. Sim describes FPL's IRP process, presents the
2 need for new resources to meet customers' demand for electricity in 2008
3 through 2017, concludes that DSM alone cannot meet this need and explains
4 the analyses FPL performed to evaluate the addition of WCEC 3 in 2011
5 compared to other self-build alternatives. FPL witness Sim also outlines
6 FPL's RFP process and describes the analyses performed to evaluate
7 proposals submitted in response to the RFP. FPL witness Sim presents the
8 results of FPL's analyses, and explains his conclusion that based on FPL's
9 evaluation, adding WCEC 3 in 2011 is the best choice for FPL's customers.

10
11 FPL witness Alan Taylor of Sedway Consulting describes his role as an
12 Independent Evaluator of FPL's proposed WCEC 3 and of the generating
13 capacity proposals received by FPL in response to its RFP, describes the
14 process he followed and the tools he used to conduct his economic evaluation,
15 presents the results of that evaluation, and explains his conclusion that the
16 addition of WCEC 3 constitutes the most cost-effective alternative to meet
17 FPL's resource need.

18
19 FPL witness Heather Stubblefield describes the transportation plan to deliver
20 natural gas and light oil to WCEC 3 and testifies to the ready availability of
21 natural gas for that plant, as part of FPL's overall system. FPL witness
22 Stubblefield also supports the fuel price forecast used in FPL's economic
23 analysis of WCEC 3 and the available generation alternatives.

1 FPL witness Kennard Kosky presents the environmental compliance cost
2 forecast for SO₂, NO_x, mercury (Hg), and CO₂ utilized by FPL in its analysis
3 of WCEC 3 and available generation alternatives. In addition, FPL witness
4 Kosky discusses the magnitude of future reductions in emissions that will be
5 realized through the addition of WCEC 3 in 2011.

6
7 FPL witness John Gnecco presents the engineering details of FPL's proposed
8 WCEC 3, which involves the construction of a new state-of-the-art 3x1
9 combined cycle (CC) unit. Included in FPL witness Gnecco's testimony are
10 the cost and performance specifications of this unit, which are reflected in
11 FPL's economic analyses, including the RFP analysis. FPL witness Gnecco
12 also describes why, from the perspective of permitting, project management,
13 equipment procurement and construction, proceeding to add WCEC 3
14 immediately so that it can be placed in service in June 2011 is clearly in the
15 best interest of FPL's customers.

16
17 **III. Selection of WCEC 3 in 2011 as Best, Most Cost-Effective Alternative**

18
19 **Q. Please outline how FPL determined its generation capacity needs through**
20 **2017 as part of its IRP process.**

21 **A.** As explained by FPL witness Morley, in early 2008 FPL reviewed and revised
22 its peak electricity demand forecast to reflect recent growth trends. FPL's
23 current peak demand forecast was used in its generation reliability assessment

1 using the two reliability criteria previously approved by the Commission. One
2 criterion consists of maintaining a 20% reserve margin; the other criterion
3 consists of demonstrating that the Loss of Load Probability (LOLP) in FPL's
4 system will remain lower than 0.1 days per year during the planning period.
5 FPL witness Sim discusses the reliability criteria.

6 **Q. What was the result of FPL's generation reliability assessment in 2008?**

7 A. FPL's reliability assessment completed in early 2008 determined that, due to
8 load growth and the expiration of power purchases FPL's total resource need
9 in 2011 through 2017 is 6,490 MW. After considering all cost-effective DSM
10 increases in this period, all projected cost-effective renewable resources, and
11 the uprates to FPL's existing nuclear units already approved by the
12 Commission, FPL will still need to add 4,844 MW of new generation capacity
13 in this period, as stated above, in order to continue to meet its 20% reserve
14 margin. FPL also determined that adding the new generating capacity required
15 to meet the 20% reserve margin criterion as specified above would enhance
16 and further ensure FPL's ability to meet the 0.1 days per year LOLP criterion
17 during that period.

18 **Q. What amount of cost-effective DSM is available during FPL's planning**
19 **period?**

20 A. As can be determined from column 5 in Exhibit SRS-1 attached to FPL
21 witness Sim's testimony, FPL projects that it will add about 884 MW
22 (summer MW at the generator) of new DSM in the years 2011 through 2017,
23 sufficient to avoid about 1,061 MW of new generating capacity in that

1 planning period. However, this increase in DSM has already been reflected in
2 the calculation FPL has performed, which identified a need for 4,844 MW of
3 new generation capacity in 2011 through 2017, above the 1,061 MW avoided
4 by new DSM, as well as renewable purchases and the nuclear uprates. It is
5 important to note from these figures that without DSM FPL's total generation
6 capacity need in this period would be 5,905 MW, and that the 1,061 MW
7 avoided through DSM additions cover almost 18% of that total capacity need.

8
9 It is also important to note that, as indicated by FPL witness Sim, through
10 2007 FPL and its customers have avoided the need for 4,753 MW of
11 generation capacity as a result of cost-effective DSM programs, and that in
12 2008 through 2010 DSM increases will be sufficient to avoid another 454
13 MW of generating capacity. Added to the 1,061 MW of capacity that will be
14 avoided by DSM additions in 2011 through 2017, FPL and its customers will
15 have avoided a total of 6,268 MW of generating capacity by 2017 as a result
16 of DSM programs, equal to 21% of the projected amount of FPL-owned
17 generating capacity (29,878 MW) in operation by 2017.

18 **Q. Is there DSM adequate to avoid or significantly mitigate the need for**
19 **WCEC 3?**

20 **A.** No. At present FPL has not identified any additional cost-effective DSM
21 beyond that already reflected in the need calculations. Therefore, considering
22 the need for resources through 2017, DSM is not available to avoid or
23 indefinitely defer the need for WCEC 3. In fact, even after the addition of all

1 the currently projected DSM increases reflected in FPL's resource plan, and
2 after adding WCEC 3 in 2011, FPL would still need to add about 3,625 MW
3 of new generating capacity by 2017.

4
5 As FPL witness Sim discusses in his testimony, FPL will continue to evaluate
6 DSM opportunities as part of its planning process, and as part of the
7 Commission's upcoming DSM Goals proceeding, and to the extent that FPL
8 were to identify and implement additional cost-effective DSM opportunities in
9 the future, such additional DSM would help reduce part of the 3,625 MW of
10 currently projected generation capacity need through 2017 that remains after
11 the addition of WCEC 3 in 2011. This remaining projected need of 3,625
12 MW, which is shown on Exhibit RS-2 as being met by "Natural Gas and/or
13 Other Resources," is determined by subtracting the capacity provided by
14 WCEC 3 (1,219 MW) from the total need for new generating capacity (4,844
15 MW).

16 **Q. What amount of cost-effective generation capacity from renewable
17 resources is available during FPL's planning period?**

18 A. FPL's resource plan already includes all the existing firm renewable
19 generating capacity that FPL is currently purchasing, including about 143
20 MW from contracts that expire by 2012, which FPL will try to renew. FPL's
21 resource plan also reflects 126 MW of new capacity from renewable resources
22 based on what FPL believes is a reasonable estimate of cost-effective
23 proposals for renewable generating capacity it will receive by June 2008 in

1 response to FPL's new, April 2008 request for proposals for renewable
2 generation and FPL's own renewable development efforts. At present FPL has
3 not been able to identify any other cost-effective sources of firm renewable
4 generating capacity.

5 **Q. Is there adequate firm generating capacity from renewable resources to**
6 **avoid or significantly mitigate the need for WCEC 3?**

7 A. No. As explained above, all of the existing and new potential cost-effective
8 firm generating capacity from renewable resources during the planning period
9 has already been reflected in FPL's resource plan. Therefore, neither the need
10 for, nor the benefits provided by, WCEC 3 in 2011 are diminished by DSM or
11 renewable resources.

12 **Q. How did FPL select the addition of WCEC 3 in 2011 as FPL's most cost-**
13 **effective alternative to meet the initial portion of FPL's need in 2011**
14 **through 2017?**

15 A. FPL compared adding WCEC 3 in 2011 to delaying until 2012 the addition of
16 WCEC 3, as well as to adding an equivalent combined cycle unit at a different
17 location in 2012 and in 2013. As explained by FPL witness Sim, FPL also
18 compared the addition of WCEC 3 in 2011 to adding generation of a different
19 size at WCEC in 2012. As explained by FPL witness Sim, all the analyses
20 FPL performed confirmed that adding WCEC 3 in 2011 is the best alternative
21 for FPL's customers.

1 **Q. What resource plans were used by FPL in the economic analysis of**
2 **WCEC 3 and other self-build alternatives, using FPL's 2008 load**
3 **forecast?**

4 A. The resource plans FPL utilized are presented in Exhibit SRS-9 attached to
5 FPL witness Sim's testimony. For the period 2011 through 2017, FPL's basic
6 resource plan consists of the following: 1,061 MW of avoided capacity due to
7 884 MW of new DSM in 2011 through 2017; the approved uprates at existing
8 nuclear units that add 414 MW; extension of all existing renewable power
9 purchases, including one for 45 MW that expires in 2011, plus assumed new
10 renewable capacity totaling 126 MW; and four gas-fueled baseload combined
11 cycle units that add 4,876 MW (one of which is the proposed WCEC 3 in
12 2011). In the aggregate, this resource plan adds 6,522 MW of total net
13 resources to meet a projected need of 6,490 MW of resources in 2011 through
14 2017. The alternative self-build resource plans differed only in terms of the
15 location and timing of the first new combined cycle unit addition, compared to
16 adding WCEC 3 in 2011.

17 **Q. Is it possible that the other resource additions, after 2011, reflected in**
18 **these resource plans would change in the future?**

19 A. Yes. A utility's resource plan is not, and cannot be, static. As indicated earlier
20 in my testimony, FPL is considering converting one or more of its existing
21 conventional plants to new, cleaner, highly efficient advanced generation. In
22 addition, FPL is evaluating self-build renewable resource opportunities,
23 pursuing additional renewable purchases and continuing to evaluate cost-

1 effective DSM opportunities. The outcome of these efforts could well change
2 FPL's resource plan beyond 2011.

3
4 However, the objective of the generation additions reflected in the resource
5 plans presented by FPL witness Sim is to provide a reasonable, neutral
6 backdrop against which the proposed addition of WCEC 3 in 2011 can be
7 fairly compared to other self-build available generation capacity alternatives
8 that FPL could use in place of WCEC 3 in 2011 as the initial step in its
9 strategy to meet its capacity needs through 2017. At this time, FPL is not
10 committed to pursuing any of the three additional gas-fueled combined cycle
11 units that would be added, according to the resource plan, after WCEC 3
12 between 2014 and 2017.

13
14 Therefore, as the projected need for new resources in the future changes, and
15 as other resource alternatives such as additional cost-effective DSM, or
16 additional renewable resources (purchased or self-build), or the cleaner, high
17 efficiency conversion of existing generating plants, or other alternatives
18 become available, and as factors that affect some or all of the resource
19 alternatives change, FPL's resource plan would be modified. Nevertheless,
20 the resource plans utilized in FPL's analyses reflect reasonable choices for
21 meeting FPL's needs through 2017, based on what is known today. In
22 summary, they provide appropriate frames of reference within which to assess
23 the customer benefit of adding WCEC 3 in 2011.

1 **Q. How did the addition of WCEC 3 compare with the other self-build**
2 **alternatives?**

3 A. FPL determined that adding WCEC 3 in 2011 would result in the most cost-
4 effective resource plan. Specifically, adding WCEC 3 in 2011 results in
5 savings of \$137 million (CPVRR) compared to delaying WCEC 3 to 2012,
6 and \$460 million (CPVRR) compared to delaying a similar new unit to 2013.
7 FPL witness Sim's testimony discusses these evaluations in detail. He also
8 describes the earlier analyses FPL performed to compare WCEC 3 in 2011 to
9 other self-build alternatives that differed in size, timing and location using
10 FPL's previous load forecast. The results of those earlier analyses indicated
11 that adding WCEC 3 in 2011 would be \$148 million (CPVRR) less costly
12 than delaying WCEC 3 to 2012, and \$432 million (CPVRR) less costly than
13 adding a 2x1 CC unit at WCEC in 2012 instead of WCEC 3 in 2011. These
14 results, which are presented in FPL witness Sim's testimony, demonstrate that
15 the addition of WCEC 3 in 2011 is the best, most cost-effective self-build
16 alternative, as the initial step in FPL's strategy to meet FPL's resource need
17 through 2017, under both the 2008 FPL load forecast and FPL's previous load
18 forecast.

19

20 **IV. Evaluation of Proposals Received in Response to FPL's RFP**

21

22 **Q. How many alternate resource plans did FPL develop utilizing proposals**
23 **received in response to its RFP?**

1 A. FPL developed five alternate resource plans utilizing the three proposals
2 submitted in response to FPL's RFP. Two of the proposals were mutually
3 exclusive, so only five combinations could be constructed from the three
4 proposals. These five resource plans are described in FPL witness Sim's
5 testimony and presented in Exhibit SRS-9, attached to FPL witness Sim's
6 testimony.

7 **Q. How did these alternate resource plans utilizing the RFP proposals**
8 **compare to the resource plan with WCEC 3 in 2011?**

9 A. As shown on Exhibit SRS-14, attached to FPL witness Sim's testimony, of the
10 resource plans with the RFP proposals (Resource Plans 2 through 6), the best
11 (Resource Plan 2) was more than \$600 million (CPVRR) more costly than the
12 resource plan with WCEC 3 in 2011 (Resource Plan 1); the worst resource
13 plan was about \$1 billion more costly than the resource plan with WCEC 3 in
14 2011. Therefore, the addition of WCEC 3 in 2011 results in a far more
15 economic resource plan than can be achieved with the proposals submitted in
16 response to FPL's RFP.

17 **Q. Did the proposals submitted in response to FPL's RFP provide any non-**
18 **economic advantage compared to the addition of WCEC 3 in 2011?**

19 A. No. As stated earlier in this testimony, adding WCEC 3 in 2011 results in
20 improved system fuel efficiency, reduced emissions and reduced oil and gas
21 use. The generating units proposed in response to FPL's RFP do not provide
22 comparable benefits. In addition, as FPL witness Sim states, the non-
23 economic portion of the proposal evaluation raised questions that would have

1 required further technical information and explanations on the part of the
2 bidders and further evaluation by FPL. Similarly, the non-economic
3 evaluation determined that the type and extent of exceptions taken to FPL's
4 draft contract language suggested that significant work would be required to
5 reconcile apparent differences between the bidders and FPL before a contract
6 that effectively protected FPL's customers could be negotiated. In addition, as
7 submitted, all three proposals violated one or more of the minimum
8 requirements specified in the RFP to protect FPL and its customers. Resolving
9 these violations of the minimum requirements would have required changes to
10 the proposals. Because the proposals were clearly not cost-competitive, by a
11 very wide margin, it was not necessary to pursue any of these concerns.
12 However, the fact that these concerns did exist serve to reinforce the
13 conclusion that the proposals did not provide any non-economic advantage
14 that could mitigate their sizable economic disadvantage compared to adding
15 WCEC 3 in 2011.

17 **V. Benefits of Cleaner, High Efficiency Conversion of Existing Plants**

18
19 **Q. What does the contemplated cleaner, high efficiency conversion of**
20 **existing FPL plants involve?**

21 **A.** In effect, the conversion of existing conventional plants to cleaner, high
22 efficiency generation consists of replacing the selected existing steam plants,
23 which generally have heat rates of approximately 10,000 Btu/kWh, with one

1 or more new 3x1 G state-of-the-art advanced combined cycle units with a net
2 summer peak rating of 1,219 MW and a base operating heat rate of 6,582
3 Btu/kWh. These new combined cycle units would use natural gas as the
4 primary fuel, and would be capable of using light fuel oil as backup fuel. The
5 net peak capacity increase after the conversion of two or more existing plants
6 could be about 1,200 MW, but there would be no increase in steam
7 generation. This total net system capacity increase (compared to system
8 capacity before the existing plants are removed from service) would be
9 comparable to that provided by a new 3x1 G combined cycle unit. The
10 cleaner, high efficiency conversion plan currently contemplated by FPL would
11 remove existing plants from service beginning in 2010 or early 2011. The new
12 converted plants would return to service between June of 2013, and June of
13 2014, consistent with FPL's projected resource need in those years.

14 **Q. What advantages does the cleaner, high efficiency conversion of existing**
15 **FPL plants provide, compared to adding a new generating unit to FPL's**
16 **system as needed, without making any changes to the existing generation**
17 **portfolio?**

18 A. The principal advantage of FPL's currently contemplated generation
19 conversion plan is that, in addition to providing as much net new capacity as
20 would be obtained from adding a new advanced combined cycle unit, these
21 cleaner, high efficiency conversions also transform existing, low efficiency
22 steam generation into highly efficient, low emission, gas-fueled, advanced
23 combined cycle generation. In effect, these conversions would result in

1 replacing about 1,200 MW of inefficient steam generation with 2,400 MW of
2 highly efficient combined cycle generation.

3
4 As a result, this cleaner, high efficiency conversion plan would result in
5 system fuel cost savings, reduced system emissions of CO₂, SO₂ and NO_x, and
6 reduced system fuel use.

7 **Q. Has FPL quantified the magnitude of these advantages as they affect its**
8 **customers?**

9 A. Yes. FPL has developed preliminary results that quantify the customer
10 benefits of its conversion plan by comparing the economics and emissions of
11 this conversion plan to those of a resource plan that does not include cleaner,
12 high efficiency conversions. These preliminary results indicate that the
13 conversion plan would result in total savings of more than \$200 million
14 (CPVRR) compared to the “no conversions” plan. These cost benefits would
15 be incremental to the benefits realized through the addition of WCEC 3 in
16 2011.

17
18 In addition, the conversion plan currently contemplated could reduce FPL’s
19 system CO₂ emissions in 2017 by as much as 900,000 tons compared to the
20 “no conversions” plan. As a result, this cleaner, high efficiency conversion
21 plan could enable FPL to achieve in 2017 the level of FPL system CO₂
22 emissions in 2000, consistent with the 2017 CO₂ emissions target proposed in
23 July 2007 as part of the Governor’s Executive Order 07-127.

1 **Q. Has FPL made a final decision to proceed with this conversion plan?**

2 A. No. The results developed to date are preliminary. FPL is completing its
3 detailed evaluation of all aspects of this cleaner, high efficiency conversion
4 plan in order to ensure that this plan would be beneficial to its customers
5 before it makes a final decision to proceed. FPL anticipates that this effort will
6 be completed in time for FPL to make a decision by May of 2008. However, it
7 is clear that FPL would not be able to implement the conversion of existing
8 units in 2013 and 2014 unless it adds WCEC 3 in 2011.

9 **Q. Why is adding WCEC 3 in 2011 necessary for FPL to proceed with the**
10 **conversion of existing plants in 2013 and 2014?**

11 A. In order to do the work required to convert existing steam plants to new,
12 cleaner, highly efficient generation, it will be necessary to remove from
13 service generation capacity – possibly more than 1,200 MW - at the selected
14 existing plant sites by 2011. Removing from service this quantity of
15 generating capacity in 2011 would reduce FPL's reserve margin to less than
16 16%, well below the 20% reserve margin level that the Commission and FPL
17 agree is necessary to ensure reliable service. Adding the 1,219 MW of WCEC
18 3 in June of 2011 would offset the loss of generating capacity from the
19 existing plants being removed from service and would restore the reserve
20 margin to just above 20%. Without WCEC 3, FPL would have to obtain some
21 other capacity alternative to maintain system reliability if it were to proceed
22 with the cleaner, high efficiency conversion of existing plants. However, as I
23 have explained, because adding WCEC 3 is the most economic resource

1 available to FPL, it would not be beneficial to FPL's customers to implement
2 any of the other alternatives. Therefore, adding WCEC 3 in 2011 is necessary
3 and appropriate if FPL is to proceed with the cleaner, high efficiency
4 conversion plan.

5

6

**VI. Adverse Consequences of Denying a Determination of Need for
WCEC 3 in 2011**

7

8

9 **Q. Would there be any adverse consequences to FPL and its customers if the**
10 **Commission were not to grant an affirmative determination of need for**
11 **WCEC 3 in 2011 in this proceeding?**

12 **A.** Yes. If a determination of need for WCEC 3 in 2011 were not granted in this
13 proceeding, FPL's customers will face significant adverse consequences
14 related to the cost of electricity, air emissions and other factors.

15 **Q. Please describe the adverse consequences of denying a need**
16 **determination for WCEC 3 in 2011 and, for example, deferring**
17 **construction until 2013.**

18 **A.** FPL's analysis shows that delaying the addition of the 1,219 MW of capacity
19 provided by WCEC 3 until 2013 will result in much higher costs to FPL's
20 customers. FPL has estimated the incremental cost to be \$460 million
21 (CPVRR). However, because the cost uncertainty of capacity additions
22 increases with time, the actual cost of a 2013 capacity addition could be
23 significantly greater than has been estimated, and the cost penalty to FPL's

1 customers due to delaying WCEC 3 could therefore be significantly higher
2 than \$460 million (CPVRR).

3
4 Delaying WCEC 3 to 2013 will also result in higher emissions of CO₂ (2.2
5 million tons), SO₂ (6,500 tons), and NO_x (10,750 tons), as well as lower fuel
6 efficiency and consequently increased use of fuel oil (2.1 million barrels) and
7 natural gas (18 million MMBtu) during that two-year period.

8
9 In addition, not granting the need determination for WCEC 3 in 2011 would
10 indefinitely defer the opportunity to effect the cleaner, high efficiency
11 conversion of any of FPL's existing plants because without WCEC 3 in
12 service by 2011 FPL cannot remove existing plants from service to effect the
13 conversion. This would result in FPL forgoing a very significant opportunity
14 to provide additional benefits to its customers in 2013 and 2014. In summary,
15 it is clear that FPL's customers would not benefit from a rejection of FPL's
16 petition for a determination of need for WCEC 3 in 2011.

17

18 CONCLUSION

19

20 **Q. Please summarize your testimony.**

21 A. The addition of WCEC 3 in 2011 will be the most beneficial choice among the
22 many alternatives that FPL has considered. FPL first considered DSM and
23 renewable resources. FPL has already included in its resource plan all the

1 cost-effective DSM additions that have been identified. There is no additional
2 cost-effective DSM that could diminish the significant benefits to FPL's
3 customers of adding WCEC 3 in 2011.

4
5 Similarly, FPL has already included in its resource plan all the potential cost-
6 effective renewable firm capacity that has been identified through
7 communications with existing suppliers, issuing a request for proposals for
8 renewable generation, and other contacts with potential suppliers. There is no
9 additional cost-effective firm renewable capacity that could affect the benefits
10 of adding WCEC 3 in 2011. Furthermore, FPL will continue to pursue
11 additional cost-effective DSM and renewable resources, both purchased and
12 self-built, and to the extent that such additional resources become available
13 and/or are developed, FPL can and will effectively integrate them into its
14 resource plan. However, the benefit of adding WCEC 3 in 2011 will not be
15 diminished.

16
17 FPL also considered many other alternatives, including delaying the FPL self-
18 build capacity addition to 2012 or 2013, siting the capacity addition at a
19 different location and adding a smaller generating unit. FPL also issued an
20 RFP to solicit proposals that would compete with WCEC 3 in 2011. FPL's
21 analysis results show that the addition of WCEC 3 in 2011 is, by far, the most
22 cost-effective self-build alternative available to FPL and its customers, and
23 that it is more than \$600 million (CPVRR) less costly than the best among the

1 proposals submitted in response to FPL's RFP. Further, adding WCEC 3 in
2 2011 results in reduced emissions of CO₂, SO₂ and NO_x, and reduced use of
3 oil and natural gas.

4
5 In addition, adding WCEC 3 in 2011 provides a significant strategic benefit in
6 that it would make it possible for FPL, subject to verification of the benefits of
7 the cleaner, high efficiency conversion plan, to complete in 2013 and 2014 the
8 conversion of one or more existing conventional plants to new, cleaner, highly
9 efficient generation. This cleaner, high efficiency conversion plan is projected
10 to add significant economic and environmental benefits to FPL's customers,
11 beyond those provided by the addition of WCEC 3 in 2011.

12
13 Because of these significant benefits, the Commission should grant an
14 affirmative determination of need for the addition of WCEC 3 in 2011.

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

16 **A. Yes.**

Summary of Benefits of Adding WCEC 3 In 2011
Compared to Delaying the Unit Addition Until 2013

- Total customer savings of \$460 Million (CPVRR) compared to delaying WCEC 3 to 2013.
- Total customer savings of more than \$600 million (CPVRR) compared to best proposal received in response to RFP.
- Reduction in air emissions: CO₂ by 2.2 million tons, SO₂ by 6,500 tons, and NO_x by 10,750 tons.
- FPL's system average heat rate, the measure of fuel efficiency, improved by 1.4%.
- Reduced use of fuel oil by 1.2 million barrels and natural gas by 18 million MMBtu.
- Reduced uncertainty regarding the cost of WCEC 3 compared to delaying the capacity addition.
- Creates the option to implement the cleaner, high efficiency conversion of existing FPL plants by 2013 and 2014.
- Preserves the balance between load and generation capacity in Southeast Florida.

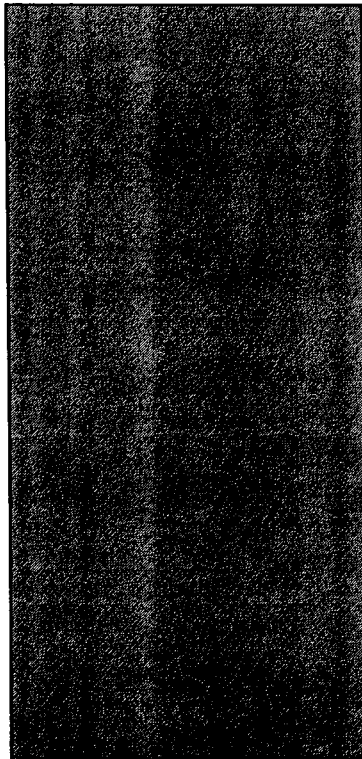
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FPL's Flexibility to Incorporate Increased DSM and Renewable Resources

**Resource
Need
(2011 – 2017)
6,490 MW**



**Resource
Supply
(2011 – 2017)
6,490 MW**

