**BEFORE THE PUBLIC SERVICE COMMISSION**

In re: Florida Power & Light Company's Petition to Determine Need for FPL Glades Power Park Units 1 and 2 Electrical Power Plant
_____/

DOCKET NO.: 070098-EI

**CONSERVATIONIST INTERVENORS' POST-HEARING MEMO**

Intervenors, the Sierra Club, Inc. (Sierra Club), Save Our Creeks (SOC), Florida Wildlife Federation (FWF), Environmental Confederation of Southwest Florida (ECOSWF), Natural Resources Defense Council (NRDC) and Ellen Peterson ("The Conservationist Intervenors") respectfully file this post-hearing memorandum.

**STATEMENT OF ISSUES AND POSITIONS**

ISSUE 1: Is there a need for the proposed generating units, taking into account the need for electric system reliability and integrity, as this criterion is used in Section 403.519, Florida Statutes?

POSITION: * No. End-user energy efficiency would itself be sufficient to satisfy anticipated increasing demand for electricity. The Public Service Commission's own study shows that conservation efforts by Florida utilities have no substantial effects now and are predicted to have only negligible effects in the future. FPL

spends only one fourteenth what a comparably sized electric utility in California spends on efforts to reduce electrical demand through greater efficiencies. *

ISSUE 2: Is there a need for the proposed generating units, taking into account the need for adequate electricity at a reasonable cost, as this criterion is used in Section 403.519, Florida Statutes?

POSITION: * No. Conservationist Intervenors have found that FPL has substantially understated future carbon costs in its economic analysis and failed to demonstrate that GPP is the least cost, least risk addition to its system. FPL's analyses in support of GPP do not comprehensively consider potential $CO_2$ prices and do not evaluate a full range of technically feasible alternatives. *

ISSUE 3: Is there a need for the proposed generating units, taking into account the need for fuel diversity and supply reliability, as this criterion is used in Section 403.519, Florida Statutes?

POSITION: * No. End-user energy efficiency would itself be sufficient to satisfy anticipated increasing demand for electricity and would provide fuel diversity and supply reliability. *

ISSUE 4: Are there any conservation measures taken by or reasonably available to Florida Power & Light Company which might mitigate the need for the proposed generating units?

POSITION: * Upon consideration of the amounts and costs of additional cost-effective demand-side management (DSM) resources that FPL could be expected to acquire if it intensified, expanded, and accelerated its planned energy-efficiency portfolio, increased DSM would defer the need for additional capacity. These additional efficiency savings would cost significantly less than the levelized (life-cycle) costs of the proposed units. More ambitious DSM would displace the need for the capacity of the Glades units beyond the planning horizon through 2023. *

ISSUE 5: Has FPL appropriately evaluated the cost of $CO_2$ emission mitigation costs in its economic analysis?

POSITION: * No. Conservationist Intervenors have found that FPL has substantially understated future carbon costs in its economic analysis and failed to demonstrate that GPP is the least cost, least risk addition to its system. FPL's analyses in support of GPP do not comprehensively consider potential $CO_2$ prices and do not evaluate a full range of technically feasible alternatives. *

ISSUE 6: Are the proposed generating units the most cost-effective alternative available, as this criterion is used in Section 403.519, Florida Statutes?

POSITION: * No. Additional capacity would not be needed if FPL expanded conservation efforts through demand side management. An IGCC plant in Florida can provide electricity at a lower cost than the proposed ultra-supercritical pulverized coal plant. The additional value of an IGCC plant is its ability to use

various fuels including coal, petroleum coke, natural gas, biomass, and waste materials. This flexibility would enable an IGCC plant to respond to future changes in fuel costs and provide significant cost savings during the life of the IGCC plants.*

ISSUE 7: Based on the resolution of the foregoing issues, should the Commission grant FPL's petition to determine the need for the proposed generating units?

POSITION: * No. FPL's petition should be denied for the reasons stated above.*

ISSUE 8: Should this docket be closed?

POSITION: * This docket should be closed.*

## INTRODUCTION

At great expense to ratepayers, Florida Power & Light (FPL) proposes building a massive 1960 megawatt (MW) pulverized coal plant that will emit 14 million tons of carbon dioxide ($CO_2$) annually. This proposal flies in the face of national and international recognition that climate change poses a severe threat which must be addressed by imposing a cost on carbon substantial enough to result in dramatic reductions in greenhouse gas emissions to avert the worst effects of climate change. As one of the largest sources of greenhouse gases, electric utilities should be maximizing efficiency and supporting only those energy technologies that will minimize greenhouse gas emissions. Instead, FPL is proposing to construct a facility that may well be the largest single new source of $CO_2$ in the nation, exposing Florida ratepayers to certain but not precisely quantifiable future costs for carbon emissions.

FPL could defer the need for the Glades Power Park (GPP) if it intensified, expanded, and accelerated its planned energy-efficiency portfolio by acquiring additional cost-effective demand-side management (DSM) resources. Further, these additional efficiency savings would cost significantly less than the levelized (life-cycle) costs of the two proposed units. In fact, such ambitious DSM would displace the need for the capacity of the Glades units through the planning horizon of 2023. Recent experience of Massachusetts' utilities demonstrates that FPL

could scale up its residential and nonresidential efficiency savings by roughly half. Using recent actual and planned expenditures and savings by Pacific Gas & Electric to project annual budgets and electricity savings if FPL replicated its performance with and commitment to acquiring all cost effective DSM would more than triple the peak-demand reduction FPL plans to realize over the long term from its DSM portfolio. Through this type of end-user efficiency measures, DSM could defer the need for the two proposed FPL Glades units at a cost significantly less than the costs of the units.

Individual states, regional groups of states, shareholders, and corporations are making serious efforts and taking significant steps toward reducing greenhouse gas emissions in the United States. Efforts to pass federal legislation addressing carbon have gained ground in recent years. These developments, combined with the growing scientific understanding of, and evidence of, climate change mean that establishing federal policy requiring greenhouse gas emission reduction is just a matter of time. On April 2, 2007, the United States Supreme Court decided the case of Massachusetts v. Environmental Protection Agency, 127 S.Ct. 1438 (2007). The Court made numerous key findings relevant to this discussion, including the following: (1) global warming is occurring and is caused by greenhouse gases, (2) $CO_2$ is an air pollutant under Section 7602(g) of the federal Clean Air Act, and (3)

the EPA has statutory authority to regulate emission of greenhouse gases, which include $CO_2$.

In recognition of the reality of climate change and the changing regulatory climate, FPL has signed on to numerous agreements endorsing the need to address climate change and advocate federal, mandatory legislation of greenhouse gases. Indeed, on March 30, 2007, FPL released a White Paper pushing for a more stringent way to make the United States reduce greenhouse gas emissions and for a price to be placed directly on carbon. Conservationist Intervenors have provided an estimate of the likely cost arising from future greenhouse gas restrictions/reductions, as well as an FPL-specific context for those costs and a critique of FPL's resource planning in general. Conservationist Intervenors have found that FPL has substantially understated future carbon costs in its economic analysis and failed to demonstrate that GPP is the least cost, least risk addition to its system. FPL's analyses in support of GPP do not comprehensively consider potential $CO_2$ prices and do not evaluate a full range of technically feasible alternatives. Accordingly, Conservationist Intervenors recommend that the Commission deny FPL's need request.

Although Conservationist Intervenors contend that there is no need for and oppose the construction of any type of coal plant by FPL, an IGCC plant in Florida can provide electricity at a lower cost than the proposed ultra-supercritical

pulverized coal plant. The additional value of an IGCC plant is its ability to use various fuels including coal, petroleum coke, natural gas, biomass, and waste materials. This flexibility will enable IGCC plants to respond to future changes in fuel costs and changes in environmental regulations and provide significant cost savings during the life of the IGCC plants. As stated above, energy efficiency measures can eliminate the need for a new coal plant in FPL's system, but if the Commission's decision comes down to a choice between the pulverized coal plant proposed by FPL and an IGCC plant, Conservationist Intervenors unequivocally support an IGCC plant for the reasons stated above. However, even an IGCC plant should not be built until there is technology in place for carbon capture and sequestration.

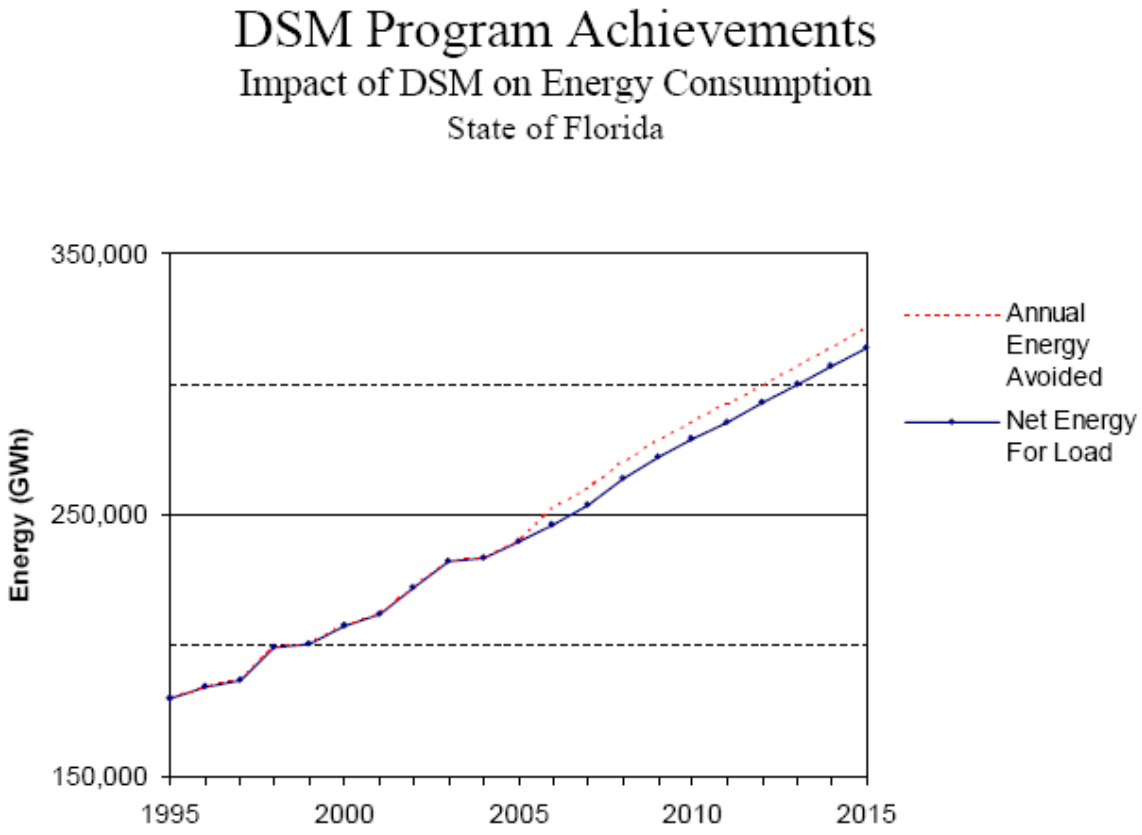
## FPL COULD DEFER THE NEED FOR GPP THROUGH 2023 IF IT IMPLEMENTED A MORE AMBITIOUS PLAN TO CONSERVE ELECTRICITY

Section 403.519, Florida Statutes, requires the Commission, in its determination of need for GPP, to "expressly consider the conservation measures taken by or reasonably available to the applicant or its members which might mitigate the need for the proposed plant …."

***There is Substantial Untapped Potential in Florida for Increased Energy Savings through Conservation.***

Regrettably, the State of Florida and the Florida electric utility industry have a less than impressive track record when it comes to conservation measures taken to mitigate the need for proposed power plants, as demonstrated during the cross-examination of FPL witness Dr. Steven R. Sim. A document marked as Exhibit 205, a presentation given by Commission Staff on September 26, 2006, entitled, *Energy Efficiency, Integrated Resource Planning and the Role of the Public Service Commission,* was introduced during the cross-examination of Dr. Sim. Tr. Vol. 12 at 1840 (Sim). On page 20 of Exhibit 205 is a graph entitled *DSM Program Achievements, Impact of DSM on Energy Consumption, State of Florida.* A replication of the graph is shown below. Upon review of the graph during his cross-examination by counsel for the Conservationist Intervenors, Dr. Sim testified that he agreed that the graph showed that as of 2005, virtually no annual energy had been avoided through DSM, and from 2005 projected to 2015, there was and

will be a negligible amount of annual energy avoided (although he disagreed with the data shown on the graph). Tr. Vol. 12 at 1843 (Sim).




John Plunkett, an expert witness for the Conservationist Intervenors, produced an exhibit to his prefiled Direct Testimony that was introduced as Exhibit 203 during the cross-examination of Dr. Sim by counsel for the Conservationist Intervenors. Tr. Vol. 12 at 1837 (Sim). The exhibit is entitled *DSM and the Need Date for the Glades Units*. The exhibit is replicated as Exhibit 1 to this brief. The

exhibit shows the Pacific Gas and Electric (PG&E) Scaled DSM budget projected for 2008 to be $537 million. Tr. Vol. 12 at 1837-38 (Sim).[1]

Exhibit 204, an excerpt of the *Florida Public Service Commission Annual Report on Activities Pursuant to the Florida Energy Efficiency and Conservation Act, February 2007*, shows FPL's DSM expenditures recovered through the Environmental Conservation Cost Recovery Clause (ECCR) to be $144,192,696 for the year 2005. Tr. Vol. 12 at 1838 (Sim). Dr. Sim acknowledged that he was aware that FPL's "current DSM expenditures are in the ballpark of 150 million a year." Tr. Vol. 12 at 1838 (Sim). Subsequently during continuation of the cross-examination, Dr. Sim was shown Exhibit DB-3 to C. Dennis Brandt's (Brandt) prefiled Rebuttal Testimony, marked as Exhibit 130. Tr. Vol. 12 at 1841 (Sim). Dr. Sim conceded that the $39,119,000 figure on Exhibit 130 represented FPL's *total* conservation expenditure for 2005, barely more than one quarter of the $144,192,696 recovered under the ECCR clause. Tr. Vol. 12 at 1841-42 (Sim). Dr. Sim testified that the $144 million figure included "conservation, research and development, demonstration programs as well as load management." Tr. Vol. 12 at 1842 (Sim). Accordingly, it appears that FPL's conservation expenditure for 2005 is only slightly more than 7 % of PG&E's scaled DSM budget projected for 2008. It necessarily follows that there is a substantial untapped potential for

[1] PG&E is an electric utility operating in the State of California. Tr. Vol. 10 at 1406 (Plunkett).

increased investment by FPL in DSM programs to avoid the need for the proposed coal plant, and this underperformance is consistent with Florida's negligible annual energy avoided as shown in Exhibit 205 above.

Upon consideration of the amounts and costs of additional cost-effective demand-side management ("DSM") resources that FPL could be expected to acquire if it intensified, expanded, and accelerated its planned energy-efficiency portfolio, Conservationist Intervenors' expert, John Plunkett (Plunkett), found that increased DSM could defer the need for the two units. Tr. Vol. 10 at 1402 (Plunkett). Further, these additional efficiency savings would cost significantly less than the levelized (life-cycle) costs of the units. Tr. Vol. 10 at 1403 (Plunkett). In fact, an ambitious DSM program modeled after Pacific Gas and Electric (PG&E) would displace the need for the capacity of the Glades units through the planning horizon of 2023. Tr. Vol. 10 at 1402 (Plunkett). Using recent experience of Massachusetts' utilities enables the scaling up of FPL residential and nonresidential efficiency savings by roughly half. Tr. Vol. 10 at 1402 (Plunkett). Using recent actual and planned expenditures and savings by PG&E to project annual budgets and electricity savings, if FPL replicated PG&E's performance and commitment to acquiring all cost effective DSM, FPL would more than triple the peak-demand reduction FPL plans to realize over the long term from its DSM portfolio. Tr. Vol. 10 at 1402 (Plunkett). It is through this type of end-user

efficiency measures that DSM could defer the need for the two proposed FPL Glades units at a cost significantly less than the costs of the units.

By cutting load growth beyond the reductions planned by FPL, additional DSM postpones the date at which peak load reaches the level FPL now forecasts for the in-service date of the proposed Glades units. The greater the increase in DSM savings, the farther into the future additional DSM postpones the need date. Exh. 125 for details. FPL can achieve this objective by increasing its *spending depth* (dollar of program expenditure per kWh sold) and *savings yield* (kWh per dollar of portfolio expenditure). Tr. Vol. 10 at 1402 (Plunkett); Exh. 125. The additional efficiency savings would cost significantly less than the levelized (life-cycle) costs of GPP. For example, Massachusetts and PG&E residential efficiency programs cost or are expected to cost between 5 and 6 cents/kWh. Their commercial/industrial savings cost is in the range of 3 to 4 cents/kWh levelized. By comparison, FPL projects that the Glades units will cost between 8 and 10 cents/kWh depending on the scenario. [2] Tr. Vol. 10 at 1403 (Plunkett).

FPL has some relatively small savings planned in its existing DSM programs. Without those planned savings, FPL would reach between 2010 and 2011 the 24,391 peak load it forecasts for 2013 with its planned savings. FPL's planned DSM will have the effect of deferring the need for the capacity from the

[2] FPL Need Study for Electrical Power, Appendix M, p.7-6.

new units by 2-3 years. Indeed, FPL's planned DSM savings add up to more than its share of the statewide efficiency potential recently estimated by the American Council for an Energy-Efficient Economy. Tr. Vol. 10 at 1404 (Plunkett). Some states have acquired and/or plan to acquire far less DSM savings (on a proportional basis) than FPL, and others have an established track record of acquiring very substantially more. Accordingly, the latter offer a basis for projecting additional DSM spending and savings for FPL based upon actual spending depth and savings yield achieved by DSM program administrators in recent years.

Spending and performance can be reasonably compared between or among jurisdictions. DSM spending divided by electricity sales indicates the relative depth of DSM investment. DSM savings divided by program expenditures indicates the kWh yield per dollar invested. Because of diminishing returns, increasing spending depth corresponds with decreasing yield.

The figures for spending depth and savings yield can be adjusted for differences in scale between utilities or jurisdictions. Calculating these values and making comparisons at the sector – residential vs. nonresidential – level allows adjustment for differences in customer mixes between utilities or jurisdictions when projecting total spending and savings for FPL. Tr. Vol. 10 at 1405 (Plunkett). Spending and savings results for 7 Northeastern states are presented in Exhibit 123. Massachusetts stands out with the deepest nonresidential spending

($3.4 per MWh of nonresidential sales) and the deepest savings as a percent of sales. Massachusetts makes the best choice for projecting additional spending and savings from the Northeast experience for FPL. Tr. Vol. 10 at 1405 (Plunkett); Exh. 123. Assuming 10 years for residential and 15 years for nonresidential measure lives and the 10.05% nominal cost of capital FPL uses, levelized costs of saved electric energy from the Massachusetts portfolio has been 5.7 cents/kWh from residential customers, and 4.2 cents/kWh from nonresidential customers (allowing for 2 years' inflation at 2.5% to adjust the 2005 constant dollars in the table).

Exhibit 124 presents spending and savings information from Pacific Gas & Electric, including actual expenditures and savings for 2004 and projected values for 2006-2008. PG&E plans to more than triple its $107 million 2004 spending to $332 million by 2008. These growing investments are projected to acquire progressively deeper savings (e.g., from 1.2% in annual residential savings in 2004 up to 2.7% of residential sales in 2008). Associated with these deeper investments are significant declines in yield. PG&E offers a good basis for projecting FPL's performance if it matched one of the industry's leaders. Making the same assumptions as Mr. Plunkett did for the Massachusetts calculations, he calculated the levelized costs for PG&E's historic and planned expansion in DSM (in current dollars) per kWh saved in the residential sector will rise from 3.5 cents/kWh in

2004 to 5.4 cents/kWh in 2008. In the nonresidential sector, levelized costs would climb from 2.2 cents/kWh saved in 2004 to 3.4 cents/kWh by 2008.

Mr. Plunkett estimated additional DSM procurement for FPL by applying the sectoral spending depths and savings yields from Massachusetts and PG&E to FPL's forecast residential and nonresidential sales to scale sectoral DSM spending and savings for FPL. He used Massachusetts historical spending and performance over 2002-2004 to project scaled savings and spending for FPL. Then, he used PG&E's 2006-2008 projected spending and savings, incorporating planned substantial declines in savings yields accompanying the deepening spending. Tr. Vol. 10 at 1407 (Plunkett). The results of these calculations are presented in Exhibit 125. Both the Massachusetts and PG&E scaled savings would provide more peak reduction by 2013. Assuming FPL begins in 2008 to acquire additional energy-efficiency, a Massachusetts-scaled portfolio could be expected to produce an additional 445 MW (beyond the 1,199 MW FPL plans to realize by 2013). PG&E-scaled efforts would be expected to yield an additional 1,616 MW between 2008 and 2013. Tr. Vol. 10 at 1407 (Plunkett).

If FPL were to scale its DSM spending and savings to what Massachusetts electric utilities were achieving between 2002 and 2004, system load would not reach the 24,391 MW that FPL forecasts for 2013, the in-service date of the first Glades unit, until sometime between 2014 and 2015. But with DSM scaled

according to PG&E's 2006-2008 DSM plans, FPL's load would not reach 24,391 MW at any time during the planning horizon (through 2023). For example, FPL summer peak load would only reach 23,777 MW by 2020 under a PG&E-scaled DSM portfolio. In effect, such ambitious DSM would displace the need for the capacity of the Glades units, at least as indicated by the system load coinciding with FPL's planned in-service date for the first unit. Tr. Vol. 10 at 1408-09 (Plunkett).

It is entirely reasonable for this Commission to rely on DSM data from distant regions with different climates, demographics, and economies to form expectations about FPL's future DSM savings. Tr. Vol. 10 at 1408 (Plunkett). Absent detailed study of maximum efficiency potential or actual experience with aggressive programs in Florida, mature DSM portfolio performance elsewhere is the best information available for gauging how much more FPL could accomplish and how much this would cost. Of course the efficiency opportunities in FPL territory will vary widely from those in Massachusetts and northern California. These differences do not necessarily introduce bias into the comparisons or projections based on them. Tr. Vol. 10 at 1408 (Plunkett). For example, the saturation and annual hourly usage of air-conditioning is the most obvious difference between Florida and these regions. Potential savings from high-efficiency air-conditioning should be greater and more cost-effective in FPL

territory than in Massachusetts or PG&E territory. While it is not necessarily our contention that the Commission and FPL use precisely these projections as the basis for DSM investment planning, they are sufficient for establishing a credible idea of how much DSM FPL could be expected to achieve if it pursued a more ambitious DSM portfolio. Tr. Vol. 10 at 1408 (Plunkett).

***The RIM Test Unduly Restricts DSM Savings, while the TRC Test Allows for Greater DSM Savings and Lower Customer Bills.***

As stated earlier, the additional DSM savings would be cost-effective compared to the Glades units. However, it is unlikely that the additional DSM savings proposed by Mr. Plunkett would be considered cost-effective under the Rate Impact Measure ("RIM") test for DSM as adopted by this Commission. Tr. Vol. 10 at 1409-10 (Plunkett). On the other hand, FPL's planned DSM does pass the RIM test. It is surmised by Mr. Plunkett that this is because under the RIM test, levelized program costs must be less than the difference between long-run avoided costs and marginal retail rates. Tr. Vol. 10 at 1409-10 (Plunkett). The levelized costs of PG&E and Massachusetts DSM portfolios almost certainly exceed the difference between FPL's avoided costs and rates, and therefore would not pass the RIM test. Tr. Vol. 10 at 1409-10 (Plunkett). However, this does not change the previously stated conclusions about the relative cost-effectiveness of additional DSM compared to the Glades units. The RIM (also known as the "non-participant" and "no-losers") test is a rough and inaccurate indicator of

distributional equity between groups of ratepayers.[3] It is not a valid indicator of economic efficiency. If FPL can truly achieve additional DSM savings at half the costs of the Glades units, then its ratepayers and the economy in which they live and do business will be far better off. Such significant cost savings between one resource and another is the meaning of "cost-effective" as set forth in Section 403.519, Florida Statutes.

The cost effectiveness analyses used by the Commission to evaluate a utility's proposed conservation programs is described in the Cost Effectiveness Manual for Demand Side Management Programs and Self Service Wheeling Proposals, Adopted at June 11, 1991 Agenda Conference, Effective July 17, 1991. Exh. 198; Tr. Vol. 12 at 1814-15 (Sim). The Manual states that "[t]he use of this manual is authorized by FPSC Rule 25-17.008, F.A.C." Exh. 198; Tr. Vol. 12 at 1816 (Sim). The Manual further provides that "[t]here are three tests contained in this manual: the Total Resource Test, the Participants Test, and the Rate Impact Test. In evaluating conservation and direct load control programs, **the Commission will review the results of all three tests to determine cost-effectiveness**." (Emphasis supplied). Exh. 198; Tr. Vol. 12 at 1817 (Sim). When confronted with the Manual, Dr. Sim testified that the Manual is no longer in

[3] It should be noted that Mr. Plunkett did not coin the phrase "no losers test' to describe the RIM test. See use of the phrase in Exhibit 205, page 14, in a presentation by Commission Staff on September 6, 2006.

effect. Tr. Vol. 12 at 1817 (Sim). He did not recall any Commission rule that adopts the Manual and incorporates it by reference and persisted in asserting that the Manual was superseded by a subsequent Commission order. Tr. Vol. 12 at 1818 (Sim). However, he conceded that the Commission has the flexibility to consider any cost-effectiveness test they wish to consider. Tr. Vol. 12 at 1818 (Sim).

The rule referenced in the Manual, Rule 25-17.008, Florida Administrative Code, is currently in effect and provides that it applies to all utilities whenever an evaluation of the cost-effectiveness on an existing, new or modified demand side conservation program is required by the Commission. Exh. 199; Tr. Vol. 12 at 1819, 1823 (Sim). Subsection (2) of the rule states that the purpose of the rule is to establish minimum filing requirements for reporting cost-effectiveness data for any demand side conservation program proposed by an electric utility pursuant Rule 25-17.001, F.A.C. Exh. 199; Tr. Vol. 12 at 1819-20 (Sim). Most importantly, subsection (3) of the rule provides that "[f]or the purpose of this rule, the Commission adopts and incorporates by reference the publication 'Florida Public Service Commission Cost Effectiveness Manual for Demand Side Management Programs …." Exh. 199; Tr. Vol. 12 at 1819 (Sim). Finally, subsection (4) clarifies that nothing in the rule "shall be construed as prohibiting any party from providing additional data proposing additional formats for reporting cost

effectiveness data." Exh. 199; Tr. Vol. 12 at 1820 (Sim). Dr. Sim agreed that the rule provides for flexibility in the formats in which cost-effectiveness can be alleged and reported and added that FPL has utilized this provision more than once in persuading Commission Staff that FPL can do better in calculating the costs and/or benefits of DSM if allowed to include additional calculations. Tr. Vol. 12 at 1821 (Sim). Consequently, it is clear that the Manual marked as Exhibit 198 has been adopted by a currently effective Commission rule, and that taken together, the Manual and the rule obligate the Commission to consider the Total Resource Cost (TRC), Participants, and RIM tests, as well as other formats in evaluating the cost-effectiveness of utilities' DSM programs.

Rule 25-17.008 cross-references Rule 25-17.001, F.A.C., which provides in subsection (4) that another priority is "increasing the efficiency of the end-use consumption of electricity to the extent cost-effective." Exh. 199; Tr. Vol. 12 at 1821-22 (Sim). Increasing the efficiency of the end-use consumption of electricity in a cost-effective manner is precisely what the Conservationist Intervenors are proposing as the best solution to address the electricity needs of FPL customers.

The Commission addressed the TRC, Participants, and RIM tests in *In re: Adoption of Numeric Conservation Goals and Consideration of National Energy Policy Act Standards (Section 111) by Florida Power and Light Company,* Docket No. 930548-EG, and issued Order No. PSC-94-1313-FOF-EG on October 25,

1994. Exh. 200: Tr. Vol. 12 at 1822-23 (Sim). Although the Commission set the overall conservation goals for each utility based on measures that pass both the Participants and RIM tests, it encouraged utilities to evaluate implementation of TRC measures when it is found that savings are large and rate impacts are small. Exh. 200; Tr. Vol. 12 at 1822-23 (Sim). The Commission expressed a concern that goals based on measures that pass TRC but not RIM would result in increased rates and would cause customers who do not participate in a utility DSM measure to subsidize customers who do participate. Further, the Commission found that since the record in that particular docket reflected that the benefits of adopting the TRC test were minimal, even a slight increase in rates would not be justified.

In the present docket, the Conservationist Intervenors have presented expert testimony of John Plunkett and documentary evidence that shows that if FPL pursued an aggressive DSM Plan modeled after the actual experience and projections of PG&E in California, the TRC test would permit significantly more energy savings (sufficient to avoid the need for GPP) while the RIM test would not even allow the expansive DSM programs that produce such savings. Tr. Vol. 10 at 1409-10 (Plunkett). In this respect, the evidence in the present docket presents a profound distinction from the 1994 docket in which the difference in demand and energy savings between TRC and RIM were found to be negligible. Exh. 200.

Even Dr. Sim agreed that the TRC test generally provides higher energy savings than the RIM test. Tr. Vol. 12 at 1835 (Sim).

It is critical to understand the distinction between rates, the unit costs of electricity, and the amount of total customer bills in the context of the TRC and RIM tests. Substantially more energy can be saved under the TRC test, and as a result of market forces, rates may increase due to the decrease in energy use. However, customers who choose to take advantage of energy savings will experience lower total bills in spite of any increase in the unit costs, i.e., an increase in rates. Common sense suggests that a customer will be more concerned about his or her total bill than the cost per kWh or the unit cost. The Participant test is defined in Exhibit 198, the Commission's Cost Effectiveness Manual for DSM Programs, as measuring the impact of the program on the participating customers. Clearly, participating customers will benefit under the TRC test by reduced energy consumption and lower bills. More aggressive DSM programs include more aggressive marketing, advertising, and public awareness of DSM savings available to customers, and in the case of broad DSM programs with high public awareness, everybody participates and in the end everybody benefits.

According to the *EPA Clean Energy-Environment Guide to Action, 4.2 Public Benefits Funds for Energy Efficiency*, many "states use a Total Resource Cost (TRC) Test as the basic economic assessment tool. The TRC Test assesses

the net lifetime benefits and costs of a measure or program, accounting for both the utility and program participant perspectives." Exh. 201; Tr. Vol. 12 at 1828-29 (Sim). The EPA publication stated further:

> If using only one test, states are moving away from the Rate Impact Measure (RIM) test because it does not account for the interactive effect of reduced energy demand from efficiency investments on longer-term rates and customer bills. Under the RIM test, any program that increases rates would not pass, even if total bills to customers are reduced. In fact, there are instances where measures that increase energy use pass the RIM test.

Exh. 201; Tr. Vol. 12 at 1828-29 (Sim). The EPA defines TRC as follows:

> Compares the total costs and benefits of a program, including costs and benefits to the utility and the participant and the avoided costs of energy supply.

Exh. 201. This definition is substantially similar to the definition in Exhibit 198, the Commission's Cost Effectiveness Manual. The EPA defines the RIM test as follows:

> Assesses the effect of changes in revenues and operating costs caused by a program on customers' bills or rates.

Exh. 201. This definition is also substantially similar to the definition in the Commission's Cost Effectiveness Manual. Exh. 201. Exhibit 202, *National Overview of the Status of Utility DSM*, shows that among the states that use a benefit/cost test for energy efficiency, most use the TRC test and only one uses the RIM test as a primary test. Since Florida uses the RIM test as a primary test and uses a benefit/cost test for energy efficiency, there is an inference that Florida is

the only state still using the RIM test as a primary test. Significantly, if more effective DSM programs fail the RIM test and are denied because of anticipated rate increases, those same customers will surely experience rate increases as a result of the cost of building GPP.

FPL witnesses Brandt and Sim each testify that FPL is ranked nationally by DOE as first in conservation MW achieved. Tr. Vol. 5 at 1794; Tr. Vol. 12 at 1794. However, Mr. Plunkett explained that he has reviewed the numbers at the Energy Information Administration that show that since FPL is the largest in MWh sales, in terms of absolute numbers their kW reductions are the biggest. On the other hand, if you divide their peak demand savings they are realizing into their total peak demand, their kW reductions are quite a bit smaller, and they would be ranked pretty far down the list. Tr. Vol. 10 at 14537-38 (Plunkett).

The Commission should conclude that the Glades units are not needed because of the availability of additional DSM that would be cost-effective compared to building and operating them. This conclusion is based on the well-established track records and plans of some of the nation's leading energy-efficiency portfolio managers. The Commission should not approve FPL's application as filed. Instead, it is recommended that the Commission deny FPL's application and direct FPL to conduct a thorough study of the economically achievable potential for energy-efficiency investments in its territory based on best

practices in program design and implementation followed by the managers of the most aggressive DSM portfolios of other states. It is further recommended that the Commission direct FPL to proceed on a parallel path to design and develop an aggressive DSM portfolio capable of deferring the need for additional generation by at least five years (2018). This deferral will buy time for FPL and the Commission to develop and evaluate a wider range of demand-side and supply-side alternatives to the proposed units. FPL should be directed to include a revised DSM plan based on these parallel DSM efforts with any future application submitted to this Commission for a need determination for new generation resources. Such a resubmission should constitute one of the conditions the Commission should impose if it decides not to deny the application outright.

## THE PROPOSED GLADES COUNTY COAL-FIRED POWER PLANT IS NOT THE LOWEST COST OPTION

In its Application, FPL asks the Commission to approve a need determination for the Everglades coal-fired power plant based on the perceived need for increased fuel diversity within the state. FPL argues that due to the state's current reliance on natural gas as a source of fuel for electricity generation and the historical volatility in natural gas prices, the Commission should approve the Everglades power plant even though natural gas options are cheaper.

While FPL's request partially arises from the Commission's desire to diversify the state's electricity portfolio, the current proposal weights too heavily the objective of fuel diversification, fails to adequately account for the costs of upcoming global warming legislation (as discussed in detail below), fails to adequately account for other costs, fails to adequately consider other means of fuel diversification, and ultimately reflects an imprudent decision for Florida ratepayers and energy analysts.

***FPL's Economic Analysis Fails to Adequately Assess the True Costs of the Everglades Power Plant.***

FPL's economic analysis is inadequate because the company never performed a sensitivity analysis of the risk of increases in the actual capital cost of completing the proposed coal-fired power plant and placing the generating units in commercial operation. In addition, FPL unreasonably required all options to have 60-days of fuel on-site, which artificially increased the cost of the natural gas option because it would require a liquid natural gas storage facility be built on-site.

*FPL's Analysis is Flawed Because it Did Not Perform a Sensitivity Analysis for Increased Construction Costs.*

Building a coal-fired power plant entails major financial risks. FPL identified many of those risks in its Need Study. Need Study at p. 17. One of the major uncertainties is the risk of increased capital cost of completing the power plant and placing the generating units in commercial operation. Need Study at p. 17. Although FPL identified this risk, it did not analyze it.

The projected costs of building new coal plants have increased dramatically over the past few years. Tr. Vol. 4 at 584 (Schlissel). This increase is due in large part to intense global competition for coal plants coupled with constrained supply. Indeed, William Yeager, an FPL witness, states:

> The immense scope of this project, in the first instance, necessarily limits the number of potential EPC [engineer, procure, construct] contractors. Thus, the EPC pricing was based on an initial inquiry to three major contractors with coal engineering, procurement, construction experience. In fact, the result of this inquiry produced only one contractor with resources available in sufficient quantity to handle a project of this magnitude in the timeframe required.

Tr. Vol. 7 at 1034 (Yeager). This comment demonstrates that demand is high and suppliers can charge a premium for coal plant components and construction services because projects are not competitively bid upon. Tr. Vol. 4 at 585 (Schlissel).

This high demand translates into a significant cost risk for the Everglades power plant. Indeed, FPL states:

> There are factors that could cause the capital cost of FGPP to be higher than projected. One reason for this is that there is a much longer lead time required, at least five and a half years from the date of this Need filing for development, permitting and construction of the first FGPP unit, compared to just over three years for gas-fired units, and a correspondingly greater opportunity for changes in the cost of equipment, labor and materials to occur.

Need Study at 16.

Unfortunately, FPL has done no analysis of potential capital cost increases of its proposed coal-fired plant. Tr. Vol. 4 at 585-88 (Schlissel). Although FPL witness William Yeager challenged this conclusion, he failed to identify a single economic scenario in which FPL examined or quantified the risk of increases in the actual capital cost of completing the plant. Tr. Vol. 7 at 1039-41 (Yeager). Mr. Yeager could not refer to such an analysis because no such sensitivity analysis exists. This is a fatal flaw in FPL's economic analysis.

*FPL's Analysis is Flawed Because it Unreasonably Required 60-days of Fuel Stored On-site*.

FPL claims that having the capability to store up to sixty days of fuel on site, for both a coal-fired or a natural gas-fired power plant, provides a significant reliability benefit. In its economic analysis, FPL compared these two types of facilities, both with sixty days worth of fuel storage capacity on site. Tr. Vol. 12 at 1894-1907 (Silva); Exh. 7. This analysis is misleading and biased in favor of a coal-fired power plant because no reasonable utility stores sixty days of natural gas on site since natural gas supplies are sufficiently reliable. A facility to store a sixty-day supply of natural gas on site was included to artificially inflate the cost of a natural gas fired plant and make the proposed coal-fired power plant appear more economical.

It is reasonable to conclude that a coal-fired power plant should have a sixty-day supply of coal on site. On-site coal storage is necessary at a large coal facility

because of the notorious unreliability of the coal transportation and delivery system – especially for land-locked locations like the site of the proposed Everglades power plant, which would need to rely entirely on rail access for coal delivery. It is unreasonable, however, to claim that a natural gas fired power plant also needs to have sixty days of fuel on site. Natural gas is reliably delivered through a pipeline. It is not subject to as many delivery disruptions as coal, which is delivered via ground transportation. Second, since supplies are reliable it is imprudent to require a sixty-day storage supply of natural gas because natural gas is stored in LNG ("Liquid Natural Gas") storage facilities, which are expensive to build and operate. Adding the unnecessary costs of a sixty-day LNG storage facility to the natural gas alternative creates a deceptive comparison, artificially making the Everglades power plant appear more economic.

In fact, FPL's own responses to Staff Interrogatories 64, 65, 66, and 67 demonstrate that it is unreasonable to require a 60-day storage supply of natural gas. FPL's response to Staff Interrogatory 64 notes that natural gas supplies have been curtailed three times in the past ten years: (1) in 1998 after the failure of its pipeline; (2) in 2005 as a result of Hurricane Katrina; and (3) in 2005 as a result of Hurricane Rita. Exh. 2 at 116. According to FPL's response to Staff Interrogatory 65, the 1998 disruption lasted approximately 60 hours. Exh. 2 at 117. The disruptions from Hurricanes Katrina and Rita lasted 11 and 7 days, respectively.

Exh. 2 at 117. Even if the Commission accepts that the company should account for natural gas supply disruptions, the most severe such disruption documented in this case was far shorter than sixty days. There is no need to stockpile sixty days of natural gas at any generating station. In fact, the record includes no evidence that any utility actually does. Moreover, FPL noted that although it did have to curtail some gas burning at its natural gas-fired facilities during these disruptions, it was able to make up for any shortages "through alternatives such as modifying system dispatch, fuel switching and purchased power." Exh. 2 at 118.

Finally, the Commission should keep in mind two critical points when considering FPL's claim that a coal-fired unit would provided greater reliability. First, coal deliveries are also susceptible to weather-related delays and disruptions, as well as other causes, such as train derailments. Second, relying on burning coal to avoid potential supply disruptions from hurricanes is inherently contradictory. Accepted science holds that increased carbon dioxide emissions in the atmosphere have and will continue to increase the frequency and magnitude of hurricanes. Exh. 128 at 16, 54. Greater carbon dioxide emissions from coal-burning power plants would lead to more significant atmospheric warming and larger and more frequent storms.

The Everglades power plant simply can not economically compete with a natural gas plant (as discussed in detail below), so FPL is trying to artificially inflate the cost of the natural gas alternative.

***Even with FPL's Flawed Economic Analysis, the Everglades Coal-Fired Power Plant is Not the Lowest Cost Option.***

FPL presented its base economic assumptions in Exhibit 6. The results of this analysis show that, under most credible scenarios, the Everglades power plant would not be the lowest cost option when compared to the natural gas alternatives. Moreover, even in those few credible scenarios where the Everglades power plant does appear to be the lower cost option, it only becomes more economical far in the future.

FPL compared the costs of building a coal-fired power plant and a natural-gas fired power plant. FPL came up with 16 different cost scenarios for comparison of the two choices. These were described in detail by FPL witness Rene Silva in his testimony. Tr. Vol. 3 at 327 (Silva). David A. Schlissel, an expert witness testifying on behalf of the Conservationist Intervenors, created a table that summarizes the results of the cost scenarios described by Mr. Silva. Tr.

Vol. 4 at 579 (Schlissel). The results of these scenarios were summarized in the following table[4]:

**Table 1. Cost Differentials of FPL Scenarios**

| | **A – No $CO_2$** | **B – Low $CO_2$** | **C – Mid $CO_2$** | **D – High $CO_2$** |
|---|---|---|---|---|
| **High Differential** | (2,792) | (2,045) | (1,127) | (666) |
| **Shocked Differential** | (873) | (113) | 804 | 1,278 |
| **Medium Differential** | (219) | 537 | 1,466 | 1,930 |
| **Low Differential** | 1,912 | 2,670 | 3,604 | 4,037 |

*A negative value indicates that the Plan with Coal is less expensive than the Plan without Coal.*

This table shows on the horizontal axis four possible carbon dioxide cost scenarios (reflecting a zero carbon cost scenario and three scenarios of increasing carbon dioxide cost as you move from left to right). On the vertical axis are four coal-natural gas price differential scenarios (reflecting a decreasing price differential between the two fuels as you move from top to bottom). Thus, FPL looked at four different natural gas price forecasts and four different environmental compliance scenarios. A negative value, designated by parentheses, indicates that

[4] FPL witness Judah Rose noted that there were two errors in the table contained in Mr. Schlissel's Supplemental Testimony. The table reproduced herein represents the table Mr. Rose concedes accurately represents the findings of Mr. Silva. Tr. Vol. 10 at 1580-81 (Rose).

the plan with the Everglades coal-fired power plant would be less expensive than a natural gas-fired power plant.

The Commission should not even consider the four scenarios in Column A. Column A presents a price comparison based on the assumption that there will be no future carbon regulation. This position is completely untenable because carbon regulation is inevitable. Tr. Vol. 4 at 557 (Schlissel). In fact, all parties to this proceeding agree that carbon dioxide regulation is necessary to address the very serious threat that global warming poses. Moreover, Judah Rose, an expert witness for FPL, stated that is unreasonable at this point in time to assume there will be no regulation of carbon. Tr. Vol. 10 at 1605 (Rose). Indeed, under this more realistic (but still inappropriate) representation, *eight of the twelve* remaining scenarios show that a natural gas plant would be the lower cost option.

Remarkably, FPL also suggests that even with future carbon regulation, its Everglades coal-fired power plant could get off scot-free because the company has a low carbon dioxide profile. The seriousness of the global warming challenge that we must address as a nation forecloses this as a realistic option. The Everglades power plant would operate for upwards of 50 years and emit 14.5 million tons of carbon dioxide annually. As discussed below, these emissions would completely offset the carbon dioxide emission reductions achieved by seven states through the Regional Greenhouse Gas Initiative. It is pure fantasy to believe that a power plant

that single-handedly offsets the climate change policy of seven states would receive free allowances for such massive new carbon dioxide emissions. Moreover, scientists anticipate that very significant emission reductions will be necessary, in the range of 80% below 1990 emission levels, to achieve stabilization targets that will keep global temperature increases to a somewhat manageable level. Tr. Vol. 4 at 574 (Schlissel). With approximately 150 new or proposed coal-fired power plants planned nationwide,[5] global warming regulation will need to address emissions from these new plants in order to provide the kinds of reductions *required* to stabilize the earth's temperature.

The Commission should also disregard the four low $CO_2$ cost scenarios in the second column of Table 1. FPL evaluates each of the scenarios through the year 2054. Tr. Vol. 4 at 580 (Schlissel). FPL's environmental compliance forecasts must be evaluated for their reasonableness over this same period of time. In real dollars, the highest price this forecast would ever reach would be $10/ton in 2022. Tr. Vol. 4 at 581 (Schlissel). Under any reasonable estimate, this price would not be enough incentive to make carbon capture and sequestration viable. Tr. Vol. 4 at 581 (Schlissel). In fact, according to the Massachusetts Institute of Technology study "The Future of Coal," it would take $30 per ton of carbon dioxide to make carbon capture and sequestration competitive with coal

[5] See http://www.netl.doe.gov/coal/refshelf/ncp.pdf.

combustion. Tr. Vol. 10 at 1597 (Rose). Essentially, FPL's low forecast rests upon the assumption that U.S. greenhouse gas regulation will never result in significant reductions in greenhouse gas emissions. Tr. Vol. 4 at 581 (Schlissel). This assumption is unreasonable over such a long period of time. Tr. Vol. 4 at 581 (Schlissel). Therefore, the scenarios assuming FPL's low $CO_2$ price forecast also should not be considered.

Looking at FPL's analysis and eliminating the first and second column because they are unrealistic, it is evident that the Everglades power plant is unlikely to be the lowest cost option.

**Table 1. Cost Differentials of FPL Scenarios**

| | **A – No $CO_2$** | **B – Low $CO_2$** | **C – Mid $CO_2$** | **D – High $CO_2$** |
|---|---|---|---|---|
| **High Differential** | ~~(2,792)~~ | ~~(2,045)~~ | (1,127) | (666) |
| **Shocked Differential** | ~~(873)~~ | ~~(113)~~ | 804 | 1,278 |
| **Medium Differential** | ~~(219)~~ | ~~537~~ | 1,466 | 1,930 |
| **Low Differential** | ~~1,912~~ | ~~2,670~~ | 3,604 | 4,037 |

*A negative value indicates that the Plan with Coal is less expensive than the Plan without Coal.*

This leaves only eight realistic scenarios, located in the two right-hand columns of the table. As Mr. Schlissel explained, these two scenarios may be reasonable. Tr. Vol. 4 at 582 (Schlissel). Looking at these two columns, it is clear

from FPL's own analysis that the proposed coal-fired power plant is the more expensive option in six of the eight scenarios. It is only in the two scenarios that assume a high differential price between natural gas and coal that the Everglades power plant would be the more economic option. Therefore, based on FPL's own analysis, a natural gas power plant is a more economical choice.[6]

In its response to Staff Interrogatory 25, FPL provided the Cumulative Present Value Revenue Requirements for each of the 16 scenarios analyzed. Exh. 2 at 31-32. This data reveals some startling results. First, it confirms that, if the first two columns are not considered, the proposed coal-fired power plant would only be the lowest cost option in the two High Differential price scenarios. In each of the six other scenarios, the Everglades power plant would be the more expensive option.

Second, while the data does show that the Everglades power plant would be the lowest cost option through 2054 in the High Differential-Mid $CO_2$ scenario, the

[6] In an attempt to distract the Commission from the obvious result of its own analysis, Florida Power & Light suggests that the Low Differential-High $CO_2$ scenario is not likely to occur because high carbon dioxide costs are likely to drive the industry away from coal and towards natural gas. This assertion contradicts FPL's own position that carbon capture and sequestration from pulverized coal plants will prove to be not only technologically feasible, but also economically prudent. It is also undermined by the fact that FPL's carbon cost forecasts are artificially low and represent an unreasonable forecast until 2054. Even accepting the assertion that the Low Differential-High $CO_2$ scenario is unlikely, however, the Everglades power plant still would be the more expensive option in five of eight likely scenarios.

coal-fired power plant would be the more expensive option for the first twenty years of the study period. Thus, under this High Differential-Mid $CO_2$ scenario, the Everglades power plant would be the more expensive option until 2028 and only thereafter would it be the lowest cost option. The same would be true for the High Differential-High $CO_2$ scenario, under which the Everglades power plant would be the lowest cost option through the overall study period to 2054, but would be the higher cost option until 2033. Thus, even in the scenarios most favorable to the coal-fired power plant, the proposed project would be the higher cost alternative for at least the first twenty years. It would only be in the distant future that ratepayers might receive some economic benefit from this coal-fired power plant. Even this potential future economic benefit is speculative because more distant economic projections are inherently less reliable.

Indeed, FPL recognizes that the proposed Everglades power plant is not the lowest cost option – even given FPL's use artificially low carbon costs and biased economic analysis. Illustrating this point is FPL's repeated statement that it is "not recommending approval of the FGPP based on any specific, projected set of assumptions or comparative economic results against other forms of generation." Tr. Vol. 3 at 301 (Silva).

Thus, the Commission does not even have to find that FPL's carbon cost forecasts are inadequate to determine that the proposed coal-fired power plant is

not the most economic option for ratepayers. The Commission only has to look at FPL's own economic analysis to determine that the Everglades power plant is not the lowest cost option.[7]

## FPL INADEQUATELY ACCOUNTED FOR THE FUTURE COST OF $CO_2$ REGULATION ON THE ECONOMICS OF THE PROPOSED GLADES COUNTY POWER PLANT

FPL's analysis of the proposed Everglades coal-fired power plant and available alternatives does not provide the Florida Public Service Commission (hereafter the "Commission") with the information needed to make an informed decision. While FPL has prepared a future carbon dioxide cost "scenarios analysis," this analysis is inadequate and misleading because the company insufficiently evaluated the impacts of upcoming global warming legislation and presented an unreasonably limited range of future carbon costs. Therefore, the Commission should not rely upon the information presented by FPL.

However, it is extremely important to emphasize that even in FPL's carbon dioxide cost scenarios analysis, the Everglades project is the lower cost option only in those scenarios which assume either (1) that there will be no costs from the regulation of carbon dioxide emissions; or (2) or that there will be very, very low

[7] The proposed pulverized coal plant would also be more expensive than an IGCC plant able to run on petroleum coke, because any higher capital costs involved in building an IGCC plant would be more than offset by the savings in fuel costs over the life of the plant. Tr. Vol. 11 at 1687-88 (Jenkins) (proffer by D. Guest).

costs from the regulation of carbon dioxide emissions; or (3) that there will be extremely high natural gas prices. The Everglades project was the more expensive option in all of the other scenarios which looked at what Florida Power & Light termed its mid and high CO2 forecasts. This conclusion is even more significant because Florida Power & Light's carbon dioxide cost scenarios analysis was limited to only coal and natural gas options. Lower cost zero emitting resources such as energy efficiency were excluded from the analysis.

***Sound Science Unequivocally Establishes the Threat of Global Warming***

Global warming is a fact that is scientifically well established. In 2001, the Intergovernmental Panel on Climate Change issued its Third Assessment Report.[8] Exh. 128 at 14. The report, prepared by hundreds of scientists worldwide, concluded that the earth is warming, that most of the warming over the past fifty years is attributable to human activities, and that the average surface temperature is likely to increase between 1.4 and 5.8 degrees Centigrade during this century. Exh. 128 at 14-15. This warming will have a wide range of climate impacts, including unusually high temperatures, increased storm intensity, melting of the polar icecaps, glaciers, ice shelves and permafrost, coral bleaching, sea level rise, changes in precipitation patterns, and increased climate variability. Exh. 128 at 16,

[8] The Intergovernmental Panel on Climate Change issued its Fourth Assessment Report on Friday, May 4, 2007. This brief does not discuss the latest paper; however, it is accessible at http://www.ipcc.ch.

54. In 2001, the Intergovernmental Panel on Climate Change reported that greenhouse gas emissions would have to decline to a very small fraction of current emissions in order to keep global warming to a 2 to 3 degree Centigrade temperature increase. Exh. 128 at 15.

Since 2001, even more compelling evidence has come out on global warming. In June 2005, the National Science Academies from eleven nations, including the United States, issued a Joint Statement on a Global Response to Climate Change. Exh. 128 at 15. The Joint Statement concluded that significant warming was occurring, the warming in recent decades is attributable to human activities, the scientific information is significant to justify taking prompt action, and actions taken now will reduce the magnitude and rate of climate change. Exh. 128 at 15. The Joint Statement concluded by urging all nations to take prompt actions to reduce the causes of climate change. Exh. 128 at 15.

A primary driver of global warming is carbon dioxide. Carbon dioxide is emitted by burning fossil fuels, such as coal. Already, humans have increased the background levels of carbon dioxide in the atmosphere by roughly one-third since pre-industrial times.

The Everglades coal-fired power plant represents an enormous new source of carbon dioxide emissions. If approved, the plant will emit 14.5 million tons of carbon dioxide annually. Tr. Vol. 4 at 576 (Schlissel). To put this amount into

perspective, it is illustrative to compare the emissions from this plant with progress being made by a number of states. The Regional Greenhouse Gas Initiative – a cooperative effort by seven Northeastern and Mid-Atlantic states to reduce carbon dioxide emissions by 10% by 2020 through the implementation of a multi-state, cap-and-trade program – is expected to reduce carbon dioxide emissions by 12 million tons per year. The Everglades power plant, with 14.5 million tons of carbon dioxide emissions annually, would more than offset this progress. In fact, the carbon dioxide emissions from this one power plant in Florida would essentially void the carbon reductions that will be accomplished by seven states.

***Regulations Imposing a Financial Cost on Carbon Dioxide Emissions are Likely to be Adopted within the Next Few Years.***

There is substantial momentum toward establishing a national policy addressing global warming. David Schlissel's testimony and the attached Synapse report, "Climate Change and Power: Carbon Dioxide Emissions Costs and Electricity Resource Planning," (Exh. 128) describe various actions proposed by the U.S. Congress to address global warming. Mr. Schlissel and the Synapse report analyze policy trends at the national and state government level, the underlying climate science, and the growing recognition within the private sector that regulations are needed and inevitable. Mr. Schlissel testified that "the question is not whether the United States will develop a national policy addressing climate change, but when and how." Tr. Vol. 4 at 557 (Schlissel). Senator

McCain, author of one of the climate bills under consideration, echoed this sentiment when he said that the chances of approving meaningful legislation before 2008 were "pretty good" and he believed "we've reached the tipping point in this debate, and it's long overdue." Tr. Vol. 4 at 566 (Schlissel).

As mentioned above, multiple bills have been proposed in Congress that would impose mandatory, market-based limits on carbon dioxide emissions. These proposals would employ a cap-and-trade regulatory approach that would require power plant operators to own an allowance for each ton of carbon dioxide emitted. Allowances would be tradable among emitters, and market forces would set the price of the allowances. Federal legislators are beginning to lay the groundwork for such a national regulatory program.

Some within the electric sector vocally support such federal regulation, including FPL. In fact, all parties to this proceeding agree that carbon dioxide regulation is both necessary to address the very serious threat that global warming poses generally and to Florida in particular.[9] Indeed, FPL's parent company (FPL Group) is a participant in the U.S. Climate Action Partnership ("USCAP"), a partnership of industry and nonprofit groups calling for a swift and meaningful

[9] As described by Governor Crist in his 2007 State of the State speech: "With almost 1200 miles of coastline and the majority of our citizens living near the coastline, Florida is more vulnerable to rising ocean levels and violent weather patterns than any other state, yet we have done little to understand and address the root causes of this problem, or, frankly, to even acknowledge that the problem exists." Tr. Vol. 12 at 1942.

response to the threat of global warming.[10] Exh. 210 at 12; Tr. Vol. 2 at 252 (Olivera). Similarly, there is general agreement that a very aggressive regulatory program will be necessary to address global warming as described in the USCAP report. Exh. 210 at 6-7. The USCAP document identifies the level at which ambient carbon dioxide must be stabilized in order to avoid serious climate disruption, 450-550 parts per million in ambient air. Exh. 210 at 6.[11] The USCAP participants (including FPL) emphasize that to stabilize greenhouse gases at this level; we will need to reduce annual carbon dioxide emission from current levels by some 60-80% by the year 2050. Exh. 210 at 7.[12]

Not only will the Everglades power plant likely face federal regulation, it may also face state carbon regulation. To date, state governments have taken the lead on implementing climate change policy. For instance, Governor Schwarzenegger and the California legislature reached an agreement on AB32, the Global Warming Solutions Act. Tr. Vol. 4 at 568 (Schlissel). The Act creates an economy-wide cap on greenhouse gas emissions, which limits California's

[10] Judah Rose, a Florida Power & Light expert witness, conceded that it would be unreasonable at this point in time to assume there will be no regulation of carbon. Tr. Vol. 10 at 1605 (Rose).

[11] This level reflects the prevailing scientific opinion regarding global warming and its potential to seriously affect climate and weather patterns worldwide. Tr. Vol. 2 at 28 (Cavros); Tr. Vol. 4 at 574 (Schlissel).

[12] Scientists anticipate that very significant emission reductions will be necessary, in the range of 80% below 1990 emission levels, to achieve stabilization targets that will keep global temperature increases to a somewhat manageable level. Tr. Vol. 4 at 574 (Schlissel).

greenhouse gas emissions to 1990 levels by 2020. T. Vol. 4 at 568 (Schlissel). Similarly, the Governor of Arizona issued an Executive Order (EO 2006-13) establishing a statewide goal to reduce Arizona's greenhouse gas emissions to 2000 levels by 2020 and 50% below this level by 2040. Tr. Vol. 4 at 568 (Schlissel). Governor Crist stated in his 2007 State of the State speech:

> Following this legislative session, I will bring together the brightest minds to begin working on a plan for Florida to explore groundbreaking technologies and strategies that will place our state at the forefront of a growing worldwide movement to reduce greenhouse gases. Tr. Vol. 12 at 1942.

Carbon regulation at the federal level is inevitable and perhaps may occur at the state level. Based on the inevitability of carbon regulation, there will unquestionably be a significant cost differential between zero emitting sources such as energy efficiency and operating moderately carbon dioxide emitting sources, such as a natural gas unit, and a high carbon dioxide emitting source such as a pulverized-coal power plant.

***Electric Utilities are Likely to be One of the Most Carbon Regulated Facilities.***

Electric utilities are likely to be one of the first industries, if not the first industry, subject to carbon regulation because electricity generation represents a significant portion of the total national carbon dioxide emissions and because of the relative ease in regulating stationary sources, as opposed to mobile sources. Tr. Vol. 4 at 562 (Schlissel).

The United States emits more greenhouse gases, including carbon dioxide, than any other nation. Exh. 128 at 16. The United States is responsible for 24% of the global carbon dioxide emissions. Exh. 128 at 16. Within the United States, the electricity sector is responsible for 39% of carbon dioxide emissions, and within that sector, coal-fired power plants are responsible for 82% of carbon dioxide emissions.[13] Exh. 128 at 18. As a result, any regulatory program addressing domestic global warming emission will require significant reductions in emission from electric generating units, particularly coal-fired power plants.

In addition, controlling emissions from large, stationary point sources is easier, and often cheaper, than controlling emissions from smaller and/or mobile point sources. Exh. 128 at 12. Therefore, the electric sector is likely to play a key role in future carbon regulation scenarios. Exh. 128 at 12. In fact, it is predicted that 65% to 90% of energy-related carbon dioxide emission reductions will come from the electricity sector. Exh. 128 at 3. The Everglades power plant is thus likely to be subject to intensive carbon regulation in the future.

***FPL's Future Carbon Cost Forecasts Are Inadequate because they are Only Based on a Very Limited Number of Bills That Have Been Introduced in Congress or That Were Not Introduced.***

A utility that wants to go forward with a new, carbon intensive energy resource project must properly consider the cost of future carbon regulation. The

[13] Gas-fired plants and oil fired plants are responsible for 13% and 5%, respectively, of carbon dioxide emissions from the electricity sector.

challenge, as with any unknown cost, is to forecast a reasonable range of costs based on an analysis of the available information. FPL has not forecast a reasonable range of future carbon costs because its projections are based on a very limited number of bills and none of these bills contain target levels of carbon dioxide emissions that would actually stabilize the concentration of carbon dioxide in our atmosphere, a prerequisite to keeping global temperatures at a manageable level.

According to FPL's response to Staff's First Set of Interrogatories, No. 35, the bills upon which these forecasts are based are: (1) Senator Jeff Bingaman's discussed but never introduced Climate and Economy Insurance Act; (2) Senator Tom Carper's Clean Planning Act of 2006 (S.2724); (3) Senator Feinstein Discussion Draft – Strong Economy and Climate Protection Act; (4) Senators John McCain and Joe Lieberman – Climate Stewardship Act (S.1151). Exh. 2 at 50.

First, it is essential to emphasize that none of these bills would have achieved the 60% to 80% reductions in CO2 emissions from current levels by 2050 that FPL and the other participants in USCAP say should be specified by Congress. Exh. 210 at 7. Indeed, the discussion draft of Sen. Bingaman's never introduced Climate and Economy Insurance Act would have required reductions in the intensity of CO2 emissions per MWh but would not have required any overall reductions in the levels of CO2 emissions. Senator Carper's Clean Air Planning

Act would have only capped air emissions after 2013 at 2001 levels – far, far short of the 60% to 80% reductions FPL has publicly supported. Similarly, Sen. Feinstein's proposed 2006 bill would have capped future CO2 emissions at only 7.25% below current levels. Finally, Sen. McCain and Lieberman's S.1151 bill would only have capped emissions at 2000 levels. Clearly, then, the proposed and discussed legislative bills which formed the basis for FPL's CO2 price forecasts are not even consistent with the Company's own stated objective of reducing CO2 emissions by 60% to 80% by 2050.

It is unwise to base a forecast of carbon dioxide allowance prices through 2054 on a limited number of past bills when some of these bills have evolved dramatically since then to include more aggressive emission reductions. Tr. Vol. 4 at 583-84 (Schlissel). For instance, the latest version of the McCain-Lieberman bill introduced in 2007 has more aggressive emission reductions than it did 2006. Tr. Vol. 4 at 583-84 (Schlissel). In addition, the 2007 Feinstein-Carper bill goes much farther than the 2006 bill, mandating additional reductions after 2015; specifically, mandating a 1% reduction from 2016 to 2019 and 1.5% reduction starting in 2020. Tr. Vol. 10 at 1602-03 (Rose).

Second, it is unreasonable to base the projection solely on these four proposed or discussed bills because none of them would actually have led to levels of reductions in carbon dioxide emissions that would be required in order to

stabilize the concentration of carbon dioxide in our atmosphere. Tr. Vol. 4 at 584 (Schlissel). Scientists anticipate that very significant emission reductions will be necessary, in the range of 80% below 1990 emission levels, to achieve stabilization targets that will keep global temperature increases to a somewhat manageable level. Tr. Vol. 4 at 574 (Schlissel). As such, there is a substantial likelihood that response to climate change impacts will require much more aggressive emission reductions than those contained in U.S. policy proposals, and in the Kyoto Protocol, to date. Tr. Vol. 4 at 574 (Schlissel). If the severity and certainty of climate change are such that emission levels 70-80% below current rates are mandated, this could result in very high marginal emission reduction costs. Tr. Vol. 4 at 574 (Schlissel).

Objective analysis of more current legislative proposals suggests that the cost of carbon dioxide emission could be significantly higher, especially if national policy moves in the direction that FPL itself advocates. Indeed, if we are to truly address the threat of global warming, and reduce domestic carbon dioxide emission by 60-80% by 2050, as FPL Group and the other USCAP participants call for, the regulatory regime will need to be significantly more aggressive than currently proposed legislation. Thus, to the extent that any analysis relies solely on existing legislative proposals to reflect the cost of carbon dioxide emissions over the entire

50-plus year projected life of the Everglades power plant, such analysis is likely to underestimate actual costs.

FPL is proposing a tremendously carbon-intensive project; the Everglades power plant will annually emit 14.5 million tons of carbon dioxide for the entire lifetime of the facility. Tr. Vol. 4 at 576 (Schlissel). The cost of these carbon dioxide emissions, as FPL indicates in its Application, would be passed along to its electricity customers. Based on the conservative carbon dioxide cost projections in the Synapse Report, the incremental annual costs associated with these carbon dioxide emissions would range from $122,262,000 to $480,040,000 *each year*. Exh. 128; Tr. Vol. 4 at 576 (Schlissel). Thus, FPL's failure to adequately account for the cost of emitting carbon dioxide over the life of the proposed facility has direct adverse implications for FPL electricity customers (as well as indirect adverse implications associated with the serious environmental consequences of the Everglades power park).

***FPL's Future Carbon Cost Forecasts***

David Schlissel's testimony and the attached Synapse report reliably forecast the range of future carbon costs based on past bills introduced into Congress. Mr. Schlissel describes how the federal Energy Information Administration, Massachusetts Institute of Technology, and others have conducted computer modeling to project how much carbon dioxide allowances would cost under

various federal regulatory approaches. Tr. Vol. 4 at 574-76 (Schlissel). After reviewing such studies (in conjunction with its understanding of climate science and policy), Synapse forecasts low-case, middle-case, and high-case scenarios of future carbon costs. Tr. Vol. 4 at 574-76 (Schlissel). The allowances price trajectories all begin at relatively low levels in 2010 (from $0 to $10/ton) and rise at different rates over the next 20 years. Tr. Vol. 4 at 574-76 (Schlissel). Reduced to a single, levelized value, the allowance price forecasts are these:

| Low-Case | Mid-Case | High-Case |
|---|---|---|
| $7.80 | $19.10 | $30.50 |

Tr. Vol. 4 at 575 (Schlissel). These forecasts were based on the bills that had been introduced in Congress through last spring and/or had been analyzed by the Energy Information Administration, Massachusetts Institute of Technology, and Environmental Protection Agency. Tr. Vol. 4 at 576 (Schlissel). However, unlike the analysis done by ICF International, these projections were not arbitrarily reduced from their expected projections. In addition, unlike FPL, Mr. Schlissel and Synapse concede that these forecasts are very conservative because they are based on past bills and future bills will be more stringent. Tr. Vol. 4 at 576 (Schlissel).

The range of allowance prices Mr. Schlissel and the Synapse report forecast would have a substantial impact on the cost of the Everglades power plant. Mr.

Schlissel testified that, assuming a 92% average annual capacity factor for the power plant, the levelized annual cost to FPL and its ratepayers of carbon dioxide emissions would be: $122,262,000 for the low-case scenario, $309,602,000 for the mid-case scenario, and $480,040,000 for the high-case scenario. Tr. Vol. 4 at 576 (Schlissel).

However, Judah Rose conceded during the hearing that Synapse's mid-case projection is not that far off ICF's mid-case projection. In his pre-filed testimony, Mr. Rose stated that Synapse's reliance on the Massachusetts Institute of Technology study "The Future of Coal" explains the "slight overestimation of $CO_2$ prices." Tr. Vol. 10 at 1572 (Rose). However, during cross-examination, Mr. Rose acknowledged that the mid-range price for carbon dioxide from approximately 2011 to 2030 for FPL is similar to the mid-range carbon dioxide costs projected by Mr. Schlissel and Synapse. Specifically, he stated that "We're pretty close on the mid and expected cases" and that this difference is about a $5 to $6 per ton of carbon dioxide difference. Tr. Vol. 10 at 1599-1600 (Rose).

In light of this concession and ICF's arbitrary reduction in expected carbon costs, the Commission should rely on the projected carbon costs provided by Mr. Schlissel and Synapse. Indeed, a prudent decision maker should rely on these more reliable forecasts because FPL has already stated that it intends to pass costs associated with carbon regulation on to its consumers.

## QUESTIONS CONCERNING POLLUTION EMISSION LEVELS AND METHODS OF ABATING POLLUTION FALL OUTSIDE THE JURISDICTION OF THE COMMISSION

The Commission has determined that its jurisdiction is strictly limited to matters relating to the need for additional electrical generating capacity and does not reach the scientific and technical questions concerning levels of pollutants, the degree to which pollutants should be controlled or how pollution control takes place. By Order dated March 14, 2007, the Commission acting through Commissioner Carter determined that environmental compliance costs would be dealt with by a separate docket and would not be considered in the needs determination hearing. On March 6, 2007, the Commission's order on intervention by the Conservationist Intervenors specifically excluded those intervenors from relying on pollution impacts as a basis for standing in the needs determination hearing. In entering this order, the Commission sustained the objection of FPL to the effect that pollution emission issues are not within the jurisdiction of the Commission but fall within the jurisdiction of other state agencies. FPL's Response to Petition to Intervene, March 9, 2007. This order acknowledges that

these matters require substantial scientific and technical expertise that falls outside the expertise of the Commission.[14]

Nonetheless, FPL put in evidence on issues relating to projected emission rates and control technologies for mercury, nitrogen oxide, sulfur dioxide, particulates and carbon dioxide. All of these are air pollutants. *Massachusetts et al. v. Environmental Protection Agency et al.*, 127 S.Ct 1438, 1433 (2007) (finding carbon dioxide to be an air pollutant under the Clean Air Act). The Conservationist Intervenors responded to that evidence so that it would not go unanswered. Nonetheless, this Commission has entered an order determining that it lacks jurisdiction to determine the extent of pollutant emissions and the methods by which they can or cannot be controlled. Those matters would be dealt with by agencies that have both the expertise and the jurisdiction to deal with them. Tr. Vol. 11 at 1762.

## FPL'S ANALYSIS OF IGCC IS FLAWED

With a more aggressive program to ramp-up renewable resources, and with significantly more ambitious energy efficiency and conservation initiatives, FPL can avoid, reduce, or significantly defer the need for new capacity. Nonetheless, if

[14] For example, Commission staff elicited evidence from FPL to the effect that emissions from pulverized coal plants and IGCC plants are the same. However, these extremely unfavorable projections of IGCC emission levels were from "FPL estimates" of IGCC plants that are in planning stages, [Tr. Vol. 9 at 1217-18 (Sim)] and turned out to be about double the actual emission levels of the IGCC plant operated by TECO. Tr. Vol. 11 at 1755-58 (Kosky); Exh. 184 at 10.

the Commission concludes that the new capacity that FPL identifies in its Application is needed in the time frame that FPL proposes, FPL has still failed to show that it has selected the appropriate technology. While FPL's own analysis shows that the proposed Pulverized Coal Plant compares poorly from a cost perspective to natural gas (as discussed above), the proposed plant also compares poorly to a project based on the Integrated Gasification Combined Cycle technology (IGCC).

As the record indicates, IGCC is a highly efficient means of producing electricity from coal that involves the transformation of coal into a "synthesis gas" or "syngas" that can run a combined cycle power block.[15] This transformation is the product of a high pressure, high temperature chemical process, that has several advantages over conventional combustions technologies. As discussed below, next-generation IGCC is expected to produce electricity from coal more efficiently than FPL's selected pulverized coal technology. As to the matter of comparative air emissions, the technical requirements of the Clean Air Act and the comparative technologies to deal with air emissions fall outside the jurisdiction of this Commission. The staff of the Commission lacks the expertise of the Department of Environmental Protection air regulation division and should not make findings

[15] Exh. 183 at 4-5. Mr. Furman's Direct Testimony includes a full discussion of the technical aspects of IGCC. Tr. Vol. 10 at 1453-55 (Furman); Exh. 94, 95, and 96.

in that specialized technical area. FPL has not been issued any environmental permits (which will include a case-specific analysis of environmental performance – mandated under the Federal Clean Air Act and other Federal law – comparing the project to other possible options).

IGCC can run on a wider range of fuels (including a wide variety of coal types, petcoke, and biomass) and it can produce a variety of products (including electricity, hydrogen, liquid fuels, and a variety of chemical products). Tr. Vol. 10 at 1476, 1481 (Furman). Mr. Chuck Black, the current President of Tampa Electric (one of the domestic utilities with the most experience with IGCC) recently explained in a letter to the U.S. House Subcommittee on Energy and Air Quality:

> [The] Polk [IGCC plant] has demonstrated the flexibility of using a number of different solid fuels including over 15 coal types, petroleum coke and biomass. This is seen as a major advantage over natural gas from a price, volatility and security of supply standpoint.[16]

***IGCC is much farther along than FPL suggests***

There are a number of misperceptions about IGCC that are advanced by FPL. As a threshold matter, gasification is *not* a new technology. Various types of facilities have been using gasification technologies (including coal gasification) at commercial scales since the 1800s. Tr. Vol. 10 at 1467 (Furman). Currently, there

[16] Exh. 183 at 4. As discussed herein, because the Polk facility was one of the first-generation IGCC units, any new IGCC unit would perform significantly better in all respects – thus, while experience with Polk is important, the performance of that unit is not a valid basis for comparison when considering new-build options.

are approximately 117 commercial gasification plants operating world-wide (with 385 gasifers), producing a variety of products, including fertilizers, fuels, steam, hydrogen and other chemicals, as well as electricity, from a variety of input materials. Exh. 105, 108, 109, 110, 111, 172, 173, and 174; Tr. Vol. 10 at 1451 (Furman). In fact, gasification (including coal gasification) is not uncommon in the U.S. – there are numerous gasifiers around the country and two domestic IGCC units that have been in continuous operation for more than a decade – the Wabash facility in Indiana and the Tampa Electric's Polk facility (two first-generation IGCC units). Exh. 105, 111, and 114; Tr. Vol. 10 at 1464-68 (Furman). As the record demonstrates, gasification (including IGCC) is a proven technology that is being widely relied upon in the U.S and abroad. In total, there are at least 14 commercially operating IGCC facilities world-wide with a combined capacity of approximately 3,880 MW(net) and almost a million hours of combined operation on syngas. Exh. 109, 170 at p. 5, and 172; Tr. Vol. 10 at 1467-1468 (Furman).

Another myth about IGCC is that it cannot be privately financed and that equipment suppliers do not offer performance guarantees. Both of these assertions are manifestly untrue, as demonstrated in the record for this proceeding. Numerous gasification projects (including IGCC projects) have been privately financed, including the Puretollano IGCC project in Spain, the ISAB Energy, Api Energia, and Sarlux IGCC projects in Italy, and gasification projects in Kansas,

Delaware, and Singapore. Exh. 170 at p. 7. Additionally, Tampa Electric, which has considerable experience with IGCC, confirms that suppliers are in fact offering "comprehensive EPC contracts with performance guarantees." Exh. 184 at slide 20; Tr. Vol. 10 at 1469 (Furman).

For purposes of this proceeding, the most important of the existing IGCC facilities are the newest units, built after the first-generation Polk and Wabash facilities, and the units that are currently proposed for construction in the U.S and abroad. These new facilities, including four existing units in Italy, reflect second-generation IGCC technology, and demonstrate some very important developments in the technology – such as increased reliability and availability. For example, the Sarlux and ISAB Energy plants have consistently achieved an availability of greater than 90%. Exh. 170 (Gas Turbine World article discussing dramatic improvements in availability and reliability for second-generation IGCC to more than 90%);[17] Exh. 113 (showing greater than 90% availability and reliability for relatively new IGCC units in China). Tampa Electric's President has explained that "[a]n important point, which is undervalued by many is that the overall availability of the plant, including operation on backup fuel in combined cycle mode, is very high. Gasifier availability can be engineered to be as high as the particular project economics dictate." Exh. 183 at 5.

[17] In addition, the Italian units demonstrate that IGCC can be built and operated at a scale above 500 MW where appropriate. Exh. 170.

The next generation of currently proposed domestic IGCC units promises to improve upon the impressive performance of the existing second-generation units. These observations are critical, because FPL is asking the Commission to make an apples-to-oranges comparison between optimistically state-of-the-art pulverized coal technology (the proposed GPP facility) and no-longer-relevant first generation IGCC. Instead, the Commission should compare the proposed pulverized coal plant to similarly optimistic state-of-the-art IGCC technology, which means the most recently completed projects, (e.g., new units in Italy and China) and the various project proposals and proposed permits for the next-generation of IGCC here in the U.S. and abroad.[18]

Finally, if Conservationist Intervenors are correct about FPL's ability to effectively defer the need for new electricity capacity by implementing aggressive renewable, energy efficiency, and conservation programs (as discussed earlier in this brief), the additional time would allow for IGCC to advance even further. This would allow FPL to make decisions about how to meet its future capacity needs in the most rational and responsible manner possible.

[18] Exh. 110, 173, and 174 (identifying more than 70 currently proposed IGCC and coal to liquids or coal to chemical gasification projects inside and outside of the U.S.).

***FPL's Analysis of The IGCC Technology Is Incorrect***

In its Application and witness testimony, FPL makes several incorrect assertions about the relative advantages and disadvantages of pulverized coal versus IGCC:

- FPL fails to acknowledge in its Application materials that IGCC units with backup fuel (such as petroleum distillate) are easily as reliable as natural gas combined cycle (NGCC). Tr. Vol. 10 at. 1483, 1493-94 (Furman); Exh. 170 (2006 Gas Turbine World article reporting greater then 90% capacity factors at new IGCC plants even *without* spare gasifiers or backup fuel).[19]
- FPL undercounts the number of IGCC facilities operating worldwide – ignoring all operating facilities other than those that operate on 100 percent coal. Exh 172. Because the gasification technology can use a wide range of fuels including coal, the number of operating plants should be counted as 17 rather than four. In fact, fuel versatility is one of the major benefits of IGCC, and all operating IGCC units are relevant to the current inquiry.
- FPL also erroneously relies on the fact that IGCC plants are not as big as the two 960 mw pulverized coal units proposed for Glades County. Where two pulverized coal units are proposed, the difference is only that three IGCC

[19] While units discussed in this article may have spare gasifiers or backup fuel, the analysis specifically excluded operation on backup fuel to show the availability of the units *on syngas*. Exh. 170 at 3.

units would be needed to reach the same overall capacity. This is similar to the multiple units used in NGCC plants. Tr. Vol. 10 at 1486-87 (Furman).

- FPL also erroneously asserts that next-generation IGCC units will suffer from initial start-up difficulties that the GPP will not experience. In fact domestic utilities have even less experience with the pulverized coal technology that FPL has proposed than they do with IGCC. Indeed, in the U.S. there are currently about seven times more IGCC units planned than ultra-supercritical pulverized coal (USPC). First generation super-critical (SCPC) plants have a history of experiencing significant problems and "if the track record of these new USPC plants follows that [pattern] of SCPC plants then the additional costs for the proposed FGPP plant will be much greater than the IGCC alternative." Tr. Vol. 10 at 1488 (Furman). Moreover, the first generation IGCC plants have worked out many of the "bugs" that emerging technologies frequently experience.[20] Tr. Vol. 10 at 1487-88 (Furman).
- FPL consistently posits the worst possible assumptions with respect to IGCC. For example, with regard to IGCC plant reliability, it asserts that an IGCC plant would need to shut down whenever a gasification train is removed from service. This assumes both that the plant would not have a

[20] It is worth noting here that, unlike IGCC, there is no significant experience with already existing "first-generation" USPC in the U.S.

spare gasifier and that there would be no source of backup fuel to run the combined cycle portion of the plant that generates the electricity. Tr. Vol. 7 at 920 (Jenkins). Were there a spare gasifier, one unit could shut down without affecting performance. And backup fuel is likely to be available to keep the combined cycle units running in the case of short-term gasifier shutdowns. In fact, in this regard, an IGCC unit is far more flexible than a pulverized coal unit.[21] Tr. Vol. 10 at 1489 (Furman).

- FPL asserts that IGCC plants have experienced some unique challenges regarding rotor reliability. This is misleading because the rotor troubles experienced by IGCC units was identical to difficulties experienced by NGCC units, and these problems have been adequately addressed by the applicable control systems which fully protect gas turbine rotors. The turbine problems have been fixed and are no longer a concern. Tr. Vol. 10 at 1490-93 (Furman); Exh. 120. FPL also erroneously asserts that gas turbines cannot operate on the hydrogen streams produced by IGCC units. Tr. Vol. 7 at 935 (Jenkins); Tr. Vol. 10 at 1498 (Furman).

[21] If, for example, there is a malfunction in one of the boiler units that requires a shut-down, the capacity from that unit will be lost in its entirety. For IGCC, on the other hand, a malfunction of one piece of equipment would require only taking that piece of equipment out of service – thus, depending on the particular equipment at issue, it may not affect generation at all (e.g,. if the gasifier goes down and backup fuel is available), or it may affect total capacity only by a small increment (e.g., the approximately 300 MW associated with a single combined cycle unit).

- FPL contends that a “nonstardard” configuration would be required that would take longer to design and construct. Tr. Vol. 7 at 923-924 (Jenkins). However, three “reference design” units of 630 MW each could provide FPL with a total of 1890 MW – using a standard configuration of two gas turbines and one steam turbine per unit. Tr. Vol. At 1494-95 (Furman).
- FPL asserts that IGCC is not reliable enough. Where FPL asserts that it will achieve 92 percent availability, the record is replete with objective sources of information that confirm that next-generation IGCC – either with or without a backup fuel source – will perform well above 80% availability. As discussed above, several Italian IGCC units are currently performing at greater than 90% availability without backup fuel. Additionally, Chuck Black of TECO has explained:

  > The reliability and availability of Polk's IGCC unit has improved steadily since entering commercial service. The unit had some problems with heat exchangers and other items that led to lower than expected initial reliability. These problems have been addressed and the availability of the gasifier is now in the 80% range, which is consistent with its design. Polk's gasifier availability is somewhat lower than would be expected for the next generation IGCC plant due to the lack of redundancy of some critical equipment. The combined cycle portion of the plant can also be operated on distillate oil. This capability to run on a back up fuel, increases the overall availability of the unit to the mid 90% range which is better than any single fuel, coal fired technology.

  Exh. 183 at 3. In addition to this inaccurate assumption about IGCC reliability, FPL unreasonably assumes 92% availability for a technology

with which it has no experience, and with which no domestic utility has any significant experience. In fact, FPL's own consultant (Black and Veatch) recently identified supercritical pulverized coal units as having an availability of about 83.2% (a much more reasonable assumption for this technology). Exh. 168 slide 16. The record indicates that the proposed pulverized coal plant would be less reliable and available than a next-generation IGCC plant

- FPL overlooks the fact that IGCC plants can run on much cheaper fuel than pulverized coal plants, more than offsetting the small additional capital cost of the IGCC technology. The proposed pulverized coal plant would be capable of burning only 20% petcoke, with the remaining 80% being coal from Central Appalachia or Columbia. Tr. Vol. 4. at 481, 500 (Schwartz); Tr. Vol. 6 at 806 (Hicks). As FPL witness Mr. Schwartz explained "The low volatility of petroleum coke limits its use in pulverized coal boilers. . . As a result, petroleum coke is typically limited to 20% of the feed stock. . . ." Tr. Vol. 4 at 500 (Schwartz). An IGCC unit is subject to no such limit, and can take full advantage of lower petcoke prices – burning up to 100% petcoke. Tr. Vol. 10 at 1456 (Furman); Exh. 97. The delivered fuel price forecast upon which FPL relies in part to demonstrate the cost of operating the proposed pulverized coal plant, Exh. 91, showed that petcoke will be

cheaper than coal by $1.00/mmBtu by 2013 and will increase to $1.60/mmBtu by 2024. This cost advantage of IGCC would produce a cost saving for 1960 MW power plant of about $120 million/year, or approximately $6 billion over the life of the plant. Exh. 97; Tr. Vol. 10 at 1456 (Furman).

- FPL overstates the capital costs of an IGCC plant. Florida specific data from TECO's recent Ten Year Site Plan included capital costs of approximately $3,180/KW (with a 2013 in-service date).[22] Comparing this to the GPP, which includes capital costs of approximately $2,806/KW,[23] it appears that the DOE-estimated capital cost differential of 12% between IGCC and pulverized coal presented in Exhibit 99 corroborates this small capital cost differential.
- FPL contends in essence that IGCC is too undeveloped to be a prudent choice of technologies. According to the U.S. Department of Energy, there are at least 26 IGCC projects currently proposed around the U.S.[24] Exh. 111. The fact is, many utilities – like Tampa Electric Company ("TECO")

[22] This analysis removes land costs to ensure an apples-to-apples comparison.
[23] As discussed earlier in this brief, the capital costs for GPP are one of the "key areas of uncertainty" for the project, Tr. Vol. 3 at 334 (Silva), and may prove to be substantially higher than anticipated.
[24] Conversely, there are only 4 proposed ultra super critical pulverized coal plants – a reality that reflects the relative disadvantages of this technology as compared to IGCC. Tr. Vol. 10 at 1453 (Furman); Exh. 119.

right here in Florida – have honestly evaluated the available technologies and concluded that IGCC is the best alternative.

***The Commission Should Reject FPL's Comparative Analysis of Pulverized Coal and IGCC***

In the end, it is evident that FPL's analysis overestimates the cost of IGCC, and underestimates its benefits. As the record shows, an unbiased analysis would likely demonstrate that an IGCC plant can provide new base load capacity for FPL at a lower cost than the GPP. While IGCC may cost somewhat more to build than the proposed GPP, it would have lower fuel costs. The decision to allow FPL to move forward with the proposed GPP would subject ratepayers to the significant risk associated with the cost of future $CO_2$ controls, which have not been adequately integrated into an objective technology analysis. In the end, analysis by the U.S. Department of Energy (DOE), EPA, and others, and statements by FPL's own witness, illustrate the cost benefits of IGCC. Accordingly, the Commission should reject FPL's Application and require FPL to perform objective and unbiased evaluation of available technologies.[25]

[25] At the very least, the record for this proceeding demonstrates that FPL's decision to charge forward with a carbon intensive project, without specifically engaging in a broader policy discussion about Florida's energy future, is ill advised. Given our rapidly improving understanding of global warming the Commission should not ignore the impact of its decision on state policy on that issue.

## CONCLUSION

The proposed coal-fired generating units are not needed, because end-user efficiency would itself be sufficient to satisfy anticipated increasing demand for electricity and would provide fuel diversity and reliability. Although Conservationist Intervenors contend that there is no need for and oppose the construction of any type of coal plant by FPL, if the Commission's decision comes down to a choice between the pulverized coal plant proposed by FPL and an IGCC plant, Conservationist Intervenors suggest than an IGCC plant would be a better alternative because it would provide electricity at a lower cost than a pulverized coal plant, has greater fuel versatility, and with its capability to run on a back up fuel, has greater overall availability than a any single coal fired technology. Further, the GPP is not the lowest cost option, since it relies too heavily on the objective of fuel diversification, but fails to adequately account for the costs of upcoming global warming legislation, fails to adequately consider other means of fuel diversification, and ultimately reflects an imprudent decision for Florida ratepayers. FPL has done no analysis of potential capital costs increases of its proposed coal-fired plant. Moreover, all parties to the proceeding agree that carbon dioxide regulation is necessary to address the very serious threat of global warming. This Commission should find that FPL's carbon forecasts are inadequate, and only has to look at FPL's own economic analysis to determine that

the Everglades power plant is not the lowest cost option. For the reasons stated above, the Commission should deny FPL's petition for approval of the proposed power plants.

/s/ Michael A. Gross

Michael A. Gross
FL Bar ID. 0199461
David G. Guest
Florida Bar ID. 0267228
Monica K. Reimer
FL Bar ID. 0090069
Earthjustice
111 S. Martin L. King Blvd.
Tallahassee, FL 32301
(850) 681-0031

Attorneys for Intervenors

## CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing was served on this 7th day of May, 2007, via electronic mail and US Mail on:

R. Wade Lichtfield
Natalie F. Smith
Florida Power & Light Company
700 Universe Boulevard
Juno Beach, FL 33408

Mr. Bill Walker
Florida Power & Light Company
215 South Monroe Street, Suite 810
Tallahassee, FL 32301-1859

Myron Rollins
Black & Veatch
11401 Lamar Avenue
Overland Park, KS 66211

Shaw Stiller
Department of Community Affairs
Division of Community Planning
2555 Shumard Oak Blvd.
Tallahassee, FL 32399-2100

Michael P. Halpin
Department of Environmental Protection
Siting Coordination Office
2600 Blairstone Road MS 48
Tallahassee, FL 32301

Katherine E. Fleming, Esq.
Jennifer Brubaker, Esq.
Lorena Holley, Esq.
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399-0850

Charles J. Beck, Esq.
Office of Public Counsel
Deputy Public Counsel
c/o The Florida Legislature
111 W. Madison St., Room 812
Tallahassee, FL 32399-1400

Tamela Ivey Perdue
Associated Industries of Florida
Stiles, Taylor & Grace, PA
PO Box 1140
Tallahassee, FL 32301

Bob and Jan Krasowski
1086 Michigan Avenue
Naples, Florida 34103-3857

___/s/ Michael Gross_____
Attorney

# EXHIBIT 1

**Docket No. 070098-EI**
**Alternative DSM**
**Exhibit JJP-4, Page 1 of 1**

**DSM and the Need Date for the Glades Units**

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FPL Summer MW Requirements** | | | | | | | | | | | | | | |
| FPL Forecast | 22,259 | 22,770 | 23,435 | 24,003 | 24,612 | 25,115 | 25,590 | 26,100 | 26,772 | 27,410 | 28,079 | 28,737 | 29,391 | 30,091 |
| FPL DSM | 381 | 524 | 656 | 784 | 918 | 1,056 | 1,199 | 1,350 | 1,366 | 1,486 | 1,606 | 1,726 | 1,846 | 1,966 |
| Forecast With FPL DSM | 21,878 | 22,246 | 22,779 | 23,219 | 23,694 | 24,059 | **24,391** | 24,750 | 25,406 | 25,924 | 26,473 | 27,011 | 27,545 | 28,125 |
| PG&E Scaled DSM | 381 | 718 | 1,089 | 1,501 | 1,926 | 2,365 | 2,815 | 3,277 | 3,751 | 4,239 | 4,739 | 5,251 | 5,775 | 6,314 |
| Forecast With PG&E Scaled DSM | 21,878 | 22,052 | 22,346 | 22,502 | 22,686 | 22,750 | 22,775 | 22,823 | 23,021 | 23,171 | 23,340 | 23,486 | 23,616 | 23,777 |
| Mass. Scaled DSM | 381 | 575 | 775 | 983 | 1,197 | 1,418 | 1,644 | 1,876 | 2,115 | 2,361 | 2,612 | 2,870 | 3,133 | 3,405 |
| Forecast With Mass. Scaled DSM | 21,878 | 22,195 | 22,660 | 23,020 | 23,415 | 23,697 | 23,946 | 24,224 | 24,657 | 25,049 | 25,467 | 25,867 | 26,258 | 26,686 |
| **DSM Budgets (Millions Nominal $)** | | | | | | | | | | | | | | |
| PG&E Scaled DSM | | $ 537 | $ 594 | $ 704 | $ 745 | $ 788 | $ 827 | $ 871 | $ 917 | $ 967 | $1,014 | $1,066 | $1,119 | $1,179 |
| Mass. Scaled DSM | | $ 321 | $ 341 | $ 361 | $ 382 | $ 404 | $ 424 | $ 446 | $ 470 | $ 496 | $ 520 | $ 546 | $ 574 | $ 604 |