BEFORE THE FLORIDA
PUBLIC SERVICE COMMISSION

DOCKET NO. 070098-EI
FLORIDA POWER & LIGHT COMPANY

IN RE: FLORIDA POWER & LIGHT COMPANY'S PETITION TO DETERMINE NEED FOR FPL GLADES POWER PARK UNITS 1 AND 2 ELECTRICAL POWER PLANT

REBUTTAL TESTIMONY & EXHIBIT OF:

KENNARD F. KOSKY

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

REBUTTAL TESTIMONY OF KENNARD F. KOSKY

DOCKET NO. 070098-EI

MARCH 30, 2007

Q. Please state your name and business address.

A. My name is Kennard F. Kosky and my business address is 6241 NW 23rd Street, Suite 500, Gainesville, Florida 32653.

Q. Have you previously provided testimony in this proceeding?

A. Yes. I sponsored direct testimony dated February 1, 2007 related to certain environmental aspects of FPL Glades Power Park (FGPP) including an overview of the major environmental requirements, information on the environmental design to meet, or be better, than these environmental requirements, a description from an environmental perspective that the selected technology is the best alternative to meet the fuel diversity and a description of the existing and possible future environmental requirements and potential costs. My key conclusions based upon my training, 35 years of experience, and analysis conducted in relation to the Site Certification Application for FGPP, were: (i) the selection of ultra-supercritical pulverized coal (USCPC) technology and environmental controls for FGPP not only meets, but exceeds the extensive environmental regulatory requirements; (ii) the technology selected for FGPP is the best available alternative from an

environmental perspective consistent with maintaining fuel diversity; and (iii) the environmental compliance costs evaluated by FPL to meet future environmental requirements reflect an appropriate range of possible future costs, which fairly and reasonably takes into account uncertainty concerning future environmental requirements and costs.

Q. In the preparation of this rebuttal testimony have you reviewed the direct testimonies of Mr. Richard C. Furman and Mr. David A. Schlissel filed on behalf of certain interveners?

A. Yes. I reviewed the direct testimonies of Mr. Furman and Mr. Schlissel both dated March 7, 2007 and the supplemental direct testimonies of Mr. Furman and Mr. Schlissel dated March 16, 2006.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to address certain environmental assertions regarding FGPP in the testimonies of Mr. Richard Furman and Mr. David A. Schlissel. The specific items I will address are:

- IGCC technology does not provide significantly lower air emissions than the USCPC technology proposed for FGPP as stated by Mr. Furman. [Furman Testimony at Page 3 (Lines 18-20), Page 12 (Lines 14-24), Pages 13-15, Page 16 (Lines 1-16)]
- IGCC technology is not appropriate for consideration as Best Available Control Technology (BACT) under the Florida Department of Environmental Protection (FDEP) Prevention of Significant Deterioration (PSD) regulations approved by the Environmental

Protection Agency (EPA) as claimed by Mr. Furman. [Furman Testimony Page 3 (Lines 23-25, Page 16 (Lines 17-24), Page 17 (Lines 1-14)]

- USCPC will be fully compliant with applicable mercury regulations and IGCC does not provide greater mercury emissions reduction than USCPC being proposed for FGPP as stated to by Mr. Furman. [Furman Testimony Page 6 (Lines 18-20), Page 27 (Lines 4-24), Page 28 (Lines 1-8)]
- USCPC does not require taller stacks than IGCC for the reasons asserted to by Mr. Furman. [Furman Testimony Page 18 (Line 25), Page 19 (Lines 1-14)]
- IGCC does not necessarily produce less solid wastes than the USCPC being proposed for FGPP. [Furman Testimony Page 3 (Lines 20-21), Page 28 (Lines 9-20]
- USCPC does not have higher air quality impacts than IGCC as suggested by Mr. Furman. [Page 27 (Lines 4-25, Page 28 and Page 29 (Lines 1-11)]
- Alternative carbon dioxide allowance costs presented by Mr. Schlissel (Page 21, Figure 1) are not analytically persuasive. FPL considered reasonable and appropriate environmental costs in the ranges that are predicted to occur in the future.

Q. Are you sponsoring any exhibits to your rebuttal testimony?

A. Yes. I am sponsoring an exhibit consisting of two documents, KFK-8 and KFK-9, which is attached to my rebuttal testimony.

Q. Do you agree with Mr. Furman's testimony that IGCC provides significantly lower air emissions than USCPC proposed for FGPP?

A. No. As I testified in my direct testimony (Page 12, Lines 7-17) and demonstrated in Document Nos. KFK-4 and KFK-5 emission rates proposed for FGPP are lower than IGCC for some air pollutants and higher for others. Mr. Furman's characterization that IGCC has significantly lower emissions than USCPC is not correct.

Q. Do Mr. Furman's Exhibits RCF-8 through RCF-11 support his assertion that IGCC has significantly lower emissions? Please explain.

A. No they do not. Exhibits RCF-8 and RCF-9 provided comparisons of FGPP and a hypothetical IGCC of the same size. However, the information used to develop these exhibits are not supported by Exhibits RCF-10 and RCF-11 as suggested by his testimony and confirmed in his deposition. I evaluated the information in Exhibits RCF-10 and RCF-11 and the emission rates for SO_2, NO_x, particulates and mercury in any combination and the information does not support Mr. Furman's estimated emissions in Exhibit RCF-9. In addition, it should be noted that many of the projects shown in Exhibit RCF-10 have not yet been approved and the emission rates have not been demonstrated for IGCC. In contrast, the air quality control systems proposed for FGPP have

been demonstrated as effective on over 100,000 MW for pulverized coal-fired power plants.

Q. Does past performance of existing IGCC demonstrate that this technology will have performance and emission rates suggested by Mr. Furman?

A. No, in fact existing performance suggests quite the contrary. One of the four existing IGCCs in the U.S. is Tampa Electric's Polk Power Station. Mr. Furman noted this facility many times in his testimony suggesting that operational and emissions performance of IGCC has been demonstrated. The latest data from continuous monitoring systems required by EPA and FDEP for 2005 indicate that the Polk IGCC operated only about 65 percent of the time in 2005. In addition to having a low rate of operation, from an emission perspective, the annual average emission rate of sulfur dioxide was 0.16 lb/MMBtu for Polk Power or about four times higher than that proposed for FGPP at 0.04 lb/MMBtu. The annual average nitrogen oxides emission rate was 0.06 lb/MMBtu, which is higher than the 0.05 lb/MMBtu proposed for FGPP. In addition, with respect to mercury, the Polk plant, which is an approximate 252 MW net facility, reported 67 pounds of mercury emissions in 2005. Scaled up to 1960 MW (equal to FGPP) and accounting for full operation, that would be about 800 pounds. This compares very unfavorably with the maximum mercury emissions filed by FPL with respect to FGPP of a maximum of 183.8 pounds of mercury per year. It should also be noted that the Polk IGCC unit is about 16 percent less efficient (based on Polk's recent

self-reporting of an annual heat rate of 10,200 btu/kwh compared with FGPP's expected 8800 btu/kwh), which results in even higher emission rates on a MW-hr generated basis. Past actual experience demonstrates that operational and emissions performance favor the USCPC technology selected for FGPP.

Q. Is IGCC technology appropriate for consideration as BACT as testified by Mr. Furman? What is the basis for your answer?

A. No. While Mr. Furman raises this point as if it is an open issue, this is a regulatory determination within the jurisdiction of the FDEP that was resolved by EPA guidance and FDEP practice regarding the nature of BACT reviews. A BACT review requires an analysis of technologies for the particular type of source being proposed by the applicant, or in this case power generation technology (e.g., combined cycle, pulverized coal and IGCC). Both EPA and FDEP have addressed the specific issue regarding IGCC as an alternative control technology under BACT for pulverized coal units. The EPA and FDEP have both stated that IGCC is not an alternative control technology for pulverized coal-fired power plants and should not be evaluated as BACT. In a letter addressing this issue EPA's statement was: "EPA's view is that applying IGCC technology would fundamentally change the scope of the project and redefine the basic design of the proposed source." [Letter from Stephen D. Page, Director, Office of Air Quality, Planning and Standards, United States Environmental Protection Agency, to Paul Plath, Senior Partner, E3 Consulting, LLC (December 13, 2005)]. FDEP included this position in the

Technical Evaluation and Preliminary Determination for the draft permit issued for Seminole Generating Station Unit 3 Project.

Over the past few years, several PSD permit applications have been submitted to various permitting agencies proposing to construct pulverized coal-fired steam electric generating units. In a majority of these preconstruction permit reviews, the permitting agency applied the BACT process to the source as defined by the applicant (e.g., pulverized coal (PC) steam electric generating unit), and have specifically stated that IGCC is a different technology than PC and therefore is not part of the BACT process. For example, this conclusion was determined in the following PSD permit applications: (1) KCP&L Hawthorne Facility in Missouri; (2) Thoroughbred Generating Facility in Kentucky; (3) Wygen II Project in Wyoming; (4) Roundup Power Project in Montana; and (5) Sunflower Electric – Holcomb Generating Project in Kansas. In each of these recent PSD permit applications, the permit applicant defined the source as a pulverized coal-fired unit, and applied the BACT process to identify the best available technologies to control emissions from a pulverized coal-fired unit.

In his Exhibit RCF-12, Mr. Furman cites 30-year old legislative history language that does not recognize the longstanding history and practice of BACT reviews. Mr. Furman admitted at his deposition that he did not know

where this exhibit came from. (Furman Deposition Page 49, Line 24). Mr. Furman's claim should be rejected.

Q. Does IGCC provide greater mercury emissions reduction than USCPC being proposed for FGPP as stated to by Mr. Furman?

A. No. The EPA recently promulgated final New Source Performance Standards (NSPS) for New and Existing Steam Electric Utility Generating Units (71 Federal Register, No. 111 Pages 33388 through 33402, June 9, 2006). This update of the NSPS was promulgated as part of the Clean Air Mercury Rule (CAMR). Mercury emission standards were adopted for PC and IGCC units. EPA developed this rule after reviewing the available technologies to reduce mercury from both PC and potential IGCC units. EPA's technology evaluation concluded that both technologies could meet an emission rate of 20 x 10^{-6} lb per MW-hr. In fact, EPA lowered the NSPS mercury emission rate for PC units in the final promulgation in June 2006. As shown in Document No. KFK-6 of my direct testimony, the maximum mercury emission rate being proposed for FGPP is less than one-half of the recent NSPS.

Q. Do you agree with Mr. Furman's conclusion that FGPP is at risk in meeting the proposed mercury emission limit?

A. No. Mr. Furman's testimony demonstrates a lack of understanding of mercury removal processes in USCPC units and his assertion that it is not economically feasible to remove mercury from the exhaust gases of a USCPC unit is incorrect. Mercury removal in USCPC involves the entire air quality control systems that for FGPP includes selective catalytic reduction (SCR),

fabric filter, wet limestone flue gas desulfurization (FGD) and wet electrostatic precipitator (WESP). The use of sorbents, like powered activated carbon, enhances the overall removal process. In many studies supported by EPA and DOE, the air quality control system being proposed for FGPP can achieve 90 percent mercury removal and the use of powered activated carbon can further enhance this level of removal. The additional commitment by FPL to utilize powered activated carbon enhances mercury removal and provides further assurance that the mercury emission limit can be achieved. The cost for all these controls were included in FPL's filing before the Commission.

Q. In your opinion is there any risk of FGPP meeting the proposed mercury emission rate?

A. In my opinion, there is no risk that FGPP cannot meet the proposed mercury emission rate. The combination of SCR, fabric filter, wet FGD and WESP combined with powered activated carbon will meet or be better than the proposed mercury emission limit.

Q. Will the mercury emissions from FGPP using this USCPC technology rather than IGCC contribute measurable amounts of mercury to Florida's environment as suggested in Mr. Furman's testimony and exhibits? Please explain your answer.

A. No. There is a misconception within Mr. Furman's testimony that suggests that the mercury emissions from FGPP would have adverse impacts. The emissions of mercury from FGPP and the resultant impacts will be very low and must be put in perspective. I have prepared Document No. KFK-8, which

provides an overview of the different sources of mercury and the amount of deposition in southern Florida. The mercury emissions and deposition of FGPP are included on the document. Of the total mercury emitted to the atmosphere worldwide, only about three percent is from sources in the U.S. Mercury emissions from U.S. power plants account for less than one percent of the worldwide total. In contrast, about one-third of the worldwide mercury emissions are from natural sources (volcanoes and oceans) and about 50 percent of the man-made emissions are from Asia. The result is that of the majority of mercury in Florida's atmosphere is from sources outside Florida. The contribution of mercury emissions from FGPP will be very small (<0.6 percent) at the maximum emission rate and expected to be even lower as I will explain later. As a consequence, the majority of mercury deposition in Florida is from sources other than those in Florida. FGPP will add such small amounts of mercury as to be immeasurable in Florida's environment. To be specific, the maximum estimated mercury deposition when FGPP is operational will be 250 times lower than mercury currently being deposited from other sources (i.e., 0.4 percent). Within the Everglades National Park, the maximum mercury deposition from FGPP will be 4,000 times lower than the amount that is currently being deposited by other sources (i.e., 0.03 percent). The contribution of mercury from FGPP to Florida's environment will be too small to be measurable.

Q. In your opinion, will the controls proposed for FGPP result in lower total mercury emissions than provided in the Site Certification Application and Air Construction/Prevention of Significant Deterioration Permit Application submitted to FDEP?

A. Yes. My opinion is based on technical knowledge of the co-beneficial mercury removal capabilities of the combination of controls, which form the basis for proposing the mercury emission rates. The maximum FGPP mercury emission rates were based on conservative (worse than what would be expected to occur) concentrations of mercury in the coal, mercury removal efficiencies and operational factors. In my opinion, the actual mercury emissions from FGPP once operational will be approximately 50 percent lower than the maximum "potential" emissions that I described previously.

Q. Will lower mercury emissions result in even lower mercury deposition?

A. Yes.

Q. Do you agree with Mr. Furman's assertion that USCPC units require taller stacks than IGCC because impacts are unacceptable to people?

A. No. Mr. Furman's conclusion demonstrates a total lack of understanding of both the regulations and process involving determining environmental impacts from power plants. The reason that PC units have taller stacks than IGCC units is a result of their physical differences and not environmental impacts. As I demonstrated in Document No. KFK-3, the maximum impacts of FGPP are well below the FDEP ambient air quality standards designed to protect public health and welfare, with an adequate margin of safety. Indeed, the

maximum air quality impacts of FGPP are over 17 times lower than the FDEP PSD Increments designed to protect air quality from degradation. This is achieved by the high efficiency of FGPP and the comprehensive suite of emission controls that I have described, the costs of which have been presented as part of FPL's testimony and exhibits in this proceeding.

Q. Explain briefly the solid wastes or byproducts produced by USCPC and IGCC.

A. In contrast to Mr. Furman's Exhibit RCF-25, USCPC units produce useful byproducts that have a long history of use. Fly ash collected in the fabric filters will have properties useful in the manufacture of concrete block. Bottom ash is used as an aggregate in construction projects. These byproducts have been recycled for over thirty years in Florida. The wet FGD system will produce wallboard grade gypsum that can be used in the manufacturer of building products. In fact, the Seminole Generating Station has a large manufacturing plant co-located on the site where gypsum produced by the wet FGD is used to manufacture wallboard. IGCC produces a slag as well, consisting of either elemental sulfur or sulfuric acid. IGCC overall has lower quantities of byproducts but the ultimate amount of useful byproducts for IGCC remains to be seen.

Q. Please explain why USCPC may have lower amount of byproducts.

A. The byproducts produced by USCPC have demonstrated markets for reuse. Ash has been used in concrete and cement manufacture for decades. Gypsum produced by wet FGD is a preferential byproduct for wallboard manufacture.

On the other hand, IGCC slag does not have a long track record for reuse as that for the byproducts of PC units. If there is no market for IGCC generated slag, then there would be larger amounts of byproducts from an IGCC unit than an USCPC unit.

Q. Does USCPC have higher air quality impacts than IGCC as suggested by Mr. Furman?

A. No. In fact air quality impacts may be higher with IGCC for certain air emissions. In determining air quality impacts, the physical configuration of air emissions source is an important aspect in determining impacts. Document No. KFK-9 shows the impacts of FGPP compared to a comparable size IGCC plant. For this example, I used the air quality impact analysis prepared for the Orlando Utilities Commission Unit B IGCC recently permitted by FDEP. As shown in this exhibit, the air quality impacts for FGPP are lower than a comparable sized IGCC for most air pollutants. This is true, even though for several pollutants the emission rates for the IGCC example are lower than that proposed for FGPP.

Q. Are the allowance costs used in FPL's economic analysis reasonable and appropriate future environmental compliance costs?

A. Yes. As I stated in my direct testimony, FPL considered reasonable and appropriate environmental costs in the ranges that are predicted to occur in the future. While there is considerable uncertainty on what will actually be required in the future, the environmental costs utilized represent a range of

possible future environmental costs that included the high, medium and mild forecasts of potential CO_2 regulation.

Q. Has your opinion changed in light of the CO_2 costs presented by Mr. Schlissel in his direct and supplemental testimony? Please explain your opinion.

A. No, the CO_2 cost projections presented by Mr. Schlissel have not changed my opinion. There is no indication that the CO_2 allowance costs forecasts in the Synapse Energy Economics Report and sponsored by Mr. Schlissel were developed in a fashion that recognized the relationships of the electric, fuel and environmental markets. In contrast, the allowance forecasts by ICF used in the FPL economic analysis are predicted using integrated modeling of the electric, fuel and environmental markets in the U.S. The ICF process is described in detail by FPL's witness Judah Rose. In contrast with Mr. Schlissel's "forecasts", ICF's forecasts are based on ICF's extensive experience in evaluating these markets for allowance costs of SO_2 and NO_x. These air emissions are currently regulated under a cap-and-trade system that would likely be a model for future potential legislation initiatives involving CO_2. Indeed, allowance costs for SO_2 and NO_x have a long track record under the 1990 Amendments of the Clean Air Act. In my opinion, any forecasts of future environmental costs must include energy, fuel and environmental markets since they are interrelated. Mr. Schlissel's and Synapse Energy Economics' forecasts do not.

Q. Is it appropriate to use as the sole basis of FPL's economic analysis the highest CO_2 costs as suggested by Mr. Schlissel?

A. No.

Q. Why would this be incorrect?

A. As I stated in my direct testimony, there is considerable uncertainty in the future regulation of CO_2. While legislation is possible sometime in the future, the precise framework of such legislation is uncertain. To encompass this uncertainty, future costs should consider an appropriate and reasonable range of future environmental costs. The use of a "highest cost scenario" as the sole basis for an economic analysis in this case reflects an outcome that is less likely given the range in potential legislation. The range used in the FGPP economic analysis provides a reasonable and appropriate approach to evaluate future environmental costs.

Q. Are you familiar with Mr. Schlissel's testimony that FGPP will emit 14.5 million tons of CO_2 per year?

A. Yes.

Q. In your opinion, other than future potential costs, does the amount of CO_2 have any other meaningful environmental aspect? Please explain your answer.

A. No, other than estimating potential CO_2 cost from potential future legislation that has not yet been passed, there is no meaningful environmental aspect whatsoever to the tons/year of CO_2 from a single power plant. As I explained in my direct testimony (Page 13, Lines 9 through 22), a more meaningful

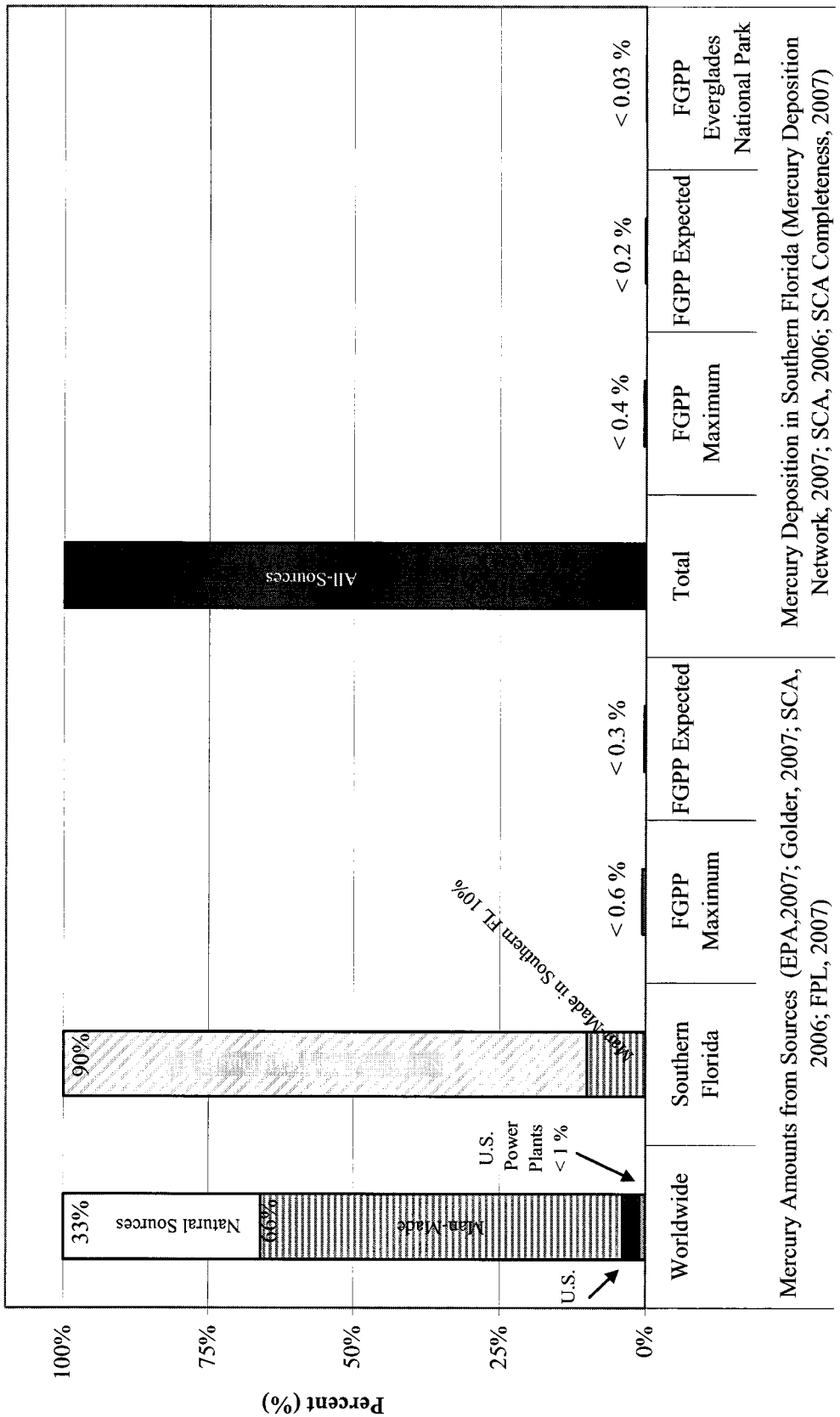
comparison for CO_2 is the efficiency of the power plant and how emission rates are trending. FGPP will be a highly efficient coal-fired power plant and this efficiency translates to less CO_2 for each MW-hr generated. For example, I evaluated the CO_2 emission rates and efficiencies for major existing coal-fired power plants in Florida. Because FGPP is so efficient, it will actually emit two million tons per year less of CO_2 than other Florida power plants for the same amount of generation. If all other major coal-fired power plants in Florida were as efficient as FGPP, the CO_2 emission generated would be over six million tons/year less or about 15 percent less.

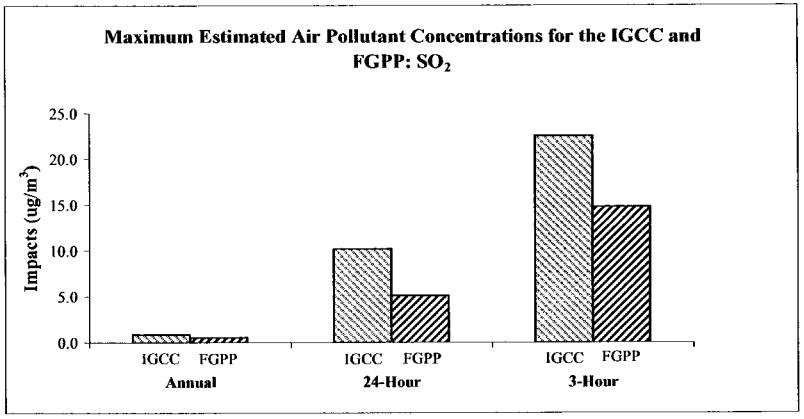
It must be recognized that CO_2 is emitted by all fossil fuels. In 2005, the estimated CO_2 emissions in Florida were on the order of 300 million tons. About 36 percent of the CO_2 emissions in Florida are from transportation, while about 45 percent is from electric generation (EPA Climate Change Web Site, 2007). Each vehicle in Florida emits an average of 4.6 tons per year. Clearly, future legislation of CO_2 may involve much more than coal-fired power plants. Indeed, Mr. Schlissel recognized this in his direct testimony. Table 1 of his direct testimony (Pages 10 and 11) includes legislation that would apply to many sources of CO_2 rather than solely coal-fired power plants. This is shown by the legislation indicated as "Economy Wide" in the table.

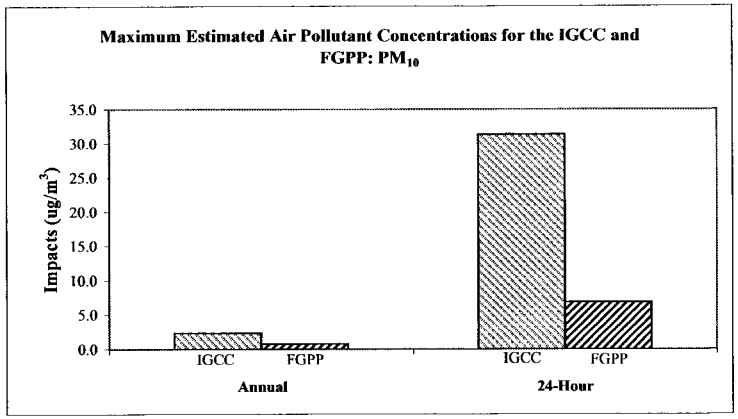
As I testified previously, FPL Group has one of the lowest CO_2 profiles in the country and in the 2015 to 2020 timeframe the CO_2 emission rate is expected to be 17.4 percent lower. Indeed, this trend in lower CO_2 emission rates with FGPP is beneficial from an overall environmental standpoint of CO_2 emissions.

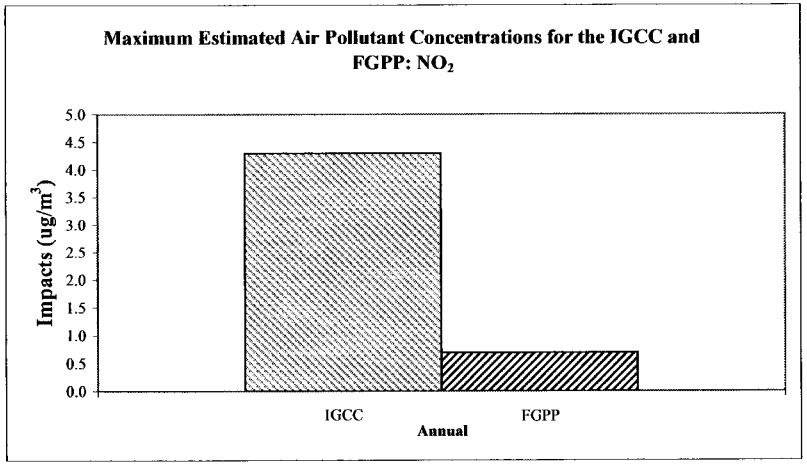
Q. Does this conclude your rebuttal testimony?

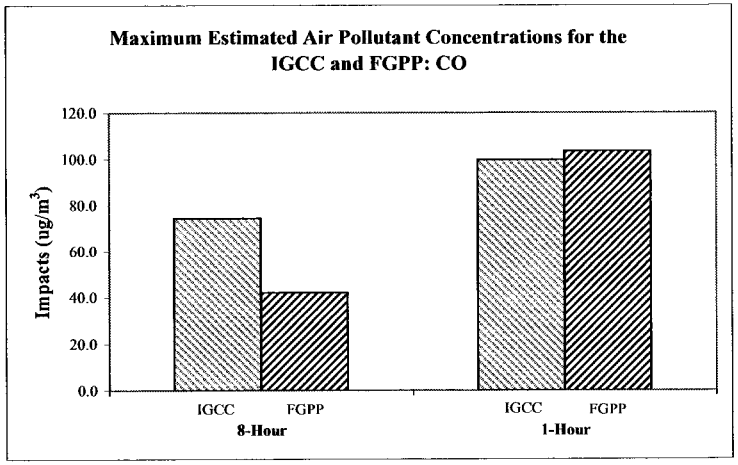
A. Yes.


Mercury Sources and Deposition
Percent (%)
100%
75%
50%
25%
0%
U.S.
33%
Natural Sources
67%
Man-Made
U.S. Power Plants < 1 %
90%
Man-Made in Southern FL 10%
All-Sources
< 0.6 %
< 0.3 %
< 0.4 %
< 0.2 %
< 0.03 %
Worldwide
Southern Florida
FGPP Maximum
FGPP Expected
Total
FGPP Maximum
FGPP Expected
FGPP Everglades National Park
Mercury Amounts from Sources (EPA,2007; Golder, 2007; SCA, 2006; FPL, 2007)
Mercury Deposition in Southern Florida (Mercury Deposition Network, 2007; SCA, 2006; SCA Completeness, 2007)









Maximum Air Quality Impact Predicted for the FPL Glades Power Park Compared to IGCC

Sources: OUC Unit B ICGG SCA, 2006. FGPP SCA, 2006.

Docket No. 070098-EI
K. Kosky, Exhibit No. ____
Document No. KFK-9
Maximum Air Quality Impact Predicted for the FPL Glades Power Park Compared to IGCC