

ORIGINAL

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

CMP \_\_\_\_\_  
COM 5  
CTR DTG  
ECR \_\_\_\_\_  
GCL 1  
OPC 1  
RCA \_\_\_\_\_  
SCR \_\_\_\_\_  
SGA \_\_\_\_\_  
SEC \_\_\_\_\_  
OTH \_\_\_\_\_

DIRECT TESTIMONY & EXHIBIT OF:

KENNARD F. KOSKY

DOCUMENT NUMBER-DAT

01098 FEB-15

FPSC-COMMISSION CLERK

1                   **BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

2                   **FLORIDA POWER & LIGHT COMPANY**

3                   **DIRECT TESTIMONY OF KENNARD F. KOSKY**

4                   **DOCKET NO. 07\_\_\_\_-EI**

5                   **JANUARY 29, 2007**

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

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

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

11          A.     I am employed by Golder Associates Inc., an engineering consulting firm  
12               specializing in ground engineering and environmental services. I am a  
13               Principal with the firm in the Gainesville office involved primarily in the  
14               environmental aspects of electric power plants.

15          **Q.     Please describe your educational background and professional  
16               experience.**

17          A.     I received a Bachelor of Science degree in engineering from Florida Atlantic  
18               University, and a Master of Science degree in environmental engineering from  
19               the University of Central Florida. I also completed one and half years of  
20               doctoral-level course work in the engineering Ph.D. program at the University  
21               of Florida.

1 Over the last 30 years my primary activities have involved the siting and  
2 licensing of electric power plants. I have worked on over 50,000 megawatts  
3 (MWs) of new and existing generation including conventional coal, oil and  
4 gas-fired steam generating units, combined cycle units, integrated coal  
5 gasification combined cycle (IGCC) units, simple cycle units, municipal solid  
6 waste (MSW) fired units, biomass-fired steam generating units, and diesel  
7 units. My primary technical activities have involved developing air  
8 emissions, evaluating air pollution control technologies and performing air  
9 quality impact evaluations of these facilities. A copy of my curriculum vitae  
10 is attached as Document No. KFK-1 to my testimony.

11 **Q. Please describe any professional registrations or certifications that you**  
12 **hold in your field of expertise.**

13 A. I am a registered Professional Engineer in mechanical engineering in the State  
14 of Florida. I have been practicing as a registered Professional Engineer since  
15 1976.

16 **Q. Could you please describe your responsibilities for FPL's Glades Power**  
17 **Park?**

18 A. I had the overall responsibility for the preparation of the Site Certification  
19 Application (SCA) for the FPL Glades Power Park (FGPP). I signed and  
20 sealed the SCA as a Professional Engineer. I also had overall responsibility  
21 for the preparation of the Prevention of Significant Deterioration (PSD)/Air  
22 Construction Permit Application for FGPP and signed and sealed the  
23 application as a Professional Engineer.

1 **Q. Are you sponsoring an exhibit in this case?**

2 A. Yes, I am sponsoring an exhibit consisting of seven documents, KFK-1  
3 through KFK-7, which is attached to my direct testimony. This exhibit  
4 provides some environmental comparisons of the FGPP and other power  
5 facilities and is based upon FGPP information that is currently being reviewed  
6 by the Florida Department of Environmental Protection (FDEP) and other  
7 state and regional environmental agencies which have regulatory jurisdiction  
8 concerning environmental, land use and other matters. The exhibit I am  
9 sponsoring consists of the following documents:

- 10 ○ Document No. KFK-1, curriculum vitae of Kennard F. Kosky
- 11 ○ Document No. KFK-2, a comparison of the air emissions of FGPP  
12 with existing generation technologies
- 13 ○ Document No. KFK-3, a comparison of the environmental impacts of  
14 FGPP with regulatory standards
- 15 ○ Document No. KFK-4, a comparison of the air emissions of FGPP  
16 with OUC Stanton Energy Center Unit B IGCC
- 17 ○ Document No. KFK-5, a comparison of the air emissions of FGPP  
18 with AEP Mountaineer IGCC
- 19 ○ Document No. KFK-6, a comparison of the mercury emissions of  
20 FGPP with EPA's New Source Performance Standards
- 21 ○ Document No. KFK-7, environmental compliance costs used in FGPP  
22 Economic Analysis

1 **Q. Are you sponsoring any sections of the Need Study document?**

2 A. Yes. I am sponsoring the following sections of the Need Study document:  
3 Section III.C. Environmental Controls, Section V. A. 3. Environmental  
4 Regulations and Section V. A. 4. a. (iii) Environmental Compliance Costs.  
5 Additionally, I sponsor Appendix F of the Need Study.

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

7 A. My understanding is that the Commission will consider and determine the  
8 need for FGPP pursuant to the utility laws and regulations that it is  
9 responsible for administering, which laws and regulations do not include  
10 environmental regulation. However, electric power plants constructed in  
11 Florida must comply with environmental regulations, and the costs of  
12 compliance are part of the project. Accordingly, the purpose of my testimony  
13 is to provide the Commission an overview of the key environmental aspects of  
14 FGPP and of the environmental regulatory uncertainties, both of which affect  
15 the cost of the project.

16  
17 Based upon my training, experience and analysis conducted in relation to this  
18 project, my testimony reaches and supports the following key conclusions: (i)  
19 the selection of ultra-supercritical pulverized coal (USCPC) technology and  
20 environmental controls for FGPP not only meets, but exceeds the extensive  
21 environmental regulatory requirements; (ii) the technology selected for FGPP  
22 is the best available alternative from an environmental perspective consistent  
23 with maintaining fuel diversity; and (iii) the environmental compliance costs

1           evaluated by FPL to meet future environmental requirements reflect an  
2           appropriate range of possible future costs, which fairly and reasonably takes  
3           into account uncertainty concerning future environmental requirements and  
4           costs.

5   **Q.   How is your testimony organized?**

6   A.   My testimony is divided into four sections. Section I provides an overview of  
7           the major environmental requirements for FGPP. Section II presents  
8           information on how FGPP's design will not only meet, but exceed these  
9           requirements. In this section, I will also provide environmental comparisons  
10          of FGPP with existing and other planned generation that demonstrates the  
11          favorable environmental characteristics of FGPP, while contributing to fuel  
12          diversity for customers in the timeframe required. Section III describes how  
13          FGPP, from an environmental perspective, is the best alternative to meet the  
14          fuel diversity need in FPL's system. Section IV describes the existing and  
15          possible future environmental requirements and their potential influence on  
16          future environmental compliance costs of FGPP. In this section, I will  
17          describe how these existing and possible future environmental costs were  
18          included in FPL's analysis.

1           **SECTION I: ENVIRONMENTAL APPROVALS AND REQUIREMENTS**

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**Q.     What are the environmental approvals applicable to FGPP?**

A.     FGPP is required to obtain federal, state and regional environmental approvals and permits. The principal environmental approval is Site Certification under Florida's Power Plant Siting Act (PPSA). This is a comprehensive review of all environmental aspects of FGPP coordinated through the FDEP and involving all state and regional agencies with environmental responsibility and those agencies potentially affected by FGPP. This includes, but is not limited to, the FDEP, Florida Department of Community Affairs, Florida Department of Transportation, Florida Fish and Wildlife Conservation Commission, and the South Florida Water Management District (SFWMD). This comprehensive environmental review evaluates FGPP's environmental controls and determines compliance with applicable environmental standards. This ultimately leads to a comprehensive analysis by agencies and Conditions of Certification that set forth environmental requirements. FGPP will also require federal and federally delegated permits. This includes an approval by the U.S. Army Corp of Engineers for impacts to wetlands, a PSD/Air Construction Permit by the FDEP, and an Underground Injection Control Permit from the FDEP.

1 **Q. Please summarize the major requirements for the environmental**  
2 **approvals of FGPP.**

3 A. The major requirements include (i) minimizing impacts to wetlands and  
4 providing compensatory wetland mitigation; (ii) preventing adverse impacts to  
5 fish and wildlife; (iii) using the lowest quality water and minimizing impacts  
6 to surface and ground waters; (iv) installing Best Available Control  
7 Technology (BACT) from an environmental regulatory perspective; and (v)  
8 demonstrating that the air quality standards are met.

9 **Q. What is BACT?**

10 A. BACT is a technology standard administered by the FDEP pursuant to its PSD  
11 program that establishes an emission rate for all regulated pollutants requiring  
12 review. BACT cannot be any less stringent than any established emission  
13 standard for new facilities and is generally the lowest emission rate that is  
14 technically feasible for the specific type of facility. The FDEP ultimately  
15 establishes BACT based on the information in the PSD/Air Construction  
16 Permit Application and an evaluation of all recent similar projects in the U.S.  
17 For a coal-fired power generation facility, the air emissions controls are  
18 typically the most significant from a cost and environmental perspective.

19 **Q. What is the current status of obtaining environmental approvals?**

20 A. The SCA was submitted on December 22, 2006, and is currently under  
21 review. The permit applications for the PSD/Air Construction Permit,  
22 Underground Injection Control (UIC) Permit, and U.S. Army Corp of



1 Engineers wetlands permit were also submitted to the applicable agencies.  
2 These applications are currently under review.

3 **Q. What are the general timeframes for approvals?**

4 A. The site certification approval process has the longest statutory timeframe and  
5 generally takes about 14 months from submission of the application to  
6 approval by the Governor and Cabinet as the Siting Board. However, the  
7 approval of the site certification as well as individual permits can be  
8 challenged and delay approval. Challenges within the PPSA process or a  
9 challenge to the PSD/Air Construction Permit could delay approval due to  
10 discovery and extended hearings. The amount of time required for challenges  
11 is uncertain but historically has extended potential regulatory approvals by  
12 many months and even years.

13

## 14 SECTION II: FGPP COMPLIANCE PLANS

15

16 **Q. What general features of FGPP serve to meet environmental**  
17 **requirements?**

18 A. The FGPP site was selected at a location that provides the needed  
19 infrastructure for fuel delivery and which also minimizes environmental  
20 impacts. For example, the FGPP site is currently in agriculture that has  
21 previously impacted the environment. The site includes sufficient land area to  
22 provide mitigation for wetlands impacts. Water use effects will be minimized  
23 by using excess stormwater from SFWMD canals and lower-quality water

1 from the Upper Floridan Aquifer. Water will be recycled as much as possible  
2 and released using UIC wells. FGPP will not have industrial water discharges  
3 to surface waters or groundwater that can impact the environment.  
4 Byproducts will be recycled to the greatest extent practicable. Byproducts  
5 that cannot be recycled will be placed in an area designed to have minimal  
6 impacts to the environment. Air emissions from FGPP will be minimized by  
7 use of the USCPC combustion technology selected by FPL and installation of  
8 state-of-the-art air pollution control equipment.

9 **Q. Please explain briefly the technology proposed for FGPP that will**  
10 **minimize air emissions.**

11 A. Minimizing air emissions involves two components. First, the higher energy  
12 efficiency of the USCPC technology reduces the amount of fuel required and,  
13 therefore, reduces the amount of air emissions per unit of energy produced.  
14 FGPP will utilize two USCPC fired steam generators with a heat rate much  
15 lower, meaning much more efficient, than nearly all coal-fired plants in the  
16 U.S. Second, each USCPC unit will be installed with proven air pollution  
17 control technology that, when combined together, will result in emissions that  
18 are among the lowest in the U.S. for similar new facilities and result in among  
19 the very lowest air quality impacts. The technology will include combustion  
20 controls to minimize formation of nitrogen oxides (NO<sub>x</sub>), carbon monoxide  
21 (CO) and volatile organic compounds (VOCs), Selective Catalytic Reduction  
22 (SCR) for further minimizing NO<sub>x</sub> emissions, Fabric Filter to minimize  
23 particulate matter (PM), a wet-limestone Flue Gas Desulfurization (FGD) to

1 minimize emissions of acid gases such as sulfur dioxide (SO<sub>2</sub>), and a wet  
2 Electrostatic Precipitator (ESP) to minimize particulate matter and aerosols.  
3 Together these controls also minimize trace metals air emissions including  
4 mercury. In addition, sorbent injection will be used to further enhance the  
5 removal of mercury in the air pollution control systems. As explained below,  
6 these technologies minimize air emissions to the greatest extent practicable,  
7 which results in minimal environmental impacts.

8 **Q. Based upon your training, experience and analysis, have you concluded**  
9 **whether the environmental controls planned for FGPP meet the**  
10 **requirements of BACT?**

11 A. Yes. I conclude that the environmental controls planned for FGPP meet the  
12 requirements of BACT. The emission rates proposed as BACT in the  
13 application submitted meets all the regulatory requirements of a BACT  
14 analysis as specified by the FDEP. Indeed the emission rates combined with  
15 the heat rate of FGPP are lower than most recently permitted pulverized coal-  
16 fired units in the U.S. Typical BACT emission limits are expressed in pounds  
17 of air pollutant for a normalized amount of heat input or pounds per million  
18 Btu. This measure does not take into account energy efficiency. Since FGPP  
19 will be an ultra super-critical steam generation unit, it is more efficient than  
20 conventional and many new units. Therefore, air emissions when taking into  
21 account energy efficiency will be lower. It should be noted that the FDEP has  
22 jurisdiction to determine that FGPP's environmental controls are BACT.

1 **Q. How do the air emission rates for FGPP compare with recent generation**  
2 **projects in Florida?**

3 A. I prepared Document No. KFK-2 to show a comparison of the emission rates  
4 established for some recent generation projects in Florida with those of FGPP.  
5 The air emissions rates are shown in pounds per net megawatt-hour (MW-hr)  
6 since, as I described previously, energy efficiency is an important criterion in  
7 minimizing air emissions. I have included on this chart an existing IGCC  
8 unit, a recent conventional pulverized coal unit, a recent Department of  
9 Energy (DOE) clean-coal circulating fluidized bed coal-fired unit and a  
10 natural gas-fired combined cycle unit. I included the latter for comparison  
11 since much of FPL's new generation over the last five years has been natural  
12 gas combined cycle. The air emissions presented in Document No. KFK-2 are  
13 the primary regulated air pollutants and include NO<sub>x</sub>, SO<sub>2</sub>, and PM. As shown  
14 in the document, the emissions of FGPP of NO<sub>x</sub> and SO<sub>2</sub>, while not as low as  
15 natural gas combined cycle, will be much lower than recent coal projects. Of  
16 course, adding additional natural gas generation would not result in reducing  
17 the use of natural gas or in diversifying fuel sources for FPL's customers. For  
18 PM, emissions of all technologies provide low air emissions rates with natural  
19 gas combined cycle providing the lowest.

20 **Q. How will the emission rates proposed for FGPP affect air quality?**

21 A. The emissions rates will only minimally affect Florida's air quality. In fact,  
22 the air quality impacts, which are the most important aspect in evaluating air  
23 emissions, will not only meet all applicable requirements, but will not degrade

1 the air. I prepared Document No. KFK-3 to show the maximum impacts of  
2 FGPP with respect to Florida's ambient air quality standards and the PSD  
3 Increments. The ambient air quality standards were established to protect the  
4 general public with an adequate margin of safety, while the PSD Increments  
5 protect the air from degradation. As shown, the maximum impacts are a very  
6 small fraction of the regulatory standards.

7 **Q. How do the emissions of FGPP compare with those of new IGCC units?**

8 A. I prepared two documents. Document No. KFK-4 shows the emission rates of  
9 FGPP compared with the proposed Orlando Utilities Commission's (OUC)  
10 Stanton Unit B IGCC unit. As shown in the chart, the emission rates for  
11 FGPP will be lower for NO<sub>x</sub> and higher for SO<sub>2</sub>. The OUC unit is a nominal  
12 270 MW. Document No. KFK-5 shows a comparison of FGPP with the  
13 nominal 500-MW IGCC Mountaineer project being proposed by American  
14 Electric Power. As shown in this document, the rates for FGPP will be lower  
15 for NO<sub>x</sub> and higher for SO<sub>2</sub>. It should be noted that the emission rates shown  
16 in Document No. KFK-5 are very low, and as I have stated earlier, FGPP will  
17 fully comply with all air quality standards.

18 **Q. Will the emission rates of mercury from FGPP meet or be less than**  
19 **regulatory standards?**

20 A. Yes. The emission rates of mercury from FGPP will be about one-half of the  
21 latest and most stringent mercury emission standard recently established by  
22 the Environmental Protection Agency (EPA). I have prepared Document No.

1 KFK-6, which shows the new EPA standard and the maximum emissions  
2 proposed for FGPP.

3 **Q. Does FPL's environmental compliance plan for FGPP meet, or exceed,**  
4 **the applicable environmental requirements?**

5 A. Yes. FPL's environmental compliance plan for FGPP will meet all applicable  
6 environmental requirements and standards. Indeed, many of the  
7 environmental designs will exceed (in this case I mean be better than), the  
8 requirements and standards.

9 **Q. How does FPL's emission rates compare to other utilities?**

10 A. FPL's overall emission profile is low compared to all other utilities in the US.  
11 In a study conducted by the National Resource Defense Council, FPL  
12 emission rates in lb/MW-hour for SO<sub>2</sub>, NO<sub>x</sub> and CO<sub>2</sub> were found to be one of  
13 the lowest in the country for fossil-fuel fired generation.

14 **Q. Will the emissions of FGPP change FPL's emission profile?**

15 A. No. FPL's emissions profile will not change and will likely be lower when  
16 FGPP begins operation. For example, the NO<sub>x</sub> emissions from FGPP on a  
17 lb/MW-hour basis are four times lower than FPL's already low utility-wide  
18 NO<sub>x</sub> emission rate for fossil generation. In this case, the addition of FGPP  
19 will improve FPL's low emissions profile. In fact, in 2015, FPL's rate of CO<sub>2</sub>  
20 emissions with FGPP would be trending downwards. The average rate of CO<sub>2</sub>  
21 emissions for the period 2015 through 2020 is expected to be 17.4% lower  
22 than the period from 2000 through 2005.

1     **SECTION III: ENVIRONMENTAL CONSIDERATIONS OF ALTERNATIVE**  
2                                     **GENERATION**

3  
4     **Q.     Are you familiar with the environmental aspects of possible generation**  
5             **alternatives that are potentially available to provide FPL’s generation**  
6             **requirements in the 2013 and 2014 timeframe?**

7     A.     Yes. Over the last several years I have been involved in the environmental  
8             licensing of over 5,000 MW of natural gas-fired combined cycle plants. I  
9             have been involved in the environmental feasibility and licensing of IGCC  
10            since 1990. I have considerable experience, starting in the late 1970s, in  
11            licensing conventional pulverized coal-fired facilities.

12    **Q.     How does the design of FGPP compare with the other potential**  
13             **generation alternatives from an environmental perspective?**

14    A.     As I presented in Document No. KFK-2, a natural gas combined cycle plant  
15             would have environmental advantages over other available technologies.  
16             Natural gas is the cleanest combusting fossil fuel and can be efficiently used  
17             in a combined cycle facility. While these facilities can be constructed in a  
18             size to meet FPL’s generation requirements for 2013 through 2014, the  
19             continued use of natural gas does not contribute to fuel diversity in FPL’s  
20             system. The use of conventional pulverized coal-fired technology, while  
21             reliable with proven pollution control technology, is less efficient than the  
22             USCPC technology being proposed for FGPP. FGPP will combine proven,  
23             demonstrated and reliable air pollution control technologies that will minimize

1 environmental impacts with the highly efficient USCPC technology. As I  
2 have shown in Document Nos. KFK-2 and 3, the air emissions will be low and  
3 the environmental impacts will be minimal. The use of IGCC technology, as I  
4 have shown in Document Nos. KFK-4 and 5, does not have distinct  
5 environmental advantages over USCPC technology. Moreover, there are no  
6 existing or planned IGCC units or plants anywhere near the approximately  
7 2,300 MW of generation capacity needed by FPL to serve its customers in the  
8 2012 through 2015 timeframe. For these reasons, FPL's selection of USCPC  
9 technology is the correct one from an environmental perspective, taking into  
10 account the need for reliable production of large amounts of power from a  
11 fuel-diverse generation source beginning in the 2013 through 2014 timeframe.

12 **Q. In your opinion, is FGPP the best available environmental choice to**  
13 **achieve fuel diversity in the 2013 to 2014 timeframe?**

14 A. Yes. My opinion is based on the fact that FGPP will utilize available and  
15 demonstrated generation and environmental control technologies. The  
16 environmental controls have been proven to reduce air emissions resulting in  
17 minimal potential environmental impacts.



1           **SECTION IV: FUTURE ENVIRONMENTAL CONSIDERATIONS**

2

3   **Q.    What additional future environmental requirements will potentially be**  
4           **applicable to FGPP?**

5    A.    The EPA promulgated two major environmental regulations that will be  
6           applicable to FGPP.  These regulations are EPA’s Clean Air Interstate Rule  
7           (CAIR) and the Clean Air Mercury Rule (CAMR).  CAIR establishes state  
8           limits on annual and seasonal emissions on NO<sub>x</sub> and annual emissions of SO<sub>2</sub>.  
9           The limits apply to 25 states, primarily in the eastern U.S., and the District of  
10          Columbia (DC).  The limits were established in two timeframes: NO<sub>x</sub> - 2009  
11          through 2014; 2015 and beyond, and SO<sub>2</sub> – 2010 through 2014; 2015 and  
12          beyond.  EPA’s rule includes a cap-and-trade system that allows affected  
13          facilities to meet the requirements through either the addition of control  
14          technologies or acquisition of allowances through a market based system.  The  
15          cap-and-trade system in EPA’s CAIR regulations is similar to the successful  
16          Acid Rain Program referred to as Title IV that was initially developed through  
17          the 1990 amendments of the Clean Air Act.  In implementing CAIR, the EPA  
18          allowed states to utilize model rules in implementing CAIR or develop  
19          specific regulations to meet the requirements of CAIR.  The FDEP has  
20          adopted the EPA model rule that would allow the use of the national cap-and-  
21          trade system.

1 EPA's CAMR regulations have two components. First, the EPA issued New  
2 Source Performance Standards for the mercury emissions from new sources  
3 like FGPP. As I have shown in Document No. KFK-6, FGPP will have a  
4 mercury emission rate that is about one-half of the new EPA standards.  
5 Second, EPA's CAMR established mercury emission limits on states, and  
6 similar to CAIR, allows for a cap-and-trade program to meet requirements.  
7 The state mercury emission limits start in 2010 and are reduced in 2018.  
8 FDEP has established a hybrid rule that is more stringent than the EPA rule in  
9 the 2010 through 2017 timeframe, and the EPA model rule in 2018. Florida  
10 allows the use of the cap-and-trade program.

11 **Q. How will EPA's CAIR and CAMR regulations influence FGPP?**

12 A. FPL will be required to hold allowances for the actual emissions from FGPP  
13 of NO<sub>x</sub>, SO<sub>2</sub>, and mercury. These allowances would have a potential  
14 economic impact, since allowances must be obtained through a state pool or  
15 the cap-and-trade system.

16 **Q. Did FPL consider the potential economic impacts of CAIR and CAMR?**

17 A. Yes. FPL utilized potential costs based on projections developed through a  
18 comprehensive analysis of multiple factors involving air pollution control  
19 costs, fuel utilization and market factors. These projections, while necessarily  
20 having a range of uncertainty, are based on air pollution control costs and  
21 experience from the Acid Rain Program (Title IV). The control technologies  
22 for NO<sub>x</sub> and SO<sub>2</sub> are well established and their cost can be estimated with  
23 reasonable accuracy. The Acid Rain Program has been operating for a decade

1 and while there have been fluctuations in allowance costs, past projections  
2 have been within the expected range. The cost estimates for mercury were  
3 developed in a similar manner and also considered the fact that some states  
4 will implement CAMR outside the model cap-and-trade system.

5 **Q. Are there any laws regulating CO<sub>2</sub>?**

6 A. No, there are no current rules regulating CO<sub>2</sub>.

7 **Q. Did FPL consider possible CO<sub>2</sub> regulations in the economic analysis of  
8 FGPP? If so, how?**

9 A. Although there are no current laws regulating emissions of CO<sub>2</sub>, FPL  
10 considered the potential future regulation of CO<sub>2</sub> using projections developed  
11 from federal legislative initiatives and the basic framework of the cap-and-  
12 trade system. Over the last several years there have been federal legislative  
13 initiatives that have proposed different forms of CO<sub>2</sub> regulation based on the  
14 cap-and-trade system. These initiatives have included both multi-sector and  
15 electric sector regulation with variable reductions of CO<sub>2</sub> emissions. These  
16 federal legislative initiatives formed the bounds for the potential costs that  
17 may occur in the future.

18 **Q. Please explain the range of compliance costs for the CAIR, CAMR and  
19 potential CO<sub>2</sub> regulations that were included in the economic analysis of  
20 FGPP.**

21 A. I prepared Document No. KFK-7, which shows the allowance costs in  
22 nominal dollars used in the economic analyses for FGPP. The compliance  
23 costs under the cap-and-trade system are based on the cost of allowances,

1 which is multiplied by the amount of allowances required for FGPP for the  
2 specific pollutant. The allowance costs for NO<sub>x</sub>, SO<sub>2</sub>, mercury, and CO<sub>2</sub> are  
3 shown in Document No. KFK-7. The allowance costs were based on  
4 information from ICF International in a report titled “U.S. Emission & Fuel  
5 Markets Outlook, 2006 edition.” The ICF report provides allowance cost  
6 forecasts that are based on integrated modeling of the electric, fuel and  
7 environmental markets in the U.S. Four allowance cost scenarios were used  
8 in the economic analysis of FGPP. These scenarios were: Scenario A –  
9 Allowance Costs for SO<sub>2</sub>, NO<sub>x</sub>, and mercury, referred to as 3P (P in this case  
10 means “Pollutant”); Scenario B – Allowance Costs for SO<sub>2</sub>, NO<sub>x</sub>, and  
11 mercury, with low CO<sub>2</sub> allowance costs, referred to as 4P-mild; Scenario C –  
12 Allowance Costs for SO<sub>2</sub>, NO<sub>x</sub> and mercury, with moderate CO<sub>2</sub> allowance  
13 costs, referred to as 4P-medium; and Scenario D – Allowance Costs for SO<sub>2</sub>,  
14 NO<sub>x</sub>, and mercury, with high CO<sub>2</sub> allowance costs, referred to as 4P-high.  
15 The range of low, medium and high costs of CO<sub>2</sub> allowances that were used  
16 are consistent with current legislative proposals being considered by Congress  
17 and reflect the appropriate range of potential future allowance costs for CO<sub>2</sub>.  
18 The allocations of SO<sub>2</sub>, NO<sub>x</sub>, and mercury allowances were based on the  
19 CAIR and CAMR rules developed by the FDEP. For CO<sub>2</sub> it was assumed that  
20 100 percent of the required allowances would be purchased under a cap-and-  
21 trade system similar to an auction.

1 **Q. In your opinion, are the allowance costs shown in Document No. KFK-7**  
2 **and used in FPL's economic analysis, reasonable and appropriate future**  
3 **environmental compliance costs?**

4 A. Yes. My opinion is based upon my training and experience, and my in-depth  
5 review of FPL's economic analysis. I concluded that FPL considered  
6 reasonable and appropriate environmental costs in the ranges that are  
7 predicted to occur in the future. While there is, of course, considerable  
8 uncertainty on what will actually be required in the future, the environmental  
9 costs utilized were developed using known regulations for limiting NO<sub>x</sub>, SO<sub>2</sub>  
10 and mercury, a range of legislative initiatives that are being considered for the  
11 regulation of CO<sub>2</sub>, environmental control costs that can be estimated with  
12 reasonable accuracy, and market factors established by the cap-and-trade  
13 program.

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

15 A. My testimony provides an overview of the key environmental aspects of  
16 FGPP. My testimony demonstrates that the technologies selected for FGPP  
17 that include USCPC technology and state-of-the-art air pollution control  
18 equipment will meet or exceed the environmental regulatory requirements.  
19 FGPP will have minimal environmental impacts. As a result, FGPP is the best  
20 available alternative to maintain fuel diversity from an environmental  
21 perspective. Future environmental regulations require consideration of  
22 compliance costs. Cap-and-trade regulations required by the EPA have been  
23 adopted by the FDEP for the future regulation of SO<sub>2</sub>, NO<sub>x</sub> and mercury

1 emissions. These regulations will require FPL to hold allowances with  
2 associated costs for these pollutants. Regulation of CO<sub>2</sub> emissions has not  
3 been implemented but is likely in the future. Together, the existing and  
4 potential future environmental regulations have considerable uncertainty for  
5 associated compliance costs. To address this uncertainty, a range of  
6 compliance cost developed from integrated modeling of the electric, fuel and  
7 environmental markets in the U.S. was used in the economic analyses  
8 conducted for FGPP. The compliance costs used in the economic analysis  
9 were an appropriate range of potential costs that reasonably encompasses the  
10 uncertainty in future environmental compliance costs for FGPP.

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

12 **A. Yes.**



## **Kennard F. Kosky, M.S., P.E.**

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- Education** M.S., Environmental Engineering, University of Central Florida, 1976  
B.S.E., Ocean Engineering, Florida Atlantic University, 1970  
Completed coursework (1.5 years) for Ph.D. in Environmental Engineering,  
University of Florida, 1982
- Affiliations** Registered Professional Engineer, State of Florida, No. 14996  
Air and Waste Management Association, National and Florida
- Experience**
- 1996 to Date **Golder Associates** **Gainesville, FL**  
*Principal*  
Principal Engineer, Project Director, and Project Manager for Permitting and Environmental Impact Assessments. Specializes in power plants, industrial facilities, and agricultural activities involving air quality. Provides oversight on permitting and licensing activities including emissions estimates and impact analyses. Provides expert testimony on pollution control quality issues and noise for a variety of electrical power, industrial, and mining activities. Note: KBN merged with Golder Associates in 1996.
- 1985 - 1996 **KBN Engineering and Applied Sciences (KBN)** **Gainesville, FL**  
*President and Principal Engineer*  
Responsible for administration of a 100-person environmental consulting firm generating about \$8 million per year in revenues. Principal Engineer, Project Director, and Project Manager for Permitting and Environmental Impact Assessments for electric power and industrial facilities. Provided expert testimony on pollution control and quality issues for a variety of industrial activities.
- 1980 - 1985 **Environmental Science and Engineering, Inc. (ESE),  
Energy and Power Programs,  
Project Operations Department** **Gainesville, FL**  
*Vice President/Director*  
Directed Power Programs group that included a wide diversity of services to the power industry. Project Manager of the \$3 million Florida Acid Deposition Study. Project Director and Manager for a variety of permitting and licensing projects. Provided expert testimony on a variety of projects.
- 1978 - 1980 **ESE** **Gainesville, FL**  
*Director, Air Science Division*  
Responsible for all corporate air resource activities including stack testing, permitting dispersion modeling, ambient monitoring, noise monitoring, and industrial hygiene. Staff consisted of 25 professionals in three groups: Source Testing, Ambient Monitoring, and Permitting. Project Manager for multidisciplinary power projects.
- 1974 - 1978 **ESE** **Gainesville, FL**  
*Group Leader, Air Quality Management, Air Sciences Division*  
Responsible for staff involved with ambient air monitoring, dispersion modeling, and air permitting. Project Manager for multidisciplinary power projects.

## **Kennard F. Kosky, M.S., P.E.**

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- 1970 - 1974      **Florida Dept. of Pollution Control**      **Tallahassee/Orlando, FL**  
*Air Pollutant Engineer*  
Lead engineer in air operations involved in implementing State Implementation Plan (SIP) and air pollution regulations. Performed air permitting for over 200 facilities. Coauthor of the first Florida SIP including conducting emission inventory, ambient monitoring analysis, regulatory analysis, and regulation development.
- 1970      **Schlumberger Well Services**      **Morgan City, LA**  
*Well Logging Engineer*  
Performed geological logging of exploratory wells for oil and/or gas production in the Gulf of Mexico.



## **Kennard F. Kosky, M.S., P.E.**

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### **PROJECT RELATED EXPERIENCE**

Mr. Kosky has performed over 200 projects focusing on a variety of industrial activities. These projects have involved control technology evaluations, regulatory interpretation, monitoring, permitting, impact analyses, and expert testimony. The following overview and project descriptions are examples of Mr. Kosky's experience.

#### **Major Project Experience**

#### **Multiple Sites**

##### Type of Industrial Activities

Power Plants – 68  
Landfills – 4  
Chemical Plants – 7  
Rubber Manufacturing – 2  
Metal Coil Coating – 3  
Mining – 4  
Pulp & Paper – 7  
Resource Recovery/Incinerator – 9  
Steel Mills – 4  
Printing/Coating – 4  
Food/Agricultural Facilities – 15  
Petroleum Exploration and Refining – 9  
Aerospace – 2  
Fiberglass Boat Manufacturing – 4  
Superfund – 5

##### Type of Projects

Permitting – 92  
Air Pollution Emission Estimates – 67  
Air Impact Analyses – 63  
Air Pollution Control – 75  
Policy and Regulations – 6  
Air Monitoring – 26

#### **Domestic Experience**

#### **Multiple Sites**

Mr. Kosky has directed and performed projects related to his expertise in the following states:

- Southeastern US: Florida, Georgia, South Carolina, North Carolina, Alabama, Mississippi, Tennessee, Kentucky, Louisiana, and Arkansas
- Mid-Atlantic: Maryland, Virginia, West Virginia, District of Columbia, and New Jersey
- Northeast: Connecticut and New York
- Mid-West: Illinois, Indiana, Missouri, and Iowa
- West: Texas, Nevada, California, Montana, Arizona, Alaska, and Hawaii

#### **International Project Experience**

Mr. Kosky has performed a wide variety of international projects—many associated with the Multi-Lateral (e.g., World Bank) and Bi-Lateral (e.g., USAID) organizations. Projects located in the following continents and countries:

- Asia: China, Pakistan, India, Russia, Taiwan, Thailand, and Indonesia
- Africa: Egypt and Mauritius
- Latin America and Caribbean: Guatemala, Honduras, Jamaica, Dominican Republic, Mexico, and Panama
- South America: Brazil and Argentina
- Europe: Italy, Poland, Hungary and Bulgaria, and the Czech Republic
- Middle East: Saudi Arabia

## **Kennard F. Kosky, M.S., P.E.**

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### **PROJECT RELATED EXPERIENCE – DOMESTIC**

#### **FPL Glades Power Park**

##### **Florida Power & Light Company (FPL)**

**Palm Beach County, FL**

Project Manager for the preparation of licensing documents for the two nominal 980-megawatt (MW) ultra supercritical pulverized coal fired units and associated facilities located on a 4,900 acre site in Glades County, Florida. These units are being licensed under Florida's Power Plant Siting Act. Environmental documents prepared include the Site Certification Application (SCA), Federal Aviation Administration (FAA) obstruction to navigation application, U.S. Army Corps of Engineers (USACE) dredge and fill permit application, and air permit application [including prevention of significant deterioration (PSD) application]. The SCA was submitted in December 2006.

#### **Petroleum Coke Co-Firing**

##### **St. Johns River Power Park**

**Jacksonville, FL**

Project Manager and engineer-of-record for the FDEP authorization allowing up to 30 percent petroleum coke to be co-fired with coal. The authorization allowed co-firing with petroleum coke from 20 percent to 30 percent.

#### **West County Energy Center**

##### **Florida Power & Light Company (FPL)**

**Palm Beach County, FL**

Project Manager for the preparation of licensing documents for the 2,450-megawatt (MW) West County Energy Center, Palm Beach County, Florida. This project involved the licensing of two 3-on-1 combined-cycle units using three MHI 501G 250-MW combustion turbines (CTs) with associated heat recovery steam generators (HRSGs), and a 440-MW steam turbine. These units are licensed under Florida's Power Plant Siting Act. Environmental documents prepared include the Site Certification Application (SCA), Federal Aviation Administration (FAA) obstruction to navigation application, U.S. Army Corps of Engineers (USACE) dredge and fill permit application, and air permit application [including prevention of significant deterioration (PSD) application]. Full Governor/Cabinet approval was obtained in December 2006.

#### **Application for Certificate of Public Convenience and Necessity,**

##### **Brandon Shores Units 4 and 5,**

##### **Constellation Power Source**

**Ann Arundel County, MD**

Project Manager for the preparation of the Certificate of Public Convenience and Necessity (CPCN) Application for installation of air pollution control systems and associated facilities on the two nominal 670 MW Brandon Shores Units 1 and 2. This project involves the installation of fuel gas desulfurization (FGD) systems, fabric filters, new dual flue stack, and material handling facilities for coal, limestone and FGD byproducts. These units are licensed under Maryland's Public Service Commission (PSC). Environmental documents prepared include the CPCN and air permit application (including PSD application).

#### **Site Certification Application and Licensing For Seminole Generating Station Unit 3**

##### **Seminole Electric Cooperative**

**Putnam County, FL**

Technical direction and review for the Site Certification Application and Air Construction/PSD Permit Application for SGS Unit 3, a nominal 750 MW (net) supercritical pulverized coal-fired unit. Provided expert testimony for the local land use hearing and prepared expert testimony for the Site Certification Hearing.

## **Kennard F. Kosky, M.S., P.E.**

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### **Kenai Blue Sky Coal Gasification Project Environmental Permitting Feasibility Analysis for Coal-Gasification and Pulverized Coal-Fired Power Plant**

**Agrium U.S., Inc.**

**Kenai, AK**

Project Manager for the preparation of environmental permitting feasibility of coal-gasification and 400-200 MW pulverized coal fired power plant to be located at an existing ammonia/urea production facility. The project would involve the installation of coal gasification to product hydrogen and carbon dioxide as feedstock for the ammonia/urea production facilities. The coal-fired power plant would supply steam and energy for the gasification process and ammonia/urea production facilities, as well as supplying some power to the local grid. The coal gasification process and power plant would utilize Alaskan sub-bituminous coal.

### **Southwest St. Lucie Power Project**

**Florida Power & Light Company (FPL)**

**St. Lucie County, FL**

Project Manager for the preparation of licensing documents for the 1,700-megawatt (MW) Southwest St. Lucie Power Project to be located in St. Lucie County, Florida. The project involved two nominal 850 MW supercritical pulverized coal fired units and associated facilities. Portions of the SCA was completed but not submitted.

### **Application for Certificate of Public Convenience and Necessity,**

**Crane Generating Station, Constellation Power Source**

**Baltimore County, MD**

Project Manager for the preparation of the Certificate of Public Convenience and Necessity (CPCN) Application for installation of coal barge unloading facility for the Crane Generating Station. This project involved the refurbishment of an existing oil unloading dock and coal handling equipment. These units are licensed under Maryland's Public Service Commission (PSC). Environmental documents prepared include the CPCN and air permit application.

### **Site Certification Application and Licensing of the**

**Turkey Point Expansion Project for**

**Florida Power & Light Company (FPL)**

**Miami-Dade County, FL**

Project Manager for the preparation of licensing documents for the 1,150-megawatt (MW) Turkey Point Expansion Project, Miami-Dade County, Florida. This project involved the licensing of 4-on-1 combined-cycle units using four GE Frame 7FA 170-MW combustion turbines (CTs) with associated heat recovery steam generators (HRSGs), and a 440-MW steam turbine. These units are licensed under Florida's Power Plant Siting Act. Environmental documents prepared include the Site Certification Application (SCA), Federal Aviation Administration (FAA) obstruction to navigation application, U.S. Army Corps of Engineers (USACE) dredge and fill permit application, and air permit application [including prevention of significant deterioration (PSD) application]. Full Governor/Cabinet approval was obtained in February 2005.

### **Burner Replacement for Gerdau-Ameristeel**

**Baldwin, FL**

Obtained a non-PSD determination from the Florida Department of Environmental Protection (FDEP) for a burner replacement project associated with an electric arc furnace. Project involved site visit, technical support, and discussions with FDEP.

## **Kennard F. Kosky, M.S., P.E.**

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### **Petroleum Coke Co-Firing at the Cedar Bay Cogeneration Project**

**Jacksonville, FL**

Project Manager and engineer-of-record for the FDEP authorization allowing up to 35 percent petroleum coke to be co-fired with coal. The Cedar Bay facility consists of three 75-MW circulating fluidized bed (CFB) boilers fired with coal and located in Jacksonville, Florida. The authorization allowed co-firing with petroleum coke.

### **Hines Energy Center Power Block 3 for Progress Energy (formerly Florida Power Corporation)**

**Polk County, FL**

Project Manager and engineer-of-record for the air construction and PSD permit application for a 530-MW combined-cycle power project located in Polk County, Florida. Directed preparation of SCA sections related to air emission, best available control technology (BACT), air impacts, and noise impacts. Testified on all air quality and noise aspects at the SCA Hearing.

### **Air Construction Permits for Tropicana Products, Inc.**

**Bradenton, FL**

Project Manager and engineer-of-record for various projects at Tropicana's Bradenton Citrus Processing Plant. The projects involved replacing the GE LM5000 aero-derivative gas turbine with the larger GE LM6000 turbine, like-kind replacement of the duct burner system on the cogeneration facility, and the installation of a stand-by boiler.

### **Air Construction Permit for Hydro Aluminum of North America St. Augustine, FL**

Project Manager for the preparation of two air construction permits for secondary aluminum foundry. Project involved physical changes to the melting furnace and increasing production limits. Project was able to net out of PSD review.

### **Site Certification Application and Licensing of Expansion Projects for**

**Florida Power & Light Company**

**Martin and Manatee Counties, FL**

Project Manager of the preparation of licensing documents for two 1,150-MW Expansion Projects. These projects involved the licensing of 4-on-1 combined-cycle units using four GE Frame 7FA 170-MW CTs with associated HRSGs, and a 440-MW steam turbine. These units were licensed under Florida's Power Plant Siting Act. Environmental documents prepared include the SCA, FAA obstruction to navigation application, and air permit application (including PSD application).

### **Application for Certificate of Public Convenience and Necessity,**

**Dickerson Units 4 and 5, Mirant Corporation**

**Montgomery County, MD**

Project Manager for the preparation of the Certificate of Public Convenience and Necessity (CPCN) Application for the 1,100-MW Units 4 and 5 Project. This project involved the licensing of two 2-on-1 combined-cycle units using two existing GE Frame 7F 160-MW CTs and adding two GE Frame 7FA 170 MW CTs, four associated HRSGs, and two 220-MW steam turbines. These units are licensed under Maryland's Public Service Commission (PSC). Environmental documents prepared include the CPCN, FAA obstruction to navigation application, USACE dredge and fill permit application, and air permit application (including PSD application).

## **Kennard F. Kosky, M.S., P.E.**

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**Application for Certificate of Public Convenience and Necessity,  
Chalk Point Units CT7 through CT10, Mirant Corporation Charles County, MD**  
Project Manager of the preparation of the CPCN Application for the 320-MW CT Project. This project involved the licensing of four GE Frame 7EA 80-MW simple-cycle units. These units are licensed under Maryland's PSC. Environmental documents prepared include the CPCN, FAA obstruction to navigation application, and air permit application (including PSD application).

**Greenhouse Gas Life-Cycle Analysis for  
Bitor America Corporation Boca Raton, FL**  
Project Manager for the preparation of a life-cycle analysis of greenhouse gas (GHG) emissions from various fossil fuels and technologies. The life-cycle analysis compared GHG emissions from the use of coal, natural gas, LNG, oil, and Orimulsion. The technologies evaluated included conventional steam generation, Integrated Gasification Combined-Cycle (IGCC), and combined-cycle.

**Odor Evaluations for Sea Ray Boats, Inc. Palm Coast, FL**  
Project Manager for the evaluation of odor impacts from styrene emissions associated with an existing fiberglass boat manufacturing facility in Flagler County, Florida. Project involved meteorological monitoring, styrene monitoring using SUMA canisters, air dispersion modeling and conceptual design of exhaust stack. Involved in negotiations with regulatory agency on consent order requirements and made public presentations to citizens group.

**Odor Evaluations for Sea Ray Boats, Inc. Merritt Island, FL**  
Project Manager for the evaluation of odor impacts from styrene emissions associated with three co-located fiberglass boat manufacturing plants located in Brevard County, Florida. Project involved air dispersion modeling and conceptual design of exhaust stacks for two facilities. Involved in negotiations with regulatory agency and made public presentations to citizens group.

**Lone Oak Energy Center for Calpine Eastern Corporation Lowndes County, MS**  
Project engineer for the air construction and PSD permit application for an 800-MW combined-cycle power project.

**Calhoun County Peaker Project for FPL Energy Calhoun County, AL**  
Project Manager for the air construction and PSD permit applications and environmental permits for a 680-MW simple-cycle power project.

**Hillabee Energy Center for Calpine Eastern Corporation Tallapoosa County, AL**  
Project engineer for the air construction and PSD permit applications for a 700-MW combined-cycle power project.

**Auburndale Peaker Project for Calpine Eastern Corporation Polk County, FL**  
Project Manager and engineer-of-record for the air construction and PSD permit applications for a 130-MW simple-cycle power project.

**Hines Energy Center Power Block 2 for  
Florida Power Corporation Polk County, FL**  
Project Manager and engineer-of-record for the air construction and PSD permit applications for a 530-MW combined-cycle power project.

## **Kennard F. Kosky, M.S., P.E.**

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**Osprey Energy Center for Calpine Eastern Corporation** **Polk County, FL**  
Project Manager and engineer-of-record for the air construction and PSD permit applications for a 530-MW combined-cycle power project. Provided technical oversight for the preparation of the SCA.

**Simple-Cycle Power Projects for Florida Power & Light Company** **Martin and Ft. Myers, FL**  
Project Manager and engineer-of-record for the air construction and PSD permit applications for two 170-MW simple-cycle units located at the existing FPL Martin and Ft. Myers Power Plant sites. Each project also required an evaluation of the noise impacts. The project at the Martin Plant required a modification of the SCA.

**Shady Hills Generating Station for IPS Avon Park Corporation and El Paso Energy** **Hardee County, FL**  
Project Manager and engineer-of-record for the air construction and PSD permit applications for a 510-MW simple-cycle power project.

**Odor and Air Quality Consulting for the Viera Company** **Brevard County, FL**  
Lead technical consultant in providing oversight on the air permitting of a waste scrap shredder. Project involved specifying procedures and reviewing results of source tests and impact analyses.

**Installation of Citrus Fruit Extractors for Tropicana Products, Inc.** **Ft. Pierce, FL**  
Project manager and engineer-of-record for the air construction and PSD permit applications for the addition of fruit extractors at the Tropicana Plant. Detailed air dispersion modeling was required.

**DeSoto Power Project for IPS Avon Park Corporation and Entergy Power Group** **DeSoto County, FL**  
Project Manager and engineer-of-record for the air construction and PSD permit applications for a 680-MW simple-cycle power project.

**Air Construction Permit Preparation and Review for Solutia, Inc.** **Pensacola, FL**  
Preparation of air construction permits for various process additions to the Solutia nylon production plant. This included new adipic acid production intermediates. Assisted Solutia in the review and comments to FDEP on the Title V permit application. Prepared an air permit application for an inlet fogging system for Solutia's cogeneration facility.

**Sea Ray Boats, Inc., Cape Canaveral Plant** **Brevard County, FL**  
Project Manager for a BACT evaluation and air modeling impact analysis for a new fiberglass boat manufacturing facility. Project involved negotiations with regulatory agency on permit conditions.

**Heard County Power Project for Dynergy, Inc.** **Hardee County, FL**  
Project engineer for the air construction and PSD permit applications for a 510-MW simple-cycle power project.

**Fogger Installation at Combustion Turbine Sites** **Jacksonville, FL**  
Project Manager for the preparation of air permit applications for the installation of inlet cooling "foggers" on simple-cycle CTs at Jacksonville Electric Authority's (JEA) Northside and Kennedy Plant sites. Project involved developing strategy for "netting out" of PSD.

## **Kennard F. Kosky, M.S., P.E.**

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### **Palmetto Power Project for Dynegy, Inc.**

**Hardee County, FL**

Project Director and engineer-of-record for the air construction and PSD permit applications for a 510-MW simple-cycle power project.

### **Vandolah Power Project for IPS Avon Park**

#### **Corporation and El Paso Energy**

**Hardee County, FL**

Project Manager and engineer-of-record for the air construction and PSD permit applications for a 680-MW simple-cycle power project.

### **Fogger Installation at Combustion Turbine Sites for**

#### **Florida Power & Light Company**

**Multiple Sites, FL**

Project Manager for the preparation of air permit applications for the installation of inlet cooling "foggers" at the Ft. Myers, Putnam, and Martin Plant sites. Project involved developing strategy for "netting out" of PSD.

### **Independent Power Projects for Tenaska, Inc.**

**Multiple Sites**

Project Director and engineer-of-record for the preparation of PSD and air permit applications the following projects: Heard County, Georgia – 850-MW simple-cycle; Autauga County, Alabama, Two Projects – an 800-MW combined-cycle and an 8870-MW combined-cycle project located on adjacent sites; Lakefield, Minnesota – 480-MW simple-cycle (BACT); Coosa County, Alabama Project – 540-MW simple-cycle project.

### **Oleander Power Project for Constellation Energy**

**Brevard County, FL**

Project Manager for the preparation of PSD and Air Permit Applications for the Oleander Power Project. Project consisted of 5 General Electric Frame 7FA simple-cycle CTs (nominal 850 MW). Project involved providing expert testimony.

### **Repowering Project for Florida Power & Light Company**

**Sanford, FL**

Project Manager for the preparation of air permit applications for conversion of two existing steam electric units (Units 4 and 5) at the FPL Sanford Plant to combined cycle using 8 General Electric Frame 7FA CTs. The repowering would produce a nominal 2,200 MW of gas-fired combined-cycle generation. The project involved the preparation of the PSD and Air Permit Applications, noise evaluation, and FAA Notifications.

### **Generation Project for Thermal EcoTek, Corporation**

**Lake Worth, FL**

Project Manager for the preparation of the PSD and Air Permit Applications for the Lake Worth Generation Project. Project consisted of the repowering of 2 existing steam units with a nominal capacity of 74 MW using a General Electric Frame 7FA CT (170 MW).

### **Repowering Project Licensing for Florida Power & Light Company Ft. Myers, FL**

Project Manager for environmental licensing documents for the conversion of the existing steam electric units (Units 1 and 2) at the FPL Ft. Myers Plant to combined cycle using 6 General Electric Frame 7FA CTs. The repowering would produce a nominal 1,500 MW of gas-fired combined-cycle generation. The project involved the preparation of the PSD and Air Permit Applications, Environmental Resource Permit (ERP) Application, Wastewater Discharge Permit Application (i.e., the SPDES), FAA Notifications, and county applications.

## **Kennard F. Kosky, M.S., P.E.**

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**Lakeland Electric (City of Lakeland) McIntosh Unit 5** **Lakeland, FL**  
Project Manager for the preparation of the PSD and air permit applications for the McIntosh Unit 5 simple-cycle project. Included preparation of the Modification Request to Site Certification for McIntosh Unit 3. Project consisted of the first Westinghouse 501G CT with a nominal capacity of 250 MW.

**Title V Permit Applications for Eagle-Picher Corporation** **Multiple Sites**  
Project Director for the preparation of Title V Permit applications or Federally Enforceable Synthetic Minor Operating Permit applications for 9 facilities in 6 states. The facilities include activities associated with metal coil coating, rubber part manufacturing, and printing. The states where the facilities are located include Connecticut, Florida, Michigan, New Jersey, Pennsylvania, and New York.

**Odor and Noise Monitoring for North and South Broward Resource Recovery Facilities** **Broward County, FL**  
Project director for noise and odor studies at two large municipal waste combustors. The studies were based on ASTM methods to demonstrate conformance with requirements of regulatory approvals.

**Destin Dome Natural Gas Development Project for Chevron U.S.A. Production Company** **Pensacola, FL**  
Project Manager for the OCS air permit application submitted to the U.S. Environmental Protection Agency (EPA) to develop the natural gas reserves in a 33-square-mile area offshore of Pensacola. The projects involved preparation of permit applications including emission estimates of well drilling and production facilities. Air emission sources included two drilling rigs, one central production facility, and 16 satellite production facilities. The project included PSD evaluations to determine BACT and air impact analysis using the OCD air dispersion model.

**Title V Permit Applications for Potomac Electric Power Company** **Multiple Sites**  
Project Manager for the preparation of Title V Permit applications or Federally Enforceable Synthetic Minor Operating (FESOP) Permit applications for 7 facilities in 2 states and 1 jurisdiction. The Title V facilities consist of 6 power plants with coal and oil fossil fuel-fired steam generating units, CTs, and diesel units. The FESOP is for a service facility. The facilities are located in Maryland (3 plants and the service facility), Virginia (1 plant) and the District of Columbia (2 plants).

**Air Permitting for Destin Dome Blocks 57 and 96, Chevron U.S.A. Production Company Outer Continental Shelf** **Pensacola, FL**  
Project Manager for the Outer Continental Shelf (OCS) air permits issued by the EPA to conduct well drilling within the U.S. boundary, offshore of Florida. The projects involved preparation of permit applications including emission estimates of well drilling activities. The applications were the first in the Eastern U.S. under 40 Code of Federal Regulation (CFR), Part 55. These regulations were promulgated as a result of the 1990 Amendments of the Clean Air Act (CAA) Amendments. Presented information on the emissions and impacts of the activity at an EPA sponsored public hearing.

**Kaiser Aluminum-Gramercy and Baton Rouge Cogeneration Plants** **Baton Rouge, LA**  
Project Manager for obtaining air permits on two cogeneration facilities. The facilities were required to obtain PSD approval and meet NSPS requirements.



## **Kennard F. Kosky, M.S., P.E.**

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**PSD Approval for Cogeneration Facility at Borden Chemical      Baton Rouge, LA**  
Project Director for an 80-MW cogeneration facility constructed for Borden Chemical. The project involved obtaining PSD approval from the state agency.

**Site Certification Application for Orimulsion Conversion      Manatee County, FL**  
Project Director for the licensing of Orimulsion firing at FPL's Manatee Power Plant. The plant consists of two nominal 800-MW units. Technical activities focused on the preparation of BACT evaluation and air pollution control aspects of the project.

**Petroleum Coke and Title V Application for  
City of Lakeland Department of Electric and Water Utilities      Lakeland, FL**  
Project Manager and engineer-of-record for providing technical assistance to obtain approval for co-firing petroleum coke (20 percent) and coal (80 percent) at McIntosh Power Plant, Unit 3. McIntosh Unit 3 is a 364-MW coal-fired facility. Project Manager and engineer-of-record for preparation of Title V applications.

**Coal and Petroleum Coke Co-firing Permit for  
St. Johns River Power Plant      St. Johns County, FL**  
Project Manager and engineer-of-record for obtaining approval from the regulatory agencies to co-fire up to 20 percent of petroleum coke by weight with coal in two nominal 700-MW units. Permit application and supporting material prepared. Performed emissions estimates and impact analyses of potentially toxic air emissions (metals). Provided support and presentations to local chapter of Sierra Club who intervened in the permit proceeding. Performed post-test analyses to demonstrate compliance with settlement agreement.

**Title V Economic Evaluation for  
Florida Electric Power Coordinating Group      Tampa, FL**  
Performed an economic evaluation for Florida Electric Power Coordinating Group (FCG) on the cost to prepare Title V permits as initially proposed by FDEP and presented the results of the evaluation at the FDEP Title V Workshop. The presentation assisted in modifying the FDEP requirements to more closely follow EPA requirements.

**Electric Utility Regulatory Requirements for  
Florida Electric Power Coordinating Group      Tampa, FL**  
Lead the effort to prepare a comprehensive list of regulatory requirements specific for the electric utility industry. The list, which includes all applicable and non-applicable requirements, forms the basis for compliance statements required of the responsible official.

**Title V Permit Recommendations for  
Florida Electric Power Coordinating Group      Tampa, FL**  
Providing recommendations for preparation of Title V permits for the FCG. This includes interfacing with FDEP and providing comments on insignificant activities and application form submittal. Also provided FDEP comments on data input requirements and suggestions that will make the application form easier to develop.

## **Kennard F. Kosky, M.S., P.E.**

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### **Florida Power Corporation Title V Applications**

### **Multiple Sites**

Project Director and engineer-of-record for Title V applications for 11 facilities. The facilities include coal-, oil-, and gas-fired fossil fuel steam generator units, simple-cycle CT units, combined-cycle unit, and diesel generators. Project involved regulatory requirements, emissions inventories, trivial activity lists and application preparation.

### **Title V Permits for Florida Power & Light Company Facilities**

### **Multiple Sites**

Assisting FPL in the preparation of Title V permit applications for all facilities. This includes 11 power plants and several minor facilities. Engineer-of-record for the applications, and responsible for overseeing the applications' preparation. Also providing input on regulatory requirements and emissions. Currently, one permit application has been completed in draft form.

### **Title V Permit Implementation Plan for Tennessee Valley Authority**

### **Multiple Sites**

Assisted Tennessee Valley Authority (TVA) in developing a comprehensive list of applicable requirements in three states (Tennessee, Kentucky, and Alabama) for 10 facilities. Also performed site visits for four major plants (7,550-MW coal-fired with CTs) to develop a list of major sources and insignificant activities. The result was a comprehensive Title V plan, which is currently being implemented by TVA. Performed reviews of Title V applications for three power facilities.

### **Gulf Power Company Title V Applications**

### **Multiple Sites**

Project Manager and engineer-of-record for Title V applications for three coal-fired facilities. Performed site visits for each facility and developed listing of regulatory requirements.

### **Title V Database for Various Clients**

### **Multiple Sites**

Developed a Title V database built around the FDEP Title V permit application form. The database is designed to manage the data and print out a form identical to the FDEP form. The database will provide a format suitable for electronic submittal to FDEP.

### **Emissions Inventory and Title V Applications for**

### **Potomac Electric Power Company (PEPCO)**

### **Multiple Sites in Maryland**

Project Manager for the development of a comprehensive emissions inventory and preparation of Title V applications for all of PEPCO facilities. This includes 6 power plants (4 coal-fired plants, 1 oil/gas plant, and 1 CT plant) located in three regulatory jurisdictions. The inventory will involve the development of an emission inventory management system that will manage the data.

### **Site Certification Application at Hardee Power Station,**

### **Seminole Electric Cooperative Incorporated**

### **Hardee County, FL**

Project Director for SCA and environmental assessment (EA) for a 660-MW combined-cycle electric-generating plant. Responsible for the technical, budgetary, and scheduling aspects of the project. The permitting documents prepared were designed to fulfill requirements of the PSC and the U.S. Department of Agriculture (USDA) Rural Electrification Administration (REA). Provided expert testimony for the project.

## **Kennard F. Kosky, M.S., P.E.**

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**Transmission Line Corridor Siting at Hardee Power Station for Seminole Electric Cooperative Incorporated Hardee County, FL**  
Project Director for siting and licensing of three 230-kilovolt (kV) transmission lines (total of 78 miles) to connect the Hardee Power Station to the Florida transmission grid. Siting of the transmission line corridors was accomplished using the PC ARC/INFO® geographic information system (GIS). Developed all required information and impact analyses for the Florida SCA to be presented to the Florida Department of Environmental Regulation (FDER) and PSC.

**Site Certification Application and Licensing of the Lauderdale Repowering Project for Florida Power & Light Company Ft. Lauderdale, FL**  
Project Manager for the preparation of licensing documents for the Lauderdale Repowering Project, Broward County, Florida. This project involved replacing two existing steam generators with advanced CTs and HRSGs. The repowered units were designed to have a capacity of approximately 960 MW, approximately 640 MW resulting from the addition of the advanced CTs. Environmental documents prepared include the SCA, National Pollutant Discharge Elimination System (NPDES) application, FAA obstruction to navigation application, USACE dredge and fill permit application, and air permit application (including PSD application).

**Test Burn of Orimulsion Fuel for Florida Power & Light Company Sanford, FL**  
Project Manager for a test burn to discover if Orimulsion fuel had the potential to displace No. 6 fuel oil in steam electric power plants at Sanford Unit 4. Project provided the opportunity to evaluate the technical and operational features associated with burning Orimulsion fuel under utility operating conditions.

**Air Construction Permit Application for TransPac, Inc. Santa Rosa County, FL**  
Project Manager for project requiring permit to construct an air pollutant source. Developed report supplementing the application to construct a minor-source waste storage and treatment facility. The objective of this report was to evaluate the impact of the facility based on a comparison of the proposed facility's impacts to the FDER's proposed toxic air pollutant guidelines.

**Air Quality Impacts of Siting 1,050-MW CTs for Florida Power Corporation Multiple Sites**  
Project Manager of air quality impact analyses performed to evaluate locating CTs at six potential sites in Florida: Intercession City, DeBary, Avon Park, Turner, Bartow, and Anclote. The analyses were undertaken to determine compliance with ambient air quality standards (AAQS) and PSD increments for the maximum proposed plant size (i.e., 1,050 MW).

**Particulate Matter Air Quality Assessment of Helper Cooling Towers for Florida Power Corporation Citrus, FL**  
Project Manager of project to determine the impacts of the proposed cooling towers on ambient particulate matter (PM) levels, considering all PM emissions associated with the CT units, cooling towers, helper cooling towers, and coal- and ash-handlers already existing onsite. Impacts were addressed in regard to allowable PSD increments for PM [as total suspended PM, i.e., PM(TSP)] and AAQS for PM [as particulate with an aerodynamic diameter less than 10 micrometers ( $\mu\text{m}$ ), i.e.,  $\text{PM}_{10}$ ].

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### **Site Evaluation of 1,000-MW CT Project for Florida Power Corporation**

#### **Multiple Sites in FL**

Project Manager responsible for evaluating the availability of water-supply sources, raw water treatment requirements, and wastewater disposal options at six facilities for the 1,000-MW CT siting project. Water supply sources were evaluated to determine their feasibility for use and included existing permitted groundwater and surface water withdrawals, new groundwater sources, new surface water withdrawals, and secondary effluent from nearby municipal wastewater treatment facilities.

### **CT Site Evaluation and Chalk Point Environmental Assessment for Potomac Electric Power Company**

#### **Chalk Point, MD**

Project Manager of project to provide alternative site and environmental information required under the Maryland PSC rules for receiving a CPCN for a new generation facility. The two primary objectives of the report were to identify and evaluate suitable sites for accommodating approximately four CTs and to evaluate the environmental baseline information and potential impacts of locating the CTs at the preferred site.

### **Gator Power Cogeneration Facility PSD Review for Florida Power Corporation**

#### **Gainesville, FL**

Project Manager for PSD review for a cogeneration facility consisting of a CT and HRSG. The report addressed the new source review (NSR) requirements contained in air quality regulations on both the state and federal levels.

### **Fog Visibility Study for Parsons, Brinkerhoff, Quade, and Douglas, Inc.**

#### **Charleston, SC**

Project Manager responsible for study designed to obtain meteorological and fog/visibility data on the I-526 Cooper River Crossing in North Charleston. Objectives of the program were to document the frequency and duration of fog and the meteorological conditions during which it occurs; to identify and differentiate the fog plume created by the cooling towers from that of other sources; and to correlate the data collected with data observed at the National Weather Service (NWS) station in Charleston.

### **Site-Specific Environmental Evaluation for Potomac Electric Power Company**

#### **Multiple Sites in Maryland**

Project Manager responsible for presenting the methodology and results of a site-specific environmental evaluation. The objective of the site environmental evaluation was to determine the environmental suitability of CT units with projected early 1990s in-service dates. The candidate site environmental evaluation consisted of analyzing candidate sites based on six environmental factors.

### **PSD Permit Application for Environmental Incineration Systems, Inc.**

#### **Duval County, FL**

Project Manager of permitting activities for proposed municipal solid waste recycling/volume reduction facility. The facility was designed to reduce the amount of solid waste input to landfills in Duval County by up to 175,200 tons per year (TPY). The proposed facility was classified as a "major" source under federal and state air pollution control regulations and was subject to the PSD provisions of the regulations.

## **Kennard F. Kosky, M.S., P.E.**

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### **PSD Permit Application for Cogeneration Project for Tropicana Products, Inc.**

**Bradenton, FL**

Project Manager responsible for permitting a cogeneration facility consisting of a CT, a HRSG, and an associated auxiliary steam generator. The report addressed the NSR requirements contained in the state and federal regulations.

### **Crystal River PSD Analysis for Florida Power Corporation**

**Crystal River, FL**

Project Manager of air dispersion modeling analyses performed to determine the TSP impacts of PM emissions from the cooling towers at FPC's Crystal River facility. A modeling protocol was prepared by KBN and reviewed and commented upon by the EPA.

### **EMSoft II®, Permit Manager for Manatee County Public Health Unit**

**Manatee County, FL**

Designed and developed the EMSOFT II®, a software package for micro-computers designed to assist end users in managing environmental permits and requirements through a relational database capable of generating a series of specific reports.

### **Agrico Chemical Company Mine**

**Hillsborough County, FL**

Project Manager for the EA for a phosphate mine located in eastern Hillsborough County, Florida. The project involved the development of baseline conditions including monitoring of air, water, and ecological conditions. Impact analyses involving various environmental disciplines were conducted using approved regulatory techniques.

## **Kennard F. Kosky, M.S., P.E.**

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### **PROJECT RELATED EXPERIENCE – INTERNATIONAL**

#### **Best Available Control Technology Assessment and Toxic Air Emission Evaluation for Coleson Cove Refurbishment Project, New Brunswick Power Corporation**

**New Brunswick, Canada**

Senior consulting engineer for developing a best available control technology (BACT) assessment and toxic air emission inventory for the conversion of the 1,050-MW Coleson Cove plant from residual oil to Orimulsion. Project involved a detailed assessment of control equipment for sulfur dioxide (SO<sub>2</sub>), PM, nitrogen oxides (NO<sub>x</sub>) and sulfuric acid mist (SAM). Develop a toxic air emissions inventory. Provided presentations at multi-agency meetings and public hearings.

#### **Combined-Cycle Projects for Southern Energy, Inc.**

**Multiple Sites in Italy**

Provided technical review and assistance for two 370-MW combined-cycle projects to be located in east central Italy. Reviewed the designs and impact methodologies to provide senior oversight of projects.

#### **Environmental Due Diligence**

**Campeche, Mexico**

Project Director for the environmental due diligence for the Cantarell Nitrogen Project located near Campeche, Mexico. Project is the largest nitrogen plant in the world with an associated 400-MW power complex to provide power for the nitrogen plant. Review licensing reports and documents for conformance with Mexican regulations and “world norms”. Review being conducted for international financial institutions.

#### **Environmental Benchmarking of Power Facilities, Worldwide, Confidential Client**

**Multiple Sites**

Project Manager assisting an international energy company in the evaluation of their environmental conformance with international accepted norms of all of their facilities worldwide. This involved evaluating over 10,000 MWs at approximately 12 different power facilities including hydro. These plants were located in Asia, South America, North America, and Europe. Evaluation was to assist with the development of an environmental management system for all of the company’s facilities.

#### **Shanghai Municipal Electric Power Company**

##### **Waigaoqiao Environmental Assessment**

**Shanghai, China**

Project Manager for World Bank EA of the addition of two 1,000-MW coal-fired super-critical units to the Waigaoqiao Power Plant site. This was referred to as Phase II, while Phase I, the existing plant, consists of four 300-MW units. The EA also considered the addition of a Phase III which would be identical to Phase II (i.e., another two 1,000-MW units). The EA was prepared to meet World Bank guidelines and involved developing information and performing analyses for Phases I, II, and III.

#### **Baley Gold Mine Project**

**Western Russia**

Task Manager for the environmental assessments relating to the potential air and noise impacts from a gold mine project located in Eastern Russia. The task involved developing emissions and impact estimates for mining 25 million tonnes of material from an open pit mine. Impacts were determined using EPA dispersion models. Noise impacts from mine activities were determined using the NOISECALC model.

## **Kennard F. Kosky, M.S., P.E.**

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### **Nickel and Cobalt Mine Project**

**Cupey, Cuba**

Working through Golder's Mississauga Office provided air impact analyses for a nickel and cobalt mine located in Cupey, Cuba. The major emissions from the project were from the ore processing, which contained PM and SO<sub>2</sub>. The EPA dispersion model ISC3ST was used to estimate impacts using a 1-year meteorological data base. Impacts were compared to the World Bank ambient guidelines.

### **Ambient Air Monitoring Laboratories and Training Program for the Electricity Generating Authority of Thailand**

**Bangkok, Thailand**

Project Director responsible for designing and constructing two mobile laboratories as well as providing air quality and meteorological equipment. Equipment will be installed in specialty-designed cubicles, and mounted on a Nino truck chassis. The intensive training program will consist of 2 months training in the United States for three EGAT engineers.

### **Air Resources Studies, Mae Moh Power Plant and Lignite**

**Mine for the Electric Generating Authority of Thailand Mae Moh Valley, Thailand**

General Consultant for Air Quality/Project Manager managing activities within an environmental program for proposed plant and mine development in Mae Moh Valley, Northern Thailand.

### **Environmental Licensing Studies for the Electricity Generating Authority of Thailand**

**Bangkok, Thailand**

Air Resources, Subproject Manager, responsible for studies of coal-fired power plant. Managed air resources investigations as part of overall environmental studies of proposed coal-fired power plant to be located on the Gulf of Thailand, 70 kilometers (km) southeast of Bangkok.

### **Ambient Monitoring Network for the Electricity Generating Authority of Thailand**

**Gulf of Thailand**

Project Director/Air Resources, Subproject Manager, performing environmental licensing studies for a 2400-MW, coal-fired plant.

### **Environmental Assessment of Gas Turbine Electrical Generating Facility, World Bank**

**Hunts Bay, Jamaica**

Air Engineer responsible for developing mitigation and monitoring measures based on the results of air modeling to reduce the impacts from SO<sub>2</sub> and NO<sub>x</sub> in the Hunts Bay area.

### **Development of Air Quality Standards for the Government of Mauritius for the World Bank**

**Mauritius**

Project Manager tasked with assisting the government of Mauritius in developing air quality standards and designing appropriate monitoring programs required for regulatory enforcement.

### **Environmental Assessment for 60-MW Diesel-Powered Facility**

**Rockfort, Jamaica**

Air Engineer responsible for developing mitigation and monitoring measures based on the results of air modeling to reduce the impacts from sulfur dioxide and nitrogen oxides in the Rockfort project area.

### **Environmental Assessment of the Gas/Coal Electrical Generating Facility in Mauritius for the World Bank**

**St. Aubin, Mauritius**

Project Director responsible for conducting all field work for the environmental assessment of a coal- and gas-fired electrical generating facility at St. Aubin in air quality, water quality, and ecology.

## **Kennard F. Kosky, M.S., P.E.**

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### **Environmental Screening of Four Proposed Power Plant Sites for the World Bank**

**Kingston, Jamaica**

Air Engineer responsible for conducting the air quality components of an environmental screening of four potential sites for a 60-MW diesel electrical generating facility.

### **Technical Cooperation Mission for the World Bank      Multiple Sites in Bulgaria**

Team Member on the World Bank Mission to determine the major environmental problems in Bulgaria and to identify potential areas for World Bank funding. Responsible for portions of the mission involving toxic/hazardous waste and air pollution. Contributed to the mission's Aide Memoire and directed the preparation of an overall report summarizing the state of the environment in Bulgaria.

### **Environmental Strategy Study of Air Quality, World Bank Multiple Sites in Hungary**

Team Member on mission providing an overview of key air quality problems in Hungary; a description and assessment of regulatory institutions, regulations, and policy; and identification of initial approaches and investment opportunities for improving air quality. During the mission, discussions were held with relevant governmental organizations, various industries, and environmental interest groups (non-governmental organizations) throughout Hungary. Project focused on preparation of an Aide Memoire and summary report dealing with industrial pollution.

### **Environmental Project for World Bank**

**Katewice/Krakow, Poland**

Team Member of the World Bank Mission that recommended and defined an environmental project for the Katewice/Krakow area. Interviewed various governmental personnel to determine needs and developed a comprehensive program for a \$7-million loan. Developed request for quotations for various components of the recommended study. The focus of the study was air quality.

### **Multidisciplinary Electric Power Plant Projects for the U.S. Agency for International Development(USAID)**

**Multiple Sites, Pakistan**

Project Manager for several multidisciplinary projects involving the development of electrical power plants in Pakistan. The projects included the Lakhra Mine and Power Plant EA, the Jamshoro Oil-Fired Power Plant EA, the Guddu Combined-Cycle Expansion Project, the Kalifia Point Private Sector Power Project, and the Environmental Guidelines for Electric Power Development in Pakistan.

### **Private Sector Power Project for USAID**

**Multiple Sites, Pakistan**

Project Manager responsible for performance of an air quality impact evaluation to investigate a large coal-fired power plant planned by the Government of Pakistan and a 1,200-MW oil-fired power plant proposed by a group of private firms. Determined the air quality effects of each plant, as well as the cumulative effects of both plants, on the area's ambient air quality. Prepared guidelines providing the private sector proposer a framework for preparing an EA from which significant environmental impacts and alternative designs to mitigate them can be determined. Project also included the establishment of a framework for future assessments of the respective plants, a preliminary evaluation of cooling water requirements, and a determination of potential water quality and ecological impacts.



## **Kennard F. Kosky, M.S., P.E.**

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### **Guddu Environmental and Social Soundness**

#### **Assessment for Gibbs & Hill, Inc.**

#### **Guddu, Pakistan**

Project Manager of an Environmental and Social Soundness Assessment (ESSA) associated with the construction and operation of a proposed 300-MW addition to a 600-MW combined-cycle power plant in Guddu, Pakistan. The ESSA, designed to provide decision makers with a full discussion of significant environmental effects associated with the power plant expansion, included an evaluation of alternatives or mitigating measures.

#### **Duri Field EA for Caltex Pacific**

#### **Duri Field, Indonesia**

Project Manager of the air quality assessment of the Duri Field steam-flood project. This project was the largest steam-flood project in the world and involved an assessment of over 300 steam generators using Duri Crude. Directed all activities and presented the results of the study to the newly formed Ministry of Environment.

### **EAs of Electrical Generating Facilities for**

#### **Electricity Generating Authority of Thailand (EGAT)**

#### **Multiple Sites, Thailand**

Project Manager for 8 years of numerous multidisciplinary projects involving EAs of electrical generating facilities in Thailand. The projects included an assessment of a 600-MW coal-fired power plant in Ao Pai; an assessment of constructing 600 MW of additional generation at the Mae Moh site; an assessment of a combined-cycle power plant at Khanom; and a mine and power plant mitigation assessment for the Mae Moh facility.

## **Kennard F. Kosky, M.S., P.E.**

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### **EXPERT/EXPERT WITNESS TESTIMONY EXPERIENCE**

Mr. Kosky has provided expert testimony in over 50 Cases. He has testified in the following types of proceedings:

- Hearing Officers and Administrative Law Judges (ALJs);
- Public Service Commissions;
- Circuit Court;
- Federal District Court;
- Governor of Florida;
- State and County Environmental Commissions;
- Environmental review Boards;
- County Commissions;
- Land Use Commissions; and
- EPA.

Mr. Kosky has been accepted as an expert in the following areas:

- Air Quality Impact Analyses;
- Air Pollution Control Technology (Design and Engineering);
- Best Available Control Technology;
- Air Pollution Emission Estimates;
- Air Regulation and Compliance; and
- Noise Evaluation and Impact Analyses.

Mr. Kosky has been accepted as an expert in proceeding held in the following states:

- Florida,
- Maryland,
- Georgia,
- South Carolina,
- Hawaii,
- California, and
- Louisiana.

#### **Agrico Chemical Company**

**Bartow, FL**

Florida Department of Environmental Regulation Administrative Hearing. Provided assistance to attorneys at hearing for cross examination of opposing witnesses. Case involved permits for prilled sulfur terminal. 1979.

#### **Fugitive Emissions Expertise**

**Alachua County, Florida**

Circuit Court. Provided expert testimony on the impacts of fugitive dust related to highway construction.

#### **AstraZeneca**

**Tarpon Springs, FL**

EPA ASTDR. Provided technical support for Stauffer Chemical Company Superfund Site. Technical expertise provided in air monitoring and air impact analyses. 2001 to present.

#### **Baltimore Gas and Electric Company**

**Baltimore, MD**

Provided expert testimony for the following:

- Presentation for Maryland PSC staff and hearing examiners on the technical issues related to BACT. 1992.
- Hearing Examiner. Provided direct and supplemental written expert testimony for 800-MW combined-cycle Perryman Project. Testimony required for the PSC CPNC. Testimony focused on air emissions and BACT for the project. 1990 to 1991.

## **Kennard F. Kosky, M.S., P.E.**

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### **Broward County Resource Recovery Office**

**Broward County, FL**

Hearing Examiner. Preparation and presentation of testimony for the North and South Broward County Resource Recovery projects on BACT. Testimony was part of a power plant site certification project. 1985 to 1986.

### **Calpine Eastern Corporation**

**Auburndale, FL**

Administrative Law Judge. Provided expert testimony on a 500-MW combined-cycle unit located at the Osprey Energy Center in Auburndale, Polk County, Florida. Testimony focused on air emissions, BACT, and noise. 2001.

### **Chevron, Inc.**

**Pensacola, FL**

Presentation before an EPA Region IV panel regarding the air emissions and impacts of drilling rig as part of Outer Continental Shelf Air Permit (40 CFR 55). The project was located in Destin Dome, which is located about 30 miles offshore from Pensacola. Permit was granted.

### **City of Jacksonville**

**Jacksonville, FL**

Circuit Court. Provided technical support for a class certification involving the air quality impacts of incinerators operating from about 1950 to 1970. Provided technical analysis and presented opinions at a deposition. 2004.

### **City of Lakeland Utilities**

**Lakeland, FL**

Provided expertise for the following:

- Administrative Law Judge. Presented expert testimony on the addition of the steam cycle for McIntosh Unit 5. As Project Manager for the project, the testimony covered all environmental disciplines including air emissions, BACT, and general environmental impacts.
- Hearing Examiner. Presented technical information and the results of modeling during hearings on site certification for a new electrical generating plant.

### **Constellation Energy**

**Ann Arundel County, MD**

Public Service Commission Hearing Officer. Provided expert testimony for an application for a Certificate of Public Necessity and Convenience (CPCN) for the installation of air pollution control systems and boiler/turbine upgrades for the Brandon Shores Generating Station. Testified on air quality including BACT, noise and visual aspect of the application.

### **Constellation Energy**

**Brevard County, FL**

Administrative Law Judge. Provided expert testimony for the air pollution controls and BACT for an 850-MW simple-cycle power plant to be located in Brevard County.

### **Confidential Clients**

Provided expertise for the following (only partially listed):

- Provided technical expertise in anticipation of litigation for dioxin contamination from a refinery. Performed air impact analysis and assessment.
- Provided expert technical expertise for cases filed against facilities by Justice Department related to EPA's New Source Review regulations. 1998 to present.

## **Kennard F. Kosky, M.S., P.E.**

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### **Del Monte Fresh Produce, Inc. Power & Light Company**

**Oahu, HI**

Jury Trial. Provided testimony in the United States District Court, District of Hawaii, related to air emission and impacts from pesticides. 2004.

### **Delmarva Power & Light Company**

**Dorchester, MD**

Hearing Examiner. Provided direct and supplemental written and oral testimony for nominal 300-MW coal-fired power plant located in Dorchester, Maryland. Case was part of the CPCN before the Maryland PSC. Testimony was related to the air pollution control technology, Lowest Achievable Emission Rate (LAER) and BACT. 1994.

### **Florida Department of Environmental Regulation**

**Multiple Sites, FL**

Provided expertise for the following:

- Hearing Examiner. FDER. Provided expert testimony regarding NO<sub>x</sub> emission limits for fossil fuel steam generators. Three hearings involved and ultimately lead to the NO<sub>x</sub> task force. 1973.
- Hearing Examiner. Florida Environmental Regulation Commission (FERC). Administrative Hearing. Testified on impacts of rule change on phosphate rock dryers. Testimony related to air quality impacts and control technology. 1973.
- Hearing Examiner. FDER Administrative Hearing. Prepared testimony on air quality impacts of control strategy for pulp mill. Testimony involved dispersion modeling and control techniques. 1973.
- FERC. Testimony on emergency action plans and compliance schedules for the State Implementation Plan. Testimony given at six locations throughout Florida. 1973.

### **Florida Electric Power Coordinating Group**

**Multiple Site, FL**

Provided expertise for the following:

- FERC and Honorable Bob Graham, Governor of Florida. Two Hearings. Prepared technical information that allowed suspension of emissions for 120 days due to energy emergency. Approval given by all parties. 1979.
- FERC. Prepared report and testimony and presented support of a rule change for three southeast Florida counties. Rule change involved elevating ambient air quality standards. The rules were changed to be consistent with the rest of the state. 1975.
- FERC. Prepared report and testimony presented in support of a rule change that would allow the use of fuel with a higher sulfur content. Project involved approximately 10,000 MW of fossil-fueled steam generators. The rule was changed. 1975.

### **Florida Power Corporation (Progress Energy)**

**Multiple Sites, FL**

Provided expertise for the following:

- Administrative Law Judge. Provided expert testimony on a gas and distillate oil-fired 500-MW combined-cycle unit located at the Hines Energy Center in Polk County, Florida. Testimony focused on air emissions, BACT, air impacts, and noise. Certification issued by Governor and Cabinet. 2001.
- Administrative Law Judge. Provided expert testimony for the use of petroleum coke with coal in two units at the Crystal River Power Plant. Focus of testimony was regulatory applicability of PSD rules to the use of petroleum coke. 1997.
- Hearing Examiner. FDER Administrative Hearing. Presented testimony on environmental impacts of Crystal River Units 4 and 5 (1,400-MW, coal-fired power plant). Permit approved. 1978.

## **Kennard F. Kosky, M.S., P.E.**

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### **Florida Power & Light Company**

### **Multiple Sites, FL**

Expert testimony provided for the following:

- Administrative Law Judge. Provided expert testimony for the West County Energy Center, a 2,450-MW Power Plant located in Palm Beach County, Florida. Testimony included air emissions (toxics), air quality impacts, and noise. 2006.
- St. Lucie County Board of County Commissioners. Provided expert testimony at the land use hearing before the St. Lucie County Commission of the emissions and air quality impacts of the 1,700 MW Southwest St. Lucie Power Project.
- Administrative Law Judge. Provided expert testimony for Turkey Point Expansion Project, an 1,100-MW Power Plant located in Miami-Dade County, Florida. Testimony included air emissions (toxics), air quality impacts, and noise. 2004.
- Administrative Law Judge. Provided expert testimony for Manatee Expansion Project, an 1,100-MW Power Plant located in Manatee County, Florida. Testimony included air emissions (toxics), air quality impacts, and noise. 2003.
- Administrative Law Judge. Provided expert testimony for Martin Expansion Project a 1,100-MW Power Plant located in Martin County, Florida. Testimony included air emissions (toxics), air quality impacts, and noise. 2003.
- Manatee County Planning Commission and Manatee County Board of County Commission. Provided testimony on environmental issues related to land use for the Manatee Combined-Cycle Project. 2002.
- PSC for South Carolina. Provided expert testimony for the Cherokee Falls simple-cycle power project. Testimony covered all environmental matters related to the project. 2002.
- Administrative Law Judge. Provided expert testimony for Manatee Orimulsion Conversion Project. Focus of testimony was BACT and air emissions (including toxics). 1998.
- Administrative Law Judge. Provided expert testimony for Manatee Orimulsion Conversion Project. Focus of testimony was BACT and air emissions (including toxics). 1995.
- Hearing Examiner. Provided expert testimony for the Martin combined-cycle project (1,600-MW combined-cycle coal gasification facility). Provided testimony on air emissions and BACT for Site Certification issued by Governor and Cabinet. 1990.
- Hearing Examiner. Expert testimony provided for the Lauderdale Repowering Project (800-MW combined-cycle facility). Testimony provided on air emissions, BACT, and noise. 1990.
- FDER Official. Expert testimony provided for SIP revision, various PSD aspects of test firing Orimulsion in a 400-MW gas-/oil-fired power plant. Air emissions and impacts presented. 1990.
- Hearing Examiner. Presented expert testimony for FPL to assess impacts from atmospheric downwash at 225-MW oil/natural gas-fired power plant. 1984.
- Broward County Commission. Prepared and presented testimony concerning the air quality impacts of using 2.5-percent sulfur fuel in FPL's 1,200-MW Port Everglades Plant. 1982.
- Dade County Environmental Resource Management Board. Prepared and presented testimony concerning the air quality impact of using 2.5-percent sulfur fuel in FPL's 800-MW Turkey Point Plant. Two hearings were held. The impacts to a PSD Class I area were at issue. 1982.
- Manatee County Commission. Prepared and presented testimony on the air quality impact of using 2.5-percent sulfur fuel in FPL's 1,600-MW Manatee Plant. Two hearings were involved. 1981.
- FDER. Presented testimony related to air quality impacts for particulate variance for FPL's Sanford, Ft. Myers, and Canaveral power plants. Variance extended. 1981.
- FERC. Testified before the FERC concerning the impacts of Sanford Unit 4 firing with coal-oil mixture (COM). FPL's request was for a temporary variance in particulate emissions so that full scale testing of COM could be performed. 1980.
- Dade County Commission. Prepared testimony and presented the results of modeling and technical information in support of a rule change on ambient air quality standards. 1977.

## **Kennard F. Kosky, M.S., P.E.**

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- FERC. Prepared testimony and presented the results of atmospheric dispersion modeling and other technical data at two separate hearings before the FERC in support of the contention that FPL's Manatee Plant was an existing source and thus could burn higher sulfur fuel. Approval given by both state and EPA. 1976.

### **Florida Sugar Cane League**

**Multiple Sites, FL**

Expertise provided for the following:

- Palm Beach County Commission. Testified in opposition to proposed special emission limits on the sugar cane industry in Palm Beach County. 1976.
- Florida Congressional Representative Paul Rogers. Presented technical information pertaining to CAA Amendments. Presentation in support of the League's position with respect to a proposed rule governing the significant deterioration of air quality. 1976.
- FERC. Presented testimony on the results of modeling and other technical information in support of the SO<sub>2</sub> rule change for three Florida counties. 1975.

### **Gold Kist**

**Live Oak, FL**

Local district court. Prepared reports, testimony, and interrogatories on case involving air pollution impacts on local car dealer. 1975 to 1979.

### **Lake Worth Utilities**

**Lake Worth, FL**

Hearing Examiner. Presented technical information and the results of modeling during hearings on site certification for a new electrical generating plant. 1977.

### **Maxwell House Division, General Foods Corporation**

**Jacksonville, FL**

District Administrator of the Occupational Safety and Health Administration (OSHA). Testified in support of the noise reduction program at the Maxwell House can plant. 1975.

### **McGowan Working Partners**

**Jefferson Parrish, LA**

Judge for the Second Parish Court. Provided expert testimony related to the air emissions and dispersion of a short-term spill of 31% hydrochloric acid from a tank.

### **Metropolitan Dade County**

**Dade County, FL**

Provided expert testimony in the following:

- PSC. Provided direct written and oral testimony for an addition to the Metropolitan Dade County Resource Recovery Facility, Florida. Case was part of the Site Certification under Florida's Power Plant Siting Act and ruled before the Governor and Cabinet acting as the Siting Board. In these proceedings, the PSC certifies the need for the project. Testimony was related to the purpose and need for the addition to the facility. This included compliance with state rules and legislative intent related to the project. 1993.
- Hearing Examiner. Presented expert testimony on the environmental impacts of Dade County Resource Recovery Facility consisting of four steam generators and associated turbines generating 77 MW by firing refuse-derived fuel. Permit granted. 1977.

## **Kennard F. Kosky, M.S., P.E.**

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### **Mirant Corporation**

### **Multiple Sites, MD**

Provided expert testimony for the following:

- PSC Hearing Officer. Provided testimony on all air-related analyses for the Chalk Point Simple-Cycle Project.
- PSC Hearing Officer. Provided testimony on all air related analyses for the Dickerson Combined-Cycle Project. 2001 and 2002.

### **Montenay Power Corporation**

### **Miami-Dade County, FL**

Miami-Dade County Community Zoning Appeals Board. Provided expert testimony on the potential impacts of an existing resource recovery facility on a parcel of land being re-zoned from industrial to residential. Testimony included air quality impacts from fugitive dusts and odors as well as noise.

### **O.K.C. Cement**

### **Sumpter County, FL**

FDER Administrative Hearing. Testified about the results of atmospheric dispersion modeling and air quality analysis during hearings about significant deterioration. 1977.

**Potomac Electric Power Company** — Provided expert testimony for the following:

- Hearing Examiner. Provided expert testimony for Chalk Point CTs (two 100-MW and two 80-MW). Testimony focused on siting and overall environmental impacts. 1988 to 1989.
- Hearing Examiner. Preparation and presentation of direct and rebuttal testimony on the environmental aspects of siting a coal gasification combined-cycle power plant. Case involved the Maryland Public Service Commission. 1987 to 1988.

### **Seminole Electric Cooperative Incorporated**

Provided expert testimony for the following:

- Hearing Examiner. Provided direct written and oral testimony for 440-MW combined-cycle power plant located in Hardee County, Florida. Case was part of the Site Certification under Florida's Power Plant Siting Act and ruled before the Governor and Cabinet acting as the Siting Board. Testimony was related to the air pollution control technology, BACT, and noise impacts. 1995.
- Hearing Examiner. Provided expert testimony on air emissions, noise, and BACT for the Hardee Power Station, a 600-MW combined-cycle facility in central Florida. 1990.

### **Tampa Electric Company (TECO)**

### **Tampa, FL**

Provided expertise for the following:

- FERC. Prepared testimony based on the results of modeling and other technical data in support of the contention that TECO's Big Bend Unit 3 was an existing source and thus could burn higher sulfur fuel. 1976.
- Fifth Circuit Court of Appeals. Assisted in the preparation of legal briefs for litigation of the EPA's ruling concerning SIP revision. Case involved atmospheric dispersion modeling. 1976.
- Hillsborough County Environmental Regulatory Commission. Prepared reports and testimony on air quality standards and significant deterioration. 1976.
- FDER Administrative Hearing. Prepared testimony in support of TECO's proposed use of high sulfur fuel. Technical information and the results of atmospheric dispersion modeling were presented during hearings on significant deterioration of air quality. 1976.
- EPA Region IV Administrator. Testified in opposition to the Administrator's ruling regarding TECO's proposed use of high sulfur fuel. 1975.

## **Kennard F. Kosky, M.S., P.E.**

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### **TexasGulf, Inc.**

**NC**

Assisted senior counsel in responding to a Notice of Violation from the State of North Carolina. Provided technical expertise and reports for submittal to court. 1981.

### **The Viera Company**

**Brevard County, FL**

Assisted senior counsel in the mediation involving odors and air quality impacts of a revised air pollution permit. Provided technical expertise and review of reports. 1999.

### **Woodward Hall & Primm**

**Houston, TX**

Assisted senior counsel in the toxic tort suit involving the Motco Superfund Site. Technical expert for air monitoring and air quality impacts. Provided technical expertise, review of plaintiff's reports, and provided independent reports.



## **Kennard F. Kosky, M.S., P.E.**

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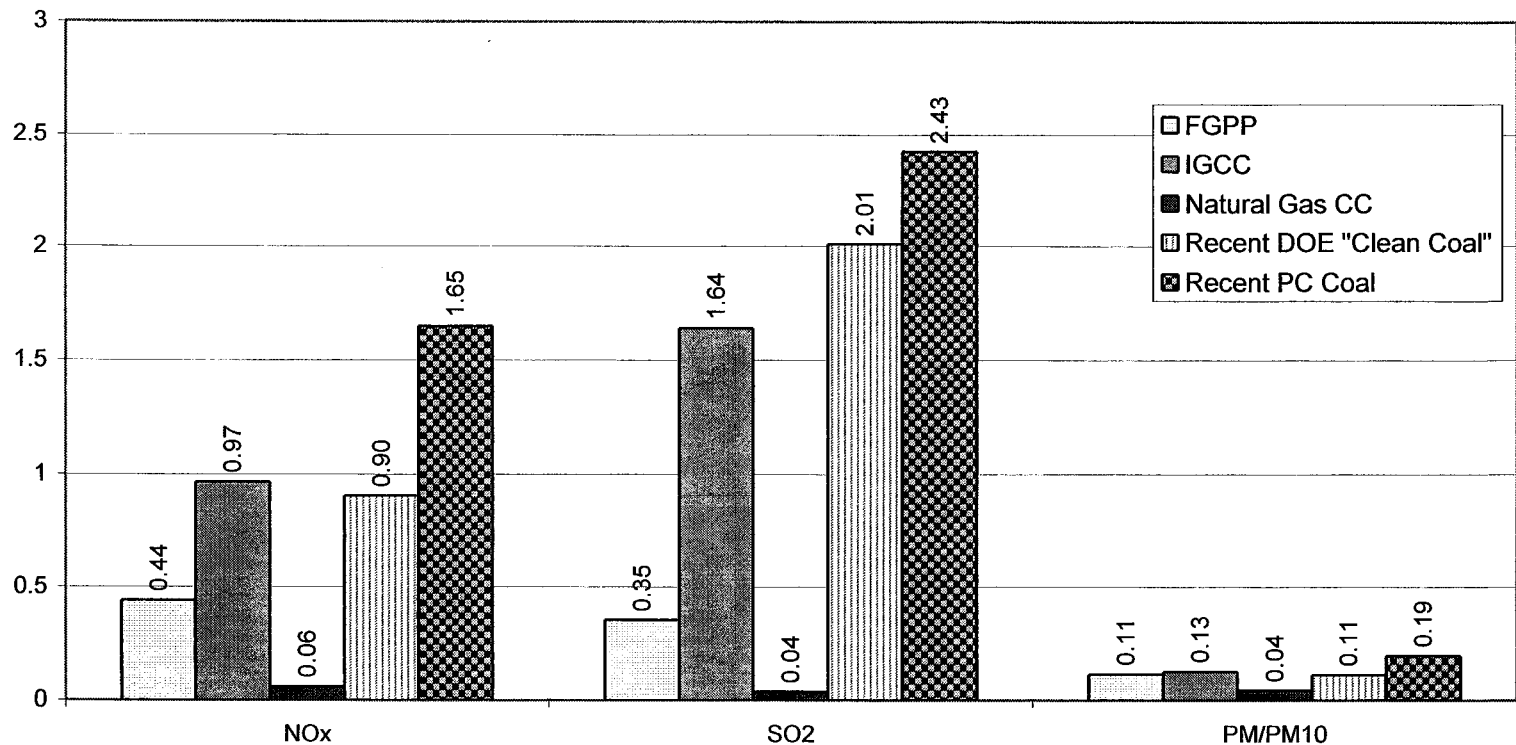
### **PUBLICATIONS**

Mr. Kosky has authored and coauthored hundreds of reports and permits submitted to regulatory agencies. He has authored and coauthored over a dozen articles related to air pollution topics (i.e., emission estimates, air impacts, and permitting) and licensing power generation facilities.

### **LANGUAGES**

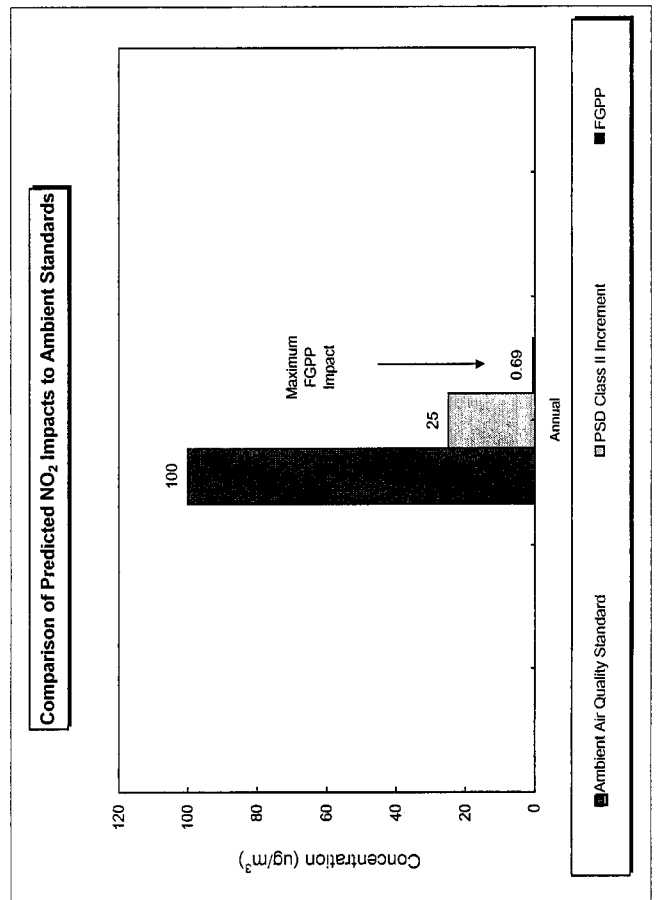
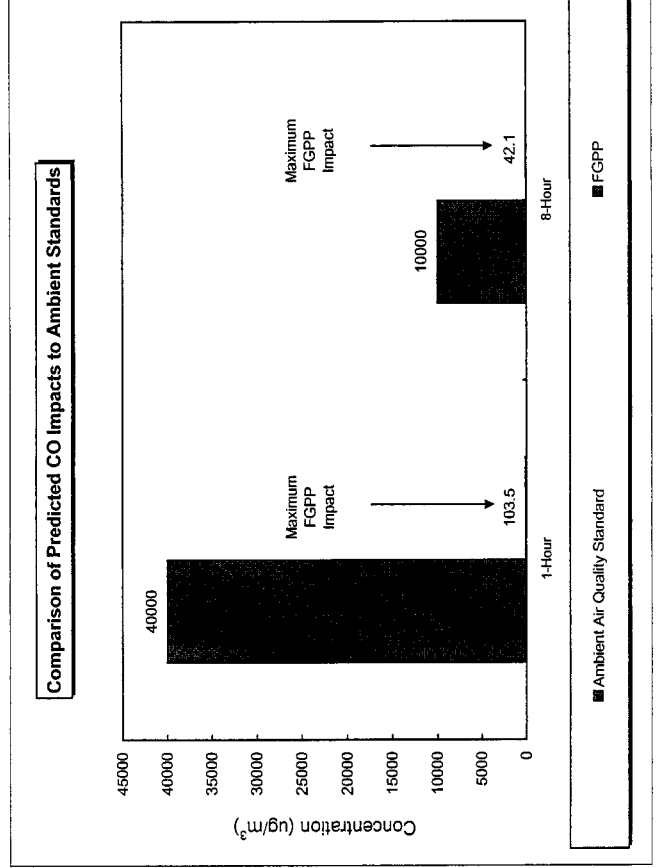
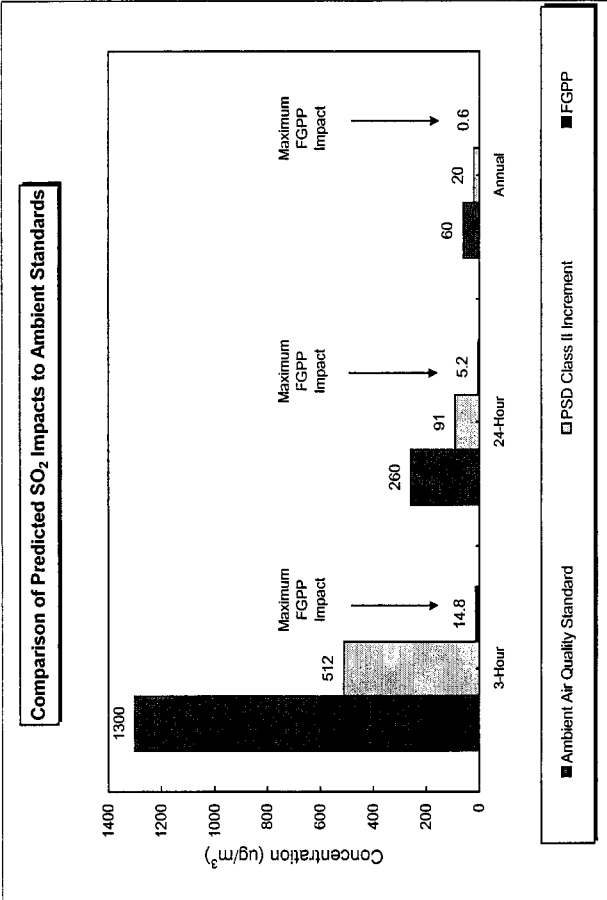
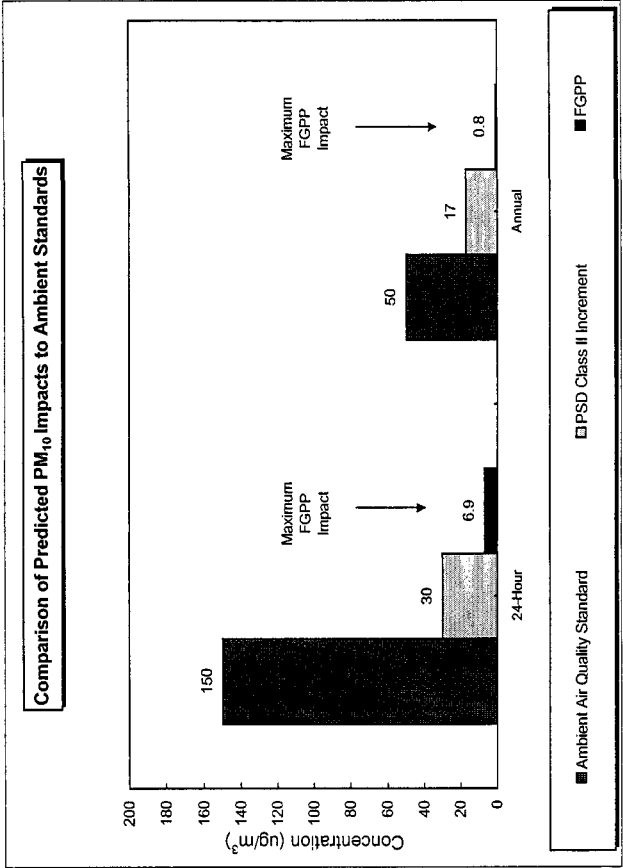
English (Native Speaker)  
Spanish (Read)

**FPL Document No. KFK-2**  
**Comparison of FGPP Emissions with IGCC<sup>1</sup>, Natural Gas Combined Cycle<sup>2</sup>, Recent DOE**  
**"Clean Coal"<sup>3</sup> and Recent PC Coal<sup>4</sup> Projects**  
**(lb/MW-hr net output)**



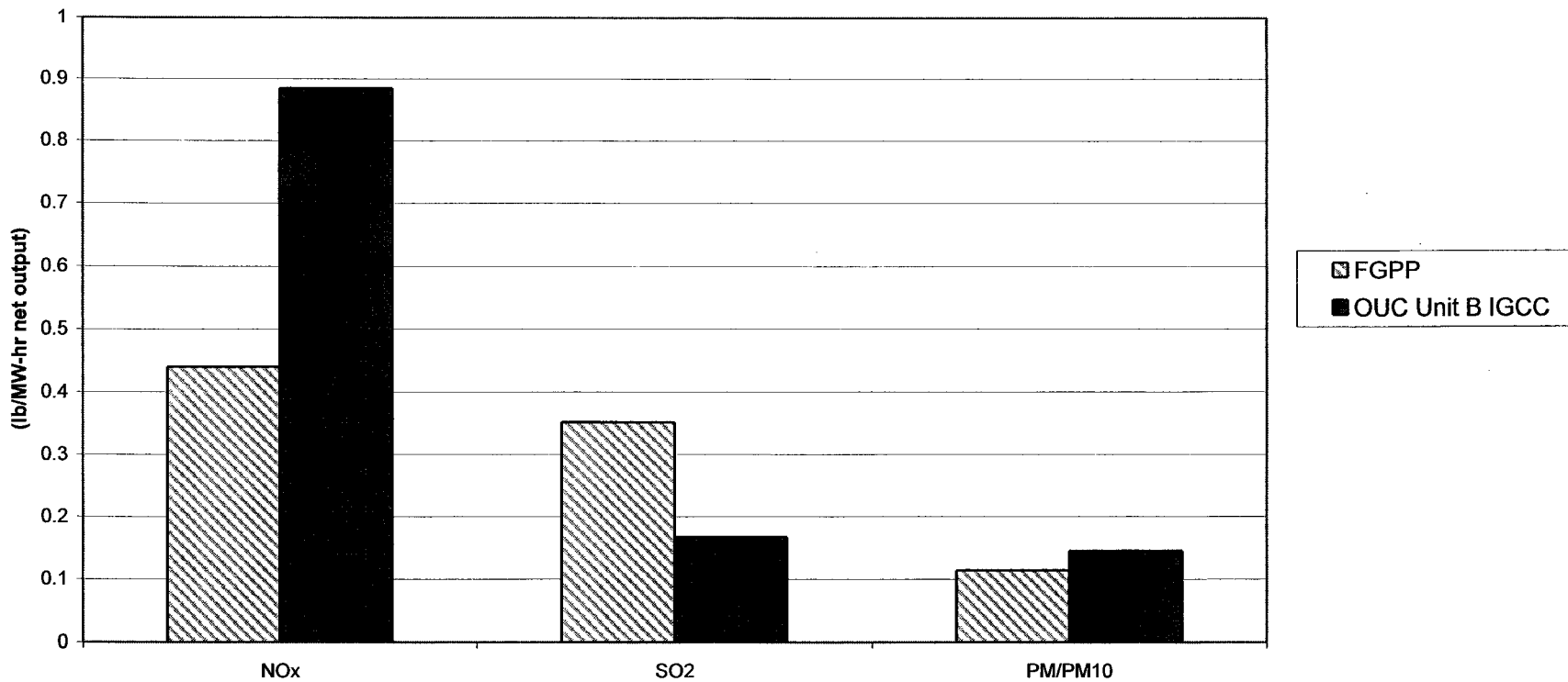
<sup>1</sup> IGCC = TECO Polk Plant (COD 1996)  
<sup>2</sup> NGCC = TP5 (COD 2007)  
<sup>3</sup> DOE Clean Coal = JEA Northside CFB (COD 2001)  
<sup>4</sup> Recent PC Coal = Stanton Unit 2 (COD 1995)

**FPL Document No. KFK-3  
Maximum Air Quality Impact Predicted for the FGPP Compared to Ambient Air  
Quality Standards and PSD Class II Increments**



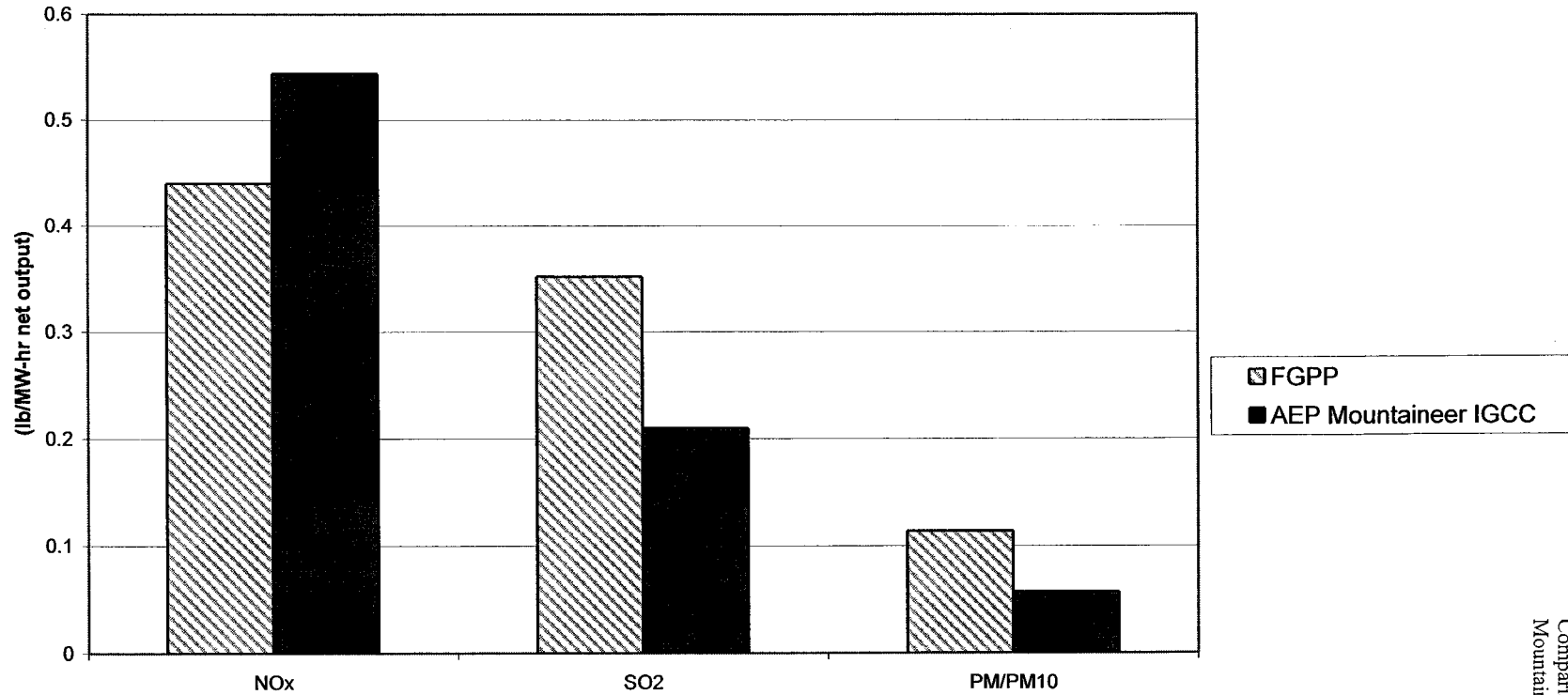
Source: Golder, 2006.

FPL Document No. KFK-4  
Comparison of FGPP Emissions with OUC Unit B IGCC



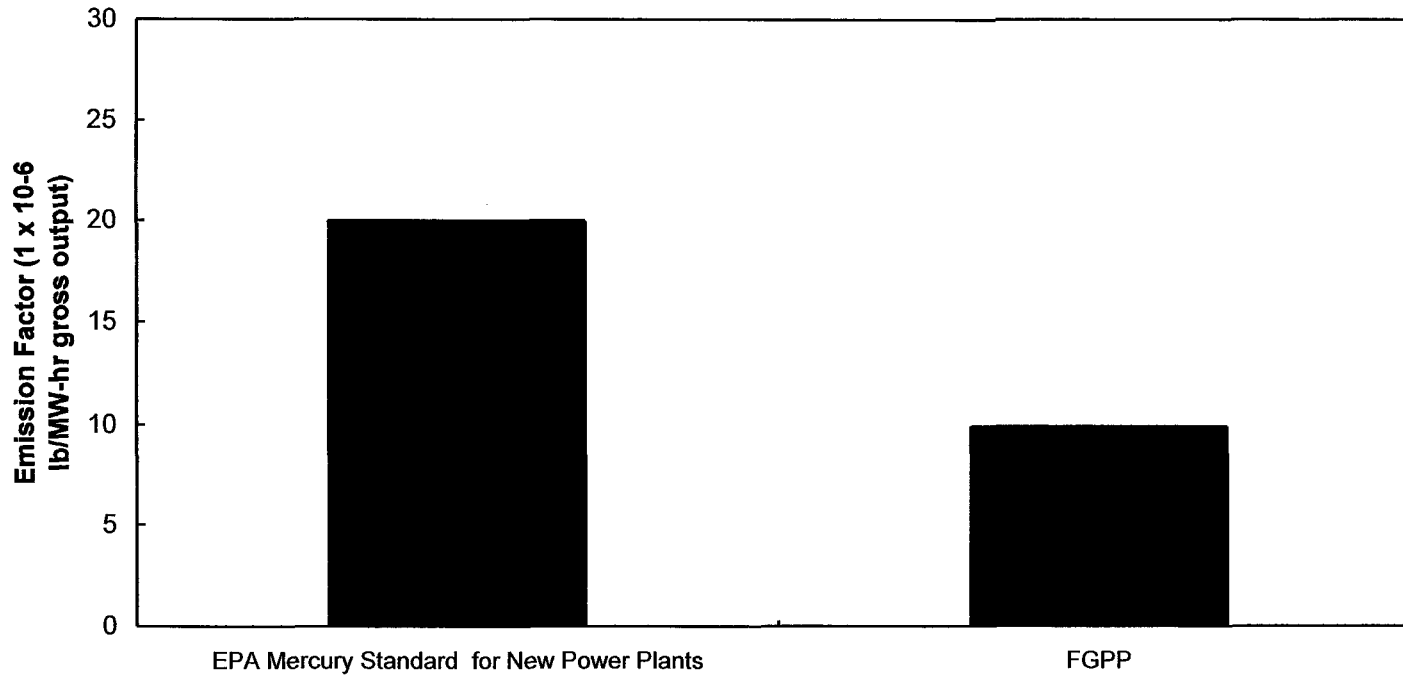
Note: Emissions levels shown for FGPP represent only a small fraction of ambient standards.

**FPL Document No. KFK-5  
Comparison of FGPP Emissions with AEP Mountaineer IGCC**



Note: Emissions levels shown for FGPP represent only a small fraction of ambient standards.

**FPL Document No. KFK-6**  
**Proposed Mercury Emission Factor ( $1 \times 10^{-6}$  lb/MW-hr gross output)**  
**for FGPP**



Note: New EPA Standard promulgated in June, 2006.

**Environmental Compliance Costs**

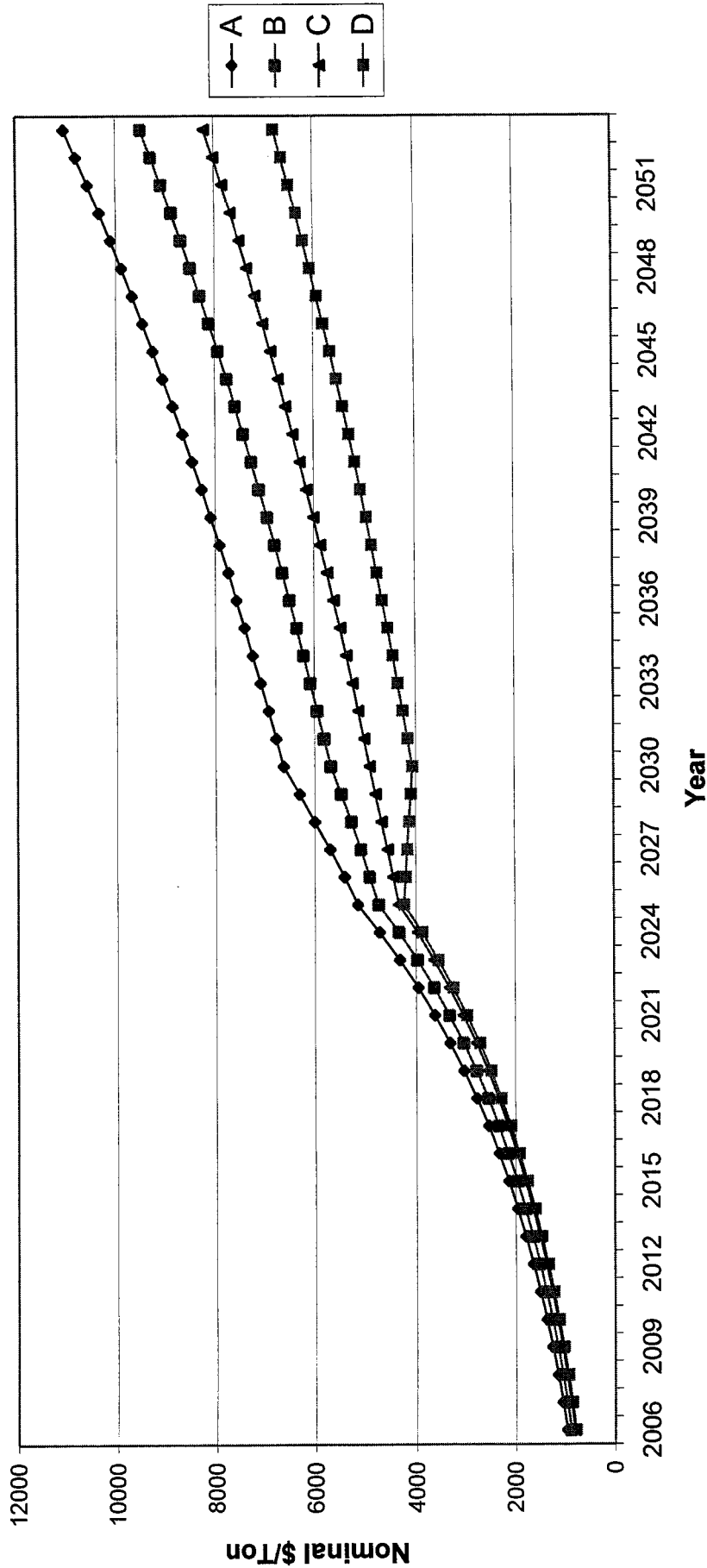
**Scenario A** - Allowance Costs for SO<sub>2</sub>, NOx and Hg, referred to as 3P (P in this case means "Pollutant")

**Scenario B** - Allowance Costs for SO<sub>2</sub>, NOx and Hg, with low CO<sub>2</sub> allowance costs, referred to as 4P - mild

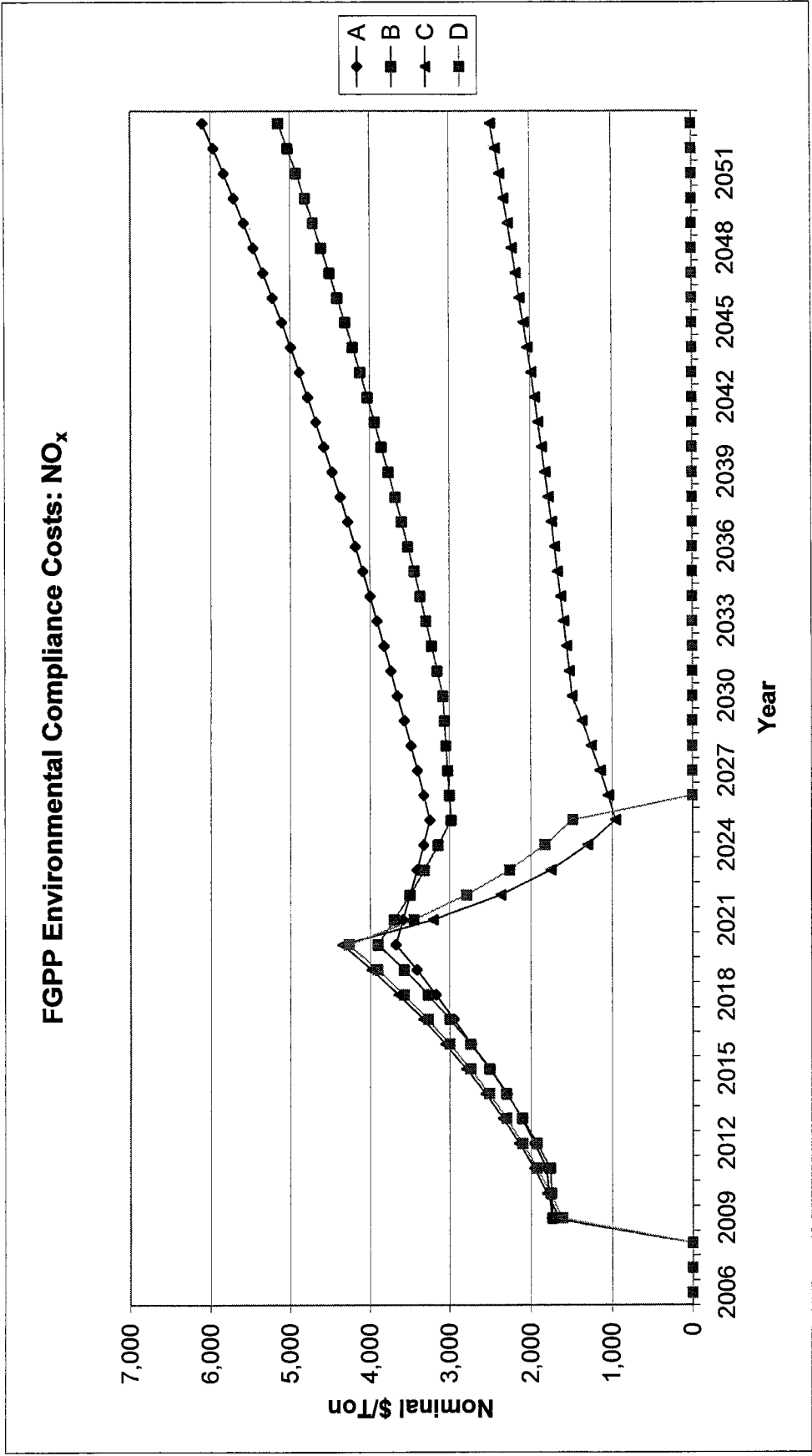
**Scenario C** - Allowance Costs for SO<sub>2</sub>, NOx and Hg, with moderate CO<sub>2</sub> allowance costs, referred to as 4P - medium

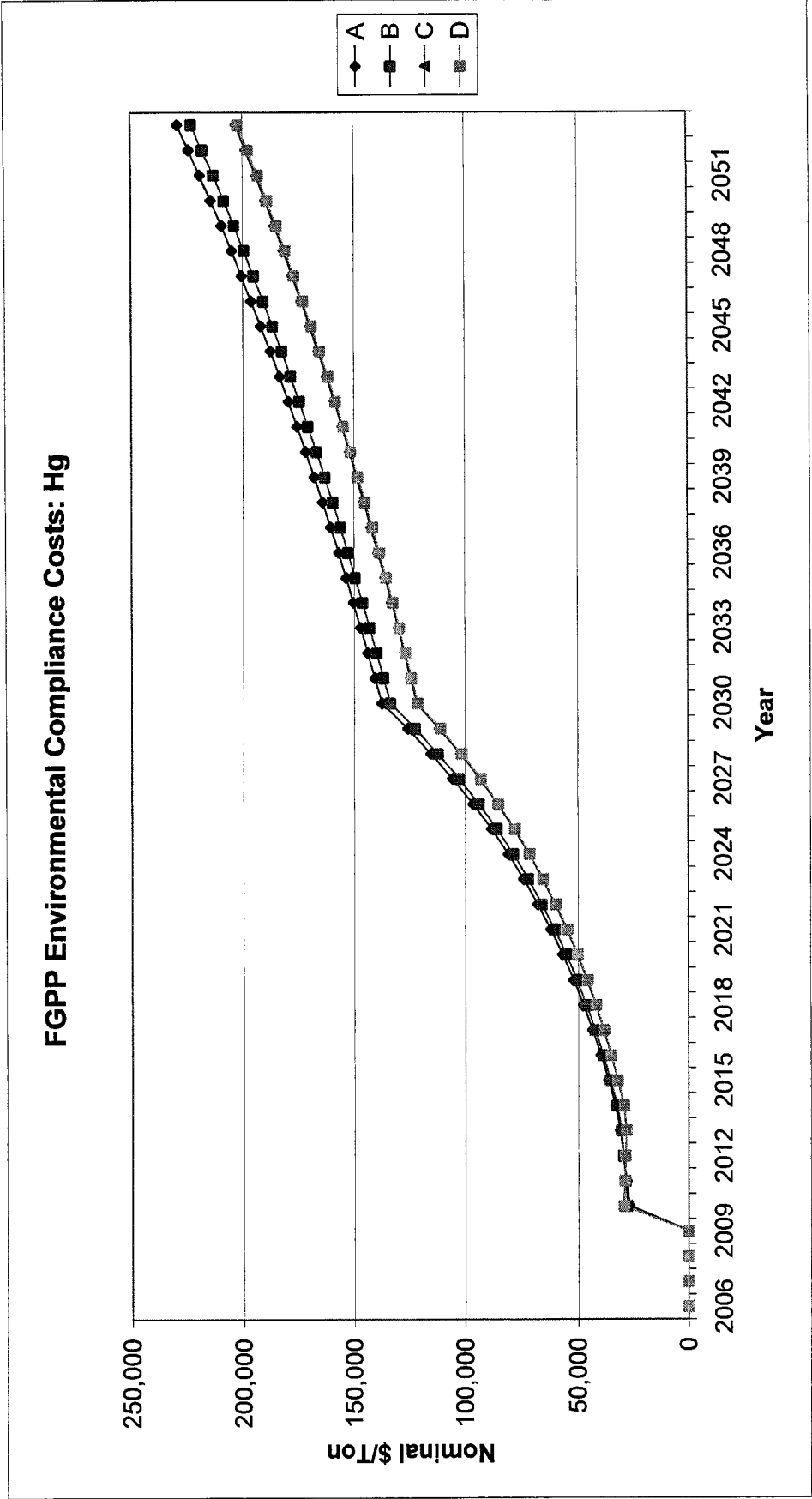
**Scenario D** - Allowance Costs for SO<sub>2</sub>, NOx and Hg, with high CO<sub>2</sub> allowance costs, referred to as 4P - high

### FGPP Environmental Compliance Costs: SO<sub>2</sub>









### FGPP Environmental Compliance Costs: CO<sub>2</sub>

