

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DIRECT TESTIMONY OF

SAMUEL WATERS

ON BEHALF OF

PROGRESS ENERGY FLORIDA

DOCKET NO. 070007-EI

JUNE 1, 2007

1 Q. Please state your name, employer, and business address.

2 A. My name is Samuel S. Waters and I am employed by Progress Energy Carolinas
3 (PEC). My business address is 410 S. Wilmington Street, Raleigh, North Carolina,
4 27602.

5
6 Q. Please tell us your position with PEC and describe your duties and
7 responsibilities in that position.

8 A. I am Director of System Planning and Regulatory Performance for Progress Energy
9 Carolinas (PEC). I am responsible for directing the resource and transmission
10 planning processes for PEC and continue to be responsible for environmental planning
11 for both PEC and Progress Energy Florida (PEF). Our resource planning process is an
12 integrated approach to finding the most cost-effective alternatives to meet each
13 company's obligation to serve, in terms of long-term price and reliability. We
14 examine both supply-side and demand-side resources available and potentially
15 available to the Company over its planning horizon, relative to the Company's load

CMP _____
COM 5
CTR Orig
ECR _____
GCL 1
OPC _____
RCA 2
SCR _____
SGA _____
SEC _____
OTH _____

1 forecasts. In my capacity as Director of System Planning, I oversaw the completion of
2 the PEF's most recent TYSP document filed in April 2007.

3

4 **Q. Please summarize your educational background and employment experience.**

5 **A.** I graduated from Duke University with a Bachelor of Science degree in Engineering in
6 1974. From 1974 to 1985, I was employed by the Advanced Systems Technology
7 Division of the Westinghouse Electric Corporation as a consultant in the areas of
8 transmission planning and power system analysis. While employed by Westinghouse,
9 I earned a Masters Degree in Electrical Engineering from Carnegie-Mellon University.

10

11 I joined the System Planning department of Florida Power & Light Company (FPL) in
12 1985, working in the generation planning area. I held a number of positions within
13 FPL, assuming the position of Director, Resource Planning in 2000.

14

15 I joined Progress Energy in January of 2004. I became Director, System Resource
16 Planning for both PEC and PEF in 2006. I assumed my current position in April of
17 this year. I am a registered Professional Engineer in the states of Pennsylvania and
18 Florida, and a Senior Member of the Institute of Electrical and Electronics Engineers,
19 Inc. (IEEE).

20

21 **Q. Have you previously testified before this Commission?**

22 **A.** Yes. I have testified in several dockets related to resource planning and the need for
23 power.

1

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

3 A. In Order No. PSC-05-0998-PAA-EI, the Commission found that costs for complying
4 with the new Clean Air Interstate Rule (CAIR) and Clean Air Mercury Rule (CAMR) are
5 eligible for recovery through the ECRC subject to PEF's demonstration that costs for
6 specific projects are reasonable and prudent as they are submitted for recovery in the
7 annual ECRC proceedings. In last year's annual ECRC proceeding, Docket No. 060007-
8 EI, PEF submitted the report entitled "Progress Energy Florida – Integrated Clean Air
9 Compliance Plan", dated March 31, 2006, along with supporting testimony. The purpose
10 of my testimony is to present an updated version of that report and discuss the results of
11 new analyses that are based on revisions to the alternative plans and changes cost
12 assumptions.

13

14 **Q. Are you sponsoring any exhibits with your testimony?**

15 A. Yes. I am sponsoring Exhibit No. __ (SSW-1), a report entitled "Progress Energy
16 Florida - Integrated Clean Air Compliance Plan", dated June 1, 2007, which I will refer
17 to as the "Updated Clean Air Report" or "Updated Report." The Updated Clean Air
18 Report, which is being submitted separately with my pre-filed testimony, details the
19 Company's Integrated Clean Air Compliance Plan and supporting analyses. I am also
20 sponsoring Exhibit No. __ (SSW-2), "Summary of Alternative Environmental
21 Compliance Plans – 2006", Exhibit No. __ (SSW-3), "Summary of Alternative
22 Environmental Compliance Plans – Current", Exhibit No. __ (SSW-4), "Comparison of

1 Cumulative Present Value of Revenue Requirements” and Exhibit No. ___, (SSW-5),
2 Impact of Allowance Price Uncertainty”.

3

4 **Q. Would you please summarize the report submitted by the Company in 2006?**

5 A. The 2006 report described an evaluation of five alternative environmental compliance
6 plans for Progress Energy Florida developed to meet the standards imposed by CAIR,
7 CAMR and the Clean Air Visibility Rule (CAVR), then recently promulgated by the
8 Environmental Protection Agency. The five alternative compliance plans evaluated in
9 the 2006 report are summarized in my Exhibit No. __ (SSW-2).

10

11 As shown in the exhibit, the five plans considered a variety of compliance options
12 including different types of control technologies, fuel switching and allowance trading.
13 The projected capital costs of the alternative plans shown in the original report ranged
14 from \$570 million to \$1.2 billion, excluding AFUDC. The alternative plans were
15 compared on a revenue requirements basis, including capital carrying charges, fuel
16 impacts, non-fuel O&M impacts, and allowance costs.

17

18 **Q. Which of the alternative plans proved to be the lowest cost?**

19 A. The plan identified as Plan D had the lowest projected total costs when all factors were
20 considered, including allowance purchases, incremental O&M and fuel switching. Plan
21 D can be summarized as:

22

SO₂ Controls

23

- Installation of wet scrubbers at Crystal River Units 4 and 5

- 1 ● Fuel Switching at Crystal River Units 1 and 2 to burn low sulfur coal
- 2 ● Fuel switching at Anclote Units 1 and 2 to burn low sulfur oil and natural
- 3 gas
- 4 ● Purchases of SO₂ allowances

5 NO_x Controls

- 6 ● Installation of low NO_x burners and selective catalytic reduction systems
- 7 (SCRs) at Crystal River Units 4 and 5
- 8 ● Installation of low NO_x burners and separated over-fire air (LNB/SOFA) at
- 9 Anclote Units 1 and 2
- 10 ● Purchase of annual and ozone season allowances

11 Mercury Controls

- 12 ● Installation of wet scrubbers and SCRs at Crystal River Units 4 and 5 will
- 13 provide co-benefit of reducing mercury emissions
- 14 ● Installation of powdered activated carbon injection on Crystal River Unit 2

15 The plan selected represented a balance between reducing emissions by adding controls
16 to the largest and newest coal units on the PEF system and making use of the allowance
17 markets. The total cost of Plan D was more than \$100 million, NPV lower than the next
18 lowest cost alternative plan.

19

20 **Q. What changes have occurred since the original analysis, necessitating revision of**
21 **the analyses and report?**

22 A. There are several changes. First, project cost projections have increased since the
23 original analysis was performed. The increases are significant enough that they require a

1 second look at the alternative plans. In addition, for the reasons discussed by Mr.
2 Cornell, the schedules have changed for the planned FGD and SCR installations at
3 Crystal River Unit 4. The other significant change from the original study, which affects
4 Plans D and E, was to eliminate the use of natural gas at the Anclote Plant. In the 2006
5 report, the Anclote Plant was assumed to burn 40% natural gas after 2010 in Plans D and
6 E. At that time, pipeline capacity was assumed to be available to deliver the gas at no
7 additional cost. This assumption is no longer valid, as all available pipeline space is
8 currently reserved, and any additional capacity would result in additional cost.

9
10 **Q. Were there any other changes to the revised analysis?**

11 A. Yes. An additional plan, designated Plan F, was added to the analysis. Plan F is similar
12 to Plan A, in which environmental controls are added to all four Crystal River units, but
13 in Plan F, controls are added to Units 1 and 2 on a delayed basis. In Plan F, FGD and
14 SCR controls are added to Crystal River Unit 1 [REDACTED] and to Unit 2 [REDACTED]. The
15 addition of this plan to the analyses provides two additional insights. First, it tests the
16 plan which controls all units to see if delaying any of the controls improves the
17 economics of the Plan, and second, it provides some insight into what might happen to
18 Plan D if controls are imposed on Crystal River Units 1 and 2 at some later date. This is
19 possible if the "Beyond BART" requirements of the Clean Air Visibility Rule are
20 invoked, as described in Chapter 4 of Exhibit __ (SSW-1), or in the case where
21 allowance prices turn out to be much higher than forecasted and adding controls results
22 in the lower cost alternative. All six of the plans evaluated in the current analysis are
23 shown in Exhibit No. __ (SSW-3).

1

2 **Q. What were the results of the revised economic analysis of the alternative plans?**

3 A. The results of the economic comparisons of the alternative plans are shown in Exhibit
4 No. __ (SSW-5). As was the case in the original analysis, Plan D remains the most cost
5 effective compliance plan, with an approximately \$200 million cost advantage, NPV,
6 over the next most cost-effective plan, Plan C. And as was the case in the 2006 analysis,
7 the higher CPVRR cost of Plans A, B, C are largely due to the capital costs associated
8 with the emissions controls installed. Plan F, which as described above is similar to Plan
9 A, shows a higher CPVRR for the same reason. Plans A and F are higher cost than Plans
10 B and C, as they have controls on all four Crystal River Units while B and C control only
11 three units.

12

13 Plan E, which has controls only on the two smaller Crystal River units, shows a much
14 higher cost than Plan D, which controls the two larger Crystal River units. This higher
15 cost results from the large number of emissions allowances that must be obtained in Plan
16 E to meet emissions limits for the system.

17

18 **Q. What sensitivity analyses were conducted as part of the quantitative evaluation?**

19 A. As was discussed in the original report, the greatest remaining uncertainty is the cost of
20 emissions allowances over time. Since each of the alternative plans is dependent to at
21 least some degree on the price of allowances bought and/or sold, significant changes to
22 the assumed price might impact the results of the analyses. Thus, it is important to
23 determine the sensitivity of the results to changes in the allowance price projections.

1

2 **Q. What were the results of the sensitivity analysis of allowance costs?**

3 A. Exhibit No. __ (SSW-6) presents the CPVRR of the alternative plans assuming low and
4 high allowance prices. The figures shows Plan D is the lowest costs plan under the base
5 and low allowance price assumptions. Assuming high allowance prices, Plan A is the
6 most economic plan. This is because Plan A has SO₂ and NO_x emissions below the
7 number of allowances received and can; therefore, sell allowances, reducing the overall
8 cost of the plan. Because Plan E relies on significant allowance purchases, the costs
9 associated with Plan E are highly variable when exposed to low and high allowance
10 prices. By contrast, Plan D is impacted to a smaller degree by allowance prices. Under a
11 high forecast scenario, Plan A becomes the lowest cost plan, since it relies the least on
12 purchases of allowances.

13

14 **Q. What do you conclude from these analyses about which plan is the most**
15 **appropriate environmental compliance plan for PEF?**

16 A. As in the 2006 study, the economic analyses identify Plan D as the most cost effective
17 alternative to meet all applicable environmental standards. Not only is Plan D the most
18 cost effective alternative under base planning assumptions, it is the most robust plan over
19 a range of possible allowance prices, representing the best balance between increased
20 capital expenditures for added controls and increased allowance prices. I believe that
21 Plan D is the most appropriate environmental compliance plan for PEF.

22

23 **Q. How does the Plan D meet PEF's planning objectives?**

1 A. First, the Plan meets the requirements of CAIR, CAMR and CAVR, as well as other
2 state and federal environmental requirements.

3

4 Second, the plan manages risks and provides flexibility by striking a good balance
5 between reducing emissions and making limited use of allowance markets. Should it
6 appear that allowance prices are going to be higher than currently projected, the Plan
7 provides PEF with the ability to install additional controls on the Crystal River units at a
8 future date, potentially taking advantage of any technology improvements that develop in
9 the interim. Additionally, should PEF experience higher load growth than expected, or if
10 plans for future baseload units change, PEF could then add controls on Crystal River
11 Units 1 and 2, if necessary.

12

13 Finally, Plan D controls costs. As shown in Exhibit No. __ (SSW-5), the CPVRR for
14 Plan D are projected to be approximately \$200 million less than the next lowest cost plan
15 under the base assumptions. As discussed above, Plan D is also the lowest cost plan
16 when allowance price uncertainties are factored into the analysis. Thus, the Plan is the
17 most cost-effective means of achieving compliance at the lowest reasonable cost to
18 PEF's customers.

19

20 **Q. What action should the Commission take at this time regarding PEF's Integrated**
21 **Clean Air Compliance Plan?**

22 **A.** As discussed above, PEF's Integrated Clean Air Compliance Plan (designated Plan D)
23 is the most cost-effective alternative for complying with CAIR, CAMR, CAVR and

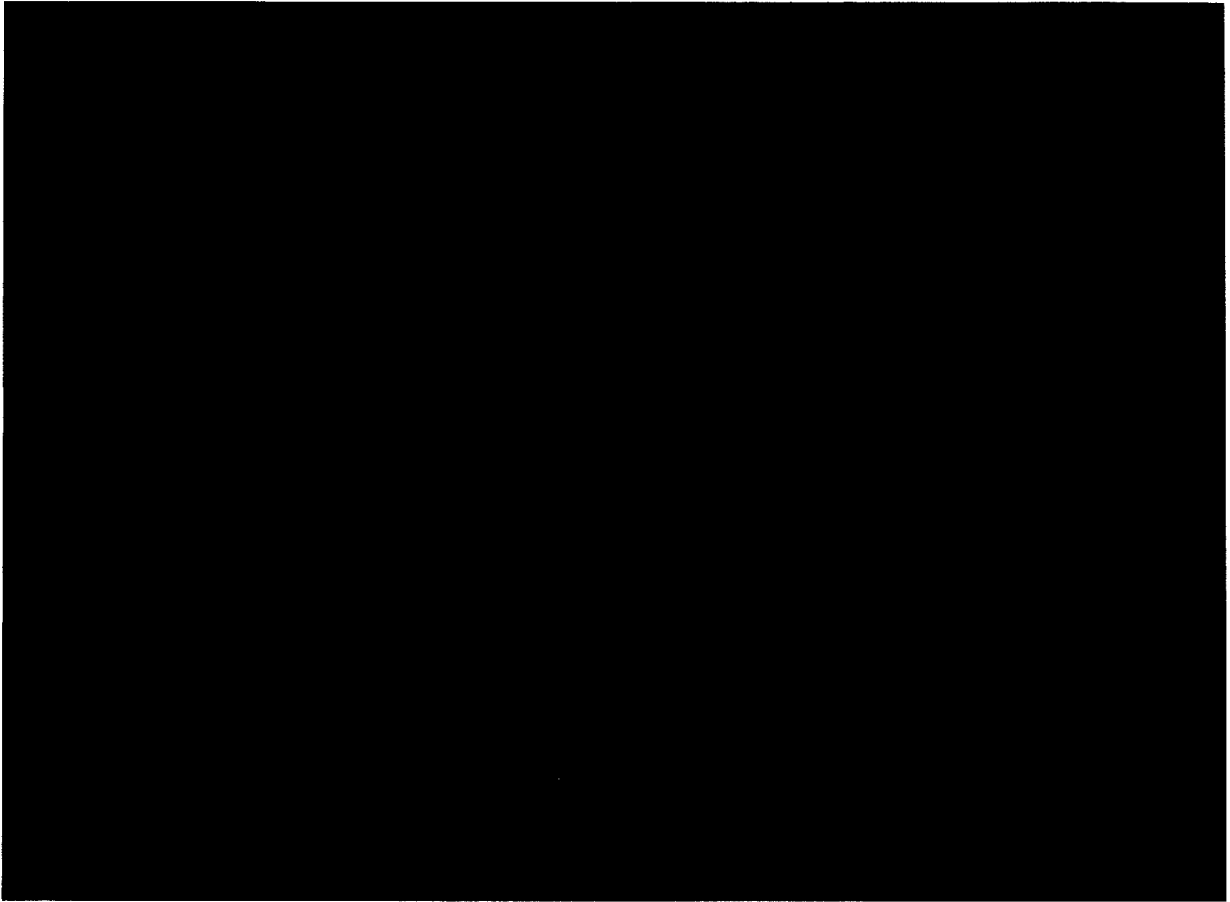
1 related regulations. It also manages risks and provides flexibility by striking a good
2 balance between reducing emissions and making limited use of allowance markets.
3 For these reasons, the Commission should find that PEF's Integrated Clean Air
4 Compliance Plan is reasonable and prudent, and that costs incurred to implement that
5 plan would be permitted subject to a finding of reasonableness and prudence at the
6 time the specific expenses are presented for cost recovery.

7

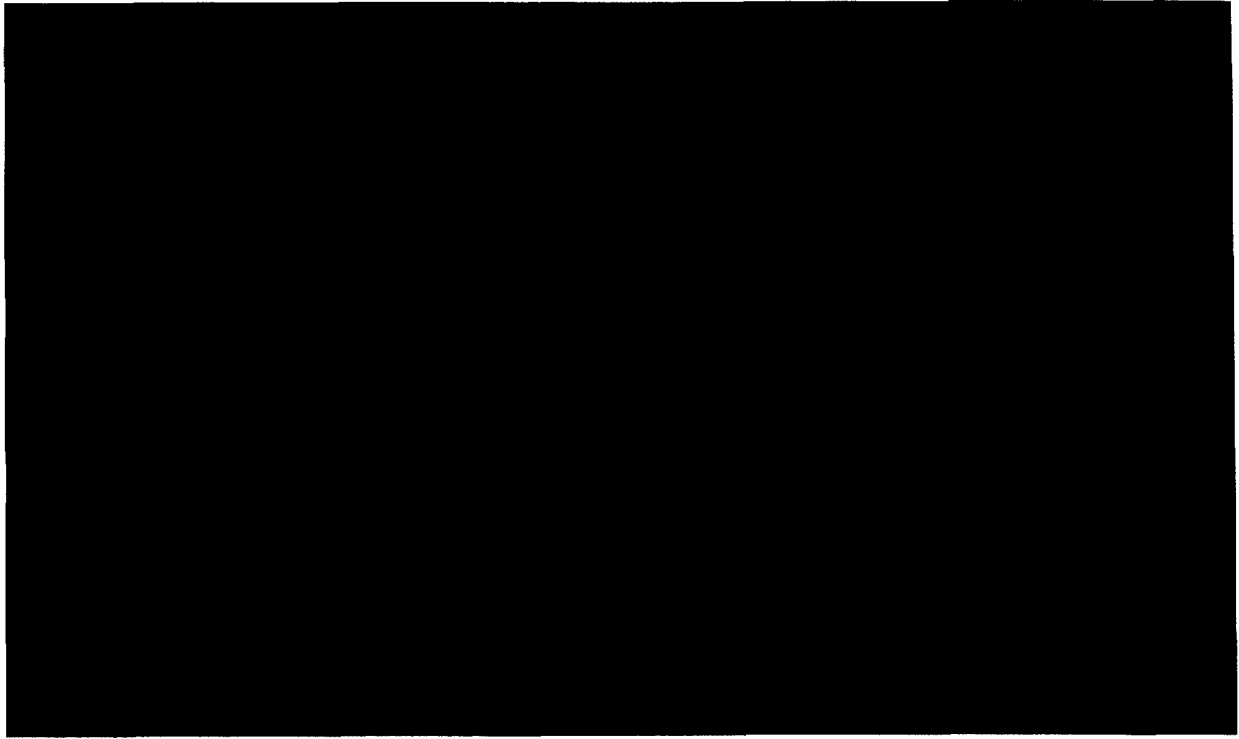
8 **Q. Does this conclude your testimony?**

9 A. Yes, it does.

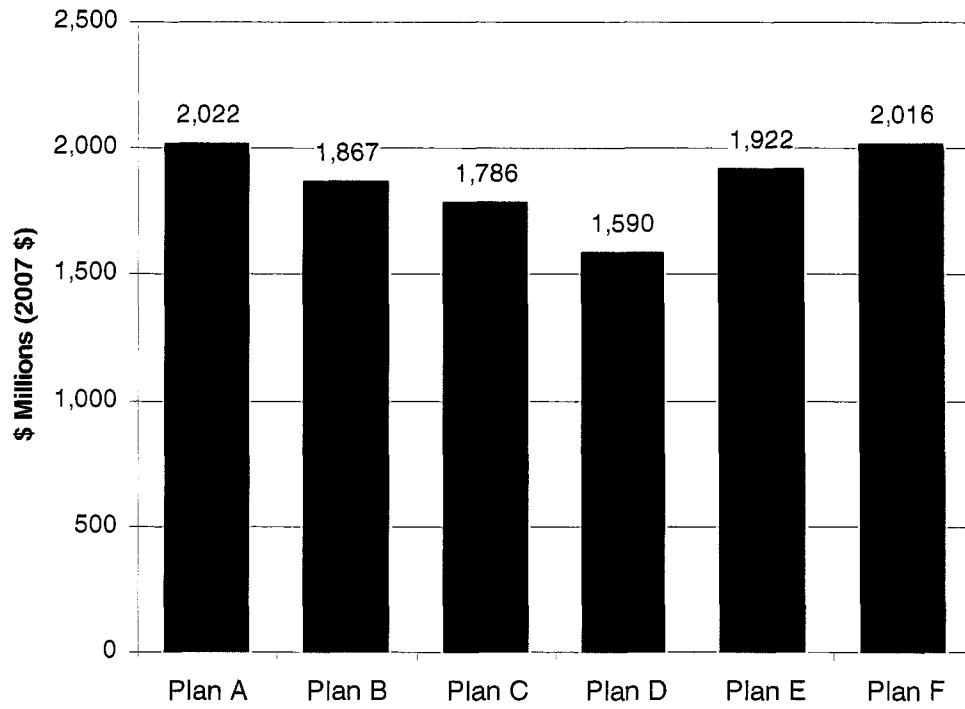
Summary of Alternative Compliance Plans – 2006



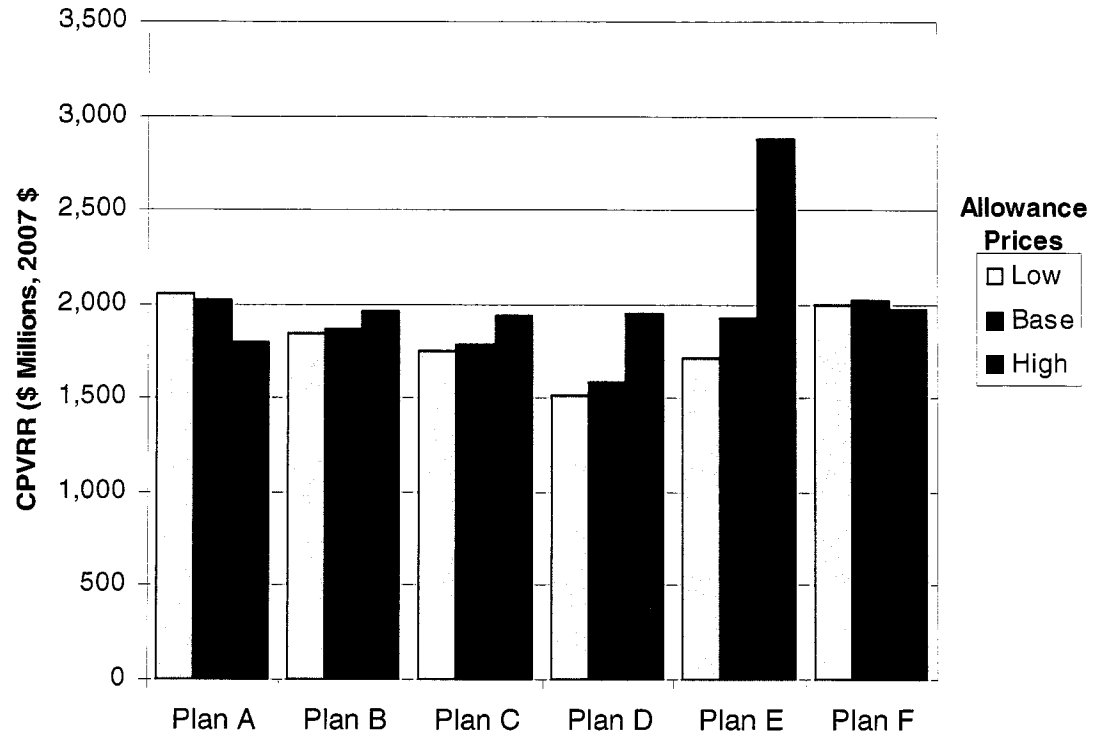
Summary of Alternative Compliance Plans – Current



Comparison of Cumulative Present Value of Revenue Requirements



Impact of Allowance Price Uncertainty



REDACTED

**Progress Energy Florida
Integrated Clean Air Compliance Plan**

**Submitted to the
Florida Public Service Commission**

June 1, 2007



DOCUMENT NUMBER-DATE

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List of Acronyms & Abbreviations

BACT	Best Available Control Technology
BART	Best Available Retrofit Technology BOFA
CAIR	Clean Air Interstate Rule
CAMR	Clean Air Mercury Rule
CAVR	Clean Air Visibility Rule
CPVRR	cumulative present value revenue requirements
DEP	Florida Department of Environmental Protection
EPA	U.S. Environmental Protection Agency
ESP	electrostatic precipitator
FGD	flue gas desulfurization
FIP	Federal implementation plan
Gwh	gigawatt-hour
Hg	mercury
lbs/mmBtu	pounds per million Btu
LNB	low NOx burners
LOI	loss on ignition
MW	megawatt
MWh	megawatt-hour
NOx	nitrogen oxides
NSR	New Source Review
O&M	operation and maintenance
OFA	overfire air
PAC	powdered activated carbon
PEF	Progress Energy Florida, Inc.
PM	particulate matter
SCR	selective catalytic reduction
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SO ₃	sulfur trioxide
SOFA	separated overfire air

Executive Summary

The Clean Air Interstate Rule (CAIR), Clean Air Mercury Rule (CAMR), and Clean Air Visibility Rule (CAVR) programs pose major new challenges for Progress Energy Florida (PEF). The purpose of this report is to update the Florida Public Service Commission (FPSC) on the status of the new regulatory programs and PEF's implementation of its Integrated Clean Air Compliance Plan. In addition, this report presents the results of PEF's continued evaluation of alternative plans and an assessment of risks that may affect the costs and timing of PEF's implementation of the selected plan.

On March 31, 2006, PEF submitted a report and supporting testimony presenting its integrated plan for complying with the new rules, as well as the process PEF utilized in evaluating alternative plans. PEF's Integrated Clean Air Compliance Plan, designated in the report as Plan D, was found to be the most cost-effective compliance plan for CAIR, CAMR, and CAVR from among five alternative plans. PEF determined that the Integrated Clean Air Compliance Plan meets PEF's objectives of (1) meeting all CAIR, CAMR, and CAVR requirements; (2) providing flexibility; (3) managing risk; and (4) controlling costs.

During the past year, changed conditions have necessitated revisions to the alternative plans evaluated in the 2006 report. The most significant changes, affecting four of the five plans, are the in-service dates of the Flue Gas Desulfurization (FGD) and Selective Catalytic Reduction (SCR) controls on Crystal River Unit 4. [REDACTED]

[REDACTED]. In addition, PEF has developed and evaluated a sixth alternative plan, designated Plan F.

Consistent with the approach utilized in 2006, PEF has performed a quantitative evaluation to compare the ability of the modified alternative plans to meet environmental requirements, while managing risks and controlling costs. The analysis included an examination of the projected emissions of the plans and economic impacts, in terms of cumulative present value of revenue requirements (CPVRR) of the six alternative plans. This analysis demonstrates that Plan D, as modified, still has the lowest CPVRR revenue requirements.

A summary of the primary components of this Plan are as follows:

SO₂

- Installation of wet scrubbers on Crystal River Units 4 and 5
- Fuel switching at Crystal River Units 1 and 2 to burn low sulfur coal
- Fuel switching at Anclote Units 1 and 2 to burn low sulfur oil
- Purchases of sulfur dioxide (SO₂) allowances

NO_x

- Installation of low NO_x burners (LNBS) and SCRs to control nitrogen oxide (NO_x) emissions from Crystal River Units 4 and 5
- Installation of LNBS and Separated over-fire air (LNB/SOFA) at Anclote Units 1 & 2
- Purchase of annual and ozone season allowances

1
2
3

Mercury

- Installation of wet scrubbers and SCRs at Crystal River Units 4 and 5 will provide co-benefit of reducing mercury emissions
- Installation of powdered activated carbon injection on Crystal River Unit 2
- Purchase of mercury (Hg) allowances

The Plan is expected to meet environmental requirements by striking a balance between reducing emissions by adding controls to the largest and newest coal units on the PEF system, and making use of the allowance markets.

While a significant amount of study, engineering, and analysis has already been completed to support the development of PEF's Plan, there are still a number of uncertainties and outstanding issues. One of the primary outstanding issues relates to PEF's Anclote Units. Information provided by vendors indicates that while LNB/ SOFA installations are effective at reducing NO_x emissions, they also have the potential to increase particulate emissions. PEF is engaged in a current study to determine the magnitude of potential increases, whether additional particulate controls – such as ESP's – would need to be added, what control technology to use and whether the cost of such additional controls would increase the cost per ton of NO_x removal above the expected cost of NO_x allowances. The full cost impact of this issue can not be determined at this time. For these reasons, this report also presents an assessment of risks that could impact the costs and timing of PEF's implementation of the Integrated Clean Air Compliance Plan. The Company will use this Plan to guide internal planning and budgeting efforts. However, since compliance planning is a dynamic process, PEF will continue to evaluate compliance options in light of changed circumstances and will adjust the Integrated Clean Air Compliance Plan accordingly.

Chapter 1 Overview of Report

Introduction

In March of 2006, PEF filed with the Florida Public Service Commission a report and supporting testimony outlining our integrated plan for complying with EPA's recently promulgated CAIR, CAMR, and CAVR programs. Among other things, the 2006 report described PEF's decision-making process and provided a clear understanding of why the Plan was chosen. The purpose of this report is to update the Commission on the status of PEF's implementation and continued evaluation of its Integrated Clean Air Compliance Plan.

Objectives and Decision Criteria

PEF's objective remains to select a plan that: (1) meets all CAIR, CAMR, and CAVR requirements; (2) manages risk; (3) provides flexibility; and (4) controls costs. These objectives require PEF to balance both cost and risk to select an "optimal" strategy. Each of these objectives can be further defined as follows:

- **Meet environmental requirements**—This objective is straightforward. PEF takes its environmental responsibility seriously and will meet all requirements of the CAIR, CAMR, and CAVR, and all other state and federal environmental regulations.
- **Manage risk**—In making long-term planning decisions, uncertainties are numerous and include the cost of technology options, fuel and allowance markets, and the structure and type of environmental regulations.
- **Provide flexibility**—Strategic flexibility is defined as the ability to change direction based on new information. As plans extend into the future, the possibilities for unforeseen circumstances increase. Therefore, it is important to maintain the ability to alter course based on new information.
- **Control costs**—PEF seeks to achieve compliance using the most cost-effective plan to provide emission reductions at the lowest reasonable cost to its customers.

Report Organization

The remainder of this report is organized as follows:

Chapter 2 provides a recap of the originally filed Integrated Clean Air Compliance Program.

Chapter 3 presents Findings and Recommendations based on PEF's continued evaluation of alternative compliance plans.

Chapter 4 summarizes the status of the pertinent regulations and PEF's implementation of its Integrated Clean Air Compliance Plan to date.

Chapter 5 discusses the analysis of the alternative plans and the results of the evaluations.

Chapter 6 provides an assessment of ongoing risks associated with PEF's compliance Plan.

Appendix 1 provides the summaries of contracts PEF has entered to date in implementing the compliance plan.

Chapter 2 Recap of Originally Filed Integrated Clean Air Compliance Plan

In March of 2006, PEF filed with the Florida Public Service Commission a report and supporting testimony outlining our integrated plan for complying with the U.S. Environmental Protection Agency's (EPA's) recently promulgated CAIR, CAMR, and CAVR programs. PEF's Integrated Clean Air Compliance Plan, which was designated in the report as Plan D, was found to be the most cost-effective compliance plan for CAIR, CAMR, and CAVR from among five alternative plans. The five plans considered a variety of compliance options including different types of control technologies, fuel switching, and allowance trading.

In the 2006 report, PEF projected capital costs of the plans to range from approximately \$570 million to \$1.2 billion, excluding AFUDC. AFUDC would increase the overall cost by approximately \$62 million to \$120 million. The Plan with the highest projected capital costs would have called for installation of scrubbers and SCRs on all four Crystal River units and NOx controls on both Anclote units to be in full compliance with both CAIR and BART. At the low capital cost end of the spectrum, PEF would have installed scrubbers and SCRs only on Crystal River Units 1 and 2 and NOx controls on the Anclote units at a capital cost of approximately \$570 million to comply with CAVR and rely on fuel switching and allowance purchases for total CAIR compliance. The Plan that PEF indicated it intended to pursue (Plan D) included scrubbers and SCRs only on Crystal River Units 4 and 5, NOx controls on Anclote Units 1 and 2, allowance purchases, and fuel switching to comply with CAIR. The Plan relied on the premise that CAIR would satisfy BART requirements. Although the total capital costs for the Plan were projected at \$736 million (excluding AFUDC), it had the lowest total projected costs when all factors were considered including allowance purchases, incremental O&M, and fuel switching. The majority of the capital costs would be incurred in the 2007-2009 time period.

A summary of the primary components of Plan D were as follows:

SO₂

- Installation of wet scrubbers on Crystal River Units 4 and 5
- Fuel switching at Crystal River Units 1 and 2 to burn low sulfur coal
- Fuel switching at Anclote Units 1 and 2 to burn low sulfur oil and natural gas
- Purchases of SO₂ allowances

NOx

- Installation of low NOx burners and selective catalytic reduction systems (SCRs) at Crystal River Units 4 and 5
- Installation of low NOx burners and separated over-fire air (LNB/SOFA) at Anclote Units 1 & 2
- Purchase of annual and ozone season allowances

Mercury

- Installation of wet scrubbers and SCRs at Crystal River Units 4 and 5 will provide co-benefit of reducing mercury emissions
- Installation of powdered activated carbon injection on Crystal River Unit 2

- Purchase of mercury (Hg) allowances

Quantitative Analysis of Alternative Compliance Plans

PEF performed a quantitative evaluation to compare the ability of the alternative plans to meet environmental requirements, while managing risks and controlling costs. The analysis included an examination of the projected emissions of the plans and economic impacts, in terms of CPVRR. As discussed in the 2006 report, Plan D had the lowest CPVRR. Plan A was projected to be the most expensive plan, largely due to the capital costs associated with the additional emission controls installed. Plans B and C, which also complied with CAIR without long-term purchases of allowances, were projected to be less costly than Plan A. It is noteworthy that Plan E was more costly than Plan D, even though the capital requirements were considerably less than any other plan. This was due to the significant amount of allowance purchases that would be required.

Qualitative Assessment of Plans

PEF also conducted a qualitative assessment of the plans in terms of providing flexibility as well as some potential uncertainties not considered in the quantitative assessment. As noted above, Plan D achieves compliance by installing emission controls on PEF's two largest coal units (as well as NO_x controls on the Anclote units). Because Crystal River Units 4 and 5 are also the newest coal units on the system, there should be less uncertainty in the cost to install the equipment on the units. It also will be easier to install controls on Units 4 and 5 because there are fewer physical obstacles around which to design and construct the control equipment. Plan D also provides flexibility. Because SO₂ and NO_x emissions were below or near the amount of allowance PEF was to receive through 2014 (or beyond in the case of SO₂), this provides time for resolution of allowance market uncertainties. If allowance prices and the projection of future allowance prices increase significantly, PEF would have the ability to add controls to Crystal River Units 1 and 2 at a later date. Plan D would also allow time for mercury control technologies to advance.

Selected Plan

PEF determined that Plan D was the preferable plan from a number of perspectives and it met all of the objectives set out by the Company. The Plan would strike a good balance between reducing emissions, by adding controls to the largest and newest coal units on the PEF system, and making use of the allowance markets to comply with CAIR. The plan would comply with CAMR by reducing mercury emissions through the synergistic effect of wet scrubber and SCRs on Crystal River Units 4 and 5. Emissions would be reduced greater than required in the early years, and these early reductions would be banked for use later in time. To reduce mercury emissions further and remain in compliance through 2025, activated carbon injection controls would be added to Crystal River Unit 2 prior to 2018.

Plan D provided flexibility by making use of allowance markets to account for a small portion of reductions required by CAIR. Because of the controls added for Plan D, PEF would need to purchase a minimal number of allowances through 2014. This would provide time for the allowance markets to stabilize, or for at least some of the market uncertainties to be resolved. Should it appear that allowance prices are going to be high after 2014, Plan D provided PEF with the ability to add controls to additional Crystal River units at a future date, possibly taking advantage of any technology improvements that may be made. Likewise, should PEF experience

higher load growth than expected, or if plans for future baseload units change, PEF could add controls on Crystal River Units 1 and 2, if necessary. Thus, Plan D enabled PEF to manage its risks better than the other plans developed.

Uncertainties

While a significant amount of study, engineering, and analysis had already been completed when PEF submitted the 2006 Plan, there were and still are a number of uncertainties and outstanding issues including opacity and particulate emissions, water use permitting, quality and sources of limestone, and effectiveness of mercury removal technologies. In addition to the project and technology uncertainties surrounding these projects, there remained a great deal of uncertainty associated with the regulations themselves and how the Florida DEP and US EPA would implement the rules. Due to these uncertainties, PEF indicated that it would continue to review its Plan and adjust it accordingly so as to assure compliance with all applicable regulations with the most cost effective strategy.

Chapter 3 Findings & Recommendations

During the past year, changed conditions have necessitated revisions to the alternative plans evaluated in the 2006 report. As discussed in Chapter 5, the most significant changes, affecting four of the five plans, are the in-service dates of the FGD and SCR controls on Crystal River Unit 4. [REDACTED]

[REDACTED]. In addition, PEF developed and evaluated a sixth alternative plan, designated Plan F.

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Consistent with the approach utilized in the 2006 evaluation, PEF evaluated the six alternative plans to determine which would ensure compliance with the regulations and best meet the objections and decision criteria summarized in Chapter 1. This chapter describes the updated evaluation and the components of PEF's updated Integrated Clean Air Compliance Plan.

Integrated Clean Air Compliance Plan

PEF's Integrated Clean Air Compliance Plan, designated in this report as Plan D, has again found to be the most cost-effective compliance plan for CAIR, CAMR, and CAVR from among the six alternative plans. The Integrated Clean Air Compliance Plan still meets PEF's objectives of (1) meeting all CAIR, CAMR, and CAVR requirements; (2) providing flexibility; (3) managing risk; and (4) controlling costs.

The Plan meets environmental requirements by striking a good balance between reducing emissions, through installation of controls on PEF's largest and newest coal units, and making use of the allowance markets to comply with CAIR and CAMR requirements. It also provides flexibility by making use of allowance markets to account for a small portion of the reductions required by CAIR. Should it appear that allowance prices are going to be higher than currently projected, the Plan provides PEF with the ability to add controls to additional Crystal River units at a future date, possibly taking advantage of any technology improvements that may be made. The Plan also allows time for mercury control technologies to advance. Finally, should PEF experience higher load growth than expected, or if plans for future baseload units change, PEF may then add controls on Crystal River Units 1 and 2, if necessary. Thus, the Integrated Clean Air Compliance Plan enables PEF to manage its risks.

SO₂ Plan

The most significant component of PEF's Integrated Clean Air Compliance Plan is the installation of wet scrubbers on Crystal River Units 4 and 5. The plan includes switching Crystal River Units 1 and 2 to burn low-sulfur (1.2 lbs SO₂/mmBtu) "compliance" coal beginning in 2010, and burning low sulfur oil at Anclote Units 1 and 2 starting in 2010. [REDACTED]

[REDACTED]. PEF has assumed fuel switching to take place in the analyses described in this report. However, the final decision to switch fuels will be made closer to implementation time. The fuel to be burned by PEF at these units will be that which has the lowest overall cost when the cost of allowances is factored into the overall cost.

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NOx Plan

The primary component of PEF's Integrated Clean Air Compliance Plan is the installation of LNBs and SCR systems on Crystal River Units 4 and 5. Currently, the Plan also includes LNB/SOFA controls to be installed on the Anclote units for NOx reductions. However, as discussed in Chapter 4, additional study of this option is required. These control options are among the lowest incremental cost options available, and provide most, but not all, of the NOx reductions required by CAIR. [REDACTED]

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Mercury Plan

Installation of wet scrubbers and SCRs on Crystal River Units 4 and 5 will provide a co-benefit of reducing emissions of mercury. PEF expects mercury emissions reductions to be greater than required between 2010 and 2011, and the Integrated Clean Air Compliance Plan relies on being able to bank the excess reductions for use in later years. [REDACTED]

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[REDACTED]. The Plan includes installing PAC injection systems with additional polishing filters on Crystal River Unit 2 [REDACTED] to further reduce mercury emissions. The polishing filters will provide PEF the ability to continue selling the fly ash produced rather than disposing of the ash in a landfill, thereby avoiding additional landfill costs. [REDACTED], PEF will continue to monitor the research and development of mercury control technologies and will choose the most reliable and cost-effective control technology when the time arrives.

Visibility Plan

PEF operates four units that are BART-eligible, including Anclote Units 1 and 2 and Crystal River Units 1 and 2 (Bartow Unit 3 is also BART-eligible, but is being repowered and is not included in the discussion here). As indicated above, the Integrated Clean Air Compliance Plan includes switching to low-sulfur oil and the installation of LNBs at Anclote Units 1 and 2, which will bring the Anclote units into compliance with CAIR. Per the Florida DEP's BART requirements, Rule 62-296.340, F.A.C., a BART determination is not required for SO₂ and NOx for any BART-eligible source that is subject to CAIR. Therefore, visibility impacts from particulate matter emissions are only evaluated for the BART determination. While additional controls may be required for individual units that are shown through modeling to contribute significantly to visibility impairment in a Class I area, PEF expects that installing controls on the larger Crystal River Units 4 and 5 will significantly improve the visibility in Class I areas, more so than would controlling emissions on Units 1 and 2 at Crystal River.

Chapter 4 Status of Regulations and Implementation of PEF's Integrated Clean Air Compliance Plan

This chapter provides an update of the status of the CAIR, CAMR and CAVR programs, as well as PEF's implementation of its Integrated Clean Air Compliance Plan.

Requirements Under the Clean Air Interstate Rule

This section discusses the regulatory requirements of CAIR, which EPA signed in March 2005.

General Overview

CAIR requires significant reductions of SO₂ and NO_x from power plants in 28 eastern states and the District of Columbia through an emissions cap-and-trade program. CAIR will be implemented in two phases – the first phase beginning in 2010 for SO₂ and 2009 for NO_x compliance, and the second phase beginning in 2015. When fully implemented in 2015, CAIR is expected to result in a 70 percent reduction in SO₂ emissions and a 65 percent reduction in NO_x in the affected 28-state region as compared to current emission levels.

Status of CAIR Regulations

CAIR requires affected states to revise their SIPs to ensure achievement of specific emission targets. EPA encourages states to use a model cap-and-trade program included in CAIR, but states have the discretion to adopt alternative control programs to achieve CAIR emission targets. States were required to submit their SIP revisions to EPA by September 11, 2006. On June 29, 2006 the Florida DEP adopted a state CAIR that is based on the EPA model rule with minor revisions to the NO_x emissions allocation period and the definition of new sources. An administrative challenge of the Florida CAIR delayed the state's submittal of the CAIR SIP revision. On March 1, 2007, however, an Administrative Law Judge upheld the Florida CAIR and, on March 16, 2007, the Florida DEP officially submitted its CAIR SIP revision for EPA review and approval. Under a Federal Implementation Plan (FIP) signed by EPA on March 15, 2006, the federal SO₂ and NO_x cap-and-trade programs could be imposed if EPA does not officially approve Florida's SIP revision.

A group of Florida utilities, including PEF, has challenged EPA's decision to include the state of Florida in the federal CAIR. The legal proceedings will likely not conclude prior to 2008 and the outcome cannot be predicted.

Sulfur Dioxide Requirements

CAIR requires significant reductions in SO₂ emissions in the affected 28-state region. The reductions will be implemented in two phases – the first phase beginning in 2010 and the second phase beginning in 2015. CAIR encourages states to use the cap-and-trade approach that was established in Title IV of the 1990 Clean Air Act Amendments, which is also known as the Acid Rain Program. Under Title IV, SO₂ emissions allowances were allocated to all affected units. CAIR implements the additional reductions by increasing the number of allowances required to offset SO₂ emissions. Beginning in 2010, CAIR requires two allowances for each ton of SO₂ emitted, as compared to the one allowance per ton requirement under the existing Title IV program. Beginning in 2015, each ton of emissions will require 2.86 allowances.

Nitrogen Oxides Requirements

CAIR also requires significant reductions in NO_x emissions in the affected 28-state region. The reductions will be implemented in two phases – the first phase beginning in 2009 and the second phase beginning in 2015. As with SO₂, CAIR encourages use of a cap-and-trade approach to achieve emissions reductions. Under the EPA model cap-and-trade program, EPA will allocate emissions allowances to each participating state. For instance, Florida will be allocated 99,445 allowances from 2009-2014, and 82,871 allowances in 2015 and thereafter. The states will then allocate their budgeted allowances to individual emitting units. Allocations will be made separately for both the annual and “ozone season” (May through September) periods.

PEF’s anticipated total NO_x allocations have changed since PEF originally submitted its Integrated Clean Air Compliance Plan in 2006. Expected annual allowances have decreased approximately 2,800 tons per year between 2009 and 2014, and 2,200 tons per year afterward. Ozone season allowances have decreased approximately 1,300 tons per year between 2009 and 2014, and 1,100 tons per year afterward. The CAIR methodology allocates allowances to specific units based on published heat input data, with downward adjustments to be made in the future based on the number of new units that become subject to the program. PEF continues to develop and implement its CAIR NO_x compliance plan based on the emission targets and allocation methodologies set forth in Florida’s adopted CAIR rule and pending SIP revision.

Permit Requirements

Each affected facility’s Title V air operating permit will be revised to reflect changes required by the final state CAIR. In addition, air construction permits must be obtained prior to the installation of pollution control equipment.

Requirements Under the Clean Air Mercury Rule

This section provides a discussion of the regulatory requirements of CAMR, which was signed by EPA in March 2005.

General Overview

The final CAMR was signed by the Acting EPA administrator on March 15, 2005. CAMR requires significant reductions in mercury emissions nation-wide from coal-fired power plants through an emissions cap-and-trade program. CAMR will be implemented in two phases: the first phase beginning in 2010 and the second phase beginning in 2018. When fully implemented in 2018, CAMR will result in a 70 percent reduction in mercury emissions from coal-fired power plants in the U.S. Under CAMR, EPA will allocate mercury emissions allowances to each state that participates in the cap-and-trade program. The participating states will then allocate them to individual coal-fired units.

Status of CAMR Regulation

States were required to submit to EPA revisions to their SIPs by November 17, 2006. On June 29, 2006 the Florida DEP adopted a cap-and-trade rule based on the EPA model rule with adjustments to the number of allowances allocated during the first phase of implementation after 2011. Beginning in 2012, the rule allocates 70% of the available allowances to existing units, and it establishes a 25% set-aside. The set-side allowances may be used for compliance if a unit

has mercury pollution controls installed and still cannot meet its compliance obligation using the 70% allocation alone. The 25% set-aside results in a decrease of approximately 150 pounds in the total mercury emissions allocations to PEF's Crystal River coal-fired units between 2012 and 2017, compared to what PEF anticipated in its Integrated Clean Air Compliance Plan in 2006. The DEP submitted the adopted mercury rule to EPA as a SIP revision in December 2006.

Permit Requirements

Each affected facility's Title V air operating permit will be revised to reflect changes required by the final state mercury rule. In addition, air construction permits must be obtained prior to the installation of pollution control equipment.

Requirements Under the Clean Air Visibility Rule

This section provides a discussion of the regulatory requirements of the Clean Air Visibility Rule (CAVR), which was signed by EPA in June 2005.

General Overview

On June 15, 2005, EPA finalized amendments to the 1999 regional haze rule. Among other things, the final version of CAVR requires best available retrofit technology (BART) controls for certain industrial facilities emitting air pollutants that reduce visibility in certain areas. These areas are designated as Class I, and they include national parks and wilderness areas. There are four such areas in Florida, including Everglades National Park, Chassahowitzka National Wildlife Refuge and the St. Marks and Bradwell Bay Wilderness Areas.

Status of CAVR Regulation

States are in the process of adopting the federal CAVR requirements. States must submit to EPA their SIPs revisions by December 17, 2007. The Florida DEP adopted a CAVR based on the federal rule in January 2007.

BART Requirements

BART requirements apply to facilities that began operation between August 1962 and August 1977. These BART-eligible sources may be required to install BART for SO₂, NO_x and particulate matter, if they are not subject to CAIR and do not adversely impact visibility of near by Class I areas. PEF operates five BART-eligible sources, including Anclote Units 1 and 2, Bartow Unit 3, and Crystal River Units 1 and 2.

The EPA rule establishes presumptive BART emission limits for coal-fired and oil-fired units greater than 200MW in size. For SO₂, the presumptive limit for coal units is based on use of flue gas desulfurization (FGD or "scrubbers") with a 95 percent removal efficiency or an emissions rate of 0.15 lb SO₂/mmBtu. For oil-fired units such as the Anclote units, the presumptive limit for SO₂ is oil with a sulfur content of less than one percent. For NO_x, the EPA presumptive limit for tangential coal-fired boilers such as Crystal River Units 1 and 2 is 0.28 lb NO_x/mmBtu. BART for NO_x emissions from an oil-fired unit is defined as combustion controls. Particulate matter from coal-fired units is already controlled with electrostatic precipitators (ESPs), and the BART regulation is silent on particulate control for oil-fired units.

The deadline for installing BART controls in the Florida rule is December 31, 2013. Per the Florida DEP's BART requirements, a BART determination is not required for SO₂ and NO_x for

any BART-eligible source that is subject to CAIR. If after the December 2013 compliance deadline, Florida DEP determines that reasonable progress has not been made toward improving visibility in Class I areas, controls may be required for individual units. This additional further progress requirement may impact Crystal River Units 1 and 2, which would lead to the installation of additional controls prior to December 31, 2017.

Permit Requirements

The Florida BART rule required that utilities submit BART permit applications for affected units by January 31, 2007. These applications were required to contain demonstrations that the CAVR BART requirements will be satisfied or notify that the units are exempted from the rule. Changes resulting from BART implementation will be reflected in amendments to the facilities' Title V air operating permits. In addition, air construction permits must be obtained prior to the installation of pollution control equipment. PEF timely submitted its BART notifications/applications, and they are currently under review by the DEP.

The Crystal River Units 1 and 2 BART application addressed particulate matter emissions. Particulate emissions were modeled at the New Source Performance Standard level of 0.015 pounds per million BTUs heat input. The modeling showed no appreciable change in visibility at the Class I areas; therefore, PEF concluded that no additional particulate controls are required. On February 27, 2007 the FDEP requested additional information regarding PEF's application. PEF is currently in the process of responding to this request.

For Anclote Units 1 and 2, PEF has provided all additional information requested by the Agency and is awaiting FDEP's determination of the BART exemption.

Other Environmental Requirements

NPDES Permitting

SCR and FGD systems create wastewater that must be treated and discharged to the environment. A discharge of waste water to surface waters is not anticipated. The existing National Pollutant Discharge Elimination System (NPDES) permits for the affected generating units will not need to be modified to authorize the discharge of treated wastewater.

Consumptive Use (Water) Permitting

FGD systems require the use of a large amount of freshwater, brackishwater and /or seawater in the pollutant removal process. Freshwater and/or brackishwater would be withdrawn from the existing underlying aquifer. Saltwater would most likely be withdrawn from an existing plant intake. The Southwest Florida Water Management District (SWFWMD or District) is the permitting authority for the consumptive use of water at the Crystal River site. Freshwater is a limited and valuable resource that is becoming more difficult to obtain. To procure an authorization for the freshwater withdrawal, an extensive demonstration of need and impact must be made to the District. The District will require that efforts be made to reduce the use of freshwater to the maximum extent possible. This would include the minimization of the existing water use as well as any possible process changes that could result in water conservation. The District also requires consideration of the lowest quality of water that is acceptable. Lower quality saltwater or brackishwater can be used in some FGD systems and, therefore, will need to be addressed as a potential alternative to freshwater during the consumptive use permitting

process. The SWFWMD has requested that PEF perform a water supply alternatives analysis investigating the potential to utilize saltwater, brackish water and/or desalinated water in place of fresh groundwater wherever feasible. This study must be completed prior to any staff recommendation to the District Governing Board. District staff has stated that no water will be authorized for use in Units 1 & 2 at this time.

NSR Permitting

Under DEP's New Source Review (NSR) permitting program, preconstruction air permits are required for plant modifications that result in significant increases in certain air pollutants. One condition of NSR permitting is to install Best Available Control Technology (BACT) for emission increases above specific threshold levels. Historically, pollution control projects were exempt from NSR permitting. In 2005, however, a federal appeals court vacated the NSR exemption for pollution control projects and, effective February 2006, the exemption was removed from Florida's SIP. As a result, NO_x or SO₂ control projects included in PEF's compliance plan are now be subject to NSR review if they result in significant increases in other pollutants, such as particulate matter.

On May 18, 2007, the DEP issued a final air construction permit for the Crystal River Unit 4 and 5 projects. Among other things, the permit included BACT requirements for particulate matter (PM/PM₁₀), sulfuric acid mist, and carbon monoxide. The estimated cost of these requirements has been included in the economic analysis presented in Chapter 5. However, there is an outstanding issue regarding the potential effect of the Anclote LNB/SOFA projects on particulate emissions. PEF is analyzing whether the LNB/SOFA projects will result in increases of particulate emissions that trigger BACT requirements. If BACT is required, additional particulate controls, such as precipitators, would likely need to be installed and, as a result, the project schedules would need to be moved back in time. If it is determined that precipitators or other controls need to be installed, PEF will evaluate whether the cost of the additional controls increases the cost per ton of NO_x removal above the expected cost of NO_x allowances. Because PEF's analysis of the issue is ongoing, however, cost estimates for particulate controls and potential schedule impacts have not been incorporated into PEF's economic analysis.

Status of PEF's Integrated Clean Air Compliance Plan

This section provides an update of PEF's implementation of its Integrated Clean Air Compliance Program.

Significant Milestones

PEF is currently working with Environmental Partners Crystal River (EPCR), a joint venture of the primary engineering and construction companies, to finalize the Engineering, Procurement and Construction (EPC) contract and to complete the detailed construction schedule for Crystal River Units 4 and 5 work. In order to ensure the in-service dates are met for the key environmental equipment installation for Crystal River Units 4 and 5, the following schedule of key milestone activities have been agreed upon between PEF and EPCR.

Date	Activity
May 2007	Mobilize contractors & begin site preparation
Third Quarter 2007	Complete foundation work
Third Quarter 2008	Absorber tower erection complete
██████████	██
Fourth Quarter 2008	Crystal River Unit 5 liner and duct complete
First Quarter 2009	Material handling construction complete
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Project to date Spending

As of the end of the first quarter 2007, the approximate total project costs incurred by Progress Energy Florida (PEF) for expenditures related to CAIR are \$58 million. The \$58 million includes: \$55 million of contract billings, \$2 million of owners costs, and \$1 million of AFUDC. AFUDC began accruing with the start of construction in March 2006. The contract billings include payments for: design and engineering work, procurement of major equipment, issuance of a Letter Of Intent (LOI) and environmental permits.

Design and engineering work is being performed by two major vendors, Worley Parsons and Babcock & Wilcox. The major equipment that is being procured includes: ID fans, limestone silos, rotary feeders, piping, oxidation air blowers, SCR expansion joints, chimney, catalyst, and stack/absorber.

Pursuant to the LOI, [REDACTED] was paid to the construction vendor; Environmental Partners Crystal River (EPCR). EPCR consists of three vendors: Zachry, Burns & McDonnell, and Utility Engineering. EPCR is currently mobilizing and has initiated site and prep-work for upcoming construction.

Permits for SCR air, storm water modification, waste water, and VBS exemption have been approved through April 2007. Other permits that have been applied for include an air construction permit, a consumptive water use permit, access road environmental resources permit (ERP), and a permit for the well water pipeline.

Chapter 5 Evaluation and Results

This section provides a quantitative analysis of the alternative compliance plans, including an examination of the projected emissions of the plans and the impact on costs, in terms of cumulative present value of revenue requirements (CPVRR).

Plans Evaluated

The alternative compliance plans evaluated for this report are similar to the plans evaluated in PEF's 2006 report, with some minor changes, as discussed below. No other changes were made to the plans. Implicit in this is the assumption that all the plans can be implemented today as envisioned, which is not likely the case. For all practical purposes, Plans A and E cannot be implemented as originally indicated, simply due to the passage of time. Even though they cannot be implemented, they are still shown in the analysis results to maintain continuity with the 2006 Plan report.

Changes to Alternative Plans

During the past year, changed conditions have necessitated revisions to the alternative plans. The most significant changes, affecting four of the five plans, are the in-service dates of the FGD and SCR controls on Crystal River Unit 4. [REDACTED]

PEF changed the Unit 4 FGD and SCR project schedules to (1) optimize the most efficient construction schedule, which will mitigate cost escalation risks, (2) account for constrained labor and equipment availability in the 2008-2009 time frame. The original schedule called for as much work as possible to be done on Crystal River Unit 4, including installation of the SCR, during an outage planned for the [REDACTED] so that the work necessary for the tie in of the FGD in [REDACTED], would be minimal. This was necessary to avoid impacting an outage already planned for the [REDACTED] on PEF's Crystal River Unit 3. Due at least in part to the increased demand for pollution control projects prompted by the adoption of CAIR, lead-times for critical SCR equipment have increased. To compensate for the increased lead-times, in late 2006, the company decided to reschedule the Unit 4 SCR project for an outage in the [REDACTED]. As preliminary engineering and planning progressed, however, it became evident that there was not adequate time to permit, design, engineer, procure, and construct the Unit 4 SCR system by the [REDACTED]. We considered various options and chose to combine the SCR and FGD work into one outage in the [REDACTED]. Given the scope and amount of work to be performed at the Crystal River Energy Complex in the [REDACTED] outage, we determined that it would not be reasonable or prudent to combine the Crystal River Unit 4 SCR and FGD project into that outage.

The other change, which affects Plans D and E, is the elimination of the use of natural gas at the Anclote Plant. In the 2006 report, the Anclote Plant was assumed to burn 40% natural gas after 2010 in Plans D and E. Burning 40% natural gas was determined to be economical for SO₂ emissions reduction; however, the analysis assumed that the pipeline capacity to get natural gas to Anclote was available at no additional cost. This assumption is no longer valid as there is no extra pipeline capacity available. Including a pipeline reservation fee makes burning gas at

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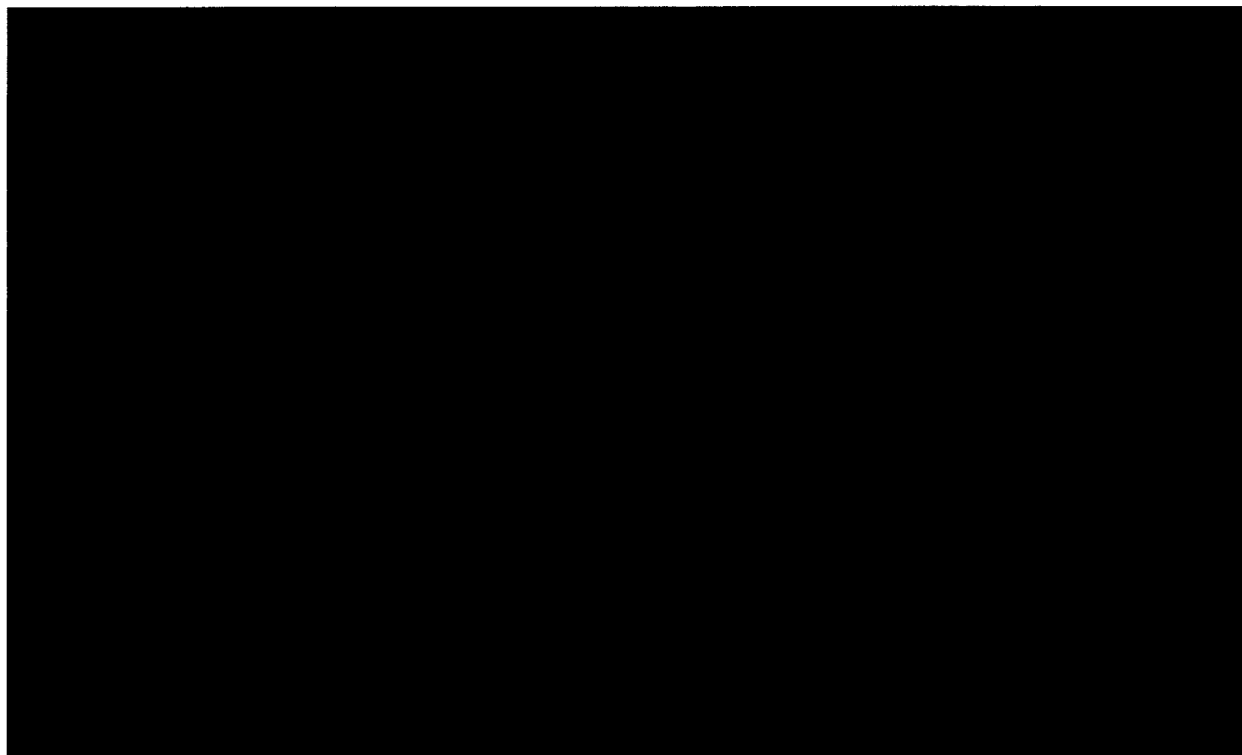
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Anclote uneconomical at this time. An alternative to reserving new pipeline transportation would be to divert natural gas for Anclote from the PEF combustion turbines (CTs) and burn distillate (#2) fuel oil at the CTs; however, doing so would increase emissions and increase costs since distillate fuel oil is more expensive than natural gas and the residual (#6) fuel oil used at Anclote. As discussed in the 2006 report, the final decision to switch to lower sulfur fuels will be made closer to implementation time. The fuel to be burned will be that which has the lowest overall cost. PEF will continue to monitor the fuel price and pipeline availability dynamics.

In addition to these five plans, a new alternative plan, Plan F, was developed and evaluated. Plan F is similar to Plan A, but the controls on Crystal River Units 1 and 2 are on a delayed schedule. In Plan F, FGD and SCR controls are added to Crystal River Unit 1 by 2015 and FGD and SCR controls are added to Crystal River Unit 2 by 2016. Once controls are added, Plan F is the same as Plan A from an emissions perspective. Plan F also represents how Plan D could evolve if circumstances change in the future. The additional controls on Units 1 and 2 may need to be added in response to the "Beyond BART" requirements of the Clean Air Visibility Rule, as discussed in Chapter 4, or they could be added if allowances prices turn out to be higher than anticipated.

Table 1 outlines the six plans evaluated.

Table 1. Summary of Alternative Compliance Plans



Environmental Compliance

The compliance achieved by each plan for CAIR and CAMR is demonstrated by the following charts. In the charts, the projected emissions of SO₂, NO_x, and mercury for Plans A through F are shown compared to the number of allowances the Company expects to receive. The expected allowances are shown by a black line. For SO₂, the line showing allowances actually represents "emission-equivalent" allowances. Emission-equivalent allowances are the number of allowances divided by the "CAIR factor." The CAIR factor is the number of allowances that must be "redeemed" for each ton of SO₂ emissions. The value of the CAIR factor is 2.0 from 2010-2014 and 2.86 in 2015 and beyond.

SO₂

The projected PEF system emissions of SO₂ for the Baseline (without CAIR) and for Plans A through F are shown in Figure 1. As can be seen in the chart, only Plan A reduces emissions below the number of allowances during Phase I of CAIR, and only Plans A and F have emissions below the number of allowances during Phase II. Plans A and F have scrubbers on all four Crystal River coal units. Plans B and C, which include scrubbers on three of the four Crystal River coal units, have emissions near the number of allowances in Phase II. [REDACTED]

[REDACTED]. The chart also shows that Plan D will reduce emissions by more than [REDACTED] compared to the Baseline.

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Figure 1. SO₂ Emission Projections

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NOx

The projected PEF system emissions of annual NOx for Plans A through F are shown in Figure 2 (ozone season emissions are approximately half of the annual allowances). As shown in the chart, none of the plans reduces emissions below the number of allowances in 2009 through 2011. Only Plan A reduces emissions below the number of allowances during the latter half of Phase I of CAIR, and only Plans A and F have emissions below or only slightly above the number of allowances after 2015. Plans A and F have SCRs on all four Crystal River coal units.



emissions by more than [redacted] compared to the Baseline.

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Figure 2. NOx Emission Projections



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Mercury

The projected PEF system emissions of mercury for Plans A through F are shown in Figure 3. Only Plan A reduces mercury emissions below the number of allowances in all years of Phase I. Plans B, C, D, and F reduce emissions below the number of allowances in 2010 and 2011, and would be able to bank and use these allowances to cover emissions that are greater than the number of allowances during the latter years of Phase I. In Phase II, none of the plans reduce

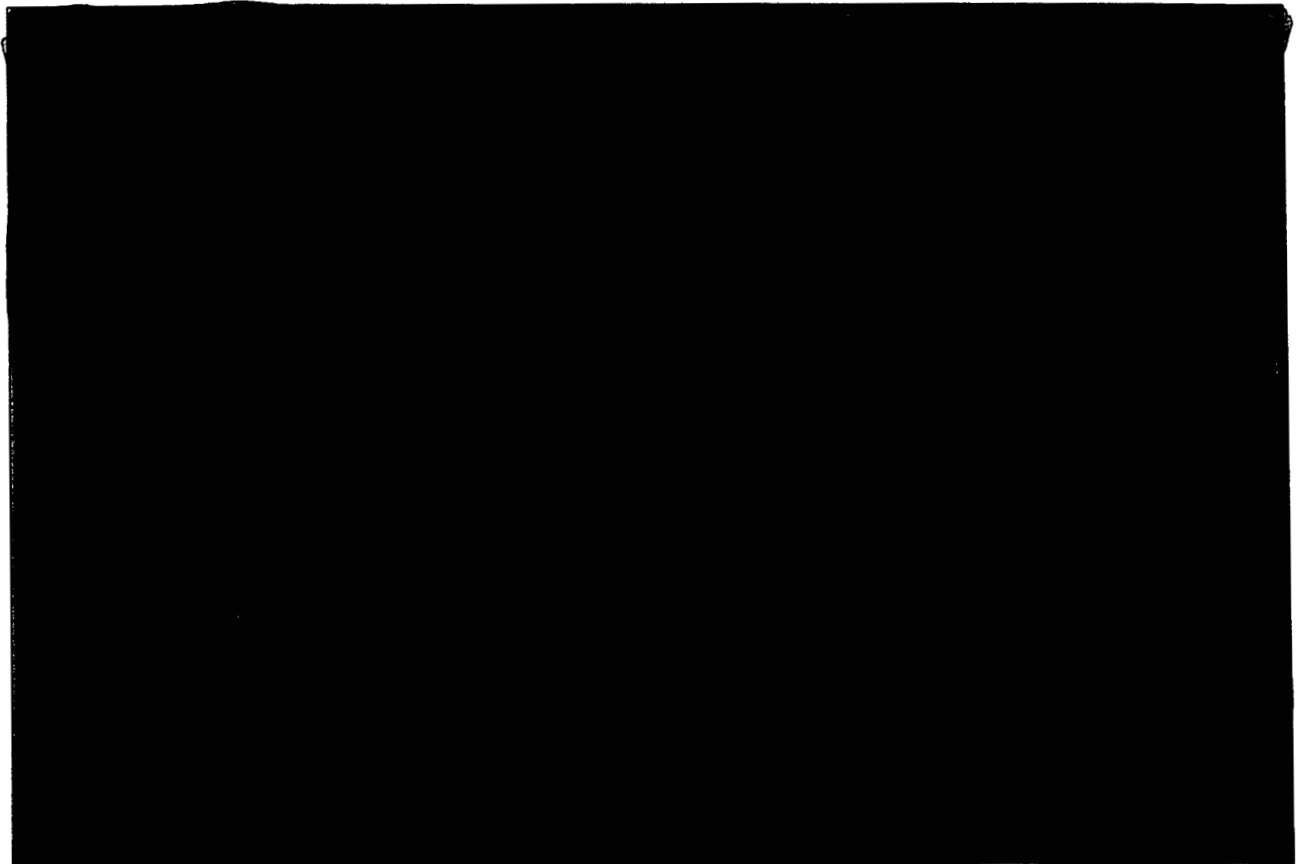
emissions below the number of allowances provided; thus, either additional controls will be required or allowances will need to be purchased. [REDACTED]

[REDACTED]. The chart shows that the Plan D mercury emissions are reduced by over [REDACTED] compared to the Baseline.

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The increase in mercury emissions during Phase II is due to new coal unit additions in the later years of the study. The proposed SIP includes a new unit set-aside provision, so additional allowances may be available, reducing the need for reductions as shown in the chart.

Figure 3. Mercury Emission Projections



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Economic Impact of Compliance

As described above, the economic impact of the alternative compliance plans were compared using the CPVRR. Included in the CPVRR are the projected capital and O&M costs associated with controls, the projected cost of reagents (limestone and ammonia), credits for the sale of by-products (gypsum), the projected change in fuel costs compared to the Baseline projection, and the projected cost of purchasing or selling allowances.

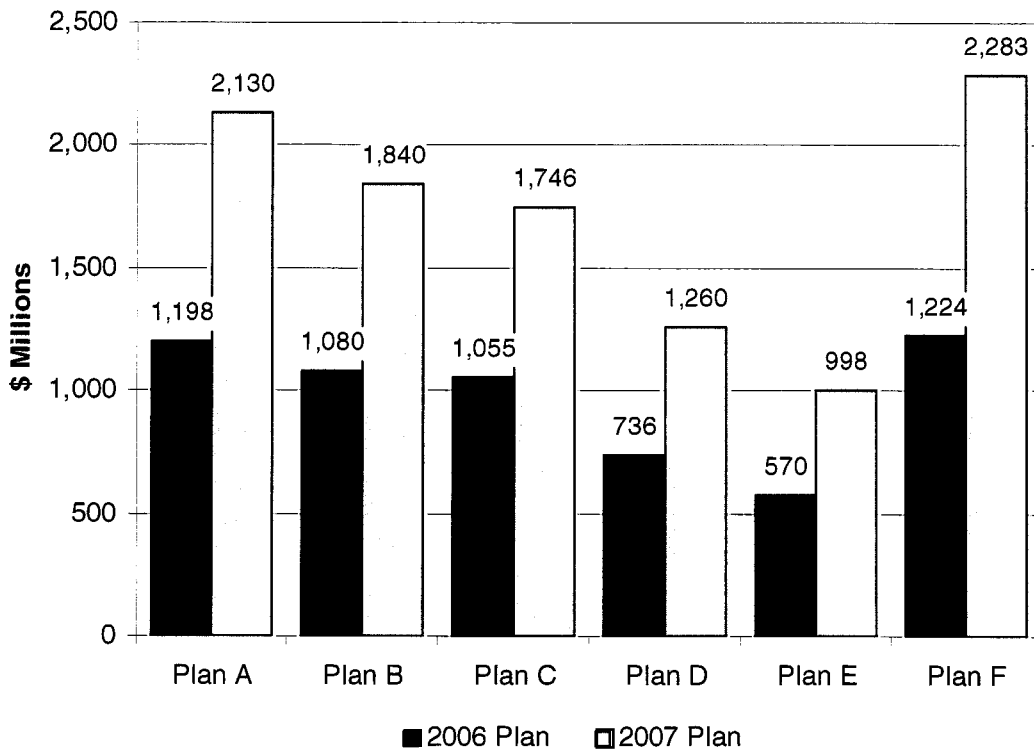
Changes in Assumptions

Construction Costs

The estimated costs to add pollution controls on the PEF units have increased since the time the 2006 Compliance Plan and are shown in Figure 4. The construction costs for Plan D are now approximately 70% greater than they were in the 2006 Plan Report. There are several reasons for the cost increases.

One of the impacts of the final CAIR rule was to create significant industry demand for major retrofit construction projects to engineer, procure, and install the necessary air pollution control equipment. This occurred at a time when there was already significant construction activity due, in part, to an improving economy. The situation was exacerbated by even more construction demand in the aftermath of Hurricane Katrina and by the rising demand for steel, concrete and other commodities in countries such as China and India. As a result of these world-wide market conditions, PEF and the industry began to see significant increases in costs for major construction projects, especially for SCR and scrubber installations. The increases were primarily driven by significant escalation in the cost of basic construction materials and in labor costs.

Figure 4. Construction Expenditures Compared to 2006 Plan

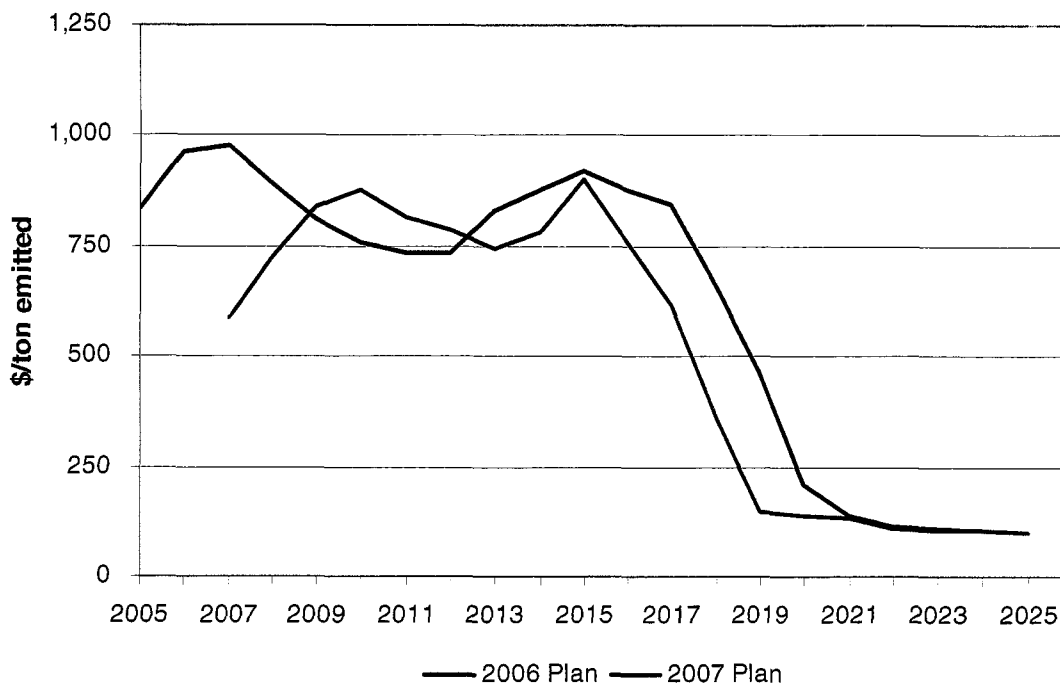


Allowance Prices

As discussed in the 2006 PEF Compliance Plan report, allowance prices have been extremely volatile. Since the time of the 2006 Plan, forecasted allowance prices have decreased according to the Company's allowance price forecast service, as shown in Figures 5 and 6. Also discussed

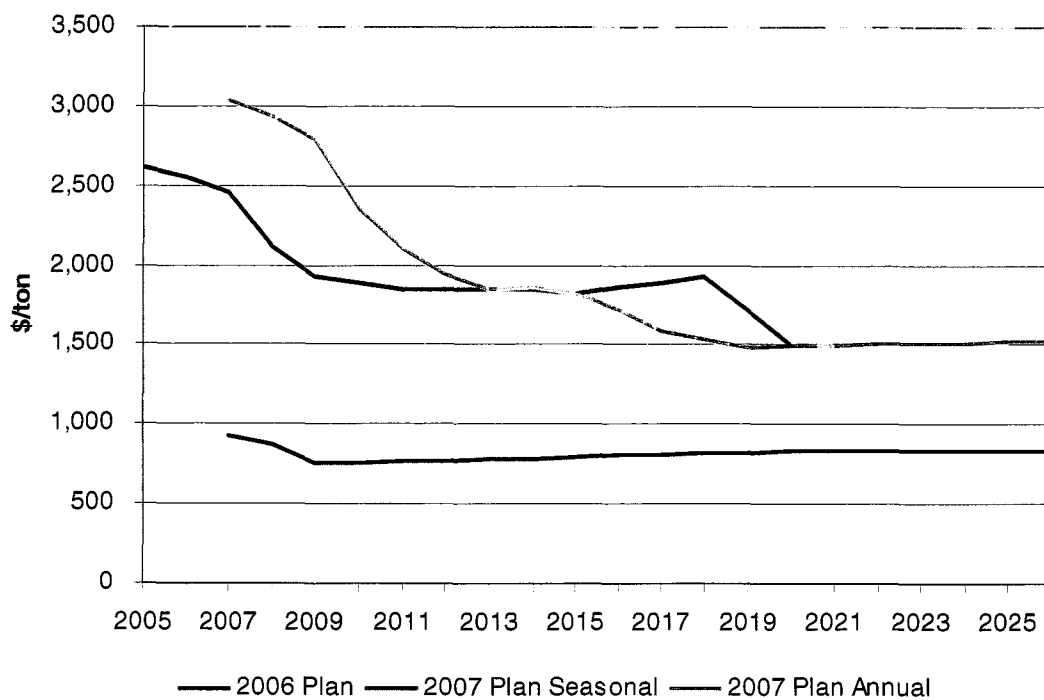
in the 2006 Plan was the uncertain nature of allowance prices. This uncertainty has not been resolved. Figures 7 and 8 show projected high and low SO₂ and NO_x allowances prices.

Figure 5. Comparison of SO₂ Allowance Price Forecasts



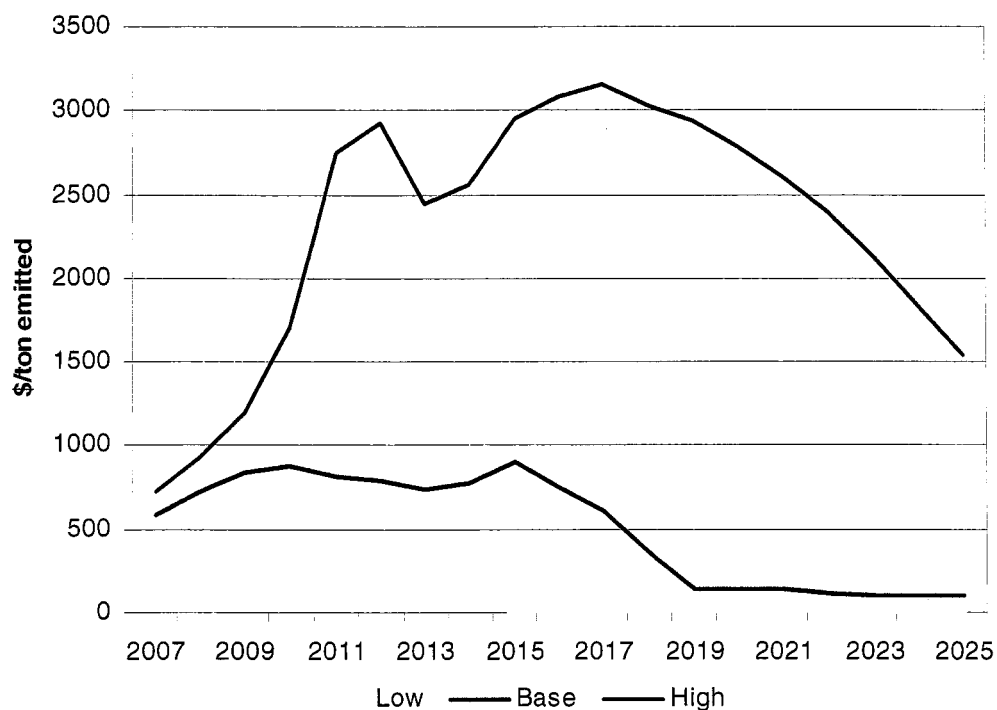
Source: JD Energy

Figure 6. Comparison of NO_x Allowance Price Forecasts



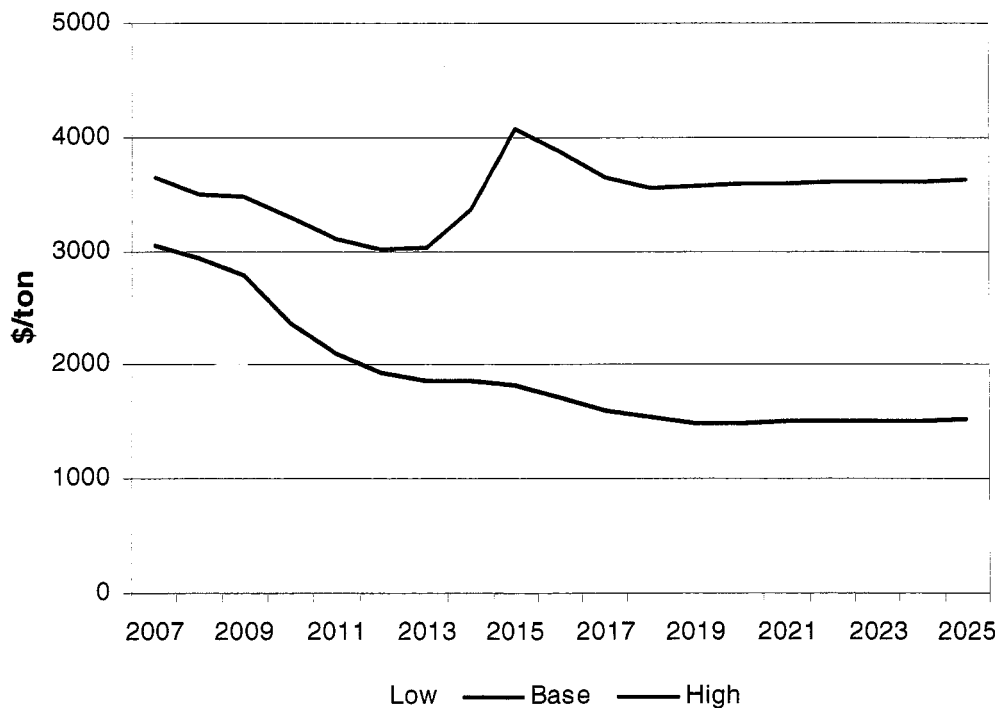
Source: JD Energy

Figure 7. Uncertainty in SO₂ Allowance Prices



Sources: JD Energy

Figure 8. Uncertainty in NO_x Allowance Prices

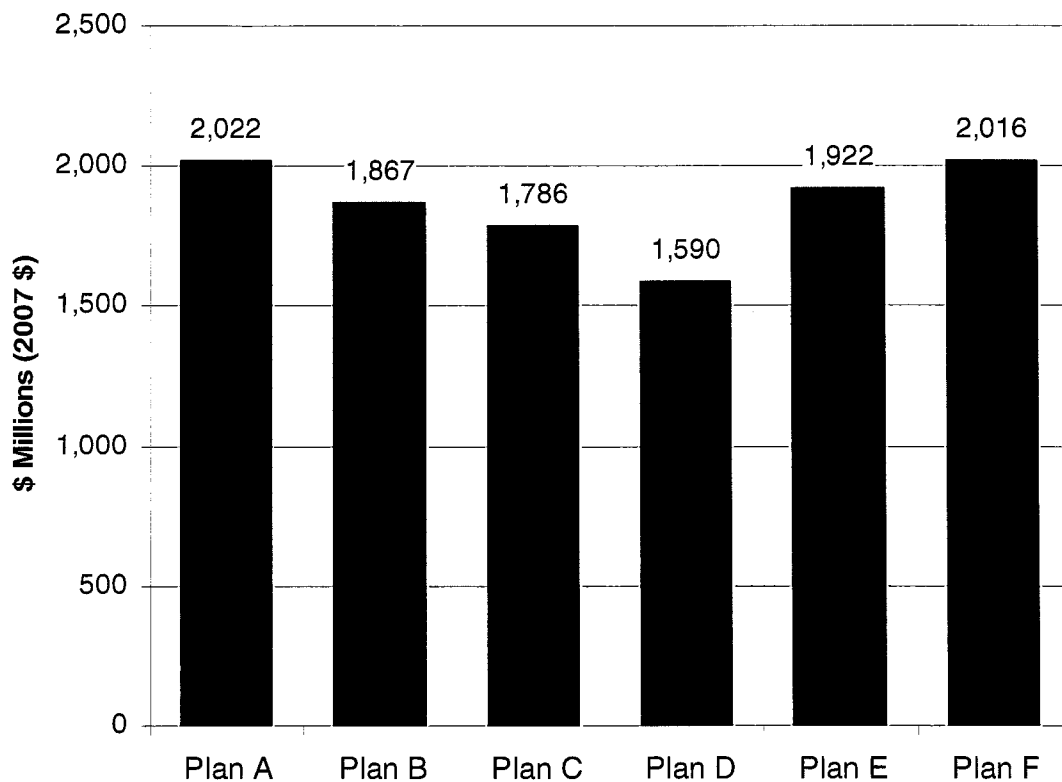


Source: JD Energy

Results of Economic Analysis

The higher capital costs associated with the pollution controls result in higher revenue requirements compared to the 2006 Plan. Because the cost for controls on each of the units increased, the costs of the plans relative to each other are consistent with what was seen in the 2006 Plan. The evaluated CPVRR of the plans are shown in Figure 9. The figure shows Plan A to be the most expensive plan and Plan D to be the least expensive plan. The results shown in Figure 9 are the costs including the economic impact of assuming allowances are either sold or purchased in each year (rather than banking allowances and using them in later years).

Figure 9. Comparison of Cumulative Present Value of Revenue Requirements

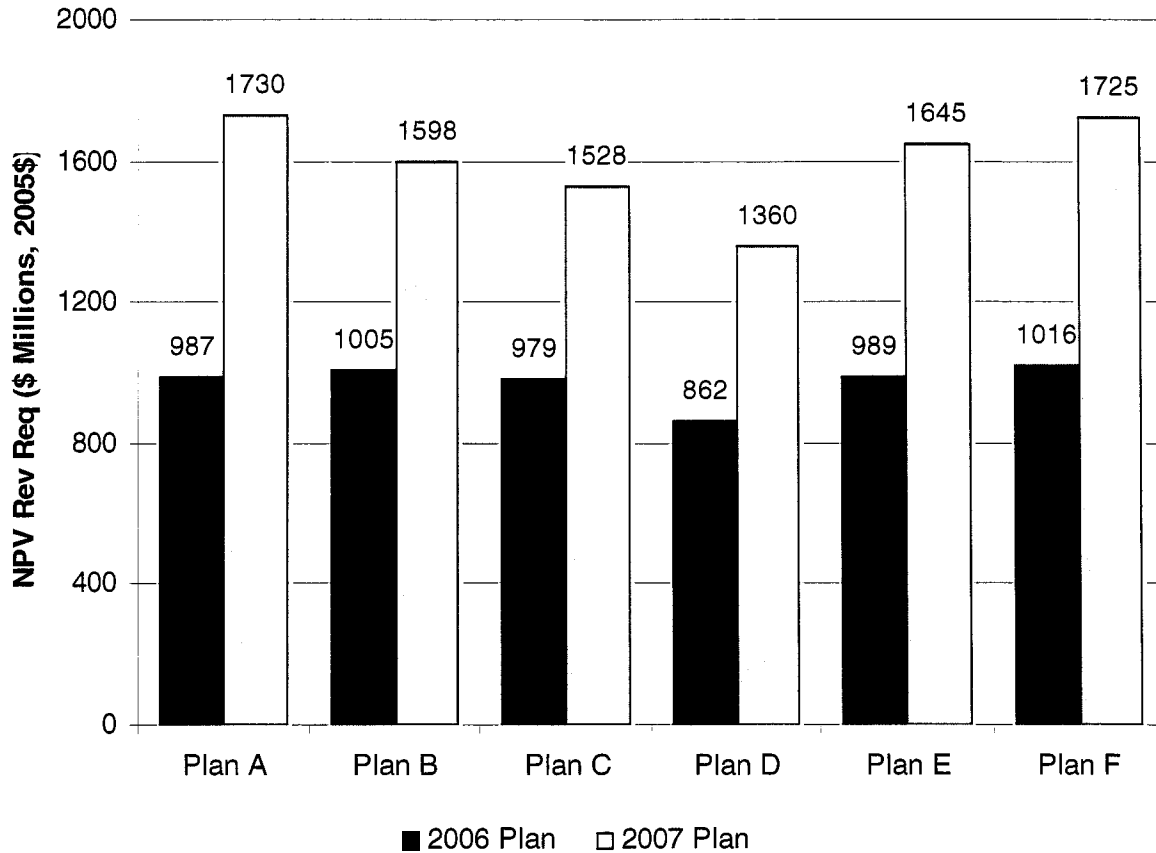


As in the 2006 Plan, the higher CPVRR cost of Plans A, B, C, and F are largely due to the capital costs associated with the emission controls installed. Plans B and C, which also comply with CAIR without significant long-term purchases of allowances, are less costly than Plans A and F. This result is expected because only three of the Crystal River units have emission controls installed, compared to Plans A and F, which have controls installed on all four units. Plan D is the plan with the lowest cumulative present value of revenue requirements. Plan D strikes a balance between installing controls and buying allowances by adding controls to the two largest coal units on the PEF system. It is noteworthy that Plan E is more costly than Plan D, even though the capital expenditures are considerably less. This is caused by the significant amount of allowance purchases that would be required with Crystal River Units 1 and 2 controlled, as assumed in Plan E, rather than Units 4 and 5 in all the other plans. The difference in costs between Plan D and Plan F illustrates the additional costs that may be incurred if pollution

controls are required on Crystal River Units 1 and 2 in order to comply with the “beyond BART” requirements of CAVR.

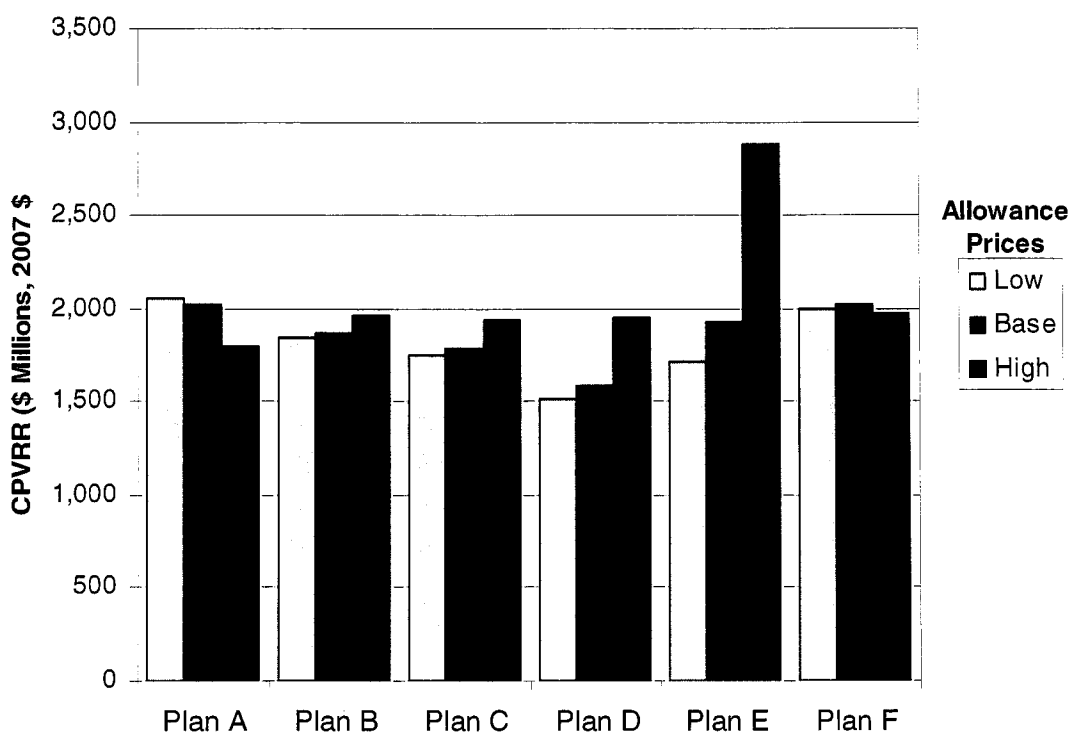
The CPVRR costs of the plans are now higher than what was projected in the 2006 Plan Report, as shown in Figure 10. The CPVRR cost of Plan D is now approximately 60% higher than the cost evaluation prepared for the 2006 Plan Report. As can be seen in the figure, the cost of the other plans increase by similar, or higher, percentages. Plans B, C, and E are between 55% and 65% higher than in the 2006 Plan Report and Plans A and F are 75% and 70% higher, respectively.

Figure 10. Costs of Plans Compared to 2006 Plan



Because the alternative plans developed rely on varying amounts of allowance purchases and the economics of some of the plans are impacted through the assumed sale of allowances more than others, the plans were also evaluated using the lower and higher allowance prices shown in Figures 7 and 8. Figure 11 presents the CPVRR of the alternative plans assuming low and high prices, in addition to the base allowance prices. The figure shows Plan D is the lowest cost plan under the base and low allowance price assumptions. Assuming high allowance prices, Plan A would be the most economic plan. This is because Plan A has SO₂ and NO_x emissions below the number of allowances received and can, therefore, sell allowances, reducing the overall cost of the plan. Plan E has the highest CPVRR when allowance prices are high because of the higher number of allowances that must be purchased to achieve compliance. Plans B, C, D, and F have approximately the same total CPVRR under the high allowance price scenario.

Figure 11. Impact of Allowance Price Uncertainty



Conclusion

As in the 2006 study, the economic analyses identify Plan D as the most cost effective alternative to meet the CAIR, CAMR, and CAVR regulations. Not only is Plan D the most cost effective plan under the base assumptions, it is the least cost plan if allowance prices are lower than the base assumptions and its costs are approximately the same as other plans that could be implemented if allowance prices go as high as tested under the high allowance price scenario. Thus, Plan D represents a good balance between adding controls and making use of allowance markets to comply with CAIR and CAMR requirements. If allowance prices appear to follow the high price forecast, Plan D provides PEF with the ability to add controls to either, or both, of Crystal River Units 1 and 2 in the future.

Chapter 6 Risk Assessment

As discussed in PEF's 2006 report, there are a number of uncertainties associated with the new CAIR, CAMR, and CAVR programs. These include regulatory uncertainties concerning the state's implementation of the new rules, as well as technological issues. This section provides an assessment of ongoing risks that could impact the costs and timing of PEF's implementation of its Integrated Clean Air Compliance Plan.

Environmental regulation

The compliance plan assumes no significant change in environmental laws and regulations during the course of this project. Potential changes in mercury and/or greenhouse gas legislation may impact the controls and/or technologies deployed.

Permits and Authorizations

The schedule assumes the timely receipt of approvals and permits from local, state, and federal regulatory agencies to facilitate the start of construction, including site certification, air permits, storm water, well water, access roads, wetlands mitigation, and wastewater. Other construction projects in Florida have experienced numerous permitting delays.

Third-party intervention

Certain segments of our existing workforce are unionized and the representative bargaining unit may intervene from time to time with the equipment and construction vendors selected for the project (mostly open shop contractors).

Allowance for Funds Used During Construction (AFUDC)

Currently the AFUDC rate applied to major construction projects has been established by the Florida Public Service Commission and our estimates assume average annual cash flows as the basis for AFUDC calculation. Changes in either the timing of cash flows on a monthly basis or changes in the AFUDC rate prescribed by the FPSC may alter the total project cost.

Scope Changes

Although we are seeking certain firm-price contracts for the major equipment and construction aspects of the project, any subsequent scope changes, unknown site conditions, or unknown degradation to existing plant equipment/systems may result in cost impacts to the project.

Pre-existing site conditions

Although certain engineering and design activities have been completed, unforeseen pre-existing site conditions (subsurface, excavation, hazardous materials, etc.) may not be known until construction begins. Additionally, inspections of the internal operations of plant equipment may result in additional design modifications or change orders.

Design scope definitions

The full design scope definitions may not be fully clarified at the time the EPC contract is signed. Such items shall be treated as an allowance and cost may increase or decrease based upon further engineering studies.

Schedule

Although most contracts contain provisions for date certainty completion with liquidated damages for delays, the non-performance of suppliers or contractors may adversely impact the schedule and/or cost of the project. The schedule assumes our ability to procure major long-lead time equipment and obtain permits on a timely basis. Additionally, as discussed below, force majeure events could adversely impact the construction schedule and cost of the project.

Change orders and/or claims

As common in the construction industry, certain aspects of the execution of the contract may need to be altered due to investigations, inspections or other unforeseen modifications in the design that may result in either change orders or claims and these modifications may alter cost and/or schedule assumptions.

Vendor solvency

Although we assess the vendors' ability to fulfill contractual obligations prior to contract execution, any change in their solvency may impact overall cost and/or schedule of the project.

Economic evaluation

Subsequent changes in cost forecasts for emissions allowances, fuel, operating and maintenance expenses, construction costs, etc., may result in a different preferred compliance option.

Technical Feasibility

Although the air quality control technologies (AQCS) under consideration for this plan have been deployed at other coal generating units, the retrofit of any existing operating coal power plant comes with inherent design, construction, commissioning, and operability risk. Additionally, the design of an AQCS project of this magnitude (low NO_x burners + SCR catalysts + precipitators + scrubbers) assumes the ability to meet required permitted emissions levels for NO_x, SO₂, carbon monoxide (CO), mercury, sulfur trioxide (SO₃), and particulate matter.

Gypsum by-product disposal

The contract with a third-party to acquire by-products from the FGD process assumes a given quality and quantity of by-product. Additionally, the by-product customer is building a manufacturing facility adjacent to the Crystal River complex. Accordingly, our ability to dispose of the by-product may be impacted by the permitting and construction schedule of this facility.

Nuclear plant operations at Crystal River

The fossil units at the Crystal River complex are adjacent to the nuclear power plant and may be subject to enhanced security events that could halt or delay construction activities. Construction could also be impacted by NRC-imposed regulations or rules related to chemicals used in the operation of the compliance controls or gypsum facilities and/or enhanced background investigations for technical and craft personnel. Additionally, the construction activities related to the steam generator replacement and uprate plans may be concurrent with the CAIR construction schedule and could have an impact.

Turndown operations

The design of the new air quality control system is intended to allow the existing plant to meet its current minimum load requirements, however, actual results may differ from design and potential re-work or other plant needs might be necessary.

Performance targets

While the design of the compliance controls is intended to meet certain performance targets (emissions reduction, auxiliary power, duct pressure drop), the actual results may differ from the design targets and additional modifications, enhancements or improvements may result.

Start up and Commissioning

The retrofit of controls onto an existing operating plant may require operational refinements of both the generation and controls equipment to perform to its intended design. These refinements may result in schedule and/or cost changes.

Hazardous materials

The addition of the compliance controls and nearby gypsum plant will increase the level of certain chemicals during construction and operation, such as ammonia and natural gas, that will result in greater oversight of these and other hazardous materials.

Fabrication plant for fiberglass ductwork

The vendor providing the new fiberglass flue ductwork plans to manufacture the ductwork near Crystal River and their ability to acquire land, receive permits, and build the facility may impact the overall cost and schedule of the project.

Owner-supplied equipment

The performance (engineering, manufacturing, and delivery) of the owner-supplied equipment vendors, primarily the key compliance technologies, has a direct impact to the overall schedule and cost of the project. Any nonconformance or performance shortfalls by these vendors may result in claims or change orders by the EPC Contractor.

Warranty Risk

While our contractual arrangements contain warranty provisions, latent defects within the equipment or defects as a result of installation by the EPC Contractor may result in schedule and/or cost changes.

Third party damage

Damage to existing assets caused by third-parties during construction may have a negative impact on the operating units at Crystal River. A builder's risk insurance policy will be in place to cover potential damage to the new construction work while the existing plant will be covered under Progress' umbrella policy.

Quality assurance and control

While quality control and assurance is monitored throughout the design, manufacturing, and construction phases of the project, rework required during these phases may result in schedule and or cost changes.

Force Majeure

The Crystal River fossil units are located within proximity to the Gulf of Mexico at an elevation relatively close to sea level. The units are also located adjacent to an operating nuclear power plant. The design factor for the compliance controls is designed to withstand up to 120 mph winds. Accordingly, a catastrophic weather event may result in declaration of force majeure by vendors and/or contractors. Additionally, other events such as terrorism, nuclear accidents, enhanced security, storm surges, other causes of increases in sea level, labor halts for suppliers or contractors, transportation delays for major equipment and other events may result in declaration of force majeure. An event of Force Majeure may have a schedule and/or cost impact to the project.

Safety

Over the duration of the environmental compliance projects, we anticipate in excess of 2 million direct field craft man-hours to complete the construction efforts. While we will continue to foster our safety-oriented culture, the additional personnel and heavy equipment, in conjunction with the planned nuclear construction activities and ongoing plant operations, increases the potential of safety related events.

Conclusion

Given the uncertainties discussed above, as well as circumstances that may come to light in the future, PEF's compliance planning process is dynamic. As more information is developed, PEF will continue to evaluate compliance options in light of changed circumstances and, when appropriate, the Company will adjust the Integrated Clean Air Compliance Plan accordingly.

Appendix 1 Contracts

EPC Contract – Crystal River Units 4 & 5 Scrubber Project

Name of Counterparty: Environmental Projects Crystal River (EPCR) - a joint venture comprised of Zachry Construction Corporation (Zachry), Utility Engineering Corporation (a subsidiary of Zachry), and Burns & McDonnell, Inc.

Scope of Service: EPCR will be responsible for the engineering, procurement, construction and project management for the Flue Gas Desulphurization (“FGD”) system and the Selective Catalytic Reduction (“SCR”) system to be installed at Progress Energy Florida’s (“PEF”) Crystal River Plant, Units 4 & 5 that is not covered by PEF’s other contractual arrangements with WorleyParsons, which has provided some preliminary engineering and procurement work for certain critical path elements, and with The Babcock & Wilcox Company, which has provided and will continue to provide certain process design and procurement work for portions of the SCR and FGD systems.

Selection Process:

In May 2006, PEF issued an RFP to Zachry, Fluor Enterprises, Shaw Stone & Webster, Inc., and Bechtel Power Corporation, all of whom had been identified as qualified vendors who were interested in performing the extensive work required to implement PEF’s CAIR Compliance Plan projects at Crystal River. The RFP required submittal of an open book, detailed cost breakdown structure aligned with an eventual conversion to a lump sum type format. The cost breakdowns were required to be submitted in a specific format so that the Company could review various components of the fixed price type structure, among other things, scope of supply, quantities, subcontracts, equipment, escalation rates, contingencies, fees, general and administrative (“G&A”) costs, and indirect costs. The Company communicated with all four qualified vendors, but EPCR was the only bidder willing to provide a competitive open book type approach bid with the ability to convert to a lump sum, fixed price type format. Two of the bidders declined to provide a competitive bid and were only interested in working on an exclusive basis with the Company and one bidder determined that it did not have an available project team to support the project.

In November 2006, following a detailed review of the EPCR proposal and an evaluation of the capabilities of the EPCR partners, the parties executed a Letter of Intent (LOI) to provide time for PEF to further define the scope of the project so that detailed pricing could be developed and evaluated. The LOI has been extended and revised to provide a framework for the ongoing negotiations as well as the basis for preliminary engineering, procurement and initial site-related activities necessary to progress toward meeting the in-service dates of the various projects.

Cost: Under the LOI, PEF will pay Zachry up to [REDACTED] for costs associated with the Preliminary Work. To date, Zachry has provided indicative, lump sum pricing of approximately [REDACTED] for the EPC contract. The final price contract value will be determined at the completion of the contract negotiations.

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LOI Terms & Conditions:

The LOI is limited in cost exposure with a not-to-exceed cap of [REDACTED] for costs associated with the Preliminary Work. PEF's intent in issuing the LOI is to have the Preliminary Work commence during the course of ongoing negotiations on the EPC Contract so that the project can be completed in a timely manner.

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The Stebbins Engineering and Manufacturing Company

Name of Counterparty: The Stebbins Engineering and Manufacturing Company
("Stebbins")

Scope of Service: Design, fabricate, construct and assemble two Flue Gas Desulphurization Absorber Towers ("FGD Towers") for the Crystal River Units 4 & 5 scrubber project

Selection Process:

As part of Progress Energy Florida's ("PEF") compliance with CAIR and CAMR, PEF executed a contract with Stebbins for the design, fabrication, construction and assembly of the FGD Towers for the CR 4 & 5 scrubber project. PEF executed the contract to meet the current 2009 and 2010 in-service schedule and implement CAIR/CAMR compliance plan in the most cost-effective manner.

Stebbins is one of two companies that manufacture scrubber towers. PEF compared Stebbins' concrete and ceramic tile design against the other manufacturer's (The Babcock & Wilcox Company) alloy design. Based on overall cost, suitability for the Crystal River site, and prior experience with Stebbins, PEF selected Stebbins. PEF's sister utility, Progress Energy Carolinas ("PEC"), had used Stebbins to construct nearly identical towers at its Roxboro, Mayo and Asheville plants. Stebbins performed well and met schedules on these projects. By using Stebbins, PEF also takes advantage of engineering efficiencies gained from PEC's experience and obtained a place in the tight production queue for such equipment. Further, PEF obtained a place in the tight production queue for such equipment. Based on the foregoing, PEF selected Stebbins to perform this work and executed a contract with Stebbins on January 24, 2007.

Cost: [REDACTED]

Principal Terms & Conditions

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Commonwealth Dynamics, Inc.

Name of Counterparty: Commonwealth Dynamics, Inc. ("CDI")

Scope of Service: Design, fabricate and construct one Flue Gas Chimney ("FG Chimney") for the Crystal River Units 4 & 5 scrubber project

Selection Process:

As part of Progress Energy Florida's ("PEF") compliance with CAIR and CAMR, PEF executed a contract with CDI for the design, fabrication and construction of one FG Chimney for the CR 4 & 5 scrubber project. PEF executed the contract to meet the current 2009 and 2010 in-service schedule and implement CAIR/CAMR compliance plan in the most cost-effective manner.

PEF selected of CDI to design and erect the Crystal River chimney on the basis of both competitive pricing and technical and commercial evaluations performed as part of the Progress Energy Carolina (PEC) scrubber program. Early in the PEC program, the Company reviewed the marketplace and found only three companies with the capability to design and manufacture Flue Gas chimneys for scrubber projects: CDI, Pullman Power, and Hamon-Custodis. PEC obtained proposals from those companies and after evaluation of appropriate competitive factors, including safety programs, cost, design, resource availability, and ability to meet required schedules, awarded the PEC chimney work to CDI. For Crystal River, PEF negotiated a price with CDI based on the PEC competitive prices adjusted for quantity differences and material, equipment, and labor escalation. At the time the Crystal River contract was negotiated, the market for chimney work had changed significantly since the PEC projects were bid. As more utilities initiated scrubber additions, the demand for the limited resources of three chimney erectors increased significantly along with corresponding escalation in material, equipment, and labor costs. During negotiations, CDI agreed to hold its profit, overhead, and contingency to those percentages that had won the competitive bids at PEC and adjust labor and material prices based on current market conditions. Negotiating a contract with CDI on this basis provided PEF an opportunity to "lock-in" the chimney work for Crystal River on a reasonable price basis and on a schedule that supported the needs of the Crystal River project. At the conclusion of the negotiations, PEF executed a contract for the Crystal River chimney with CDI on January 26, 2007.

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CERAM Environmental, Inc.

Name of Counterparty: CERAM Environmental, Inc. ("CERAM")

Scope of Service: Design, fabrication, delivery and testing of the Selective Catalytic Reduction ("SCR") Catalyst for the Crystal River Units 4 & 5 scrubber project

Selection Process:

As part of Progress Energy Florida's ("PEF") compliance with CAIR and CAMR, PEF executed a contract with CERAM for the design, fabrication, and delivery of the SCR Catalyst for the Crystal River Unit 4 & 5 scrubber project. PEF executed the contract to meet the current 2009 and 2010 in-service schedule and implement CAIR/CAMR compliance plan in the most cost-effective manner.

PEF selected CERAM on a competitive bid basis and CERAM's ability to perform the work in accordance with PEF's specifications. On behalf of PEF, The Babcock & Wilcox Company ("B&W") reviewed the market and identified two potential vendors for the SCR Catalyst: CERAM and Cormetech, Inc. Both CERAM and Cormetech submitted bids for the design and manufacture of the SCR Catalyst. PEF determined that CERAM's bid provided the best offer, in terms of lowest cost and more favorable terms and conditions. PEF selected CERAM to negotiate a final agreement and executed a contract with CERAM on December 27, 2006.

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WorleyParsons Group, Inc.

Name of Counterparty: WorleyParsons Group, Inc. f/k/a Parsons Energy & Chemicals Group, Inc. ("WP")

Scope of Service:

Contract 114016, Work Authorization No. 24, Effective July 10, 2006. Work to be completed by the fourth quarter of 2006. Services for Units 4 and 5 steel support including detailed engineering and design.

Contract 114016, Work Authorization No. 24, Amendment No. 1, Effective November 30, 2006. Work to be completed by January 4, 2007. Additional engineering services for SCR steel design.

Contract 114016, Work Authorization No. 24, Amendment No. 2, Effective January 23, 2007. Increases dollar amount authorized for this work authorization.

Contract 114016, Work Authorization No. 25, Effective August 1, 2006. Work to be completed by December 31, 2007. SO3 mitigation study, preliminary engineering and procurement of limestone and gypsum handling system.

Contract 114016, Work Authorization No. 25, Amendment No. 1, Effective November 9, 2006. Howden ID fans.

Contract 114016, Work Authorization No. 26, Effective August 1, 2006. Work to be completed by December 31, 2007. Complete pressure transient study, bid evaluation for ID fans and motors, assist in EPC technical evaluation, scope finalization, review of EPC engineering documents, schedule and vendor documents.

Contract 114016, Work Authorization No. 29, Effective September 19, 2006. Establish costs and schedules to implement Continuous Mercury Monitoring Systems and integrate with the existing CEMS.

Contract 114016, Work Authorization No. 29, Amendment No. 1, Effective December 31, 2006. Extends completion date of Contract from December 31, 2006 to June 1, 2007.

Contract 114016, Work Authorization No. 42, Effective February 14, 2007. Provide procurement services for the purchase of ID Fans and Transformers for Units 4 & 5.

Selection Process:

As part of Progress Energy Florida's ("PEF") compliance with CAIR and CAMR, PEF entered into an alliance agreement with WP to furnish engineering, procurement and project management services for PEF's Flue Gas Desulfurization ("FGD") projects and FGD projects for Progress Energy Carolinas ("PEC"), PEF's sister utility. PEC first developed a short list of firms based on technical evaluations of statement of qualifications submitted by bidders. PEC then conducted interviews, site visits, and evaluations of additional information provided by the short-listed vendors to evaluate their experience, qualifications and project management programs. Based on this evaluation process, WP was selected as the Architect/Engineer.

After it became clear that CAIR would require installation of FGD and SCR controls on the Crystal River units, PEF became a party to the WP contract so that preliminary design and engineering work could begin expeditiously. On December 26, 2002, PEC entered into a master contract with WP. Progress Energy Service Company, acting as agent for PEF and PEC, amended and restated the master contract on July 10, 2006 (the "Master Contract") to meet the current 2009 and 2010 in-service schedule and implement CAIR/CAMR compliance plan in the most cost-effective manner.

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The Babcock & Wilcox Company

Name of Counterparty: The Babcock & Wilcox Company ("B&W")

Scope of Service:

Contract 242070 executed July 14, 2005. Project planning, scheduling and engineering with PEF associated with the FGD and SCR work for the Crystal River Power Plant Project. – This Contract is closed. The work was authorized in Amendments 9, 16 and 17. [REDACTED]

Contract 119440, Amendment No. 9, Effective February 27, 2006 – amends contract to include Progress Energy Florida, Inc.

Contract 119440, Work Authorization 14, Effective April 20, 2006 – Authorizes B&W to order ball mills and absorber recycle pumps for Crystal River Units 4 & 5.

Contract 119440, Work Authorization 14, Amendment No. 1, Effective December 5, 2006 – Increases value of work order to cover additional LG and LD time equipment costs.

Contract 119440, Work Authorization 15, Effective May 1, 2006 – Crystal River Unit 4 Selective Catalytic Reduction - Authorizes B&W to continue design specifications, material selections, vendor supply evaluations, water balances, and purchasing critical long lead time equipment.

Contract 119440, Work Authorization 15, Amendment No. 1, Effective November 8, 2006 – Increases value of work order to cover cost of sonic horns at Crystal River Plant Unit 4.

Contract 119440, Work Authorization 15, Amendment No. 2, Effective January 1, 2007 – Increases value of work order to cover material and labor costs for Crystal River Unit 4 Selective Catalytic Reduction.

Contract 119440, Work Authorization 15, Amendment No. 3, Effective April 11, 2007 – Increases value of work to cover Engineering/PM Services.

Contract 119440, Work Authorization 16, Effective May 1, 2006 – Crystal River Unit 4 Flue Gas Desulphurization - Authorizes B&W to continue process design, general arrangement and equipment layout drawings, design specifications, material selections, vendor supply evaluations, water balances, limestone analyses and purchasing critical long lead time equipment.

Contract 119440, Work Authorization 16, Amendment No. 1, Effective October 16, 2006 – Increases value of work order to cover costs for the purchase of long lead time and common equipment used for Crystal River Unit 4 Flue Gas Desulphurization.

Contract 119440, Work Authorization 16, Amendment No. 2, Effective January 1, 2007 – Increases value of work order to cover costs for engineering/PM services and for procuring Unit 4 absorber oxidation air lances.

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Contract 119440, Work Authorization 17, Effective May 1, 2006 – Crystal River Unit 5 Flue Gas Desulphurization - Authorized B&W to begin process design, general arrangement and equipment layout drawings, design specifications, material selections, vendor supply evaluations, water balances, limestone analyses and purchasing critical long lead time equipment.

Contract 119440, Work Authorization 17, Amendment No. 1, Effective October 16, 2006 – Increases value of work order to cover costs for the purchase of long lead time and common equipment used for Crystal River Unit 5 Flue Gas Desulphurization.

Contract 119440, Work Authorization 17, Amendment No. 2, Effective January 1, 2007 – Increased contract amount to cover costs for procuring Unit 5 FGD and common equipment.

Contract 119440, Work Authorization 19, Effective October 20, 2006 – Crystal River Unit 5 SCR - Authorized B&W to continue process design, general arrangement and equipment layout drawings, design specifications, material selections, vendor supply evaluations, water balances, limestone analyses and purchasing critical long lead time equipment.

Contract 119440, Work Authorization 19, Amendment No. 1, Effective January 1, 2007 – Increases value of work order to cover costs for engineering/PM services and for procuring Unit 5 Selective Catalytic Reduction.

Selection Process:

As part of Progress Energy Florida's ("PEF") compliance with CAIR and CAMR, PEC entered into an alliance agreement with B&W to furnish engineering, procurement and project management services for PEF's Flue Gas Desulphurization ("FGD") projects and FGD projects for Progress Energy Carolinas ("PEC"), PEF's sister utility. On March 14, 2003, PEC entered into a master contract with B&W (the "Master Contract"). PEC amended the Master Contract to add PEF as a party effective February 27, 2006, and to meet the current 2009 and 2010 in-service schedule and implement CAIR/CAMR compliance plan in the most cost-effective manner.

Cost: [REDACTED]

Principal Terms & Conditions

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