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March 16, 2007

Blanca Bayo
Director, Office of the Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, FL 32399

RE: Docket No. 070098-EI, Florida Power & Light Company's Petition to Determine Need for FPL Glades Power Park Units 1 and 2 Electrical Power Plant

Dear Ms. Bayo,

Please find enclosed an original and 15 copies of The Sierra Club, Inc. (Sierra Club), Save Our Creeks (SOC), Florida Wildlife Federation (FWF), Environmental Confederation of Southwest Florida (ECOSWF), and Ellen Peterson's Notice of Filing Corrected Direct Testimony of David A. Schlissel.

Please stamp the filing confirmation on the additional copy of this letter provided for your convenience. Thank you for your attention to this matter.

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- SEC CC: All Official and Interested Parties
- OTH _____

Sincerely,

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FPSC-COMMISSION CLERK

BEFORE THE PUBLIC SERVICE COMMISSION

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

DOCKET NO.: 070098-EI

Filed March 14, 2007

**NOTICE OF FILING CORRECTED DIRECT
TESTIMONY OF DAVID A. SCHLISSEL**

Intervenors, The Sierra Club, Inc. (Sierra Club), Save Our Creeks (SOC), Florida
Wildlife Federation (FWF), Environmental Confederation of Southwest Florida (ECOSWF), and
Ellen Peterson, hereby file their Notice of Filing Corrected Direct Testimony of David A.

Schlissel and state:

1. Intervenors' expert witness, David A. Schlissel filed direct testimony and exhibits in this docket on March 7, 2007.
2. The testimony has been corrected to identify the correct company on page 19, line 5, and page 22, line 19.
3. The answer on page 23, lines 2-3 has been conformed to the First Order Revising Order Establishing Procedure issued on March 7, 2007, which provided that Intervenors were not intended to have a right to file Rebuttal Testimony on March 21, 2007, but were granted an extension to file direct testimony on March 16, 2007.
4. Mr. Schlissel's corrected direct testimony is hereby substituted for his original testimony filed on March 7, 2007, and Exhibits DAS-1 through DAS-3 attached to Mr. Schlissel's original direct testimony filed on March 7, 2007 should be considered as part of his corrected testimony for all purposes.

Respectfully submitted this 16th day of March, 2007.



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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing was served on this 16th day of March, 2007, via electronic mail and US Mail on:

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ORIGINAL

BEFORE THE PUBLIC SERVICE COMMISSION

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

DOCKET NO.: 070098-EI

CORRECTED DIRECT TESTIMONY OF

DAVID A. SCHLISSEL

ON BEHALF OF

THE SIERRA CLUB, INC.

SAVE OUR CREEKS

FLORIDA WILDLIFE FEDERATION

ENVIRONMENTAL CONFEDERATION OF SOUTHWEST FLORIDA

ELLEN PETERSON

MARCH 16, 2007

DOCUMENT NUMBER-DATE

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TABLE OF EXHIBITS

Exhibit DAS-1	<i>Professional Qualifications of David A. Schlissel</i>
Exhibit DAS-2	<i>Summary of Senate Greenhouse Gas Cap-and-Trade Proposals in Current U.S. 110th Congress</i>
Exhibit DAS-3	<i>Climate Change and Power: Carbon Dioxide Emissions Costs and Electricity Resource Planning</i>

1 **I. Identification and Qualifications**

2 **Q: State your name, occupation and business address.**

3 A. My name is David A. Schlissel. I am a Senior Consultant at Synapse Energy
4 Economics, Inc, 22 Pearl Street, Cambridge, MA 02139.

5 **Q. Please describe Synapse Energy Economics.**

6 A. Synapse Energy Economics ("Synapse") is a research and consulting firm
7 specializing in energy and environmental issues, including electric generation,
8 transmission and distribution system reliability, market power, electricity market
9 prices, stranded costs, efficiency, renewable energy, environmental quality, and
10 nuclear power.

11 Synapse's clients include state consumer advocates, public utilities commission
12 staff, attorneys general, environmental organizations, federal government and
13 utilities. A complete description of Synapse is available at our website,
14 www.synapse-energy.com.

15 **Q. Please summarize your educational background and recent work
16 experience.**

17 A. I graduated from the Massachusetts Institute of Technology in 1968 with a
18 Bachelor of Science Degree in Engineering. In 1969, I received a Master of
19 Science Degree in Engineering from Stanford University. In 1973, I received a
20 Law Degree from Stanford University. In addition, I studied nuclear engineering
21 at the Massachusetts Institute of Technology during the years 1983-1986.

22 Since 1983 I have been retained by governmental bodies, publicly-owned
23 utilities, and private organizations in 28 states to prepare expert testimony and
24 analyses on engineering and economic issues related to electric utilities. My
25 clients have included the Staff of the Arizona Corporation Commission, the
26 General Staff of the Arkansas Public Service Commission, the Staff of the
27 Kansas State Corporation Commission, municipal utility systems in

1 Massachusetts, New York, Texas, and North Carolina, and the Attorney General
2 of the Commonwealth of Massachusetts.

3 I have testified before state regulatory commissions in Arizona, New Jersey,
4 Connecticut, Kansas, Texas, New Mexico, New York, Vermont, North Carolina,
5 South Carolina, Maine, Illinois, Indiana, Ohio, Massachusetts, Missouri, Rhode
6 Island, Wisconsin, Iowa, South Dakota, Georgia, Minnesota and Michigan and
7 before an Atomic Safety & Licensing Board of the U.S. Nuclear Regulatory
8 Commission.

9 A copy of my current resume is attached as Exhibit DAS-1.

10 **II. Introduction and Summary**

11 **Q: On whose behalf are you testifying?**

12 **A: My testimony is sponsored by the Sierra Club, Inc., Florida Wildlife**
13 **Federation (FWF), Save Our Creeks (SOC), the Environmental**
14 **Confederation of Southwest Florida (ECOSWF) and Ellen Peterson.**

15 **Q. What is the purpose of this Direct Testimony?**

16 A. Synapse has been asked to evaluate Florida Power & Light Company's ("FPL")
17 justification for the proposed Glade Power Park Units 1 and 2 based on the
18 information provided in FPL's Petition and supporting testimony. This Direct
19 Testimony presents the results of our evaluation of the likely future costs that
20 will result from greenhouse gas emission regulations/restrictions.

21 **III. Federally Mandated Greenhouse Gas Emission Reductions can be**
22 **Expected in the Near Future**

23 **Q. Is it prudent to expect that a policy to address climate change will be**
24 **implemented in the U.S. in a way that should be of concern to utilities**
25 **building new coal plants?**

26 A. Yes. The prospect of global warming and the resultant widespread climate
27 changes has spurred international efforts to work towards a sustainable level of
28 greenhouse gas emissions. These international efforts are embodied in the

1 United Nations Framework Convention on Climate Change (“UNFCCC”), a
2 treaty that the U.S. ratified in 1992, along with almost every other country in the
3 world. The Kyoto Protocol, a supplement to the UNFCCC, establishes legally
4 binding limits on the greenhouse gas emissions of industrialized nations and
5 economies in transition.

6 Despite being the single largest contributor to global emissions of greenhouse
7 gases, the United States remains one of a very few industrialized nations that
8 have not signed the Kyoto Protocol.¹ Nevertheless, individual states, regional
9 groups of states, shareholders and corporations are making serious efforts and
10 taking significant steps towards reducing greenhouse gas emissions in the United
11 States. Efforts to pass federal legislation addressing carbon, though not yet
12 successful, have gained ground in recent years. These developments, combined
13 with the growing scientific understanding of, and evidence of, climate change
14 mean that establishing federal policy requiring greenhouse gas emission
15 reductions is just a matter of time. The question is not whether the United States
16 will develop a national policy addressing climate change, but when and how.
17 The electric sector will be a key component of any regulatory or legislative
18 approach to reducing greenhouse gas emissions both because of this sector’s
19 contribution to national emissions and the comparative ease of regulating large
20 point sources.

21 There are, of course, important uncertainties with regard to the timing, the
22 emission limits, and many other details of what a carbon policy in the United
23 States will look like.

¹ As I use the terms “carbon dioxide regulation” and “greenhouse gas regulation” throughout our testimony, there is no difference. While I believe that the future regulation we discuss here will govern emissions of all types of greenhouse gases, not just carbon dioxide (“CO₂”), for the purposes of our discussion we are chiefly concerned with emissions of carbon dioxide. Therefore, I use the terms “carbon dioxide regulation” and “greenhouse gas regulation” interchangeably. Similarly, the terms “carbon dioxide price,” “greenhouse gas price” and “carbon price” are interchangeable.

1 In this case, though, the best evidence of this is the simple fact that FPL is
2 requesting PSC approval to recover environmental compliance costs associated
3 with the Glades Power Park.

4
5 **Q. If the Glades Power Park Project were to be built, is carbon regulation an**
6 **issue that could be reasonably dealt with in the future, once the timing and**
7 **stringency of the regulation is known?**

8 A. Unfortunately, no. Unlike for other power plant air emissions like sulfur dioxide
9 and oxides of nitrogen, there currently is no commercial or economical method
10 for post-combustion removal of carbon dioxide from ultra-supercritical
11 pulverized coal plants. FPL agrees on that point. At page 26, lines 16-18 of his
12 testimony, Stephen Jenkins says “Similar R&D is proceeding for CO₂ capture
13 technology that could be applied to PC plants. Applying CO₂ capture to a PC
14 plant is presently much more difficult and expensive than for an IGCC plant.”

15 **Q. How does FPL view the prospects for carbon regulation?**

16 A. FPL Group, FPL’s parent company, has signed on to numerous agreements
17 endorsing the need to address climate change. Most recently, it endorsed the
18 Joint Statement of the Global Roundtable on Climate Change (GROCC). The
19 statement urges:

- 20 • Scientifically informed targets...for “stabilization of greenhouse gas
21 concentrations in the atmosphere at a level that would prevent dangerous
22 anthropogenic interference with the climate system.”
- 23 • Clear, efficient mechanisms to place a market price on carbon emissions.
- 24 • Government policy initiatives to address energy efficiency and de-
25 carbonization in all sectors
- 26 • Signatories to this statement will support scientific processes including
27 the Intergovernmental Panel on Climate Change; work to increase public

1 awareness of climate change risks and solutions; report information on
2 their GHG emissions, engage in GHG emissions mitigation; which can
3 include emissions trading schemes; champion demonstration projects;
4 and support public policy efforts to mitigate climate change and its
5 impacts.

6 FPL Group has also joined the high profile U.S. Climate Action Partnership (“US
7 CAP”) which advocates for federal, mandatory legislation of greenhouse gases.

8 The six principles of the groups are:

- 9 • Account for the global dimensions of climate change;
- 10 • Create incentives for technology innovation;
- 11 • Be environmentally effective;
- 12 • Create economic opportunity and advantage;
- 13 • Be fair to sectors disproportionately impacted; and
- 14 • Reward early action.

15 These are only two examples of FPL Group’s activities with respect to climate
16 change, but taken together, partnerships such as US CAP and public statements
17 by FPL Group imply that the Company is at least aware of the problem of
18 climate change and knows that climate change regulation is not just an
19 environmental issue; it is also a consumer issue.

20 **Q. Do other utilities have opinions about whether and when greenhouse gas
21 regulation will come?**

22 A. Yes. A number of utility executives have argued that mandatory federal
23 regulation of the emissions of greenhouse gases is inevitable.

24 For example, in April 2006, the Chairman of Duke Energy, Paul Anderson,
25 stated:

1 From a business perspective, the need for mandatory federal
2 policy in the United States to manage greenhouse gases is both
3 urgent and real. In my view, voluntary actions will not get us
4 where we need to be. Until business leaders know what the rules
5 will be – which actions will be penalized and which will be
6 rewarded – we will be unable to take the significant actions the
7 issue requires.²

8 Similarly, James Rogers, who was the CEO of Cinergy and is currently CEO of
9 Duke Energy, has publicly said “[I]n private, 80-85% of my peers think carbon
10 regulation is coming within ten years, but most sure don’t want it now.”³ Mr.
11 Rogers also was quoted in a December 2005 *Business Week* article, as saying to
12 his utility colleagues, “If we stonewall this thing [carbon dioxide regulation] to
13 five years out, all of a sudden the cost to us and ultimately to our consumers can
14 be gigantic.”⁴

15 Not wanting carbon regulation from a utility perspective is understandable
16 because carbon price forecasting is not simple and easy, it makes resource
17 planning more difficult and is likely to change “business as usual.” For many
18 utilities, including FPL, that means that it is much more difficult to justify
19 building a pulverized coal plant. Regardless, it is imprudent to ignore the risk.

20 Duke Energy is not alone in believing that carbon regulation is inevitable and,
21 indeed, some utilities are advocating for mandatory greenhouse gas reductions.
22 In a May 6, 2005, statement to the Climate Leaders Partners (a voluntary EPA-
23 industry partnership), John Rowe, Chair and CEO of Exelon stated, “At Exelon,
24 we accept that the science of global warming is overwhelming. We accept that
25 limitations on greenhouse gases emissions [sic] will prove necessary. Until those

² Paul Anderson, Chairman, Duke Energy, “Being (and Staying in Business): Sustainability from a Corporate Leadership Perspective,” April 6, 2006 speech to CERES Annual Conference, at: http://www.duke-energy.com/news/mediainfo/viewpoint/PAnderson_CERES.pdf

³ “The Greening of General Electric: A Lean, Clean Electric Machine,” *The Economist*, December 10, 2005, at page 79.

⁴ “The Race Against Climate Change,” *Business Week*, December 12, 2005, online at http://businessweek.com/magazine/content/05_50/b3963401.htm.

1 limitations are adopted, we believe that business should take voluntary action to
2 begin the transition to a lower carbon future.”

3 In fact, several electric utilities and electric generation companies have
4 incorporated assumptions about carbon regulation and costs into their long term
5 planning, and have set specific agendas to mitigate shareholder risks associated
6 with future U.S. carbon regulation policy. These utilities cite a variety of reasons
7 for incorporating risk of future carbon regulation as a risk factor in their resource
8 planning and evaluation, including scientific evidence of human-induced climate
9 change, the U.S. electric sector’s contribution to emissions, and the magnitude of
10 the financial risk of future greenhouse gas regulation.

11 Some of the companies believe that there is a high likelihood of federal
12 regulation of greenhouse gas emissions within their planning period. For
13 example, PacifiCorp states a 50% probability of a CO₂ limit starting in 2010 and a
14 75% probability starting in 2011. The Northwest Power and Conservation
15 Council models a 67% probability of federal regulation in the twenty-year
16 planning period ending 2025 in its resource plan. Northwest Energy states that
17 CO₂ taxes “are no longer a remote possibility.”⁵

18 Even those in the electric industry who oppose mandatory limits on greenhouse
19 gas regulation believe that regulation is inevitable. David Ratcliffe, CEO of
20 Southern Company, a predominantly coal-fired utility that opposes mandatory
21 limits, said at a March 29, 2006, press briefing that “There certainly is enough
22 public pressure and enough Congressional discussion that it is likely we will see
23 some form of regulation, some sort of legislation around carbon.”⁶

⁵ Northwest Energy 2005 Electric Default Supply Resource Procurement Plan, December 20, 2005; Volume 1, p. 4.

⁶ Quoted in “U.S. Utilities Urge Congress to Establish CO₂ Limits,” Bloomberg.com, <http://www.bloomberg.com/apps/news?pid=10000103&sid=a75A1ADJv8cs&refer=us>

1 **Q. Why would electric utilities, in particular, be concerned about future carbon**
2 **regulation?**

3 A. Electricity generation is very carbon-intensive. Electric utilities are likely to be
4 one of the first, if not the first, industries subject to carbon regulation because of
5 the relative ease in regulating stationary sources as opposed to mobile sources
6 (automobiles) and because electricity generation represents a significant portion
7 of total U.S. greenhouse gas emissions. A new generating facility may have a
8 book life of twenty to forty years, but in practice, the utility may expect that that
9 asset will have an operating life of 50 years or more. By adding new plants,
10 especially new coal plants, a utility is essentially locking-in a large quantity of
11 carbon dioxide emissions for decades to come. In general, electric utilities are
12 increasingly aware that the fact that we do not currently have federal greenhouse
13 gas regulation is irrelevant to the issue of whether we will in the future, and that
14 new plant investment decisions are extremely sensitive to the expected cost of
15 greenhouse gas regulation throughout the life of the facility.

16 **Q. Do others in the private sector, besides electric utilities, also believe that**
17 **regulation of greenhouse gases is inevitable?**

18 A. Yes. Corporate leaders, investors, financial analysts and major corporations are
19 increasingly anticipating and preparing for requirements to reduce greenhouse
20 gas emissions.⁷ For example, a recent survey of 31 multinational corporations by
21 the Pew Center on Global Climate Change found that 90 percent expect the U.S.
22 government to set standards for greenhouse gas emissions imminently.⁸ About
23 18 percent believe that federal standards will take effect before 2010: another 67
24 percent believe those standards will take effect between 2010 and 2015.⁹

⁷ Exhibit DAS-3, at pages 34 of 63 to 37 of 63.

⁸ <http://www.pewclimate.org/docUploads/PEW%5FCorpStrategies%2Epdf>, at page 1.

⁹ Ibid.

1 Investors and investment analysts also are anticipating the imminent
2 establishment of federally mandated reductions in greenhouse gas emissions. For
3 example, in October 2004, Fitch Ratings reported that over the next ten years, it
4 expected that:

5 the power industry to face higher environmental standards for
6 sulfur dioxide (SO₂), nitrogen oxide (NO_x) and mercury, as well
7 as new rules for the emissions of greenhouse gases (GHGs). As
8 the scientific debate has moved from the topic of “whether global
9 warming exists) to a discussion of the magnitude of the problem,
10 concerns about GHGs have expanded to a wider audience.
11 Investors and insurance companies are becoming increasingly
12 concerned about the financial effects of future environmental
13 regulations on the power sector as a primary emitter of GHGs.
14 Requirements to control the sources of global warming and
15 enhanced regulation of other pollutants could increase the
16 financial liability of coal-dependent power producers, thereby
17 leading to lower returns and lower post-investment cash
18 generation.¹⁰

19 Fitch Ratings has more recently been quoted as telling industry representatives
20 that it believes that a federal law to cap CO₂ emissions is “imminent” and that
21 “compliance costs could have a significant effect on the credit profiles of
22 generators.”¹¹

23 **Q. Have mandatory greenhouse gas emissions reductions programs begun to be**
24 **examined and debated in the U.S. federal government?**

25 A. To date, the U.S. government has not required greenhouse gas emission
26 reductions. However, a number of legislative initiatives for mandatory emissions
27 reduction proposals have been introduced in Congress. These proposals establish
28 carbon dioxide emission trajectories below the projected business-as-usual
29 emission trajectories, and they generally rely on market-based mechanisms (such
30 as cap and trade programs) for achieving the targets. The proposals also include

¹⁰ *Status of Environmental Regulation*, Fitch Ratings Corporate Finance, October 12, 2004.

¹¹ *CO₂ Trading Plan could cost US utilities \$6bil/year: Fitch, Platts, 7Nov2006*,

1 various provisions to spur technology innovation, as well as details pertaining to
 2 offsets, allowance allocation, restrictions on allowance prices and other issues.
 3 Through their consideration of these proposals, legislators are increasingly
 4 educated on the complex details of different policy approaches, and they are
 5 laying the groundwork for a national mandatory program. The federal proposals
 6 that would require greenhouse gas emission reductions that had been submitted
 7 in Congress through early February 2007 are summarized in Table 1 below.

8 **Table 1. Summary of Mandatory Emissions Targets in Proposals**
 9 **Discussed in Congress¹²**

Proposed National Policy	Title or Description	Year Proposed	Emission Targets	Sectors Covered
McCain Lieberman S.139	Climate Stewardship Act	2003	Cap at 2000 levels 2010-2015. Cap at 1990 levels beyond 2015.	Economy-wide, large emitting sources
McCain Lieberman SA 2028	Climate Stewardship Act	2003	Cap at 2000 levels	Economy-wide, large emitting sources
National Commission on Energy Policy (basis for Bingaman-Domenici legislative work)	Greenhouse Gas Intensity Reduction Goals	2005	Reduce GHG intensity by 2.4%/yr 2010-2019 and by 2.8%/yr 2020-2025. Safety-valve on allowance price	Economy-wide, large emitting sources
Jeffords S. 150	Multi-pollutant legislation	2005	2.050 billion tons beginning 2010	Existing and new fossil-fuel fired electric generating plants > 15 MW
Carper S. 843	Clean Air Planning Act	2005	2006 levels (2.655 billion tons CO ₂) starting in 2009, 2001 levels (2.454 billion tons CO ₂) starting in 2013.	Existing and new fossil-fuel fired, nuclear, and renewable electric generating plants > 25 MW
Feinstein	Strong Economy and Climate Protection Act	2006	Stabilize emissions through 2010; 0.5% cut per year from 2011-15; 1% cut per year from 2016-2020. Total reduction is 7.25% below current levels.	Economy-wide, large emitting sources
Rep. Udall - Rep. Petri	Keep America Competitive Global Warming Policy Act	2006	Establishes prospective baseline for greenhouse gas emissions, with safety valve.	Energy and energy-intensive industries

¹² More detailed summaries of the bills that have been introduced in the U.S. Senate in the 110th Congress are presented in Exhibit DAS-2.

Carper S.2724	Clean Air Planning Act	2006	2006 levels by 2010, 2001 levels by 2015	Existing and new fossil-fuel fired, nuclear, and renewable electric generating plants > 25 MW
Kerry and Snowe S.4039	Global Warming Reduction Act	2006	No later than 2010, begin to reduce U.S. emissions to 65% below 2000 levels by 2050	Not specified
Waxman H.R. 5642	Safe Climate Act	2006	2010 – not to exceed 2009 level, annual reduction of 2% per year until 2020, annual reduction of 5% thereafter	Not specified
Jeffords S. 3698	Global Warming Pollution Reduction Act	2006	1990 levels by 2020, 80% below 1990 levels by 2050	Economy-wide
Feinstein- Carper S.317	Electric Utility Cap & Trade Act	2007	2006 level by 2011, 2001 level by 2015, 1%/year reduction from 2016-2019, 1.5%/year reduction starting in 2020	Electricity sector
Kerry-Snowe	Global Warming Reduction Act	2007	2010 level from 2010-2019, 1990 level from 2020-2029, 2.5%/year reductions from 2020-2029, 3.5%/year reduction from 2030-2050, 65% below 2000 level in 2050	Economy-wide
McCain-Lieberman S.280	Climate Stewardship and Innovation Act	2007	2004 level in 2012, 1990 level in 2020, 20% below 1990 level in 2030, 60% below 1990 level in 2050	Economy-wide
Sanders-Boxer S.309	Global Warming Pollution Reduction Act	2007	2%/year reduction from 2010 to 2020, 1990 level in 2020, 27% below 1990 level in 2030, 53% below 1990 level in 2040, 80% below 1990 level in 2050	Economy-wide
Olver, et al HR 620	Climate Stewardship Act	2007	Cap at 2006 level by 2012, 1%/year reduction from 2013-2020, 3%/year reduction from 2021-2030, 5%/year reduction from 2031-2050, equivalent to 70% below 1990 level by 2050	US national
Sen. Bingaman – Discussion draft		As of 1/11/2007	2.6%/year reduction in emissions intensity from 2012-2021, 3%/year reduction starting in 2022	Economy-wide

1 **Q. Is it reasonable that the potential for passage of greenhouse gas regulations**
2 **have improved as a result of the recent federal elections?**

3 A. Yes. Although there are increasing numbers of Republican legislators who
4 recognize the need for legislation to regulate the emissions of greenhouse gases,
5 the results of the recent elections, in which control of both Houses of Congress
6 shifted to Democrats, are likely to improve the chances for near-term passage of
7 significant legislation. For example, experts at an industry conference right after
8 the elections expressed the opinion that now that Democrats have won control of
9 Congress, electric utilities should expect a strong legislative push for mandatory
10 caps on carbon dioxide emissions.¹³

11 Senator McCain also has indicated that he believed that the chances of Congress
12 approving meaningful global warming legislation before 2008 were “pretty
13 good” and that he believed that “we’ve reached a tipping point in this debate, and
14 its long overdue.”¹⁴

15 At the same time, Senators Bingaman, Boxer and Lieberman sent a letter to
16 President Bush on November 14, 2006, seeking the President’s commitment to
17 work with the new Congress to pass meaningful climate change legislation in
18 2007.¹⁵ Senators Bingaman, Boxer and Lieberman in January are the
19 chairpersons of, respectively, the Senate Energy and Natural Resources
20 Committee, the Senate Environment and Public Works Committee and the
21 Senate Homeland Security and Governmental Affairs Committee in the current
22 Congress.

23 Nevertheless, our conclusion that significant greenhouse gas regulation is
24 inevitable is not based on the results of any single election or on the fate of any
25 single bill introduced in Congress.

¹³ *Mandatory US carbon caps coming following elections: observers*, Platts 9Nov2006.

¹⁴ Ibid.

¹⁵ Ibid.

1 **Q. Have recent polls indicated that the American people are increasingly in**
2 **favor of government action to address global warming concerns?**

3 A. Yes. A summer 2006 poll by Zogby International showed that an overwhelming
4 majority of Americans are more convinced that global warming is happening
5 than they were even two years ago, and they are also connecting intense weather
6 events like Hurricane Katrina and heat waves to global warming.¹⁶ Indeed, the
7 poll found that 74% of all respondents, including 87% of Democrats, 56% of
8 Republicans and 82% of Independents, believe that we are experiencing the
9 effects of global warming.

10 The poll also indicated that there is strong support for measures to require major
11 industries to reduce their greenhouse gas emissions to improve the environment
12 without harming the economy – 72% of likely voters agreed such measures
13 should be taken.¹⁷

14 Other recent polls reported similar results. For example, a Time/ABC/Stanford
15 University poll issued in the spring found 68 percent of Americans are in favor of
16 more government action.¹⁸ In addition, a September 2006 telephone poll,
17 conducted by NYU's Brademas Center for the Study of Congress, reported that
18 70% of those polled stated that they were worried about global warming.¹⁹

19 At the same time, according to a recent public opinion survey for the
20 Massachusetts Institute of Technology, Americans now rank climate change as
21 the country's most pressing environmental problem—a dramatic shift from three
22 years ago, when they ranked climate change sixth out of 10 environmental

¹⁶ "Americans Link Hurricane Katrina and Heat Wave to Global Warming," Zogby International, August 21, 2006, available at www.zogby.com/news.

¹⁷ Ibid.

¹⁸ "Polls find groundswell of belief in, concern about global warming." Greenwire, April 21, 2006, Vol. 10 No. 9. See also Zogby's final report on the poll which is available at <http://www.zogby.com/wildlife/NWFfinalreport8-17-06.htm>.

¹⁹ Kaplun, Alex: "Campaign 2006: Most Americans 'worried' about energy, climate;" Greenwire, September 29, 2006.

1 concerns.²⁰ Almost three-quarters of the respondents felt the government should
2 do more to deal with global warming, and individuals were willing to spend their
3 own money to help.

4 **IV. State and Regional Actions**

5 **Q. Are any states developing and implementing climate change policies that**
6 **will have a bearing on resource choices in the electric sector?**

7 A. Yes. States continue to be the leaders and innovators in developing and
8 implementing policies that will affect greenhouse gas emissions.

9 On August 30, 2006, Governor Schwarzenegger and the California Legislature
10 reached an agreement on AB32, the Global Warming Solutions Act.²¹ The Act
11 creates an economy-wide cap on greenhouse gas emissions and includes
12 penalties for non-compliance. The cap limits California's greenhouse gas
13 emissions at 1990 levels by 2020. This is the first state to adopt a mandatory
14 economy-wide greenhouse gas emissions limit. California has also adopted a
15 law, SB 1368, directing the California Energy Commission to set a greenhouse
16 gas performance standard for electricity procured by local publicly owned
17 utilities, whether it is generated within state borders or imported from plants in
18 other states. The standard is to be adopted by June 30, 2007 and will apply to all
19 new long-term electricity contracts. California is also exploring coordination of
20 its statewide greenhouse gas reduction program with the Northeast's Regional
21 Greenhouse Gas Initiative.

²⁰ MIT Carbon Sequestration Initiative, 2006 Survey, <http://sequestration.mit.edu/research/survey2006.html>

²¹ Governor Schwarzenegger press release, August 30, 2006. <http://gov.ca.gov/index.php?/press-release/3722/>. Pew Center on Climate Change, "Latest News" from the states http://www.pewclimate.org/what_s_being_done/in_the_states/news.cfm

1 Similarly, in September 2006, the Governor of Arizona issued an Executive
2 Order (2006-13) establishing a statewide goal to reduce Arizona's greenhouse
3 gas emissions to 2000 levels by 2020, and 50% below this level by 2040.²²

4 Other states have indirect policies that will impact future emissions of
5 greenhouse gases. These indirect policies include the requirements by various
6 states to either consider future carbon dioxide regulation or use specific "adders"
7 for carbon dioxide in resource planning. They also include policies and
8 incentives to increase energy efficiency and renewable energy use, such as
9 renewable portfolio standards. Some of these requirements are at the direction of
10 state public utilities commissions, others are statutory requirements.

11 But states are not just acting individually; there are a number of examples of
12 innovative regional policy initiatives that range from agreeing to coordinate
13 information (e.g., Southwest governors and Midwestern legislators) to
14 development of a regional cap and trade program through the Regional
15 Greenhouse Gas Initiative in the Northeast ("RGGI"). The objective of the
16 RGGI is the stabilization of CO₂ emissions from power plants at current levels
17 for the period 2009-2015, followed by a 10 percent reduction below current
18 levels by 2019.²³

19 In an effort that could provide an important foundation for implementation of a
20 national cap on greenhouse gases, representatives of 30 states have begun
21 discussions of a multi-state climate action registry. This effort builds on existing
22 registries in the Northeast and California. The group is discussing development

²² Governor Napolitano Press release, September 8, 2006.
http://azgovernor.gov/dms/upload/NR_090806_CCAG.pdf

Pew Center on Climate Change, "Latest News" from the states
http://www.pewclimate.org/whats_being_done/in_the_states/news.cfm

²³ Table 5.5 of Exhibit DAS-3, at page 32 of 63.

1 of common accounting practices and development of an internet-based
2 monitoring system for voluntary and mandatory greenhouse gas reporting.²⁴

3 **Q. Have any states adopted direct policies that require specific emissions**
4 **reductions from electric sources?**

5 A. Yes. The states of Massachusetts, New Hampshire, Oregon and California have
6 adopted policies requiring greenhouse gas emission reductions from power
7 plants.²⁵

8 **Q. Do any states require that utilities or default service suppliers evaluate costs**
9 **or risks associated with greenhouse gas emissions in long-range planning or**
10 **resource procurement?**

11 A. Yes. As shown in Table 2 below, several states require companies to account for
12 the emission of greenhouse gases in resource planning.

13 **Table 2. Requirements for Consideration of Greenhouse Gas Emissions in**
14 **Electric Resource Decisions**

Program type	State	Description	Date	Source
GHG value in resource planning	CA	PUC requires that regulated utility IRPs include carbon adder of \$8/ton CO ₂ , escalating at 5% per year.	April 1, 2005	CPUC Decision 05-04-024
GHG value in resource planning	WA	Law requiring that cost of risks associated with carbon emissions be included in Integrated Resource Planning for electric and gas utilities	January, 2006	WAC 480-100-238 and 480-90-238
GHG value in resource planning	OR	PUC requires that regulated utility IRPs include analysis of a range of carbon costs	Year 1993	Order 93-695
GHG value in resource planning	NWPCC	Inclusion of carbon tax scenarios in Fifth Power Plan	May, 2006	NWPCC Fifth Energy Plan
GHG value in resource planning	MN	Law requires utilities to use PUC established environmental externalities values in resource planning	January 3, 1997	Order in Docket No. E-999/CI-93-583
GHG in	MT	IRP statute includes an "Environmental	August 17,	Written Comments

²⁴ O'Donnel, Arthur; "Thirty states discuss proposed emissions registry," Greenwire, October 4, 2006.

²⁵ Table 5.3 of Exhibit DAS-3, at page 29 of 63.

resource planning		Externality Adjustment Factor" which includes risk due to greenhouse gases. PSC required Northwestern to account for financial risk of carbon dioxide emissions in 2005 IRP.	2004	Identifying Concerns with NWE's Compliance with A.R.M. 38.5.8209-8229; Sec. 38.5.8219, A.R.M.
GHG in resource planning	KY	KY staff reports on IRP require IRPs to demonstrate that planning adequately reflects impact of future CO ₂ restrictions	2003 and 2006	Staff Report On the 2005 Integrated Resource Plan Report of Louisville Gas and Electric Company and Kentucky Utilities Company - Case 2005-00162, February 2006
GHG in resource planning	UT	Commission directs PacifiCorp to consider financial risk associated with potential future regulations, including carbon regulation	June 18, 1992	Docket 90-2035-01, and subsequent IRP reviews
GHG in resource planning	MN	Commission directs Xcel to "provide an expansion of CO ₂ contingency planning to check the extent to which resource mix changes can lower the cost of meeting customer demand under different forms of regulation."	August 29, 2001	Order in Docket No. RP00-787

1 **V. The Use of Carbon Dioxide Costs in Utility Planning**

2 **Q. What carbon dioxide values are being used by utilities in electric resource**
 3 **planning?**

4 **A.** Table 3 below presents the carbon dioxide costs, in \$/ton CO₂, that are presently
 5 being used in the industry for both resource planning and modeling of carbon
 6 regulation policies.

1

Table 3. Carbon Dioxide Costs Used by Utilities

Company	CO2 emissions trading assumptions for various years (\$2005)
PG&E*	\$0-9/ton (start year 2006)
Avista 2003*	\$3/ton (start year 2004)
Avista 2005	\$7 and \$25/ton (2010) \$15 and \$62/ton (2026 and 2023)
Portland General Electric*	\$0-55/ton (start year 2003)
Xcel Energy-PSCCo	\$9/ton (start year 2010) escalating at 2.5%/year
Idaho Power*	\$0-61/ton (start year 2008)
Pacificorp 2004	\$0-55/ton
Northwest Energy 2005	\$15 and \$41/ton
Northwest Power and Conservation Council	\$0-15/ton between 2008 and 2016 \$0-31/ton after 2016

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**Values for these utilities from Wiser, Ryan, and Bolinger, Mark. "Balancing Cost and Risk: The Treatment of Renewable Energy in Western Utility Resource Plans." Lawrence Berkeley National Laboratories. August 2005. LBNL-58450. Table 7.*
Other values: PacifiCorp, Integrated Resource Plan 2003, pages 45-46; and Idaho Power Company, 2004 Integrated Resource Plan Draft, July 2004, page 59; Avista Integrated Resource Plan 2005, Section 6.3; Northwestern Energy Integrated Resource Plan 2005, Volume 1 p. 62; Northwest Power and Conservation Council, Fifth Power Plan pp. 6-7. Xcel-PSCCo, Comprehensive Settlement submitted to the CO PUC in dockets 04A-214E, 215E and 216E, December 3, 2004. Converted to \$2005 using GDP implicit price deflator.

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Q. How should utilities plan for and mitigate the risk of greenhouse gas regulation?

A. The key part of that question is "plan for the risk of greenhouse gas regulation." Mitigating risk begins with the resource planning process and the decision as to the demand-side and supply-side options that should be pursued. A utility that chooses to go forward with a new, carbon intensive energy resource without proper consideration of carbon regulation is imprudent. To give an analogy it would be like choosing to build a gas-fired power plant without consideration of the cost of gas because one believes that building the plant is "worth it" regardless of what gas might cost.

1 A utility that desires to be prudent about the risk of carbon regulation would, at a
2 minimum, consider carbon regulation by developing an expected carbon price
3 forecast as well as reasonable sensitivities around that case.

4 **Q. Has Synapse developed a carbon price forecast that would assist the**
5 **Commission in evaluating FPL's Glades Power Park?**

6 A. Yes. Our forecast is described in more detail in Exhibit DAS-3, starting on page
7 41 of 63.

8 During the decade from 2010 to 2020, we anticipate that a reasonable range of
9 carbon emissions prices will reflect the effects of increasing public concern over
10 climate change (this public concern is likely to support increasingly stringent
11 emission reduction requirements) and the reluctance of policymakers to take
12 steps that would increase the cost of compliance (this reluctance could lead to
13 increased emphasis on energy efficiency, modest emission reduction targets, or
14 increased use of offsets). We expect that the widest uncertainty in our forecasts
15 will begin at the end of this decade, that is, from \$10 to \$40 per ton of CO₂ in
16 2020, depending on the relative strength of these factors.

17 After 2020, we expect the price of carbon emissions allowances to trend upward
18 toward a marginal mitigation cost. This number will depend on currently
19 uncertain factors such as technological innovation and the stringency of carbon
20 caps, but it is likely that, by this time, the least expensive mitigation options
21 (such as simple energy efficiency and fuel switching) will have been exhausted.
22 Our projection for greenhouse gas emissions costs at the end of this decade
23 ranges from \$20 to \$50 per ton of CO₂ emissions.

24 We currently believe that the most likely scenario is that as policymakers commit
25 to taking serious action to reduce carbon emissions, they will choose to enact
26 both cap and trade regimes and a range of complementary energy policies that
27 lead to lower cost scenarios, and that technology innovation will reduce the price
28 of low-carbon technologies, making the most likely scenario closer to (though

1 not equal to) low our carbon cost scenario than our high carbon cost scenario.
2 We expect that the probability of taking this path will increase over time, as
3 society learns more about optimal carbon reduction policies.

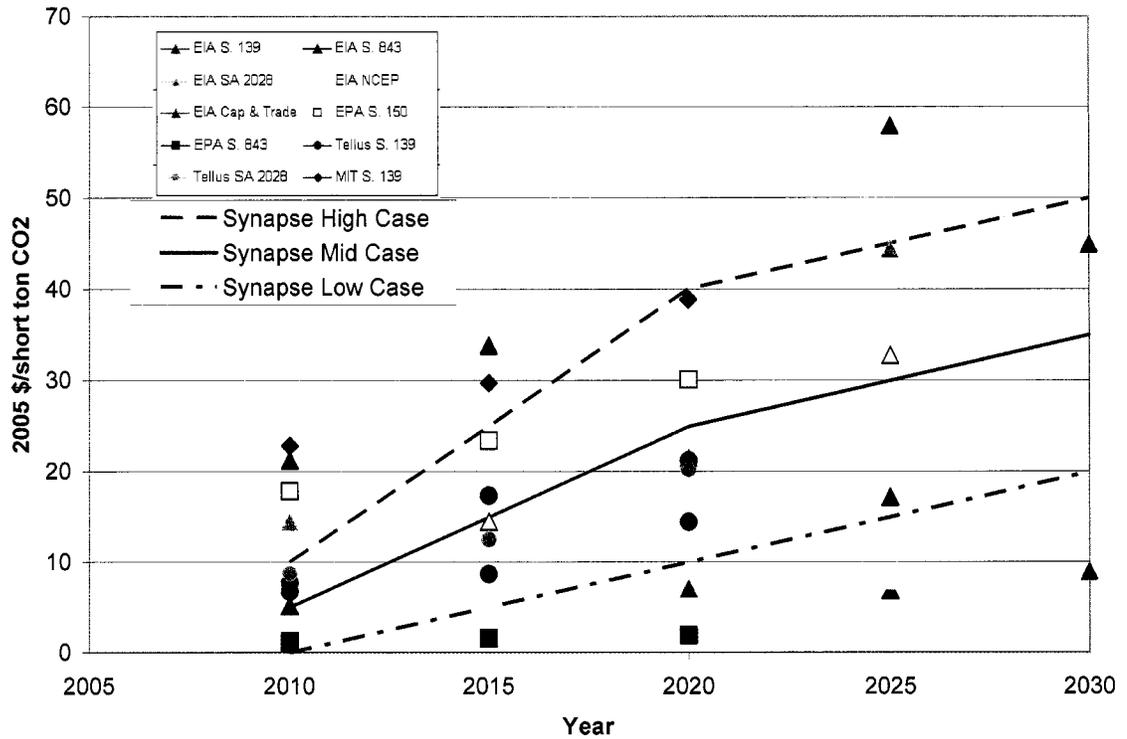
4 After 2030, and possibly even earlier, the uncertainty surrounding a forecast of
5 carbon emission prices will increase due to the interplay of factors such as the
6 level of carbon constraints required and technological innovation. Scientists
7 anticipate that very significant emission reductions will be necessary, in the
8 range of 80 percent below 1990 emission levels, to achieve stabilization targets
9 that will keep global temperature increases to a somewhat manageable level. As
10 such, we believe there is a substantial likelihood that response to climate change
11 impacts will require much more aggressive emission reductions than those
12 contained in U.S. policy proposals, and in the Kyoto Protocol, to date. If the
13 severity and certainty of climate change are such that emissions levels 70-80%
14 below current rates are mandated, this could result in very high marginal
15 emissions reduction costs, though we have not quantified the cost of such deeper
16 cuts on a per ton basis.

17 **Q. What is Synapse's forecast of carbon dioxide emissions prices?**

18 A. Synapse's forecast of future carbon dioxide emissions prices are presented in
19 Figure 1 below. This figure superimposes Synapse's forecast on the results of
20 other cost analyses of proposed federal policies:

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Figure 1. Synapse Carbon Dioxide Prices



2

3 **Q. What is Synapse’s levelized carbon price forecast?**

4 A. Synapse’s forecast, levelized²⁶ over 20 years, 2011 – 2030, is provided in Table 4
 5 below.

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Table 4. Synapse’s Levelized Carbon Price Forecast (2005\$/ton)

Low Case	Mid Case	High Case
\$7.8	\$19.1	\$30.5

²⁶ A value that is “levelized” is the present value of the total cost converted to equal annual payments. Costs are levelized in real dollars (i.e., adjusted to remove the impact of inflation).

1 **Q. Do the Synapse carbon price forecasts presented in Tables 3 and 4 reflect**
2 **the emission reduction targets in the bills that have been introduced in the**
3 **current Congress?**

4 A. No. We developed our price forecasts late last spring. These forecasts were
5 based on the bills that had been introduced in Congress through that time and/or
6 that had been analyzed by the EIA, EPA, MIT, etc. The bills that have been
7 introduced in the current US Congress generally would mandate more stringent
8 emissions reductions than the bills that we considered when we developed our
9 carbon price forecasts. Consequently, we believe that our forecasts are
10 conservative.

11 **Q. How much additional CO₂ will the Glades Power Park Units 1 and 2 emit**
12 **into the atmosphere?**

13 A. At a projected 92 percent capacity factor , the Glades Power Park Units 1 and 2
14 will emit more than 14.5 million tons of CO₂ annually.

15 **Q. Would incorporating Synapse's carbon price forecast have a material effect**
16 **on the economics of building and operating the proposed Glades Power Park**
17 **Project?**

18 A. Yes.

19 **Q. What would be the annual CO₂ cost to FPL's Glades Power Park**
20 **Applicants?**

21 A. Assuming an 92% average annual capacity factor for the Glades Power Park
22 Units, the range of annual, levelized cost to FPL of CO₂ regulation would be:

23 Low Case - 15,796,000 MWh · \$7.74/MWh = \$122,261,000
24 Mid Case - 15,796,000 MWh · \$19.60/MWh = \$309,602,000
25 High Case - 15,796,000 MWh · \$30.39/MWh = \$480,040,000

1 **Q. Does this complete your testimony?**

2 A. Yes. However, I anticipate submitting supplemental testimony on March 16,
3 2007.