

**BEFORE THE
PUBLIC SERVICE COMMISSION OF WISCONSIN**

)	
Application of Wisconsin Power & Light)	
Company d.b.a. Alliant Energy for Authority to)	
Construct a New Coal-Fired Electric Generating)	DOCKET NO. 6680-CE-170
Unit Known as the Nelson Dewey Generating)	
Station in Cassville, Grant County, Wisconsin)	
)	

**DIRECT TESTIMONY OF DAVID A. SCHLISSEL
ON BEHALF OF
THE WISCONSIN CITIZENS UTILITY BOARD
AND
CLEAN WISCONSIN**

**AUGUST 11, 2008
PUBLIC VERSION**

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Exhibit____(DAS-23) Standard & Poor's *Top Ten Credit Issues for 2008 & Beyond*

Exhibit____(DAS-24) Standard & Poor's Credit Week Report on the Credit Cost of
Going Green for U.S. Utilities

Exhibit____(DAS-25) Carbon Principles

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[Confidential]

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Exhibit____(DAS-28)

, Hookham Deposition Ex.

[Confidential]

Exhibit____(DAS-29)

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Exhibit____(DAS-30) Presentation

[Confidential]

Exhibit____(DAS-31) State of Wisconsin, Department of Administration, Division of
Energy, *Focus on Energy Public Benefits Evaluation*, February 23,
2007

Exhibit____(DAS-32) *Wind Energy Update*, National Renewable Technology
Laboratory, June 2008

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1 **1. Introduction**

2 **Q. What is your name, position 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, state
13 governments and utilities. A complete description of Synapse is available at our
14 website, www.synapse-energy.com.

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

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

21 Since 1983 I have been retained by governmental bodies, publicly-owned utilities,
22 and private organizations in 28 states to prepare expert testimony and analyses on
23 engineering and economic issues related to electric utilities. My recent clients
24 have included the New Mexico Public Regulation Commission, the General Staff
25 of the Arkansas Public Service Commission, the U.S. Department of Justice, the
26 Commonwealth of Massachusetts, the Attorneys General of the States of
27 Massachusetts, Michigan, New York, and Rhode Island, the General Electric

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1 Company, cities and towns in Connecticut, New York and Virginia, state
2 consumer advocates, and national and local environmental organizations.

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, Michigan, Florida
7 and North Dakota and before an Atomic Safety & Licensing Board of the U.S.
8 Nuclear Regulatory Commission.

9 A copy of my current resume is attached as Exhibit____(DAS-1).

10 **Q. On whose behalf are you testifying in this case?**

11 A. I am testifying on behalf of the Citizen Utility Board (“CUB”) and Clean
12 Wisconsin.

13 **Q. Have you testified previously before the Public Service Commission of**
14 **Wisconsin (“PSCW”)?**

15 A. Yes. I have testified in PSCW Dockets Nos. 6630-CE-209, 6630-CE-197, 6690-
16 UR-115, 05-EI-136, 6690-CE-187 and 6630-EI-113.

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

18 A. Synapse was retained by CUB and Clean Wisconsin to assist in their evaluation of
19 the Application of Wisconsin Power and Light Company (“WPL” or “the
20 Company”) for authority to construct, maintain and operate Nelsen Dewey Unit 3
21 (“NED 3”), a new baseload coal-fired generation plant.

22 This testimony presents the results of our analyses.

23 **Q. Please identify the other Synapse witnesses who are presenting expert**
24 **testimony in this proceeding on behalf of CUB and/or Clean Wisconsin.**

25 A. In addition to myself, Robert Fagan from Synapse is presenting expert testimony
26 in this Docket on behalf of Clean Wisconsin.

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1 **Q. Were there other members of the Synapse staff who also assisted in the**
2 **analyses undertaken by Synapse as part of its evaluation of WPL's proposed**
3 **Nelson Dewey Unit 3?**

4 A. Yes. Dr. David White, Ben Warfield, Rachel Wilson and Nick Doolittle from
5 Synapse also were members of our project team. Copies of their resumes are
6 available at www.synapse-energy.com.

7 **Q. Please summarize your conclusions.**

8 A. My conclusions are as follows:

9 1. If approved and built, on the day it begins operations, NED 3 will be a
10 coal-fired power plant that will burn a combination of Powder River Basin
11 coal and petcoke. WPL witnesses have hypothesized that the Company
12 may be able to co-fire up to 10 percent biomass at NED 3 within a year of
13 the start of commercial operations and possibly up to 20 percent by five
14 years after the start of operations. However, it is very uncertain whether
15 the Company will be able to achieve these goals. Key uncertainties exist
16 concerning the biomass fuel mix that could be burned in the plant, fuel
17 sources, fuel processing, and fuel price, as well as the amounts of
18 greenhouse gas emissions that would be emitted during the transport of the
19 biomass fuel to the site.

20 2. The addition of NED 3 would , WPL's annual CO₂
21 emissions under both the Company's Base Case IRP Resource Plan and its
22 so-called "Carbon Reduction Plan." The results of WPL's Electric
23 Generation Expansion Analysis System ("EGEAS") modeling analyses
24 reveal that annual CO₂ emissions under its IRP Resource Plan would
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26 The results of the Company's EGEAS
27 modeling also show that,
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3 3. The Company's claim that its proposed Carbon Reduction Plan actually
4 would reduce CO₂ emissions is misleading. The only "reduction" that
5 occurs is in comparison to an unrealistic future [REDACTED]
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- 8 4. The addition of NED 3 would conflict with evolving federal, state and
9 regional climate change policies with or without WPL's Carbon Reduction
10 Plan because the Company's annual CO₂ emissions would as a
11 result of the addition of NED 3 at the same time that reductions in
12 emissions would be required by federal legislation, the recommendations
13 of the Governor's Task Force on Global Warming and/or regional
14 agreements.
- 15 5. NED 3 was not selected for installation in 2013 as part of the least cost
16 resource plan in any of the cases that the PSCW Staff examined for the
17 Draft Environmental Impact State ("EIS") or the Final EIS using in the
18 EGEAS model. In fact, the plans with NED 3 in 2013 were significantly
19 more expensive than the optimal plans in the cases that the PSCW Staff
20 modeled for the Final EIS that reflected (a) the plant's currently estimated
21 cost and (b) non-zero CO₂ costs.
- 22 6. The Company has not provided any credible evidence that NED 3 is part
23 of a least cost resource plan. In particular:
 - 24 a. None of the Company's EGEAS runs use the currently estimated
25 costs of NED 3 and Columbia Unit 3 ("COL 3").
 - 26 b. Most of the Company's EGEAS runs unrealistically assume zero
27 CO₂ costs.

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- 1 c. In its EGEAS runs, WPL unrealistically constrained the amounts
2 of new wind that could be added.
- 3 d. WPL has not prepared any EGEAS runs to show that its proposed
4 Carbon Reduction Plan is the least cost and most effective option
5 for reducing its CO₂ emissions.
- 6 7. Building NED 3 would expose WPL's ratepayers to significant risks and
7 uncertainties including further increases in the project's construction cost
8 and federal and/or state restrictions on CO₂ emissions. However, WPL
9 has not adequately considered these risks and uncertainties as part of its
10 evaluation of the proposed NED 3 plant.
- 11 8. WPL has not considered the potential for further construction cost
12 increases in its planning analyses. It is reasonable to expect that the
13 estimated cost of building NED 3 will continue to rise, perhaps quite
14 significantly, before the project is completed given:
- 15 a. The continuing worldwide competition for power plant design and
16 construction resources, commodities and equipment.
- 17 b. The experiences of other power plants that are further along in the
18 procurement and construction process.
- 19 c. Evidence that costs at NED 3 already have increased since the
20 current \$1.143 billion estimate, without financing costs, was
21 released.
- 22 d. The inability of WPL in the current construction environment to
23 obtain fixed price contracts for major project work and equipment
24 procurement.
- 25 9. WPL's parent company, Alliant Energy, agrees that mandatory
26 requirements to stabilize and reduce greenhouse gas emissions are

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1 . However, WPL has not adequately considered the likelihood of
2 mandated CO₂ emissions reductions in its planning analyses.

3 10. It is generally accepted that regulation of greenhouse gases will pose
4 substantial challenges and create significant new costs for the owners of
5 coal-fired power plants. Alliant Energy has acknowledged that regulation
6 of greenhouse gas emissions could have significant cost consequences.

7 11. WPL has not adequately considered other risks in its resource planning for
8 NED 3. These risks include the potential for coal price increases and
9 supply disruptions and the adoption of policies promoting the increased
10 use of energy efficiency and renewable resources.

11 12. It would be imprudent for WPL to build NED 3 before it has been
12 determined which carbon capture and sequestration processes, if any, are
13 technically and economically viable.

14 a. WPL acknowledges that there is currently not a commercially
15 viable technology for carbon capture and sequestration from coal
16 plants like NED 3.

17 b. A number of objective sources currently estimate that the addition
18 of carbon capture and sequestration technologies could increase the
19 cost of producing power at coal-fired generating plants by 60
20 percent to 80 percent.

21 c. It is uncertain when, if ever, any carbon capture and sequestration
22 processes will be shown to be technically and economically viable.

23 13. More than fifty proposed coal-fired power plants have been cancelled,
24 delayed and/or rejected by state regulatory commissions or boards within
25 the past year because of, or at least in large part due to, the uncertainties
26 and risks regarding future power plant construction costs and the potential
27 for regulation of power plant CO₂ emissions.

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1 14. WPL has been unable to provide any documentary evidence to support its
2 claimed 50 month construction duration for NED 3. Moreover, it is
3 reasonable to expect that, if approved, the plant will experience
4 construction delays as a result of the worldwide competition for power
5 plant equipment, commodities and design and construction resources.
6 These delays would mean higher costs for ratepayers.

7 15. There are significant uncertainties associated with building NED 3:

- 8 • Uncertainty as to the plant's ultimate construction cost and
9 schedule.
- 10 • Uncertainty as to the greenhouse gas emissions reductions that
11 ultimately will be required as a result of federal, state or regional
12 actions.
- 13 • Uncertainty as to future CO₂ emissions allowance prices.
- 14 • Uncertainty whether carbon capture and sequestration will prove to
15 be technically and economically viable.
- 16 • Uncertainty as to what the costs of carbon capture and
17 sequestration will be, if it does prove viable.
- 18 • Uncertainty whether co-firing up to 20 percent biomass will be
19 technically, environmentally and commercially feasible at NED 3.
- 20 • Uncertainty concerning WPL's capacity needs in light of the
21 current economic slowdown as illustrated by the closure of the
22 General Motors plant in Janesville.
- 23 • Uncertainty concerning the enhanced Renewable Portfolio
24 Standard ("RPS") requirements that will be adopted by the State of
25 Wisconsin.

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- Uncertainty concerning the levels of energy efficiency that will be found to be economic and that will be implemented.

In light of these significant uncertainties, it would be better to adopt a resource plan that allows for the flexibility to modify course as circumstances change. Making a fixed commitment to a coal plant that is likely to cost much more than \$1.143 billion dollars, even without considering financing costs, and whose permitting and construction are likely to take 5-6 years or longer, is a mistake in such uncertain times.

16. The Company has viable alternatives to building NED 3 by 2013.

- a. Conversion of the Neenah combustion turbine plant to a baseload combined cycle facility.
- b. The adoption of aggressive energy efficiency and renewable resources goals such as those recommended by the Governor's Task Force on Global Warming.

17. The Company also should begin to develop plans for how it would achieve the greenhouse gas emissions recommendations of the Governor's Task Force on Global Warming in a way that minimizes, to the extent possible, the economic impact on its ratepayers.

18. WPL's economic impact testimony lacks probative value because it ignores (a) the potential economic benefits of alternative resource plans; (b) the adverse economic impacts of the rate increases that would be required to pay for the construction of NED 3; and (c) the potential adverse economic consequences of global warming.

For these reasons, the Commission should reject WPL's application for a Certificate of Public Convenience and Necessity ("CPCN") for the NED 3 plant.

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1 **Q. Please explain how you conducted your investigations in this proceeding.**

2 A. We have reviewed the Company's Application for a CPCN, including the Updates
3 and Appendices, the testimony and exhibits filed by WPL in this proceeding. In
4 addition, we have reviewed information and documents provided by WPL in
5 response to data requests submitted by CUB and Clean Wisconsin and by other
6 parties to this proceeding. We have also reviewed public information related to
7 the issues addressed in WPL's application, testimony and exhibits and in our
8 testimony and exhibits.

9 In addition, we have reviewed the Draft and Final Environmental Impact
10 Statements issued for the proposed NED 3 plant. We have analyzed the input and
11 output files for the EGEAS modeling analyses conducted by the Company and the
12 PSCW Staff. Finally, we have reviewed the transcripts and exhibits to the
13 depositions of WPL witnesses Bauer and Hookham.

14 **2. NED 3 Would Be A Coal-fired Power Plant – WPL Has Not Proven that**
15 **It Actually Will be Technically or Economically Feasible to Burn Up to**
16 **20 Percent Biomass**

17 **Q. Would NED 3 be a renewable or hybrid power plant?**

18 A. No. If approved and built, on the day it begins operations, NED 3 will be a coal-
19 fired power plant that will burn a combination of Powder River Basin coal and
20 petcoke. WPL witnesses have hypothesized that the Company may be able to co-
21 fire up to 10 percent biomass at NED 3 within a year of the start of commercial
22 operations and possibly up to 20 percent by five years after the start of operations.
23 However, it is very uncertain whether the Company will be able to achieve these
24 goals.

25 **Q. How many tons of Carbon Dioxide would NED 3 emit annually?**

26 A. According to WPL, if the plant were to burn 100 percent Powder River Basin
27 coal, its CO₂ emissions, would be 2,950,000 tons per year, including the CO₂

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1 equivalents of the Nitrous Oxide (“N₂O”) that NED 3 would emit.¹ If the plant
2 were to burn an 80/20 combination of PRB coal and biomass, its CO₂ emissions
3 would be 2,482,000 tons per year. If NED 3 were to burn a combination with an
4 80/20 PRB and pet coke blend, assuming that WPL is permitted by the DNR to
5 burn pet coke, and 20 percent biomass, its CO₂ emissions would be 2,425,000
6 tons per year.

7 **Q. The Final EIS has concluded the following concerning WPL’s claimed ability**
8 **to co-fire up to 20 percent biomass at NED 3:**

9 **Because WP&L did not provide any plan for how it would**
10 **acquire, transport or store the additional RRF necessary to co-**
11 **fire 20 percent biomass, the potential environmental impacts**
12 **associated with growing and aggregating the biomass fuel**
13 **stocks necessary, processing them, and transporting them to**
14 **the plant site cannot be assessed. Nor can it be determined**
15 **whether such a plan would be cost-effective or actually**
16 **feasible.**

17 **.... Without knowing what fuel stocks WP&L intends to utilize,**
18 **the methods that would be used for transport, the distance the**
19 **fuel stocks would be transported, and where the materials**
20 **would be unloaded and stored on site prior to use, it is not**
21 **feasible to assess the impacts or the cost of co-firing 20 percent**
22 **biomass at NED 3.**

23 **In addition, it is unclear how co-firing 20 percent RRF would**
24 **alter the air emission rates of a number of air pollutants from**
25 **the NED 3 facility. No air modeling for this proposal has been**
26 **submitted by WP&L.²**

¹ The terms CO₂ and greenhouse gases are used interchangeably in this testimony even though CO₂ is only one of the six gases that are collectively known as “greenhouse gases.” Although the other gases are more potent greenhouse gases, CO₂ is far more abundant and is the primary greenhouse gas emitted as a result of fossil fuel combustion. The figures for CO₂ emissions that are discussed in this testimony include the CO₂-equivalent emissions of Nitrous Oxide (“N₂O”) which is emitted in significant amounts by Circulating Fluidized Bed coal plants.

² Final EIS, at page 359.

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1 **Do you agree with these conclusions?**

2 A. Yes. It is highly uncertain, both technically and economically, whether WPL will
3 be able to achieve its stated goals of co-firing 10 percent biomass within a year of
4 the start of commercial operations at NED 3 and of co-firing 20 percent biomass
5 within five years of the start of operations. Key uncertainties exist concerning the
6 biomass fuel mix that could be burned in the plant, fuel sources, fuel processing,
7 and fuel price, as well as the amounts of greenhouse gas emissions that would be
8 emitted during the transport of the biomass fuel to the site.

9 **Q. Has WPL determined what types of biomass will be able to be co-fired at**
10 **NED 3?**

11 A. No. WPL says that NED 3 will burn a mix of coal and biomass, aiming for a
12 biomass target of 20 percent in 2018. However, biomass fuel must meet certain
13 quality requirements, e.g., heating value, moisture content, chloride and alkali
14 content, and material density.³

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³ As WPL witness Johnson noted in an e-mail produced in response to 9-CUB/RFP-2,

⁴ (Emphasis added) Exhibit____(DAS-2), at Bates Page Number WPL125285.
Deposition of Charles J. Hookham, July 24, 2008, at page 69, lines 5-7. A copy of this transcript is
included as Exhibit____(DAS-3).

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11 **Q. How much land acreage would be required to provide the biomass for NED**
12 **3?**

13 A. According to WPL witness Johnson, with a low heat content biomass, 400,000
14 tons of renewable resource fuels (“RRF”) would be needed each year to co-fire
15 NED 3 at 20 percent biomass.⁸ At a high heat content fuel, between 200,000 and
16 300,000 tons of RRF would be needed each year. The tonnage requirements of the
17 unprocessed feedstock (i.e. corn stover) will likely be higher.

18 Even assuming a relatively high heat content, at production rates of 3 tons per
19 acre per year, NED 3 would require approximately 120,000 acres for the annual
20 production of feedstocks. With production rates of 5 tons per acre, NED 3 would
21 require approximately 72,000 acres for the annual production of feedstocks.
22 Moreover, while NED 3 may require 72,000-120,000 acres for annual feedstock
23 production, the total number of acres under management would likely have to be
24 significantly higher due to the long growth cycles of many wood and agricultural
25 materials. In fact, it is anticipated that sustaining sufficient supplies of RRFs will

⁵ Id., at page 156, lines 8-14.

⁶ Id., at page 156, lines 16-21.

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⁸ , at page 3-2. A copy of this White Paper is included as Exhibit____(DAS-4)
Direct Testimony of William A. Johnson, at page 5, lines 9-12.

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1 require using more than one feedstock material (e.g. wood, stover and native
2 grasses).⁹

3 **Q. Is there any infrastructure or organization in Southwestern Wisconsin to**
4 **sustain a supply of RRFs to NED 3?**

5 A. The Company has acknowledged that there really is no infrastructure or supply
6 chain organization in the areas near the proposed NED 3 site to provide the
7 required supply of biomass for NED 3.

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16 • Because current demand for RRFs is not as robust, the supply market has
17 not yet evolved to this stage of development.¹¹

18 • Currently, as there are no industries using large amounts of RRFs in
19 Southwestern Wisconsin, there are no known RRF supply chains or
20 aggregators or processors present in the region.¹²

21 **Q. Is there space at the NED 3 site to densify the biomass?**

22 A. The Company has indicated that the NED 3 material handling system will require
23 most agricultural residue and native grass-derived RRFs to be “densified” or
24 “pellitized.” However, According to Mr. Hookham,

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⁹ Id., at page 5, lines 9-14.

¹⁰ Exhibit___(DAS-4), at page 3-1.

¹¹ Direct Testimony of William A. Johnson, at page 6, lines 8-11.

¹² Id., at page 9, lines 20-22.

¹³ Exhibit___(DAS-3), at page 173, lines 3-8.

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1 **Q. Is there any certainty as to the cost of the processed biomass that would be**
2 **co-fired at NED 3?**

3 A. No. The Company's witnesses cite a wide range of possible costs for the
4 unprocessed and processed RRFs that would be co-fired at NED 3:

- 5 • Current projections are that unprocessed feedstock will cost \$40-
6 \$100+/ton depending on the source. Until the RRF blend is determined,
7 the precise cost per ton cannot be determined, which is a continuing
8 process as explained in the testimony of Mr. William Johnson. For the
9 purposes of this analysis, a reasonable range is \$40-\$60/ton for raw
10 feedstock, with the variation being dependent on the actual percentages of
11 unprocessed wood chips/forest residues, surplus agricultural crop residues
12 and native grasses purchased by the aggregators/processors.¹⁴
- 13 • The economic impact analyses associated with sourcing RRFs is ongoing.
14 The fuel specification and volume of RRF needed at NED 3 has not yet
15 been conclusively determined by WPL. Additionally, it is possible that
16 more than one aggregator or processor will serve WPL. The finished RRF
17 cost (i.e. the sales of the aggregation/processing plant to WPL's NED 3),
18 is currently estimated to be \$60-\$160/ton. Based on processing costs in
19 comparable industries, processing is estimated to be 50%-100% of the raw
20 feedstock cost.¹⁵

21 **Q. Is there any certainty as to how the biomass will be delivered to the NED 3**
22 **site?**

23 A. It is expected that the biomass would have to be delivered by truck. Somewhere
24 between truck trips per day would be required.¹⁶ However,

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¹⁷ The requirements for transporting

the biomass for NED 3 might be quite significant as WPL has recently announced

¹⁴ Direct Testimony of T. Randall Fortenbery and Steven C. Deller, at page 19, lines 21-19.

¹⁵ Id., at page 20, lines 6-9.

¹⁶ , at Bates Page Number

WPL 068598. A copy of this presentation is included as Exhibit__(DAS-5).

¹⁷ Exhibit__(DAS-3), at page 183, lines 3-15.

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1 **Figure 1: WPL’s Projected Annual CO₂ Emissions Under Proposed IRP**
2 **Resource Plan [CONFIDENTIAL]**

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8 **Q. Has the Company adequately supported what it is characterizing as a**
9 **“Carbon Reduction Plan” that was presented in the June 2008 testimony of**
10 **WPL witness Randy Bauer?**

11 **A. No. WPL introduced this proposal relatively late in this proceeding even though**
12
13 . The components of that plan are listed on Bauer’s Schedule 7
14 which was submitted with his Direct testimony. Of those components listed,
15 increasing energy efficiency by 50%, an additional 200 MW of wind, and retiring
16 Edgewater Unit 3 were not in the 2006 IRP (as presented in Appendix A to the
17 CPCN Application).

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1 **Q.** Would adoption of WPL’s so-called “Carbon Reduction Plan” actually offset
2 the CO₂ emissions from NED 3 and lead to real reductions in the Company’s
3 emissions beginning in 2013?

4 **A.** No. As shown in Figure 2 below,
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10 **Figure 2: WPL’s Projected Annual CO₂ Emissions Under Carbon**
11 **Reduction Plan [CONFIDENTIAL]**

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13 **Q.** On what basis, then, can WPL claim that it is proposing a “Carbon
14 Reduction Plan”?

15 **A.** WPL’s claims regarding its “Carbon Reduction Plan” are extremely misleading.
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Direct Testimony of David A. Schlissel

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16 **Q. Does the Company’s “Carbon Reduction Plan” include entirely new wind**
17 **and energy efficiency proposals?**

18 A. No. A number of the features of the “Carbon Reduction Plan,” such as the Cedar
19 Ridge and Forward Energy wind purchases and the levels of energy efficiency in
20 the Shared Savings Programs, simply repackage things that the Company already
21 is doing or is committed to doing whether or not NED 3 is built. Only the 200
22 MW’s of additional wind, a 50% increase in energy efficiency and retiring
23 Edgewater 3 are “new” components. Thus, most of what is listed as components
24 of the “Carbon Reduction Plan” are not new proposals that can be counted on to
25 offset NED 3’s greenhouse gas emissions.

²⁰ Deposition of Randy Bauer, page 116, lines 22-25. A copy of the transcript from this deposition is included as Exhibit____(DAS-6).

²¹ Id., at page 119, line 9, to page 120, line 22.

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1 **Q. Is Mr. Bauer correct when he testifies that the “Carbon Reduction Plan”**
2 **would reduce CO₂ emissions in the year 2014 over what the emissions would**
3 **have been under the “No Additions” plan?²²**

4 A. It is correct that WPL’s EGEAS runs show that the CO₂ emissions in 2014 would
5 be lower under the proposed “Carbon Reduction Plan” than under the
6
7 _____
8

9 Thus, even if you accept the Company’s comparison to
10 the unrealistic “No Additions” Plan, the “Carbon Reduction Plan” would
11
12

13 Moreover the Company’s EGEAS modeling results show _____
14
15 _____
16

17 Consequently, it simply cannot
18 be said that the “Carbon Reduction Plan” would reduce CO₂ emissions on an
19

20 **Q. Did the Company make certain in the “No Additions” scenario that there**
21 **would be enough capacity to provide an adequate level of system reliability?**

22 A. No.
23
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²² Direct Testimony of Randy Bauer, at page 31, lines 1-4.

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3 **Figure 3. System Reserve Margins in “No Additions” Scenario Modeled**
4 **by WPL [CONFIDENTIAL]**

5

6 **Q. What is the significance of a negative reserve margin?**

7 A. A negative reserve margin means that the Company does not have enough
8 capacity, either owned or under firm contract, to meet its projected demands, let
9 alone to provide for a reasonable level of reserves.

10 **Q. Is the presentation of the proposed “Carbon Reduction Plan” and CO₂**
11 **Offsets in Mr. Bauer’s exhibit RDB-1, Schedule 7 also misleading?**

12 A. Yes. The comparison presented in Mr. Bauer’s Exhibit RDB-1, Schedule 7, is
13 extremely misleading in a number of ways.

14 First, Schedule 7 suggests that adoption of the “Carbon Reduction Plan” would
15 produce 3,518,000 tons of CO₂ offsets while NED 3 would emit only 2,985,000
16 tons of CO₂. The result would be a net reduction of about 530,000 of CO₂. This
17 conflicts with Mr. Bauer’s testimony that the “Carbon Reduction Plan” would

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1 produce about 32,000 tons of CO₂ reductions in 2014.²³ In fact, WPL's EGEAS
2 modeling shows that the "Carbon Reduction Plan" would [REDACTED]
3 . In fact,
4 as I noted earlier, the Company's EGEAS modeling shows that the CO₂ emissions
5 would be
6 , under the "Carbon Reduction Plan" than under even the
7 unrealistic "No Additions" scenario.

8 Second, as I also noted earlier, the "Carbon Reduction Plan" simply repackages a
9 number of features (addition of Cedar Ridge and Forward wind energy and
10 ongoing energy efficiency programs) as part of the new plan.

11 Third, WPL overstates the savings that would be attributable to the retirement of
12 Edgewater 3 by assuming that the plant would operate at an [REDACTED] percent annual
13 capacity factor. In fact, as shown in WPL's Confidential Response to
14 Interrogatory 7-CUB-1,
15 [REDACTED] Moreover, even in the "No
16 Additions" scenario, in which the WPL system is starved of new resources, the
17 EGEAS modeling shows that the annual capacity factors for Edgewater 3 would
18 never exceed [REDACTED] percent.

19 Fourth, and most significantly, as I have discussed above, Mr. Bauer's Exhibit
20 RDB-1, Schedule 7, is misleading because it does not show that the Company's
21 annual CO₂ emissions under the "Carbon Reduction Plan" would start to
22 after the plant began operations in 2013. Consequently, the adoption of the
23 "Carbon Reduction Plan"
24 [REDACTED] in the Company's annual CO₂ emissions.

²³ Direct Testimony of Randy Bauer, at page 31, lines 1-4.

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1 would lead to

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3 **4. The Addition of NED 3 Would Conflict With Evolving Federal, State**
4 **and Regional Climate Change Policies With Or Without The So-**
5 **Called “Carbon Reduction Plan”**

6 **Q. What is the goal of the climate change legislation and policies that are being**
7 **considered in the federal and state governments and in regional agreements?**

8 A. The general goal of most of the legislation and policies that are being discussed in
9 the federal and state governments would be to reduce global CO₂ emissions by 60
10 percent to 80 percent by the middle of this century. It is generally believed by
11 climate scientists that reductions of this magnitude might enable the world to
12 avoid the most harmful effects of global climate change.

13 **A. Federal Climate Change Proposals**

14 **Q. Please describe the major climate change proposals that have been**
15 **introduced in the current U.S. Congress.**

16 A. To date, the U.S. government has not required greenhouse gas emission
17 reductions. However, a number of legislative initiatives for mandatory emissions
18 reduction proposals have been introduced in Congress. These proposals establish
19 carbon dioxide emission trajectories below the projected business-as-usual
20 emission trajectories, and they generally rely on market-based mechanisms (such
21 as cap and trade programs) for achieving the targets. The proposals also include
22 various provisions to spur technology innovation, as well as details pertaining to
23 offsets, allowance allocation, restrictions on allowance prices and other issues.
24 The major federal proposals that would require greenhouse gas emission
25 reductions that have been submitted in the 110th U.S. Congress are summarized in
26 Table 1 below.

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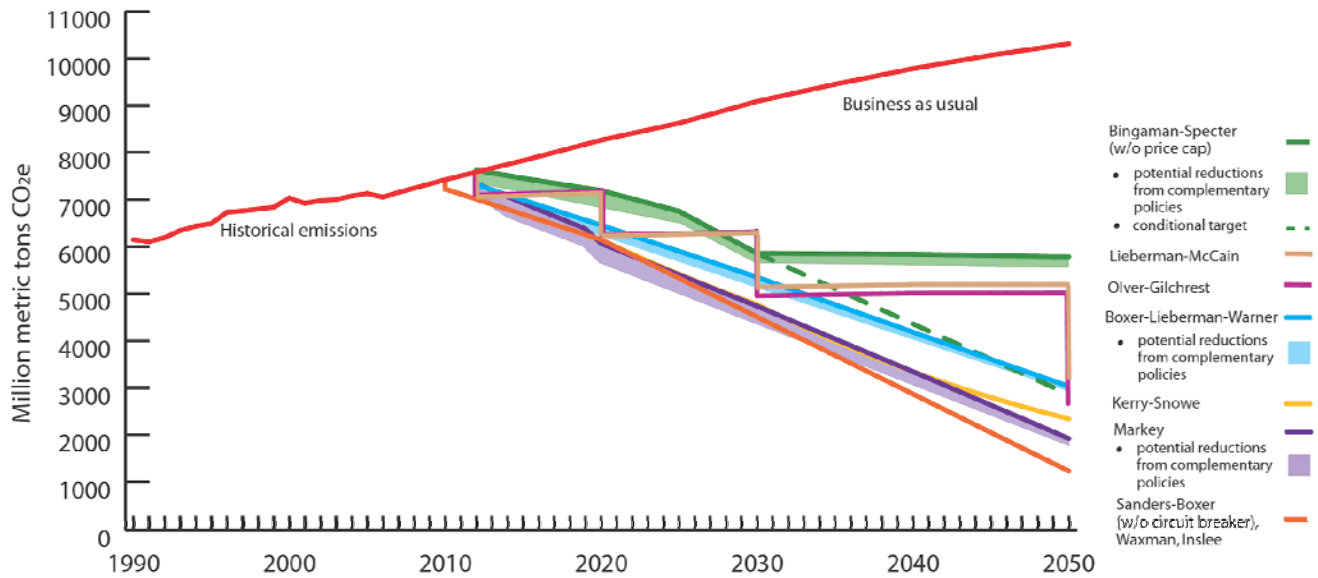
Table 1. Summary of Mandatory Emissions Targets in Proposals Discussed in the current U.S. Congress

Proposed National Policy	Title or Description	Year Proposed	Emission Targets	Sectors Covered
Feinstein-Carper S.317	Electric Utility Cap & Trade Act	2007	<ul style="list-style-type: none"> 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 S.485	Global Warming Reduction Act	2007	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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
Bingaman-Specter S.1766	Low Carbon Economy Act	2007	<ul style="list-style-type: none"> 2012 levels in 2012 2006 levels in 2020 1990 levels by 2030 President may set further goals \geq60% below 2006 levels by 2050 contingent upon international effort 	Economy-wide
Boxer-Lieberman-Warner S. 3036	Substitute for S. 2191	2008	<ul style="list-style-type: none"> 4% below 2005 level in 2012 19% below 2005 level in 2020 71% below 2005 level in 2050 	Economy wide
Markey HR. 6186	The Investing in Climate Action and Protection Act	2008	<ul style="list-style-type: none"> 2005 level in 2012 20% below 2005 level by 2020 80% below 2005 level by 2050 	Economy wide

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1 The emissions levels that would be mandated by some of these bills are shown in
2 Figure 4 below:

3 **Figure 4: Comparison of Legislative Climate Change Targets in the**
4 **Current 110th U.S. Congress as of June 5, 2008**



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For a full discussion of underlying methodology, assumptions and references, please see <http://www.wri.org/usclimatetargets>. WRI does not endorse any of these bills. This analysis is intended to fairly and accurately compare explicit carbon caps in Congressional climate proposals and uses underlying data that may differ from other analyses. Price caps, circuit breakers and other cost-containment mechanisms contained in some bills may allow emissions to deviate from the pathways depicted in this analysis.

5
6 It is uncertain which, if any, of the specific climate change bills that have been
7 introduced to date in the Congress will be adopted. Nevertheless, the general trend
8 is clear; and it would be a mistake to ignore it in long-term decisions concerning
9 electric resources. Over time the proposals are becoming more stringent as
10 evidence of climate change accumulates and as the political support for serious
11 governmental action grows.

12 **Q. How would WPL's CO₂ emissions under its proposed "Carbon Reduction**
13 **Plan" compare to the greenhouse gas emissions that would be mandated**
14 **under these legislative proposals?**

15 A. As shown in Figure 2 above, WPL's CO₂ emissions would be at the
16 same time that the legislative proposals in Congress would be mandating

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1 reductions in emissions. In other words, WPL's CO₂ emissions would
2 at a time when the mandated levels of emissions were
3 being reduced.

4 **Q. Is WPL aware that the major legislative proposals that have been introduced**
5 **in the current U.S. Congress would mandate substantial reductions in CO₂**
6 **emissions?**

7 A. Yes.

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10 **Q. Does WPL believe it is reasonable to expect that the federal government will**
11 **adopt greenhouse gas legislation?**

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²⁵ Exhibit____(DAS-8) at Bates Page Number WPL 069285.

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Q. Is WPL aware that passage of one of the legislative proposals introduced in Congress could mean that it would have to substantially reduce its emissions of greenhouse gases?

A.

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As

shown in Figure 4 below, Alliant's CO₂ emissions would be

²⁶ Exhibit___(DAS-9) at Bates Page Numbers WPL 069527 and 069528.
²⁷ Exhibit___(DAS-10), at Bates Page Number WPL 070084.
²⁸ Exhibit___(DAS-11) at Bates Page Number WPL 069447.
²⁹ Exhibit___(DAS-12), at Bates Page Number WPL 069484.

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Figure 4: Future Alliant Energy CO₂ Emissions versus National Proposals³⁰ [CONFIDENTIAL]

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Q. Would it be reasonable to assume that a new coal-fired plant like the NED 3 plant will be grandfathered under federal climate change legislation or will be favored with the provision of extra free CO₂ emission allowance allocations that could mitigate or offset the impact of CO₂ regulations?

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A. No. It is unclear what provisions for grandfathering existing coal plants (that is, allocating them allowances for free), if any, will be adopted as part of future greenhouse gas legislation. At the same time, it is unrealistic to expect that many or all of the new coal-fired plants currently being proposed will be grandfathered because of the substantial reductions in CO₂ emissions from current levels that

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³⁰ Source: Exhibit____(DAS-11), at Bates Page Number WPL 069446.

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1 have to be made by 2050 just to stabilize atmospheric concentrations of CO₂ at
2 even 450 parts per million (“ppm”) to 550 ppm.

3 Meeting these goals will require either a reduction in dependence on coal for
4 electricity generation or a very large investment in conversion of the current coal
5 generating fleet in the U.S. The only realistic way either of these is going to
6 happen is with a large marginal cost on greenhouse gas emissions such as a CO₂
7 tax or higher emissions allowance prices. It is not reasonable to expect that a new
8 coal plant like NED 3, which will substantially increase the emissions of CO₂ into
9 the atmosphere, will receive significant emission allowances under any U.S.
10 carbon regulation plan.

11 For example, the National Commission on Energy Policy³¹ has recommended that
12 “new coal plants built without [carbon capture and sequestration] not be
13 “grandfathered” (i.e., awarded free allowances) in any future regulatory program
14 to limit greenhouse gas emissions.”³² A report of an interdisciplinary study at the
15 Massachusetts Institute of Technology on *The Future of Coal* similarly noted that:

16 There is the possibility of a perverse incentive for increased early
17 investment in coal-fired power plants without capture, whether
18 SCPC or IGCC, in the expectation that the emissions from these
19 plants would potentially be “grandfathered” by the grant of free
20 CO₂ allowances as part of future carbon emissions regulations and
21 that (in unregulated markets) they would also benefit from the
22 increase in electricity prices that will accompany a carbon control
23 regime. Congress should act to close this “grandfathering”
24 loophole before it becomes a problem.³³

25 Additionally, it has been proposed in Congress that new coal-fired plants would
26 be required to actually have carbon capture and sequestration technology. For

³¹ The National Commission on Energy Policy is a bipartisan group of 20 energy experts from industry, government, academia, labor, consumer and environmental protection.

³² *Energy Policy Recommendations to the President and the 110th Congress*, National Commission on Energy Policy, April 2007, at page 21. Available at http://www.bipartisanpolicy.org/files/news/contentFiles/NCEP-Recom-final-single_4773e92b6f5c2.pdf

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1 example, a bill by Massachusetts Senator Kerry would limit CO₂ emissions from
2 new coal-fired facilities to 285 lbs/MWh. New coal-fired facilities would be
3 defined as those that begin construction on or after April 26, 2007 and would
4 certainly include the NED 3 Project.

5 **Q. But doesn't the proposed Lieberman-Warner climate change bill that has**
6 **been debated in the U.S. Senate allow for the allocation of some free CO₂**
7 **emissions allowances to new coal-fired power plants?**

8 A. It is true that the proposed Lieberman-Warner legislation, as currently written,
9 would allocate some allowances to new plants. However, there would only be a
10 fixed, and declining over time, pool of allowances for both new and existing
11 plants. Whatever allowances would be allocated to new entrants like NED 3
12 would not be available for existing plants.

13 This will be a sizeable loss to companies like WPL who already are heavily
14 dependent on coal-fired generation and will likely lead to very significant costs as
15 these companies have to buy allowances to cover generation at their existing
16 facilities. Thus, there may be no net gain of allowances allocated to WPL as
17 allowances that are allocated to NED 3 might otherwise have been available to the
18 Company for its existing generation.

19 So there is a triple uncertainty – first, will the Lieberman-Warner bill be approved
20 by Congress and signed into law as currently written? Second, how many new
21 plants will there be that will be in the new entrant pool with first access to the
22 limited, and declining, number of emissions allowances that will be available each
23 year? The greater the number of new plants in the new entrants pool, the fewer
24 allowances will be available to NED 3. Third, how many allowances will WPL
25 consequently have to buy to cover their existing generation because new plants
26 like NED 3 received free allowances?

³³ *The Future of Coal, Options for a Carbon-Constrained World, an Interdisciplinary MIT Study*, 2007, at page (xiv). Available at http://web.mit.edu/coal/The_Future_of_Coal.pdf.

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1 As a result, there is no reason to assume that WPL will receive a greater number
2 of free allowances as a result of its ownership of NED 3 than it would otherwise
3 receive for just its existing coal-fired power plants.

4 **B. Wisconsin State Climate Change Proposals**

5 **Q. What are the recommendations of the Governor’s Task Force on Global**
6 **Warming concerning targeted levels of CO₂ emissions?**

7 A. The Governor’s Task Force has recommended that policies be adopted for the
8 utility sector “that will result in a substantial reduction over time in the state’s
9 dependence on fossil fuels and, in particular, on coal-fired generation that does
10 not include carbon capture and sequestration technology.”³⁴ More specifically,
11 the Task Force recommended the following set of goals for Wisconsin net
12 greenhouse gas (“GHG”) emissions:

- 13 • A return to 2005 levels by no later than 2014.
- 14 • A 22 percent reduction from 2005 levels (roughly equivalent to 1990
15 levels by 2022).
- 16 • A 75 percent reduction from 2005 levels by 2050 (roughly equivalent to
17 70 percent below 1990 levels).³⁵

18 **Q. Has the Governor taken any actions consistent with these recommendations?**

19 A. Yes. On August 1, 2008, Governor Doyle announced that coal is not a fuel option
20 for the state-owned heating plants in Madison:

21 The state should lead by example and move away from our
22 dependence on coal at the state-owned heating plants in Madison.
23 Global warming demands leadership and as we plan for the future
24 of the Madison heating facilities, we must chart a course that
25 lowers greenhouse gas emissions and encourages new alternative
26 energy sources.³⁶

³⁴ *Final Report to Governor Jim Doyle*, July 2008, at page 8.

³⁵ *Id.*, at pages 6, 34 and 35.

³⁶ Press Release, *Governor Says No to Coal for State Heating Plants in Madison*, August 1, 2008.

Figure 5: Annual CO₂ Emissions Under WPL’s Proposed IRP Resource and Carbon Reduction Plans vs. The Recommendations of the Governor’s Task Force [CONFIDENTIAL]

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1 more wind and energy efficiency than WPL has included in either its IRP
2 Resource Plan or “Carbon Reduction Plan.”

3 **Q. Have you seen any evidence that WPL has analyzed how it would achieve the**
4 **CO₂ emission reduction goals recommended by the Governor’s Task Force**
5 **on Global Warming or whether construction of NED 3 is consistent with**
6 **those recommendations?**

7 A. No. I have seen no evidence that WPL has used the EGEAS model or has
8 prepared any other analyses to evaluate the actions it would have to take to
9 achieve the CO₂ emission reduction goals recommended by the Governor’s Task
10 Force on Global Warming.

11 **C. Midwest Regional Climate Change Proposals**

12 **Q. Please describe the recent Midwest regional efforts to address global climate**
13 **change.**

14 A. In November of 2007, the Governor’s of six Midwestern states, including
15 Wisconsin, Minnesota, Illinois, Iowa, Kansas, and Michigan and the Premier of
16 Manitoba signed the Midwestern Greenhouse Gas Accord. This agreement
17 committed the states to establishing greenhouse gas emissions targets and
18 timetables, developing a market based, multi-sector cap-and-trade mechanism to
19 achieve those reduction targets, developing a regional registry and tracking
20 mechanism, and developing and implementing additional steps as needed to
21 achieve the reduction targets.³⁷

22 **Q. Has WPL indicated that it is aware of this Greenhouse Gas Accord?**

23 A. Yes. Exhibit___(CJH-2) Schedule 3, of WPL witness Hookham indicates that
24 “*The Midwestern Greenhouse Gas Reduction Accord* is a regional agreement by
25 US Midwest states to reduce greenhouse gas emissions and combat climate

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1 change ... Reduction targets are expected to be consistent with the 60-80 percent
2 reductions recommended by the Intergovernmental Panel on Climate Change
3 (IPCC).”³⁸

4 **Q. Has WPL considered whether implementation of the Greenhouse Gas**
5 **Accord would affect its future resource plans and operations?**

³⁷ 2007 *Midwestern Greenhouse Gas Accord*, Midwestern Energy Security & Climate Stewardship
Summit, November 2007, at pages 3 and 4, available at
³⁸ <http://www.midwesterngovernors.org/resolutions/GHGAccord.pdf>.
³⁹ At page ES-3.

⁴⁰ Id. Exhibit___(DAS-13), at Bates Page Number WPL 068147

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1 **Q.** Has the Company undertaken any EGEAS modeling to examine the impact
2 that the implementation of the Midwest Governors Association’s Greenhouse
3 Gas Accord would have on its existing generation plans, costs to customers or
4 investment opportunities?

5 A. .⁴¹

6 **Q.** Has WPL prepared any other analyses, studies or reports of the implications
7 that implementation of the *Greenhouse Gas Accord* could have on the
8 Company, its existing generation plans, costs to customers and/or investment
9 opportunities?

10 A. .⁴²

11 **5.** **The results of the PSCW Staff’s EGEAS Modeling Show That NED 3**
12 **Is Not Part Of A Least Cost Resource Plan.**

13 **Q.** What were the results of the initial PSCW Staff EGEAS modeling analyses
14 that were reported in the Draft EIS?

15 A. The PSCW Staff examined 15 scenarios and over 300 sensitivities as part of the
16 EGEAS modeling reported in the Draft EIS. On the basis of this modeling, the
17 PSCW Staff concluded that “The proposed NED 3 unit is not the least cost option
18 under any scenario” it examined.⁴³ For example, in its scenario with CO₂
19 monetized at \$20/ton, the NED 3 in 2013 Base Case (with the Kewaunee contract
20 extended to 2033) was \$483 million NPV more expensive than the Optimal Plan
21 and \$440 million NPV more expensive than the No New Coal plan.⁴⁴

⁴¹ WPL Confidential Response to Interrogatory 4-CUB-19.

⁴² WPL Confidential Response to Interrogatory 4-CUB-22.

⁴³ Final EIS, at page 123.

⁴⁴ Final EIS, at page 119.

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Q. What suggestions did CUB and Clean Wisconsin submit in response to the Draft EIS?

CUB and Clean Wisconsin requested that the PSCW Staff prepare a set of new EGEAS runs that would reflect (1) WPL's new, and significantly higher, estimated costs for NED 3 and COL 3, (2) 14 percent and 15 percent reserve margins, (3) carbon regulation costs in its base case analysis, and (4) higher fossil fuel prices. In particular, CUB and Clean Wisconsin requested the PSCW Staff to perform the following combined sensitivity analyses as part of the EGEAS modeling for the Final EIS:

CUB/CW-1 WPL's most recent coal plant, including NED 3 and COL 3, capital costs, a 15 percent reserve margin, CO₂ monetized at \$20/ton, and fossil fuel prices +20 percent over the values used in the EGEAS runs presented in the Draft EIS.

CUB/CW-2 WPL's most recent coal plant capital costs (including NED 3 and COL 3), CO₂ monetized at \$20/ton, a 14 percent reserve margin, fossil fuel prices increased by twenty percent, additional DSM, and 30 percent renewables by 2030. The additional DSM and 30 percent renewables would be modeled as Staff had done for the Draft EIS.

CUB/CW-3 WPL's most recent coal plant capital costs increased by 20 percent, CO₂ monetized at \$30/ton, a 14 percent reserve margin and fossil fuel prices increased by 20 percent.

Q. What was the basis for the 14 percent and 15 percent reserve margins that CUB and Clean Wisconsin requested the PSCW Staff to model in these scenarios?

A. The 18 percent reserve margin that WPL and the PSCW Staff used in most of their EGEAS scenarios is too high. In fact, WPL has acknowledged that it is using a percent reserve margin in its 2008 IRP analyses.⁴⁵

The use of a 14 percent or 15 percent reserve margin also is consistent with regional developments. For example, the *Preliminary Report of the Midwest*

⁴⁵ WPL Response to Interrogatory 4-CUB-4.

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1 *Planning Reserve Sharing Group*, dated February 5, 2008, stated that the planning
2 reserve margin target for the 2008-2009 planning year for the West PRSG zone,
3 which includes Alliant Energy and other Wisconsin utilities, is 14.2 percent.⁴⁶ A
4 subsequent Loss of Load Expectation Study by the Midwest PRSG confirmed this
5 same figure.⁴⁷ A reserve margin range of between 14 and 15 percent also is
6 consistent with the Commission's discussion at its open meeting in Docket No.
7 05-EI-141 on June 5, 2008.

8 For these reasons, we believe a range for reserve margins of 14 percent to 15
9 percent is appropriate to use in the resource planning assessments of NED 3 and
10 alternatives.

11 **Q. What is the basis for the twenty percent higher fossil fuel prices that CUB**
12 **and Clean Wisconsin included in the three scenarios they requested PSCW**
13 **Staff to run?**

14 A. CUB and Clean Wisconsin asked the PSCW Staff to assume twenty percent
15 higher fossil fuel prices based on the increased coal and natural gas prices that
16 were being forecast as of the spring of 2008.

17 **Q. What is the basis for the \$20/ton and \$30/ton monetized CO₂ prices that CUB**
18 **and Clean Wisconsin asked the PSCW Staff to model in their additional**
19 **EGEAS run?**

20 A. Based on our work on climate change issues, Synapse believes that the \$20/ton
21 CO₂ price that the PSCW Staff had used in its EGEAS modeling for the Draft EIS
22 was reasonable, albeit low. Therefore, CUB and Clean Wisconsin asked Staff to
23 run two new EGEAS cases with this same CO₂ price. CUB and Clean Wisconsin
24 also asked the PSCW Staff to look at a scenario where CO₂ prices are higher than
25 \$20/ton – this was the basis for the \$30/ton CO₂ price case.

⁴⁶ Available at http://www.midwestmarket.org/publish/Document/6871db_117a25bcaa6_-7adf0a48324a.

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1 Q. How do the \$20/ton and \$30/ton CO₂ prices compare to other analyses of
2 future CO₂ costs?

3 A. As part of our work at Synapse we have reviewed the results of the modeling
4 analyses that have been undertaken to evaluate the CO₂ emissions allowance
5 prices that likely would result from the adoption and implementation of the major
6 greenhouse gas regulatory legislation that has been introduced in the current U.S.
7 Congress.⁴⁸ These modeling analyses include:

- 8 • The Energy Information Administration of the U.S. Department of
9 Energy's ("EIA") assessment of the *Energy Market and Economic*
10 *Impacts of S. 280, the Climate Stewardship and Innovation Act of 2007*
11 *(July 2007)*.⁴⁹
- 12 • The October 2007 Supplement to the EIA's assessment of the *Energy*
13 *Market and Economic Impacts of S. 280, the Climate Stewardship and*
14 *Innovation Act of 2007*.⁵⁰
- 15 • The EIA's assessment of the *Energy Market and Economic Impacts of S.*
16 *1766, the Low Carbon Economy Act of 2007 (January 2008)*.⁵¹
- 17 • The EIA's assessment of the *Energy Market and Economic Impacts of S.*
18 *2191, the Lieberman-Warner Climate Security Act of 2007 (April 2008)*.⁵²
- 19 • The U.S. Environmental Protection Agency's ("EPA") *Analysis of the*
20 *Climate Stewardship and Innovation Act of 2007 – S. 280 in 110th*
21 *Congress (July 2007)*.⁵³
- 22 • The EPA's *Analysis of the Low Carbon Economy Act of 2007 – S. 1766 in*
23 *110th Congress (January 2008)*.⁵⁴
- 24 • The EPA's *Analysis of the Lieberman-Warner Climate Security Act of*
25 *2008 – S. 2191 in 110th Congress (March 2008)*.⁵⁵

47 Available at http://www.midwestmarket.org/publish/Document/77a68f_119522dab5e_-7ec50a48324a.

48 The legislation examined in these modeling analyses are Senate Bill S. 280, Senate Bill S. 1766, and Senate Bill S.2191 the details of which are presented in Table 1 and Figure 4 earlier in this Testimony.

49 Available at [http://www.eia.doe.gov/oiaf/servicerpt/csia/pdf/sroiaf\(2007\)04.pdf](http://www.eia.doe.gov/oiaf/servicerpt/csia/pdf/sroiaf(2007)04.pdf).

50 Available at http://www.eia.doe.gov/oiaf/servicerpt/biv/pdf/s280_1007.pdf

51 Available at [http://www.eia.doe.gov/oiaf/servicerpt/lcea/pdf/sroiaf\(2007\)06.pdf](http://www.eia.doe.gov/oiaf/servicerpt/lcea/pdf/sroiaf(2007)06.pdf)

52 Available at [http://www.eia.doe.gov/oiaf/servicerpt/s2191/pdf/sroiaf\(2008\)01.pdf](http://www.eia.doe.gov/oiaf/servicerpt/s2191/pdf/sroiaf(2008)01.pdf).

53 Available at <http://www.epa.gov/climatechange/economics/economicanalyses.html>.

54 Available at <http://www.epa.gov/climatechange/economics/economicanalyses.html>.

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- 1 • *Assessment of U.S. Cap-and-Trade Proposals* by the Joint Program at the
2 Massachusetts Institute of Technology (“MIT”) on the Science and Policy
3 of Global Change (April 2007).⁵⁶
- 4 • *Analysis of the Cap and Trade Features of the Lieberman-Warner Climate*
5 *Security Act – S. 2191* by the Joint Program at MIT on the Science and
6 Policy of Global Change (April 2008).⁵⁷
- 7 • *The Lieberman-Warner America’s Climate Security Act: A Preliminary*
8 *Assessment of Potential Economic Impacts, prepared by the Nicholas*
9 *Institute for Environmental Policy Solutions, Duke University and RTI*
10 International (October 2007).⁵⁸
- 11 • *U.S. Technology Choices, Costs and Opportunities under the Lieberman-*
12 *Warner Climate Security Act: Assessing Compliance Pathways*, prepared
13 by the International Resources Group for the Natural Resources Defense
14 Council (May 2008).⁵⁹
- 15 • *The Lieberman-Warner Climate Security Act – S. 2191, Modeling Results*
16 *from the National Energy Modeling System – Preliminary Results*, Clean
17 Air Task Force (January 2008).⁶⁰
- 18 • *Economic Analysis of the Lieberman-Warner Climate Security Act of 2007*
19 *Using CRA’s MRN-NEEM Model*, CRA International, April 2008.⁶¹
- 20 • *Analysis of the Lieberman-Warner Climate Security Act (S. 2191) using*
21 *the National Energy Modeling System (NEMS/ACCF/NAM)*, a report by
22 the American Council for Capital Formation and the National Association
23 of Manufacturers, NMA, March 2008.⁶²

24 In total, these modeling analyses examined more than 75 different scenarios.
25 These scenarios reflected a wide range of assumptions concerning important
26 inputs such as: the “business-as-usual” emissions forecasts; the reduction targets
27 in each proposal; whether complementary policies such as aggressive investments
28 in energy efficiency and renewable energy are implemented, independent of the
29 emissions allowance market; the policy implementation timeline; program

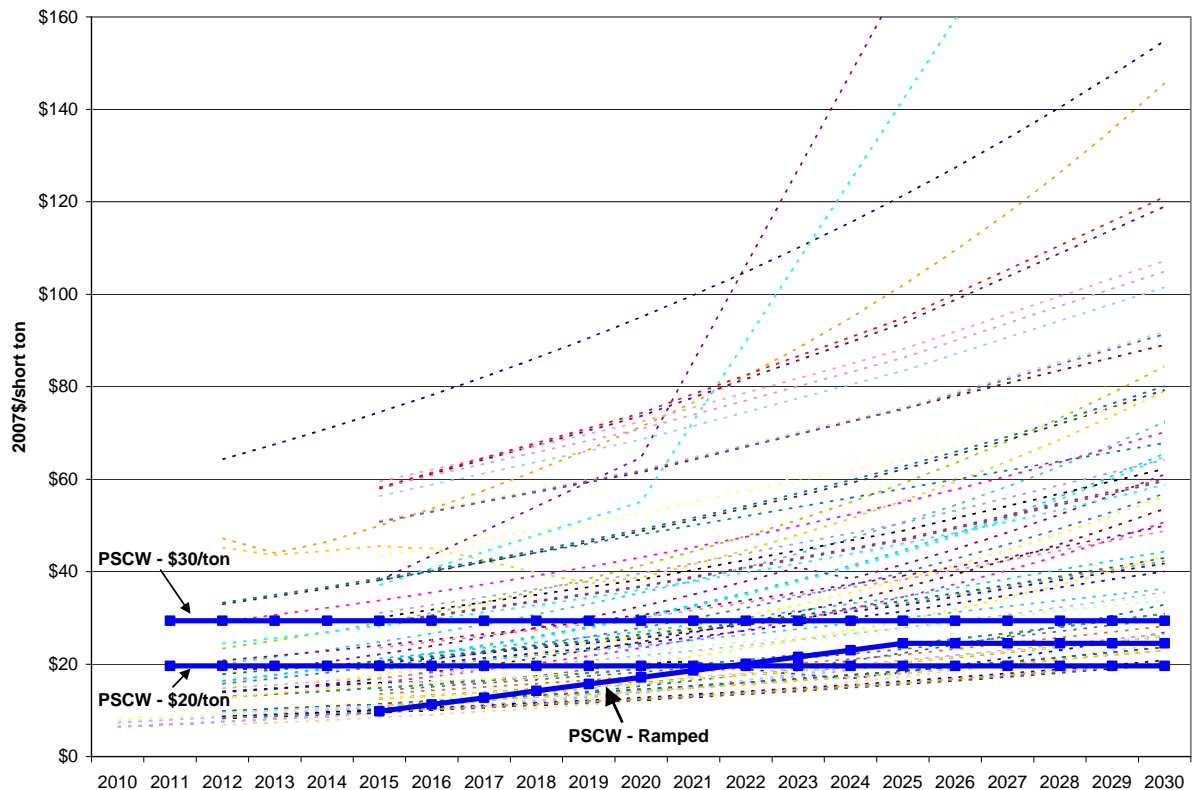
55 Available at <http://www.epa.gov/climatechange/economics/economicanalyses.html>.
56 Available at http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt146.pdf.
57 Available at http://mit.edu/globalchange/www/MITJPSPGC_Rpt146_AppendixD.pdf.
58 Available at <http://www.nicholas.duke.edu/institute/econsummary.pdf>.
59 Available at http://docs.nrdc.org/globalwarming/glo_08051401A.pdf.
60 Available at <http://lieberman.senate.gov/documents/catflwcsa.pdf>.
61 Available at http://www.nma.org/pdf/040808_crai_presentation.pdf.
62 Available at <http://www.accf.org/pdf/NAM/fullstudy031208.pdf>.

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flexibility regarding emissions offsets (perhaps international) and allowance banking; assumptions about technological progress and the cost of alternatives; and the presence or absence of a “safety valve” price.

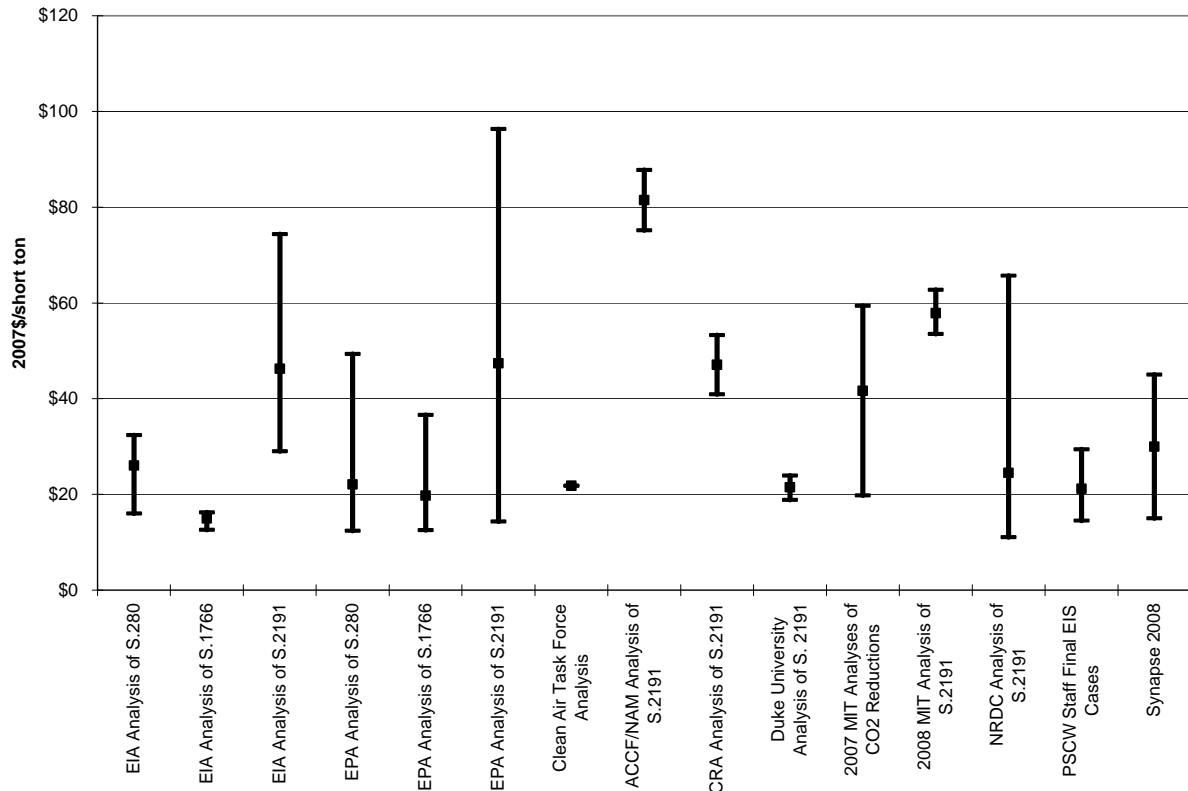
The results of these modeling analyses are presented in Figures 6 and 7 below, along with the CO₂ prices used by the PSCW Staff in their additional EGEAS modeling for the Final EIS. Figure 6 presents the annual CO₂ prices, in 2007 dollars, from the scenarios in each modeling analysis. Figure 7 then presents the ranges of levelized CO₂ prices developed in each modeling analysis.

Figure 6: CO₂ Prices in Additional PSCW Staff EGEAS Modeling vs. Results of Modeling Analyses of Major Bills in Current U.S. Congress – Annual CO₂ Prices (in 2007 dollars)



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1 **Figure 7: CO₂ Prices in Additional PSCW Staff EGEAS Modeling vs.**
2 **Results of Modeling Analyses of Major Bills in Current U.S.**
3 **Congress – Levelized CO₂ Prices (2013-2030, in 2007 dollars)**



4
5 As can be seen, the \$20/ton, \$30/ton, and Ramped CO₂ prices used by the PSCW
6 Staff in their additional EGEAS modeling are quite conservative (that is, low)
7 compared to the full range of CO₂ emissions allowance prices that could result
8 from adoption of the major greenhouse gas regulatory legislation that has been
9 introduced in the current U.S. Congress.

10 **Q. What were the results of the additional EGEAS runs that PSCW Staff made**
11 **as part of its Supplemental EGEAS work for the Final EIS?**

12 A. Table 3, below, is a copy of Table 6.9-3 Part A and Part B from the Final EIS. As
13 can be seen from this Table, the plan with NED 3 in 2013 is not the least cost
14 option in any of the six cases examined by the PSCW Staff in its additional
15 EGEAS modeling, including all four of the cases where CO₂ costs are considered.

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Table 3: Additional PSCW Staff EGEAS Analyses – PVRR Results

Additional EGEAS analysis-Appendix				
Table 6.9-3 Part A				
PVRR for the different cases and scenarios				
Sensitivity	Optimal Plan	NED 3 in 2013	No New Coal	500 MW SCPC
STAFF New Base Case w 20.8% higher costs	13,721.6	14,016.2	14,091.9	13,683.4
WPL "Adjustments"	13,879.4	14,267.2	14,306.1	13,881.8
STAFF New Base Case w CO2 RAMPED	16,587.2	17,186.0	16,602.6	16,598.1
CUB/CW-1	17,167.8	17,741.4	17,406.2	17,165.1
CUB/CW-2	16,407.7	17,053.5	16,430.5	16,411.4
CUB/CW-3	18,792.3	19,635.8	18,792.3	18,792.3
Table 6.9-3 Part B				
Difference in costs among the cases and scenarios compared to the Commission staff base case				
Sensitivity	Optimal Plan	NED 3 in 2013	No New Coal	500 MW SCPC
w 20.8% higher costs	-	338.0	413.7	5.2
WPL "Adjustments"	-	387.8	426.7	2.4
w CO2 RAMPED	-	598.8	15.4	10.9
CUB/CW-1	-	573.6	238.4	(2.7)
CUB/CW-2	-	645.8	22.8	3.7
CUB/CW-3	-	843.5	-	-

Q. What alternatives did the EGEAS model select in place of NED 3 in these new EGEAS analyses?

A. Table 4, below, is a copy of Table 6.9-3 Part C from the Final EIS. As shown in this Table, the EGEAS model selected combined cycle plants for the new capacity additions in the Optimal Plan with PSCW Staff's ramped CO₂ prices. The EGEAS model selected mostly combustion turbine units as the new capacity additions in the Optimal Plans with the \$20/ton and \$30/ton CO₂ prices. In the two scenarios with \$20/ton CO₂ prices that were requested by CUB and Clean Wisconsin, the EGEAS model did add new coal capacity as part of the Optimal Plans. However, this new coal capacity was not added until 2021 in one case and 2025 in the other.

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Table 4: Additional PSCW Staff EGEAS Analyses – New Generating Facilities Added

Table 6.9-3 Part C Generation units picked by the model for the cases and scenarios investigated				
Sensitivity	Optimal Plan	NED 3 in 2013	No New Coal	500 MW SCPC
STAFF New Base Case w 20.8% higher costs	2012--300MW CC	2013--NED3	2012--300MW CC	2012--300MW CC
	2019--COL4(300)	2018--300MW CC	2019--300MW CC	2017--155MW CT
	2020--155MW CT	2022--COL4(300)	2020--155MW CT	2021--COL4(500)
WPL "Adjustments"	2013--300MW CC	2013--NED3	2013--300MW CC	2013--300MW CC
	2016--155MW CT	2017--300MW CC	2018--300MW CC	2016--155MW CT
	2020--COL4(300)	2021--COL4(300)	2020--155MW CT	2021--COL4(300)
STAFF New Base Case w CO2 RAMPED	2013--300MW CC	2013--NED3	2013--300MW CC	2013--300MW CC
	2017--300MW CC	2017--300MW CC	2017--300MW CC	2017--300MW CC
	2022--300MW CC	2021--300MW CC	2022--300MW CC	2022--155MW CT
CUB/CW-1	2017--155MW CT	2013--NED3	2017--155MW CT	2017--155MW CT
	2019--155MW CT	2020--155MW CT	2019--155MW CT	2019--155MW CT
	2021--COL4(300)	2023--155MW CT	2021--300MW CC	2021--155MW CT
CUB/CW-2	2019--155MW CT	2013--NED3	2019--155MW CT	2019--155MW CT
	2025--COL4(300)	2026--155MW CT	2026--155MW CT	2026--155MW CT
	2026--155MW CT	2030--155MW CT	2028--155MW CT	2028--155MW CT
CUB/CW-3	2018--155MW CT	2013--NED3	2018--155MW CT	2018--155MW CT
	2020--155MW CT	2022--155MW CT	2020--155MW CT	2020--155MW CT
	2022--155MW CT	2024--155MW CT	2022--155MW CT	2022--155MW CT

Q. Were any of the scenarios that CUB and Clean Wisconsin asked the PSCW Staff to examine intended to be a “worst case” analysis?

A. No. Given the soaring construction costs that are being experienced by coal-fired power plant construction projects and the very real potential for very high CO₂ emissions allowance prices, none of the three scenarios that CUB and Clean Wisconsin asked the PSCW Staff to examine could reasonably be considered to be a “worst case” analysis. Indeed, given the current environment for power plant construction costs and the likely federal regulation of greenhouse gas emissions, it would not be unreasonable to look at scenarios that assume 30 percent or 40 percent increases in the estimated construction costs of NED 3 and COL 3 and CO₂ prices far higher than the PSCW Staff’s \$30/ton figure. In particular, we believe that it is reasonable to expect that CO₂ prices will be substantially higher than the \$30/ton price the PSCW Staff examined in Case CUB/CW-3.⁶³

⁶³ See the *Synapse 2008 CO2 Price Forecasts Report* that is included as Exhibit____(DAS-14).

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1 **Q. What would be the impact of assuming CO₂ prices higher than \$30/ton?**

2 A. Assuming higher CO₂ prices would make NED 3 even more of an uneconomic
3 option and would make the plan with NED 3 in 2013 even more expensive
4 compared to the Optimal and the No New Coal Plans.

5 **Q. Did the PSCW Staff EGEAS modeling also show that NED 3 is not part of a**
6 **least cost plan even if CO₂ costs were not considered?**

7 A. Yes. As I noted earlier, NED 3 was not the least cost option in any of the
8 scenarios examined by the PSCW Staff in the Draft EIS, including all 14 of the
9 scenarios in which the PSCW Staff did not assume any CO₂ prices. NED 3 also
10 was not selected as part of a least cost plan in the two EGEAS cases with no CO₂
11 costs that the PSCW Staff studied in the Final EIS.

12 **6. Building NED 3 Would Expose WPL's Ratepayers to Significant Risks**

13 **Q. Why is it important that WPL consider risk when evaluating the economics**
14 **of building the proposed NED 3 Plant?**

15 A. Risk and uncertainty are inherent in all enterprises. But the risks associated with
16 any options or plans need to be balanced against the expected benefits from each
17 such option or plan.

18 In particular, parties seeking to build new generating facilities and the associated
19 transmission face a host of major uncertainties, including, for example, the
20 expected cost of the facility, future restrictions on emissions of carbon dioxide,
21 and future fuel prices. The risks and uncertainties associated with each of these
22 factors needs to be considered as part of the economic evaluation of whether to
23 pursue the proposed facility or other alternatives.

24 **Q. What are the most significant fossil plant-specific risks associated with**
25 **building new coal-fired generating plants like NED 3?**

26 A. Exhibit___(DAS-15) is *Don't Get Burned: The Risks of Investing in New Coal-*
27 *Fired Power Plants*. This Synapse report discusses the risks associated with new

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1 coal-fired generating plants like the proposed the NED 3 plant. The most
2 significant of these risks are the likelihood for future restrictions on CO₂
3 emissions and the potential for further increases in the project's capital cost. Other
4 potential uncertainties for new coal plants include the potential for higher fuel
5 prices, the potential for fuel supply disruptions that could affect plant operating
6 performance, and the potential for increasingly stringent regulation of current
7 criteria pollutants.

8 **Q. Have you seen evidence that WPL is generally aware of these risks?**

9 A. Yes.

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⁶⁵ , at
⁶⁶ Bates Page Number WPL 069526. A copy of this presentation is included as Exhibit____(DAS-9).
⁶⁷ Id., at Bates Page Number WPL 069527.
⁶⁸ Id., at Bates Page Number WPL 069534.
⁶⁹ Id., Bates Page Number WPL 069535.
⁷⁰ Id., Bates Page Number WPL 069536
Id., at Bates Page Number WPL 069538.

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also reported that:

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Q. Have you seen any evidence that WPL has adequately considered the risks and uncertainties associated with building a new coal plant as part of its evaluations of the proposed NED 3 plant?

A. No. As I just discussed, . However, the evidence that I have seen shows that the Company has not adequately considered those as part of its resource planning. For example, the Company has not prepared any new EGEAS analyses with the current NED 3 and COL 3 cost estimates. In addition, most of the Company's EGEAS runs have been based on a \$0/ton price for CO₂ emissions – that is, on the assumption that there will be no federal or state regulation of greenhouse gas emissions at any time during the expected 50 to 60 year service life of NED 3. At the same time, even those EGEAS runs that did reflect non-zero CO₂ prices were biased in favor of the proposed coal plant because WPL unreasonably restrained the amounts of new wind that could be added.

⁷¹ , at
Bates Page Number WPL 070100. A copy of this presentation is included as Exhibit____(DAS-17).
⁷² Id, at Bates Page Number WPL 070102.

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1 **Q. Have any plant- or site-specific risks been identified for the proposed NED 3**
2 **plant?**

3 A. Yes. For example,
4 but
5 also noted a number of associated with the project:

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13 **Q. Is it also important to consider as part of resource planning the risks and**
14 **uncertainties associated with alternatives to a proposed coal power plant**
15 **such as renewable resources and natural gas-fired units?**

16 A. Absolutely. To the extent possible, it is important to consider all reasonable risks
17 and uncertainties in resource planning.

18 **A. WPL Has Not Considered the Potential for Further**
19 **Construction Cost Increases in its Planning Analyses**

20 **Q. Do you agree with WPL witness Hookham's explanation of the reasons for**
21 **the recent 38 to 40 percent increase in the estimated cost of the NED 3**
22 **plant?⁷⁴**

23 A. Yes. I generally agree that the worldwide competition for power plant design and
24 construction resources, commodities and equipment that is discussed in Mr.

⁷³

, at Bates Page Number WPL068658. A copy of this presentation is included as
Exhibit__(DAS-18).

⁷⁴ Direct Testimony of Charles J. Hookham, at page 14, lines 5-7.

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1 Hookham's testimony has led to skyrocketing construction costs at power plant
2 construction projects in general, and to the current \$1.143 billion estimated cost
3 for the NED 3 plant, without financing costs.

4 Mr. Hookham was asked during his deposition what accounts for the recent
5 increase in the estimated cost of NED 3. I believe his answer covers all of the
6 main drivers that have led to soaring power plant construction costs:

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29 **Q. Given the substantial jump in cost just announced for the NED 3 plant, is it**
30 **reasonable to expect that there will be further increases in the construction**
31 **cost of the project?**

32 A. Yes. It is reasonable to expect that the factors which have led to the recent
33 increase in the estimated costs for NED 3 and COL 3, and to soaring prices for

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1 other coal plants, will lead to further increases in the future. Thus, the actual cost
2 of building NED 3 can be expected to be higher, perhaps even significantly
3 higher, than WPL's most recent estimate.

4 **Q. What are the reasons for your conclusion that further increases in the cost of**
5 **the NED 3 plant can be expected?**

6 A. A number of factors lead me to the conclusion that the estimated cost of building
7 the NED 3 plant will continue to rise, perhaps quite significantly, before the
8 project is completed. These factors include: industry-wide trends and cost
9 uncertainties, as explained by Mr. Hookham; the actual cost experiences of other
10 projects that are further along in the procurement and construction process than
11 NED 3;
12 ; and, finally, the inability of WPL to obtain
13 in the current construction environment fixed price contracts for major project
14 work and equipment procurement.

15 **Q. Have you seen any evidence that the costs of key power plant design and**
16 **construction resources, commodities and equipment are continuing to rise?**

17 A. Yes. Construction industry literature and publications are filled with reports and
18 information on the continuing increases in power plant and commodity costs.
19 For example, a May 15, 2008 story in the Wall Street Journal noted that
20 "escalating steel prices are halting and slowing major construction projects
21 worldwide and limiting shipbuilding and oil and gas exploration." The same
22 article also reported that "Steel prices are up 40 percent to 50 percent since
23 December, and industry executives say they have not reached a peak" and "raw
24 materials prices have surged in the past year, fueled in part because of the rapid
25 industrialization of China, India and other developing nations."

⁷⁵ Exhibit____(DAS-3), at page 120, line 21, to page 121, line 24.

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1 **Q. Have you seen any credible evidence that the worldwide competition for**
2 **commodities and other resources that has led to recent coal-fired power**
3 **plant construction cost increases is likely to disappear or even abate**
4 **significantly in the near future?**

5 A. No. While the increases in the costs of some commodities appear to have
6 moderated, there is no evidence that the worldwide competition which has led to
7 soaring construction costs will end anytime in the foreseeable future.

8 **Q. In fact, doesn't Mr. Hookham's testimony suggest that it is reasonable to**
9 **expect further increases in the estimated cost of building NED 3?**

10 A. Yes. Mr. Hookham discusses the forecasted industry cost trends for major
11 equipment and power plant pricing and the uncertainties associated with the cost
12 of the NED 3 plant. He says "until the project is approved and procurement can
13 be completed, all procurements are subject to market-driven escalation in price
14 and future availability risk," certainly suggesting that it would not be
15 unreasonable to expect future cost increases.⁷⁶

16 **Q. Mr. Hookham discusses a number of steps that WPL has taken to mitigate**
17 **the cost uncertainties he cites. Is it possible for a company building a coal-**
18 **plant like NED 3 to fully mitigate these uncertainties and eliminate the**
19 **potential for any further construction cost increases?**

20 A. No. As Mr. Hookham explains the skyrocketing power plant costs are being
21 caused, almost completely, by factors outside the owner's control. Therefore, it is
22 impossible to eliminate them completely or even to be sure that they are
23 reasonably mitigated. Uncertainty in construction costs will remain a major risk
24 for companies wanting to build new coal-fired power plants for the foreseeable
25 future.

⁷⁶ Direct Testimony of Charles J. Hookham, at page 23, line 5, to page 24, line 7.

Public Version

1 **Q.** Has Mr. Hookham acknowledged that materials prices, which were one of
2 the primary factors that led to the recent 38 to 40 percent increase in the
3 estimated cost of the NED 3 plant, have continued to rise since the estimate
4 was released and, as a result, the estimated cost of the plant can be expected
5 to be even higher than \$1.143 billion, without financing costs?

6 **A.** Yes. As Mr. Hookham indicated in his July 24, 2008 deposition in this
7 proceeding:

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24 **Q.** What power plant experiences suggest that the cost of NED 3 will continue to
25 rise?

26 **A.** Many power plant construction projects have announced cost increases and
27 schedule delays in the past couple of years. The cost increases announced for two
28 of these projects, in particular, suggest that even plants that are much further

⁷⁷ Exhibit___(DAS-3), at page 122, lines 2-11.

⁷⁸ Id., at page 124, line 19, to page 125, line 1.

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1 along in the design, procurement and construction process than NED 3 are not
2 immune to rising costs. For example, in April 2008, Duke Energy Indiana
3 announced an 18 percent increase in the estimated cost of its proposed
4 Edwardsport IGCC coal plant just since the spring of 2007. Duke indicated that
5 higher than expected costs had been experienced when the Company actually
6 began final procurement of equipment for the plant. Duke also said that “the
7 increase in the cost estimate is driven by factors outside the Company’s control,
8 including unprecedented global competition for commodities, engineered
9 equipment and materials, and increased labor costs.”⁷⁹ Duke also noted in its
10 Petition to the Indiana Utility Regulatory Commission that this projected increase
11 in cost “is consistent with other recent power plant project cost increases across
12 the country.”⁸⁰

13 At the same time, Kansas City Power & Light recently announced a 15 percent
14 price increase for the Iatan 2 power plant that has been under construction for
15 several years and is scheduled to be completed by 2010. The company also has
16 announced that it may have to increase the cost estimate again after further
17 engineering review is completed.⁸¹ This example shows that even coal-fired
18 power plants that are under construction are not immune to further cost increases.

19 **Q. What NED 3 project-specific evidence suggests that the actual cost of**
20 **building the plant will be higher than WPL’s current \$1.143 billion cost**
21 **estimate, without financing costs?**

22 **A.** The following NED 3 project-specific evidence suggests that the actual cost of the
23 plant will be higher than WPL’s \$1.143 billion cost estimate, without financing
24 costs:

⁷⁹ Verified Petition in Indiana Utility Regulatory Commission Cause No. 43114 IGCC-1, filed on
May 1, 2008, at pages 3-4

⁸⁰ Id., at page 7.

⁸¹ WPL Response to Interrogatory 7-CUB-11.

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10 **Q. What is the current status of the design of the NED 3 plant?**

11 A. As explained by Mr. Hookham,

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13 **Q. Has WPL signed the major contracts for the NED 3 project?**

14 A. WPL has signed a contract with the Washington Group International (now URS-
15 WD) as the project EPC Contractor.

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18 **Q. Is the EPC contract with URS-WD a fixed price contract?**

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82 Hookham Deposition Ex. . A copy of this Deposition Exhibit is included as Exhibit__(DAS-19)
83 Exhibit__(DAS-3), at page 88, lines 7 to 14, page 91, lines 5 to 9, and page 105, lines 6 to 10.
84 Id., at page 91, lines 6 to 10.
85 Exhibit__(DAS-3), at page 81, line 21, to page 82, line 11, page 83, lines 3 to 16, and page 85,
lines 4 to 20..

86 at Bates Pages
Numbers WPL 068525 and WPL 068526. A copy of this Presentation is included as
Exhibit__(DAS-20).

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Q. Is it reasonable to expect that WPL will be able to obtain fixed price contracts for any of the major procurement or construction contracts?

A. No. In the past, utilities were able to secure fixed-price contracts for their power plant construction projects. However, as Mr. Hookham explained in his testimony, it is not possible to obtain fixed-price contracts for new power plant projects in the present environment.

As stated, resource constraints and current activity levels within the ranks of experienced EPC contractors and major equipment manufacturers and forecast uncertainties for material and labor escalation coupled with the timeline of the WPL project was not supportive of a competitive [Lump Sum Turnkey contract] strategy.⁸⁸

And:

⁸⁷ Id.
⁸⁸ Direct Testimony of Charles J. Hookham, at page 19, lines 1-4.
⁸⁹ Exhibit___(DAS-3), at page 126, line 21, to page 127, line 11.

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1 **Q. Is Mr. Hookham’s conclusion concerning the availability of fixed-price**
2 **contracts in today’s construction environment consistent with the recent**
3 **experience of other companies seeking to build coal-fired power plants at this**
4 **time?**

5 A. Yes. In general, other companies have given similar explanations for why they
6 have been or expect to be unable to secure fixed price contracts. For example, a
7 witness for the Appalachian Power Company, a subsidiary of American Electric
8 Power explained to the West Virginia Public Service Commission that:

9 Company witness Renchek discusses in his testimony the rapid
10 escalation of key commodity prices in the [Engineering,
11 Procurement and Construction] industry. **In such a situation, no**
12 **contractor is willing to assume this risk for a multi-year**
13 **project.** Even if a contractor was willing to do so, its estimated
14 price for the project would reflect this risk and the resulting price
15 estimate would be much higher.⁹⁰ [Emphasis added.]

16 **Q. What is the significance of the fact that WPL will not be able to secure fixed**
17 **price contracts for the NED 3 project?**

18 A. Quite simply, the inability to secure fixed price contracts in the current
19 environment means (1) that there will likely be cost uncertainty throughout the
20 remainder of the project’s design and construction and (2) that WPL will bear far
21 more of the risk associated with escalating construction costs.

22 **Q. Has WPL filed or provided during discovery any EGEAS modeling runs**
23 **with the current \$1.143 billion NED 3 cost estimate?**

24 A. No.⁹¹

⁹⁰ Testimony of William M. Jasper, in West Virginia Public Service Commission Case No. 06-0033-E-CN, at page 16, lines 16-20.

⁹¹ WPL Response to 7-CUB/RFP-13.

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1 **Q. Has WPL filed or provided during discovery any EGEAS modeling runs**
2 **which assume NED 3 construction costs higher than the current \$1.143**
3 **billion estimate?**

4 A. No.⁹²

5 **Q. Have the same factors that have increased the cost of building new coal-fired**
6 **power plants also affected the costs of building other supply-side alternatives**
7 **like natural gas-fired and wind facilities?**

8 A. Yes. However, the information I have seen suggests that the increases in the costs
9 of alternative resources, such as new gas-fired power plants, have not been as
10 substantial as those experienced by coal-fired projects.

11 But NED 3 was not even selected as part of the Optimized (i.e., least cost) plan
12 even when the PSCW Staff made the conservative assumption that the other
13 fossil-fired generating options (including natural gas burning facilities) in the
14 EGEAS model had increased by the same percentage as NED 3.⁹³

15 **Q. What impact do high coal-plant capital costs have on the relative economics**
16 **of energy efficiency as compared to the NED 3 plant?**

17 A. I have not seen any evidence that the worldwide demand for power plant
18 resources have led to the increases in the costs of energy efficiency measures of
19 the same magnitude as the increases we are seeing in the costs of coal-fired or
20 even gas-fired power plants. Therefore, it is reasonable to expect that higher coal-
21 plant capital costs improve the relative economics and attractiveness of energy
22 efficiency.

⁹² WPL Response to 7-CUB/RFP-14.

⁹³ Final EIS, at pages 360 and 361.

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1 **Q. Do you agree with Mr. Hookham's testimony that any deferral of**
2 **construction to a later time period would only serve to further increase costs?**

3 A. No. If a company is imprudently fixated on a resource option, a short-term wait
4 could lead to higher costs; conversely, various construction costs could moderate
5 over a longer time period.

6 However, if a company is prudently open to reevaluating its resource plans in the
7 light of changing circumstances, allowing time for significant uncertainties to be
8 resolved or, at least, to become less unresolved, can protect it from unwise
9 investments in expensive projects. Given all of the major uncertainties
10 concerning construction costs and regulation of greenhouse gas emissions it
11 would be prudent for WPL to wait before committing its ratepayers to a \$1.143
12 billion (without financing costs) investment in a plant like NED 3.

13 **Q. Would WPL actually benefit from higher construction costs for NED 3?**

14 A. Yes. WPL would benefit from having a larger rate base as a result of increased
15 costs of building NED 3 if the Commission determines that the Company's
16 management of the project was prudent and that the cost increases were beyond
17 its control.

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3 **B. WPL Has Not Adequately Considered the Likelihood of**
4 **Mandated CO₂ Emissions Reductions in its Planning Analyses**

5 **Q. Does WPL acknowledge that there will be mandatory requirements to reduce**
6 **greenhouse gas emissions in the foreseeable future?**

7 A. Yes. As I discussed in Section 4.A. above,

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12 Indeed, WPL's parent Company, Alliant Energy, has said publicly that
13 "mandatory requirements to stabilize and reduce greenhouse gas emissions are
14 likely. What remains uncertain is the nature, extent and timing of such
15 requirements."⁹⁷

16 **Q. Is WPL very exposed to potential regulation of greenhouse emissions?**

17 A. Coal is the most carbon-intensive fuel. WPL is extremely dependent on coal-fired
18 generation. As a result, WPL is very heavily exposed to the potential costs of
19 federal or state regulation of greenhouse gas emissions.

20 **Q. What is WPL's current fuel mix?**

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⁹⁵ Id., at Bates Page Number WPL 068212.

⁹⁶ Id., at Bates Page Number WPL 068214.

⁹⁷ Alliant Energy *Environmental Progress Report*, September 2006, at page 12.

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3 **Q. How would WPL's dependence on coal change if it is able to implement its**
4 **proposed IRP Resource Plan with NED 3 in 2013?**

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9 **Q. Is it generally accepted that the regulation of greenhouse gas emissions will**
10 **raise the costs of power from coal-fired power plants?**

11 A. Yes. Coal is the most carbon-intensive fuel. Although there are still some
12 doubters, it is widely accepted that the need to reduce greenhouse gas emissions
13 will pose substantial challenges and create significant new costs for the owners of
14 coal-fired power plants. For example, in its January 28, 2008 assessment of the
15 *Top 10 U.S. Electric Utility Credit Issues for 2008 and Beyond*, Standard &
16 Poor's noted that "the single biggest challenge regulated electric utilities will
17 tackle is the discharge of carbon dioxide (CO₂) into the air:"

18 Congress took a futile stab at the broader global warming issue in
19 late 2007, but key credit impacting decisions concerning CO₂ went
20 unresolved. Three items that will have the biggest credit impact are
21 integrated resource plans that reduce or eliminate the building of
22 new coal-fired power plants, the need for carbon sequestration on
23 existing coal units to meet newer, more exacting standards, and
24 research and development for cleaner coal technologies. All are
25 potentially large ticket items that electric utilities might have to
26 confront.¹⁰⁰

98

at Bates Page Number WPL 102848. A copy of this presentation is included as
Exhibit__(DAS-22).
99 Id. at Bates Page Number WPL 102849.
100 Exhibit__(DAS-23), at page 2.

Public Version

1 Standard & Poor's subsequently issued a Credit Week report on *The Credit Cost*
2 of *Going Green for U.S. Utilities*, in March 2008, in which it noted the following:

3 **The debate is over. Not the one concerning climate change, but**
4 **the one about whether the U.S. will act to limit greenhouse gas**
5 **emissions to address the possibility that human activities are**
6 **harming the planet. By now it's a foregone conclusion that the**
7 **U.S. will pass laws that call for significant reductions in carbon**
8 **dioxide (CO2). The only uncertainty is the details of how much**
9 **and by when.** The electric utility industry, along with
10 transportation, produces most of the greenhouse gases (primarily
11 CO2) in the country. But as a highly regulated industry, utilities
12 are more likely to be targeted for emissions control than the
13 transportation section, and that puts them squarely in the sights of
14 legislators and regulators at both the federal and state levels.

15 **So for electric utilities, the credit question is not so much**
16 **whether higher costs related to controlling emissions are**
17 **coming, but rather when and how high they'll actually go....**

18 What Could Go Wrong?

19 Among the risks are that CO2 compliance costs could spiral out of
20 control, those costs could be up for rate recovery at the same time
21 that other expenses are rising, and the costs could then get
22 "crowded out" if regulators try to ease customer rate shock. Any
23 disallowance would not necessarily be explicit, since it is difficult
24 and legally suspect to keep prudent, legislatively mandated costs
25 out of rates. The real risk to credit quality is the prospect that CO2
26 compliance costs will be the proverbial straw that leads to harsh
27 regulatory responses such as a disallowance or deferral because of
28 cost pressures tied to commodity prices, more capital spending for
29 basic reliability needs on the transmission and distribution system,
30 and added construction costs for new generation to meeting rising
31 demand.¹⁰¹ (Emphasis added)

32 **Q. Have lenders taken any actions to ensure that utilities are properly**
33 **accounting for CO₂ prices in their resource planning?**

34 **A.** Yes. In early February 2008 three leading Wall Street financial institutions,
35 Citigroup, JP Morgan Chase and Morgan Stanley, adopted a set of Carbon

¹⁰¹ Exhibit__(DAS-24), at page 15.

Public Version

1 Principles.¹⁰² These Principles created an Enhanced Diligence Framework to help
2 lenders better understand and evaluate the potential carbon risks associated with
3 coal plant investments. The three Carbon Principles adopted by these leading
4 institutions are:

- 5 ▪ ***Energy Efficiency.*** An effective way to limit CO₂ emissions is to
6 not produce them. The signatory financial institutions will
7 encourage clients to invest in cost-effective demand reduction,
8 taking into consideration the value of avoided CO₂ emissions. We
9 will also encourage regulatory and legislative changes that increase
10 efficiency in electricity consumption including the removal of
11 barriers to investment in cost-effective demand reduction. The
12 institutions will consider demand reduction caused by increased
13 energy efficiency (or other means) as part of the Enhanced
14 Diligence Process and assess its impact on proposed financings of
15 certain fossil fuel generation.
- 16 ▪ ***Renewable and low carbon distributed energy technologies,***
17 Renewable energy and low carbon distributed energy technologies
18 hold considerable promise for meeting the electricity needs of the
19 US while also leveraging American technology and creating jobs.
20 We will encourage clients to invest in cost-effective renewables
21 and distributed technologies, taking into consideration the value of
22 avoided CO₂ emissions. We will also encourage legislative and
23 regulatory changes that remove barriers to, and promote such
24 investments (included related investments in infrastructure and
25 equipment needed to support the connection of renewable sources
26 to the system). We will consider production increases from
27 renewable and low carbon generation as part of the Enhanced
28 Diligence process and assess their impact on proposed financings
29 of certain new fossil fuel generation.
- 30 ▪ ***Conventional and advanced generation.*** In addition to cost
31 effective energy efficiency, renewables and low carbon distributed
32 generation, investments in conventional or advanced generating
33 facilities will be needed to supply reliable electric power to the US
34 market. This may include power from natural gas, coal and nuclear
35 technologies. **Due to evolving climate policy, investing in CO₂-**
36 **emitting fossil fuel generation entails uncertain financial,**
37 **regulatory and certain environmental liability risks. It is the**
38 **purpose of the Enhanced Diligence process to assess and reflect**

¹⁰² A copy of the Carbon Principles are attached as Exhibit____(DAS-25).

Public Version

1 **these risks in the financing considerations for certain fossil fuel**
2 **generation. We will encourage regulatory and legislative**
3 **changes that facilitate carbon capture and storage (CCS) to**
4 **further reduce CO₂ emissions from the electric sector.**
5 (Emphasis added)¹⁰³

6 Two other major lenders, Bank of America and Credit Suisse, have subsequently
7 adopted the Carbon Principles, as well.

8 In particular, the Carbon Principles note that the emerging practices in the
9 financial community include “In the absence of clear policy on the regulation of
10 CO₂, financial institutions and clients are starting to use conservative base
11 assumptions, including a mandatory declining cap with full auctioning of
12 allowances.”¹⁰⁴ One of the institutions which has adopted the Carbon Principles,
13 Bank of America, has said that it uses a range of \$20/ton to \$40/ton for CO₂
14 prices in its assessments of proposed investments.

15 **Q. Has any lending agency of the U.S. government decided not to loan funds for**
16 **new coal-fired power plants because of the risks involved in such projects?**

17 A. Yes. The Rural Utilities Service of the U.S. Department of Agriculture
18 announced in early March 2008 that it is suspending the program through which it
19 makes loans to rural cooperatives to build new coal-fired power plants.¹⁰⁵ In a
20 letter to Congress, the Administrator of Utility Programs for the Department of
21 Agriculture indicated that loans for new base load generation plants would not be
22 made until the RUS and the federal Office of Management and Budget can
23 develop a subsidy rate to reflect the risks associated with the construction of such
24 plants.¹⁰⁶

¹⁰³ Id., at pages 11 and 14.

¹⁰⁴ Id., at page 2.

¹⁰⁵ <http://www.washingtonpost.com/wp-dyn/content/article/2008/03/12/AR2008031203784.html>.

¹⁰⁶ <http://oversight.house.gov/documents/20080312104146.pdf>.

Public Version

1 **Q. Does the Company acknowledge that regulation of greenhouse gas emissions**
2 **could have significant cost consequences?**

3 A. Yes. Eric Guelker, a witness for WPL in other proceedings, has recently testified
4 for WPL's affiliate, IPL, in a case before the Iowa Utilities Board. In that
5 testimony, Mr. Guelker explained:

6 Contrary to the media's portrayal, the significant debate over
7 greenhouse gas emissions certainty versus price certainty in carbon
8 policy development stems from the lack of technological solutions
9 currently available for greenhouse gas emissions control
10 (especially CO₂ emissions from fossil fuel combustion). As a
11 result, carbon allowance markets have the potential to be highly
12 volatile and thus, more costly, for regulated companies to use to
13 manage their carbon profiles. **Given the many uncertainties, it is**
14 **impossible to predict the cost impacts to IPL's customers,**
15 **although in general terms IPL acknowledges that the potential**
16 **for this cost to be significant.**¹⁰⁷

17 **Q. Has WPL appropriately considered the risks and potential costs of federal,**
18 **state or regional regulation of greenhouse gas emissions in its resource**
19 **planning for NED 3?**

20 A. No. The Company's EGEAS modeling analyses have been critically flawed and,
21 consequently, have not adequately evaluated the impact that the regulation of
22 greenhouse gas emissions will have on the relative risks and costs of alternative
23 resource options.

24 **Q. What were the most significant flaws in WPL's EGEAS runs?**

25 A. The most significant flaws in WPL's EGEAS runs were (1) as discussed above,
26 the failure to prepare any runs with the current NED 3 cost estimate, (2) the
27 failure to include any CO₂ costs in its base case analyses and in many of its
28 sensitivity scenarios, and (3) the Company placed unreasonable restrictions on the
29 alternatives that were made available for the EGEAS model to select.

¹⁰⁷ Direct Testimony of Eric Guelker in Iowa Utilities Board Docket RPU-08-1, at page 14.

Public Version

1 **Q.** When you use the term “the Company’s EGEAS modeling analyses” to
2 which EGEAS runs are you referring?

3 A. The Company has provided several sets of EGEAS model runs. The first set were
4 those discussed in Appendix A to the May 2007 Update to the CPCN Application.
5 These were the EGEAS runs that are discussed in the testimony of WPL witness
6 Wah Sing Ng. The second set of EGEAS runs were those provided by WPL
7 during discovery in this docket. These runs were prepared subsequent to May
8 2007. The last set included three EGEAS runs that WPL undertook to justify its
9 proposed “Carbon Reduction Plan.”

10 **Q.** Please explain why it not reasonable to assume zero CO₂ costs in resource
11 planning analyses.

12 A. Using a \$0/ton CO₂ cost in a resource planning analysis reflects the assumption
13 that there will be no regulation of greenhouse gases at any point over the next
14 thirty or more years. As even Alliant Energy has acknowledged, federal
15 regulation of greenhouse gas emissions is highly likely in the near future. States
16 also have started to take actions to reduce greenhouse gases both on their own and
17 as part of regional initiatives. The Commission recently recognized this fact in a
18 discussion at its open meeting on June 27, 2008 while discussing Docket No.
19 6630-CE-299.

20 **Q.** What EGEAS scenarios has WPL prepared with CO₂ costs?

21 A. WPL presented three cases in the May 2007 Update to the CPCN Application
22 with CO₂ costs. It also has prepared EGEAS runs with assumed CO₂ prices of
23

24 **Q.** Doesn’t this show that WPL considered a reasonable range of CO₂ costs in its
25 analyses?

26 A. No. As I discussed earlier, WPL only considered CO₂ costs as sensitivity
27 analyses, not in the development of its base cases. Also, in these scenarios with
28 non-zero CO₂ prices, WPL unreasonably limited the alternatives available to the

Public Version

1 EGEAS model to select in place of NED 3. This biased the results of the analyses
2 in favor of the proposed coal plant.

3 **Q. Please explain.**

4 A. As WPL witness Bauer has testified, WPL only made new wind available in its
5 2006 IRP EGEAS runs to the years 2008 to 2010. According to Mr. Bauer, this
6 was based on WPL's assumption that the federal wind production tax credit
7 ("PTC") would expire at the end of 2008.¹⁰⁸ This meant that in those runs, the
8 model could not select any new wind after 2010.

9 It also appears that WPL similarly limited the addition of new wind facilities in
10 the EGEAS runs it has prepared since May 2007.

11

12 **Q. Is it reasonable to assume that the wind Production Tax Credit will not be**
13 **available after 2008?**

14 A. No. I believe that it is reasonable to assume that the wind Production Tax Credit
15 will be renewed at least through 2013 or 2015. The prospects for the PTC after
16 that point are uncertain. However, it has been renewed on a number of occasions
17 and may again be renewed by the Congress for an even longer period.

18 **Q. Are you aware of any major investor-owned utilities in the Midwest that**
19 **have assumed that the wind PTC will be available beyond 2008?**

20 A. Yes. I have not made an exhaustive search but I have seen that Xcel Energy has
21 assumed that the PTC will be extended through 2015 in its November 2007
22 Resource Plan filing in Minnesota.¹⁰⁹

¹⁰⁸ Direct Testimony of Randy Bauer, at pages 11-12.

¹⁰⁹ Xcel Energy Minnesota Resource Plan Filing, at page 4-4.

Public Version

1 **Q. Does the Final EIS for the NED 3 project agree that it is reasonable to expect**
2 **that the wind PTC will be extended beyond the end of 2008?**

3 A. Yes. The Final EIS states:

4 Current law applies only to wind and certain biomass facilities that
5 come on line before December 31, 2008. However, given past
6 history, there is reason to believe that the credit will be
7 extended.¹¹⁰

8 **Q. Did WPL make any other assumptions that also biased the EGEAS model**
9 **against adding new wind facilities?**

10 A. Yes. The EGEAS model has an electronic switch that allows the model to select
11 up to a set number of so-called “superfluous units” each year. WPL set the
12 maximum number of “superfluous units” This unreasonably limited the
13 amount of wind capacity that the model could add in early years beyond that
14 needed to meet the chosen system reserve margin, even if adding more wind
15 resources would result in lower cost resource plans.

16 **Q. What is a “superfluous unit” in the EGEAS model?**

17 A. Superfluous units can be thought of in the following way: the EGEAS model
18 adds resources in each year to meet reliability constraints. These additions can be
19 considered reliability additions. However, the model also can add additional
20 resources above and beyond those that are needed to meet reliability constraints.
21 In some cases installing a capacity resource before it is needed for reliability
22 purposes may produce operating cost savings that may outweigh the additional
23 capital costs incurred. Therefore, the use of the term “superfluous” to describe
24 such units is unfortunate and inaccurate. Instead, it is more appropriate to think of
25 these units as “economic” additions as opposed to “reliability” additions.

¹¹⁰ Final EIS, at page 86.

¹¹¹ WPL Responses to Clean Wisconsin INT 5-91 and INT 5-97.

Public Version

1 **Q. Does the “superfluous units” constraint potentially bias the model against**
2 **certain types of resources?**

3 A. Yes. Smaller renewable resources such as wind farms tend to be modeled as
4 multiple smaller units unlike large baseload plants. Therefore, setting the so-
5 called “superfluous units” constraint at a maximum of per year, as WPL
6 has done, unreasonably biases the analysis against the addition of these smaller
7 wind units.

8 **Q. Does the documentation for the EGEAS model include any warnings about**
9 **this sort of effect?**

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¹¹² EGEAS User’s Guide, Version 9.02, 1999, Stone and Webster Management Consultants, Inc. A copy of this User’s Guide was provided in WPL’s Response to Clean Wisconsin Request for Documents No. POD2-32.

¹¹³ EGEAS Capabilities Manual, Version 7.3, 1995, Stone and Webster Management Consultants, Inc. A copy of this Manual was provided in WPL’s Response to Clean Wisconsin Request for Documents No. POD2-32.

Public Version

1 **Q. What impact would selecting a higher figure for the number of such**
2 **“superfluous units” that the model could select potentially have had on the**
3 **results of WPL’s EGEAS runs?**

4 A. The model would have had the option of adding more wind, perhaps in place of
5 NED 3 in 2013, if that had resulted in lower cost resource plans.

6 **Q. Are there any other factors which suggest that Wisconsin’s utilities,**
7 **including WPL, will have to add more wind capacity after 2010 or 2012 than**
8 **WPL has modeled in its EGEAS runs?**

9 A. Yes. The current Wisconsin Renewable Portfolio Standard requires that WPL
10 increase the percentage of its total electric sales from renewable resources to 5.3
11 percent in 2010 and 9.3 percent in 2015. It is unclear how the Company will be
12 able to satisfy these requirements without adding more wind after 2010 or 2012
13 beyond the amounts of wind that are added in the Company’s EGEAS CO₂ price
14 sensitivities. In fact, the PSCW Staff included in its EGEAS modeling analyses
15 an additional 400 MW of wind, beyond that added by WPL, in order to satisfy the
16 RPS requirements.¹¹⁴

17 At the same time, the Governor’s Task Force on Global Warming has
18 recommended the adoption of an enhanced RPS. This proposal would increase the
19 state’s RPS to 10 percent by 2013, 20 percent by 2020 and 25 percent by 2025. Of
20 the required 20 percent by 2020 and 25 percent by 2025, minimums of 6 percent
21 by 2020 and 10 percent by 2025 would have to come from Wisconsin-based
22 renewables.¹¹⁵ At the same time, Wisconsin and eight other states in the region,
23 working together through the Midwest Governors Association, last November
24 adopted regional renewable energy goals of 10% by 2015, 20% by 2020, 25% by

¹¹⁴ Final EIS, at page 115.

¹¹⁵ *Final Report to Governor Jim Doyle*, July 2008, at page 45.

Public Version

1 2025, and 30% by 2030.¹¹⁶ Clearly, WPL would have to add significant amounts
2 of additional wind to satisfy these enhanced RPS requirements.

3 **Q. Are there any other alternatives to NED 3 besides wind that WPL excluded**
4 **from the CO₂ cost sensitivity scenarios?**

5 A. Yes. WPL examined a number of alternatives in EGEAS scenarios without CO₂
6 costs that it did not consider in the scenarios with CO₂ costs.

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12 **Q. What were the relative NPV costs of these plans compared to WPL's base**
13 **case with NED 3 in 2013?**

14 A. Table 5 below shows the NPV costs of each of these plans.

15 **Table 5: Illustrative Resource Plans Examined by WPL Without Any**
16 **CO₂ Costs**

¹¹⁶ Midwest Governors Association, "Energy Security and Climate Stewardship Platform for the Midwest, 2007," Nov. 15, 2007. The Platform was agreed to by Indiana, Illinois, Iowa, Kansas, Michigan, Minnesota, Ohio, South Dakota, Wisconsin and the province of Manitoba. Available at http://www.midwesterngovernors.org/Publications/MGA_Platform2WebVersion.pdf.

Public Version

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2 **Q. What is the significance of the NPV costs shown in Table 5?**

3 A.

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This strongly

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suggests that these alternatives would have been the lower cost plans if WPL had
8 assumed non-zero CO₂ costs.

9 **Q. Please summarize the results of the EGEAS runs in which WPL did assume**
10 **some non-zero CO₂ costs?**

11 A.

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18 **Q. Should the Commission rely on these results to find that building NED 3 in**
19 **2013 is in the public interest?**

20 A. No. The EGEAS model only adds new coal plants

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22 . In addition, none of the Company's EGEAS runs reflect the current \$1.143
23 billion cost estimate for the plant, without financing costs. Moreover, the
24 Company's EGEAS runs were biased in favor of adding large increments of new
25 baseload capacity by the use of an percent reserve margin. Finally, the
26 Company's EGEAS runs with non-zero CO₂ costs also were biased in favor of
27 NED 3 because WPL unreasonable limited the amounts of new wind that could be

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1 added. For these reasons, none of WPL's EGEAS runs credibly show that adding
2 NED 3 would be part of a least cost plan.

3 **C. WPL Has Not Adequately Considered Other Risks Associated**
4 **With the Building of a New Coal-Fired Power Plant**

5 **Q. What are the other significant risks associated with the building of a new**
6 **coal-fired power plant like NED 3?**

7 A. There are at least three other major risks for companies proposing to build new
8 coal-fired power plants:

- 9 • That policies will be adopted promoting the increased use of energy
10 efficiency and renewable resources that will reduce the need for new
11 power generation and adversely affect the relative economics of proposed
12 coal-fired power plants.
- 13 • That coal prices will increase and that coal supplies will be subject to
14 disruption.

15 **The Adoption of Policies Requiring the Increased Use of Energy Efficiency**
16 **and/or Renewable Resources**

17 **Q. What new energy efficiency and renewable resource policies have been**
18 **proposed for the State of Wisconsin that would affect the need for and/or the**
19 **relative economics of the proposed NED 3 plant?**

20 A. As I discussed earlier, the Governor's Task Force on Global Warming has
21 recommended the adoption of an enhanced Renewable Portfolio Standard. The
22 Task Force also has recommended a set of energy efficiency targets that would
23 reduce electric load in 2009 by 0.75 percent and natural gas use by 0.5 percent
24 from what they would otherwise be. Under the recommendations of the Task
25 Force on Global Warming, the annual reduction targets would increase gradually
26 until they reach 2 percent for electric load and 1 percent for natural gas use in
27 2015 and each subsequent year.¹¹⁷

¹¹⁷ Final Report to Governor Jim Doyle, July 2008, at page 39.

Public Version

1 At the same time, as I also discussed above, the State of Wisconsin joined with
2 eight other states in the region to adopt a set of aggressive regional renewable
3 energy goals. These goals included meeting at least 2 percent of regional annual
4 retail sales of electricity through energy efficiency improvements by 2015, with
5 additional savings in subsequent years.¹¹⁸

6 The implementation of these energy efficiency and renewable resource goals
7 would have a major impact on WPL's resource plans, including the proposed
8 NED 3 plant.

9 **Q. Have you seen any evidence that WPL has analyzed the impact that the**
10 **adoption of some or all of these policies would have on its resource plans**
11 **and/or its need for, or the economics of, the proposed NED 3 plant?**

12 A. No.

13 **Coal Price Increases and Supply Disruptions**

14 **Q. What sources has WPL identified for the coal that would be burned at NED**
15 **3?**

16 A. WPL has said that the Powder River Basin ("PRB") in Wyoming would be the
17 primary source of the coal that would be burned at NED 3.¹¹⁹ Alternate sources
18 for coal would include the Illinois Basin , Appalachia, and foreign coal.

19 **Q. Have the prices for coal from the PRB increased significantly in recent**
20 **years?**

21 A. Yes. Coal prices have increased dramatically in the past year or so. For,
22 example, according to the Coal News & Markets reports from the Energy
23 Information Administration of the U.S. Department of Energy, spot prices for

¹¹⁸ Midwest Governors Association, "Energy Security and Climate Stewardship Platform for the Midwest, 2007," Nov. 15, 2007. The Platform was agreed to by Indiana, Illinois, Iowa, Kansas, Michigan, Minnesota, Ohio, South Dakota, Wisconsin and the province of Manitoba.

¹¹⁹ See page 2 of Exhibit____(CJH-2), Schedule 3.

Public Version

1 PRB coal increased from \$9.15 per short ton at the end of June 2007 to \$12.50 per
2 short ton at the end of July 2008 – a 37 percent increase.¹²⁰

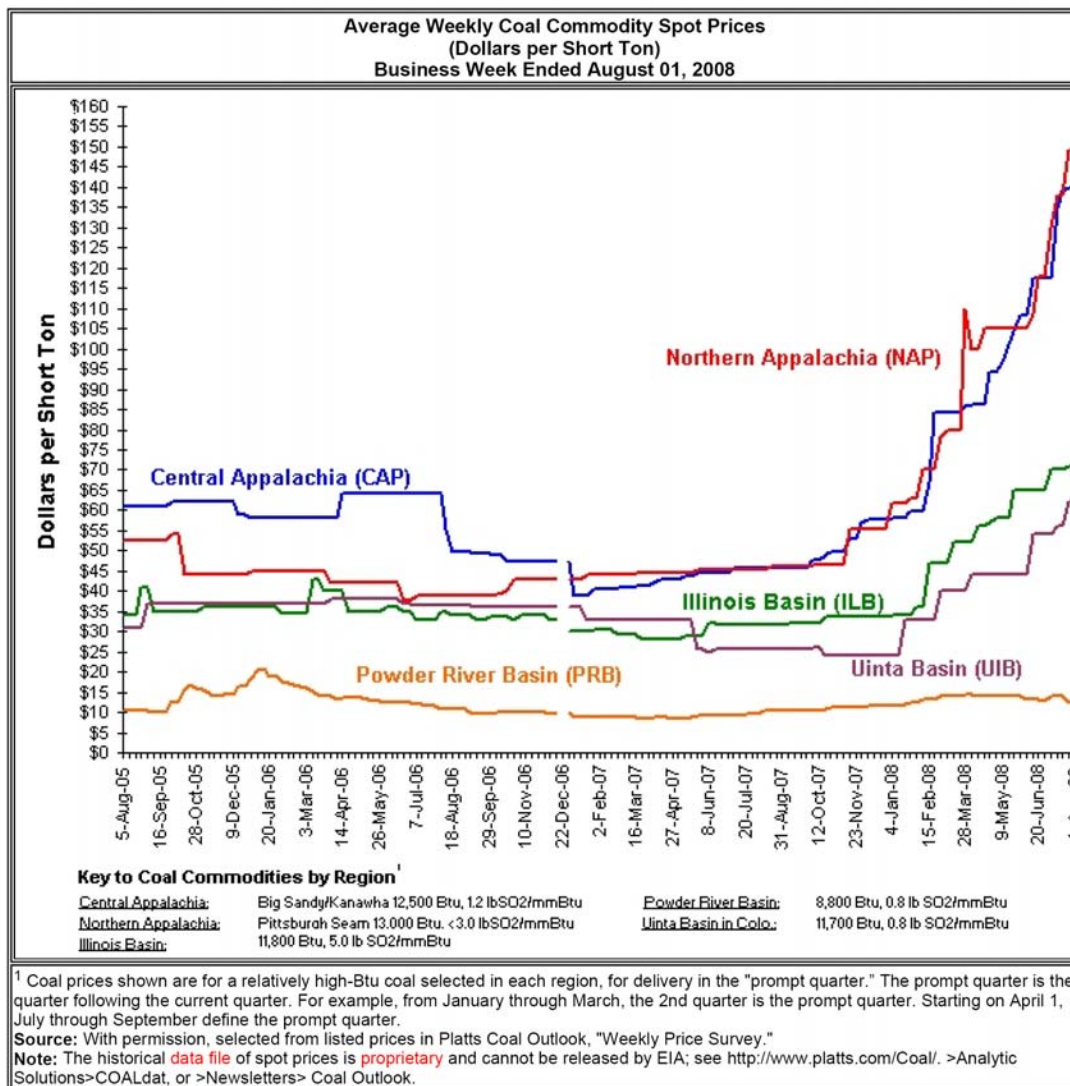
3 **Q. Have the prices of coal from other areas of the U.S. also increased**
4 **significantly in recent years?**

5 **A.** Yes. As shown in Figure 8, below, the prices of coal from Appalachia, the Illinois
6 Basin and the Uinta Basin have skyrocketed since mid 2007.

¹²⁰ The EIA Coal News & Markets Reports are available at
<http://www.eia.doe.gov/cneaf/coal/page/coalnews/coalmar.html>

Public Version

1 **Figure 8: Coal Price Increases**



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3 **Q. Is there any evidence that this is just a short term development?**

4 A. No. It appears to be a longer term development based on increasing demand for
5 U.S. mined coal in foreign markets and in the U.S. market as well. Peabody
6 Energy, for example, expects that the supply pressures that have led to these
7 increases will continue over the next several decades.

Public Version

1 **Q. What is WPL's view of the likelihood of there being major increases in the**
2 **price of coal from the Powder River Basin?**

3 **A. An August 1, 2007 presentation on *Fossil Fuel Supply* by Alliant Energy's**
4 **Director, Fossil Fuel Procurement, basically warned that major increases in the**
5 **price of PRB coal are coming:**

6 Overview

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17 The same presentation gave the following justification for fuel flexibility

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25 The presentation also noted that:

¹²¹ Exhibit___(DAS- 26), at Bates Page Number WPL 102832.

¹²² Id., at Bates Page Number WPL 102835.

**Wisconsin Power and Light
Docket No. 6680-CE-170
Direct Testimony of David A. Schlissel**

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5 **Q. Is it reasonable to expect that WPL will be able to escape rapidly escalating**
6 **coal prices by diversifying among the various coal-supplying regions of the**
7 **U.S.?**

8 A. No. It seems reasonable to expect that WPL will experience higher coal prices
9 over time even if it diversifies the sources of the coal burned at NED 3.

10 **Q. Have you seen any evidence that WPL has modeled these rapidly rising coal**
11 **prices in any of its recent EGEAS runs?**

12 A. No.

13

14 Indeed, WPL has said that it has not even prepared a new coal price forecast since
15 May of 2007.¹²⁴

16 **Q. Is it reasonable to expect that the generation at NED 3 could be affected by**
17 **supply disruptions similar to those that were experienced in 2005 and 2006**
18 **by utilities in the Midwest that depend on coal from the Powder River Basin?**

19 A. Yes. It certainly is possible that additional train or other coal transportation
20 disruptions, whether weather-caused or not, will be experienced at some point in
21 the projected operating life of NED 3.

22 Such disruptions
23 could lead to reductions in production at generating facilities and/or cost increases
24 as utilities are forced to turn to other sources for their coal or to generate power
25 with more expensive fuels.

¹²³ Id., at Bates Page Number WPL 102387.

¹²⁴ WPL Response to Clean Wisconsin's Request for Production of Documents POD 5-54.

Public Version

1 **7. It Is Imprudent to for WPL to Build NED 3 Before It Has Been**
2 **Determined Which Carbon Capture and Sequestration Processes, If**
3 **Any, Are Technically and Economically Viable**

4 **Q. Does WPL believe that there is currently a commercially viable technology**
5 **for carbon capture and sequestration from coal plants like the proposed**
6 **NED 3?**

7 A. No. When asked, WPL stated that its position “is that CO₂ emissions control
8 technologies are not currently commercially available at the scale needed for
9 utility type applications.”¹²⁵ However, the Company also said that “various
10 technologies are at various stages of demonstration that will lead to commercial
11 offerings of the technology” and “It is WPL’s position that if the reductions in
12 CO₂ emissions that are mandated by law are significant, the economic drivers will
13 provide for the development of CO₂ capture technologies for units like NED
14 3.”¹²⁶

15 **Q. Do internal WPL documents present a less optimistic assessment of the**
16 **future potential for carbon capture and sequestration?**

17 A. A June 2007 presentation to Alliant Energy’s Board of Directors noted that:

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¹²⁵ WPL Response to Interrogatory 4-CUB-29.
¹²⁶ Id.

Wisconsin Power and Light
Docket No. 6680-CE-170
Direct Testimony of David A. Schlissel

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WPL witness Hookham's Exhibit____(CJH-2), Schedule 3, *NED 3 Project Greenhouse Gas Emissions Summary*, similarly noted that:

The combination of still unproven and costly CCS technologies and currently unavailable disposal opportunities will most likely result in a delayed rollout of CCS systems to a later date in time when the technologies and science have been more thoroughly developed.¹²⁸

Mr. Hookham's Exhibit____(CJH-2), Schedule 4, *NED 3 Carbon Capture and Sequestration*, also identified a number of barriers which exist to the final selection of a carbon capture and sequestration strategy for NED 3:

1. The only commercially available technology (amine scrubbing) has a considerable capital cost for CO₂ capture equipment (typically over \$750/kW) and high operating costs and is not considered economically feasible to implement; further process enhancement for boilers are being commercially tested at present, but are not yet proven.
2. Rapidly evolving research on alternate capture technologies has been launched, with particular focus on oxy-fuel firing on CFB boilers (e.g. Alstom research) and chilled ammonia and PowerSpan ECO2 systems for PC boilers. However, the commercial availability for application to CFB boilers is considered to be at least 5 years into the future.
3. No short-term options for CO₂ disposal exist (local or regional) and regional sequestration options appear to be at least 10 years in the future.

¹²⁷ , at Bates
¹²⁸ Page Number WPL 068338. A copy of this presentation is included as Exhibit____(DAS-27).
At page 15 of 19.

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4. Legal barriers, such as liability exposure and subsurface storage rights, exist regarding long term CO₂ sequestration, which must be removed before sequestration could be a viable alternative.¹²⁹

Q. Is WPL's conclusion that there is currently no commercially viable technology for carbon capture and sequestration a generally accepted view in the industry?

A. Yes. WPL's conclusion that there is currently no commercially viable technology for carbon capture and sequestration is consistent with the general view in the electric industry. For example, a witness for Dominion Virginia Power, which also is planning to build a CFB coal-fired power plant, presented the following testimony in July 2007:

carbon capture technology is not commercially viable or available at the present time. Furthermore, the successful integration of all of the technologies needed for a commercial-scale carbon capture and sequestration system has yet even to be demonstrated. As a result, it is not currently feasible to construct a power plant with technology that can capture and store carbon emissions.¹³⁰

Q. Have you seen any estimates for the cost of carbon capture and sequestration at proposed pulverized coal plants such as NED 3?

A. Yes. Hope has been expressed concerning potential technological improvements and learning curve effects that might reduce the estimated cost of carbon capture and sequestration. However, I have seen recent studies by objective sources that estimate that the cost of carbon capture and sequestration could be quite expensive.

For example, a very recent study by the National Energy Technology Laboratory ("NETL") has projected that the cost of carbon capture and sequestration would

¹²⁹ At pages ES-3 to ES-4.

¹³⁰ Direct Testimony of Dominion Virginia Power witness James K. Martin in Virginia State Corporation Commission Case No. PUE-2007-00066, dated July 13, 2007, at page 7, line 11. A copy of this testimony is available on the Virginia State Corporation Commission website at <http://docket.scc.virginia.gov/vaproduct/main.asp>

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1 be about \$75/tonne¹³¹ of CO₂ avoided, in 2007 dollars, for pulverized coal
2 plants.¹³²

3 The 2007 *Future of Coal Study* from the Massachusetts Institute of Technology
4 estimated that the cost of carbon capture and sequestration would be about
5 \$28/ton although it also acknowledged that there was uncertainty in that figure.¹³³
6 The tables in that study also indicated significantly higher costs for carbon capture
7 for new pulverized coal facilities, in the range of about \$37/ton and higher.¹³⁴
8 Transportation and sequestration of the captured CO₂ are expected to add another
9 \$5/ton to \$10/ton to the cost.

10 Moreover, these cost estimates were for new plants that were designed and built
11 to include carbon capture technology at the outset. The MIT *Future of Coal Study*
12 concluded that it would be much more expensive to retrofit carbon capture
13 technology onto existing coal-fired power plants.¹³⁵ That means that the cost of
14 retrofitting carbon capture technology onto plants that would already be built and
15 in operation at the time that the technology becomes proven and commercially
16 viable, like NED 3, could be significantly higher than the cost figures shown in
17 the NETL and MIT studies for new coal plants.

18 The projected costs of carbon capture and sequestration have also been presented
19 in terms of a percentage increase in the costs of generating power at coal-fired
20 power plants. For example, Table 6, below, shows that a number of independent
21 sources believe that adding and operating CCS equipment will raise the cost of
22 generating electricity at new coal-fired power plants by perhaps as much as 60%
23 to 80%.

¹³¹ A tonne or metric ton is a measurement of mass equal to 1,000 kilograms or 1.1 tons.

¹³² *Cost and Performance Baseline for Fossil Energy Plants*, National Energy Technology Laboratory, Revised August 2007, at page 27.

¹³³ *The Future of Coal, Options for a Carbon-Constrained World*, Massachusetts Institute of Technology, 2007, at page xi.

¹³⁴ Id., at page 19.

¹³⁵ Id., at pages 28-29.

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Table 6: Projected Increase in the Cost of Generating Power Due to Carbon Capture and Sequestration

Source	Projected Increase in Cost of Electricity from Addition of CCS
Duke Energy Indiana ¹³⁶	68%
MIT Future of Coal Report ¹³⁷	61%
Edison Electric Institute ¹³⁸	75%
National Energy Technology Laboratory ¹³⁹	81%

I have seen some preliminary estimates that some of the new technologies being examined *may* hold the promise of lowering carbon capture and sequestration costs to perhaps as low as \$20/ton of CO₂ avoided. However, those results are very preliminary and the associated technologies are untested.

Even when the technology for CO₂ capture matures, there will always be significant regional variations in the cost of the transportation and storage of the captured CO₂ due to the proximity and quality of storage sites.

Q. Have you seen any estimates by WPL of the cost of capturing and/or sequestering CO₂ emissions from coal-fired power plants?

A. I have not seen any estimates in this proceeding of the costs of capturing CO₂ from a coal-fired power plant that have been prepared by or for the Company. The *Carbon Dioxide Capture and Sequestration Report*, that is included as Mr. Hookham's Exhibit___(CJH-2), Schedule 4, specifically notes that "Given the current status of technologies HDR/C&B did not report on the capital cost or performance impacts associated with these [capture] technologies but notes that

¹³⁶ Testimony of James E. Rogers in Indiana Utility Regulatory Commission Cause No. 43114, Joint Petitioners' Exhibit No. 1, at page 13, lines 6-11.

¹³⁷ *The Future of Coal, Options for a Carbon-Constrained World*, Massachusetts Institute of Technology, 2007, at page 19.

¹³⁸ Letter to Hon. Edward J. Markey, Chairman, Select Committee on Energy Independence and Global Warming, from Thomas R. Kuhn, Edison Electric Institute, September 21, 2007, at page 4.

¹³⁹ *Cost and Performance Baseline for Fossil Energy Plants, Revised August 2007*, DOE/NETL – 2007/1281, at page 17.

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1 such are currently substantial with over 25 percent reduction in net power
2 consumed by such processes.”¹⁴⁰

3 However, Alliant Energy asked the engineering firm Burns & McDonnell to
4 perform a high level economic evaluation of the costs to transport CO₂ in a
5 pipeline from Wisconsin to the Illinois Basin. This economic evaluation
6 estimated that the cost to transport the CO₂ would be \$13/ton of CO₂.¹⁴¹ But I
7 have not seen any estimate of what it would cost to both transport and sequester
8 CO₂ in the Illinois Basin or in Iowa or Wisconsin.

9 **Q. Has WPL included any equipment for carbon capture and/or sequestration**
10 **in the design for the proposed NED 3 plant?**

11 A. WPL has reserved space in the proposed plant design to accommodate currently
12 unknown carbon capture technology. WPL also has made the decision to oversize
13 some plant equipment (e.g., transformer, generator and last stage steam turbine
14 blades) to potentially allow increased gross power production to offset expected
15 consumption from carbon capture equipment.¹⁴² However, WPL has not included
16 any specific carbon capture equipment in the current plant design. In fact, Mr.
17 Hookham’s Exhibit___(CJH-2), Schedule 4, specifically warns that making any
18 additional hardware changes to the conceptual design (besides those mentioned
19 above) “is not considered prudent.”¹⁴³

20 **Q. Is there any consensus when carbon capture and sequestration technology**
21 **will become commercially viable for pulverized coal plants like NED 3?**

22 A. No. I have seen estimates that carbon capture and sequestration technology may
23 be proven and commercially viable from as early as 2015 to 2030 or later, if,
24 indeed, it is ever proven to be technically and commercially viable.

¹⁴⁰ At page 23.

¹⁴¹ WPL Response to Interrogatory 7-CUB-3.

¹⁴² WPL Response to Interrogatory 4-CUB-27.

¹⁴³ At page 22.

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1 For example, the 2007 *Future of Coal* study from the Massachusetts Institute of
2 Technology warned that:

3 Many years of development and demonstration will be required to
4 prepare for its successful, large scale adoption in the U.S. and
5 elsewhere. A rushed attempt at CCS [carbon capture and
6 sequestration] implementation in the face of urgent climate
7 concerns could lead to excess cost and heightened local
8 environmental concerns, potentially lead to long delays in
9 implementation of this important option.¹⁴⁴

10 **Q. Do you have any comments on the certainty expressed by WPL witness**
11 **Vesperman that NED 3 could be retrofitted for carbon capture?**

12 A. Yes. Contrary to what Mr. Vesperman has said, there is some uncertainty as to
13 whether currently unknown carbon capture equipment could be retrofitted onto
14 NED 3 at some undetermined time in the future. Site specific factors, such as a
15 limited amount of space, might pose problems for such retrofitting.

16 At the same time, other key uncertainties surrounding retrofitting coal plants for
17 carbon capture are the cost of making such retrofits and the impact that adding the
18 carbon capture equipment would have on plant performance and the cost of
19 generating power. As a result, Mr. Vesperman doesn't answer the essential
20 question: is it reasonable to expect that the prospective cost of retrofitting on an
21 existing plant like NED 3 (in 2020 or later) will be so expensive and the adverse
22 impact of adding the capture equipment so significant that other options would be
23 more economic than building the proposed coal plant in the first place?

¹⁴⁴ *The Future of Coal, Options for a Carbon-Constrained World, an Interdisciplinary MIT Study*, 2007, at page 15.

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1 **Q. Have you seen any WPL economic or modeling analyses that reflect any of**
2 **the costs or performance penalties associated with carbon capture and**
3 **sequestration from coal plants like NED 3 or COL 3?**

4 **A. No. I have not seen any WPL economic or modeling analyses that assume any**
5 **future costs for carbon capture and sequestration or any performance penalties**
6 **from the addition of such equipment.**

7 **Q. Is it prudent for WPL to build NED 3 before the existing uncertainties**
8 **concerning the technical and economic viability of carbon capture and**
9 **sequestration are resolved?**

10 **A. No. Based on the evidence I have discussed above, it appears today that it will be**
11 **extremely expensive to retrofit carbon capture equipment on coal-fired power**
12 **plants. It also appears that the operation of such equipment will have a substantial**
13 **adverse impact on plant performance and the cost of generating power. It may**
14 **turn out that some of the technologies being considered for carbon capture will be**
15 **less expensive and have less of an adverse impact on plant performance than is**
16 **currently anticipated. But it is unreasonable to bet ratepayer money that will, in**
17 **fact, be the case. Instead, a more prudent option would be to delay the decision to**
18 **build a new coal-fired power plant until R&D and pilot projects demonstrate**
19 **which capture and sequestration alternatives, if any, are technically and**
20 **commercially viable. Rather than rushing ahead into the unknown, it would be**
21 **prudent to wait before undertaking a billion-dollar-plus coal-fired project that will**
22 **have to be retrofitted with a currently unknown technology at some point in its**
23 **operating life.**

24

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1 **8. More than 50 proposed Coal-fired Power Plants Have Been**
2 **Cancelled, Delayed or Rejected by State Regulatory Commissions**
3 **Since Late 2006 Due, in Large Part, to the Risks of Rising**
4 **Construction Costs and Pending Federally Mandated Reductions in**
5 **CO₂ Emissions**

6 **A. Proposed coal-fired power plants have been cancelled and**
7 **delayed by investor-owned companies and public utilities**

8 **Q. Have any proposed coal-fired generating projects been cancelled or delayed**
9 **as a result of concern over increasing construction costs or the potential for**
10 **federal regulation of greenhouse gas emissions?**

11 **A.** Yes. According to published reports, more than 20 coal-fired power plant
12 projects have been cancelled or rejected by state regulatory commissions or
13 boards since December 2006 and more than three dozen others have been
14 delayed, at least in part, because of concern over rising construction costs and
15 climate change. For example:

16 **▪** Westar Energy announced in December 2006 that it was deferring site
17 selection for a new 600 MW coal-fired power plant due to significant
18 increases in the facility's estimated capital cost of 20 to 40 percent, over
19 just 18 months. This prompted Westar's Chief Executive to warn: "When
20 equipment and construction cost estimates grow by \$200 million to \$400
21 million in 18 months, it's necessary to proceed with caution."¹⁴⁵ As a
22 result, Westar Energy has suspended site selection for the coal-plant and is
23 considering other options, including building a natural gas plant, to meet
24 growing electricity demand. The company also explained that:

25 most major engineering firms and equipment manufacturers
26 of coal-fueled power plant equipment are at full production
27 capacity and yet are not indicating any plans to
28 significantly increase their production capability. As a
29 result, fewer manufacturers and suppliers are bidding on
30 new projects and equipment prices have escalated and
31 become unpredictable.¹⁴⁶

¹⁴⁵ Available at
[http://www.westarenergy.com/corp_com/corpcomm.nsf/F6BE1277A768F0E4862572690055581C/\\$file/122806%20coal%20plant%20final2.pdf](http://www.westarenergy.com/corp_com/corpcomm.nsf/F6BE1277A768F0E4862572690055581C/$file/122806%20coal%20plant%20final2.pdf).

¹⁴⁶ Id.

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- 1 ▪ Tenaska Energy cancelled plans to build a coal-fired power plant in
2 Oklahoma in July 2007 because of rising steel and construction prices.
3 According to the Company's general manager of business development:

4 ... coal prices have gone up "dramatically" since Tenaska
5 started planning the project more than a year ago.

6 And coal plants are largely built with steel, so there's the
7 cost of the unit that we would build has gone up a lot... At
8 one point in our development, we had some of the steel and
9 equipment at some very attractive prices and that
10 equipment all of a sudden was not available.

11 We went immediately trying to buy additional equipment
12 and the pricing was so high, we looked at the price of the
13 power that would be produced because of those higher
14 prices and equipment and it just wouldn't be a prudent
15 business decision to build it.¹⁴⁷

- 16 ▪ In April 2008, Associated Electric Cooperative, Inc., the wholesale power
17 supplier for 57 electric cooperatives in Missouri, Southeast Iowa, and
18 northeast Oklahoma, delayed its plans to build the Norborne 660 MW
19 coal-fired power plant due to increasing costs and other uncertainties.
20 According to AECI:

21 The Norborne project costs have significantly increased in
22 less than three years and are now estimated at \$2 billion
23 due to worldwide demand for engineering, skilled labor,
24 equipment and materials.

25 The U.S. Department of Agriculture Rural Utilities Service,
26 a traditional funding source for rural electric cooperatives,
27 is currently unable to finance baseload generation for
28 cooperatives. Although AECI's AA credit rating is one of
29 the strongest ratings among all electric utilities nationally,
30 seeking private lending would further increase project
31 costs.

32 There also is increasing uncertainty in the regulatory
33 environment, and Congress continues to debate the
34 environmental and economic impact of reducing
35 greenhouse gas emissions, making the cost of reducing
36 carbon dioxide from power plants unknown.¹⁴⁸

¹⁴⁷ Available at www.swtimes.com/articles/2007/07/09/news/news02.prt.
¹⁴⁸ <http://www.aeci.org/NR20080303.aspx>.

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At the same time, AECI noted that it would continue to look at energy efficiency initiatives, natural gas, renewable and nuclear resources to address future generation needs.

- Rocky Mountain Power, a division of PacifiCorp, cancelled two proposed coal plants in the fall of 2007. The Company explained the following in a November 28, 2007 letter to the Public Service Commission of Utah:

Furthermore, due to the current uncertainty in the ability to quantify in any meaningful way the cost of compliance with potential federal CO₂ legislation, Bridger 5 as a supercritical unit is no longer a viable option for 2014. Within the last few months, it has become apparent that Congress will enact some restriction upon carbon emissions, but the project cost impact upon new coal generation is currently within such a wide range as to make meaningful risk assessment futile. On November 13, 2007, the National Association of Regulatory Utility Commissioners adopted its first resolution acknowledging that climate change legislation addressing carbon emissions will occur. Within the last few months, most of the planned coal plants in the United States have been cancelled, denied permits, or been involved in protracted litigation. Accordingly, the Company submits that IPP 3, Bridger 5, and the IGCC option at Jim Bridger are no longer viable options for [its] 2012 RFP for the 2012 and 2014 time frame, respectively.

While the Company is not excluding new coal generation ownership from its 20 year options, absent some change in conditions, it cannot be determined at this time whether new coal generation will satisfy the least cost, least risk standards that would enable us to consider it as a viable option within our ten year plans.
(Emphasis added)¹⁴⁹

- Xcel Energy announced in October 2007 that it was deferring indefinitely its plans to build an integrated gasification combined cycle plant ("IGCC") in Colorado because the development costs were higher than the utility originally expected.¹⁵⁰

¹⁴⁹ <http://www.psc.utah.gov/elec/05docs/0503547/55486NoticeWithdrawal.doc>.
¹⁵⁰ Denver Business Journal, October 30, 2007.

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- 1 ▪ TXU cancelled 8 of 11 proposed coal-fired power plants in the spring of
2 2007 , in large part because of concern over global warming and the
3 potential for federal legislation restricting greenhouse gas emissions.¹⁵¹
- 4 ▪ Four public power agencies in Florida suspended permitting activities for
5 the coal-fired Taylor Energy Center in the spring of 2007 because of
6 growing concerns about greenhouse gas emissions.¹⁵²
- 7 ▪ Tampa Electric cancelled a proposed IGCC plant in the fall of 2007 due to
8 uncertainty related to CO₂ regulations, particularly capture and
9 sequestration issues, and the potential for related project cost increases.
10 According to a press release, “Because of the economic risk of these
11 factors to customers and investors, Tampa Electric believes it should not
12 proceed with an IGCC project at this time,” although it remains steadfast
13 in its support of IGCC as a critical component of future fuel diversity in
14 Florida and the nation.
- 15 ▪ The Orlando Utilities Commission announced in November 2007 that it
16 was cancelling the coal gasification portion of a 285-megawatt IGCC plant
17 at the Stanton Energy Center. Construction will continue on the natural
18 gas-fired combined cycle generating unit. The Commission cited the
19 impact of possible federal and state regulations related to future emissions
20 restrictions in the state of Florida as the primary reason for terminating
21 construction.¹⁵³
- 22 ▪ In June 2007, the Tondu Corp. announced that it was suspending plans to
23 build a planned 600 MW IGCC facility in Texas citing high costs and
24 other concerns related to technology and construction risks.¹⁵⁴

**B. Proposed coal-fired power plants have been rejected by state
regulatory commissions in North Carolina, Florida, Oklahoma,
Kansas and Virginia**

**Q. Have any proposed coal-fired generating projects been rejected by state
regulatory commissions due, in whole or in part, to concerns over increasing
construction costs or the potential for federal regulation of greenhouse gas
emissions?**

**A. Yes. Although some new coal-fired power plant projects have been approved by
state regulatory commissions and agencies during 2007, since last December**

¹⁵¹ See www.marketwatch.com/news/story/txu-reversal-coal-plant-emissions.

¹⁵² See www.taylorenergycenter.org/s_16asp?n=40.

¹⁵³ <http://www.ouc.com/news/releases/20071114-secb.htm>.

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1 proposed coal-fired power plant projects have been rejected by the Oregon Public
2 Utility Commission, the Florida Public Service Commission, and the Oklahoma
3 Corporation Commission. The North Carolina Utilities Commission rejected one
4 of the two coal-fired units proposed by Duke Energy Carolinas for its Cliffside
5 Project. The Kansas Department of Health and Environment also has recently
6 rejected proposed coal-fired power plants. The Virginia State Corporation
7 Commission recently rejected a proposed IGCC coal plant citing uncertainties of
8 costs, technology, and unknown federal mandates.¹⁵⁵

9 The decision of the Florida Public Service Commission in denying approval for
10 the 1,960 MW Glades Power Project was based on concern over the uncertainties
11 over plant costs, coal and natural gas prices, and future environmental costs,
12 including carbon allowance costs.¹⁵⁶ In addition, the Oklahoma Corporation
13 Commission voted in September 2007 to reject Public Service of Oklahoma's
14 application to build a new coal-fired power plant.¹⁵⁷

15 The Minnesota Public Utilities Commission also has refused to approve an
16 agreement under which Xcel Energy would have purchased power from a
17 proposed IGCC facility due to concerns over the uncertainties surrounding the
18 plant's estimated construction and operating costs and operating and financial
19 risks.¹⁵⁸

20 On October 18, 2007, the Kansas Department of Health and Environment rejected
21 an application to build two 700 MW coal-fired units at an existing power plant
22 site. In a prepared statement explaining the basis for this decision, Rod Bremby,
23 Kansas's secretary of health and environment noted that "I believe it would be
24 irresponsible to ignore emerging information about the contribution of carbon

¹⁵⁴ <http://www.reuters.com/article/companyNewsAndPR/idUSN1526955320070615>
¹⁵⁵ Final Order in Case No. PUE-2007-00068, April 14, 2008. Available at
http://scc.virginia.gov/newsrel/e_apfrate_08.aspx.
¹⁵⁶ Order No. PSC-07-0557-FOF-EI, Docket No. 070098-EI, July 2, 2007.
¹⁵⁷ Cause No. PUD 200700012 signed Order No. 545240, October 2007.
¹⁵⁸ Order in Docket No. E-6472/M-05-1993, dated August 30, 2007, at pages 16-19.

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9. WPL Was Unable to Provide Any Evidence to Support its Claimed 50 Month Construction Duration for NED 3

Q. Does WPL provide detailed information on the proposed construction schedule for the NED 3 plant?

A. No. WPL witness McFarland presents only a single table in response to the question “How long will it take to build NED 3?”¹⁶¹ This table merely lists a number of the major construction activities and provides the Company’s estimated number of months that each activity would be on the project’s critical path. The total proposed construction duration is 50 months from the start of construction through the beginning of commercial operations.

Q. Have you had an opportunity to review the detailed information that forms the basis for the activity critical path durations that are presented in the Table on page 14 of Mr. McFarland’s testimony?

A. No. It appears from WPL’s response to discovery that there is no detailed information that formed the basis for the individual activity critical path durations presented in Mr. McFarland’s testimony. CUB requested that WPL provide “the source documents, workpapers and other documentation that form the basis for the construction activity critical path durations presented in the table on page 14 of the Direct Testimony of Dennis L. McFarland.” WPL’s response was that:

¹⁶⁰ at Bates Page Number WPL 068148. A copy of this presentation is included as Exhibit___(DAS-13)

¹⁶¹ Direct Testimony of Dennis L. McFarland, at page 14.

¹⁶² WPL Response to 7-CUB/RFP-9.

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1 **Q. Are there any factors that, in your opinion, could lead to a construction**
2 **critical path longer than 50 months?**

3 A. Yes. The same competition for power plant design and construction resources,
4 commodities and equipment that have led to the soaring coal plant construction
5 costs also could extend the proposed NED 3 construction schedule. For example,
6 in his discussion of the major uncertainties in the cost estimates for NED 3 and
7 COL 3, WPL witness Hookham noted that the delivered costs for major
8 equipment were uncertain “given the relatively small number of capable and
9 experienced suppliers, including those for the boilers and air quality control
10 systems, and their current excessive backlog effect on cost and schedule...”

11 Indeed, the industry is reporting longer lead times for major power plant
12 equipment. These longer lead times are likely to affect how long it would take to
13 build NED 3.

14 **Q. What is your conclusion regarding WPL’s claimed 50 month construction**
15 **schedule for NED 3?**

16 A. In the current construction environment, a 50 month schedule from the start of
17 construction activities to the beginning of commercial operations may turn out to
18 be overly optimistic. A longer construction schedule would push the start of
19 commercial operations at NED 3 into late 2013, 2014 or perhaps later.

20 **Q. What impact would such a delay have on the cost of NED 3?**

21 A. Delays in construction mean higher costs for ratepayers.

22 **10. The Company Has Viable Alternatives to Adding NED 3 in 2013**

23 **Q. Is it a prudent decision to go ahead with the NED 3 project at this time, given**
24 **all of the uncertainties you have discussed?**

25 A. No. I have concluded that pursuing the NED 3 plant at this time would not be a
26 prudent decision. First, none of PSCW Staff’s EGEAS runs show that NED 3 is

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the least cost option. Moreover, there are significant uncertainties associated with building the new coal-fired power plant:

- Uncertainty as to the plant's ultimate construction cost and schedule
- Uncertainty as to the greenhouse gas emissions reductions that ultimately will be required as a result of federal, state or regional actions
- Uncertainty as to future CO₂ emissions allowance prices
- Uncertainty whether carbon capture and sequestration will prove to be technically and economically viable
- Uncertainty as to what the costs of carbon capture and sequestration will be, if it does prove viable
- Uncertainty whether co-firing up to 20 percent biomass will be technically, environmentally and commercially feasible.
- Uncertainty concerning WPL's capacity needs in light of the current economic slowdown as illustrated by the closure of the General Motors plant in Janesville.
- Uncertainty concerning the enhanced RPS requirements that will be adopted by the state
- Uncertainty concerning the levels of energy efficiency that will be found to be economic and that will be implemented

In light of these significant uncertainties, it would be better to adopt a resource plan that allows for the flexibility to modify course as circumstances change. Making a fixed commitment to a coal plant that is likely to cost much more than \$1.143 billion dollars, even without considering financing costs, and whose permitting and construction are likely to take 5-6 years or longer, is exactly the wrong kind of action in such uncertain times.

Most importantly, building a new coal-fired power plant at a time when nearly everyone recognizes that major reductions in greenhouse gas emissions will be essential to avoid the most harmful effects of climate change is a major step in the wrong direction. It will lock WPL and its ratepayers into an expensive coal-fired power plant for the next 50 or 60 years even if changing circumstances render that plant technologically and/or economically obsolete early in its service life. This is

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1 true whether or not that coal-fired power plant is misleadingly dressed up as part
2 of a “Carbon Reduction Plan.”

3 **Q. Are there viable alternatives for WPL if the Commission were to deny the**
4 **CPCN for NED 3?**

5 A. Yes. Wisconsin Statute 1.12 establishes a priority of the options that should be
6 considered, to the extent that they are cost-effective and technically feasible. This
7 priority includes (a) energy conservation and efficiency, (b) noncombustible
8 renewable energy resources, (c) combustible renewable energy resources, (d)
9 natural gas, (c) oil or coal with a sulfur of less than 1 percent, and all other
10 carbon-based fuels.

11 There is a portfolio of reasonable actions involving higher priority, cost-effective
12 and technically feasible energy efficiency, wind resources and conversion of the
13 Neenah facility from combustion turbine to combined cycle capacity that WPL,
14 with the Commission’s assistance and oversight, can take in place of NED 3.

15 The first step would be to begin the process to convert the Neenah combustion
16 turbine (“CT”) power plant to a combined cycle (“CC”) facility. It is reasonable to
17 expect that this conversion can be done at significantly lower cost than the
18 construction of a greenfield CC plant because WPL already will own the CTs and
19 related equipment at the Neenah site.

20 In fact, when it applied for a Certificate of Authority to acquire the Neenah
21 facility, WPL noted that the plant:

22 was designed and built to support expansion up to a 525-MW
23 combined cycle plant. Although WPL has no plans at present to
24 expand the plant, the existing natural gas infrastructure would be
25 sufficient to meet the needs of an expanded 525-MW plant should
26 that become desirable.¹⁶³

¹⁶³ WPL Application, at page 6.

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1 WPL further noted that the Neenah facility “was specifically designed for
2 expansion to a 525-MW combined cycle plant, if desired...”¹⁶⁴

3 Although, WPL notes the possibility of converting Neenah to a 525 MW facility,
4 an initial feasibility assessment performed for WPL has concluded that

5
6 .¹⁶⁵ In either case, converting the Neenah facility to combined cycle
7 technology would provide a of efficient new baseload and
8 intermediate capacity.¹⁶⁶

9 Second, with the assistance of a collaborative process involving interested
10 stakeholders, WPL should begin to develop a plan to aggressively acquire and
11 build renewable resources and to implement expanded energy efficiency
12 programs. At a very minimum, WPL should be required to immediately pursue
13 the amounts of new wind (200 MW) and energy efficiency (increasing savings by
14 50%) that are included in the Company’s proposed “Carbon Reduction Plan.”
15 Ultimately, the Company should be working towards meeting the RPS targets and
16 energy efficiency goals set out in the Final Report of the Governor’s Task Force
17 on Global Warming and the accords signed last November by the Midwestern
18 Governors, including Governor Doyle of Wisconsin.

19 Third, the Company should begin to develop plans for how it would achieve the
20 greenhouse gas emissions recommendations presented in the Final Report of the
21 Governor’s Task Force on Global Warming in a way that minimizes, to the extent
22 possible, the economic impact on its ratepayers.

¹⁶⁴ Id., at page 21.

¹⁶⁵

¹⁶⁶ is included as Exhibit____(DAS-28).

Report is included as Exhibit____(DAS-29). . A copy of this

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1 **Q. Would the Neenah facility after conversion to a combined cycle plant be able**
2 **to provide baseload power?**

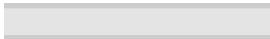
3 A. Yes. The plant would be able to operate in both intermediate and baseload modes.

4 **Q. But shouldn't the Commission be concerned about increasing WPL's**
5 **dependence on highly volatile natural gas?**

6 A. Of course, it is reasonable to be concerned about an over-dependence on price-
7 volatile natural gas. That is why I am recommending that WPL pursue aggressive
8 energy efficiency efforts and the aggressive development of renewable resources
9 in order to minimize the amount of new gas-fired or, perhaps, coal-fired capacity,
10 that will be needed at some point in the future.

11 However, it also should be recognized that neither the Company nor the region
12 are highly dependent on natural gas as part of their generation fuel mix.
13
14
15

16 167

17 At the same time, Alliant Energy's fuel mix, by energy, was 
18

19 Moreover, as I discussed earlier, WPL witness Bauer reported in an August 2007
20 presentation that the Company

21 Thus adding a repowered Neenah facility as a new 471-525 MW
22 baseload plant would not be expected to cause WPL to be unduly reliant on
23 natural gas in 2013 or later.

167 Exhibit___(DAS-17), at Bates Page Number WPL 070109.
168

at Bates Page Number WPL 068396. A copy of
this presentation is included as Exhibit___(DAS-30).
169 See Exhibit___(DAS-22) at Bates Page Number WPL 102848.

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1 Supply diversity is a very important consideration in resource planning. Reducing
2 WPL's current heavy dependence on fossil-fired generation, **especially coal-fired**
3 **power**, and moving towards greater use of renewable resources and energy
4 efficiency should be a major goal given the threat posed by global climate change
5 and the inevitability of federal regulation of greenhouse gas emissions in the near
6 future. Adding a new, efficient combined cycle gas-fired plant, that is, the
7 converted Neenah facility, would be a reasonable transition to what hopefully will
8 be a future with more renewable resources, more energy efficiency and, perhaps,
9 truly clean coal technologies.

10 The Commission's recent Certificate and Order granting Wisconsin Electric
11 Power Company permission to construct certain emissions control equipment at
12 Units 5-8 of its Oak Creek Power Plant noted the following as one of the bases for
13 its determination:

14 Because clean coal technologies are not yet available, nor are they
15 likely to be available for an in-service date of 2019, retirement of
16 the four Oak Creek units now may create the need for construction
17 by WEPCO of a future coal plant that would be technically
18 obsolete early in its useful life. Therefore, the proposed project
19 represents a bridge to that future that will allow WEPCO to meet
20 its electric supply requirements in a cost-effective manner while
21 the details of the carbon-constrained world become clearer and
22 technologies to operate in the world are developed.¹⁷⁰

23 Converting an existing CT facility to combined cycle capacity represents a similar
24 bridge to the future while the details of the carbon-constrained world become
25 clearer and technologies to operate in that world are developed. As I have
26 explained, building NED 3 would be an expensive bridge to the past.

¹⁷⁰ *Certificate and Order*, Docket No. 6630-CE-299, July 10, 2008, at pages 12 and 13.

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11. The Economic Impact Testimony Submitted by WPL Witnesses Fortenbery and Deller Lacks Probative Value

Q. Do you have any comments on the economic benefits testimony submitted by Professors Fortenbery and Deller on behalf of WPL?

A. Yes. I have a number of criticisms of the economic benefits testimony submitted by Professors Fortenbery and Deller.

First, it is no surprise that building the \$1 billion plus NED 3 plant would create both temporary construction and permanent operation jobs and through the multiplier effect, provide economic benefits. Major construction projects generally have these results. However, they also can have negative economic impacts that are not addressed by Professors Fortenbery and Deller.

Second, a more relevant question is whether building NED 3 would provide more local and statewide economic benefits than undertaking alternative, and perhaps, lower cost alternatives. As I am sure Professors Fortenbery and Deller must be aware, building and operating natural gas-fired power plants and wind facilities also create jobs, as does installing and implementing energy efficiency measures - although it is true that these jobs and economic benefits may be in different towns, villages and counties than the proposed NED site.¹⁷¹ However, Professors Fortenbery and Deller only show the economic benefits from building NED 3 rather than comparing those benefits with the jobs and economic benefits that would follow from expenditures on alternatives to the coal plant. By only providing the benefits that would flow from spending money on NED 3 Professors Fortenbery and Deller have given an incomplete and distorted picture.

Third, Professors Fortenbery and Deller calculate the economic benefits from being able to import lower cost power into Wisconsin. But again, their one-sided analysis assumes that building NED 3 is the only way, or is at best the lowest cost

¹⁷¹ Exhibit___(DAS-31) and Exhibit___(DAS-32) present illustrative examples of the economic benefits that have been calculated as flowing from expenditures on wind facilities and energy efficiency.

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1 way, to do this. They don't ask or address whether there may be lower cost
2 options that can achieve the same reductions in power costs and, perhaps, create
3 the same jobs and economic benefits.

4 Fourth, Professors Fortenbery and Deller focus on job creation and the economic
5 benefits of spending the money to build and operate NED 3. However, they
6 ignore the fact that someone will have to pay for the construction and operation of
7 NED 3. Thus, they don't consider in their analysis the adverse economic impact
8 of the higher electricity rates that WPL's customers will have to pay as a result of
9 the commitment to NED 3 and that these higher rates can be expected to have a
10 negative impact on the economy.

11 Finally, and perhaps most importantly, the simplistic analysis presented by
12 Professors Fortenbery and Deller ignores the real environmental and economic
13 damage to which the millions of tons of additional CO₂ that NED 3 will emit each
14 year will contribute for the next fifty or sixty years. There no longer is any
15 credible doubt that global climate change will have very substantial economic as
16 well as environmental consequences. It can reasonably be expected that some of
17 these economic consequences will be felt in Wisconsin and in the counties near
18 the proposed plant site. If Professors Fortenbery and Deller are going to present
19 the economic benefits of building NED 3, they also should provide the adverse
20 economic consequences of doing so. Unfortunately, they have not.

21 **Q. Is the proposed NED 3 plant the only reasonable option for stimulating the**
22 **growth of a biomass industry in SW Wisconsin?**

23 A. No. DTE Energy has signed a PPA to provide 40 MW of biomass generated
24 power from the Stoneman Plant in Cassville to Dairyland Coop. The need to
25 supply biomass to this facility also would stimulate the growth of a biomass
26 industry in SW Wisconsin.

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

28 A. Yes.