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 Unit Known as the Nelson Dewey Generating Station in Cassville, Grant County, Wisconsin

DOCKET NO. 6680-CE-170

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-32) Wind Energy Update, National Renewable Technology Laboratory, June 2008
1. Introduction

Q. What is your name, position and business address?

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

Q. Please describe Synapse Energy Economics.

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

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

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

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

Since 1983 I have been retained by governmental bodies, publicly-owned utilities, and private organizations in 28 states to prepare expert testimony and analyses on engineering and economic issues related to electric utilities. My recent clients have included the New Mexico Public Regulation Commission, the General Staff of the Arkansas Public Service Commission, the U.S. Department of Justice, the Commonwealth of Massachusetts, the Attorneys General of the States of Massachusetts, Michigan, New York, and Rhode Island, the General Electric
Company, cities and towns in Connecticut, New York and Virginia, state
consumer advocates, and national and local environmental organizations.
I have testified before state regulatory commissions in Arizona, New Jersey,
Connecticut, Kansas, Texas, New Mexico, New York, Vermont, North Carolina,
South Carolina, Maine, Illinois, Indiana, Ohio, Massachusetts, Missouri, Rhode
Island, Wisconsin, Iowa, South Dakota, Georgia, Minnesota, Michigan, Florida
and North Dakota and before an Atomic Safety & Licensing Board of the U.S.
Nuclear Regulatory Commission.

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

Q. On whose behalf are you testifying in this case?
A. I am testifying on behalf of the Citizen Utility Board (“CUB”) and Clean
Wisconsin.

Q. Have you testified previously before the Public Service Commission of
Wisconsin (“PSCW”)?
A. Yes. I have testified in PSCW Dockets Nos. 6630-CE-209, 6630-CE-197, 6690-

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

This testimony presents the results of our analyses.

Q. Please identify the other Synapse witnesses who are presenting expert
testimony in this proceeding on behalf of CUB and/or Clean Wisconsin.
A. In addition to myself, Robert Fagan from Synapse is presenting expert testimony
in this Docket on behalf of Clean Wisconsin.
Q. Were there other members of the Synapse staff who also assisted in the analyses undertaken by Synapse as part of its evaluation of WPL’s proposed Nelson Dewey Unit 3?

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

Q. Please summarize your conclusions.

A. My conclusions are as follows:

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

2. The addition of NED 3 would reduce WPL’s annual CO₂ emissions under both the Company’s Base Case IRP Resource Plan and its so-called “Carbon Reduction Plan.” The results of WPL’s Electric Generation Expansion Analysis System (“EGEAS”) modeling analyses reveal that annual CO₂ emissions under its IRP Resource Plan would

The results of the Company’s EGEAS modeling also show that,
3. The Company’s claim that its proposed Carbon Reduction Plan actually would reduce CO2 emissions is misleading. The only “reduction” that occurs is in comparison to an unrealistic future.

4. The addition of NED 3 would conflict with evolving federal, state and regional climate change policies with or without WPL’s Carbon Reduction Plan because the Company’s annual CO2 emissions would as a result of the addition of NED 3 at the same time that reductions in emissions would be required by federal legislation, the recommendations of the Governor’s Task Force on Global Warming and/or regional agreements.

5. NED 3 was not selected for installation in 2013 as part of the least cost resource plan in any of the cases that the PSCW Staff examined for the Draft Environmental Impact Statement (“EIS”) or the Final EIS using in the EGEAS model. In fact, the plans with NED 3 in 2013 were significantly more expensive than the optimal plans in the cases that the PSCW Staff modeled for the Final EIS that reflected (a) the plant’s currently estimated cost and (b) non-zero CO2 costs.

6. The Company has not provided any credible evidence that NED 3 is part of a least cost resource plan. In particular:

   a. None of the Company’s EGEAS runs use the currently estimated costs of NED 3 and Columbia Unit 3 (“COL 3”).

   b. Most of the Company’s EGEAS runs unrealistically assume zero CO2 costs.
c. In its EGEAS runs, WPL unrealistically constrained the amounts of new wind that could be added.

d. WPL has not prepared any EGEAS runs to show that its proposed Carbon Reduction Plan is the least cost and most effective option for reducing its CO₂ emissions.

7. Building NED 3 would expose WPL’s ratepayers to significant risks and uncertainties including further increases in the project’s construction cost and federal and/or state restrictions on CO₂ emissions. However, WPL has not adequately considered these risks and uncertainties as part of its evaluation of the proposed NED 3 plant.

8. WPL has not considered the potential for further construction cost increases in its planning analyses. It is reasonable to expect that the estimated cost of building NED 3 will continue to rise, perhaps quite significantly, before the project is completed given:

a. The continuing worldwide competition for power plant design and construction resources, commodities and equipment.

b. The experiences of other power plants that are further along in the procurement and construction process.

c. Evidence that costs at NED 3 already have increased since the current $1.143 billion estimate, without financing costs, was released.

d. The inability of WPL in the current construction environment to obtain fixed price contracts for major project work and equipment procurement.

9. WPL’s parent company, Alliant Energy, agrees that mandatory requirements to stabilize and reduce greenhouse gas emissions are
However, WPL has not adequately considered the likelihood of mandated CO₂ emissions reductions in its planning analyses.

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

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

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

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

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

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

13. More than fifty proposed coal-fired power plants have been cancelled, delayed and/or rejected by state regulatory commissions or boards within the past year because of, or at least in large part due to, the uncertainties and risks regarding future power plant construction costs and the potential for regulation of power plant CO₂ emissions.
14. WPL has been unable to provide any documentary evidence to support its claimed 50 month construction duration for NED 3. Moreover, it is reasonable to expect that, if approved, the plant will experience construction delays as a result of the worldwide competition for power plant equipment, commodities and design and construction resources. These delays would mean higher costs for ratepayers.

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

- 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 at NED 3.
- 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 Renewable Portfolio Standard (“RPS”) requirements that will be adopted by the State of Wisconsin.
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1. 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.
Q. Please explain how you conducted your investigations in this proceeding.

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

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

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

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

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

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

A. According to WPL, if the plant were to burn 100 percent Powder River Basin coal, its CO₂ emissions, would be 2,950,000 tons per year, including the CO₂
equivalents of the Nitrous Oxide ("N\textsubscript{2}O") that NED 3 would emit.\footnote{The terms CO\textsubscript{2} and greenhouse gases are used interchangeably in this testimony even though CO\textsubscript{2} is only one of the six gases that are collectively known as "greenhouse gases." Although the other gases are more potent greenhouse gases, CO\textsubscript{2} is far more abundant and is the primary greenhouse gas emitted as a result of fossil fuel combustion. The figures for CO\textsubscript{2} emissions that are discussed in this testimony include the CO\textsubscript{2}-equivalent emissions of Nitrous Oxide ("N\textsubscript{2}O") which is emitted in significant amounts by Circulating Fluidized Bed coal plants.} If the plant were to burn an 80/20 combination of PRB coal and biomass, its CO\textsubscript{2} emissions would be 2,482,000 tons per year. If NED 3 were to burn a combination with an 80/20 PRB and pet coke blend, assuming that WPL is permitted by the DNR to burn pet coke, and 20 percent biomass, its CO\textsubscript{2} emissions would be 2,425,000 tons per year.

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

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

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

In addition, it is unclear how co-firing 20 percent RRF would alter the air emission rates of a number of air pollutants from the NED 3 facility. No air modeling for this proposal has been submitted by WP&L.\footnote{Final EIS, at page 359.}
Do you agree with these conclusions?

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

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

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

As WPL witness Johnson noted in an e-mail produced in response to 9-CUB/RFP-2, (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).
Q. How much land acreage would be required to provide the biomass for NED 3?

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

Even assuming a relatively high heat content, at production rates of 3 tons per acre per year, NED 3 would require approximately 120,000 acres for the annual production of feedstocks. With production rates of 5 tons per acre, NED 3 would require approximately 72,000 acres for the annual production of feedstocks.

Moreover, while NED 3 may require 72,000-120,000 acres for annual feedstock production, the total number of acres under management would likely have to be significantly higher due to the long growth cycles of many wood and agricultural materials. In fact, it is anticipated that sustaining sufficient supplies of RRFs will

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5 Id, at page 156, lines 8-14.
6 Id, at page 156, lines 16-21.
7 A copy of this White Paper is included as Exhibit___(DAS-4).
8 Direct Testimony of William A. Johnson, at page 5, lines 9-12.
require using more than one feedstock material (e.g. wood, stover and native grasses).⁹

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

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

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

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

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

A. The Company has indicated that the NED 3 material handling system will require most agricultural residue and native grass-derived RRFs to be “densified” or “pellitized.” However, According to Mr. Hookham, ¹³
Q. Is there any certainty as to the cost of the processed biomass that would be co-fired at NED 3?

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

- Current projections are that unprocessed feedstock will cost $40-$100+/ton depending on the source. Until the RRF blend is determined, the precise cost per ton cannot be determined, which is a continuing process as explained in the testimony of Mr. William Johnson. For the purposes of this analysis, a reasonable range is $40-$60/ton for raw feedstock, with the variation being dependent on the actual percentages of unprocessed wood chips/forest residues, surplus agricultural crop residues and native grasses purchased by the aggregators/processors.14

- The economic impact analyses associated with sourcing RRFs is ongoing. The fuel specification and volume of RRF needed at NED 3 has not yet been conclusively determined by WPL. Additionally, it is possible that more than one aggregator or processor will serve WPL. The finished RRF cost (i.e. the sales of the aggregation/processing plant to WPL’s NED 3), is currently estimated to be $60-$160/ton. Based on processing costs in comparable industries, processing is estimated to be 50%-100% of the raw feedstock cost.15

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

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

17 The requirements for transporting the biomass for NED 3 might be quite significant as WPL has recently announced

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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 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 that it has chosen five companies “to help establish a biomass supply chain” for NED 3. Three of the five companies are located in northwestern Wisconsin.\(^{18}\)

2 Q. Do WPL’s estimates of the CO\(_2\) emissions from NED 3 include the emissions from the truck trips that WPL estimates would be required each year to deliver the biomass to the site?

3 A. No.\(^{19}\)

4

5


7 Q. What would WPL’s annual CO\(_2\) emissions be under its proposed IRP resource plan with NED 3 beginning operations in 2013?

8 A. The Company’s annual CO\(_2\) emissions through 2035 under its proposed IRP Resource Plan with NED 3 are shown in Figure 1, below.


\(^{19}\) Exhibit-___(DAS-3), at page 184, line 16, to page 185, line 15.
Q. Has the Company adequately supported what it is characterizing as a “Carbon Reduction Plan” that was presented in the June 2008 testimony of WPL witness Randy Bauer?

A. No. WPL introduced this proposal relatively late in this proceeding even though . The components of that plan are listed on Bauer’s Schedule 7 which was submitted with his Direct testimony. Of those components listed, increasing energy efficiency by 50%, an additional 200 MW of wind, and retiring Edgewater Unit 3 were not in the 2006 IRP (as presented in Appendix A to the CPCN Application).
Q. Would adoption of WPL’s so-called “Carbon Reduction Plan” actually offset the CO₂ emissions from NED 3 and lead to real reductions in the Company’s emissions beginning in 2013?

A. No. As shown in Figure 2 below,

Figure 2: WPL’s Projected Annual CO₂ Emissions Under Carbon Reduction Plan [CONFIDENTIAL]

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

A. WPL’s claims regarding its “Carbon Reduction Plan” are extremely misleading.
Q. Does the Company’s “Carbon Reduction Plan” include entirely new wind and energy efficiency proposals?

A. No. A number of the features of the “Carbon Reduction Plan,” such as the Cedar Ridge and Forward Energy wind purchases and the levels of energy efficiency in the Shared Savings Programs, simply repackage things that the Company already is doing or is committed to doing whether or not NED 3 is built. Only the 200 MW’s of additional wind, a 50% increase in energy efficiency and retiring Edgewater 3 are “new” components. Thus, most of what is listed as components of the “Carbon Reduction Plan” are not new proposals that can be counted on to 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.
Q. Is Mr. Bauer correct when he testifies that the “Carbon Reduction Plan” would reduce CO₂ emissions in the year 2014 over what the emissions would have been under the “No Additions” plan?\textsuperscript{22}

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

\begin{verbatim}

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

Moreover the Company’s EGEAS modeling results show

\begin{verbatim}

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

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

A. No.

\end{verbatim}

\textsuperscript{22} Direct Testimony of Randy Bauer, at page 31, lines 1-4.
Q. What is the significance of a negative reserve margin?

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

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

A. Yes. The comparison presented in Mr. Bauer’s Exhibit RDB-1, Schedule 7, is extremely misleading in a number of ways. First, Schedule 7 suggests that adoption of the “Carbon Reduction Plan” would produce 3,518,000 tons of CO₂ offsets while NED 3 would emit only 2,985,000 tons of CO₂. The result would be a net reduction of about 530,000 of CO₂. This conflicts with Mr. Bauer’s testimony that the “Carbon Reduction Plan” would
produce about 32,000 tons of CO\textsubscript{2} reductions in 2014.\textsuperscript{23} In fact, WPL’s EGEAS modeling shows that the “Carbon Reduction Plan” would . In fact, as I noted earlier, the Company’s EGEAS modeling shows that the CO\textsubscript{2} emissions would be , under the “Carbon Reduction Plan” than under even the unrealistic “No Additions” scenario.

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

Third, WPL overstates the savings that would be attributable to the retirement of Edgewater 3 by assuming that the plant would operate at an percent annual capacity factor. In fact, as shown in WPL’s Confidential Response to Interrogatory 7-CUB-1,

Moreover, even in the “No Additions” scenario, in which the WPL system is starved of new resources, the EGEAS modeling shows that the annual capacity factors for Edgewater 3 would never exceed percent.

Fourth, and most significantly, as I have discussed above, Mr. Bauer’s Exhibit RDB-1, Schedule 7, is misleading because it does not show that the Company’s annual CO\textsubscript{2} emissions under the “Carbon Reduction Plan” would start to after the plant began operations in 2013. Consequently, the adoption of the “Carbon Reduction Plan” in the Company’s annual CO\textsubscript{2} emissions.

\textsuperscript{23} Direct Testimony of Randy Bauer, at page 31, lines 1-4.
Q. Has the Company presented any evidence that its “Carbon Reduction Plan” is the lowest cost option for reducing CO₂ emissions?

A. No. The Company has not presented any evidence of either the economic costs of its proposed “Carbon Reduction Plan” or of the relative costs of that plan compared to other, and more credible, options for reducing its annual CO₂ emissions. Indeed, the Company’s Confidential Response to Interrogatory 7-CUB-19 indicated that some costs in the EGEAS modeling of the “Carbon Reduction Plan” and “No Additions” scenarios are

Q. Would WPL secure any economic advantage from retiring Edgewater 3 and replacing it with capacity from NED 3?

A. Yes.

Q. Please summarize your conclusions regarding WPL’s “Carbon Reduction Plan.”

A. According to the Company’s own modeling analyses, using its own assumptions, implementation of the proposed “Carbon Reduction Plan” would lead to annual CO₂ emissions after the plant began commercial operations. In fact, as shown in Figure 1 above, the name “Carbon Reduction Plan” is a complete misnomer. Building NED 3 even in conjunction with the additional energy efficiency and wind resources that WPL has put in its “Carbon Reduction Plan”
would lead to


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

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

A. Federal Climate Change Proposals

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

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

<table>
<thead>
<tr>
<th>Proposed National Policy</th>
<th>Title or Description</th>
<th>Year Proposed</th>
<th>Emission Targets</th>
<th>Sectors Covered</th>
</tr>
</thead>
</table>
  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 | 2010 level from 2010-2019  
  1990 level from 2020-2029  
  2.5%/year reductions from 2020-2029  
  3.5%/year reduction from 2030-2050  
  65% below 2000 level in 2050 | Economy-wide |
| McCain-Lieberman S.280   | Climate Stewardship and Innovation Act | 2007 | 2004 level in 2012  
  1990 level in 2020  
  20% below 1990 level in 2030  
  60% below 1990 level in 2050 | Economy-wide |
| Sanders-Boxer S.309      | Global Warming Pollution Reduction Act | 2007 | 2%/year reduction from 2010 to 2020  
  1990 level in 2020  
  27% below 1990 level in 2030  
  53% below 1990 level in 2040  
  80% below 1990 level in 2050 | Economy-wide |
  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 | 2012 levels in 2012  
  2006 levels in 2020  
  1990 levels by 2030  
  President may set further goals >60% below 2006 levels by 2050 contingent upon international effort | Economy-wide |
  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 | 2005 level in 2012  
  20% below 2005 level by 2020  
  80% below 2005 level by 2050 | Economy wide |
The emissions levels that would be mandated by some of these bills are shown in Figure 4 below:

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

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

**Q.** How would WPL’s CO₂ emissions under its proposed “Carbon Reduction Plan” compare to the greenhouse gas emissions that would be mandated under these legislative proposals?

**A.** As shown in Figure 2 above, WPL’s CO₂ emissions would be at the same time that the legislative proposals in Congress would be mandating
reductions in emissions. In other words, WPL’s CO₂ emissions would
at a time when the mandated levels of emissions were
being reduced.

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

A. Yes.

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

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

As shown in Figure 4 below, Alliant’s CO₂ emissions would be
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?

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

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

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

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

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

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

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

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

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

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

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

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

B. Wisconsin State Climate Change Proposals

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

A. The Governor’s Task Force has recommended that policies be adopted for the utility sector “that will result in a substantial reduction over time in the state’s dependence on fossil fuels and, in particular, on coal-fired generation that does not include carbon capture and sequestration technology.”

More specifically, the Task Force recommended the following set of goals for Wisconsin net greenhouse gas (“GHG”) emissions:

- A return to 2005 levels by no later than 2014.
- A 22 percent reduction from 2005 levels (roughly equivalent to 1990 levels by 2022).
- A 75 percent reduction from 2005 levels by 2050 (roughly equivalent to 70 percent below 1990 levels).

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

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

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

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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.
Q. How do WPL’s projected CO₂ emissions under its proposed IRP Resource Plan and its “Carbon Reduction Plan” compare to the reduction goals recommended by the Governor’s Task Force on Global Warming?

A. As shown in Figure 5 below, adding NED 3 as part of either WPL’s proposed IRP Resource Plan or its “Carbon Reduction Plan” would lead to a considerable emissions at the same time that the Governor’s Task Force is recommending that emissions levels be reduced significantly beginning in 2014. Consequently, approval of NED 3 with or without WPL’s so-called “Carbon Reduction Plan” would the Task Force recommendations.

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]
Q. What reductions would WPL have to make from its forecast levels of CO₂ emissions in order to meet the recommendations of the Governor’s Task Force on Global Warming?

A. WPL would have to make in its annual CO₂ emissions under both its proposed IRP Resource Plan and the “Carbon Reduction Plan” in order to meet the recommendations of the Governor’s Task Force on Global Warming, as shown in Table 2 below.

Table 2: Reductions in WPL’s Annual CO₂ Emissions That Would Be Needed to Satisfy Task Force Recommendations

Thus, if the recommendations of the Task Force on Global Warming are adopted, WPL would have to make in its annual CO₂ emissions even under its proposed “Carbon Reduction Plan.” This would require substantially
more wind and energy efficiency than WPL has included in either its IRP Resource Plan or “Carbon Reduction Plan.”

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

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

C. Midwest Regional Climate Change Proposals

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

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

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

A. Yes. Exhibit___(CJH-2) Schedule 3, of WPL witness Hookham indicates that “The Midwestern Greenhouse Gas Reduction Accord is a regional agreement by US Midwest states to reduce greenhouse gas emissions and combat climate change
change … Reduction targets are expected to be consistent with the 60-80 percent
reductions recommended by the Intergovernmental Panel on Climate Change
(IPCC).”

Q. Has WPL considered whether implementation of the Greenhouse Gas
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 At page ES-3.
39 Exhibit___(DAS-13), at Bates Page Number WPL 068147
40 Id.
Q. Has the Company undertaken any EGEAS modeling to examine the impact that the implementation of the Midwest Governors Association’s Greenhouse Gas Accord would have on its existing generation plans, costs to customers or investment opportunities?

A.  

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

A.  

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

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

A. The PSCW Staff examined 15 scenarios and over 300 sensitivities as part of the EGEAS modeling reported in the Draft EIS. On the basis of this modeling, the PSCW Staff concluded that “The proposed NED 3 unit is not the least cost option under any scenario” it examined. For example, in its scenario with CO\textsubscript{2} monetized at $20/ton, the NED 3 in 2013 Base Case (with the Kewaunee contract extended to 2033) was $483 million NPV more expensive than the Optimal Plan and $440 million NPV more expensive than the No New Coal plan.

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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.
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

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

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

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

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

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

A. Based on our work on climate change issues, Synapse believes that the $20/ton CO₂ price that the PSCW Staff had used in its EGEAS modeling for the Draft EIS was reasonable, albeit low. Therefore, CUB and Clean Wisconsin asked Staff to run two new EGEAS cases with this same CO₂ price. CUB and Clean Wisconsin also asked the PSCW Staff to look at a scenario where CO₂ prices are higher than $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.
Q. How do the $20/ton and $30/ton CO₂ prices compare to other analyses of future CO₂ costs?

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


- The October 2007 Supplement to the EIA’s assessment of the Energy Market and Economic Impacts of S. 280, the Climate Stewardship and Innovation Act of 2007.⁵⁰

- The EIA’s assessment of the Energy Market and Economic Impacts of S. 1766, the Low Carbon Economy Act of 2007 (January 2008).⁵¹


- The U.S. Environmental Protection Agency’s (“EPA”) Analysis of the Climate Stewardship and Innovation Act of 2007 – S. 280 in 110th Congress (July 2007).⁵³


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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.


⁵⁰ Available at http://www.eia.doe.gov/oiaf/services/rap/s280_1007.pdf.


⁵³ Available at http://www.epa.gov/climatechange/economics/analysis/ClimateStewardship.pdf.

⁵⁴ Available at http://www.epa.gov/climatechange/economics/analysis/LiebermanWarner.pdf.
Assessment of U.S. Cap-and-Trade Proposals by the Joint Program at the Massachusetts Institute of Technology (“MIT”) on the Science and Policy of Global Change (April 2007).\textsuperscript{56}

Analysis of the Cap and Trade Features of the Lieberman-Warner Climate Security Act – S. 2191 by the Joint Program at MIT on the Science and Policy of Global Change (April 2008).\textsuperscript{57}

The Lieberman-Warner America’s Climate Security Act: A Preliminary Assessment of Potential Economic Impacts, prepared by the Nicholas Institute for Environmental Policy Solutions, Duke University and RTI International (October 2007).\textsuperscript{58}

U.S. Technology Choices, Costs and Opportunities under the Lieberman-Warner Climate Security Act: Assessing Compliance Pathways, prepared by the International Resources Group for the Natural Resources Defense Council (May 2008).\textsuperscript{59}

The Lieberman-Warner Climate Security Act – S. 2191, Modeling Results from the National Energy Modeling System – Preliminary Results, Clean Air Task Force (January 2008).\textsuperscript{60}


Analysis of the Lieberman-Warner Climate Security Act (S. 2191) using the National Energy Modeling System (NEMS/ACCF/NAM), a report by the American Council for Capital Formation and the National Association of Manufacturers, NMA, March 2008.\textsuperscript{62}

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

\textsuperscript{55} Available at http://www.epa.gov/climatechange/economics/economicanalyses.html.
\textsuperscript{56} Available at http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt146.pdf.
\textsuperscript{57} Available at http://mit.edu/globalchange/www/MITJPSPGC_Rpt146_AppendixD.pdf.
\textsuperscript{58} Available at http://www.nicholas.duke.edu/institute/econsummary.pdf.
\textsuperscript{59} Available at http://docs.nrdc.org/globalwarming/glo_08051401A.pdf.
\textsuperscript{60} Available at http://lieberman.senate.gov/documents/catflwcsa.pdf.
\textsuperscript{61} Available at http://www.nma.org/pdf/040808_crai_presentation.pdf.
\textsuperscript{62} Available at http://www.accf.org/pdf/NAM/fullstudy031208.pdf.
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)
As can be seen, the $20/ton, $30/ton, and Ramped CO₂ prices used by the PSCW Staff in their additional EGEAS modeling are quite conservative (that is, low) compared to the full range of CO₂ emissions allowance prices that could result from adoption of the major greenhouse gas regulatory legislation that has been introduced in the current U.S. Congress.

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

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

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⁶³ See the Synapse 2008 CO₂ Price Forecasts Report that is included as Exhibit_(DAS-14).
Q. What would be the impact of assuming CO₂ prices higher than $30/ton?

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

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

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

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

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

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

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

A. Exhibit___(DAS-15) is Don’t Get Burned: The Risks of Investing in New Coal-Fired Power Plants. This Synapse report discusses the risks associated with new
coal-fired generating plants like the proposed the NED 3 plant. The most
significant of these risks are the likelihood for future restrictions on CO₂
emissions and the potential for further increases in the project’s capital cost. Other
potential uncertainties for new coal plants include the potential for higher fuel
prices, the potential for fuel supply disruptions that could affect plant operating
performance, and the potential for increasingly stringent regulation of current
criteria pollutants.

Q. Have you seen evidence that WPL is generally aware of these risks?
A. Yes.

One month later,
The same presentation also discussed:

The presentation also reported that:

Finally, the presentation reported that:

Bates Page Number WPL 069526. A copy of this presentation is included as Exhibit___(DAS-9).
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, 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.
Q. Have any plant- or site-specific risks been identified for the proposed NED 3 plant?

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

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

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

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

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

A. Yes. I generally agree that the worldwide competition for power plant design and 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.
Hookham’s testimony has led to skyrocketing construction costs at power plant construction projects in general, and to the current $1.143 billion estimated cost for the NED 3 plant, without financing costs.

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

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

A. Yes. It is reasonable to expect that the factors which have led to the recent increase in the estimated costs for NED 3 and COL 3, and to soaring prices for
other coal plants, will lead to further increases in the future. Thus, the actual cost
of building NED 3 can be expected to be higher, perhaps even significantly
higher, than WPL’s most recent estimate.

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

A. A number of factors lead me to the conclusion that the estimated cost of building
the NED 3 plant will continue to rise, perhaps quite significantly, before the
project is completed. These factors include: industry-wide trends and cost
uncertainties, as explained by Mr. Hookham; the actual cost experiences of other
projects that are further along in the procurement and construction process than
NED 3;

; and, finally, the inability of WPL to obtain
in the current construction environment fixed price contracts for major project
work and equipment procurement.

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

A. Yes. Construction industry literature and publications are filled with reports and
information on the continuing increases in power plant and commodity costs.

For example, a May 15, 2008 story in the Wall Street Journal noted that
“escalating steel prices are halting and slowing major construction projects
worldwide and limiting shipbuilding and oil and gas exploration.” The same
article also reported that “Steel prices are up 40 percent to 50 percent since
December, and industry executives say they have not reached a peak” and “raw
materials prices have surged in the past year, fueled in part because of the rapid
industrialization of China, India and other developing nations.”

75 Exhibit__(DAS-3), at page 120, line 21, to page 121, line 24.
Q. Have you seen any credible evidence that the worldwide competition for commodities and other resources that has led to recent coal-fired power plant construction cost increases is likely to disappear or even abate significantly in the near future?

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

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

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

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

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

76 Direct Testimony of Charles J. Hookham, at page 23, line 5, to page 24, line 7.
Q. Has Mr. Hookham acknowledged that materials prices, which were one of the primary factors that led to the recent 38 to 40 percent increase in the estimated cost of the NED 3 plant, have continued to rise since the estimate was released and, as a result, the estimated cost of the plant can be expected to be even higher than $1.143 billion, without financing costs?

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

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

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

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77 Exhibit___(DAS-3), at page 122, lines 2-11.
78 Id, at page 124, line 19, to page 125, line 1.
along in the design, procurement and construction process than NED 3 are not immune to rising costs. For example, in April 2008, Duke Energy Indiana announced an 18 percent increase in the estimated cost of its proposed Edwardsport IGCC coal plant just since the spring of 2007. Duke indicated that higher than expected costs had been experienced when the Company actually began final procurement of equipment for the plant. Duke also said that “the increase in the cost estimate is driven by factors outside the Company’s control, including unprecedented global competition for commodities, engineered equipment and materials, and increased labor costs.” Duke also noted in its Petition to the Indiana Utility Regulatory Commission that this projected increase in cost “is consistent with other recent power plant project cost increases across the country.”

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

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

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

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

A. As explained by Mr. Hookham,

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

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

Q. Is the EPC contract with URS-WD a fixed price contract?
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.
Q. Is Mr. Hookham’s conclusion concerning the availability of fixed-price contracts in today’s construction environment consistent with the recent experience of other companies seeking to build coal-fired power plants at this time?

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

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

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

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

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

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

A. No. 92

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

A. Yes. However, the information I have seen suggests that the increases in the costs of alternative resources, such as new gas-fired power plants, have not been as substantial as those experienced by coal-fired projects. But NED 3 was not even selected as part of the Optimized (i.e., least cost) plan even when the PSCW Staff made the conservative assumption that the other fossil-fired generating options (including natural gas burning facilities) in the EGEAS model had increased by the same percentage as NED 3. 93

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

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

92 WPL Response to 7-CUB/RFP-14.
93 Final EIS, at pages 360 and 361.
Q. Do you agree with Mr. Hookham’s testimony that any deferral of construction to a later time period would only serve to further increase costs?

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

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

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

A. Yes. WPL would benefit from having a larger rate base as a result of increased costs of building NED 3 if the Commission determines that the Company’s management of the project was prudent and that the cost increases were beyond its control.
B. WPL Has Not Adequately Considered the Likelihood of Mandated CO₂ Emissions Reductions in its Planning Analyses

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

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

Indeed, WPL’s parent Company, Alliant Energy, has said publicly that “mandatory requirements to stabilize and reduce greenhouse gas emissions are likely. What remains uncertain is the nature, extent and timing of such requirements.”

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

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

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

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

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

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

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

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

What Could Go Wrong?

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

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

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

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101 Exhibit__(DAS-24), at page 15.
These Principles created an Enhanced Diligence Framework to help lenders better understand and evaluate the potential carbon risks associated with coal plant investments. The three Carbon Principles adopted by these leading institutions are:

- **Energy Efficiency.** An effective way to limit CO₂ emissions is to not produce them. The signatory financial institutions will encourage clients to invest in cost-effective demand reduction, taking into consideration the value of avoided CO₂ emissions. We will also encourage regulatory and legislative changes that increase energy efficiency in electricity consumption including the removal of barriers to investment in cost-effective demand reduction. The institutions will consider demand reduction caused by increased energy efficiency (or other means) as part of the Enhanced Diligence Process and assess its impact on proposed financings of certain fossil fuel generation.

- **Renewable and low carbon distributed energy technologies.** Renewable energy and low carbon distributed energy technologies hold considerable promise for meeting the electricity needs of the US while also leveraging American technology and creating jobs. We will encourage clients to invest in cost-effective renewables and distributed technologies, taking into consideration the value of avoided CO₂ emissions. We will also encourage legislative and regulatory changes that remove barriers to, and promote such investments (included related investments in infrastructure and equipment needed to support the connection of renewable sources to the system). We will consider production increases from renewable and low carbon generation as part of the Enhanced Diligence process and assess their impact on proposed financings of certain new fossil fuel generation.

- **Conventional and advanced generation.** In addition to cost effective energy efficiency, renewables and low carbon distributed generation, investments in conventional or advanced generating facilities will be needed to supply reliable electric power to the US market. This may include power from natural gas, coal and nuclear technologies. Due to evolving climate policy, investing in CO₂-emitting fossil fuel generation entails uncertain financial, regulatory and certain environmental liability risks. It is the purpose of the Enhanced Diligence process to assess and reflect

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102 A copy of the Carbon Principles are attached as Exhibit__(DAS-25).
these risks in the financing considerations for certain fossil fuel
generation. We will encourage regulatory and legislative
changes that facilitate carbon capture and storage (CCS) to
further reduce CO₂ emissions from the electric sector.
(Emphasis added)¹⁰³

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

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

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

A. Yes. The Rural Utilities Service of the U.S. Department of Agriculture
announced in early March 2008 that it is suspending the program through which it
makes loans to rural cooperatives to build new coal-fired power plants.¹⁰⁵ In a
letter to Congress, the Administrator of Utility Programs for the Department of
Agriculture indicated that loans for new base load generation plants would not be
made until the RUS and the federal Office of Management and Budget can
develop a subsidy rate to reflect the risks associated with the construction of such
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.
Q. Does the Company acknowledge that regulation of greenhouse gas emissions could have significant cost consequences?

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

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

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

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

Q. What were the most significant flaws in WPL’s EGEAS runs?

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

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107 Direct Testimony of Eric Guelker in Iowa Utilities Board Docket RPU-08-1, at page 14.
Q. When you use the term “the Company’s EGEAS modeling analyses” to which EGEAS runs are you referring?

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

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

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

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

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

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

A. No. As I discussed earlier, WPL only considered CO₂ costs as sensitivity analyses, not in the development of its base cases. Also, in these scenarios with non-zero CO₂ prices, WPL unreasonably limited the alternatives available to the
EGEAS model to select in place of NED 3. This biased the results of the analyses in favor of the proposed coal plant.

Q. Please explain.

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

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

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

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

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

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

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108 Direct Testimony of Randy Bauer, at pages 11-12.
Q. Does the Final EIS for the NED 3 project agree that it is reasonable to expect that the wind PTC will be extended beyond the end of 2008?

A. Yes. The Final EIS states:

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

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

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

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

A. Superfluous units can be thought of in the following way: the EGEAS model adds resources in each year to meet reliability constraints. These additions can be considered reliability additions. However, the model also can add additional resources above and beyond those that are needed to meet reliability constraints. In some cases installing a capacity resource before it is needed for reliability purposes may produce operating cost savings that may outweigh the additional capital costs incurred. Therefore, the use of the term “superfluous” to describe such units is unfortunate and inaccurate. Instead, it is more appropriate to think of 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.
Q. Does the “superfluous units” constraint potentially bias the model against certain types of resources?

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

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


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

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

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

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

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

114 Final EIS, at page 115.
Clearly, WPL would have to add significant amounts of additional wind to satisfy these enhanced RPS requirements.

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

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

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

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

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

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

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

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

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

A. No. The EGEAS model only adds new coal plants. In addition, none of the Company’s EGEAS runs reflect the current $1.143 billion cost estimate for the plant, without financing costs. Moreover, the Company’s EGEAS runs were biased in favor of adding large increments of new baseload capacity by the use of an percent reserve margin. Finally, the Company’s EGEAS runs with non-zero CO₂ costs also were biased in favor of NED 3 because WPL unreasonable limited the amounts of new wind that could be
added. For these reasons, none of WPL’s EGEAS runs credibly show that adding NED 3 would be part of a least cost plan.

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

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

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

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

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

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

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

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

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

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

**A.** No.

**Coal Price Increases and Supply Disruptions**

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

**A.** WPL has said that the Powder River Basin (“PRB”) in Wyoming would be the primary source of the coal that would be burned at NED 3.\footnote{See page 2 of Exhibit ___(CJH-2), Schedule 3.} Alternate sources for coal would include the Illinois Basin, Appalachia, and foreign coal.

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

**A.** Yes. Coal prices have increased dramatically in the past year or so. For example, according to the Coal News & Markets reports from the Energy Information Administration of the U.S. Department of Energy, spot prices for...
PRB coal increased from $9.15 per short ton at the end of June 2007 to $12.50 per short ton at the end of July 2008 – a 37 percent increase.120

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

A. Yes. As shown in Figure 8, below, the prices of coal from Appalachia, the Illinois 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
Q. Is there any evidence that this is just a short term development?

A. No. It appears to be a longer term development based on increasing demand for U.S. mined coal in foreign markets and in the U.S. market as well. Peabody Energy, for example, expects that the supply pressures that have led to these increases will continue over the next several decades.
Q. What is WPL’s view of the likelihood of there being major increases in the
price of coal from the Powder River Basin?

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

> Overview

> The same presentation gave the following justification for fuel flexibility

> The presentation also noted that:

\[\text{Exhibit } (\text{DAS- 26}), \text{ at Bates Page Number WPL 102832.}\]
\[\text{Id., at Bates Page Number WPL 102835.}\]
Q. Is it reasonable to expect that WPL will be able to escape rapidly escalating coal prices by diversifying among the various coal-supplying regions of the U.S.?

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

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

A. No.

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

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

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

Such disruptions could lead to reductions in production at generating facilities and/or cost increases as utilities are forced to turn to other sources for their coal or to generate power 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.
7. It Is Imprudent to for WPL to Build NED 3 Before It Has Been Determined Which Carbon Capture and Sequestration Processes, If Any, Are Technically and Economically Viable

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

A. No. When asked, WPL stated that its position “is that CO\textsubscript{2} emissions control technologies are not currently commercially available at the scale needed for utility type applications.”\textsuperscript{125} However, the Company also said that “various technologies are at various stages of demonstration that will lead to commercial offerings of the technology” and “It is WPL’s position that if the reductions in CO\textsubscript{2} emissions that are mandated by law are significant, the economic drivers will provide for the development of CO\textsubscript{2} capture technologies for units like NED 3.”\textsuperscript{126}

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

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

\begin{itemize}
  \item ...
  \item ...
\end{itemize}

\textsuperscript{125} WPL Response to Interrogatory 4-CUB-29.

\textsuperscript{126} Id.
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 CO\(_2\) 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 CO\(_2\) disposal exist (local or regional) and regional sequestration options appear to be at least 10 years in the future.

\(^{127}\) Page Number WPL 068338. A copy of this presentation is included as Exhibit (DAS-27).

\(^{128}\) At page 15 of 19.
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.
be about $75/tonne of CO₂ avoided, in 2007 dollars, for pulverized coal plants.\textsuperscript{132}

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

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

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

\textsuperscript{131} A tonne or metric ton is a measurement of mass equal to 1,000 kilograms or 1.1 tons.
\textsuperscript{132} \textit{Cost and Performance Baseline for Fossil Energy Plants}, National Energy Technology Laboratory, Revised August 2007, at page 27.
\textsuperscript{133} \textit{The Future of Coal, Options for a Carbon-Constrained World}, Massachusetts Institute of Technology, 2007, at page xi.
\textsuperscript{134} \textit{Id.} at page 19.
\textsuperscript{135} \textit{Id.} at pages 28-29.
Table 6: Projected Increase in the Cost of Generating Power Due to Carbon Capture and Sequestration

<table>
<thead>
<tr>
<th>Source</th>
<th>Projected Increase in Cost of Electricity from Addition of CCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duke Energy Indiana</td>
<td>68%</td>
</tr>
<tr>
<td>MIT Future of Coal Report</td>
<td>61%</td>
</tr>
<tr>
<td>Edison Electric Institute</td>
<td>75%</td>
</tr>
<tr>
<td>National Energy Technology Laboratory</td>
<td>81%</td>
</tr>
</tbody>
</table>

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

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

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

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

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

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

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

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

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

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

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

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

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

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

A. No. Based on the evidence I have discussed above, it appears today that it will be
extremely expensive to retrofit carbon capture equipment on coal-fired power
plants. It also appears that the operation of such equipment will have a substantial
adverse impact on plant performance and the cost of generating power. It may
turn out that some of the technologies being considered for carbon capture will be
less expensive and have less of an adverse impact on plant performance than is
currently anticipated. But it is unreasonable to bet ratepayer money that will, in
fact, be the case. Instead, a more prudent option would be to delay the decision to
build a new coal-fired power plant until R&D and pilot projects demonstrate
which capture and sequestration alternatives, if any, are technically and
commercially viable. Rather than rushing ahead into the unknown, it would be
prudent to wait before undertaking a billion-dollar-plus coal-fired project that will
have to be retrofitted with a currently unknown technology at some point in its
operating life.
8. More than 50 proposed Coal-fired Power Plants Have Been Cancelled, Delayed or Rejected by State Regulatory Commissions Since Late 2006 Due, in Large Part, to the Risks of Rising Construction Costs and Pending Federally Mandated Reductions in CO₂ Emissions

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

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

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

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

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

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

... coal prices have gone up “dramatically” since Tenaska
started planning the project more than a year ago.

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

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

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

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

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

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

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.
TXU cancelled 8 of 11 proposed coal-fired power plants in the spring of 2007, in large part because of concern over global warming and the potential for federal legislation restricting greenhouse gas emissions.\textsuperscript{151}

Four public power agencies in Florida suspended permitting activities for the coal-fired Taylor Energy Center in the spring of 2007 because of growing concerns about greenhouse gas emissions.\textsuperscript{152}

Tampa Electric cancelled a proposed IGCC plant in the fall of 2007 due to uncertainty related to CO\textsubscript{2} regulations, particularly capture and sequestration issues, and the potential for related project cost increases. According to a press release, “Because of the economic risk of these factors to customers and investors, Tampa Electric believes it should not proceed with an IGCC project at this time,” although it remains steadfast in its support of IGCC as a critical component of future fuel diversity in Florida and the nation.

The Orlando Utilities Commission announced in November 2007 that it was cancelling the coal gasification portion of a 285-megawatt IGCC plant at the Stanton Energy Center. Construction will continue on the natural gas-fired combined cycle generating unit. The Commission cited the impact of possible federal and state regulations related to future emissions restrictions in the state of Florida as the primary reason for terminating construction.\textsuperscript{153}

In June 2007, the Tondu Corp. announced that it was suspending plans to build a planned 600 MW IGCC facility in Texas citing high costs and other concerns related to technology and construction risks.\textsuperscript{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...
proposed coal-fired power plant projects have been rejected by the Oregon Public Utility Commission, the Florida Public Service Commission, and the Oklahoma Corporation Commission. The North Carolina Utilities Commission rejected one of the two coal-fired units proposed by Duke Energy Carolinas for its Cliffside Project. The Kansas Department of Health and Environment also has recently rejected proposed coal-fired power plants. The Virginia State Corporation Commission recently rejected a proposed IGCC coal plant citing uncertainties of costs, technology, and unknown federal mandates.\textsuperscript{155}

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

The Minnesota Public Utilities Commission also has refused to approve an agreement under which Xcel Energy would have purchased power from a proposed IGCC facility due to concerns over the uncertainties surrounding the plant’s estimated construction and operating costs and operating and financial risks.\textsuperscript{158}

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

\textsuperscript{154} http://www.reuters.com/article/companyNewsAndPR/idUSN1526955320070615
\textsuperscript{157} Cause No. PUD 200700012 signed Order No. 545240, October 2007.
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dioxide and other greenhouse gases to climate change and the potential harm to
our environment and health if we do nothing.”159

Q. Has WPL been aware of these developments?

A. Yes. The Company has closely followed the developments with regard to other
coal plants. For example, a December 2007 presentation to Alliant Energy’s
Board of Directors reported:

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159 See www.kansascity.com/105/story/323833.html.
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:

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\(^{160}\) 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.
Q. Are there any factors that, in your opinion, could lead to a construction critical path longer than 50 months?

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

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

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

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

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

A. Delays in construction mean higher costs for ratepayers.

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

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

A. No. I have concluded that pursuing the NED 3 plant at this time would not be a prudent decision. First, none of PSCW Staff’s EGEAS runs show that NED 3 is
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
true whether or not that coal-fired power plant is misleadingly dressed up as part of a “Carbon Reduction Plan.”

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

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

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

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

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

was designed and built to support expansion up to a 525-MW combined cycle plant. Although WPL has no plans at present to expand the plant, the existing natural gas infrastructure would be sufficient to meet the needs of an expanded 525-MW plant should that become desirable.\(^{163}\)

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\(^{163}\) WPL Application, at page 6.
WPL further noted that the Neenah facility “was specifically designed for expansion to a 525-MW combined cycle plant, if desired…” 164

Although, WPL notes the possibility of converting Neenah to a 525 MW facility, an initial feasibility assessment performed for WPL has concluded that in either case, converting the Neenah facility to combined cycle technology would provide a of efficient new baseload and intermediate capacity. 166

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

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

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164 Id, at page 21.
165 is included as Exhibit___(DAS-28).
166 Report is included as Exhibit___(DAS-29).
Q. Would the Neenah facility after conversion to a combined cycle plant be able to provide baseload power?
A. Yes. The plant would be able to operate in both intermediate and baseload modes.

Q. But shouldn’t the Commission be concerned about increasing WPL’s dependence on highly volatile natural gas?
A. Of course, it is reasonable to be concerned about an over-dependence on price-volatile natural gas. That is why I am recommending that WPL pursue aggressive energy efficiency efforts and the aggressive development of renewable resources in order to minimize the amount of new gas-fired or, perhaps, coal-fired capacity, that will be needed at some point in the future.

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

At the same time, Alliant Energy’s fuel mix, by energy, was

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

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

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167 Exhibit__(DAS-17), at Bates Page Number WPL 070109.
168 Exhibit__(DAS-22) 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.
Supply diversity is a very important consideration in resource planning. Reducing WPL’s current heavy dependence on fossil-fired generation, especially coal-fired power, and moving towards greater use of renewable resources and energy efficiency should be a major goal given the threat posed by global climate change and the inevitability of federal regulation of greenhouse gas emissions in the near future. Adding a new, efficient combined cycle gas-fired plant, that is, the converted Neenah facility, would be a reasonable transition to what hopefully will be a future with more renewable resources, more energy efficiency and, perhaps, truly clean coal technologies.

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

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

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

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. 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

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

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

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

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

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

Q. Does this complete your testimony?

A. Yes.