BEFORE THE
PUBLIC SERVICE COMMISSION OF WISCONSIN

Joint Application of Wisconsin Power & Light Company, Wisconsin Public Service Corporation, and Madison Gas and Electric Company for a Certificate of Authority to Install Emissions Reductions Systems at the Columbia Energy Center Units 1 and 2	)))))))	**DOCKET NO. 05-CE-138**

SURREBUTTAL TESTIMONY
OF DAVID A. SCHLISSEL
ON BEHALF OF
JOHN MUIR CHAPTER OF THE SIERRA CLUB

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OCTOBER 16, 2009

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Q. What are 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. Have you previously filed testimony in this proceeding?

A. Yes. I filed Direct Testimony on September 25, 2009 and Rebuttal Testimony on October 9, 2009.

Q. What is the purpose of this Rebuttal Testimony?

A. I will be responding in this Surrebuttal Testimony to points made by PSCW Staff witnesses Koepke and Detmer and by Applicant witnesses Guelker and Friedman.

Q. Do the Applicants and/or PSCW Staff provide any persuasive evidence that the Commission should approve a certificate for the proposed Columbia Emissions Reduction Project at this time?

A. No. All of the parties agree that there is substantial uncertainty regarding future environmental regulations affecting coal-fired power plants including Columbia Units 1 and 2. The EGEAS analyses presented by the Applicants and PSCW Staff show that delay of the scrubber project until at least 2018 is a lower cost option than proceeding with the scrubber in 2013. At the same time, the Applicants have admitted that buying credits, rather than installing SO2 controls, would be the lower cost option for complying with existing regulations.

Given these circumstances, it would be reasonable for the Commission to wait for several years before deciding whether to allow the Applicants to proceed with the Emissions Reduction Project. This delay would allow for further clarity and insights on what the future environmental regulations will be, what capital and operating costs these regulations can be expected to impose on Columbia Units 1 and 2 and whether retirement is more or less expensive for ratepayers than adding all of the pollution controls required to continue operating the Columbia units.

Contrary to such a reasoned approach, the Applicants argue that they should proceed with the Emissions Reduction Project specifically because of the uncertainty concerning future environmental regulations. This position is nonsensical. In times of uncertainty, it is prudent to adopt flexible resource plans that could be revised as circumstances change or become clearer.

The Applicants claim that the Emissions Reduction Project is a bridge to a low carbon future. It actually is not a bridge at all. Rather, it would be an anchor that would commit the Applicants to continuing to run and add expensive pollution controls to relatively old coal units and to maintaining their dependence on coal, the most carbon-intensive fuel. Instead of seeking to maintain this dependence, the Applicants should pursue alternatives that would allow for actual reductions in their CO_2 emissions in the near future, not reductions some ten or twenty years down the line, premised on the development of currently untested technologies.

Q. Do you think that there is an economic reason why the Applicants want to pursue the Emissions Reduction Project at this time in spite of the uncertainty regarding future environmental regulations and costs?

A. Yes. The Emissions Reduction Project would represent major investments that each of the Applicants could add to their rate bases and, thereby, substantially increase their profits. This incentive exists for the Applicants even though the Emissions Reduction Project is not the lowest cost option for ratepayers or the best alternative for the environment.

PSCW Staff Witness Koepke

Q. Do you have any comment on PSCW Staff witness Koepke's Rebuttal Testimony that he feels comfortable using the Commission Staff's CO_2 forecast because those prices comport well with both the Synapse low CO_2 forecast and with the recent CBO forecast?[1]

A. Yes. I believe that there are several problems with Mr. Koepke's Rebuttal Testimony on this point.

First, and most importantly, as I have discussed in my Direct and Supplemental Direct Testimony, it is more reasonable to look at a range of projected CO_2 prices given the uncertainty surrounding the design and details of likely federal greenhouse gas legislation. As can be seen from Figure 2 in my Direct Testimony, almost all of the recent modeling analyses of proposed federal greenhouse gas legislation have looked at a number of possible scenarios and have resulted in a wide range of potential CO_2 prices. At the same time, as can be seen from the Applicants' Exhibit 9, an increasing number of utilities and state regulatory commissions have used a wide range of potential CO_2 prices in resource planning analyses. Contrary to this evidence, however, Mr. Koepke supports reliance on only a single, low set of projected CO_2 prices. This is unreasonable. I agree with Mr. Koepke that the CBO price trajectory and the Synapse Low forecast are within the range of reasonable CO_2 prices that should be considered in resource planning analyses. However, given the uncertainties, it is prudent to also consider higher CO_2 prices such as the Synapse Mid and High forecasts, as well.

Second, the comparison between the Synapse CO_2 price forecasts and the CBO forecast that Mr. Koepke presents in his Exhibit 906 suggests that all of the costs are being presented on the same basis. This is incorrect. In fact, the CBO CO_2

[1] Rebuttal Testimony of Dennis L. Koepke, at page 2901, lines 9-22.

price forecast is in 2007 dollars per metric tonne. This is indicated in Footnote Number 10 on page 12 of 32 of Mr. Koepke's Exhibit 905. The Synapse CO_2 price forecasts are in nominal dollars per short ton. Therefore, it is not an apples-to-apples comparison as Mr. Koepke's testimony suggests.

Third, Mr. Koepke focuses exclusively on the single price scenario in the recent CBO report (Exhibit 905). He ignores the results of the seventeen different scenarios modeled by the U.S. Energy Information Administration and the U.S. EPA. As shown in Figure S1 below, the single CBO CO_2 price trajectory that Mr. Koepke cites for support is significantly lower than the projected CO_2 prices in almost all of the different scenarios analyzed by the EIA and the EPA. An assessment of the likely CO_2 costs under the proposed Waxman-Markey bill should rely on all of these results, rather than by focusing solely on the single scenario studied by the CBO.

Finally, Mr. Koepke does not provide any evidence to support his belief that it, if you only look at a single set of CO_2 prices, it is more appropriate to focus on the Synapse Low CO_2 price forecast instead of the Synapse Mid CO_2 price forecast. Even the Applicants have acknowledged that the Synapse CO_2 price forecasts represent a reasonable range for the monetization of greenhouse gas emissions for use in resource planning.[2]

Q. How do the CBO's projected CO_2 prices under Waxman-Markey compare with the ranges of CO_2 prices projected in the modeling performed by the EIA and the EPA?

A. Figure S1, below, presents the annual CO_2 prices projected by the CBO, the EIA and the EPA in their modeling of the Waxman-Markey bill. The black line in Figure S1 represents the single CBO CO_2 price trajectory upon which Mr. Koepke

[2] See, for example, Exhibit 403 (DAS-4) to my Direct Testimony.

relies. The dashed red lines represent the results of the EIA and EPA modeling of the Waxman-Markey bill. The blue lines, representing the Synapse Mid, Low and High CO_2 price forecasts are included in Figure S1 for reference.

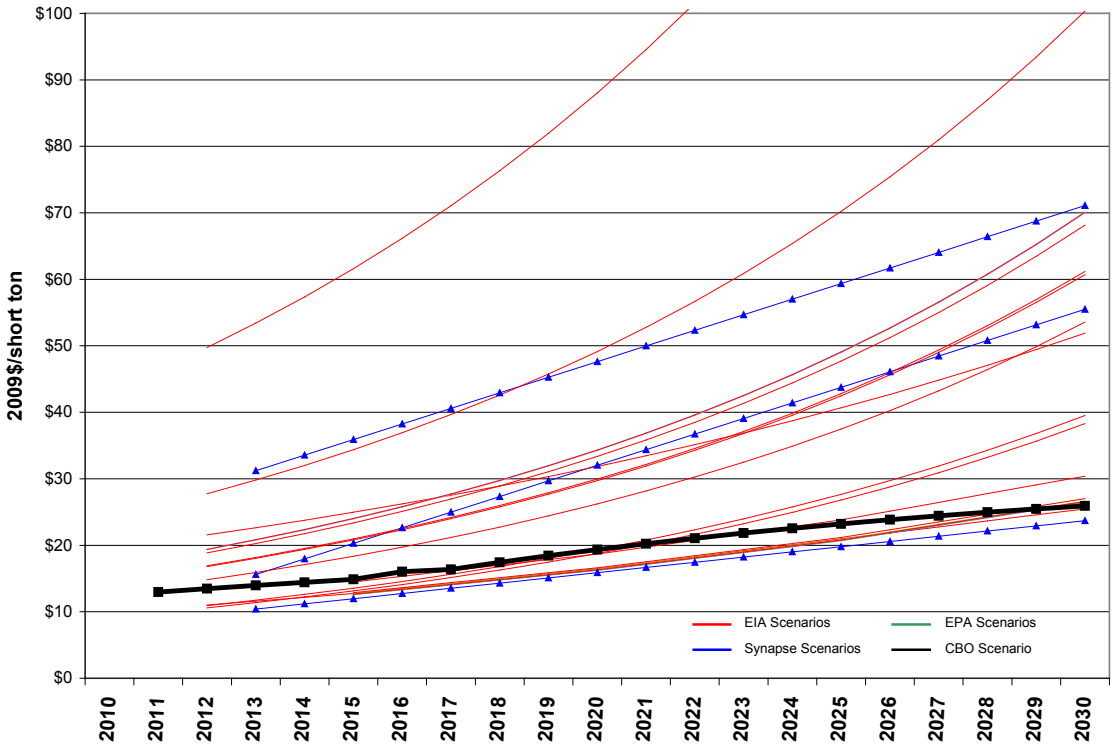

Figure S1: CO_2 Prices from EIA, EPA and CBO Modeling of H.R. 2454

As can be seen, the CBO's single CO_2 price trajectory is low compared to most of the CO_2 price trajectories from the EIA and EPA modeling. Figure S1 also shows that the range of Synapse's Mid, Low and High CO_2 price forecasts remains valid and consistent with the results of the modeling of the Waxman-Markey bill.

PSCW Staff Witness Detmer

Q. Do you agree with Staff witness Detmer that any delay in implementation of the Emissions Reduction Project once significant costs have been incurred would lead to increased AFUDC costs not accounted for in the modeling?[3]

A. Yes. It certainly is correct that once significant costs have been incurred, any delay in the project would lead to increased AFUDC costs. It also is correct that neither the Applicants nor the Staff have modeled any scenario at all in which the cost of Emissions Reduction Project rises above the Applicants' current estimate. In addition, it is not uncommon for costs to increase and delays to be experienced, during major construction projects such as this. For these reasons, it would be better for the Commission to deny the Applicants' request for approval to proceed with the Project at this time before significant costs have been incurred.

Q. Do you agree with Mr. Detmer that the primary savings in retiring older plants comes from reduced expenditures for fixed O&M costs and the avoidance of major repairs for these units?[4]

A. I certainly agree with Mr. Detmer that the savings from retiring older plants would come from reduced fixed O&M and capital additions costs and from avoiding major repairs. I further believe that these savings could be quite significant. However, I also believe that the primary savings from retiring older plants would come from reduced emissions including, especially, actually reducing the Applicants' CO_2 emissions and sparing ratepayers from having to pay the costs that will be associated with such emissions over time.

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[3] Rebuttal Testimony of Kenneth J. Detmer, at page 2906, lines 16-21.
[4] Id, at page 2908, lines 5-7.

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Q. Does the evidence presented by Mr. Detmer show that the natural gas prices used by the Applicants and PSCW Staff are reasonable?

A. Not at all. Mr. Detmer's Exhibit 908 shows that the September 2009 NYMEX natural gas prices for near term are significantly lower than the gas prices used by the Applicants in their EGEAS modeling. For this reason alone, the Commission should give very little weight to the EGEAS analyses presented by the Applicants. Similarly, because it appears that the PSCW Staff's EGEAS analyses used the same natural gas prices as the Applicants, the Staff's modeling runs also are biased in favor of continued operation of the Columbia units.

Notably, at the same time that Detmer's own exhibit shows that the Applicants' near term gas prices are wrong, he also presents no evidence showing that the Applicants' long-term natural gas prices are any more reasonable than their near term forecasts. Yet he appears to use the Applicants' long term gas prices in his EGEAS modeling.

Q. Have you seen any evidence that suggests that the Applicants' long term gas price forecasts are also too high?

A. Yes. Figure S2, below, compares the gas prices used by the Applicants in their EGEAS modeling with the March 2009 AEO gas price forecast for the MAPP region, including Wisconsin, and recent NYMEX futures prices adjusted to include the $1 per Mcf average delivery cost reported by Applicant witness Friedman.[5]

[5] Rebuttal Testimony of Richard E. Friedman, at page 2065, lines 13-23.

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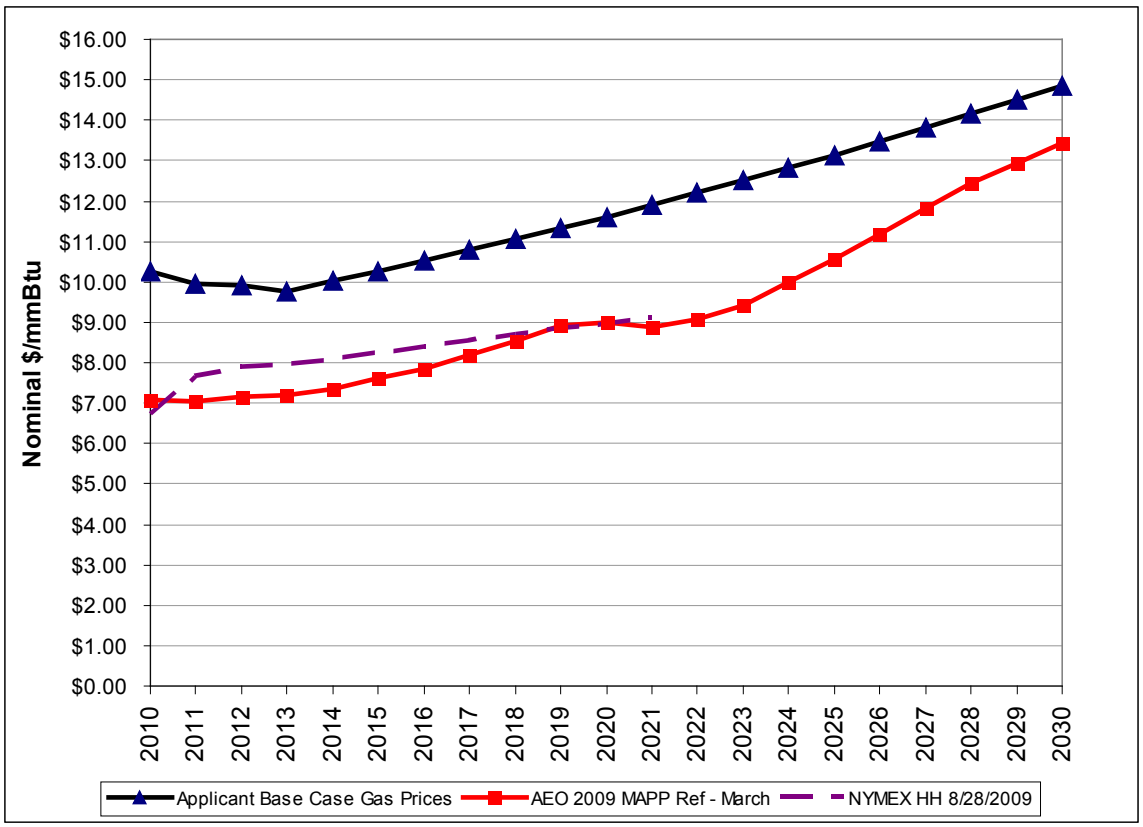

Figure S2: Natural Gas Price Comparisons

As can be seen from Figure S2, the base gas prices used by the Applicants (and apparently PSCW Staff) in their EGEAS modeling are significantly higher than both the adjusted NYMEX Henry Hub futures prices (including delivery costs) and the March 2009 AEO long term natural gas price forecast for the MAPP region (that includes Wisconsin).

Q. Have you seen any credible evidence to support Mr. Detmer's testimony on the impact that retirement of existing coal units would likely have on natural gas prices?

A. No. As I discussed in my Direct Testimony, I believe that it is possible that federal regulation of greenhouse gas emissions (which would lead to the retirement of existing coal units) might lead to some increase or some decrease in

natural gas prices. However, the effect that regulation of greenhouse gases will have on natural gas prices will be much more complicated than Mr. Detmer, or Applicant witness Friedman, imply. A number of important factors will influence future natural gas prices including natural gas supplies, the timing and cost of federal greenhouse gas emissions, the levels of energy efficiency and renewable resources that will be implemented, and the state of the overall economy. Although it may seem appealing to assert that carbon regulation will significantly increase the demand for natural gas and, therefore, prices, such an assumption is far too simplistic and ignores the many other factors that will likely mitigate or offset any such increases.

For example, as I noted in my Direct Testimony, a recent study by the U.S. Department of Energy's National Renewable Energy Laboratory examined the costs and benefits of achieving 20 percent wind energy penetration by 2030.[6] One of the benefits that this DOE study found was that wind generation could displace up to 50 percent of the electricity that would be generated from natural gas – this, in turn, could translate into a reduction in national demand for natural gas of 11 percent.[7]

The increasing local, state and national efforts and expenditures on energy efficiency also will work to reduce future natural gas demands. At the same time, as I also discussed in my Direct Testimony, dramatically higher domestic natural gas reserves have been identified just this year. In short, it is becoming clear that carbon regulation will be accompanied by other policies that will increase renewable energy production and the savings from energy efficiency. These

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6 *20 Percent Wind Energy by 2030*, available at http://www.20percentwind.org/20p.aspx?page=Report.

7 Id, at pages 16 and 154.

complementary policies will exert downward pressure on natural gas demand and prices.

Q. Have you had a full opportunity to review the output files for the new EGEAS runs presented by Mr. Detmer in his Rebuttal Testimony?

A. I have reviewed Mr. Detmer's tables presenting the results of his new EGEAS runs but not the output files themselves.

Q. Do you have any comments on the results of the two scenarios run by Mr. Detmer in which he adjusted Staff Future 2 to reflect the Synapse CO_2 prices and the LaCapra natural gas prices?

A. Yes. I have two comments. First, in both of the new scenarios run by Mr. Detmer, delaying the scrubber until 2018 remains the lowest cost option.[8] Second, although it is helpful that Mr. Detmer examined scenarios with the Synapse CO_2 prices and the LaCapra natural gas prices, it would have been very helpful if he also had run a combined scenario that reflected both of these changes at the same time.

Q. Please explain why you believe that it would be important for the Commission to see such a combined scenario with both the Synapse CO_2 prices and the LaCapra natural gas prices?

A. Mr. Detmer's Exhibit 907 shows that in Staff's Future 2 with the Synapse Mid CO_2 prices, Plan 4, the retirement of Columbia Units 1 and 2 is only $289 million NPVRR more expensive than Plan 1 and only $71 million NPVRR more expensive than Plan 2. These are extremely minor differences (0.6 percent compared to Plan 1 and 0.15 percent compared to Plan 2) when all of the uncertainties associated with projecting thirty years out into the future are considered.

Moreover, in Mr. Detmer's rerun of Staff Future 2 with LaCapra's natural gas prices, the NPVRR difference between Plan 4 and Plan 1 decreases from $1,082 million to $608 million, a decrease of approximately $474 million.[9] I'm not suggesting that by combining the results of the two scenarios, that Plan 4 will automatically become the less expensive option. However, the magnitude of the potential $474 million decrease in NPVRR from changing from the very high Applicant/Staff gas prices to the LaCapra prices suggests that a combined scenario would reduce and could very well turnaround the $289 million NPVRR cost benefit shown in Exhibit 907 for Plan 1 and the $71 million NPVRR benefit shown for Plan 2 into NPVRR benefits for Plan 4. In other words, in a combined scenario-- which represents the more reasonable assumptions-- Mr. Detmer's EGEAS runs might show that Plan 4 is a lower cost option than Plan 1 and/or Plan 2.

Q. Have you been able to review any of the calculations that formed the basis for Mr. Detmer's testimony that installing the emission controls in 2013 and prematurely retiring Columbia Units 1 and 2 in 2020 or 2025 is a lower cost option for ratepayers than retirement of the units in 2013?[10]

A. No.

Q. Do you nevertheless have any doubts about these results?

A. Yes. It appears from Mr. Detmer's Rebuttal Testimony that these conclusions are based on EGEAS runs that assume the Applicant/PSCW Staff very high gas costs and very low CO_2 prices. Given these assumptions, the results of the analyses are biased in favor of continued operation of the Columbia Units.

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[8] See Mr. Detmer's Exhibits 907 and 909.
[9] Mr. Detmer's Exhibit 909.
[10] Rebuttal Testimony of Kenneth J. Detmer, at page 2910, lines 8-14.

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Q. Do you believe that investing $627 million (without AFUDC) in scrubbers and related emissions control equipment for Columbia Units 1 and 2 by 2013, with the thought that the units might be retired in 2020 or 2025 is a prudent strategy?

A. No. Instead, the Applicants should retire Columbia Units 1 and 2 and spend the additional funds on lower cost energy efficiency and on renewable resources and, perhaps, gas facilities that are expected to produce benefits for ratepayers beyond 2020 or 2025. If it is cost effective to install the mercury pollution controls by 2015 to gain a few additional years before retirement, while avoiding the substantially larger expenditures for SO_2 controls, that option should be considered also.

Applicant Witness Friedman

Q. Does Mr. Friedman present any evidence that natural gas prices can reasonably be expected to increase by 30 percent in every year as a result of federal regulation of greenhouse gas emissions?

A. No. Mr. Friedman presents absolutely no evidence, credible or otherwise, that supports the Applicants' assumption that natural gas prices would increase by 30 percent in every year starting in 2013.

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Q. Mr. Friedman states in his Rebuttal Testimony that the reason why the data from the EIA's recent modeling of H.R. 2454, the Waxman-Markey shows natural gas prices decreasing is because most of the scenarios studied assume significant additions to the number of nuclear power plants in the U.S.[11] Do you agree?

A. No. The EIA also modeled several "Limited Alternatives" scenarios in which the additions of nuclear capacity, dedicated biomass and coal plants with carbon capture and sequestration were constrained. In one of these "Limited Alternatives" scenarios, the use of international offsets also was prohibited. The results of these "Limited Alternatives" modeling scenarios contradict any suggestion that the results of the EIA's modeling of the Waxman-Markey bill support the Applicants' assumption that regulation of greenhouse gas emissions will lead to 30 percent increases in the prices of natural gas in every year of the study period.

Q. What impact did the proposed Waxman-Markey bill have on natural gas prices in these scenarios?

A. The annual changes in natural gas prices in each of the two "Limited Alternatives" scenarios modeled by the EIA, as compared to the base case without any CO_2 regulation, are presented in Figure S3 below. This Figure presents the same information that was presented in Figure 5 on page 518 of my Direct Testimony except that all of the other scenarios modeled by the EIA other than the "Limited Alternatives" scenarios have been removed. These other scenarios, as Mr. Friedman noted, had assumed large nuclear additions.

[11] Rebuttal Testimony of Richard E. Friedman, at page 2059, line 12, through page 2060, line 32.

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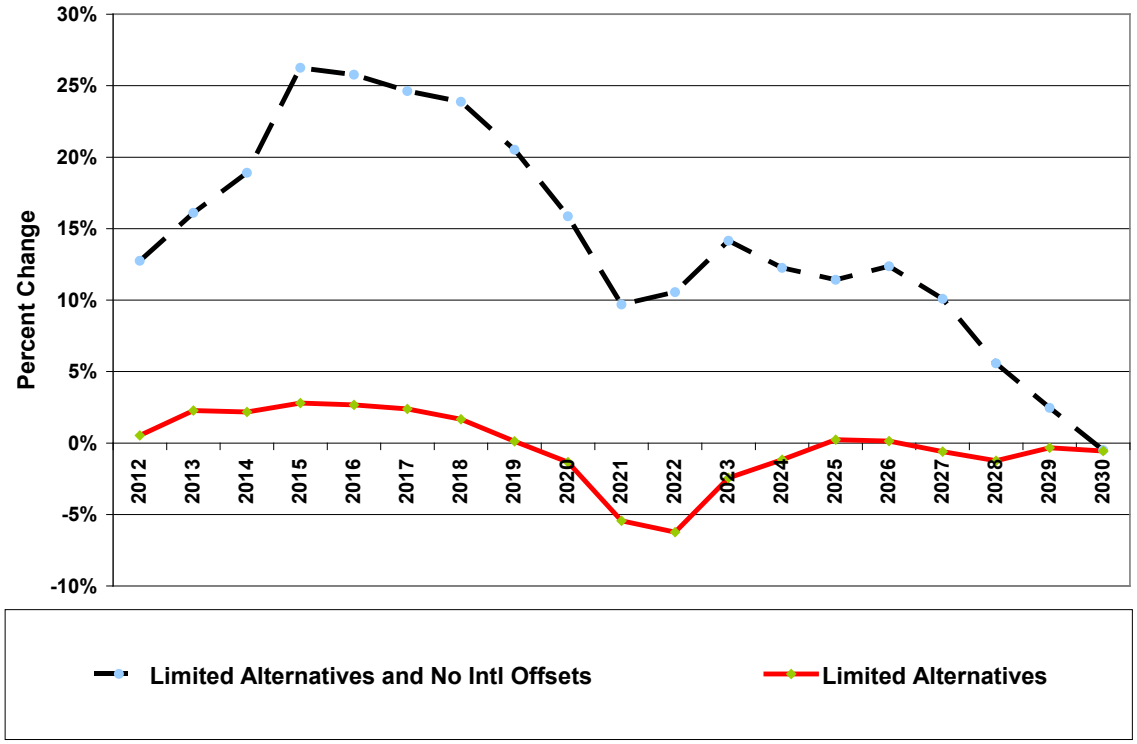

Figure S3: Changes from Base Case Natural Gas Prices in EIA "Limited Alternatives" Modeling Scenarios

As can be seen from Figure S3, natural gas prices did not increase very much, if at all, in the EIA "Limited Alternatives" scenario that constrained new nuclear, biomass and coal plant with CCS additions. In fact, over time natural gas prices are projected to decrease because of the cost of the fuel's CO_2 emissions.

Natural gas prices rose significantly in the scenario which added a prohibition on the use of international offsets to "Limited Alternatives" scenario. But even then, the gas prices in this combined scenario were significantly higher than the reference case gas prices in only in a few initial years – they then began to decrease over time relative to the reference case gas prices. Contrary to Mr. Friedman's testimony, which suggested that the decreases in gas prices were solely due to substantial new nuclear additions, the results presented in Figure S3 show no significant increases in gas prices, over the long term, in the two

scenarios with significant constraints on the addition of new nuclear, biomass and coal plant with CCS resources. Clearly, the results of the EIA's modeling of these two "Limited Alternatives" scenarios contradict the Applicants' assumption that natural gas prices would increase by 30 percent in every year, and that any such drastic increase would begin in 2013, two years before federal regulation of greenhouse gas emissions was assumed to start.

Q. Would the use of international offsets be prohibited or allowed under the Waxman-Markey bill?

A. The Waxman-Markey bill and the Kerry-Boxer legislation under consideration in the U.S. Senate both would allow the significant use of international offsets. Therefore, the gas price impacts would be expected to track the lower line in Figure S3. However, the results of the EIA's modeling show that even if carbon regulation is enacted without international offsets, it is not reasonable to expect that natural gas prices will increase by 30 percent in any year, let alone every year, as Applicants contend.

Q. Do the results of the October 2007 National Gas Council study discussed by Mr. Friedman support the assumption that federal regulation of greenhouse gas emissions would increase natural gas prices by 30 percent in every year?

A. No. The following figure is copied from page of the National Gas Council study included as Mr. Friedman's Exhibit

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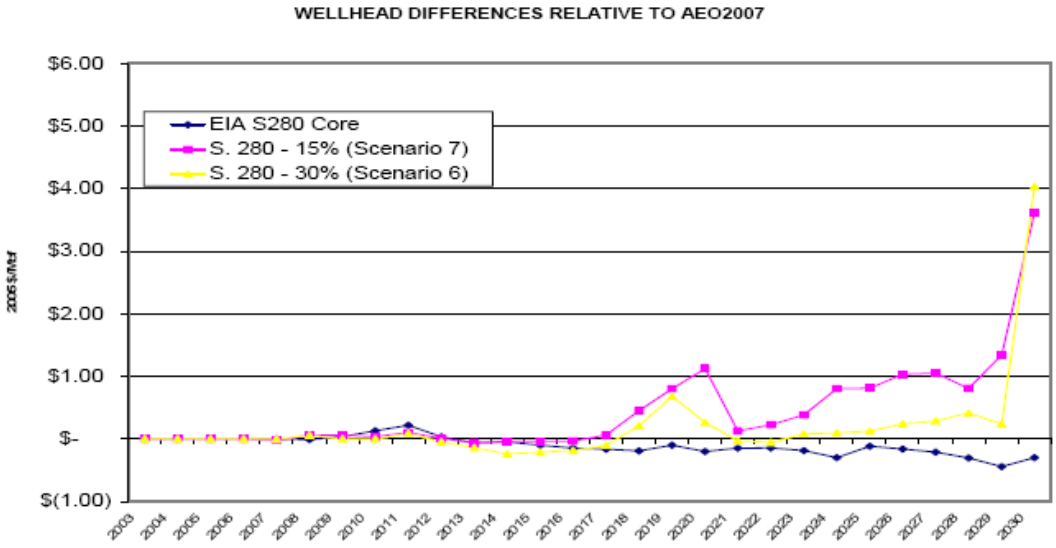
Figure 9: Changes in Wellhead Gas Prices (relative to *AEO2007*) for Scenarios (Real 2005$)



As can be seen, the wellhead gas prices in the National Gas Council's modeling of what it calls the EIA S280 Core scenario remain about the same as the prices in the reference case (no greenhouse gas regulation) through approximately 2013. Thereafter, the gas prices in the EIA S280 Core scenario decrease below the prices in the no greenhouse gas reference case.

The wellhead gas prices in the National Gas Council's modeling of the two other scenarios included in its October 2007 similarly remain about the same as the prices in the reference case (without greenhouse gas regulation). The prices in these two scenarios then spike up to about 15 percent above the reference case prices in 2020 but then drop back down. The wellhead prices begin to increase above the reference case gas prices again in 2023 or so but only really spike again in the years 2029-2029.

It is clear from this figure that none of the three scenarios modeled by the National Gas Council support a conclusion that natural gas wellhead prices will increase by 30 percent above the reference case prices in every year of the analysis. In fact, in one of the three scenarios the gas prices remain at or below

reference case levels. In the second scenario, the wellhead gas prices only climb above reference case levels starting in 2026, except for a three year period from 2019-2021 when they rise to perhaps 7% to 10% above reference case levels. The wellhead gas prices in the third scenario again remain about the same as the reference case prices through 2018 and then only spike above 15 percent higher than reference case levels in the last two years of the analysis, 2029 and 2030. None of these results support the assumption made by the Applicants, and apparently accepted by the PSCW Staff, that federal greenhouse gas regulation will lead to dramatically higher natural gas prices.

Q. Does the National Gas Council study reflected the substantially higher domestic U.S. natural gas reserves that have been announced in recent months and/or the substantially lower future gas prices in the NYMEX futures and the AEO's March 2009 long-term forecast?

A. It appears that the answer to this question is no. The National Gas Council study does not reflect the substantially higher estimate of domestic U.S. natural gas reserves that have been released in recent months or the substantially lower current and projected natural gas prices. This is not surprising because the study was prepared during 2007 and released in October of that year.

Q. What effect would you anticipate that the recently announced 35 percent higher estimates of domestic U.S. natural gas reserves would have on the results of the Natural Gas Council study?

A. I would expect that the natural gas prices, and the increases in prices in the scenarios with carbon regulation, will be even lower with the new higher estimates of natural gas supplies.

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Q. Are there any reasons why the Commission should not give significant weight to the results of the National Gas Council study?

A. Yes. The results of the study are stale, as explained in my previous answers. In addition, the National Gas Council study mentions that a total of seven scenarios were modeled for each of seven focus areas.[12] However, the results of only three of these scenarios were presented in the study. In other words, more than half of the modeling results were omitted from report, raising questions about the results of all of the other scenarios that the National Gas Council did not discuss. Moreover, the study does not present all of the underlying modeling data on which it is based. Without this underlying modeling data, it is not possible to confirm the results presented in the study.

Q. Mr. Friedman has quoted a portion of a June 2006 speech by Federal Reserve Chairman Bernanke for evidence as to developments in the natural gas market.[13] Are there any important developments in the natural gas market that Dr. Bernanke did not discuss in the section of the speech quoted by Mr. Friedman?

A. Yes. The section of Dr. Bernanke's speech from June 2006 quoted in Mr. Friedman's Rebuttal Testimony did not discuss the 35 percent increase in natural gas supplies that have been announced this year. As I noted in my Direct Testimony, this huge increase in natural gas supplies has been described as a significant development in the U.S. gas markets.

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[12] Exhibit 19, at page 8.
[13] Id, at page 2061, line 20, to page 2062, line 40.

Q. Are there any sections of Dr. Bernanke's June 2006 speech that are relevant to today's gas market and to the issue of the future availability and price of natural gas?

A. Yes. Dr. Bernanke makes the following, and apparently correct, predictions a mere two paragraphs after the section of his speech quoted in Mr. Friedman's testimony:

> Thus, natural gas prices are likely to remain elevated for at least the coming few years. It is possible, however, that within a decade new supplies from previously untapped areas of North America could boost available output here, while imports of LNG will increase to more substantial levels as countries seek to bring their isolated natural gas reserves to market. Given time, these developments could serve to lower natural gas prices in the United States significantly. Nonetheless, because of the higher costs of producing these supplies relative to the traditional sources of natural gas, as well as the elevated cost of other energy sources such as oil, natural gas prices seem unlikely to return to the level of the 1990s.[14]

Q. Do you have any comment on Mr. Friedman's testimony that given the supply and demand relationships for natural gas, the enactment of significant CO_2 legislation that effectively restricted or eliminated coal as a fuel source for electric generation would lead to significant increase in natural gas demand?[15]

A. Yes. Mr. Friedman posits a completely unrealistic set of circumstances. There is no serious legislative or regulatory proposal before Congress or the EPA that would effectively restrict or eliminate coal as a fuel source for electric generation, especially not over a short time period. Instead, the proposals that have been and are being considered in Congress and the EPA would call for the gradual reduction of CO_2 emissions over the next four decades. An important step toward

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[14] Exhibit 20 (RFB-1B), at page 2.
[15] Rebuttal Testimony of Richard E. Friedman, at page 2063, lines 8-18.

achieving these reductions will be the displacement or retirement, over time, of some existing coal-fired generation. It is reasonable to expect, moreover, that some of this existing coal-fired generation will be replaced by energy efficiency and renewable resources, and perhaps, in some areas, nuclear generation – as well as by some additional natural gas-fired generation.

Mr. Friedman testifies that an increase of 30 percent in natural gas prices in "not at all unreasonable considering the driver which is the potential elimination, or at least sharp reduction, of coal from the resource mix without a substantial addition of either nuclear or renewable generation to replace the displaced coal generation."[16] Again he posits a completely unrealistic, and almost hysterical, situation. No serious proposal that has been or is being considered by the U.S. Congress or the EPA, and certainly not the Waxman-Markey or the Kerry-Boxer bills currently being considered in Congress, would sharply reduce or eliminate coal from the resource mix overnight or by 2013 or anytime in the near future.

Q. Mr. Friedman has testified that the decreases in the NYMEX natural gas futures prices between 2008 and September 2009 are the direct result of the current recession.[17] Do you agree?

A. No. Although the recession is an important factor in current natural gas prices and the NYMEX futures prices, it is reasonable to expect that increased natural gas supplies also have had an impact on the reductions in NYMEX futures prices. In addition, there has been some discussion that the very high natural gas prices experienced in the summer of 2008, in particular, were the result of speculation.

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16 Id, at page 2065, lines 7-10.
17 Id, at page 2065, lines 1-5.

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Q. Do you have any comment on Mr. Friedman's testimony that "it is completely reasonable to expect increases in the price of natural gas in the 30% or higher range if a significant CO_2 price scenario is assumed?"[18]

A. Yes. The very low single set of CO_2 prices that the Applicants assume in their EGEAS modeling cannot reasonably be considered to be a "significant CO_2 price scenario." As I've shown in Figures 1 and 2 in my Direct Testimony and by Applicant witness Guelker's Exhibit 9, the Applicants set of CO_2 prices is very low compared to the ranges of CO_2 prices (1) that have been developed as a result of the modeling of legislation considered in the U.S. Congress and (2) that have been used for resource planning by regulatory commissions and utilities around the nation.

Q. Does Mr. Friedman acknowledge in his Rebuttal Testimony that it is unlikely that a significant monetization of CO_2 costs will occur overnight?

A. Yes. At page 2068 of his Rebuttal Testimony Mr. Friedman testifies that:

> I believe that while there may be movement towards some form of CO_2 cost or tax, it is extremely unlikely that any implementation would occur without a gradual phase-in over time.

Q. Do you agree with this statement in Mr. Friedman's Rebuttal Testimony?

A. Yes. That is why I believe that the Applicants' assumption that natural gas prices will increase by 30 percent starting in 2013 and remain 30 percent in every year throughout the study period is very unrealistic. There is a gradual phase-in over time of significant caps of CO_2 emissions, and consequently CO_2 prices, in the proposed Waxman-Markey bill and in every piece of proposed climate change legislation with which I'm familiar.

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[18] Id, at page 2063, lines 21-22.

Q. Is Mr. Friedman's testimony on this point consistent with the remainder of his Rebuttal Testimony?

A. No. As I have discussed earlier, the remainder of Mr. Friedman's Rebuttal Testimony is filled with descriptions of circumstances in which Congress or the EPA impose sudden restrictions or the elimination of coal-fired generation. His acknowledgement that any significant movement towards some form of CO_2 cost or tax will be phased-in over time undercuts and conflicts with the remainder of his Rebuttal Testimony.

Q. Do you have any comment on the Charles River Associates ("CRA") study that Mr. Friedman cites as supporting an objective assessment of the possible impact on the U.S. economy as a consequence of stringent CO_2 legislation?[19]

A. Yes. I have two comments on this study.

First, it was commissioned by the American Petroleum Institute.[20] There is absolutely no way that a "study" commissioned and used by that lobbying organization with a very specific and anti-regulatory agenda can credibly be called an objective assessment.

Second, and perhaps more importantly, the CRA report simply does not address CO_2 costs or climate change legislation despite Mr. Friedman's representation that it does. Instead, the study addresses the energy policy legislation then pending before Congress, but not climate change legislation. This is clear from page iv of Mr. Friedman's Exhibit 22 which states that the CRA report:

> examined the following current provision in the congressional bills: a mandatory oil savings program, a renewable portfolio fuels standard (RFS), oil industry tax increases, a "price gouging" provision, a renewable portfolio standard (RPS) for the electric power sector, more

[19] Id, at page 2067, lines 16-23.
[20] http://www.api.org/Newsroom/study-hurt-economy.cfm.

stringent CAFE standards, and various proposed access restrictions on domestic production of oil and natural gas."[21]

Consequently, when Mr. Friedman quotes from the report that "the proposed energy legislation would have significant adverse impacts on the U.S. economy" he is quoting from a study that discusses a two year old piece of legislation that does not address federal regulation of greenhouse gas emissions.

Applicant Witness Guelker

Q. Does Applicant witness Guelker's comparison of the Applicants' CO_2 prices to the prices used by other regulatory commissions and utilities in resource planning analyses show that it is reasonable for the Applicants to only use that single set of CO_2 prices?[22]

A. No. In his Exhibit 9 (EJG-5) Mr. Guelker compares the Applicants' single set of CO_2 prices with a figure presenting the CO_2 prices that were used back in July 2008 by a number of state regulatory commissions and utilities. As Mr. Guelker testifies, this figure, without the Applicants' CO_2 prices, was taken from my Exhibit 402 which was the Synapse July 2008 CO_2 Price Forecast report.

Mr. Guelker apparently wants the Commission to accept that the Applicants' single set of CO_2 prices is reasonable merely because it falls somewhere within the ranges of CO_2 prices used by other commissions and utilities. But that is wrong. The entire point of the chart, Mr. Guelker's Exhibit 9 (EJG-5), is that so many of the other commissions and utilities examine wide ranges of CO_2 costs in their resource planning analyses, not just a single set of prices, in order to reflect the uncertainties associated with the cost, details and timing of federal regulation of greenhouse gas emissions. These other commissions and utilities do not rely

[21] Exhibit 22, page iv and also see pages 1-2.
[22] Rebuttal Testimony of Eric J. Guelker, at page 2018, lines 1-7.

solely on a single projection of CO_2 prices as the Applicants and Mr. Koepke do in this case.

It also is clear from Mr. Guelker's Exhibit 9 (EJG-5) that many other commissions and utilities examine much higher CO_2 costs in their resource planning analyses than the Applicants have assumed in this proceeding.

Q. Does Exhibit 9 (EJG-5) show that the Applicants' CO_2 prices are higher than the prices used by a number of utilities including Nevada Power, Public Service of Colorado, Sierra Pacific and several utilities in California?

A. Yes. That is what Exhibit 9 appears to show. However, I would note that the data in Exhibit 9 was correct when my Exhibit 402 was created, back in July 2008. Since then, a number of the utilities and regulatory commissions included in Exhibit 9 have increased the ranges of CO_2 costs that they use or require to be used in resource planning analyses.

For example:

- The levelized CO_2 price shown in Exhibit 9 for the California Public Utilities Commission ("CPUC") and three investor-owned utilities in that state (PG&E, SCE and SDG&E) have been increased significantly since July 2008. In December of 2008, the CPUC adopted the Synapse Mid-CO_2 prices that were presented in our July 2008 CO_2 Price Forecast, a copy of which is included as my Exhibit 402.[23] The CPUC's adoption of the Synapse Mid CO_2 price forecast was based in part on a presentation I gave at a CPUC-sponsored workshop in March 2008. As can be seen from Exhibit 9, the $30/ton levelized CO_2 price in the Synapse Mid Forecast is substantially higher than the CO_2 prices that the Applicants used in their EGEAS modeling in this proceeding and that Staff has recommended that this Commission use.

[23] California Public Utilities Commission Resolution E-4214, dated December 18, 2008, at pages 15-16. A copy of this Resolution is available at http://docs.cpuc.ca.gov/word_pdf/FINAL_RESOLUTION/95553.pdf

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- At the time we developed the information presented in Mr. Guelker's Exhibit 9, Public Service Company of Colorado assumed two scenarios for future CO_2 prices in its resource planning. The low forecast started at $6/ton in 2010 and would increase in subsequent years at only the rate of inflation, approximately 2.5 percent. The high forecast started at $9/ton in 2010 and increased at the same rate. The costs formed the basis for the levelized prices for Public Service of Colorado shown in Exhibit 9 of approximately $5.57 to $8.36/ton.

  Several months later, Public Service of Colorado proposed to the Colorado Commission, and the Commission agreed, that it needed to look at a wider and a higher range of CO_2 prices in its resource planning. As a result, Public Service now has a base case CO_2 forecast which starts at $20/ton in 2010 and increases at 7 percent per year. The levelized price for this forecast is $35.53/ton. The Company also looks at the high and low sensitivity forecasts that begin at $10/ton and $40/ton in 2010 and also increase at 7 percent per year. Consequently, Public Service of Colorado currently looks at a range of CO_2 prices that is significantly higher and wider than what appears in Mr. Guelker's Exhibit 9.

- As of July 2008 Nevada Power Company used a single set of CO_2 prices in its resource planning analyses that began at approximately $6.40/ton in 2010 (in 2008 dollars) and increased to only about $9.30/ton in 2030. The result was the very low $7.62/ton levelized price shown in Exhibit 9.

  However, as shown in Figure S4 below, the Company now uses a much wider and much higher range of CO_2 prices in its resource planning.

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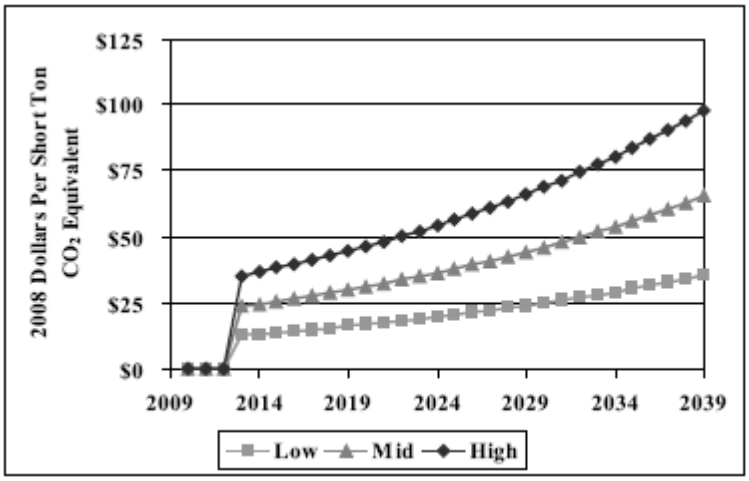

Notes: All values in 2008 dollars per short ton of CO_2 equivalent (CO_2e). To covert values to dollars per metric ton, multiply by 1.10.

Figure S4: Sierra Pacific Power 2009 CO_2 Cost Forecasts for Resource Planning[24]

Thus Sierra Pacific's CO_2 forecasts now start at between $15/ton and $30-35/ton in 2012, and increase to between $25/ton to nearly $70/ton in 2030. These CO_2 prices are dramatically higher than are suggested by the now out-of-date levelized prices for Nevada Power shown in Mr. Guelker's Exhibit 9.

- Like Nevada Power, Sierra Pacific Power is revising the CO_2 costs it is using in resource planning analyses. As of July 2009, Sierra Pacific used a single set of CO_2 prices that began at approximately $6.15/ton (2008$) in 2010 and increased to only about $8.55/ton in 2030. As Sierra Pacific is in the same state as Nevada Power and is in the same state, it is expected to use the same CO_2 as are presented in Figure S4 above when it submits its next Integrated Resource Plan to the Nevada Commission.

- Other state regulatory commissions and utilities also have increased the ranges of CO_2 prices that the use in resource planning. For example, the Minnesota Commission recently changed the starting ends for the range of CO_2 prices that utilities in that state should use. The old range was from $4/ton to $30/ton in 2012. The new range required by the Commission is $9/ton to $39/ton, also starting in 2012.[25]

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[24] Technical Appendix to Volume 17 of Nevada Power's 2010-2029 Triennial Integrated Resource Plan, Nevada Public Utilities Commission Docket No. 09-07-003, at page 151.

[25] Available at https://www.edockets.state mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&doc

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Q. Mr. Guelker testifies that the CO_2 prices used in the Applicants' modeling analyses are both adequate and reasonable?[26] Have you seen any evidence that any of the Applicants actually use a wide range of CO_2 prices in their internal analyses?

A. [redacted][27] [redacted]

Q. How do the CO_2 prices used by WPSC in its internal analyses compare to the Synapse CO_2 price forecasts and the CO_2 prices used by Applicants in their modeling analyses in this proceeding?

A. [redacted].

umentId=%7b12B0DA3E-BDE7-4102-B279-626C16181609%7d&documentTitle=200910-42619-01

[26] Rebuttal Testimony of Eric J. Guelker, at page 2018, lines 12-13.

[27] At page 14 of the deposition transcript.

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Q: What is your conclusion?

A: After reviewing the analyses and testimony in this proceeding, I believe that given all of the uncertainty, the Commission should reject the Applicants' request for a Certificate of Authority for the Emissions Reduction Project.

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Q. Does this complete your Surrebuttal Testimony?

A. Yes.