BEFORE THE
MISSISSIPPI PUBLIC SERVICE COMMISSION

In RE: Petition of Mississippi Power Company for a Certificate of Public Convenience and Necessity Authorizing the Acquisition, Construction, and Operation of an Electric Generating Plant, Associated Transmission Facilities, Associated Gas Pipeline Facilities, Associated Rights-of-Way, and Related Facilities in Kemper, Lauderdale, Clarke, and Jasper Counties, Mississippi	))))))))	**DOCKET NO. 2009-UA-014**

DIRECT TESTIMONY OF DAVID A. SCHLISSEL ON BEHALF OF THE SIERRA CLUB

PUBLIC VERSION PROTECTED MATERIALS REDACTED

DECEMBER 7, 2009

List of Exhibits

1. Introduction

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. 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 General Staff of the Arkansas Public Service Commission, the U.S. Department of Justice, the Attorney General of the State of New York, 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, California, 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 Sierra Club.

Q. What is the purpose of your testimony?

A. Synapse was retained by the Sierra Club to assist in reviewing Mississippi Power Company's ("MPCo" or "the Company") proposed Kemper County IGCC plant. This testimony presents the results of our analyses.

Q. Please summarize your conclusions.

A. Our conclusions are as follows:

1. Despite the Company's assertions that it has conducted a comprehensive integrated resource planning process, the Company's procedure for soliciting resources to meet its identified need has been heavily skewed to its preferred outcome, depriving itself, the Commission, other parties, and ultimately ratepayers of a full assessment of options to meet need.

2. Over the next five years, Mississippi Power Company should pursue a combination of purchased power contracts for capacity and energy from existing generation sources and comprehensive energy efficiency programs through competitive solicitations.

3. There appear to be substantial uncommitted resources available in Mississippi. In 2008, there were 5,862 MW of combined-cycle natural

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gas-fired capacity in Mississippi. None of the generating units operated above a 50% capacity factor.

4. Additional energy efficiency resources appear to be available to assist in meeting Mississippi Power Company's projected need even if the Company actually retires older gas-and coal-fired units. For example, an analysis by Georgia Tech found that there is the potential for 11.6 percent reductions in total consumption in Mississippi.

5. The three sets of CO_2 prices that Mississippi Power Company considers in its analyses of the proposed Kemper County IGCC plant and alternatives ($10/ton, $20/ton and $30/ton) are within a zone of reasonableness. However, they do not adequately reflect the reasonable risk that CO_2 prices will be higher than the Company now forecasts. To reflect this risk, it is necessary that Mississippi Power Company's assessments include scenarios with higher CO_2 costs such as the Synapse 2008 High CO_2 Forecast.

6. It is reasonable that the base case scenarios in the Company's economic assessments of the proposed Kemper County IGCC plant and alternatives should reflect the Company's planned capture of 65 percent of the CO_2 that would otherwise be emitted into the atmosphere. However, in order to reflect technological uncertainty regarding CO_2 capture and sequestration, Mississippi Power Company should examine scenarios which assume that zero percent of the CO_2 from the Kemper County plant is captured as well as scenarios in which 30 percent or 50 percent of the CO_2 is captured.

7. Mississippi Power Company's High, Moderate with Volatility and Moderate gas prices forecasts are significantly higher than both the NYMEX Henry Hub futures prices and the March 2009 AEO long term natural gas price forecast for SERC. Only the Company's Low gas price forecast is comparable to the AEO March 2009 long term gas price

forecast for the SERC region although even this Low gas price forecast is still substantially higher than current NYMEX futures.

8. There is a significant risk that the actual cost of constructing the proposed Kemper County IGCC plant could be substantially higher than Mississippi Power Company's current estimate. The Company's economic assessments should reflect this risk by including scenarios in which the cost of the proposed IGCC plant is 20 percent and 40 percent above the currently estimated cost.

Q. Were there other members of the Synapse project team who also assisted in the analyses undertaken by Synapse as part of its evaluation of the proposed emissions reduction project at Columbia Units 1 and 2?

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

ALTERNATIVE TO PROPOSED KEMPER COUNTY IGGC PLANT

Q. What do you propose that the company do to meet the need identified in Phase I?

A. I propose that, over the next five years, the company pursue a combination of purchased power contracts for capacity and energy from existing generation sources and comprehensive energy efficiency programs through competitive solicitations. The Company should issue an RFP for both mid-term (5) and longer term capacity and energy from existing power plants; the Company could also consider actually purchasing ownership interests in existing plants. Such a contractual approach would enable the Company to achieve more favorable arrangements than it could through market purchases. Further, the Southern Company could also bid its excess capacity in response to the same RFP. Despite the Company's assertions that it has conducted a comprehensive integrated resource planning process, the Company's procedure for soliciting resources to meet its identified need has been heavily skewed to its preferred outcome, depriving itself, the Commission, other parties, and ultimately ratepayers of a full assessment of options to meet need. A hybrid approach to meeting the need, that relies on existing resources in the wholesale markets and on increased efficiency for customers, will allow the Company maximum flexibility in the next several years and will avoid risks that the Company's ratepayers would face due to investment in a large, long-lived, capital-intensive baseload power plant prior to the finalization of a federal program restricting carbon emissions.

Q. The Company states that uncommitted resources have had two opportunities to fill MPC's anticipated need. Do you agree?

A. No. As described in Company witness Rozier's Testimony, and as the Commission noted in its Phase I Order, MPC's solicitations requested solid-fuel supply options, and placed additional requirements on non-solid-fuel resources. Further, within the solicitation itself, the Company stated its preference for a self-build option (June 2007 Invitation and 2008 Invitation). In its approach, the Company defined the solicitation so narrowly that self-build solid-fuel generation was clearly favored; the solicitation was not consistent with integrated resource planning.

Q. What natural gas supply options are available?

A. There appear to be substantial uncommitted resources available in Mississippi. In 2008, there were 5,862 MW of combined-cycle natural gas-fired capacity in Mississippi. None of the generating units operated above a 50% capacity factor. As shown in Table 1 below, which was constructed using data from the EPA Clean Air Markets Division, the average capacity factor was about 25%.

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Facility Name	Max Gross Capacity (MW)	Generation in 2008 (MWh)	Capacity Factor
Daniel Electric Generating Plant	181	598,944	37.77%
Daniel Electric Generating Plant	179	577,737	36.84%
Daniel Electric Generating Plant	182	587,789	36.87%
Daniel Electric Generating Plant	181	586,762	37.01%
Batesville Generation Facility	270	582,429	24.62%
Batesville Generation Facility	270	483,553	20.44%
Batesville Generation Facility	281	1,099,668	44.67%
Caledonia	301	843,256	31.98%
Caledonia	300	910,451	34.64%
Caledonia	0	0	0.00%
Hinds Energy Facility	180	264,437	16.77%
Hinds Energy Facility	183	275,030	17.16%
Attala Generating Plant	169	690,820	46.66%
Attala Generating Plant	169	738,060	49.85%
Southaven Combined Cycle	299	735,233	28.07%
Southaven Combined Cycle	300	828,301	31.52%
Southaven Combined Cycle	0	0	0.00%
Magnolia Facility	342	352,595	11.77%
Magnolia Facility	333	370,831	12.71%
Magnolia Facility	338	349,348	11.80%
Choctaw Gas Generation, LLC	442	869,604	22.46%
Choctaw Gas Generation, LLC	432	863,130	22.81%
Reliant Energy Choctaw County Gen	170	4,276	0.29%
Reliant Energy Choctaw County Gen	174	21,459	1.41%
Reliant Energy Choctaw County Gen	186	16,984	1.04%

Table 1: Mississippi Combined Cycle Unit 2008 Generation and Capacity Factors

Q. The Company states that it has determined that the anticipated level of peak demand reduction available from active and passive DSM is "inadequate to fully meet the projected load requirements of MPC's customers."[1] Do you agree?

A. While the Company may be correct that demand reduction associated with energy efficiency programs is insufficient to meet the entire projected need, energy efficiency could nevertheless play a much more significant role in the Company's plans for meeting customer needs in the next ten years. The Company anticipates adding between 47 and 75 MW of new demand resources by 2020 (Mississippi

1 Direct Testimony of Frances Turnage, filed January 16, 2009, at pages. 18-19.

Power Company Brief, page 16). That is between 1.5% and 2.5% of the Company's projected load in 2020, or an annual increase of about one quarter of one percent at maximum.[2] This level of increase is dwarfed by the achievements of other companies and by the annual goals established by many states.

Q. Why do you believe that additional energy efficiency resources are available?

A. An analysis by Georgia Tech found that there is substantial energy efficiency resource potential in the South in general, as well as in Mississippi in particular:

> The South has been one of the last regions of the country to embrace energy efficiency programs and to develop an energy-efficiency culture of consumer behavior. For Energy Star appliances with sales data that are tracked by EPA, the South has the lowest rates of market penetration (McNary, 2009). Per capita spending on electric utility energy efficiency programs in the Southeast is just one-fifth the national average. This fact is reflected in the assessments of Elliott et al. (2003) and Elliott and Shipley (2005), which examined the effect of having each state implement policies like those developed in California and the Northeast. In 2003 and 2005, ten southern states were given a "D" grade for current policies and environment (the lowest grade given to any state). Texas was the only state in the South to receive an "A". For context, of the 48 contiguous states, grades were distributed as: A (12), B (12), C (8), and D (16).
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> The 2008 state efficiency scorecard does not include grades; rather, the authors' advise that states be evaluated in "bins" which are based on rankings (Eldridge et al, 2008). For consistency, this report assumes that the first bin would be the equivalent of an A and the last the equivalent of a D; grades would be distributed as A(10), B(12), C(9), D(17).[6] Of the 16 states in the South, 9 received a D – one less than in 2005. However, the score for Texas was downgraded to a "B" and no state in the South received an "A."[3]

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[2] Exhibit AUG-SUPP 2, 2010 Load Forecast

[3] Chandler and Brown; *Meta-Review of Efficiency Potential Studies and Their Implications for the South;* The School of Public Policy at The Georgia Institute of Technology, Working paper #51, August 2009.

Georgia Tech projects potential reductions in total consumption in Mississippi of 11.6% by 2020.[4]

While this study alone does not in itself demonstrate specific opportunities in the Company's service territories, it does call into question whether the Company has tapped available resources and fully explored opportunities. The Company's failure to even solicit demand-side offers (MPCo response to MPUS 1-9) is not consistent with an integrated resource planning process that places supply side and demand side resources on equivalent footing. Mississippi Power Company's customers, residential, commercial and industrial alike, deserve a thorough evaluation and pursuit of available energy efficiency and demand reduction resources.

Q. What do you propose that the Company do to investigate energy efficiency and demand reduction resources?

A I recommend that the Commission require the Company to conduct a thorough evaluation of potential for energy efficiency resources in the Company's service territory, including a solicitation for energy efficiency resources. The Commission should also consider requiring that the Company use a total resource cost test ("TRC") rather than the Rate Impact Measurement test ("RIM") in cost-effectiveness determinations. The TRC test evaluates whether the cash savings of a program exceed the cash costs of a program, thus considering benefits to a utility's system, whereas the RIM test considers specifically the impact on ratepayers who do not participate in a given program. The Guide to Resource Planning with Energy Efficiency, a Report of the National Action Plan for Energy Efficiency ("NAPEE" or "National Action Plan") states, "The TRC test, which measures the regional net benefits, is the appropriate cost test from a regulatory perspective. All energy efficiency that passes the TRC will reduce the total costs

[4] Chandler and Brown; *State Specific Summaries of the Meta-Review of Efficiency Potential Summaries and Their Implications for the South;* The School of Public Policy at The Georgia

of energy in a region."[5] The TRC test is most consistent with the goals of integrated resource planning for a utility. [redacted] Additional demand and energy reductions would be available from a more comprehensive approach to demand side programs.

Q. What benefits does your proposal of a hybrid approach tapping available uncommitted resources in the wholesale market, and available energy efficiency and demand reductions resources provide?

A. This approach would be robust and resistant in the face of the many uncertainties that will challenge the Company and its ratepayers in the next several years. Investment in a large, long-lived, capital intensive coal-fueled resource exposes the Company's ratepayers to unnecessary risks of future cost increases, particularly given that the Company has not explored other options through well-designed competitive solicitations. Greater investment in energy efficiency would be particularly cost-effective given impending carbon emission restrictions.

FUTURE CO_2 EMISSIONS COSTS

Q. Is the range of CO_2 costs that MPCo considers in its resource evaluations reasonable?

A. No. The three sets of CO_2 prices that MPCo considers in its resource analyses ($10/ton, $20/ton and $30/ton) are within a zone of reasonableness. However, they do not adequately reflect the reasonable risk that CO_2 prices will be higher

Institute of Technology, Working paper #51, Appendix D. August 2009

5 Department of Energy and Environmental Protection Agency. Guide to Resource Planning with Energy Efficiency: A Resource of the National Action Plan for Energy Efficiency. November 2007, p. 5-3. Available at http://www.epa.gov/cleanenergy/documents/resource_planning.pdf.

than the Company now forecasts. To reflect this risk, it is necessary to include scenarios with higher CO_2 costs.

Q. Are you familiar with the resource planning work performed by the Boston Pacific Company, the consultant to the Mississippi Public Service Commission in this proceeding?

A. Yes. Dr. Roach from Boston Pacific advised the Minnesota Public Utilities Commission in the fall of 2008 in a case in which I was involved. In that assignment, Boston Pacific advised the Minnesota Commission on the appropriate construction costs, emissions costs and fuel costs that should be used in economic analyses of the now-cancelled Big Stone II coal-fired power plant.

Q. What range of CO_2 emissions prices did Boston Pacific recommend to the Minnesota PUC for use in resource planning?

A. Boston Pacific recommended that a range of CO_2 prices between \$8/ton and \$60/ton be used:

> Clearly, the estimates … show that there is no one "right" number when it comes to greenhouse gas emissions costs. How, then, are utilities supposed to make decisions about resource acquisition? In our opinion, the best practice is to analyze resource choices over a variety of emissions costs, with the goal of selecting resources that deliver low-cost supply under a range of emissions regulations. The low end of the range can be set around \$8, beginning in 2012, reflecting a relatively low-cost regime. The high end can be set at \$60 a ton, reflecting a bill with tighter emissions caps along with adverse outcomes such as limited development of new nuclear and renewable generation and limited ability to use offsets. Mid-range cases of \$20 and \$40 per ton should be examined as well. All costs should be escalated with inflation each year after 2012 and should be modeled as a tax. Emissions costs are typically modeled as a tax to all generation, because each bill has differences in allowance distribution among resources and among free allowances and

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> auctions. Moreover, "free" allowances have an opportunity cost equal to the market price.[6]

And:

> Resource choice must be assessed over a range of CO_2 taxes because future emissions costs will depend on a variety of factors from (a) the emissions targets in Federal Legislation to (b) the costs and availability of offsets to (c) the growth of nuclear and renewable sources of generation. We believe the best practice would be to test resource selection at $8, $20, $40 and $60 per ton of CO_2 starting in 2012 and escalating at inflation thereafter. The goal of these analyses will be to identify, if possible, a portfolio of resources that deliver low cost supply to ratepayers under a variety of greenhouse gas regimes. At a minimum, such an analysis will reveal the breakpoints; that is, what level of CO_2 tax [will] switch the choice from one resource to another.[7]

Q. Do you agree with the range of CO_2 emissions prices (or taxes) that Boston Pacific recommended to the Minnesota PUC to analyze resource choices?

A. Yes. In general, I agreed with the range of CO_2 emissions prices recommended by Boston Pacific except I testified that the low end of that range ($8/ton in 2012, escalating at the rate of inflation) was too low and would not reduce greenhouse gas emissions in the amounts and the time that the scientific community agrees is necessary to avoid the most harmful impacts of climate change.

Q. What CO_2 prices does Synapse recommend be used in resource planning analyses?

A. Synapse recommends that the following range of CO_2 prices be used in resource planning.[8]

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6 *Report Responding to the Commission's Inquiries on Emissions Costs, Construction Costs, and Fuel Costs*, Boston Pacific Company, Inc., October 21, 2008, at pages 13 and 14.

7 Id, at pages 15-16.

8 See the Synapse *2008 CO_2 Price Forecasts*, July 2008, a copy of which is attached as Exhibit DAS-2.

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The 2008 Synapse Low CO_2 Price Forecast starts at $10/ton in 2013, in 2007 dollars, and increases to approximately $23/ton in 2030. This represents a $15/ton levelized price over the period 2013-2030, in 2007 dollars.

The 2008 Synapse High CO_2 Price Forecast starts at $30/ton in 2013, in 2007 dollars, and rises to approximately $68/ton in 2030. This High Forecast represents a $45/ton levelized price over the period 2013-2030, also in 2007 dollars.

Synapse also has prepared a 2008 Mid CO_2 Price Forecast that starts close to the low case, at $15/ton in 2013 in 2007 dollars, but then climbs to $53/ton by 2030. The levelized cost of this mid CO_2 price forecast is $30/ton in 2007 dollars.

Q. How does the range of CO_2 emissions prices that Boston Pacific has recommended compare to Synapse's recommended range of CO_2 prices?

A. Figure 1, below, compares the levelized costs of the CO_2 price scenarios that Boston Pacific recommended to the Minnesota PUC be used for resource planning analyses, the Synapse Low, Mid and High CO_2 price forecasts, and the $10,, $20 and $30 per ton scenarios considered by Mississippi Power Company.

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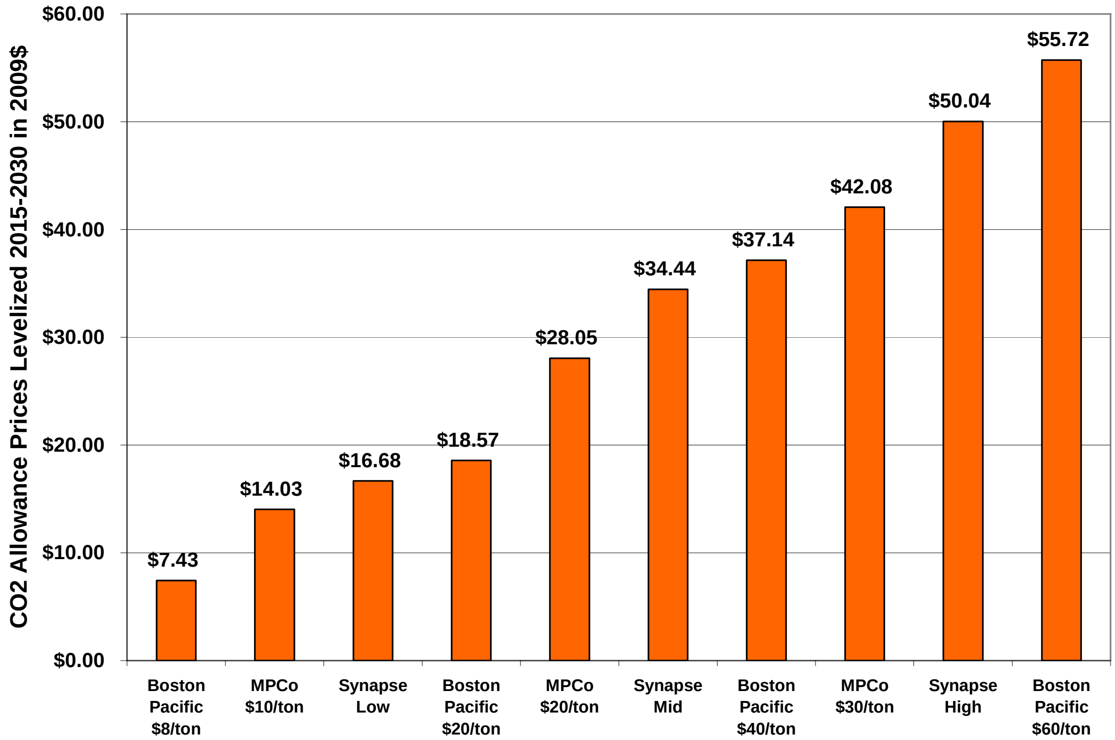
Figure 1: Boston Pacific, Synapse and Mississippi Power Company CO_2 Price Forecasts (levelized 2015-2030, in 2009$)



As can be seen, in levelized terms, the two ranges of CO_2 emissions prices, that is, Boston Pacific and Synapse, are reasonably consistent. Also, in levelized terms, the high end of the Mississippi Power Company range of CO_2 prices is approximately $8/ton below the Synapse High Forecast and is more than $13/ton below the high end of the Boston Pacific recommended range of CO_2 prices.

Q. How do the CO_2 prices recommended by Synapse and Boston Pacific for use in resource planning compare to other analyses of future CO_2 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 CO_2 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. These modeling analyses include:

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- The Energy Information Administration of the U.S. Department of Energy's ("EIA") assessment of the *Energy Market and Economic Impacts of S. 280, the Climate Stewardship and Innovation Act of 2007* (July 2007).[9]
- 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*.[10]
- The EIA's assessment of the *Energy Market and Economic Impacts of S. 1766, the Low Carbon Economy Act of 2007* (January 2008).[11]
- The EIA's assessment of the *Energy Market and Economic Impacts of S. 2191, the Lieberman-Warner Climate Security Act of 2007* (April 2008).[12]
- The EIA's assessment of the Energy Market and Economic Impacts of H.R. 2454, the American Clean Energy and Security Act of 2009. (August 2009).[13]
- 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).[14]
- The EPA's *Analysis of the Low Carbon Economy Act of 2007 – S. 1766 in 110th Congress* (January 2008).[15]
- The EPA's *Analysis of the Lieberman-Warner Climate Security Act of 2008 – S. 2191 in 110th Congress* (March 2008).[16]
- The EPA's *Analysis of the American Clean Energy and Security Act of 2009, H.R. 2454 in the 111th Congress* (June 2009)[17]
- *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).[18]

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9 Available at http://www.eia.doe.gov/oiaf/servicerpt/csia/pdf/sroiaf(2007)04.pdf.
10 Available at http://www.eia.doe.gov/oiaf/servicerpt/biv/pdf/s280_1007.pdf
11 Available at http://www.eia.doe.gov/oiaf/servicerpt/lcea/pdf/sroiaf(2007)06.pdf
12 Available at http://www.eia.doe.gov/oiaf/servicerpt/s2191/pdf/sroiaf(2008)01.pdf.
13 Available at http://www.eia.doe.gov/oiaf/servicerpt/hr2454/index.html.
14 Available at http://www.epa.gov/climatechange/economics/economicanalyses.html.
15 Available at http://www.epa.gov/climatechange/economics/economicanalyses.html.
16 Available at http://www.epa.gov/climatechange/economics/economicanalyses.html.
17 Available at http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf.
18 Available at http://web.mit.edu/globalchange/www/MITJPSPGC_Rpt146.pdf.

- *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).[19]

- *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)[20]

- *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).[21]

- *The Lieberman-Warner Climate Security Act – S. 2191, Modeling Results from the National Energy Modeling System – Preliminary Results*, Clean Air Task Force (January 2008).[22]

- *Economic Analysis of the Lieberman-Warner Climate Security Act of 2007 Using CRA's MRN-NEEM Model*, CRA International, April 2008.[23]

- *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.[24]

In total, these modeling analyses examined more than 85 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 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.

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19 Available at http://mit.edu/globalchange/www/MITJPSPGC_Rpt146_AppendixD.pdf.
20 Available at http://www.nicholas.duke.edu/institute/econsummary.pdf.
21 Available at http://docs.nrdc.org/globalwarming/glo_08051401A.pdf.
22 Available at http://lieberman.senate.gov/documents/catflwcsa.pdf.
23 Available at http://www.nma.org/pdf/040808_crai_presentation.pdf.
24 Available at http://www.accf.org/pdf/NAM/fullstudy031208.pdf.

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The results of these modeling analyses are presented in Figure 2 below, along with the CO_2 prices recommended by Synapse, Boston Pacific and Mississippi Power Company. Figure 2 presents the ranges of levelized CO_2 prices developed in each modeling analysis, levelized from 2015-2030, in 2009 dollars.

- S.280 refers to the McCain Lieberman bill introduced in 2007 in the 110th U.S. Congress
- S.1766 refers to the Bingaman-Specter bill introduced in 2007 in the 110th U.S. Congress
- S. 2191 refers to the Lieberman-Warner bill introduced in 2007 in the 110th U.S. Congress
- HR. 2454 refers to the Waxman-Markey bill introduced in 2009 in the current 111th U.S. Congress

The modeling analyses in Figure 2 includes studies prepared by the U.S. EPA, the Energy Information Administration ("EIA") of the US Department of Energy, the Clean Air Task Force, the American Council for Capital Formation and the National Association of Manufacturers, CRA, International, Duke University, the Massachusetts Institute of Technology ("MIT") and the Natural Resources Defense Council ("NRDC").

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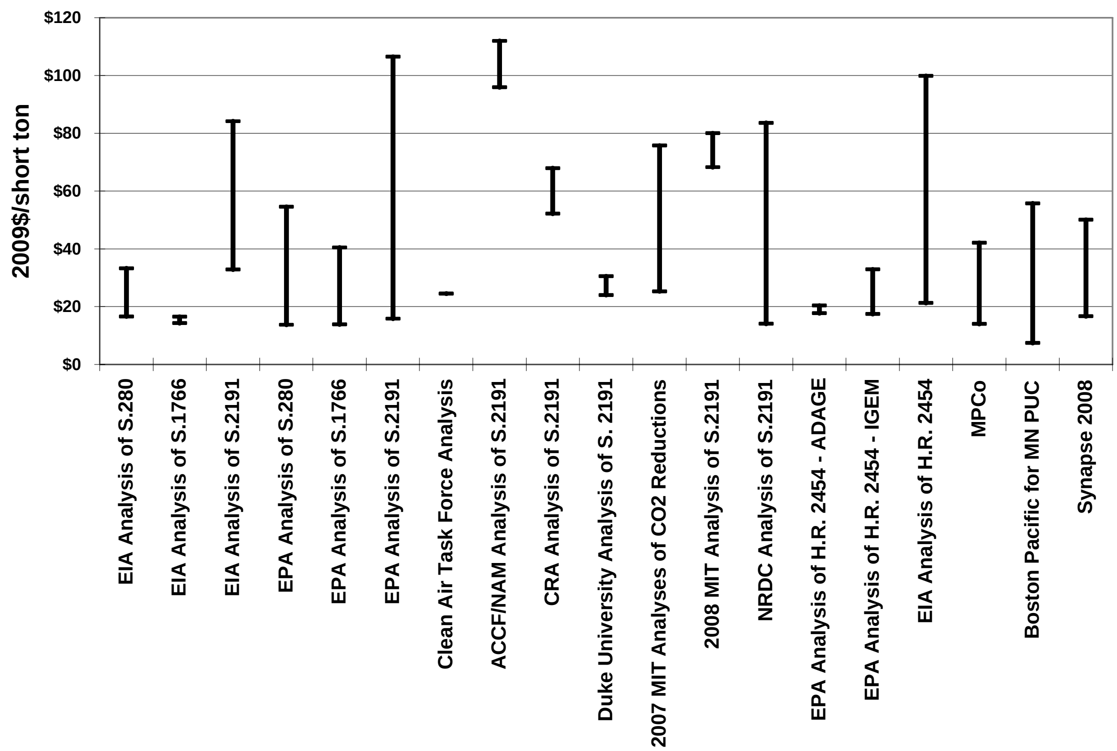
Figure 2: CO_2 Prices Recommended by Synapse, Boston Pacific and MPCo vs. Results of Modeling Analyses of Major Bills in U.S. Congress – Levelized CO_2 Prices (2015-2030, in 2009 dollars)



As can be seen, the ranges of CO_2 prices recommended by Synapse and Boston Pacific are very reasonable compared to the full range of CO_2 emissions allowance prices that could result from adoption of the major greenhouse gas regulatory legislation that has been introduced in the U.S. Congress. In fact, there are a significant number of possible scenarios where CO_2 emissions allowance prices could be substantially higher than the high ends of the price ranges that Synapse and Boston Pacific have recommended for use in resource planning assessments.

Q. Should the Commission give any weight to the results of any modeling scenarios with a $0/ton price for CO_2 emissions?

A. No. Mississippi Power has acknowledged that climate change legislation, regulating greenhouse gas emissions, can be anticipated in the foreseeable future,

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and is indeed "imminent."[25] We agree. Given the trends in the legislation that has been introduced and considered in the U.S. Congress in recent years, it is unreasonable to assume that there will not be any regulation of CO_2 emissions (and, hence, no monetized values for CO_2 emissions) at any time in the next three or more decades. There may be uncertainty over the specific monetized values for CO_2 emissions, but federal regulation of greenhouse gas emissions is a matter of "when" and "how," not "if."

Q. What are your conclusions concerning the CO_2 prices that Mississippi Power Company should use in its economic analyses of the proposed Kemper County IGCC plant and alternatives?

A. In addition to the range of CO_2 prices that it has proposed to consider, Mississippi Power Company should look at CO_2 prices above its $30/ton price trajectory – for example, the Synapse High CO_2 price trajectory. Given the uncertainties associated with the design and implementation of a federal regime for the regulation of CO_2 emissions, and the results of the modeling of proposed federal climate change legislation, it is not unrealistic to anticipate that CO_2 prices could be higher than the Company now proposes to consider.

Q. Should Mississippi Power Company model some scenarios in which it is unable to capture 65 percent of the CO_2 that would be emitted by the Kemper County IGCC plant?

A. Yes. It may be that the Company is unable to achieve its goal of capturing 65 percent of the CO_2 from the Kemper County IGCC plant on the schedule it projects. While most recent legislative proposals require CCS for new coal-fired power plants so that all new plants would eventually have to capture and sequester emissions on the order of 65%, the proposals provide some "ramp-up" time for CCS technologies. To reflect the technological uncertainty associated

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[25] Direct Testimony of Kimberly D. Flowers, filed January 16, 2009, at page 45 and Mississippi Power Company's response to Data Request No. MPUS 1-5.

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with capture of the CO_2, MPCo should examine scenarios in which none of the CO_2 is captured and in which only 30 percent or 50 percent is captured.

NATURAL GAS PRICES

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

A. Yes. Figures 3A, 3B, 3C and 3D, below, compares the gas prices used by Mississippi Power Company for its $10/ton, $20/to and $30/ton scenarios with the March 2009 AEO gas price forecast for the SERC Region and recent NYMEX futures prices.

Figure 3A: Natural Gas Price Comparisons with MPCo High Gas Prices [Confidential]

[redacted]

Figure 3B: Natural Gas Price Comparisons with MPCo Moderate with Volatility Gas Prices [Confidential[

[redacted]

Figure 3C: Natural Gas Price Comparisons with MPCo Moderate Gas Prices [Confidential]

[redacted]

Figure 3D: Natural Gas Price Comparisons with MPCo Low Gas Prices [Confidential]

[redacted]

As can be seen from Figure 3, the High, the Moderate with Volatility and the Moderate gas prices used by Mississippi Power Company are significantly higher than both the NYMEX Henry Hub futures prices and the March 2009 AEO long term natural gas price forecast for SERC. Only MPCo's Low gas price forecast is comparable to the AEO March 2009 long term gas price forecast although even the MPCo Low gas price forecast is still substantially higher than the NYMEX futures.[26]

Q. Do you agree with the Commission's Order directing Mississippi Power Company to test additional scenarios with lower gas prices?[27]

A. Yes. I believe that it would be appropriate for MPCo to consider the two lower gas price forecasts ordered by the Commission given new estimates of domestic

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26 Some of the differential between the MPCo's gas price forecasts and the NYMEX futures may be attributable to delivery costs but that should not represent a significant portion of the differences shown in Figures 3A, 3B, 3C and 3D for MPCo's High, Moderate with Volatility and Moderate gas prices.

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U.S. natural gas reserves. These increased natural gas supplies can be expected to exert downward pressure on gas prices as shown by the significantly lower NYMEX futures prices contained in Figures 3A through 3D above.

Indeed, Entergy Corporation has described these new supplies of natural gas as a structural change in the natural gas market. This structural change has two important impacts on the resource planning for companies like Mississippi Power. First, as a result of the existing and expected supply glut, current and projected prices of natural gas have been reduced. At the same time, the dramatically larger domestic supplies of natural gas should be able to accommodate any increased demands from any fuel switching due to federal regulation of greenhouse gas emissions without causing significant increases in natural gas prices.

The structural change in the natural gas markets already has had a significant impact on utilities' resource planning. For example, in early April of this year, Entergy Louisiana informed the Louisiana Public Service Commission of its intent to defer (and perhaps cancel) the proposed retirement of an existing gas-fired power plant and its replacement by a new coal-fired unit. Entergy explained that it no longer believed that a new coal plant would provide economic benefits for its customers due to its current expectation that future gas prices would be much lower than previously anticipated:

> Perhaps the largest change that has affected the Project economics is the sharp decline in natural gas prices, both current prices and those forecasted for the longer-term. The prices have declined in large part as a result of a structural change in the natural gas market driven largely by the increased production of domestic gas through unconventional technologies. The decline in the long-term price of natural gas has caused a shift in the economics of the Repowering Project, with the Project currently – and for the first

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[27] *Order Finding Need for Generating Capacity and Energy*, Docket No. 2009-UA-014, at page 10.

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time – projected to have a negative value over a wide range of outcomes as compared to a gas-fired (CCGT) resource.[28]

4. Recent Natural Gas Developments

Until very recently, natural gas prices were expected to increase substantially in future years. For the decade prior to 2000, natural gas prices averaged below $3.00/mmBtu (2006$). From 2000 through May 2007, prices increased to an average of about $6.00/mmBtu (2006$). This rise in prices reflected increasing natural gas demand, primarily in the power sector, and increasingly tighter supplies. The upward trend in natural gas prices continued into the summer of 2008 when Henry Hub prices reached a high of $131.32/mmBtu (nominal). The decline in natural gas prices since the summer of 2008 reflects, in part, a reduction in demand resulting from the downturn in the U.S. economy.

* * * *

However, the decline also reflects other factors, which have implications for long-term gas prices. During 2008, there occurred a seismic shift in the North American gas market. "Non-conventional gas" – so called because it involves the extraction of gas sources that previously were non-economic or technically difficult to extract – emerged as an economic source of long-term supply. While the existence of non-conventional natural gas deposits within North America was well established prior to this time, the ability to extract supplies economically in large volumes was not. **The recent success of non-conventional gas exploration techniques (e.g., fracturing, horizontal drilling) has altered the supply-side fundamentals such that there now exists an expectation of much greater supplies of economically priced natural gas in the long-run….**

* * * *

Of course, it should be noted that it is not possible to predict natural gas prices with any degree of certainty, and [Entergy Louisiana] cannot know whether gas prices may rise again. Rather, based upon the best available information today, it appears that gas prices will not reach previous levels for a sustained period of time

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[28] Exhibit DAS-3, *Report and Recommendation Concerning the Little Gypsy Unit 3 Repowering Project*, submitted by Entergy Louisiana to the Louisiana Public Service Commission, April 1, 2009, at pages 6-8.

> because of the newly discovered ability to produce gas through non-traditional recovery methods…[29] [Emphasis added]

Entergy's conclusion that there has been a seismic shift in the domestic natural gas industry was confirmed in early June 2009 by the release of a report by the American Gas Association and an independent organization of natural gas experts known as the Potential Gas Committee, the authority on gas supplies. This report concluded that the natural gas reserves in the United States are 35 percent higher than previously believed. The new estimates show "an exceptionally strong and optimistic gas supply picture for the nation," according to a summary of the report.[30]

A Wall Street Journal Market Watch article titled "U.S. Gas Fields From Bust to Boom" similarly reported that huge new gas fields have been found in Louisiana, Texas, Arkansas and Pennsylvania and cited one industry-backed study as estimating that the U.S. now has enough natural gas to satisfy nearly 100 years of current natural gas-demand.[31] It further noted that

> Just three years ago, the conventional wisdom was that U.S. natural-gas production was facing permanent decline. U.S. policymakers were resigned to the idea that the country would have to rely more on foreign imports to supply the fuel that heats half of American homes, generates one-fifth of the nation's electricity, and is a key component in plastics, chemicals and fertilizer.
>
> But new technologies and a drilling boom have helped production rise 11% in the past two years. Now there's a glut, which has driven prices down to a six-year low and prompted producers to temporarily cut back drilling and search for new demand.[32]

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[29] Id, at pages 17, 18 and 22.

[30] *Estimate Places Natural Gas Reserves 35 percent Higher*, New York Times, June 9, 2009.

[31] Available at http://online.wsj.com/article/SB124104598912705 85.html.

[32] Id.

Q. The Company's witnesses in this Docket have repeatedly cited natural gas price volatility as a reason for building the proposed Kemper County IGCC plant. Should this Commission be concerned about natural gas price volatility?

A. Yes. All fuel prices will exhibit some degree of price volatility – that is daily, weekly or monthly variations based on fluctuations in the relationships between supplies and demand, and weather. Of course, Commissions should be concerned about such volatility and should require utilities to take reasonable actions to hedge natural gas supplies in order to minimize volatility.

It is obvious that MPCo's focus on natural gas price volatility is intended to taint the options of building a new gas-fired plant or purchasing power from existing gas-fired units. However, there are a number of other key variables, in addition to future natural gas prices, which also are highly uncertain. These include the ultimate cost of the Kemper County plant (including its CO_2 capture and sequestration facilities) and future coal prices, as well as the cost of carbon emissions (as discussed above). A utility such as Mississippi Power Company should consider all of these uncertainties in its resource planning and the Commission also should consider them in its deliberations.

Q. Are there other alternatives for limiting the dependence of Mississippi Power or the State of Mississippi on natural gas besides building the proposed Kemper County IGCC plant?

A. Yes. Energy efficiency (both for electricity and for natural gas) and renewable technologies are reasonable alternatives for limiting dependence on natural gas. Repowering older natural gas-fired units with newer, more efficient combined cycle technology is another option.

In addition, many utilities regularly limit their exposure to natural gas price uncertainty and volatility through financial or physical hedging.

Q. Is MPCo currently heavily dependent on natural gas for generating electricity?

A. No. In fact, the Company actually is heavily dependent on coal-fired generation: in 2006, 71 percent of the MWhs generated by MPCo came from coal; in 2007, 69 percent of MWhs generated by the Company came from coal and in 2008, 67 percent of the Company's MWhs were from coal-fired units.

Q. Didn't Company witness Flowers testify that 53 percent of the MPCo's existing generation uses natural gas as the primary fuel?[33]

A. Yes. However, Ms. Flowers testimony appears to be based on the total MWs of gas-fired capacity on the Company's system. When discussing fuel mix and fuel diversity, it is more appropriate to examine the MWhs generated by each fuel type than the MWs of generating capacity that each fuel provides. For example, the 53 percent of MPCo's generating capacity represented by gas-fired units provided only 31 percent of the Company's MWhs in 2007 and only 33 percent of MPCo's MWhs in 2008.

Conversely, as noted in the previous answer, the 47 percent of the Company's generation that is coal-fired provided 67 percent of MPCo's MWhs in 2008. Consequently, focusing on MWs instead of MWhs will distort how reliant the Company actually is on the different fuels.

[33] Direct Testimony of Kimberly D. Flowers, filed January 16, 2009, at pages 17 and 18.

Q. The Company has said that the "adoption of a carbon control legislation would likely cause fuel prices, especially natural gas, to rise due to fuel use shifting from coal to natural gas."[34] Is it reasonable to assume that natural gas prices would increase significantly if the federal government adopts legislation or regulations to regulate and reduce greenhouse gas emissions?

A. No. It is possible that natural gas demand could be somewhat higher due to CO_2 emission regulations and, as a result, natural gas prices could be expected to be somewhat higher than otherwise would be the case. However, the effect is very complicated and will depend on a number of factors, such as how much new natural gas capacity is built as a result of the higher coal-plant operating costs due to the CO_2 emission allowance prices, how much additional DSM and renewable alternatives are added to the U.S. system, the levels and prices of any incremental natural gas imported into or developed in the U.S., and changes in the dispatching of the electric system. Indeed, depending on future circumstances there may be some periods in which the prices of natural gas may be lower as a result of CO_2 regulations. Thus it is very difficult to determine, at this time, the amount by which natural gas prices might increase, if at all, due to the regulation of CO_2 emissions.

In fact, the detailed modeling of proposed greenhouse gas legislation does not unambiguously support the conclusion that the price of natural gas would increase as a result of a federal program for regulating greenhouse gas emissions but reveals a much more complex dynamic.

Q. Has Synapse examined the impact that the enactment of CO_2 emissions regulations might have on natural gas prices?

A. Yes. As part of our work on climate change issues, Synapse has reviewed the publicly available modeling results concerning the impact that adoption and

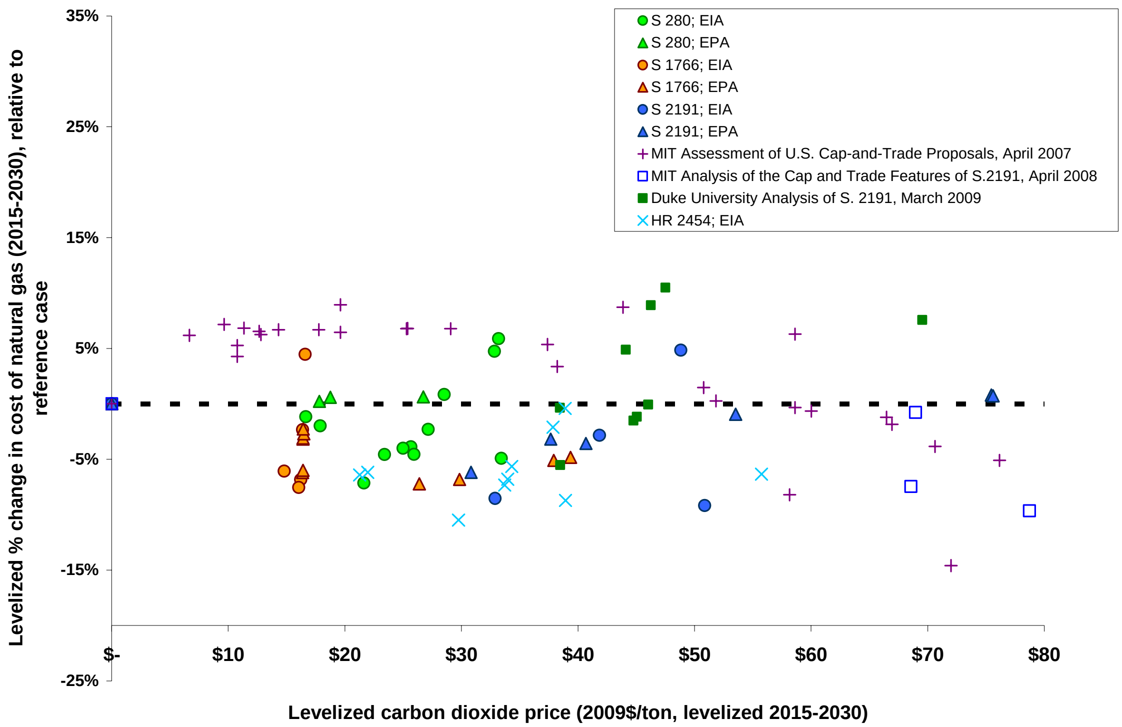
34 Exhibit KDF-1, page 24.

implementation of CO_2 regulatory legislation could have on natural gas prices. The results of our review are presented in Figures 4, 5 and 6, below.

Figure 4, below, shows the levelized percentage changes in natural gas prices (i.e., increases or decreases from the base case, which includes no regulation of greenhouse gas emissions) in a large number of scenarios from the major climate change proposals that have been introduced in the U.S. Congress in recent years. Each data point shown in Figure 4 reflects the levelized change in the natural gas prices in a modeled scenario and the levelized CO_2 price for that scenario.

The levelized CO_2 prices and natural gas price changes presented in Figure 4 have been developed from the results of modeling by the EIA of the Department of Energy, the U.S. EPA, and the Joint Program at MIT on the Science and Policy of Global Change, and cover multiple climate change proposals in the 110th U.S. Congress: Senate Bill S.280 (the McCain-Lieberman bill), Senate Bill S.1766 (the Bingaman-Specter bill), Senate Bill S.2191 (the Lieberman-Warner bill) and House Bill 2454 in the 111th Congress (the American Clean Energy and Security Act of 2009, "Waxman-Markey").

Figure 4: **The relationship between CO_2 emissions allowance prices and natural gas prices.**



As shown clearly in Figure 4, *none* of the results of any of the independent modeling analyses support an assumption that regulation of CO_2 emissions will increase natural gas prices by any significant amount, especially not at very low CO_2 prices.

In fact, the results of the modeling of a substantial number of the CO_2 regulation scenarios represented in Figure 4 suggest that the adoption of greenhouse gas regulation could lead to lower natural gas prices as the demand for and the use of natural gas decline due to its greenhouse gas emissions. Thus, there is no credible modeling evidence to support any assumption that federal regulation of greenhouse gas emissions would inevitably lead to a significant increase in the price of natural gas, particularly at relatively low CO_2 prices.

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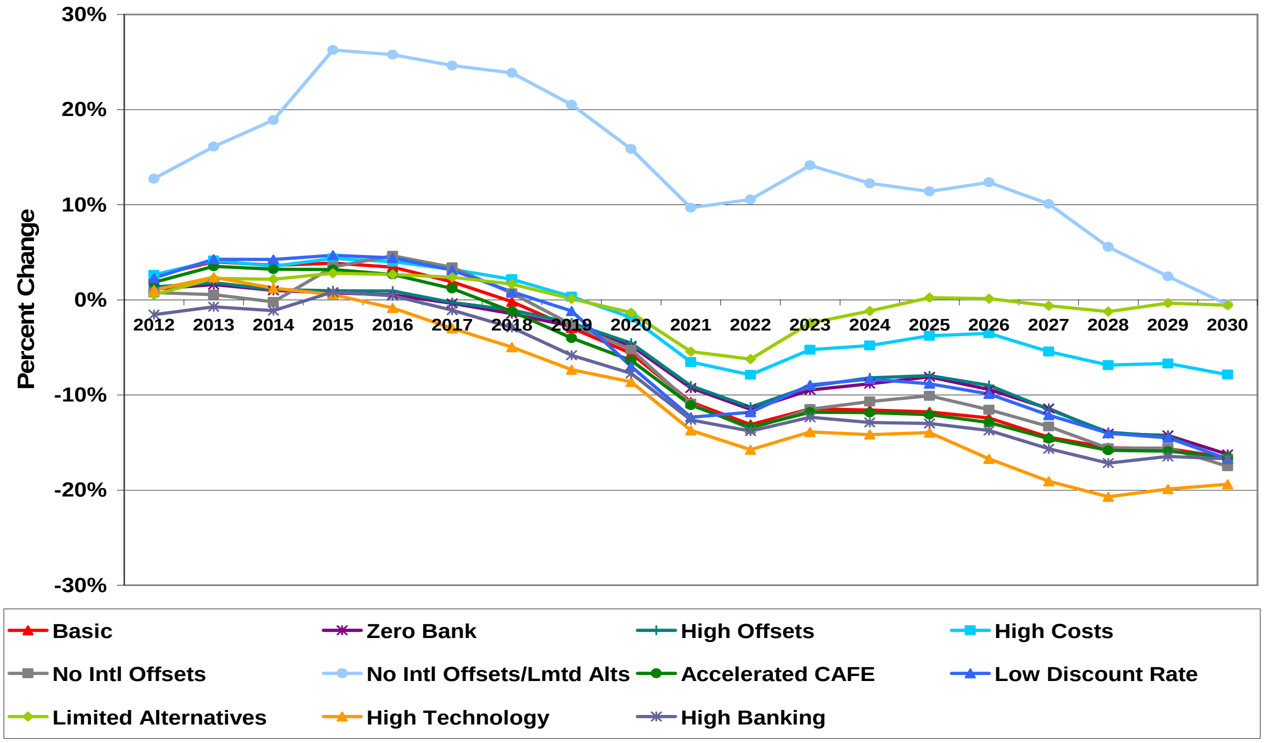
Q. Does Figure 4, above, include the recent modeling of the HR 2454, the Waxman-Markey legislation that has been approved by the U.S. House of Representatives?

A. Yes. The results of the recent EIA modeling of the Waxman-Markey bill are included in Figure 4.

Q. Have you seen any other evidence that suggests that federal regulation of greenhouse gas emissions will not cause significant increases in natural gas prices?

A. Yes. Figure 5, below, presents the annual percentage changes in natural gas prices in each of the scenarios examined by the EIA in its recent modeling of the Waxman-Markey bill from the gas prices in the EIA's reference case without any regulation of CO_2 emissions. This information provides insight in the ranges of natural gas prices that could be expected from adoption of the Waxman-Markey bill.

Figure 5: Annual Changes in Natural Gas Prices from Reference Case in EIA Modeling of Proposed Waxman-Markey Legislation



As can be seen from Figure 5, under the Waxman-Markey bill that has been passed by the House of Representatives, in almost all of the scenarios studied by the EIA, natural gas prices would increase somewhat for a few initial years except for a single scenario in which there would only be limited alternatives to using gas in place of coal and in which the use of international offsets would not be allowed. Indeed, in many of the cases studied by the EIA, natural gas prices would be expected to decrease over time as a result of the federal regulation of greenhouse gas emissions.

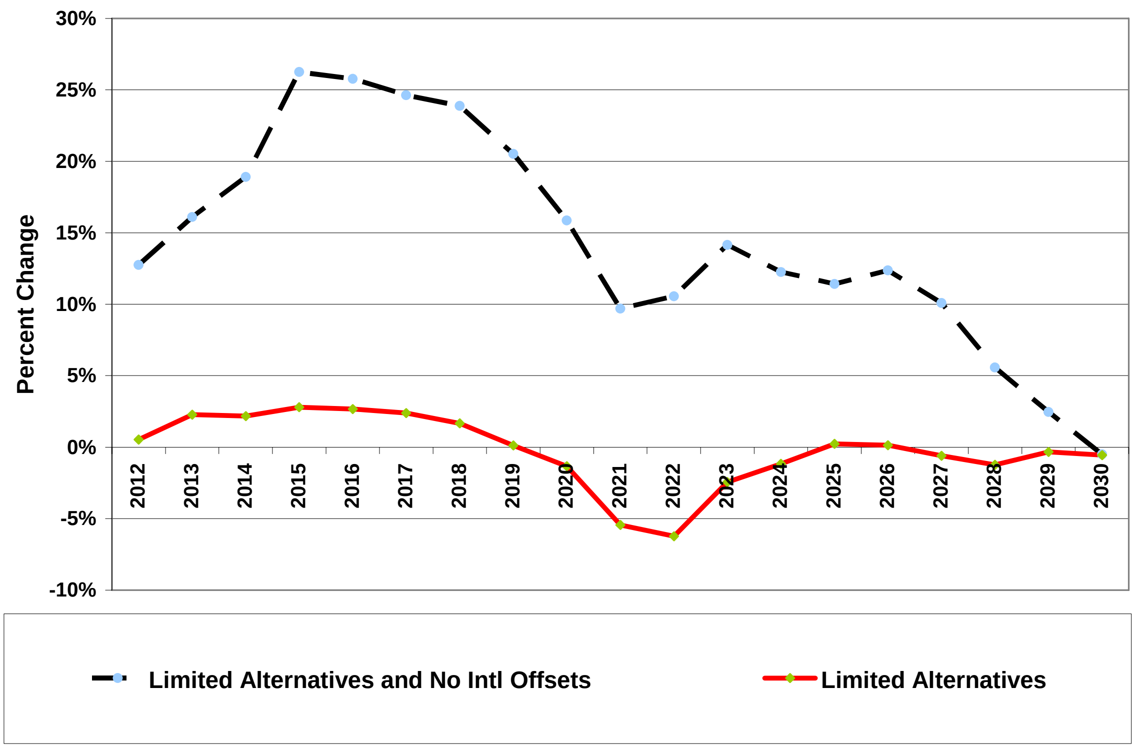
Q. Doesn't the EIA's recent modeling of H.R. 2454, the Waxman-Markey bill, show natural gas prices decreasing simply because most of the scenarios studied assume significant additions to the number of nuclear power plants in the U.S?

A. No. The EIA also modeled two "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.

Q. What impact did the proposed Waxman-Markey bill have on natural gas prices in these two Limited Alternatives 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 6 below. This Figure presents the same information that was presented in Figure 5, above, except that all of the other scenarios modeled by the EIA other than the "Limited Alternatives" scenarios have been removed. These other scenarios assumed some large nuclear additions.

Figure 6: Changes from Base Case Natural Gas Prices in EIA "Limited Alternatives" Modeling Scenarios



As can be seen from Figure 6, natural gas prices did not increase very much, at all, as compared to the reference case prices in the EIA "Limited Alternatives" scenario that constrained new nuclear, biomass and coal plant with CCS additions.[35] In fact, over time natural gas prices were projected to decrease, as compared to the reference case, because of the cost of the fuel's CO_2 emissions.

Natural gas prices only increased significantly in the scenario which added a prohibition on the use of international offsets to the "Limited Alternatives" scenario.

[35] The reference case examined by the EIA did not assume regulation of CO_2 emissions.

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

A. No. The Waxman-Markey bill and the Kerry-Boxer legislation under consideration in the U.S. Senate both would allow significant use of international offsets. Therefore, the gas price impacts are more likely to track the lower line in Figure 6.

Q. But doesn't common sense suggest that regulating greenhouse gas emissions will lead to less coal-fired generation and more of a dependence on natural gas – thereby increasing the demand for and price of natural gas?

A. Not necessarily, especially over the mid-to-longer term. In fact, there are several reasons why federal regulation of greenhouse gas emissions may not lead to any meaningful increases in the price of natural gas. First, natural gas plants also emit CO_2. Thus, there will be incentives as a result of federal regulation of greenhouse gases to shift away from use of natural gas to more carbon neutral options such as energy efficiency and renewable resources. This will act to reduce the demand for natural gas as well as coal-fired generation.

It also is generally accepted that strategies for reducing our national greenhouse gas emissions will require implementing complementary policies adding large amounts of new wind and energy efficiency. Thus, legislative proposals for regulation of greenhouse gases, such as the Waxman-Markey bill also included increased investments in these areas. Consequently, carbon legislation, when coupled with increasing amounts of new wind and energy efficiency, actually may lead to decreases in the demand for and, consequently, reduced costs for natural gas over the long term, counter to what the Applicants have assumed.

For example, 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.[36] 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.[37]

The substantially higher domestic U.S. natural gas supplies that have been identified within the past year, as I discussed earlier, also will reduce the impact that regulation of CO_2 emissions could have on natural gas prices.

IGCC PLANTCONSTRUCTION COSTS

Q. What is the currently estimated construction cost for the proposed Kemper County IGCC plant?

A. MPCo's currently estimated construction cost for the Kemper County plant is $2.106 billion. This reflects approximately $254.6 million in incentives and benefits.[38]

Q. Are any elements of the current Kemper County plant construction cost estimate subject to cost caps?

A. No. MPCo has indicated that "Unless fixed by third-party contract when executed, none of the estimates contained in the Company's filing are subject to contractual 'cost caps.'"[39]

Q. What is the status of the contracting for the purchase of equipment for the Kemper County plant?

A. MPCo has said that it has signed a contract for the steam turbine generator.[40] The vendors for the remaining equipment are unknown because either the

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36 *20 Percent Wind Energy by 2030*, available at http://www.20percentwind.org/20p.aspx?page=Report.

37 Id, at pages 16 and 154.

38 Mississippi Power Company response to Data Request No. Entegra 1-4.

39 Mississippi Power Company response to Data Request No. Entegra 1-5.

equipment has not yet been set out for bid or, for those pieces that have been bid, the Company has not yet selected a vendor.[41]

Q. What is the status of the design for the proposed Kemper County IGCC plant?

A. According to MPCo, the detailed design for the Project has not yet begun.[42]

Q. Is it reasonable to expect that the cost to build the proposed Kemper County IGCC plant will increase significantly over time if the project is approved by the Commission and built?

A. Yes. Coal power plant construction costs have risen dramatically in recent years as a result of a worldwide competition for design and construction resources, equipment, and commodities like concrete, steel, copper and nickel. Terms like "staggering" and "skyrocketing" have been used to describe these cost increases. Coal-fired power plants that were estimated to cost $1500 per kilowatt in 2002 are now projected to cost in excess of $3500 per kilowatt.[43]

Almost all other proposed coal-fired power plants, of which I am aware, have experienced large cost increases in recent years. For example, the estimated per unit construction cost of Duke Energy Carolina's Cliffside Project increased by 80 percent between the summer of 2006 and June 2007. Similarly, AMP-Ohio just cancelled its proposed Meigs County coal plant after the estimated cost of the plant increased by 37 percent in only 13 months after the previous estimate was issued.

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[40] Mississippi Power Company responses to Data Request No. Entegra 1-14.a.

[41] Id.

[42] Mississippi Power Company response to Data Request Sierra Club-MPC 1-41.

[43] See the Synapse Report, *Coal-Fired Power Plant Construction Costs*., a copy of which is attached as Exhibit DAS-4.

Consequently, it is reasonable to expect that the actual cost of building the Kemper County IGCC plant will be significantly higher than Mississippi Power Company currently estimates.

Q. Are there any reasons to expect that the technology being proposed for the Kemper County Project might be susceptible to cost increases?

A. Yes. As Company witness Flowers has testified, the Kemper County plant will represent the first large-scale application of the TRIG gasification technology.[44] I understand that although the process that MPCo plans to use to capture the CO_2 from the proposed IGCC plant has been used in industry for years, it has not yet been used on the commercial scale at which it would be used at the proposed plant. This creates some additional cost uncertainty.

Q. What other IGCC plants are currently under construction in the U.S.?

A. I believe that Duke Energy Indiana's Edwardsport plant is the only IGCC project that is currently under construction in the U.S. A number of other IGCC plants have been proposed but some have been cancelled and the remaining projects have either been formally delayed or are otherwise not moving forward very aggressively.

Q. Have you seen any explanations of why some utilities have cancelled or significantly delayed their proposed IGCC plants?

A. Yes. For example, Xcel Energy announced in October 2007 that it was indefinitely deferring its plans to build an IGCC plant in Colorado because the development costs were higher than the utility originally expected.[45]

Similarly, Tampa Electric cancelled a proposed IGCC plant in the fall of 2007 due to uncertainty related to CO_2 regulations, particularly capture and sequestration issues, and the potential for related project cost increases. According to a press

[44] Direct Testimony of Kimberly D. Flowers, filed January 16, 2009, at page 40, lines 5-6.

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.

In addition, the Tondu Corp. announced in June 2007 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.[46]

Q. Are you aware of whether any state regulatory commissions have denied rate recovery for investments in a proposed IGCC plant or have refused to allow a utility to enter into a purchase power agreement for the output from a proposed IGCC plant?

A. Yes. In August of 2007, the Minnesota Public Utilities Commission refused to require Xcel Energy to enter into an agreement to purchase power from a proposed IGCC plant on the grounds that the terms and conditions of the proposed contract were not consistent with the public interest because they would result in unreasonably high prices for Xcel and unreasonably high rates for Xcel's ratepayers.[47]

Then, in April of 2008, the Virginia State Corporation Commission denied Appalachian Power Company's request to recover costs associated with a proposed IGCC plant from its Virginia ratepayers citing uncertainties of costs, technology, and unknown federal mandates.[48] The Commission found that the

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45 Denver Business Journal, October 30, 2007.
46 http://www.reuters.com/article/companyNewsAndPR/idUSN1526955320070615
47 Order in Docket No. E-6472/M-05-1993, issued on August 30, 2007, at page 17. Available at https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId={825E0DB0-0D4B-4261-BF18-84643EAC49BD}&documentTitle=4762105.
48 Final Order in Case No. PUE-2007-00068, April 14, 2008. Available at http://scc.virginia.gov/newsrel/e_apfrate_08.aspx.

Company's (APCo) cost estimate for project was "not credible" -- it had not been updated since November 2006.[49]

The Commission also concluded that "… APCo has no fixed price contract for any appreciable portion of the total construction costs; there are no meaningful price or performance guarantees or controls for this project at this time. This represents an extraordinary risk that we cannot allow the ratepayers of Virginia in APCo's service territory to assume."[50]

It also noted the uncertainties surrounding federal regulation of carbon emissions and carbon capture and sequestration technology and costs and observed that the Company was asking for a "blank check."[51] On this basis, the Commission concluded that "We cannot ask Virginia ratepayers to bear the enormous costs – and potentially huge costs – of these uncertainties in the context of the specific Application before us."[52]

Q. What has been the construction cost experience of Duke Energy Indiana's Edwardsport IGCC Project?

A. At the time it requested a certificate from the Indiana Utility Regulatory Commission in the spring of 2007, Duke Energy Indiana estimated that its proposed Edwardsport IGCC unit would cost $1.985 billion. However, in April 2008, just one year later, Duke announced an 18 percent increase in the estimated cost of its proposed IGCC coal plant. 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

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[49] Id, at pages 4 to 5.
[50] Id, at page 5.
[51] Id, at page 10.
[52] Id, at page 10.

labor costs."[53] Duke also noted in its Petition to the Indiana Utility Regulatory Commission that this projected increase in cost was "consistent with other recent power plant project cost increases across the country."[54]

Then, just two weeks ago, Duke announced another 6.4 percent increase in the IGCC unit and warned the Indiana Commission that there may be further increases in the project, which is only 44 percent complete:

> The Edwardsport IGCC Project has made considerable progress in the six months since our previous filing. Construction is proceeding at an expected pace and the total project is approximately 44% complete. Yet, despite Petitioner's best efforts to rigorously manage the Edwardsport IGCC Project, we have experienced design modifications and scope growth above what was anticipated from the preliminary engineering design, adding capital costs to the Project. We are currently forecasting that the additional capital cost items will use the remaining contingency and escalation amounts in the current \$2.35 billion cost estimate and add approximately \$150 million, or about 6.4%, to the estimated cost of the Project. The Company is in the process of determining how this increase in capital costs will impact the total Project cost estimate, including the impact associated with additional contingency. Over the next few months, we will be examining items such as craft labor estimates, final engineering, procurement and start-up estimates to better understand the potential cost increases and how much additional contingency will be needed to complete the Project.[55]

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

54 Id, at page 7.

55 *Verified Petition and Motion for Subdocket Proceeding*, Duke Energy Indiana, Indiana Utility Regulatory Commission Cause No. 43114 IGCC-4, November 24, 2009, at page 3.

Q. Is it reasonable to expect that the construction cost of the Kemper County IGCC plant will increase by more than the approximate $260 million in financial incentives that Mississippi Power Company says it will be receiving from the investment tax credits, DOE loan guarantees, and other incentives?[56]

A. Yes. Given the cost escalation experienced by other coal plant construction projects, including, especially, the Edwardsport IGCC plant, it is reasonable to expect that the construction cost of the Kemper County plant will increase by substantially more than $260 million, thereby offsetting the benefits provided by the investment tax credits and the other benefits from the federal, state and local governments cited by MPCo.

Q. How should MPCo reflect the future of higher construction costs in its economic analyses of the proposed Kemper County IGCC unit?

A. The Company's base case analyses should reflect MPCo's most recent cost estimate for the Kemper County plant. However, there is a significant risk that the actual cost of constructing the proposed Kemper County IGCC plant could be substantially higher than Mississippi Power Company's current estimate. The Company's economic assessments should reflect this risk by including scenarios in which the cost of the proposed IGCC plant is 20 percent and 40 percent above the currently estimated cost.

Q. Does this complete your testimony?

A. Yes.

[56] January 2009 Petition for Facilities Certificate for the Kemper County IGCC Project, at page 6.