STATE OF INDIANA

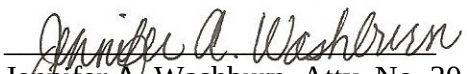
INDIANA UTILITY REGULATORY COMMISSION

VERIFIED PETITION OF INDIANAPOLIS POWER & LIGHT COMPANY ("IPL"), AN INDIANA CORPORATION, FOR (1) CERTIFICATES THAT PUBLIC CONVENIENCE AND NECESSITY ("CPCN") WILL BE SERVED BY COMPLIANCE PROJECTS TO ALLOW IPL TO COMPLY WITH FEDERALLY MANDATED REQUIREMENTS AT PETERSBURG GENERATING STATION; (2) APPROVAL OF ASSOCIATED ACCOUNTING AND RATEMAKING TREATMENT, INCLUDING COST RECOVERY IN ACCORDANCE WITH IND. CODE § 8-1-8.4-7 AND AUTHORITY TO DEFER COSTS UNTIL SUCH COSTS ARE REFLECTED IN RATES; AND 3) TO THE EXTENT NECESSARY OR APPROPRIATE ISSUANCE OR MODIFICATION OF CPCN FOR THE USE OF CLEAN COAL TECHNOLOGY PURSUANT TO IND. CODE CH. § 8-1-8.7	)	**CAUSE NO. 44794**

SUBMISSION OF REDACTED DIRECT TESTIMONY

Citizens Action Coalition of Indiana, Inc., and Sierra Club, Inc., by counsel, respectfully submit the following redacted prefiled testimony and exhibits in the above captioned Cause to the Indiana Utility Regulatory Commission.

Respectfully submitted,



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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing was served by electronic mail or U.S. Mail, first class postage prepaid, this 4th day of October, 2016, to the following:

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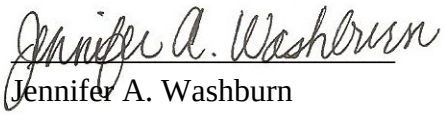

Jennifer A. Washburn
Citizens Action Coalition

STATE OF INDIANA

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VERIFIED PETITION OF INDIANAPOLIS POWER & LIGHT COMPANY ("IPL"), AN INDIANA CORPORATION, FOR (1) CERTIFICATES THAT PUBLIC CONVENIENCE AND NECESSITY ("CPCN") WILL BE SERVED BY COMPLIANCE PROJECTS TO ALLOW IPL TO COMPLY WITH FEDERALLY MANDATED REQUIREMENTS AT PETERSBURG GENERATING STATION; (2) APPROVAL OF ASSOCIATED ACCOUNTING AND RATEMAKING TREATMENT, INCLUDING COST RECOVERY IN ACCORDANCE WITH IND. CODE § 8-1-8.4-7 AND AUTHORITY TO DEFER COSTS UNTIL SUCH COSTS ARE REFLECTED IN RATES; AND 3) TO THE EXTENT NECESSARY OR APPROPRIATE ISSUANCE OR MODIFICATION OF CPCN FOR THE USE OF CLEAN COAL TECHNOLOGY PURSUANT TO IND. CODE CH. § 8-1-8.7	)	**CAUSE NO. 44794**

DIRECT TESTIMONY OF DAVID A. SCHLISSEL
ON BEHALF OF
CITIZENS ACTION COALITION OF INDIANA AND SIERRA CLUB
OCTOBER 4, 2016

PUBLIC VERSION

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INTRODUCTION

Q. Please state your name and business address.

A. My name is David A. Schlissel. I am the President of Schlissel Technical Consulting, Inc., 45 Horace Road, Belmont, Massachusetts 02478.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the Citizens Action Coalition of Indiana and Sierra Club ("Joint Intervenors").

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 38 states to prepare expert testimony and analyses on engineering and economic issues related to electric utilities. My recent clients have included the U.S. Department of Justice, the Attorney General and the Governor of the State of New York, state consumer advocates, and national and local environmental and consumer organizations.

I have filed expert testimony before state regulatory commissions in Arkansas, Arizona, California, Colorado, Connecticut, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oregon, Rhode Island, South Carolina, South Dakota, Texas, Vermont, Virginia, West Virginia, and Wisconsin and before an Atomic Safety & Licensing Board of the U.S. Nuclear Regulatory Commission.

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A copy of my current resume is included as Attachment DS-1. Additional information about my work is available at www.schlissel-technical.com.

Q. Have you testified previously before this Commission?

A. Yes. I have testified in Cause Nos. 38045, 43114, 43114 S1, and 43114 IGCC-1, IGCC-4, IGCC-4S1, IGCC-8, IGCC-10, and IGCC-12 & 13. I also submitted testimony in Cause No. 38702-FAC-40-S1, which was settled prior to the scheduled hearings.

Q. What is the purpose of your testimony in this proceeding?

A. I was asked to assess the economic viability of Indianapolis Power & Light's (IPL or the Company) proposed environmental upgrades at the Petersburg Units 1-4.

Q. What materials have you reviewed in your preparation of this testimony?

A. I have reviewed the testimony and exhibits filed by IPL and the Company's responses to discovery requests submitted by the active parties to this proceeding, as well as publicly available information on the Petersburg units, natural gas prices, and past, current and future MISO loads, resources, and energy and capacity market prices.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Q. Please summarize your principal conclusions and findings.

A. The results of IPL's analysis of the proposed National Ambient Air Quality Standards (NAAQS) and Coal Combustion Residuals (CCR) environmental upgrades at Petersburg are driven by the extremely optimistic, unreasonable assumption that the future will be very different (and much more favorable to the economics of coal-fired generation) than the recent past. In particular, IPL assumes that:

1. [redacted]

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2. Petersburg will [redacted] its recent multi-year trend of declining generation and, instead, [redacted] factors for a period of some 12 to 16 years, or longer.

3. [redacted]

4. Despite the tremendous growth in installed wind capacity in recent years and sharply declining wind and solar costs, Petersburg will not face increasing competition from renewable wind and solar resources in future years.

5. Petersburg's future operating performance will not deteriorate and/or its operating costs or capex will not increase significantly despite the aging of plant components, structures and equipment.

Also, IPL's analysis of the proposed NAAQS and CCR environmental upgrades is biased by its failure to consider the potential for renewable wind and solar photovoltaic (PV) resources and energy efficiency to be significant contributors as part of a portfolio of alternatives for replacing Petersburg's energy and capacity.

Q. Please summarize your recommendations.

A. I am recommending that the IURC deny IPL's application and instead require the Company to evaluate the economics of alternatives to Petersburg's continued operation in the context of its ongoing IRP analyses.

I am also recommending that because IPL is basing its economic analyses on such a drastic change in future circumstances from what we have seen in recent years, that if the Company is allowed to undertake the proposed NAAQS and CCR environmental upgrades, it be required to bear some of the risks that the revenues it receives from selling Petersburg's energy and capacity into the MISO markets do not fully recover its future costs of producing power at the plant. Ratepayers, who have had no say in deciding whether the Company should complete the proposed environmental

upgrades and continue to operate Petersburg should not be forced to bear all of these significant risks.

NATURAL GAS PRICES

Q. Why are the projected natural gas prices assumed in IPL's economic analyses of its proposed NAAQS and CCR environmental upgrades important?

A. The level of natural gas prices affect the cost of generating power at natural gas-fired plants which, in turn, determines the market clearing prices during many peak- and off-peak hours of the year. At the same time, the level of future natural gas prices assumed in an analysis of proposed plant upgrades will impact how much generation the plant is modeled to produce because, in scenarios with lower gas prices, generation from a coal-fired plant like Petersburg will be displaced in the model in more hours of the year. Thus, lower natural gas prices would adversely impact the economics of investing in proposed plant upgrades in two ways: by reducing the revenue that the plant owner would receive from selling its generation into the MISO energy market and by decreasing the amount of power (in MWh) that the plant would generate. Consequently, it is important not to use a range of natural gas prices in the analysis that is too high, as this will bias the analysis in favor of the plant's continued operation and completion of the proposed environmental upgrades and against any alternative that includes either some new natural gas-fired capacity or increased reliance on the energy market.

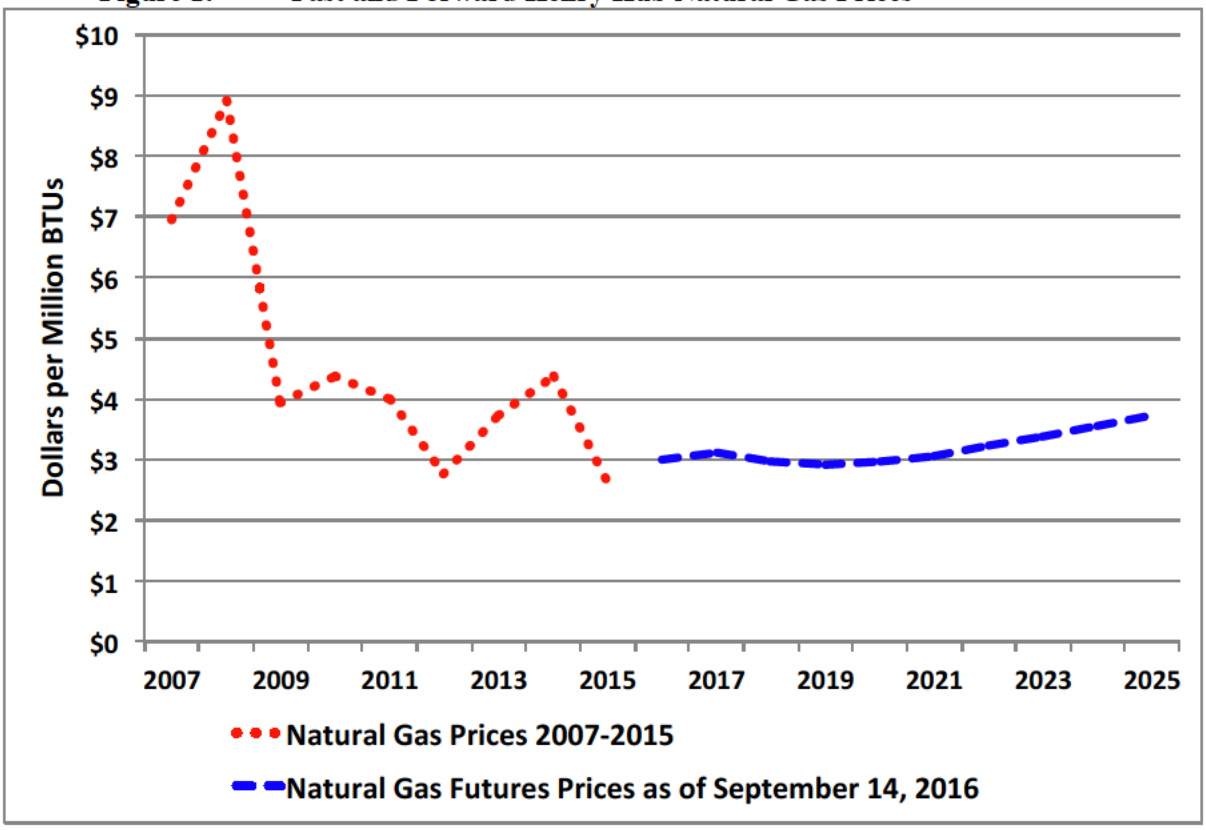
Q. Are the analyses discussed in the testimony filed by IPL witnesses Soller and Crockett based on a reasonable range of projected natural gas prices?

A. No. The range of natural gas prices on which IPL's economic analyses are based is [redacted]. This biases the analyses in favor of undertaking the proposed environmental upgrades at Petersburg.

Q. Please explain.

A. As shown in Figure 1, below, natural gas prices collapsed between 2008 and 2009 as a result of increased supplies due to the production from shale gas formations, and have remained low since then except for a small uptick in early 2014. Current natural gas futures prices (which represent the market's view of future natural gas prices) also are expected to remain very low in coming years, with only modest escalation through 2025.

Figure 1: Past and Forward Henry Hub Natural Gas Prices[1]



[1] Historic prices from EIA. Forward gas prices from OTC Global Holdings, downloaded from SNL Financial on September 15, 2016.

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Q. How do the natural gas prices that IPL used in its analyses of the proposed NAAQS and CCR environmental upgrades compare to recent gas prices and futures prices?

A. As shown in Figure 2 (Confidential), below, the base case and high gas price forecasts assume that there will be [redacted] than that reflected in the futures prices available in the market.

Figure 2: IPL's Assumed Natural Gas Prices v. Recent Prices and Futures Prices as of September 14, 2016(Confidential)[2]

Q. What is the source of the IPL gas price forecasts shown in Figure 2?

A. IPL used ABB's Fall 2015 forecast in its modeling analyses of the proposed NAAQS and CCR environmental upgrades.

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[2] IPL Data from IPL Response to CAC DR 2.6, Confidential Attachments (to be provided with JIs' Workpapers).

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Q. How accurate have ABB's Fall 2015 natural gas price forecasts been so far in 2016?

A. Actual Henry Hub natural gas prices during the first eight months of 2016 averaged $2.25 per million BTUs. As shown in Figure 3 (Confidential), below, this [redacted].

Figure 3: IPL's Fall Gas Price Forecasts vs. Actual 2016 Prices (Confidential)[3]

[3] IPL Data from IPL Response to CAC DR 2.6, Confidential Attachments (to be provided with JIs' Workpapers).

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Q. What is your recommendation concerning the natural gas prices that IPL should have used to analyze the economic viability of its proposed Petersburg NAAQS and CCR environmental upgrades?

A. The Company should use the ABB Fall 2015 low gas price forecast as its base case and considered high and low gas price sensitivity studies of ±10% around that base case forecast. This would have been more than reasonable given that ABB's Fall 2015 low gas price forecast is higher than both current futures prices and actual prices through August 2016.

ENERGY MARKET PRICES

Q. What is the recent history of energy market prices in MISO Zone 6, the zone that includes Indiana and portions of Kentucky?

A. Competitive energy market prices (EMPs) dropped significantly after natural gas prices collapsed in 2009. As shown in Figure 4, below, both peak- and off-peak hour energy market prices in MISO Zone 6 have, on average, remained low since then, except for an uptick during 2014 as a result of the polar vortex event. Current forward prices suggest EMPs will remain low for the coming years.

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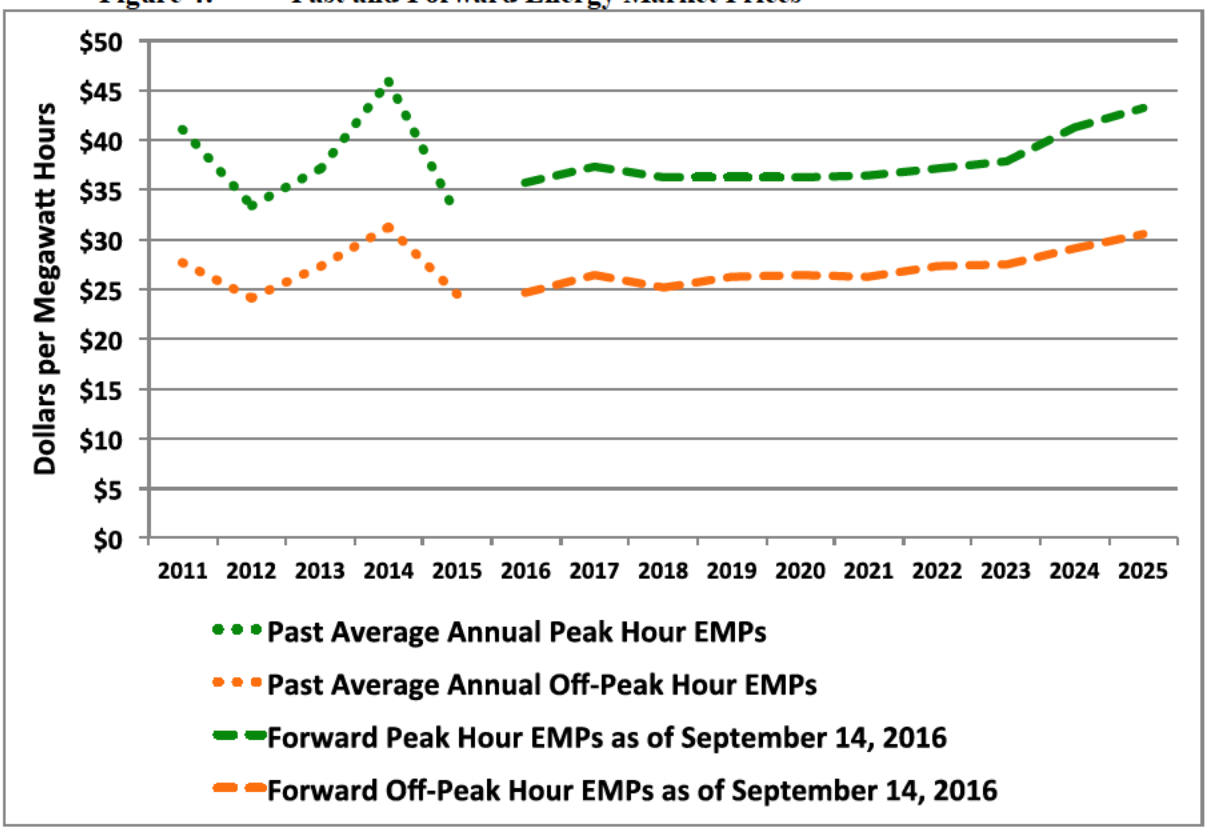
Figure 4: Past and Forward Energy Market Prices[4]



Q. What is the source of the energy market prices that IPL uses in its analyses of the proposed Petersburg NAAQS and CCR environmental upgrades?

A. IPL uses three energy market price forecasts from ABB's Fall 2015 forecast in its analyses of the proposed NAAQS and CCR upgrades – Base Case, Low Gas Price, and High Gas Price. It also has used two forecasts from ICF, a Federal Legislative Scenario, and a Mass Cap Scenario.

[4] Past and forward MISO energy market prices downloaded from SNL Financial.

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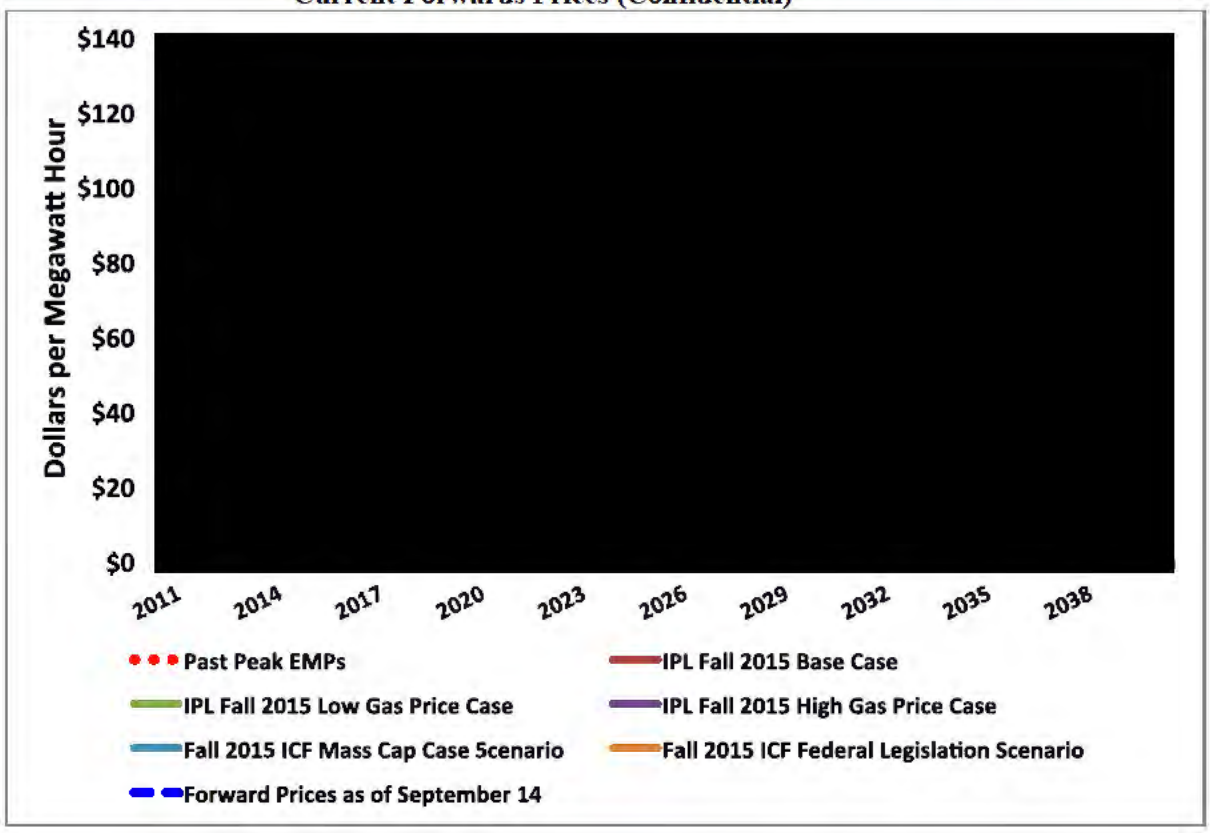
Q. How do the energy market prices that ICF uses in its analyses of the proposed Petersburg NAAQS and CCR environmental upgrades compare to recent and forward EMPs?

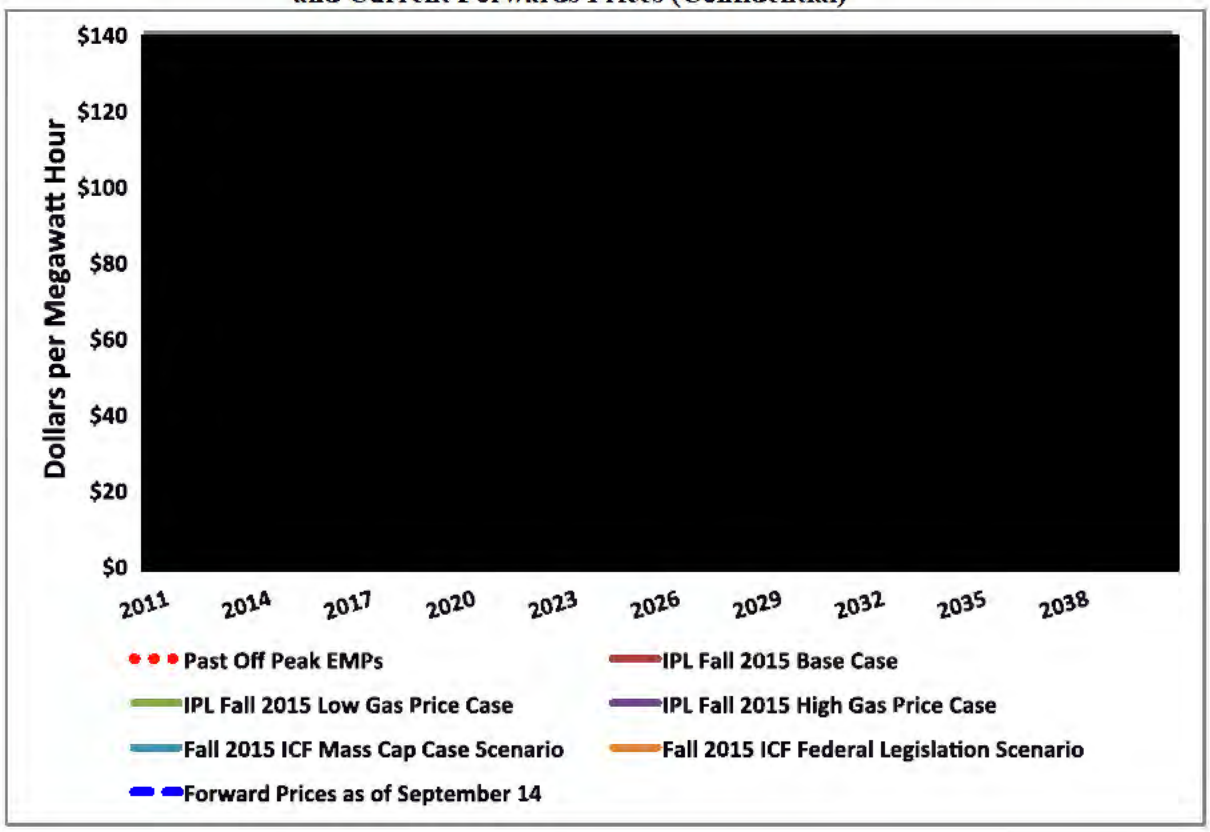
A. As shown in Figure 5 (Confidential) and Figure 6 (Confidential), the forecast peak- and off-peak hour EMPs in IPL's Fall 2015 Base and High Gas Price and the two ICF scenarios [redacted] in coming years, [redacted] the recent EMPs and current forward energy market prices [redacted]. Even the forecast off-peak EMPs in IPL's Low Gas Price case are [redacted] than current forwards prices.

Figure 5: IPL's Forecast Peak Energy Market Prices v. Recent EMPs Prices and Current Forwards Prices (Confidential)[5]



[5] IPL Data from IPL Response to CAC DR 2.6, Confidential Attachments (to be provided with JIs' Workpapers).

Figure 6: IPL's Forecast Off-Peak Energy Market Prices v. Recent EMPs Prices and Current Forwards Prices (Confidential)[6]



Q. Have the peak and off-peak energy market prices in the Fall 2015 forecast accurately predicted actual market prices so far in 2016?

A. No. As shown in Figures 7.a. (Confidential) and 7.b. (Confidential), actual peak hour EMPs in the first eight months of 2016 averaged some [redacted] the prices projected in the Fall 2015 Forecast used by IPL. Off-peak prices average some [redacted].

[6] IPL Data from IPL Response to CAC DR 2.6, Confidential Attachments (to be provided with JIs' Workpapers).

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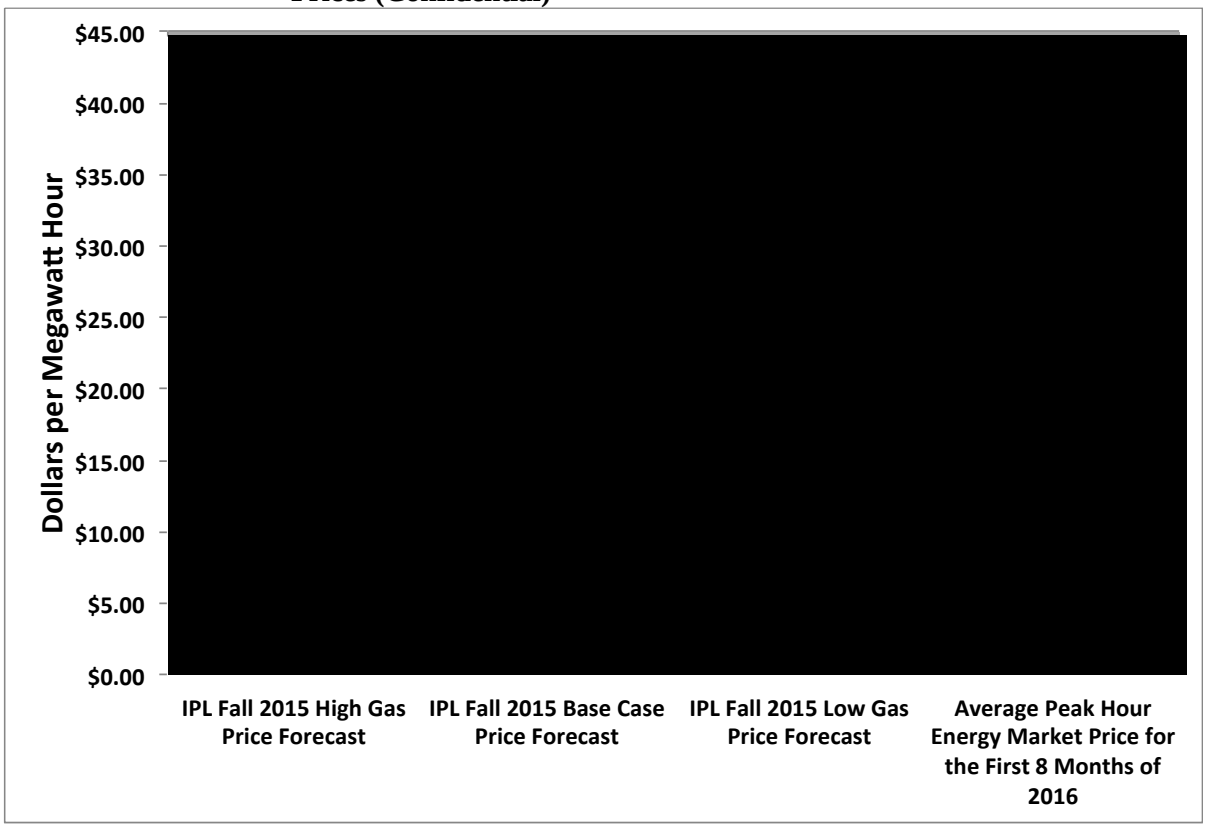
Figure 7.a.: IPL's Fall 2015 Peak Energy Market Price Forecasts vs. Actual 2016 Prices (Confidential)[7]



[7] IPL Data from IPL Response to CAC DR 2.6, Confidential Attachments (to be provided with JIs' Workpapers).

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Figure 7.b.: IPL's Fall 2015 Off-Peak Energy Market Price Forecasts vs. Actual 2016 Prices (Confidential)[8]

Q. Has there been any trend in recent energy market forward prices?

A. Yes. As shown in Figure 8.a. and Figure 8.b., energy market forward prices have trended fairly substantially downward in recent years.

[8] IPL Data from IPL Response to CAC DR 2.6, Confidential Attachments (to be provided with JIs' Workpapers).

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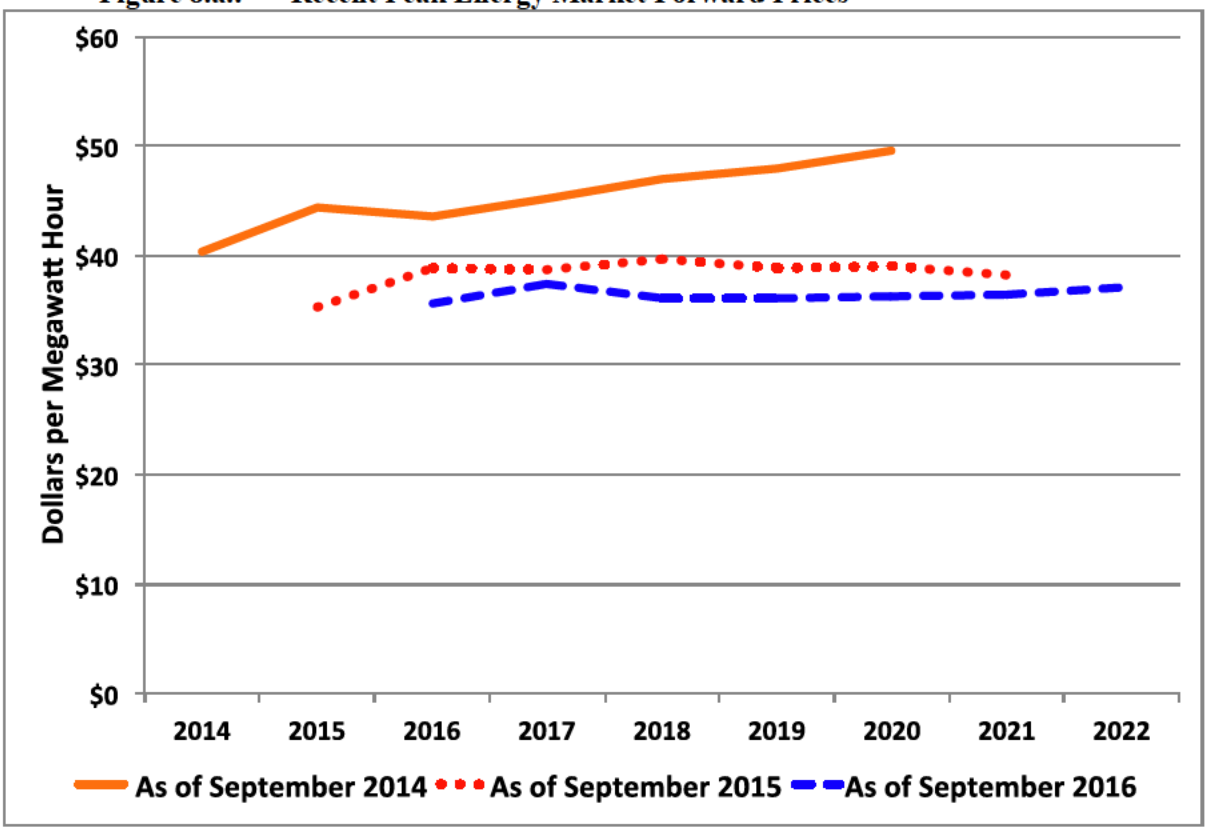
Figure 8.a.: Recent Peak Energy Market Forward Prices[9]



[9] Source: Forward Energy Market Prices downloaded from SNL Financial.

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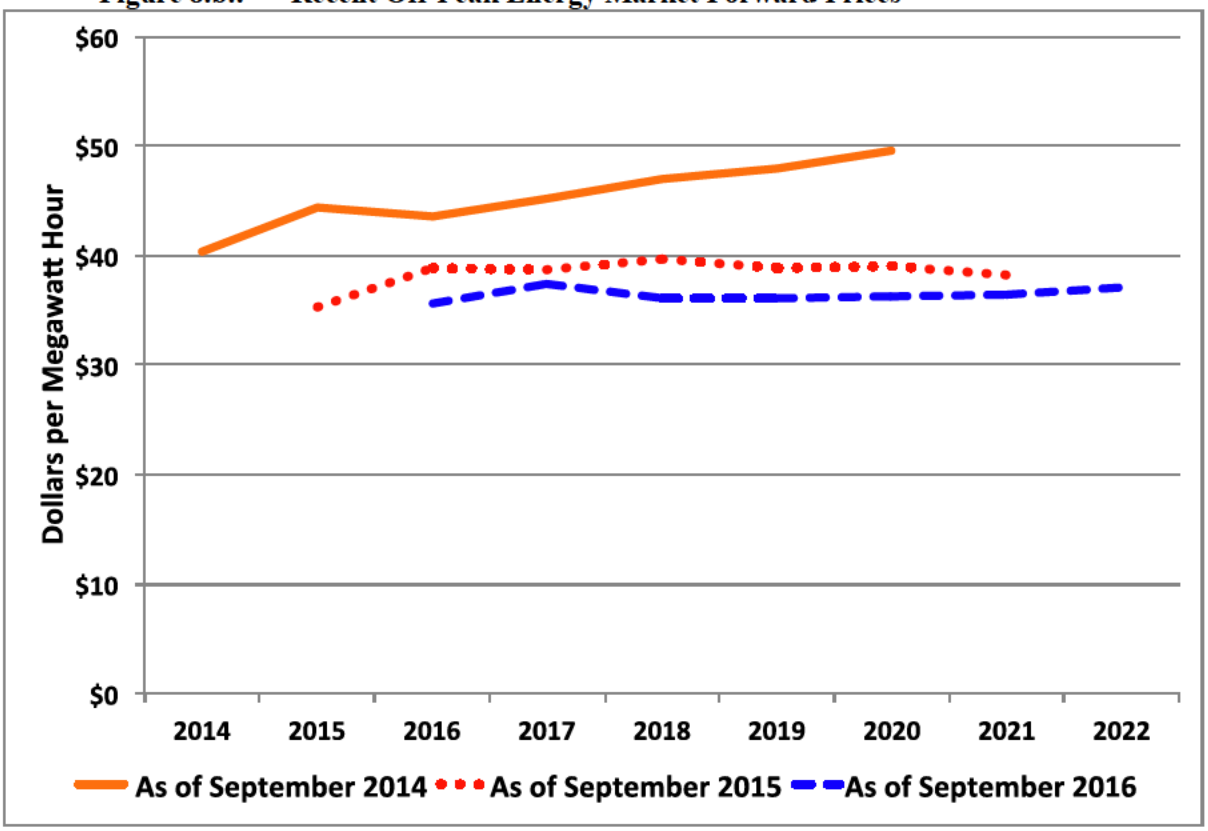
Figure 8.b.: Recent Off-Peak Energy Market Forward Prices[10]



Q. Are there any factors besides low natural gas prices that you expect will work to keep energy market prices low?

A. Yes. I believe that increasing competition from renewable wind and solar resources also will put pressure on energy market prices to remain low in coming years.

Q. Please explain.

A. MISO coordinates the movement of wholesale electricity in a multi-state region. One of the many ways in which it performs this function is through its energy market, which schedules generators to meet load on a day-ahead basis. This market balances supply and demand by continuously matching bids to provide electricity from generators with orders from utilities and other load-serving entities that buy power for

[10] Id.

resale to end users. All bids to supply electricity are stacked from lowest to highest, and accepted in that order until all requests for power (demand) have been met. The market price that results from minimizing bid production cost is the marginal cost of providing one more megawatt of energy to that location or node. This market price is known as the locational marginal price ("LMP") and every electricity supplier is paid the price of the highest-accepted bid regardless of its actual offer.

Simplistically, generators make offers into the MISO energy market that reflect the variable costs of production, which includes fuel, sorbents and reagents needed to operate pollution control systems, and variable operation and maintenance costs. Since renewables have no fuel costs, they typically bid into the market at zero (or sometimes with a negative bid because of the production tax credit), these resources are typically dispatched first. Nuclear and fossil fuel units are dispatched as needed to meet demand.

This is critical for two reasons. First, the ultimate energy price received by all generators is kept low when more renewable energy is used to meet demand because demand can be met without having to go to generators that are less efficient and more costly to run. Second, the increase in renewable generation will impact how often the plant runs. Not all generators in MISO are necessary to serve load every hour of the year; they will be dispatched according to demand. Since the market is continuously matching supply with demand, some generators may run at full load while others are only dispatched sporadically. Cumulatively this means that the ultimate energy market price is lower and that renewable energy will displace higher-priced energy from coal-fired units, like Petersburg.

Q. Has MISO added a significant amount of renewable energy?

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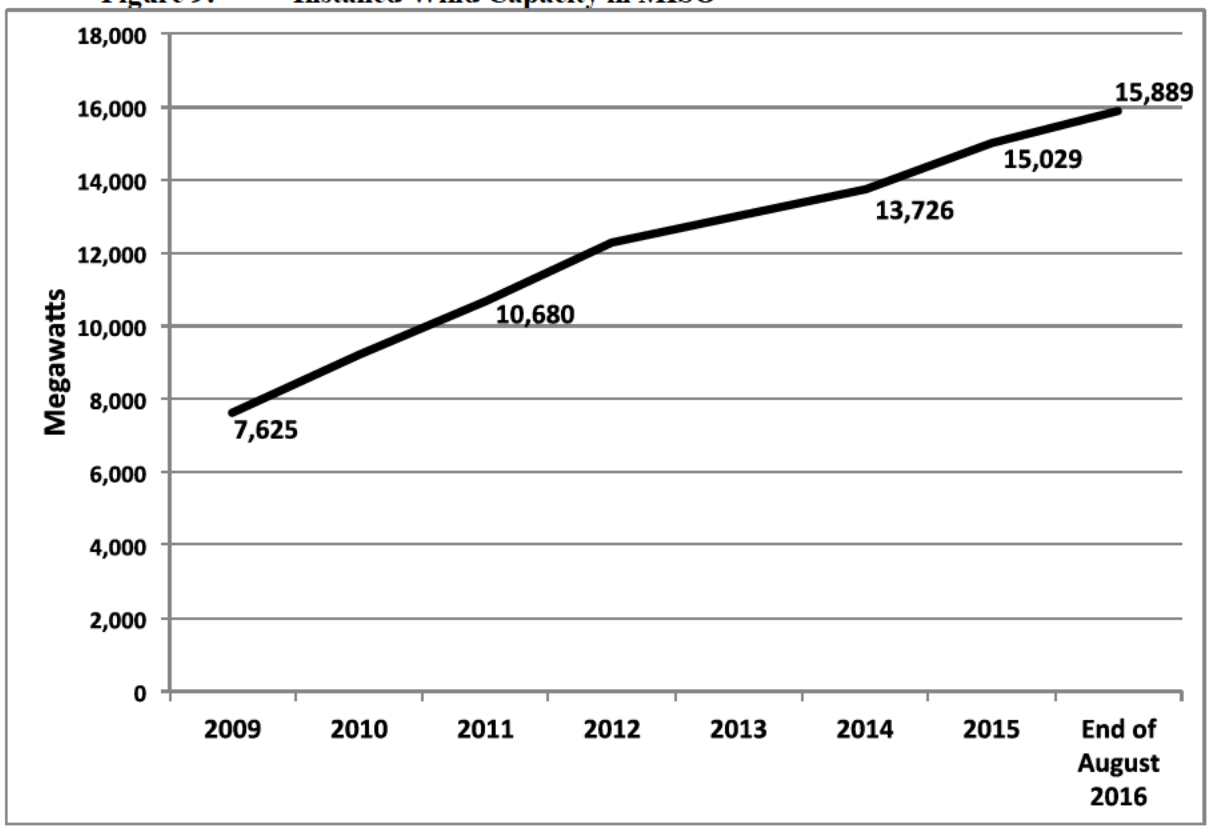
A. Yes. There already is a significant amount of installed wind capacity in MISO, having increased from 500 MW when the market began in 2005, to 7,600 MW in 2009 and nearly 16,000 MW at the end of August of this year.[11]

Figure 9: Installed Wind Capacity in MISO[12]



Although most of this wind capacity is in the western and northern areas of MISO, there was 1,895 MW of wind turbine capacity in Indiana as of the end of December 2015.[13]

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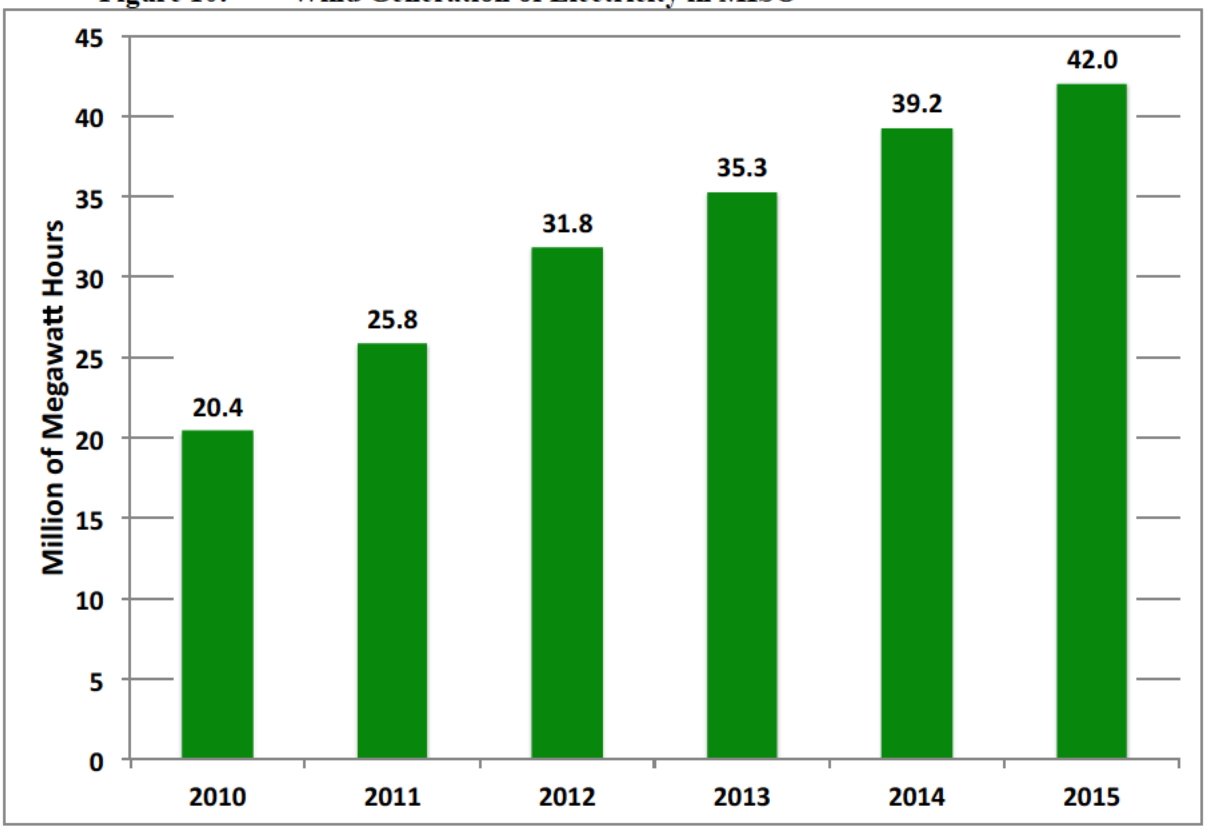
[11] MISO *Monthly Market Operations Reports*, available at https://www misoenergy.org/MarketsOperations/MarketInformation/Pages/MonthlyMarketOperationsReport.aspx

[12] Source: MISO *Annual and Monthly Market Operations Reports.* Available at https://www misoenergy.org/MarketsOperations/MarketInformation/Pages/MonthlyMarketOperationsReport.aspx

Generation of electricity by wind facilities has grown accordingly as the amount of installed wind has increased.

Figure 10: Wind Generation of Electricity in MISO[14]



Q. Does MISO anticipate that additional wind will be added in coming years?

A. Yes. MISO Executive Vice President of Operations and Corporate Services Richard Doying recently has been cited by SNL Financial as expecting a total of 25,000 MW of new wind will be added, presumably within the next decade.[15] This is consistent

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13 *2015 Wind Technologies Market Report*, U.S. Department of Energy, Lawrence Berkeley National Laboratory, August 2016, at Figure 5. Available at https://emp.lbl.gov/publications/2015-wind-technologies-market-report.

14 Source: MISO *Monthly Market Operations Reports*. Available at https://www misoenergy.org/MarketsOperations/MarketInformation/Pages/MonthlyMarketOperationsReport.aspx.

15 *MISO considers how to adapt to rapidly changing resource mix*, by Michael Lustig, SNL Financial, August 22, 2016.

with the new draft MISO *MTEP 16* study which projects that some 21,624 MW of new wind (net capacity) will be added between 2015 and 2019.[16]

Q. How many MW of wind are in the MISO Interconnection Queue?

A. As of the end of August 2016, there were wind projects with a total of 15,138 MW of capacity in the MISO 2016 Definitive Planning Queue.[17]

Q. What are the driving forces for the expansion of wind capacity in MISO?

A. There are several factors underlying the recent and projected expansion in wind-powered capacity in MISO, as well as the rest of the U.S.

1. Improvements in wind turbine technology have led to increased performance including, in particular, higher project capacity factors.[18]

2. Declining wind turbine prices have pushed down installed project costs, and continue to do so.[19]

3. Wind Power Purchase Agreement (PPA) prices have fallen significantly since 2009 including PPAs for power in the states within MISO.[20]

4. Congress' extension of the wind PTC through 2022.

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16 MISO *Book 1 Transmission Studies: Second Posting September 19, 2016 Draft*, at page 177. Available at https://www.misoenergy.org/Library/Repository/Study/MTEP/MTEP16/MTEP16%20Report.pdf.

17 MISO September 2016 *Informational Forum*, at page 43. Available at https://www misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/Informational%20Forum/2016/201609%20Informational%20Forum%20Presentation.pdf .

18 *2015 Wind Technologies Market Report*, U.S. Department of Energy, Lawrence Berkeley National Laboratory, August 2016, at pages vii and viii. Available at https://emp.lbl.gov/publications/2015-wind-technologies-market-report.

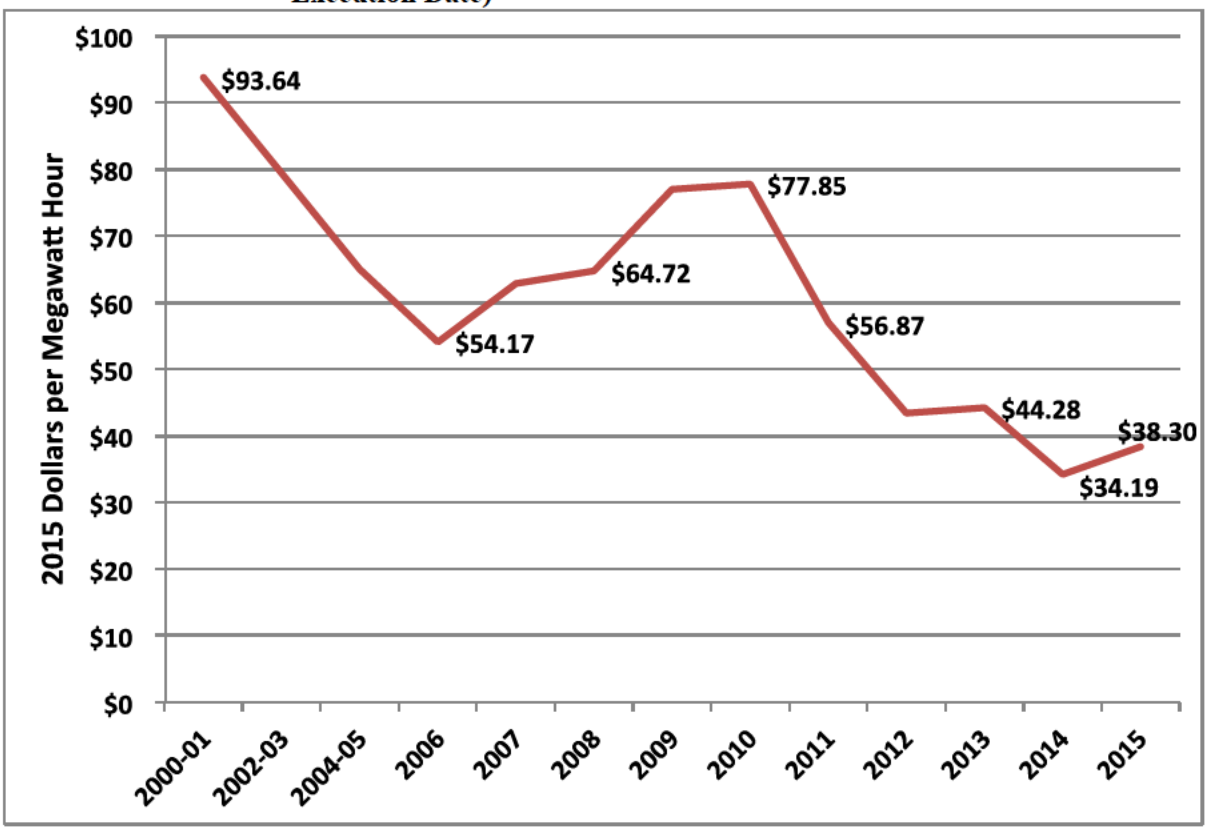
19 Id., at page ix.

20 Id.

Q. By how much have the prices of wind PPA's fallen since 2009?

A. Figure 11, below, shows the 50 percent decline in Wind PPA prices (in constant 2015 dollars) in the Great Lakes region of the U.S. since 2009.

Figure 11: Wind PPA Prices (Generation-weighted average levelized by PPA Execution Date)[21]



Q. Have solar prices similarly declined in recent years?

A. Yes. As shown in Figure 12, below, installed prices for utility-scale solar projects have declined nearly 60 percent since the years 2007-2009.[22] Installed prices for

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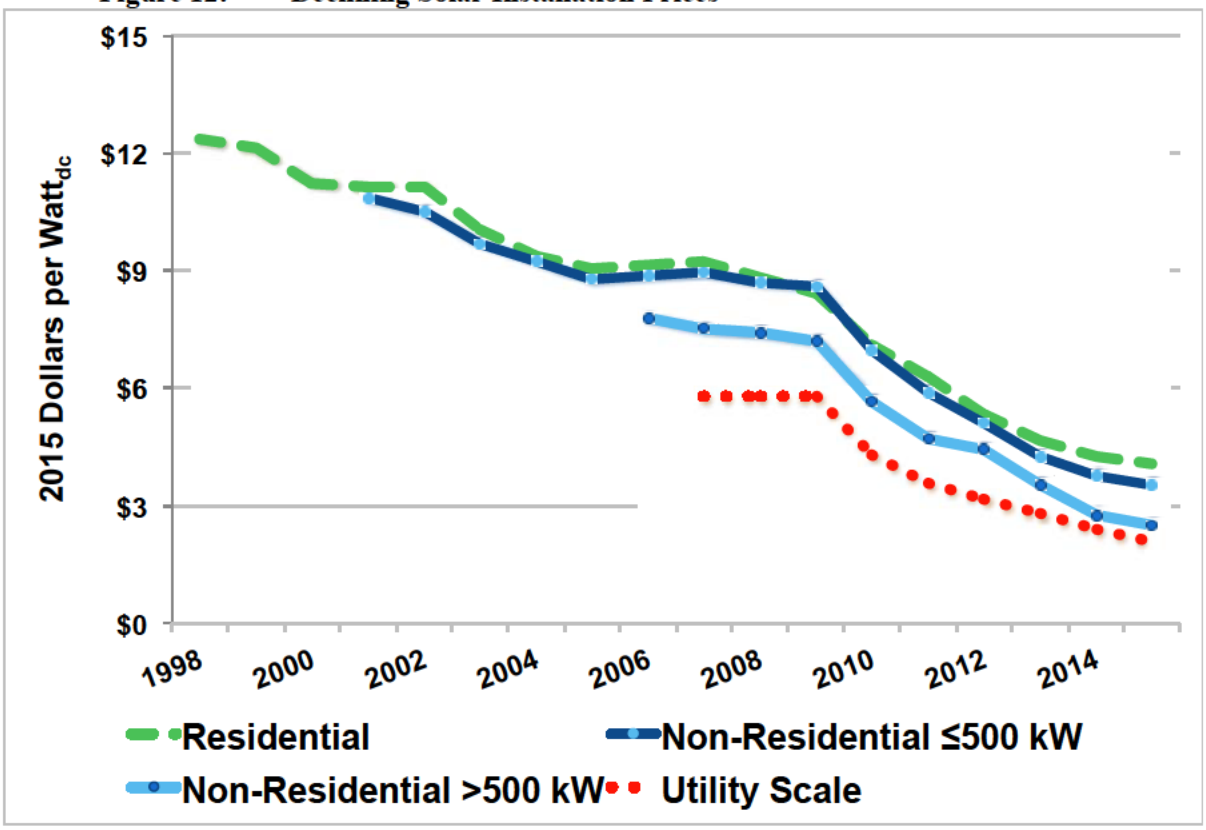
21 Id., at Figure 48.

22 *Utility-Scale Solar 2015*, Lawrence Berkeley National Laboratory, August 2016, at page 12. Available at https://emp.lbl.gov/sites/all/files/lbnl-1006037_report.pdf.

distributed solar PV resources have declined by an average of 6 percent to 12 percent a year since 1998, with the most rapid reductions occurring after 2009.[23]

Figure 12: Declining Solar Installation Prices[24]



Q. Are installed solar prices expected to continue to decline in coming years?

A. Yes. The goal of the U.S. Department of Energy's SunShot Initiative is to reduce installed solar prices to $1,000 per MW.[25] However, analysts believe that installed prices can be reduced to even lower prices.[26]

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23 *Tracking the Sun IX: The Installed Price of Residential and Non-Residential Photovoltaic Systems in the United States*, Lawrence Berkeley National Laboratory, August 2016, at page 14. Available at https://emp.lbl.gov/sites/all/files/tracking_the_sun_ix_report.pdf.

24 Id., at Figure 48.

25 See http://energy.gov/eere/sunshot/sunshot-initiative.

26 *US Solar & Alternative Energy: It's Not Just Solar Panel Costs Dropping*, UBS Financial, September 27, 2016. Available at https://neo.ubs.com/shared/d1acSU2mm9/.

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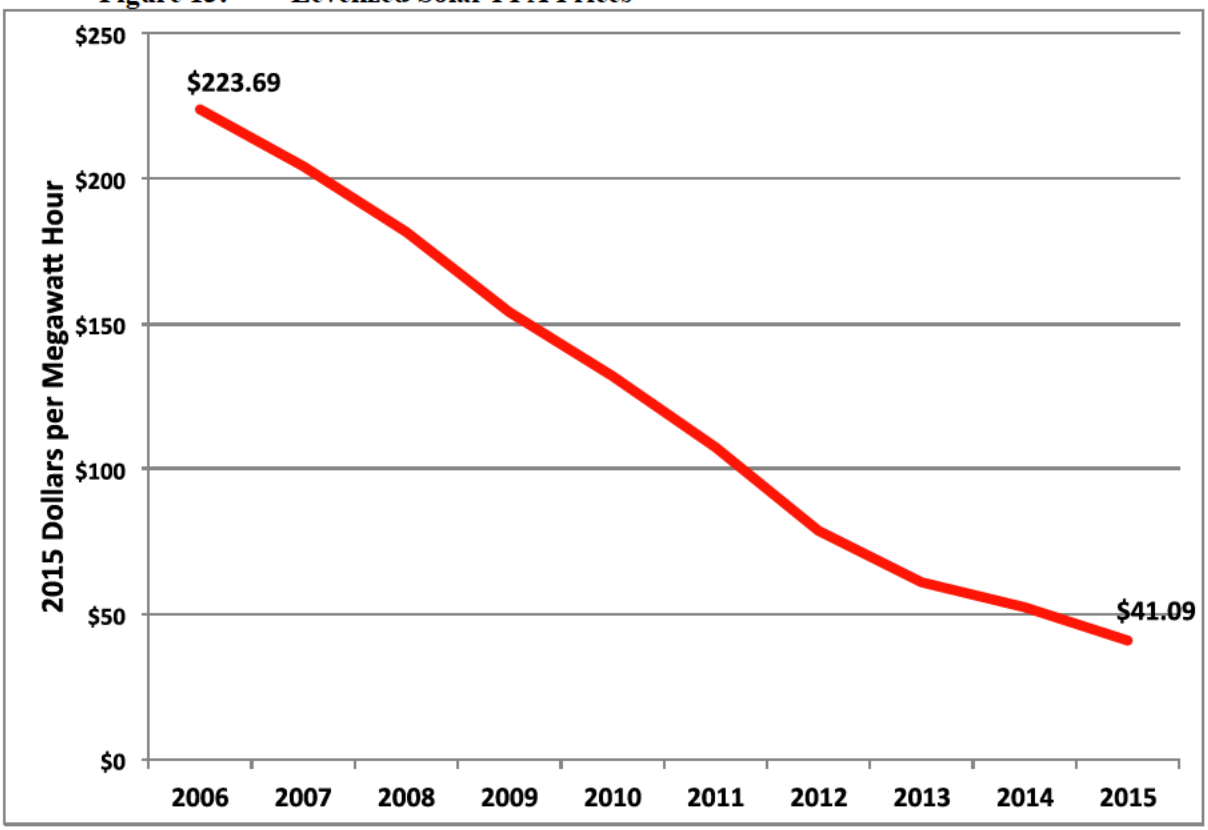
Q. Have solar PPA prices fallen as installed prices have declined?

A. Yes. As shown in Figure 13, below, solar PPA prices in the U.S. have fallen dramatically as a result of lower installation prices and improved panel operating performance. Many new PPAs around the nation for power from utility-scale projects have been priced at or below $50/MWh levelized.

Figure 13: Levelized Solar PPA Prices[27]



Q. How much solar is there currently in MISO?

A. According to data from S&P Global Market Intelligence, MISO currently has 250 MW of solar capacity.[28]

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27 Id., at Figure 48.

28 *MISO sees potential for huge, wind, solar expansion from Clean Power Plan*, SNL Financial, March 16, 2016.

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Q. How much solar capacity is currently in the MISO interconnection queue?

A. As of August 2016, projects in the MISO Interconnection Queue totaled 2,188 MW.[29]

Q. Have you seen any projections of how much new solar capacity may be added in MISO in the near-future?

A. MISO's draft MTEP 16 study forecasts the possible addition of 13,220 MW of solar between 2015 and 2019.[30] MISO's analysis of the potential impact of the Clean Power Plan identified a huge potential for wind and solar, saying the Plan could lead to 217,000 of wind capacity and 125,000 MW of solar by 2050.[31]

Q. How can all of the new, low cost wind and solar be expected to affect energy market prices in MISO?

A. The new wind and solar can be expected to put downward pressure on energy market prices to remain low, perhaps even below their current levels.

1. Without fuel costs, wind and utility-scale solar are at the beginning of the dispatch curve that, in turn, pushes all of the fossil-fired plants further up the dispatch order. Thus, the presence of the wind and solar can be expected to lead to a lower cost, more efficient fossil-fired plant setting the market clearing prices in many, if not all hours. In fact, given the experience in MISO to-date, wind resources can be expected in many hours to actually be the

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[29] MISO September 2016 *Informational Forum*, at page 43. Available at https://www misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/Informational%20Forum/2016/201609%20Informational%20Forum%20Presentation.pdf

[30] MISO *Book 1 Transmission Studies: Second Posting September 19, 2016 Draft*, at page 177. Available at https://www.misoenergy.org/Library/Repository/Study/MTEP/MTEP16/MTEP16%20Report.pdf.

[31] *MISO sees potential for huge wind, solar expansion from Clean Power Plan*, SNL Financial, March 16, 2016.

marginal capacity that sets the market clearing prices.[32] In particular, solar generation acts to keep energy market prices low during periods of peak demands (hot summer afternoons). Wind generation puts pressure on market prices to remain low during both peak and off-peak periods.

2. Distributed rooftop solar PV resources reduce the loads on the electric grid and, therefore, reduce the need for generation from coal and gas-fired plants and also, can put pressure on market prices to remain low.

Q. What is your recommendation concerning the energy market prices that the Company should use to analyze the economic viability of its proposed Petersburg NAAQS and CCR environmental upgrades?

A. IPL should use the peak and off-peak energy market prices in its Low Gas Price case as its Base Case prices, with a ± 10 percent range for sensitivity studies.

PETERSBURG'S FUTURE OPERATING PERFORMANCE

Q. Has the generation from the Petersburg units changed much in recent years?

A. Yes. After consistently remaining above 11.2 million MWh through 2008, the annual generation from the Petersburg plant declined by 23 percent between 2008 and 2015, as shown in Figure 14, below.

[32] For example, see the *MISO 2015-2016 Winter Assessment Report*, dated May 2016, at page 14. Available at https://www misoenergy.org/Library/Repository/Report/Seasonal%20Market%20Assessments/2016%20Winter%20Assessment%20Report.pdf.

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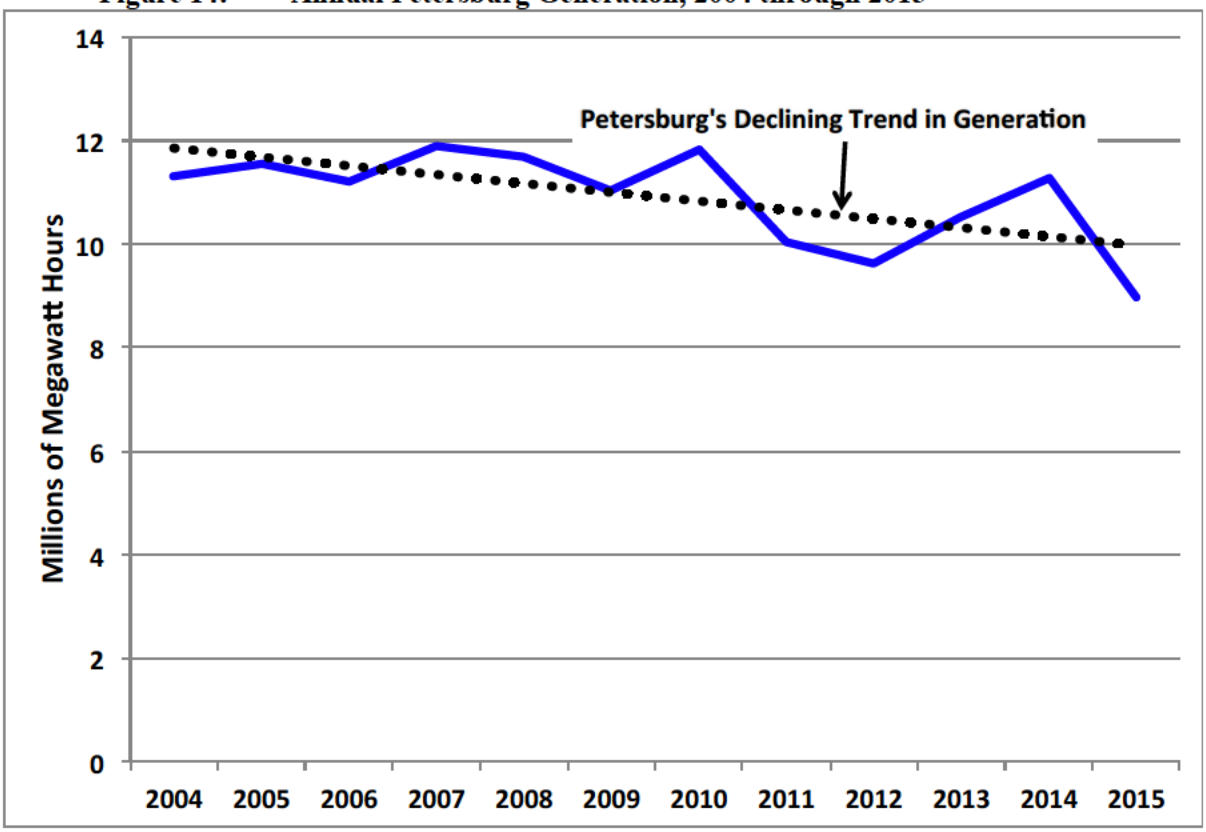
Figure 14: Annual Petersburg Generation, 2004 through 2015[33]



This downward trend represents a decline from a 76 percent annual capacity factor in 2008 to just a 59 percent capacity factor in 2015.

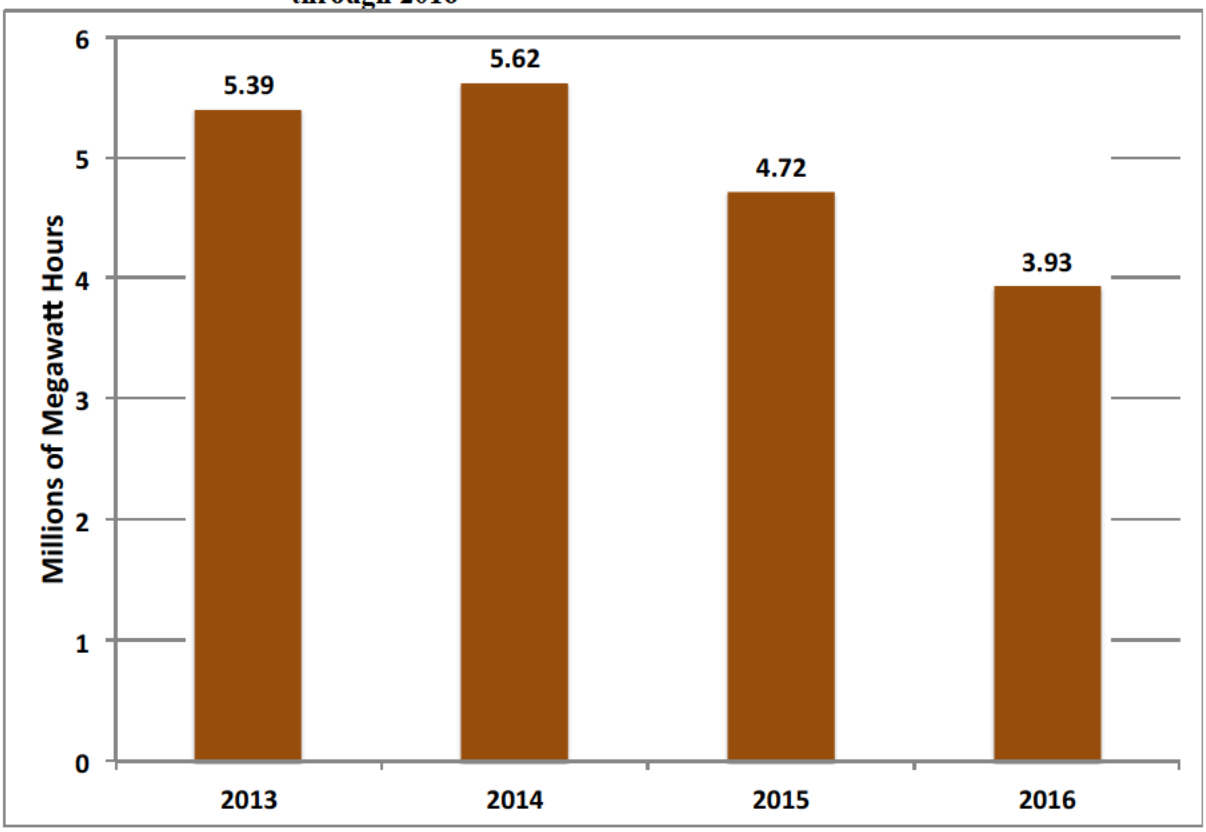
Q. Has Petersburg's generation continued to decline in 2016?

A. Yes. Petersburg's generation during the first half of 2016 declined by 17 percent from the first half of 2015, after having declined by 16 percent 2014 to 2015.

[33] Data from EIA Form 923, downloaded from SNL Financial.

CONFIDENTIAL INFORMATION REDACTED

Figure 15: Petersburg Generation during the Months of January-June, 2013 through 2016[34]



Q. What does IPL forecast for the Petersburg's future operating performance in its analyses of the NAAQS and CCR environmental upgrades?

A. Figure 16 (Confidential), shows that IPL is projecting that Petersburg's declining trend in generation, shown in Figure 14, above, [redacted] in its Base Case and that the plant will operate at an average [redacted] percent average annual capacity factor from 2018 through 2036.

[34] Data from EIA Form 923, downloaded from SNL Financial.

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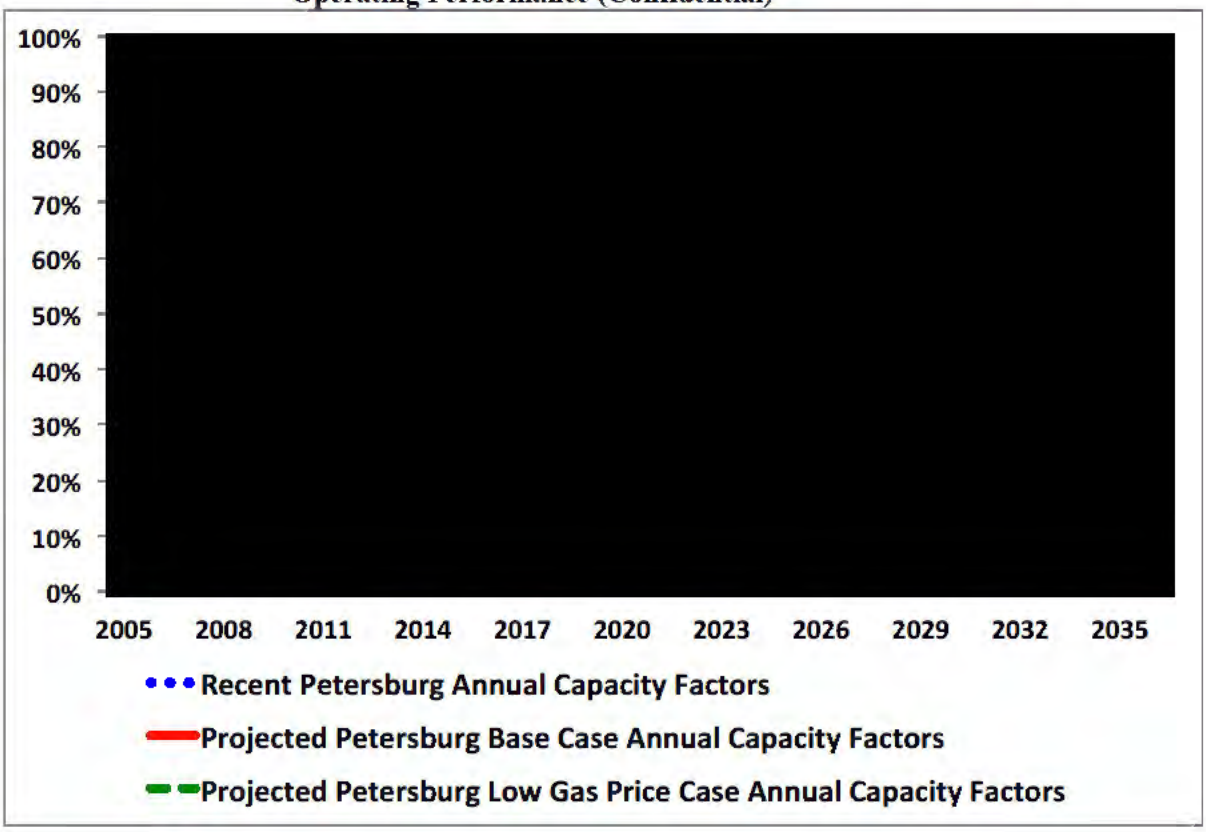
Figure 16: IPL's Projected Base Case and Low Gas Price Case Petersburg Operating Performance (Confidential)[35]



Q. How does IPL expect to achieve this turnaround in Petersburg's operating performance?

A. IPL's Base Case modeling projects that Petersburg Units 2, 3 and 4 will achieve [redacted] capacity factors after 2017 than they achieved in the years 2011 through 2015, as shown in Figure 17 (Confidential), below.

[35] Source: IPL Confidential Workpapers JMS-7 through JMS-10.

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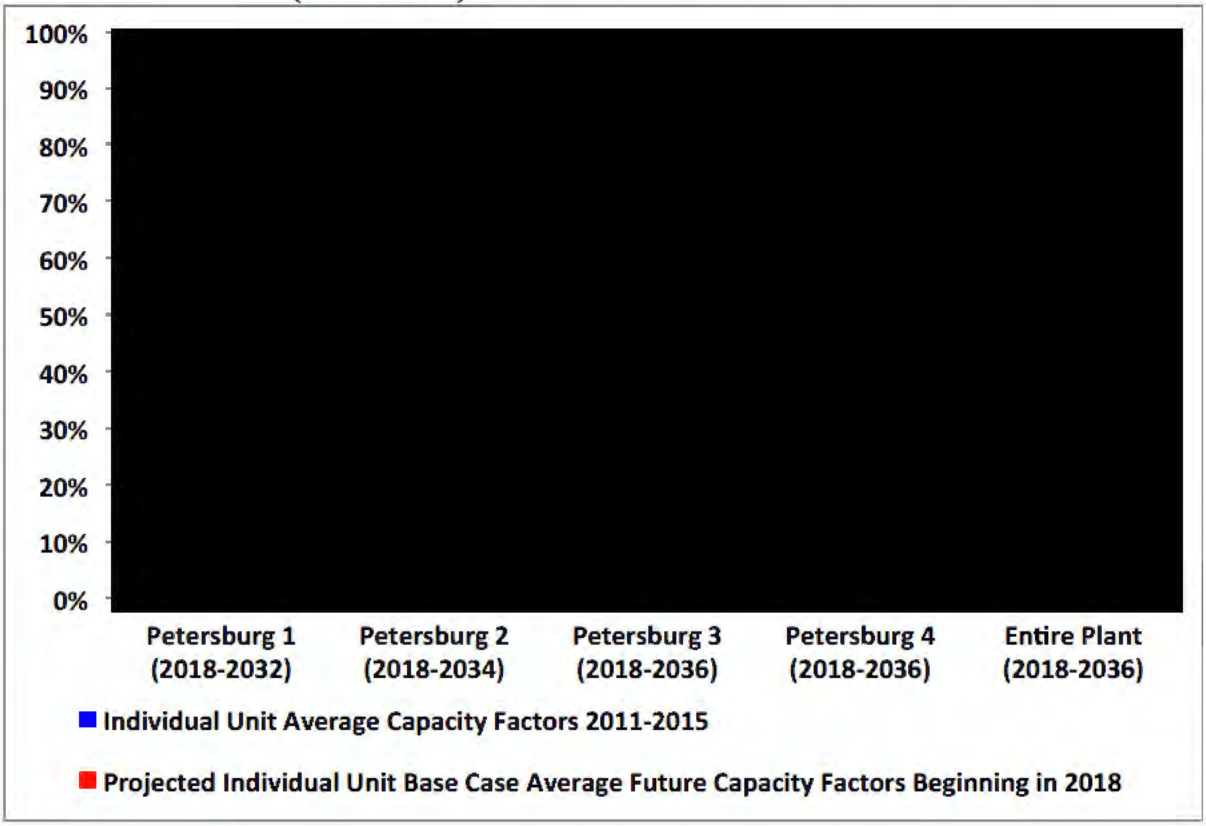
Figure 17: IPL's Projected Base Case Petersburg Unit-Specific Operating Performance vs. Actual Performance in the Years 2011-2015 (Confidential)[36]



Thus, IPL is projecting that Petersburg Units 3 and 4, in particular, will generate [redacted] after the NAAQS and CCR upgrades are completed than they produced in recent years. IPL's projected [redacted], as shown in Figure 18 (Confidential), below.

[36] Source: IPL Confidential Workpapers JMS-7 through JMS-10.

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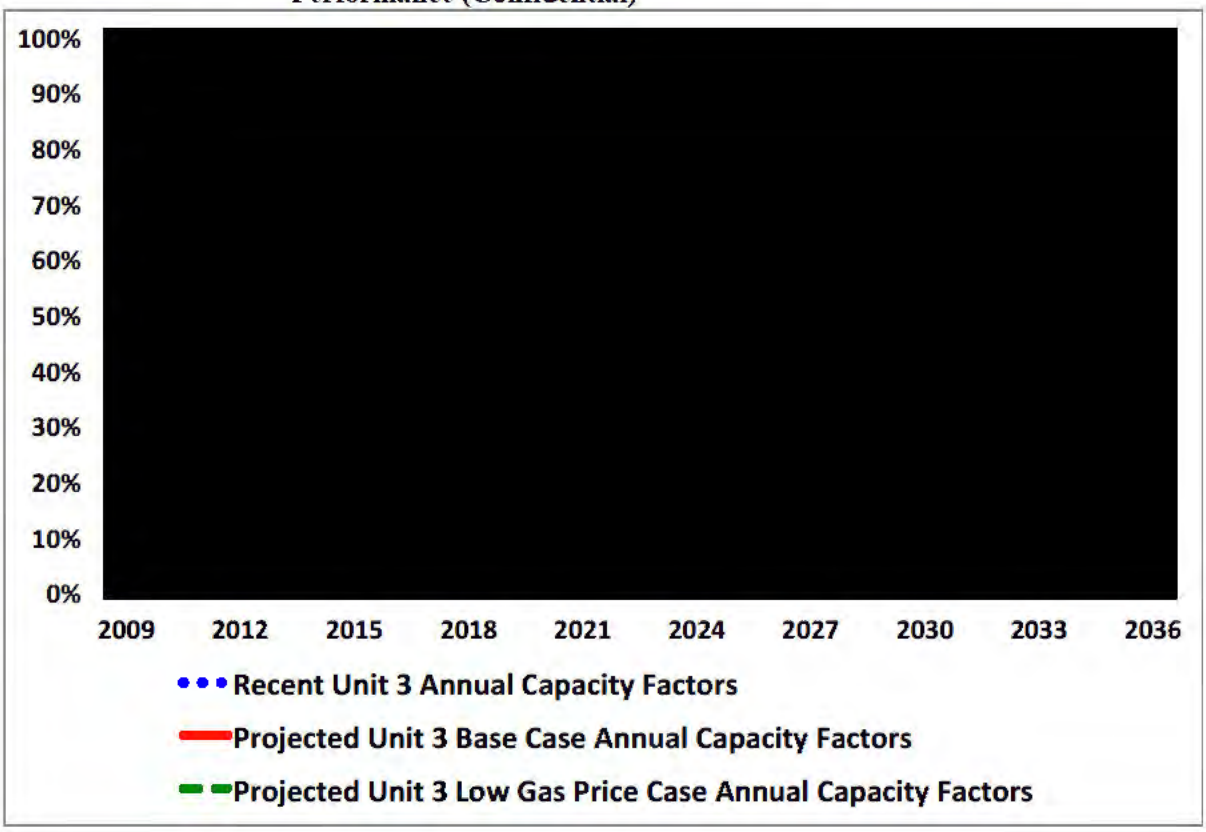
Figure 18: IPL's Projected Base Case Petersburg Unit 3 Annual Operating Performance (Confidential)[37]



Q. What does IPL project for Petersburg's future operating performance in the Low Gas Price Case?

A. IPL's modeling projects that if natural gas prices remain at the levels in its Low Gas Price forecast, Petersburg will achieve only an average [redacted] percent annual capacity factor.

[37] Id.

Q. Do you believe it is reasonable to expect that Petersburg will generate as much energy after the NAAQS and CCR environmental upgrades are completed in 2017 as IPL projects in its Base Case analysis?

A. No. I believe it is reasonable to expect that although there might be temporary upticks in the plant's generation, at best, it's production probably will continue to decline in coming years due to (1) continued low natural gas prices, (2) the impact of plant aging, and (3) increased competition from renewable wind and solar resources, as discussed earlier in this testimony.

Q. How old is each of the Petersburg units?

A. The current ages of the Petersburg Units and their ages in 2025 are shown in Figure 19, below.

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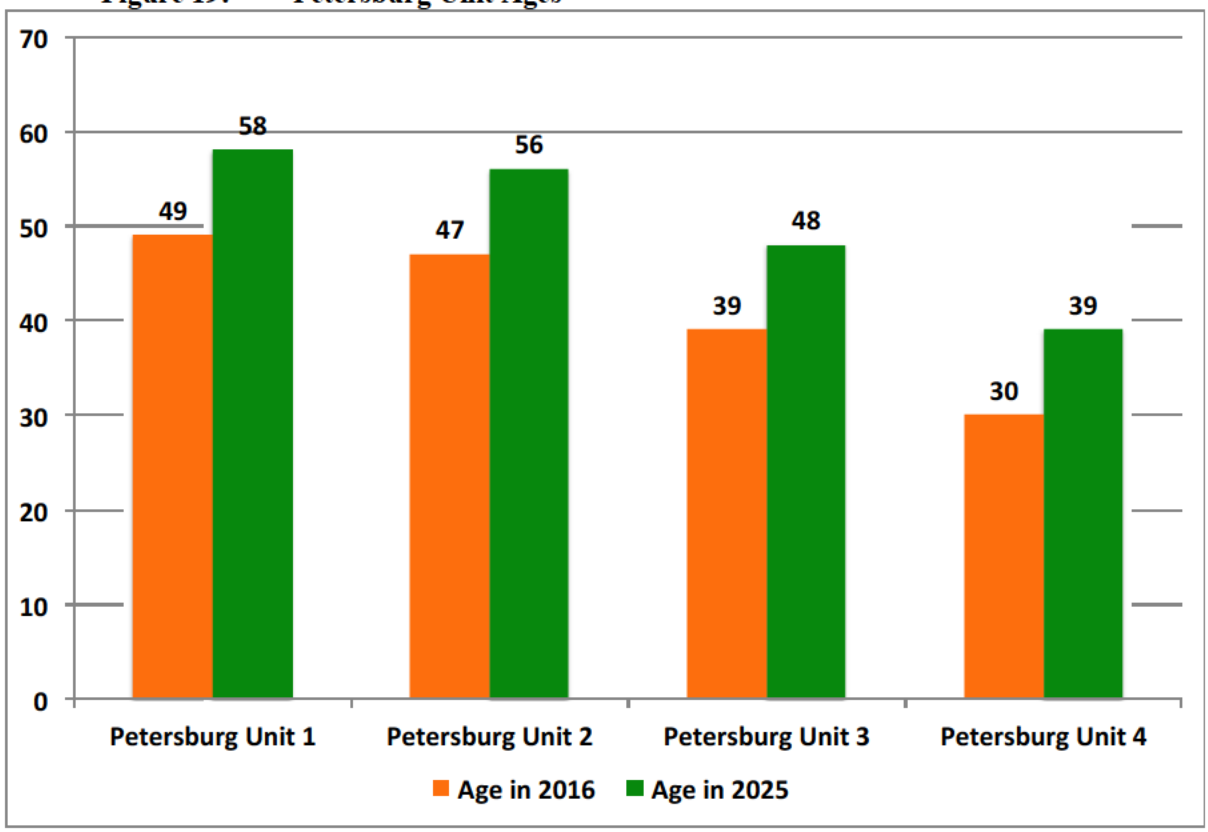
Figure 19: Petersburg Unit Ages[38]



Q. Do you think it is reasonable to expect that the operating performance of the Petersburg units will deteriorate as they age?

A. Yes. I believe that it is reasonable to expect that the operating performance of the Petersburg Units, especially Units 1-3, will deteriorate as they age and/or that the cost of continuing to operate the units will increase due to age-related degradation or the need to replace degraded plant equipment.

Babcock & Wilcox, an experienced designer and builder of fossil-fuel-fired and nuclear electric generating units, including coal-fired plants, has identified the following consequences of plant aging:

[38] Source: Data in IPL's response to Data Request OUCC 3-4 (Attachment DS-2).

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Power Plant Aging

At the beginning of power plant life there is a period in which the operators and maintenance crews learn to work with the new system and minor problems are resolved. This period may be marked with a high forced outage rate, but this quickly declines as the system is broken in.

As the plant matures, the personnel adapt to the new system, and any shortcomings are overcome or better understood. During this phase the forced outage rate remains low, availability is high, and the operating and maintenance costs are minimal. This mature phase normally lasts 25 to 30 years, depending on the design and use of the unit. The power plant is usually operated near rated capacity during this period.

Following this phase, the aging process becomes noticeable. Forced outages and maintenance costs increase and availability declines. Component end of life usually causes the higher forced outage rate. Occasional operational error and the degradation of boiler components due to erosion, corrosion, creep and fatigue lead to localized failures. The forced outage rate steadily increases during this phase unless major overhauls or component replacements are instituted.[39]

* * * *

Traditional Roles of the Aging Plant

As the aging plant becomes less reliable, its role is often changed. Newer, more reliable plants are less costly to maintain and are generally more efficient to handle the base power load. The older plants become auxiliary units or are designated for peaking service. Older plants with higher heat rates, i.e., lower efficiencies, or with low capacity may be retired. Prior to the 1980s, it was assumed that older plants would be torn down to make room for the newer, larger, more efficient units. It was common to retire a plant after 35 to 40 years of service.

This planned obsolescence began to change in the early 1980s. The cost of newer, more efficient plants became more than most boiler operators could readily finance. As a result new construction was delayed and plans to retire the older plants were put on hold. The need to keep the older units running brought about a new strategy of life extension. This is a strategy that delays the plant retirement while maintaining acceptable availability. The strategy requires the replacement of some components to keep the

[39] Babcock & Wilcox, Steam, Its Generation and Use, 40th Edition, (1992), Chapter 46, at pages 46-1 et seq.

plant running with acceptable forced outage rates and maintenance costs. These replacements or repairs expand upon those traditionally incorporated in a plant maintenance program. Significant capital expenditures are normally required to affect the availability rate."[40]

Q. Have IPL or ABB prepared any assessments of the impact of aging on coal plant operating performance, operating & maintenance costs, and/or capital expenditures?

A. No.[41]

CAPACITY PRICES

Q. What assumptions concerning future capacity prices did IPL use in its analyses of the proposed Petersburg NAAQS and CCR environmental upgrades?

A. As shown in Figure 20 (Confidential), IPL assumed that future capacity prices will [redacted]

[40] Id. at pages 46-1 and 46-2.

[41] IPL responses to Data Requests CAC DR 2-13 (Attachment DS-3) and CAC DR 2-14 (Attachments DS-4).

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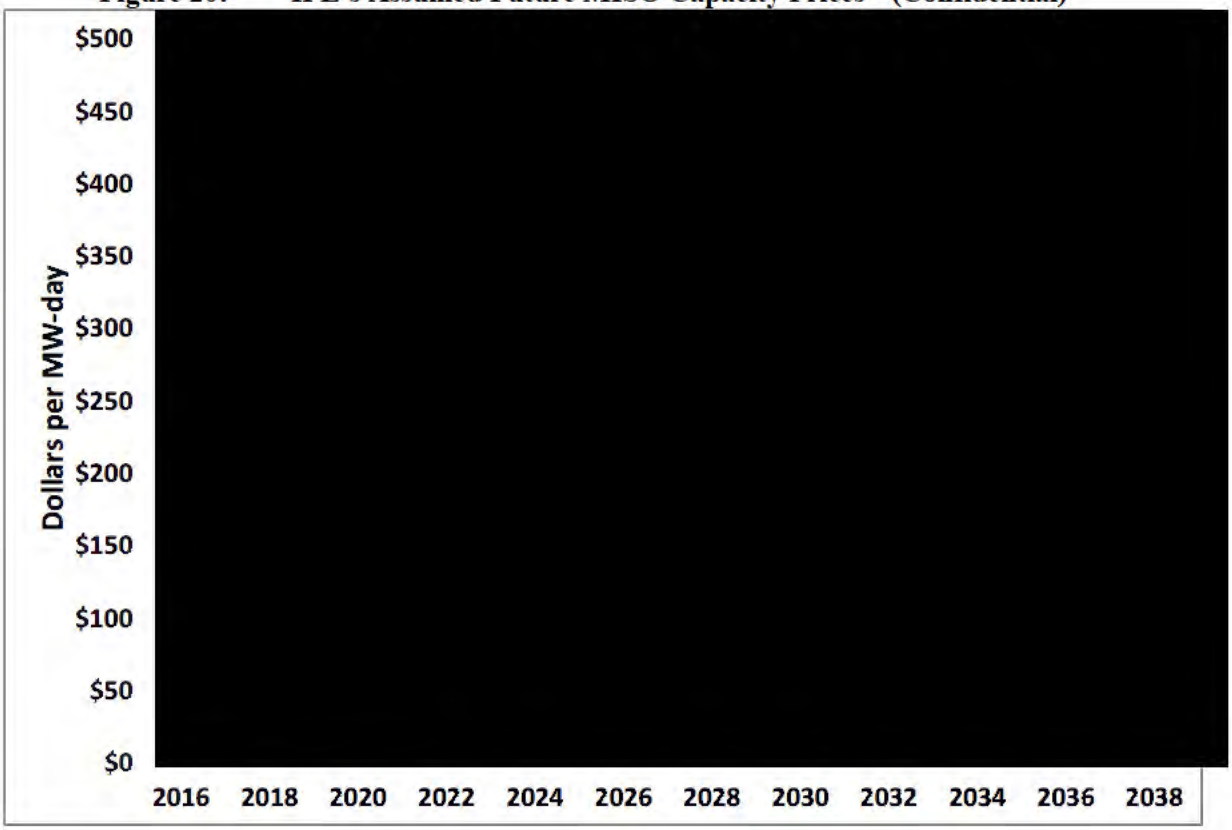
Figure 20: IPL's Assumed Future MISO Capacity Prices[42] (Confidential)



Q. Do these [redacted] capacity prices affect the results of IPL's analyses of the proposed NAAQS and CCR environmental upgrades?

A. Yes. These **very high** capacity prices have a dramatic impact on the results of IPL's analyses.

Q. Please explain.

A. A power plant's Gross Margin is the difference between the total cost of producing power at the plant and the revenues that its owner earns from selling its output into the competitive MISO wholesale energy markets, as shown in Figure 21 (Confidential), below, the Gross Margin from the Petersburg plant will be [redacted] in the Company's Low Gas Price Case in all of the years between 2016 and 2036. The

[42] IPL Confidential Workpaper JMS-1.

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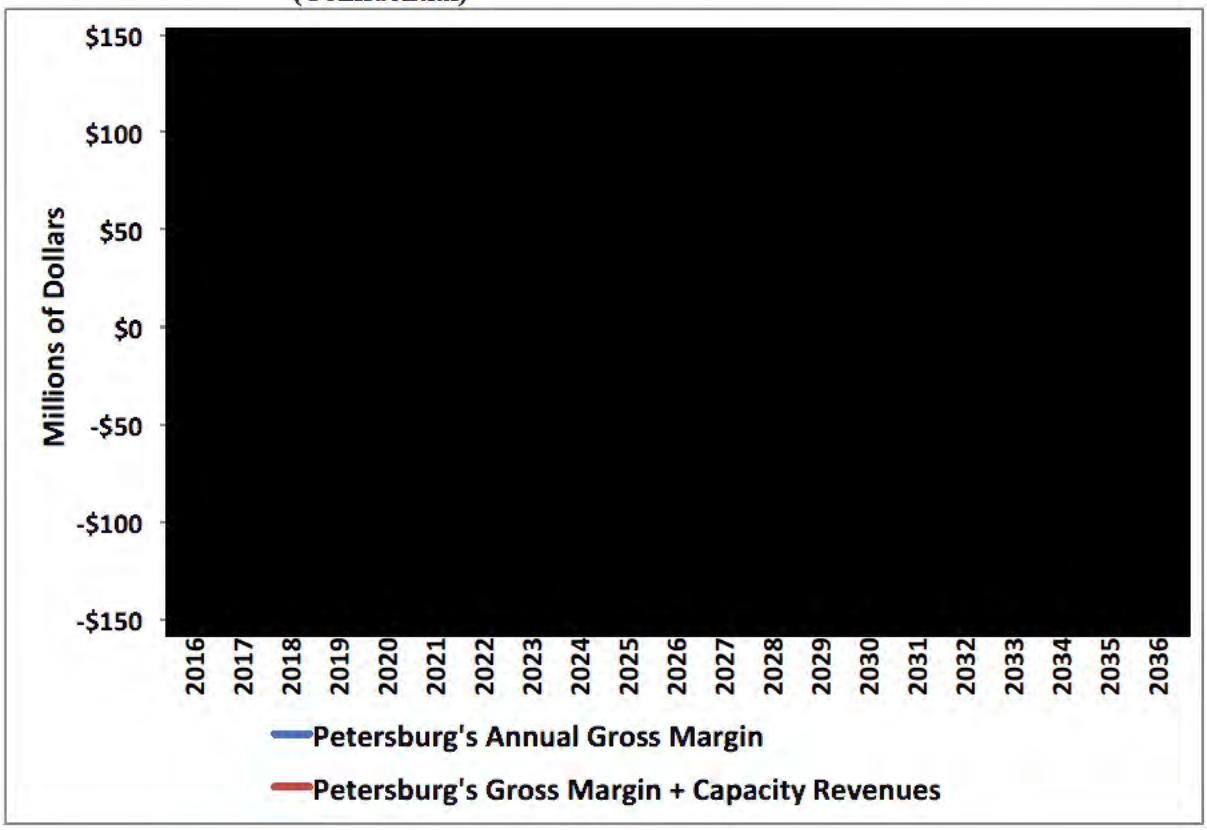
net revenues from the plant only turn [redacted] when capacity revenues are included. It is important to note that Figure 21 uses all of IPL's assumptions from the Low Gas Price Case for Petersburg's operating performance and operating costs and for future energy and capacity market prices.

Figure 21: Net Revenues from the Petersburg Plant With and Without Capacity (Confidential)[43]



Thus, the annual capacity prices are a critical input to the economic analyses, determining whether the continued operation of the plant is economic for ratepayers or not. If future capacity prices are [redacted] what IPL's has assumed, the plant's annual energy and capacity market revenues [redacted] than its annual costs of production. This will make continued operation uneconomic for IPL's ratepayers

[43] Source: Data from IPL Confidential Workpapers JMS-7 through JMS-10.

who will bear the burden of paying for all of the [redacted] unless the IURC requires IPL to implement a cost sharing mechanism.

Q. What have been the actual annual capacity prices in MISO zone 6?

A. Capacity prices have see-sawed during the last four auctions, rising to $72 per MW-day for the capacity year 2016-2017.

Q. Has the Company explained the basis for its assumptions that capacity prices in Zone 6 [redacted] in the near future?

A. No. However, capacity prices are determined by the balance between expected loads and how much capacity is bid into the capacity auction. There is no evidence that the loads in Zone 6 are projected to increase substantially in coming years. Consequently, I expect that the Company's assumed capacity prices are based on the premise that the amount of capacity being bid into the auction will be lower in future years.

Q. Is this a reasonable assumption?

A. No. There is a total of 21,962 MW of proposed capacity (including 500 MW from a new DC connection) in the 2016 Definitive Planning Queue as of the end of August 2016. At the same time, the September 2016 draft MISO MTEP 16 study forecasts that generation capacity in MISO will increase by 56,942 MW in the years 2015 to 2019.[44] This reflects 96,536 MW of capacity additions, offset by 39,594 MW of retirements.

[44] MISO *Book 1 Transmission Studies: Second Posting September 19, 2016 Draft*, at page 177. Available at https://www.misoenergy.org/Library/Repository/Study/MTEP/MTEP16/MTEP16%20Report.pdf.

Q. But hasn't there been a recent analysis that predicts that MISO will be short of capacity by as early as 2021?

A. Yes. The June 2016 OMS MISO Survey found that additional actions will be needed to ensure sufficient resources are available in MISO going forward.[45] However, there are a number of caveats associated with that Survey.

First, it only considered existing resources and new generators with signed interconnection agreements or external resources with firm contracts to MISO load. It did not include potential new generators without signed Generator Interconnection Agreements. Thus, there almost certainly will be more capacity available in future years than is reflected in the OMS MISO Survey.

Second, the Survey acknowledged that its outlook "depends heavily on load projections; current forecasts of modest load growth are not in line with recent history of flat year-to-year loads."[46]

Q. Is MISO proposing to change its capacity auction process that can be expected to help provide greater incentives for new capacity?

A. Yes. MISO is proposing to transition to a 3-year Forward Auction similar to that in PJM. I believe that the plan is to have this Forward Auction process in place by about 2018.

Q. What has been the experience in other MISO zones and in PJM? Have capacity prices [redacted] by as much as IPL projects they will [redacted] in Zone 6 in Indiana?

A. No. The experience in MISO Zone 4 (Southern Illinois) and PJM is that capacity prices have see-sawed up-and-down, [redacted] as IPL

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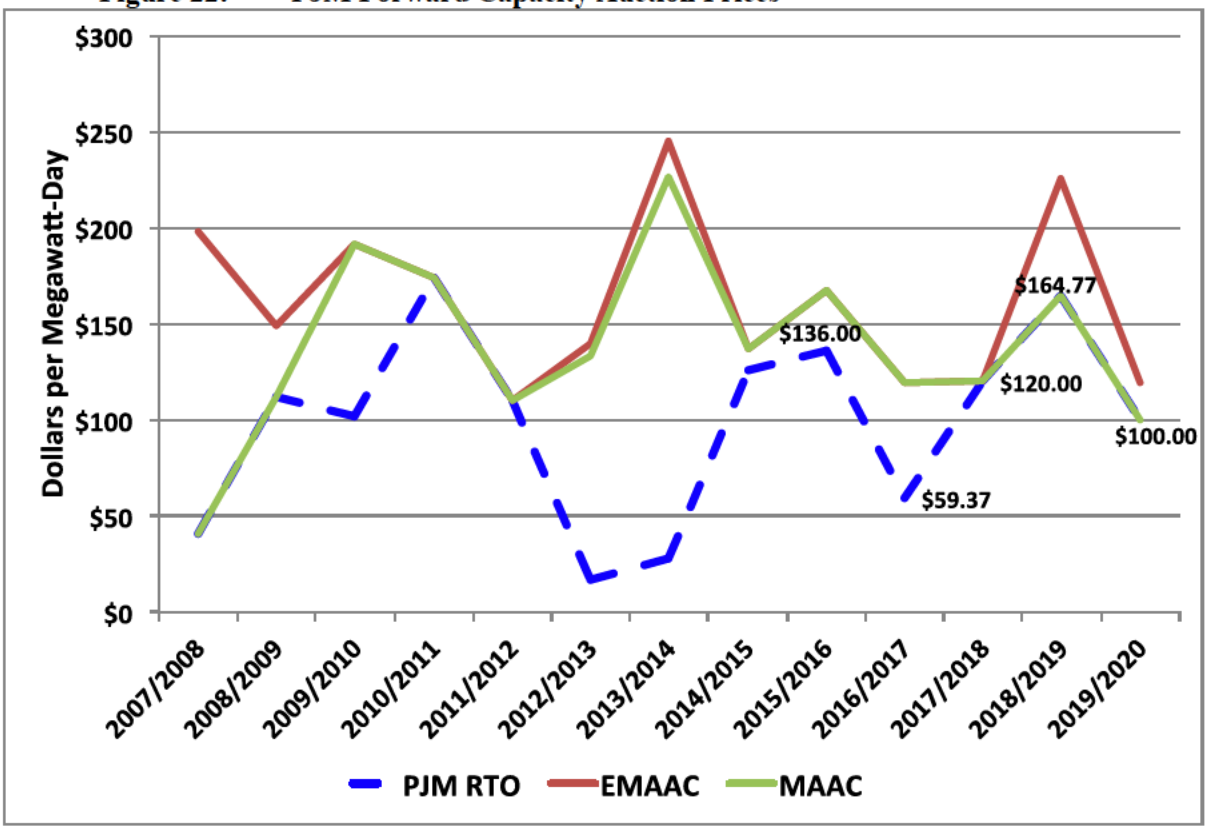
45 Available at https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/Workshops%20and%20Special%20Meetings/2016/OMS-MISO%20Survey/2016OMS-MISOSurveyResults.pdf.

46 Id., at page 1.

assumes in its economic analyses of the proposed Petersburg NAAQS and CCR environmental upgrades.

Figure 22: PJM Forward Capacity Auction Prices[47]



Thus, capacity prices is the overall, transmission-unconstrained PJM RTO zone dropped from $136 per MW-day in the 2015/2016 capacity year to $59.37 in 2016/2017, then rose to $164.77 in 2018/2019, before once again falling to $100.00 in the most recent auction for the 2019/2020 capacity year. The capacity prices in the transmission constrained EMAAC and MAAC zones of PJM have exhibited similar see-sawing behavior.

Capacity prices also have see-sawed in MISO Zone 4, as can be seen in Figure 23, below.

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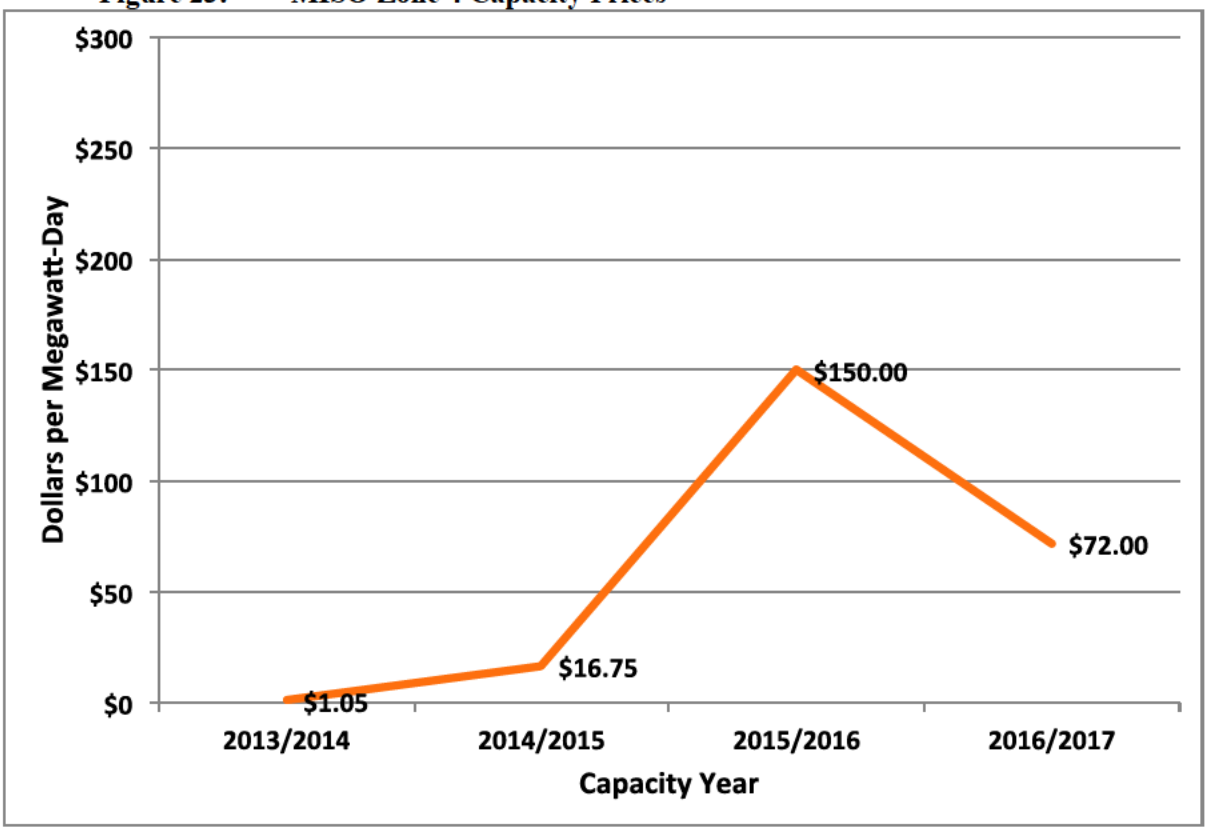
47 *RPM Base Residual Auction Results*, published annually by PJM.

Figure 23: MISO Zone 4 Capacity Prices



Thus, instead of continuing to rise after reaching $150 per MW-day in the 2015/2016 Capacity Year, capacity prices in MISO Zone 4 have fallen by more than 50 percent, to $72 per MW-day in the current capacity year.

Q. Do you believe that it is reasonable to forecast, as IPL has, that capacity market prices [redacted] after that?

A. No. For the reasons I have just outlined, I think it is reasonable to expect that, long-term, annual capacity prices in MISO, including Zone 6, will continue to see-saw up-and-down as they have in recent years, perhaps around a level near the current $100 per MW-day prices in PJM.

And the see-sawing of capacity prices makes common sense. As prices increase, especially with a three-year Forward Capacity Auction, the developers of new capacity resources will see greater incentives to bid their proposed facilities into the

market. The entry of this new capacity is likely to stabilize or even depress capacity prices. That has been the experience in PJM and I see no reason why it won't happen in MISO, especially with the expectation that there will be a lot of new capacity added to the MISO grid in coming years.

ECONOMIC ANALYSES

Q. Should the IURC give any weight to the economic analyses presented in the testimony and attachments of IPL witness Soller?

A. No. IPL's economic analyses are heavily biased in favor of the completion of the proposed NAAQS and CCR environmental upgrades and their results are simply not credible.

Q. Please explain.

A. As I have shown above, IPL has used high-to-very-high natural gas prices and energy market prices in its Base Case and High Gas Price Case analyses. It also has assumed that the declining annual generation from the Petersburg plant will turn around sharply and, instead of continuing to decline, the plant's annual output will increase to and remain at sustained high levels through its remaining service life. Moreover, IPL has used extraordinarily high annual capacity market prices that are simply not credible in light of the levels of new generating supplies that are currently being projected to be added in MISO in coming years and the see-sawing of capacity market prices in MISO Zone 4 and PJM. Furthermore, the PVRR figures presented by Ms. Soller are distorted because of the unreasonably high probabilities assigned to the results of the Base and High Gas Price Cases – as shown in Figure 3 on page 13 of Ms. Soller's testimony, 80 percent weight is given to these results.

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Q. Have you completed an economic analysis that you believe reflects more reasonable assumptions as to future energy and capacity market prices and Petersburg generation and production costs?

A. Yes. I have completed an economic analysis that has a Mid-Case that is based upon the annual energy market prices, annual levels of Petersburg generation, and annual Petersburg production costs from IPL's Low Gas Price Case for the years 2016 through 2036. This Mid-Case also assumes that beginning in 2018, capacity market prices will average $100 per MW-day, in 2015 dollars. In addition, the Mid-Case assumes that Petersburg's annual production costs will be 5 percent higher than IPL has modeled.

Q. What other scenarios have you examined?

A. I have analyzed both a High (or "Optimistic") Case and a Low (or More Pessimistic) Case.

The High ("Optimistic") Case assumes that energy market prices and Petersburg's annual generation are each 10 percent higher than in the Mid-Case. Capacity market prices are assumed in this case to be 20 percent higher than in the Mid-Case, as well. The high case also assumes that Petersburg's annual production costs will be as IPL has modeled.

The Low ("More Pessimistic") Case that assumes that energy market prices and Petersburg's annual generation are each 10 percent lower than in the Mid-Case. Capacity market prices are assumed in this case to be 20 percent lower than in the Mid-Case. Petersburg's annual production costs are assumed to be 10 percent higher than the Company has modeled.

Q. Why you adjusted IPL's projected production costs for the Petersburg plant in your analyses?

A. Yes. Figure 25 (Confidential), below, compares the annual rates of growth for Petersburg's Total Production Costs (in $), Non-Fuel O&M (in $), and Fuel Costs (in

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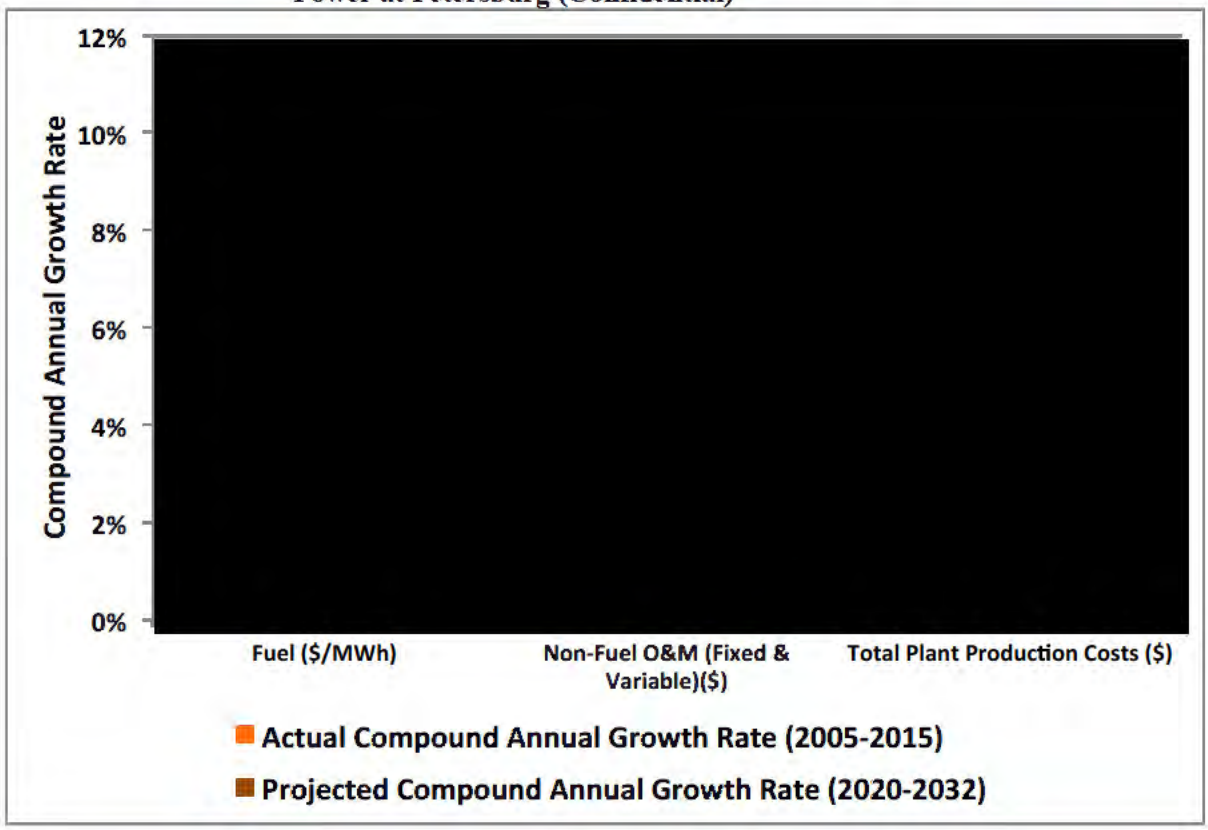
$/MWh) experienced during the years 2005-2015 with IPL's projections for the years 2020-2032. As can be seen, IPL is projecting much lower growth in these costs in coming years than the plant actually experienced between 2005 and 2015. This doesn't seem reasonable given that each of Petersburg's units will be substantially older during the years 2020-2032 than they were in the years 2005-2015.

Figure 24: Actual and IPL's Projected Annual Growth in the Cost of Producing Power at Petersburg (Confidential)[48]



For this reason, in the Mid-Case I have assumed that Petersburg's production costs for the years 2020-2036 will be 5 percent higher than IPL has projected. In the Low (More Pessimistic) Case I have assumed annual production costs will be 10 percent higher. In the High (Optimistic) Case I have used IPL's projected Petersburg production costs without any adjustment.

[48] Data from IPL Informal Confidential Workpaper Pete 1-4 Model Results-Last Endpoint.xlsb (to be provided in JIs' Workpapers) and IPL Confidential Workpaper JMS-7 to JMS-10.

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Q. What are the results of your economic analyses?

A. The results of my economic analyses are presented in Figure 24 (Confidential) and Table 1 (Public), below:

Figure 25: Annual Economic Results (Confidential)[49]

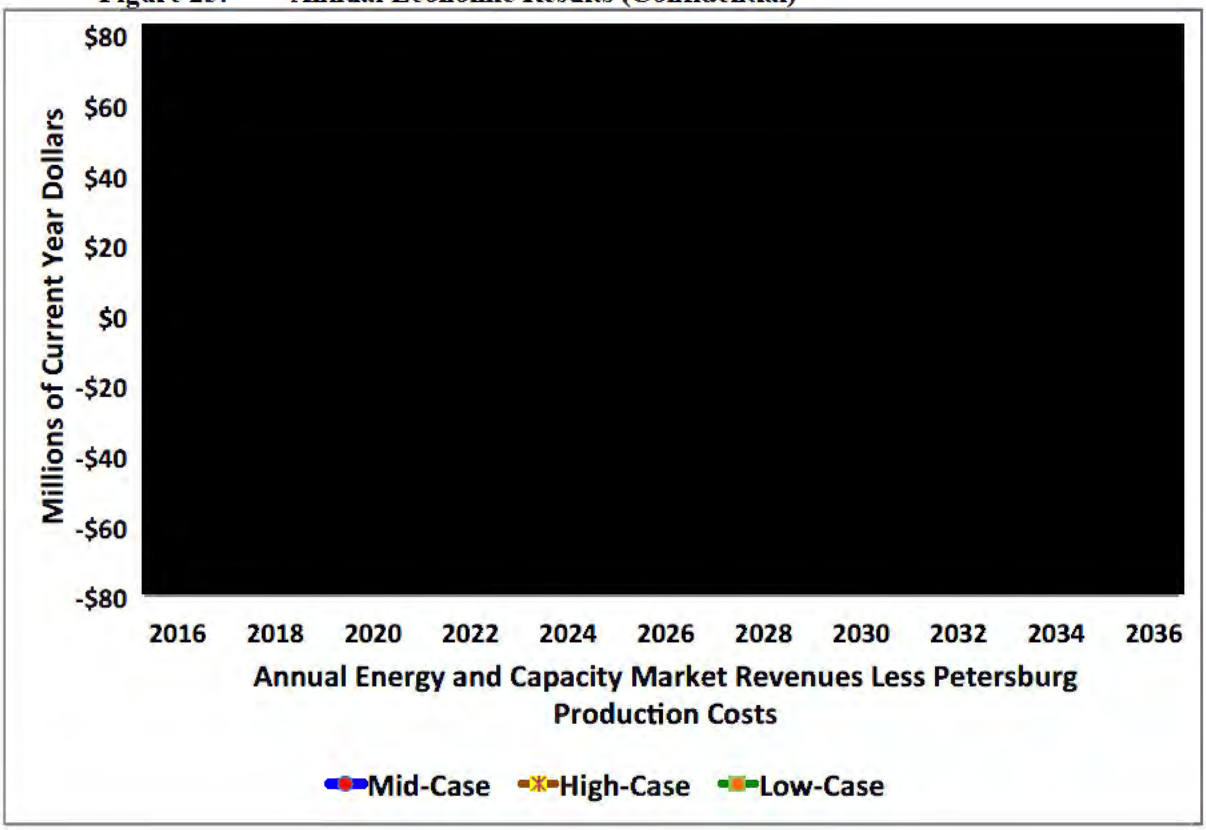

Table 1: Economics Results in Net NPV and Nominal Dollars (Public)[50]

	NPV	Nominal Dollars
Mid-Case	-$262.86	-$501.24
High or Optimistic Case	$83.36	$176.68
Low or More Pessimistic Case	-$505.20	-$965.16

Thus, the investment in the proposed NAAQS and CCR environmental upgrades and the continued operation of Petersburg Units 1-4 through is not economic in the Mid-

[49] Data compiled from Confidential Pete 1-4 Model Results-Last Endpoint.xlsb (to be provided in JIs' Workpapers) and IPL Confidential Workpaper JMS-7 to JMS-10.

[50] Data compiled from IPL Witness Soller's Public Testimony and Attachments JMS-1 through 3.

and the Low (More Pessimistic) Cases and is only marginally economic is the High (Optimistic) Case.

Q. Did you assume any CO_2 prices in any of the three Cases you analyzed?

A. No. Consequently, my analysis is conservative because completion of the proposed environmental upgrades and continued operation of the Petersburg plant would be even more uneconomic for ratepayers than my analyses indicate if CO_2 prices were included.

Q. Are there any other costs that are not reflected in the economic analyses presented in Figure 25 (Confidential)?

A. Yes. The results in in Figure 25 (Confidential) and Table 1 (Confidential) do not reflect the additional costs paid by ratepayers for excess capacity because IPL's system is overbuilt. Plus, if I fully understand the Company's methodology, these results also do not include the $47 million cost of the CCR-Bottom Ash Compliance Project. Continued operation of Petersburg would be uneconomic even in the High (Optimistic) Case if CO_2 prices and these costs were included in the analysis.

Q. Does the Low Case, which you've referred to as the "More Pessimistic" Case, represent a worst-case analysis?

A. Not at all. It's certainly possible that one or more of the Petersburg units could generate less energy than I've assumed in the More Pessimistic Case or that energy market or capacity prices could be even lower than I've assumed. Petersburg's production costs also could be higher, especially as the units age.

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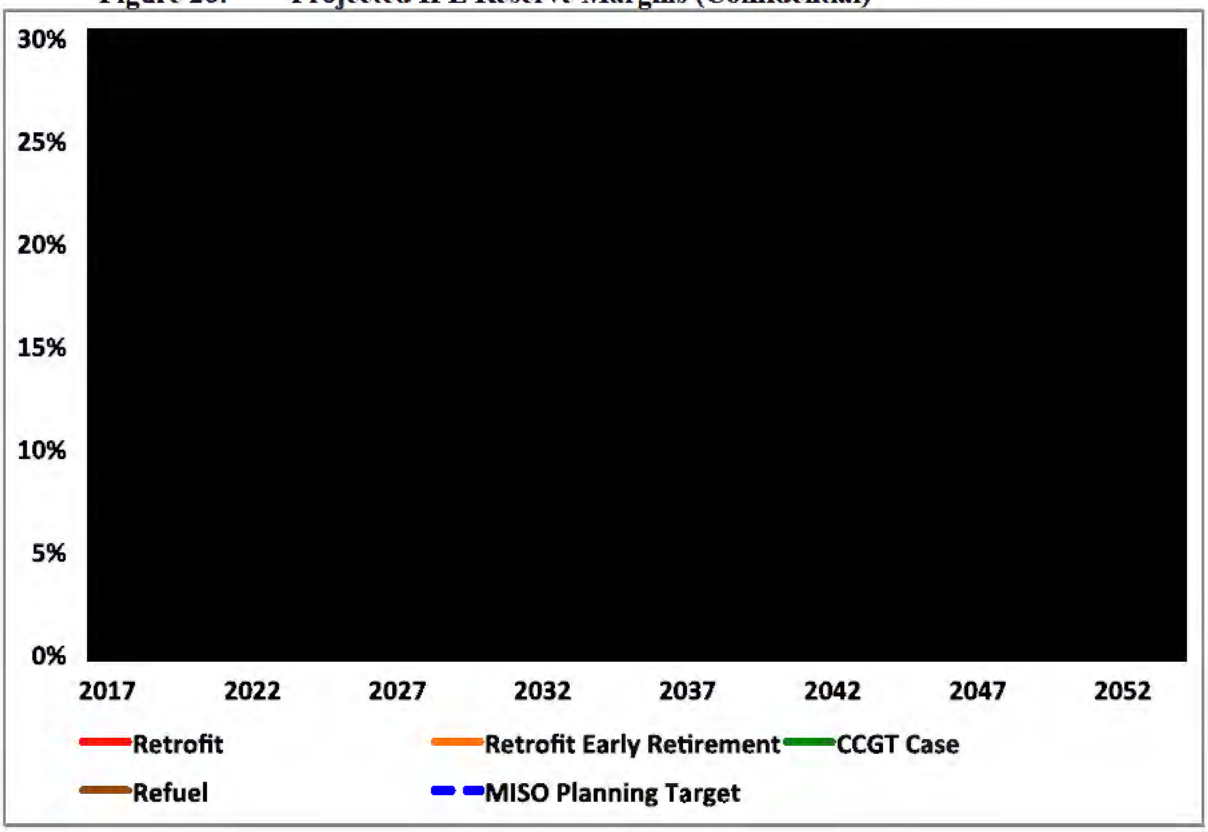
RESERVE MARGINS

Q. What will be IPL's capacity reserve margins if it continues to operate Petersburg?

A. Figure 26 (Confidential), below, shows the annual reserve margins under the four alternatives considered in IPL's economic analyses of the proposed NAAQS and CCR environmental upgrades.

Figure 26: Projected IPL Reserve Margins (Confidential)[51]



[51] IPL Confidential Workpaper JMS-10.

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Q. What is the significance of the reserve margins shown in Figure 26 (Confidential)?

A. These annual reserve margins, which were taken directly from IPL Confidential Workpaper JMS-10, show:

[redacted]

Q. Given the reserve margins shown in Figure 26 (Confidential), is it reasonable to expect that IPL could retire one or more of the Petersburg units in the near future without adversely affecting system reliability?

A. Yes. Given the reserve margins shown in Figure 26 (Confidential), the capacity that is expected to be added to MISO over the next few years, and the MISO peak- and off-peak forward energy market prices, I believe that the Company should undertake a phased retirement of Petersburg Units 1-4 starting in the next couple of years and this would not adversely impact either (1) system reliability or (2) the cost to ratepayers. This is especially true if IPL aggressively undertook energy efficiency and entering into PPA agreements for some of the wind resources expected to be added to MISO over the next 3-4 years.

GREENHOUSE GAS EMISSIONS

Q. Are the proposed NAAQS and CCR environmental upgrades going to do anything to reduce the Carbon Dioxide (CO_2) emissions from the Petersburg plant?

A. No. As shown in Figure 27, below, the annual CO_2 emissions from Petersburg in both IPL's Base Case and Low Gas Price Case are not projected [redacted] until the units begin in be retired, starting in 2032.

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Figure 27: Annual IPL System CO_2 Emissions (Confidential)[52]

Q. What actions should IPL take to begin to reduce its system CO_2 emissions before 2032?

A. As part of its current IRP, the Company should develop a plan to reduce its annual CO_2 emissions, including a plan to retire the Petersburg units as quickly as possible by adopting a portfolio of alternatives that includes as much wind, solar, and energy efficiency as is technically and economically feasible, and as little new natural gas capacity and reliance on the MISO energy and capacity markets as is necessary.

[52] Source: Data from IPL's Confidential Workpapers JMS-7 to JMS-10.

Q. Should the IURC approve or reject the Company's request for a CPCN for the proposed NAAQS and CCR environmental upgrades?

A. The IURC should reject the Company's request for the CPCN and instead require IPL to begin planning for the retirement of Petersburg Units 1-4 through its current IRP process.

Q. Are there any conditions that the IURC should apply if it decides to approve IPL's CPCN request?

A. Yes. As I have explained, the Company's economic analyses showing that there would be a net benefit to completing the proposed NAAQS and CCR environmental upgrades and continuing to operate Petersburg Units 1-4 through the scheduled ends of their service lives is premised on unreasonable projections for future natural gas prices, energy market prices, plant generation, and especially capacity market prices, that represent significant departures from the recent past. For this reason, the Company's proposal for a CPCN exposes ratepayers to the significant risk that the costs of continuing to produce power at Petersburg will exceed, perhaps by a substantial margin, the revenues it will be able to earn from selling the plant's energy, capacity, and auxiliary services into the MISO markets.

Therefore, I believe that the IURC should adopt a mechanism so that IPL (and its owner) would bear the risks that its projections in this proceeding are not accurate. More specifically, I am proposing that in any year in which the total revenues from selling Petersburg's energy, capacity and auxiliary services into the MISO markets do not fully cover the total costs of producing power at Petersburg (including fuel, non-fuel O&M (both variable and fixed), capital expenditures and emissions costs, including the costs of CO_2 emissions when prices are set), the Company, not the ratepayers, would bear the net shortfall.

In addition, to protect ratepayers against the possibility that IPL will retire Petersburg after making the investments for the NAAQS and CCR environmental upgrades, the Commission should adopt the condition on granting the CPCN that it adopted in

Cause 44242. Specifically, the Commission found in the Order in that Cause (at page 36) that, "in the event that [Harding Street Station Unit 7] is taken out of service, . . . IPL should not continue to collect depreciation expense for the [Harding Street Station Unit 7] clean energy projects that are . . . approved in this Order."

Q. Does this complete your testimony at this time?

A. Yes.

VERIFICATION

I, David A. Schlissel, affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information and belief.

David A. Schlissel — October 4, 2016

David A. Schlissel — Date

Attachment DS-1

David A. Schlissel

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SUMMARY

I have worked since 1974 as a consultant and attorney on complex management, engineering, and economic issues, primarily in the field of energy. This work has involved conducting technical investigations, preparing economic analyses, presenting expert testimony, providing support during all phases of regulatory proceedings and litigation, and advising clients during settlement negotiations. I received undergraduate and advanced engineering degrees from the Massachusetts Institute of Technology and Stanford University, respectively, and a law degree from Stanford Law School.

PROFESSIONAL EXPERIENCE

Electric Resource Planning - Analyzed the financial and economic costs and benefits of energy supply options. Examined whether there are lower cost, lower risk alternatives than proposed fossil and nuclear power plants. Evaluated the financial, economic and system reliability consequences of retiring existing electric generating facilities. Investigated whether new electric generating facilities are used and useful. Investigated whether new generating facilities that were built for a deregulated subsidiary should be included in the rate base of a regulated utility. Assessed the reasonableness of proposed utility power purchase agreements with deregulated affiliates. Investigated the prudence of utility power purchases in deregulated markets.

Coal-fired Generation – Evaluated the economic and financial risks of investing in, constructing and operating new coal-fired power plants. Analyzed the economic and financial risks of making expensive environmental and other upgrades to existing plants. Investigated whether plant owners had adequately considered the risks associated with building new fossil-fired power plants, the most significant of which are the likelihood of federal regulation of greenhouse gas emissions and construction cost increases.

Power Plant Air Emissions – Investigated whether proposed generating facilities would provide environmental benefits in terms of reduced emissions of NO_x, SO_2 and CO_2. Examined whether new state and federal emission standards would lead to the retirement of existing power plants or otherwise have an adverse impact on electric system reliability.

Power Plant Water Use – Examined power plant repowering as a strategy for reducing water consumption at existing electric generating facilities. Analyzed the impact of converting power plants from once-through to closed-loop systems with cooling towers on plant revenues and electric system reliability. Evaluated the potential impact of the EPA's Proposed Clean Water Act Section 316(b) Rule for Cooling Water Intake Structures at existing power plants.

Electric System Reliability - Evaluated whether existing or new generation facilities and transmission lines are needed to ensure adequate levels of system reliability. Investigated the causes of distribution system outages and inadequate service reliability. Examined the reasonableness of utility system reliability expenditures.

Power Plant Repowering - Evaluated the environmental, economic and reliability impacts of rebuilding older, inefficient generating facilities with new combined cycle technology.

Power Plant Operations and Economics - Investigated the causes of more than one hundred power plant and system outages, equipment failures, and component degradation, determined whether these problems could have been anticipated and avoided, and assessed liability for repair and replacement costs. Examined power plant operating, maintenance, and capital costs. Evaluated utility plans for and management of the replacement of major power plant components. Assessed the adequacy of power plant quality assurance and maintenance programs. Examined the selection and supervision of contractors and subcontractors.

Nuclear Power – Reviewed recent cost estimates for proposed nuclear power plants. Examined the impact of the nuclear power plant life extensions and power uprates on decommissioning costs and collections policies. Examined the reasonableness of utility decisions to sell nuclear power assets and evaluated the value received as a result of the auctioning of those plants. Investigated the significance of the increasing ownership of nuclear power plants by multiple tiered holding companies with limited liability company subsidiaries. Investigated the potential safety consequences of nuclear power plant structure, system, and component failures.

Transmission Line Siting – Examined the need for proposed transmission lines. Analyzed whether proposed transmission lines could be installed underground. Worked with clients to develop alternate routings for proposed lines that would have reduced impacts on the environment and communities.

Electric Industry Regulation and Markets - Examined whether generating facilities experienced more outages following the transition to a deregulated wholesale market in New England. Evaluated the reasonableness of nuclear and fossil plant sales, auctions, and power purchase agreements. Analyzed the impact of proposed utility mergers on market power. Assessed the reasonableness of contract provisions and terms in proposed power supply agreements.

Expert Testimony - Presented the results of management, technical and economic analyses as testimony in more than 100 proceedings before regulatory boards and commissions in 35 states, before two federal regulatory agencies, and in state and federal court proceedings.

Litigation and Regulatory Support - Participated in all aspects of the development and preparation of case presentations on complex management, technical, and economic issues. Assisted in the preparation and conduct of pre-trial discovery and depositions. Helped identify and prepare expert witnesses. Aided the preparation of pre-hearing petitions and motions and post-hearing briefs and appeals. Assisted counsel in preparing for hearings and oral arguments. Advised counsel during settlement negotiations.

TESTIMONY, AFFIDAVITS, DEPOSITIONS AND COMMENTS

Montana Public Service Commission (Docket Nos. D2013.5.33 and D2014.5.46) – May 2015
The circumstances surrounding the extended outage of Colstrip Unit 4 from July 1, 2013 through January 23, 2014.

Indiana Utility Regulatory Commission (Cause Nos. 43114 IGCC 12 & 13) – December 2014
Whether Duke Energy Indiana's Edwardsport IGCC Project was in service between June 7, 2013 and March 31, 2014 and the Project's current operational performance and cost status and future prospects.

Public Service Commission of West Virginia (Case No. 14-0546-E-PC) – August 2014
The reasonableness of American Electric Power's proposed transfer of 50 percent of the Mitchell Coal Plant to its regulated affiliates in West Virginia.

Mississippi Public Service Commission (Docket No. 2013-UN-189) – March and June 2014
The prudence of Mississippi Power Company's management of the planning for the Kemper County IGCC Plant.

Indiana Utility Regulatory Commission (Cause Nos. 43114 IGCC 8, 10, and 12) – June 2012, April 2013 and April 2014
Startup and pre-operational testing delays at Duke Energy Indiana's Edwardsport IGCC Project.

Public Service Commission of West Virginia (Case No. 12-1655-E-PC) – June 2013 and July 2013
The reasonableness of Appalachian Power Company's proposed acquisition of 2/3 of Unit 3 of the John E. Amos power plant and ½ of the two unit Mitchell power plant.

Public Service Commission of West Virginia (Case No. 12-1571-E-PC) – April 2013
The reasonableness of Monogahela Power Company's proposed acquisition of 80 percent of the Harrison Power Station.

Virginia State Corporation Commission (Case No. PUE-2012-00128) – March 2013
Whether Dominion Virginia Power's proposed Brunswick Project natural gas-fired combined cycle power plant is needed and in the public interest.

Arizona Corporation Commission (Docket No. E-01922A-12-0291 – December 2012
Reasonableness of Tucson Electric Power's proposed Environmental Compliance Adjustor mechanism.

U.S. Nuclear Regulatory Commission (Docket Nos. 50-247-LR and 50-286-LR) – June 2012
Reply to testimony filed by Entergy Nuclear and NRC Staff concerning the relicensing of Indian Point Units 2 and 3.

Mississippi Public Service Commission (Docket No. 2009-UA-014) – March 2012
Petition to Reopen the docket for the Kemper County IGCC Plant based on changed circumstances.

Mississippi Public Service Commission (Docket No. 2009-UA-279) – February 2012
The financial and economic risks of retrofitting Mississippi Power Company's Plant Daniel Coal Plant.

Georgia Public Service Commission (Docket No. 34218) – November 2011
The reasonableness of Georgia Power Company's proposed fossil plant decertification/retirement plan.

Missouri Public Service Commission (Case No. EO-2011-0271) – October 2011
Reasonableness of Ameren Missouri's 2011 Integrated Resource Plan filing.

Maryland Public Service Commission (Case No. 9271) – October 2011
The reasonableness of Constellation Energy Group's proposed divestiture of three coal-fired power plants as mitigation for market power concerns arising from its proposed merger with Exelon Corporation.

Minnesota Public Utilities Commission (Docket No. E017/M-10-1082) – August and September 2011
Whether the proposed addition of the Big Stone Plant Air Quality Control System is a lower cost alternative for the ratepayers of Otter Tail Power Company than retirement of the Plant and replacement by a natural gas-fired combined cycle unit possibly combined with new wind capacity.

Indiana Utility Regulatory Commission (Cause No. 43114 IGCC 4S1) – June, July, and October 2011 and June 2012
Duke Energy Indiana's imprudence and gross mismanagement of Edwardsport IGCC Project.

Kansas State Corporation Commission (Docket No. 11-KCPE-581-PRE) – June 2011
The reasonableness of the proposed environmental upgrades at the La Cygne Generating Station Units 1 and 2.

Arizona Corporation Commission (Docket No. E-01345A-10-0474) – May 2011
The reasonableness of Arizona Public Service Company's proposed acquisition of Southern California Edison's share of Four Corners Units 4 and 5.

Public Utility Commission of Colorado (Docket No. 10M-245E) – September, October and November 2010
The reasonableness of Public Service of Colorado's proposed Emissions Reduction Plan.

Indiana Utility Regulatory Commission (Cause No. 43114 IGCC 4S1) – July, November and December 2010
The reasonableness of Duke Energy Indiana's new analyses of the economics of completing the Edwardsport Project as an IGCC plant.

Oregon Public Utility Commission (Docket LC 48) – May and August 2010
Comments and Reply Comments on Portland General Electric Company's 2009 Integrated Resource Plan.

South Dakota Public Service Commission (Docket No. EL-09-018) – April 2010
The reasonableness of Black Hills Power Company's 2007 Integrated Resource Plan and the Company's decision to build the Wygen III coal-fired power plant.

Michigan Public Service Commission (Docket No. U-16077) – April 2010
Comments on the City of Holland Board of Public Works' 2010 Power Supply Study.

Illinois Commerce Commission (Tenaska Clean Coal Facility Analysis) – April 2010
Comments on the Facility Cost Report for the proposed Taylorville IGCC power plant.

North Carolina Utilities Commission (Docket No. E-100, Sub 124) – February 2010
The reasonableness of the 2009 Integrated Resource Plans of Duke Energy Carolinas and Progress Energy Carolinas.

Mississippi Public Service Commission (Docket No. 2009-UA-014) – December 2009
The costs and risks associated with the proposed Kemper County IGCC power plant.

Public Service Commission of Wisconsin (Docket No. 05-CE-137) –December 2009 and January 2010
The costs and risks associated with the proposed installation of emissions control equipment at the Edgewater Unit 5 coal-fired power plant.

Public Service Commission of Wisconsin (Docket No. 05-CE-138) –September and October 2009
The costs and risks associated with the proposed installation of emissions control equipment at the Columbia 1 and 2 coal-fired power plants.

Public Service Commission of Michigan (Docket No. U-15996) – July 2009
Comments on Consumer Energy's Electric Generation Alernatives Analysis for the Balanced Energy Initiative including the Proposed Karn-Weadock Coal Plant.

Public Service Commission of Michigan (Docket No. U-16000) – Juy 2009
Comments on Wolverine Power Cooperative's Electric Generation Alternatives Analysis for the Proposed Rogers City Coal Plant.

Georgia Public Service Commission (Docket No. 27800-U) – December 2008
The possible costs and risks of proceeding with the proposed Plant Vogtle Units 3 and 4 nuclear power plants.

Public Service Commission of Wisconsin (Docket No. 6680-CE-170) – August and Sepember 2008
The risks associated with the proposed Nelson Dewey 3 baseload coal-fired power plant.

Indiana Utility Regulatory Commission (Cause No. 43114 IGCC 1) – July 2008
The estimated cost of Duke Energy Indiana's Edwardsport Project.

Public Service Commission of Maryland (Case 9127) – July 2008
The estimated cost of the proposed Calvert Cliffs Unit 3 nuclear power plant.

Ohio Power Siting Board (Case No. 06-1358-EL-BGN) – December 2007
AMP-Ohio's application for a Certificate of Environmental Compatibility and Public Need for a 960 MW pulverized coal generating facility.

U.S. Nuclear Regulatory Commission (Docket Nos. 50-247-LR, 50-286-LR) – November 2007 and February 2009
The available options for replacing the power generated at Indian Point Unit 2 and/or Unit 3.

West Virginia Public Service Commission (Case No. 06-0033-E-CN) – November 2007
Appalachian Power Company's application for a Certificate of Public Convenience and Necessity for a 600 MW integrated gasification combined cycle generating facility.

Iowa Utility Board (Docket No. GCU-07-01) – October 2007
Whether Interstate Power & Light Company's adequately considered the risks associated with building a new coal-fired power plant and whether that Company's participation in the proposed Marshalltown plant is prudent.

Virginia State Corporation Commission (Case No. PUE-2007-00066) – November 2007
Whether Dominion Virginia Power's adequately considered the risks associated with building the proposed Wise County coal-fired power plant and whether that Commission should grant a certificate of public convenience and necessity for the plant.

Louisiana Public Service Commission (Docket No. U-30192) – September 2007
The reasonableness of Entergy Louisiana's proposal to repower the Little Gypsy Unit 3 generating facility as a coal-fired power plant.

Arkansas Public Service Commission (Docket No. 06-154-U) – July 2007
The probable economic impact of the Southwestern Electric Power Company's proposed Hempstead coal-fired power plant project.

North Dakota Public Service Commission (Case Nos. PU-06-481 and 482) – May 2007 and April 2008
Whether the participation of Otter Tail Power Company and Montana-Dakota Utilities in the Big Stone II Generating Project is prudent.

Indiana Utility Regulatory Commission (Cause No. 43114) – May 2007
The appropriate carbon dioxide ("CO_2") emissions prices that should be used to analyze the relative economic costs and benefits of Duke Energy Indiana and Vectren Energy Delivery of Indiana's proposed Integrated Gasification Combined Cycle Facility and whether Duke and Vectren have appropriately reflected the capital cost of the proposed facility in their modeling analyses.

Public Service Commission of Wisconsin (Docket No. 6630-EI-113) – May and June 2007
Whether the proposed sale of the Point Beach Nuclear Plant to FPL Energy Point Beach, LLC, is in the interest of the ratepayers of Wisconsin Electric Power Company.

Florida Public Service Commission (Docket No. 070098-EI) – March 2007
Florida Light & Power Company's need for and the economics of the proposed Glades Power Park.

Michigan Public Service Commission (Case No. 14992-U) – December 2006
The reasonableness of the proposed sale of the Palisades Nuclear Power Plant.

Minnesota Public Utilities Commission (Docket No. CN-05-619) – November 2006, December 2007, January 2008 and November 2008
Whether the co-owners of the proposed Big Stone II coal-fired generating plant have appropriately reflected the potential for the regulation of greenhouse gases in their analyses of the facility; and whether the proposed project is a lower cost alternative than renewable options, conservation and load management.

North Carolina Utilities Commission (Docket No. E-7, Sub 790) – September 2006 and January 2007
Duke's need for two new 800 MW coal-fired generating units and the relative economics of adding these facilities as compared to other available options including energy efficiency and renewable technologies.

New Mexico Public Regulatory Commission (Case No. 05-00275-UT) – September 2006
Report to the New Mexico Commission on whether the settlement value of the adjustment for moving the 141 MW Afton combustion turbine merchant plant into rate base is reasonable.

Arizona Corporation Commission (Docket No. E-01345A-0816) – August and September 2006
Whether APS's acquisition of the Sundance Generating Station was prudent and the reasonableness of the amounts that APS requested for fossil plant O&M.

U.S. District Court for the District of Montana (Billings Generation, Inc. vs. Electrical Controls, Inc, et al., CV-04-123-BLG-RFC) – August 2006
Quantification of plaintiff's business losses during an extended power plant outage and plaintiff's business earnings due to the shortening and delay of future plant outages. [Confidential Expert Report]

Deposition in South Dakota Public Utility Commission Case No. EL05-022 – June 14, 2006

South Dakota Public Utility Commission (Case No. EL05-022) – May and June 2006
Whether the co-owners of the proposed Big Stone II coal-fired generating plant have appropriately reflected the potential for the regulation of greenhouse gases in their analyses of the alternatives to the proposed facility; the need and timing for new supply options in the co-owners' service territories; and whether there are alternatives to the proposed facility that are technically feasible and economically cost-effective.

Georgia Public Service Commission (Docket No. 22449-U) – May 2006
Georgia Power Company's request for an accounting order to record early site permitting and construction operating license costs for new nuclear power plants.

California Public Utilities Commission (Dockets Nos. A.05-11-008 and A.05-11-009) – April 2006
The estimated costs for decommissioning the Diablo Canyon, SONGS 2&3 and Palo Verde nuclear power plants and the annual contributions that are needed from ratepayers to assure that adequate funds will be available to decommission these plants at the projected ends of their service lives.

New Jersey Board of Public Utilities (Docket No. EM05020106) – November and December 2005 and March 2006
Joint Testimony with Bob Fagan and Bruce Biewald on the market power implications of the proposed merger between Exelon Corp. and Public Service Enterprise Group.
Virginia State Corporation Commission (Case No. PUE-2005-00018)– November 2005
The siting of a proposed 230 kV transmission line.

Iowa Utility Board (Docket No. SPU-05-15) – September and October 2005
The reasonableness of IPL's proposed sale of the Duane Arnold Energy Center nuclear plant.

New York State Department of Environmental Conservation (DEC #3-3346-00011/00002) – October 2005
The likely profits that Dynegy will earn from the sale of the energy and capacity of the Danskammer Generating Facility if the plant is converted from once-through to closed-cycle cooling with wet towers or to dry cooling.

Arkansas Public Service Commission (Docket 05-042-U) – July and August 2005
Arkansas Electric Cooperative Corporation's proposed purchase of the Wrightsville Power Facility.

Maine Public Utilities Commission (Docket No. 2005-17) – July 2005
Joint testimony with Peter Lanzalotta and Bob Fagan evaluating Eastern Maine Electric Cooperative's request for a CPCN to purchase 15 MW of transmission capacity from New Brunswick Power.

Federal Energy Regulatory Commission (Docket No. EC05-43-0000) – April and May 2005
Joint Affidavit and Supplemental Affidavit with Bruce Biewald on the market power aspects of the proposed merger of Exelon Corporation and Public Service Enterprise Group, Inc.

Maine Public Utilities Commission (Docket No. 2004-538 Phase II) – April 2005
Joint testimony with Peter Lanzalotta and Bob Fagan evaluating Maine Public Service Company's request for a CPCN to purchase 35 MW of transmission capacity from New Brunswick Power.

Maine Public Utilities Commission (Docket No. 2004-771) – March 2005
Analysis of Bangor Hydro-Electric's Petition for a Certificate of Public Convenience and Necessity to construct a 345 kV transmission line

United States District Court for the Southern District of Ohio, Eastern Division (Consolidated Civil Actions Nos. C2-99-1182 and C2-99-1250)
Whether the public release of company documents more than three years old would cause competitive harm to the American Electric Power Company. [Confidential Expert Report]

New Jersey Board of Public Utilities (Docket No. EO03121014) – February 2005
Whether the Board of Public Utilities can halt further collections from Jersey Central Power & Light Company's ratepayers because there already are adequate funds in the company's decommissioning trusts for the Three Mile Island Unit No. 2 Nuclear Plant to allow for the decommissioning of that unit without endangered the public health and safety.

Maine Public Utilities Commission (Docket No. 2004-538) – January and March 2005
Analysis of Maine Public Service Company's request to construct a 138 kV transmission line from Limestone, Maine to the Canadian Border.

California Public Utilities Commission (Application No. AO4-02-026) – December 2004 and January 2005
Southern California Edison's proposed replacement of the steam generators at the San Onofre Unit 2 and Unit 3 nuclear power plants and whether the utility was imprudent for failing to initiate litigation against Combustion Engineering due to defects in the design of and materials used in those steam generators.

United States District Court for the Southern District of Indiana, Indianapolis Division (Civil Action No. IP99-1693) – December 2004
Whether the public release of company documents more than three years old would cause competitive harm to the Cinergy Corporation. [Confidential Expert Report]

California Public Utilities Commission (Application No. AO4-01-009) – August 2004
Pacific Gas & Electric's proposed replacement of the steam generators at the Diablo Canyon nuclear power plant and whether the utility was imprudent for failing to initiate litigation against Westinghouse due to defects in the design of and materials used in those steam generators.

Public Service Commission of Wisconsin (Docket No. 6690-CE-187) – June, July and August 2004
Whether Wisconsin Public Service Corporation's request for approval to build a proposed 515 MW coal-burning generating facility should be granted.

Public Service Commission of Wisconsin (Docket No. 05-EI-136) – May and June 2004
Whether the proposed sale of the Kewaunee Nuclear Power Plant to a subsidiary of an out-of-state holding company is in the public interest.

Connecticut Siting Council (Docket No. 272) – May 2004
Whether there are technically viable alternatives to the proposed 345-kV transmission line between Middletown and Norwalk Connecticut and the length of the line that can be installed underground.

Arizona Corporation Commission (Docket No. E-01345A-03-0437 – February 2004
Whether Arizona Public Service Company should be allowed to acquire and include in rate base five generating units that were built by a deregulated affiliate.

State of Rhode Island Energy Facilities Siting Board (Docket No. SB-2003-1) – February 2004
Whether the cost of undergrounding a relocated 115kV transmission line would be eligible for regional cost socialization.

State of Maine Department of Environmental Protection (Docket No. A-82-75-0-X) – December 2003
The storage of irradiated nuclear fuel in an Independent Spent Fuel Storage Installation (ISFSI) and whether such an installation represents an air pollution control facility.

Rhode Island Public Utility Commission (Docket No. 3564) – December 2003 and January 2004
Whether Narragansett Electric Company should be required to install a relocated 115kV transmission line underground.

New York State Board on Electric Generation Siting and the Environment (Case No. 01-F-1276) – September, October and November 2003
The environmental, economic and system reliability benefits that can reasonably be expected from the proposed 1,100 MW TransGas Energy generating facility in Brooklyn, New York.

Wisconsin Public Service Commission (Case 6690-UR-115) - September and October 2003
The reasonableness of Wisconsin Public Service Corporation's decommissioning cost collections for the Kewaunee Nuclear Plant.

Oklahoma Corporation Commission (Cause No. 2003-121) – July 2003
Whether Empire District Electric Company properly reduced its capital costs to reflect the write-off of a portion of the cost of building a new electric generating facility.

Arkansas Public Service Commission (Docket 02-248-U) – May 2003
Entergy's proposed replacement of the steam generators and the reactor vessel head at the ANO Unit 1 Steam Generating Station.

Appellate Tax Board, State of Massachusetts (Docket No C258405-406) – May 2003
The physical nature of electricity and whether electricity is a tangible product or a service.

Maine Public Utilities Commission (Docket 2002-665-U) – April 2003
Analysis of Central Maine Power Company's proposed transmission line for Southern York County and recommendation of alternatives.

Massachusetts Legislature, Joint Committees on Government Regulations and Energy – March 2003
Whether PG&E can decide to permanently retire one or more of the generating units at its Salem Harbor Station if it is not granted an extension beyond October 2004 to reduce the emissions from the Station's three coal-fired units and one oil-fired unit.

New Jersey Board of Public Utilities (Docket No. ER02080614) – January 2003
The prudence of Rockland Electric Company's power purchases during the period August 1, 1999 through July 31, 2002.

New York State Board on Electric Generation Siting and the Environment (Case No. 00-F-1356) – September and October 2002 and January 2003
The need for and the environmental benefits from the proposed 300 MW Kings Park Energy generating facility.

Arizona Corporation Commission (Docket No. E-01345A-01-0822) – May 2002
The reasonableness of Arizona Public Service Company's proposed long-term power purchase agreement with an affiliated company.

New York State Board on Electric Generation Siting and the Environment (Case No. 99-F-1627) – March 2002
Repowering NYPA's existing Poletti Station in Queens, New York.

Connecticut Siting Council (Docket No. 217) – March 2002, November 2002, and January 2003
Whether the proposed 345-kV transmission line between Plumtree and Norwalk substations in Southwestern Connecticut is needed and will produce public benefits.

Vermont Public Service Board (Case No. 6545) – January 2002
Whether the proposed sale of the Vermont Yankee Nuclear Plant to Entergy is in the public interest of the State of Vermont and Vermont ratepayers.

Connecticut Department of Public Utility Control (Docket 99-09-12RE02) – December 2001
The reasonableness of adjustments that Connecticut Light and Power Company seeks to make to the proceeds that it received from the sale of Millstone Nuclear Power Station.

Connecticut Siting Council (Docket No. 208) – October 2001
Whether the proposed cross-sound cable between Connecticut and Long Island is needed and will produce public benefits for Connecticut consumers.

New Jersey Board of Public Utilities (Docket No. EM01050308) - September 2001
The market power implications of the proposed merger between Conectiv and Pepco.

Illinois Commerce Commission Docket No. 01-0423 – August, September, and October 2001
Commonwealth Edison Company's management of its distribution and transmission systems.

New York State Board on Electric Generation Siting and the Environment (Case No. 99-F-1627) - August and September 2001
The environmental benefits from the proposed 500 MW NYPA Astoria generating facility.

New York State Board on Electric Generation Siting and the Environment (Case No. 99-F-1191) - June 2001
The environmental benefits from the proposed 1,000 MW Astoria Energy generating facility.

New Jersey Board of Public Utilities (Docket No. EM00110870) - May 2001
The market power implications of the proposed merger between FirstEnergy and GPU Energy.

Connecticut Department of Public Utility Control (Docket 99-09-12RE01) - November 2000
The proposed sale of Millstone Nuclear Station to Dominion Nuclear, Inc.

Illinois Commerce Commission (Docket 00-0361) - August 2000
The impact of nuclear power plant life extensions on Commonwealth Edison Company's decommissioning costs and collections from ratepayers.

Vermont Public Service Board (Docket 6300) - April 2000
Whether the proposed sale of the Vermont Yankee nuclear plant to AmerGen Vermont is in the public interest.

Massachusetts Department of Telecommunications and Energy (Docket 99-107, Phase II) - April and June 2000
The causes of the May 18, 1999, main transformer fire at the Pilgrim generating station.

Connecticut Department of Public Utility Control (Docket 00-01-11) - March and April 2000
The impact of the proposed merger between Northeast Utilities and Con Edison, Inc. on the reliability of the electric service being provided to Connecticut ratepayers.

Connecticut Department of Public Utility Control (Docket 99-09-12) - January 2000
The reasonableness of Northeast Utilities plan for auctioning the Millstone Nuclear Station.

Connecticut Department of Public Utility Control (Docket 99-08-01) - November 1999
Generation, Transmission, and Distribution system reliability.

Illinois Commerce Commission (Docket 99-0115) - September 1999
Commonwealth Edison Company's decommissioning cost estimate for the Zion Nuclear Station.

Connecticut Department of Public Utility Control (Docket 99-03-36) - July 1999
Standard offer rates for Connecticut Light & Power Company.

Connecticut Department of Public Utility Control (Docket 99-03-35) - July 1999
Standard offer rates for United Illuminating Company.
Connecticut Department of Public Utility Control (Docket 99-02-05) - April 1999
Connecticut Light & Power Company stranded costs.

Connecticut Department of Public Utility Control (Docket 99-03-04) - April 1999
United Illuminating Company stranded costs.

Maryland Public Service Commission (Docket 8795) - December 1998
Future operating performance of Delmarva Power Company's nuclear units.

Maryland Public Service Commission (Dockets 8794/8804) - December 1998
Baltimore Gas and Electric Company's proposed replacement of the steam generators at the Calvert Cliffs Nuclear Power Plant. Future performance of nuclear units.

Indiana Utility Regulatory Commission (Docket 38702-FAC-40-S1) - November 1998
Whether the ongoing outages of the two units at the D.C. Cook Nuclear Plant were caused or extended by mismanagement.

Arkansas Public Service Commission (Docket 98-065-U) - October 1998
Entergy's proposed replacement of the steam generators at the ANO Unit 2 Steam Generating Station.

Massachusetts Department of Telecommunications and Energy (Docket 97-120) - October 1998
Western Massachusetts Electric Company's Transition Charge. Whether the extended 1996-1998 outages of the three units at the Millstone Nuclear Station were caused or extended by mismanagement.

Connecticut Department of Public Utility Control (Docket 98-01-02) - September 1998
Nuclear plant operations, operating and capital costs, and system reliability improvement costs.

Illinois Commerce Commission (Docket 97-0015) - May 1998
Whether any of the outages of Commonwealth Edison Company's twelve nuclear units during 1996 were caused or extended by mismanagement. Whether equipment problems, personnel performance weaknesses, and program deficiencies could have been avoided or addressed prior to plant outages. Outage-related fuel and replacement power costs.

Public Service Commission of West Virginia (Case 97-1329-E-CN) - March 1998
The need for a proposed 765 kV transmission line from Wyoming, West Virginia, to Cloverdate, Virginia.

Illinois Commerce Commission (Docket 97-0018) - March 1998
Whether any of the outages of the Clinton Power Station during 1996 were caused or extended by mismanagement.

Connecticut Department of Public Utility Control (Docket 97-05-12) - October 1997
The increased costs resulting from the ongoing outages of the three units at the Millstone Nuclear Station.

New Jersey Board of Public Utilities (Docket ER96030257) - August 1996
Replacement power costs during plant outages.

Illinois Commerce Commission (Docket 95-0119) - February 1996
Whether any of the outages of Commonwealth Edison Company's twelve nuclear units during 1994 were caused or extended by mismanagement. Whether equipment problems, personnel performance weaknesses, and program deficiencies could have been avoided or addressed prior to plant outages. Outage-related fuel and replacement power costs.

Public Utility Commission of Texas (Docket 13170) - December 1994
Whether any of the outages of the River Bend Nuclear Station during the period October 1, 1991, through December 31, 1993, were caused or extended by mismanagement.

Public Utility Commission of Texas (Docket 12820) - October 1994
Operations and maintenance expenses during outages of the South Texas Nuclear Generating Station.

Wisconsin Public Service Commission (Cases 6630-CE-197 and 6630-CE-209) - September and October 1994
The reasonableness of the projected cost and schedule for the replacement of the steam generators at the Point Beach Nuclear Power Plant. The potential impact of plant aging on future operating costs and performance.

Public Utility Commission of Texas (Docket 12700) - June 1994
Whether El Paso Electric Company's share of Palo Verde Unit 3 was needed to ensure adequate levels of system reliability. Whether the Company's investment in Unit 3 could be expected to generate cost savings for ratepayers within a reasonable number of years.

Arizona Corporation Commission (Docket U-1551-93-272) - May and June 1994
Southwest Gas Corporation's plastic and steel pipe repair and replacement programs.

Connecticut Department of Public Utility Control (Docket 92-04-15) - March 1994
Northeast Utilities management of the 1992/1993 replacement of the steam generators at Millstone Unit 2.

Connecticut Department of Public Utility Control (Docket 92-10-03) - August 1993
Whether the 1991 outage of Millstone Unit 3 as a result of the corrosion of safety-related plant piping systems was due to mismanagement.

Public Utility Commission of Texas (Docket 11735) - April and July 1993
Whether any of the outages of the Comanche Peak Unit 1 Nuclear Station during the period August 13, 1990, through June 30, 1992, were caused or extended by mismanagement.

Connecticut Department of Public Utility Control (Docket 91-12-07) - January 1993 and August 1995
Whether the November 6, 1991, pipe rupture at Millstone Unit 2 and the related outages of the Connecticut Yankee and Millstone units were caused or extended by mismanagement. The impact of environmental requirements on power plant design and operation.

Connecticut Department of Public Utility Control (Docket 92-06-05) - September 1992
United Illuminating Company off-system capacity sales. [Confidential Testimony]

Public Utility Commission of Texas (Docket 10894) - August 1992
Whether any of the outages of the River Bend Nuclear Station during the period October 1, 1988, through September 30, 1991, were caused or extended by mismanagement.

Connecticut Department of Public Utility Control (Docket 92-01-05) - August 1992
Whether the July 1991 outage of Millstone Unit 3 due to the fouling of important plant systems by blue mussels was the result of mismanagement.

California Public Utilities Commission (Docket 90-12-018) - November 1991, April 1992, June and July 1993
Whether any of the outages of the three units at the Palo Verde Nuclear Generating Station during 1989 and 1990 were caused or extended by mismanagement. Whether equipment problems, personnel performance weaknesses and program deficiencies could have been avoided or addressed prior to outages. Whether specific plant operating cost and capital expenditures were necessary and prudent.

Public Utility Commission of Texas (Docket 9945) - June 1991
Whether El Paso Electric Company's share of Palo Verde Unit 3 was needed to ensure adequate levels of system reliability. Whether the Company's investment in the unit could be expected to generate cost savings for ratepayers within a reasonable number of years. El Paso Electric Company's management of the planning and licensing of the Arizona Interconnection Project transmission line.

Arizona Corporation Commission (Docket U-1345-90-007) - December 1990 and April 1991
Arizona Public Service Company's management of the planning, construction and operation of the Palo Verde Nuclear Generating Station. The costs resulting from identified instances of mismanagement.

New Jersey Board of Public Utilities (Docket ER89110912J) - July and October 1990
The economic costs and benefits of the early retirement of the Oyster Creek Nuclear Plant. The potential impact of the unit's early retirement on system reliability. The cost and schedule for siting and constructing a replacement natural gas-fired generating plant.

Public Utility Commission of Texas (Docket 9300) - June and July 1990
Texas Utilities management of the design and construction of the Comanche Peak Nuclear Plant. Whether the Company was prudent in repurchasing minority owners' shares of Comanche Peak without examining the costs and benefits of the repurchase for its ratepayers.
Federal Energy Regulatory Commission (Docket EL-88-5-000) - November 1989
Boston Edison's corporate management of the Pilgrim Nuclear Station.

Connecticut Department of Public Utility Control (Docket 89-08-11) - November 1989
United Illuminating Company's off-system capacity sales.

Kansas State Corporation Commission (Case 164,211-U) - April 1989
Whether any of the 127 days of outages of the Wolf Creek generating plant during 1987 and 1988 were the result of mismanagement.

Public Utility Commission of Texas (Docket 8425) - March 1989
Whether Houston Lighting & Power Company's new Limestone Unit 2 generating facility was needed to provide adequate levels of system reliability. Whether the Company's investment in Limestone Unit 2 would provide a net economic benefit for ratepayers.

Illinois Commerce Commission (Dockets 83-0537 and 84-0555) - July 1985 and January 1989
Commonwealth Edison Company's management of quality assurance and quality control activities and the actions of project contractors during construction of the Byron Nuclear Station.

New Mexico Public Service Commission (Case 2146, Part II) - October 1988
The rate consequences of Public Service Company of New Mexico's ownership of Palo Verde Units 1 and 2.

United States District Court for the Eastern District of New York (Case 87-646-JBW) - October 1988
Whether the Long Island Lighting Company withheld important information from the New York State Public Service Commission, the New York State Board on Electric Generating Siting and the Environment, and the U.S. Nuclear Regulatory Commission.

Public Utility Commission of Texas (Docket 6668) - August 1988 and June 1989
Houston Light & Power Company's management of the design and construction of the South Texas Nuclear Project. The impact of safety-related and environmental requirements on plant construction costs and schedule.

Federal Energy Regulatory Commission (Docket ER88-202-000) - June 1988
Whether the turbine generator vibration problems that extended the 1987 outage of the Maine Yankee nuclear plant were caused by mismanagement.

Illinois Commerce Commission (Docket 87-0695) - April 1988
Illinois Power Company's planning for the Clinton Nuclear Station.

North Carolina Utilities Commission (Docket E-2, Sub 537) - February 1988
Carolina Power & Light Company's management of the design and construction of the Harris Nuclear Project. The Company's management of quality assurance and quality control activities. The impact of safety-related and environmental requirements on construction costs and schedule. The cost and schedule consequences of identified instances of mismanagement.

Ohio Public Utilities Commission (Case 87-689-EL-AIR) - October 1987
Whether any of Ohio Edison's share of the Perry Unit 2 generating facility was needed to ensure adequate levels of system reliability. Whether the Company's investment in Perry Unit 1 would produce a net economic benefit for ratepayers.

North Carolina Utilities Commission (Docket E-2, Sub 526) - May 1987
Fuel factor calculations.

New York State Public Service Commission (Case 29484) - May 1987
The planned startup and power ascension testing program for the Nine Mile Point Unit 2 generating facility.

Illinois Commerce Commission (Dockets 86-0043 and 86-0096) - April 1987
The reasonableness of certain terms in a proposed Power Supply Agreement.

Illinois Commerce Commission (Docket 86-0405) - March 1987
The in-service criteria to be used to determine when a new generating facility was capable of providing safe, adequate, reliable and efficient service.

Indiana Public Service Commission (Case 38045) - November 1986
Northern Indiana Public Service Company's planning for the Schaefer Unit 18 generating facility. Whether the capacity from Unit 18 was needed to ensure adequate system reliability. The rate consequences of excess capacity on the Company's system.

Superior Court in Rockingham County, New Hampshire (Case 86E328) - July 1986
The radiation effects of low power testing on the structures, equipment and components in a new nuclear power plant.

New York State Public Service Commission (Case 28124) - April 1986 and June 1987
The terms and provisions in a utility's contract with an equipment supplier. The prudence of the utility's planning for a new generating facility. Expenditures on a canceled generating facility.

Arizona Corporation Commission (Docket U-1345-85) - February 1986
The construction schedule for Palo Verde Unit No. 1. Regulatory and technical factors that would likely affect future plant operating costs.

New York State Public Service Commission (Case 29124) – December 1985 and January 1986
Niagara Mohawk Power Corporation's management of construction of the Nine Mile Point Unit No. 2 nuclear power plant.
New York State Public Service Commission (Case 28252) - October 1985
A performance standard for the Shoreham nuclear power plant.

New York State Public Service Commission (Case 29069) - August 1985
A performance standard for the Nine Mile Point Unit No. 2 nuclear power plant.

Missouri Public Service Commission (Cases ER-85-128 and EO-85-185) - July 1985
The impact of safety-related regulatory requirements and plant aging on power plant operating costs and performance. Regulatory factors and plant-specific design features that will likely affect the future operating costs and performance of the Wolf Creek Nuclear Plant.

Massachusetts Department of Public Utilities (Case 84-152) - January 1985
The impact of safety-related regulatory requirements and plant aging on power plant operating costs and performance. Regulatory factors and plant-specific design features that will likely affect the future operating costs and performance of the Seabrook Nuclear Plant.

Maine Public Utilities Commission (Docket 84-113) - September 1984
The impact of safety-related regulatory requirements and plant aging on power plant operating costs and performance. Regulatory factors and plant-specific design features that will likely affect the future operating costs and performance of the Seabrook Nuclear Plant.

South Carolina Public Service Commission (Case 84-122-E) - August 1984
The repair and replacement strategy adopted by Carolina Power & Light Company in response to pipe cracking at the Brunswick Nuclear Station. Quantification of replacement power costs attributable to identified instances of mismanagement.

Vermont Public Service Board (Case 4865) - May 1984
The repair and replacement strategy adopted by management in response to pipe cracking at the Vermont Yankee nuclear plant.

New York State Public Service Commission (Case 28347) -January 1984
The information that was available to Niagara Mohawk Power Corporation prior to 1982 concerning the potential for cracking in safety-related piping systems at the Nine Mile Point Unit No. 1 nuclear plant.

New York State Public Service Commission (Case 28166) - January 1983 and February 1984
Whether the January 25, 1982, steam generator tube rupture at the Ginna Nuclear Plant was caused by mismanagement.

U.S. Nuclear Regulatory Commission (Case 50-247SP) - May 1983
The economic costs and benefits of the early retirement of the Indian Point nuclear plants.

REPORTS, ARTICLES, AND PRESENTATIONS

How the High Cost of Power from Prairie State is Affecting Bowling Green Municipal Utilities' Customers. July, 2014.

Overpriced Power: Why Batavia is Paying So Much for Electricity. Updated March 2014.

Huntley Generating Station: Coal Plant's Weak Financial Outlook Calls for Corporate & Community Leadership. January 2014. Co-authored with Cathy Kunkel and Tom Sanzillo.

When, Not If: Bridgeport's Future and the Closing of PSEG's Coal Plant.

Changing Course: A Clean Energy Investment Plan for Dominion Virginia Power. Co-authored with Jeff Loiter and Anna Sommer. August 2013.

Mountain State Maneuver: AEP and FirstEnergy try to stick ratepayers with Risky Coal Plants. September 2013. Co-authored with Cathy Kunkel.

Public Utility Regulation without the Public: The Alabama Public Service Commission and Alabama Power. Co-authored with Anna Sommer. March 2013

A Texas Electric Capacity Market: The Wrong Tool for a Real Problem. Co-authored with Anna Sommer. February 2013.

Dark Days Ahead: Financial Factors Cloud Future Profitability at Dominion's Brayton Point Power Plant. Co-authored with Tom Sanzillo. February 2013.

Report on the Kemper IGCC Project: Cost and Schedule Risks. November 2012.

The Prairie State Coal Plant: the Reality vs. the Promise. August 2012.

The Impact of EPA's Proposed 316(b) Existing Facility Rule on Electric System Reliability, July 2011.

The Economics of Existing Coal-Fired Power Plants, Presentation at EUCI Conference in St. Louis, MO, November 2010.

Presentation to the Indiana Utility Regulatory Commission on the Need for the Proposed Duke Energy Indiana Edwardsport IGCC Project, November 2010.

Reply Comments on Portland General Electric Company's 2009 Integrated Resource Plan, September 2010.

Presentation to the Oregon Public Utility Commission on Portland General Electric Company's 2009 Integrated Resource Plan, May 2010.

Comments on Portland General Electric Company's 2009 Integrated Resource Plan, May 2010.

Comments on the Facility Cost Report for Tenaska's Proposed Taylorville IGCC Plant, April 2010.

Comments on City of Holland Board of Public Work's 2010 Power Supply Plan, April 2010.

Phasing Out Federal Subsidies for Coal, April 2010.

Comments on Draft Portland General Electric Company 2009 Integrated Resource Plan, October 2009.

The Economic Impact of Restricting Mountaintop/Valley Fill Coal Mining in Central Appalachia, August 2009.

Energy Future: A Green Energy Alternative for Michigan, report, July 2009.

Energy Future: A Green Energy Alternative for Michigan, presentation, July 2009.

Preliminary Assessment of East Kentucky Power Cooperative's 2009 Resource Plan, June 2009.

The Financial Risks to Old Dominion Electric Cooperative's Consumer-Members of Building and Operating the Proposed Cypress Creek Power Station, April 2009.

An Assessment of Santee Cooper's 2008 Resource Planning, April 2009.

Nuclear Loan Guarantees: Another Taxpayer Bailout Ahead, Report for the Union of Concerned Scientists, March 2009.

New Hampshire Senate Bill 152: Merrimack Station Scrubber, March 2009.

The Risks of Building and Operating Plant Washington, Presentation to the Sustainable Atlanta Roundtable, December 2008.

The Risks of Building and Operating Plant Washington, Report and Presentation to EMC Board Members, December 2008.

Don't Get Burned, the Risks of Investing in New Coal-Fired Power Plants, Presentation at the University of California at Berkeley Energy and Resources Group Colloquium, October 2008.

Don't Get Burned, the Risks of Investing in New Coal-Fired Power Plants, Presentation at Georgia Tech University, October 2008.

Nuclear Power Plant Construction Costs, Synapse Energy Economics, July 2008.

Coal-Fired Power Plant Construction Costs, Synapse Energy Economics, July 2008.

Synapse 2008 CO_2 Price Forecasts, Synapse Energy Economics, July 2008.

Don't Get Burned, the Risks of Investing in New Coal-Fired Power Plants, Presentation at the NARUC ERE Committee, NARUC Summer Meetings, July 2008.

Are There Nukes In Our Future, Presentation at the NASUCA Summer Meetings, June 2008.

Risky Appropriations: Gambling US Energy Policy on the Global Nuclear Energy Partnership, Report for Friends of the Earth, the Institute for Policy Studies, the Government Accountability Project, and the Southern Alliance for Clean Energy, March 2008.

Don't Get Burned, *the Risks of Investing in New Coal-Fired Power Plants,* Presentation to the New York Society of Securities Analysts, February 26, 2008.

*Don't Get Burned,*Report for the Interfaith Center for Corporate Responsibility, February 2008.

The Risks of Participating in the AMPGS Coal Plant, Report for NRDC, February 2008.

Kansas is Not Alone, *the New Climate for Coal*, Presentation to members of the Kansas State Legislature, January 22, 2008.

The Risks of Building New Nuclear Power Plants, Presentation to the Utah State Legislature Public Utilities and Technology Committee, September 19, 2007.

The Risks of Building New Nuclear Power Plants, Presentation to Moody's and Standard & Poor's rating agencies, May 17, 2007.

The Risks of Building New Nuclear Power Plants, U.S. Senate and House of Representative Briefings, April 20, 2007.

Carbon Dioxide Emissions Costs and Electricity Resource Planning, New Mexico Public Regulation Commission, Case 06-00448-UT, March 28, 2007, with Anna Sommer.

The Risks of Building New Nuclear Power Plants, Presentation to the New York Society of Securities Analysts, June 8, 2006.

Conservation and Renewable Energy Should be the Cornerstone for Meeting Future Natural Gas Needs. Presentation to the Global LNG Summit, June 1, 2004. Presentation given by Cliff Chen.

Comments on natural gas utilities' Phase I Proposals for pre-approved full cost recovery of contracts with liquid natural gas (LNG) suppliers and the costs of interconnecting their systems with LNG facilities. Comments in California Public Utilities Commission Rulemaking 04-01-025. March 23, 2004.

The 2003 Blackout: Solutions that Won't Cost a Fortune, The Electricity Journal, November 2003, with David White, Amy Roschelle, Paul Peterson, Bruce Biewald, and William Steinhurst.

The Impact of Converting the Cooling Systems at Indian Point Units 2 and 3 on Electric System Reliability. An Analysis for Riverkeeper, Inc. November 3, 2003.

The Impact of Converting Indian Point Units 2 and 3 to Closed-Cycle Cooling Systems with Cooling Towers on Energy's Likely Future Earnings. An Analysis for Riverkeeper, Inc. November 3, 2003.

Entergy's Lost Revenues during Outages of Indian Point Units 2 and 3 to Convert to Closed-Cycle Cooling Systems. An Analysis for Riverkeeper, Inc. November 3, 2003.

Power Plant Repowering as a Strategy for Reducing Water Consumption at Existing Electric Generating Facilities. A presentation at the May 2003 Symposium on Cooling Water Intake Technologies to Protect Aquatic Organisms. May 6, 2003.

Financial Insecurity: The Increasing Use of Limited Liability Companies and Multi-tiered Holding Companies to Own Electric Generating Plants. A presentation at the 2002 NASUCA Annual Meeting. November 12, 2002.

Determining the Need for Proposed Overhead Transmission Facilities. A Presentation by David Schlissel and Paul Peterson to the Task Force and Working Group for Connecticut Public Act 02-95. October 17, 2002.

Future PG&E Net Revenues From The Sale of Electricity Generated at its Brayton Point Station. An Analysis for the Attorney General of the State of Rhode Island. October 2, 2002.

PG&E's Net Revenues From The Sale of Electricity Generated at its Brayton Point Station During the Years 1999-2002. An Analysis for the Attorney General of the State of Rhode Island. October 2, 2002.

Financial Insecurity: The Increasing Use of Limited Liability Companies and Multi-Tiered Holding Companies to Own Nuclear Power Plants. A Synapse report for the STAR Foundation and Riverkeeper, Inc., by David Schlissel, Paul Peterson, and Bruce Biewald, August 7, 2002.

Comments on EPA's Proposed Clean Water Act Section 316(b) for Cooling Water Intake Structures at Phase II Existing Facilities, on behalf of Riverkeeper, Inc., by David Schlissel and Geoffrey Keith, August 2002.

The Impact of Retiring the Indian Point Nuclear Power Station on Electric System Reliability. A Synapse Report for Riverkeeper, Inc. and Pace Law School Energy Project. May 7, 2002.

Preliminary Assessment of the Need for the Proposed Plumtree-Norwalk 345-kV Transmission Line. A Synapse Report for the Towns of Bethel, Redding, Weston, and Wilton Connecticut. October 15, 2001.

ISO New England's Generating Unit Availability Study: Where's the Beef? A Presentation at the June 29, 2001 Restructuring Roundtable.

Clean Air and Reliable Power: Connecticut Legislative House Bill HB6365 will not Jeopardize Electric System Reliability. A Synapse Report for the Clean Air Task Force. May 2001.

Room to Breathe: Why the Massachusetts Department of Environmental Protection's Proposed Air Regulations are Compatible with Reliability. A Synapse Report for MASSPIRG and the Clean Water Fund. March 2001.

Generator Outage Increases: A Preliminary Analysis of Outage Trends in the New England Electricity Market, a Synapse Report for the Union of Concerned Scientists, January 7, 2001.

Cost, Grid Reliability Concerns on the Rise Amid Restructuring, with Charlie Harak, Boston Business Journal, August 18-24, 2000.

Report on Indian Point 2 Steam Generator Issues, Schlissel Technical Consulting, Inc., March 10, 2000.

Preliminary Expert Report in Case 96-016613, Cities of Wharton, Pasadena, et al v. Houston Lighting & Power Company, October 28, 1999.

Comments of Schlissel Technical Consulting, Inc. on the Nuclear Regulatory Commission's Draft Policy Statement on Electric Industry Economic Deregulation, February 1997.

Report to the Municipal Electric Utility Association of New York State on the Cost of Decommissioning the Fitzpatrick Nuclear Plant, August 1996.

Report to the Staff of the Arizona Corporation Commission on U.S. West Corporation's telephone cable repair and replacement programs, May, 1996.

Nuclear Power in the Competitive Environment, NRRI Quarterly Bulletin, Vol. 16, No. 3, Fall 1995.

Nuclear Power in the Competitive Environment, presentation at the 18th National Conference of Regulatory Attorneys, Scottsdale, Arizona, May 17, 1995.

The Potential Safety Consequences of Steam Generator Tube Cracking at the Byron and Braidwood Nuclear Stations, a report for the Environmental Law and Policy Center of the Midwest, 1995.

Report to the Public Policy Group Concerning Future Trojan Nuclear Plant Operating Performance and Costs, July 15, 1992.

Report to the New York State Consumer Protection Board on the Costs of the 1991 Refueling Outage of Indian Point 2, December 1991.

Preliminary Report on Excess Capacity Issues to the Public Utility Regulation Board of the City of El Paso, Texas, April 1991.

Nuclear Power Plant Construction Costs, presentation at the November, 1987, Conference of the National Association of State Utility Consumer Advocates.

Comments on the Final Report of the National Electric Reliability Study, a report for the New York State Consumer Protection Board, February 27, 1981.

OTHER SIGNIFICANT INVESTIGATIONS AND LITIGATION SUPPORT WORK

Reviewed the salt deposition mitigation strategy proposed for Reliant Energy's repowering of its Astoria Generating Station. October 2002 through February 2003.

Assisted the Connecticut Office of Consumer Counsel in reviewing the auction of Connecticut Light & Power Company's power purchase agreements. August and September, 2000.

Assisted the New Jersey Division of the Ratepayer Advocate in evaluating the reasonableness of Atlantic City Electric Company's proposed sale of its fossil generating facilities. June and July, 2000.

Investigated whether the 1996-1998 outages of the three Millstone Nuclear Units were caused or extended by mismanagement. 1997 and 1998. Clients were the Connecticut Office of Consumer Counsel and the Office of the Attorney General of the Commonwealth of Massachusetts.

Investigated whether the 1995-1997 outages of the two units at the Salem Nuclear Station were caused or extended by mismanagement. 1996-1997. Client was the New Jersey Division of the Ratepayer Advocate.

Assisted the Associated Industries of Massachusetts in quantifying the stranded costs associated with utility generating plants in the New England states. May through July, 1996

Investigated whether the December 25, 1993, turbine generator failure and fire at the Fermi 2 generating plant was caused by Detroit Edison Company's mismanagement of fabrication, operation or maintenance. 1995. Client was the Attorney General of the State of Michigan.

Investigated whether the outages of the two units at the South Texas Nuclear Generating Station during the years 1990 through 1994 were caused or extended by mismanagement. Client was the Texas Office of Public Utility Counsel.

Assisted the City Public Service Board of San Antonio, Texas in litigation over Houston Lighting & Power Company's management of operations of the South Texas Nuclear Generating Station.

Investigated whether outages of the Millstone nuclear units during the years 1991 through 1994 were caused or extended by mismanagement. Client was the Office of the Attorney General of the Commonwealth of Massachusetts.

Evaluated the 1994 Decommissioning Cost Estimate for the Maine Yankee Nuclear Plant. Client was the Public Advocate of the State of Maine.

Evaluated the 1994 Decommissioning Cost Estimate for the Seabrook Nuclear Plant. Clients were investment firms that were evaluating whether to purchase the Great Bay Power Company, one of Seabrook's minority owners.

Investigated whether a proposed natural-gas fired generating facility was need to ensure adequate levels of system reliability. Examined the potential impacts of environmental regulations on the unit's expected construction cost and schedule. 1992. Client was the New Jersey Rate Counsel.

Investigated whether Public Service Company of New Mexico management had adequately disclosed to potential investors the risk that it would be unable to market its excess generating capacity. Clients were individual shareholders of Public Service Company of New Mexico.

Investigated whether the Seabrook Nuclear Plant was prudently designed and constructed. 1989. Clients were the Connecticut Office of Consumer Counsel and the Attorney General of the State of Connecticut.

Investigated whether Carolina Power & Light Company had prudently managed the design and construction of the Harris nuclear plant. 1988-1989. Clients were the North Carolina Electric Municipal Power Agency and the City of Fayetteville, North Carolina.

Investigated whether the Grand Gulf nuclear plant had been prudently designed and constructed. 1988. Client was the Arkansas Public Service Commission.

Reviewed the financial incentive program proposed by the New York State Public Service Commission to improve nuclear power plant safety. 1987. Client was the New York State Consumer Protection Board.

Reviewed the construction cost and schedule of the Hope Creek Nuclear Generating Station. 1986-1987. Client was the New Jersey Rate Counsel.

Reviewed the operating performance of the Fort St. Vrain Nuclear Plant. 1985. Client was the Colorado Office of Consumer Counsel.

WORK HISTORY

2012- Director of Resource Planning Analysis, Institute for Energy Economics and Financial Analysis

2010 - President, Schlissel Technical Consulting, Inc.

2000 - 2009: Senior Consultant, Synapse Energy Economics, Inc.

1994 - 2000: President, Schlissel Technical Consulting, Inc.

1983 - 1994: Director, Schlissel Engineering Associates

1979 - 1983: Private Legal and Consulting Practice

1975 - 1979: Attorney, New York State Consumer Protection Board

1973 - 1975: Staff Attorney, Georgia Power Project

EDUCATION

1983-1985: Massachusetts Institute of Technology
Special Graduate Student in Nuclear Engineering and Project Management,

1973: Stanford Law School,
Juris Doctor

1969: Stanford University
Master of Science in Astronautical Engineering,

1968: Massachusetts Institute of Technology
Bachelor of Science in Astronautical Engineering,

PROFESSIONAL MEMBERSHIPS

- New York State Bar since 1981

Attachment DS-2

Data Request OUCC DR 3 - 4

Please provide date each Petersburg unit was placed in service.

Objection:

Response:

The In-Service Dates (commercially available dates) for the Petersburg Units are as follows:

Petersburg Unit 1: 6/22/1967
Petersburg Unit 2: 12/25/1969
Petersburg Unit 3: 11/29/1977
Petersburg Unit 4: 4/28/1986

See also Petitioner's Attachment BDS-2.

Attachment DS-3

Data Request CAC DR 2 **-** 13

Describe what assumptions was made by Ms. Soller or Ms. Crockett in their analyses concerning the following:
a. Whether the operating performance (in terms of heat rate, EFOR, generation or capacity factor) would decline as the units age.
b. Whether the costs of operating and maintenance the Petersburg units would increase as the units age.
c. Whether higher capex would be required as the Petersburg units age.

Objection:

Response:

a. IPL did not assume declination in operating parameters in its analysis due to the inclusion of planned maintenance.
b. Annual escalation rates due to inflation were applied to O&M expenses.
c. Capex expenses in the model include annual escalation rates to reflect inflation as well.

Attachment DS-4

Data Request CAC DR 2 **-** 14

Provide any assessments of the impact of aging on coal plant operating performance, operating & maintenance costs and/or capex that have been prepared by or for ABB or that are in the possession of Ms. Soller or Ms. Crockett.

Objection:

Response:

No such assessments have been prepared by or for ABB or that are in the possession of Ms. Soller or Ms. Crockett.