STATE OF IOWA
BEFORE THE IOWA UTILITIES BOARD

IN RE: INTERSTATE POWER AND LIGHT COMPANY EMISSIONS PLAN AND BUDGET	)	DOCKET NO. EPB-2016-0150

DIRECT TESTIMONY (PUBLIC)
OF
NATHANIEL BAER

On Behalf of

Environmental Law & Policy Center
Iowa Environmental Council

April 27, 2017

Q. What is your name and business address?

A. My name is Nathaniel Baer. My title is Energy Program Director with the Iowa Environmental Council. Our offices are located at 521 East Locust Street, Suite 220, Des Moines, Iowa 50309.

Q. On whose behalf are you testifying today?

A. I am testifying on behalf of the Iowa Environmental Council and Environmental Law & Policy Center.

Q. Please describe your background.

A. I have a bachelor of arts degree from Earlham College in Richmond, Indiana and a law degree from the University of Iowa College of Law in Iowa City, although I am not a practicing attorney. I have worked for the Iowa Environmental Council (IEC) since 2007. The Iowa Environmental Council is a 501(c)(3) non-profit, member-based corporation that works to advance public policies that provide a safe, healthy environment and sustainable future for all Iowans. In my capacity at IEC, I have worked on a wide range of energy policy issues, including renewable energy, transmission, energy efficiency, biofuels, and transportation. This has included work on state and federal legislation and administrative rules both with federal and state agencies, as well as a range of dockets at the IUB. I have served on stakeholder committees, such as energy research or policy committees, established by the Iowa legislature, Midwestern Governors Association, Iowa Department of Transportation, and the University of Northern Iowa's Center for Energy and Environmental Education. I recently served on the Iowa Energy Resources

working group for the Iowa Energy Plan and am on the board of directors for the regional non-profit organization Wind on the Wires. I have participated regularly in the Iowa energy efficiency stakeholder collaborative convened by the Office of Consumer Advocate since 2009 and the Midcontinent Power Sector Collaborative since September 2014.

Q. Have you testified with the Iowa Utilities Board before?

A. Yes. I provided testimony in MidAmerican Energy's general rate case, RPU-2013-0004, in MidAmerican's last two requests for wind energy ratemaking principles in Wind X, RPU-2015-0002, and Wind XI, RPU-2016-0001, and in Interstate Power & Light's application for wind energy ratemaking principles, RPU-2016-0005. In addition, I have drafted or assisted in drafting our organization's comments and joint comments in various dockets before the IUB, including NOI-2006-0004, NOI-2009-0002, NOI-2011-0002, NOI-2011-0003, NOI-2014-0001, NOI-2014-0002, NOI-2015-0001, RMU-2014-0007, RMU-2016-0003, RMU-2016-0006, RMU-2016-0018, TF-2012-0546, TF-2012-0574, TF-2014-0294, TF-2014-0320, TF-2016-0290, TF-2016-0294, TF-2016-0321, TF-2016-0323, DRU-2017-0001, and SPU-2017-0001.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to identify specific concerns and shortcomings with IPL's proposal to add selective catalytic reduction (SCR) technology at the Ottumwa Generating Station (OGS). I recommend that IPL update and revise its analysis to include more accurate information on renewable energy cost, performance, and contribution to

the IPL system. In addition, if the results of the updated analysis show that retiring OGS is more cost-effective and better for customers than adding the SCR and continuing its operation – which is likely – then I further recommend that IPL commit to retire OGS instead of adding the SCR.

Q. What has IPL proposed with respect to an SCR at OGS?

A. IPL has proposed to add an SCR to OGS to reduce nitrogen oxide emissions. The decision to add the SCR has very significant implications for IPL's long-term resource plans as well as for MidAmerican Energy's long-term resource plans. IPL has indicated that by adding the SCR, it intends to or is likely to operate the plant for approximately [redacted] more years, or until approximately [redacted] IPL and MidAmerican are joint owners of OGS.

Q. Please summarize your concerns with IPL's proposal.

OGS is a large coal unit that will be more expensive to operate on an annual basis once the SCR is added. The SCR technology has a substantial upfront cost as well as annual operations and maintenance costs and other annual costs. The decision to incur the expense of constructing it and operating it each year for nearly [redacted] years – along with all of the other expenses of operating this coal unit including fuel, general operations and maintenance, additional pollution control equipment and measures, and other costs – should be compared to other resource options to determine the best outcome for IPL's customers. Because MidAmerican is a joint owner of OGS, the same is true for MidAmerican and its customers. The analysis should be robust and include an updated and transparent set of assumptions available for stakeholder review and input.

Q. Please summarize your concerns with IPL's resource planning and analysis.

A. IPL has used a number of outdated or flawed assumptions in its resource planning analysis. These assumptions overstate the cost of renewable resources, particularly solar PV, understate the performance of wind energy, and understate the additions of customer-sited renewable generation. As a result, IPL's analysis is an inadequate comparison of the option of adding the SCR to OGS to the option of retiring the unit and using a mix of renewable resources and market purchases to meet energy and capacity needs.

Q. What type of analysis did IPL include in its initial EPB filing?

A. IPL filed virtually no analysis comparing the SCR with other options in its initial EPB filing.

Q. What additional analysis and documentation has IPL subsequently provided?

A. IPL subsequently provided a presentation and a number of documents in discovery. IPL used previous resource plans and analyses conducted for the purposes of other dockets, including its RPU-2016-0005 wind ratemaking principle docket, to support its proposal to add the SCR in this docket. IPL previously conducted EGEAS analysis to support the addition of an SCR at OGS, including in 2014 and 2015. IPL appears to have updated certain assumptions in the summer of 2016 but has not updated a number of key assumptions.

Q. What are the primary EGEAS analyses or results that IPL has presented to support the SCR?

A. IPL identified several EGEAS analyses and results to support the SCR addition. IPL Response to Environmental Intervenors Data Request 15, Attachment OGS SCR Installation Presentation, filed as Exhibit EI-1 Attachment OGS SCR Installation Presentation (Confidential). These include the Control Case, Gas Conversion Case, Retirement Case, and a sensitivity identified as Solar Costs 20% Higher. IPL has also conducted additional EGEAS analyses or sensitivities, such as limits on market purchases or a termination of its PPA at the Duane Arnold Energy Center nuclear power plant.

I will primarily focus my testimony on the Control Case, Retirement Case, and Solar Costs 20% higher sensitivity.

Q. Please summarize the expansion plan impacts of the Control Case, Retirement Case, and Solar Costs 20% Higher sensitivity.

A. The Control Case presents the results of the addition of an SCR at OGS and the operation of OGS through [redacted] Under this case, IPL adds [redacted] MW of wind between [redacted] and [redacted] and [redacted] MW of solar PV in [redacted] MW annual increments between [redacted] and [redacted] IPL also adds almost [redacted] MW of gas CTs in [redacted] and [redacted] and shows market purchases most years between [redacted] and [redacted] for a total of [redacted] MW. Exhibit EI-1 Attachment OGS SCR Installation Presentation (Confidential).

The Retirement Case presents the results of the retirement of OGS in [redacted] Under this case, IPL adds [redacted] MW of wind between [redacted] and [redacted] and [redacted] MW of solar in [redacted] MW annual increments between [redacted] and [redacted] and between [redacted] and [redacted] IPL also adds about [redacted] MW of gas CTs in [redacted] and [redacted] and shows market purchases in each year between [redacted] and [redacted] for a total of [redacted] MW. Exhibit EI-1 Attachment OGS SCR Installation Presentation (Confidential).

In some respects, the results of the two cases are similar, in that IPL would add wind, solar, and gas CTs and purchase from the market in both cases. The difference is the mix and quantity of resources. The Retirement Case has twice the solar capacity added – [redacted] MW more than the Control Case – as well as [redacted] MW more wind, significantly more market purchases, and less new gas.

I note that the analysis appears have been conducted before IPL secured regulatory approval for its 500 MW New Wind Project in the fall of 2016, so 500 MW of the [redacted] MW (Control Case) or [redacted] MW (Retire Case) of wind should likely be removed from the expansion plan and moved to the wind column for committed units.

IPL also conducted a sensitivity that increased the cost of solar by 20% in these cases, called Solar Costs 20% Higher. Exhibit EI-1 Attachment OGS SCR Installation Presentation (Confidential). Given the quantity of solar added in the Retirement Case, this sensitivity appears to have a significant impact. I will address this further in my testimony below.

Q. What is the impact of these scenarios on IPL's overall generation mix?

A. IPL's energy mix includes generation from coal, gas, nuclear, market, solar and wind throughout the 2016-2035 time frame in both the Control Case and Retirement Case. Exhibit EI-1 Attachment OGS SCR Installation Presentation (Confidential). In the Control Case, coal continues to be the largest single source of generation in almost every year of this time frame, at between [redacted]% and [redacted]% in most years. Wind is the second largest source most years, followed by nuclear, market purchases, gas, and then solar, and there is zero solar until [redacted] In the Retirement Case, there is more evenly distributed generation from coal, nuclear, gas and market purchases, each in the [redacted]% range in most years. Wind is the largest source at between [redacted]% and [redacted]% in most years, and solar increases gradually each year starting in [redacted] Market purchases are only [redacted]% higher in the Retirement Case in most years. While both the Retirement Case and Control Case have a mix of resources, the Control Case relies more heavily on coal and less on renewables, while the Retirement Case modestly increases the generation from renewables.

Q. How has IPL compared these cases?

A. IPL compared the Present Value Revenue Requirement (PVRR) of each case. Exhibit EI-1 Attachment OGS SCR Installation Presentation (Confidential). The Control Case is the base case with a null or zero value. The other cases or sensitivities are compared against that with either a higher or lower PVRR than the Control Case.

The results show the Retirement Case is [redacted] than the Control Case. However, IPL has noted that EGEAS does not capture or monetize every value that might be considered when comparing these cases. IPL has monetized excess capacity values from OGS that EGEAS does not capture and factored that into the analysis. Exhibit EI-1 Attachment OGS SCR Installation Presentation (Confidential).

Q. What solar costs did IPL use?

A. IPL used data from the National Renewable Energy Laboratory (NREL) Annual Technology Baseline (ATB) from 2015. IPL Response to Environmental Intervenors Data Request 5, filed as Exhibit EI-2 (Confidential). The 2015 NREL ATB provides several cost scenarios solar PV as well as cost and performance options or scenarios for other renewable energy technologies.[1] IPL selected the cost from the "Mid" option for solar. There is also a "Low" option and a "High" option for 2015.

Q. What are your concerns with IPL's solar cost assumption?

I have significant concerns that IPL's solar costs are too high for both the Control and Retirement Cases and the Solar 20% Higher sensitivity. I am further concerned that IPL did not conduct or present a sensitivity with solar costs at a lower amount, but only at the 20% higher amount. The impact of solar costs is significant because of the amount of solar installed in the Retirement Case compared to the Control Case.

[1] Although replaced by the later 2016 version, main 2015 NREL ATB documents are available from NREL at http://www.nrel.gov/analysis/data_tech_baseline_legacy.html (last accessed April 26, 2017).

There is more recent solar cost information available for IPL to use from the 2016 NREL ATB, which was released in September 2016. This data shows much lower solar costs in future years. The 2016 NREL ATB is more recent data and more representative of the latest understanding of future solar costs, which have been coming down significantly in recent years.

In the table below, I have included the solar unit additions in the Control Case and Retirement Case EGEAS results, the solar costs that IPL used from the 2015 NREL ATB, and the updated solar costs from both the "Low" and "Mid" TRGs from the 2016 NREL ATB.

I note that the updated solar costs are lower in every year where EGEAS selects solar unit additions. In the [redacted] years where [redacted] MW of solar are added in the Retirement Case, but not in the Control Case, the updated solar costs are quite a bit lower – approximately [redacted]% lower in the "Mid" TRG or over [redacted]% lower in the "Low" TRG. I will note that the 2015 NREL ATB costs appear to be presented in 2013 dollars while the 2016 NREL ATB costs appear to be presented in 2014 dollars. I have not adjusted the 2015 and 2016 NREL ATB costs to be in the same dollar year, but I would expect a minimal difference between 2013 and 2014 that would not affect that conclusion that the 2016 NREL ATB presents significantly lower solar costs. If anything, reducing the 2016 NREL ATB 2014 dollars to 2013 dollars would increase the gap between the 2015 NREL ATB and the 2016 NREL ATB.

Comparison of IPL Solar Costs and 2016 NREL ATB Mid and Low Costs

Year	Control Case Solar Additions in MW	Retirement Case Solar Additions in MW	2015 NREL ATB - Mid (IPL assumption) in 2013$	2016 NREL ATB - Mid in 2014$	Percentage change from IPL 2015 NREL ATB	2016 NREL ATB - Low in 2014$	Percentage change from IPL 2015 NREL ATB
2020							
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028							
2029							
2030							
2031							
2032							
2033							
2034							
2035							

Q. What are the trends related to solar costs?

A. Solar costs have been coming down significantly in recent years. The cost reductions have been more rapid than many predicted and therefore it is important to use the most recent cost information available.

For example, the December 2016 release of levelized cost information from Lazard includes a summary of cost decreases for wind and solar in recent years.[2] According to Lazard, unsubsidized wind levelized costs have decreased 66% in the past seven years. Unsubsidized solar levelized costs have decreased 85% in the past seven years.

Q. What do you recommend regarding solar costs?

IPL should update its analysis to reflect the solar costs in the 2016 NREL ATB. IPL can use the 2016 NREL ATB "Mid" TRG costs for this as a starting point. IPL should more accurately capture likely cost reduction trends and should conduct a sensitivity using the 2016 NREL ATB "Low" costs. Both the "Low" and "Mid" costs from the 2016 NREL ATB are important to model, since they both represent possible futures for solar costs. Conversely, the outdated 2015 NREL ATB "Mid" costs and the sensitivity with solar costs 20% higher than the "Mid" costs very likely overstate the cost of solar in future years.

Q. What wind performance assumption did IPL use?

A. IPL uses an annual capacity factor of [redacted]% for the performance of wind unit additions. IPL Response to Environmental Intervenors Data Request 3, filed as Exhibit EI-3 (Confidential), and IPL Response to Environmental Intervenors Data Request 5 and Attachment 5A, filed as Exhibit EI-2 (Confidential). IPL also maintains the [redacted]% capacity factor as a static assumption regardless of the future year that wind units are installed.

[2] Lazard, *Levelized Cost of Energy Analysis – Version 10.0* (2016) available at https://www.lazard.com/media/438038/levelized-cost-of-energy-v100.pdf.

The [redacted]% capacity factor is based, at least in part, on the 2015 NREL ATB. The Land-Based Wind section of the 2015 NREL ATB includes five Techno-Resource Groups (TRGs), each of which has different capacity factors, different capital costs, and other differences. IPL selected TRG [redacted]

Q. What are your concerns with IPL's wind performance assumption?

A. I have two primary concerns with IPL's wind performance assumptions.

First, the [redacted]% capacity factor now represents the low end of expected performance for wind turbines installed in Iowa. When IPL filed its New Wind Project application in 2016, IPL projected an annual average capacity factor range of 44% to 51%. Witness Tom Wind included in his testimony his recent projection for a single turbine project of 51% (a GE 1.79 MW turbine) and concluded that IPL's project is likely to achieve the upper end of its projected range. Changes in the annual capacity factor can make a big difference in annual energy generation. For example, 100 MW of wind at 44% would generate 385,440 MWh annually while 100 MW of wind at 51% would generate 446,760 MWh annually.

Second, IPL does not increase the capacity factor in future years but maintains the [redacted]% capacity factor regardless of year. The 2015 and 2016 NREL ATB both provide incremental increases in capacity factor in future years. This is a reasonable adjustment that recognizes gradual improvements in technology, such as taller turbines and longer blades. For example, in the 2015 NREL ATB, TRG [redacted] Mid wind capacity factor increases

from [redacted]% to [redacted]% in 2020 and to [redacted]% in 2030. Similarly, in the 2016 NREL ATB, the TRG 3 Low wind capacity factor starts at 48% in 2014 and increases to 52% in 2020 and 55% in 2030.[3]

Q. What do you recommend regarding wind performance assumptions?

A. IPL should conduct a sensitivity using a higher wind capacity factor, such as the 51% in the upper end of its stated range in capacity factors in the New Wind Project docket. IPL should also provide for incremental increases in capacity factor, such as those provided in the 2016 NREL ATB TRG 3 Low and TRG 2 Low.

Q. What wind costs did IPL use?

A. Like the solar costs, IPL used the outdated 2015 NREL ATB for wind costs and selected a wind cost option or scenario (TRG[redacted] Mid) that is also too high. IPL Response to Environmental Intervenors Data Request 5 and Attachment 5A, filed as Exhibit EI-2 (Confidential). IPL also made an adjustment to the 2015 NREL ATB wind costs that increases the cost.

Q. What do you recommend regarding wind costs?

A. IPL should use the updated 2016 NREL ATB for wind costs and should select several TRG options with higher performance and lower costs, including the TRG 3 Low and TRG 2 Low. In addition, IPL should conduct a sensitivity without the additional wind cost adjustment.

[3] The 2016 NREL ATB includes 10 TRGs instead of 5 in the 2015 version. TRG[redacted] in the 2016 version is not the same as TRG[redacted] in the 2015 version.

Q. How did IPL project customer-sited renewable additions?

A. IPL's forecast for additions of customer-sited renewable energy, such as solar PV, appears to have been conducted in September 2015. Most notably, IPL assumed that the federal investment tax credit (ITC) for solar would expire in 2016 and that this would dramatically reduce annual or incremental customer-sited renewable additions starting in 2017.

IPL's forecast for all customer-sited solar – residential and business – is 431 kW-AC in 2017, 554 kW-AC in 2018, and 759 kW-AC in 2019, and 1,128 kW-AC in 2020. Between 2017 and 2025, IPL's forecast shows 10,747 kW-AC of customer-sited solar. IPL Response to Environmental Intervenors Data Request 11, filed as Exhibit EI-4.

Q. What are your concerns with IPL's projections for customer-sited renewable energy?

IPL's assumptions for customer-sited renewables are outdated and do not reflect current policy or the reality on the ground. In fact, Congress extended the federal ITC in late 2015. The extension continues the 30% ITC for solar – its full value – through 2021 and then begins a partial phase out. The federal ITC would be reduced from 30% to 26% in 2022 and 22% in 2023. In 2024, the federal ITC goes to 10% for business taxpayers and expires for residential taxpayers. In Iowa, the Iowa legislature also extended the Iowa solar investment tax credit – a 50% match of the federal credit – in the 2016 legislative session. As a result, both the federal ITC and Iowa ITC are scheduled to be available at full value through 2021 before the partial phase-out begins.

Q. What impact will this extension have in Iowa and in IPL's service territory?

A. I would expect that annual or incremental additions of customer-sited solar PV are likely to continue at approximately the 2016 pace at least through 2021. In 2016, IPL added 9,390 kW of customer-sited solar generation. Response to Environmental Intervenors Data Request 12, filed as Exhibit EI-5. Some customers may have committed to add solar before Congress extended the federal ITC, so this number could be a bit high. Conversely solar costs continue to fall, which opens the market for more customers. An annual or incremental range of 8,000 to 10,000 kW-AC would be reasonable to forecast, or between 72 MW and 90 MW added between 2017 and 2025.

For context, the Solar Energy Industries Association projects that 223 MW of solar will be installed in Iowa over the next five years.[4] Not all of this will be customer-owned or customer-sited generation, nor would it all be in IPL's service territory. If approximately one-third were built in IPL's service territory between 2017 and 2021, that would result in 72 MW in five years – the low end of my estimate above. This would also leave another four years (2022-2025) for an additional 18 MW to be built to reach the high end of my estimate above. In other words, my projections are seven to eight times the amount of customer-sited solar that Alliant projected in its analysis in 2015.

Q. What impact would there be from updating the assumptions about customer-owned solar?

A. Customer-sited solar reduces IPL's need for both capacity and energy from other resources. The capacity reduction is important. When IPL conducted this analysis, MISO

[4] http://www.seia.org/sites/default/files/IA%202016Q4.pdf.

had not provided solar PV accreditation guidance. IPL Response to Environmental Intervenors Data Request 10, filed as Exhibit EI-6. Lacking that guidance, IPL used its own analysis with a .473 multiplier: Solar nameplate capacity in kW-AC multiplied by .473. Using this methodology, 100 MW of customer-sited solar would allow for a demand adjustment 47.3 MW. Although EGEAS does not select customer-sited renewable energy as a resource, IPL can adjust the load forecast downward to reflect the presence of customer-sited renewables. IPL Response to Environmental Intervenors Data Request 4, filed as Exhibit EI-7.

MISO has since determined that solar will receive a 50% capacity credit, which is slightly higher than the IPL assumption.

The much larger customer-sited solar additions between 2017 and 2025 and the demand adjustments (using either the IPL assumption or the MISO assumption) should reduce IPL's need for market purchases. Both the Control Case and the Retirement Case rely on market purchases, with the Retirement Case having significantly higher market purchases. In both cases, there are a number of years where there are 50 MW purchases from the market and in both cases the market purchases do not begin until after 2024, or after most of the federal ITC-supported customer-sited solar would be installed. Improving the assumptions for customer-sited renewables may not change the relative NPRR comparison between the Control Case and Retirement Case since the assumptions would apply equally to both cases. However, to the extent that increased reliance on

market purchases is perceived as a barrier or a risk to the Retirement Case, improving these assumptions will provide a benefit.

Q. What impact would updating all of these inputs and assumptions have on the results of the analysis?

A. I believe the impact could be significant. For example, the impact of one single sensitivity change that IPL has presented – raising the cost of solar by 20% - changed the Retirement Case NPRR by $[redacted]. Before the sensitivity, the Retirement Case was $[redacted] than the Control Case. After the sensitivity, the Retirement Case was $[redacted] than the Control Case. The Retirement Case has significantly more solar deployed than the Control Case, so it makes sense that increasing the cost of solar would increase the cost of the Retirement Case.

Given this impact, I believe a single sensitivity – reducing solar costs by [redacted]% or [redacted]% – would cause the Retirement Case to have a significantly lower NPRR than the Control Case. These lower solar costs are supported by updated information provided by NREL, as I noted earlier in my testimony.

In addition to this change, additional updates to assumptions would further improve the Retirement Case. The Retirement Case has [redacted] MW more wind than the Control Case. Increasing the performance of wind energy would reduce IPL's need to run units with fuel and other costs, rely on market energy purchases, or add capacity to meet energy

needs. Improving the performance of wind and reducing the cost of wind should improve the NPRR of the Retirement Case compared to the Control Case.

Increasing customer-owned generation additions, particularly for solar, will reduce IPL's need to run units with fuel and other costs, rely on the market for energy and capacity purchases, or add capacity to meet both energy and capacity needs.

With these updates, it is very possible that a revised EGEAS analysis would show the Retirement Case to have a lower NPRR even after post-hoc adjustments for things that EGEAS does not monetize, such as excess capacity values from OGS.

Q. Have you conducted an EGEAS analysis?

A. No. I do not have access to EGEAS. IPL would need to update the inputs and assumptions and provide the results. Alternatively another party with access to EGEAS could perform this analysis.

Q. Has IPL presented an EGEAS analysis with updated renewable energy costs, renewable performance assumptions, and other similar updates?

A. No. We asked IPL to conduct additional EGEAS analysis. We specifically requested that IPL update its inputs and assumptions regarding renewable costs, renewable performance, and customer-sited renewable additions. IPL refused to conduct this analysis. IPL Response to Environmental Intervenors Data Request 13, filed as Exhibit EI-8.

Q. What other factors would impact the results of the comparison between the Control Case and the Retirement Case?

A. There are many assumptions and inputs that I did not review but that could influence the comparison of these two cases, including the NPRR. For example, IPL made certain assumptions about the annual capacity factor of OGS if it continues to run as a coal unit or if it were converted to natural gas, as well as the price of natural gas, the price of firm gas at the pipeline, or the upfront cost of converting OGS from coal to gas. The same is true for market energy and capacity costs, the downward influence of additional low-cost wind generation on market energy and capacity costs, the amount of energy efficiency in IPL's forecast, and the rate of inflation.

On the issue of inflation, IPL assumed a [redacted]% annual rate of inflation in every year between 2019 and 2035. IPL Response to Environmental Intervenors Data Request 5, filed as Exhibit EI-2 (Confidential). This is considerably higher than the average rate of inflation between 2014 and 2018 in IPL's information, which is [redacted]%. IPL Response to Environmental Intervenors Data Request 5, filed as Exhibit EI-2 (Confidential). A higher rate of inflation would increase the capital cost of renewable energy in future years. In addition to the [redacted]% annual rate, IPL should evaluate a lower rate of [redacted]% or [redacted]%. Given the larger quantity of renewables added in the Retirement Case after 2025, a lower inflation rate should further improve the Retirement Case compared to the Control Case.

Q. What are there implications for MidAmerican's resource plans and customers?

A. IPL and MidAmerican jointly own OGS. IPL's share is 48% and MidAmerican's is 52%. MidAmerican likely would be responsible for covering 52% of the upfront costs of installing the SCR as well as for that proportionate share of the operating costs.

Q. Has IPL presented information supporting the reasonableness of the SCR for MidAmerican's customers?

A. No. For example, IPL's EGEAS analysis only includes IPL's system and does not include MidAmerican's load and generation. IPL Response to Environmental Intervenors Data Request 14, filed as Exhibit EI-9.

Q. Has MidAmerican presented information supporting the reasonableness of the SCR of its customers?

A. No. According to IPL, MidAmerican has not provided IPL with separate analysis regarding OGS or the addition of an SCR. IPL Response to Environmental Intervenors Data Request 19, filed as Exhibit EI-10.

Q. What are your recommendation regarding IPL's proposal to add an SCR to OGS?

A. IPL should conduct a fresh analysis using the revised and updated assumptions that I outlined above, including the 2016 NREL ATB cost and performance assumptions for solar and wind, incremental additions of customer-owned solar and MISO's 50% capacity credit for solar. IPL should more thoroughly and exhaustively evaluate how retiring the OGS unit and meeting energy and capacity needs with low-cost renewables

would be a better outcome for customers, including both MidAmerican and IPL customers given the joint ownership of OGS. I also recommend that IPL conduct this type of resource planning with meaningful opportunities for stakeholder review and input. If the results of a revised analysis indicate that the Retirement Case is a better option for customers, which I think can be expected, then IPL should retire OGS by the end of [redacted] rather than install an SCR and continue its operation for another [redacted] or [redacted] years.

Q. Does this conclude your testimony?

A. Yes.

AFFIDAVIT OF
NATHANIEL BAER

STATE OF IOWA)
) ss.
COUNTY OF BLACKHAWK)

I, Nathaniel Baer, being first duly sworn, depose and state that the statements contained in the foregoing prepared direct testimony are true and correct to the best of my knowledge, information and belief, and that such prepared direct testimony constitutes my own statement in this proceeding.

Further affiant sayeth not.

/s/ Nathaniel Baer

Nathaniel Baer

Subscribed and sworn to before me,
a Notary Public in and for said County and
State, this 27 day of April 2017.

/s/ Kyle Walker

Notary Public