March 16, 2017

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Mr. M. Bob Pauley, Chief Technical Advisor of Research, Policy, and Planning
Jeremy Comeau, Assistant General Counsel
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Electronically delivered

Re: Public Version of the Selected Assumptions Summary Report for the Indiana 2016 IRPs

Dear Director Borum, Chief Technical Advisor Pauley, and Assistant General Counsel Comeau,

Pursuant to the Indiana Utility Regulatory Commission's ("IURC" or "Commission") draft Integrated Resource Planning Rule, 170 IAC 4-7, Citizens Action Coalition of Indiana ("CAC"), Earthjustice, Indiana Distributed Energy Alliance ("IndianaDG"), Sierra Club, and Valley Watch (collectively, "Commenters") hereby submit the attached public version of the Selected Assumptions Summary Report for Indiana 2016 IRPs by Anna Sommer with Sommer Energy, LLC, and Elizabeth A. Stanton, PhD, with Applied Economics Clinic. We appreciate the opportunity to comment, as well as Commission Staff's willingness to provide us with extensions of time that allowed us to seek information from the utilities through an informal discovery process.

The attached summary report highlights some of the key efficiency, commodity, and price projections used by Indianapolis Power & Light ("IPL"), Northern Indiana Public Service Company ("NIPSCO"), and Southern Indiana Gas & Electric Company d/b/a Vectren Energy Delivery ("Vectren") in their 2016 IRPs, to the extent that they are comparable. This material is presented separately from our reports reviewing each of these individual IRPs because it includes information that is considered confidential to each utility and therefore cannot be viewed by the other utilities and/or information that is only meaningful within the context of comparing it to another utility.

We will be filing the confidential version of this report under seal in the utilities' three confidentiality dockets, Cause Nos. 44873 (IPL), 44874 (NIPSCO), 44890 (Vectren); however, the utilities will not be served the fully unredacted version due to the above stated confidentiality issue.

Thank you very much for this opportunity. We look forward to the issuance of and opportunity to comment on the Director's Draft Report. Please feel free to contact Jennifer Washburn, Counsel at Citizens Action Coalition, with any questions or concerns.

Respectfully,

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Confidential Selected Assumptions Summary Report for Indiana 2016 IRPs (Public Version)

Submitted to the IURC on March 16, 2018

Authors:

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on behalf of CAC, Earthjustice, Indiana Distributed Energy Alliance, Sierra Club, and Valley Watch

Overview

This summary report highlights some of the key efficiency, commodity, and price projections used by Indianapolis Power & Light Company ("IPL"), Northern Indiana Public Service Company ("NIPSCO"), and Southern Indiana Gas & Electric Company d/b/a Vectren Energy Delivery ("Vectren") in their 2016 IRPs, to the extent that they are comparable. This material is presented separately from our reports reviewing each of these individual IRPs because it includes information that is considered confidential to each utility and therefore cannot be viewed by the other utilities and/or information that is only meaningful within the context of comparing it to another utility.

The report begins with a discussion of the adoption rates used in the energy efficiency potential studies performed by AEG on behalf of IPL and NIPSCO. AEG did not perform a potential study for Vectren for purposes of its 2016 IRP. The remainder of the report compares the capacity, power, gas, and coal prices used by these utilities.

Analysis

1. Adoption Rates in AEG Energy Efficiency Potential Studies

We are concerned about AEG's ability to produce a truly independent analysis of energy efficiency potential—particularly given:

- the current importance of energy efficiency potential studies to the determination of cost-effective energy efficiency savings in Indiana IRPs; and
- the current interpretation of how those IRP results should be translated to Indiana DSM plans.

Many elements of these potential studies are a "black box" to us—that is, little or no explanation is provided of these studies' rationale, assumptions, and methodology. AEG's explanation of Technical Potential—found in both the IPL and NIPSCO 2016 Market Potential Studies[1]--provides an example of the functional impact of AEG's lack of transparency in its modeling and presentation:

> *Technical Potential is the theoretical upper limit of energy efficiency potential, assuming that customers adopt all feasible measures regardless of cost or customer preference. At the time of existing equipment failure, customers replace their equipment with the most efficient option available. In new construction, customers and developers also choose the most efficient equipment option. (AEG 2016 MPS for IPL, p.4; AEG 2016 MPS for NIPSCO, p.5)*

[1] AEG's 2016 *DSM Market Potential Study* for IPL is Attachment 5.6 to the IPL 2016 IRP ("AEG 2016 MPS for IPL"); AEG's 2016 *DSM Market Potential Study for Electricity* for NIPSCO is Attachment B, Exhibit 1 to the NIPSCO 2016 IRP ("AEG 2016 MPS for NIPSCO").

Conceptually, AEG's explanation is understandable to us, although we dispute the appropriateness of limiting potential by assuming that equipment is only replaced when it fails.[2] AEG's use of this limiting definition will not lessen total technical potential over the life of any particular measure. It will, however, limit energy efficiency potential in the near term and is counter-intuitive since customers can and do replace measures before they fail as a result of energy efficiency programs.

Transparency would be an issue even if AEG had not made this limiting assumption. It would be very difficult for any stakeholder to verify whether AEG's estimates of technical potential actually constitute a "theoretical upper limit of energy efficiency potential" because (a) the data underlying this estimate are not provided as part of the IRP, and (b) these data would be extremely time-consuming to review even if a stakeholder had them in their possession. The same critique could be made regarding the transparency of other potential levels estimated by AEG, e.g., economic, achievable, etc.

One small window into AEG's black box is its adoption rates applied to help determine the level of achievable potential, which are readily comparable between NIPSCO and IPL. AEG gives achievable potential one definition in its 2016 MPS for NIPSCO:

> *Achievable Potential refines economic potential by applying customer participation rates that account for market barriers, customer awareness and attitudes, program maturity, and other factors that affect market penetration of DSM measures. (AEG 2016 MPS for NIPSCO, p.5)*

And two definitions in AEG's 2016 MPS for IPL—one for each of two levels of achievable potential: "Maximum Achievable" and "Realistic Achievable". IPL selected the Maximum Achievable Potential for the construction of its DSM bundles, and defines it as follows:

> *Maximum Achievable Potential (MAP) estimates customer adoption of economic measures when delivered through DSM programs under ideal market, implementation, and customer preference conditions and an appropriate regulatory framework. Information channels are assumed to be well established and efficient for marketing, educating consumers, and coordinating with trade allies and delivery partners. Maximum Achievable Potential establishes a maximum target for the savings that an administrator can hope to achieve through its DSM programs and involves incentives that represent a substantial portion of measure costs combined with high administrative and marketing costs. This leads measures in MAP to be less cost effective than in RAP, described below. (AEG 2016 MPS for IPL, p.5)*

In contrast, Realistic Achievable Potential is defined in AEG's 2016 MPS for IPL as:

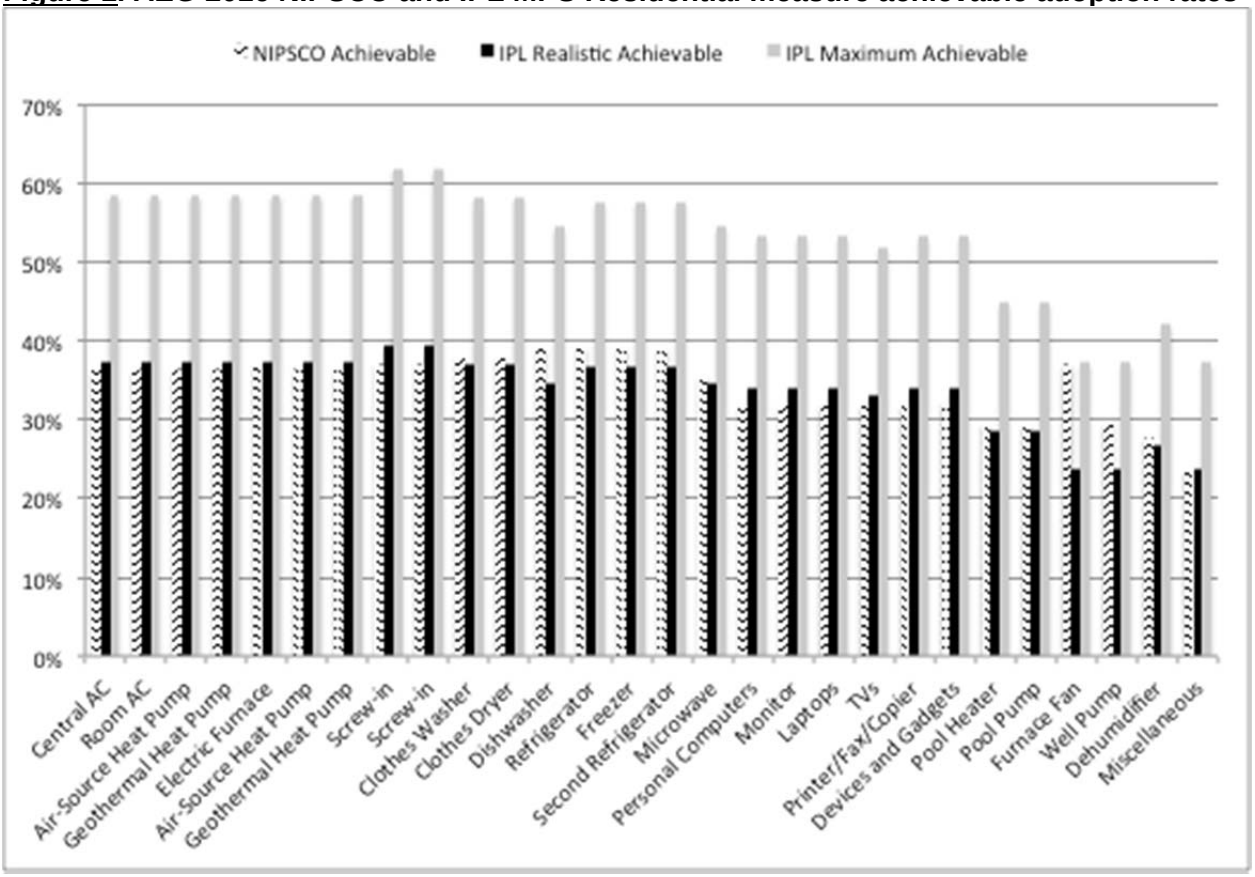
> *Realistic Achievable Potential (RAP) reflects expected program participation given DSM programs under more typical market conditions and barriers to customer acceptance, non-ideal implementation channels, and constrained program budgets. The delivery environment in this analysis projects the current state of the DSM market in IPL's service territory and projects typical*

[2] Kramer, Chris, and Glenn Reed (2012) *Ten Pitfalls of Potential Studies*. Regulatory Assistance Project and Energy Future Group. (http://www.raponline.org/wp-content/uploads/2016/05/energyfutures-kramerreed-tenpitfallsesdraft2-2012-oct-24.pdf), p.9.

> *levels of expansion and increased awareness over time. (AEG 2016 MPS for IPL, p.5)*

These are not just semantic differences. The three definitions of achievable potential correspond to three distinct sets of adoption rates. AEG's adoption rates were provided as appendices to the NIPSCO and IPL 2016 DSM Market Potential Studies (see Figure 1). Neither appendix is accompanied by any narrative describing how or on what basis these adoption rates were developed.

Figure 1. AEG 2016 NIPSCO and IPL MPS Residential measure achievable adoption rates



Source: AEG 2016 MPS for NIPSCO, Appendix B; AEG 2016 MPS for IPL, Appendix B

Figure 1 raises several critical questions regarding AEG's method for estimating achievable potential:

1. The NIPSCO "Achievable" adoption rates are very similar to the IPL Realistic Achievable rates. Can NIPSCO's "Achievable" potential, therefore, be viewed as a lower boundary on achievable potential? If it can, this means that any calculation of the Maximum Achievable potential is absent from NIPSCO's study.
2. The AEG Project Director was the same person for both the NIPSCO and IPL 2016 MPSs; several other AEG staff members also worked on both reports. Why then do these reports use different definitions of Achievable Potential?
3. If there are data to back up this range of adoption rates as appropriate, then it would appear that different circumstances result in different adoption rates for the same measures. Can the circumstances associated with these divergent adoption rates speak to how efficiency programs are best designed so as to maximize participation and

savings? Put another way, should Figure 1 be interpreted to reveal that NIPSCO is assuming that it will design its programs in a suboptimal manner?

Differences between the commercial and industrial measure adoption rates between the two potential studies also raise important questions. There is a single set of NIPSCO adoption rates for each of the commercial and industrial sectors. However, for IPL, adoption rates vary depending on the business type. For example, while an interior screw-in light bulb is assumed to have the same adoption rate for every business type in the commercial sector in the NIPSCO study, different business types have different adoption rates for an interior screw-in light bulb in the IPL study—and these differences are not limited to AEG's so-called Maximum Achievable and Realistic Achievable potential. IPL's business customers are assumed to have different adoption rates depending on whether that light bulb is used in a small office, large office, school, college, and so on. Table 1 shows a selection of these adoption rates.

Table 1. AEG 2016 MPS for NIPSCO and IPL Selected 2018 adoption rates for an interior screw-In lightbulb

NIPSCO Commercial	28%
IPL Small Office (RAP)	44%
IPL Small Office (MAP)	67%
IPL Large Office (RAP)	30%
IPL Large Office (MAP)	47%
IPL School (RAP)	25%
IPL School (MAP)	39%
IPL College (MAP)	7%
IPL College (RAP)	11%
IPL Warehouse (MAP)	16%
IPL Warehouse (RAP)	24%

Source: AEG 2016 MPS for NIPSCO, Appendix B; AEG 2016 MPS for IPL, Appendix B
Note: RAP is Reasonable Achievable Potential; MAP is Maximum Achievable Potential.

For many other measures, AEG's 2016 MPS for IPL assumes a similarly wide variety of adoption rates depending on business type. AEG offers no substantiation for these very detailed differing adoption rates. Without further information and access to AEG's underlying data, it is not clear why the approach taken should be so different between the two utilities. It would appear that AEG has much more detailed adoption rate data available to it for IPL than it does for NIPSCO, but there's no explanation for why that would be the case.

Though certainly concerning, the purpose of this comparison is not to examine specific adoption rates and try to determine which is appropriate, but rather to illustrate the lack of transparency that characterizes AEG's energy efficiency potential studies and the difficulty in providing a thorough review of these studies even if they were more transparent. As we discuss in our comments on both the IPL and NIPSCO IRPs (see Section VI of our IPL report and Section IX

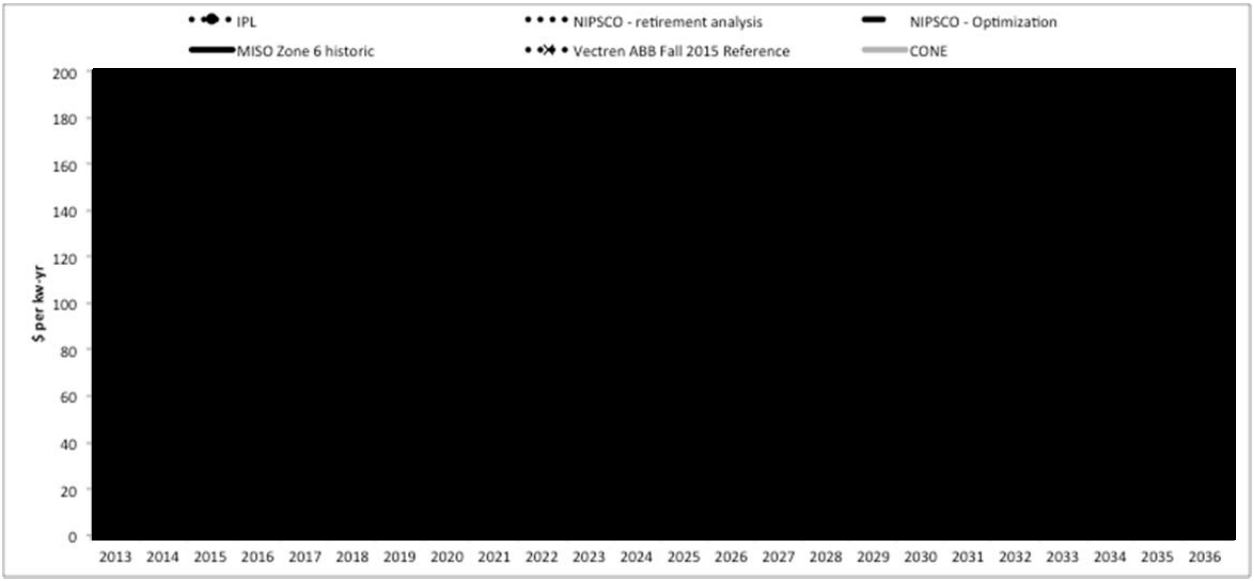
of our NIPSCO reports), we think there is a better way to consider DSM within an IRP that does not place such a heavy emphasis on potential studies.

2. MISO Capacity Prices

Most of the capacity prices used by the three companies in their IRPs reach very high prices relative to recent historical prices in MISO Zone 6 (the zone in which Indiana is located): see NIPSCO - retirement analysis, IPL, and Vectren ABB Fall 2015 Reference together with the MISO Zone 6 historical capacity price in Confidential Confidential Figure 2 below.

Confidential Figure 2 also presents the NIPSCO capacity price used for "optimization," which is very different than that used for the retirement analysis for coal plants. In several instances, these forecasts take just three years to [redacted] our estimated forecast of MISO's Cost of New Entry (CONE) going forward[3] (shown in grey), which is noteworthy because CONE sets the cap on MISO capacity prices in that it represents the highest offer price that can be made into the MISO Planning Resource Auction (PRA).

Confidential Figure 2. [redacted]



Source: IPL 2016 IRP Confidential Attachment 5.10, NIPSCO Response to CAC 1-016 Attachment A, NIPSCO Base Preferred Plan.REP Strategist file provided in response to CAC 1-001, Vectren A-Business As Usual GAF Input Summary Report provided in unnumbered informal discovery request, MISO and SNL Financial.

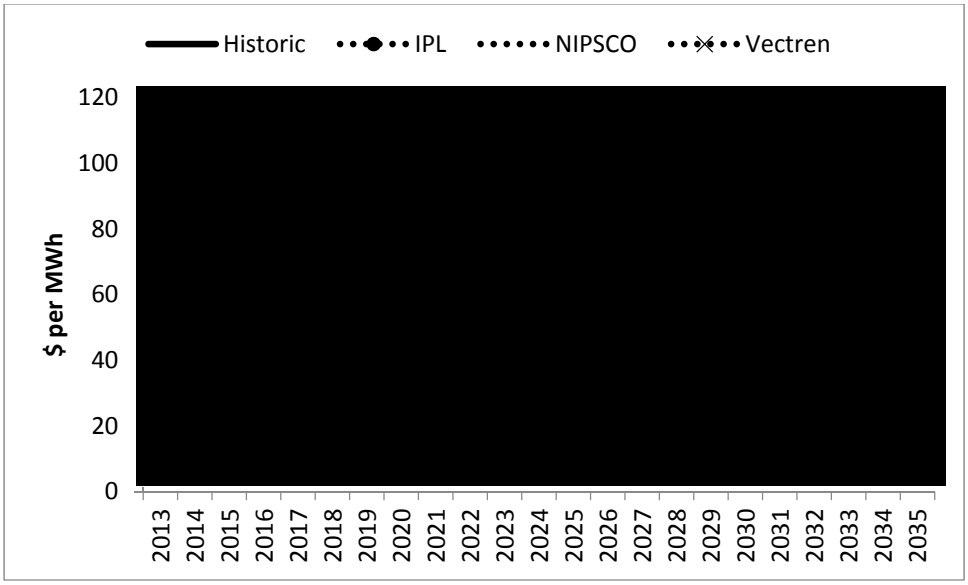
[3] Note that we created this multi-year CONE projection by taking the 2017/2018 Planning Year CONE value and escalating it at 2% percent per year.

3. MISO Power Prices

To create the subsequent figures, we used an open access software called WebPlotDigitizer[4] to pull specific data points from confidential and public graphs in the NIPSCO and Vectren IRPs. We used this methodology because NIPSCO would not make available to stakeholders the specific annual values for its commodity and power price inputs despite the fact that the graphs showing this information are public. We followed the same practice for Vectren because this information is only presented in graphical format in its IRP. IPL data was presented in tabular format in ABB's confidential report.

As depicted in Confidential Confidential Figure 3 and Confidential Confidential Figure 4, all three utilities presented base power price projections for both on and off-peak. These projections represent significant increases from historic levels by 2036. NIPSCO and IPL projected power prices are [redacted] than those of Vectren.

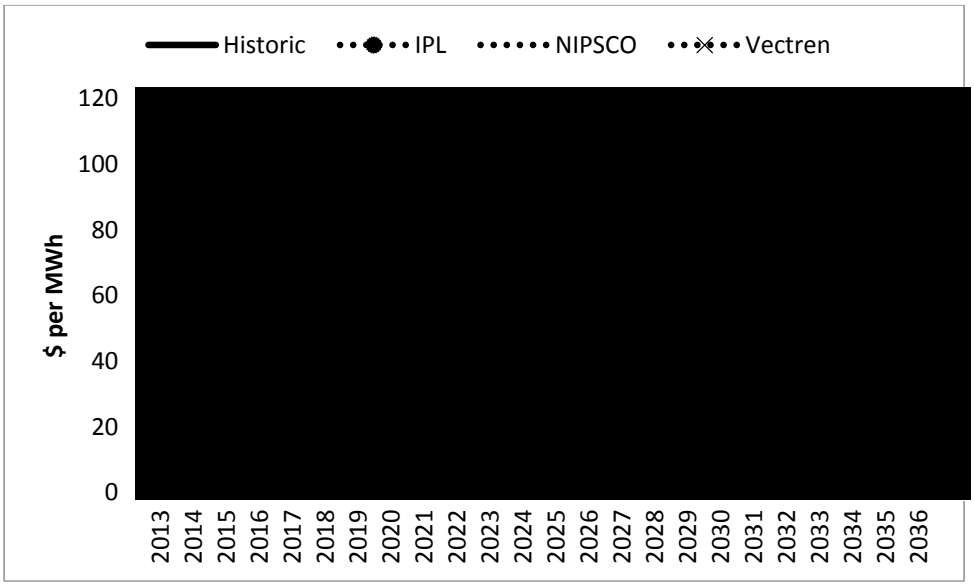
Confidential Figure 3. [redacted]



Source: IPL 2016 IRP Confidential Attachment 2.2 – Table 2-1, NIPSCO 2016 IRP, Figure 8-7, Vectren 2016 IRP Confidential Figure 6.6, and SNL Financial.

[4] http://arohatgi.info/WebPlotDigitizer/

Confidential Figure 4. [redacted]

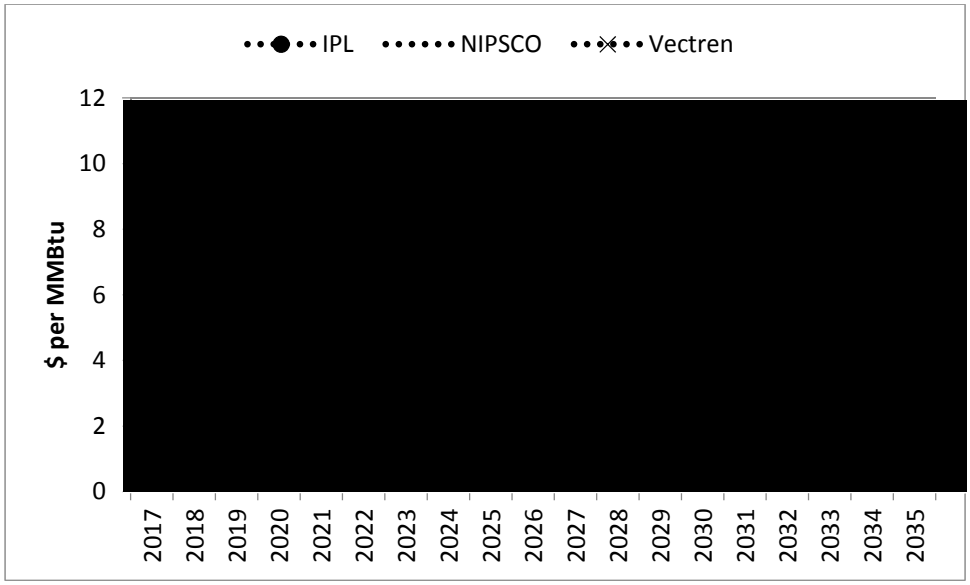


Source: IPL 2016 IRP Confidential Attachment 2.2 – Table 2-1, NIPSCO 2016 IRP, Figure 8-8, Vectren 2016 IRP Confidential Figure 6.6, and SNL Financial.

4. Natural Gas Prices

IPL's base natural gas price is [redacted] than those of the other two utilities (see Confidential Confidential Figure 5). There are some caveats to this comparison, however. While Vectren and IPL used Henry Hub forecasted prices, NIPSCO used a gas price projection for the Chicago City Gate. This means that a small amount[5] of the difference between NIPSCO and the other gas prices can be attributed to the assumed delivery point.

Confidential Figure 5. [redacted]



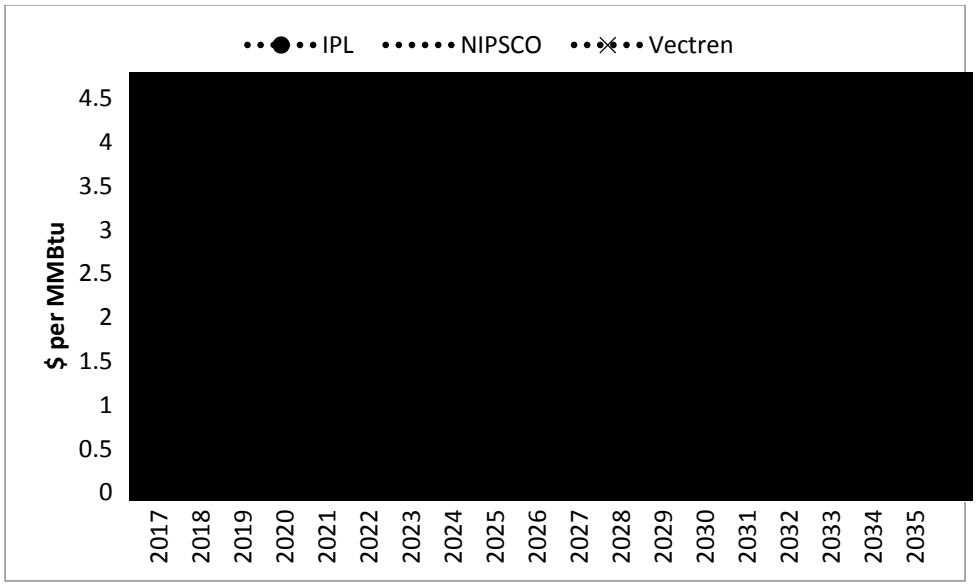
Source: IPL 2016 IRP Confidential Attachment 2.2 – Table 3-1, NIPSCO 2016 IRP, Figure 8-3, and Vectren 2016 IRP Confidential Figure 6.2.

[5] For example, OTC Global Holdings show that Chicago forward prices are, on average, about $0.14 per MMBtu lower than Henry Hub prices.

5. Coal Prices

Again, IPL's Illinois Basin coal prices are much [redacted] than those of Vectren and NIPSCO (see Confidential Confidential Figure 6). We believe that all three forecasts are without transportation costs and are in nominal dollars, so this should be a true apples to apples comparison. We have reason to question whether the coal forecast shown here for IPL is actually used in IPL's IRP, however, because their modeling seems to show a much [redacted] projection. We plan to investigate further and address this issue in our reply to the Director's Draft report.

Confidential Figure 6. [redacted]



Source: IPL 2016 IRP Confidential Attachment 2.2 – Table 2-4, NIPSCO 2016 IRP, Figure 8-5, and Vectren 2016 IRP Confidential Figure 6.3.