

**Indianapolis Power & Light Company Reply to Director’s Report  
on the 2016 Integrated Resource Plans  
August 28, 2017**

**Introduction**

Indianapolis Power & Light Company (“IPL”) submitted its 2016 Integrated Resource Plan (“IRP”) on November 1, 2016. The Indiana Utility Regulatory Commission (“IURC” or “Commission”) published its draft “Director’s Report for the 2016 Integrated Resource Plans” on July 28, 2017. This document includes IPL’s responses to this report. IPL appreciates the IURC’s engagement in the stakeholder process and its comprehensive and thoughtful review of the IRPs.

IPL’s comments focus on overall suggestions for improvement as well as the four elements highlighted in the Director’s report:

1. Fuel and commodity price forecasts;
2. Construction of resource portfolios based on the development of a wide range of scenarios and sensitivities;
3. The treatment of Demand-Side Management (“DSM”) on as comparable a basis as possible with all other resources; and
4. Discussion of the metrics that each utility considered to evaluate the IRPs.

**Overall Improvements**

The Director’s report made suggestions for improvement regarding the content and presentation of basic information included in the utilities’ IRPs. IPL will include additional basic Company information in an easy to use format in future IRPs and is willing to work with the other utilities to discuss ways to do so in a way that is easy for the Commission and other stakeholders to access and analyze. IPL also appreciates the specific recommendation to enhance the use of summary tables and figures for comparing candidate resource portfolios in future IRPs and the examples referenced in the Director’s report such as Vectren’s portfolio comparison table referenced in CAC et al Comments to the 2016 Vectren IRP on pg. 11. IPL plans to incorporate these suggestions and continue to seek stakeholder feedback in future IRPs.

With regard to the feedback related to modeling capabilities, IPL is in the process of changing resource optimization and production cost modeling tools and expects to have more flexibility to model scenarios, sensitivities, stochastic results and quantify results in future IRPs.

**Indianapolis Power & Light Company Reply to Director’s Report  
on the 2016 Integrated Resource Plans  
August 28, 2017**

**Fuel and Commodity Price Forecasts**

IPL agrees that the interrelationship between commodities and power markets will continue to evolve with the changing landscape of natural gas production and demand, the changing national and regional resource mix, and stagnant regional load growth projections. The forecasts and projections have a major influence on the portfolios generated as part of an IRP process, and IPL is committed to enhancing robust modeling techniques and discussing assumptions in an open and transparent manner as part of the stakeholder process. IPL is confident that ABB’s Reference Case methodology is consistent with forecasting best practices and relies on fully integrated energy models that ultimately build up to the power prices used in the production cost modeling. In the next IRP, IPL will commit more to fully describing the fundamentals underlying the forecasts used.

Regarding using MISO as a resource, IPL is fully engaged in various MISO stakeholder committees related to scenario planning, including the Economic Planning Users Group (EPUG) and the Planning Advisory Committee (PAC). In general, MISO utilizes fundamental forecasts for commodities to use in their production cost studies. For example, in the MTEP process, MISO utilizes a blend of NYMEX natural gas futures prices in the short term and fundamental forecasts in the long term for the MTEP scenarios.<sup>1</sup> IPL will continue to explore ways to incorporate MISO studies and information into the scenario development process. An example of this could be information from the MISO Renewable Integration Impact Assessment that was announced at the August 16, 2017, PAC committee meeting.<sup>2</sup> IPL expects to be involved as a stakeholder in the development of this study as well as other future studies.

---

<sup>1</sup> “MTEP17 Futures”, MISO Planning Advisory Committee, Slide 18,  
<https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/PAC/2016/20161019/20161019%20PAC%20Supplemental%20MTEP17%20Futures%20Summary.pdf>

<sup>2</sup> “Renewable Integration Impact Assessment”, MISO Planning Advisory Committee,  
<https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/PAC/2017/20170816/20170816%20PAC%20Item%2003a%20Renewable%20Integration%20Impact%20Assessment%20Discussion.pdf>

**Indianapolis Power & Light Company Reply to Director’s Report  
on the 2016 Integrated Resource Plans  
August 28, 2017**

**Resource Portfolios**

IPL utilized deterministic scenario planning in combination with probabilistic sensitivities in this IRP. The Commission and the CAC pointed out that IPL only showed the six portfolios using the base case assumptions and suggested a better method would be to run each scenario through each set of assumptions or drivers. The result would be the matrix table in Figure 1 where the cells highlighted in gray will be the lowest cost and each portfolio can be evaluated against the other.

**Figure 1. IPL 2016 IRP Results (Developed from Figure 8.31 on p. 180)**

	<b>Base Case</b>	<b>Robust</b>	<b>Recession</b>	<b>Enviro</b>	<b>DG</b>	<b>Quick</b>
<b>Base Case</b>	<b>\$10,309</b>	\$10,549	\$11,042	\$11,989	\$11,092	\$11,988
<b>Robust</b>						
<b>Recession</b>						
<b>Enviro</b>						
<b>DG</b>						
<b>Quick</b>						

IPL could accommodate showing a similar table in the next IRP, but believes that the probabilistic modeling effectively accomplished the same thing in a more robust manner by showing how each portfolio performed across 50 simulations using alternative assumptions, not just the three to four drivers that changed with each scenario. An alternative approach to each of these methods would be to incorporate stochastics into the capacity optimization up front. Rather than generating five to ten portfolios from deterministic scenarios, the optimization engine would select the best portfolio across all of the probabilistic simulations. IPL’s new modeling software is expected to enable this type of capacity optimization modeling in addition to traditional deterministic scenarios combined with stochastic sensitivities. Some binary factors such as regulation or carbon pricing are difficult to capture stochastically, so IPL expects to rely on multiple methods for developing and evaluating portfolios in the next IRP.

**Demand-Side Management (DSM)**

As noted in the Director’s Report, IPL decided to use two decision points (2018 and 2021) for DSM in the IRP due to the “limitation on the number of resources that the capacity expansion model could handle.” As mentioned above, IPL is in process of implementing new modeling software prior to preparing the 2019 IRP. Based on conversations with the modeling vendor, it is IPL’s understanding that the software has the capability to model additional DSM decision points and produce additional modeling results.

**Indianapolis Power & Light Company Reply to Director's Report  
on the 2016 Integrated Resource Plans  
August 28, 2017**

As noted in the Director's Report on p. 12, IPL used DSM costs provided by the Market Potential Study ("MPS") in its 2016 IRP which included a base estimate with no high or low variations. IPL acknowledges that, while there is no one correct approach, capturing variability in DSM costs may lead to a more robust analysis. As a follow up, IPL plans to review options to capture DSM cost variability in the 2019 IRP. Particularly, the Director's Report was complementary of Vectren and Dr. Richard Stevie's approach in Vectren's 2016 IRP. IPL plans to contact Dr. Stevie and review his methodology.

**Metrics**

IPL appreciates the feedback from the Commission regarding the increased use of metrics and how the metrics can be improved upon in the next IRP. The presentation of probabilistic results is challenging, and IPL tried to strike a balance to provide clear but also thorough results. Model output such as the tornado charts are harder to interpret and condense into a single metric or value, whereas other items like expected value and risk can be easily quantified. This resulted in a mix of deterministic and probabilistic results in the metrics chart, in addition to a combination of results presentation and discussion in the report. IPL will work toward an enhanced discussion of the results in the next IRP as it pertains to the stochastic results. IPL expects the probabilistic modeling results to be fully incorporated into the metrics and portfolio evaluation in the next IRP.

Regarding the risk metrics specifically, IPL believes that the expected value, which is the mean outcome from the simulations, does capture both "good" (low PVRR) and "high" (high PVRR) outcomes. The expected value is effectively a probability-weighted PVRR for each portfolio across the same set of simulations.

**Risk of Investments and PPAs**

The Director's report addresses portfolio risk in multiple areas. IPL appreciates the recognition of investment risks as stated below on page 17. "IPL seems to recognize that some level of reliance on the market for both capacity and/or energy can be economic or risky but they do not seem to recognize that long-term resource acquisition embodied in both owned resources and Purchase Power Agreements (PPAs) represent their own forms of risk when all aspects of the electric utility world are changing rapidly and fundamentally."

IPL believes a diverse portfolio will mitigate investment risks through a mix of technologies, fuel sources and a blend of PPA and ownership asset structures. Customers often cite a desire for price certainty which long-term asset ownership and PPAs provide. IPL welcomes stakeholders'

**Indianapolis Power & Light Company Reply to Director's Report  
on the 2016 Integrated Resource Plans**

**August 28, 2017**

insights and opinions about identifying and quantifying long-term acquisition risks in the 2019 IRP process.

**Common Definitions**

The Directors report includes a discussion about more clearly defining portfolio metrics/characteristics such as resiliency, diversity, balance, and robustness as referenced in the report "PJM's Evolving Resource Mix and System Reliability." IPL welcomes further discussion about this topic with the Indiana utilities and stakeholders.

**Planning Interaction with RTOs**

The Commission states on Page 50, Section 8.1.2, "Ideally, Indiana utilities would work with their respective RTOs to consider the broader regional implications of a variety of short, mid-term, and long-run resource options that are comparatively economical and provide appropriate reliability. For example, if a significant amount of coal-fired capacity is being retired in the MISO and/or PJM regions, would this influence retirement decisions for coal units in Indiana?"

IPL is an active participant in the MISO transmission and generation interconnection planning processes. MISO footprint wide resource additions and retirements were imbedded in the fundamental forecast developed by IPL's consultant as part of IPL's analysis.

Moving forward, changes to the way resources are addressed in the MISO Transmission Expansion Planning ("MTEP") process are expected. IPL has suggested that MISO model the utility member resource plans for long-term MTEP planning, but this has not yet occurred. The use of utility plans becomes more critical, particularly if the footprint experiences a high level of Distributed Energy Resources ("DERs") which will require greater collaboration between the operator of the distribution system and the operator of the transmission system.

**Conclusion**

IPL recognizes the evolutionary nature of resource planning and the stakeholder IRP process. IPL anticipates continuous improvement in the future.