STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

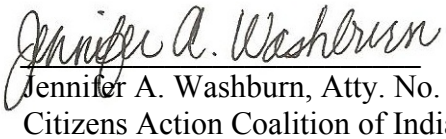
VERIFIED PETITION OF SOUTHERN INDIANA GAS AND ELECTRIC COMPANY d/b/a VECTREN ENERGY DELIVERY OF INDIANA, INC. ("VECTREN SOUTH") FOR (1) ISSUANCE OF A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR THE CONSTRUCTION OF A COMBINED CYCLE GAS TURBINE GENERATION FACILITY ("CCGT"); (2) APPROVAL OF ASSOCIATED RATEMAKING AND ACCOUNTING TREATMENT; (3) ISSUANCE OF A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR COMPLIANCE PROJECTS TO MEET FEDERALLY MANDATED REQUIREMENTS ("CULLEY 3 COMPLIANCE PROJECT"); (4) AUTHORITY TO TIMELY RECOVER 80% OF THE COSTS INCURRED DURING CONSTRUCTION AND OPERATION OF THE CULLEY 3 COMPLIANCE PROJECTS THROUGH VECTREN SOUTH'S ENVIRONMENTAL COST ADJUSTMENT MECHANISM; (5) AUTHORITY TO CREATE REGULATORY ASSETS TO RECORD (A) 20% OF THE REVENUE REQUIREMENT FOR COSTS, INCLUDING CAPITAL, OPERATING, MAINTENANCE, DEPRECIATION, TAX AND FINANCING COSTS ON THE CULLEY 3 COMPLIANCE PROJECT WITH CARRYING COSTS AND (B) POST-IN-SERVICE ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION, BOTH DEBT AND EQUITY, AND DEFERRED DEPRECIATION ASSOCIATED WITH THE CCGT AND CULLEY 3 COMPLIANCE PROJECT UNTIL SUCH COSTS ARE REFLECTED IN RETAIL ELECTRIC RATES; (6) ONGOING REVIEW OF THE CCGT; (7) AUTHORITY TO IMPLEMENT A PERIODIC RATE ADJUSTMENT MECHANISM FOR RECOVERY OF COSTS DEFERRED IN ACCORDANCE WITH THE ORDER IN CAUSE NO. 44446; AND (8) AUTHORITY TO ESTABLISH DEPRECIATION RATES FOR THE CCGT AND CULLEY 3 COMPLIANCE PROJECT ALL UNDER IND. CODE §§ 8-1-2-6.7, 8-1-2-23, 8-1-8.4-1 ET SEQ., 8-1-8.5-1 ET SEQ. AND 8-1-8.8 ET SEQ.	)	**CAUSE NO. 45052**

SUBMISSION OF PUBLIC POST-HEARING RESPONSE BRIEF OF CAC, SIERRA CLUB AND VALLEY WATCH

Citizens Action Coalition of Indiana, Inc. ("CAC"), Sierra Club, and Valley Watch (collectively, "Joint Intervenors") respectfully submit the public, redacted post hearing response brief in the above referenced Cause to the Indiana Utility Regulatory Commission. The unredacted pages of the post-hearing response brief which contain information Vectren deems

confidential is being simultaneously filed, under seal, with the Commission. Petitioner has previously confirmed that the docket entry issued on March 29, 2018, is sufficient to protect this information as confidential.

Respectfully submitted,



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JOINT INTERVENORS' POST-HEARING RESPONSE BRIEF

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The Commission should deny the application for certificates of public convenience and necessity of Southern Indiana Gas & Electric Company d/b/a Vectren Energy Delivery of Indiana, Inc. ("Vectren"), to build a combined cycle gas turbine and to invest more ratepayer money to continue operating Culley Unit 3. Vectren's application is insufficiently supported, excessively risky, and not the right option for its customers.

Vectren is right to come to the Commission and confess that its aging coal fleet is no longer competitive in the energy marketplace. Vectren's aging and inefficient coal units should be retired and replaced with less expensive, less risky generation. But Vectren is flat wrong to suggest an expensive over-build of gas generation is the best option for customers who have had the highest bills in the state for eight years due to Vectren's past over-investment in coal generation.

Vectren has coveted a large capital investment since at least its 2016 Integrated Resource Plan ("IRP"), which produced results appearing to show a large gas plant as a low-cost and low-risk option. However, the record evidence in this case demonstrates that Vectren's 2016 IRP substantially understated the true cost of the proposed gas plant. As a result, the 2016 IRP artificially disadvantaged and screened out other resource alternatives. Vectren further disadvantaged alternatives by relying on exaggerated cost estimates for energy efficiency and renewables.

Vectren's proposed large gas plant was never the lowest-cost option in its analysis. Vectren also claims to have assessed the risk of its proposal, but it used arbitrary and subjective metrics. While that faulty risk analysis originally selected the gas plant as lowest-risk, removing the worst metrics changed the results: Vectren's plan was never the lowest-risk alternative, even under its own flawed analysis.

IRPs are not intended to be final resource commitments, but rather a compass to guide the utility through a variety of scenarios. *See* Joint Intervenors' ("JI") Ex. 2, Attach. TFC-6, p. 36. Yet, after loading its 2016 IRP with assumptions that favored building a new gas plant, Vectren treated it as a final resource decision and never looked back. When Vectren updated a handful of Strategist modeling runs in 2017, it loaded the model with gas-heavy portfolio options and continued its biased assumptions against other resources. When Vectren issued a Request for Proposals, it excluded every possible alternative but the gas plant it wanted. Only through such a distorted process could the smallest utility in the state possibly attempt to justify building the state's largest gas plant.

It hardly takes a microscope to see Vectren's proposal is dangerously imprudent. In the midst of an affordability crisis, the utility proposes to build considerably more generation than it needs to supply its customers. Vectren claims that building excess capacity will be a boon for its customers thanks to off-system sales, but that claim depends on unsupported assumptions that capacity and energy prices will skyrocket in the coming years to levels higher than in MISO's entire history. Vectren's proposal to overbuild capacity is an unnecessary and exceedingly risky bet of its customers' money on the future of capacity and energy markets that is antithetical to public convenience and necessity.

Vectren's proposal also deprives its customers of flexibility and diversity, rather than promoting it. If allowed to build a single plant with a 40-year lifespan to meet 70% of generation needs, there will be scant opportunity for Vectren's portfolio to respond to the inevitable technological, regulatory, and economic changes of the coming decades. And these changes are coming—Vectren's own witnesses testified as much. The cost trajectory for renewable resources and storage technologies has dramatically declined in recent years. Other

Indiana utilities are already planning to retire coal plants and replace them with these clean, and increasingly affordable, alternatives. Investors are rushing away from fossil fuels, already drying up access to capital for utilities with gas-heavy portfolios, and agencies are contemplating future regulations to curb climate change impacts. It is manifestly imprudent for a small utility to plan a billion dollar capital investment to maintain its fossil fuel dependence, particularly when doing so means sacrificing diversity and flexibility.

The following discussion addresses these many flaws in Vectren's application and the record evidence in detail. With respect to the proposed gas plant, Section III.A addresses Vectren's modeling, showing that the Company employed a convoluted, nontransparent, and unnecessarily complex methodology that is irredeemably flawed and was riddled with inconsistent and inappropriate assumptions about resource options. Section III.B discusses Vectren's analysis of current and potential Demand Side Management, explaining how Vectren continues to bias against and failed to credibly evaluate achievable and cost-effective demand response and energy efficiency potential. Section III.C focuses on the Company's inadequate exploration of alternatives through a Request for Proposals that excluded every resource but large gas plants and thus leaves the Commission with no market confirmation of Vectren's modeling exercises. Section III.D reviews Vectren's own witnesses' testimony on how its proposal to maintain a fossil-fuel heavy portfolio will foreseeably constrain its future access to capital. Section III.E addresses Vectren's purported risk analysis, which ignored known risks, has not been updated in several years, and cannot be relied upon to produce accurate results. Section III.F discusses the unlawful cross-subsidization between Vectren's gas and electric customers inherent in the Company's plans to develop a new gas pipeline. Section III.G explains that coal industry fuel security propaganda mischaracterizes the facts and should have no bearing

on whether to build one type of generation over another. Finally, Section III.H reviews the laundry list of statutory requirements Vectren has not satisfied, necessitating protection for ratepayers and the denial of the Company's expensive and insufficiently supported application. With respect to the proposed Culley 3 Compliance Projects, Section IV reviews the statutory requirements Vectren's evidence has not satisfied, again necessitating denial.

I. FACTUAL BACKGROUND

For a detailed description of the factual and procedural background in this case, please refer to Joint Intervenors' Proposed Order at pages 6–51.

II. LEGAL STANDARDS

A. Legal Standard for Review of the Proposed CCGT

Chapter 8.5 of the Indiana Code establishes the legal standard that Vectren must meet to obtain a Certificate of Public Convenience and Necessity ("CPCN") for the proposed combined cycle gas turbine ("CCGT"). First, Vectren must provide "substantial evidence" to the Commission that "public convenience and necessity requires, or will require…" the construction of this CCGT. Ind. Code Ann. §§ 8-1-8.5-2, 8-1-8.5-5(b)(3). NIPSCO v. U.S. Steel, 907 N.E.2d 1012, 1015–16 (Ind. 2009).

In other words, Vectren must identify a public need for additional capacity, and then demonstrate that the CCGT would fill this need. In re NIPSCO, Cause No. 43396, at 22 (IURC May 28, 2008) ("Our threshold inquiry addresses whether NIPSCO has demonstrated a need for additional generating capacity in this proceeding."). Vectren's submissions must be sufficient for the Commission to make "specific findings of fact" on that need. United States Gypsum, Inc. v. Indiana Gas Co., 735 N.E.2d 790, 795 (Ind. 2000).

The Commission must also examine whether Vectren's construction proposal is consistent with the terms of the State Energy Plan, if the Commission considers the State Energy Plan to be developed, in whole or in part, for purposes of this proceeding, including:

(1) The probable future growth of the use of electricity, as predicted in the Forecast prepared by the State Utility Forecasting Group. Ind. Code Ann. § 8-1-8.5-5(b)(2)(A); *id.* § 8-1-8.5-3.5; In re NIPSCO, Cause No. 43396, at 22 (listing "NIPSCO's projected growth" as an item necessary to review in an application for a CPCN for a CCGT).
(2) The Commission's estimate of the probable needed generating reserves.
(3) The Commission's judgment on the optimal extent, size, mix, and general location of generating plants.
(4) The Commission's judgment on the optimal arrangements for statewide or regional pooling of power and arrangements with other utilities and energy suppliers achieve maximum efficiencies for the benefit of the people of Indiana.
(5) The comparative costs of meeting future growth by other means of providing reliable, efficient, and economic electric service, including purchase of power, joint ownership of facilities, refurbishment of existing facilities, conservation (including energy efficiency), load management, distributed generation, and cogeneration.

Ind. Code Ann. § 8-1-8.5-3(b); *id.* § 8-1-8.5-5(b)(2)(A). Or, the Commission must make a finding that the construction proposal is consistent with Vectren's current or updated Integrated Resource Plan ("IRP"), with the Commission effectively approving Vectren's IRP herein if that is the case, as well as determining whether the construction plan is consistent with the whole or parts of the State Energy Plan, if the Commission considers it to be developed for purposes of this case. Ind. Code Ann. §§ 8-1-8.5-5(b)(2)(B), (d), 8-1-8.5-3(e)(1). The IRP must "assess[] a variety of demand side management and supply side resources to meet future customer electricity service needs in a cost effective and reliable manner" and meet the requirements of the IRP rule at 170 Ind. Admin. Code 4-7 *et seq*. Ind. Code Ann. § 8-1-8.5-3(e)(2).

Next, if the Commission does determine that Vectren has demonstrated a public need, determined it is consistent with the State Energy Plan and/or consistent with Vectren's current or updated IRP, and approves Vectren's current or updated IRP, Vectren must give the Commission

substantial information about all possible alternatives to serve that need. In re NIPSCO, Cause No. 43396, at 22 (listing "**all** of the sources utilized by NIPSCO" as an item necessary to review in an application for a CPCN for a CCGT) (emphasis added). Ind. Code Ann. §§ 8-1-8.5-4 and 8-1-8.5-3(b)(5) require Vectren to provide "enough information so that the Commission can take into account all of the enumerated alternatives in making its determination." In re Joint Petition of PSI Energy, Inc. and CINCAP VII, LLC, Cause No. 42145, at 14 (IURC Dec. 19, 2002). The Indiana Code lists the following alternative "methods for providing reliable, efficient, and economical electric service" that the Commission must consider before acting upon any petition for construction:

a. The interchange of power[1];
b. The pooling of facilities;
c. The purchase of power. Regarding this alternative, Vectren is required to solicit competitive bids to obtain purchased power capacity and energy from alternative suppliers. Ind. Code. Ann. § 8-1-8.5-5(e)(2)(B).
d. The joint ownership of facilities;
e. The refurbishment of existing facilities;
f. Conservation[2];
g. Load management;
h. Cogeneration; and
i. Renewable energy resources.

Ind. Code Ann. § 8-1-8.5-4. The Commission is not held to Vectren's view of the relative importance of these alternatives. In re Joint Petition of PSI Energy, Inc. and CINCAP VII, LLC, Cause No. 42145, at 14 ("The statute does not limit the Commission's discretion to weigh the importance of each alternative in determining the public interest.").

[1] "[T]he exchange of power and energy between electric utilities for such purposes as achieving operational economies, mutual emergency support, reserve sharing and coordination of maintenance." In re Indiana Municipal Power Agency, Cause No. 39477, 1992 WL 474805, at 10 (IURC Dec. 30, 1992).

[2] "[C]onsideration of conservation and load management should include a review of the historic utilization and efficacy of such programs in reducing or delaying overall capacity needs." In re NIPSCO, Cause No. 43396, at 26 (IURC May 28, 2008).

In comparing these alternatives to the CCGT, the Commission will examine whether Vectren conducted proper least-cost planning. In re Petition of Southern Indiana Gas & Electric Co., Cause No. 38738, at 5 (IURC Oct. 25, 1989) ("[L]east-cost planning is an essential component of our Certificate of Need law." Least-cost planning is a "planning approach which will find the set of options most likely to provide utility services at the lowest cost once appropriate service and reliability levels are determined."). Although "[t]he 'least-cost planning' approach is used to identify the lowest-cost project[,] [it] does not require the automatic selection of the absolute least-cost alternative. Rather, we look for the least-cost approach that is also reasonable, and we consider factors such as service reliability, technical constraints, plan flexibility, and optionality." In re Indianapolis Power & Light Company, Cause No. 44794, at 34 (IURC Apr. 26, 2017). In re Joint Petition of PSI Energy Inc. and CINCAP VII, LLC, Cause No. 42145, at 4 (least-cost planning must incorporate a utility's "obligation to provide reliable service"). However, it is imperative that the utility not abuse this discretion, which is why the utility is only provided "some," not unlimited, discretion in choosing a least cost resource path. In re Petition of PSI Energy Inc., Cause No. 39175, 1992 WL 207191, at Sec. 8 "All-Source Bidding," para. 3 (IURC May 13, 1992) (least-cost planning means that a utility must "be given *some* discretion to exercise its reasonable judgment in selecting the option or options to implement which minimize the cost of providing [reliable, efficient, and economical] service." (emphasis added)).

Finally, if the Commission finds that the proposed CCGT meets a public need, that no alternative would serve that public interest better, and that Vectren exercised reasonable judgment in its least-cost planning and selection of option/s to minimize the cost of providing service, a certificate still cannot be granted unless the Commission makes "a finding as to the

best estimate of construction . . . costs" for the proposed CCGT. Ind. Code Ann. § 8-1-8.5-5(b)(1). In so doing, the Commission must make a finding as to whether Vectren properly solicited competitive bids for all engineering, procurement, and construction costs (to the extent commercially practicable), and whether Vectren's submitted estimates are the result of proper competitive bidding processes. *Id.* § 8-1-8.5-5(e)(1)(A).

B. Legal Standard for Review of the Proposed Culley Compliance Projects

The Commission may grant a CPCN for a "compliance project" only after examining six factors. *Id.* § 8-1-8.4-6(b)(1)(A)-(E), (b)(2). These factors include: "[a] description of the projected federally mandated costs associated with the proposed compliance project," *Id.* § 8-1-8.4-6(b)(1)(B); "[a]lternative plans that demonstrate that the proposed compliance project is reasonable and necessary," *Id.* § 8-1-8.4-6(b)(1)(D); "[i]nformation as to whether the proposed compliance project will extend the useful life of an existing energy utility facility and, if so, the value of that extension," *Id.* § 8-1-8.4-6(b)(1)(E); and "[a]ny other factors the commission considers relevant," *Id.* § 8-1-8.4-6(b)(2). The statute puts the burden on Vectren to "demonstrate[] that it adequately considered alternative means of meeting its customers' demand requirements." In re Duke Energy Ind. Energy Inc., Cause No. 43114, at 43 (IURC Nov. 20, 2007).

III. THE COMMISSION MUST DENY THE REQUESTED CPCN FOR CONSTRUCTION OF AN EXPENSIVE, OVERSIZED, AND RISKY GAS PLANT.

A. Vectren's CPCN request should be denied because the Integrated Resource Plan modeling on which it is based is irremediably flawed.

Vectren's use of multiple models in a way that was convoluted, nontransparent, and littered with flawed and inconsistent assumptions is inadequate and unreliable. As explained in detail below, Vectren failed to reasonably consider and evaluate statutorily required options for

providing reliable, efficient, and economical electric service, including conservation, load management, and renewable energy sources in Ind. Code Ann. § 8-1-8.5-4. *Cf.* In re Petition of PSI Energy, Inc., Cause No. 39175, at 14; *see also* In re Joint Petition of PSI Energy, Inc. and CINCAP VII, LLC, Cause No. 42145, at 4. Because of Vectren's failure to meet the regulatory standards in preparing for this case and its failure to use reasonable judgment in selecting the resource option or options to implement which minimize the cost of providing service under Ind. Code Ann. § 8-1-2-4, the Commission should reject Vectren's plan.

1. Vectren's unnecessarily complex resource analysis was based on multiple models and the result of a process that was convoluted, nontransparent, and filled with flawed and inconsistent assumptions to make sure its desired outcome was achieved.

With the use of multiple models, Vectren's analysis was convoluted, nontransparent, and created not only the potential for, but the reality of, flawed and inconsistent input assumptions with results that lack credibility, namely all results supporting a large CCGT. The more models (and iterations of modeling) used, the more difficult it became to follow the Company's process. JI Witness Comings found that "[w]hile it is not unusual for a utility to rely upon outside modeling to develop key inputs like power and capacity prices, the use of so many models in the actual selection of the preferred portfolio creates ample opportunity for flawed and/or inconsistent input assumptions and other settings that could create bias in favor [of] the [Company's] preferred plan." JI Ex. 2, p. 10, lines 1–5. A close look at Vectren's analysis unveils its disregard for the regulatory process and the great lengths Vectren pursued to support its preferred plan. And, even in this multi-stage, convoluted modeling process, none of the modeling exercises have shown the Company's plan to be least-cost.[3] *Id.* at p. 19, lines 3–12.

[3] Vectren's plan was not the lowest cost plan performed by Strategist in its 2016 IRP or its updated 2017 modeling. Vectren's plan was not the lowest cost in the PROMOD modeling, and not the lowest risk in the Aurora results.

Setting aside the fact this process was so convoluted that it cannot be proven to be reliable, none of the following analytical steps that Vectren conducted found that Vectren's preferred plan was actually the least-cost or least-risk plan. A close examination of these steps and their relationships to each other show insurmountable inconsistencies, inaccuracies, and flawed reasoning that cannot be ignored:

Step 1: Strategist modeling analysis performed for its 2016 IRP

- Strategist has a margin of error in the net present value analysis at around 4 percent. Tr. C-73, line 22–Tr. C-74, line 5. At this stage, several portfolios show net present values very close to the cost of Vectren's preferred plan, Portfolio L, JI Ex. 2, p. 11, lines 5–9, all of which would have been within the margin of error that Vectren's witnesses identified.
- Strategist cannot simulate hourly dispatch like PROMOD modeling can (the model the Company used later in its analysis). *Id.* at p. 7, lines 21–25. Strategist merely relies upon a load duration curve using "typical" time-slices, frequently one week per month, which is then extrapolated into an annual figure, yet Vectren used this model both to choose between limited sets of resource alternatives and to simulate the operation of fixed portfolios of different resources. *Id*. at p. 6, line 18–p. 7, line 2.
- The 2016 IRP concluded the lowest cost plan was to retire all coal units and replace them with natural gas units. *Id.* at p. 10, lines 24–27; Petitioner's Ex. 5, p. 10, lines 16–17. This was not the resource path Vectren pursued in this proceeding.

Step 2: A risk assessment and scorecard performed by Pace Global, using the Aurora model, for the 2016 IRP

- Pace Global produced market prices using the Aurora model and inputs provided by Vectren, such as fuel prices. The power prices were then fed into the Strategist modeling. The Strategist modeling produced a mix of portfolios that were then fed back into Aurora for "risk analysis" which then led to the selection of the preferred portfolio. JI Ex. 2, p. 9, lines 1–12.
- Aurora was used to test a fixed set of portfolios developed from Step 1's Strategist modeling. Pace Global used Aurora to perform stochastics on each portfolio. *Id.* at p. 7, lines 3–9.
- Pace Global has no internal practice of reporting amongst colleagues when modeling processes are critiqued by clients, stakeholders, or regulators. Tr. D-72, lines 4–9.
- Here, Vectren's preferred plan (Portfolio L) ranked 9th out of 15 portfolios evaluated in terms of least cost Net Present Value ("NPV"). JI Ex. 2, p. 12, lines 1–5; Petitioner's Ex. 5, Attach. MAR-1, p. 280. Portfolio L was also not shown to be the least risk in Aurora. JI Ex. 2, p. 12, lines 6–11; Petitioner's Ex. 5, Attach. MAR-1, p. 231. Portfolio L was only found to have the highest

score after Pace Global applied its risk analysis with arbitrary thresholds to evaluate certain risks and the employment of arbitrary weighting of risk factors. JI Ex. 2, p. 12, line 12–p. 13, line 2.

- Even though some – but not all – Strategist modeling was later rerun with updated inputs after the 2016 IRP submission, Vectren never reran the Aurora modeling with those partially updated inputs. *Id.* at p. 7, lines 5–6. As a result, Vectren's risk analysis rests on inputs that are several years old and do not include considerable cost estimate increases for the preferred build.

Step 3: Updated 2017 Strategist modeling performed after the 2016 IRP submission

- Vectren chose to focus on different types of natural gas procurement in this 2017 updated Strategist modeling, rather than evaluating a wide set of resources. *Id.* at p. 14, lines 1–7. In fact, 9 of the 11 portfolios evaluated in the updated Strategist modeling included a new natural gas combined cycle generator. *Id*.
- Vectren updated its 2016 IRP's coal and gas price forecasts, MISO energy and capacity prices, solar photovoltaic ("PV") costs, energy efficiency ("EE") costs, and the solar capacity credit (with the credibility of all these price forecasts and costs being seriously questioned by Joint Intervenors in Section III.B of the brief below). *Id*. at p. 6, lines 11–13.
- The Company constrained the model by removing the option for Strategist to consider early retirement (including retirement of Culley 3 with more up-to-date assumptions), conversion, and refuel options for coal units and assumed extension of Warrick Unit 4's operating life through 2023. Petitioner's Ex. 5, p. 13–15. In other words, coal retirement decisions were not based on the 2017 updated modeling; rather Burns & McDonnell removed the Strategist model's ability to economically retire endogenously, meaning the model could not choose when to retire a resource on an economic basis. Instead, coal retirement decisions were hard-wired into the model so it could not optimize based on economics. JI Ex. 2, p. 10, lines 15–23; Petitioner's Ex. 5, p. 10, lines 16–19.
- The Company included differing caps in the model in terms of the amount of capacity market purchases that could be made between 2017–2023 versus post-2023. Vectren imposed a 10 MW cap[4] for purchases past 2023. Tr. C-90, line 6–Tr. C-91, line 12; *see also* JI Ex. 2, p. 22, Figure 9.
- Vectren's 2016 IRP preferred plan, Portfolio L, still did not look [redacted] from a cost perspective in Vectren's 2017 updated Strategist modeling. JI Ex. 2, p. 13, line 7–11; JI Ex. 2-C, p. 14, Figure 6 (Confidential).

Step 4: Updated scorecard by Pace Global, excluding some of the original risk factors but using the original 2016 IRP Strategist modeling results

- Vectren asked Pace Global to rework its scorecard analysis based on feedback from the IURC Director's Report on Vectren's 2016 IRP. However, Vectren

[4] A 10 MW cap of market capacity would be less than 1 percent of Vectren's whole peak load forecast. Tr. C-92, lines 10–18.

and Pace Global failed to re-run the Aurora model part of the risk analysis with the partially updated inputs to develop new NPV estimates for each portfolio under each risk factor. JI Ex. 2, p. 14, line 8–p. 15, line 2; Petitioner's Ex. 5, p. 15, lines 15–17.

- Instead, it just removed two risk factors ("net sales" and "remote generation risk") from the final scorecard calculation, based on feedback from the IURC Director of Resource Planning. JI Ex. 2, p. 14, lines 8–p. 15, line 2; Petitioner's Ex. 7, p. 19, lines 13–18.
- The weighting determinations appear to be arbitrary and subjective with no explanation of how they were determined. JI Ex. 2, pp. 43–44.
- Vectren's preferred plan, Portfolio L, moved down to the third highest ranking. *Id.* at p. 15, lines 3–6; Petitioner's Ex. 7, Gary Vicinus workpapers. But, Vectren rejected two lower cost and lower risk portfolios (Portfolio D consisting of 400 MW of wind and the retirement of Culley Unit 3; and Portfolio K labeled as "Diversified w/ Coal"). JI Ex. 2, p. 15, lines 3–10, Figure 7. Vectren overrode the results of its modeling to select a higher cost, higher risk portfolio based on subjective, qualitative judgments. Petitioner's Ex. 5, p. 16; JI Ex. 2, p. 15, line 7–p. 16, line 4. As discussed below in Section IV of the brief, Joint Intervenors took serious issue with these questionable rationales to reject Portfolio D. *See also* JI Ex. 2, p. 16, line 5–p. 17, line 14.

Step 5: A request for proposal ("RFP") that only resulted in gas bids, which were then compared to self-build proposals from the Company

- The goal of the RFP was to solicit only bids for large gas plants, Tr. A-126, lines 3–11; Tr. B-22, lines 17–21. Vectren did not try to get any information from the marketplace for PPAs that could have a term of less than 20 years, Tr. B-28, lines 20–23. In this RFP, Vectren did not try to get any information from the marketplace on potential solar projects, potential wind projects, potential use of energy storage. Tr. B-24, lines 4–7; Tr. B-33, lines 1–13; Tr. B-39, lines 23–25.
- The RFP states a bias towards ownership that would discourage other types of bids like power purchase agreements. JI Ex. 2, p. 45, line 18–p. 46, line 2; Petitioner's Ex. 6, Attach. MEL-1, p. 34.
- The RFP required the resource's location in MISO Zone 6, limiting the location of the resource to within parts of Indiana and Kentucky. JI Ex. 2, p. 46, lines 2–8.
- The RFP limited the size of the resource capacity to between 600 and 800 MW, rather than considering smaller resources or combinations of small resources less than 600 MW. *Id.* at p. 46, lines 9–17.
- The RFP limited responses to only dispatchable units, Tr. B-24, lines 4–7, "so not renewables." Tr. B-39, lines 23–25.
- Only natural gas bids resulted from this RFP. JI Ex. 2, p. 45, lines 15–16.

Step 6: *Modeling using PROMOD performed by Burns and McDonnell to evaluate two select gas responses to the RFP with two self-build proposals from Vectren*

- PROMOD evaluated only four gas procurement options, including two self-build options and two procurement options outside of Vectren's territory. *Id.* at p. 8, lines 6–7.
- This model is a dispatch-only model, meaning it simulates the operation of power plants but cannot select a resource portfolio as Strategist can. *Id.* at p. 7, lines 20–23. Yet, PROMOD's dispatch simulation is more detailed than can be performed in Strategist. PROMOD can simulate hourly, chronological dispatch while Strategist relies upon a load duration curve using "typical" time-slices, frequently one week per month, which is then extrapolated into an annual figure. *Id.* at p. 7, lines 21–25.
- In PROMOD, modeling showed the smaller of the two self-build options (a 668 MW plant) was lower cost than the larger plant (808 MW) ultimately pursued by the Company. *Id.* at p. 8, lines 13–18; Petitioner's Ex. 6, Attach. MEL-1, pp. 107–108. According to Burns and McDonnell, the two non self-build options were more expensive due to congestion costs. JI Ex. 2, p. 8, lines 13–18; Petitioner's Ex. 6, Attach. MEL-1, pp. 105.

Step 7: *Additional PROMOD modeling runs were presented in rebuttal that were runs proposed by the OUCC concerning different scenarios in which one or more units at A.B. Brown would be converted to gas.*

- Here, the cost estimate for the CCGT had a "plus or minus 10 percent" that was closer to the proposed $781 million requested. Tr. C-74, line 17–Tr. C-75, line 1. In other words, the price of the CCGT in this round of modeling could have been as high as $850 million. Tr. D-5, lines 11–18.
- Vectren did not do a risk analysis for this iteration of modeling. Tr. E-45, line 9–Tr. E-46, line 13.

Overall, Vectren's analytical Steps 1 and 2 were used to justify its decision to pursue a specific portfolio, Portfolio L, which included the generic natural gas combined cycle plant. JI Ex. 2, p. 7, lines 13–15. All subsequent analytical steps constrained the models' optimization function or provided restrictions to bias Vectren's preferred outcome. Vectren's cost of the CCGT also started at an estimate of $630 million "plus or minus 50 percent," (Tr. C-74, lines 6–16), which "did not coincide with the [$]781[million]" ultimately requested by the Company. Tr. C-104, lines 21–25. Yet, Vectren still began with this conclusion from the IRP that a generic CCGT, even with a very different cost estimate for this proceeding, was the best option for

ratepayers. Tr. C-107, lines 12–16. Additionally, it has still not been verified that the stated capital cost of the new pipeline that would be required to fuel the CCGT was what was used in the actual modeling. JI Ex. 2, p. 44, line 12–p. 45, line 10. This raises grave concerns that Vectren skewed the initial resource selection of the CCGT versus other alternatives by not including the cost of this pipeline in the initial modeling when this decision was made. Considering the flaws and inconsistencies in the steps outlined above, the Commission cannot conclude that Vectren reasonably evaluated other resource alternatives or respected the regulatory standard for this statutorily required assessment.

Other inconsistencies not captured above include:

1. Vectren Witness Lind admitted, on cross-examination, that "the 2016 IRP did not include the cost of Brown scrubber replacement in them . . . [s]o the retirement analysis for the '16 IRP did not include that," while the 2017 update including a hardwired "retirement analysis for the Brown units did include the cost of replacing the scrubber as part of that analysis." Tr. D-11, line 18–Tr. D-12, line 3.

2. Vectren used three different load forecasts: Itron Nov. 2016 forecast used for 2016 IRP modeling; two additional forecasts submitted to MISO developed in 2017 and 2018. The Nov. 2016 Itron forecast is the highest among the three and the one that Vectren relied upon in modeling. JI Ex. 2, pp. 30–33.

Vectren touts the frequency with which its various modeling exercises and analytical steps selected a CCGT as confirmation that a CCGT is the most appropriate resource option. *E.g.*, Vectren Brief at 5. Commissioners in Michigan recently cautioned against drawing just such a conclusion. Order at 66, In re DTE Elec. Co., Case No. U-18419 (Mich. Pub. Serv. Comm'n Apr. 27, 2018) ("The Commission expects that an effective IRP should produce results, under certain scenarios, that show the preferred course of action is not actually the best option. This is how we know the IRP is testing the robustness of the preferred course of action by examining how it performs under various assumptions, even if those assumptions may seem unrealistic today."). What Vectren touts as confirmation of its results has been judged elsewhere

to potentially "give the impression that modeling results were steered or forced into a pre-determined result." *Id.*

2. Vectren's plan is based on assumed and exaggerated renewable cost estimates

The Commission must consider the better options available under Ind. Code Ann. § 8-1-8.5-4(2), including renewable energy sources, as compared to Vectren's pursuit of an oversized gas plant. Vectren's preferred expansion and retirement plan actually contemplates a decrease in renewable energy from 4.4% in 2015 of Vectren's energy portfolio to 3.8% in 2036, despite the rapid decrease in the costs of renewables. JI CX 4, p. 5, lines 18–22. Vectren assumed exaggerated wind and solar cost estimates in its 2016 IRP and even in its 2017 updated solar price, which consequently biased the modeling against renewables. In the 2016 IRP, Vectren chose Portfolio L (even though Portfolio D with 400 MW of wind was cheaper), which is the resource path Vectren is pursuing now: 4 MW of solar in 2018 and an additional 50 MW in 2019, and no utility-owned wind. JI Ex. 2, Attach. TFC-3, p. 11, Table 2; Petitioner's Ex. 1, p. 8, lines 3–5. For the 2017 update of the IRP, Vectren updated the solar costs, but failed to update the wind costs. Petitioner's Ex. 5, pp. 13–15. The 2017 update to the model also imposed several constraints, including not allowing the Strategist model to economically choose or optimize any early retirement, conversion, and refuel options for coal units, and it locked in the assumption that Warrick Unit's operating life would extend through 2023, which inevitably altered how renewables could compete in the model. *Id*.

For solar, Vectren used unreasonable costs for solar capital and fixed O&M in both its 2016 IRP and its 2017 update that run contrary to the experience of the last decade and the consensus of the solar market experts. As Joint Intervenors indicated in their comments on Vectren's 2016 IRP (JI Ex. 2, Attach. TFC-3, p. 33), Vectren's forecasts are simply too high, especially in comparison to a projection by the National Renewable Energy Laboratory's Annual

Technology Baseline forecast ("NREL ATB") that relies upon "14 system price projections from 8 separate institutions with short-terms projections made in the past six months and long-term projections made in the last three years" including institutions that represent both public (e.g., the U.S. Energy Information Administration and the International Energy Agency) and private research firms (e.g., Bloomberg New Energy Finance and GTM Research). JI Ex. 2, pp. 38, 41–42. This NREL ATB forecast is also relied upon by MISO and will be relied upon by Duke in its current IRP. *Id*. at 40. JI Witness Comings shows a confidential comparison between the NREL ATB forecast and Vectren's forecast for solar. It shows that Vectren's assumed costs for solar capital and fixed O&M are [redacted], while the NREL ATB forecast offers a credible and reasonable assignment of costs wherein installed solar project costs have declined dramatically over the past decade and utility scale solar costs are likely to continue to decline throughout the planning period. JI Ex. 2-C, p. 41, Figures 21 and 22 (Confidential).

In addition, Vectren failed to model solar plus battery storage as a resource option, despite there being no technical reason why it could not have modeled it. JI Ex. 2, Attach. TFC-3, p. 11, Table 2; Tr. C-95, lines 18–21. NIPSCO modeled storage after receiving twenty-one bids for storage-related products. JI CX 13, p. 19. These included four solar + storage asset sale or option bids at an average bid price of $1,182.79/kW, seven solar + storage PPA bids at an average bid price of $5.90/kW-month plus $35/MWh average, and eight storage only PPA bids at an average bid price of $11.24/kW-month. *Id*.

Vectren also assumes higher capital costs for wind, sticking with the high costs it used in the 2016 IRP and failing to update them in 2017, despite Joint Intervenors and other organizations pointing out this error during the 2016 IRP stakeholder process. JI Ex. 2, Attach.

TFC-3, pp. 32–33. In its 2016 planning analysis, Vectren did not have project specific information that one would receive through a recent all-source RFP. Since it did not have this specific information, it would have been more appropriate for Vectren to use the NREL ATB forecast, is a survey of over 160 wind experts, which "may be the largest elicitation ever performed on an energy technology in terms of expert participation." JI Ex. 2, pp. 38–39 (quoting the authors of the study by NREL). NREL applies the results of this expert survey to estimate the future levelized cost of energy in various locations. Instead, Vectren failed to address this criticism to its 2016 IRP wind capital cost assumption and used the same high cost wind assumption from the IRP in its 2017 update.

Even using the 2016 IRP high capital wind costs in the 2017 update, a portfolio with 400 MW of wind and the retirement of Culley Unit 3 was selected as the least cost portfolio over Vectren's preferred one, i.e., Portfolio D won over Vectren's preferred Portfolio L. JI Ex. 2, pp. 15–16; Petitioner's Ex. 7, p. 19 and Gary Vicinus workpapers. Portfolio D's overall score with the wind also scored better than Portfolio L's score in Pace Global's 2017 updated risk analysis. JI Ex. 2, pp. 15–16. Nonetheless, Vectren chose not to go with Portfolio D because (1) the Company determined the portfolio would include "a significant capacity deficit" due to the wind; (2) the Company was uncertain of the future capacity credit for wind in MISO; and (3) the Company claimed keeping Culley 3 operational would provide "additional flexibility to meet future growth." Petitioner's Ex. 5, p. 16. Thus, the Company essentially counted capacity risk twice against wind by including the factor in the quantitative risk assessment then using that same factor to reject a better-performing portfolio (according to its own risk assessment

methodology) on a qualitative basis.[5] *Compare* Petitioner's Ex. 5, p. 16, *with* Tr. F-28, lines 1–19.

It is also questionable that the Company would cite to uncertainty with regard to wind capacity credits as a rationale not to pursue additional wind resources when it readily and willingly forecasts other uncertain factors in its modeling. Tr. F-27, lines 6–16. It even projected a wind capacity factor for this case. *Id*. Many elements of electric system modeling have uncertainty, such as fuel prices, capital costs, capacity factors, and peak load; and the Company just forecasts estimates for these elements. Vectren should have done the same for wind capacity credits, rather than asserting Vectren's unwillingness to forecast this uncertainty as a reason to reject a portfolio with 400 MW of wind. JI Ex. 2, pp. 15–16.

Finally, Vectren did not incorporate any RFP-based actual costs for wind and solar; and, as discussed below, the RFP that Vectren did conduct was biased in favor of gas and thus resulted in only gas bids. Simply put, its assumed costs for renewables are not in line with reality. Had Vectren used an RFP to get actual costs for wind and solar, the prices would have likely been much lower than what Vectren assumed. Another Indiana electric utility, NIPSCO, used an open, competitive RFP for inputs to use in its IRP modeling. It received 90 bids for resources in five states including average prices of $26.97/MWh for wind bids and $35.67/MWh for solar bids. JI Ex. 2, pp. 46–47; JI CX 13, pp. 14–19. Vectren witness Lind admitted, on

[5] The Company partly updated the risk analysis from the 2016 IRP for this case by removing "net sales" and "remote generation" from the final scorecard calculation, based on feedback from the IURC Director Resource Planning. JI Ex. 2, pp. 14–15; Petitioner's Ex. 7, p. 19, lines 13–18. The "remote generation" factor had primarily affected those resource portfolios with greater reliance on wind generation. JI Ex. 2, Attach. TFC-5, pp. 40. But, Pace Global did not re-run the Aurora model to develop new NPV estimates for each portfolio under each risk factor. Still, Vectren's preferred Portfolio, Portfolio L, at that point moved from highest to third highest ranking, and Portfolio D with 400 MW scored higher than Portfolio L in terms of risk. JI Ex. 2, pp. 14–15.

cross-examination, that if Vectren were to do an RFP and receive proposals from renewable energy developers, they could take the cost examination that is contained in those proposals and plug it into updated modeling for this case. Tr. C-95, lines 4–9.

In sum, Vectren's assumptions concerning the modeling of renewable energy, including price assumptions, were faulty, and the Company ignored the comments during its IRP stakeholder process pointing out many of these flaws. Vectren also failed to take steps to obtain better information about the cost and availability of renewable resource options from third parties, such as it could have done efficiently using an open, competitive RFP instead of one artificially constrained to only solicit bids for a large gas plant.

3. Vectren's preferred portfolio is not the least-cost, and Vectren continues to ignore the affordability struggles of its captive customers.

None of the modeling exercises or analytical steps supporting the Company's case in this proceeding were shown to be least-cost on a Net Present Value basis. Its preferred plan was not the lowest cost plan in Strategist in its 2016 IRP or in its updated 2017 modeling. JI Ex. 2, p. 19, lines 3–12. And, it was not the lowest cost in the PROMOD modeling. *Id*. Only gas resources were considered in the RFP. Tr. A-126, lines 3–11; Tr. B-22, lines 17–21. Vectren's analysis was designed to advance a more expensive option that the Company wanted, ignoring the needs of its customers who have the highest bills in the state.

History shows that Vectren's pattern of objectionable decision-making and questionable planning has burdened the utility's customers with the highest electricity bills in the state since 2011, based on a consumption level of 1,000 kilowatt hours. JI Ex. 1, pp. 7–8, especially Figure 3 (citing CAC Admin. Notice Ex. 2-8); Petitioner's Ex. 1-R, p. 27. Despite Vectren arguing these costs were essentially inevitable, Vectren's residential customers paid, on average, $21 per month more in 2018 than the next highest bills among Indiana's jurisdictional electric utilities,

NIPSCO. JI Ex. 1, p. 5, lines 20–23 (citing CAC Admin. Notice Ex. 1). This is more than a stroke of bad luck. Outside of Indiana, Vectren's average bill in 2016 far exceeded average national electric utility bills, including those in the neighboring states of Illinois, Michigan, Ohio, and Wisconsin. JI Ex. 1, p. 6 (citing Attach. KLO-1). The burden of these inordinately high bills is particularly harsh given that Vectren's service territory includes areas that experience higher poverty levels and lower household income than the average across Indiana, JI Ex. 1, pp. 9–10, and Vectren has no electric low income program or other serious initiatives to address the electric utility bill affordability crisis in its service territory even for its most vulnerable customers. Tr. A-99, lines 18–24; Tr. A-103, lines 15–25.

Although Vectren argues that its bills seemingly have remained flat for several years, Petitioner's Ex. 1-R, p. 27, Vectren acknowledged that it has many already-approved deferred costs that will, and many proposed costs that would, come home to roost in a major way in the near future, including:

- The majority of the $497.5 million of TDSIC costs over the next seven years, which includes partial collection through a fixed customer charge [In re Verified Petition of Southern Indiana Gas & Elec. Co., Cause No. 44910, at 34–35 (IURC Sept. 20, 2017)], combining the $446.5 million in TDSIC replacements and upgrades and rate case deferred recovery totaling $51 million for smart meter/AMI investments);
- Approximately $270 million in stranded coal assets at the time of the rate case around 2023-2024, if not sooner (Tr. H-24, lines 16–21; IG CX 1);
- Approximately $67 million for already completed projects at their coal plants, which, if approved, will cost residential customers $29 per year, beginning in 2019 (Petitioner's Ex. 13, p. 20, lines 12–14);
- Approximately $95 million for projects at Culley 3, which, if approved, will cost residential customers $25 per year by 2023 (Petitioner's Ex. 4, p. 26, line 20);
- Approximately $781 million if the 850 MW gas plant is approved, with an estimated accuracy plus or minus 10 percent, leaving potential for ratepayers to pick up the tab for as much as $859 million;
- Approximately $87 million in estimated capital expense for a pipeline that would be necessary to operate the gas plant if approved, with an estimated accuracy at plus or minus 20 percent, leaving potential for ratepayers to pick up a tab for as

> much as $104 million (Tr. H-13, lines 7–14), not even including the annual operating costs for the pipeline.

For the proposed gas plant and lateral pipeline alone, if the capital costs are at the higher estimated range, it could reach a total of $963 million, which is more than a 50 percent increase in Vectren's most recent estimated electric rate base at approximately $1.4 billion. Petitioner's Ex. 13, p. 29, line 20; Tr. H-30, line 24–Tr. H-31, line 8; Tr. H-33, lines 10–24.

Vectren is asking for the Commission to approve nearly a billion dollars in new capital expenditures from its ratepayers in this case, yet it has not bothered to project the bill impacts of those expenditures. JI CX 3; Tr. H-27, lines 16–20. Vectren essentially tells the Commission in this case not to worry about the impact on its customers, since a rate case will address the final bill impact. Tr. A-52, line 23–Tr. A-53, line 7. But, as shown above, Vectren's next five – seven years, including the impact of a rate case, will already include at least $497.5 million in TDSIC and AMI costs, any stranded coal assets, and multiple coal plant compliance project costs. Vectren's Director of Rates and Regulatory Analysis admitted that customers will be experiencing a massive rate increase—it is just a matter of when that will occur. Tr. H-30, lines 2–23. And while Vectren readily tracks the financial health of the Company, Tr. A-79, line 18–Tr. A-84, line 9, Vectren admitted that it does not regularly track or analyze basic customer affordability metrics like its customers' ability to pay Vectren bills. In other words, Vectren does not track and analyze basic utility affordability data like general residential disconnects for inability to pay, arrearages, and disconnect notices for inability to pay, or low income home energy assistance program residential disconnects for inability to pay, arrearages, disconnect notices for inability to pay. JI CX 1 & 2.

If the Commission approves this request, Vectren's bills and rates are sure to increase, as the smallest investor-owned electric utility proposes to build the biggest gas plant in the

state. Tr. A-23, lines 8–14. "Vectren customers need protection from unjust and unreasonable rates. The Indiana Utility Regulatory Commission can and should provide that protection." JI Ex. 1, p. 10. Not only does Indiana law require Vectren, as a state-franchised utility with a monopoly service territory and captive customers, to offer just and reasonable rates for the provision of utility service, Ind. Code Ann. § 8-1-2-4, the Indiana General Assembly recently instituted state policy to protect affordability of utility service with regard to utility investment in infrastructure. *Id.* § 8-1-2-0.5. Nonetheless, Vectren has shown a disregard for the financial health of its ratepayers and an inability to make prudent decisions for its ratepayers.

4. Vectren's preferred portfolio is not the least risk.

Vectren's preferred plan would result in a less diverse and oversupplied portfolio that would expose ratepayers to significant market risk. As it did with coal, Vectren again proposes to heavily rely on a single type of fossil fuel based generation, this time at just one plant, increasing exposure to fuel price and regulatory risks over the next 30 years or more. Vectren also exposes ratepayers to risk in its assumption of high load and high market prices, which biases results in favor of portfolios that oversupply the system. The Commission should reject Vectren's ill-conceived proposal to build an oversized plant that is overly dependent on gas.

Vectren claims its proposal will diversify its generation portfolio but nothing could be further from the truth. The proposed single gas plant would be used for greater than two-thirds of its overall need, and it would increase Vectren's reliance on fossil fuels from 95.6% in 2015 to 96.2% by 2036. JI CX 4, p. 5, line 18–p. 6, line 3. Rather than diversifying its portfolio, Vectren proposes to swing to an over-dependence on gas. JI Ex. 2, p. 18. As the Commission's Director of Resource Planning put it in both his Draft Report and Final Report on the 2016 IRPs:

> It bears reiterating from the fuel and commodity price discussion that the range of fuel price projections may have been unduly limited by using only one standard deviation from the expected value (mean). The relatively recent

> (5 years or so) experience in the natural gas industry provides support for a wider range of price trajectories. That is, few analysts ten years ago – even five years ago – would have thought the current price projections for natural gas to be within the realm of reasonable probabilities. Ten years ago, the notion of a *black swan event* might have been ascribed to the current projections for natural gas prices and the attendant ramifications for coal in regional economic dispatch. Given Vecten's appropriate emphasis on maintaining options, having a more robust analysis of natural gas and commodity prices – higher and lower – would seem to be appropriate, especially for the mid and longer-term analysis.

JI Ex. 2, Attach. TFC-5, pp. 33–34 (internal citations deleted); JI Ex. 2, Attach. TFC-6, pp. 39–40.

Vectren also exposes ratepayers to risk in assumptions in its modeling and convoluted analytical steps that double down on a bet of high load and high market prices, which biases results in favor of portfolios that oversupply the system. If high load and high market prices do not materialize, Vectren's system will be overbuilt with resources its ratepayers do not need and selling capacity at low market prices that will not amount enough to reimburse or otherwise make it worth it for the ratepayer.

Vectren assumptions of high capacity prices, which biases results in favor of oversupplying demand, are sometimes as much as [redacted] times historical average:

- In Jan. 2016, Vectren projected 2018 market price of [redacted]/kW-yr;
- In 2016 IRP, assumed 2018 market price of [redacted]/kW-yr,
- Actual 2018 was less than $3/kW-yr.

JI Ex. 2-C, pp. 23–24. This saddles ratepayers with significant risk of this unreasonable assumption.

Vectren's modeling also assumed its system would generate more electricity than it has in the past. Its Strategist modeling forecasted that Vectren would be a net seller of [redacted] GWh in 2017, but Vectren turned out to be a net purchaser of 30 GWh in 2017. JI Ex. 2-C, p. 29. Vectren relies on the premise that economic development requires the surplus capacity of 22%,

despite the repeated testimony and evidence in this proceeding that Vectren's current customers simply do not need this surplus capacity from a full 850 MW of the CCGT proposed in this case. Tr. E-33, line 9–Tr. E-34, line 11; Tr. E-34, line 25–Tr. E-35, line 4. So, the request for an 850 MW CCGT is driven in part by assumptions about the value of capacity and energy in the MISO markets in the future, and Vectren is asking existing customers to pay more up front for capacity and energy that they themselves will not use. Tr. E-35, lines 18–Tr. E-36, line 22. Their back up plan is to sell the excess capacity and energy on the market, but even Vectren admitted, on cross-examination, that there is no guarantee that off-system sales will actually materialize as projected by the Company. Tr. E-38, lines 15–22.

Despite Vectren's claims to the contrary, Vectren is able to keep the lights on at a reasonable cost and meet MISO's Planning Reserve Margin without building an outsized gas plant likely to be the utility's next stranded asset. *Contra* Vectren Brief at 5. Vectren relied in part on the premise that MISO Zone 6 may have a capacity shortfall, which Vectren purports could justify the need for overbuilding its system. The 2018 OMS MISO survey showed an outlook for 2019 forecasting a capacity surplus in MISO Zone 6 of 0.5 to 0.6 GW and an outlook for 2023 forecasting a capacity shortfall of 1.6 GW to a surplus of 0.3 GW. Petitioner's Ex. 20-R, Attach. JMJ-1R, pp. 7–8.

But, when one examines the historical OMS MISO Zone 6 annual surveys since 2014, these predictions did not come to fruition. For example, between the 2014 and 2015 annual MISO surveys, there was significant change in the outlook for 2016. The 2014 OMS survey had shown a range from surplus of 0.1 to a shortfall of 1.2 GW for 2016, while the 2015 survey showed a potential capacity shortfall for 2016 ranging from 0 to 0.4 GW. *Compare* JI CX 47, slide 7, *with* JI CX 46, slide 4. Yet, in 2016, the capacity shortfall never occurred. In fact, by the

OMS MISO 2016 survey, it was showing a capacity surplus for 2017. JI CX 45, slide 9. And by the OMS MISO 2017 survey, there was a projected capacity surplus for 2018. JI CX 44, slide 14. And by the OMS MISO 2018 survey, there was a capacity surplus for 2019. Petitioner's Ex. 20-R, Attach. JMJ-1R, p. 7. In fact, there has yet to be an actual capacity shortfall in MISO, despite every one of the 2014-2018 OMS surveys predicting a potential near-term capacity shortfall in MISO Zone 6. *See* Tr. I-56, lines 11–14. It could be argued too that these OMS MISO surveys seemingly stimulate the market to ensure that capacity shortfalls never occur, following the simple law of supply and demand.

Thus, it is perplexing why Vectren, with all its expert support, would continue to suggest these surveys are somehow definite and certain in terms of predicting future resource needs, and it is terribly risky for Vectren to make this gamble with ratepayer dollars. And despite Vectren's reliance on these surveys for its proposition to overbuild its system, Vectren admitted that it has never done an independent evaluation of the extent to which OMS MISO surveys' methodology tend to over-predict MISO capacity shortfalls. *See* Tr. I-60, line 16–Tr. I-61, line 1. Furthermore, the OMS MISO surveys have other limitations insofar as they discount the capacity of new generation that are currently in the MISO queue, even projects that are well along in the queue are not credited in the OMS MISO survey at 100% of the capacity that they provide (Tr. I-58, lines 19–23; Petitioner's Ex. 20-R, p. 5, line 13), and they fail to account for demand-side measures that may be coming online in the next few years. Tr. I-64, line 25–Tr. I-65, line 11.

Vectren argues against denial of its CPCN based on the Commission's consideration of Indianapolis Power & Light Company's Eagle Valley CCGT CPCN request, calling out Commission concern over the risk of reliance on capacity purchases for a large portion of IPL's resource requirements. Vectren Brief at 4. The analogy depends on crediting Vectren assertions

that denial of its CPCN request necessarily means the *only* other option to supply power to Vectren customers will be total reliance on capacity purchases. That assertion is incredible. If it were credible, then Vectren has failed to act prudently on behalf of its customers, and now seeks to benefit from a timing problem of its own making. There is no guarantee of CPCN approval, and utility planning should account for the real possibility of denial.

Thankfully, contrary to Vectren's incredible assertion, the reality is that there is time to faithfully reexamine resource alternatives before locking customers into a 30-year resource decision with considerable operational, cost, and regulatory risk. As stated through Vectren's testimony and evidence, the transition it is undergoing away from uneconomic and harmful coal-fired generation is hardly unique. Utilities across the state and country are finally acknowledging what has long been true: continued operation of coal-fired units is imprudent. Other Indiana utilities are examining the same transition timelines; if they have time, Vectren has time.

B. Vectren's Analysis of Demand Response and Energy Efficiency was biased and inadequate.

Significant issues exist with Vectren's IRP and subsequent modeling relied upon by the smallest electric utility to propose the largest gas plant in Indiana. Vectren's stakeholders have not been silent. They have used the proper venues to air their grievances and written and presented studies demonstrating Vectren's failure to adequately invest in demand side resources and to use the grid more efficiently. *See* JI Ex. 2, Attach. TFC-21 (Advanced Energy Economy's study); *id.*, Attach. TFC-3 (stakeholder comments on Vectren's 2016 IRP, especially pp. 35–39 and Attach. A); *id.*, Attach. TFC-4 (stakeholder comments on the Director's draft report addressing Vectren's 2016 IRP, especially pp. 4–6). The Commission should conclude after critically examining Vectren's analysis of comparative costs, which includes consideration of

purchased power, conservation, and load management, that far more cost effective solutions to meet customer demand under Ind. Code Ann. § 8-1-8.5-3(b)(5) and § 8-1-8.5-4(2) exist and should be pursued before the construction of a new power plant, especially one of this size. The Commission could reject Vectren's CPCN on this basis alone.

Demand side management, like energy efficiency and demand response, serve as an alternative to traditional supply side electricity resources and help the system, and customers, use less electricity. As noted by the Commission, "Indiana's energy environment is characterized by low energy prices and high energy consumption; and that additional benefits, such as keeping energy costs low and mitigating environmental issues, could be obtained with increased utilization of DSM programs." In re Commission's Investigation into Any and All Matters Related to Commission Approval of Participation by Indiana End-Use Customers in Demand Response Programs Offered by the Midwest ISO and PJM Interconnection, Cause No. 43566, at 42 (IURC July 28, 2010) (referencing conclusions from In re Commission's Investigation Into the Effectiveness of DSM Programs, Cause No. 42693, Phase I Order, at 29–31 (IURC Apr. 23, 2008)). And Vectren, "as the mandatory provider[] of electric service to all customers within their certificated service areas," has

> the obligation to plan for and serve end-use customers' demand. In meeting their public service obligation, electric utilities have for decades fashioned tariffs, special contracts and programs designed to foster customer demand response. The demand reductions and resulting cost savings of these Commission-approved mechanisms are engrained in the electric utilities' cost of service to customers and in short and long-term energy and capacity planning. The reasonable minimization of purchased power costs and minimization of the need for new generation is part of Indiana's traditional utility regulatory framework.

Id. at 43–44.

1. Vectren's modeling and current practice biases against demand response investments.

Demand response resources, like interruptible tariffs, typically compensate customers to use "less electricity during key hours when electricity prices are high, and/or the electric grid is at risk of having demand exceed supply." JI Ex. 2, Attach. TFC-21, p. 1. And, demand response can meet a significant portion of projected peak demand. *Id.*, Attach. TFC-21, p. 14. Considering the fact that Vectren's current interruptible riders are too restrictive, and that Vectren's updated model only considered demand response in some of its runs and at levels only slightly higher than its existing level of demand response, it is not surprising that Vectren's 20 year plan for demand response is incredibly low.

Vectren's current interruptible riders are so restricted that only 35 MW of demand response from four customers are participating in these riders, despite Vectren having the second highest percentage of sales to industrial customers of any of the electric investor-owned utilities in 2015 or 2016. *Id*., p. 11. Compare that to "NIPSCO [which] has the highest share of industrial sales (55 percent) and highest percentage of demand response (16 percent), as a share of peak load in Indiana." *Id.*, pp. 34–35.

Vectren has three distinct interruptible riders: (1) Rider IC, or Interruptible Contract; (2) Rider IO, or Interruptible Option; and (3) Rider MISO DR, or MISO Demand Response. Vectren testifies that Vectren's eligible customers are "generally unwilling to take the risks associated with participating in a DR program" as a rationale for low or no participation in these riders. Petitioner's Ex. 19-R, p. 8, lines 1–3. Yet, Joint Intervenors showed how Vectren's three interruptible riders each have onerous restrictions and penalties that make them unappealing to customers so that they do not want to or cannot participate in providing this demand response resource. A report prepared for Indiana Advanced Energy Economy ("AEE") by Demand Side Analytics in February 2018 provided information on demand response potential for the state of

Indiana. The report concluded that "[w]hile Duke, NIPSCO, and I&M have well developed portfolios of non-residential DR resources, Vectren and IPL show limited contribution to resource adequacy from C&I [commercial and industrial] demand response." JI Ex. 2, p. 34 (quoting JI Ex. 2, Attach. TFC-21, p. 10). AEE's medium case industrial demand response potential in 2018 includes 1,379 MW of day-ahead demand response and 743 MW of day-of demand response, with "[t]he remaining non-residential potential [ ] largely concentrated in Vectren and Indianapolis Power and Light service territories." *Id.* (quoting JI Ex. 2, Attach. TFC-21, p. 31); *see also id.* (citing J1 Ex. 2, Attach TFC-21, p. 13).

Vectren's main interruptible rider, Rider IC (JI CX 36), has about 60 customers eligible to participate in this interruptible rider but only four customers actually do. Tr. I-14, lines 1–18. Vectren's Rider IC is limited and too restrictive, while another Indiana utility "includes a variety of DR options on various tariff riders that dictate the number of hours of availability annually, notification time, and participant compensation via demand charge credit." JI Ex. 2, Attach. TFC-21, p. 10. Offering proper compensation to commercial and industrial customers to participate in Vectren's interruptible tariffs is critical to successfully providing significant opportunity for curtailment. *See id.*, p. 36, lines 18–21. If Vectren does not pay enough for this extremely cost-effective opportunity to shave peak, customers will not want to participate and the resource will not be realized. Unfortunately, Vectren's Rider IC pays poorly at approximately $3.50 per kW per month (and its Rider IO pays even less) (JI CX 38, p. 2; Tr. I-16, lines 2–14), while NIPSCO actually has five different options that range from $2.16 to $9.50

per kW per month. JI CX 39, pp. 5–6; *see also* Tr. I-32, line 10–Tr. I-34, line 5. Rider IO, with zero customers participating, pays even less at approximately $3.104.[6] JI CX 37.

Vectren's Rider IC is also arbitrarily limited to just two rate classes, offering no explanation as to why the other rate classes cannot be eligible for Rider IC. JI CX 36, p. 1; Tr. I-15, lines 1–6.[7] Vectren says these ineligible rate classes could just participate in the less lucrative Rider O; tellingly though, Vectren does "not have any customers participating in the [lesser paying] Rider IO." Tr. I-15, lines 19–20.

Vectren's Rider IC also arbitrarily limits participation to customers who commit to providing 1 MW of Demand Response. JI CX 36, p. 1. This is a very large threshold that many customers cannot meet. Aggregation services could help in overcoming this restriction, but Vectren fails to allow this as an option in Rider IC. *Id*. These third parties can aggregate customers who cannot provide an entire 1 MW at a time with other customers who cannot provide an entire 1 MW at a time to collectively provide that 1 MW to Vectren during a peak emergency event. Vectren noted that the Rider MISO DR tariff does allow for aggregation to meet its 1 MW requirement, but there are no customers participating in this Rider, probably because it only pays energy payments, not capacity payments. Tr. I-18, line 13–Tr. I-21, line 18. The Commission, in its July 28, 2010 Order on customer participation in wholesale markets, "strongly encourage[d]" its utilities to "explore opportunities with [aggregators or curtailment service providers] which may further enhance participation in demand response by customers of

[6] Rider IO provides a Capacity Credit that "is equal to 80% of the 'Capacity Payment to a Qualifying Facility' in effect in Company's Rate CSP." JI CX 37, p. 2. The Company's Rate CSP provides a capacity payment to a qualifying facility at $3.88 per kW per month. 80% x $3.88 = $3.104. JI CX 38, p. 2.

[7] In Vectren's case, other rate classes such as Vectren's Demand General Service (DGS), Municipal Levee Authority Service (MLA), and Off-Season Service (OSS) should also be allowed to participate in Vectren's Rider IC. Tr. I-15, lines 1-10.

all sizes, classes and sophistication." In re Commission's Investigation, Cause No. 43566, at 47–48. Unfortunately, 8.5 years later, Vectren has failed to take seriously this encouragement from the Commission.

Another arbitrary restriction in Vectren's Rider IC is its requirement for 250 hours of availability, meaning that a customer has to agree to be able to provide a total of 250 hours of interrupted service per year in total. JI CX 36, p. 1. Vectren's Rider IO is even worse, requiring 50 more hours of availability than Rider IC for a required total of 300 hours. JI CX 37. This is a large quantity of time for a customer to agree to for curtailment, especially considering these are primarily working businesses that need variety and options to choose from. By contrast, NIPSCO's Rider 775 has different availability options at 20-hours, 100-hours, 200-hours, and 400-hours. JI CX 39. This allows a business the opportunity to pick an option that works for it.

Vectren's Rider IC also requires a 10-minute response time from its Demand Response resources, which is very onerous for customers. JI CX 36, p. 1. A 10-minute response time means that once Vectren calls upon a customer to curtail load, the customer must do so within 10-minutes. Vectren's Rider IO is not much better, requiring 1-hour response time. JI CX 37, p. 1. Compare this to NIPSCO's interruptible tariff options, offering varied response times at 4 hours, 2 hours, and 10 minutes. JI CX 39.

Finally, Vectren's Rider IC subjects participating customers to a very strong penalty for failure to respond within 10 minutes with 1 MW of demand response, equal to 10 times the capacity credit per kVa. JI CX 36, p. 2. It does not appear that any of the five options under NIPSCO's Rider 775 assign a monetary penalty from NIPSCO to its participating customers for failure to respond with the curtailment within the required response time besides passing along

any penalties from any governmental agencies, but NIPSCO does remove said customer from the program for three years. JI CX 39, p. 7.

And, in Vectren's modeling of demand response to see how it would compete against an expensive new generation source, Vectren limited the amount that was allowed to compete. Vectren considered only a small amount of additional demand response beyond its existing demand response totaling just 35 MW from four customers, and that was just in some, not all, of its updated Strategist runs between years 2020 and 2024. JI Ex. 2, Attach. TFC-21, p. 11; JI Ex. 2, p. 33, lines 10–15; Petitioner's Ex. 6 and Strategist workpapers.

These limitations to demand response on a current basis and in its forward-looking model are unreasonable and should weigh heavily in the Commission's consideration of whether this utility should be allowed to undergo such a significant new construction project.

2. Vectren's modeling and current practice biases against energy efficiency investments.

Despite the Commission previously recognizing that "[s]aving energy is the most cost effective way of meeting future energy supply needs and has the corresponding benefit of reducing the need to build additional generation capacity," In re Commission's Investigation, Cause No. 42693, Phase II Order, at 30 (IURC Dec. 9, 2009), Vectren underinvests and plans to continue underinvesting in energy efficiency. The Commission noted that while it "recognizes the need to approve additional generation capacity as necessary to meet the needs of customers and ensure Indiana's ongoing economic success, it also recognizes that an important component of long-term planning for Indiana's generation needs is the effective utilization of DSM programs by jurisdictional utilities that have a duty to serve their ratepayers in a cost effective manner." *Id*. Unfortunately, Vectren has failed to effectively utilize DSM programs since the repeal of the Energy Efficiency Resource Standard with Senate Enrolled Act 340 (2014), and its cost and potential assumptions are biased against DSM in its 2016 IRP and its few updates to

energy efficiency in its 2017 analysis. In other words, Vectren's assumptions are biased against DSM and did not adequately consider conservation as a path to stave off generation spending. The Commission should reject Vectren's request in this proceeding as it takes into account other more reliable, efficient, and lower-cost electric service resources under Ind. Code Ann. § 8-1-8.5-4(2), especially conservation.

a) Vectren overstates the cost of energy efficiency, biasing it against other resources and taking away its ability to effectively compete in Vectren's 2016 IRP and 2017 updated analysis.

If Vectren assigns costs to energy efficiency that are too high, it will not effectively compete in Vectren's modeling of resources. This biases the results of the modeling against energy efficiency in favor of building more new generation. Overall, Vectren followed four steps to come up with pricing for each energy efficiency block of 0.25% of sales that it plugged into its model. Vectren constructed a total of eight (8) separate savings blocks of 0.25% of sales.

i. Step 1: Errors in the cost estimation for the initial Block 1 compound with every subsequent block.

For Step 1 of Vectren's development of the cost of energy efficiency, Vectren estimated the cost for the first, initial 0.25% of sales, i.e. Block 1, to plug into the planning model. Joint Intervenors identified several errors in Vectren's assumptions for Block 1. JI Ex. 3, p. 7, line 3–p. 9, line 3. Because this is the first block and Vectren escalates all other cost assumptions off of this first block, any errors in the development of the cost for Block 1 compound and result in an overstatement of energy efficiency that gets worse with every subsequent block of 0.25% of sales. *See id.* at p. 9, lines 1–3. Ultimately, the overstatement of costs in the initial Block 1 amounts to about a 28% higher cost of net energy savings for *every* block. *Id*.

1. It was inappropriate for Vectren to use a planning program expenditure, when Vectren's actual program expenditures come in at an average of 88% the planning expenditures forecast.

Vectren's first error in developing the costs for Block 1 was its use of a planning cost projection from 2016, when Vectren's actuals have come in under its planned budget for every year except 2016. JI CX 15–16, 18–24. Although Vectren retorts that it is just a $0.02/kWh difference, Petitioner's Ex. 8-R, p. 4, lines 1–9, it is a 15% difference that can make a very significant difference in economic optimization resource models, especially if other factors in the model contain errors. JI Ex. 3, p. 7, lines 10–13.

Vectren also attempts to discount the trend of actuals coming in under the planned costs by claiming that the 2017 actual cost of $0.22/kWh is an anomaly due to higher C&I participation, particularly in lighting. *See* Petitioner's Ex. 8-R, p. 4, lines 10–18. However, this simply is not true: Vectren's data show that every year besides 2016, the year Vectren chose, has actuals coming in lower than planned budgets. JI CX 15–16, 18. Furthermore, Vectren's own Market Potential Study showed a projected increase in C&I portfolio savings overall and in C&I lighting, so it is confusing why Vectren would call 2017 an anomaly. *See* JI CX 29, especially sections (h) and (i). Although the 2016 actual expenditures came in at 101% of the 2016 planning expenditures forecast, the average actual expenditures across all of 2012–2017 is 88% of the planning expenditures forecast, showing that 2016 is the real anomaly. JI CX 15–16, 18. More importantly, actual costs per kWh for first year costs should be used over planned figures when the data is readily available, as it was to Vectren.

2. Vectren mismatched the savings assumptions to the cost assumption: Vectren's 2016 savings were really 1.3% of eligible sales, so it should have assigned the 2016 cost assumption to 5.2 blocks of 0.25% of savings, not just the 1 block of 0.25% savings.

A second error in Vectren's development of costs for Block 1 is its mismatched application of a cost for 1.3% eligible savings to a block amounting only to 0.25% savings. This error is a major problem given that Vectren compounded it by continuing to escalate costs for each subsequent 0.25% savings block. When Vectren applied the 2016 planned costs as a proxy for Block 1, it should have assigned that cost to 1.3% savings worth of blocks or 5.2 blocks of savings. Instead, Vectren biased its energy efficiency cost assumptions again by using the 2016 planned cost for just 1 block, not the 5.2 blocks that would have made this a more honest application of the data. *See* JI Ex. 3, pp. 7–8 (table 3 shows how this application to 5.2 blocks should have occurred). This error alone resulted in an overstatement of Block 1's cost and subsequent Blocks' cost by approximately 4.2%. *Id*.

3. Vectren's 2016 planned cost assumption was in 2015 dollars.

A third error was Vectren's expression of 2016 planned costs in 2015 dollars, which Vectren admits. Petitioner's Ex. 8-R, p. 7, lines 7–12. In so doing, Vectren inappropriately adjusted those costs up by its assumed 1.6% inflation. JI Ex. 3, p. 7; *id.*, Public Workpaper 2, "Levelized Cost tab" (Vectren document). Vectren had the 2016 data; rather than using the 2016 dollar figure for the 2016 planned costs, Vectren created yet another discrepancy in the data and another opportunity to adjust the cost of energy efficiency. In expressing the 2016 planned costs in 2015 dollars, Vectren inappropriately included one additional year of inflation which artificially increased the cost of energy efficiency.

4. Vectren inappropriately applied the wrong net-to-gross ratio to Block 1, which impacted all the other blocks.

A fourth error in Vectren's development of costs for Block 1 is that it did so for gross savings, rather than net, and then adjusted the 0.25% gross savings downward with an incorrect net-to-gross ratio. *Id.* at p. 8, lines 8–14. Vectren does not dispute its use of a net-to-gross ratio of 0.80 rather than 0.84 which was Vectren South's actual evaluated figure in 2017. Petitioner's Ex. 8-R, p. 5, line 20-p. 6, line 7. A net-to-gross ratio of 0.84 was also Vectren's average net-to-gross ratio for the past 5 years. JI Ex. 3, p. 8, lines 8-14. Vectren states because its NTG ratio "has been both above and below 0.80", Vectren South "rounded" its 0.83 NTG from its 2015 evaluation down to 0.80. *Id*. Vectren South admits that the difference between the 0.84 NTG ratio and Vectren South's 0.80 NTG ratio amounts to a 5% difference in the cost of net savings. Tr. F-98, lines 18-25. In other words, Vectren overstated the costs in such a way that it made Block 1 worth only 0.20% of eligible sales for a block that was supposed to represent 0.25%. JI Ex. 3, p. 8, lines 8-14.

ii. Step 2: Vectren estimated increases in the cost of efficiency as savings levels grow in size, i.e. Vectren estimates increases between each block of 0.25% sales.

After the overstatement of the costs in the initial Block 1 amounting to about a 28% higher cost of net energy savings per block, Vectren forecasted another large increase in the cost of efficiency in Step 2 of its cost development. For Step 2, Vectren estimated increases in the cost of efficiency as efficiency grew in size. In other words, between the first block of 0.25% sales plugged into the model (Block 1) and the second (Block 2), Vectren assumed the cost grows to deliver that second 0.25% eligible sales. Vectren then assumed another cost escalation between Blocks 2 and 3, Blocks 3 and 4, Blocks 4 and 5, Blocks 5 and 6, Blocks 6 and 7, and finally between Blocks 7 and 8. Even though Joint Intervenors' expert witness, Mr. Mellinger,

expressed concerns about this assumption, he used this Vectren assumption in order to be conservative with his forecast of missed efficiency opportunities by Vectren. *Id.* at p. 4, line 17–p. 5, line 4 & Table 1.

iii. Step 3: Vectren estimated increases in the cost of efficiency each and every year in the forecast.

For Step 3 of Vectren's development of the cost of energy efficiency, Vectren assumed very high increases in the cost of efficiency would occur in each and every year that it modeled. However, Vectren provides no verifiable basis for this assumption, and empirical data from Vectren's own last five years of experience do not align with these very high rates of annual growth in cost. *See id.* at p. 9, line 4–p. 12, line 5. Instead, Vectren continues to rely upon its former cost analysis by Dr. Richard Stevie that used EIA 861 data for his conclusion that energy efficiency costs grow each year and as more efficiency is procured. The Director of Resource Planning noted in the 2016 IRP Report:

> The Director appreciates the analysis performed by Dr. Stevie but is concerned that if the adjustments made to correct for admitted serious data limitations is sufficient to overcome the problems being addressed. Drawing strong policy recommendations in such circumstances is probably not warranted. More on this topic is discussed below in CAC et al.'s comments on energy efficiency. Hopefully, future analysis will be more reliant on empirical data derived from DSM's effects by Vectren's customers.

Id. at p. 9 (quoting JI Ex. 2, Attach. TFC-6, p. 43). Empirical data from DSM's effects by Vectren's customers are and have been available, and they do not support Vectren's assumption of a 4.0% compound annual growth rate. Rather, Vectren's empirical data show a growth rate of 0.4% per gross kWh saved or 0.8% per net kWh saved. *Id.* at p. 10, lines 5–7. In addition, in a study across twenty states, the American Council for an Energy Efficient Economy ("ACEEE") found an annual growth rate of 1.4%, without accounting for cost increases due to other states having achieved much greater levels of savings than Vectren has. *See id.* at p. 10, line 8–p. 11,

line 8 (comparing ACEEE's 1.4% growth rate encompassing annual increases and savings level increases to Vectren's 4% annual increases plus Vectren's 1% increases per every 0.25% gross savings). Holding all other assumptions the same and looking just at the use of the erroneous 4% compound annual growth rate Vectren assumed rather than the 0.8% from the "empirical data derived from DSM's effects by Vectren's customers" shows increases in costs of about 6% in 2020, 24% in 2025, and 46% by 2030. *Id.* at p. 11, line 18–p. 12, line 5 (and quoting JI Ex. 2, Attach. TFC-6, p. 43).

Vectren attempts to discredit this criticism by arguing that Joint Intervenors cherry-picked the 2013–2017 timeframe and instead should have used 2011, 2012, and 2018, as well. Petitioner's Ex. 8-R, p. 6, lines 8–25. Vectren put together an analysis that tacked 2011, 2012, and 2018 data onto Joint Intervenors' analysis, but it should not be considered insofar as Vectren again mixes planned and actual figures to come to an even more shocking compound annual growth rate of 7.5%. *Id*.; JI CX 25. Including 2011, 2012, and 2018 is inappropriate in that analysis for several reasons. First, the 2018 data were based on planned figures, not actuals, compromising Vectren's analysis on rebuttal on that basis alone insofar as the analysis was based on known results, while 2018 is just an estimate or forecast. Second, 2011 and 2012 were the first two years of program delivery. Tr. G-7, line 24–Tr. G-8, line 10. It is curious that Vectren should suggest an assumption that costs in the future should be much higher because of actual costs in the first two years of program delivery back in 2011 and 2012 were much lower. This is inappropriate given the immaturity of the program at that point and the low level of savings. JI CX 25. Also, back in 2011 and 2012, there was a different policy landscape wherein opt out legislation for industrial customers (statutorily defined as 1 MW and above) to stop paying into and participating in the program simply did not exist at that time. Tr. G-8, lines 7–16. Finally,

Vectren's witness could not recall when asked if Vectren only provided data starting with 2013. Tr. G-8, line 25–Tr. G-9, line 9. Thus, for these reasons, Joint Intervenors' Witness Mellinger thought it most appropriate to analyze the 2013–2017 data with 2013 as the base year; but interestingly, selecting 2012, 2014 or 2015 as the base year would have made Joint Intervenors' growth rate even lower. JI CX 25.

In sum, Vectren assumed very high increases in the cost of efficiency between each and every year that it modeled, ultimately biasing energy efficiency from effectively competing against supply-side resources.

iv. Step 4: Vectren estimated the cost of efficiency as if it were capitalized, although Vectren actually just expenses efficiency.

For Step 4 of Vectren's development of the cost of energy efficiency, Vectren levelized its costs of energy efficiency using a pre-tax weighted average cost of capital, despite the fact that Vectren does not capitalize energy efficiency. JI CX 26. In other words, even though Vectren expenses energy efficiency through a tracker, Vectren used a mechanism that assumes Vectren capitalizes the cost of energy efficiency with a rate of return for shareholders. JI Ex. 3, p. 12. Thus, to correct this error, one must instead estimate efficiency costs in terms of the total dollars to be spent in the year the efficiency savings are produced as JI Witness Mellinger did. *Id.* at pp. 13–14.

v. Overall, Vectren made serious, irreparable errors in its estimation of the cost of energy efficiency.

Just correcting the errors Vectren made in its development of the cost for Block 1 in Step 1, Vectren overstated the cost of energy efficiency by 28%. If the errors Vectren made in Steps 3 and 4 were also corrected by using a 0.8% annual growth rate, rather than one at 4%, and adjusting the costs in terms of total dollars to be spent in the year the efficiency savings are produced, rather than capitalizing efficiency costs, then the 28% overstatement of costs would be

even greater. Assuming all of the corrections flagged by Joint Intervenors were made to Steps 1, 3, and 4, it results in an NPV for energy efficiency of $164.43 per MWh, compared to Vectren's net present value of $285.81, amounting to a difference of 174%. *Compare* JI CX 27 (showing Vectren's estimates), *with* JI Ex. 3, p. 13, Table 3 (showing JI Witness Mellinger's corrections to Vectren's estimates).

It is important to highlight the fact that Vectren made only one revision to the efficiency costs between its 2016 IRP and the 2017 update, and refused to make any others in response to the Director's 2016 IRP Report which criticized Dr. Stevie's efficiency analysis. *See* Petitioner's Ex. 8-R, p. 3, lines 3–7; JI Ex. 2, Attach. TFC-5 at 37 and Attach. TFC-6 at 43. Thus, the same problems that the Director and stakeholders criticized Vectren for in its 2016 IRP stakeholder process still exist, particularly the ones related to Dr. Stevie's data quality. The Company claims it is reasonable to update *just* the cost growth factors (i.e., from one 0.25% of sales block to the next 0.25% of sales block) for DSM used in its 2016 IRP for use in the 2017 update, but not other factors related to cost, to preserve the "integrity of the Company's 2016 IRP model." *Id*. In essence, the Company doubles down on Dr. Stevie's DSM cost growth report in terms of annual, or year to year, cost increases of DSM used for planning purposes, despite the Commission's criticisms of such. Although the Company partly addressed the cost growth when growing the size of DSM, the Company refused to correct the cost growth of DSM over time, which has the biggest impact on the cost of energy efficiency used in the 2017 update. In the end, Vectren's ratepayers lose from this maze of confusion resulting in an incredible overestimation of the cost of energy efficiency and Vectren's continued neglected investment in energy efficiency in favor of building new generation.

b) Vectren underestimates the potential to expand energy efficiency in its service territory.

Vectren's level of efficiency savings in its current 2018-2020 plan only comes in at just 0.93% of eligible retail sales for energy efficiency net savings, which is even lower than Vectren's 2016-2017 DSM savings goals. *See* JI Ex. 3, pp. 43–44 (comparing Vectren's savings plan to net savings of 1.98% of eligible sales for Commonwealth Edison serving Chicago area for 2018-2021, and 1.45% with plans to increase to 2.0% by 2021 for Consumers Energy in Michigan). Unfortunately, Vectren's planned future for energy efficiency only gets worse from there.

Vectren's preferred plan shows energy efficiency levels at half of its current and recent historical results with its base case not selecting any energy efficiency whatsoever. JI CX 28; Tr. G-26, lines 7–25; JI Ex. 3, p. 14, lines 10–16. Vectren's preferred plan shows only 0.75% eligible retail sales worth of energy efficiency from 2021–2026, dropping down to a total of 0.50% eligible retail sales worth of energy efficiency from 2027–2036. JI CX 28; Tr. G-26, lines 7–25; JI Ex. 3, p. 14, lines 10–16. This is not because of the lack of cost-effective energy efficiency potential in Vectren's service territory. *See* JI Ex. 3, pp. 14–15, 39–40. Rather, it is the combined result of Vectren's assumptions and biases against energy efficiency, especially the cost of such, and other restrictions and convoluted steps Vectren took to ensure it would arrive at a capital-heavy investment like an oversized gas plant.

Joint Intervenors found, after analyzing measures and program designs that are absent or underutilized by Vectren, that additional energy efficiency savings of up to 44,000 gross MWh annually (for a total of 2% eligible retail sales) are possible within Vectren's electric service territory. *Id*. This is an approximately 1.2% increase over and above Vectren's planned total of

roughly 37,000 gross MWh annually between 2018–2020. *Id*. Specifically, Vectren could obtain significant gains in savings for its customers by offering:

(1) strategic energy management;
(2) midstream program designs;
(3) commercial lighting with a revised forecast of LED linear lamp and fixture volume plus midstream service delivery, as well as networked lighting controls;
(4) commercial heating, ventilation, air conditioning ("HVAC") and Refrigeration (collectively, "HVAC/R") with a revised forecast of volume due to midstream service delivery; and
(5) residential HVAC and domestic hot water volume forecast revisions due to midstream service delivery.

Id. Joint Intervenors' analysis of 2% eligible sales worth of potential is not even a comprehensive assessment of measures and program approaches, but rather focused on high potential "silver bullet" opportunities, meaning even more than this 2% is possible. *Id.* at p. 41. Notably, Joint Intervenors' first-year costs of additive savings identified in their analysis comes in at $0.11–$0.13/kWh, compared to Vectren's first year portfolio cost assumption of $0.23/kWh in its 2018–2020 plan. *Id*. at p. 42.

Vectren has not implemented or provided further evidence of a future strategic energy management ("SEM") program. SEM is a continuous improvement approach that creates persistent energy and cost savings for industrial and other large customers by integrating energy management into organizational practices, policies, and processes. *Id.* at pp. 15–16. If Vectren did SEM for non-opt out customers, it could achieve an additional 12,000 MWh/year in new additive annual savings with a program levelized cost at $0.02 in 2018. *Id*. at pp. 18–19.

Vectren also has not implemented any midstream programs, and Vectren made no arguments against such program assumptions in rebuttal. Vectren's concession on this point alone would unlock 30–50% of JI Witness Mellinger's savings potential forecast per year between 2019–2025, and even more in outer years. *Id*. at p. 20; *see also id.*, Attach. DM-4.

Midstream programs apply incentives at the point of purchase for products sold through wholesale and/or retail distributors, allowing products to achieve higher levels of sales penetration and reach a greater number of customers. *Id.* at pp. 20–21. Properly designed and implemented midstream programs can also easily address the issue of ineligible participation posed by the opt out legislation. *Id*. at p. 21. Vectren could achieve much higher participation levels by offering midstream programs for commercial lighting, commercial HVAC, commercial refrigeration, residential HVAC, and residential hot water. *Id*.

There are more opportunities too in commercial lighting than Vectren is currently pursuing or planning to pursue, amounting to 19,000 MWh per year more than in its 2018-2020 plan. *Id.* at p. 29. Vectren already offers rebates for LED linear lamps and fixtures in its several of its programs, yet Vectren does not account for these potential future savings in their forecasts, despite the incredible potential due to adoption being at a very early stage and improved LED efficacy. *Id.* at pp. 22–23. In fact, Vectren only forecasted that LED linear lamps and fixtures would be 15% of non-custom lighting savings, and drops that forecast even further between 2018 and 2020. *Id*. at p. 24. Yet, these measures are not subject to the General Service Lighting standards included within the Energy Independence and Security Act ("EISA"), meaning they are not at risk of having a changed baseline like residential screw-base bulbs, so this drop in potential does not follow logic. *Id.* at p. 25. Network lighting controls are also not part of any past or planned efforts by Vectren. *Id*. at p. 26.

Vectren argues that lighting savings cannot be depended on in the long term by pointing to a DOE report that actually shows enormous potential savings. JI CX 30, p. vii, Figure ES.1. Vectren claims the DOE report estimates that 80% of the installed stock will be LED by 2030, yet Vectren fails to recognize that Joint Intervenors' analysis focused on the linear type of LEDs,

which show up as having the largest potential in that same DOE report. JI CX 29; JI CX 30, especially p. 25, Figure 4.5. This DOE forecast assumes continued utility investment as part of their forecast. JI CX 30, p. vi. Yet reaching this point of saturation represents an immense savings opportunity, which was the very point of Mr. Mellinger's analysis relying on estimates from that very same DOE report. JI CX 30. This same DOE report also points to dramatic cost decreases in LED lighting over time especially between now and 2025, undercutting Vectren's further argument that future C&I lighting savings will not be cost effective. JI CX 30, p. 76, Figure D-2.

Vectren further argues that codes are eroding the savings potential for C&I lighting, Petitioner's Ex. 8-R, p. 4, lines 22–24, but when pressed in discovery, Vectren referenced International Energy Conservation Code ("IECC") 2009, 2012, and 2015 in an effort to support such a claim. *See* JI CX 29. However, these codes only apply to new construction projects. International Code Council, 2009, 2012, 2015 International Energy Conservation Code ("IECC"), Section 101, Scope and General Requirements. In the Company's 2018-2020 plan, C&I new construction accounts for a total of 2,840 GWh out of the entire C&I portfolio total of 48,233 GWh (6%), so the excluded amount is not great. JI Ex. 3, Public Workpaper 1, Tab 2018-20 Planned Measures. Furthermore, Indiana Energy Code is based on ASHRAE 90.1 2007 which predates even the earliest IECC code referenced by Vectren. 675 Ind. Admin. Code 19-4-1.

Vectren also attempts to rely on its conservative Market Potential Study as a reason for underestimating energy efficiency potential in its service territory over the planning period. Market Potential Studies ("MPS") are already inherently conservative, including Vectren's. *See* JI Ex. 3, pp. 45–46. Generally speaking, MPSs understate potential by focusing on measures that

are known today, failing to recognize the full potential from custom measures and programs, not fully accounting for higher savings as technologies evolve or costs decrease, failing to include all benefits from efficiency, failing to account for market transforming effects, failing to account for new ways to approach markets like midstream programs with lower administrative costs, and recognizing only a portion of economic potential after it is arbitrarily whittled down to what is "achievable." *Id*. at pp. 48–49. Emerging technology is a particularly large amount of savings that is rarely captured by an MPS. *See, e.g.*, JI CX 32, p. 15 ("Cadmus' 2012 study for the Iowa Utility Association . . . finds [emerging technology] could increase electric market potential (i.e., maximum achievable potential) by up to 3% . . . . KEMA's 2010 study for Xcel Energy Colorado finds that economic potential increases by 24% when [emerging technologies] are included.").

Vectren's most recent MPS, published in 2013, covered 2015-2023 and carries similar flaws that result in an underestimation of savings potential. Vectren's MPS omitted several measures that could have brought in substantial savings, made no estimate regarding emerging technologies, and did not consider any new or alternative program designs. JI Ex. 3, pp. 45–52.

3. Vectren currently and plans to continue to bias against and underinvest in demand response and energy efficiency options for its customers.

The Commission should reject Vectren's request for a CPCN as other, better methods exist to procure service for Vectren's ratepayers. Vectren's restrictions to its interruptible tariffs and its flawed assumptions for energy efficiency are irredeemably flawed. While Vectren attempts to rush through this 850 MW gas plant, it is undergoing a new market potential study with its Oversight Board to assess demand side management potential in its service territory. Tr. F-32, lines 20–25. This new data will then most likely be used in Vectren's 2019 IRP and will undergo review and scrutiny through the IRP stakeholder process that should begin any day now

and that promises to be more robust and transparent than Vectren's 2016 IRP stakeholder process. Tr. F-31, line 20–Tr. F-32, line 14.

Vectren's defense of its efforts to undervalue and restrict the implementation of energy efficiency and demand response is especially concerning considering Vectren is a "peaky" utility. *See* Petitioner's Ex. 5, Attach. MAR-1, pp. 629–30, 639–46; Tr. E-34, lines 12–24. An analysis of current power system planning in Indiana found that "a significant share of the system capacity is built to meet demand in a very small number of hours." JI Ex. 2, Attach. TFC-21, p. 1. It also found that "about 8-10% of [Indiana's] infrastructure requirements and costs are needed to meet demand in this very small number of hours." *Id*. Insofar as "the electricity system is sized to meet demand at all hours of the day, peak demand reductions improve the economic efficiency of the system by reducing the need for capital-intensive infrastructure investment and improving the utilization of existing generation, transmission and distribution assets." *Id*. Energy efficiency and demand response can do this and can do it at a much lower cost than building an oversized gas plant.

C. Vectren Unreasonably Limited its Request for Proposals and Failed to Explore the Potential for Reliable, Relatively Diverse and Inexpensive Alternatives as a result.

Vectren's Request for Proposals ("RFP") reflects concerted effort to reinforce a predetermined conclusion by unnecessarily limiting generator characteristics rather than testing that conclusion against alternatives in the marketplace. As a result, Vectren has failed to comply with section 8-1-8.5-5(e), failed to explore alternatives, and failed to demonstrate that the proposed gas plant is the least-cost option to meet any demonstrated need. *See* In re Indianapolis Power & Light Co., Cause No. 44794, at 32. The Commission should reject Vectren's assumption that a single large gas plant is the most cost-effective, reliable solution to meet over two-thirds of its customers' energy needs for the next 30 years.

1. Indiana Law Requires the Commission to Consider whether Vectren Solicited Competitive Bids to Obtain Capacity and Energy from Alternative Suppliers.

To ensure a proposed project comports with public convenience and necessity and truly provides a low cost solution, applicants are required to solicit competitively bid alternatives. Under section 8-1-8.5-5(e) of the Indiana Code, the Commission must consider factors including "[s]olicitation by the applicant of competitive bids to obtain purchased power capacity and energy from alternative suppliers." Solicitation of competitively bid alternatives is required when a utility proposes a project larger than 80 MW, to ensure that large projects are tested against alternatives available in the marketplace. Ind. Code Ann. § 8-1-8.5-5(e); *see also* In re Petition of Southern Indiana Gas & Electric Co., Cause No. 38738, at 5 ("[L]east-cost planning is an essential component of our Certificate of Need law."). Further, solicitation of competitively bid alternatives ensures compliance with section 8-1-8.5-4, which requires an applicant to provide "enough information so that the Commission can take into account all of the enumerated alternatives in making its determination." In re Joint Petition of PSI Energy, Inc. and CINCAP VII, LLC, Cause No. 42145, at 14.

In order to make these required findings, the Commission must evaluate whether an applicant adequately used competitive bidding to identify potentially more cost-effective alternative supply options. For example, a broad solicitation of alternative resources that yields no competitive alternatives provides evidence that the applicant's proposal could indeed be the best option. *See, e.g.*, In re NIPSCO, Cause No. 43396, at 6–7 (relying on all-source RFP to support CPCN request for purchase of large CCGT). Conversely, an overly restrictive solicitation designed to exclude alternatives would leave substantial questions about whether lower-cost alternative options are available. *See, e.g.*, In re IPL, Cause No. 44339, at 25 (IURC May 14, 2014) (noting limited value of overly restrictive RFP that "appeared . . . designed and

carried out with the intention of showing that IPL's self-build option was not inferior to other potential new build locations").

2. Vectren Unreasonably Restricted its RFP, Leaving the Commission and Customers with No Market Confirmation that the Proposed Gas Plant is the Most Affordable Solution Today.

Vectren once observed that the ever changing context in which utilities operate "highlight[s] the need to regard IRPs . . . as a *compass* rather than a commitment to a specific resource strategy." JI Ex. 2, Attach. TFC-6, p. 36. On this point, we might all agree. But Vectren's rhetoric is incongruent with the Company's actual actions, particularly its unreasonably constrained RFP process before pursuing this CPCN request. Vectren did not use the RFP process to test the conclusion of its IRP modeling against real market responses. Instead, Vectren issued an RFP that only sought bids for a 600-800MW gas plant. Petitioner's Ex. 2, p. 5 ("The RFP was limited to the type of generation called for in our IRP modelling—a CCGT."); *see also* Tr., A-34, line 12 ("We issued an RFP for the type of power that we needed."); Tr., B-22, lines 17–21;. Vectren thusly shielded its preferred build from competing against real-world alternatives, instead treating its 2016 IRP as a commitment to a specific resource strategy. *Cf.* JI Ex. 2, Attach. TFC-6, p. 10 (explaining that IRP results are merely an indicative analysis that "does not bind the utility to adhere to the preferred resource portfolio").

With the help of a paid third-party consultant, Burns & McDonnell, a series of limitations were developed to ensure Vectren's preferred build would only compete against the most similar alternatives: large CCGTs built elsewhere by other parties. Petitioner's Ex. 2-R, p. 3; Tr. B-38, lines 16–19. The Company did not use the RFP to collect actual cost data on potential solar, wind, or storage projects. Tr. B-33, lines 1–13. Instead, Vectren excluded these resources from its RFP at a time when the MISO Generation Interconnection queue has a record number of generator requests generally, and from renewable developers in particular. Petitioner's

Ex. 20-R, pp. 21, 24 (explaining record high of 554 projects totaling 92.5 GW in MISO queue, 87% of which are renewable projects). Paired with storage or meeting a portion of the total need, these renewable resource alternatives could have provided a cleaner, lower-cost supply alternative, and Vectren would have the option of pairing them with other resources, including a smaller gas plant, to create more diverse portfolios than the ones that it analyzed for this case. Though Vectren argues the reasonableness of its estimated renewable costs, Vectren Br. at 8, the Company made no effort to go to the market for actual renewable project costs. That fact is especially troubling given that NIPSCO's recent all-source RFP, addressed in further detail below, received considerably more responses and resulted in the conclusion that renewable projects offer a lower-cost, lower-risk solution than a large gas plant. *See infra* Section III.C.3, pp. 50–52.

In contrast, because Vectren tailored its solicitation to exclude these renewable alternatives, the utility can point to no evidence showing its preferred gas plant can compete with renewables outside the Company's modeling, in the real world. *See* Ind. Code Ann. § 8-1-8.5-5(e). Given the convoluted and inconsistent nature of Vectren's modeling evidence and the resulting probability that such modeling cannot accurately predict real-world outcomes, *supra* Section III.A.1, pp. 9–14, the need for Vectren to test that conclusion against alternatives in the marketplace is especially important. Further, Vectren has failed to provide sufficient information on the costs of meeting the demonstrated need through renewable energy resources, as required by section 8-1-8.5-4. In short, Vectren has failed to provide "enough information so that the Commission can take [the alternative] into account . . . in making its determination." In re Joint Petition of PSI Energy, Inc. and CINCAP VII, LLC, Cause No. 42145, at 14.

In addition to protecting its preferred build from competing against renewables, Vectren's RFP excluded resources smaller than 600 MW. Petitioner's Ex. 6, Attach. MEL-1,p. 34; JI Ex. 2, p. 46; Tr. B-25, lines 21–24. In so doing, Vectren foreclosed consideration of combinations of smaller resources that might have offered less market risk exposure and greater diversity, flexibility, and cost-efficiencies than a large gas plant. Tr. B-25, lines 21–24. A smaller resource or a combination of smaller resources could provide lower market risk exposure, increased optionality, and greater resource diversity. JI Ex. 2, p. 46. Yet, again, because Vectren tailored its solicitation to exclude these alternatives, the utility can point to no evidence showing its preferred gas plant can compete with combinations of smaller resources outside the Company's modeling, in the real world. Instead, Vectren unilaterally decided that a combination of smaller resources would not suffice. In so doing, Vectren improperly treated its 2016 IRP results as a resource decision, excluded further examination years later of potentially less expensive and less risky alternatives, and usurped the discretion of the Commission in weighing robust evidence on the viability of alternatives. However, under Chapter 8.5, it is the Commission's responsibility to ensure that all prudent alternatives have been evaluated and that the utility's proposed plan is in the public interest; the Commission's review of alternatives cannot be limited to those favored by the utility. *See* In re Joint Petition of PSI Energy, Inc. and CINCAP VII, LLC, Cause No. 42145, at 14 ("The statute does not limit the Commission's discretion to weigh the importance of each alternative in determining the public interest.").

After limiting generator types and sizes for the RFP, Vectren further restricted RFP responses to only large gas plants sited in MISO Zone 6. The Company did not use the RFP to collect actual cost data on resources in areas immediately adjacent and deliverable to Vectren's system, such as Illinois (MISO Zone 4), for example. JI Ex.2, p. 46. Although the Company

justifies its refusal to collect any data on potential resources outside MISO Zone 6 by pointing to MISO local resource clearing requirements ("LCRs") and congestion costs, neither justification withstands scrutiny. First, MISO's LCR for Zone 6 requires just 67% of Vectren's generation to be sited in Indiana. Petitioner's Ex. 2, p. 4; Tr. I-84, lines 2–23. That percentage is calibrated to ensure system reliability, meaning MISO expects reliability to be adequately maintained so long as no more than roughly a third of generation is sited outside Zone 6. While that reliability requirement may fluctuate some over time, it allows for reliance on a significant proportion of generation outside Zone 6. Vectren, however, has planned its proposed portfolio to rely 100% on resources within Zone 6, which it characterizes as "zero risk" planning. Tr. I-86, lines 7–20. But "zero risk" is imprudent and expensive planning that far exceeds MISO's already protective standard and fails to take advantage of a principal benefit of operating in the MISO marketplace—efficient use of existing transmission and generation assets. Here, as in most situations, zero risk planning is likely to lead to a suboptimal or imprudent result.[8] Vectren should have explored—not rejected without any analysis—the possibility that a combination of resources including some sited immediately adjacent to its system could cost-effectively and reliably serve its customers.

Second, Vectren's congestion analysis does not support conclusions beyond the single question asked in that analysis: would congestion costs for a site over 100 miles off-system make a particular third-party build more expensive than Vectren's self-build estimate. Tr. B-37, lines

[8] For example, in response to the risk of a car accident, a zero risk approach would require never driving or riding in an automobile. A more prudent approach would manage the risk of an accident via *how* one operates a car, so the benefits of transportation via car are reaped whilst risk is minimized. Here, Vectren's insistence that 100% of its resources are located in Zone 6 is the equivalent of refusing to use a car in order to avoid a car accident. The more prudent approach would manage the risk of remote generation by reasonably limiting the amount, location, and volume of remote generation, so the benefits of existing resources are reaped whilst risk is minimized.

3–12. Vectren would prefer to extend the conclusion of its congestion analysis to claim that no off-system resource could possibly compete with a self-build at the Brown site because one off-system resource could not compete. *See* Vectren Br. at 10 ("RFP demonstrated the materiality of congestion costs associated with an off-system resource."). The Commission should decline Vectren's invitation to logical farce and instead give the Company's examination of congestion costs only the weight it is due. Vectren demonstrated the materiality of congestion costs associated with one off-system resource and made no investigation whatsoever of congestion costs beyond that one site. Vectren has presented no evidence evaluating the availability of system-adjacent resources in MISO Zone 4 or the attendant congestion costs to deliver power from such a resource. Instead, Vectren designed its analysis to wholly exclude such resources, thereby protecting its preferred build from the threat of real-world competition.

In concert, these RFP limitations worked to ensure that Vectren's preferred gas plant self-build would have as little competition as possible from outside bidders in the real marketplace. Vectren narrowly tailored its solicitation to include only large gas plants in Zone 6, and then only analyzed congestion costs for one alternative site. This analysis thus guaranteed that Vectren's self-build would emerge as the preferred alternative from the RFP: by constraining the analysis to evaluate only whether a large on-system gas plant, where there would be no congestion costs, would be less expensive than building essentially the same gas plant off-system, where there would be congestion costs. In effect, the process appears "designed and carried out with the intention of showing that [Vectren's] self-build was not inferior to other new build locations" for a large gas plant in Zone 6. In re IPL, Cause No. 44339, at 24. The solicitation does nothing to collect market-based data on different generation types, sizes and combinations, or locations, effectively excluding other alternatives from competing against Vectren's preferred self-build in

the RFP process. As a result, Vectren has not presented the Commission with substantial evidence that it solicited competitively bid alternatives, Ind. Code Ann. § 8-1-8.5-5(e)(2)(B), leaving other methods of providing reliable, efficient, and economical electric service unexplored. Ind. Code Ann. § 8-1-8.5-4(2).

3. The Commission Has the Authority to Deny the Proposed Project Unless and Until Vectren Comes Forward with Real Market Evidence Affirming its 2016 IRP Modeling Results.

Vectren asks the Commission to conclude that its hypothetical modeling exercise is an adequate substitute for testing actual market prices through an all-source RFP process. The Commission should require more before allowing the smallest utility in the state to spend its customers' money for the construction of the largest gas plant in the state. Since at least as early as 2008, Indiana utilities have demonstrated the value of all-source RFPs in resource planning. *See* In re NIPSCO, Cause No. 43396 (supporting CPCN request with all-source RFP *and* CCGT-specific RFP). Indeed, NIPSCO recently conducted an all-source RFP and reached a very different result than Vectren after evaluating real-world market cost data. JI Ex. 2, p. 46–47; JI CX 14. Unlike Vectren, NIPSCO allowed RFP responses from all technology types, included consideration of "smaller resources to offer their solution as a piece of the total need," expressed no preference for ownership over PPAs, and required deliverability to (but not siting in) MISO Zone 6. JI Ex. 2, pp. 46–47; JI CX 13, p. 12. While Vectren's heavily restricted RFP garnered few responses with virtually no diversity among them, NIPSCO received 90 bids totaling nearly 10GW of capacity after issuing an all-source RFP. JI Ex. 2, p. 47; JI-CX-14, p. 39. Upon incorporating the pricing from those many and varied RFP responses into its resource modeling, NIPSCO found renewable resources provided lower-cost, lower-risk solutions than a new gas plant. JI-CX 14, p. 47.

By including the full diversity of "alternative suppliers" NIPSCO ensured the Commission would eventually be given enough information to consider all alternatives in deciding whether a CPCN should issue. In re Joint Petition of PSI Energy, Inc. and CINCAP VII, LLC, Cause No. 42145, at 14 ("[W]hat is important is that the Commission be given enough information so that the Commission can take into account all of the enumerated alternatives in making its determination."); *e.g.*, In re NIPSCO, Cause No. 43396 (supporting CPCN request with all-source RFP *and* CCGT-specific RFP). By instead issuing a solicitation designed to exclude alternative suppliers, Vectren has no market-based test of the Company's 2016 IRP conclusions. According to Witness Luttrell, Vectren "complied" with the requirement of 8-1-8.5-5(e) by issuing an RFP that was designed to exclude every resource but a large CCGT sited in Zone 6. Petitioner's Ex. 2-R, p. 3; Tr. B-38, lines 13–19 ("As far as going out on what I'll call competitive procurement . . . we did go out for an RFP for competing bids for *the source* that we were looking for.") (emphasis added). Vectren needed to do more than solicit bids for the gas plant it wanted; it needed to use the solicitation to explore whether capacity and energy from alternative means could offer a better solution for its customers.[9]

Vectren spent untold thousands of customer dollars paying third parties to define hypothetical resource prices used in its IRP modeling. A necessary and more cost-effective compliment to that modeling is obvious: obtaining real-world cost data from the market using an all-source RFP. Under section 8-1-8.5-5(e), the Commission should require Indiana utilities to

[9] Though Mr. Luttrell stated in his pre-filed testimony that the Company had "no ability to impact the amount or quality of the bids that were submitted," Petitioner's Ex. 2-R, p. 6, at hearing, he conceded that if Vectren had not excluded the vast majority of potential resources, it may have received greater than six proposals. Tr. B-34, lines 8–21. As noted above, NIPSCO received over 90 bids totaling over 10 GW in response to its recent all-source RFP. JI Ex. 2, p. 47.

thusly use the marketplace before committing customer money to building a new resource on the basis of modeling evidence alone.

D. Vectren's Proposal Is Over-Reliant on Carbon-Based Fuels, Creating an Unacceptable Risk of Constraints on Future Access to Capital.

Vectren's testimony describes a near future where carbon-based fuels are discouraged: not just by regulators, but also by investors who divest shares of utilities that are over-reliant on carbon-based fuels. Nevertheless, Vectren plans to rely on methane gas for over seventy percent of its capacity. This ignores investor concerns and therefore risks constraints on future access to capital. Both Vectren and the Commission must plan for a future in which carbon-based fuels are discouraged, under Ind. Code Ann. §§ 8-1-8.5-3.5 and -4. Vectren's failure to do warrants denial of this CPCN application.

1. Vectren and the Commission Must Both Consider Investor Concerns on Over-Reliance on Carbon-Based Fuels.

Vectren continues to ignore calls from the Commission, investors, and stakeholders to address over-reliance on carbon-based fuels. In 2008, the Commission encouraged Vectren to make "efforts to prepare for a future in which carbon is regulated . . .." Citizens Action Coal. of Indiana, Inc. v. PSI Energy, Inc., 894 N.E.2d 1055, 1065 (Ind. Ct. App. 2008) (upholding Commission order requiring utility to make efforts to deal with future carbon regulations). In the present environment, Vectren must also address investors' Calls to Action to avoid over-reliance on carbon-based fuels. "[Investor-owned electric utilities] recognized the need to be responsive to stakeholders regarding [environmental, societal, and governance] issues[.]" Petitioner's Ex. 16-R, p. 5.[10] However, Vectren's plan to switch from coal to methane gas fails to address

[10] "Q: Does the electric industry face the potential that access to capital could be constrained due to [environmental, societal, and governance] issues?
A: Yes. Key stakeholders and investors have issued impactful calls-to-action and threatened divestment and in some cases have divested from some of our member companies whose long-

investors' concerns because, as detailed below, numerous investors and stakeholders have issued Calls to Action concerning investments into **all** carbon-based fuels, not just coal.

Vectren's access to capital is critical because the "investor-owned electric company sector is the most capital-intensive industry . . .." *Id*. Because investments into carbon-based fuels create a risk of constraints on future access to capital, the Commission must factor that risk into its evaluation, under Ind. Code Ann. § 8-1-8.5-4, of carbon-free alternatives to Vectren's proposed CCGT. The Commission must also incorporate evaluation of that risk into its judgment "on the optimal extent, size, mix, and general location of generating plants." Ind. Code Ann. § 8-1-8.5-3(b)(3).

2. Vectren Has Failed to Address Investor Concerns on Over-Reliance on Carbon.

Three years ago, the California Insurance Commissioner sent a letter to every large California insurance company, opining that "investments in coal **and** the carbon economy run the risk of becoming a 'stranded asset' of diminishing value." Petitioner's Ex. 16-R, Attach. RFM-13R, p. 2 (emphasis added).[11] Mr. McMahon did not challenge the California Insurance Commissioner's opinion, even when given the opportunity to do so. Tr. C-21–C-27. Nor did Mr. McMahon refute the risk that Vectren's proposed CCGT could become a stranded asset: "I really don't think I could speculate on that. You know, I don't have the – that's not really my field to make that estimate." Tr. C-40, lines 22–24. Vectren's counsel later described the California Insurance Commissioner's letter as a "call . . . for divestiture from companies that

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term [Environmental, Societal, and Governmental] / sustainability risk profiles were unclear based on existing reporting." Petitioner's Ex. 16-R, p. 7.

[11] Ms. Medine also referenced a recent Rocky Mountain Institute report titled "The Economics of Clean Energy Portfolios," stating that new investments into methane gas plants are "at risk of becoming stranded assets." ICC Ex. 1, p. 34.

maintain gas," and a "call to **not** invest in companies that are continuing to invest in gas." Tr. C-53, lines 7–10 (emphasis added).[12]

Mr. McMahon's testimony next described Norges Bank's criteria for exclusion of investor-owned utilities from its sovereign wealth fund. Tr. C-13, lines 16–22. Vectren's massive commitment to methane gas instead of renewable energy risks triggering three separate Norges Bank criteria, because it would result in higher greenhouse gas emissions, higher fugitive methane emissions, and a low percentage of clean energy in the company's portfolio:

- Criterion for exclusion based on unacceptable greenhouse gas emissions. Tr. C-14, lines 3–6. Indiana Coal Council witness Emily Medine performed a Lifecycle Assessment in accordance with National Energy Laboratory standards, and determined that the proposed CCGT will produce forty-six percent more greenhouse gas emissions over its lifetime than a combination of coal and clean energy. ICC Ex. 1, pp. 32–34.
- Criterion for exclusion based on fugitive methane emissions. Tr. C-14, lines 7–10. Vectren's commitment to a methane gas-fired plant would significantly **increase** the utility's methane emissions. Vectren wholly ignored the risk of future methane regulations in its risk analysis. Tr. D-45, lines 1–3.
- Criterion for exclusion based on a low share of business from clean energy sources. Tr. C-14, lines 11–18). Vectren's current IRP envisions less than twenty percent of its 2036 Preferred Portfolio Resource Mix coming from clean energy.

When asked whether Norges Bank could exclude a utility from the sovereign wealth fund based on these three criteria, Mr. McMahon conceded, "I mean, I think that's a possibility." Tr. C-16, line 3. Vectren's failure to address this possibility is critical because, as Mr. McMahon explained, "Norges [Bank] is a significant sovereign wealth fund and investor in our space . . .." Tr. C-15, lines 2–3.

Next, Mr. McMahon's testimony described a March 2018 Call to Action from the New York State Comptroller. Tr. C-7–C-13; Petitioner's Ex. 16-R, Attach. RFM-8R. The

[12] Mr. McMahon also included a copy of California law Section 7513.75 in his testimony. Upon questioning, Mr. McMahon explained that in this law, "California Public Employees' Retirement System, "they do talk about a transition to . . . clean, pollution free energy resources." Tr. C-20, lines 1–2.

Comptroller sent a letter to "10 of the largest greenhouse gas emitting companies held by the [New York State Common Retirement] Fund, urging them to reduce emissions and address risks arising from climate change." Petitioner's Ex. 16-R, Attach. RFM-8R. When Mr. McMahon "first saw this list of companies, we were very interested in it . . . who was on it, who wasn't on it . . . ." Tr. C-12, lines 21–23. Mr. McMahon was "surprised" to see NextEra Energy,[13] Entergy, Southern Energy,[14] and Calpine Corporation in the Comptroller's Call to Action, because those companies primarily burn methane gas, not coal. Tr. C-10, lines 16–21; *see also* Tr. C-13, line 1 ("I'm not exactly sure how they ended up on this list."). Vectren's proposed long-term commitment to methane gas leaves it vulnerable to a similar "surprise."

3. Vectren Must Immediately Address Investors' Concerns on Over-Reliance on Carbon-Based Fuels.

At the hearing, the Commission highlighted the risk that Vectren has failed to address: "Mr. McMahon, what do you believe is the likelihood that the investor view of the natural gas-fired investments will move towards that of its view of coal today?" Mr. McMahon's testimony demonstrates that investor views are moving **now**. Moody's Corporation has already downgraded Vectren's outlook to "negative" after evaluating the "multi-year capital plans" Vectren seeks approval of in this proceeding. OUCC CX 2, October 2018 S&P Global article, "Moody's dims outlook on Vectren Utility Holdings, subsidiaries." Vectren South's weak outlook is a direct result of the company's capital plans, not the Tax Cuts and Jobs Act: rather, Vectren South's "weakness . . . is exacerbated by the . . . US Tax Cuts and Jobs Act." *Id.*

Moody's, the California Insurance Commissioner, Norges Bank, and the New York State Comptroller have all realized that a portfolio of clean energy resources supported by demand

[13] NextEra has a more aggressive carbon reduction goal than Vectren: 65% by 2021. JI CX 5, p. 7.

[14] In fact, "[a]s of 2017, [Southern Energy] had made a very significant switch between coal to natural gas --- from 2007." Tr. C-11, line 24–C-12, line 2.

response, battery storage, energy efficiency, and distributed generation will inevitably reach cost parity with a CCGT. The Rocky Mountain Institute demonstrated this could happen as early as 2026. ICC Ex.1, Attach. ESM-9, pp. 7–8.[15]

Several utilities have already embraced this inevitability by rejecting methane gas as a so-called "bridge fuel" and moving directly from coal to renewable energy. Over the last decade, new renewable energy resources have displaced both coal and methane gas in Texas and California. *Id.* at pp. 4–5. ICC Witness Ms. Medine's testimony lists examples of this trend in five other states, including Indiana:

- September 2017: Duke Energy replaced gas turbines with battery storage in the Western Carolinas. Tr. C-34.
- March 2018: Arizona Corporation Commission issued a nine-month moratorium on large gas-fired plants. *Id*. Mr. McMahon stated, "I'm not that familiar … with that case. I did not know that [a study to determine if a mix of storage and demand-side management could meet its future needs] was a part of that case."
- June 2018: Xcel Energy proposed replacing two Colorado fossil plants with wind, solar, and storage. Tr. C-35.
- June 2018: Consumers Energy called for replacing Michigan coal plants primarily with renewable energy resources. Tr. C-35–C-36.
- September 2018: NIPSCO previewed findings from its Integrated Resource Plan calling for the replacement of coal generation with renewable energy and not gas. Tr. C-37. Mr. McMahon stated, "I had heard about the announcement with respect to coal, but . . . I did not know the other side of that . . . . I was not fully aware of the renewables piece of that." *Id.*

In sum, Vectren's plan to rely on methane gas for seventy percent of capacity ignores investor concerns about over-reliance on carbon-based fuels. The recent Moody's downgrade shows how this could constrain the company's future access to capital. OUCC CX 2; OUCC CX 5. Both Vectren **and** the Commission must address the risk that overreliance on carbon-based fuels could constrain future access to capital, or that carbon investments could become stranded

[15] Lazard's Annual Levelized Cost of Energy Analysis demonstrates that wind and solar are already cheaper energy sources than a CCGT. *Id.* at p. 7.

assets.[16] Mr. McMahon was "surprised" that recent investor Calls to Action targeted investments into **all** carbon-based fuels, and not just coal.[17] Mr. McMahon appeared just as surprised that NIPSCO and several other utilities have responded to the Calls to Action, and protected future access to capital, by rejecting methane gas as a bridge fuel.[18] Vectren, on the other hand, stubbornly proposes a thirty-year, $1 billion commitment to methane gas. This creates unacceptable risk of constraints on future access to capital, and warrants denial of this application.

E. Vectren Unreasonably Relies on a Highly Flawed Risk Assessment to Conceal the Obvious Risk of Depending on a Single, Large Gas Plant to Supply the Bulk of Energy Needs.

Vectren has not adequately or credibly assessed the risk of its proposed transition to reliance on a single gas plant to generate the bulk of its capacity and energy needs—an essential step in evaluating alternatives and ensuring a project comports with least cost planning principles. Ind. Code Ann. § 8-1-8.5-4(2); In re IP&L, Cause No. 44794, at 31 (explaining least-cost planning demands an evaluation in terms of cost, "service reliability, technical constraints, plan flexibility, and optionality"). A reliable risk assessment considers the most material risks, captures the relative import of those risks, transparently measures each risk, and accurately ranks risk exposure, all based on the best available data. Tr. D-47, lines 6–8; In re IPL, Cause No. 44794, at 29 ("[I]t is appropriate that modeling take into consideration reasonable risks and unknowns."). Vectren's risk analysis, conducted by Pace Global, does none of those things. Vectren and Pace Global designed metrics that wholly exclude or misconstrue material risks that would disfavor the Company's preferred large gas plant. Vectren arbitrarily scored and weighted those inapt metrics, and subjectively scored portfolios. These flaws alone render the risk

[16] PSI Energy, Inc., 894 N.E.2d at 1065; Ind. Code Ann. §§ 8-1-5-3.5, 8-1-5-4.
[17] Tr. C-13, line 1.
[18] Tr. C-34–C-37.

analysis unreliable, but to make matters worse, Vectren never updated its risk modeling after its 2016 IRP, despite having updated inputs for myriad variables in its possession and considerable time and opportunity to do so. As elaborated below, these substantial flaws add up to an unreliable "risk" analysis, systematically biased in favor of a predetermined conclusion.

1. The risk analysis improperly relies on stale data from the 2016 IRP.

Vectren's risk analysis is unreliable for the simple fact that the Company has not updated its risk analysis modeling since its 2016 IRP. Aurora modeling supporting the risk analysis was done during Vectren's 2016 IRP process. Since that time, and prior to initiating this proceeding, Vectren obtained and used numerous updated modeling inputs, including: solar capital costs; variable production costs and revenue requirements assumptions for existing units; forecasted cost for wholesale market capacity and energy; delivered fuel prices for gas and coal; and costs associated with new energy efficiency programs. Petitioner's Ex. 6, pp. 9–10. Vectren also corrected its capital cost estimate for its preferred gas plant. None of these updated inputs were used in the risk analysis modeling. Vectren made no updates to the Aurora modeling inputs and refused to rerun the modeling used to support the risk analysis. Tr. D-66, lines 2–7 ("We did not re-run a risk analysis with the updated assumptions associated with the changes over the past two years.").

On behalf of Vectren, Mr. Vicinus muses that updated Aurora modeling was not necessary because, by his estimation, the updated inputs are within the range of inputs considered in the prior stochastic analysis so the results would be unchanged.[19] Petitioner's Ex. 7-R, p. 6. In truth, Mr. Vicinus is guessing—advancing a personal hunch in the absence of

[19] Mr. Vicinus also asserted that such an update would be "a time consuming endeavor." Petitioner's Ex. 7-R, p. 6. What Mr. Vicinus means more specifically is that a mere two to three months would be necessary to update the Aurora modeling. Tr. D-68, lines 15–17. Considering that the analysis supports a decision that locks Vectren's customers into a 30-year (or 360-month) decision, three months spent updating analysis would surely be time well spent.

updated computer modeling. *See* JI Ex. 2, p. 43 (explaining that risk analysis does not rely on updated modeling). Given the extent of changes in data inputs in recent years and the considerable cost of the proposed plant, the Commission should require Vectren to do more than guess at what updated risk modeling would show. *See* In re IPL, Cause No. 44339, at 27 ("[W]e believe that IPL could have reasonably updated the [model] given the extent of changes in data inputs and assumptions and provided a more robust analysis.").

Updating the risk modeling would have allowed Vectren to determine how the many changed inputs influence the risk profile of each portfolio. *See id.* (noting "IPL failed to use the [model] to determine if the timing, technology type, and size of resource choices might have changed given the many changed inputs"); *see also* JI Ex. 2, Attach. TFC-6, p. 1 (observing that IRP process requires each utility to "make continuing improvements to its planning"). This is not a case where updating the risk analysis would have delayed Vectren's decision-making or CPCN filing. *Cf.* In re IPL, Cause No. 44794, at 28 ("Continuing to delay a decision each time new or updated information becomes available could result in never making a decision."). It would not have been a challenge to update modeling inputs and re-run the model: updated modeling inputs were in Vectren's possession and put to use in its updated Strategist modeling; and re-running Aurora with updated inputs would have taken a mere two to three months. Tr. D-68, lines 12–17. *Cf.* In re IPL, Cause No. 44794, at 28 (utility excused from including updated gas fuel forecasts not in its possession at the time of its analysis).

In these circumstances—and irrespective of additional flaws in the risk analysis set out below—the Commission should exercise its authority to require Vectren to update its risk analysis modeling before approving a proposed new gas plant with an expected 30-year operating life. Without an updated risk analysis, the Commission cannot conclude that Vectren

adequately considered alternatives which may have better served its customers. *See* Ind. Code Ann. § 8-1-8.5-4(2).

2. The selected metrics ignore material risks in a manner that consistently favors Vectren's preferred large gas plant.

a) Vectren takes a one-sided view of market and capacity risks, thereby neglecting the risks coincident to an over-build system.

Vectren's risk analysis failed to fully account for market exposure and capacity risks, thereby biasing results in favor of building an over-sized resource. The Company's risk analysis employs a one-sided view of market risk: assuming "surplus capacity and generation offers only benefits to ratepayers." JI Ex. 2, p. 20, lines 23–24. Such a view "only holds true when market prices and/or load are high enough to justify it." *Id.* at p. 21, line 1. If high market prices and/or high loads do *not* materialize, ratepayers will suffer the cost of that imprudent overbuilding. *Id.* at p. 21, lines 2–4. Vectren offered no testimony defending its one-sided treatment of market risk. By structuring its market risk metric in this way, the Company's risk analysis wholly neglected the real risk of future low market prices or reduced loads. In practical effect, by designing this one-sided market risk metric to neglect the risks of future low market prices or reduced loads, the analysis favors relatively overbuilt portfolios, importantly including Vectren's preferred portfolio.

Vectren's "capacity purchase" metric similarly took a one-sided view of risk. The Company designed this metric to presume that purchasing capacity to make up for a shortfall is inherently more risky than selling excess capacity. *Id.* at p. 43. That is only the case if capacity prices increase to much higher levels than they are currently, in which case purchasing capacity would be expensive and selling it lucrative. *Id.* If capacity prices remain low, however, the opposite is true. *Id.* By designing a capacity purchase risk metric that evaluates only one side of a two-sided coin, Vectren biases its analysis in favor of building excess capacity. *Id.* It further

biased the analysis to reward overbuilt portfolios by assuming capacity prices will skyrocket in the coming years. *Id.* at pp. 23–25. Finally, it is important to remember that Vectren's Strategist modeling had already accounted for exposure to capacity purchase risks by restricting the amount of capacity purchases portfolios could rely on. Tr. C-90–C-91 (confirming Strategist modeling capped capacity purchases at only 10 MW per year). That Strategist restriction alone limited any risk exposure tied to capacity purchases, making the inclusion of a one-sided capacity purchase metric in the risk analysis little more than an opportunity to bias results toward overbuilt portfolios.

Indeed, Vectren's preferred portfolio scored well under these metrics. Only 4 portfolios among 15 scored better than the Company's preferred portfolio on market purchases; and only 2 portfolios among 15 scored better on capacity purchases. Logically, Vectren's preferred portfolio would not have fared so well had the metric also accounted for the real risk that future load, market prices, and capacity prices will be relatively low, at least periodically. Rather than evaluate the magnitude of that risk, Vectren wholly ignores it.

b) Vectren's assessment of environmental risk ignores potential for future greenhouse gas regulations, thereby neglecting real risks coincident to gas plants.

Though Vectren rhetorically recognizes the importance of "identify[ing] the most important factors that are driving the risk to the business," Tr. D-47, lines 6–8, Vectren failed to do so in practice. When it comes to assessing environmental risk, Vectren used a narrow and imprudent approach. Specifically, Vectren's risk analysis considered just one aspect of potential environmental risk: carbon dioxide emissions.[20] Tr. D-44, lines 14–15. That is the case notwithstanding the fact that Vectren's own witnesses acknowledge carbon dioxide is not the

[20] Vectren also modeled emission reductions for sulfur oxides and nitrogen oxides, but did not include those emission reductions in its final analysis of "risk," given that all the portfolios considered performed similarly. Tr. D-44.

only air pollutant that could impact the financial and operational viability of its portfolio over the long-term. *See, e.g.*, Petitioner's Ex. 11-R, p. 11, lines 5–18 (acknowledging potential future methane regulations "is a concern the industry recognizes"). While closing coal units may reduce carbon dioxide emissions, replacing that generation with a gas plant guarantees significant ongoing greenhouse gas emissions regardless, particularly methane emissions.

Methane emissions are a major constituent of total greenhouse gas emissions and likely an eventual object of future regulation. Alliance Ex. 2, p. 8, lines 12–20; Petitioner's Ex. 11-R, p. 11, lines 5–18. As a result, reliance on a gas-heavy portfolio could threaten Vectren's future access to capital, as major investors increasingly restrict investments to entities with significant greenhouse gas emissions, particularly including methane emissions. *See supra* Section III.D. Further, future regulation of methane emissions could foreseeably cause increases in the delivered price for gas, driving up operating costs as well.

Despite these well-known facts, Vectren wholly ignored the risk of future methane regulations in its analysis. *Cf.* In re IPL, Cause No. 44794, at 29 ("[I]t is appropriate that modeling take into consideration reasonable risks and unknowns."). In the IRP process, none of Vectren's scenarios imagined a future world with methane regulations. Similarly, no objective or metric in Vectren's risk analysis considered exposure to the risk of future methane regulations. As a result, neither Vectren's IRP modeling nor its subsequent risk analysis did anything to capture a major risk of its preferred large self-build gas plant. Should Vectren win approval to rely on this one plant for nearly 70% of the utility's entire load, the advent of methane regulations anytime over the coming decades could substantially increase costs for the customers footing the bill. Vectren fails to acknowledge this risk, much less quantify it.

c) Vectren designed "Balance and Flexibility" metrics that favor its preferred portfolio by concealing risk throughout the planning period and artificially testing diversity.

Turning to the "Balance and Flexibility" metrics, Vectren's risk analysis failed to credibly account for the apparent risk of relying on a single plant and a single fuel for the bulk of customers' needs over several decades. Instead, the Company's metrics were designed to *conceal* the risk of overreliance on a single plant or fuel. Consider a prime example: the Number of Technologies metric. In its 2016 IRP, Vectren explained the importance of evaluating risk through the number of technologies in the resource mix:

> Vectren must be in a position to be able to quickly adapt to changing market and regulatory conditions. If Vectren relies heavily on the economic performance of any one technology, such as natural gas or coal, higher than anticipated fuel costs for one technology could expose customers to higher prices than a more balanced portfolio. A measure of protection is to have a diverse portfolio that deploys multiple technologies in the resource mix. This approach forms natural hedges in case any single technology becomes obsolete through technological change.

Petitioner's Ex. 5, Attach. MAR-1, p. 230, Figure 7.20. Reading this description, Vectren's preferred portfolio should not fare well, as it recommends reliance on a single plant and a single fuel for greater than two-thirds of the utility's load over a 30-year horizon. Such a portfolio plainly contemplates heavy reliance on the economic performance of one technology, risks potential exposure to higher fuel prices, and provides little to no flexibility to "quickly adapt" over the coming 30-years. Yet, Vectren's preferred portfolio scored a perfect "10," significantly padding its overall score in the risk analysis. Petitioner's Ex. 7, Attach. GV-4, p. 4.

That perfect score is the result of designing the number of technologies metric to conceal risk inherent in Vectren's preferred portfolio. To evaluate the risk of overreliance on any given technology, the "Number of Technologies" metric considered the presence or absence six types of generation, judged only in the final year of the planning period: gas, coal, wind, solar, storage, and demand side management. Tr. D-52, lines 3–7; Tr. D-55, lines 6–24 (confirming number of

technologies considered only in year 2036). By looking only at the final year of the planning period, this metric conceals the year-to-year risk of overreliance on particular technologies throughout the planning period—a key, but hidden, detail.[21] As a result, a portfolio that relied on a mix of all six technologies throughout the planning period, thereby mitigating risk through generation diversity in every year of the planning period, would be scored identically to a portfolio that only relied on all six technologies starting in the year 2036. This absurd result flows from Vectren's decision to design the metric to ignore year-to-year risk rather than measure it.

Further, contrary to Vectren's narrative explanation, the metric does nothing to evaluate overreliance on particular technologies or fuel-types. Instead, it captures simply presence or absence of each generator type. In this way, Vectren scored its preferred portfolio the same as portfolios that truly had a balanced mix of different generation types and fuels. This is shown by comparing the actual diversity of portfolio L, Vectren's preferred portfolio, and portfolios I and J, all three of which scored perfect "10s." Petitioner's Ex. 7, Attach. GV-5*; id.,* Attach. GV-4, p. 4. Portfolio L proposes reliance on gas for over two-thirds of Vectren's generation—an obviously risky proposition. Yet, because only presence or absence mattered, Vectren scored its preferred portfolio as highly as portfolios I and J, both of which reduced reliance on gas generation from 889 MW to 330 MW, creating room for wind, solar, and storage technologies to

[21] Vectren did not disclose that the number of technologies metric considered each portfolio only in the year 2036 through the text the 2016 IRP or through any of Mr. Vicinus' pre-filed testimony or discovery responses. Prior to hearing, this key detail was instead only hinted at by one subheading in Figure 7.20 of the IRP, which reads "Balanced Energy Metric 2036." Asked via discovery whether the length of time any given technology would be in use was considered under the metric, Vectren responded, "no," without elaboration. JI CX 9. In fact, the length of time each technology is in use did matter: only resources still operating in 2036 count. Meaning, portfolios that retire Culley Unit 3 early, for example, get no credit for having coal among the number of technologies still operating in 2036.

supply a balanced portion of the total portfolio. This absurd result shows that the metric operated to pad the score of the preferred portfolio—not to credibly assess the risk of overreliance on a single technology or fuel.

3. Vectren arbitrarily weighted the metrics in its risk analysis.

While the metrics themselves are inapt, that weakness in the analysis is exaggerated by the fact that Vectren arbitrarily weighted each of those metrics. Because the weighting of each metric is outcome determinative, this arbitrary weighting further undermines the value of Vectren's analysis. JI Ex. 2, pp. 43–44. As with other aspects of its analysis for this case, Vectren's convoluted risk analysis created multiple opportunities for the Company to introduce errors and arbitrary assumptions into the process that had the net effect of steering the outcome toward the result that Vectren wanted: building a large gas plant.

Vectren's testimony with respect to weighting was self-contradictory and poorly supported. Initially, Mr. Vicinus testified that equal weights were applied to each objective in the risk analysis. Petitioner's Ex. 7, p. 18 ("We weighed each objective equally . . ."). On rebuttal, Mr. Vicinus contradicted himself, submitting written testimony denying that objectives were weighted at all, equal or otherwise. Petitioner's Ex. 7-R, p. 5 ("Vectren did not weigh any of its objectives for cost, risk (variability), cost-risk trade-off, flexibility/diversity or local economic impact."). Mr. Vicinus's own exhibits clear up the confusion engendered by his testimony. As plainly shown his "Revised Balanced Scorecard," each of the six objectives in Vectren's risk analysis was equally weighted at 17% in the original and updated analysis. Petitioner's Ex. 7, Attach. GV-4. Where multiple metrics were used for a given objective, each was weighted equally as well.

Vectren offers no reasoned justification for weighting each of the identified objectives equally. Instead, Mr. Vicinus variously explained the arbitrary application of equal weights as

an attempt to "avoid the *perception* of subjectivity*," id.* at p. 18 (emphasis added); avoidance of "difficult" distinctions "that would be hard to justify," Petitioner's Ex. 7-R, p. 5, lines 9–11; concern that "intervenors could have raised questions about the validity" of selected weights, *id.* at p. 5, lines 13–14; and because "different stakeholders value different objectives differently." *Id.* at p. 5, lines 15–16.

Mr. Vicinus's various, incoherent attempts to explain the structure and weighting of the metrics in the risk analysis only underscores the subjectivity inherent in any such analysis—including one where the metrics are weighted equally. By arbitrarily applying equal weights, Vectren's analysis treats the risk of carbon emissions as equally important to the balance and flexibility of the portfolio and local economic impacts, among other examples, and dilutes the importance of least-cost planning to the analysis. Though arbitrary, Vectren's weighting of the different metrics in the risk analysis is outcome determinative, as is demonstrated by its updates to the analysis. Following criticisms from the Director's 2016 IRP Report, Vectren updated its risk analysis by removing metrics for "Remote Generation Risk" and "Net Sales," which appeared to be ill-defined and one-sided, respectively. Petitioner's Ex. 7, Attach. GV-4, pp. 2–4. With the removal of each metric, the weights for remaining metrics increased and the outcome of the analysis materially changed: Vectren's preferred portfolio newly appeared more risky than several alternatives. This was not a change in the substance of Vectren's analysis, only in the number and weighting of different metrics considered.

4. Vectren subjectively and inaccurately scored different portfolios.

Vectren's risk analysis is also unreliable and should be disregarded by the Commission because it continues to rely on a subjective and arbitrary scoring system. Vectren falsely claims that it addressed concerns about its earlier scoring system appearing to be subjective and arbitrary. In fact, Vectren's updated scoring of the risk analysis left that system in place for

metrics accounting for nearly half of each portfolio's overall score, leaving ample room for Vectren's own biases in favor of building a gas plant to determine the outcome of the analysis.

In the original risk analysis accompanying Vectren's 2016 IRP, each portfolio was ranked as "red," "yellow," or "green" for each risk metric and overall. Commenting on those rankings, the Director's Report observed that "distinctions between rankings (red/yellow/green) seemed arbitrary," a point confirmed through data requests. JI Ex. 2, Attach. TFC-6, p. 41. The Director's Report continued to note that "[t]he arbitrariness, combined with the significant effects on overall rankings, raises concern," and that "[w]hile the use of only 3 possible rankings may be visually appealing, it exacerbates the importance of arbitrary distinctions." *Id.*

According to Mr. Vicinus's testimony, the arbitrary scoring concern raised in the Director's Report was addressed in the Company's updated risk scoring, which abandoned red/yellow/green distinctions in favor of using a numerical index for each metric. Petitioner's Ex. 7, pp. 20–21. Mr. Vicinus initially asserted that by eliminating the color scheme and assigning a numerical index to each metric, "the distinctions between metrics is purely objective—the greater the relative difference between portfolios in any metric, the greater the difference in the index value." *Id.* at p. 21, lines 2–4. On cross-examination, Mr. Vicinus conceded that this was an overstatement, explaining that "you can't make it purely objective." Tr. D-49, line 23.

Not only is the revised approach assuredly *not* purely objective, for several metrics, three arbitrary color assignments were simply switched to three arbitrary numerical values: red, yellow, green became zero, five, ten. Colors were swapped for equally arbitrary numbers in the "Cost-Risk Trade-Off," "Largest 24/7 Power Source," "Number of Technologies," and "Local Economic Impact" metrics. *Id.*, Attach. GV-4; Tr. D-51. As cautioned by the Director's Report,

these still-arbitrary scores have significant effects on overall rankings and should raise concern. These four metrics, combined, account for roughly 45% of each portfolio's overall score. Meaning, nearly half of each portfolio's overall score is derived from an arbitrary scoring approach Vectren falsely claimed to have remedied. Retaining this arbitrary scoring system for these four metrics favored Vectren's preferred portfolio, which scored as high or higher across these four factors than any other portfolio, undoubtedly as a result of Vectren's evident desire to use this analysis to support its interest in constructing the large gas plant it is seeking in this case.

In sum, the Commission should reject Vectren's risk analysis. It depends on modeling that has not been updated since the development of Vectren's 2016 IRP, despite material changes to numerous inputs in the intervening years and ample opportunity to have updated the risk modeling. The analysis ignores and mischaracterizes known risks that would disfavor the preferred portfolio. The metrics that are considered are inaptly designed, arbitrarily weighted, and subjectively scored. Such an analysis cannot be relied upon as evidence of the relative risk of different resource alternatives, and as a result, the Commission must find Vectren has failed to adequately consider those alternatives. Ind. Code Ann. § 8-1-8.5-4(2).

F. Vectren's Proposal Would Unlawfully Force Captive Electric Customers to Cross-Subsidize Vectren's Gas Customers.

Vectren proposes to supply the CCGT with a gas pipeline connecting to the Texas Gas Transmission system in Kentucky. Petitioner's Ex. 11, p. 2 lines 22–25. Vectren will recover the $87M cost of pipeline construction from captive electric customers, but Vectren Gas will actually own the pipeline. Tr. G-68, lines 21–25; Tr. G-89, lines 8–11. Vectren anticipates benefits from pipeline ownership, and all of those benefits will flow to gas customers, rather than the captive electric customers who paid for the pipeline. Tr. G-68, lines 21–25; Tr. G-89, lines 8–11. This is unlawful cross-subsidization and warrants the Commission's denial of this CPCN.

1. The Pipeline Will Be an Asset Delivering Benefits to Vectren Gas.

Vectren witness Pergola's Direct Testimony explained that Vectren Gas anticipated two benefits from pipeline ownership.

First, Vectren Gas designed the pipeline to have "excess capacity available for either existing or future large natural gas customers . . . ." Petitioner's Ex. 11, p. 7, lines 13–14. Vectren witness Perry Pergola explained how Vectren Gas would profit from sale of that excess capacity: "in the future, should a large customer decide to locate near the CCGT facility, a portion of the new Vectren South (Gas) lateral could be allocated to that customer." *Id.* at p. 7, lines 1–9.[22] Mr. Pergola confirmed that the revenues from those gas sales would flow to Vectren Gas:

> Q: Who would . . . those customers pay for that gas?
>
> A: Obviously, they pay the utility. If they were an industrial customer, they are obviously paying a transportation rate to the utility, and obviously if they're a residential customer, they're paying the gas cost rate to the utility in today's world.
>
> Q: Okay, and when you say the utility, you mean Vectren South Gas.
>
> A: Correct.

Tr. G-72, line 23–G-73, line 7.

Mr. Pergola's Direct Testimony also explained a second benefit of the pipeline to Vectren Gas: "in an emergency situation, it could be used to serve a portion of the demands of Vectren gas customers . . . ." Petitioner's Ex. 11, p. 7.[23]

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[22] Mr. Pergola could not testify as to the probability that a new Vectren Gas customer could locate close enough to the proposed CCGT to be served by the pipeline, stating, "I don't know the geography of that area. . . . I can't even speculate on that." Tr. G-74–G-75.

[23] When questioned at the hearing on how this could be accomplished, Mr. Pergola repeatedly deferred to Vectren witness Stephen Hoover, ultimately stating, "I can really not respond to that. I do not have enough knowledge to answer that question," Tr. G-71, lines 12–13, and "I'm not an engineer." Tr. G-75, line 21.

2. Vectren's Plan To Force Captive Electric Customers To Pay For The Vectren Gas Pipeline Is Cross-Subsidization.

If the pipeline is an asset that benefits Vectren Gas customers, then it stands to reason that those customers should pay for its construction and operation. Yet, Vectren proposes to impose those costs on its captive electric customers: this is unlawful cross-subsidization. The Commission has consistently rejected utility attempts to force captive ratepayers to cross-subsidize other customers. In a 2010 proceeding, the Commission examined a utility's application of a customer's gas bill payment towards his electric bill balance. In re Appeal of the Consumer Affairs Divisions Decision of the Complaint of Michael Brenston Against N. Indiana Pub. Serv. Co., Cause No. 43708, 2010 WL 2095672, at *5 (IURC May 19, 2010). The Commission ruled that this constituted unlawful cross-subsidization, and warned all utilities that cross-subsidization "should be avoided at all costs." *Id.* Vectren's proposal does not heed this warning: the utility proposes to apply money from customers' electric bill payments to construction of an asset that would be owned by Vectren Gas. Ultimately, gas customers would reap the benefit of this asset without having to pay for its construction. This constitutes an unlawful cross-subsidy, with adverse rate impacts to electric customers. In re Indianapolis Power & Light Co., Cause No. 39236, 1992 WL 12710787, at *20 (IURC Sept. 2, 1992) (utility's expert witness explained that each utility must "recover the costs [of a Commission-approved expense] from those who get the benefits so that no cross-subsidy or adverse rate impact will result").

In a 2009 proceeding, the Commission examined, among other things, the costs for energy utilities to begin offering certain communications services. Investigation of the Indiana Util. Regulatory Comm'n of Smart Grid Investments & Smart Grid Info. Issues, Cause No.

43580 (IURC Dec. 16, 2009). An expert in that case testified that the utility could not charge captive energy customers for costs of assets used for communications services:

> Mr. Matsumoto testified that recovery of the investments and expenses associated with communications services through rates or riders charged to captive energy customers would be inequitable to those customers and result in their subsidizing the telecommunications offerings of their energy utility. . . . [I]f the investments and expenses for communications services are not appropriately identified and recovered [from communications customers], customers with no desire or intention to purchase any communications services, would effectively subsidize the subscribers of those services and the cross-subsidies that could be created . . . .

Id. at 20.[24] In the instant case, the pipeline is an investment associated with gas services, because Vectren Gas will own it, and all benefits will flow to Vectren gas customers. Recovery of construction costs from captive electric customers, therefore, is inequitable and forces them to subsidize Vectren's gas service.

At the hearing, Vectren witness Perry Pergola unequivocally stated that Vectren's captive electric customers would pay for construction of this asset, but Vectren Gas would own it.

> Q: So once all this work is done, the pipeline is built, the Texas Gas Transmission infrastructure improvements are done, once all of this is complete, Vectren Gas will own and operate the pipeline lateral; is that correct?
>
> A: That is the proposed plan at this time.

Tr. G-68, lines 21–25. Vectren witness Hoover further confirmed Vectren's unlawful cross-subsidization plan:

> Q: Vectren South Gas is going to . . . initially pay for the cost of constructing this pipeline lateral, is that correct?
>
> A: Yes.

[24] In the 2009 proceeding, the Industrial Group also addressed the need to avoid cross-subsidization and "provided an example of a combined electric and gas utility which must allocate costs [separately] to electric and gas services and retail and wholesale jurisdictions." Investigation of the Indiana Util. Regulatory Comm'n of Smart Grid Investments & Smart Grid Info. Issues, Cause No. 43580, at 25.

Q: And Vectren South Gas will recover . . . those costs from Vectren South Electric eventually; is that correct?

A: I believe that is the case, but that's not my area.

Q: And Vectren South Electric will eventually recover those costs from Vectren South Electric's electric customers through the fuel adjustment clause; is that accurate?

A: That is my understanding of what has been proposed.

…

Q: And the costs of Texas Gas Transmission's Kentucky [upgrades], those will also be part of the costs that Vectren South Electric recovers from their electric customers; is that accurate?

A: That is my understanding.

Q: Mr. Hoover, can you explain why Vectren South Gas is going to own this pipeline but Vectren South Electric's electric customers are paying for it?

Q: No.

Tr. G-88, line 10–G-89, line 11.

In sum, Vectren's proposal to force captive electric customers to pay for a Vectren Gas asset is an unlawful cross-subsidization. Piling this added charge on top of Vectren's electric bills, already the highest in the state, is unjust and unreasonable. Numerous previous Commission proceedings explain, and reject, this type of practice.

G. The Coal Intervenors' "resilience" arguments do not provide a sound basis for the Commission's determination in this proceeding.

As reflected in the foregoing discussion, there are ample reasons to deny Vectren's imprudent pursuit of a portfolio principally dependent on a single large gas plant. "Fuel security" is not among them. Witnesses on behalf of Alliance Coal and Indiana Coal Council (the "Coal Intervenors") argued that Vectren's uneconomic coal units should be retained for sake of grid resilience, which they claim depends on "fuel secure" coal generation. Contrary to arguments from the coal industry, the actual evidence concerning grid resilience shows that the

electric system is reliable and resilient without coal-fired generation. The same can be true of Vectren's system.

As explained by Joint Intervenors' Witness Michael Goggin,[25] the Coal Intervenors' fuel security arguments in this case depend on misrepresenting empirical evidence and the conclusions of FERC and NERC, the regulatory entities tasked with ensuring the bulk power system continues to operate in the face of sudden disturbances. Alliance Witness Nasi and ICC Witness McConnell advance resilience as a well-defined metric which coal-fired generators provide. Neither FERC nor NERC has reached those conclusions. JI Ex. 5, p. 5. Both agencies consider resilience measurements ill-defined and neither has concluded any single class of generator is necessary to ensure the reliability and resilience of the bulk power system. *Id*. In fact, FERC unanimously rejected a proposal from the Department of Energy seeking special compensation for coal-fired generators based on claims that "fuel security" purportedly served resilience. *Id.* at p. 6; Grid Reliability and Resilience Pricing, Order Terminating Rulemaking Proceeding, Initiating New Proceeding, and Establishing Additional Procedures, 162 FERC ¶ 61,012, *9 (Jan 8, 2018). Instead, FERC concluded that extensive comments by grid operators across the country—including MISO—"do not point to any past or planned generator retirements that may be a threat to grid resilience." Grid Reliability and Resilience Pricing, Order Terminating Rulemaking Proceeding, Initiating New Proceeding, and Establishing Additional Procedures, 162 FERC ¶ 61,012, at para. 15. Since that unanimous denial, it continues to be the

[25] JI Witness Michael Goggin brings considerable qualifications to this discussion of resilience, including service on the Planning Committee, Operating Committee, and Standards Committee of NERC, the federal entity principally charged with ensuring the reliability and resilience of the electric grid. JI Ex. 5, p. 2.

case that FERC has not identified any particular type of generation as uniquely necessary for grid resilience. JI Ex. 5, p. 6.

Like FERC, NERC has not identified "fuel security" as a necessary resilience metric. Quite the opposite, NERC staff inventoried how the organization's existing activities already address all aspects of electricity resilience. *Id.* at p. 7 (citing NERC, "Resilience Framework," March 2018, pp. 63–66). As explained by Mr. Goggin, never in NERC's years of study and assessment has the organization found that retention of coal-fired power plants is a necessary means to ensure reliability in the face of disruptive events. *Id.* at pp. 7–8.

In advancing "fuel security" arguments in this proceeding, Witnesses Nasi and McConnell go beyond misrepresenting the conclusions of FERC and NERC to also distort empirical evidence on the true threats to resilience. Alliance Ex. 1; ICC Ex. 3. The majority of recent events involving risks of generation shortfalls during extreme weather or other events were caused by equipment failures—not a lack of fuel security. For example, during the 2014 Polar Vortex, NERC, PJM, and others each independently found coal plant equipment failures were among the largest causes of outages. JI Ex. 5, p. 8. Coal plant equipment failures similarly accounted for 40% of all outages in rolling blackouts experienced in Texas in 2011. *Id*. Irrespective of fuel supply, equipment failures at coal plants, particularly older units with higher forced outage rates, threaten reliable and resilient service.

Further, even if coal units were not plagued with inconsistent performance in critical times, it must be remembered that coal units are vulnerable to fuel supply risks. Rail congestion limited coal deliveries and threatened the operation of coal plants in MISO as recently as 2014. *Id.* at p. 9. Droughts have limited barge deliveries to coal plants and forced plants offline due to

cooling water constraints. *Id.* Too much rain soaking coal piles has forced reduced outputs. *Id.* These examples reveal the folly of thinking fuel dependence increases system resilience.

Even when coal plants survive equipment failures and fuel supply interruptions, their operations remain wanting. Contrary to McConnell's testimony, NERC has found that 90% of conventional coal units fail to provide sustained primary frequency response. *Id.* at p. 9 (citing NERC, "Frequency Response Initiative Report," October 2012). According to MISO's Independent Market Monitor, "coal plants account for over 80% of generator deviations from scheduled output levels, imposing significant cost and reliability concerns on the system." *Id.* at pp. 9–10. Coal plants are uniquely vulnerable to grid disturbances affecting essential plant equipment such as pumps and conveyer belts, creating a significant resilience threat: risk of cascading failures following a frequency and voltage disturbance. *Id.* at p. 10. Increasingly, aging coal units are an operational liability.

Trying to bolster any argument that keeps coal online, Nasi relies on a heavily critiqued study of last year's "bomb cyclone" winter storm. Alliance Ex. 1, pp. 18–23. The report—like Nasi's fuel security arguments generally—is analytically unsound. The report used a single metric to measure "resilience": comparison of electricity output of different resources during the high-load winter event against the preceding 26 days of December 2017. JI Ex. 5, p. 11. As Mr. Goggin explained "[i]ncreased utilization is not a metric of resilience; it is just a testament to coal generation's poor economics." *Id.* High operating costs for coal plants kept the units idled or off-line before the winter event. *Id.* Thus, these units had additional capacity, which was only called upon once demand and energy prices rose. *Id.* Rather than measuring resilience, the report merely identified the most expensive resources on the system. *Id.* Reacting to the report,

PJM issued a statement that its "overall conclusions are incorrect" and that it misrepresented coal plant dispatch during the winter event. *Id*.

Ultimately, while we agree with other arguments advanced by the Coal Intervenors, this particular testimony from Witnesses Nasi and McConnell is misleading and irrelevant to the issue before the Commission. Resilience of the bulk power system is critical, but it is importantly not at stake in this proceeding.[26] The resilience and reliability of Vectren's system does not depend on the presence or absence of coal units, as other generation technologies are perfectly capable of providing the energy and essential reliability services necessary to maintain operations through disturbances. "Concerns about the 'resilience' of certain classes of generation do not provide a useful framework or reasoned basis to evaluate planning decisions before the Commission." *Id.* at p. 16. In deciding this case, the Commission should reject the invitation to consider coal industry propaganda claiming coal plant "fuel security" is essential to resilience grid—it plainly is not.

H. Vectren's proposal to build a large CCGT does not meet the statutory standard, and the Commission must deny the requested CPCN.

As the foregoing discussion demonstrates, the Commission must deny Vectren's request for a CPCN for its proposed CCGT because the utility has not adequately examined alternative resource options and cannot show that public convenience and necessity require it. Accordingly, and as the following review shows, Vectren has not demonstrated that its application meets the requirements of Chapter 8.5.

Vectren failed to fulfill the requirements of section 8-1-8.5-4(1), which obligates an applicant to consider potential arrangement with other utilities for the interchange of power, the

[26] Resilience is not at stake when planning generation resources because less than 0.01% of nationwide outage hours are the result of generation shortfalls. Instead, the vast majority of outages result from transmission and distribution line failures. JI Ex. 5, p. 17 (citing Attach. MG-3, Silverstein/Grid Strategies Resilience Report, at 33).

pooling of facilities, the purchase of power, or joint ownership of facilities, *inter alia*. Vectren's RFP expressed a bias against power purchase agreements and did not accept bids for co-ownership. *See supra* Section III.C.2, pp. 45–50; JI Ex. 2, p. 45; Public's Ex. 1, p. 7. As a result, Vectren left these alternatives unexplored as it pursued a self-build that would deliver its shareholders—but not necessarily its customers—the most economic benefits, *i.e.*, earning a return on and of its investment for the lifetime of the plant. Public's Ex. 1, p. 7.

Vectren failed to fulfill the requirements of section 8-1-8.5-4(2), which obligates an applicant to investigate "other methods for providing reliable, efficient, and economical electric service, including the refurbishment of existing facilities, conservation, load management, cogeneration and renewable energy sources." Vectren unfairly screened refurbishment options out during its 2016 IRP. *Id.* at pp. 8–9. Vectren made no investigation of cogeneration. *Id.* at p. 8. With respect to Demand-Side Management, Vectren has little demand response participation relative to available potential as a result of its uniquely restrictive and onerous provisions in its interruptible tariffs. *See supra* Section III.B.1, pp. 27–31. Despite that current untapped potential, Vectren artificially capped the amount of new demand response in its modeling, basing its future potential on its poor, current levels. *See supra* Section III.B.1; JI Ex. 2, pp. 33–37. Vectren's modeling of energy efficiency was riddled with errors, relied on overstated costs, and overlooked achievable potential, tamping down current already meager efficiency levels of less than 1.0% annual eligible retail sales to just 0.75% by 2021 and 0.50% by 2027. *See supra* Section III.B.2; JI Ex. 3, pp. 4–12. Vectren's modeling of solar and wind resources relied on overstated capital cost assumptions. *See supra* Section III.C.2, pp. 45–50 (not 100% sure this was the section to refer to); JI Ex. 2, pp. 37–42. And Vectren excluded renewable energy sources from its RFP. *See supra* Section III.C.2; JI Ex. 2, p. 45. The Company's 2016 IRP

modeling understated the cost of the proposed CCGT, and in so doing, disadvantaged every alternative. *See supra* Section III.A; Public's Ex. 1, p. 14. In addition to inadequately evaluating these alternatives, Vectren failed to assess the risk of its proposed gas plant relative to alternatives. Instead, Vectren manufactured an analysis that relies on stale data, arbitrary weighting, and subjective and misleading scoring. *See supra* Section III.E; JI Ex. 2, pp. 42–44.

Vectren failed to fulfill the requirements of section 8-1-8.5-5(b)(1), which requires a utility provide the best estimate of construction, purchase, or lease costs based on the evidence of record, *inter alia*. Contrary to the statute, Vectren has not provided a sufficient cost estimate in this proceeding. *See* Public's Ex. 1, pp. 5, 14. Vectren's estimate is not the result of competitive bidding, and the bulk of Vectren's modeling in support of its preferred portfolio significantly understated the cost of the proposed build, biasing results in its favor. *See id.* at p. 14 (explaining shortcomings of Vectren's cost estimate).

Vectren failed to fulfill the requirements of section 8-1-8.5-5(b)(2), because Vectren's proposed plan is inconsistent with the Statewide Analysis of Future Resource Requirements for Electricity ("State Energy Plan"), assuming the Commission considers it is developed, in whole or in part, for purposes of this proceeding. Under Vectren's proposed course of action, it would neither retain maximum flexibility nor minimize risks. *See* State Energy Plan, p. 5 ("A key consideration in long-term resource planning is the need to retain maximum flexibility in utility-resource decisions to minimize risks."). Similarly, Vectren's proposal is fundamentally inconsistent with its 2016 IRP Objectives, which include minimizing cost to customers, mitigating risk to customers, and building a balanced mix of energy resources. Vectren's preferred gas plant may have been selected from its flawed IRP process, but that result directly conflicts with the intended IRP objectives. The conflict between the objectives and the result

evinces a flawed methodology. JI Ex. 2, pp. 8–10. For purposes of the requested CPCN, the Commission cannot approve Vectren's IRP and cannot find the proposed project consistent with that IRP.

Vectren failed to fulfill the requirements of section 8-1-8.5-5(b)(3), which calls for a finding that the public convenience and necessity requires the proposed facility. There is no need for the amount of capacity Vectren wants to make its customers pay to build. *See supra* Section III.A, pp. 8–25; JI Ex. 2, pp. 21–22; Public's Ex. 3, pp. 5–6. If built, the proposed gas plant would leave Vectren's system substantially oversupplied throughout the IRP planning period. JI Ex. 2, pp. 21–22. The proposed gas plant would not diversify Vectren's portfolio—the utility would continue to rely on a single fossil fuel for the bulk of its energy needs. *Id.* at pp. 18–19. And because the system will be so overbuilt, there would be no foreseeable opportunity to diversify by adding different energy resources in the future.

Vectren failed to fulfill the requirements of section 8-1-8.5-5(e)(1), which demands estimated costs that are the result of competitively bid engineering, procurement, or construction contracts. As noted above, Vectren's $781 million cost estimate is not the result of competitive bidding.

Vectren's proposal does not satisfy section 8-1-8.5-5(e)(2), specifically consideration of reliability and the solicitation of competitive bids to obtain purchased power capacity and energy from alternative suppliers. Vectren's proposed plant is a threat to reliability because it reduces the diversity of Vectren's portfolio and over relies on a single plant and single fuel. Rather than using competitive bidding processes to identify low cost alternatives, Vectren issued an RFP it concedes was specifically designed to allow bids from only large gas plants just like what Vectren wanted to build itself. *See supra* Section III.C.2, pp. 45–50.

Beyond the requirements of Chapter 8.5, the Commission must consider Vectren's proposal relative to Indiana's policy to protect the affordability of utility service. Ind. Code Ann. § 8-1-2-0.5. Joint Intervenors share OUCC witness Ms. Aguilar's concern that the Commission cannot adequately "protect[] the affordability of utility services for present and future generations of Indiana citizens" because Vectren has not provided adequate evidence on the costs of its projects and the impact of those costs on customers. Public's Ex. 1, pp. 6–7 ("It is the Commission's obligation to consider the impact [on] captive consumers who will be subjected to a large increase in rates if the proposed plant is approved."). Vectren's customers cannot afford its proposal, JI Ex. 1, pp. 8–10, and it is the Commission's obligation to protect those customers. Ind. Code Ann. § 8-1-2-0.5.

In sum, Vectren has not provided substantial evidence to the Commission that public convenience and necessity requires the construction of the proposed CCGT, necessitating denial of the requested CPCN. *Id.* § 8-1-8.5-2.

IV. THE COMMISSION MUST DENY THE REQUESTED CPCN FOR THE PROPOSED CULLEY 3 COMPLIANCE PROJECT.

Vectren asks the Commission to approve a project designed to extend the useful life of the 270 MW F.B. Culley 3 coal-fired generating unit beyond 2023.[27] Vectren Verified Petition, Para. 20. Vectren lists the cost of this project as $90M,[28] but as detailed below, the true cost is actually $193M. Vectren's request fails four of the requirements under Chapter 8.4 for approval of a ratepayer-funded compliance project and must be denied.

[27] The project involves closing the Culley West ash pond and installing a new ash pond, a spray dry evaporator, and a submerged chain conveyor. Petitioner's Ex. 9, pp. 12, 18–20.
[28] Vectren Verified Petition ¶ 20.

A. Vectren has Failed to Demonstrate the Value of Extending the Life of Culley 3 Past 2023, as Required By Ind. Code Ann. § 8-1-8.4-6(b)(1)(E).

The purpose of the proposed Compliance Project is to extend the life of Culley 3 beyond 2023.[29] The Certificate of Need Law, therefore, requires Vectren to demonstrate the **value** of extending Culley 3 beyond 2023. Ind. Code Ann. § 8-1-8.4-6(b)(1)(E). Vectren has failed to provide enough information for the Commission to determine whether a Culley 3 extension has any value at all.

The Commission's analysis must start with the analysis of Culley 3 in Vectren's 2016 Integrated Resource Plan. The 2016 IRP considered fifteen portfolios.[30] Petitioner's Ex. 7, Attach. GV-5. Portfolios that retired Culley 3 were [redacted] than portfolios extending Culley 3: beyond the margin of error.[31] Tr. C-77, line 5–C-78, line 12; Tr. C-71, lines 12–15. No other difference between portfolios resulted in a cost difference larger than the margin of error. Therefore, the **only** significant conclusion of analysis of the portfolios' costs is that extension of Culley 3 is not the least-cost option.

Vectren's analyses of the portfolios also concluded that extension of Culley 3 is also not the least-risk option. Vectren selected seven objectives upon which to evaluate the scenarios. Petitioner's Ex. 5, p. 5. Vectren selected flexibility as one objective. *Id.* Vectren also selected "risk" as an objective; the risk objective factored in "volatilities in the wholesale energy market prices" and "the potential exposure to MISO markets." Petitioner's Ex. 7, p. 11.

To identify the best portfolio across all objectives, Vectren had its consultants conduct scenario optimization modeling (done by Burns & McDonnell) and a risk analysis (done by Pace

[29] "Absent this project, Culley 3 would have to be retired no later than the end of 2023." Vectren Verified Petition, p. 3.
[30] "A portfolio is a mix of supply and demand side resources to meet customer load over a 20 year horizon." Petitioner's Ex. 5, p. 5.
[31] Vectren witness Lind explained that the margin of error for Net Present Values of the different portfolios was about five percent. Tr. C-73–C-74.

Global). Both analyses incorporated flexibility and exposure to a volatile energy market. And both analyses recommended the retirement of Culley 3. First, the Burns & McDonnell scenario optimization modeling, testing "a wide range of possible future states … **always** selected [replacement of] **all** coal fired generation by 2024." Petitioner's Ex. 5, pp. 10-8 to 10-13.[32] (emphasis added). Next, the Pace Global risk analysis selected Portfolio D, in which Vectren would retire Culley 3, over Vectren's preferred portfolio, in which Vectren would invest in Culley 3 to extend its life beyond 2023.[33] Petitioner's Ex. 7, Vicinus Workpapers.

In sum, Vectren's request for the Culley 3 Compliance Project urges the Commission to ignore the conclusions of the Company's own analyses. Vectren claims that the Commission cannot trust its analyses, recommending the retirement of Culley 3, because they failed to incorporate the objectives of flexibility and exposure to a volatile energy market. Petitioner's Ex. 5, p. 16.[34] This is false because as detailed above, Vectren specifically selected both as objectives in the analyses. Moreover, if the Commission must dismiss these analyses to approve the proposed Culley 3 Compliance Plan, then it raises serious doubt about how the Commission can then rely on these same analyses to approve the proposed CCGT. Vectren has failed to demonstrate that extending Culley 3 beyond 2023 has any value at all. The Commission must therefore deny the proposed Culley 3 Compliance Project. Ind. Code Ann. § 8-1-8.4-6(b)(1)(E).

[32] Vectren subsequently had Burns & McDonnell conduct an updated scenario optimization modeling. JI Ex. 2, p. 11. In the updated modeling, Vectren rigged the modeling to prevent selection of Culley 3 retirement. *Id.* Setting aside any dispute over that decision, the updated modeling sheds no light on whether Culley 3 should be retired or not.
[33] This was after two factors were removed at the direction of the Director.
[34] Vectren also speculates that it might not find a suitable location for the wind resources called for in Portfolio D, but provides no actual analysis of potential locations. Petitioner's Ex. 5, p. 16. Since Vectren's own modeling recommended replacement of Culley 3 with wind resources as a better option than Vectren's preferred portfolio, the burden is upon Vectren to conduct this analysis.

B. The Commission Cannot Make the Necessary Finding, Under Ind. Code Ann. § 8-1-8.4-7, that the Public Convenience and Necessity Will Be Served By Extending Culley 3 Beyond 2023.

The cost of Portfolio D is significantly lower than the company preferred portfolio. Vectren asserts that the cost of this compliance project is $90M, but the true cost of extending Culley 3 beyond 2023 is reflected in the $193M cost difference between Portfolio D and Vectren's preferred portfolio.[35] JI Ex. 2, p. 20.

In the next step of the analysis of the proposed compliance project, the Commission must weigh the value of extending Culley 3 against the $193M cost and determine whether it serves the public convenience and necessity. Ind. Code Ann. § 8-1-8.4-7. In other words, the Commission must evaluate the cost/risk tradeoff of extending Culley 3 at a cost of $193M. Vectren's own analysis rejects the cost/risk tradeoff of extending Culley 3: therefore the Commission must reject the proposed Culley 3 Compliance Project.

As detailed above, Pace Global's risk analysis selected Portfolio D, which retires Culley 3, over Vectren's preferred portfolio, which extends Culley 3 beyond 2023. Pace Global's conclusion depended, in large part, on its determination on the objective of "cost-risk tradeoff." Pace Global's original 2016 risk analysis gave Portfolio D the highest "cost-risk tradeoff" score, "Green." Petitioner's Ex. 7, Vicinus Workpapers. Vectren's Preferred Portfolio only received a "Yellow." *Id.* Pace Global's revised analysis again scored Portfolio D better on cost-risk tradeoff to Vectren's preferred portfolio: 10 to 5. *Id.*

In sum, Vectren's own risk analysis finds that extending Culley 3 is not a worthwhile cost/risk tradeoff. The undeniable implication of this finding is that the extending Culley 3

[35] The difference is six percent of Net Present Value: larger than the margin of error for Net Present Value for the portfolios. Tr. C-77, line 14–Tr. C-78, line 1.

would not serve the public convenience and necessity. For this reason, the Commission must deny the proposed Culley 3 Compliance Project. Ind. Code Ann. § 8-1-8.4-7.

C. Vectren has Failed to Demonstrate that the Proposed Culley 3 Compliance Project is Necessary to Comply with Federally Mandated Requirements. Ind. Code Ann. § 8-1-8.4-6(b)(1)(C).

Vectren's testimony makes it clear that the three installments are not necessary if Culley 3 is retired by December 2023.[36] Vectren has failed to demonstrate that extending Culley 3 beyond 2023 is necessary. Therefore, any projects required for that extension are not "federally mandated." The Certificate of Need law does not allow Vectren to recover such costs from ratepayers. Ind. Code Ann. § 8-1-8.4-6(b)(1)(C).

D. Vectren Failed to Examine "[A]Lternative Plans that Demonstrate that the Proposed Compliance Project is Reasonable and Necessary," Ind. Code Ann. § 8-1-8.4-6(b)(1)(D).

Retiring Culley 3 by December 2023 is an alternative that avoids the costs of the proposed Compliance Project. The evidence in the record demonstrates that Culley 3 retirement is a better option than extending Culley 3. Vectren failed to properly examine this evidence. Vectren also deliberately suppressed further examination of this alternative, by rigging the updated Burns & McDonnell modeling to prevent selection of Culley 3 retirement. Tr. C-84, lines 7–24. The statute puts the burden on Vectren to "demonstrate[] that it adequately considered alternative means of meeting its customers' demand requirements." In re Duke Energy Ind. Energy Inc., Cause No. 43114, at 30. Vectren's proposed Compliance Project must be denied because the company failed to adequately consider Culley 3 retirement, which is a more than adequate means to meet customer demand. Ind. Code Ann. § 8-1-8.4-6(b)(1)(D).

[36] On compliance with the ELG Rule, Vectren witness Retherford asserts that "facilities that retire prior to December 31, 2023, do not have to comply with the ELG rule." Petitioner's Ex. 9, p. 10. On compliance with the CCR Rule, Retherford asserts that Vectren "intends to . . . continue to use the Culley East pond [for coal ash] through 2023 . . . under the timetable established in the Company's current NPDES permit." *Id.* at pp. 19–20.

In sum, the Commission must deny Vectren's proposal to extend Culley 3 beyond 2023, as it fails to meet four separate statutory criteria for approval of ratepayer-funded Compliance Projects.

V. CONCLUSION

Vectren's representations in this case do not reflect lessons learned. Vectren arrived at its proposal through biased and unreliable modeling, designed to confirm a prefigured outcome rather than sincerely hunt out the least risk, least cost option for its customers. Vectren continues to be unable to demonstrate great foresight or planning acumen,[37] to the detriment of the customers it serves. In order to protect ratepayers from Vectren's speculative, risky investment plans, the Commission should deny the petition in this Cause and instead have Vectren reevaluate its resource path in its 2019 IRP Stakeholder Process.

In Cause No. 44242, IPL requested approval of a CPCN for Mercury and Air Toxics Rule compliance projects for five of its coal units. Ultimately, the Commission did approve the settlement agreeing to the retrofits at all five units, but not without shifting the risk for one project onto IPL[38] and ordering a $10 million credit to customers to "send[] an appropriate message" to the utility. In re IPL, Cause No. 44242, at 36 (IURC Aug. 14, 2013). The

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[37] "Q: Three years ago you were in for a MATS proceeding, Cause No. 44446, at that time telling the Commission about how valuable it was to keep your coal plants running . . . Vectren determined the continued operation of Brown Units 1 and 2, Culley 3, and Warrick 4 was the best option, end quote. Was that true at the time?
A: It was true at the time."
Tr. A-20, lines 13–24.
"Q: And you would agree that having such a large percentage of your generation in one plant presents considerable risks to those ratepayers, doesn't it?
A: No, I don't think it presents any more risk than the situation we have today with 95 percent or really 100 percent of our base load from coal."
Tr. A-23, line 24–Tr. A-24, line 4.

[38] If IPL were to retire the projects before they are fully depreciated, IPL could not recover the undepreciated amounts from ratepayers. In re IPL, Cause No. 44242, at 36 (IURC Aug. 14, 2013).

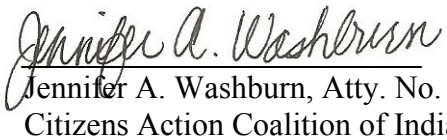
Commission found that "IPL's initial presentation of its cost/benefit study through an overly simplistic analysis was disappointing" and "represented a poor management decision and demonstrated a lack of due regard for the regulatory process." *Id*. at 31. The Commission stated that "IPL's presentation of its case in this proceeding fell below our expectations given the size of the proposed capital investment, the timeframe in which this Commission was provided to make a decision, and the contested nature of the proceeding that should have been anticipated prior to filing this Cause." *Id*. at 35. The Commission continued by noting its own "responsibility to insure that the regulatory process involves the presentation of the best evidence possible, given the facts and circumstances of a particular case." *Id*. The Commission explained that the Commission "[m]erely chastising IPL in this Order would not, in our opinion, have a lasting impact on insuring the quality of the support in the regulatory process. Instead, this Commission should provide feedback to a utility in a manner that provides an incentive for improving quality, while moving the regulatory process forward." *Id*.

Here, Vectren's transgressions far exceed IPL's. IPL's modeling and presentation of evidence reflected laziness and lack of rigor in its analysis of alternatives to meet the public need. Vectren, on the other extreme, took great steps to force its preferred outcome. While IPL relied on an overly simplistic analysis, Vectren rigged the data and the process through convoluted, contradictory, and nontransparent steps filled with unreasonably biased assumptions. Ultimately, Vectren's resource investment decisions were based on subjective, qualitative factors with the effect of overriding the rest of its overly complicated multi-stage and inconsistent modeling. Furthermore, while its modeling contained many irredeemable flaws, even Vectren's flawed exercise did not show that the preferred plan was low cost or low risk. The Commission should not award such misleading behavior and should take this as an opportunity to reaffirm the

standard by which utilities are held to when making major capital decisions with ratepayer dollars.

For the foregoing reasons, Joint Intervenors respectfully request that the Commission deny the requested CPCN to construct an 850 MW (or 700 MW) gas plant and the Culley Unit 3 retrofit projects insofar as Vectren has not only provided insufficient justification, but Vectren has also shown a disregard for the regulatory process. In the alternative, should the petition be granted, given the excessive market risk of Vectren's plan, Vectren should be held accountable if this investment in place of other lower cost, lower risk alternatives does not pay off by requiring the following conditions to protect customers and encourage prudent planning: (1) limit capital costs charged to ratepayers for the gas plant to those presented in Vectren's filing; (2) apply credits to ratepayers for off-system sales revenue that were projected in this filing but do not materialize; (3) exempt ratepayers from environmental compliance costs for Culley Unit 3 over and above what is included in this filing.

Respectfully submitted,



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