

**DATA REQUESTS**

5-1. Mr. Joiner discusses matters concerning the MISO market. Describe in complete detail **each factor** that Vectren takes into consideration in determining day ahead:

A. System electric load it will have to meet next day

**Response:**

Vectren South objects to this request to the extent that "day ahead" is vague, ambiguous and subject to interpretation.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

Vectren South has provided a response under the assumption that "day ahead" refers to the day prior to the Midcontinent Independent System Operator's ("MISO") next operating day.

A. Vectren South utilizes Pattern Record Technology ("PRT") and Nostradamus, neural network forecasting tools, to model an hourly day ahead system electric load forecast. Both PRT and Nostradamus utilizes forecasted temperature, wind speed, cloud cover, humidity, and historical patterns to determine forecasted load for the next day.

OFFICIAL  
EXHIBITS

IURC  
INTERVENOR'S *-Indiana*  
EXHIBIT NO. *3*  
*D6*  
DATE *11-17-20* REPORTER *LR*

5-1. Mr. Joiner discusses matters concerning the MISO market. Describe in complete detail **each factor** that Vectren takes into consideration in determining day ahead:

B. The amount of generation it will commit to the MISO day ahead market.

**Response:**

Vectren South objects to this request to the extent that “day ahead” is vague, ambiguous and subject to interpretation.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

Vectren South has provided a response under the assumption that “day ahead” refers to the day prior to MISO’s next operating day.

- B. Unless required for reliability of the Bulk Electric System or Regulatory Compliance, Vectren South does not commit, or must run, its generation resources into the MISO Day Ahead Market. Vectren South is obligated to offer the resources into the MISO Day Ahead Market if the resources are available. MISO determines the commitment of these resources based on economic factors.

5-1. Mr. Joiner discusses matters concerning the MISO market. Describe in complete detail **each factor** that Vectren takes into consideration in determining day ahead:

- C. The amount of energy it can reasonably anticipate from Vectren owned solar and wind facilities

**Response:**

Vectren South objects to this request to the extent that “day ahead” is vague, ambiguous and subject to interpretation.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

Vectren South has provided a response under the assumption that “day ahead” refers to the day prior to MISO’s next operating day.

- C. Vectren South owns two solar facilities. These facilities are behind the meter and are not considered for MISO day ahead market activities. Vectren does not currently own any operational wind facilities.

5-1. Mr. Joiner discusses matters concerning the MISO market. Describe in complete detail **each factor** that Vectren takes into consideration in determining day ahead:

- D. The amount of energy it can reasonably anticipate from solar and wind facilities from which Vectren purchases contracted output.

**Response:**

Vectren South objects to this request to the extent that “day ahead” is vague, ambiguous and subject to interpretation.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

Vectren South has provided a response under the assumption that “day ahead” refers to the day prior to MISO’s next operating day.

- D. Vectren South currently is not obligated by any agreement to purchase solar generation. Vectren South utilizes PRT, a neural network forecasting tool, to model an hourly day ahead wind forecast for each of its wind contracts. PRT utilizes forecasted temperature, wind speed, cloud cover, humidity, and historical patterns to determine forecasted generation output from each facility.

5-1. Mr. Joiner discusses matters concerning the MISO market. Describe in complete detail **each factor** that Vectren takes into consideration in determining day ahead:

E. The amount of energy Vectren will bid to purchase in the day ahead market.

**Response:**

Vectren South objects to this request to the extent that “day ahead” is vague, ambiguous and subject to interpretation.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

Vectren South has provided a response under the assumption that “day ahead” refers to the day prior to MISO’s next operating day.

E. Vectren utilizes PRT and Nostradamus, neural network forecasting tools, to model an hourly day ahead load forecast. Both PRT and Nostradamus utilize forecasted temperature, wind speed, cloud cover, humidity, and historical patterns to determine forecasted load for the next day. Vectren will bid the forecasted load into the MISO Day Ahead Market for purchase.

5-2 Describe in detail how the next day weather forecast e.g. temperatures, sunny or cloudy, windy or calm impacts:

A. Vectren's day ahead MISO bidding,

**Response:**

A. Please refer to response to 5-1.A.

5-2 Describe in detail how the next day weather forecast e.g. temperatures, sunny or cloudy, windy or calm impacts:

B. Vectren's next purchased power forecast,

**Response:**

B. Please refer to response to 5-1.A.

5-2 Describe in detail how the next day weather forecast e.g. temperatures, sunny or cloudy, windy or calm impacts:

- C. Vectren's anticipated output from Vectren owned solar and wind facilities and contracted for output from solar and wind facilities

**Response:**

- C. Please refer to responses to 5-1.C and 5-1-D. Vectren does not forecast the potential generation from its solar facilities; nor is Vectren currently obligated by any agreement to purchase solar generation. Vectren does not currently own any operational wind facilities. Regarding its wind contracts, Vectren South utilizes PRT, a neural network forecasting tool, to model an hourly day ahead wind generation forecast for each of its wind contracts. PRT utilizes forecasted temperature, wind speed, cloud cover, humidity, and historical patterns to determine forecasted generation output from each contracted facility.



5-3 In predicting how it will meet its day ahead demand, does Vectren rely on the predicted outflow from qualifying facilities? Does it rely on the predicted outflow from contracted for commercial solar installations? For each such facility explain the steps and elements by which Vectren determines the anticipated energy that will next day be available from such facilities.

**Response:**

Vectren South objects to this request to the extent that “day ahead” is vague, ambiguous and subject to interpretation. Vectren South also objects to this request to the extent that “qualifying facilities” and “contracted for commercial solar installations” are vague and ambiguous.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

Vectren South has provided a response under the assumption that “day ahead” refers to the day prior to MISO’s next operating day.

Please refer to response to 5-2.C. Vectren will bid the forecasted load into the MISO Day Ahead Market for purchase. Vectren South does not rely on its solar facilities to predict how it will meet demand. These facilities are behind the meter.

5-4 If required by an IURC final order to develop a model, in part using AMI metering results, that correlates Vectren customer EDG production with varying weather conditions, what model would Vectren use or create and what would be the model's inputs and process?

**Response:**

Vectren South objects to this request on the grounds that is based on a hypothetical and any response would require speculation.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

Absent a requirement as such, Vectren South has not attempted to use or create such a model.

5-5 Admit that Vectren has not attempted to create a model to determine the predictability of ED customer excess generation under differing weather conditions and differing times of year.

**Response:**

Vectren South objects to this request on the grounds that Vectren South does not currently have any EDG customers and whether or not a model will be created related to the excess generation of such customers would be speculation.

Additionally, Vectren South objects to this request to the extent that “ED” is vague and ambiguous.

Subject to and notwithstanding the foregoing objections, Vectren South responds as follows:

Absent a requirement as such, Vectren South has not attempted to create such a model.

- 5-8 Because day ahead load cannot be predicted with 100 percent accuracy all of the time,
- A. What percentage or factor of error or “cushion” does Vectren include in its day ahead projection of load. For example, do you overstate expected load by 5 percent to ensure adequate supply?

**Response:**

- A. Vectren does not include a percentage, factor of error, or “cushion” in its day ahead load forecast.

5-8 Because day ahead load cannot be predicted with 100 percent accuracy all of the time,

- B. Or is such a safety cushion not needed because of the 5 minute and hourly MISO markets?  
Explain your answer in full detail.

**Response:**

- B. Please refer to 5-8.A. In addition, Vectren's load forecast procedure strives to accurately predict load needs and does not utilize any adder to the modeled forecast. If the Day Ahead demand bid is short of Vectren's demand needs, the additional energy is purchased in MISO's Real-Time market. Inversely, if the Day Ahead demand bid is overstated to Vectren's actual needs, the energy is sold back to MISO in the Real-Time market.

5-9 Please provide the studies which Vectren has conducted or Vectren has caused to be conducted that would estimate the extent to which EDG outflows would contribute to traffic on the system and could cause constraints leading to congestion.

**Response:**

Vectren South objects to extent it requests that Petitioner perform or conduct a study that does not currently exist.

Subject to and without waiving the foregoing objection, Petitioner states as follows:

Vectren South has not performed such a study or studies, nor caused such study or studies to be conducted.

5-10 Please admit or deny that it is possible that solar DG excess energy is consumed within the neighborhood of the DG customer and may not contribute to transmission system congestion?

**Response:**

Vectren South objects to this request on that basis that it calls for speculation about what is possible and what may or may not happen in a hypothetical situation.

Subject to and without waiving the foregoing objection, Petitioner states that it is unable to admit or deny the foregoing statement.

5-11 Please provide the study or studies Vectren has performed that would show the extent to which customer owned EDG facilities' excess generation can be reasonably predicted on a daily basis based on the day ahead anticipated weather report and past excess generation results from Vectren DG customers.

**Response:**

Vectren South objects to extent it requests that Petitioner perform or conduct a study that does not currently exist.

Subject to and without waiving the foregoing objection, Petitioner states as follows:

Vectren South has not performed such a study or studies.



5-12 At page 6, lines 29-32, Mr. Joiner indicates the impact that customer owned DG would have on Vectren South's capacity obligation, if any, would be negligible. Please admit it is equally true that the impact that customer owned DG would have on Vectren South's day ahead planning commitment to MISO would be negligible. If you do not admit, fully explain why it would be more than negligible.

**Response:**

Denied. Capacity is an annual calculation, while day ahead is an hourly calculation and the level to which Vectren South must plan is more granular.

5-13 Please admit that with the benefit of AMI metering data, Vectren will be able to reasonably predict what customer excess DG can be expected under varying weather conditions. If you do not admit this fully state and explain each reason upon which your denial is based.

**Response:**

Vectren South objects to this request because Vectren South does not currently have any EDG customers and therefore a response calls for speculation.

Subject to and without waiving the foregoing objection, Petitioner states that it is unable to admit or deny the foregoing statement.

5-14 Please admit that the DG customer in flows during peak conditions are typically lower than they otherwise would be because of DG customer's energy production that reduces energy inflow. If you do not admit this fully state and explain each reason upon which your denial is based.

**Response:**

Vectren South objects to this request to that extent that "peak conditions" and "typically" are vague and ambiguous. Additionally, Vectren South objects to this request on the basis it calls for speculation.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

If "peak conditions" references the customer's peak demand requirement, the Vectren South cannot admit or deny the statement that the customer's inflow would be "typically" lower than they otherwise would be. It would be dependent upon the customer, the alignment of the distributed generation resource with that customer's peak demand, and whether or not that customer's peak demand occurs at a period when the distributed generation resource is producing.

If "peak conditions" references the distributed generation resources peak production period, the Vectren South cannot admit or deny the statement that the customer's inflow would be "typically" lower than they otherwise would be. Again, it requires an understanding on whether the customer's distributed generation resource is aligned with the customer's peak demand.

5-15 Please admit that EDG owners only receive through the RCRA a tiny portion of capacity revenues from any excess capacity that Vectren South is able to offer into the MISO market. If you do not admit this fully state and explain each reason upon which your denial is based.

**Response:**

Vectren South objects to this request to that extent Vectren South does not currently have any EDG customers and therefore a response calls for speculation.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

Assuming the question references current customers under Rider NM as owners of distributed generation resources, as the Company does not currently have any Rider EDG customers, the Company can admit that the percentage of total residential customers under Rider NM is small. Vectren South allocates capacity revenues within the RCRA using approved allocation factors, and recovers these costs (or credits these revenues) proportionally based on energy (kWh) sales.

5-16 For the years 2014 – 2020 during the months of June – September at what time of day did Vectren reach its peak load in its two highest demand days months in each of those months.

**Response:**

Vectren South objects to this request to the extent that determining the process to query, create a report for, and validate, the data requested would be overly burdensome in light of the time provided for Vectren South to respond to these data requests.

Additionally, Vectren South objects to the request on the grounds that it is unreasonably burdensome in that it obligates Vectren to create reports and compilations of data not currently generated.

Subject to and notwithstanding the foregoing objections, Vectren South responds as follows:

Based on data provided in the FERC Form 1, please see below.

<u>Year</u>	<u>Date</u>	<u>Hour Ending</u>
2014	6/19/2014	16:00
	7/1/2014	15:00
	8/27/2014	16:00
	9/5/2014	15:00
2015	6/23/2015	15:00
	7/29/2015	15:00
	8/3/2015	16:00
	9/2/2015	15:00
2016	6/23/2016	14:00
	7/13/2016	16:00
	8/25/2016	16:00
	9/7/2016	16:00
2017	6/14/2017	16:00
	7/21/2017	15:00
	8/21/2017	16:00
	9/21/2017	16:00
2018	6/29/2018	16:00
	7/5/2018	15:00
	8/28/2018	16:00
	9/4/2018	15:00
2019	6/26/2019	16:00
	7/10/2019	15:00
	8/20/2019	14:00
	9/11/2019	16:00
2020	6/29/2020	15:00
	7/9/2020	16:00
	8/10/2020	16:00
	9/8/2020*	17:00
	*Current month; values are not official	

5-17 P. 8 line 25 Provide the Vectren study or studies that have been performed that prove customer owned DG without additional transmission reinforcement will likely degrade system reliability and at a minimum increase the potential for curtailments.

**Response:**

Vectren South objects to this request to the extent that “P. 8 line 25” is vague and ambiguous.

Additionally, Vectren South objects to the extent it requests that Petitioner perform or conduct a study that does not exist.

Subject to and without waiving the foregoing objections, Petitioner states as follows:

Vectren South has not performed such a study or studies.

5-18 On page 9 of 10, lines 4 – 5, of Mr. Joiner's rebuttal testimony he testifies that "Mr. Rutter is cherry picking one particular example of a historic contract."

A. Is the contract that Mr. Joiner refers to a contract that was in place and effective at the time the IRP Yes effective contract

**Response:**

A. Yes.

5-18 On page 9 of 10, lines 4 – 5, of Mr. Joiner’s rebuttal testimony he testifies that “Mr. Rutter is cherry picking one particular example of a historic contract.”

B. Is that contract currently in effect?

**Response:**

B. Yes.



5-18 On page 9 of 10, lines 4 – 5, of Mr. Joiner’s rebuttal testimony he testifies that “Mr. Rutter is cherry picking one particular example of a historic contract.”

C. Does Mr. Joiner believe the price of energy in that contract a reasonable price?

**Response:**

C. Vectren South objects to this request to that extent that the term “reasonable” is vague, ambiguous and subject to interpretation.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

When considering the terms of Vectren South’s contractual requirements and obligations related to that contract, the price of energy in that contract is reasonable.

5-19 On page 9 of Mr. Joiner's rebuttal testimony lines 5 – 7, he testifies that "Moreover, while the rate provided in that historic contract is higher than Vectren South's other commitments, it is a planning resource that provides the Company with operational flexibility and a reliable source of power during peak Times." Please provide the following:

1. Copies of all contracts with Vectren South's other commitments referred to by Mr. Joiner in his testimony.

**Response:**

1. Vectren South is in the process of seeking the consent of the facility owners prior to disclosing such contracts subject to a non-disclosure agreement.

5-19 On page 9 of Mr. Joiner's rebuttal testimony lines 5 – 7, he testifies that "Moreover, while the rate provided in that historic contract is higher than Vectren South's other commitments, it is a planning resource that provides the Company with operational flexibility and a reliable source of power during peak Times." Please provide the following:

2. A full description as to how these other Vectren South commitments provide operational flexibility?

**Response:**

Vectren South objects to this request to the extent that "other commitments" is vague, ambiguous and subject to interpretation.

Subject to and notwithstanding the foregoing objection, Vectren South responds as follows:

Vectren South has provided a response under the assumption that "other commitments" refers to any resource that Vectren South operates, maintains or in which it has a financial obligation.

2. Vectren South's other commitments provide generation diversity in regard to their fuel and technology type. This diversity provides operational flexibility in how Vectren South's generation is offered into the wholesale market and how Vectren South's generation resources are able to meet load needs throughout the day and year.

5-19 On page 9 of Mr. Joiner's rebuttal testimony lines 5 – 7, he testifies that "Moreover, while the rate provided in that historic contract is higher than Vectren South's other commitments, it is a planning resource that provides the Company with operational flexibility and a reliable source of power during peak Times." Please provide the following:

3. A full description as to how these other Vectren South commitments provide a reliable source of power during peak times.

**Response:**

3. Vectren South's generation fleet has dispatchable power that can be utilized as needed to serve its customers.

5-20 Mr. Joiner testifies on page 9 of 10 lines 16 – 18, “That the current EDG rate of \$0.3181 per kWh when converted to MWh is \$31.81 which exceeds the 2019/2020 Vectren South IRP Avoided Costs figure stated in Witness Rutter’s testimony of \$28.63.”

- A. Please provide support for the \$28.63 avoided cost figure Mr. Joiner refers to in his rebuttal testimony?

**Response:**

- A. Mr. Joiner’s testimony was referring to the marginal system cost in \$/MWh in 2020 from Figure 11.34 on page 313 of Vectren’s IRP, which was referred to by Mr. Rutter.

5-20 Mr. Joiner testifies on page 9 of 10 lines 16 – 18, “That the current EDG rate of \$0.3181 per kWh when converted to MWh is \$31.81 which exceeds the 2019/2020 Vectren South IRP Avoided Costs figure stated in Witness Rutter’s testimony of \$28.63.”

- B. Admit that the System Marginal Cost to which Mr. Rutter referred of \$28.63 if multiplied by 1.25 equals \$35.7875. If you do not admit this fully state and explain each reason upon which your denial is based.

**Response:**

- B. Admit.

5-20 Mr. Joiner testifies on page 9 of 10 lines 16 – 18, “That the current EDG rate of \$0.3181 per kWh when converted to Mwh is \$31.81 which exceeds the 2019/2020 Vectren South IRP Avoided Costs figure stated in Witness Rutter’s testimony of \$28.63.”

- C. Admit that Vectren’s 2019/2020 IRP Figure 11.34 – Avoided Costs and the Total Capacity Avoided Cost is \$154.96 for 2020. If you do not admit this fully state and explain each reason upon which your denial is based.

**Response:**

- C. Denied. Total Capacity Avoided Cost in \$/kW in 2020 from Figure 11.34 on page 313 of Vectren South’s IRP is \$154.96, which includes avoided Transmission & Distribution capital cost. As explained on page 312 of Vectren South’s 2019/2020 IRP, “The avoided power capacity costs are reflective of the estimated replacement capital and fixed O&M cost. For this avoided cost analysis, a 236 MW 1x F-class simple cycle gas turbine (“SCGT”) was used as a comparison due to the low capital and fixed O&M costs.” A SCGT is a utility-owned resource with the ability to produce power when needed in any of the 8,760 hours in a typical year and is accredited through MISO as such.

5-20 Mr. Joiner testifies on page 9 of 10 lines 16 – 18, “That the current EDG rate of \$0.3181 per kWh when converted to MWh is \$31.81 which exceeds the 2019/2020 Vectren South IRP Avoided Costs figure stated in Witness Rutter’s testimony of \$28.63.”

D. What benefits does Mr. Joiner believe that DG customers and DERs in general bring to system reliability? Please explain in detail.

**Response:**

D. Please refer to page, lines 23-30 of Mr. Joiner’s rebuttal testimony.