Response of CAC, Earthjustice, and Vote Solar to the Director's Draft Report for Vectren's 2019/2020 Integrated Resource Plan

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Director's Draft Report on Vectren's 2019/2020 IRP

We appreciate the Director's Draft Report on Southern Indiana Gas and Electric Company d/b/a Vectren a CenterPoint Energy Company's ("Vectren") 2019-2020 Integrated Resource Plan ("IRP") published April 9, 2021, as well as the opportunity to respond to such before the Director's Final Report is issued. We concur with the Director that Vectren's IRP was "a significant revision of its 2016 IRP." Like the Director, we also feel there is still room for improvement in Vectren's 2022 IRP and offer these comments in an effort to clarify our prior comments and provide additional information that may help the Director in making his recommendations for future improvements by Vectren.

In the Draft Report, the Director makes several recommendations to Vectren. We agree with Vectren's goal to continue work on developing electric vehicle forecasts and determining the impact of charging on peak demand. We also support the Director's statement that, "Vectren's portfolio design does not leave much space for model selection." [1] We agree with the Director's recommendation of completing an optimization run with minimum constraints or pre-selected decisions within the model, including any analysis of the timing and quantity of installing new wind, solar, and/or battery storage resources.

The following sections provide more clarity on our previous comments submitted November 13, 2020 ("Joint Comments") related to the industrial sales forecast, the bundling of energy efficiency, Vectren's resource optimization, and its modeling of a seasonal construct.

1 Distributed Energy Resources

The Director notes in his Draft Report that Vectren has raised concerns about the need to modify its distribution system in order to accommodate higher levels of distributed generation ("DG"). Much of what Vectren is concerned about are issues that arose with earlier versions of DG technology and/or are fixable. For example, Vectren can help fix reverse flow issues by siting energy storage near the source of distributed generation and/or providing incentives to DG adopters to co-install battery storage at their own locations to absorb excess generation.

Secondly, the power quality and harmonics concerns are overstated. If, for example, flicker is one of the power quality concerns, that is associated with relatively low-frequency variations in the voltage of the grid. Historically, these voltage variations have been associated with large installations of PV-only or wind-only systems in which sudden changes in irradiance or wind speed caused sudden changes in active power delivered from these systems. These sudden changes in active power could result in sudden changes in voltage, or flicker. However, if Vectren incentivizes DG systems distributed across its service territory and DG systems that include battery storage, this would likely eliminate concerns about flicker. Sudden changes in irradiance, for example, can be immediately compensated by the battery system to smooth changes in net power from these systems. And the geographic diversity of many PV-plus-storage systems helps to slow fluctuations in power and voltage because the sudden changes in irradiance at one site is unlikely to be coincident with that of many other sites.

[1] Director's Draft Report on Vectren's 2019/2020 IRP, p. 21.

We also think harmonics are unlikely to be a major concern because modern inverter technology operates at very high switching frequencies (ones to tens of kilohertz or kHz). These high frequencies are filtered out by the components built into the inverters and further filtered by conventional equipment like transformers and shunt capacitors. Furthermore, the source for the harmonics are from many small systems, and these will not be coincident. Thus, the net effect is the very low level of harmonics sourced by inverters will be further cancelled out by other inverter systems.

2 Industrial Sales Forecast

One of the main concerns we had with Vectren's industrial sales forecast was that Vectren was unwilling to provide the supporting information used to develop the first five years of the internally developed forecast period.

We agree with the Director's statement about the industrial load forecast:

> *Long-term forecasts are inherently more uncertain than short-term forecasts for all types of customers but the risks of serving industrial customers warrants increased scrutiny. Unfortunately, there was little information about the long-term forecast analysis or efforts to improve the credibility of industrial customers.*[2]

In its response to stakeholder comments expressing concern about the increase in the industrial sales forecast, Vectren stated:

> *As described in the IRP, Vectren utilized its internal estimate for large sales in the first 5 years of the forecast and then relied on modest long-term annual growth estimates thereafter. This process ensures that Vectren captures large, expected shifts in load, up or down, based on conversations/negotiations with Vectren's largest active and prospective customers. Estimates from large customers not only feed Vectren's integrated resource planning but also the company budget and are submitted to MISO. Vectren only includes projects with the most certainty within the forecast. Large shifts in load must be accounted for outside of econometric modeling. For example, when a large customer recently installed a cogeneration facility, there was drop of about 80 MWs in the year that it was installed. A drop of this magnitude cannot be predicted within econometric modeling, nor is it reflective of potential future drops in large customer load additions. Additionally, Vectren continues to engage in confidential negotiations with potential customers for large load additions*.[3]

[2] Director's Draft Report on Vectren's 2019/2020 IRP, p. 10.

[3] Vectren Response to Stakeholder Comments, pp. 2-3.

We understand that there are events, such as an addition or loss of a large industrial customer, that cannot be captured in econometric modeling and that adjustments have to be made for those events. The concern expressed by the Joint Commenters was that stakeholders were not able to access the information that Vectren used to develop the first five years of its industrial sales forecast, even under a signed nondisclosure agreement. We have reviewed several industrial forecasts from other utilities, and we have always been able to access the forecast under a signed nondisclosure agreement. Vectren's refusal to provide any information to substantiate a major part of its load forecast raises concerns not just about transparency but also about over procurement of resources. This is especially concerning given this very issue has been hotly contested in prior Vectren IRPs, CPCNs, and elsewhere. Now is the time for Vectren to provide transparency and remove this from the list of litigated issues.

3 Director's Concern about Vectren's Energy Efficiency Bundles

In his Draft Report discussion of Vectren's modeling of energy efficiency, the Director stated:

> *Despite the significant improvements, the Director's primary concern is each bundle combines residential and C&I measures. Combining unrelated measures across residential and C&I measures, except that they have similar costs, makes a questionable load shape obscuring the time aspects of different measures. This is an important consideration in a world increasingly characterized by low marginal costs across most hours, it is important that the hourly impact of DSM measures be given particular attention.*[4]

We agree with the Director that the time valuing of demand-side management ("DSM") can better elucidate its value and that an accurate hourly shape of DSM is a critical input for that reason. In our opinion, the problem lies not in the grouping of measures across the residential and C&I sectors, but in the grouping of measures by cost. On this topic, the Director stated:

> *The Director is not sure he understands the Joint Commenters' concerns about organizing EE bundles based on measure cost. The Director thinks organizing the measures into bundles based on costs provides a reasonable means of understanding at what level of costs EE is competitive with other resource options as represented in the IRP optimization model. Resource optimization is always based on relative costs and this approach provides helpful information on the cost-effectiveness of EE compared to other potential resources. The Director, of course, recognizes that IRP models normally don't include all components of avoided costs and that there remain substantial questions as to how to measure various types of avoided costs. Nevertheless, the Director believes the type of bundling methodology used by Vectren provides some insights into the cost-effectiveness of EE.*[5]

[4] Director's Draft Report on Vectren's 2019/2020 IRP, p. 15.

[5] Director's Draft Report on Vectren's 2019/2020 IRP, p.38.

Grouping of DSM measures in some fashion is necessary to condense the problem size to a manageable level. And the Indiana utilities offer measures to both the residential and C&I sectors, so in that sense Vectren's methodology is consistent with the realities of DSM implementation. However, because DSM programs are typically developed to offer measures that cover multiple needs and to minimize multiple treatments of program participants, it does not make sense to separate measures by cost rather than by program type. Indeed, Vectren's methodology runs the risk of selecting (within the model) measures with a load shape, e.g. commercial HVAC measures, that is only partially consistent with the measures actually offered, e.g. a combination of commercial HVAC and residential appliance incentives.

Even if measures were grouped by cost *and* by customer class, there would still be a mismatch between the bundles modeled and the programs that are ultimately implemented. DSM programs do not consist of just the least expensive measures, although oftentimes lower cost measures are used (in addition to measures that are effective but more expensive) to ensure that overall program delivery is cost-effective. Grouping by cost ignores the fact that actual program design will ultimately include both measures that are in bundles that were selected by the model as well as those that are not.

We agree that the measures selected do not need to exactly match the program offered, but we do think broad agreement between the measures selected and those implemented (in terms of class and end-use) is a reasonable goal to aim for and would ensure that cost-effective DSM is being selected in the IRP.

4 Resource Optimization and Risk Analysis

Vectren evaluated the different candidate portfolios under the balanced scorecard approach that included defined metrics that could be calculated. Vectren then evaluated the preferred portfolio under additional qualitative metrics. In the Draft Report, the Director states,

> *The Director especially appreciates the discussion of the quantitative scorecard metrics and the "other" metrics that are more qualitative in nature. Vectren clearly discusses how the metrics were applied to the portfolios and how Vectren used the results to inform its decisions to derive the preferred portfolio. One can disagree with how Vectren applied the metrics, but one cannot say Vectren's thoughts are not made clear.*[6]

The IRP narrative did not include much information about how the other candidate portfolios, aside from the preferred portfolio, performed across the other metrics used to support the selection of the Preferred Plan. For example, Vectren used unserved energy as the metric for reliability. Vectren reported that there was no unserved energy in the preferred portfolio,[7] but did not report how the other candidate portfolios compared on this metric. In order to compare

[6] Director's Draft Report on Vectren's 2019/2020 IRP, p. 21.

[7] Vectren's 2019/2020 IRP, p. 263.

candidate portfolios, it would be beneficial to know how each portfolio stacks up for some of the other metrics that Vectren used to support the selection of the preferred portfolio outside of the metrics in the balanced scorecard.

5 Vectren's Response to Comments on the Seasonal Planning Construct

Vectren stated in its response to our comments that:

> *Joint Commenters suggest that Vectren's preferred portfolio is overbuilt and that Vectren does not need to build a second CT. They suggest that MISO's projected changes to accreditation of renewable resources should be a scenario, not a reference case assumption. Since filing the IRP, changes to MISO resource accreditation has become more certain, not less. In the December 2020 MISO Resource Adequacy Sub Committee meeting, MISO indicated that sub-annual planning and Planning Resource Auction reform are imminent. Concept design is expected in the first quarter of 2021, with a FERC filing following in Q2-Q3 of 2021. While the final design is yet to be shared, all presented options indicate the need to consider resource accreditation sub-annually. Vectren is not speculating about this reality, it is responsibly planning for it by considering how much resources could be accredited in the winter and the summer.*[8]

CAC and Vectren are in agreement that MISO is likely to file for a change in its (currently annual) resource adequacy ("RA") construct, although the anticipated filing date at the Federal Energy Regulatory Commission has now been pushed out to September 2021.[9] However, our main dispute with Vectren is not whether a change in RA construct is coming but rather that the details of that change have not been fully developed in the collaborative stakeholder process, so it does not make sense at all to make resource decisions on the basis of a single RA approach. Indeed, there are material differences between how Vectren modeled a seasonal construct and the construct currently proposed by MISO, including differences in how the planning reserve margin is applied and differences in thermal unit accreditation.

In Vectren's response to the Joint Commenters' discussion about how Vectren modeled a seasonal planning construct, Vectren stated:

> *The Joint Commenters appeared to misunderstand how Vectren ultimately implemented a summer/winter construct. While Vectren tried to model winter and summer accreditation during portfolio development, this proved to be too difficult. Vectren ultimately built portfolios based on summer peaking requirements, as done in the past; however, Vectren ensured portfolios would meet both summer and winter requirements. This is particularly important with solar resources, which are*

[8] Director's Draft Report on Vectren's 2019/2020 IRP, p. 37.

[9] MISO presentation to MISO Resource Adequacy Subcommittee, May 12, 2021, https://cdn.misoenergy.org/20210512%20RASC%20Item%2004a%20Sub-Annual%20Construct%20Presentation548774.pdf, at 2, 4.

> *expected to receive little to no accreditation in the winter. As such, portfolios that have too much solar pose a big risk to Vectren and its customers (more discussed below).*[10]

In the Draft Report, the Director credits Vectren's response, stating:

> *The Director also understands the intent of Vectren when it tried modeling a seasonal planning reserve margin and resource accreditation. Vectren's experience demonstrates the complexities that may have to be addressed as MISO implements different resource planning requirements. Vectren explored the implications of a seasonal reserve margin and modified its modeling when the results were unreasonable.*

We appreciate Vectren's feedback on the Joint Comments and the Director's follow-up remarks, but it was our understanding, based on the Aurora modeling inputs provided to us, that Vectren applied an unvarying reserve margin for the whole year and modeled a seasonal capacity credit for wind and solar resources. Figure 1 below shows a screenshot of the Aurora Time Series Monthly Table for the reserve margin time series. The table indicates that the modeled planning reserve margin is the same in each month.

	Time Series Monthly Table				Note: Vectren data starting on Row 14,831										Delivered Gas Price is
				mn_70098CO2											
	ID	Use	1	2	3	4	5	6	7	8	9	10	11	12	P
81	PlanningMargin_MISO_Vectren	Zone Planning Reserve Margin MISO	4.53	4.53	4.53	4.53	4.53	4.53	4.53	4.53	4.53	4.53	4.53	4.53	
27															

Figure 1. Screenshot of Reserve Margin Input in Aurora Time Series Monthly Table[11]

Furthermore, in a September 8, 2020 meeting with Vectren's IRP consultant, Siemens, we were told that the planning reserve margin methodology was to look at the highest peak value regardless of season, apply the planning reserve margin to that value, and hold that absolute constant throughout all seasons. This is definitely not even close to the construct that MISO is currently considering, in which resource adequacy needs would vary across four seasons within the year.[12] As the Joint Commenters previously stated,

> *We have no issue with capturing the uncertainty of MISO's PRM going forward, but Vectren has done the opposite. It has laid all its bets on the idea that the PRM will be modified in a very specific way. Vectren applied the reserve margin*

[10] Director's Draft Report on Vectren's 2019/2020 IRP. P. 37.

[11] File "Vectren IRP_Aurora Study Input Tables_Reference Case_05.01.20_CONFIDENTAIL", worksheet "Time Series Monthly". Note that Vectren/CenterPoint has agreed to make this figure public.

[12] See MISO's May 12, 2021 presentation to Resource Adequacy Subcommittee, *supra* note 9, at 6.

> *requirement to its annual peak load to determine the total requirement and then enforced that PRMR across all months of the year in all modeling runs.*[13]

The Director's Final Report should note Vectren's failure to account for multiple possibilities in terms of MISO's ultimate approved modifications to its resource adequacy construct, as a single planning reserve margin built only on the summer peak, is likely inconsistent with the purpose and likeliest of outcomes of MISO's policy change process on this issue.

Joint Commenters also observed in their Comments that Vectren's modeled capacity accreditation (Expected Load Carrying Capability or "ELCC") for wind and solar resources is generally lower than that assumed by MISO, in part because Vectren's model is assuming penetration of wind and solar to occur more quickly than is realistic.[14] As the Joint Commenters previously stated, "Had Vectren used a more appropriate ELCC for solar resources, the High Tech scenario would not require the two combustion turbine ("CT") resources Vectren says it needs to meet its capacity obligations."[15]

Vectren's response to comments did not directly grapple with the issue raised by Joint Commenters about the pace of wind and solar penetration, arguing:

> *Even if the steep drop in accreditation of solar resources occurs a few years later, this does not point to the need for more solar resources. Vectren's preferred portfolio calls for 700-1,000 MWs of solar. The range was provided to help ensure that Vectren adds solar resources responsibly as to not overbuild.*[16]

Vectren's response, despite gesturing to a "range," did not explain what amount of solar could have been selected by the model if more appropriate renewable ELCCs were modeled. The Director's Draft Report largely did not address the issue.

In Section 8.2.2 of the IRP,[17] Vectren discusses the sensitivity that was evaluated to look at a summer and winter capacity accreditation. Figure 2 below shows the seasonal capacity accreditation that Vectren modeled for solar and wind resources under this sensitivity.

[13] Joint Comments at 15.

[14] Joint Comments at 16-20.

[15] *Id.* at 19.

[16] Director's Draft Report on Vectren's 2019/2010 IRP at 37.

[17] Vectren's 2019/2020 IRP, pp. 248-250.

Seasonal Capacity Accreditation	Year 1 (2019)	
	Summer	Winter
Solar	50%	11%
Wind MISO Zone 6	8%	17%
Gas Generator	~90%	~95%

Figure 2. Vectren Seasonal Capacity Accreditation[18]

It was our understanding that Vectren used different seasonal accreditation values for this sensitivity and that is how it differed from what Vectren modeled for its portfolios. Figure 3 below shows a screenshot of the monthly time series values that were modeled for the capacity accreditation for one of the new solar resources that Vectren modeled. As the screenshot shows, Vectren is modeling a lower seasonal accreditation for solar in the fall and winter months compared to the spring and summer months.

Time Series Monthly Table				Note: Vectren data starting on Row 14,831								Delivered Gas Price is	
			mn_70098CO2										
ID	Use	1	2	3	4	5	6	7	8	9	10	11	12
Vectren_Solar_100_MW_UCAP_2019	Vectren UCAP	0	0	0	0	0	0	0	0	0	0	0	0
Vectren_Solar_100_MW_UCAP_2020	Vectren UCAP	0	0	0	0	0	0	0	0	0	0	0	0
Vectren_Solar_100_MW_UCAP_2021	Vectren UCAP	0	0	0	0	0	0	0	0	0	0	0	0
Vectren_Solar_100_MW_UCAP_2022	Vectren UCAP	0.07	0.07	0.07	0.29	0.29	0.29	0.29	0.29	0.29	0.07	0.07	0.07
Vectren_Solar_100_MW_UCAP_2023	Vectren UCAP	0.07	0.07	0.07	0.29	0.29	0.29	0.29	0.29	0.29	0.07	0.07	0.07
Vectren_Solar_100_MW_UCAP_2024	Vectren UCAP	0.06	0.06	0.06	0.27	0.27	0.27	0.27	0.27	0.27	0.06	0.06	0.06
Vectren_Solar_100_MW_UCAP_2025	Vectren UCAP	0.06	0.06	0.06	0.26	0.26	0.26	0.26	0.26	0.26	0.06	0.06	0.06
Vectren_Solar_100_MW_UCAP_2026	Vectren UCAP	0.06	0.06	0.06	0.25	0.25	0.25	0.25	0.25	0.25	0.06	0.06	0.06
Vectren_Solar_100_MW_UCAP_2027	Vectren UCAP	0.06	0.06	0.06	0.24	0.24	0.24	0.24	0.24	0.24	0.06	0.06	0.06
Vectren_Solar_100_MW_UCAP_2028	Vectren UCAP	0.05	0.05	0.05	0.24	0.24	0.24	0.24	0.24	0.24	0.05	0.05	0.05
Vectren_Solar_100_MW_UCAP_2029	Vectren UCAP	0.05	0.05	0.05	0.23	0.23	0.23	0.23	0.23	0.23	0.05	0.05	0.05
Vectren_Solar_100_MW_UCAP_2030	Vectren UCAP	0.05	0.05	0.05	0.22	0.22	0.22	0.22	0.22	0.22	0.05	0.05	0.05
Vectren_Solar_100_MW_UCAP_2031	Vectren UCAP	0.05	0.05	0.05	0.21	0.21	0.21	0.21	0.21	0.21	0.05	0.05	0.05
Vectren_Solar_100_MW_UCAP_2032	Vectren UCAP	0.05	0.05	0.05	0.2	0.2	0.2	0.2	0.2	0.2	0.05	0.05	0.05
Vectren_Solar_100_MW_UCAP_2033	Vectren UCAP	0.04	0.04	0.04	0.2	0.2	0.2	0.2	0.2	0.2	0.04	0.04	0.04
Vectren_Solar_100_MW_UCAP_2034	Vectren UCAP	0.04	0.04	0.04	0.19	0.19	0.19	0.19	0.19	0.19	0.04	0.04	0.04
Vectren_Solar_100_MW_UCAP_2035	Vectren UCAP	0.04	0.04	0.04	0.18	0.18	0.18	0.18	0.18	0.18	0.04	0.04	0.04

Figure 3. Screenshot of Solar Capacity Credit Input in Aurora Time Series Monthly Table[19]

Joint Commenters respectfully ask that the Director's Final Report address this issue of capacity accreditation for renewables and its implications for future resource needs.

[18] Vectren's 2019/2020 IRP, Figure 8-6, p. 249.

[19] File "Vectren IRP_Aurora Study Input Tables_Reference Case_05.01.20_CONFIDENTAIL", worksheet "Time Series Monthly". Note that Vectren/CenterPoint has agreed to make this figure public.

6 Conclusion

We reiterate our appreciation for the Director's Draft Report on Vectren's 2019/2020 IRP and the opportunity to provide comments. The Draft Report is attentive to both issues raised by stakeholders and those identified by the Director. We welcome continued dialogue on this and other IRP issues of importance in Indiana.