STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

Illinois Commerce Commission	:	
On Its Own Motion	:	
	:	23-NOI-1
Notice of Inquiry Regarding	:	
Ameren Illinois RTO Cost-Benefit Study	:	

REPLY COMMENTS OF CHARLES RIVER ASSOCIATES
NOVEMBER 1, 2023

Charles River Associates (CRA) has reviewed Initial Comments submitted under this Notice of Inquiry and respectfully submits these Reply Comments on the Ameren Illinois RTO Cost-Benefit Study (the "Study").

I. Background

ICC order under Docket No. 22-0485 directed Ameren Illinois Company (AIC) to conduct an analysis of the relative costs and benefits of participation in MISO verses PJM. AIC engaged CRA to conduct the cost-benefit analysis as CRA has significant expertise and experience in the execution of RTO cost-benefit studies. The Study was submitted to the Illinois Commerce Commission (ICC) on July 21, 2023. On August 3, 2023, the ICC issued 23-NOI-1 establishing a timeline for Initial Comments and Reply Comments on the Study. CRA has reviewed Initial Comments from ICC Staff, MISO, PJM, ComEd, Illinois Industrial Energy Consumers (IIEC), and AARP Illinois in preparing these Reply Comments.

II. Design of RTO Cost-Benefit Study

The ICC order provided AIC a level of independence in the execution of the Study but did direct analysis of the costs and benefits to ratepayers, including, but not limited to, consideration of reliability, resource adequacy, resiliency, affordability, equity, the impact on the environment, and the general health, safety, and welfare of the people of the State of Illinois. CRA's approach

evaluated relative costs and benefits of remaining in MISO or joining PJM through economic and qualitative frameworks. Key economic cost/benefit components included: 1. Energy Trade Benefits; 2. Transmission Expansion Costs; 3. Capacity Costs; 4. RTO Administrative Costs; and 5. Exit & Integration Fees. Qualitatively, CRA provided a cost/benefit assessment of emissions, environmental justice and equity considerations, and resiliency analysis. CRA presented this approach to stakeholders, including the ICC, MISO, and PJM, for comment and question early in the process.

CRA's analysis captures the costs and benefits of MISO Zone 4 operating in PJM – a market that is more in line with a retail access state like Illinois per the ICC Staff Initial Comments.[1] The CRA analysis concludes that AIC remaining in MISO avoids significant economic costs for ratepayers of both AIC and ComEd even though PJM may be more aligned with Illinois' policies. While it is difficult to quantify potential synergies and other benefits of participating in a potentially "better fit" market, components that CRA was able to forecast point to higher costs in the *Join PJM Case*.

In accordance with the ICC order, CRA conducted its analysis over a 10-year period from 2025-2034. CRA identified benefits/costs in each individual year and discounted these values to 2023$ using a societal discount rate based on actual, long-term Treasury bond yields (3.8%). Costs identified in the Study are incurred in each individual year and will remain unchanged regardless of the study duration (i.e., costs would not be spread across a longer timeframe if assumed). Furthermore, while a longer forecast period could provide additional insights, future costs/benefits will be discounted to 2023$ thus having a proportionally smaller impact to the benefits/costs identified in the original 10-year study period.

[1] ICC Staff Initial Comments at page 9

III. Capacity Costs

In the Ameren Illinois RTO Cost-Benefit Study, the overall estimated net cost of a change in RTO was mostly driven by the estimated increase in capacity costs in Illinois. As such, several commenters, including the ICC Staff and PJM, focused a significant portion of their comments on the topic of capacity costs. Commenters brought further attention to the assumptions that drove the capacity cost results and the uncertainties that merit consideration. Overall, these comments do not draw into question CRA's approach or the general finding of increased capacity costs, but they do challenge the degree of impact under various potential market outcomes and ISO-led market design changes. CRA finds that none of the concerns raised would change the overall finding, including the many market design evolutions in MISO and PJM that are expected in coming years. As observed by the IIEC[2], "marginal changes to these study assumptions would not be expected to alter the conclusion that a decision to require AIC to exit MISO and join PJM would result in substantial incremental costs to Illinois in the billions of dollars." Each of the major comments on capacity costs are addressed below.

The ICC Staff begins its comments on capacity costs by noting the different overall structure of the two capacity constructs. In MISO, the Planning Resource Auction (PRA) is essentially a residual market where capacity is mostly obtained outside the market and the market is used for balancing and for the acquisition of capacity by utilities that are "short" capacity, such as AIC. In PJM, the Reliability Pricing Model (RPM) construct is more of a true capacity market that is used by the majority of load serving entities to ensure resource adequacy. The ICC Staff observes there has been significant volatility in capacity prices in MISO, suggesting that several capacity price spikes "raised concerns about the MISO market being able to meet Illinois' resource

[2] IIEC Initial Comments at page 4

adequacy needs."[3] And further, that "it is unclear that the high capacity prices alone will correct the tightness in the capacity market."[4] CRA tends to agree with the ICC Staff's characterizations of the two resource adequacy constructs, but does not draw the same conclusions about the level of concern for volatile prices. The shift to a seasonal construct has likely mitigated some of the volatility by isolating spikes to individual seasons and the planned move to a sloped demand curve will likely have a similar mitigating impact on volatility, as noted by the IIEC.[5]

In addition, it is not clear that occasional price spikes provide a vastly different entry signal than consistent prices with a similar overall average price. CRA's analysis suggests that over the full-time horizon, the average capacity prices do not separate dramatically between MISO and PJM except when Zone 4 is moved to PJM. In that case, capacity prices would indeed send an entry signal in both Zone 4 and ComEd, but they do not lead to a significantly different reliability outcome, and thus the benefit of the signal is likely not commensurate with the additional cost. As discussed later, the benefits are accounted for in the feedback considerations between CRA's capacity market modeling and capacity expansion modeling.

As for the increase in Illinois net capacity costs that result from a move of Zone 4 to PJM, there are two main drivers highlighted in the Study: 1) an increase in ComEd capacity prices as Zone 4 brings its "short" position into a somewhat isolated area in PJM, forcing prices to rise to find supply to meet the increased demand, and 2) an increase in Zone 4 capacity prices and capacity quantities due to the design of PJM's RPM relative to MISO's PRA and the associated reserve margin impacts. These two drivers are somewhat similar in magnitude. Of the two drivers, the second is more sensitive to assumptions about market design changes.

[3] ICC Staff Initial Comments at page 2
[4] ICC Staff Initial Comments at page 3
[5] IIEC Initial Comments at page 6

Regarding the capacity price increases in ComEd, this outcome was an expected modeling result from the addition of the capacity "short" Zone 4 to PJM. The extent of the impact was unclear prior to the analysis, but it turned out to be substantial due to the tightness in what was modeled as a constrained region based on significant analysis of capacity transfer limits, as described in the Study. It is not uncommon for prices in constrained zones in PJM to "separate" or "breakout" from the rest of PJM, as seen in ComEd for delivery years from about 2018 to 2020.

ICC Staff noted that it is "reasonable to expect capacity prices in the ComEd zone to increase with Ameren Illinois joining PJM."[6] PJM acknowledged this expected directional result as rational. PJM also correctly observed that it is "possible that the capacity shortfall in Zone 4 is similarly impacting costs across the MISO footprint."[7] However, the Study was focused on Illinois impacts and therefore did not assess this dynamic. The impact on ComEd capacity prices was the most impactful result for Illinois and its magnitude is not highly sensitive to assumptions.

ICC Staff suggests that "the Study doesn't attempt to estimate the impact that the increasing capacity prices could have on the amount of capacity resources in the combined ComEd/AIC zone." They then note that higher capacity prices tend to drive capacity supply responses, either through new construction or decreased retirements.[8] This dynamic is indeed important, but it is not missed by the Study. Instead, feedback between the capacity modeling and the long-term capacity expansion modeling was explicitly considered. In addition, it was confirmed that entry occurred when net revenues were high in either market. Net revenues for new entrants are often highly impacted by capacity prices, thus incorporating the feedback effect suggested by the ICC Staff. It was also confirmed that capacity prices responded to increased capacity in both RTOs.

[6] ICC Staff Initial Comments at page 8
[7] PJM Initial Comments at page 3
[8] ICC Staff Initial Comments at page 8

Regarding the increase in prices in Zone 4, this result aligns with known differences in the MISO and PJM capacity constructs, as well as known supply and demand dynamics. As described in the Study, the main drivers are the higher reserve margin, the sloped demand curve, and the lack of a seasonal capacity construct in PJM, which causes summer supply/demand dynamics to drive prices across the entire year. It is true that market design changes are likely imminent, but not all of the changes referenced by PJM and ICC Staff are guaranteed to come to fruition. Even if they were, the proposed changes are not all fully formed and their impact on the capacity prices for Zone 4 as a participant in either RTO are uncertain. For example, PJM recently deferred the discussion of seasonal capacity constructs to a later date and seems more likely to have a two-season construct, which differs from the four-season construct in MISO. Regardless, as mentioned above, even with fully symmetrical market designs and similar supply/demand dynamics, the impact in ComEd would likely endure and lead to the same overall result for the entire study period.

The ICC Staff also raises concern with the Study's assumption that "all Illinois utilities in MISO will shift over to PJM." The ICC Staff notes that this may not occur as CWLP and SIPC could decide to stay in MISO.[9] CRA considered this possibility but assessed that the most likely outcome would be a shift of the entirety of Zone 4 to PJM. This is mostly due to the expected challenge of small, islanded utilities remaining in MISO given current MISO membership rules and transmission topology and ownership. Regardless, as the ICC Staff observes, the impact of such a decision on the overall Illinois costs of a move are not substantial. In terms of capacity costs, CWLP and SIPC were assumed to procure only residual capacity needs at the market clearing price. The volume procured is small and not impactful on the overall result.

[9] ICC Staff Initial Comments at page 7

Finally, the AARP observes that the Study suggests that "a move to capacity procurement outside of RTOs could mitigate" the capacity cost difference.[10] It is true that there are measures that regulators and policymakers could take to bring the capacity costs closer together in the two scenarios through long-term contracting. However, over time procurements will be driven by the opportunity cost for capacity sellers, which are influenced by market prices. In addition, this massive shift in the regulatory construct in Illinois could be expected to result in higher capacity prices than relying on developed capacity markets that are aimed at least-cost procurement to meet reliability needs.

IV. Reliability Analysis

Under the Reliability Assessment Module[11], the Study ensures that each resulting RTO wide (PJM and MISO) capacity expansion plan, under each case (*Status Quo* and *Join PJM Case*), and under each scenario, meets reliability requirements.[12] Therefore, from the resource adequacy perspective, these portfolios are equally reliable and can perform under a range of combined weather patterns and random outage events simulations (1,050 combinations).

To complement the analysis performed in the Reliability Assessment Module, the Study included the characterization of the severity of tail events to provide insights into the load shed events given that LOLE only describes the expected value. This analysis[13] is performed by assessing the magnitude of the total MWh at risk (expected unserved energy) for each portfolio, per year, in the most extreme simulation which stresses the systems with a severe weather outcome

[10] AARP Illinois Initial Comments at page 3
[11] Ameren Study at page 6
[12] The reliability target used was Loss of Load Expectation, LOLE) of 0.1 days/year of loss of load events due to capacity shortages.
[13] Ameren Study at page 36

combined with high occurrences of generation outages (1 simulation out 1050 samples in the distribution).

As the ICC's staff correctly points out, when detailing the magnitude of the MWh at risk under this most extreme weather and forced outages realization, MISO exhibits a higher risk profile than PJM later in the forecast period. However, it is important to point out certain details when assessing the resiliency analysis: (i) the resiliency analysis quantifies effects of the worst case scenario (1 out of 1050) but it is worth noting that each system is designed to meet the same LOLE standard; ii) in the first year analyzed, 2025, MISO reported lower MWh at risk than PJM, which could indicate that if MISO takes corrective measures in the medium-term, it could mitigate some of that risk; and, iii) when comparing the ratio of the magnitude of the MWh at risk to the total annual demand, by RTO, at the specified years, the percentage difference between the two RTOs is minimal (a difference of 0.02% of total MWh at risk). Therefore, attempting to quantify the impact of this resiliency analysis will prove subjective and it will not add substantial evidence to overcome the economic burden if MISO Zone 4 were to join PJM.

V. Transmission Costs

The Study's cost-benefit analysis focuses on the net costs of a move to PJM by comparing costs if AIC were to remain in MISO (*Status Quo Case*) versus the costs of joining PJM (*Join PJM Case*). CRA forecasted transmission costs resulting from both MISO and PJM (Table 3 & 5 of the Study). Initial comments from PJM suggest that MISO transmission costs were not allocated appropriately in the Study.[14] To provide clarification, MISO transmission costs expected during the forecast period (Schedule 26-A MVPs, Tranche 1, and Tranche 2) will be incurred by AIC regardless of whether AIC remains in MISO or joins PJM – resulting in a zero net cost between

[14] PJM Initial Comments at page 5

the *Status Quo Case* vs *Join PJM Case*. The only incremental transmission costs result from those incurred by joining PJM. Additionally, MISO Tranches 3 and 4 were not considered in this analysis as they are expected to be approved beyond the study period of 2025-2034. Furthermore, these project plans are not finalized and there is not sufficient information on how costs will be allocated across MISO.

Forecasting future transmission costs in PJM proved to be more difficult relative to MISO as PJM does not perform long-range transmission studies similar to MISO's Long-Range Transmission Planning (LRTP). CRA consulted with PJM on this topic and leveraged any publicly available data to support PJM transmission cost forecasting. As such, it is reasonable to assume some load-ratio share allocation of offshore wind transmission projects. However, if CRA were to exclude the costs allocated based on the offshore wind study as PJM suggests[15] it would have minimal impact on the Study outcome as offshore wind transmission costs only represent 0.5% ($19.3 M) of the net costs identified in the Study.

VI. Conclusion

CRA appreciates the opportunity to provide these Reply Comments on the Ameren Illinois RTO Cost-Benefit Study. CRA's analysis is in line with the ICC order under Docket No. 22-0485 directing the Study. CRA stands by the results and the conclusion that AIC remaining in MISO avoids significant economic costs for Illinois ratepayers.

[15] PJM Initial Comments at page 6

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Respectfully submitted,

/s/ James McMahon

James McMahon
Vice President – Energy Practice
Charles River Associates
200 Clarendon Street
Boston, MA 02116
603-591-5898
jmcmahon@crai.com