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May 22, 2023

Jenifer French
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Re: *In the Matter of the Application Seeking Approval of Ohio Power Company's Proposal to Enter into an Affiliate Power Purchase Agreement for Inclusion in the Power Purchase Agreement Rider*, Case No. 14-1693-EL-RDR; *In the Matter of the Application of Ohio Power Company for Approval of Certain Accounting Authority*, Case No. 14-1694-EL-AAM

Dear Chair French:

In accordance with Section III.B.2 of the December 14, 2015 Joint Stipulation and Recommendation, I am submitting AEP Ohio's 2023 State of the Market Report for the Commission's consideration.

Thank you for your attention to this matter.

Respectfully submitted,

/s/ Steven T. Nourse

cc: Parties of Record

State of the PJM Capacity and Energy Market June 2023

A whitepaper presented by
AEP Ohio

AMERICAN ELECTRIC POWER®
BOUNDLESS ENERGY℠

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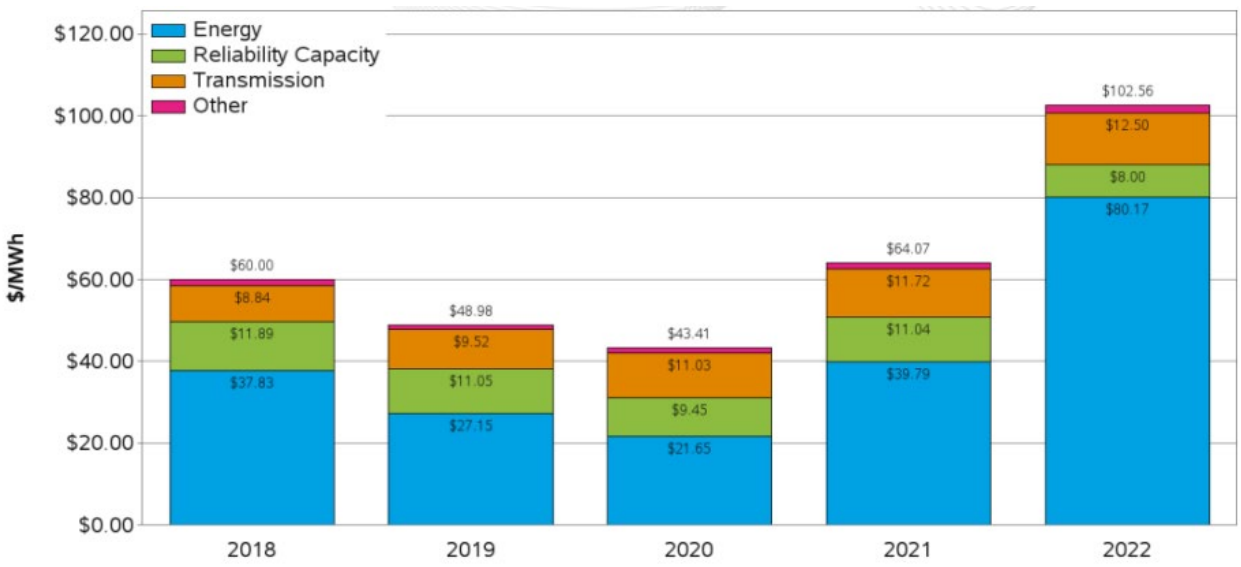
Key Items

Introduction. AEP Ohio Power Company ("AEP Ohio" or the "Company") is a longtime participant in the PJM Interconnection LLC ("PJM") markets and recognizes the potential benefits associated with a market paradigm for both capacity and energy. While PJM has been undertaking several issues within the energy and ancillary service markets, the primary stakeholder efforts are related to the capacity market, interconnection queue reforms along with operational and credit issues associated with Winter Storm Elliott. AEP Ohio continues to work diligently within the PJM process to deliver reliable, economic power to our Ohio customers.

Wholesale Prices. Wholesale prices increased over 60% from 2021 to 2022, rising from $64.07/MWH to $102.56/MWH. The primary driver was higher fuel and associated consumables compared to 2021.



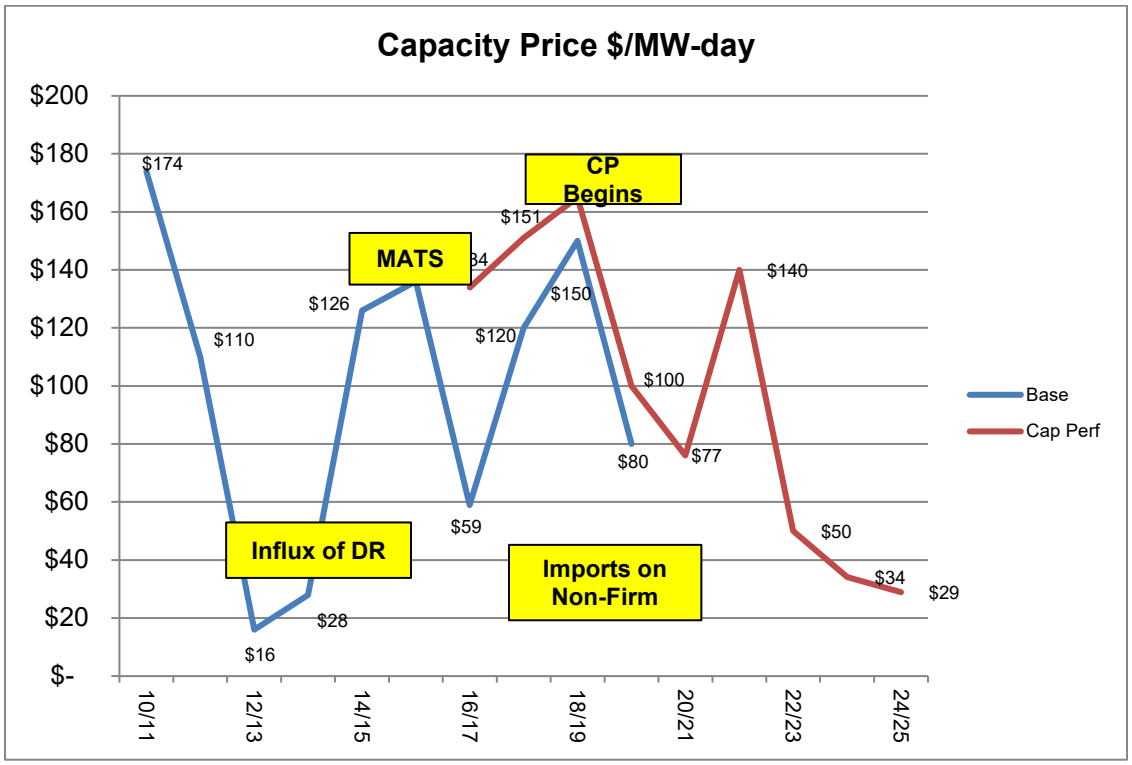
The bar charts above show the total average wholesale market cost for serving load from 2017 through 2022. This excludes distribution and other state-specific charges outside of the PJM market.

- **Energy** comprises the largest portion of the all-in cost to serve wholesale load. The net effect was a doubling in energy costs in 2022 from $39.79/MWH to $80.17/MWH.
- **Capacity** prices (expressed here in $/MWH on the charts rather than $/MW-day) were down ($3.04/MWH) due to the change in clearing prices from the capacity auction.
- **Transmission** costs per MWH were up slightly ($0.78/MWH).
- **Other** costs include ancillary services such as black start, regulation, and spinning reserves, and remain a small part of the overall wholesale price.

PJM's Capacity Auction

PJM began to catch up on delayed capacity auctions, conducting auctions for both the 2023/24 delivery year (in June 2022) and the 2024/25 delivery year (in December 2022).

History of Price Changes and Causes (Graph below). Although intended as an incentive to build new natural gas-fired generation resources, RPM has historically cleared at prices well below the cost of constructing a new natural gas unit (Cost of New Entry or CONE), which PJM posted for its 2024/25 auction as approximately $278/MW-day[1]. The reasons for the low clearing prices range from high reserve levels within the footprint to the economics of the natural gas/electric market.



AEP Ohio's view is that the capacity auction is not a true market mechanism. The demand curve is an administrative construct negotiated by stakeholders and approved by FERC. The supply offers are monitored by PJM's independent market monitor to assure offers are neither too high nor too low. Additionally, the Minimum Offer Pricing Rule (MOPR) order adds another layer of administrative oversight to this supposedly competitive process.

[1] PJM Planning Parameters for the 2024/25 RPM auction. Net CONE on a ICAP basis. https://pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2024-2025/2024-2025-planning-period-parameters-for-base-residual-auction.ashx

The RPM design does not reduce volatility, as can be seen from the graph. This is because the basic premise of the auction process remains: it provides a one-year price for a physical asset that is intended as a 30-year investment.[2] This inherent volatility continues even after the adoption of multiple rule changes since the inception of the RPM in 2007.

Issues Affecting the Capacity/Energy Market

Resource Adequacy White Paper - Energy Transition in PJM: Resource Retirements, Replacements and Risks: In February 2023, PJM released a study examining forecasted generation retirements, new resources anticipated to come online, and potential reliability risks based on current load growth. The study concludes that PJM could be short reserve margins as early as 2028. Key assumptions in PJM's analysis include:

- Generation Resource Retirements - PJM is forecasting 40 GW of retirements by 2030. This accounts for about 21% of PJM's current installed generation. Retirements due to policy decisions (EPA rules, state policies and company ESG commitments) represent about 24 GW of that forecasted amount.
- New Generation: PJM forecasted several scenarios of resource additions based on historical interconnection queue entry and anticipated commercial probability of project completion. PJM's forecasts show no thermal generator additions after 2023, only renewable resources. The impact is highlighted in the actual capacity value of the resource additions which is approximately 1/3 of the full nameplate value.

Critical Issue Fast Path (CIFP) for Resource Adequacy Issues: In coordination with the white paper release, the PJM Board also announced in February 2023 they are initiating an accelerated process to address resource adequacy issues called the Critical Issue Fast Path (CIFP). They note that while PJM has a large reserve margin, with pending retirements, the slow pace of new resource additions, load growth and events like Winter Storm Elliott, there is a need to drive policy changes. The targeted timeframe for a FERC filing is October 2023.
The Board highlighted four areas they want addressed:

- **Enhanced risk modeling**. In particular, the Board would like to improve the way PJM accounts for winter risk and correlated outages in its reliability planning.
- **Evaluation of potential modifications to the Capacity Performance construct and alignment of permitted offers to the risk taken by suppliers**. Evaluate changes to ensure that market sellers can reflect the risk of taking on a capacity obligation in their capacity market offers.
- **Improved accreditation**. The Board believes that it is necessary to enhance PJM's accreditation approach to ensure that the reliability contribution of each resource is accurately determined and aligned with compensation.

[2] The PJM Tariff actually requires new generator offers to reach a certain point in their construction and approval requirements before they are allowed to offer into the auction.

- **Synchronization between the RPM and Fixed Resource Requirement (FRR) rules**. The Board would like any changes in RPM rules to also be mapped to FRR rules to ensure that supply resources and consumers are held to comparable standards.

The CIFP process breaks down into 4 stages that will result in meetings to occur on an accelerated basis.

- Stage 1: PJM develops a Problem Statement/Issue Charge and a proposal.
- Stage 2: PJM and stakeholders develop options to address the items in scope.
- Stage 3: PJM and stakeholders finalize proposals.
- Stage 4: Advisory vote on the proposals at the Members Committee.
- Board Approves FERC filing (targeting FERC filing in October 2023)

In addition, PJM made a section 205 filing April 11, 3023 in Docket No. ER23-1609 to delay RPM Auctions through the 2028/2029 Delivery Year. This likely will result in any changes taking effect beginning with the 2025/26 capacity auction.

AEP is highly engaged in these policy reform efforts and will continue to drive for further reforms that are in the interest of our customers and needed for ongoing reliability of service. Providing safe and reliable electric service is AEP's top priority and our ability to do so relies heavily on the continued resiliency of the PJM system.

Procurement of Clean Resource Attributes: PJM also initiated a task force to discuss capacity/energy market changes to enable states and other entities to procure clean resource attributes on a voluntary basis. Key work activities and scope include:

- Education regarding the procurement of clean resource attributes and how those attributes are defined across jurisdictions, markets and various procurement mechanisms.
- Discuss objectives and product definition for a market construct to enable voluntary procurement of clean resource attributes.
- Develop the necessary qualitative and quantitative analysis to examine:
    - Reliability implications
    - Cost impacts
    - Greenhouse gas emissions impacts
    - Jurisdictional implications

This effort is in the early conceptual stage. AEP remains watchful that no shifting of costs occurs and reliability of the grid is not negatively impacted by any market rule changes.

PJM Operational Challenges and Market Impacts During Winter Storm Elliott: PJM stated it was adequately prepared for the winter storm event through the execution of its winter preparedness plan, which includes meeting with federal and state regulators and neighboring systems to review winter preparations, weekly operational review meetings with major natural gas pipeline operators and winter readiness assessments. PJM issued Winter Advisory and Alerts prior to the storm as early as December 20, 2022.

PJM provided a preliminary review of the events in January and based on preliminary generator availability data submitted to PJM on December 23, 2022, PJM believed it had almost 29 GW of reserve capacity available to absorb load and generation contingencies and to support our neighboring systems. However, due to contributing factors consisting of severe cold and blizzard conditions, actual load came in close to 15% over PJM's forecast. As PJM called in reserves, a significant portion of the generating fleet from its preliminary data analysis failed to perform. PJM experienced 46 GW on forced outages on December 24 – about 70% related to natural gas. The "Top 3" root causes for generator unavailability was attributed to Plant Equipment, Fuel Supply, and Unit Trips.

PJM is currently evaluating the event to determine lessons learned in the areas of generator performance and gas availability, load forecasting, timing and criteria for emergency procedures, resource scheduling, capacity performance (execution of performance event process and where there can be more clarity), and unit cost offer verification. PJM will perform a full analysis of the event which is estimated to be completed Mid-July 2023. PJM will also provide a "lessons learned" report in May 2023.

Non-performance charges for December 23 and 24 were approximately $1.8 billion. On April 3, 2023, FERC approved PJM's filing in Docket No. ER23-1038-000 to address potential credit issues resulting from Winter Storm Elliott. PJM had proposed for any future Capacity Performance Assessments, if there are fewer than six monthly bills remaining in a Delivery Year for which non-performance charges from an event have not been invoiced, PJM would have the ability to allocate the charges up to a maximum of nine monthly bills (allowing them to be paid in the following delivery year). PJM said it will evaluate each event separately before extending the payment period, based on magnitude of the charges, the charges compared to expected capacity revenues and other factors.

PJM also added a transitional rule to deal with Winter Storm Elliott. PJM will allow a generator owner to choose between 1) paying the non-performance charges during the current delivery year (3 monthly billings) with no interest charges, or 2) divide the non-performance charges over nine months, subject to interest (at the FERC rate). If a generator chooses this nine-month extension, it applies to the entire portfolio (not by unit). For the Winter Storm Elliott non-performance charges, approximately 30% of the accounts with charges elected the nine-month option. However, this accounted for about 70% of the total charges. This highlights the potential default risk PJM has in the later months (June – November).

Interconnection Queue Reform: Generator interconnection is of concern in PJM as there are about 175,000 megawatts of energy projects — 95 percent of which are wind, solar, energy storage or a hybrid of renewables with storage — that are currently waiting to receive interconnection agreements from PJM. Due to the volume of projects entering the PJM queues over the past five years, PJM created an Interconnection Process Reform Task Force in April 2021 to investigate opportunities to improve the interconnection process. Following extended debate and procedural challenges from stakeholders, the final proposed interconnection reform solution was approved by PJM stakeholders at the April 27, 2022, Members Committee.

On November 29, 2022, FERC issued an order for PJM's Generator Interconnection Queue Reforms as submitted by PJM on June 14, 2022. FERC accepted PJM's filing as just and reasonable, to be effective, as requested, pending compliance filings, one which has already been submitted by PJM. The package represents the following core tenants:

- Departure from "First In, First Out" processing to "First Ready, First Served"
- Increased Financial Security/Readiness Deposits
- Simplified Study Life Cycle ("Cluster Approach") not to exceed 2 years
- Transition Procedures
    - PJM anticipates transitioning to their new generator interconnection process beginning July 1, 2023, with the new process scheduled to begin early 2026.

AEP expects to add ~15 GW of regulated renewables as part of our plan to shift our generating fleet to about half renewable energy by the end of the decade. The obsolete PJM interconnection process has struggled to accommodate the inflow of renewable generation requests. As such, AEP supports and believes PJM's new interconnection reforms reflects reasonable means to support meaningful queue reform in a timely manner. Although, AEP will continue to advocate for further enhancements to the generator interconnection process through PJM's stakeholder process.

Conclusion

AEP Ohio has divested all its de-regulated generation in Ohio. Nevertheless, AEP Ohio believes it is imperative to work with the Public Utilities Commission of Ohio to formulate the best strategy for serving our Ohio customers with clean, reliable, and diverse power supply for the long term.

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Case No(s). 14-1694-EL-AAM, 14-1693-EL-RDR

Summary: Report AEP Ohio's 2023 State of the Market Report. electronically filed by Mr. Steven T. Nourse on behalf of Ohio Power Company.