AEP OHIO
An AEP Company
BOUNDLESS ENERGY™

Legal Department

American Electric Power
1 Riverside Plaza
Columbus, OH 43215-2373
AEP.com

May 28, 2020

Samuel C. Randazzo
Chairman, Public Utilities Commission of Ohio
Public Utilities Commission of Ohio
180 East Broad Street
Columbus Ohio 43215-3793

Steven T. Nourse
Vice President - Legal
(614) 716-1608 (P)
(614) 716-2014 (F)
stnourse@aep.com

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 Chairman Randazzo:

In accordance with Section III.B.2 of the December 14, 2015 Joint Stipulation and Recommendation, I am submitting AEP Ohio's 2020 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 2020

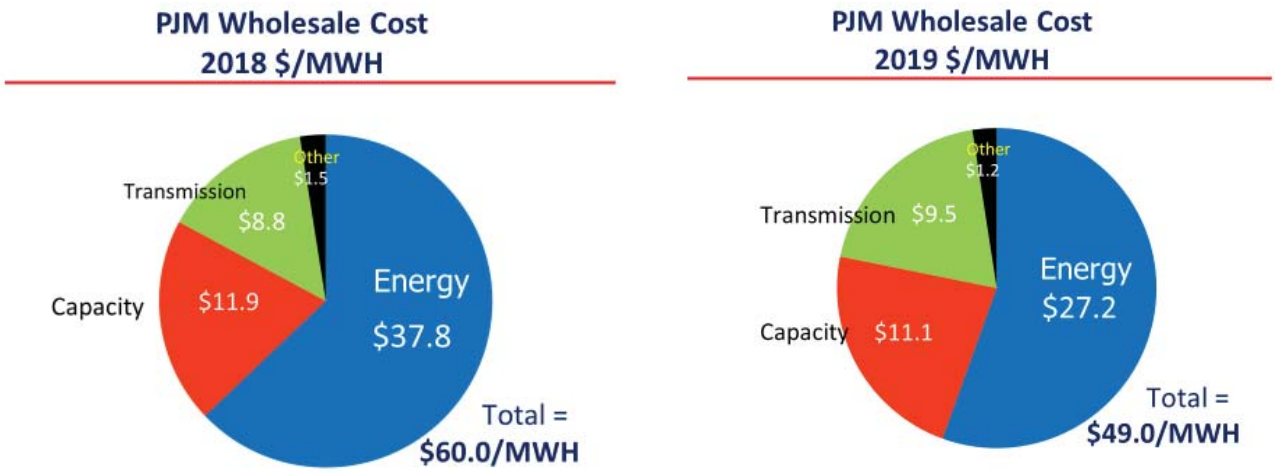
A whitepaper presented by
AEP Ohio

Table of Contents

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. However, AEP Ohio also believes that there is a balance between market paradigms and individual state policy goals. In 2019, this came to the forefront with the capacity docket at FERC, plus multiple challenges identified in developing approaches to carbon and energy pricing. Nevertheless, AEP Ohio continues to work diligently within the PJM process to deliver reliable, economic power to our Ohio customers.

Wholesale Prices. Wholesale prices decreased over 18% from 2018 to 2019, declining from $60.00/MWH to $49.00/MWH. Lower natural gas prices and higher reserve margins were the primary drivers for this decline in energy prices.



The pie charts above show the total average wholesale market cost for serving load in 2018 versus 2019. 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. Natural gas prices decreased by over 30% in 2019 (from $3.15 to $2.56[1]), and heating/cooling degree days were approximately 5% below 2018. The net effect was a 28% decrease in energy costs in 2019 to $27.2/MWH.
- **Capacity** prices (expressed here in $/MWH on the charts rather than $/MW-day) were down slightly ($0.8/MWH) due to the change in clearing prices from the capacity auction.

[1] https://www.macrotrends.net/2478/natural-gas-prices-historical-chart

- **Transmission** costs per MWH were up slightly ($0.7/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 Delayed

The Ohio State of the Market Report for 2018 indicated that PJM was awaiting a FERC Order on certain capacity construct issues before conducting the capacity auction for 2022/23. FERC issued this order December 19, 2019[2], and PJM has yet to schedule the capacity auction for 2022/23.

In its December 2019 order, FERC directed PJM to expand its Minimum Offer Price Rules (MOPR) to apply to any new or existing resource that receives a state subsidy. FERC defined state subsidies as any payment made via a state mechanism that provides revenues to generators outside of a competitive market. The prime example for Ohio would be payments for Zero Emission Credits (ZECs). Also included would be future construction of renewables under a Renewable Portfolio Standard, or any kind of regulatory payment provided under state legislative or regulatory rulings.

Specific to Ohio's retail auction, some parties interpret the FERC order to say that MOPR might apply to any unit that is directly or indirectly connected to a sale made by a retail supplier in state retail auctions. AEP Ohio disagrees with this interpretation, and as of the date of this report is advocating with PJM to include such comments in their June 2020 MOPR compliance filing. AEP Ohio will also submit comments to FERC after PJM makes their filing.

Separately, FERC provided for certain limited exemptions to resources that would have the MOPR applied. These are as follows:

- Existing renewable resources that are participating in state renewable portfolio;
- Existing demand response, energy efficiency, and storage resources;
- Existing self-supply resources; and
- Competitive resources that do not receive state subsidies.

Important to AEP's regulated states, PJM's longstanding Fixed Resource Requirement Alternative remains unchanged by the FERC order.

MOPR Values

The default MOPR for new units will be based on Net Cost of New Entry (CONE). PJM's filed recommendations are as follows:

[2] Docket #EL16-49-000

- Combined cycle = $152/MW-day
- Combustion turbine = $246/MW-day
- Solar w/tracking = $175/MW-day
- Onshore wind = $1,023/MW-day

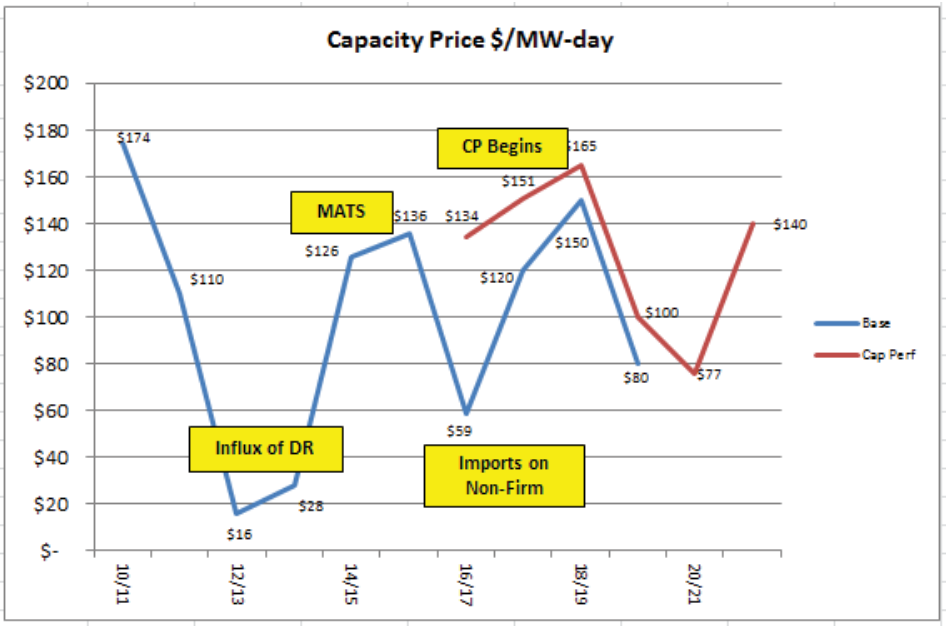
The default MOPR for existing units will be based on future Avoidable Cost Rates (ACR). These are much lower because ACR excludes finance and other fixed costs. PJM's estimates for Net ACR values as of the date of this report are:

- Single unit nuclear = $210/MW-day
- Multi-unit nuclear = $0/MW-day
- Coal = $37/MW-day
- Combined cycle = $0/MW-day
- Combustion turbine = $2/MW-day
- Solar w/tracking = $0/MW-day
- Onshore wind = $0/MW-day

Unit-specific calculations. In all cases (new and existing), owners may submit a unit-specific calculation to PJM and the Market Monitor if they believe their calculated value is different from the default value.

Timing request to FERC. PJM has requested that the first auction for 2022/23 to be run 6 ½ months after FERC issues an order on the compliance filing. This will likely put the auction in the first quarter of 2021. PJM would run subsequent catch-up auctions roughly 4 ½ months apart.

History of Price Changes and Causes (Graph 1). 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 2021/22 auction as approximately $300/MW-day[3]. 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 Monitoring Analytics, the company name for PJM's independent market monitor to assure offers are neither too high nor too low. Additionally, the MOPR order adds another layer of administrative oversight to this supposedly competitive process.

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.[4] This inherent volatility continues even after the adoption of multiple rule changes since the inception of the RPM in 2007.

Issues Affecting the Energy Market

Price formation in shortage conditions. Last year we reported that PJM had requested FERC approval to make major revisions to the energy market price formation rules. The most significant requested revision was to increase reserve pricing during shortage conditions, where PJM proposed to allow the prices to increase significantly as reserves gradually get tighter. As of the date of this report, FERC has still not ruled on this docket (#ER17-775-000). AEP Ohio filed comments in support of the PJM proposal as consistent with a better market design but tempered support by questioning the magnitude of PJM's maximum reserve price and slope of the reserve demand curve.

Fast Start Pricing and 5-minute Dispatch. Also in 2019, PJM had filed a recommendation to FERC regarding allowing fast-start generators (e.g. combustion turbines) to set energy prices when they are dispatched. Rather than ruling on the specific issue of this docket (#ER19-2722), FERC ordered PJM to realign their dispatch algorithm to more properly match the dispatch signals with the pricing signals. These dispatch signals are given every five minutes. As of the date of this report, PJM is expected to make a compliance filing in the summer of 2020. AEP Ohio's position is that both fast start pricing and 5-minute dispatch will properly address flaws in the system. However, we believe neither will have a significant impact on overall energy prices.

[3] PJM Planning Parameters for the 2020/21 RPM auction. http://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2021-2022/2021-2022-bra-planning-period-parameters.ashx?la=en

[4] 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.

Carbon Adders. PJM has been conducting regular stakeholder meetings on the potential to use carbon adders in the dispatch algorithm to recognize the value of carbon emissions to the footprint. The stakeholders acknowledge the challenges associated with the leakage issue – how to properly recognize carbon values in states with carbon objectives without causing harm to states which do not. Concurrently, in April 2020 a broad consortium of entities (inside and outside of PJM) requested FERC to hold a technical conference to discuss the feasibility of various approaches to resolving the carbon emission conundrum. As of this filing, FERC has not issued any orders on this docket (#AD20-14-000). AEP will likely be part of the panel discussions if FERC conducts this technical conference.

Energy Storage. FERC has issued an order requiring PJM to file by October a proposal for addressing the capacity values of all generating resources. The initial focus of this effort was to determine proper valuation for storage resources (e.g. batteries), which are greatly reduced by PJM's 10-hour minimum run time requirement. But in FERC's most recent order, the commission stated they want PJM to evaluate the capacity value of all resources, including storage, renewables, and fossil generators. PJM's filing is due October 2020. AEP Ohio believes it is prudent and timely to evaluate the capacity value of renewables and storage units, as these resources will comprise a more significant part of the PJM dispatch in the future.

Financial Transmission Rights. The *Report of the Independent Consultants on the GreenHat Default*[5] included a recommendation to "conduct a general review of the FTR market…to evaluate the risks and rewards of potential structural reforms." Under the guidelines from this report, the PJM stakeholders have begun a comprehensive review of ARR/FTR market design that may address specific technical issues and/or broader policy issues. This will be a long-term review process, and the stakeholders have not developed any recommendations as of the date of this report.

GreenHat Default Wrap-up. In last year's report, AEP Ohio discussed that the financial firm, GreenHat L.L.C., defaulted on a three-year Financial Transmission Rights (FTR) trading position in the PJM market. As of the date of this report, two of the three years have been liquidated on a daily basis, with only a small remaining percentage of MWHs remaining in the third year. The total amount of the default is estimated at $185M, with AEP Ohio's share estimated at approximately 1% of the total. Since the default in 2018, PJM has hired a Chief Risk Officer (a newly created position), replaced the Chief Financial Officer, and replaced the CEO. PJM and stakeholders have been diligent on addressing credit and collateral shortcomings exposed by the GreenHat default. The stakeholders are also beginning discussions around potential revisions to the overall financial markets.

[5] https://www.pjm.com/-/media/library/reports-notices/special-reports/2019/report-of-the-independent-consultants-on-the-greenhat-default.ashx?la=en

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.

Summary: Report - 2020 State of Market Report Submitted by AEP Ohio electronically filed by Mr. Steven T Nourse on behalf of Ohio Power Company