



An AEP Company

BOUNDLESS ENERGY™

Legal Department

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

May 30, 2019

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 2019 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 2019

presented by
AEP Ohio



Table of Contents

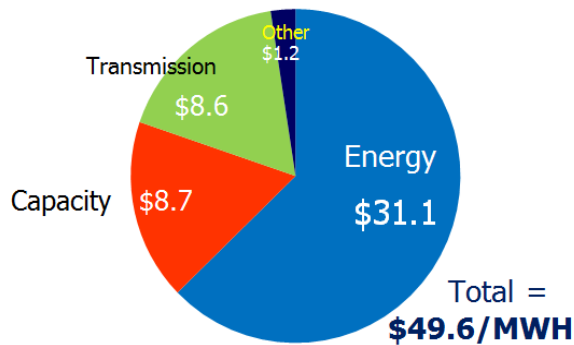
Key Items	3
PJM’s Capacity Construct	4
Energy Price Formation	5
Grid Resilience and Fuel Security	6
GreenHat Default	6
Ongoing Stakeholder Processes	7
Conclusion	7
Appendix	7

Key Items

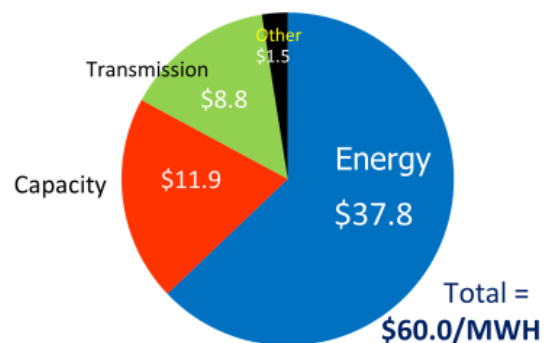
Ohio Power Company (“AEP Ohio” or the “Company”) is a longtime participant in the PJM Interconnection LLC (“PJM”) markets and recognizes the potential benefits associated with a market paradigm for both capacity and energy. However, AEP Ohio also believes that there are shortcomings in both the capacity and energy markets in PJM that fail to provide proper price signals, proper incentives for long term capital investment, and proper recognition of grid resilience risks, especially as they relate to natural gas supplies and fuel diversity.

Wholesale Prices. Wholesale prices increased approximately 21% from 2017 to 2018, rising from \$49.60/MWH to \$60.00/MWH for an average wholesale customer. This was largely driven by higher natural gas and capacity costs, plus a consistently higher load throughout the year due to both colder winter temperatures and hotter summer temperatures than normal.

**PJM Wholesale Cost
2017 \$/MWH**



**PJM Wholesale Cost
2018 \$/MWH**



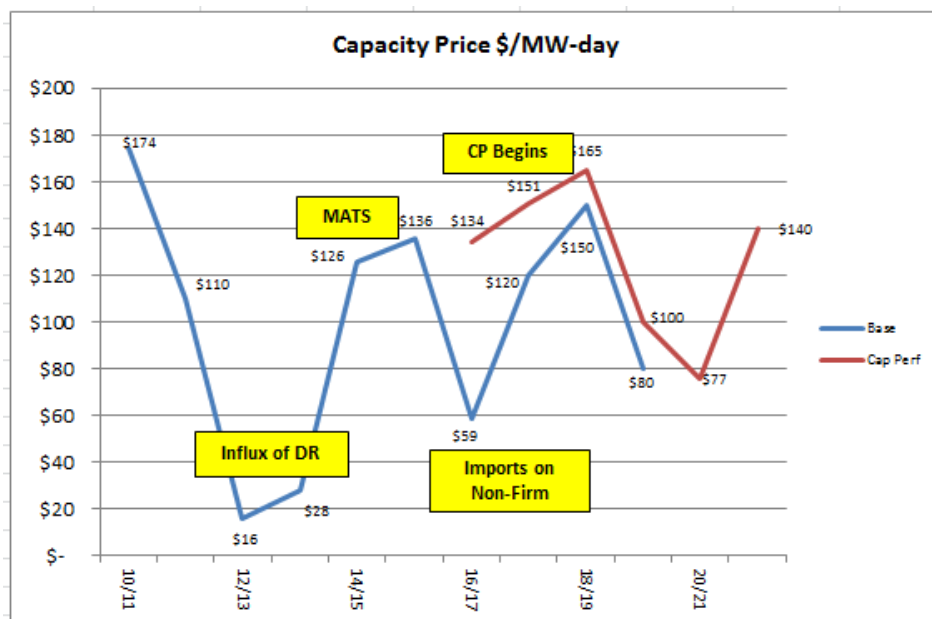
- **Energy** comprises the largest portion of the all-in cost to serve. Natural gas prices increased in 2018, and heating/cooling degree days were well above average for most of the year. The net effect was a 21% increase in energy costs in 2018 to \$37.8/MWH.
- **Capacity** prices (expressed here in \$/MWH on the charts rather than \$/MW-day) were up \$3.2/MWH, or over 36%, due to the change in clearing prices from the capacity auction, discussed in more detail below.
- **Transmission** costs per MWH were up only slightly in 2018 over 2017. And transmission costs comprised only 15% of the overall wholesale costs in 2018.
- **Other** costs include ancillary services such as black start, regulation, and spinning reserves.

PJM's Capacity Construct

In May 2018, PJM held its Capacity Auction for 2021/22. The 2021/22 auction cleared at \$140/MW-day for the Rest-of-Market (AEP's) region, significantly above the \$77/MW-day price for 2020/21. There were several off-setting contributors to this year's outcome:

- **Reduction in Nuclear Generation.** Approximately 7,400 MWs of additional nuclear generation failed to clear for 2021/22 compared to last year. This was a combination of units owned by Exelon and FirstEnergy (FE). As a result, these two regions cleared higher than Rest-of-Market: FE at \$171/MW-day and Exelon's ComEd region at \$196/MW-day.
- **New Capacity.** New capacity for 2021/22 decreased from 2,300 MWs last year to 900 MWs this year.
- **High Reserve Margin.** PJM continued to clear high reserves margins. The reserve margin cleared for 2021/22 was 22%, down slightly from the 23% cleared last year.
- **Demand Response Increase Significant.** Demand response increased over 3,000 MWs, clearing over 11,000 MWs for 2021/22.

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-day¹. The reasons for the low clearing prices



¹ 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>

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 design will not reduce volatility or increase reliability in the long term. 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.

The rudimentary problem with the auction process is that once a unit is constructed, if it offers even \$1/MW-day above the clearing price, it receives no capacity payment, thereby forgoing all capacity revenues for a year. Thus, owners of existing units are incented to offer at or near zero. This is borne out historically, as over 80% of the offers in the PJM auctions have been at or near zero.

PJM's 2018 Capacity Filing. On October 2, 2018, PJM submitted a proposal for additional changes to the capacity auction process. The proposal was in response to a Federal Energy Regulatory Commission (FERC) Order issued on June 29, 2018, which directed PJM to develop a Fixed Resource Requirement (FRR)-like alternative for generation within the PJM footprint that receives state subsidies. This state subsidies issue has become more significant as Illinois and New Jersey have approved Zero Emissions Credit plans for nuclear units in their states, and Pennsylvania and Ohio are discussing the same possibility.

AEP Ohio (as part of the AEP Service Corporation) filed comments in that docket, defending attacks on the existing FRR self-supply alternative that AEP's regulated states have utilized since the inception of Reliability Pricing Model (RPM) in 2007. AEP Ohio also provided supporting comments for the PJM proposal as being most conducive for any future asset development plans in both Ohio and any of our jurisdictions.

Timing: FERC has not issued an order as of the date of this report. PJM has filed with FERC to confirm that PJM plans to conduct its capacity auction for 2022/23 delivery year in August 2019.

Energy Price Formation

In February 2019, PJM requested FERC approval to make major revisions to the energy market price formation rules. This request occurred despite PJM failing to achieve approval from the PJM stakeholders. The most significant requested revision was to increase reserve pricing during shortage conditions, where PJM proposes to allow the prices to increase significantly as

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.

reserves gradually get tighter. PJM estimates these changes, if adopted as proposed, will cause energy market prices to increase by approximately 2%. FERC is not likely to rule on this docket until late 2019 at the earliest. 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.

Grid Resilience and Fuel Security

In late 2018, PJM published a whitepaper with the results of a fuel security study PJM conducted over the course of the year. The report indicated that PJM could maintain reliability for several years even under extreme winter weather, gas pipeline disruptions, and escalated resource retirements. However, PJM remains concerned about the long term resilience of the system, and has launched a stakeholder process in 2019 to further discuss what should be done to address fuel and grid security going forward.

PJM continues to take the position that market-based changes to the capacity and energy markets will address resilience exposures. AEP Ohio is skeptical that PJM's market approaches can resolve significant resilience issues that may be identified from further studies or the stakeholder process. AEP Ohio believes an engineering approach to addressing resilience issues is more fitting than relying on market solutions, including evaluating the potential for transmission solutions to address the fuel security risks.

GreenHat Default

In June 2018, a small financial firm, GreenHat L.L.C., defaulted on a three-year Financial Transmission Rights (FTR) trading position in the PJM market. The amount of the default is based on the actual future liquidation of the positions, but is estimated to be in excess of \$185M. Although certain credit requirement changes have been made to the review process, they came too late to mitigate the GreenHat issue. Under pressure from stakeholders, the PJM Board hired three outside consultants to investigate what led up to the GreenHat default. The report has been issued, and PJM has been implicated on several shortcomings related to its handling of the GreenHat situation. PJM's Chief Financial Officer elected early retirement in April 2019. Additionally, on May 28, 2019, PJM's Chief Executive Officer Andy Ott also announced he would be retiring effective June 30, 2019. Finally, the PJM Board has indicated that it is establishing a new Chief Risk Officer position, reporting directly to the Board, to address PJM's ongoing risk exposures going forward.

Ongoing Stakeholder Processes

Within PJM, the stakeholder process moves at a deliberate pace. Stakeholder initiatives often take many months to reach a definitive conclusion. In addition, the stakeholder process is controlled by sector-weighted voting, which gives several smaller interest groups significant voting power. The AEP operating companies (including AEP Ohio) own 10-15% of load, generation, and transmission facilities in PJM. Yet because of the governance rules, AEP has a cumulative voting impact of less than 2% in sector-weighted voting. AEP's voting power is equal to that of smaller companies in AEP's sector that do not own generation or transmission assets.

Conclusion

AEP Ohio has divested all its de-regulated generation in Ohio. The Company takes the position that cost-of-service regulation inherently takes a long-term view of investments necessary to maintain proper fuel diversity, plant type diversity, transmission needs, and reliability. This results in reduced market volatility and increased consumer benefits in the longer run. In AEP Ohio's experience, state utility commissions have successfully considered the inherent risks, costs, and benefits accruing to retail customers as a result of long term planning.

Appendix

Characteristics of Capacity Market Design

The PJM Reliability Pricing Model Capacity Market (RPM) was approved by FERC in 2007. Within the RPM, the Base Residual Auction (BRA) is an annual capacity auction that sets prices and quantities for a single-year product, three years in advance. Although the intent of the construct is to provide incentives for continued investment,

- It does not provide multi-year revenue stability.
- It does not offer any protection from price volatility.

The basic auction design involves both an administrative demand curve and a partially-mitigated supply curve. The demand curve was negotiated in the original 2006 FERC settlement and re-negotiated in a stakeholder process in 2015. The curve is based on a PJM load forecast

and target reserve margins. The curve is steep, such that a small change in the supply curve causes a significant change in clearing prices.³

The entire demand curve is constructed around the cost of constructing a new natural gas combustion turbine. And it is designed around the promotion of a single fuel source: natural gas. There are no rules to ensure a diversity of capacity resources or diversity of fuel.

The supply curve for the BRA is based on offers submitted during the annual auction. These offers are submitted only once at the beginning of the auction (in contrast to a descending clock auction where suppliers can make decisions on whether to participate as prices decline). However, suppliers that submit offers above a certain price⁴ must submit their offer to the PJM Market Monitor for review to determine if it is cost-based. Historically this happened infrequently. But an increasing number of older units have been offering above the trigger point, as they determine they will have to retire if they do not receive sufficient revenues from the capacity market clearing price.

Once a generation unit is cleared in the BRA, there is no guarantee for clearing at the same price in future auctions. Therefore, an offer into the capacity performance construct means a commitment to construct a real physical asset with a useful life of 20-30+ years, but with only a one-year price guarantee.

Vertically integrated utilities that have both load obligations and generating assets can opt out of the RPM auction as long as they meet the reserve margin set by PJM. This alternative is called a Fixed Resource Requirement (FRR). Even though FRR entities do not have to participate in the BRA, they are held to the same operating requirements and non-performance assessments as the entities participating in the BRA. AEP's regulated operating companies in PJM and Duke Energy Kentucky currently are the only entities choosing to meet their load and reserve obligations under an FRR capacity plan.

³ In its 2014 review of the capacity market, the Brattle Group recommended a change in the curve shape to be consistent with a more gradual decline in reliability value at higher reserve margins. AEP supported the recommendations, which were largely adopted by PJM.
<http://www.pjm.com/~media/documents/reports/20140515-brattle-2014-pjm-vrr-curve-report.ashx>

⁴ For the 2020/21 BRA, this level was approximately \$250/MW-day.

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

5/30/2019 4:30:48 PM

in

Case No(s). 14-1693-EL-RDR

Summary: Report - AEP Ohio is Submitting its State of the Market Report electronically filed by Mr. Steven T Nourse on behalf of Ohio Power Company