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Powering Reliability Through Market Design

The Independent Market Monitor for PJM

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Introduction

Reliability is a core goal of PJM. Reliability should remain a core goal of PJM. Reliability is a core responsibility of PJM. Reliability should remain a core responsibility of PJM. Maintaining and improving competitive markets should be a core goal of PJM. Maintaining and improving competitive markets is a core responsibility of PJM. The goal of competition in PJM is to provide customers reliable wholesale power at the lowest possible price, but no lower. FERC said exactly that in Order No. 2000.¹ The PJM energy markets have done that and have met that goal. The PJM markets work, even if not perfectly. The results of PJM markets were reliable in the first six months of 2026, although reliability is deteriorating. The results of the energy market were competitive in the first six months of 2026. The results of the 2025/2026, 2026/2027, and 2027/2028 capacity markets were not competitive. The PJM markets bring customers the benefits of competition when the market rules allow competition to work and prevent the exercise of market power.

The PJM energy and capacity markets are components of the PJM market; both are essential to providing reliable energy to customers at the lowest possible price. The energy market results incorporate immediate short term conditions including weather, the existing generation fleet, unit availability, actual load, transmission limitations, and fuel availability and costs. The capacity market results incorporate load forecasts and the response of investors in resources to expected market conditions. The energy market and the capacity market face interrelated challenges. There are interactive effects between the incentives in the energy market and the incentives in the capacity market.

In Response to PJM's Path C:

It would be a mistake to attempt to engineer the energy market to administratively shift some of the capacity market missing money to the energy market. No good reason has been provided for doing so. Current efforts to do that in the Reserve Certainty Senior Task Force (RCSTF) are not transparent or well defined. The recovery of the missing money in the capacity market is, by definition, administrative and will be no less administrative if somehow included in the energy market. Recovery of the missing money in the energy market is hard to do in any predictable or verifiable way and likely to undercut the goals of stability and predictability in the markets. It has proven to be a mistake to attempt to engineer the capacity market using the flawed ELCC approach or by making arbitrary changes to the VRR curve or undermining the net energy market revenue offset in individual offers and in the definition of the VRR curve, all of which PJM has done recently.

¹ *Regional Transmission Organizations*, Order No. 2000, 89 FERC ¶ 61,285, *mimeo* at 3 (1999), *order on reh'g*, Order No. 2000-A, 90 FERC ¶ 61,201 (2000), *aff'd sub nom. Pub. Util. Dist. No. 1 of Snohomish County, Washington v. FERC*, 272 F.3d 607 (D.C. Cir. 2001).

The Capacity Market Design Should Be Improved:

There are clear warning signs for the capacity market and for PJM reliability in recent market results. The capacity market was short of meeting its reliability objective in the recent capacity auctions for the 2026/2027 BRA and the 2027/2028 BRA. PJM was also short of meeting its reliability target as of June 1, 2025, on an ICAP and a UCAP basis. The amount that PJM is short capacity grew from 208.7 MW in the 2026/2027 BRA, to 6,516.6 MW in the 2027/2028 BRA, and to 6,831.3 MW in the 2028/2029 BRA. The capacity market price impacts on customers have been very large and are not reversible. The price impacts will be even larger in the near term unless the issues associated with data center load are addressed in a timely manner, prior to the next BRA, scheduled for December 2026.

Data center load growth is the primary reason for recent and expected capacity market conditions, including total forecast load growth, the tight supply and demand balance, and high prices. But for data center growth, both actual and forecast, the capacity market would not have seen the same tight supply demand conditions, the same high prices observed in the 2025/2026 BRA, the 2026/2027 BRA, and the 2027/2028 BRA, and the currently expected tight supply conditions and high prices for subsequent capacity auctions. Forecast data center load growth has been the primary cause to date and the accuracy of those forecasts is highly questionable.

Holding aside all the other issues associated with the 2025/2026 BRA, 2026/2027 BRA, 2027/2028 BRA and 2028/2029 BRA, existing and forecast data center load by itself resulted in a significant increase in BRA revenues for each of the delivery years. Based on actual auction clearing prices and quantities and uplift MW, inclusion of existing and forecast data center load growth resulted in a combined total increase in capacity market revenues for the 2025/2026 BRA, the 2026/2027 BRA, the 2027/2028 BRA, and 2028/2029 BRA of \$29,368,774,465.^{2 3} This total will continue to grow until the issues associated with the addition of large data center loads are addressed.

The impact on the 2026/2027 and 2027/2028 BRA revenues would have been higher had PJM not used the Agreement VRR curve.⁴ If the 2026/2027 BRA had been run with PJM's

² See the "Analysis of the 2027/2028 RPM Base Residual Auction – Part A," (January 5, 2026). <https://www.monitoringanalytics.com/reports/Reports/2026/IMM_Analysis_of_the_20272028_RPM_Base_Residual_Auction_Part_A_20260105.pdf>

³ See Monitoring Analytics, LLC, "Market Monitor Report," (July 28, 2026) <https://www.monitoringanalytics.com/reports/Presentations/2026/IMM_MC_Market_Monitor_Report_20260728.pdf>.

⁴ On December 30, 2024, in Docket No. EL25-46-000, Governor Josh Shapiro and the Commonwealth of Pennsylvania filed a complaint against PJM asserting that the maximum price for PJM's capacity auctions is unjust and unreasonable. The Governor and PJM reached an Agreement. On February 20, 2025, in Docket No. ER25-1357-000, pursuant to FPA section

proposed unrestricted VRR curve, total revenues would have been \$19,294,286,100, an increase of \$3,169,915,210, or 19.7 percent, compared to the actual auction results. If the 2027/2028 BRA had been run with PJM's proposed unrestricted VRR curve, total revenues would have been \$26,324,850,846, an increase of \$9,913,272,621, or 60.4 percent, compared to the actual auction results. If the 2028/2029 BRA had been run with PJM's proposed unrestricted VRR curve, total revenues would have been \$29,722,226,243, an increase of \$13,314,277,218, or 81.1 percent, compared to the actual auction results. In other words, the inclusion of data center load in the last three auctions increased customers' bills by \$20,036,670,606, even with the maximum price from the Agreement in place. The market distorting effect of data center load would have been \$46,434,135,655 but for the Agreement. The result of the Agreement was to reduce that impact by \$26,397,465,049. Contrary to assertions that the Agreement was a typical regulatory response to high prices, the maximum price resulting from the Agreement is more consistent with a competitive outcome than would have occurred without the Agreement. The Agreement was a logical and reasonable response to the unmitigated market distortions created by unsubstantiated data center load forecasts that should not have been included in the market clearing in the first place.

PJM's proposals for a Reliability Backstop Procurement (RBP) and for an Interim Adequacy Service (IRAS) will continue to impose the costs of data centers on other customers. The capacity auction for the 2029/2030 Delivery Year to be held in December, 2026, will continue to include forecast data center load and is likely to result in shifting billions more in costs to other customers. Rather than requiring data centers to purchase capacity, the RBP is designed to require LSEs and their customers to pay for the shortfall in capacity that is a direct result of forecast data center load. The RBP permits the exercise of market power by capacity market sellers in a market that forces load to buy at the price offered by generators but allows generators the choice of offering and the choice of what price to offer. PJM will include new IRAS data center load that does not bring new generation in the VRR curve if PJM has no shortfall for three years.

Response to PJM Path A:

The longstanding and recently revived assertion that the Agreement is evidence of a so called credibility trap is not correct. The assertion that PJM market prices are never allowed to reflect shortage is demonstrably false. The assertion that there should not be a regulatory response to extreme prices that do not reflect market fundamentals is wishful thinking on the part of some but not founded in the fact that FERC uses markets to create just and reasonable rates. That argument also relies on the paternalistic

205, PJM submitted proposed revisions to its Tariff to establish a specific maximum price and minimum price for all RPM auctions for the 2026/2027 and 2027/2028 Delivery Years, consistent with the Agreement. The resultant VRR curve is termed the restricted VRR curve, or the Agreement VRR curve.

assertion that EDCs and LSEs should be required to hedge their obligations and the incorrect conclusion that if there had been hedges, load would not be paying the excess costs imposed by data center loads. Hedges can never beat the market over time because every hedge has a buyer and a seller.

There is nothing market based about the PJM VRR curve that would have been in place but for the maximum price in the Agreement. Any assertions that the PJM VRR curve represents a true market solution are unsupported and fail to recognize the distortionary effects of including unsubstantiated forecast data center load. The PJM VRR curve is based on a faulty calculation of Gross CONE and Net CONE.⁵ The PJM VRR curve, proposed by PJM in the Quadrennial Review and effective for the 2028/2029 Base Residual Auction but for the Agreement, includes a maximum price equal to the greater of 1.15 times Gross CONE minus 0.75 times Net EAS ($1.15 \times \text{Gross CONE} - 0.75 \times \text{EAS}$), or 0.2 times Gross CONE. There is no reason to inflate the maximum price and PJM has provided no logical rationale for this overstatement.

Large data center load additions have already had a significant and irreversible impact on PJM customers that will be paid through May 31, 2029, and will have additional significant impacts on other customers as a result of higher transmission costs, higher energy market prices and higher capacity market prices.

Some participants contend that PJM markets are just facing an unexpected growth in demand and that the normal supply and demand dynamics should be allowed to play out without recognition of these unique circumstances. This position is that prices should be allowed to rise, incentives to build generation will result, and supply and demand will return to balance. This simplistic view ignores the fact that it is the unexpected addition of extraordinarily high levels of data center load (largely based on unsubstantiated forecasts) that have resulted in the supply-demand imbalance. This position also ignores related underlying issues including the excessive maximum price in the capacity market, the uncertainty introduced by PJM's 2015 capacity market reforms and reliance on low probability high impact PAI penalties as a performance incentive, the uncertainty and understatement of available capacity that result from ELCC and the uncertainty hangover from the prior queue management issues. The unexpected role of data center load has created a policy issue that the Commission needs to address, consistent with the Commission's view on the role of competitive markets.

Other participants take the more radical view that the owners of existing capacity should be able to sell their resources to data centers directly and without limit. The proponents of that view have failed to explain why it is reasonable to create chaos for all the other PJM customers. Removal of significant levels of capacity from the PJM market that serves all other customers would create extreme price impacts in the energy and

⁵ See the Comments of the Independent Market Monitor for PJM, Docket No. ER26-455-000, (January 20, 2026).

capacity markets, reliability shortfalls in the capacity market, and blackouts from inadequate energy. This is not speculation. This is simple math and logic.

Improvements to the PJM Market Design:

Markets cannot automatically solve all problems and it is not enough to simply assert that the market will solve all the problems associated with data center load. The wholesale power markets created by FERC need rules and include rules based on the Commission's judgment about the appropriate rules required to meet the Commission's objectives. FERC relies on competitive markets to be a more effective substitute for traditional economic regulation. FERC's rules about market design and rules governing demand and supply are essential to creating the conditions under which markets can work, in significant part because there is endemic structural market power in the capacity market. The decisions about the interconnection of large new data center loads when there is not enough capacity to maintain system reliability are public, regulatory decisions because they are about competitive outcomes that are in the interests of all market participants. PJM markets are not laissez faire markets.

There is a path forward that does not use the current data center issues as a pretext for redefining fundamental elements of the PJM market design. That path starts with the recognition that the source of the current issues is data center load. The next step is to provide a mechanism for data center load to be served reliably while not distorting prices for all other customers. That step would remove data center load from the next BRAs and rely on bilateral contracts between data centers and generators, whether from negotiated bring your own new generation ("BYONG") contracts or from a reliability backstop auction. The rest is details. In contrast, PJM's proposal will ensure that other customers will continue to pay the price for the addition of data center load.

It is clear that continuing to simply accept the interconnection of large data center loads that cannot be served reliably because there is not adequate dispatchable capacity, is not a reasonable path forward and is not an efficient or competitive market solution and is not a solution of any kind. That path leads to continued shortfalls, increased reliability issues, continued maximum prices, and continued calls to abandon markets.

The current supply of capacity in PJM is not adequate to meet the demand from large data center loads and will not be adequate in the foreseeable future. This is a simple factual issue. There is not enough capacity currently to meet the data center load. The solution is not to create reliability issues and wealth transfer issues by clearing the capacity market at the maximum price and at a quantity less than the reliability requirement by allowing the ongoing interconnection of large data center loads without adequate generation to serve them and without a clear path to adding the required capacity or to defining full curtailability.

The market solution is to require data centers to bring their own new generation. This would include an expedited fast track load and generation interconnection process for large new data center loads that bring their own new generation with locational and

temporal characteristics reasonably matched to their load profile. The preferred solution would include creating a queue for the addition of large new data center loads, which would not be interconnected until there is adequate capacity to serve them. This broad bring your own new generation solution to the issues created by the addition of unprecedented amounts of large data center load does not require a continued massive wealth transfer through ongoing shortage pricing. It is essential to have a pragmatic market solution that is consistent with and sustains efficient and competitive PJM markets rather than to create the conditions for a return to cost of service regulation or a variant of cost of service regulation.^{6 7 8}

All loads should be served. All loads should be served reliably. The process for adding large data center loads should be transparent. All loads should benefit from competitive markets. All loads should have equal access to the transmission system. All loads should be treated as full transmission customers. All loads and generation are and should be on the grid and the grid is highly interconnected.

The temptation to create complex regulatory structures to shift data center costs and risks to other customers should be resisted. PJM's filing fails to resist that temptation.⁹ The Market Monitor filed a detailed response at FERC to PJM's RBP filing.¹⁰ The Market Monitor will file a detailed response to PJM's IRAS filing. A few of the basic issues are identified here. The PJM filing is fatally flawed for a number of reasons. The filing would explicitly remove protections against market power by eliminating the single clearing price competitive design, by eliminating the maximum price, by failing to define a competitive offer, and most importantly by undermining the longstanding must buy/must sell PJM capacity market design. The filing fails to recognize that the target shortfall MW are entirely comprised of forecast data center load. PJM would allocate the costs that result from the backstop auction to PJM LSEs and their customers on a nonmarket basis. PJM's proposal to allocate the costs of the reliability backstop auction to LSEs with data center load that are defined to be short is inconsistent with the basic

⁶ In response to the proposed use of a backstop auction to create a market mechanism to facilitate data center load bringing its own new generation, the MMU has made a proposal.

⁷ See Monitoring Analytics, LLC, Reliability Backstop Auction Design Proposal – V6, which can be found at <<https://www.monitoringanalytics.com/reports/Presentations/2026/IMM%20Backstop%20auction%20design%20proposal%20-%20V6%202026.06.19.pdf>>.

⁸ See the 2026 *Quarterly State of the Market Report for PJM: January through March*, Section 1: Introduction.

⁹ See *Reliability Backstop Procurement to Address Resource Adequacy Concerns Stemming from Large Loads*, PJM Interconnection L.L.C., Docket No. ER26-3380-000 (July 31, 2026).

¹⁰ Comments of the Independent Market Monitor for PJM, Docket No. ER26-3380-000 (August 19, 2026) <https://www.monitoringanalytics.com/filings/2026/IMM_Protest_Docket_No_ER26-3380_20260821.pdf>.

design of the PJM Capacity Market. The reliability backstop auction should be solely for data center load rather than imposed on other customers. The costs and risks of data center load should be assigned to data center load and not to LSEs and to their other customers as a result. The PJM filing ignores the fundamental locational aspect of the PJM Capacity Market, creating the likelihood that all customers will have to pay for locational capacity market price differences, for increased energy costs from an inefficient dispatch, and for the transmission upgrades needed to move power from the resources to the load. The PJM filing fails to require that the output of the accepted supply offers reasonably matches the energy usage of data centers. The failure to match will result in data center load increasing energy prices for all customers.

PJM's RBP proposal imposes costs and risks that result from data center load on PJM customers through LSEs and is therefore not consistent with the ratepayer protection pledge. The PJM filing is not consistent with either the Principles or the Pledge.

PJM's proposal explicitly shifts significant risk to other PJM customers. Other PJM customers, whether residential, commercial or industrial, should not be treated as a free source of insurance, or collateral, or financing for data centers. Yet that is what the PJM backstop auction would actually do. Although presented in superficially complex PJM tariff and legal terms, the proposals would shift risk to other PJM customers who would have no choice in the matter. Making LSEs the counterparty to transactions and requiring LSEs to bilaterally acquire capacity resources would shift risk to the other customers of each LSE in addition to radically changing the capacity market design and returning to the pre-markets period when generation owners exercised market power against competitive LSEs.

Running a backstop auction with the shortfall from the prior BRA based on forecast data center load, directly increases costs for all other customers and imposes the risks associated with uncertain data center forecasts on other customers. The issue of shifting risk is not a general concern to be put off to the uncertain future but must be a core element of any backstop proposal.

The most fundamental flaw in PJM's approach is PJM's mistaken narrative that the PJM Capacity Market is primarily a bilateral market. That assertion is not correct. That assertion is not supported by history. That assertion is not supported by the actual capacity market design and the actual functioning of the PJM Capacity Market. The capacity market was implemented in 1999 at the request of the Pennsylvania Public Utility Commission in order to prevent existing generation owners from exercising market power against new entrant competitive LSEs. That market power could be exercised because the only source of capacity for a new entrant LSE to meet its reliability obligation was a bilateral contract with existing generation owners. Then, as now, the ownership of capacity was highly concentrated and the generation owners had the ability to exercise market power in those bilateral negotiations. The solution was a competitive capacity market that required all generation owners to sell their capacity at a competitive price and all LSEs to buy the capacity needed to meet their reliability

requirements at a competitive price. The result was access to competitively provided capacity that permitted competitive new entrant LSEs to compete with the incumbent utilities to meet load.

PJM's proposal would reverse the advantages of the competitive capacity market and restore market power through bilateral contracts and the requirement that each LSE meet its data center load through bilateral contracts for capacity. Data center loads are not the responsibility of the LSEs where the data centers choose to locate or of the other customers of the LSEs. Data center loads should pay their own costs and cover their own risks.

The Costs of Wholesale Power

One of the benefits of competitive power markets is that changes in input prices and changes in the balance of supply and demand are reflected immediately in energy prices for both price decreases and price increases. Energy prices increased in the first six months of 2026 from the first six months of 2025. The real-time load-weighted average LMP in the first six months of 2026 increased \$20.79 per MWh, or 40.2 percent, from the first six months of 2025, from \$51.75 per MWh to \$72.54 per MWh.

Of the \$20.79 per MWh increase in the real-time load-weighted average LMP, \$9.43 per MWh (45.3 percent) was the transmission constraint penalty factor component of LMP, \$7.26 per MWh (34.9 percent) was the fuel and consumables cost components of LMP, \$1.82 per MWh (8.8 percent) was the market power components of LMP, and \$1.06 per MWh (5.1 percent) was the emissions cost components of LMP.

The total cost of wholesale power increased in the first six months of 2026 from the first six months of 2025. Energy costs (63.5 percent), capacity costs (17.1 percent) and transmission costs (17.4 percent) are the three largest components of the total cost of wholesale power, comprising 98.0 percent of the total cost per MWh in the first six months of 2026. The total cost of energy per MWh increased by \$23.47 from \$49.21 in the first six months of 2025 to \$72.68 in the first six months of 2026, an increase of 47.7 percent. The total cost of capacity per MWh increased by \$13.23 from \$6.39 in the first six months of 2025 to \$19.61 in the first six months of 2026, an increase of 207.1 percent. The total cost of transmission per MWh increased by \$1.06 from \$18.82 in the first six months of 2025 to \$19.88 in the first six months of 2026, an increase of 5.6 percent. The total cost per MWh of wholesale power increased by \$38.34 from \$76.16 in the first six months of 2025 to \$114.50 in the first six months of 2026, an increase of 50.3 percent.

The inclusion of data center load in the capacity market resulted in an increase in capacity costs and a corresponding increase in the total cost of wholesale power in PJM. In the first six months of 2026, the total cost per MWh of wholesale power increased by \$11.11 (9.7 percent) from \$103.40 to \$114.50 as a result of the inclusion of data center load in the PJM Capacity Market. This cost increase does not include the impact on energy or transmission costs.

Specific PJM Market Design Improvements:

While there are multiple centrifugal forces acting on PJM markets, there are still options available to maintain well functioning markets. Steps that can and should be taken immediately to offset those forces include: implement a bring your own new generation option for the interconnection of large new data center loads including a targeted backstop auction; improve the ELCC/CP capacity market design; enhance the PJM reserve products to address intermittent resource uncertainty; create rules for the competitive and transparent advanced commitment of generation for extreme weather; identify the availability of firm gas supply and gas transportation; require generators to procure natural gas transportation; ensure transparent information from pipelines; identify the need for dual fuel capacity; modify the RMR process; add comprehensive expedited queue options under PJM control to replace retiring resources and address immediate reliability issues; ensure integrated PJM transmission and reliability planning; ensure that large new loads are not subsidized or given preferential treatment; ensure that market power mitigation measures are strengthened and clarified, not eroded; facilitate more competition for transmission projects; and include direct comparisons between generation and transmission options to address reliability issues.

The assertion that yet another holistic review of PJM markets is required or is a panacea is, for many, merely a euphemism for raising prices. PJM has pursued a range of arbitrary mechanisms for raising prices, from extreme ORDCs, to fast start pricing, to unsupported increases in reserve requirements, to transmission constraint penalty factors, to PJM's version of ELCC, to modified capacity market demand curves that artificially reduce the net energy market revenue offset.

The goal of the ongoing review of PJM markets should be to continue to refine the PJM market design in order to permit supply and demand fundamentals to be reflected in prices in a transparent and predictable manner. The goal should be to avoid micromanaging market design features to achieve specific price outcomes or to continuously change the market rules in an effort to reach a desired result. Capacity market prices will be higher for organic load as the higher marginal costs of capacity are revealed in the capacity market. Energy market prices reflect input costs whether higher or lower.

PJM markets do not need a holistic review. The goal should be continuous improvement rather than continued crisis management. The focus should be on the fact that PJM markets and the underlying software need to be operated as efficiently as possible, relying on fully updated software. PJM's improved and approved market power mitigation process cannot work until PJM commitment and dispatch software is upgraded. These upgrades have been delayed by multiple years and have no firm expected implementation date. PJM's communications software and methods for providing information to generating units need to be fully updated. PJM operators need to have tools for advance scheduling and fuel inventory tracking that permit the efficient use of resources under extreme conditions.

The evolution of wholesale power markets is far from complete. The PJM markets need rules in order to provide reliable energy through competition. The foundational principle of using markets, with rules to prevent the exercise of market power and provide competitive results, is essential. Private investors, regardless of technology or subsidies, will put capital at risk and earn compensatory returns in markets that are not skewed in favor of any specific technology and in markets that are stable and that do not add risk and volatility. The core elements of the PJM market design remain robust. The use of locational marginal prices (LMP) in the energy market and partially locational prices in the capacity market continue to be essential to getting the price signals right. Technological and policy changes do not require that the core elements change. However, the market design can and must be improved and made more reliable and more efficient and more competitive. The current PJM ELCC capacity market design adds unnecessary risk and volatility that are not part of the market fundamentals. The ELCC approach needs to be applied on a unit specific basis, incorporate hourly supply and demand matching, and pay resources based on actual availability and performance rather than on assumed performance derived from a very limited data set of misinterpreted performance results based on unrepresentative extreme historical weather and specific PJM commitment and dispatch decisions. The capacity market also needs to eliminate artificial PAI risk that leads to uneconomic retirements and exits from PJM and establish effective performance incentives that apply every day. The basic logic of market power mitigation in both energy and capacity markets needs to be restored. The queue process should allow for a comprehensive, expedited process to resolve identified reliability issues. There should be an expedited interconnection process for large data center load additions that bring their own generation. Competition to build transmission, to implement dynamic line ratings (DLR) and to add grid enhancing technologies (GETs) should be expanded.

In the interests of all market participants, PJM, its current and potential market participants and stakeholders, PJM states, PJM customers, and the FERC will need to continue to work constructively to refine the competitive market design and to ensure the continued effectiveness of PJM markets in providing customers wholesale power at the lowest possible price, but no lower. PJM should be required to act in the public interest rather than acting as a membership organization.