UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Sierra Club, et al.,

v. Docket No. EL24-148-000

PJM Interconnection, L.L.C.

COMMENTS AND MOTION TO LODGE OF THE ORGANIZATION OF PJM STATES, INC.

On September 27, 2024, the Sierra Club, Natural Resources Defense Council, Public Citizen, Sustainable FERC Project, and the Union of Concerned Scientists ("Complainants") filed a complaint pursuant to section 206 of the Federal Power Act asserting that PJM's capacity market rules are unjust and unreasonable because they fail to account for the resource adequacy contributions of Reliability Must Run ("RMR") units in PJM's capacity auctions.[1] OPSI agrees, but is concerned that complainants may be underestimating the true cost impact by failing to account for different parameters in *future* auctions.[2] Therefore, the Commission should direct PJM to revise its capacity market construct to reflect the reliability contribution of these resources even if FERC must direct PJM to delay the 2026/2027 Base Residual Auction ("BRA") scheduled for this December. Failing to consider the reliability contribution of RMR units in the 2025/2026 BRA imposed unjust and unreasonable costs on consumers. Without revisions, PJM's failure to consider

[1] Sierra Club, et al., *Complaint of Sierra Club, Natural Resources Defense Council, Public Citizen, Sustainable FERC Project, and Union of Concerned Scientists*, EL24-148-000 (Sept. 27, 2024) ("Complaint").

[2] OPSI's following members support these Comments: the Delaware Public Service Commission, Public Service Commission of the District of Columbia, Illinois Commerce Commission, Kentucky Public Service Commission, Maryland Public Service Commission, Michigan Public Service Commission, New Jersey Board of Public Utilities, Tennessee Public Utility Commission, Virginia State Corporation Commission, and Public Service Commission of West Virginia. The Indiana Utility Regulatory Commission, North Carolina Utilities Commission, Public Utilities Commission of Ohio, and Pennsylvania Public Utility Commission abstained in the vote on this filing.

the reliability contribution of RMR units in the 2026/2027 BRA will impose additional unjust and unreasonable costs on consumers.

I. COMMENTS

The Complainants argue that PJM's capacity market rules are not just and reasonable because they fail to account for the resource adequacy contributions of generating units operating under an RMR arrangement.[3] They call on the Commission to order PJM reform its capacity market rules to consistently account for the resource adequacy contributions of RMR units and establish a refund effective date of September 27, 2024.[4] OPSI agrees that PJM should require units operating pursuant to an RMR arrangement be included in PJM's capacity construct as available capacity, and OPSI stated this in a letter to the PJM Board on September 27, 2024.[5] OPSI wrote, "If these units will be available for dispatch during the relevant Delivery Year, the reliability value of these units should be duly reflected when settling the capacity market."[6] OPSI concluded by asking the PJM Board to "direct PJM staff to determine appropriate procedures, requirements, and notice to include the RMR capacity as available capacity for the 2026/2027 BRA."[7]

Complainants assert that PJM forces customers to pay twice for the same capacity by not requiring RMR units to bid into the capacity market or adjust its capacity procurement targets to account for the reliability contribution of RMR units.[8] They argue that this "creates a degree of scarcity that does not exist."[9] In its letter, OPSI cited analysis that indicates the exclusion of RMR

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[3] Complaint at 1.
[4] *Id.*
[5] OPSI, Letter to PJM Board of Managers at 2, (Sept. 27, 2024) available at: https://opsi.us/wp-content/uploads/2024/09/OPSI-BRA-RESPONSE-LETTER-2024.09.27.pdf ("OPSI Letter").
[6] *Id* at 3.
[7] *Id.*
[8] Complaint at 2.
[9] *Id.* at 4.

units from the 2025/2026 Base Residual Auction ("BRA") created "artificial scarcity" which drove up capacity prices by $4 - $5 billion.[10]

Complainants assert that failure to account for RMR capacity will likely cost consumers $4 - $5 billion in future auctions.[11] OPSI agrees that excluding RMR capacity from the supply stack will cost consumers at least this much. However, the actual cost impact could be far greater because the $4 - $5 billion cost estimate does not account for changes to the BRA parameters that make the BRA clearing price far more sensitive to the amount of cleared capacity. As shown in Attachment B to this filing, when accounting for these parameter changes the actual cost impact to consumers of excluding RMR capacity from the supply stack in the 2026/2027 BRA *alone* could be as high as $14.5 billion.[12]

Complainants' witness states that market participants are unlikely to respond to "distortion[s] of the actual conditions on the system"[13] and that associated increases in capacity prices "will only provide windfall profits to existing generators, rather than facilitating necessary new entry."[14] They conclude by arguing PJM's current rules which allow RMR units to decide whether or not their reliability value will be considered in PJM's capacity construct is not just and reasonable.[15] OPSI asserted that the exclusion of RMR units from PJM's capacity construct, coupled with PJM's use of the Gross CONE of a combined-cycle natural gas unit to establish the maximum price of the Variable Resource Requirement ("VRR") curve could expose customers to

[10] OPSI Letter at 3
[11] Complaint at 4.
[12] *See infra*, Att. B.
[13] Complaint, Affidavit of James F. Wilson at P 33.
[14] Complaint at 41.
[15] *Id.* at 43.

capacity prices of nearly $700/MW-day in the 2026/2027 delivery year "and could send a price signal that only acts as a transfer of wealth from load to generators."[16]

Complainants state that three specific issues, "the anticipated slate of retirements, the slow pace of PJM's interconnection queue, and inadequate transmission planning to address foreseeable retirements", may cause RMR arrangements to become more common in the future.[17] They ask the Commission to delay the upcoming auction "for a limited time" and require PJM to revise its tariff or allow PJM to run the 2026/2027 Base Residual Auction subject to refund.[18]

Additionally, OPSI stated that PJM's lack of a must-offer requirement for intermittent and storage resources, its use of a combined-cycle natural gas unit as the reference resource in its VRR curve, and the failure of its Effective Load Carrying Capability ("ELCC") accreditation methodology to consider the full reliability contribution of thermal resources in the winter, requires the PJM Board take immediate action to ensure future auction results reflect market fundamentals even if this required a slight delay in the 2026/2027 BRA.[19] Complainants also encouraged PJM to delay its auction to correct RMR participation rules, but the PJM Board of Managers refused.[20]

As it stated in its letter to the PJM Board, OPSI has serious concerns that the 2025/2026 BRA did not send prices consistent with market fundamental and that these issues could worsen

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[16] OPSI Letter at 4.
[17] Complaint at 26.
[18] *Id*. at 53.
[19] OPSI Letter at 3-4.
[20] *See* Sierra Club, Earthjustice, Union of Concerned Scientists, Natural Resources Defense Council, and Public Citizen, Letter to PJM Board of Managers re: Support for Urgent Reforms Regarding Reliability Must Run Units and the PJM Capacity Market (Sept. 6, 2024) available at: https://www.pjm.com/-/media/about-pjm/who-we-are/public-disclosures/2024/20240906-pios-letter-of-support-to-pjm-bard-on-rmrs-in-rpm.ashx. *See also* PJM Board of Managers, PJM Board Response to Consumer Advocates' Letter Regarding Urgent Reforms to the PJM Capacity Market Regarding Reliability Must Run Units (Sept. 19, 2024) available at: https://www.pjm.com/-/media/about-pjm/who-we-are/public-disclosures/2024/20240919-pjm-board-response-consumer-advocates-letter-re-urgent-reforms-pjm-capacity-market-re-reliability-must-run-units.ashx.

with the 2026/2027 BRA.[21] Therefore, OPSI urges the Commission to grant the complaint and require PJM to revise its capacity market rules to ensure RMR capacity is reflected as available capacity when settling the capacity market even if that requires FERC to direct PJM to slightly delay the 2026/2027 BRA.

II. MOTION TO LODGE

Pursuant to Rule 212 of the Federal Energy Regulatory Commission's ("FERC" or "Commission") Rules of Practice and Procedure, 18 C.F.R. § 385.212, OPSI moves to lodge a letter it wrote to the PJM Board of Managers dated September 27, 2024.[22] Generally, the Commission finds good cause to grant a motion to lodge where the information will supplement the record in the proceeding and may assist the Commission in the decision-making process.[23] OPSI's letter discusses not just the RMR issue raised by Complainants but provides the Commission important context related to the issues in the complaint, and it provides the Commission with additional context to inform the Commission's decision making. Therefore, the Commission should grant this motion to lodge OPSI's September Letter in this docket.

III. CONCLUSION

For the reasons stated above, OPSI respectfully requests, the Commission grant the complaint and find PJM's capacity market rules are unjust and unreasonable because they create prices signals that are not consistent with market fundamentals.

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[21] OPSI Letter at 5.
[22] OPSI Letter, Attachment A.
[23] *See Consumers Energy Co. v. Midcontinent Indep. Sys. Operator, Inc.*, 167 FERC ¶ 61,212, at P 11 (2019) ("Motions to lodge information from other proceedings may be appropriate in some instances to supplement the Commission's record."); *see, e.g.*, *Indep. Power Producers of N.Y., Inc.*, 150 FERC ¶ 61,214, at P 63 (2015) (accepting motions to lodge because the documents provided aided in the Commission's disposition of matters raised in the complaint); *Xcel Energy Southwest Transmission Co.*, 149 FERC ¶ 61,182, at PP 9, 63 (2014) (accepting motion to lodge providing information that assisted FERC in its decision-making process).

Respectfully Submitted,

Gregory V. Carmean
Executive Director
Organization of PJM States, Inc.
700 Barksdale Road, Suite 1
Newark, DE 19711
302-266-0914
greg@opsi.us

Benjamin B. Sloan
Director of Legal and Regulatory Affairs
Organization of PJM States, Inc.
700 Barksdale Road, Suite 1
Newark, DE 19711
601-214-8481
ben@opsi.us

Dated: October 8, 2024

CERTIFICATE OF SERVICE

I hereby certify that the foregoing has been served in accordance with 18 C.F.R. Section 385.2010 upon each person designated on the official service list compiled by the Secretary in this proceeding.

/s/ Gregory V. Carmean
Gregory V. Carmean
Executive Director
Organization of PJM States, Inc.
700 Barksdale Road, Suite 1
Newark, DE 19711
Tel: 302-266-0914

Dated at Newark, Delaware this October 8, 2024.

Attachment A
OPSI Letter to PJM Board of Managers
September 27, 2024

Organization of PJM States, Inc. (OPSI)

President: **Hon. Emile C. Thompson** *Chairman, PSC of District of Columbia*
Vice President: **Vacant**
Secretary: **Hon. Dennis P. Deters** *Commissioner, PUC of Ohio*
Treasurer: **Hon. Michael T. Richard** *Commissioner, Maryland PSC*

Members:
Delaware Public Service Commission ● Public Service Commission of District of Columbia ● Illinois Commerce Commission Indiana Utility Regulatory Commission ● Kentucky Public Service Commission ● Maryland Public Service Commission Michigan Public Service Commission ● New Jersey Board of Public Utilities ● North Carolina Utilities Commission Public Utilities Commission of Ohio ● Pennsylvania Public Utility Commission ● Tennessee Regulatory Authority Virginia State Corporation Commission ● Public Service Commission of West Virginia.

September 27, 2024

Mr. Mark Takahashi, Chair, PJM Board of Managers
Mr. Manu Asthana, PJM President, and CEO
PJM Interconnection, L.L.C.
2750 Monroe Boulevard
Audubon, Pennsylvania 19403

Dear Mr. Takahashi and Mr. Asthana:

On July 30, 2024, PJM Interconnection, L.L.C ("PJM") released the results of the Base Residual Auction ("BRA") for the 2025/2026 Delivery Year. The clearing price for the region increased from $28/MW-day for the 2024/2025 Delivery Year to $270/MW-day, resulting in $14.7 billion in costs to consumers[1] and causing widespread concern about the swift and steep increase in prices.[2] Changes to PJM's planning parameters for the upcoming auction in December are further cause for concern. States in the PJM region rely on a well-functioning, robust competitive market to ensure electric reliability served at lowest cost in accordance with relevant laws and regulations. However, PJM's capacity market construct appears to have flaws that require the PJM Board's immediate attention and timely resolution.

On September 20, 2024, the Independent Market Monitor for PJM ("IMM") released a report concluding that these results "were significantly affected by flawed market design decisions" as well as "the exercise of market power" and thus "do not solely reflect supply and demand fundamentals."[3] The IMM found that these defects will force consumers to pay billions more for capacity than they would in a well-functioning

[1] PJM, 2025/2026 Base Residual Auction Report at 3 (July 30, 2024) available at: https://pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2025-2026/2025-2026-base-residual-auction-report.ashx.
[2] OPSI's following members support this letter: the Delaware Public Service Commission, Public Service Commission of the District of Columbia, Illinois Commerce Commission, Kentucky Public Service Commission, Maryland Public Service Commission, Michigan Public Service Commission, New Jersey Board of Public Utilities, Pennsylvania Public Utility Commission, Tennessee Public Utility Commission, Virginia State Corporation Commission, and Public Service Commission of West Virginia. The Indiana Utility Regulatory Commission, North Carolina Utilities Commission, and Public Utilities Commission of Ohio abstained in the vote on this letter.
[3] Independent Market Monitor for PJM, Analysis of the 2025/2026 RPM Base Residual Auction Part A 4-5 (Sept. 20, 2024) available at https://www.monitoringanalytics.com/reports/Reports/2024/IMM_Analysis_of_the_20252026_RPM_Base_Residual_Auction_Part_A_20240920.pdf ("IMM Analysis").

market.[4] Moreover, changes to PJM's planning parameters for the 2026/2027 BRA include a maximum potential capacity price of nearly $700/MW-day. These flaws could lead to the upcoming auction clearing at the maximum capacity price which would assign a total cost to customers of over $30 billion for the 2026/2027 Delivery Year—more than double what customers will pay for the 2025/2026 Delivery Year. This is unacceptable. The PJM Board must address these fundamental market flaws prior to the next BRA, so that consumers are assured just and reasonable capacity prices.

PJM has stated that there are four primary reasons for the increased prices: 1) increased demand; 2) decreased generation; 3) new results in its Reserve Requirement Study, and 4) changes made through last year's Critical Issues Fast Path ("CIFP") process for resource adequacy.[5] Generally, OPSI does not disagree with PJM that generation is retiring faster than new resources are coming online, and OPSI supports prices that reflect market fundamentals However, in proposing its recent capacity market changes to the Federal Energy Regulatory Commission ("FERC") in 2023, PJM predicted that the proposed market rule changes, under tighter system conditions, could result in a cost increase of between $4.3 and $5.1 billion.[6] However, the actual increase was well over $12 billion – an outcome significantly higher than PJM expected even under extreme conditions.

Further, the IMM's analysis raises concerns for OPSI around the efficacy of reforms put in place during the CIFP process, which focused on resource accreditation and risk modeling. OPSI appreciates that in the PJM Board's recent letter to several consumer advocates, the Board states, "[T]here are [] actions we believe are important to pursue to try to ensure that market prices correctly reflect the supply-demand challenge we are experiencing."[7] The PJM Board also stated that "PJM will work with the IMM" to ensure resources' decision to not offer is justified on a stand-alone basis and not made to benefit other resources in the resource owners' portfolio.[8]

Yet, in that same letter the PJM Board signaled it does not intend to make any market changes before the 2026/2027 BRA. PJM's reluctance to review and improve aspects of its capacity construct in the near term is troubling, as is its failure to investigate the potential design flaws and exercise of market power that may have led to unreasonably high prices in the 2025/2026 BRA.

The Third Circuit Court of Appeals has recently held that once a legal consequence attaches to an action during PJM's pre-auction activities, that action may not be altered and FERC may not alter the result of that auction except in certain rare circumstances.[9] In light of this reality, disciplined and thorough analysis is needed before initiating an auction that could significantly impact the lives of the over 65 million customers in our states. PJM should examine actions it can take before running an auction for the 2026/2027

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[4] *See id.* at 8-12 (quantifying the cost to consumers of various capacity market design decisions and the exercise of market power); *id.* at 3-4 (explaining how certain resources' categorical exemptions from the must-offer requirement enabled them to drive capacity prices above competitive levels).

[5] PJM, 2025/2026 Base Residual Auction Results presented at the PJM MRC at slide 10 (Aug. 21, 2024) available at: https://www.pjm.com/-/media/committees-groups/committees/mrc/2024/20240821/20240821-item-08---2025-2026-base-residual-auction---presentation.ashx.

[6] PJM Interconnection L.L.C., *Capacity Market Reforms to Accommodate the Energy Transition While Maintaining Resource Adequacy*, Docket No. ER24-99-000, Attachment D, Affidavit of Dr. Walter Graf on Behalf of PJM Interconnection, L.L.C. at P 37 (Oct. 13, 2023) (Graf Affidavit).

[7] PJM Board Response Consumer Advocates Letter Re Urgent Reforms PJM Capacity Market Re Reliability Must Run Units dated September 19, 2024 ("PJM Board Letter").

[8] *Id.*

[9] PJM Power Providers Grp. v. FERC, 96 F.4th 390 (3d Cir. 2024).

delivery year to ensure the costs assigned to customers are just and reasonable. To this end, OPSI recommends the PJM Board direct PJM to take action on six items – four before the next auction, even if it requires a slight delay, and two that should be prioritized soon after.

Before the Next Auction

1. Reliability Must Run ("RMR") Units

The PJM Board should direct PJM to consider mandating that capacity of generating units that are under RMR contracts and expected to be operational during the relevant Delivery Year be included as available capacity. Under current auction rules, generating units that are under RMR contracts are not required to offer into PJM's capacity auctions, nor are they included in the bid stack, even if they are contracted to remain online to preserve reliability. While RMR units are included in calculations for local reliability requirements,[10] they are not included in the supply curve.[11] PJM must examine this inconsistency and how the reliability value of RMR units is included in the capacity market and whether adjustments are appropriate. If these units will be available for dispatch during the relevant Delivery Year, the reliability value of these units should be duly reflected when settling the capacity market.

Recent analysis estimated that the exclusion of these resources in the July auction created artificial scarcity, which alone drove up capacity prices by roughly $5 billion,[12] and the IMM's 2025/2026 BRA analysis confirms a market outcome impact approaching this amount.[13] The PJM Board should direct PJM staff to determine appropriate procedures, requirements, and notice to include the RMR capacity as available capacity for the 2026/2027 BRA.

2. Must Offer Requirements for All Capacity Resources

The fact that not all generators are required to participate in PJM's capacity auctions may lead to an inaccurate assessment of supply scarcity in the region. The IMM's 2025/2026 BRA analysis recommends that the must-offer requirement be applied to all capacity resources.[14] The analysis cautions that a failure to apply this requirement to all resources will create market power issues as capacity from intermittent and storage resources increases.[15] The analysis further cautions that this lack of a requirement will create price volatility and uncertainty in the market.[16] OPSI agrees that all capacity resources must participate in PJM's capacity construct to prevent resource owners from not offering some portions of their portfolio to benefit other portions of their portfolio.

Exceptions to the must offer requirement for generation resources undermine a key component of the capacity market where consumers must buy capacity no matter how high the price. It is important that PJM

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[10] PJM Response to the 2023 State of the Market Report, at 3-4 (August 2024) available at: https://www.pjm.com/-/media/library/reports-notices/state-of-the-market/20240822-pjm-response-to-the-2023-state-of-the-market-report.ashx.

[11] IMM Analysis at 9 ("In summary, holding everything else constant, the fact that the RMR resources in the BGE LDA were not included in the supply curve at $0 per MW-day resulted in a 41.2 percent increase in RPM revenues, $4,287,256,309, for the 2025/2026 RPM Base Residual Auction compared to what RPM revenues would have been had the capacity of those RMR resources been included in the supply curve at $0 per MW-day.").

[12] Synapse Energy Economics, Bill and Rate Impacts of PJM's 2025/2026 Capacity Market Results & Reliability Must-Run Units in Maryland (Aug. 29, 2024) available at: https://opc.maryland.gov/Portals/0/Files/Publications/RMR%20Bill%20and%20Rates%20Impact%20Report_2024-08-13%20Final%20corrected%208-29-24.pdf?ver=fHKa18_idtwi4Rm4OeK-7A%3d%3d.

[13] IMM Analysis at 2.

[14] IMM Analysis at 3.

[15] OPSI recognizes that capacity related penalties must correspond to the ability for those resources realistically to perform.

[16] Graf Affidavit at 5.

consider having all resources that are expected to be online and producing power offer into PJM's capacity auctions. This includes all intermittent and storage resources with capacity interconnection rights, which make up the vast majority of resources waiting to interconnect to PJM's system. OPSI has long been in alignment with these concerns.

3. Maximum Capacity Price

Given changes to PJM's planning parameters, PJM's 2026/2027 BRA could produce prices that reach almost $700 MW/day and assign costs over twice as high as the $14.7 billion assigned to customers in July. OPSI appreciates the PJM Board's commitment to reevaluate the demand curve it uses, specifically the maximum price, to ensure it sends a price in response to supply scarcity. However, PJM should prioritize reforms that would apply to the 2026/2027 BRA. Otherwise, beginning with the next auction, PJM's updated reference resource will be in effect and the demand curve price cap will be set based on the gross cost of developing a combined-cycle natural gas unit ("CCNG") instead of a combustion turbine, which PJM used in the July auction.

OPSI has become concerned that basing the VRR curve price cap on the gross Cost of New Entry ("CONE") of a CCNG unit may be problematic due to the substantial energy and ancillary service ("E&AS") revenues that a CCNG unit would receive. With a higher E&AS offset, CCNG would not be as dependent on capacity revenues as a combustion turbine and could send a price signal that only acts as a transfer of wealth from load to generators. Furthermore, recognizing that the nonperformance penalty is tied to Net CONE and Net CONE is set at $0 in most of the RTO for the next auction, PJM will effectively be permitting many cleared resources to fail to operate when called upon for dispatch with no prospect of punitive consequences.

4. ELCC Accreditation

The PJM Board should direct PJM to conduct a review of its newly implemented marginal Effective Load Carrying Capability ("ELCC") methodology as soon as possible. It is not clear that the current methodology allows resources that can serve the region in the times of the year deemed riskiest by PJM to offer their full value into PJM's capacity auctions. More immediately, and prior to the next auction, OPSI urges PJM to review and remedy the use of summer ratings as a cap for thermal-resource accreditation, which, as the IMM's analysis explains, may "unnecessarily limit[] supply" because most of the risk used in PJM's accreditation methodology is winter risk.[17] The IMM's analysis further cautions that the use of these summer ratings affects the accreditation of other resources, the auction's reliability requirement, and the assignment of capacity interconnection rights.[18] The IMM estimates, "[T]he use of summer ratings rather than winter ratings for [combined cycle] and [combustion turbine] resources in the marginal ELCC based accreditation resulted, depending on the impact on the reserve margin, in… a 22.7 percent to a 118.1 percent increase in RPM revenues, $2,721,494,123 to $7,953,702,391, for the 2025/2026 RPM Base Residual Auction."[19] OPSI is concerned that the value of natural gas units may be an underrepresentation of those units' ability to reduce winter risk. PJM's methodology relies on historic unit performance that may not reflect recent unit upgrades and PJM's more recent winter period operational practices, and it may cap their expected performance at an unrealistically low level.

<u>After the Next Auction</u>

5. Sub-Annual Capacity Construct

[17] *Id.* at 6.
[18] *Id.*
[19] *Id.* at 8.

It is critical that PJM begin work studying and implementing a sub-annual capacity market which could more accurately capture risk than PJM's current construct. This would allow generators to more accurately offer their contribution to reducing risk on the system. OPSI emphasized this in comments to FERC and the PJM Board last year with the expectation that once FERC accepted PJM's proposal PJM would begin this work "as soon as possible."[20]

6. Continued Improvements to the Interconnection Process

Lastly, the PJM Board must continue to prioritize reforms to PJM's interconnection process. New generating resources are not able to interconnect to PJM's system in a timely manner, which is one of the fundamental responses PJM should get from the market sending high prices. Because PJM's capacity construct and interconnection process have been consistently delayed and disrupted over the past few years, PJM's capacity auctions are not sending price signals to which new resources can actually respond. OPSI recognizes that there are forces outside of PJM's control that affect how fast resources can interconnect and that there may be resources with PJM approval in hand that have not begun construction. As an example, resources with signed interconnect agreements, or those close to execution, are likely to have challenges getting siting permits given the long interconnect processing delays of the past interconnect process, and that significant supply chain issues still exist for vital equipment such as transformers. However, PJM must do everything in its control to process new generation requests as quickly as possible and to ensure that generation approved to come online can do so. OPSI appreciates the PJM Board's intention to advance a proposal to "fast-track" some incremental generation projects,[21] as it could be an important element of the Holistic Immediate Needs approach recommended by OPSI. [22]

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In closing, OPSI has serious concerns that the capacity prices customers will pay as a result of the 2025/2026 BRA may not reflect market fundamentals, especially since the price signals in these BRAs will not likely be actionable in the time frame applicable to these auctions. This problem could worsen with the 2026/2027 BRA. Therefore, it is critical that the PJM Board take immediate action to address the market structure flaws identified above by directing PJM to implement interim and/or comprehensive reforms that protect consumers and restore confidence in PJM's markets going forward. OPSI is committed to ensuring that customers only pay capacity prices necessary to maintain reliability and calls on the PJM Board to make the same commitment.

Respectfully submitted,

Emile Thompson
President, Organization of PJM States

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[20] OPSI, Letter to the PJM Board at p. 1 (Aug. 30, 2023) ("If the PJM Board chooses to file at FERC an annual capacity market construct, OPSI recommends the Board direct PJM Staff to prioritize the development of a more granular capacity market design with stakeholders as soon as possible.") available at: https://opsi.us/wp-content/uploads/2023/09/2023.08.30-OPSI-CIFP-LETTER-TO-PJM-BOM.pdf. *See also* PJM Interconnection L.L.C., *Comments of the Organization of PJM States, Inc.* at p. 4-5 (Nov. 9, 2023).

[21] PJM Board Letter at 5.

[22] OPSI Letter to the PJM Board of Managers (November 28, 2023) available at: https://opsi.us/wp-content/uploads/2023/11/HIN-Process-PJM-Board-Letter-11.28.23.pdf.

Attachment B

Estimate of the Cost of Excluding RMR Capacity from the 2026/2027 BRA

Excluding RMR capacity from the capacity supply stack in the 2026/2027 Base Residual Auction ("BRA") will have a far greater cost impact on consumers than it did in the 2025/2026 BRA. This is because the clearing price in the 2026/2027 BRA will be far more sensitive to changes in the amount of capacity that clears the auction due to the fact that the 2026/2027 Variable Resource Requirement ("VRR") curve will have a dramatically different shape and far steeper slope than the 2025/2026 VRR curve.[24] The underlying causes of these significant changes to the VRR curve was PJM decision to start using a natural gas combined cycle unit as the reference resource and a forward looking energy and ancillary service ("EAS") revenue offset for Net Cost of New Entry ("Net CONE") calculations.[25] As shown below, the result is that excluding RMR capacity from the capacity supply stack could cost consumers in the PJM region about $14.5 billion in the 2026/2027 BRA, rather than just the $4 to $5 billion it cost ratepayers in the 2025/2026 BRA.[26]

The cost impact of excluding RMR capacity can be estimated by calculating the degree of movement along the VRR curve its exclusion causes, and calculating the difference in clearing price and cleared capacity with that RMR capacity included and excluded. Doing so requires both an estimate of the quantitative shift in cleared capacity that results from excluding RMR capacity and the formula of the VRR curve for the 2026/2027 BRA. The Independent Market Monitor for PJM ("IMM") calculated that the exclusion of RMR resources from the 2025/2026 BRA reduced the amount of Unforced Capacity ("UCAP") that cleared the auction by 1,440.6 megawatts

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[24] *See* Pete Langbein & Tim Bachus, PJM Interconnection, *Planning Parameters for the 26/27 BRA* 5 (Sept. 11, 2024), https://www.pjm.com/-/media/committees-groups/committees/mic/2024/20240911/20240911-item-09---2627-planning-parameters.ashx (showing the change in the VRR curve graphically); *id.* at 9 (noting that "[s]everal [locational deliverability area] VRR curves are very steep").

[25] *Id.* at 3.

[26] Complaint of Sierra Club et al. at 1 (Sept. 27, 2024) ("Complaint").

("MW").[27] Assuming that excluding RMR capacity again would similarly reduce the amount of capacity that clears the 2026/2027 BRA by 1,440.6 MW, one can estimate the resulting cost impact by deriving the formula for the 2026/2027 VRR curve.

Attachment DD of PJM's Open Access Transmission Tariff ("Tariff") provides that the VRR curve is "plotted on a graph on which Unforced Capacity is on the x-axis and price is on the y-axis."[28] The curve itself is "plotted by combining (i) a horizontal line from the y-axis to point (1), (ii) a straight line connecting points (1) and (2), and (iii) a straight line connecting points (2) and (3)."[29] At point (1), the price ("P_1") equals Gross CONE or 1.75 times Net CONE, whichever is greater, "divided by (one minus the pool-wide average EFORd)," while the amount of UCAP ("U_1") is equal to "the PJM Region Reliability Requirement multiplied by 99%."[30] At point (2), the price ("P_2") equals 0.75 times Net CONE "divided by (one minus the pool-wide average EFORd)," while the amount of UCAP ("U_2") equals "the PJM Region Reliability Requirement multiplied by 101.5%).[31] At point (3), the price ("P_3") is zero and UCAP ("U_3") equals "the PJM Region Reliability Requirement multiplied by 104.5%."[32]

PJM has calculated and posted the final prices values at Points 1, 2, and 3—that is, the value of P_1, P_2, and P_3. P_1 equals $695.83 per MW-day, while both P_2 and P_3 equal $0 per MW-day.[33] P_2 equals $0 per MW-day because PJM calculated that the Net CONE for a natural gas

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[27] Complaint, Att. 1 at 14, tbl.5.
[28] PJM Open Access Transmission Tariff, Att. DD, § 5.10(a)(i) ("Tariff").
[29] *Id.* Note that although the Tariff describes these points as Points 1, 2, and 3, in PJM's posted auction parameters they are instead referred to as Points (a), (b), and (c) respectively. *See* PJM Interconnection, *2026-2027 RPM Base Residual Auction Planning Parameters* (Aug. 26, 2024), https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2026-2027/2026-2027-planning-period-parameters-for-base-residual-auction.ashx ("2026/2027 BRA Parameters Excel File").
[30] Tariff, Att. DD, § 5.10(a)(i).
[31] *Id.*
[32] *Id.*
[33] 2026/2027 BRA Parameters Excel File.

combined cycle unit now is $0 per MW-day in most of PJM.[34] As both P_2 and P_3 equal $0 per MW-day, the segment of the VRR curve that runs from Point 2 to Point 3 is a line segment co-extensive with the x-axis where the clearing price is $0 per MW-day.

PJM has posted preliminary UCAP values for the PJM Region Reliability Requirement and Points 1, 2, and 3,[35] but these values were calculated without adjusting the PJM Region Reliability Requirement ("Reliability Requirement") for Fixed Resource Requirement ("FRR") Obligations.[36] As the Tariff requires that the Reliability Requirement must be adjusted for FRR Obligations "for the purposes of the Base Residual Auction,"[37] its final value and by extension the values of U_1, U_2, and U_3 are currently unknown. OPSI Staff therefore estimated what these final values will be by assuming that total FRR obligations for the 2026/2027 Delivery Year ("DY") will be 1.9% higher than they were for 2025/2026 DY, as the overall Reliability Requirement for the 2026/2027 DY is 1.9% higher than the Reliability Requirement for the 2025/2026 DY.[38] As the unadjusted Reliability Requirement for the 2026/2027 DY is 147,246.4 MW and total FRR Obligations for the 2025/2026 DY were 10,866 MW,[39] the estimated Reliability Requirement for the 2026/2027 DY is:

$$47{,}246.4 - (10{,}886 * 1.019) = 147{,}246.4 - 11{,}092.834 \approx 136{,}153.6\ MW$$

Consequently, the estimated values for U_1, U_2, and U_3 are as follows:

$$U_1 = 136{,}153.6\ MW * 0.99 \approx 134{,}792.1\ MW$$

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[34] PJM Interconnection, *2026/2027 RPM Base Residual Auction Planning Period Parameters* 6 tbl.3 (Aug. 26, 2024), https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2026-2027/2026-2027-planning-period-parameters-for-base-residual-auction-pdf.ashx ("2026/2027 BRA Parameters Report").
[35] 2026/2027 BRA Parameters Excel File.
[36] 2026/2027 BRA Parameters Report at 2, tbl.1.
[37] *See* Tariff, pt. 1, § 1 ("'PJM Region Reliability Requirement' shall mean, for purposes of the Base Residual Auction, the Forecast Pool Requirement multiplied by the Preliminary PJM Region Peak Load Forecast, *less the sum of all Preliminary Unforced Capacity Obligations of FRR Entities in the PJM Region* . . . ." (emphasis added)).
[38] 2026/2027 BRA Parameters Report at 2, tbl.1
[39] *Id*.; 2026/2027 BRA Parameters Excel File.

$$U_2 = 136{,}153.6\ MW * 1.015 \approx\ 138{,}195.9\ MW$$

$$U_3 = 136{,}153.6\ MW * 1.045 \approx\ 142{,}280.5\ MW$$

This information enabled OSPI Staff to approximately determine the coordinates for Points 1, 2, and 3 and by extension the formulas describing the 2026/2027 VRR curve. Specifically, the coordinates of Point 1 are (134,792.1, 695.83), the coordinates of Point 2 are (138,195.9, 0), and the coordinates of Point 3 are (142,280.5, 0). Thus, between the y-axis (where U equals 0 MW) and Point 1, the VRR curve is a horizontal line segment where P equals $695.83 per MW-day when U is greater than or equal to 0 MW but less than or equal to 134,792.1 MW. Because P equals $0 per MW-day at both points 2 and 3, the VRR curve is again a horizontal line segment where P equals $0 per MW-day when U is greater than or equal to 138,195.9 MW and less than or equal to 142,280.5 MW.

Between Points 1 and 2 the VRR curve is a downward sloping line segment whose slope and formula can be calculated using the known coordinates of Points 1 and 2. The slope ("*m*") of this line segment is approximately:

$$m = \frac{P_2 - P_1}{U_2 - U_1} = \frac{0 - 695.83}{138{,}195.9 - \ 134{,}792.1} = \frac{-695.83}{3{,}403.8} \approx\ -0.204$$

Using this value for the slope and the coordinates for Point 2, the equation of the line containing this line segment can be calculated using the point slope formula:

$$P - P_2 = m(U - U_2)$$

$$P - 0 = -0.204\ (U - 138{,}195.9)$$

$$P\ \approx\ -0.204U + 28{,}191.96$$

This equation can be used to estimate the cost impact on PJM load of again excluding RMR capacity from the capacity supply stack, if one assumes for simplicity that the PJM region is

unconstrained,[40] the 2026/2027 BRA will clear between Points 1 and 2, and that excluding RMR capacity will again decrease the amount of cleared capacity by 1,440.6 MW. For example, if one assumes the action will clear with about 1,440.6 MW of excess capacity (capacity beyond the reliability requirement) at 137,594.1 MW, then the clearing price would be $122.74 per MW-day:[41]

$$P \approx -0.204(137{,}594.2) + 28{,}191.96 = -28{,}069.2168 + 28{,}191.96 \approx 122.74$$

The total cost to load for the full 2026/2027 DY would be the clearing price times the amount of cleared capacity times the number of days in the DY:

$$Annual\ Cost\ to\ Load = \frac{\$122.74}{MW * day} * 137{,}594.2\ MW * 365\ \frac{days}{year} = \$6{,}164{,}233{,}919.42$$

If the RMR capacity was instead excluded and the auction cleared at exactly the Reliability Requirement of 136,153.6 MW, then the clearing price would be $416.63 per MW-day:

$$P \approx -0.204(136{,}153.6) + 28{,}191.96 = -27{,}775.3344 + 28{,}191.96 \approx 416.63$$

The total cost to load for the 2026/2026 DY would then be:

$$Annual\ Cost\ to\ Load = \frac{\$416.63}{MW * day} * 136{,}153.6\ MW * 365\ \frac{days}{year} = \$20{,}704{,}871{,}144.32$$

Thus, the total increase in costs to load from excluding the RMR capacity would be:

$$\$20{,}704{,}871{,}144.32 - \$6{,}164{,}233{,}919.42 = \$14{,}540{,}637{,}224.90$$

In other words, under these assumptions, the cost to load of excluding RMR capacity would be approximately $14.5 billion.

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[40] OPSI recognizes that in reality it is highly unlikely that all LDAs will clear at the same and that this simplifying assumption introduces some error. This is one of the reasons why OPSI believes that the results of this analysis should only be taken as an approximate, indicative description of what could happen if RMR capacity is again excluded from the capacity supply stack.

[41] Note that in practice the "lumpiness" of capacity offers means the actual clearing price for a certain level of cleared capacity will be slightly different then the clearing price calculated by inputting the amount of cleared capacity into the equation describing the VRR curve.

Comparing the slope of the 2026/2027 VRR curve between Points 1 and 2 with the slope of the 2025/2026 VRR between Points 1 and 2 as well as Points 2 and 3 illustrates why the cost of excluding RMR capacity in the 2026/2027 BRA could be significantly higher than it was in the 2025/2026 BRA. Per the 2025/2026 auction parameters, the coordinates of Point 1 were (133,554.2, 451.62), the coordinates of Point 2 were (137,160.4, 171.61), and the coordinates of Point 3 were (144,105.7, 0).[42] The slope between Points 1 and 2 on the 2025/2026 VRR curve was thus:

$$m = \frac{171.61 - 451.62}{137{,}160.4 - 133{,}554.2} = \frac{-280.01}{3{,}606.2} \approx -0.078$$

Similarly, the slope between Points 2 and 3 on the 2025/2026 VRR curve was:

$$m = \frac{0 - 171.61}{144{,}105.7 - 137{,}160.4} = \frac{-171.61}{6{,}945.3} \approx -0.025$$

In contrast, the slope of the 2026/2027 VRR curve between Points 1 and 2 is about -0.204. In other words, the slope of the 2026/2027 VRR between where it reaches the price cap and where it reaches a clearing price of zero is thus about 2.6 times steeper the 2025/2026 VRR curve was between Points 1 and 2 and about 8.2 times steeper than the 2025/2026 VRR curve was between Points 2 and 3. This is why the same shift in the quantity of capacity that cost load $4 billion to $5 billion in the 2025/2026 BRA could easily cost load as much as $14.5 billion in the 2026/2027 BRA.

However, OPSI urges caution in interpreting this result given the simplifying assumptions underlying this calculation. OPSI is *not* projecting that excluding RMR capacity from the capacity

[42] PJM Interconnection, *2025-2026 RPM Base Residual Auction Planning Parameters* (June 8, 2023), https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2025-2026/2025-2026-planning-period-parameters-for-base-residual-auction.ashx.

supply stack in the 2026/2027 BRA will cost consumers $14.5 billion. OPSI only intends to show that excluding RMR capacity could plausibly cost load roughly three times as much as the $4 billion to $5 billion it cost load in the 2025/2026 BRA.