| 2027/2028 Base Residual Auction PJM Stakeholder Feedback Survey Responses |
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| **As a result of the capacity shortfall in the 2027/2028 Base Residual Auction PJM is required to perform an investigation of the cause and provide recommendations pursuant to section 16.2 of Attachment DD of the Tariff. Please provide any thoughts you have on these topics.** |
| • PJM should consider how ELCC contributed to perceived shortfall, especially the valuation of dispatchable resources. (Re-look at accreditation)<br>• Look at Unit Specific ELCC instead of blanket for categories of resources.<br>• PJM should evaluate why some resources who had a "must offer" requirement resources didn't offer.<br>• PJM should ensure that MW's that were above the cap are evaluated. (How much above the cap were they?)<br>• What was the impact of the Price Cap?<br>• If a backstop auction is triggered to procure additional MW's to meet the reserve margin will PJM look to LSE's who are deficient for cost allocation?<br>• Before conducting a backstop auction PJM should determine how much Capacity is actually available in ICAP terms as compared to forecasted ICAP before determining any quantity. (What's available on the system without the influence of ELCC?)<br>• Determine resources in the queue which are backed by load and which are backed by States. (What resources that are in the queue will be built and what are the states doing?)<br>• In regard to Load Forecasting – check the actuals because data center growth may not be real. |
| It is essential that PJM implement solutions that address several foundational issues that have landed us in this situation in the first place.<br>First - accurate load forecasting. PJM must implement solutions to more accurately forecast incoming load additions. We don't even know the scope of the problem we are trying to solve, or if there is a problem at all, without first resolving this issue.<br>Second - PJM must accurately value existing resources. The current ELCC construct places excessive weight on winter risk—without the benefit of a sub-annual auction to compensate resources appropriately in other seasons. This creates distorted values and contributes to under-compensation of important capacity.<br>PJM must continue advancing, and implementing, a seasonal market construct and/or revising ELCC accreditation values.<br>After these foundational issues are resolved or at least improved, we will be better able to asses whether a shortfall exists at all and whether Reliability Backstop Auction is necessary. |
| Negotiated rules were written to provide the most use of market mechanisms prior to out of market interventions. They may or may not be appropriate today. |
| I concur. |
| We are concerned that the Unforced Capacity Resources shortage observed in the 2027/2028 BRA will negatively impact ratepayer affordability and reliability in the 2027/2028 delivery year. We are also concerned that this shortage is indicative of suboptimal capacity market conditions that will continue to challenge ratepayer affordability and reliability in ensuing BRA auctions. In the interest of protecting New Jersey ratepayers in the 2027/2028 delivery year and beyond, we urge PJM to pursue corrections to the RPM that directly respond to these ratepayer concerns. Specifically, we call for the extension of the BRA price cap of $329 per MW-day. A price cap extension is reasonable given that the "confluence of events" that justified its creation, including rapid load growth, generator retirements, and slow new entry of replacement generation, continue to significantly impact the BRA.<br>However, modifications to the RPM alone may insufficiently protect ratepayers from the heightened costs and decreased reliability that are prompted by the 2027/2028 capacity auction clearing 5.2 percentage points below the 20% IRM. RPM corrective action may also fail to singlehandedly resolve the challenges prompted by the unprecedented amount of load that is seeking interconnection in the near future. Our internal calculations considering forecasted load growth and projected capacity additions estimate that PJM will continue to clear critically short of its reliability requirement and at the price cap for the two subsequent BRA auctions. The risks to ratepayer affordability and reliability that are posed by such an outcome are deemed unacceptable by us.<br>We therefore additionally urge PJM to present a solution to the Critical Issue Fast Path that aggressively addresses the challenges posed by the significant load growth from LLAs in the PJM region and to progress stakeholder conversations on the reliability backstop and resource adequacy procurements. A sufficiently aggressive solution would include mandatory load flexibility and accounting mechanisms for large load customers paired with the Expedited Interconnection Track and BIGPAL proposal elements. This solution would incent the addition of new capacity resources while shifting investment risks from ratepayers onto those who create these risks, the large load customers. Meanwhile, mandatory load flexibility and accounting mechanisms protect consumers by managing the amount of load required in the capacity auctions. We strongly support a mandatory response to the CIFP process and also recognizes that new supply resource additions are vital for addressing continued load growth. Even if there is only a moderate chance that the subsequent BRA auctions will clear short despite corrective action taken this year, PJM should address the unprecedented situation that it finds itself in and take all possible action to deliver affordable wholesale rates and reliable service. |
| The Reliability Backstop Auction (RBA) is a market-based mechanism that exists in PJM's current tariff and with appropriate, limited modifications, offers a viable means of addressing resource adequacy concerns by providing accurate price signals to generation developers. When this backstop mechanism is triggered, PJM must seek Commission approval to conduct the RBA, enabling the procurement of additional generation capacity—or baseload resources—on a cost-of-service basis for a term of up to fifteen years. During the offer window, sellers submit cost-based proposals specifying price, capacity, location, technical characteristics, requested term, and the first full Delivery Year for which the resource will be available. Multi-year offers clear in ascending order of lowest total price and receive commitments for the full term offered, thereby providing long-term certainty for resources essential to reliability.<br>PJM should focus on enhancing this existing market construct. First, the RBA trigger should be revised so that the auction would commence when two consecutive Base Residual Auctions clear below 98% of the reliability requirement, rather than the current standard of three auctions clearing below 99% of the reserve margin. Shortening the trigger window from three auctions to two is reasonable given current circumstances and the significant projected growth in future load. Second, PJM should consider changes to its current timeline for the RBA to run, shortening the windows currently outlined in the tariff such that the auction can run, and its results be known, on an expedited basis. Finally, resources selected in the RBA should compete on equal footing with other existing generation resources, bidding into both the energy and ancillary service markets, dispatched according to economic signals, and paid market prices. The pricing mechanism in the RBA should cover the fixed costs needed to develop the generation, with the variable costs being left to Commission-regulated markets.<br>Additionally, PJM needs to refine its Load forecast and its ELCC determinations to minimize large fluctuations. Market Participants should have the best information at the time of the auction. However, large swings in the projected Large Load Additions and volatility and lack of transparency with ELCC from auction to auction (including IAs) do not support PJM's goal for resource adequacy. |
| There are two major causes for the shortfall. The first is the rapid increase in data center load growth. The second is the chilling impact that the EPA's proposed carbon rules had on the economics of fossil generation. |
| Our firms believe any reliability backstop implemented by PJM, whether under the current tariff rules or a newly proposed backstop, should preserve market signals and price formation. Regulatory uncertainty and out of market actions distort market prices and chill the investment environment. Any backstop auction should have rules that are clearly defined, predictable, and durable. A competitive procurement run by PJM should limit any contract to as short a term as possible, implemented within scope of the capacity market mechanism, have an offer floor, have a sunset date, and procure no more than 98% of the reserve margin requirement. |
| PJM should provide a comprehensive analysis of resource adequacy within the PJM region as part of this investigation, either through an update to the 4R report or by issuing a new report. This report should clearly explain the current and projected resource adequacy situation, including detailed analysis by state or zone and by year for the next 5-10 years. As the RTO, PJM should regularly share this information and should use the opportunity presented by this investigation to deliver a thorough assessment. |
| Delivery Year 2025 Load Growth Forecast*<br>(MW) 2026 Load Growth Forecast*<br>(MW) Reduction<br>(MW) Reduction (%)<br>2026/27 5,434 2,872 2,562 47%<br>2027/28 10,682 6,946 3,736 35%<br>2028/29 16,479 12,062 4,417 27%<br>2029/30 22,589 18,023 4,566 20%<br>*Based on projected summer peak load in a given delivery year less 153,503 MW actual weather-normalized summer peak in 2025<br>• The 2026 load forecast reflects a 47% reduction in the load growth for the 26/27 auction conducted over the summer and a 35% reduction in the load growth for the 27/28 auction conducted last month. While this increased scrutiny is appropriate, the resulting decline raises concerns about the accuracy of prior forecasts, especially given the significant market and reliability actions taken in response to the 2025 projections. With the updated forecast indicating a much smaller resource adequacy gap, the scope and nature of PJM's reliability solutions may necessarily differ. This highlights the critical need for improved forecast rigor, enhanced validation of large load additions, and greater accountability of entities to ensure load projections are not materially overstated. Many of the choices PJM may make to address any reliability shortfall are predicated on the potential size of the shortfall. Material errors in the load forecast undercut PJM's ability to make fact-based decisions critical to supporting long-term reliability and competitive markets. Material errors in the load forecast also undermine market participants' confidence in the markets and dampen the interest in the investment needed to meet any resource adequacy challenge.<br>• At the same time, PJM should consider strengthening reliability backstop mechanisms in the capacity market to better manage the supply demand uncertainty driven by future deactivations, progress and timing of new entry.<br>• PJM should expeditiously implement the improvements to reliability backstop mechanism included in the "Joint Stakeholder" CIFP proposal. The existing reliability backstop mechanism does not appear able to expeditiously respond to the current supply/demand situation in PJM (e.g., rapid load growth in the face of recent resources retirements, etc.), and the enhanced reliability backstop mechanism is designed to be more responsive under the current circumstances consistent with the existing market structure.<br>o The enhancements to the reliability backstop mechanism will demonstrate clear PJM commitment to reducing the shortfall and preserving reliability within the existing market structure. With potential that the BRA may clear below the reliability requirement for the next several auction cycles, the proposed enhanced reliability backstop should be implemented now.<br>o As a result of the capacity shortfall in the Base Residual Auction for the 2027/2028 delivery year, PJM is required to perform an investigation of the cause of the shortfall and provide recommendations pursuant to section 16.2 of Attachment DD of the Tariff. Filing the enhanced reliability backstop proposal satisfies that obligation.<br>• Key elements of the proposed Enhanced Reliability Backstop (as outlined in the Joint Stakeholder CIFP Proposal):<br>o Trigger: Only used in years when RPM clears below 98% of the reliability requirement.<br>o Eligible resources can (at their option) offer a minimum term supply commitment at the top of the Variable Resource Requirement (VRR) curve.<br>o Eligible resources include: new/reactivated generation, existing generation with an offer cap above top of the VRR curve, traditional demand response.<br>o Bidders may offer up to 7 years but shorter-term offers will clear first.<br>o Eligible resources must be reasonably likely to perform in the delivery years cleared.<br>• As part of our protest to the IMM's complaint in FERC Docket No. EL26-30, we included an Affidavit of Aaron T. Patterson explaining the Enhanced Reliability Backstop mechanism in detail along with proposed tariff language to expedite implementation. Please feel free to contact me (contact information given above) if you would like to discuss these enhancements or further changes to them that could be helpful under the circumstances.<br>o More details can be found here: 20251215-5454_ Protest of IMM Complaint.pdf<br>• PJM should not extend the existing cap or collar<br>o If an extension is considered, it should feather into the administrative demand curve filed in the most recent periodic review of the capacity market.<br>• PJM should not file proposals that include variations on Non-Capacity Backed Load (NCBL) or Bring Your Own Generation (BYOG)<br>o These proposals would have a long-lasting and devastating impact on the PJM markets, economic development in PJM, and national security.<br>• While expediting the interconnection of new megawatts is an important priority to address any reliability shortfall, PJM should not move forward with the expedited interconnection proposal it offered during the CIFP process due to the proposal's potentially discriminatory design.<br>• In order to expedite the interconnection of shovel ready resources, PJM should consider developing a non-discriminatory proposal to enable shovel ready resources to rapidly interconnect. |
| Key Drivers:<br>• Prolonged low clearing prices and high reserve margins signaled that no new investment was needed. Emerging reliability risks (whether via loss of supply or addition of load) were not able to be reflected in market outcomes.<br>• Unstable market design where consistent changes focused on impacting marginal resources (e.g., CP, ELCC reforms, MOPR, Must-Offer, Treatment of RMR resources, Net CONE x B, treatment of DR, treatment of load forecast, etc) impeded stable price formation and weakened long term investment signals.<br>• Punitive offer mitigation and binding price caps prevented resources from reflecting true going forward costs, contributing to retirements and limiting new entry.<br>• Interconnection delays, driven by backlog of the processing of the queue along with material constraints among network upgrades, permitting, siting, and supply chain challenges against a backdrop of consistently lower prices severely inhibited new resources from entering the market in a timely or predictable fashion. Responses to capacity market outcomes are lagging by the nature of the forward market design; interconnection process delays served to exacerbate the lagging response.<br>• State policy pressures added complexity often without corresponding mechanisms to maintain reliability. This is inclusive of both clean energy mandates and "whipsawing" state policies from one year to the next.<br>• Low incentive for long-term retail hedging in the face of the panoply of issues above—most of which created consistent downward pressure on prices—retail entities had lower incentives to hedge long term supply.<br>_____<br>Recommendations Going Forward<br>• Eliminate unnecessary and punitive market mitigation, including unnecessary caps and inaccurate CONE values so prices can support new investment.<br>• Prioritize reliability and market efficiency through competition.<br>• Focus PJM reforms on a small set of high-impact priorities rather than layered, incremental changes.<br>• Refine ELCC to provide greater stability and predictability from auction-to-auction and among auctions serving the same delivery year.<br>• Consider a prompt auction design to better align procurement with actual system needs.<br>• Improve load forecasting methodologies to reflect load patterns (e.g., data centers).<br>• Remove barriers for DERs and VPPs and enhance demand response participation to expand supply-side participation. These are the nearest-term resources available to support reliability.<br>• Consider approaches to account for zones that consistently under procure capacity, including potential consequences that better align procurement behavior with reliability responsibilities. |

The PJM region is facing an unprecedented resource adequacy challenge as demand rapidly outpaces supply. The result has been an affordability crisis for New Jersey customers and growing concern that the resource adequacy problem will become a reliability problem. That concern has come into stark focus with PJM's 2027/28 Base Residual Auction, which was the first time since the capacity market was put in place almost 20 years ago that PJM was unable to procure enough generation to meet PJM's reliability requirement, which is to ensure that the lights don't go out during times of system stress no more than one day in 10 years. Continuous reforms to PJM's capacity market over the past several years have failed to mitigate the looming resource adequacy crisis. Additionally, reforms have failed to address the elephant in the room, which is that PJM is being relied on across the region by many states to address resource adequacy, but PJM cannot plan or direct the build of generation that is needed to address the problem.

PJM President and CEO Manu Asthana pointed out this conflict in his written remarks to FERC on May 20, 2025 (see Docket AD25-7-000), stating the following: "Load serving entities in some regions appear to be primarily relying on the spot capacity market rather than using bilateral contracting first, and using the capacity market as a secondary, residual market." He continued on to state that the reliance on PJM's capacity market "is exacerbating the affordability challenges". This raises a foundational question, which is: Who is ultimately responsible for remedying the capacity shortfall – it is PJM or is it the states?

Recommendations:

(i) PJM must provide stakeholders with a clear understanding of the purpose of the capacity market and PJM's role in resource adequacy: PJM reforms have not addressed this fundamental misunderstanding of the purpose of the capacity market. Clear direction from PJM is needed to understand (1) what are the goals and objectives of RPM? and (2) what is PJM's role in addressing resource adequacy? Is PJM primarily responsible for bringing supply on to the system to meet demand or not, and what exactly does that responsibility (whether it is primary or secondary) entail? Answers to these questions are critical to identifying needed market reforms that further both reliability and affordability for customers. Beyond underscoring the need for PJM to answer these important threshold questions, we offer the following thoughts with respect to capacity market issues currently being discussed by PJM and its stakeholders:

(ii) Adjusting the Cost of New Entry through this investigation is not a solution to the shortfall: We caution PJM against adjusting the Cost of New Entry while there is a Quadrennial Review filing pending before the FERC and there are Critical Issues Fast Path – Large Load Additions reforms under consideration by the PJM Board and pending implementation. In addition, there are two notable reforms under consideration that will help to address, but will not resolve, the significant capacity shortfall:

(1) Moving forward with an expedited queue immediately: The ultimate solution to the resource adequacy problem in PJM is to bring significant amounts of new generation supply on-line as soon as possible and will require PJM working with the states – who have ultimate responsibility to plan generation – to get this done. It takes time to build generation, and we encourage PJM to move forward with an expedited interconnection queue for state-sponsored, shovel-ready resources that gives all PJM states an equal opportunity to address resource adequacy.

(2) Load forecasting process changes to make the process clearer and more transparent to stakeholders, including the states: The load forecast is a critical component in generation procurement. Greater confidence in PJM's methodology for developing the load forecast is needed, and we encourage PJM to (a) apply bright-line criteria to large load adjustment requests for inclusion in the forecast; (b) codify the methodology for considering and including large loads in the load forecast in PJM Manual 19 rather than relying on a guidance document;(c) include a step in the load forecasting process for state commission review of large load adjustment requests prior to incorporate requests into the load forecast; and (d) engage an experienced third party to validate the large load forecast.

(iii) All solutions must consider costs to customers: Cost to customers must be considered in PJM's investigation and the development of solutions. Extending the price collar for another auction cycle is a way to bring short-term affordability relief for customers but much more will be needed as part of comprehensive, underlying reform.

Conclusion: Resource adequacy is a serious challenge for PJM, for asset owners with responsibility for reliability and for all states and customers in the region, and an "all-of-the-above" approach is needed. PJM must provide stakeholders, including states, with a clear understanding of the purpose and objectives of the capacity market and what PJM's roles and responsibilities are in addressing resource adequacy, which will inform fundamental changes that may be needed to PJM's capacity market. PJM must also follow a transparent and orderly process for tackling this resource adequacy crisis rather than careening from one approach to another or getting caught in the "push/pull" of its stakeholder process. As was starkly illustrated by the results of the 2027/28 BRA – where prices remained stubbornly high at the same time PJM failed to procure enough generation to meet its own reliability requirement - this approach is not optional and time is of the essence.

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The 2027/2028 BRA capacity shortfall appears to result from a convergence of structural, market, and regulatory factors that have constrained both new entry and existing resource retention. First, the repeated use of a compressed forward auction timeline over recent years has materially reduced the ability of developers to commit new capacity within PJM's traditional three year forward window. Shorter forward periods limit financing certainty, squeeze development schedules, and reduce supply elasticity. PJM's own documentation on auction delays demonstrates that shortened forward periods have repeatedly disrupted expected development and entry cycles.

Second, broader interconnection queue delays continue to prevent otherwise viable new resources from offering into the BRA in a timely manner. For many developers—particularly those pursuing storage, hybrid resources, or flexible distributed assets—uncertainty around deliverability studies and interconnection timing serves as a concrete barrier to entry. Even projects with strong economics struggle to align project schedules with BRA timelines under current queue conditions.

Third, changes to resource accreditation methodologies have reduced the effective UCAP contributions of intermittent resources, storage, and demand response. As ELCC based accreditation is implemented, many resources see accredited capacity decline even as nameplate capacity grows. Similarly, increased administrative requirements for DR and CSP participation—including pre registration, collateral posting, and multi step confirmation workflows—have raised participation costs. While these requirements improve reliability modeling, they also unintentionally restrict participation for resource types that historically provided meaningful incremental supply.

Fourth, ongoing economic pressures on existing generation have accelerated retirements. Volatility in market seller offer cap rules, uncertainty in net revenue expectations, and multi year periods of relatively low clearing prices have weakened the economic case for continued operation of marginal thermal units. The resulting retirements directly reduce available UCAP and contribute to the shortfall relative to the approved IRM.

With respect to barriers to entry, there are several that merit PJM's attention under Tariff Attachment DD §16.2. Financing conditions have tightened substantially since earlier CONE calibrations; construction cost inflation, higher interest rates, supply chain delays, and labor cost escalation have all raised the real cost of new entry. As a result, current CONE values may underestimate the true cost of building new capacity resources. PJM should consider updating CONE to reflect current financial and construction realities. In addition, interconnection delays remain one of the most significant barriers to timely capacity entry. Streamlined processes, expanded fast track pathways, and improved transparency around deliverability constraints would materially enhance developers' ability to offer firm capacity into the BRA.

Another area warranting consideration is the treatment of modern distributed, emissions controlled reciprocating engine technologies—including ultra low NOx (ULN) medium speed engines. These technologies represent fast deployable, highly reliable capacity that can provide meaningful UCAP if properly recognized within PJM's accreditation and market rules. As commercial data centers and industrial facilities increasingly deploy ULN systems capable of meeting stringent environmental standards, PJM should ensure that these resources are not inadvertently excluded due to legacy assumptions about diesel based backup generation. Updated accreditation frameworks that reflect the performance characteristics and emissions compliance of modern ULN systems could unlock a large pool of distributed, geographically flexible capacity that strengthens reliability.

Based on the above, several corrective actions are recommended. PJM should re establish a predictable three year forward auction schedule to restore investor and developer confidence. PJM should also revise CONE values to reflect current cost conditions and ensure sell offers from prospective new capacity are economically feasible. Interconnection and deliverability processes should be streamlined to better align with BRA timelines, allowing developers to make firm commitments. Accreditation and participation requirements for DR, distributed resources, and modern ULN equipped backup generation should be modernized to avoid unintentionally restricting resources capable of providing reliable capacity. Finally, PJM should enhance transparency in accreditation changes, LDA specific constraints, and marginal resource implications so that market participants can better anticipate how their projects will be treated in future BRAs.

In summary, the shortfall in the 2027/2028 BRA likely reflects the combined impact of compressed auction timelines, interconnection uncertainty, evolving accreditation rules, accelerated retirements, and insufficient alignment between market rules and the economics of new entry. Addressing these factors through updated CONE values, improved forward schedule stability, streamlined interconnection, and modernized accreditation for distributed and ULN capable resources would strengthen PJM's ability to maintain adequate installed reserve margins and reduce the likelihood of future shortfalls.

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1. Factors Contributing to the 27/28 BRA Shortfall

•Rapid load forecast growth, particularly from new large load customers.

•Regulatory and market uncertainty resulting from frequent rule and parameter changes.

•Compressed auction timeline that limited participants' ability to respond to cost, supply chain, and interconnection conditions.

•Accreditation impacts from marginal ELCC, which reduced accredited capability across several resource categories and increased uncertainty.

•Price collar effects that muted investment signals in zones facing tightening supply conditions.

•Interconnection and construction of new generation lagging the pace of entry for large load customers, resulting in demand growth exceeding new supply additions.

Higher reliability requirements amplifying scarcity outcomes.

2. Recommended Focus Areas for the PJM's BRA Investigation

•Provide a clear decomposition of the offer stack, including accreditation impacts and risk driven offer adjustments.

•Include counterfactual analysis of clearing outcomes without the price collar to evaluate its effect on supply incentives.

•Offer detailed ELCC model sensitivity results and documentation of refinement priorities. (E.g. evaluate auction results if ELCC reforms were endorsed and approved by FERC)

•Assess the degree to which interconnection throughput is contributing to the shortfall, including queue timelines and upgrade constraints.

•Provide clear, transparent methodology and publication schedules for all investigation components.

3. Near Term Corrective Actions to Consider Before the 29/30 BRA

•Evaluate whether temporary, targeted adjustments to backstop related tariff provisions may be appropriate under current reliability conditions (e.g. relaxation of 3 -year trigger).

•Re-evaluate the role and design of price collars as market conditions evolve.

•If backstop procurement is ultimately pursued, provide transparent and expedited interconnection pathways for selected projects.

•Increase transparency around resource development pipelines, load trends, and interconnection milestones (Update to 4R report).

4. Medium Term Reforms to Improve Capacity Market Performance and Reliability

•Address the mismatch between demand growth and interconnection progress by identifying process/coordination improvements, prioritizing upgrades, or streamlined pathways for projects that materially support reliability in high growth zones.

•Enhance ELCC transparency and implement model improvements identified through ongoing evaluation processes.

# Response to PJM 2027/2028 BRA Stakeholder Feedback Survey

## Investigation of Capacity Shortfall - Root Causes and Recommendations

### EXECUTIVE SUMMARY

The capacity shortfall in the 2027/2028 Base Residual Auction[1] triggered the first step of the Reliability Backstop provision in the OATT[2] which requires PJM to conduct a review of the causes and recommend corrective action including, without limitation, adjusting the Cost of New Entry to the extent determined necessary by such investigation, or addressing other barriers to entry identified by such investigation. As part of the investigation, PJM has released a survey of the Members for their feedback on the causes and potential corrective actions.

We are pleased to present these comments on the cause of the shortfall and potential corrective actions PJM might take in response.

The shortage resulted from a fundamental structural mismatch between the physical realities of power plant development and the market's ability to provide timely investment signals, driven primarily by a widely unforecasted material increase in future demand. **PJM itself characterized these conditions as "market conditions of near or actual shortage" in its November 2025 Quadrennial Review filing to FERC.** This shortage was mathematically inevitable given three compounding factors:

1. **Market Signal Timing Failure**: A 50-month development lead time combined with price discovery occurring 32+ months after investment decisions must be made
2. **Interconnection Queue Bottleneck**: Queue restrictions during the critical 2022-2023 period that prevented supply response even when economically justified
3. **Regulatory Uncertainty**: Unstable market rules that amplify investment risk beyond economic fundamentals

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[1] Conducted between December 4, 2025 and December 10, 2025, with the results posted December 17, 2025
[2] Open Access Transmission Tariff, Attachment DD, Section 16. *Reliability Backstop*

## I. ROOT CAUSE ANALYSIS

### A. Market Signal Timing Disconnect - The Primary Cause

#### The Development Timeline Reality

According to PJM's 2025 Quadrennial Review filing (November 2025), which includes the Brattle/Sargent & Lundy CONE Report, combined cycle development now requires 50 months from project initiation to commercial operation date. **Critically, this timeline has increased by 18 months since the 2022 CONE study specifically due to "the tight market for turbines and other major components."** The CONE report also estimates the timeline for a new combustion turbine facility at 44 months, but importantly the early stages of development require the same steps and timeline. The extended timeline was validated through direct consultation with GE regarding turbine payment schedules. Critical commitment points include:

- **Month 0**: Project development begins
- **Month 5**: Equipment contract lock-in (point of no return)
- **Month 44/50**: Commercial Operation Date

**For the 2027/2028 BRA (June 2027 delivery year):**

- Required development start: **April 2023**
- Equipment commitment deadline: **September 2023**

**The Information Available to Developers in April 2023:**

When developers needed to commit to 50-month, billion dollar projects, the only capacity market price signals available were:

- 2024/2025 BRA: **$28.92/MW-day** (the lowest clearing price in PJM history)
- 2023/2024 BRA: $34.13/MW-day (declining trend)
- 2022/2023 BRA: $50.00/MW-day
- **Pattern visible: Prices declining sharply** ($50 → $34 → $29)

**What developers could not know in April 2023:**

Prices from BRAs held subsequent to development start date (progressive price discovery):

- 2025/26 BRA: **July 30, 2024** (cleared at $269.92 - first high price signal, but 15 months too late)
- 2026/27 BRA: **July 22, 2025** (cleared at $329.17 - 27 months too late and administratively capped based)

- 2027/28 BRA: **December 17, 2025** (cleared at $333.44 - 32 months too late and also administratively capped)

**Economic Analysis**

At the required decision point (April 2023), a rational economic analysis showed:

- Known capacity revenue: $28.92/MW-day was grossly insufficient to justify investment (only 3.7% of PJM's current Gross CONE for new entry)
- This rate is insufficient to cover capital costs with financing, let alone fixed operating expenses and required investor returns
- No prudent developer would commit $1+ billion to a project with such inadequate capacity market revenue

**Moreover, the visible price trend reinforced this negative outlook:**

- Three-year trend: $50.00 → $34.13 → $28.92 (declining 42% over two auctions)
- In the absence of demand growth or other things changing the supply demand balance, developers seeing this trend would rationally expect continued price weakness, not a sudden reversal
- The declining trend provided no indication that scarcity was developing
    - As discussed below, there was little ability by PJM or the industry at large to predict the impending increases in load at this time and thus load growth was not reflected in price
- Any forward projection from April 2023 would have suggested further price erosion, making the investment case even worse

By contrast, when the 2027/2028 BRA cleared at $333.44/MW-day in December 2025, even that higher auction clearing price was the second and final year of an administrative price collar that capped prices below the long-term maximum capacity market price.

- If not for the administrative price collar, capacity revenue of $333.44/MW-day (43% of PJM's Gross CONE) may have justified development investment when combined with energy and ancillary service revenues, though this would depend on project-specific costs, financing conditions, and market expectations
- This price signal, had it been available in April 2023, could have supported new entry decisions
- However, this price discovery occurred **32 months after** the April 2023 decision point and **27 months after** the September 2023 equipment lock-in
- Moreover, even the first high price signal ($269.92 in July 2024) came **15 months after** the decision point and **10 months after** equipment commitments were made

**Developers responded rationally to the price signals available. The design flaw is that price signals arrived three years after investment decisions must have been made.** As

a consequence, for the 27/28 delivery year, the region must rely on those resources that were already in the interconnection queue or those that can achieve commercialization faster than a greenfield CT or CCGT. As we have discussed publicly before, we have identified opportunities to significantly increase the capacity at our existing facilities under timelines that are much faster than those of a greenfield facility. Moreover, we have identified locations that could support significant entry of new Battery Storage capacity, also under significantly shortened timelines. In both cases, interconnection speed (discussed below) becomes the timeline constraint. In the case of Battery Storage, current market prices remain insufficient to support their commercialization.

**B. Load Forecast Uncertainty - The Hidden Demand Driver**

As mentioned above, the information gap problem extended beyond capacity prices to the fundamental driver of those prices: demand growth. For more than a decade, PJM had experienced flat to even negative load growth, and PJM's long-term forecasts at the time reinforced expectations that this trend would continue. So when developers made investment decisions in April 2023, they read PJM's 2023 Long-Term Load Forecast Report as confirming minimal, steady growth—not foreshadowing the abrupt, unprecedented surge that would later drive capacity scarcity. **Load Forecast Revisions for 2027/28 Delivery Year:**

Reflecting that step change in future expectations of load, between the 2023 forecast (available at the April 2023 decision point) and the 2025 forecast (used in the 27/28 BRA), PJM revised its 2027 summer peak projection upward dramatically:

- **2023 forecast:** 154,275 MW
- **2024 forecast:** 159,859 MW - *+5,584 MW (+3.6%)*
- **2025 forecast:** 165,403 MW - *+11,128 MW (+7.2%)*

**The 11,128 MW upward revision between 2023 and 2025 is equivalent to approximately 14 large combined cycle plants of unanticipated demand.** This 7.2% revision represents 5-10x typical load forecast variability and was driven primarily by AI-driven data center expansion, port electrification, and industrial load growth.

**The Dual Information Failure:**

Developers in April 2023 faced two simultaneous information failures:

1. **Price Signal Failure:** Capacity prices at $28.92 (lowest ever) with declining trend indicated oversupply
2. **Load Forecast Failure:** 2023 forecast showed modest ~1% annual growth, missing the coming data center explosion

Both signals pointed in the same direction: **don't build**. Neither indicated coming scarcity. By the time revised forecasts appeared (January 2024 and January 2025), developers had already passed the equipment lock-in point (September 2023) and couldn't respond.

**Structural Mismatch - Load Can Arrive Faster Than Supply:**

This period of fast moving market dynamics has taught a valuable lesson. Data center load can materialize in 18-24 months from initial inquiry to energization. Combined cycle development now requires 50 months under an extended development timeline. This creates a fundamental asymmetry: **load can arrive faster than supply can physically respond**, even with perfect foresight. The market's ability to balance supply and demand breaks down when demand changes materialize more rapidly than the development cycle allows for supply response. For those reasons, the capacity market requires time to respond to price signals. With the current expectations for large-scale increases year over year in system demand, combined with the expectation that the market prices will reflect the resulting scarcity, market sentiment now aligns with the observable forward market dynamic. The challenge now is timing.

**C. Interconnection Queue Structural Barrier**

**Queue Timing Restrictions**

PJM's BRA eligibility requirements compound the information gap problem. Based on PJM's own published BRA schedule and queue progression timelines:

**Only Transition Cycle 1 (TC1) resources were eligible for the 2027/2028 BRA**

- TC1 requirement to participate: BRA participation requires a new project to be in Phase III System Impact Study phase of the process. Notification to participants of them achieving Phase III was provided on December 3, the day before the start of the BRA.
- TC2 resources: Not eligible until 2028/2029 delivery year or later
- Cycle 1 resources: Not eligible until 2029/2030 delivery year or later

**The Queue Hold Impact**

In 2022, PJM imposed a hold on new interconnection requests. The queue remains closed as of January 2026 and is scheduled to reopen in April 2026 when it will begin accepting **Cycle 1** applications. This created an impossible timeline:

- **TC1 status requirement:** Projects must have already been in the queue before the 2022 hold began
- **One exception pathway (created 2024):** PJM created the Reliability Resource Initiative (RRI) in 2024 to allow certain shovel-ready, high-reliability projects to enter

TC1 outside the normal queue process. However, this pathway was not available when developers needed to make investment decisions in April 2023. As such, the vast majority of RRI projects were for delivery periods later than 27/28 or represented smaller uprate projects that could be commercialized by that delivery year.
    - It is notable that even though the majority of RRI projects have commercial operation dates beyond 27/28, the response generated by a single year of higher clearing prices through the RRI was significant, totaling over 11 GW. Indeed, we were selected to develop over 500 MW at two existing facilities for operation beginning in 2030.
- TC1 Phase III notification for participation in the 27/28 BRA was provided on December 3, 2025, the day before the BRA commenced.
- Queue reopening for Cycle 1: April 2026
- **Critical gap:** When developers made investment decisions in April 2023, the only path to TC1 status was to already be in the queue from before the hold imposed in 2022. The RRI exception pathway didn't exist yet. By the time RRI was created in 2024, the April 2023 development decision point had also already passed. When the queue reopens in April 2026, it will be for **Cycle 1** projects - which are **not eligible for 27/28 BRA**. Cycle 1 projects will only be eligible for 2029/30 or later delivery years.

**The Physical Impossibility:**

Any developer that decided to build in April 2023 faced a closed queue with no available path to 27/28 BRA eligibility, unless they happened to already be in TC1. To qualify as TC1, a project would have needed to be in the queue before the 2022 hold - before the investment decision point and before any price signals or load forecasts indicated such investment would be justified. The RRI pathway was not created until 2024 (after the April 2023 decision point), and even then did not produce meaningful new supply for the 27/28 BRA because of critical development timing issues. By the time new interconnection requests can be filed through the standard process (April 2026), those projects will enter as Cycle 1, ineligible for the 2027/28 BRA.

**Supply Constraint Result**

The combined effect of these restrictions was severe:

- Only **one** new natural gas plant in TC1 position: 569 MW Dominion Chesterfield
    - This resource received Capacity Interconnection Rights (CIRs) from the deactivation of Chesterfield Units 3, 4, and 5
    - **This represents replacement capacity, not capacity growth**
- RRI projects, which represented the only pathway for new projects to achieve TC1 status outside the normal queue process, did not provide significant new supply for the 27/28 BRA

- Outside of minimal RRI uprate projects, no other new thermal generation was eligible

**The shortage in the 27/28 BRA was not due to lack of developer interest or the market failing — it was due to physical impossibility of meeting eligibility requirements when the queue was closed during the critical entry period, and the failure of the RRI exception pathway to deliver significant new entry for the 27/28 delivery year.**

**D. Regulatory Uncertainty and Cost Recovery Concerns**

Beyond the timing and queue barriers, regulatory uncertainty creates additional investment risk that deters capacity development even when price signals eventually improve:

1. **Market Seller Offer Cap Restrictions (September 2021 - June 2025):**

In September 2021, FERC ordered PJM to implement a restrictive Market Seller Offer Cap (MSOC) based on net Avoidable Cost Rates, limiting generators' ability to reflect the incremental risk of capacity performance obligations in their bids. This change, first applied in the 2023/24 BRA (June 2022), contributed to a 32% price decline from $50.00 (2022/23) to $34.13 (2023/24).

When developers needed to make investment decisions in April 2023, the MSOC prevented resources from adequately reflecting Capacity Performance risk in their offers. PJM recognized this problem and filed a proposal in October 2023 (Docket No. ER24-98) to allow Capacity Performance Quantifiable Risk (CPQR) in offer caps - but this was 6 months after the April 2023 decision point. FERC rejected the proposal in February 2024 and only approved a revised version in June 2025 - 27 months after developers needed to make their investment decisions. Throughout the critical 2023-2024 period, regulatory uncertainty persisted about whether capacity market prices could adequately reflect the cost and risk of providing that capacity.

2. **Focused MOPR Implementation (September 2021 - present):**

In September 2021, the "Focused MOPR" took effect by operation of law (FERC deadlock 2-2), dramatically reversing FERC's December 2019 "Expanded MOPR" that had restricted state-subsidized resources. The Focused MOPR allowed state-subsidized renewable and nuclear resources to bid into the capacity market without price floors, potentially at prices below their cost of providing capacity. This change was challenged in court by generators concerned about price suppression from subsidized competition, creating legal uncertainty that wasn't resolved until December 2023.

When developers needed to decide in April 2023, they faced:

- Recent major MOPR reversal (Expanded MOPR 2019 → Focused MOPR 2021)
- Pending legal challenges to Focused MOPR
- Declining prices potentially attributable to subsidized resource participation ($50 → $34 → $29 during 2021-2023)
- Uncertainty about whether FERC might reverse course again

This regulatory pendulum created profound uncertainty about whether capacity market prices reflected genuine market fundamentals or temporary regulatory artifacts subject to future reversal.

3. **Long-term investment horizon mismatch**: Power plant development requires 20+ year investment certainty, but market rules can change within the 50-month development cycle. The MSOC and MOPR reversals in 2021, followed by PJM's rejected attempt to fix MSOC in 2024, demonstrated that major rule changes can and do occur mid-development cycle.
4. **Cost of New Entry concerns**: While the 2027/2028 clearing price of $333.44/MW-day is historically high, it is administratively set as part of the price collar and it may not fully reflect:
    - The 18-month timeline extension documented in the Quad Review
    - Post-2022 equipment cost escalation
    - Supply chain risk premiums
    - Regulatory risk premiums now required by investors

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## II. THE TIMELINE IMPOSSIBILITY

**Critical Timeline for June 2027 COD:**

April 2023: Development decision point (50 months before June 2027)
Known price: $28.92/MW-day (lowest in PJM history)
Visible trend: Declining ($50 → $34 → $29) - signals continued weakness
Developer response: Economically irrational to proceed
Queue status: CLOSED

September 2023: Equipment lock-in (Month 5 - point of no return)
Known price: Still only $28.92/MW-day
Queue status: CLOSED

July 2024: 2025/26 BRA clears at $269.92/MW-day
First high price signal appears
Reality: 15 months after decision point, 10 months after lock-in
TOO LATE - Project path already committed

July 2025: 2026/27 BRA clears at $329.17/MW-day
Economic signal: Strongly positive
Reality: 27 months after decision point, 22 months after lock-in
TOO LATE

Q3-Q4 2025: TC1 GIA execution deadline for 27/28 BRA eligibility
Only projects already in queue (pre-2022 hold) could meet this
Queue status: Still CLOSED for new applications

December 2025: 2027/28 BRA clears at $333.44/MW-day
Economic signal: Confirms sustained high prices
Physical reality: 32 months after decision point, 27 months after lock-in
TOO LATE for June 2027 delivery (18 months away)

April 2026: Queue scheduled to reopen for Cycle 1 applications
Cycle 1 projects not eligible for 27/28 BRA
Earliest delivery for Cycle 1: 50 months forward = June 2030
Cannot help 2027/2028 shortage

**Key Insight:** Even when scarcity became visible in 2024 (with the $269.92 clearing price and accompanying load forecast), it was already 15 months too late. The decision point had passed, equipment was committed, and the queue remained closed. This timeline demonstrates that even perfect foresight could not have prevented the shortage given the structural barriers in place.

**The Shortage Persists:** The structural nature of this capacity shortfall is evidenced by the 2026/27 BRA results (held July 2025), which cleared at the price collar cap of $329.17/MW-day with only 139 MW UCAP margin above the reliability requirement. The shortage was not a one-time anomaly but reflects a fundamental supply-demand imbalance that extends beyond 2027/28.

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## III. CONCLUSION: A PREDICTABLE AND PREVENTABLE SHORTAGE

The 2027/2028 capacity shortfall was not a failure of the capacity market mechanism—it was a predictable consequence of structural design mismatches:

**The Mathematical Certainty:**

1. Combined cycle development requires 50 months, while a Combustion Turbine requires 44 months (per PJM Quad Review)
2. Investment decision required: April – November 2023 (44-50 months before June 2027)

3. Price signal available: $28.92/MW-day (insufficient to justify investment)
4. Visible price trend: Declining sharply ($50 → $34 → $29), signaling continued market weakness rather than coming scarcity
5. Load Forecast trend: Flat historical and minimal projected load growth into the future
6. Interconnection queue: Closed (physically unable to enter even if economically justified)
7. High prices discovered: July 2024 onwards (first signal 15 months after decision point, 10 months after equipment lock-in)
8. Interconnection queue: Held closed during 2022-2023, preventing new projects from achieving TC1 status required for 27/28 BRA eligibility
9. 27/28 BRA cleared: December 2025 (32 months after decision point, TC1 deadline of Q3-Q4 2025 accessible only to pre-hold queue projects)

**Outcome: Shortage was inevitable**

The market worked exactly as designed — developers responded rationally to available information and followed established queue procedures. The problem is that the design requires developers to make multi-billion dollar commitments based on price signals – in this case grossly inadequate to incent such investment -- and then locks them out through queue restrictions.

**Key Insight: PJM cannot eliminate the 50-month development timeline (that's physics and supply chains), but PJM can provide better price transparency and stability (that's market design).**

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## RECOMMENDED INVESTIGATION FOCUS

We respectfully recommend that PJM's investigation focuses on three critical questions:

### 1. CONE Adequacy

Does the current Cost of New Entry adequately reflect the true cost of new entry given the 50-month timeline, 18-month supply chain extension, and post-2022 cost environment?

PJM's recent answer to protests in its 2025 Quadrennial Review proceeding (Docket No. ER26-455-000, filed January 2, 2026) acknowledged concerns raised by us and P3 that "the actual gross CONE for the CT may be significantly greater than the values estimated by PJM's consultants." While PJM defended its consultants' estimates for purposes of that proceeding, the capacity market shortage investigation should examine whether the CONE values used in recent auctions have understated the true cost of new entry, potentially

contributing to insufficient price signals during the critical 2023-2024 investment decision period.

**2. Auction Timing - Two Potential Paths Forward**

How can BRA structure be modified to align price signals with investment decision timing? PJM should evaluate several distinct approaches:

**Option A: Enhanced Forward Auction Structure with Administrative Backstop**

**Primary objective:** Return to and maintain a consistent 3-year forward auction cadence as soon as possible. The current compressed auction schedule has been a documented barrier to entry, preventing developers from having adequate lead time to respond to price signals. A stable 3-year forward schedule should be the baseline market design, particularly now that capacity scarcity conditions are broadly recognized and appear to be a durable feature of future auctions.

**Interim measure - Administrative Backstop to Multi-Year Contracting:**

While working to restore the 3-year forward auction schedule, implement a modification to the reliability backstop mechanism (similar to our proposal in the recent Critical Issue Fast Path process) that would allow faster triggering of multi-year contracting with PJM when market response is inadequate:

- **Trigger mechanism:** Avoid dipping more than the Reference Resource UCAP MW below Point A on the VRR curve
    - The current Reliability Backstop trigger requires three consecutive auctions to clear below Point A, which delays action to restore resource adequacy
    - Our proposal would allow the Reliability Backstop to trigger immediately based on the Reference Resource UCAP threshold
- **Effect:** This would move the clearing point back to the inflection point on the VRR curve rather than allowing steep descent below Point A, similar to the provisions of the current Reliability Backstop in the Tariff
- **Result:** Faster triggering of reliability backstop and multi-year contracting mechanisms
- **Benefit:** Potentially allow for faster entry of new supply if market response to price signals proves inadequate within the standard auction timeframe

To be deemed eligible to participate in the reliability backstop procurement, new resources should meet stringent project maturity, availability and financial security requirements to insure against speculative projects crowding out new capacity that can help mitigate capacity scarcity.

**Alternative: Two-Clear Mechanism for Large Load Integration**

If PJM determines that native load is no longer willing or able to pay the capacity prices needed to incent new capacity resources to be built, PJM should consider implementing our two-clear auction mechanism proposed in the CIFP process. As described in greater detail in the materials presented in the recent PJM CIFP process, this approach would:

**Clear 1 (Organic Load and Paired Large Loads):**

- Existing load and large loads with contracted generation participate
- Market clears based on supply-demand balance for established load
- Organic load and paired large loads pay the competitive market-clearing price

**Clear 2 (Unpaired Large Load Entry):**

- New large loads without contracted generation may enter by paying an entry fee (based on gross CONE, on a $/kW basis)
- Entry fee revenues flow to all cleared supply, providing strong investment signal beyond single-year clearing prices
- Excess revenues above VRR price cap rebated to Clear 1 buyers, reducing their costs
- Large loads internalize the capacity scarcity cost they create

**Key benefits of two-clear structure:**

- Protects existing consumers from price impacts of unprecedented large load growth
- Maintains competitive market price discovery and scarcity pricing
- Creates powerful investment incentive through entry fee revenue to all supply
- Incentivizes large loads to pair with new generation to avoid entry fees
- Creates an accelerated interconnection pathway for new capacity that is paired with large loads
- Enables multi-year revenue certainty for new supply (through 7-year price lock mechanism)
- Allocates costs based on cost causation rather than suppressing price signals

This approach and the administrative backstop provides a safety valve that enables multi-year commitments when the market demonstrates insufficient supply response in a given delivery year, addressing the timing mismatch between development cycles and auction schedules without requiring a complete redesign of the BRA structure. While the tariff contemplates a back stop, because it has never been implemented, significant details would have to be worked out, including contract timelines, quantity, cost allocation, and evaluating the most cost effective offers. In any consideration of changes to the Reliability Backstop, PJM must be careful to protect the competitive market signals to ensure that the market remains the mechanism to incent new supply entry.

**Option B: Transition to Prompt Auction with Bilateral Markets**

- Move to prompt (or near-prompt) capacity auction timing
- Create market mechanisms and frameworks that facilitate bilateral contracting between capacity suppliers and load-serving entities
- Incent long-term bilateral contracts that provide developers the revenue certainty needed for 50-month development cycles
- This approach acknowledges that administered auctions with short lead times cannot provide the forward certainty that long-lead resources require

Both approaches address the fundamental timing mismatch, but through different market structures. The investigation should evaluate which approach (or hybrid) best serves PJM's reliability objectives while enabling timely investment signals.

Note that nothing precludes using a reliability backstop with Option B.

**3. Queue-Market Alignment - Immediate Action for 2028/29 BRA**

How can interconnection queue progression be aligned with BRA eligibility to avoid leaving available capacity on the sidelines? **PJM has an immediate opportunity to mitigate the ongoing shortage for the 2028/29 delivery year:**

The 2028/29 BRA is currently scheduled to commence June 30, 2026 and close July 7, 2026. However, Transition Cycle 2 (TC2) Phase II is scheduled to complete July 1, 2026, with Phase III commencing July 2, 2026. Participation in the BRA requires developers to be in Phase III of the interconnection process.

**The timing problem:** TC2 developers will receive the Phase III information needed to make their offer decisions either just before or potentially even after the BRA opens. With the auction window spanning June 30 - July 7, developers may have insufficient time to evaluate their Phase III status and prepare competitive offers.

**The opportunity:** There are 18 natural gas plants in TC2 with in-service dates on or before June 1, 2028 that could potentially participate in the 28/29 BRA if given adequate time to evaluate their Phase III position.

**Recommendation:** Delay the 2028/29 BRA opening from June 30 to approximately mid-August 2026. This would:

- Allow TC2 Phase III to be fully established (begins July 2, 2026)
- Give developers 6+ weeks to evaluate their Phase III status and prepare offers
- Potentially add significant new supply to the auction (18 gas plants representing substantial capacity)
- Demonstrate PJM's commitment to maximizing participation and competition

- Help mitigate the ongoing capacity shortage for 2028/29 delivery year

This is a concrete, immediately actionable step that requires no market design changes - only a brief administrative auction delay to better align with queue milestone timing.

Over the longer term, changes to the reliability backstop mechanism, or adoption of capacity market reforms, such as our CIFP proposal described above may require additional modifications to the interconnection process to ensure that resources contracted and proceeding to commercialization are not constrained by delayed interconnection timelines. The adoption of those types of interconnection reforms must be consistent with the objective of closing the physical capacity shortage on the system.

These questions directly address the Tariff Section 16.2 mandate to investigate causes and recommend corrective action regarding barriers to entry and CONE adjustments.

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**We appreciate the opportunity to provide input to this critical investigation and stands ready to engage further in stakeholder discussions on these recommendations.**

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## SUPPORTING EVIDENCE REFERENCES

This response is based on:

- PJM 2025 Quadrennial Review Filing (Docket No. ER26-455-000, filed November 7, 2025 and answer filed January 2, 2026)
- Brattle 2025 CONE Report for PJM (attached to Quadrennial Review filing)
- Affidavit of Dr. Samuel A. Newell, Dr. Andrew W. Thompson, Dr. Bin Zhou, and Joshua C. Junge
- PJM BRA Clearing Price Results (Official PJM Table 2 - Historical data through 2027/2028)
- PJM BRA Schedule and Queue Eligibility Requirements
- Our internal analysis of development economics and market timing