



Constellation appreciates the opportunity to provide feedback to PJM and work as a constructive partner with PJM, States, and stakeholders in developing a durable framework for resource adequacy and restore the vibrancy of its markets. Competitive markets have reliably and cost effectively served consumers in the PJM region for over a quarter of a century. As PJM notes in its paper, *Powering Reliability Through Market Design* (Investment Paper), generators competing to serve load save consumers billions of dollars every year by optimizing the use of the entire regional fleet. Well-designed competitive markets also shift risks to those best equipped to manage them and, by doing so, insulate consumers from changes in load, poor resource performance, and fluctuating conditions.

In recent years, however, structural challenges and exogenous factors have chipped away at the efficacy of these markets. While PJM acknowledges some of these challenges and factors in the Investment Paper, PJM overemphasizes some factors while discounting others. More importantly, in the name of addressing an immediate resource adequacy challenge, price volatility, and political expediency, PJM has chased short-term relief through a series of choices that have undercut market operations and, if not corrected, will further degrade resource adequacy in the region. PJM should return to the market fundamentals that were previously a hallmark of the RTO, strengthening market signals, increasing investment, and ensuring durable, long-term resource adequacy.

Background and Market Principles

PJM's 2028/29 Reliability Pricing Model (RPM) Base Residual Auction (BRA) cleared 6,831 MW UCAP below the RTO reliability requirement, following a significant shortfall observed in the 2027/28 RPM BRA.¹ These shortfalls highlight current resource adequacy challenges, which as outlined below have been driven by fundamental market tightness and made worse by a series of market interventions. Over the past several years, a confluence of several trends including load growth, ongoing retirements of existing resources, and delays in permitting and processing resources through interconnection queues, combined with escalating construction costs and expanding timelines for equipment delivery have resulted in fundamentally tighter electricity markets. Load forecasting practices have not kept pace with the need to more accurately estimate both the scale and actual timing of the anticipated new load. Resource planning also has become more challenging as extreme weather events and the increased penetration of

¹ "2028/2029 Base Residual Auction Report", PJM July 14, 2026. Available at: [2028-2029-bra-results-report.pdf](#)

intermittent resources and fuel availability exposes the need for more robust ELCC calculations so that the market can more appropriately reflect the contribution to reliability from capacity resources.

A number of these challenges are not new. Indeed, PJM pointed to the ongoing risk of retirement of existing thermal facilities in its 2023 paper *Energy Transition in PJM: Resource Retirements, Replacements & Risks* (4R Report),² which outlined a range of economic and environmental policy challenges facing these resources. That paper also highlighted that the interconnection queue was dominated by intermittent resources that provide a different reliability profile than the thermal resources most at risk for retirement. At the same time PJM was highlighting future reliability challenges stemming from these retirements and its own load forecasts showed increasing demand from electrification and growing data center demand, the BRA auctions cleared at historic lows - \$50/MW-day in 2022/23 and \$34/MW-day in 2023/24³ – sending a blunt and stark signal for generation to retire. Resource adequacy begins with resource retention. The cheapest, fastest, and lowest risk megawatt is almost always the one already permitted, connected, and in operation, and the market should be, but has not been, designed consistent with that resource adequacy benefit.

As PJM considers the next evolution in its markets to maintain long-term resource adequacy, it cannot focus myopically on new generation. While new resources are certainly needed, they do no good if existing resources are retiring or exiting the market at a faster pace. Noted economists Peter Cramton, Alex Ockenfels, and Steven Soft explained the value of existing resources and the resource adequacy and long-term cost implications when existing resources are not properly valued or valued less than new resources:

There is confusion around giving capacity payments to generators that would remain in the market without such payments. Why are they being paid to do what they would do anyway? The simplest answer is one that answers a good many, perhaps even most, capacity market puzzles. Existing plants are paid because that is what an ideal energy-only market would do. An energy-only market pays for peak capacity with scarcity prices that rise above the variable cost of a peaker. But when there is

² “Energy Transition in PJM: Resource Retirements, Replacements & Risks”, PJM February 24, 2023, Available at: [energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx](https://www.pjm.com/markets/energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx)

³ Table 2, “2028/2029 Base Residual Auction Report”, PJM July 14, 2026. Available at: [2028-2029-bra-results-report.pdf](https://www.pjm.com/markets/2028-2029-bra-results-report.pdf)

scarcity, every operable plant is running, and all are paid the same scarcity price—even though they would stay in the market without such payments. A deeper answer would explain why ideal markets pay existing plants the same for their electricity as new plants. One could imagine inducing new plants to enter the market with long-term contracts that pay for both variable and fixed costs, but paying existing plants only a tiny bit more than their variable costs. They would not close, because some profit is better than none. This is called a regulatory taking or expropriation, and it can work effectively if investors are surprised. But once the policy is known, new plants will demand contracts that protect them from future expropriations and likely charge a significant risk premium as well.⁴

It also is important to remember that both new and existing resources have capital costs and that the cost of maintaining the existing fleet is significant (including maintenance costs, relicensing costs, fuel conversions etc.). Many of PJM’s recent market interventions have been aimed at undercutting existing resource revenue, making retirement or market exit more likely. Actions that bifurcate the market, whether between existing and new resources, between new loads and existing loads, or between retail loads and large loads, should be avoided as much as possible. The Federal Energy Regulatory Commission has long recognized the value of a single-clearing price market, finding with specific reference to PJM: “In a competitive market, prices do not differ for new and old plants or for efficient or inefficient plants; commodity markets clear at prices based on location and timing of delivery. . . Such competitive market mechanisms provide important economic advantages to electricity customers. . . This market result benefits customers, because over time it results in an industry with more efficient sellers and lower prices.”⁵ More recently, in May 2025, NYISO’s Market Monitoring Unit and FTL consulting affirmed that, while discriminating between existing and new capacity can result in short-term reductions in costs to consumers, “in the longer run, as more existing capacity inefficiently exits as a result of the artificially low capacity price and is replaced with high-cost new

⁴ Capacity Market Fundamentals, Peter Cramton, Axel Ockenfels, and Steven Stoft; *Economics of Energy & Environmental Policy*; p.40.

⁵ *PJM Interconnection LLC*, 117 FERC ¶ 61,331 at P 141 (2006).

capacity, the short-run consumer savings will tend to turn into higher costs for future consumers.”⁶

It is equally important for PJM to reestablish investor faith in its markets. After years of historically low – and unsustainable – capacity prices, increasing demand and tightening supply have resulted in higher clearing prices that triggered unprecedented political sensitivity and backlash. The RPM price collar that was introduced for the 2026/27 and 2027/28 Delivery Years was proposed as a one-time only event and approved as such by FERC only to be extended through the 2028/29 and 2029/30 Delivery Years, leaving market participants unsure of future revenue streams and dimming investment appetite. There is now an expectation that capacity market prices will be low not only when there is surplus capacity (as would be expected through a market) but also when supply is tight (through an out-of-market constraint). This expectation has a chilling effect on investment, whether to retain existing resources or develop new ones.

At the same time, the reliance on a range of out-of-market actions such as Reliability Must Run (RMR) contracts and bidding RMR resources as price takers into the BRA further dilutes the very market signals needed both to preserve existing capacity and to provide an incentive for new capacity to enter the market. Such actions only increase the potential for more RMR agreements and market inefficiencies. The Reliability Backstop Procurement (RBP), if accepted as proposed, will compound this problem by requiring RBP resources to offer into RPM auctions as a price taker, effectively the same as dropping as much as 6,800 MW of RMR capacity into RPM. This will be particularly damaging if the new large load associated with the RBP resources comes in slower than the RBP resources (or does not come in at all).

All of these decisions by PJM are undermining the very investment signals that PJM is saying that it wants to send. To reset the direction in PJM, it is essential that we clearly identify the problems that we are aiming to tackle and ensure that changes being made address those problems. Simply put, we need a functioning market that allows supply and demand dynamics to be reflected through clear price signals. As the NEDC/PJM Governors’ made clear in their Statement of Principles Regarding PJM, it is now time to “Return PJM to Market Fundamentals.” This will provide investors with direction and incentivize the

⁶ See “Discriminatory capacity market pricing designs”, NYISO, ICAP Working Group, Available at: <https://www.nyiso.com/documents/20142/51574954/2%20Workshop%20on%20Discriminatory%20Capacity%20Auction%20Design%20-%20052225%20icap.pdf/9d71f2ba-cd0c-08be-3851-5da9a26769a1>

retention of existing resources along with the construction of new resources as needed. At the same time, we need to ensure that the market framework has political and regulatory durability. These are not competing goals; they are both necessary conditions. A market that does not have political and regulatory durability will not attract the necessary capital to develop and retain resources, and a market that does not retain and develop needed resources is not durable.

Responses and Recommendations

Turning to PJM's prompts, Constellation outlines below our recommendations for reforms that will allow PJM to preserve a well-functioning, competitive market that maintains durable resource adequacy going forward.

1. The path(s) (either as described in the PJM paper or alternative paths) that your organization believes PJM should pursue and why

As PJM acknowledges, the paths laid out in the Investment Paper are directional and not mutually exclusive. There are “no regrets” changes that will strengthen the foundation of PJM markets that should proceed immediately, even while PJM collaborates with stakeholders to identify, develop and implement a new approach to longer-term resource adequacy. Specifically, PJM should complete the Energy & Ancillary Services (E&AS) reforms developed through the Reserve Certainty Senior Task Force (RCSTF). These reforms are essential because PJM increasingly relies on out-of-market actions to address operational needs that are not adequately reflected in existing market products. Failure to correct this problem will undermine the viability and success of any of the longer-term resource adequacy reforms ultimately pursued by PJM.

Known and recurring reliability needs are not currently incorporated into today's market products and price formation, resulting in excessive reliance on manual actions, increasing uplift, and shifting costs away from those able to manage them most efficiently. The RCSTF E&AS reforms are a critical first step in addressing these problems. The bulk of payments to resources in PJM flow through the E&AS markets, and yet that compensation is not fully aligned with resource availability and performance. The RCSTF reforms are not perfect, and more work needs to be done, but timely implementation will greatly improve E&AS market operations.

Path C contemplates a more significant shift of revenue recovery to the E&AS markets from the capacity market, paired with long-term forward contracting. Tying compensation as much as possible to availability and performance during actual operations is and should be a cornerstone of PJM's market design, but relying solely on the E&AS markets for resource adequacy would require adoption of E&AS price caps that are much higher than is likely politically acceptable in the PJM region, even with widespread forward contracting by load. Investment in both new and existing generation requires durable revenue certainty. Relying solely on a short-term market signal that is price-constrained due to political tolerance is not a viable path for PJM.

Path B suffers a different fatal flaw: it is fundamentally inapposite to reliably meeting the demand for electricity in the region, which is PJM's professed north star. Path B abandons market signals, chooses winners and losers when sufficient supply is not available, and does not create a durable forward-looking revenue framework for attracting and retaining the resources needed to satisfy the electricity demand in the region. Excessive reliance on involuntary demand curtailment or mechanisms such as Interim Resource Adequacy Service ("IRAS") harm both PJM's markets and overall system reliability in three distinct ways.

- Employing mandatory curtailments relatively early in emergency operations (before, for example voluntary pre-emergency and emergency demand response) is economically inefficient and less reliable. The large loads likely to be forced to curtail early are likely to be customers for whom curtailment is relatively costly and difficult and, therefore, carries a higher risk of non-performance when curtailed. Relying on such involuntary load curtailments as the initial line of defense under emergency conditions will raise production costs, decrease total social surplus, and increase reliability risk.
- Mandatory early curtailments suppress the scarcity signals that competitive energy markets need to incent the development and retention of resources, including voluntary demand response, that can respond to scarcity conditions in a reliable and least cost manner.
- Discriminating among customer classes leads to bifurcated markets – as proposed in PJM's IRAS filing – which creates a disconnect between the level of resource adequacy signaled by capacity market clearing prices and the actual, worse level of

physical resource adequacy that exists in reality. New resources will not be provided with a signal to enter via the capacity market and existing resources will not be provided with a comparable signal to remain in the market. This will result in existing resources exiting the market early and new resources delaying entry in search of better out-of-market options.

For these reasons, PJM should not rely on differentiated reliability as either a short-term or long-term organizing principle for its markets. Near-term scarcity conditions should not become the basis for abandoning PJM's common and long-held reliability standard. Perpetual involuntary curtailment of certain customers cannot become a substitute for procuring the resources necessary to serve load reliably.

The forward-contracting objective underlying Path A is the most viable option for the PJM region. PJM has correctly identified a fundamental problem: too many consumers have been left exposed to abrupt changes in annual capacity costs. Meanwhile, generation investors under current market conditions require substantially longer-term revenue certainty to support investment. A greater degree of forward commitment can help bridge this gap and create a more durable pathway for maintaining adequate supply.

During the period where RPM auction prices cleared at low levels, market participants did not have a strong incentive to hedge and a significant portion of load began "riding" the annual capacity market, often through state default service auctions. This behavior had several negative consequences, most notably leaving customers – residential consumers in particular – exposed to price volatility. When prices were low, the underlying risk was not apparent, but when prices rose the risk became clear and undermined public confidence in the market. Higher levels of price volatility present a clear incentive for market participants to better hedge their positions and protect against large swings in underlying prices. Increased levels of hedging in turn can help mitigate the impact of this volatility on customer classes that are least able to bear them.

While Electric Distribution Companies (EDCs)/Load Serving Entities (LSEs) retain the responsibility for hedging their loads, States can and should play a role in removing regulatory barriers to hedging, defining which customer classes should face hedging requirements, the structure of hedging requirements (e.g., the percentage of load to be hedged for each specified durations, etc.) and identifying sophisticated participants, like large loads, who can manage risk. This has not happened, leaving PJM in the position of

“fixing” the failure of EDCs/LSEs and States to hedge through interventions that have eroded public faith and investor confidence in the durability of the market. As contemplated in Path A, EDCs/LSEs with support from the States should engage in staggered hedging by procuring tranches of capacity over time, thereby insulating retail customers from procuring all their capacity needs from a single high clear. Ideally, market volatility alone should have served as the incentive to hedge retail load, just as it incentivizes many large loads to engage in long-term contracting. History has taught us, however, that additional incentives or requirements are necessary in order to achieve these benefits for all customers.

As PJM and stakeholders evaluate how to develop and implement forward contracting under Path A, we should be collectively guided by several basic market principles:

- Market design should be based on core market fundamentals and designed to incent long-term resource adequacy and not chase a specific price or outcome.
- Any PJM-level requirement must be nondiscriminatory, from the perspective of both resources (new and existing) and loads (large and small, new and existing).
- PJM should not exercise authority over retail procurement decisions that properly reside with the States.

Properly implemented, Path A will preserve competitive market signals, protect the common reliability standard, and provide a more sustainable pathway for meeting PJM’s growing resource-adequacy needs.

2. Additional or supplemental path(s) that you recommend States explore to support long-term market durability and/or customer cost stability

To complement PJM’s development and implementation of stable and long-term forward commitments, the States should provide customers with the tools to manage their exposure to wholesale market outcomes and remove barriers that prevent supply and demand from responding to wholesale market signals.

PJM identifies permitting and siting constraints as significant contributors to the current mismatch between the pace of load growth and the development of new generation. States should immediately implement reforms that make those processes

more timely and predictable. And PJM should facilitate the States' substantive review of energy infrastructure by providing regulators information and expertise needed to evaluate the need for each project.

States also should reform existing procurement rules to remove unnecessary restrictions on the ability of EDCs/LSEs to manage customers' exposure to wholesale market volatility through longer-term contracting. This includes updating rules that limit voluntary demand flexibility, bilateral contracting, and efficient siting of loads with resources through co-location. States should ensure EDCs/LSEs have the full range of tools to manage customer risk rather than relying primarily on administrative curtailment during emergency conditions.

In the restructured states, competition should continue to be used to drive efficient investment in generation. Returning to rate-based generation in restructured states would shift risks back to – and increase costs for – the very customers wholesale market reforms are designed to protect. The concerns regarding cost allocation for PJM's RBP would be far greater for a widespread return to rate-based generation, potentially saddling consumers with billions in stranded costs.

States should work with, and not against, wholesale market signals. Suppressing competitive market prices or repeatedly intervening in market outcomes for political reasons might provide short-term relief, but doing so undermines investment signals and ultimately harms consumers with higher long-term costs and reduced reliability. A durable wholesale market construct and consumer cost stability are complementary rather than competing objectives, and should be the focus of PJM, the States, and market participants.

3. Any specific areas of the market design that your organization believes should be included in the scope of the upcoming stakeholder process, including why focusing on those areas will help stabilize PJM's wholesale markets and support more durable resource adequacy in the region

PJM should include the following capacity market design reforms as it works to develop and implement Path A (while also immediately implementing the RCSTF reforms).

A prompt residual auction better aligned with load forecasting.

PJM should pair implementation of a longer-term resource adequacy framework with a residual capacity auction closer to the delivery year. Rapidly changing large load forecasts have introduced substantial uncertainty into long-range capacity requirements. A prompt auction could provide better visibility into the amount of load that has actually materialized. A prompt residual auction would be based on a more accurate assessment of the region's supply and demand picture and could potentially reduce overall capacity costs.

In its review of ISO-New England's decision to move to a prompt auction, Analysis Group found the benefits would include: more accurate information about demand; more accurate information about supply; reduced delivery risk and market uncertainty; retirement notification requirements that allow more efficient capital decisions; better alignment with operational timeframes, particularly winter fuel arrangements; resource technology neutral platform for new invest; and, an administratively simpler and less costly auction process.⁷ PJM would likely see many similar benefits. However, because the time between the auction window and the delivery year is shorter, the risk of price volatility is higher. This has the benefit of providing for a more “real-time” reflection of system conditions, but also requires, as the Analysis Group pointed out in their study, a commitment to forward hedging beyond what is provided in an RTO-directed three-year forward market. PJM therefore should pair moving to a prompt auction with the implementation of a longer-term procurement mechanism contemplated in Path A.

⁷ Capacity Market Alternatives for a Decarbonized Grid: Prompt and Seasonal Markets; Analysis Group; <https://www.analysisgroup.com/globalassets/insights/publishing/2024-capacity-market-alternatives-for-a-decarbonized.pdf>; pp 2-3.

PJM also should pair these reforms with continued efforts to improve the accuracy and timing of its load forecasts. PJM, for example, should consider whether it makes sense to wait to begin collecting large load information until after the summer is complete and the most recent peaks are observed and weather normalized. This might delay the publication of the load forecast report (and thus move the auction window to a later date in the year), but it would likely increase the accuracy of the load forecast, a key auction planning parameter. PJM should seek to align the load forecast process, resource-adequacy inputs, and delivery year planning with a new RPM auction schedule so that the residual auction clears using the latest reasonably available and internally consistent information. Simply moving the auction closer to the delivery year would provide limited benefit if PJM continued to rely on stale or mismatched assumptions regarding load and available resources.

A redesigned minimum capacity market price floor or comparable downside guardrail.

To the extent the ultimate market architecture retains a centralized capacity market or residual capacity auction, PJM should evaluate whether a carefully calibrated minimum price floor or comparable downside pricing guardrail could support more durable competitive market outcomes.

The objective of such a mechanism would not be to guarantee revenues to particular resources or prevent competitive prices from declining when supply is abundant. Rather, an appropriately designed floor could reduce extreme boom and bust capacity market signals that undermine resource retention decisions and ultimately increase reliability and customer cost risks. Since existing resources can exit the market far quicker than new resources can come in, such a mechanism would ensure existing resources do not leave when new load entry is imminent, which is particularly important if there is a move to a prompt auction. At the same time that PJM was correctly warning of an impending resource adequacy shortfall in its 4R Report, the BRA clearing prices were sending a market-exit signal. Now PJM is looking to incent the return of some of those same deactivated resources through a costly 15-year backstop procurement that the market told to retire less than half a decade ago. A minimum capacity price floor would be a limited downside guardrail intended to reduce the risk of temporarily depressed capacity prices that contribute to premature resource exits, followed by abrupt scarcity, sharply higher prices, and renewed pressure for administrative intervention.

4. Areas that should remain out of scope in these stakeholder discussions and why it is appropriate to narrow the scope of work accordingly

Given the size and complexity of the challenges facing market participants, Constellation does not at this stage recommend categorically excluding any substantive area of PJM's wholesale market design. PJM and policymakers have intervened in many important parts of the market, both in response to and as a source of the current resource adequacy challenges, and these in turn have had secondary impacts on many other facets of the market, necessitating careful and fulsome review going forward. Against that backdrop, it would be premature to determine at the outset that certain elements of the existing design should not be examined as part of the broader assessment of market durability.

5. The process that your organization would recommend be used to structure the stakeholder engagement

To ensure the most constructive and productive use of time and resources, leadership from the PJM Board and staff is critical. PJM cannot simply be a facilitator in these conversations. It must lead them and proactively seek input and participation from the States throughout the process.

PJM also should strive for increased consistency in policy direction. Repeatedly changing fundamental positions in response to short term outcomes or stakeholder pressure has eroded stakeholder confidence in PJM as an organization and its ability to administer its markets. A durable solution will require support from a wide spectrum of stakeholders, including PJM's Members. As buyers and sellers of wholesale market products that ultimately need to be able to safely and reliably operate resources and engage in commercial transactions, Members bring important perspectives that must not be ignored.

6. Any thoughts you have on issue prioritization and timing considerations for addressing these issues?

As discussed above, PJM should complete the RCSTF reforms already underway. PJM also should play a more proactive role and make clear the prioritization of the various workstreams underway and should ensure the schedule for working through the workstreams is adhered to, especially for priority items. At the Market Implementation Committee (MIC) this would include addressing advanced commitment operation, out of

market commitments, uplift, and legitimate generator cost recovery. Additionally, PJM should consider which reforms can be moved quickly through the regular stakeholder process and seek to expedite those, provided that any immediate reforms do not limit or undermine long-term reforms.

7. Any education or analysis that you would request from PJM to support the upcoming stakeholder engagement?

As PJM develops a proposal for consideration, it should conduct and present a comprehensive revenue sufficiency and market revenue analysis using the latest and most current data. This will help to ground the scope of the challenge facing the region and whether the market is providing sufficient incentives to retain existing capacity and build new resources in order to close the resource adequacy shortfall. PJM should prioritize education and analysis that supports an integrated assessment of market design, rather than evaluating reforms in isolation.

Conclusion

PJM's current resource adequacy challenges are a result of both conditions and choices. PJM and stakeholders must now make the choice to return to market fundamentals that will ensure both a durable market design and long-term resource adequacy. PJM should abandon actions that undercut its core reliability mandate, undermine accurate price formation, and market signals, and prioritize short-term relief over long-term supply. To meet the moment, PJM – and especially the PJM Board – must lead on core principles while being receptive to the views of the States and Members who serve as policymakers and market participants for the region.