

APPENDIX

ATTACHMENT A

Comments of the PSEG Companies

*Federal Energy Regulatory Commission
Docket Nos. ER25-682 and ER25-785*

Filed January 6, 2025

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

PJM Interconnection, L.L.C.)
) Docket Nos. ER25-682 and ER25-785
)
) (Not consolidated)

**COMMENTS OF
THE PSEG COMPANIES**

Pursuant to Rule 212 of the Federal Energy Regulatory Commission’s (“Commission”) Rules of Practice and Procedure, 18 C.F.R. 385.212, the PSEG Companies¹ hereby submit these comments in response to PJM’s two recent filings under Section 205 of the Federal Power Act (“FPA”) proposing reforms to the PJM Reliability Pricing Model (“RPM”) capacity market: (1) the December 9, 2024 filing in Docket No. ER25-682 (the “December 9 Filing”), and (2) the December 20, 2024 filing in Docket No. ER25-785 (the “December 20 Filing”) (collectively, the “Capacity Market Reform Filings”).

I. EXECUTIVE SUMMARY

The PJM region is facing a serious reliability crisis. Over the past several years, PJM has issued warnings that the region is facing a looming reliability crisis due to a

¹ The PSEG Companies are Public Service and Gas Company (“PSE&G”), PSEG Power LLC, and PSEG Energy Resources & Trade LLC, which are each wholly-owned, direct or indirect subsidiaries of Public Service Enterprise Group Incorporated (“PSEG”) (collectively, “PSEG” or the “PSEG Companies”).

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convergence of factors.² In the Capacity Market Reform Filings, PJM again emphasizes that there is “an extreme and rapid tightening of the supply and demand,”³ and that the region could be short of capacity in as little as two years. The tightening of supply and demand is evidenced by the fact that auction clearing prices for the 2025/2026 the delivery year hit record prices, and PJM has warned that the auction clearing prices for the upcoming 2026/2027 Base Residual Auction may hit the price cap for the RTO Region.⁴ Consequently, over the past three months alone, three complaints have been filed at FERC against PJM alleging that the market rules governing the PJM capacity market are unjust and unreasonable and that significant reforms are necessary.

In the Capacity Market Reform Filings, PJM proposes certain “targeted” reforms to the RPM capacity market.⁵ However, the PJM Board itself has acknowledged that PJM’s suite of Section 205 filings, “taken in the aggregate,” will not address the resource

² See, e.g., February 24, 2023 Letter by Mark Takahasi, Chair of the PJM Board of Managers to initiate an accelerated process to resolve resource adequacy and reliability concerns (stating that “there are numerous data points suggesting that grid operators may face challenges in maintaining reliability during the transition.”). <https://www.pjm.com/-/media/DotCom/about-pjm/who-we-are/public-disclosures/20230224-board-letter-re-initiation-of-the-critical-issue-fast-path-process-to-address-resource-adequacy-issues.ashx>

³ December 9 Filing, Transmittal Letter at 5.

⁴ December 20 Filing, Transmittal Letter at 6.

⁵ December 20 Filing, Transmittal Letter at 6 (stating that “Through this filing, PJM proposes targeted capacity market reforms to better reflect the PJM Region’s existing supply and demand fundamentals in the RPM Auctions.”). See December 9, 2024 PJM Board’s Letter to Stakeholders at 4 (characterizing the reforms presented by PJM Staff as “modest”).

adequacy challenge that the PJM region is facing and that “additional filings in the future are needed.”⁶

Given the “generational challenges” that the PJM region faces,⁷ a fundamental overhaul of the RPM market design is warranted at this time to address the meaningful reliability challenges the PJM region will face in the next few years -- challenges that are not likely to abate but in fact only worsen as electric demand continues to grow and supply continues to tighten. Accordingly, PSEG urges the Commission to direct PJM to undertake a comprehensive, holistic review of the RPM market design and take concrete steps to ensure the future reliability of the PJM system. And we stand ready to work with PJM and other stakeholders to identify and develop solutions to address the critical reliability issues facing the PJM region. As part of this effort, PSEG offers three principles to guide PJM’s reform efforts and actions:

- First, PJM must provide certainty to market participants by applying and enforcing its market rules strictly. Specifically, if a complaint is filed challenging the market rules, PJM should firmly defend its rules and not rush to seek to delay future auctions for the purpose of revising its rules in response to the specific complaints. Such actions only invite additional

⁶ See December 17, 2024 Letter to the PJM Stakeholders by Mark Takahasi, Chair, PJM Board of Managers (stating “PJM does not expect that these filings, taken in the aggregate, will fully resolve the resource adequacy challenge that we are collectively facing.”).

⁷ PJM Statement on FERC Complaint Filed by the Governor of Pennsylvania (Dec. 31, 2024) <https://www.pjm.com/-/media/DotCom/about-pjm/newsroom/2024-releases/20241231-pjm-statement-on-pa-gov-complaint.pdf>

complaints, thereby creating unnecessary uncertainty for generators, investors, and consumers. In this respect, in connection with Winter Storm Elliott, which saw a high percentage of generation outages resulting in the imposition of penalties as provided for in the PJM Tariff, PJM should have firmly applied and enforced the market rules that were in place, which would have promoted regulatory certainty and investor confidence that PJM will honor the rules that are in place.

- Second, capacity market rules must send accurate and sufficiently forward-looking price signals that promote long-term adequacy and economic efficiency by creating incentives for existing resources to remain on the system and for new market entry to meet the expected demand before the problem occurs. The price signals should provide adequate lead time (*i.e.*, a minimum of three years) for new generation resources to come online to meet the expected demand. Since its inception, the RPM capacity market has been a three-year forward looking cycle, which provides market participants with sufficient forward-looking price signals and lead time to develop new generation capacity to come online *before* the problem materializes. But due to numerous delays in the auction schedules in recent years, the RPM capacity market auctions have been on very compressed schedules, which do not provide any meaningful forward-looking signals and lead time for new generation to come online. On a going forward basis, the Commission should direct PJM to resume running its RPM auctions on a three-year cycle (without deviation) to

restore the lead time of three years for investors to respond and make the needed generation investments in PJM. Moreover, the Commission should direct PJM to evaluate whether additional reforms are needed so that the RPM construct provides longer-term and more stable price signals (*i.e.*, less volatility in capacity prices from year to year). This would enhance certainty and instill investor confidence, both of which are necessary to support and incent new generation investments to ensure resource adequacy as well as benefitting customers by providing rate stability.

- Third, PJM should take steps to ensure that the RPM market rules properly recognize the most reliable generation resources on its system, including nuclear generation. In addition, to enhance reliability, the Commission should direct PJM to adopt specific fuel reliability enhancements to improve performance by gas generators during emergency conditions.

With respect to the specific proposals contained in the Capacity Reform Filings, the Commission should approve PJM's proposal to use a combustion turbine ("CT") unit as the Reference Resource as this would promote price stability and protect consumers from high prices. The Commission should also accept PJM's proposal to establish a uniform RTO-wide Non-Performance Charge rate to provide the necessary economic incentives to generators across the PJM footprint to perform when called upon by PJM during emergency conditions. This would enhance reliability in the region.

However, PSEG urges the Commission to (1) require reliability must-run ("RMR") generation resources that are counted as Capacity Resources to be subject to the

same set of requirements applicable to all other Capacity Resources, including the enhanced testing requirements that the Commission approved earlier this year to ensure reliability; and (2) reject PJM's proposal to extend the capacity must-offer requirement to all Capacity Resources, including intermittent resources. These two proposed reforms will artificially depress market clearing prices in the short-term, and if implemented, will do little to improve reliability.

II. BACKGROUND

A. A Resource Adequacy and Reliability Crisis in PJM

Over the past several years, PJM has repeatedly expressed the concern that there is a resource adequacy problem in the PJM region due to a combination of factors, including (1) expected load growth for the foreseeable future; (2) rapid retirement of thermal generation resources; (3) slow entry of replacement generation resources; and (4) a clogged interconnection queue.⁸ According to PJM, these factors have resulted in “an extreme and rapid tightening of supply and demand,” which resulted in the record high prices in the capacity market for the 2025/2026 delivery year. Moreover, PJM projects “the rapid tightening of supply and demand trends to continue for the foreseeable future.”⁹ PJM ominously forecasts that the PJM region will not have enough generation

⁸ For example, in early 2023, PJM released a whitepaper highlighting the risks to resource adequacy. See PJM's February 24, 2023 analysis of generators at risk of retirement titled, “*Energy Transition in PJM: Resource Retirements, Replacements and Risks.*” <https://www.pjm.com/-/media/DotCom/library/reports-notices/special-reports/2023/energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx>

⁹ December 9 Filing, Transmittal Letter at 4-5.

capacity in as little as two years, and that market clearing prices are expected to hit the capacity price cap.¹⁰

B. PJM's Efforts to Reform the PJM Capacity Market

While PJM has recognized the “generational challenge” of the resource adequacy and reliability crisis facing the PJM region,¹¹ to date PJM has not taken bold or robust actions that are necessary to reform and fix the PJM capacity market. In recent filings, including the December Capacity Market Reforms, PJM has adopted an incremental approach of making “modest” or “targeted” changes.

The Commission has dedicated significant resources to evaluating the reliability concerns facing the PJM capacity market and PJM's proposed reforms in various proceedings and dockets. For example, in June 2023, the Commission convened a forum for PJM stakeholders to examine problems facing the PJM capacity market and proposals to address the reliability concerns, especially in light of Winter Storm Elliot which saw a high level of generation outages.¹²

¹⁰ December 9 Filing at 5-6, Transmittal Letter.

¹¹ PJM Statement on FERC Complaint Filed by the Governor of Pennsylvania (Dec. 31, 2024) <https://www.pjm.com/-/media/DotCom/about-pjm/newsroom/2024-releases/20241231-pjm-statement-on-pa-gov-complaint.pdf>

¹² See PJM Capacity Market Forum, Docket No. AD23-7.

In October 2023, PJM submitted proposed reforms to the RPM capacity market.¹³ The Commission took action on PJM's two filings in early 2024 by accepting some of PJM's reforms but rejecting others.¹⁴

C. The July 2024 Base Residual Auction, the Ensuing Complaints, and Auction Delays

The results of the July Base Residual Auction for the 2025/2026 delivery year suggest that PJM's reforms did not go far enough. This was evident in the fact that capacity prices in the PJM region for the 2025/2026 delivery year hit a record high at \$269.97/MW-day for much of the PJM region (approximately ten times higher than in the prior year) and even higher prices in certain PJM zones.¹⁵

In response to these high prices, three complaints have been filed alleging that various aspects of the RPM capacity market design are unjust and unreasonable.¹⁶ In response to the first two complaints, PJM asked the Commission for authorization to

¹³ See PJM's Section 205 filings in in Docket Nos. ER24-98 and ER24-99.

¹⁴ See *PJM Interconnection, LLC.*, Docket No. ER24-99, 186 FERC ¶ 61,080 (2024) (accepting PJM's revisions relating to resource adequacy modeling, capacity accreditation, testing requirements for capacity resources, and Capacity Performance stop loss); *PJM Interconnection, L.L.C.*, ER24-98, 186 FERC ¶ 61,097 (2024) (rejecting PJM's filing with guidance relating to rules governing the market seller offer cap, Capacity Performance, and a forward-looking Energy and Ancillary Services (EAS) offset for purposes of calculating the Minimum Offer Price Rule).

¹⁵ The BGE and Dominion zones saw even higher prices at \$466.35/MW-day and \$444.26/MW-day, respectively.

¹⁶ On September 27, 2024, Sierra Club and several other organizations filed a complaint challenging PJM's failure to require generators under RMR agreements to be included in the 2026/2027 auction. On November 18, 2024, Joint Consumer Advocates filed a separate complaint raising a similar issue and identifying other aspects of the PJM capacity market that are unjust and unreasonable. On December 30, 2024, Governor Shapiro and the Commonwealth of Pennsylvania filed a complaint arguing that the price cap on capacity prices should be modified. See Docket No. EL25-46.

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delay the upcoming Base Residual Auction for the 2026/2027 Delivery Year (which was scheduled to take place in December 2024) by six months until June 2025¹⁷ to give PJM time to consider additional reforms to PJM capacity market rules to address the issues raised in Complaints and other attendant issues.¹⁸ In granting PJM's request, the Commission found that the additional time would give PJM the opportunity to propose "consequential changes" to the capacity market rules.¹⁹

D. PJM's December 2024 Capacity Reform Filings

On December 9 and December 20, 2024, respectively, following an accelerated stakeholder process, PJM submitted two Section 205 filings proposing capacity market reforms.²⁰ Specifically, in the first capacity market reform filing that was filed on December 9, 2024, PJM proposes tariff revisions to: (1) recognize the resource adequacy contribution of generation resources that have been retained pursuant to a cost-based RMR agreement; (2) maintain PJM's existing use of a natural gas-fired dual fuel combustion turbine ("CT") plant as the Reference Resource; (3) provide a standardized, RTO-wide Non-Performance Charge; (4) sunset the inclusion of reactive power revenues

¹⁷ PJM also asked the Commission to recognize the "cascading effect" and to delay the capacity auctions for the next three delivery years.

¹⁸ *PJM Interconnection, L.L.C.*, Docket No. ER25-118, 189 FERC ¶ 61,105 at n.49 (2024).

¹⁹ *PJM Interconnection, L.L.C.*, Docket No. ER25-118, 189 FERC ¶ 61,105 (2024).

²⁰ Additionally, PJM has made two other Section 205 filings to address interconnection queue issues. *See* Docket No. ER25-712 (PJM's December 13, 2024 filing relating to Reliability Resource Initiative) and Docket No. ER25-778 (PJM's December 20, 2024 filing relating to Surplus Interconnection Service).

as inputs to the VRR Curve effective June 1, 2026 (i.e., the start of the 2026/2027 Delivery Year); (5) clarify that an exception from the capacity “must-offer” requirement is not an affirmative defense to market power allegations; and (6) memorialize the delayed Base Residual Auction dates in the Tariff. PJM asked the Commission to approve the tariff revisions with an effective date of February 18, 2025 so that the revisions can be implemented for the auction for the 2026/2027 delivery year.

In the second capacity market reform filing that was submitted on December 20, 2024, PJM proposed to apply the capacity must-offer requirement to all available Existing Generation Capacity Resources beginning with the 2026/2027 Base Residual Auction. PJM also proposed to modify the Market Offer Cap (MSOC) to allow sellers to submit an offer that reflects the incremental cost of the risk associated with a capacity commitment.

PJM requests effective dates of February 18, 2025 for the December 9 Filing and February 21, 2025 for the December 20 Filing so that the revised capacity market rules could be in effect beginning with the Base Residual Auction for the 2026/2027 Delivery Year.

III. COMMENTS

A. Comprehensive and Meaningful Reforms Are Needed to Address the Looming Reliability Crisis in PJM

The core mission of the RPM capacity market construct is to inform economically rational retirement decisions, signal infrastructure investment when and where needed,

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and promote innovation.²¹ By these metrics, the current RPM market construct is not achieving its core mission given current supply/demand realities. In approving the RPM market construct in 2006, the Commission found that the capacity construct that existed prior to RPM was inadequate in a number of respects, stating:

The construct before the existing centralized capacity construct does not enable market participants to see the reliability problems in particular locations, does not provide price signals that would elicit solutions to reliability problems in enough time before the problems occur, and does not allow transmission and demand response to compete on a level playing field with generation to solve reliability problems.²²

The Commission's observations in 2006 regarding the deficiencies of the prior construct apply with equal force to the current RPM market design. This is because the current market design does not allow market participants to see the reliability problems in particular zones and does not provide price signals that would elicit solutions to reliability problems in sufficient time to prevent problems from occurring.

A central feature of the PJM capacity market is that it is a competitive, market-driven, bidding process to ensure adequate generation resources at prices that are cost-effective. For this construct to work properly, there must be an adequate supply of generation resources to meet the region's peak demand and a reserve margin. However, this is not happening in PJM and PJM has acknowledged that supply will be inadequate to meet demand in as little as two years.

²¹ See *PJM Interconnection, LLC*, 115 FERC ¶ 61,079 P 2 (2006).

²² See *PJM Interconnection, LLC*, 115 FERC ¶ 61,079 P 2 (2006).

Accordingly, it is time for PJM to take bold and comprehensive actions to maintain system reliability for customers throughout PJM. In the Capacity Market Reforms, PJM recognized the limitations of its own filings and stated that additional filings are needed:

We do not expect that these filings, taken in the aggregate, will fully resolve the resource adequacy challenge that we are facing, but we believe we must take the entire suite of actions to address the immediate reliability need. We expect for PJM and the stakeholders to continue to deliberate and act on this issue of utmost criticality and to bring their best proposals forward.²³

PSEG understands PJM's desire to take action now through the two sets of proposed reforms to address both the sticker shock from the last BRA and near-term reliability concerns. Yet, the PJM Board has correctly recognized that additional reforms are needed, which in turn calls into question whether the piecemeal, "band-aid" approach reflected in these subject filings is the correct one or whether this approach may ultimately cause more harm than benefit to customers across the region. With respect to PJM's invitation to "bring their best proposals forward," we stand ready to work with PJM and other stakeholders to identify and develop solutions to ensure resource adequacy and reliability in a cost effective manner. As part of this effort, PSEG identifies several key principles that both the Commission and PJM should keep in mind:

First, PJM must follow and implement its rules so that there is needed certainty in the capacity market, which is critical to ensuring reliability. Over the past several years, there have been major, disruptive changes to the design and structure of the PJM's

²³ See PJM Board of Managers' Letter to Stakeholders at 1 (Dec. 9, 2024).

capacity market, which have resulted in PJM delaying the holding of auctions or the posting of auction results. This includes, for instance, PJM's decision to suspend midstream the auction for the 2023/2024 delivery year for the purpose of proposing tariff revisions, which was ultimately reversed by an appellate court.²⁴ This undermined regulatory certainty and investor confidence. In addition, in connection with Winter Storm Elliott, which saw a high percentage of generation outages resulting in the imposition of penalties upon those generators that did not perform when called upon, PJM should have firmly applied and enforced its own market rules under the PJM Tariff and defended its actions in the face of the complaints that were filed. This would have provided market participants with confidence and certainty that the rules will be respected.

Further, following the rules also means running auctions in accordance with established timelines. Yet, in connection with the two complaints filed by the Sierra Club and the Joint Consumers Advocates, PJM again asked to delay the upcoming auction, and the Commission granted a six-month delay to the Base Residual Auction for the 2026/2027 delivery year. PJM capacity auctions cannot be repeatedly delayed without any clear "end game" or purpose. This will undermine confidence in the market and will not send the proper price signals. It is critical for PJM, the stakeholders, and the Commission to take a realistic look at what the problem is – keeping in mind that the

²⁴ *PJM Power Providers Group v. FERC*, 96 F.4th 390, 395 at 399 (3d. Cir. 2024) (holding that "equities play no role in our application of the filed rate doctrine" even if this "bright-line rule could potentially produce a harsh result in this case.").

underlying objective of the PJM capacity market is to ensure reliability in a cost-effective manner.

Second, one of the key problems is that the current capacity market rules do not send the appropriate price signals for new generation to be built. There should be meaningful and holistic changes to the PJM capacity market to address the looming reliability crisis rather than “band-aid” fixes.²⁵ Any additional capacity reforms must send accurate and sufficiently forward-looking price signals that promote long-term resource adequacy and economic efficiency by creating incentives for existing resources to remain on the system and for new generation resource to enter the market.²⁶ A key objective of PJM’s capacity market is to create long-term price signals to attract needed reliability investments in the PJM region. In particular, the long-term price signals must provide information regarding generation supply, load levels, and transmission constraints so that generators and investors have a reasonable basis to project capacity price trends into the future and are able to plan and make sound investment decisions. Additionally, the price signals must elicit the needed solutions and provide for adequate lead time for new generation investments to be made and be in place to meet the expected demand. Specifically, the price signals should accommodate a planning horizon of a minimum of three years. While the RPM capacity market is forward-looking and based

²⁵ See PSEG’s October 22, 2024 Comments in Docket Nos. EL24-148 and ER25-118.

²⁶ See, e.g., *PJM Interconnection, LLC*, EL05-148, ER05-1410, 115 FERC 61,079 ¶ P 36 (2006) (stating that there is a “longer-term need to provide sufficient price signals to support the development of new resources and the retention of existing resources over the long term.”)

on a three-year cycle, due to numerous delays in the auction schedules, the capacity market has operated on very compressed schedules that does not provide any meaningful price signals or provide for enough lead time for new generation investments to be made to meet the expected demand. For instance, the upcoming auction (i.e., PJM's June 2025 capacity auction for the 2026/2027 delivery year) will not provide the necessary lead time for investors to rely on to build new generation resources. Accordingly, the Commission should at minimum direct PJM to run its auctions on schedule based on the three-year cycle (without further delays) in order to investors to have adequate lead time to respond to the price signals from the capacity auctions. Moreover, the Commission should direct PJM to evaluate whether additional reforms are warranted that would provide longer-term and more stable price signals (i.e., less volatility in capacity prices from year to year).²⁷ This would provide valuable information to guide new generation investments to meet expected demand, thereby ensuring adequacy, as well as promoting rate stability for customers.

Third, any market reforms must recognize and appropriately value the reliability contribution of nuclear generation. Nuclear generation resources are a critical component of the energy transition and system reliability as they provide a carbon-free source of electricity while at the same time serving as a reliable and secure baseload source of power. There is currently no effective substitute for the reliability contribution of

²⁷ PSEG would support a Commissioner-led technical conference or forum to evaluate what modifications to the PJM Tariff are needed such that the RPM capacity market will provide longer-term and stable price signals to incent and support investments in new baseload, dispatchable generation resources to the PJM market to ensure resource adequacy.

carbon-free, high-capacity factor, fuel-secure and resilient resources such as nuclear generation. The only generation resources that would even approach the reliability contribution of nuclear generation would be gas-fired generation that has firm gas supply (which is not currently a requirement in PJM) or renewables that are accompanied by battery storage. Thus, nuclear generation continues to be the most reliable generation resources and it needs to be appropriately compensated. Moreover, to improve performance by gas generators, the Commission should direct PJM to adopt specific fuel reliability enhancements, such as a firm backup fuel requirement for gas generators so that these gas units will be able to run a certain number of minimum hours when dispatched by PJM during an emergency condition. This would help to improve generator performance by gas generators during emergency conditions and enhance reliability.

B. The Commission Should Approve Two Aspects of PJM's Proposed Reforms That Are Necessary to Maintain Reliability for Customers

1. The Commission Should Approve PJM's Proposal to Retain the Dual-Fuel Combustion Turbine (CT) Unit as the Reference Unit for the Next Two Delivery Years

PJM proposes to retain through the 2027/2028 delivery the current Dual-Fuel Combustion Turbine (CT) as the Reference Resource.²⁸ According to PJM, the previous analysis that underpinned the planned switch to a combined cycle ("CC") as the Reference Resource beginning with the 2026/2027 Delivery Year did not anticipate the current market conditions.²⁹ According to PJM, a switch to a CC as the Reference Resource at this time, "in combination with other market conditions that result in substantial energy and ancillary service revenues" would result in anomalous market outcomes, including a "steep CC-based VRR Curve and market conditions that fall outside the range for which the VRR Curve was designed," unanticipated and undesirable sensitivity of auction outcomes, as well as a Net Cone that is \$0/MW-day in certain LDAs. This would result in a \$0/MW-day Non-Performance Charge rate and effectively eliminate any financial incentive for committed Capacity Resources to perform during emergency conditions.

²⁸ According to PJM, the Reference Resource is an input to the Variable Resource Requirement demand curve ("VRR Curve") used to clear RPM Auctions. In addition, the Net Cost of New Entry ("CONE") associated with the Reference Resource (*i.e.*, the resource's gross CONE less net energy and ancillary services markets ("EAS") revenues) is used as input to the Non-Performance Charge rate.

²⁹ December 9 Filing, Transmittal at 9.

PJM's proposal to use a CT unit as the Reference Resource is just and reasonable and should be accepted. Specifically, a VRR curve that uses a CT unit as the Reference Resource is less steep relative to a VRR curve that is based on combined-cycle unit. Thus, using the CT as the Reference Resource will promote price stability, which is more conducive to investment and protects consumers against very high prices at times when there is a lag between price signals and the time needed to bring new capacity online, while still sending strong price signals to attract new generation development. Moreover, PJM's proposal would address the issue of a \$0/MW-day Non-Performance Charge rate, which would effectively eliminate any financial incentive for committed Capacity Resources to perform during emergency conditions.

2. The Commission Should Accept PJM's Proposal to Establish a Uniform Non-Performance Charge Rate for the PJM Region

PJM states that the "unprecedented tightening of supply and demand" has resulted in a \$0 value in a number of LDAs," which means that the Non-Performance Charge Rate is also at zero.³⁰ This reduces or eliminates the financial incentives to perform when called upon and threatens system reliability. Thus, PJM proposes to establish a uniform Non-Performance Charge Rate for the PJM region based on the Net Cone for the region.

PSEG supports PJM's proposal to establish a uniform non-performance charge rate for the entire PJM Region. We share PJM's concern that if the Non-Performance Charge rate is zero in certain LDAs (based on the Net CONE value of the individual

³⁰ December 9 Filing, Transmittal Letter at 69.

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LDAs), generators would not have financial incentive to take steps to ensure that their committed capacity resources are able to perform when called upon during emerging conditions. This creates the potential that, for future Performance Assessment Interval (“PAI”) events, generators in certain zones will face non-performance penalties and others will not. Not only is this patently unfair and discriminatory, it also significantly reduces the incentive to perform under extreme conditions for certain resources to the overall detriment of system reliability. Accordingly, the Commission should approve PJM’s proposal to establish a uniform non-performance rate throughout the PJM region to ensure that the proper financial incentives are in place to encourage a capacity resource to perform when called upon.

C. Two Aspects of PJM’s Capacity Market Reform Filings are Flawed and Should be Rejected

- 1. If the Commission Accepts PJM’s RMR Proposal, RMR Units That Are Counted as Capacity Resources Must Satisfy the Same Requirements that Are Applicable to All Capacity Resources, including Testing Requirements**

PJM proposes to recognize and include as Capacity Resources in the RPM capacity market those generating units that have RMR agreements and that meet certain criteria as follows: (1) the ability to meet the deliverability requirements and have sufficient Capacity Interconnection Rights; (2) not cleared in the capacity market and have an accepted cost recovery agreement; and (3) reasonably expected to be able to operate for the entire Delivery Year; and (4) required by its RMR agreement to be available for PJM dispatch in expectation of all PJM emergencies.³¹ PJM proposes that

³¹ December 9 Filing, Transmittal Letter at 15,

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RMR resources that meet these criteria be included in the Base Residual Auctions for these Delivery Years as price-takers (i.e., offers of \$0/MW-day). While PJM claims that RMR resources that satisfy these criteria can perform during capacity emergencies in a manner similar to a committed Capacity Resource, PJM proposes to exempt these resources from the testing requirements under the PJM Tariff that are applicable to all Capacity Resources, asserting that its proposed criteria provide sufficient assurances that these resources will perform during capacity emergencies.”³² PSEG has several significant concerns with PJM’s proposal.

First, the capacity factor of RMR units is generally low, and therefore, these units’ contribution to system reliability is questionable at best. Thus, to include low-capacity generating units into the capacity market will have a price suppressive effect and distort price signals without resulting in an incremental contribution to reliability, and may in fact harm reliability for customers.

Second, PJM’s proposal to exempt these RMR resources from the testing requirements under the PJM Tariff that are applicable to all Capacity Resources is not just and reasonable and is unduly discriminatory. While PJM states that its proposed “objective criteria” provide “sufficient confidence” that the RMR resources “may reasonably be counted upon to perform during capacity emergencies,” PJM does not explain or justify why it would be appropriate or consistent with reliability for resources

³² PJM’s December 9 Filing, Transmittal Letter at 15, 23. PJM states that two generating units (Wagner 3 and Wagner 4) would qualify for inclusion in the supply stack “as they currently meet all the criteria. *Id.* at 25.

with RMR agreements to be counted as a Capacity Resource but not subject to the same testing requirements that are applicable to all generating resource that are counted as Capacity Resources under the PJM Tariff.

The Commission should direct PJM to apply the same testing requirements to RMR resources that are applicable to capacity resources. Earlier this year, the Commission approved PJM's enhanced resource testing requirements to ensure that resources are physically capable of performing during an emergency and to increase reliability. PJM proposed these reforms in large part due to Winter Storm Elliott. PJM's enhanced testing requirements include, among other things, capability tests to be conducted in both the summer and winter seasons during the delivery year. In approving PJM's enhanced testing requirements, the Commission stated that "the proposed additional testing requirements should enable PJM to more accurately assess a resource's physical capabilities and expected availability during periods of system stress, help PJM and generation owners identify and correct mechanical issues, and incentivize generators to keep PJM apprised of their operational status." It is puzzling that PJM is now backing away from its own testing requirements with respect to RMR units. This is unduly discriminatory and ultimately contrary to reliability. If the Commission approves PJM's proposal to include RMR generation resources in the capacity market, the Commission should direct PJM to ensure that RMR resources are treated as comparably to all other Capacity Resources and meeting the same testing requirements to provide greater certainty that these units will run if called on during emergency conditions.

2. PJM's Proposal to Apply the Must-Offer Requirement to All Capacity Resources Will Suppress Prices And May Not Contribute to Reliability

In the Capacity Market Reform Filings, PJM proposes to extend the capacity must-offer requirement to all available Existing Generation Capacity Resources, including Intermittent Resources, Capacity Storage Resources, and Hybrid Resources.³³ Under PJM's proposal, these generation resources will no longer be exempted from the must-offer obligation. PJM noted that these resources account for approximately 97% of the generation resources in the PJM queue and that there exists the potential for the exercise of market power if such resources continue to be exempted from the capacity must-offer requirement.³⁴ As discussed below, PSEG does not support PJM's must offer proposal.

These intermittent resources will exist and continue to operate and provide energy regardless of whether they are included in the RPM capacity market and receive capacity payments. Here, it is important to note that the large amount of renewable and intermittent resources that entered the interconnection queue did so at a time when capacity prices were low and intermittent resources were exempt from the must-offer requirement. In other words, capacity payments do not appear to be a major driver of intermittent resources entering the PJM markets. Thus, it is not logical for PJM to propose to extend the must offer to intermittent resources.

³³ PJM also proposes to clarify that the categorical must offer exemption for renewable intermittent resources is not a safe harbor from IMM scrutiny over withholding.

³⁴ December 20 Filing, Transmittal Letter at 7.

Second, extending the capacity must-offer requirement to these resources will not enhance reliability. Requiring intermittent resources, such as solar generation, to accept a Capacity Performance obligation with associated Non-Performance charge risk will not enhance reliability at night when these non-dispatchable resources are simply unable to perform when called upon. In fact, the must-offer requirement could discourage such resources from entering the PJM market. At the same time, PJM's must offer proposal will have a price suppressive effect given that additional existing intermittent resources will clear while not meaningfully contributing to reliability. Importantly, it is unlikely that such intermittent resources will be able to perform during emergency conditions at all. In sum, PJM's proposal does not make sense, as it will suppress market clearing prices while at the same time undermining reliability.

IV. CONCLUSION

In light of the urgent threat to system reliability in the PJM region, the Capacity Market Reform Filings simply do not go far enough. PSEG requests that the Commission direct PJM to undertake a comprehensive evaluation of the issues facing the PJM capacity market and to adopt long-term and effective solutions based on the principles that PSEG has proposed herein.

Jodi Moskowitz
Deputy General Counsel and RTO
Strategy Officer
PSEG Services Corp.
80 Park Plaza, T-20
Newark, NJ 07102
(973) 430-6409
Jodi.Moskowitz@pseg.com

Respectfully submitted,

/s/ Viet H. Ngo
Viet H. Ngo
Associate Counsel – Federal Regulatory
PSEG Services Corp.
601 New Jersey Ave, NW Suite 310
Washington, DC 20001
(202) 460-9356
Viet.Ngo@pseg.com

Attorneys for the PSEG Companies

January 6, 2025

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in the proceeding.

Dated at Washington, D.C., this 6th day of January, 2025.

/s/ Robert Gardinor
Robert Gardinor

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New Jersey Senate Legislative Oversight Committee

Testimony of Jason M. Stanek, Executive Director, Governmental Services

March 3, 2025

For Public Use

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Who Is PJM?

PJM Interconnection ensures the reliable flow of power to 65 million people in 13 states and the District of Columbia. We are similar to an air traffic controller but for the electric grid. We don't own the high-voltage transmission lines that carry electricity, but we direct and balance the flow of that power throughout our region and to and from neighboring regions. In addition to reliable operations, PJM also plans necessary enhancements to the transmission grid to ensure reliability into the future and operates the electricity markets within its region to competitively procure capacity and to meet electricity demand in real time. The purpose of these electricity markets is to cost-effectively reinforce reliable grid operations. PJM is federally regulated by the Federal Energy Regulatory Commission (FERC).

The U.S. Grid Is in an Energy Transition

As with the entire U.S. electric grid, PJM is experiencing an accelerating transition toward renewable energy. Policies and consumer choices are shifting the grid away from dispatchable thermal (coal, gas, nuclear) generation resources toward resources with little to no carbon emissions. PJM has a generation interconnection queue that mostly comprises (~98%) intermittent generation, such as wind and solar, as well as battery technology. Thus, PJM has affirmatively stated that we are in an energy transition to a changed resource mix and a greener grid.

Market Fundamentals: A Tightening of Supply and Demand

As the energy transition accelerates, trends have developed that warrant additional attention. The grid is now experiencing what PJM forecasted in its 2023 [Resource Retirements, Replacements and Risks \(PDF\)](#) paper: The loss of generation resources is outpacing the adequate addition of replacement resources amid accelerating growth in consumers' demand for electricity. This is an issue confronting grid operators throughout North America.

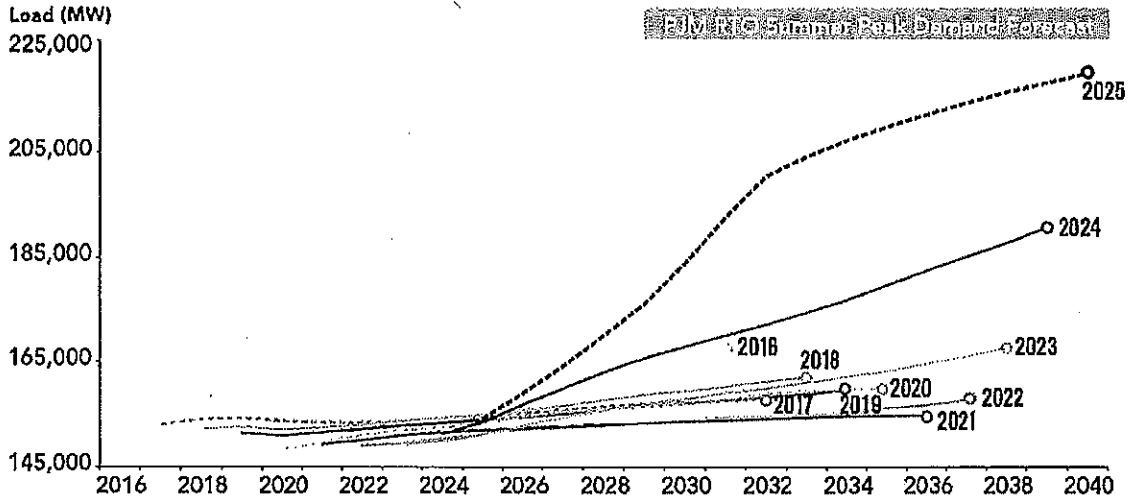
To illustrate this point, this past summer, PJM had fewer resources to draw on compared to the previous summer – approximately 182,500 MW of installed capacity was available in 2024, compared to the summer of 2023 when approximately 186,500 MW was on the system. In terms of demand for electricity, the forecasted peak demand for electricity for this past summer was approximately 151,000 MW, compared to 2023 when the summer peak load was 147,000 MW. This reduction in available supply with the projected increase in demand results in a year-over-year net difference of 8,000 MW. While PJM anticipates the addition of new generating resources in the coming years, PJM is also projecting that demand for electricity will continue to grow at a material rate over the next decade, as depicted in the line chart in [Figure 1](#), below.

In New Jersey, PJM's [2025 Long Term Load Forecast Report \(PDF\)](#) anticipates substantial increases in demand for electricity to accommodate the development of new data centers and port electrification projects. For example, in the Public Service Electric & Gas (PSEG) service territory, the distribution utility has reported that in the past year, interconnection inquiries from data centers and other large customers have increased dramatically from 400 MW a year ago to 4,700 MW today.

28x



Figure 1. PJM Summer Peak Demand (15-Year Forecast)



Maintaining Resource Adequacy and Reliability

PJM has analytically studied and will continue to study the impacts of the energy transition described above. Based on our analysis, we have observed a few trends that, when taken in the aggregate, will create a reliability concern around resource adequacy later into this decade.

- First, the rate of electricity demand is anticipated to increase significantly in the future due to the development of large data centers in the PJM service area, each of which consumes electricity in very high volumes. This significant increase in energy consumption is largely driven by the rise of artificial intelligence (AI) technologies, which are anticipated to substantially boost data center power demand. The electrification of the transportation and heating sectors and the onshoring of manufacturing are also contributing to increased demand.
- Second, the pace of retirements of existing fossil-based resources, largely due to state and federal policies, is clearly outpacing the construction of new renewable resources. There have been a variety of reasons cited for this lag in construction, including supply chain, state and local siting challenges, and issues related to project financing.
- Finally, the thermal dispatchable generators slated to retire are those that have historically provided the grid balancing services necessary to reliably operate the system. Longer-duration batteries and other potential technologies could also serve in this role in the future if they can become more cost-effective and are deployed at scale.

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Capacity Auction Results Signal Need for Additional Resources

Similar to other grid operators, PJM conducts competitive auctions to procure supply resources in advance of a future delivery year to meet the electric needs of customers in PJM's service area. This auction for capacity resources, known as the Base Residual Auction (BRA), is typically held three years in advance of the delivery year. However, the auction calendar has recently been compressed to accommodate FERC's review of changes to PJM's capacity market rules, and some auctions will be conducted closer to the delivery year.

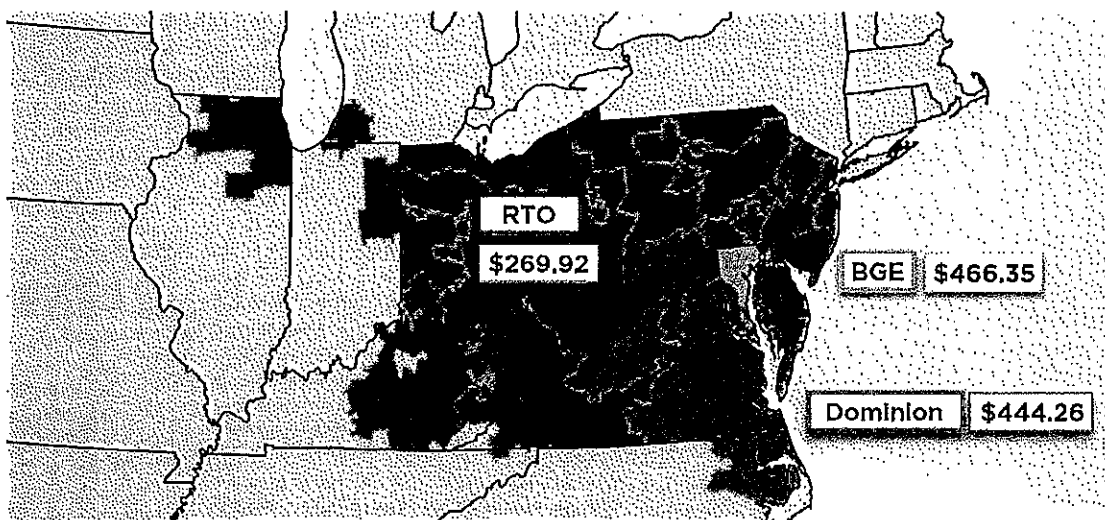
The most recent BRA was conducted in July 2024, and the auction competitively secured resources to meet the reliability requirement for the 2025/2025 Delivery Year, which begins on June 1, 2025. However, auction prices were significantly higher due to decreased electricity supply caused primarily by a large number of generator retirements, combined with increased electricity demand and the implementation of FERC-approved market reforms.

As noted in Figure 2, below, the auction produced a price of nearly \$270/MW-day for much of the PJM footprint, including all of New Jersey, compared to almost \$29/MW-day for the prior 2024/2025 auction. Two additional transmission zones (BGE and Dominion) cleared at zonal caps due to insufficient resources inside those zones and constraints on the transmission system that limit the ability to import electric capacity. Taken together, these higher prices send a clear investment signal across PJM's region that additional generating resources are needed.

It is important to note that these capacity auction results represent wholesale prices, not retail prices. While wholesale capacity prices may ultimately be reflected on a retail customer's utility bill, there are several factors that can mitigate or affect the timing and magnitude of the rate impact (e.g., the filing of a local distribution utility's rate case with the BPU). Notwithstanding, the results of the recent capacity auction have had no effect on the utility bills of New Jersey consumers to date, and any possible rate impacts will not occur until June 1, 2025, at the earliest.

The next BRA, for the 2026/2027 Delivery Year, is currently scheduled for July 2025. As PJM prepares for this next auction, there are early indications that the recent market results should incent additional capacity resources to participate.

Figure 2. PJM Base Residual Auction Results for the 2025/2026 Delivery Year (by Local Deliverability Area)



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Replacement Generation in the Interconnection Queue

PJM has made significant strides in reforming the generation interconnection queue so as to speed up the interconnection of projects in the queue that have both financial wherewithal and site control. The following figures illustrate the current state of the queue in terms of its composition of resources (Figure 3) as well as the progress that PJM has been making toward implementing FERC-approved reforms to shorten the processing times and increase the overall efficiency of the queue (Figure 4 through Figure 6). It is also important to note that approximately 50,000 MW of generating resources (mostly solar) have already been processed through the interconnection queue but have yet to connect to the PJM grid. See Figure 5. Finally, Figure 7 illustrates the total number of projects (i.e., 488) expected to clear the queue in 2024–2025, including 20 projects located in New Jersey.

Figure 3. PJM Queued Capacity (Nameplate) by Fuel Type ("Active" in the PJM Queue as of Jan. 31, 2025)

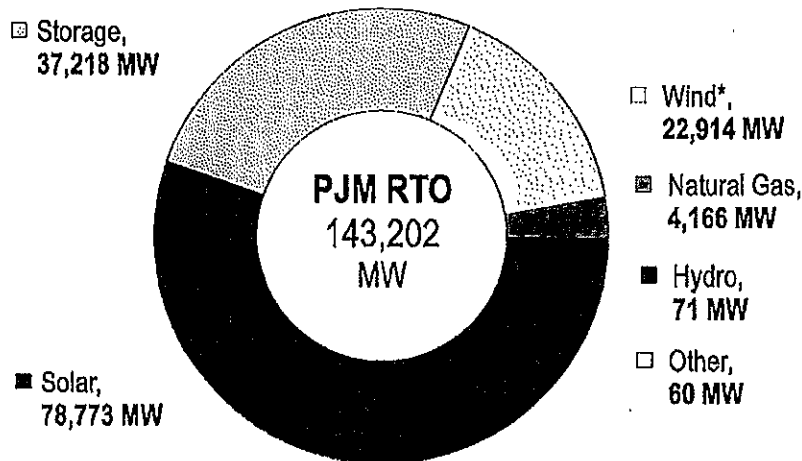


Figure 4. Interconnection Process Reform Timeline

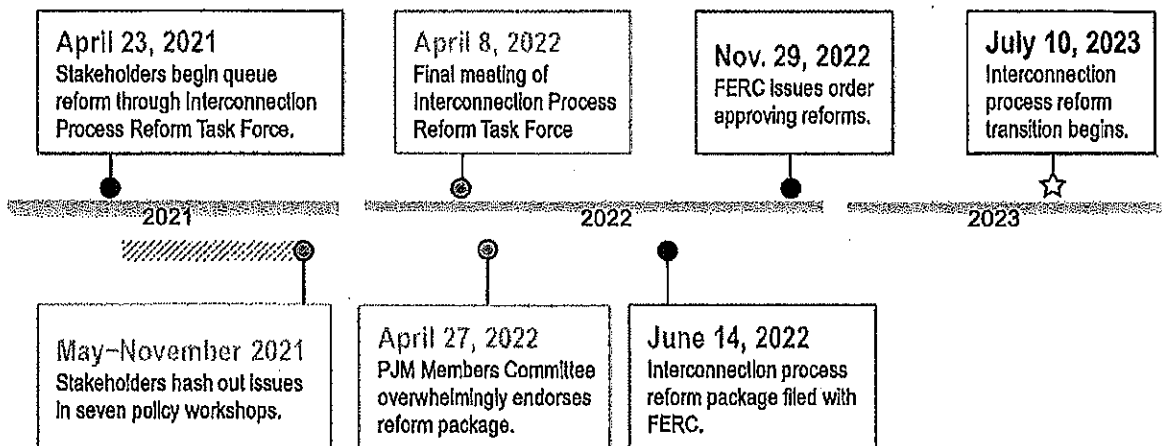


Figure 5. Interconnection Queue Breakdown and Timeline

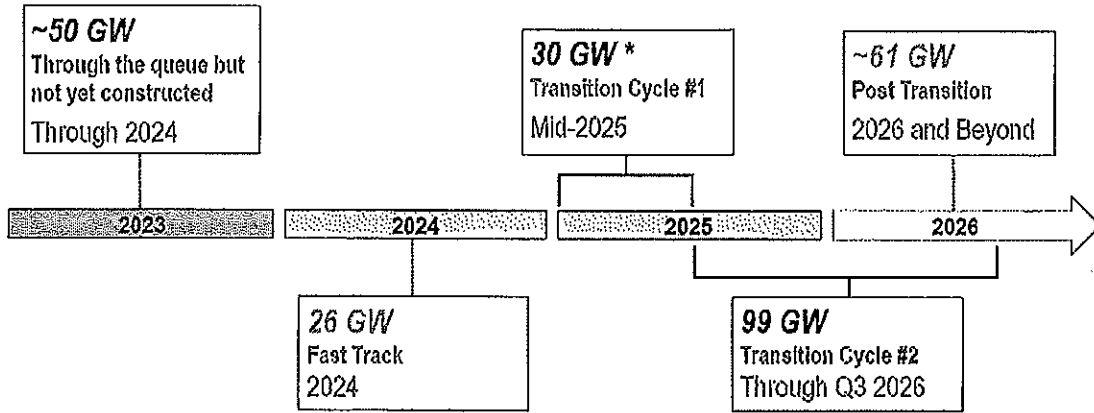
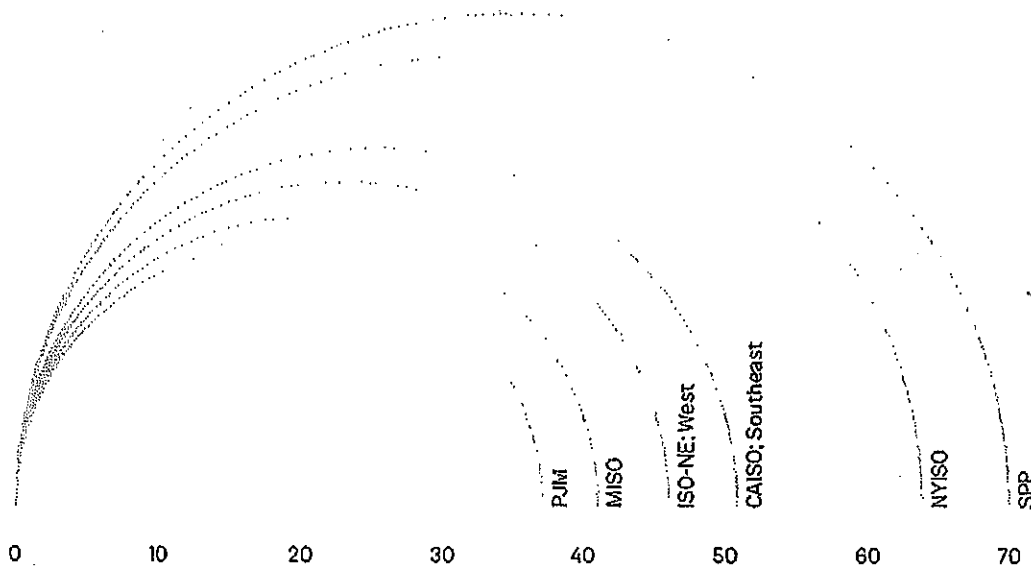


Figure 6. U.S. Interconnection Queues – S&P Global

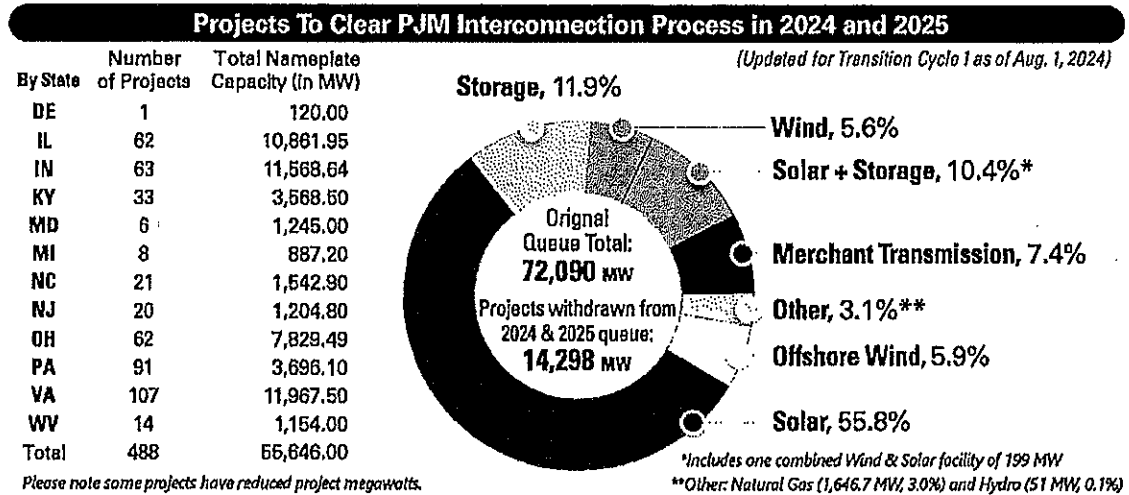
Average time from queue date to proposed online date (months)



As of June 28, 2023.
 Active queues only.
 Only includes interconnection queues for which sufficient details were available.
 Source: Public company reports (see Excel attachment for details).
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Figure 7. Projects To Clear PJM Interconnection Process in 2024 and 2025



Conclusions

- PJM understands that higher energy costs materially impact all consumers in New Jersey and throughout the region we serve. While a shrinking supply of energy and capacity, combined with increasing demand, will result in upward pressure on wholesale and retail prices, certain actions can be taken to minimize those rate impacts. As noted, any rate impacts associated with PJM's most recent capacity auction will not occur until June 1, 2025, at the earliest.
- The rise of AI technologies is significantly contributing to increased energy consumption in data centers and the need to develop new data centers. From 2024 to 2030, PJM anticipates that the share of demand attributable to data centers will triple, from 4% to 12% of all load served by PJM. These developments underscore the critical need for strategic planning in energy infrastructure, policy development and maintaining resource adequacy.
- Specifically, while PJM leaves the determination of energy policy to state and federal government, we respectfully urge that policymakers:
 - **Avoid** policies meant to push generation resources off of the system until an adequate quantity of replacement generation is online and has been shown to be operational.
 - **Help** to bring new generation resources onto the system that support reliability as soon as possible.
 - **Analyze** your state/local challenges in the deployment of new generation resources and electricity infrastructure, and **enact** policy to facilitate greater/quicker construction.
- PJM has worked to advance state energy goals like offshore wind transmission planning with New Jersey and is taking steps to maintain reliability during a period of increasing demand and diminishing supply. For more information on PJM's efforts, please visit the [Ensuring a Reliable Energy Transition](#) web page on PJM.com. It outlines the organization's reliability concerns, the actions PJM is advancing to help alleviate those concerns, and all of the studies produced in support of these efforts.

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Senate Legislative Oversight Committee

Remarks provided by Phillip Vavala, Region President Atlantic City Electric
March 3, 2025

Good morning, Chairman Zwicker and members of the Senate Legislative Oversight Committee. My name is Phillip Vavala, Region President for Atlantic City Electric and I appreciate the opportunity to speak to you today about artificial intelligence (AI), data centers and the associated energy needs to support the growth of AI companies in New Jersey.

Atlantic City Electric (ACE), a subsidiary of Exelon Corporation, delivers safe, reliable, and resilient transmission and distribution service to 572,000 customers across southern New Jersey. Exelon is the nation's largest utility company, serving more than 10 million customers through six fully regulated transmission and distribution utilities in five states and the District of Columbia.

At Atlantic City Electric, we understand the need for and support the development of large data centers, which among other things, are propelling forward the AI revolution. We currently have several feasibility studies for potential data centers that will provide details on opportunities for interconnection.

When possible, Atlantic City Electric is partnering with local and state economic development and real estate firms to pre-screen development parcels. While we cannot commit a specific amount of power availability for a site forever, the screening evaluates if the surrounding grid infrastructure has the potential to support the power needed for data centers. We recognize that this information is critical to ensure New Jersey's competitiveness in attracting large load businesses.

Atlantic City Electric wants to encourage the development of data centers. With parent company Exelon, we have joined efforts with local coalitions to pass data center tax incentives in Illinois, Maryland and Pennsylvania. These incentives preserve local property taxes paid in the communities where data centers are developed but reduce or eliminate sales tax on the equipment that gets installed in the data centers. In the last 10 years, new data centers have not been built in states that do not offer data center tax incentives.

We are seeing a significant need for transmission investments to support federal, state and customer goals on renewable energy and electrification in addition to traditional transmission expansion needs. The challenges to building out the transmission system include regulatory uncertainty, siting and permitting challenges, and generator project delays resulting from the interconnection queue backlog. Atlantic City Electric believes

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that interstate and interregional transmission development will enable us to strengthen our ties with our neighbors and increase resiliency.

Even with the company's ongoing investments, to ensure the strength and reliability of the energy grid now and in the foreseeable future, additional transmission, generation, and demand investment projects are still needed. To meet the evolving needs, additional state and federal policy may be needed to enable new transmission build-out, distribution, and generation.

PJM's Base Residual Capacity auction results, signaling resource adequacy concerns in our region that Atlantic City Electric customers began feeling last summer, emphasize the need to ensure data centers and co-location is implemented correctly. New large load such as data centers, co-located or not, will have impacts on supply demand and the overall resource adequacy situation for PJM. This underscores the need for transparent planning and collaboration across stakeholders to understand the coming load – including co-located load – and the implications for availability, reliability, and customer bill impacts.

Data centers are prioritizing speed to connection. A co-located load configuration refers to end-use customer load that is physically connected to the facilities of an existing or planned generation interconnection customer on the interconnection customer's side of the point of interconnection to the transmission system. The arrangements may be beneficial to the end use load customer to leverage often underutilized land and interconnect to the grid at locations that may offer efficiencies in securing power access.

To balance co-location benefits with customer protection, Atlantic City Electric recognizes data centers and therefore must pay their fair share to cover grid costs as well as ensure that co-location benefits do not place a burden on existing customers. Co-location arrangements must undergo targeted reliability studies to ensure they are able to safely and reliably interconnect to the grid the load should also be treated as a retail customer, paying equitable rates for the use of grid support.

We are excited about the economic possibilities data centers can bring to the communities we serve and position the U.S. as a leader in artificial intelligence. However, the energy demands must be met in a way that is fair to all customers. While co-location can be an effective solution, equitable cost sharing needs to be ensured. The right policies and rate design need to be in place to partner on an equitable framework that supports the nationwide energy transformation and economic development.

Atlantic City Electric works with data centers and other large customers to meet their service needs, no matter where they are located. Exelon has developed tools to provide quick initial assessments and conducts feasibility studies to ensure reliability for all customers. All electric customers must pay an equitable share for grid services and



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infrastructure costs. We are committed to delivering safe and reliable service to all of our customers and when equitable policies are in place, co-location and data centers can provide advantages that support both the energy sector, the local economy, the customers we serve and continue propelling New Jersey and the United States forward as AI leaders. But this cannot be done unless we partner together to ensure policy that support New Jersey residence.

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Testimony Before the New Jersey Senate Oversight Committee

Abigail Phillips, Vice President Chief Risk Officer

FirstEnergy, Jersey Central Power & Light

Monday, March 3, 2025

I. INTRODUCTION

Chairman Zwicker, members of the committee, good morning and thank you for the opportunity to testify today regarding the intersection of AI and energy policy, as well as how best to prepare New Jersey for the increasing energy demands of artificial intelligence. I am Abigail Phillips, Vice President Chief Risk Officer for FirstEnergy, Jersey Central Power & Light (“JCP&L”).

JCP&L appreciates the committee’s interest in this topic and commends your efforts in taking a proactive approach to ensuring the continued safe, affordable, and reliable delivery of electricity to all New Jerseyans. To that end, JCP&L submits the following comments in support of the discussion.

II. RESPONSE TO REQUEST FOR COMMENTS

A. The Energy Trilemma (World Energy Council Index)

To help frame the intersection of AI and energy policy, the Company recognizes the need to balance the connected challenges of energy transitions and sustainable development. The energy trilemma is a framework that considers the balance of energy reliability, affordability (cost), and sustainability (the environment). Policymakers use the World Energy Council Trilemma

framework as a tool to inform their energy policies, strategies, and investment decisions.¹ Because of AI and the rapid development of data centers, the United States is experiencing and anticipating load growth it has not seen in decades, putting policy priorities seemingly at odds with one another. We want our system to be reliable, but we also want it clean and affordable – is it possible to have all three attributes at the same time or are we going to have to make concessions in one dimension or another to achieve one policy priority over another? As we delve into the challenges AI and data centers bring, the Energy Trilemma can help us frame the optimal solutions for New Jersey to capture the great opportunities.

B. Overview of Resource Adequacy Challenge

The Company is deeply concerned about the looming resource adequacy challenges in the PJM Interconnection, L.L.C. (“PJM”) footprint and the associated affordability and reliability impacts expected to customers. Simply put, “resource adequacy” centers on the concern that the available supply of electricity generated in PJM’s footprint will be insufficient to meet the demand in the not-too-distant future. Resource adequacy is also a challenge that pulls on all three sides of this trilemma. Resource adequacy is a serious challenge, the causes of which include: 1) load demand rapidly outpaces dispatchable-on-demand generation supply due to factors such as data center growth, onshoring and electrification; 2) market signals not incenting new, dispatchable generation build; and 3) economic and policy pressures resulting in retirement of dispatchable on-demand generation. This confluence has significant impacts on: 1) reliability, with a higher likelihood of outages during peak periods potentially starting in 2029; 2) affordability, with dramatically higher capacity market clearing prices already hurting customer wallets without new

¹ See World Energy Trilemma Report 2024: Evolving With Resilience and Justice, *available at* [World Energy Trilemma 2024 Full Report.pdf \(worldenergy.org\)](#).

dispatchable-on-demand generation being planned or built; and 3) economic growth, further hindering the ability to serve growing demand and achieve economic development goals. This expected shortfall is going to be exacerbated by the increased demand we expect to see from the computing power needs of data centers needed to drive energy-intensive artificial intelligence.

As background, in furtherance of its responsibilities managing the reliability of the electric grid, PJM administers its Reliability Pricing Model, which is essentially an auction process designed to ensure that sufficient generation capacity is available to serve all energy demand within its footprint. However, PJM cannot direct the build of generation resources, nor does it dictate what types of generation are built to ensure alignment with state or federal specific policies or energy goals; PJM can only run a generation capacity market in the space. Only the states themselves have the jurisdictional authority to direct that new generation is built on a timely basis.² Without proactive steps taken by New Jersey, the resource adequacy shortfall will result in customers facing increasing costs for less reliable service with no assurance that those costs will lead to needed additional dispatchable generation. For example, New Jersey residential customers will see a 17-20% bill increase, on average, as a result of the State's annual electricity supply auction with no assurance the increase will lead to new generation.³

Electricity demand continues to increase at an unprecedented pace due to electrification and the influx of energy intensive data centers. This demand is dramatically outpacing the rate at which new generation supply is scheduled to or can come online. With compounding supply

² The states' reserved powers under the Federal Power Act include control over in-state facilities used for the generation of electric energy, and also the determination of need for new power facilities, their economic feasibility, and retail generation rates and services. *E.g., Hughes v Talen*, 136 S.Ct. 1288 at 1292 (U.S. 2016).

³ See NJBPU Announces Conclusion of New Jersey's Annual Electricity Supply Auction, dated February 12, 2025, available at [Board of Public Utilities | NJBPU Announces Conclusion of New Jersey's Annual Electricity Supply Auction](#).

retirements and the time required for new supply to be built, the gap between supply and demand could continue to grow depending on the realized demand growth. PJM began to identify a potential resource gap in its Resource Retirements, Replacements & Risks report published in early 2023.⁴ Since that time, PJM has continued to refine its forecasts. In its August 8, 2024, Planning Committee meeting, PJM listed a potential shortfall of 1,663 megawatts (“MW”) in generation capacity⁵ beginning in the 2029/2030 delivery year and increasing to 5,562 MW in generation capacity by the 2034/2035 delivery year.⁶ Additionally, the North American Electric Reliability Corporation (“NERC”) recently published its 2024 Long-Term Reliability Assessment, finding that North America “faces mounting resource adequacy challenges over the next 10 years as surging demand growth continues and thermal generators announce plans for retirement.”⁷ Most recently, PJM shared an updated load forecast, which showed the anticipated demand in 2030 is approximately 10% higher than it had previously projected.⁸ Taking the anticipated 2025 load forecast into account, the PJM Board stated in a letter it released in support of PJM’s recent

⁴ Energy Transition in PJM: Resource Retirements, Replacements & Risks, published February 2023, available at <https://www.pjm.com/-/media/DotCom/library/reports-notices/special-reports/2023/energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx>

⁵ As defined by PJM, UCAP is the denomination of the Capacity Market. UCAP is also “Unforced Capacity”, i.e., Installed Capacity (summer rated capability) that is not on forced outage. See <https://www.pjm.com/-/media/committees-groups/task-forces/ccstf/2020/20200625-workshop/20200625-item-03-terminology-for-icap-ucap-cirs-and-elcc-definitions-and-functions.ashx> at Slide 2.

⁶ PJM Supplementary Information about Effective Load Carrying Capability Class Ratings calculated for Delivery Year (“DY”) 2027/28 – DY 2034/35 (Aug. 6, 2024), available at <https://www.pjm.com/-/media/DotCom/committees-groups/committees/pc/2024/20240806/20240806-item-08---supplementary-information---elcc-class-ratings.pdf>

⁷ NERC 2024 Long-Term Reliability Assessment, published December 2024, available at https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_Long%20Term%20Reliability%20Assessment_2024.pdf

⁸ 2025 Preliminary PJM Load Forecast (December 9, 2024), available at <https://www.pjm.com/-/media/DotCom/committees-groups/subcommittees/las/2024/20241209/20241209-item-03---2025-preliminary-pjm-load-forecast.pdf>

capacity market enhancements, the PJM system could see a capacity shortage as soon as the 2026/27 Delivery Year.⁹

While demand is growing at a higher rate, supply is not only expected to be unable to keep pace with unprecedented demand increases; but it is also expected to meet a decreasing proportion of demand. Economic and policy pressures at both the state and federal levels have led to the retirement of critical generation resources that are “dispatchable”, or available on demand. Those same policy pressures have deterred investment in new, dispatchable generation despite all-time-high capacity market clearing prices of approximately \$270/MW per day for most of PJM, which was a nearly ten-fold increase from the prior auction.¹⁰ Moreover, there is a concern that proposed projects that have been approved through PJM’s interconnection queue are not actually being built.¹¹ Without further reform, costs to customers in the PJM footprint could continue to increase without any assurance that those cost increases will result in new dispatchable generation.

Some stakeholders suggest that there is sufficient generation capacity currently in the PJM queue and that addressing the backlog in PJM’s queue while leaving the market to work itself out is sufficient to address the shortfall. The Company strongly disagrees. While the PJM queue backlog is certainly a concern, the reality is that 97% of the queue consists of battery, solar, and wind projects that provide intermittent generation and simply cannot be depended upon alone. To the contrary, immediate investment in dispatchable generation is needed to ensure stable, reliable

⁹ Correspondence from the PJM Board of Managers on the filings related to enhancements to the interconnection process and adjustments to the capacity market (December 9, 2024), available at <https://www.pjm.com/-/media/DotCom/about-pjm/who-we-are/public-disclosures/2024/20241209-board-letter-outlining-action-on-capacity-market-adjustments-rri-and-sis.ashx>

¹⁰ 2025/2026 Base Residual Auction Report (July 30, 2024), available at <https://www.pjm.com/-/media/DotCom/markets-ops/rpm/rpm-auction-info/2025-2026/2025-2026-base-residual-auction-report.pdf>

¹¹ Commercial Deployment of New Generation (September 25, 2024), available at [20240925-item-09---pjm-interconnection-queue---presentation.ashx](https://www.pjm.com/-/media/DotCom/markets-ops/rpm/rpm-auction-info/2024/20240925-item-09---pjm-interconnection-queue---presentation.ashx)

supply. In its December 9, 2024 filing at FERC, PJM itself acknowledged the compelling immediate need for construction of new dispatchable generation resources.¹²

The PJM region is not alone in significant investment in new dispatchable resources. Many regions and local utility service territories are grappling with significant load growth, primarily coming from data centers, increased manufacturing, and the “energy transition.” Importantly, the nature of the demand growth identifies the type of generating resources that are needed. In this case, increased data center and manufacturing load drives a need for new dispatchable generation.¹³

The PJM capacity market was originally designed to address issues related to the competitive electricity market by addressing economic, operational, and planning challenges that became clear after the day-ahead and real-time energy markets were established. However, the capacity market was built during a time of abundant traditional, dispatchable generation sources that could reliably supply power on demand and were not dependent on weather conditions. Since then, coal, oil, and nuclear plants have continued to retire at an accelerated pace. The capacity market is not set up to deal with current circumstances to address the fast-growing nature of demand, it takes longer to build the right kind of generating capacity (supply) than it does an energy intensive data center (demand) creating an imbalance market signals are not solving for while balancing other policy objectives.

¹² See, e.g., Docket No. ER25-712, *PJM Interconnection, LLC, Tariff Revisions for Reliability Resource Initiative* at 9, 28-29 (Dec. 13, 2024) (describing resource adequacy issues caused by “thermal generation retirements, their replacement by intermittent renewable resources with low completion rates, and greatly increased load growth” and proposing modifications to the interconnection process to accelerate shovel-ready projects that “best satisfy the need” for reliable capacity that can be available quickly).

¹³ “New,” meaning new units, not uprates. “Dispatchable,” meaning that unit is available 24/7 and that the unit’s full capacity can be dispatched by PJM as required by system conditions. See generally *PJM Manual 12: Balancing Operations*, available at <https://www.pjm.com/-/media/DoCom/documents/manuals/m12.pdf>. Intermittent units – generation that is only available during limited periods – is not dispatchable (because of its limited availability). Variable generation – generation that is subject to external factors that result in moment-to-moment changes in its available output – is not dispatchable (because the unit’s output is not subject fully to central control).

The economic model that underlies the PJM power markets was not designed to achieve an optimal mix of generation with specific attributes (i.e., dispatchable). Moreover, PJM has not adjusted its market rules to fully integrate and complement renewable resources with dispatchable resources. And the marginal-cost economic model that underlies the PJM power markets does not sufficiently support the capital cost for new investment - a fact that was understood at market inception.¹⁴

JCP&L is committed to advocating for its customers and promoting solutions that result in reliable and affordable electric service in the future. The Company strongly believes that the best solution for customers includes prioritizing immediate investments in dispatchable generation while simultaneously implementing strategies to manage and moderate costs for customers. This will ensure a reliable capacity supply while maintaining long-term affordability to customers. Further, the solution must also include a focus at the state level that addresses the nature of generation supply, current demand circumstances, and the resource adequacy challenge faced by all customers.

C. State of New Jersey Energy Profile

Currently, New Jersey generating capacity resources amount to about sixty percent of what is required to meet summer peak demand. New Jersey is a net importer of electric energy, meaning it does not produce enough to sustain its own demand during peak times. Even if all resources awaiting PJM approval in New Jersey come online by 2030, the Company projects New Jersey will still have a gap of approximately 8GW in generation capacity. This is important because as AI and data centers look to locate in New Jersey, they will want a reliable source of generating

¹⁴See, e.g., Docket Nos. OA97-261, *et. al.*, *PJM*, Transcript of Technical Conference, pp. 233-36 (5/9/1997) (Mr. Falkenburg: "And when people build new generation, what happens is that the price drops and they lose money." Mr. Shanker: "That's competition.").

capacity to assure ongoing operations. If the PJM markets aren't delivering dispatchable generation at a reasonable cost – New Jersey should consider what it can do to prompt the development of new generation to be able to attract and retain these data centers to further AI efforts in the state as it does have the jurisdiction to do so.

While New Jersey has a goal of 100% clean energy use by 2035, it is important to understand that meeting the resource adequacy challenge with solar, wind, and energy storage alone is not feasible. The State must balance its clean energy goals with electric system reliability. New Jersey must consider a comprehensive approach that includes dispatchable and complementary capacity sources as well as collaboration with other states in the region. This also may require the State to consider new dispatchable on-demand generation such as nuclear energy or natural gas fired resources.

D. What is the Right Mix of Resources?

JCP&L supports development of all resources in New Jersey that address the projected gap. However, as discussed earlier in these comments, the current PJM market construct was not designed to solve the challenges presented today. As a result, the Company has very real concerns that the markets are not going to be able to compensate for the gap in generating capacity needs in sufficient time to ensure sufficient grid resources are available, leading to the conclusion that state-initiated out of market solutions must be considered.

As the Company considers what effective out of market solutions might look like, it emphasizes three critical criteria to consider to ensure success: customer impact, timing, and risk management for all affected parties. The Company's foremost priority is to ensure safe, reliable, and affordable service to its customers. In light of this, JCP&L is focused on identifying solutions that maintain service quality without causing disruptions or undue financial impact to those it

serves. Second, timing is of utmost importance. Generation shortfalls could be expected as early as 2026 or 2027, and it is estimated that it will take approximately five to six years – at the earliest - to bring new, dispatchable generation online. As a result, there is a very short window to identify a solution before customers are impacted. Given this limited timeframe, JCP&L recommends practical, immediate actions that can be implemented swiftly while minimizing risks to customers. Lastly, the Company recognizes that these solutions will come with a cost. To that end, it is critical that New Jersey finds a way to moderate the costs associated with this by working together on efficient solutions for all parties involved.

Nuclear generation, including the potential for small modular reactors (“SMRs”), is an attractive option for New Jersey because these resources are not intermittent. However, the timeline, financial uncertainty, and ongoing technological advancements associated with the development of nuclear generation may not meet the urgency of the issue in PJM’s footprint. While JCP&L recognizes the ambitious clean energy goals of New Jersey, the Company submits that the development of new gas-fired generation resources could help meet the near-term gap between supply and demand while keeping New Jersey on track to meet longer-term goals. Adding these resources will not slow the need for development of solar, wind, and energy storage generation, as a balanced mix of all types of generation is needed to meet this significant challenge.

Additionally, modular battery storage systems, combined heat and power plants, and SMRs could also help bridge the resource gap until longer term solutions can be realized.

With new load from data centers and electrification coming on in unprecedented abundance and pace, New Jersey must focus on the most efficient and effective way to bring new dispatchable generation to commercial operation within the next three to seven years. It is during this timeframe there are indications of a gap forming between supply and demand in PJM, and when a higher

likelihood of outages during peak times may occur for customers. Given the significant lead times and complex challenges involved in developing new generation projects, states cannot afford to delay action. For example, the most recent addition of dispatchable on-demand generation in the PJM region, Guernsey Power Station in Valley Township, Ohio, started construction in 2019 and was not brought online until 2023.¹⁵ However, permits for this generator were filed three years earlier, in 2016.¹⁶ At this pace, newly permitted generation would not be available until after 2030, missing the projected emergence of the generating capacity gap. Immediate state action towards resolving the projected gap is imperative to ensure sufficient dispatchable capacity to maintain grid reliability and provide stable, affordable energy. Finally, while dispatchable generating resources must make up the bulk of the potential solution and distributed energy resources cannot feasibly close the resource adequacy gap alone, options such as energy storage, demand response, and load optimization can serve an important function in addressing a portion of the generating capacity gap by reducing the need for new centralized resources.

E. How to Facilitate Completion of Construction of Resources?

There is an immediate need for State action to address the nature of generation supply, current demand circumstances, and the timing of resource adequacy challenges for all customers.

As a first step, the solutions must include a means to direct or effectively incentivize new dispatchable generation. While resource selection is a critical piece to working toward a solution, it is also important to focus on reviewing and revising the pre-construction approval process. Permitting alone for a transmission project can take up to seven years with construction taking another three years. Since 2022, the average time it takes for new generation to move through the interconnection process is five years. Efforts should be focused on developing strategies to

¹⁵ <https://guernseypowerstation.com/economic-benefits-community/>.

¹⁶ <https://www.naturalgasintel.com/news/power-developers-file-for-1650-mw-natgas-fired-plant-in-ohio/>.

streamline the permitting process and other PJM queue activities while simultaneously seeking a resource solution.

New Jersey should consider a comprehensive approach while addressing this challenge, and JCP&L has several suggested potential frameworks for ensuring that the proper resources are brought online to close the resource adequacy gap. The Company discusses these only as concepts for the Senate to consider, as further investigation into these models and collaboration with relevant stakeholders are important to determine the viability of each. We stand ready to assist the Legislature and your staff in any further discussions of these concepts.

State-initiated solutions to ensure that necessary resources are brought online might include state or utility-run competitive procurement processes whereby either state entities or utilities (either individually or in collection) would conduct competitive procurements. This State Procurement Model is familiar to New Jersey, as this is how the offshore wind procurement process was developed. New Jersey could apply the same principles to addressing generating capacity shortfalls to solve for the resource adequacy challenge. This option utilizes power purchase agreements ("PPA") for the desired output and durations that tie to system needs based on long-term forecasts. Financial certainty tied to long-term PPAs could reduce investment risk and remove challenges for developers to secure financing for new generation projects. Developers would be incentivized to build new projects that are aligned with market needs and policy goals set by the state. Moreover, state-run processes could coordinate permitting and siting to help reduce some of the barriers to developers and ultimately streamline the process for the development of new generation.

Other possible solutions might include state-owned generation. State-owned generation can provide greater control over cost and price stability. Unlike private generators, state-owned

facilities would have the ability to prioritize public interests with a focus on more stable and predictable pricing for customers. Additionally, states are in a unique position to bypass some of the financial and permitting challenges that can cause delays in the private sector leading to more timely construction of new generation to meet the demand.

It must also not be forgotten that unprecedented load growth and the needed increase in generating capacity cannot be sustained without adequate upgrades and additional infrastructure to transport the electrons from the generators to the uses of that energy both at the distribution and transmission levels. More specifically, and given the resource adequacy need, transmission, or the large-scale transfer of electrical energy from power plants to substations to end users, like data centers. The Senate should support the thoughtful and proactive buildout of transmission and programs to modernize distribution infrastructure which will support new load and economic development while ensuring that new and existing generation is able to meet the current needs of New Jerseyans.

What Can the State Senate of New Jersey do to Ensure Resource Adequacy?

Given its stance as a leader in the energy policy space, the State of New Jersey is uniquely poised to be viewed as an invaluable voice in providing overall education to key non-industry New Jersey stakeholders and decisionmakers who may not yet understand the significance of this discussion and the need for cooperative solutions. As stated, New Jersey has established compelling renewable energy goals and laudable targets for development of solar energy, offshore wind development, and energy storage programs. However, even if each of the associated goals are met, unprecedented load additions will cause a significant generating capacity gap or reliability concerns to remain. The Company does not believe it is clear the New Jersey Board of Public Utilities has the authority to implement all these solutions without legislative action to support in-

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state generation development. The Legislature also has many platforms available to communicate with the public and decisionmakers regarding the risks of capacity shortages and the importance of diversifying energy sources in an accessible way. Thus, JCP&L encourages the Legislature to take action during 2025 in these areas.

JCP&L commends the Senate in holding this hearing to discuss these very important issues and encourages continued active engagement in the dialogue with PJM and its constituent states, as well as other national-level forums. This will ensure interstate cooperation and reduction of regional free ridership to the benefit of New Jerseyans. JCP&L suggests that New Jersey create and maintain an ongoing forum amongst stakeholders oriented towards attempting to leverage existing solutions to maximum ability while brainstorming the most feasible path towards implementing real, effective solutions.

III. CONCLUSION

JCP&L appreciates the opportunity to comment on this complex and evolving topic. Although there does not appear to be a quick or simple solution, the Company applauds the Senate for attempting to get ahead of the issue and solicit comments from all interested parties. As always, providing safe and reliable service is a priority to JCP&L, and the Company is looking forward to working with all stakeholders on tackling the multi-faceted policy issues outlined above. JCP&L strongly believes that an 'all of the above' approach will be necessary to ensure the continued safe, reliable, affordable and sustainable flow of electricity to all New Jerseyans. Beyond basic utility service, economic development relies upon stable and reliable energy; failing to address the resource adequacy issues highlighted above could lead to missed opportunities for economic growth within the State. Ensuring the electric grid has sufficient capacity to meet demand is

foundational to attracting and sustaining businesses and ensuring a high quality of life for residents. The State of New Jersey has a unique opportunity to position itself as a leader in economic development by tackling this critical topic head on.

Date: March 3, 2025

Respectfully Submitted,

By: _____
Abigail

Phillips

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Good morning, Chair and members of the committee. My name is Aaron Price, CEO of TechUnited:NJ, a lifelong entrepreneur, and an advocate for the tech and startup ecosystem in New Jersey. First, I want to thank Senator Zwicker for being such a great partner to the tech community for so many years. Your leadership in science, technology, and innovation has been instrumental in keeping these critical issues at the forefront.

Just last week, we hosted a standing-room-only event on AI and energy, and it was crystal clear—this is the issue the tech community is watching. Companies, investors, and founders are all asking the same question: Can New Jersey provide the energy and infrastructure needed to power the AI revolution, or will we continue losing startups and growth-stage tech companies to other states?

The Market Opportunity

For the last 20 years, New Jersey has lost on the tech startup and growth-stage industry. Companies start here, but too often, they scale elsewhere—to New York, to Texas, to Boston—because we haven't built the infrastructure or incentives to keep them here. But right now, we have a rare second chance.

AI is projected to be a \$1.3 trillion industry in the U.S. by 2032¹ growing at over 20% annually, outpacing even the rise of cloud computing and e-commerce at their peaks. If New Jersey acts boldly, we can capture a significant share of this market—potentially tens of billions of dollars in investment, jobs, and new company formation. But if we hesitate, we will watch other states take the lead once again.

Smart Infrastructure: The Business and Energy Case

AI-driven businesses—whether in fintech, biotech, or logistics—have one non-negotiable requirement: reliable, affordable, high-density power. AI data centers demand up to 50 kW per rack—that's five times more than traditional centers.² Without the right energy infrastructure, these companies won't stay here.

And that's already happening. Companies are choosing Virginia, Texas, and North Carolina, where power is cheaper, permitting is streamlined, and grid modernization is happening now.³ Meanwhile, in New Jersey, our outdated infrastructure and high energy costs are driving AI companies and tech scale-ups out of our state.

¹ Projected U.S. AI Market Size by 2032 – Precedence Research:
<https://www.globenewswire.com/news-release/2024/11/07/2976909/0/en/Artificial-Intelligence-Market-Size-Projected-to-Hit-USD-3.68B-47.8B-by-2034.html>

² AI Data Center Power Demand – Uptime Institute:
<https://www.datacenterdynamics.com/en/opinions/power-to-the-processors-ai-data-center-energy-demands-in-the-exascale-era/>

³ States Attracting AI Companies Due to Energy Advantages – McKinsey & Company:
<https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-power-expanding-data-center-capacity-to-meet-growing-demand>



The good news? AI itself offers the solution. AI-driven smart grids can cut peak energy costs by 20%⁴, prevent blackouts, and create a more resilient, lower-cost energy supply for businesses and residents alike. The question is: will we invest in this infrastructure today, or will we wait until we've lost another generation of high-growth companies?

New Jersey's Geographic Advantage

And this isn't just about energy—it's about geography. New Jersey has a once-in-a-generation advantage in the AI era. We sit at the crossroads of major data exchanges, making us uniquely positioned for AI inference—the real-time processing of AI models. This is a massive economic opportunity that aligns perfectly with our location, workforce, and infrastructure potential⁵. My colleague will expand on this, but the bottom line is clear: if we invest in the right energy infrastructure today, we win this market tomorrow.

Policy Recommendations

So how do we get there? Here are four immediate steps New Jersey must take to secure its place in the AI economy:

1. **Invest in AI-Optimized Smart Grids** – AI can stabilize our energy supply and reduce costs for businesses.⁶
2. **Provide Targeted Energy Incentives for AI Startups & Growth-Stage Companies** – The companies leaving today could be the ones scaling here tomorrow.
3. **Support Public-Private Partnerships for AI & Energy Research** – We have world-class universities and startups that should be co-developing next-gen grid solutions.
4. **Fund Nonprofits to Educate the Community on AI** – AI is already reshaping industries. We need to ensure businesses, students, and policymakers understand its potential and how to harness it for economic growth.

For 20 years, we've watched the most promising startups and tech companies leave New Jersey. This is our moment to change that narrative. The states that invest in AI infrastructure today will dominate the AI-driven economy tomorrow. New Jersey has the location, the talent, and the ambition—but we have to act now.

This isn't just about energy. It's about whether NJ becomes a leader in the AI economy or a cautionary tale of yet another missed opportunity. The choice is ours. Let's make the right one.

⁴ AI-Driven Smart Grids Reducing Peak Energy Costs – U.S. Department of Energy (via McKinsey): <https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-power-expanding-data-center-capacity-to-meet-growing-demand>

⁵ New Jersey's Geographic Advantage for AI Inference – McKinsey & Company: <https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-power-expanding-data-center-capacity-to-meet-growing-demand>

⁶ AI-Driven Smart Grids Reducing Peak Energy Costs – U.S. Department of Energy (via McKinsey): <https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-power-expanding-data-center-capacity-to-meet-growing-demand>



March 3, 2025

Testimony of Justin Trugman

Co-founder and Head of Technology, BetterFutureLabs

Email: jt@betterfuturelabs.com

Optimizing New Jersey's Role at the Intersection of Energy and AI

Thank you all for having me today. I'm Justin, co-founder and head of technology of BetterFutureLabs—a venture studio based out of Hoboken. I'm here to discuss how we can optimize New Jersey's position at the intersection of energy and AI.

To begin, let's map out the major steps in bringing an AI model to life and their relative energy needs—so we can examine where New Jersey can, or should, play a role.

It all starts with pre-training. This is when you gather, structure, and organize the data that will be used to train the model. It's done by aggregating human-generated data as well as creating synthetic data through synthetic data generation pipelines. While the GPU inference used in these pipelines does consume energy, it's really just a tiny fraction of the overall energy cost in the AI lifecycle compared to future phases.

Next comes the training phase. This is where you see all those massive GPU clusters that make headlines. Companies invest in training clusters that may require tens of thousands—or even over 100,000—GPUs. What's interesting to note is how different the data center requirements for training are from traditional data centers. Model developers send their data to the training datacenter; the GPUs then work to train the model weights and at the end return the weighted model. So, as long as the network can support transferring all the training data in and the final model out, everything runs smoothly. This is very different from traditional application data centers, where geographic proximity to end users matter. That's exactly why you're seeing training data centers popping up in low density areas across the country where there is access to cheap clean energy and land. Because of this, it's going to be very hard for New Jersey to compete for training data centers given our high energy and land costs.

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On the other hand, once a model is trained, the next step is deploying it for on-demand customer use—this is called inference. With inference data centers, geographic proximity to users is advantageous. New Jersey, being home to a high concentration of Fortune 500 headquarters and located just across the river from New York City, is well positioned to host these data centers. This proximity requirement means we're primarily competing with neighboring states rather than with the rest of the country or the world—a competitive landscape that, with the right incentives, we can win in.

By focusing on datacenters for AI Inference, we can position our state as a hub for low-latency, high-performance AI services, benefiting from our proximity to major business centers. With targeted incentives and a more supportive business environment for large companies and growing startups alike, we can have a clear opportunity to secure a competitive edge and drive economic growth in the evolving AI landscape.

Thank you all for your time, and I look forward to making this vision a reality.

Supplementary Table:

High-Level Overview of AI Model Lifecycle and Corresponding Relative Energy Consumption

Phase	Description	Relative Energy Needs
<i>Pre-training</i>	<ul style="list-style-type: none"> Gathering, structuring, and organizing data (human-generated and synthetic) Preparing data pipelines for model training 	<ul style="list-style-type: none"> Minimal energy consumption compared to later phases GPU Inference for synthetic data generation here is only a small fraction of the total energy
<i>Training</i>	<ul style="list-style-type: none"> Using massive GPU clusters to train model weights Processing large volumes of training data 	<ul style="list-style-type: none"> Extremely high energy demand due to tens of thousands (or over 100,000) of GPUs Typically located in low-density areas with access to cheap, clean energy and affordable land
<i>Inference</i>	<ul style="list-style-type: none"> Deploying the trained model for on-demand use Running predictions 	<ul style="list-style-type: none"> Lower energy per operation than training, though overall consumption remains substantial when scaled

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PHIL MURPHY
GOVERNOR

TAHESHA WAY
LT. GOVERNOR



State of New Jersey
BOARD OF PUBLIC UTILITIES
44 South Clinton Avenue
Post Office Box 350
Trenton, New Jersey 08625-0350
www.nj.gov/bpu/
(609)777-3300

Christine Guhl-Sadovy
President

Dr. Zenon Christodoulou
Commissioner

Marian Abdou
Commissioner

Michael Bange
Commissioner

Written Testimony
Christine Guhl-Sadovy
President, New Jersey Board of Public Utilities
Senate Legislative Oversight Committee

March 3, 2025

Chairman Zwicker, Vice-Chair Ruiz, and Members of the Committee-

On behalf of the New Jersey Board of Public Utilities (NJBP or Board), please accept these written remarks for the March 3, 2025 Senate Legislative Oversight Committee Meeting on Artificial Intelligence (AI) and Energy Demand. The focus of these written remarks will be twofold: impacts of AI data centers and the actions the Board is taking to address rising energy demand and supply needs.

The data is clear, energy demand is skyrocketing. According to the PJM 2025 Long-Term Load Forecast, electricity demand within the region is expected to significantly increase, with a projected growth of over 40% within the next 14 years, translating to an additional 16,000 megawatts of demand by 2030 compared to previous forecasts.

This is being driven by a variety of factors by data center growth to support generative AI, cloud computing, and digital currencies throughout the region, population growth, the onshoring of new manufacturing, and increasing electrification across sectors. New Jersey has a modest data center load compared to leading markets. Estimates vary but range from 190 to 555 megawatts. In contrast, Virginia, the world's largest data center market, has ~6,000 MW of load. Northern Virginia, known as Data Center Alley, is the largest data center market in the entire world and handles 70% of the world's internet traffic.

As New Jersey seeks to attract data centers for their significant economic growth opportunities, co-location with new, clean generating resources should be encouraged. Co-locating data centers with existing load could have cost implications by decreasing the amount of supply able to serve other loads. In addition, new and existing data center developers should maximize energy efficiency. Within the past year, data center provider Equinix, Inc., submitted an application to New Jersey's Large Energy Users Program for its Secaucus and North Bergen facilities. The Board approved a \$627,423 incentive for energy efficiency upgrades at these facilities estimated to annually save 2,673,872 kilowatt-hours of

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electricity usage, 478.5 kilowatts of peak demand, and \$257,735 in energy costs.

Increase in projected demand has been compounded by systemic market design flaws in PJM's capacity market which have created artificial supply scarcity, which according to PJM's independent market monitor resulted in the latest auction clearing at a price that was more than twice what it would have been had the market correctly reflected supply and demand fundamentals. Those market design flaws will cost New Jersey ratepayers more than \$800 million over the course of the next year and are likely the single biggest driver of the electricity bill increases our ratepayers will experience beginning this summer. Though the Board has no jurisdiction over PJM, which is regulated by the Federal Energy Regulatory Commission ("FERC"), the Board has been pushing PJM to address these design flaws via direct conversations and advocacy in FERC proceedings. Due in part to the Board's efforts, in just the past month FERC approved two major capacity market reforms that will fix some, but not all, of these design flaws, significantly limiting the harm capacity market imperfections will inflict on New Jersey consumers in the future.

The rapid growth in the need for energy and PJM market design flaws have drastic implications for ratepayers. The news broke two weeks ago on the outcome of New Jersey's recent electricity auction, the Basic Generation Service (BGS) auction. The BGS auction determines, in part, the cost of electricity for most New Jersey residents and many businesses for a 12-month period starting June 1, 2025. The NJBPU's authority over the auction is limited to certifying the results as consistent with market trends and does not extend to influence pricing. Winning prices for all four EDCs increased compared to last year's auction, with the average monthly bill projected to increase between 17.23% and 20.20% depending on the service territory. The state's four regulated EDCs do not earn a profit on the cost of the electric supply secured in the auctions. These costs are passed through directly to ratepayers.

However, clean energy growth in New Jersey and throughout PJM has placed downward pressure on capacity costs. Without the PJM-wide (onshore) wind and solar resources that bid into PJM's 2024 capacity auction, clearing prices would likely have been about 67% higher, which would have cost New Jersey ratepayers roughly an additional \$1.1 billion in the coming year.

As of now, while PJM Interconnection has been receptive to feedback, there are nearly 1,600 projects, about 98% of which are clean energy projects in PJM's interconnection queue. These projects provide a potential source of 234,000 MW in clean energy capacity and another 16,000 MW of natural gas capacity. In New Jersey there are 79 projects alone waiting to get the approval to plug in. The NJBPU is working hard to build the programs that spur investment in clean energy technologies, and it's worked. PJM needs to do better to speed up interconnection timelines, and build out transmission to ensure more electrons get onto the grid.

Solar and battery storage are the quickest forms of electricity to get online and will have the most immediate impact on reducing capacity prices. Any new generation comes at a cost to ratepayers and it is critical to take those costs into consideration. Affordability is always a priority and as prices rise it is even more important to focus on immediate actions to reduce ratepayer costs as well as long-term solutions to demand growth. The NJBPU is committed to exploring any and all opportunities to address these issues.

If you have any questions, please contact Sophia Dolashewich, Director of Legislative Affairs, at sophia.dolashewich@bpu.nj.gov.

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New Jersey State Senate Legislative Oversight Committee

Preparing New Jersey for the Increasing Energy Demands of Artificial Intelligence

Committee Room 4, 1st Floor, State House Annex, Trenton, New Jersey
March 3, 2025, 10:00 a.m.

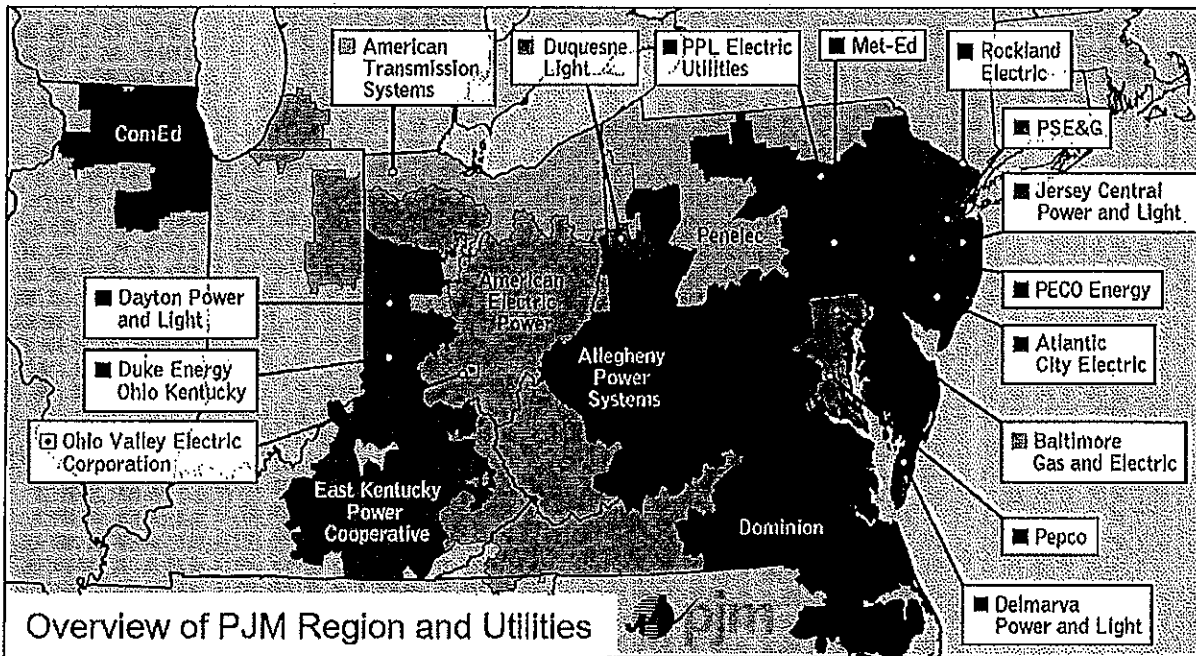
Written Comments of Public Service Electric and Gas Company

Public Service Electric and Gas Company (“PSE&G”) is the State’s largest electric public utility, serving 2.4 million customers in New Jersey. PSE&G is a leader in reliability, affordability and customer satisfaction. Last year, PSE&G received the ReliabilityOne® Award for Outstanding Reliability Performance in the Mid-Atlantic Metropolitan Service Area for the 23rd consecutive year, and the J.D. Power #1 ranking for Customer Satisfaction with Residential Electric and Gas Service in the East among Large Utilities—all while continuing to be a top performer nationally in affordability. PSE&G values the opportunity to submit comments on a topic vital to all New Jersey residents.

It is no secret that New Jersey—and the region around it—are facing significant challenges associated with both reliability, where there is an increasing concern that there will not be enough power to keep the lights on, and affordability, with electric bills set to rise significantly this summer. This rise in prices is due to the cost of the electricity itself, which PSE&G does not control. And that cost is being driven by a lack of generation supply to meet expected demand for electricity. Current market rules, set by the regional grid operator PJM, simply are not sending a signal to the market to build new generation. And because electrification, electric vehicle penetration, onshoring of manufacturing and data centers are pushing electric demand higher without electric supply increasing, prices are rising. In these comments, PSE&G explains why New Jersey is facing this serious situation and outlines the

steps that New Jersey can proactively take to assume control and maintain reliability and affordability for its residents.

First, it is important to explain why customer bills will increase this summer. That price increase is not caused by the state's electric utilities, and the utilities earn nothing from these price increases. Rather, it comes from an increase in the cost of the electricity itself, which the utilities acquire through an interstate market and deliver to customers. That interstate market is run by PJM, which plans and operates the regional power grid that includes New Jersey, twelve other states, and Washington, D.C., and includes 65 million people:



PSE&G is one of over 20 utilities in the PJM region.

PJM creates the rules for the markets, and those rules are reviewed and approved by the Federal Energy Regulatory Commission. PJM's markets are supposed to match electric generation supply with electric demand. It is PJM's responsibility to forecast across the region that includes New Jersey how much electric demand there will be in the future, and to ensure that electric generation is procured to meet that demand. New Jersey relies on PJM. Nearly 20% of

the power New Jersey uses is generated in other states and moved through the interstate wires that PJM plans and operates.

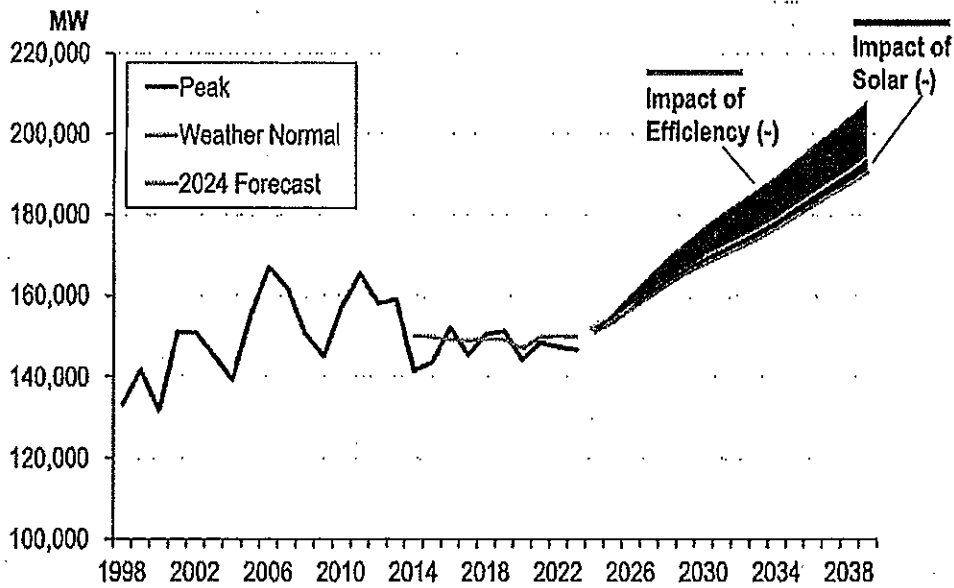
In its markets, PJM pays electric generators in primarily two ways:

1. By running an “Energy Market” for the actual power that is produced by the power plants; and
2. By running a “Capacity Market,” which pays power plants for being available to deliver power when customers need the power the most.

PJM’s Capacity Market, called the “Reliability Pricing Model” (“RPM”), is a reliability construct intended to ensure a reliable supply of power, at a reasonable cost, to meet PJM’s forecast of customer electric demand plus a reserve margin, which is an insurance policy for system emergencies. PJM runs capacity market auctions that set the price customers will pay for capacity. This price is intended to send a price signal to build new generation when it is needed to meet demand.

Yet, PJM and its markets are facing an impending crisis. In mid-2023, PJM’s President and CEO testified to the United States Senate Committee on Energy and Natural Resources that PJM’s models “show increased risk of having insufficient resources later in this decade to maintain the reliable electric service that consumers expect.” In documents filed over the past several months in multiple FERC proceedings regarding the PJM capacity market, PSE&G has emphasized the gravity of the situation and its firmly-held view that meaningful, long-term reforms – not band-aid “fixes” – are needed to that market. As just one example, attached to these comments as **Attachment A** is a PSE&G filing from earlier this year that explains why PJM’s proposed market reforms fail to address the challenges it faces, and offers true alternatives that would overhaul the market design to increase supply. As outlined in that filing and others, the impending crisis has been a long time coming for several reasons:

1. **There is significant market rules uncertainty.** PJM's capacity market rules are in a constant state of flux, marked by a series of complaints, delays, and rushed short-term fixes that may result in unintended consequences. In just the last three years, PJM has delayed the running of its capacity auction four times. Years of uncertainty send precisely the wrong message to new investment.
2. **Market rules do not currently send a long-term price signal to supply resources.** While the RPM construct was designed to send a three-year price signal to allow time for new resources to clear the auction and construct new generation, recent auctions have been run on a compressed schedule. Both last year's auction and this year's July auction will allow less than one year from the auction date to the auction's delivery year, which simply does not allow market participants enough time to respond to the price signal and exacerbates the supply/demand imbalance.
3. **The interconnection queue has been characterized by delay.** PJM has struggled to move new generation projects through its interconnection queue to replace units that have retired. PJM controls where and when new power plants can connect to the transmission grid. Historically, this process has been quite slow. To its credit, PJM has implemented new queue rules, but it may be too little, too late, as customer prices are already set to rise.
4. **Historically, PJM has under forecast demand.** As an example, in PJM's 2022 regional load forecast, PJM projected relatively flat load growth. In fact, that year PJM predicted only "slight" load growth, and even lowered certain summer peak forecasts from PJM's prior forecast, lowering its 2025 summer peak forecast by 0.5% and its 2027 summer peak forecast by 0.2%. At the time, PSE&G projected more demand on its system than PJM included in its forecast - based on, among other factors, customer connection requests and New Jersey policies. And while the 2024 PJM regional load forecast was much more in line with PSE&G's local forecast, this all occurred too late, as the resulting demand increase after years of projected flat load growth significantly contributed to the price spike between the 2024/2025 capacity market auction and the 2025/26 auction run in July 2024. Also, while PJM has recognized the benefits of solar and energy efficiency programs in the PJM region, PJM projected last June that even those programs will not offset future demand growth:



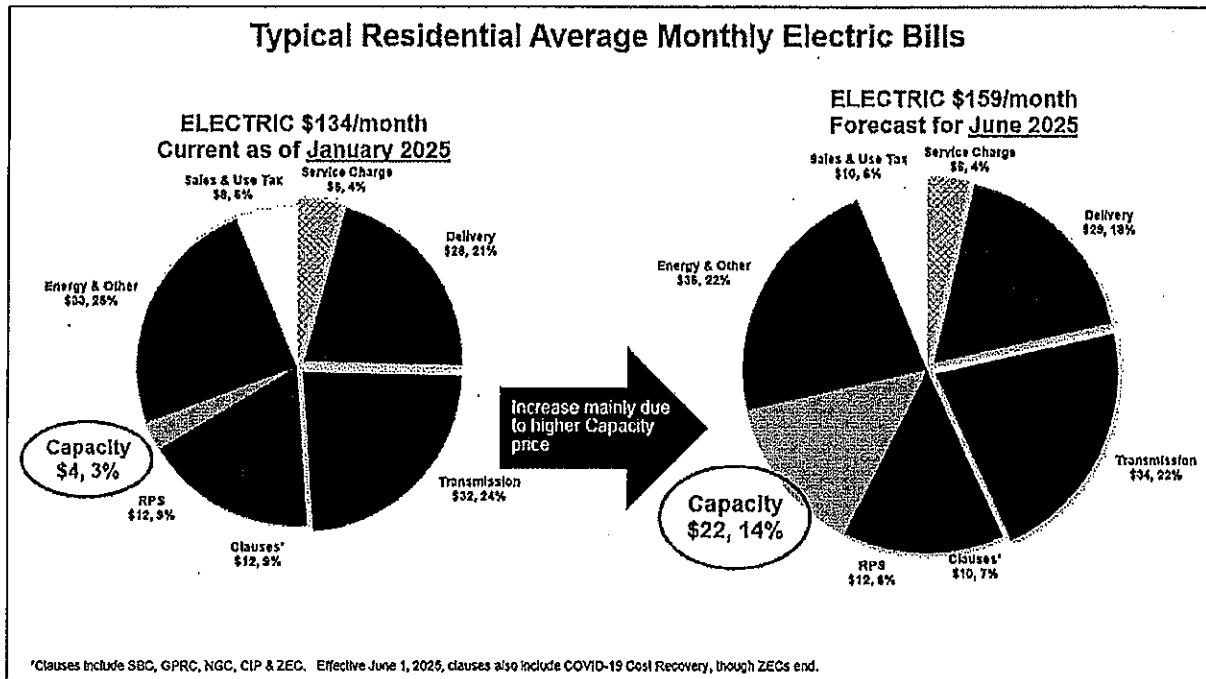
*PJM chart titled "Impact to Summer Forecast (-) Distributed Solar and Energy Efficiency"
Dated June 4, 2024*

Forecasted flat load growth masked the failure to build new generation supply. But as this Committee is aware, the world continues to change; with electrification, electric vehicles, onshoring of manufacturing and the influx of AI and data centers. The growth in large load and data center demand is especially pronounced. Last year at this time, inquiries PSE&G received from these customers totaled under 400 megawatts. Today, that interest has grown to 4,700 megawatts, which includes both mature leads and initial inquiries. This pipeline represents a year-over-year 12-fold increase. Only recently has PJM recognized that future demand is skyrocketing. Without a functioning market to spur additional supply, the result has been and will continue to be a corresponding skyrocketing of PJM's capacity prices—and, as importantly, an increase in the risk that there will not be enough electricity in times of peak demand on the system.

PJM has taken certain steps to try to improve the situation, including making several recent filings at FERC to reform its capacity market and to put in a place an expedited interconnection queue process for so-called "shovel ready" generation projects. However, even

PJM has recognized that these steps will not be enough. In a December 2024 letter to stakeholders, the Chair of PJM’s Board of Managers stated that “PJM does not expect that these filings, taken in the aggregate, will fully resolve the resource adequacy challenges that [PJM is] currently facing.”

All of these problems will be reflected in customer bills. Up until this year, the capacity price has been a miniscule portion of the average PSE&G electric bill: about 3%. But because of the recent surge in PJM capacity prices (and in February’s State-run BGS auction that reflects those prices), that 3% portion of the bill is increasing to 14%, as demonstrated below:



As a result of PJM’s auction, capacity prices rise from 3% of a bill to 14% of a bill this summer.

Now is the time for New Jersey to step up. New Jersey relies on the interstate market run by PJM to procure generation supply, and the state’s electric utilities are not currently in a position to help since state law requires utilities to be out of the generation business. Specifically, this is a function of a 1999 New Jersey law called the “Electric Discount and Energy Competition Act” (“EDECA”), which required utilities to functionally separate their utility and

generation businesses. Before EDECA, New Jersey's electric public utilities both generated electricity and delivered that electricity to customers and the state oversaw both functions. Now New Jersey is entirely dependent on PJM to procure sufficient generation through its markets to meet the energy needs of New Jersey customers, a situation that leaves New Jersey at the mercy of a paradigm that isn't working.

PSE&G stands ready to partner with the state to develop a comprehensive, integrated plan to address both reliability and affordability. Such a plan would look holistically at the supply/demand imbalance in the state and then consider concrete solutions to address it. New Jersey has made statutory changes in the past to allow rate-based generation for renewable resources to stimulate the development of in-state renewable generation; the state could consider doing so now to develop high capacity factor generation resources to meet demand. The state could also run a targeted RFP process, as it did with offshore wind generation, to procure a specific amount of new supply resources for peak demand as part of a competitive solicitation. In addition, through a comprehensive resource plan, the state could work with its utilities and with PJM to develop regional transmission solutions that would move out-of-state power into New Jersey. A partnership among the state, PSE&G and the state's other electric utilities could drive to an integrated, comprehensive solution that allows the state to take its destiny into its own hands and make sure there is adequate generation to keep the lights on for New Jersey customers and do so in a cost-effective way.

In the meantime, PSE&G will continue to deliver top-rated reliability, affordability and customer service. PSE&G will continue pursuing capital investments that focus on ensuring that the state's energy network remains reliable, resilient, effective and ready for load growth. PSE&G has led the way in addressing customer requests to connect to the grid, whether

interconnecting new solar generation, interconnecting generators connecting to the high voltage system, or large and complicated customer connections. PSE&G is proud of the speed and efficiency with which it has responded to solar net metering interconnection requests, engaging quickly with more than 12,000 requests from solar developers in 2024 across all sizes of proposed solar facilities:

Project Type	2024 Project Count	Average Response (days)
Net Metering Level 1	10,876	8
Net Metering Level 2	1,263	13
Net Metering Level 3	74	38

PSE&G's investments have created opportunities for contractors and suppliers, along with deploying a skilled workforce across the trades, without foregoing the core principle of safe and reliable service.

PSE&G advocates for finding a long-term solution that benefits our customers. The consensus is that we urgently need more generation in New Jersey. Utilities cannot control the development of generation in the state. We welcome the opportunity to work with New Jersey as it deliberates on policy choices to achieve a more affordable future. Without immediate change, costs to New Jersey utility customers will only continue to increase and New Jersey will be hampered in its efforts to electrify homes and transportation and to enjoy the economic development associated with onshore manufacturing or AI. This will be a "lose, lose" proposition for the state.

Thank you again for the opportunity to submit comments. PSE&G looks forward to working with this Committee and with the state to address these critical issues.