UNITED STATES OF AMERICA
BEFORE THE
U.S. ENVIRONMENTAL PROTECTION AGENCY

Federal Implementation Plan Addressing	)	
Regional Ozone Transport for the 2015 Ozone	)	EPA-HQ-OAR-2021-0668
National Ambient Air Quality Standard	)	

COMMENTS OF PJM INTERCONNECTION, L.L.C.

PJM Interconnection, L.L.C. ("PJM") submits these comments in response to the Environmental Protection Agency's ("EPA") proposed rule in the above-referenced docket ("Proposed Rule").[1] Certain features of the Proposed Rule have the potential to trigger material impacts to the reliability of the bulk electric system. PJM submits these comments[2] to explain the reliability challenges associated with the Proposed Rule and to propose for EPA's further consideration the following:

- addition of a dedicated bank of reliability allowances to address seasonal reliability concerns;
- addition of a reliability-based "Reliability Safety Valve" ("RSV") to support short-term reliability needs on the bulk electric system;
- elimination or substantial modification of dynamic budgeting, because, if allowed to remain, it will unnecessarily reduce the ability of capacity resources to operate; and
- recognition of the potential cost impacts associated with purchasing allowances that will likely be passed through to end-use customers.

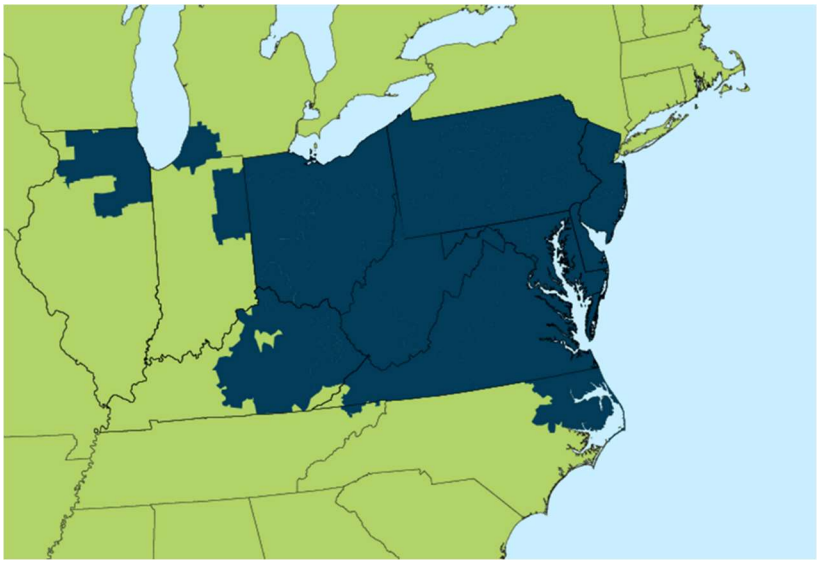
[1] Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standard, Proposed Rule, EPA-HQ-OAR-2021-0668, 87 Fed. Reg. 20,036 (Apr. 6, 2022) ("Proposed Rule").

[2] PJM, through the ISO/RTO Council, and the EPA previously collaborated during the development of the Clean Power Plan to incorporate a "Reliability Safety Valve" into the final regulation in order to allow operation of generation units needed for reliability. Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, Final Rule, EPA-HQ-OAR-2013-0602, 80 Fed. Reg. 64,662, 64,877-79 (Oct. 23, 2015) ("Clean Power Plan").

PJM believes that the proposals described herein will help manage and mitigate those risks. PJM's main objective, as set forth in its mission statement, is to "ensure the safety, reliability and security of the bulk electric power system." These comments align with our mission and objectives and have been prepared keeping in mind the legal requirements and court directives that govern EPA's development and administration of this aspect of the Cross-State Air Pollution Rule ("CSAPR").

I. COMMENTS

PJM is a federally regulated region transmission organization ("RTO") serving 65 million customers in an area spanning all or portions of Illinois, Indiana, Michigan, Kentucky, Tennessee, Ohio, West Virginia, North Carolina, Virginia, Maryland, Delaware, Pennsylvania, New Jersey, and the District of Columbia. PJM delivers power from the high-voltage transmission grid to local distribution utilities, who then are responsible for delivery to end-use customers. The following figure shows PJM's service territory.



PJM is an independent entity, separate from the companies that own electric generation and transmission facilities and has been authorized by the Federal Energy

Regulatory Commission ("FERC") to provide transmission service and otherwise administer the bulk electric system in its region. As relevant here, FERC requires PJM to work with its member companies to ensure reliable and efficient delivery of electricity to those it serves.

a. Ensuring the Reliable Operation of the Bulk Electric System, in Accordance With Applicable Reliability Standards, is PJM's Top Priority

Pursuant to legislative and regulatory directives, PJM is charged with ensuring the reliability of the bulk electric system in its respective footprint. In performing these functions, PJM must comply with federally-approved reliability standards promulgated by the North American Electric Reliability Corporation ("NERC") and the applicable Regional Entity.

1. PJM's Responsibilities as an RTO

FERC Order No. 2000 sets forth the specific characteristics and functional responsibilities of an RTO. These include:

- Short-term Reliability
- Operational Authority
- Planning and Expansion
- Congestion Management; and
- Interregional Coordination.[3]

In order to be recognized as an RTO, FERC requires that the governance structure of the entity so requesting be entirely independent of asset owners and operators. Consistent with its RTO designation,[4] PJM's Board of Managers ("Board") is entirely independent of its market

[3] *Regional Transmission Organizations*, Order No. 2000, FERC Stats. & Regs. ¶ 31,089 (1999), *order on reh'g*, Order No. 2000-A, FERC Stats. & Regs. ¶ 31,092 (2000), *aff'd sub nom*. *Pub. Util. Dist. No. 1 of Snohomish County, Washington v. FERC*, 272 F.3d 607 (D.C. Cir. 2001) ("FERC Order No. 2000").
[4] PJM received RTO designation by FERC in 2001. *See PJM Interconnection, L.L.C., et al.,* 96 FERC ¶ 61,061 (2001).

participants. As memorialized in PJM's governing documents such as the Operating Agreement, the Board's responsibility is to:

- Ensure reliable operation of the grid;
- Promote robust competitive wholesale markets; and
- Avoid undue influence by any market participant or group of market participants.

2. PJM's Limited Authority Over Generation

Consistent with its duties as an RTO, PJM has registered with the North American Electric Reliability Corporation ("NERC") as, among other categories, the balancing authority and reliability coordinator for its 13-state footprint. In this role, PJM can direct actions to ensure that the generating units within its footprint are operated in a manner which meets approved reliability standards. However, it should be noted that the generators in PJM's footprint have largely been deregulated at the wholesale level as a result of FERC rulemakings and orders. Although PJM can direct certain actions be taken by generators to avert emergencies, it should be noted that PJM cannot direct the construction or operation of particular generating units nor require upgrades to those generation units.

As a result, the PJM Tariff currently requires only 90 days' notice of a generating unit's plan to retire prior to that unit formally retiring. Within 30 days of the receipt of a generator's notice of deactivation, PJM must inform the generator whether deactivating the generating unit would adversely affect the reliability of the transmission system. Regardless of whether deactivating the generating unit would adversely affect the reliability of the transmission system, the generator may deactivate its generating unit, subject to the notice requirements in the PJM Tariff.

3. Reliability Concepts

Both NERC reliability standards, and the local reliability criteria, are intended to evaluate and ensure preservation of the electric reliability of the transmission system. As used by industry experts, the terms "electric reliability" or "reliability" refer to the delivery of electricity to customers in the amounts desired and within acceptable standards for frequency, duration and magnitude of outages and other adverse conditions or events. According to NERC, the industry has often defined "reliability" with two concepts: system security and resource adequacy.

4. Attributes of System Security

System security, as it relates to reliability, is defined as the ability of the electric system to withstand sudden disturbances such as electric short circuit or unanticipated loss of some system component such as a line, transformer, or generating unit. The notion of system security comprises two elements: 1) transmission security; and 2) maintenance of sufficient ancillary services. Transmission security ensures that all transmission assets do not exceed their designed maximum loadings and that designated voltage levels are maintained in actual operation or in the case of a contingency. Generation contributes to system security through 1) changes in the amount of generation that is dispatched to produce energy in real-time to meet load while respecting the physical limitations of the transmission system, and through 2) the provision of ancillary services that support the transmission of energy from generation to load while maintaining reliable operation of the transmission system. Ancillary services such as reactive power are necessary to maintain transmission system voltages within acceptable ranges. Other ancillary services such as regulation, frequency response, and black start also help with overall system security.

- Inertia and Frequency Response: the frequency of alternating current on the transmission system (scheduled to 60 Hertz in the US) is a key indicator of the

system's health and stability. It is impacted by any imbalance between load and generation, such as that which happens when turning on lights or when a generator trips offline. Frequency deviates upward when generation exceeds demand, and deviates downward when generation is insufficient. Frequency response is provided and maintained by inertia (from the rotating mass of synchronous, mainly thermal, generators), primary response, and secondary response.[5]

- Reactive Capability: system voltage is another key indicator of the system's health and stability. Voltage on an electric line is similar to water pressure in a hose—it is needed to ensure sufficient flow. If voltages drop too severely, the low voltages can cascade through the system to lead to a localized or widespread blackout. If voltages get too high, it can cause failure or permanent damage to system equipment. Voltage control is a resource's ability to either inject or absorb "reactive power" to maintain or restore system voltage to prescribed levels following a disturbance. Reactive power (measured in Mega VARs) cannot be easily transmitted over long distances like real power (measured in megawatts), and therefore requires resources used for voltage control to be located in close proximity to consumers or areas where voltage regulation is challenging.[6]

- Fuel Assurance: the availability of a generation resource is a measure of its ability to perform when needed by system operators. For thermal generation, it considers the probability that a resource will be on a forced (unanticipated) outage when needed, due to equipment failures, inability to secure fuel, or other reasons. Availability for intermittent resources is based on their expected ability to perform when needed during peak periods of demand, a main factor being the availability of wind or sun. Generally, resources with higher availability reduce uncertainty and provide a greater reliability value than those with poor availability.[7]

- Black Start: this capability is a reliability attribute provided by units that have the ability to start up and deliver electricity to the power grid without an outside source of power. These units are used for system restoration by helping to re-energize the grid following the unlikely event of a widespread outage or blackout.[8]

[5] Reliability in PJM: Today and Tomorrow, PJM Interconnection, L.L.C. Whitepaper at 4 (Mar. 11, 2012), available at https://pjm.com/-/media/library/reports-notices/special-reports/2021/20210311-reliability-in-pjm-today-and-tomorrow.ashx ("Reliability in PJM").
[6] Reliability in PJM at 5.
[7] Reliability in PJM at 6.
[8] Reliability in PJM at 6.

5. Attributes of Resource Adequacy

Resource adequacy is the ability of the electric system to supply the aggregate energy requirements of electricity consumers at all times, taking into account scheduled and reasonably expected unscheduled outages of generation and transmission facilities. To achieve the goal of resource adequacy, PJM maintains an installed reserve margin in excess of the forecasted peak load that achieves a loss of load expectation of 1 day in 10 years. This loss of load expectation standard is consistent with that prescribed in the ReliabilityFirst Corporation ("RFC") standard for planning resource adequacy.[9]

b. PJM Uses Various Market-Based and Non-Market Mechanisms to Ensure the Reliable Operation of the Bulk Electric System: Capacity Market, Energy Market, and Other Emergency Measures.

1. Capacity Market

PJM addresses long-term reliability and resource adequacy through its capacity market, which is called the Reliability Pricing Model. Each PJM member that provides electricity to consumers must acquire enough power supply resources to meet demand not only for today and tomorrow but for the future. Members secure these capacity resources for future energy needs through the capacity market. The capacity market ensures long-term grid reliability by procuring the appropriate amount of power supply resources needed to meet predicted energy demand three years in the future. By matching generation with future demand, the capacity market creates long-term price signals to attract needed investments to ensure adequate power supplies. This exchange provides consumers with an assurance of reliable power in the future, while capacity resources receive a dependable flow of income to help maintain their existing capability, attract

[9] RFC Standard BAL-502-RF-03: Planning Resource Adequacy Analysis, Assessment and Documentation.

investment in new resources, and encourage companies to develop new technologies and sources of electric power.

Load forecasting is an important part of maintaining the reliability of the bulk electric system. Forecasting helps PJM make decisions about how to plan and operate the bulk electric system in a reliable manner, and how to effectively administer competitive power markets. PJM members also can use forecasts to make informed decisions when participating in energy markets in the near term and about investing in new power plants and transmission facilities over the long term. Long-term forecasting occurs on an annual basis where PJM issues an updated forecast model and provides a 15-year load projection. The model indicates peak usage, net energy consumption, load management, and data on distributed solar generation and plug-in electric vehicles. The report is broken out into zones in addition to system-wide results. This long-term load forecast is a major input to the capacity market, which looks three years ahead to calculate the amount of capacity to be procured.

2. Energy Market – Day-Ahead and Real-Time

The electricity generated and sent out onto the bulk electric power grid must match customer demand. This requires a constant balancing act achieved between PJM and generators and other energy suppliers. PJM's dispatchers monitor the grid 24 hours a day, seven days a week. Dispatchers see system conditions and predict what electricity will be needed on the grid over the next two hours. Every five minutes, PJM transmits a secure electronic signal to market operations center that then transmit the signal to generating plants, telling them how many megawatts of electricity to generate. Regardless of the best planning and monitoring, there will be times when current generation does not meet demand, but PJM dispatchers are prepared with

energy reserves that can be called upon to fill the gap. PJM can ask generators to increase output or to begin generating.

The generation scheduling process begins a day ahead of when a generator is needed to run—this is called the Day-Ahead Market. The Day-Ahead Market is a forward-type market, which means that prices are set for energy that will be delivered in the future, in this case the next day. Hourly prices are calculated based on generator offers, bids from entities such as utility companies that need electricity, scheduled energy trades among PJM members and market-related financial transactions.

Load-serving entities bid in the amount of energy they would like to purchase, while generators submit offers of how much they are willing to supply and at what cost. PJM accepts offers from the lowest- to highest-priced generator until it meets the forecasted demand for electricity. PJM then clears (or chooses) the generators that have been chosen to run, and sends out an operating schedule for the following day. PJM's reliability engineers and dispatchers assess whether the cleared generators satisfy reliability requirements and the expected load forecast. Additional generators may be scheduled to meet demand.

PJM's Real-Time Market is a close relative of the Day-Ahead Market. The Real-Time Market is a spot market, meaning electricity is procured for immediate delivery. Electricity prices are calculated at five-minute intervals for more than 1,000 different pricing points based on actual grid operating conditions and are published on PJM's website. PJM continually follows fluctuations in generation, demand, and transmission, sending an electronic signal every five minutes to inform generators what their electricity output should be. If a generator is committed to run by PJM and follows dispatch instructions, it will be compensated. If a generator deviates from the signal instructions, it may be charged a penalty. Energy suppliers

are paid the day-ahead price for their scheduled output and the real-time price for any energy that exceeds the scheduled amount. Throughout this cycle, PJM, generators, and customers work together to balance electricity on the bulk electric system, enabling PJM to maintain a reliable grid at the lowest reasonable cost.

3. Must-Run Generation

If a non-retiring generation resource participating in the energy market must be run to maintain the reliability of the bulk electric system in PJM's footprint, PJM may schedule and dispatch that resource to address that reliability risk. Such generation may be dispatched out of economic merit order, that is, outside of normal dispatch protocols that generally rely on least-cost generator offers. Must run generator offers are subject to price caps that rely on cost-based offers submitted by the generator. Cost-based offers may include the costs of emission allowances.

The treatment of generators that have notified PJM that they intend to deactivate (retire) is somewhat different. PJM has no authority to order generating plants to continue to operate. Rather, PJM's responsibility is to evaluate, through a deactivation analysis, the reliability impacts caused by the proposed deactivation and identify transmission solutions to ensure ongoing reliable transmission operations. PJM may request the generating unit to continue to operate beyond its desired deactivation date. If the generation owner agrees to continue to operate, the generation owner may file a proposed rate with FERC seeking full cost recovery associated with operating the unit until it may be deactivated.

4. Emergency Operations

PJM has an emergency operations plan to sets forth how PJM will address various emergency and other unanticipated scenarios. PJM's emergency operations plan is set forth in

PJM Manual 13,[10] which describes the steps PJM shall take to mitigate an operating emergency pursuant to NERC Reliability Standard EOP-011-1 (Emergency Operations).[11] EOP-011-1 requires an operating plan to include "[p]rocesses to prepare for and mitigate Emergencies." Accordingly, PJM uses four levels of emergency-related activities starting with advisory activities and progressing through alerts, warnings, and actions (Figure 1). Advisory activities are issued one or more days in advance of the anticipated event day and are to elevate awareness. Alerts are issued one or more days in advance of the anticipated event for the purpose of giving resources time to prepare. Warnings are issued in real-time ahead of the event. Actions are issued in real-time and require a particular response from PJM or its members.

Figure 1 – Alert, Warning, and Action Types	
Alerts	Unit Startup Notification Alert
	Maximum Generation Emergency / Load Management Alert
	Primary Reserve Alert
	Voltage Reduction Alert
Warnings	Primary Reserve Warning
	Voltage Reduction Warning & Reduction of Non-Critical Plan Load
	Manual Load Dump Warning
Actions	Pre-Emergency Load Management Reductions
	Emergency Load Management Reductions
	Maximum Generation Emergency
	Emergency Voluntary Energy Only Demand Response Reductions
	Deploy All Resources Action
	Curtailment of Non-Essential Building Load & Voltage Reduction
	Manual Load Dump

[10] PJM Manual 13: Emergency Operations (Mar. 23, 2022), available at https://pjm.com/-/media/documents/manuals/m13.ashx.

[11] North American Electric Reliability Corp., Reliability Standard EOP-011-1 Emergency Operations, available at https://www.nerc.com/pa/Stand/Pages/USRelStand.aspx.

5. Reliability Issues and Areas of Concern

Implementation of the Proposed Rule has the potential to pose distinct reliability challenges that must be addressed. First is maintaining resource adequacy. Resource adequacy, in general terms, is achieved when the megawatt capacity of the generators in a particular region exceeds the forecasted load for that region by a reserve margin including a reserve to address contingencies. Although PJM today has an adequate reserve margin, the region is not immune from the trends occurring elsewhere in the country that have driven premature retirement of fossil resources at the very time when such resources will be needed as a back-up given the intermittent nature of renewable resource output.[12] To that end, PJM has recently detailed in reports the increased strains on the system and the need for fossil generation, as one component, to provide needed back-up services as the number of renewables on our system vastly increases.[13]

One factor behind this trend is generator retirements which are driven by a host of economic factors including a generator owner's decision to invest in existing facilities to meet various emission standards (or to purchase emission allowances to allow a plant to operate). Other aspects include its competitive position in the energy market, which is affected by allowance and fuel prices, or a decision to end commercial operation. Replacement of retiring

[12] For example, NERC's 2022 Summer Reliability Assessment identifies capacity shortfalls, tightening generation margins, and the potential for low wind conditions in parts of the US, including the Midcontinent Independent System Operator region to PJM's immediate west as well as in California and Texas. 2022 Summer Reliability Assessment, North American Electric Reliability Corp. at 4-5 (May 2022), available at: https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2022.pdf.

[13] Energy Transition in PJM: Emerging Characteristics of a Decarbonizing Grid, PJM Interconnection, L.L.C. at 5 (May 17, 2022), available at: https://pjm.com/-/media/library/reports-notices/special-reports/2022/20220517-energy-transition-in-pjm-emerging-characteristics-of-a-decarbonizing-grid-white-paper-final.ashx; Energy Transition in PJM: Frameworks for Analysis, PJM Interconnection, L.L.C. Whitepaper at 2 (Dec. 15, 2021), available at: https://pjm.com/-/media/library/reports-notices/special-reports/2021/20211215-energy-transition-in-pjm-frameworks-for-analysis.ashx.

generation facilities will take time. Obtaining the required regulatory approvals to construct new generation and especially any needed transmission facilities to connect that generation to the grid can be an extended process.

Second, while PJM is seeing certain shifts in its respective generation portfolio through the addition of renewable generation and inverter-based resources, thermal generators continue to provide essential reliability attributes and services. PJM's own analysis of this shift indicates that under today's generation portfolio, thermal generators supply the bulk of the essential reliability attributes needed to support the grid, which include inertia, frequency response, reactive capability, fuel assurance, and black start.[14] These essential reliability attributes will be needed for the foreseeable future.

The remaining sections contain a series of proposed rule modifications and factors for the EPA's consideration that can help address the reliability issues that could arise based on the present configuration of the rule.

c. Any Future Final Rule Should Include the Opportunity for the RTO/ISO (or the Balancing Authority in non-RTO Regions) to Request Creation of a Dedicated Bank of Regional Reliability Allowances that Would be Available to Generators on a Seasonal Basis

PJM ensures that it has a sufficient amount of generation capacity for purposes of meeting resource adequacy requirements by operating a forward-looking capacity market.[15] The RPM "promotes reliability through competitive auctions that secure capacity resources to meet system reliability three years in advance. The auctions allow both new and existing resources to participate, and provide forward price signals that support the efficient entry and exit of

[14] *See* Energy Transition in PJM: Frameworks for Analysis at 2.

[15] Not all ISO/RTO regions operate a forward-looking capacity market. Rather, they may rely on other means to meet resource adequacy requirements. Regardless of how resource adequacy requirements are met in a particular region, the reliability allowance bank proposed here would mitigate risks associated with the implementation of any future final rule.

resources on the system."[16] The benefits of the forward-looking RPM structure are that it offers financial assurances to generation developers as they make their investment decisions, and it also allows developers time to obtain the required regulatory approvals and construct the unit.

The concurrent risk, however, is that units may choose to retire (deactivate) or be unable to operate due to an emissions-related operational limitation. While the Proposed Rule does make available certain quantities of allowances so that units may operate, it is difficult to know whether those allowances will be sufficient to ensure system reliability. The size of the allowance bank is impacted by EPA's determination of the level of emissions which would meet the rule's goal. However, the size of the allowance bank (as well as reductions to that bank as a result of the workings of the dynamic budgeting process) also impacts a unit's availability to meet the reliability needs of the system. As a result, the two have a symbiotic relationship.

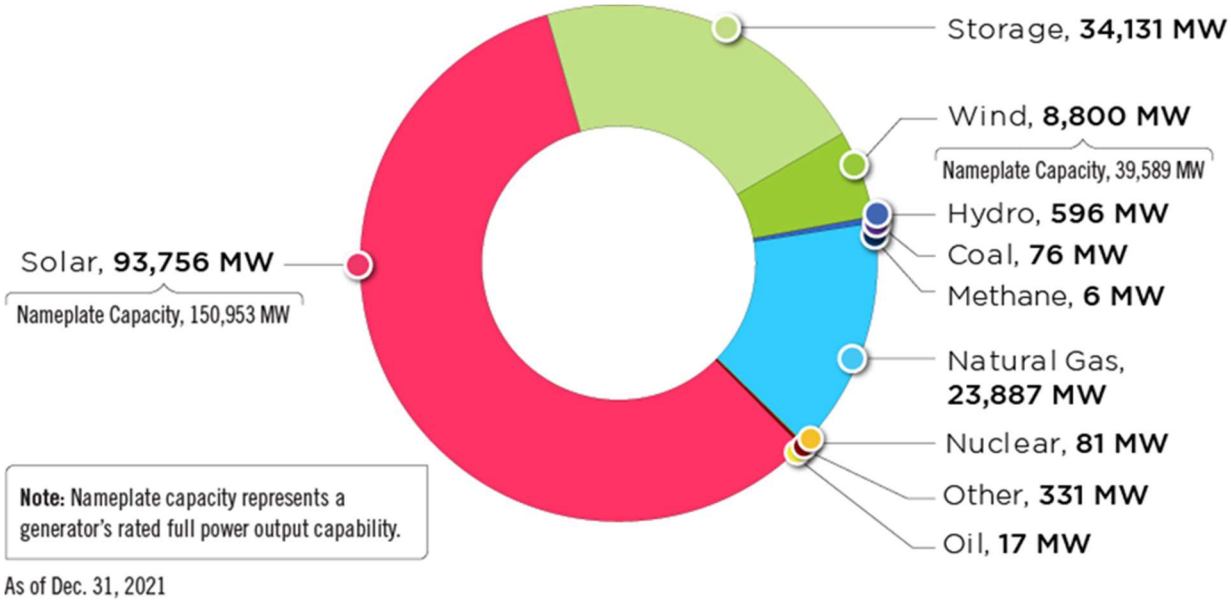
One approach is to maintain reliability through an adequate supply of allowances and mechanisms to ensure the liquidity of the allowance market at reasonable prices.

In normal periods, just as with the original SO2 trading rule, the allowance bank should be both liquid and available to meet the reliability needs of the system. However, implementation of the Proposed Rule triggers additional uncertainty (and reliability challenges) as to whether that favorable result from the SO2 allowance program will duplicate itself with this program. For one, the budgets in question are developed on a state by state basis and subject to dynamic budgeting. By contrast, reserve margins are determined by PJM on a regional basis taking into account local transmission constraints so as to avoid one state or sub-region 'leaning on' the rest of the region. Second, the PJM region and the nation as a whole has seen extreme

[16] Reliability in PJM at 9-10; PJM's capacity market, called the Reliability Pricing Model, "ensures long-term grid reliability by procuring the appropriate amount of power supply resources needed to meet predicted energy demand three years in the future." https://learn.pjm.com/three-priorities/buying-and-selling-energy/capacity-markets.aspx.

weather conditions that have brought into question strict reliance on past experience to forecast future reliability needs.[17] And third, the fleet is rapidly being populated with renewable resources (Figure 2) which, due to their intermittent nature, have a discounted capacity value.

Figure 2 – Breakdown of PJM's Generator Interconnection Queue



For these reasons, PJM recommends creation of a seasonal 'reliability safety valve' allowance bank as described in this section, in addition to the availability of waivers from the rule to deal with short term extreme circumstances as described in the next section.

Although PJM procures capacity three years forward, the allowance market operates on a far more short term basis. To ensure that the availability of allowances does not become a block to resources providing energy at reasonable cost throughout the summer season and being available to support a unit's running when PJM calls an emergency, PJM suggests that the future final rule make provision for the addition of a dedicated bank of reliability allowances specific to

[17] The February 2021 Cold Weather Outages in Texas and the South Central United States, FERC, NERC and Regional Entity Staff Report (Nov. 16, 2021) at 47, available at: https://ferc.gov/media/february-2021-cold-weather-outages-texas-and-south-central-united-states-ferc-nerc-and.

each region that would be available to generators should the RTO/ISO (or balancing authority in non-RTO regions) project a potential shortfall in reserves in a given region over the summer season coupled with insufficient availability of allowances to sustain unit operation through the summer season. In short, access to these 'regional reliability allowances' to supplement allowances that units would otherwise bring to the table, would only be triggered if the RTO/ISO, working with EPA, projects, based on transparent modeling before the start of the summer season that:

a. The availability and cost of allowances available on the market may not be sufficient to sustain units that will be needed throughout the summer season and particularly when called upon by the RTO in emergencies;
b. The price of allowances and the lack of liquidity would make it difficult for units to purchase sufficient allowances at reasonable cost to ensure reliable operations through the summer period; and
c. In areas of the system where there is limited import capability, the allowances otherwise available to units within the constrained area are insufficient to sustain reliable operations during the summer season.

The framework of this bank could consist of the following (with additional detail to be added during rule development):

- Availability of Reliability Allowances – reliability allowances may be used within that region and only during the ozone season of May 1 through September 30.
- Access to the Bank – The RTO/ISO or balancing authority,[18] working with EPA, would model the availability of allowances based on the above considerations prior to entering into the summer season. Based on that analysis, if deemed necessary, the RTO/ISO or

[18] A Balancing Authority is the "responsible entity that integrates resource plans ahead of time, maintains Demand and resource balance within a Balancing Authority Area, and supports interconnection frequency in real time." Glossary of Terms, North American Electric Reliability Corp., available at: https://www.nerc.com/pa/Stand/Glossary%20of%20Terms/Glossary_of_Terms.pdf.

balancing authority could petition for creation of a discrete bank of regional reliability allowances to ensure reliable operations through the summer period. The request must document the nature of the forecasted reliability or tight resource adequacy condition that could require units to be available to run but may not be able to do so due to an emission limitation and lack of a reasonably priced liquid allowance market going into the summer season.

- Forecasted Reliability Condition – the forecasted reliability condition would be identified through the established resource adequacy, planning, and reliability practices in use by the relevant responsible entity such as the ISO/RTO or in non-RTO regions, the balancing authority.

- Quantity – the quantity of reliability allowances available in the bank would be based on the forecasted reliability condition, the expected operation of generating unit(s) and forecasts of demand response availability during the summer season, the availability of other allowances pursuant to the rule. The recommended quantity of these regional reliability allowances would be coordinated with EPA to ensure consistency with the objectives of the final rule.

- Pricing – generators would purchase reliability allowances, which would be priced using an auction mechanism. Although these allowances would be available for use strictly in the region, the auction could be administered using the present institutions administering auctions and allowance trading programs.

- Triggering Mechanism – the regional reliability allowances represent a supplement not a replacement for emission allowances otherwise allotted under the rule. Their creation in a given season is not guaranteed–if there are no projected shortfalls in allowances given the RTO's/ISO's projection of summer demand and the market is sufficiently liquid at a reasonable allowance price, no regional reliability allowances would be created. On the other hand the RTOs/ISOs regional summer demand forecast, coupled with an analysis of regional reserve margins, allowance availability and cost, would all be factors that could trigger the creation of this regional reliability allowance supplemental bank at the beginning of the summer season. This bank of regional reliability allowances would be made available at the start of the summer season. Because their use would be restricted to only that region and only for the immediate upcoming summer season, they would truly represent a 'last resort' bank of allowances as opposed to a substitute for the allowances otherwise made available under the Proposed Rule.

- Unit Reporting – a unit's use of reliability allowances shall be reported on a monthly basis.

- Unused Reliability Allowances – unused reliability allowances may not be traded or sold and are invalid at the end of the applicable ozone season with no refunds for purchased reliability allowances. This would prevent this special bank of regional reliability allowances simply becoming a substitute for the general bank of allowances.

- Recovery of the Cost of Reliability Allowances – Recovery of the costs of allowances would track the recovery of other allowances such as NOx and SO2 allowances. In market regions, they would be includable in cost-based energy market offers.

- Disposition of the Proceeds of Purchased Allowances – As end-use customers will see higher energy prices in the region due to the CSAPR rule, the proceeds of the allowances could be rebated to customers. Today certain out-of-market costs are uplifted to customers. In the same way, these proceeds could be a credit to customers using existing uplift mechanisms.

- Priority Over the Short-Term RSV – ISOs/RTOs, reliability coordinators, planning authorities, and units shall use reasonable efforts to prioritize the use of reliability allowances over reliance on the short-term RSV described below to promote effective resource adequacy planning in conjunction with the obligations set forth in a final rule.

d. In Addition, Any Future Final Rule Should Include a Short-Term "Reliability Safety Valve" to Support the Short-Term Reliable Operation of the Bulk Electric System

In addition to the seasonal reliability allowance bank proposed above, PJM strongly supports including a short-term "Reliability Safety Valve" in a future final rule to support the reliable operation of the bulk electric system. To be clear, the Short-Term RSV would *not* be a blanket exemption from compliance. Rather, it represents a process that would be available to address reliability issues based on short-term declared system emergency conditions that might arise during the implementation of a future final rule. These emergency situations are virtually by definition measured in hours not days. If the RTO/ISO or balancing authority in non-RTO regions identifies a reliability-based need to run one or more generating units during a defined emergency condition as described below then the Short-Term RSV would allow the affected units to operate for the hours during which the emergency is in effect beyond the rule's operational constraints without having to expend their bank of available allowances.

Use of this feature would be constrained to periods when PJM has declared a reliability emergency consistent with its governing rules and emergency protocols as set forth in PJM Manual 13. PJM is requesting that the Short-Term RSV become available with the following

alerts, warnings, and actions in order to effectively manage system reliability by enabling timely preparation and operation of required resources. Triggering the Short-Term RSV at the alert stage is consistent with PJM emergency procedures, and in certain instances, will allow emergency actions to be avoided, providing greater reliability and potentially averting unnecessary operation of resources. Within the laddered framework, the Short-Term RSV would likely be associated with the following alerts, warnings and actions (Figure 3):

Figure 3 – Short-Term RSV Associated Alerts, Warnings, and Actions (with corresponding Manual 13 reference)	
Deploy All Resources Action	M13 page 38
Emergency Load Management Reduction Action	M13 page 30
Manual Load Dump Action	M13 page 41
Manual Load Dump Warning	M13 page 39
Maximum Generation Emergency Action	M13 page 33
Maximum Generation Emergency / Load Management Alert	M13 page 87
Pre-Emergency Load Management Reduction Action	M13 page 89
Voltage Reduction Action	M13 page 99
Voltage Reduction Alert	M13 page 88
Voltage Reduction Warning and Reduction of Non-Critical Plant Load	M13 page 96

These alerts, warnings and actions are used to maintain system reliability. In the past 10 years, PJM has issued the above associated group of alerts, warnings and actions infrequently, as the following list (Figure 4) suggests:

Figure 4 – Alert, Warning, and Action Events	
2011	8 events for a period of @ 106 hours
2012	2 events for a period of @ 25 hours
2013	3 events for a period of @ 67 hours

2014	9 events for a period of @ 161 hours
2015	4 events for a period of @ 15 hours
2019	1 event for a period of @ 29 hours
2022	1 event for a period of @ 36 hours

These actions have been developed in accordance with NERC standards and good utility practice, and are applied and posted in a transparent manner to ensure all stakeholders are informed.[19]

The proposed Short-Term RSV is an established concept. The EPA recognized the importance of the RSV by incorporating it into its Clean Power Plan final rule. On electric system reliability, the EPA stated that it was including implementation flexibility and the RSV in the final rule to "reflect the paramount importance of ensuring electric system reliability."[20] The Clean Power Plan's RSV included provisions addressing duration, triggering criteria, notification requirements, suspension of rule obligations, and long-term planning.[21] PJM considers these elements to be a reasonable starting framework for an RSV and encourage the EPA to include this in any future final rule.

Additionally, this feature is important because without it, PJM's only recourse to direct a unit to run that cannot due to an emissions-based limitation would be to seek relief pursuant to Section 202(c) of the Federal Power Act.[22] This extraordinary form of relief triggers a multi-agency process (e.g., Department of Energy, Federal Energy Regulatory Commission, EPA, and state-level public utility commissions) that could be more efficiently addressed (and

[19] PJM posts and maintains a searchable record of the use of its emergency procedures on its website, available at: https://emergencyprocedures.pjm.com/ep/pages/dashboard.jsf.
[20] Clean Power Plan, 80 Fed. Reg. 64,662, 64,671.
[21] Clean Power Plan, 80 Fed. Reg. 64,662, 64,877-79.
[22] 16 U.S.C. § 824a(c).

appropriately constrained) by a final rule if the EPA includes the Short-Term RSV. The Short-Term RSV outlined herein would not substitute for use of the Section 202(c) authority, but instead would provide a rational pre-defined and limited interim step, embedded in the future final rule, that would allow for short-term relief as opposed to the longer-in-duration requests (up to 90 days) that are envisioned under the DOE Secretary's Section 202(c) authority.

e. PJM Urges Reconsideration of the use of Dynamic Budgeting Because it is an Unnecessary Burden and Increases Uncertainty

The dynamic budget calculations set forth in the Proposed Rule for the 2025 and 2026 control periods rely on a complex formula that can vary from state to state and, consequently, region to region. This introduces uncertainty into the PJM planning process and increases reliability challenges. The reliability concern that PJM has identified is that resource adequacy planning is only effective if the data inputs are accurate, reliable, and known sufficiently in advance to allow impacted entities to take the appropriate action. Dynamic budgeting adds a level of complexity and uncertainty that could detract from resource adequacy planning effectiveness. For regions like PJM with forward-looking capacity markets, which looks three years ahead, knowing with a reasonable level of certainty emission obligations and operational constraints is key.

The Proposed Rule states that the "EPA will issue by ministerial action these dynamic budget quantifications approximately 1 year before the relevant control period."[23] The Proposed Rule further states that, for example, "starting in early 2024, the EPA would take the most recent 2023 ozone season data, calculate 2025 state emissions budgets using the methodology below and update" the state budgets. The Proposed Rule explains that by March 1 of 2024 the EPA

[23] Proposed Rule, 87 Fed. Reg. 20,036, 20,117.

will issue the 2025 budgets, followed by a 30-day comment period, with final budgets issued by May 1.

PJM believes that dynamic budgeting introduces reliability risks caused by the late availability of data that is critical to resource adequacy planning both near-term and in future years. The deadlines and timeframes described in the Proposed Rule are out of synch with PJM's own three year forward procurement of capacity. ISOs/RTOs, reliability coordinators, planning authorities, and affected units need this data for resource adequacy planning and to understand whether their units will be operational when needed to meet demand. The earlier that these entities have the relevant data, the more effective the planning process will be.

The overly-aggressive timing of the dynamic process renders it a poor companion to bulk electric system reliability. Accordingly, PJM urges reconsideration of the use of dynamic budgeting in any final rule.

f. Costs Associated with Emission Allowances May Result in Higher Costs to Customers

At a time of rising energy costs, the proposed rule and particularly some of its add-on features such as dynamic budgeting will only add to the strain that customers are already feeling. Although certain judicial decisions may appear to limit EPA's ultimate deadline for instituting a rule, there remains considerable flexibility in EPA's design of key components and the timing of when those components are implemented. As reserve margins shrink across the country and fuel costs rise, PJM urges the EPA to use its discretion to balance its requirements under the rule with avoiding rate shock to customers. PJM, which administers the wholesale market for electricity in a region serving 61 million customers, stands ready as a resource to EPA to help model potential cost impacts in the PJM region from various iterations and options in rule design.

II. CONCLUSION

PJM encourages the EPA to consider the potential reliability challenges that may arise during the implementation of a future final rule. In light of those challenges, PJM respectfully requests that the EPA consider including a bank of reliability allowances and a short-term RSV in the rule, as well as the discontinuation of dynamic budgeting. Finally, PJM stands ready as a resource to assist in modeling the cost impacts to ultimate customers driven by implementation of the rule and urges EPA's consideration of these cost impacts in the rule's design and implementation. PJM appreciates the opportunity to comment in this proceeding.

Respectfully submitted,

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