# A State-Led Capacity Market for PJM

**A ROADMAP FOR PJM STATES TO MEET RELIABILITY NEEDS, ATTRACT INVESTMENT, REFLECT STATE POLICY PRIORITIES & SHARE ECONOMIC BENEFITS**


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**OCTOBER 2026**



Brattle

NOTICE

This report was prepared with funding provided by the Powering Procurement in PJM Initiative managed by Abraham Silverman, housed at the Ralph O'Connor Sustainable Energy Institute (ROSEI) of Johns Hopkins University. This paper is one of a series of papers coordinated by ROSEI to present alternative solutions for meeting resource adequacy needs in the PJM region. This paper, along with the companion papers and associated Powering Procurement in PJM expert discussion group, aims to provide input to the PJM Governor's Collaborative that was inaugurated on September 26, 2025 at the regional states' Summit on the State of PJM Interconnection.

This paper builds on prior work on the potential format of a single-state or multi-state resource adequacy framework, both in the PJM region and in other ISO regions. In particular, this paper draws heavily on the market design and governance proposals developed within the New Jersey Investigation of Resource Adequacy Alternatives; the Massachusetts proposal for a New England Forward Clean Energy Market; the Organization of PJM States, Inc. (OPSI) Competitive Policy Achievement Working Group; and the most recent OPSI's Forward Energy Attribute Market (FEAM) Working Group. We further acknowledge the conceptual contributions of individual members of the Powering Procurement in PJM discussion group, in particular from Abraham Silverman and Katya Evans of Johns Hopkins University, whose commentary and input have contributed to the content of this paper.

This report is intended to be read and used as a whole and not in parts. The report reflects the analyses and opinions of the authors and does not necessarily reflect those of The Brattle Group's clients or other consultants. Nothing in this paper should be interpreted as a legal opinion.

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# Executive Summary

PJM's capacity market, the Reliability Pricing Model (RPM) has suffered a crisis of confidence in the past few years. Policymakers and consumer advocates are concerned that prices have been unacceptably high, even while high prices have failed to attract sufficient supply to meet rapid demand growth. The supply-demand gap arose partly because of the unforeseen scale of data-center-driven demand growth that the resource development pipeline was not sized to meet. It has been exacerbated by slow interconnection processes, supply chain challenges, permitting and siting delays, proposed retirement of aging plants, and regulatory uncertainty around how investors will get paid for capacity in the future. PJM staff, state policymakers, and stakeholders are developing a range of proposals for how to reform or replace the RPM with a new structure for attracting supply investment and maintaining resource adequacy.[1]

**This paper offers one pathway: A state-led capacity market.** We do not claim that a state-led capacity market (nor this variant thereof) is the only viable market design for attracting investment and maintaining reliability. And (as a potentially unpopular take) we do not view most of the core RPM design features as inherently broken. Instead, we diagnose the present crisis in PJM's resource adequacy market as stemming from two root causes: (1) an unprecedented confluence of challenging supply-demand conditions;[2] and (2) a deeper misalignment between the RPM governance structure (where states have minimal influence in RPM rule changes filed before the Federal Energy Regulatory Commission (FERC)) versus their underlying jurisdictional authorities (where states have extensive authority to establish policy over retail rates, supply planning, and competition).

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[1] As of the time of this paper publication, the primary arenas in which these various governance and market design proposals are being vetted include: (a) PJM's stakeholder workshops on Powering Reliability Through Market Design, through which PJM staff and a number of stakeholders have developed proposals for reforming the resource adequacy construct; (b) governance reform discussions arising out of a FERC technical conference on PJM Governance and Stakeholder Processes, with ongoing discussions through a FERC dispute resolution process and in a parallel process in which Members are proposing governance reforms within PJM's Markets and Reliability Committee (most recent meeting date September 24, 2026); and (c) efforts of the PJM Governors' Collaborative to review and address issues of resource adequacy, transmission planning, and governance (including the upcoming "Summit on the State of PJM Interconnection" scheduled for October 8, 2026).

[2] While we consider the large majority of the supply-demand crunch to be associated with unavoidable problems that could not have been effectively predicted or prevented by any combination of effective market design and policy, we also acknowledge that the challenges have been exacerbated by issues that in retrospect could have been at least partly avoided, including unfortunate timing and/or design flaws in RPM rules, interconnection processes, siting challenges, permitting processes, and potentially other factors.

In this paper we propose that a properly-structured, state-led capacity market can address both problems. Unfortunately, the first of these problems (supply-demand conditions) cannot be solved overnight; it can only be addressed via a stable and viable investment model that has sufficient regulatory certainty to attract investment. It will also require enough time for broader economic conditions to stabilize and absorb the accelerated pace of new entry.

The second of these problems (governance) has been simmering for years. This misalignment between state policies and RPM governance was acutely displayed via contentious FERC proceedings over prior versions of the Minimum Offer Price Rule (MOPR), in which the market rules resulted in higher prices by excluding state-supported supply from being counted in capacity market clearing.[3] More recently, states have used a combination of strong public statements, a Section 206 "unjust and unreasonable" complaint, and competing Board member proposals to assert influence over PJM rules and outcomes in the aftermath of unexpected RPM price increases.[4] These unofficial and ex-post avenues of addressing jurisdictional conflicts are all a symptom of the same underlying mismatch: states have jurisdictional authorities that FERC-jurisdictional market rules cannot take away. Yet the RPM governance process is designed to advance PJM Member-driven and PJM leadership-driven proposals into FERC filings, even when those filings misalign with or directly undermine the state-jurisdictional policy priorities.[5] The result is a contentious and disorderly regulatory climate that erodes investor confidence.

At one level, the governance problem is an intractable one, given that the foundations of PJM's governance structure are entrenched in decades-old agreements that are inherently self-reinforcing (i.e., those with the capability to change governance would not willingly cede this control.) At another level, with respect to resource adequacy, governance is a relatively simple problem with a simple solution: ask the states to take over the capacity market. Though the

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[3] For a history of the MOPR expansion and eventual narrowing, including discussions of the opposing positions of PJM states and Members, see the individual parties' filings in FERC Docket ER21-2582-000; Spees and Newell, "Economic Impacts of the Expansive Minimum Offer Price Rule within the PJM Capacity Market," filed August 20, 2021; and "Joint Statement of Chairman Glick and Commissioner Clements Regarding the Fair Rates Act on PJM MOPR," October 19, 2021.

[4] See, for example, a July 16, 2025 letter from nine PJM governors to the PJM Board of Directors, describing the present crisis of confidence and concerns over Board nominations; the Pennsylvania Governor's Office Section 206 Complaint related to the RPM price cap; and the Organization of PJM States, Inc. pre-conference and post-conference comments submitted to the FERC Technical Conference on PJM Governance.

[5] Though some discussions tend to conflate concepts of governance and jurisdiction, we use the two terms precisely in this paper: (a) *jurisdiction* refers to the underlying authority to legislate or regulate (with federal jurisdiction covering interstate commerce, including FERC oversight of interstate transmission systems, and state jurisdiction covering matters of retail ratemaking, clean energy policy, and resource planning); while (b) RTO *governance* covers the rules around which the RTO and FERC-jurisdictional Tariff and rules-change processes are administered. We argue here that a healthy governance structure should be one that acknowledges and aligns with underlying jurisdictional authorities (i.e. acknowledge that RTO governance structures are not capable of reassign state authorities to RTO members, RTO Board, or any other entity).

capacity market Tariff would remain FERC-jurisdictional, states would be in the primary decision-making role on capacity market rules and supply decisions affecting their own constituents. This would align the RPM governance structure with states' underlying policy priorities and existing jurisdictional authorities, while still complying with FERC regulations in compliance with the Federal Power Act (FPA).[6] The states would then be in a greatly improved position to update the capacity market design in ways that are more useful to states and consumers; and to weigh trade-offs amongst competing priorities in reliability, cost, risk exposure, green policy, investment competition, and retail competition. PJM as the regional market operator would also be in a better position to perform only those functions that it is best suited to fulfill (e.g., conducting technical analyses, defining and enforcing reliability commitments, enabling regional trade); PJM and members would no longer be in the awkward position of weighing policy priorities.

## WHY BOTHER WITH A REGIONAL CAPACITY MARKET?

State policymakers will only launch and participate in a state-led regional capacity market if: (a) there is a clear value proposition that a regional market offers to their constituents; and (b) states can only capture these benefits by working together. We therefore begin this exercise by re-articulating the primary benefits that a regional capacity market can deliver, beyond what individual states can do on their own:

- *Maintaining and enforcing long-term resource adequacy*, so that no individual state can free-ride on the reliability value of neighboring states' capacity investments;
- *Unlocking the benefits of trade and regional supply-demand diversity*, so that each state can share in the economic benefits created by voluntary cross-state purchases and sales, lower regional reserve margin requirements (to maintain the same level of reliability), and considering that the benefits of trade tend to be greatest in a large regional marketplace where there is more diversity in supply, demand, weather, and policy positions between potential trade partners;
- *Leveraging the competitive and scaling benefits of a large regional marketplace* that can mobilize many potential suppliers, create pricing transparency for capacity and renewable energy credits (RECs), employ effective market monitoring and mitigation, and enable a wide range of buyer purchasing preferences (volume, term, products); and

[6] For the purpose of our discussion, we assume that the governance structure would be modeled after the Western Resource Adequacy Program (WRAP), in which the Western Power Pool (WPP) manages the FERC-jurisdictional Tariff and the Southwest Power Pool (SPP) executes implementation. However, we offer a blanket disclaimer that we are not lawyers and do not assert that this assumed governance structure is necessarily the only nor the best option from a jurisdictional/legal perspective. In Section II.A we also describe several other governance options that we view as promising and could similarly accomplish the goals of a state-led capacity market.

- *Enabling full and efficient use of the transmission infrastructure*, to ensure that the grid is optimally used for delivering resource adequacy across the footprint.

These are essentially the same benefits that inspired the creation of the PJM capacity market in the first instance and that have been demonstrated in several points throughout RPM's history prior to the current crisis of confidence. However, the best-fit market design for delivering these benefits today is not necessarily the same as the original design, after considering two decades worth of changes in state policy, technology evolution, and recent market experience.

## PROPOSED STATE-LED CAPACITY MARKET DESIGN

To develop the design of a state-led capacity market, we draw extensively on the prior work by OPSI and by individual states to describe a regional market structure that would better align with the diverse regulatory needs and policy goals across the PJM region.[7] Based on this prior work, we propose that the key design features of a state-led capacity market would include:

- **A market structured to attract investments needed to serve both resource adequacy needs and states' individual policy goals**, considering the diversity of PJM states' regulatory models, clean energy mandates, and interest (or not) in relying on regional market-based investments.
- **Voluntary 3-year[8] forward auction for multi-year commitments,** in which state agencies and voluntary buyers can procure as much or as little capacity (unforced capacity, UCAP) and clean energy (REC) supply as they wish. Capacity products would be differentiated by season and capacity locational deliverability area (LDA), while RECs would continue to be defined under individual states' rules/legislation. The forward auction would be complemented by a nearer-term bilateral market and annual incremental auctions within which buyers and sellers could adjust their positions.
- **A flexible demand participation model that aligns with states' diverse regulatory models,** enabling states and voluntary buyers to customize participation by accommodating:
  - Voluntary buy bids stating maximum prices and volumes to be procured;
  - Different categories of eligible buyers relevant in different states (e.g., state agencies, integrated utilities, competitive retail providers, large customers);
  - Opportunities to secure 15-year commitments with new resources (while 5-year and shorter-term commitments can be made with both new and existing resources); and

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[7] In particular, this paper draws heavily on the market design and governance proposals developed within the New Jersey Investigation of Resource Adequacy Alternatives; the Massachusetts proposal for a New England Forward Clean Energy Market; the Organization of PJM States, Inc. (OPSI) Competitive Policy Achievement Working Group; and the most recent OPSI's Forward Energy Attribute Market (FEAM) Working Group.

[8] We assume a three-year-forward period primarily for continuity with RPM. A longer or more flexible forward period could also be considered if states and participants anticipate enabling more supply at a lower cost.

  - Options to specify eligible technologies (e.g., to align with state renewable portfolio standard (RPS) eligibility, battery mandates, or other state policies).
- Seller participation model that can enable diverse technologies and attract investments via:
  - Seasonal capacity construct that accounts for season-specific capacity value;
  - Option for new resources to gain 15-year sales commitments (while existing resources can monetize capacity sales via 5-year commitments or shorter-term sales); and
  - Ability to offer both REC and capacity sales for qualified resource types, clearing the forward auction only if the resource captures sufficient revenue across both products to justify moving ahead with the investment.
- **Mandatory residual spot capacity auction (or fixed resource requirement (FRR) showing),** that ensures all states or designated load serving entities (LSEs)/utilities have secured capacity requirements on behalf of their respective customers.
- **State-led governance model,** overseen by a Board of Directors composed of state-appointed members with authority to select the Auction Administrator and file with FERC proposed rule changes as needed to improve market performance. PJM would continue to support implementation functions, including serving as the Auction Administrator if selected by the state Board.

The following Figure 1 summarizes the auction timeline, which is similar to the existing RPM structure of forward, incremental, and spot auctions. However, the anticipated products, volumes, and use case for each auction would be substantially different under the state-led capacity market, considering that each state and voluntary buyer would determine the extent of participation in all forward auctions. Appendix Table 4 and the body of this paper describe the design proposal in more detail.

FIGURE 1: STATE-LED CAPACITY AUCTION TIMELINE




Though market design details will impact the market's function and effectiveness, **we stress that the most fundamental change is a shift in the market's design goal and purpose. The new state-led capacity market begins with the premise that states would decide how best to design and utilize the regional market to advance public interest** across the region and within each state, while simultaneously addressing resource adequacy requirements. States would continue to make policy decisions around their supply mix, hedging contracting strategy, appetite for market-driven vs. planning-driven approaches, and policy mandates. Rather than putting states in a position to work around (and sometimes against) PJM's existing capacity market, a state-led capacity market would become a vehicle through which states can attract new supply consistent with their policy goals and hold each other accountable for maintaining reliability. Even states that have minimal use for the regional capacity market will benefit from seeing the price point at which new supply commitments are attracted and enabling utilities to use the regional market to balance incremental purchases and sales. PJM's role will also be more narrowly focused on maintaining reliability, enabling regional trade, and supporting full use of the transmission system, while explicitly deferring to the states' authority to set policy and procure resources consistent with that policy.

# I. Why States Benefit from a Regional Capacity Market

State policymakers will only be interested in launching and participating in a regional state-led capacity market if it enables economic, reliability, and policy benefits beyond what individual states can accomplish on their own. The fit-for-purpose design of a state-led capacity market should focus on the core value proposition that can be accomplished by states working together. A state-led capacity market should:

- **Maintain and enforce long-term resource adequacy.** States cannot individually maintain resource adequacy because reliability is a "common good."[9] In the context of resource adequacy, this means that without an enforceable region-wide resource adequacy or capacity standard, each separate state thinking only of their own interest will have the incentive to under-invest in capacity and free ride on others for reliability (but since all states have this same incentive, the natural economic outcome is a persistent regional capacity shortage). The solution to this problem is to adopt and enforce a uniform resource adequacy standard that applies equally to all states and customers, to ensure that all states are paying for their own reliability needs and to prevent free riding.
- **Share the benefits of trade and regional supply-demand diversity.** Participating in a large regional marketplace offers the opportunity for states and customers with diverse capacity and clean supply needs to procure that supply from more cost-effective locations (and for states with low-cost supply to capture the economic benefits of energy and capacity export). Diversity in demand profiles and supply availability patterns allows all participating states to procure less supply in total (since each state can rely on neighbors that experience tight conditions at somewhat different times). In general, the more diverse the economic, policy, weather, and demand conditions are between any two states, the greater the potential benefits of engaging in mutually beneficial trade. This suggests that the state-led capacity market should aim to enable full participation of diverse customers and producers across all states, despite (and even more so because of) their dissimilar approaches to resource planning, contracting, retail markets, and clean energy policy.
- **Leverage the competitive and scaling benefits of a large regional marketplace**. States acting on their own would have limited volumes of capacity procurement or investment decisions

[9] A "common good" is a good or service that has the features of being both: (a) rivalrous (meaning that if one entity uses more of it, there is less to go around for others); and (b) non-excludable (meaning that it is not practical to stop others from accessing or using the good). The classic example of a common good is the town commons, where each individual sheep owner has an incentive to over-graze the land, while no individual sheep owner has the incentive to invest in re-seeding since others will quickly free ride on the effort.

to make in any one year and would need to make high-stakes supply decisions considering only a limited pool of potential sellers and with limited pricing information. By participating in a regional capacity pool, state agencies and smaller buyers alike would benefit from accessing a large marketplace that attracts a larger number of competitive suppliers, reduces transaction and administrative costs, enables innovative players with new solutions, produces regular and transparent pricing outcomes, incorporates effective market monitoring and mitigation, and offers the flexibility to scale up or down on purchases to align with needs. States with restructured investment models can use the regional marketplace to meet most of their supply investment needs (whether for reliability or green policy); states and utilities relying on integrated planning can use the regional marketplace to inform views on pricing and balance surplus and deficit volumes cost-effectively.

- **Enable full and efficient use of the transmission infrastructure**. Open access use of the transmission system allows these major infrastructure investments to be continuously reallocated to the most efficient use for reliability and power delivery, including for delivering resource adequacy across state borders.

In Table 1 below we summarize the primary value proposition of state-led capacity market, and the implications for what design features should be incorporated to capture these benefits.

TABLE 1: MARKET DESIGN FEATURES AND HOW THEY ACHIEVE DESIGN GOALS

| Design Goal | Design Features to Achieve Goal |
|---|---|
| **Maintain and enforce long-term resource adequacy** | • *Enforceable* capacity obligations imposed equally on all states/customers (so that no individual state or customer can free ride)<br>• Uniform definition of capacity, used to support supply and demand accounting (all parties held to the same standard, also enables trade) |
| **Capture the benefits of trade and regional supply-demand diversity** | • Facilitate the diversity of supply and demand represented by a broad regional marketplace, so that differently situated buyers and sellers can engage in mutually beneficial trade across state borders<br>• Enable diverse state regulatory models and buyers through alignment with state retail structures, and through ability to customize procurement volumes, products, commitment terms, and eligible technologies<br>• Enable diverse sellers with complementary capacity accreditations to unlock value from many supply types<br>• 2-season capacity market that reflects seasonal diversity in supply and demand |
| **Unlock the competitive and scaling benefits of a large regional marketplace** | • Regularized auctions capable of clearing large volumes of supply and demand from diverse participants<br>• Transparent pricing and volume information<br>• Effective monitoring and mitigation |
| **Enable full and efficient use of the transmission infrastructure** | • Transmission constraints reflected in capacity auction structure (similar to today's RPM, with locational reliability requirements and transmission deliverability limits) |

# II. State-led Forward Market and Spot Capacity Market Design Components

We describe here the mechanics of how a state-led capacity market would operate in the PJM region. The majority of the design elements we describe here are derived from prior capacity market design efforts developed through collaborative efforts amongst PJM and New England states.[10]

## A. Governance

The central premise of a state-led capacity market is that the governance structure would shift to one in which states have primary authority over rule changes. This shift in decision-making authority could be accomplished in several ways. Though we are not lawyers and do not take a view on the most legally sound and defensible option, we are aware of at least four distinct governance models that have been proposed or that could be adapted for use in a state-led capacity market or regional clean energy market:

1. **Western Resource Adequacy Program (WRAP):** The WRAP is a bilateral capacity market structure supporting resource adequacy and inter-state trade across 12 states or Canadian provinces in the West.[11] Under the WRAP governance structure, a non-profit entity, the Western Power Pool (WPP), acts as the public utility with Section 205 filing rights over the FERC-approved WRAP Tariff.[12] The WPP also has the authority to hire a Program Operator to

[10] In particular, this paper draws heavily on the market design and governance proposals developed within the New Jersey Investigation of Resource Adequacy Alternatives; the Massachusetts proposal for a New England Forward Clean Energy Market; the OPSI Competitive Policy Achievement Working Group; and the most recent OPSI's FEAM Working Group.

[11] The WRAP was approved by the FERC in 2023, with phased implementation through transition seasons beginning in Summer 2025, and with the first binding commitment season planned for the winter 2027/28. See WRAP Overview and WRAP Area Map.

[12] The WRAP filing states: "Currently, WPP is not a Commission-jurisdictional public utility as it does not provide any services that involve transmission of electric energy in interstate commerce or sale of electric energy at wholesale in interstate commerce. However, certain aspects of the WRAP, including its binding resource adequacy requirements and charges for non-compliance, arguably invoke the Commission's jurisdiction and it has long been the consensus of WPP members and regional stakeholders that the WRAP should be filed with the Commission. Accordingly, WPP is submitting the WRAP Tariff today for Commission acceptance under FPA section 205. Upon acceptance of this filing, WPP will serve as the public utility with a Tariff on file at the Commission, obligated to enforce the terms of the Tariff at all times. Under the Tariff, WPP serves as 'Program Administrator' for the WRAP, responsible for ensuring that all Tariff requirements are fulfilled. While WPP will serve as the Commission-jurisdictional public utility with the WRAP Tariff on file, building out the technical

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implement the Tariff, and has selected the Regional Transmission Organization (RTO) Southwest Power Pool (SPP) to serve that role.

2. **SPP Regional State Committee (RSC):** In the SPP footprint, the RSC is the regional body of state regulators (similar to OPSI in PJM). Under the SPP Tariff, the RSC sets policy on the resource adequacy approach for the region and can direct SPP to make Section 205 filings to effectuate these state policies.[13]

3. **Regional Greenhouse Gas Initiative (RGGI):** The RGGI is a multi-state regional $CO_2$ emissions market that is entirely state-jurisdictional. RGGI is operated by a non-profit entity that was created for the purpose of developing and running that market, and whose Board of Directors is comprised of state policymakers, one from each participating state.[14] The governance structure requires participating states to work together to develop a model rule for the multi-state market, and then individually implement the model rule components under state-jurisdictional authorities (whether legislative or regulatory).[15]

4. **Commodity Futures Trading Commission (CFTC) Jurisdictional**: A final governance approach is one developed and proposed by regulators across the PJM states within recent discussions around the launch of a regional Forward Energy Attribute Market (FEAM) that was intended to attract new entry in support of state clean energy policies.[16] The proposed approach would convene a Board of Directors comprised of policymakers from each PJM state. The state Board would have authorities to establish market rules and approve filings before the CFTC, as well as having the authority to select a market administrator, which was assumed to be a PJM affiliate in the first instance.

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capability to perform certain functions under the WRAP on the necessary timelines would be costly to future Participants. Accordingly, the Tariff authorizes WPP to engage one or more 'Program Operators' with existing technical expertise to assist WPP in meeting the Tariff requirements and to leverage industry experience to perform the functions necessary to operate the WRAP. WPP has engaged [SPP] to serve as Program Operator under an agreement between WPP and SPP. As the Commission is aware, SPP is a Commission-authorized RTO operating the transmission system and administering day-ahead and real-time energy markets across a fourteen-state footprint in the Midwest and South-Central United States from Texas to the Canadian Border." Footnotes omitted. See Submission of Tariff to Establish the Western Resource Adequacy Program, August 31, 2022.

13 The Tariff assigns the RSC policy authority over resource adequacy, transmission cost allocation, and financial transmission rights. The Tariff states: "The RSC will also determine the approach for resource adequacy across the entire region… As the RSC reaches decisions on the methodology that will be used to address any of these issues, SPP will file this methodology pursuant to Section 205 of the Federal Power Act. However, nothing in this section prohibits SPP from filing its own related proposal(s) pursuant to Section 205 of the Federal Power Act." See SPP Governing Documents Tariff, Section 7.2.

14 See RGGI Board of Directors.

15 See RGGI guidance for New State Participation. We note that a RGGI-inspired governance model is the stated preference of some New England policymakers in the context of discussions around a potential New England regional Forward Clean Energy Market.

16 For the OPSI comprehensive proposal for a state-led market governance structure subject to the CFTC jurisdiction, see OPSI FEAM Working Group, FEAM Governance & Administration Working Assumptions, Public Session, May 23, 2024.

Again, we do not assert any legal opinion on which of these models is the most legally sound or otherwise preferred approach for a state-led capacity market in PJM. However, for the purposes of this paper we offer one governance structure that is derived from a combination of the first and fourth approaches described above. The assumed governance structure would include:

- The creation of a new non-profit entity whose mandate is to launch and run the state-led capacity market;
- A Board of Directors of the new non-profit entity comprised of PJM state representatives (one representative for each of the 13 states and one for the District of Columbia), with each state determining the method of appointment (e.g., governor appointment, regulatory commission appointment);[17]
- Board of Directors authority to hire/fire the non-profit executive, approve the Independent Market Monitor (IMM), approve a market administrator (whether PJM or another RTO, an RTO affiliate, or directly administered by the non-profit);[18] and
- A rules-change process through which the state Board has final authority to approve whether to advance proposed rule changes to a Section 205 filing before the FERC.[19]

Though the state-led capacity market would continue to be subject to FERC review to ensure proposed rule changes are just and reasonable, the states would together have primary power of the pen to direct and approve rule-change efforts. A more comprehensive description of a proposed state-led governance structure has previously been developed through a collaborative effort of PJM states.[20]

This would be a fundamental shift from today's governance structure and would clarify and make explicit the states' role and responsibilities as the entities jointly and individually responsible for ensuring sufficient supply for resource adequacy. While all states would be bound by the mutual commitment to maintain resource adequacy for customers within their own state, no state would

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[17] The state Board could be identical to or overlapping with the OPSI Board, or it could be a separate body.

[18] This structure is analogous to the WRAP governance structure, which stipulated that the WPP has the rights to select the WRAP administrator (or "Program Operator" in WRAP parlance). In the first instance at market launch (and for the foreseeable future), the RTO SPP has been selected as the WRAP Program Operator. 182 FERC ¶ 61,063 at P 10 (2023).

[19] "Section 205 Filing Rights" are defined under Section 205 of the FPA as the right of a FERC-regulated public utility to propose new just and reasonable rates for which FERC-jurisdictional services and products can be provided. For additional discussion of Section 205 filing rights in other FERC-jurisdictional markets, see Parent, *et al.,* Governance Structure and Practices in the FERC-Jurisdictional ISOs/RTOs, prepared for the New England States Committee on Electricity, February 2021.

[20] For the OPSI comprehensive proposal for a state-led market governance structure subject to the CFTC jurisdiction, see OPSI FEAM Working Group, FEAM Governance & Administration Working Assumptions, Public Session, May 23, 2024. See also a recent opinion by Prof. Ari Pescoe, "FERC has options for modernizing PJM's governance," *Utility Dive*, September 23, 2026.

be required to transact in the forward state-led capacity market. Some states will not participate in the voluntary forward auctions and may prefer to continue their existing resource planning or competitive contract solicitation approaches. States that do procure supply via the competitive state-led capacity market would have the flexibility to determine the level of capacity hedging required for each customer segment; the amount and types of new resource procurement that should be pursued through the market; and at what prices they would be willing to secure forward capacity supply through the market.

Regardless of how individual states conduct their individual forward supply planning, the states collectively would use a combination of short-term capacity showings (with penalties for non-compliance) and mandatory spot auction participation to hold each other accountable for covering their own customers' reliability needs. (Absent this enforceability mechanism, one state could under-invest and "lean on" other states' reserve margins.)

## B. Auction Timelines and Administration

The auction timelines and administration would be much like the current RPM auction, with a few notable changes. As in the current RPM process, prior to the forward auction the auction administrator would be responsible for managing resource qualification and capacity accreditation for all resources interested in participating in the voluntary forward auction.[21]

The forward auction would be conducted annually for a delivery period starting three years forward.[22] State agencies and other qualified voluntary buyers would provide their demand buy bids in price-quantity pairs for different customer segments and would be able to choose what resources are eligible to meet that demand. Suppliers would provide their supply offers as price-quantity pairs. Buyers and sellers would both use bid structures to specify what products, commitment terms, and prices they are willing to accept. The auction administrator would clear the forward auction to establish purchase and sales commitments.[23] The outcome of the 3-year-

[21] To clarify qualification vs. accreditation: *qualification* rules determine which assets are eligible to make a capacity sale, involving factors such as resource maturity requirements, fulfillment of credit obligations, and other eligibility criteria; while *accreditation* rules establish the minimum and maximum UCAP megawatt (MW) volumes that a particular resource would be able to offer for sale.

[22] The 3-year forward period of the auction is selected here to align with the current Base Residual Auction (BRA) convention that has in the past been sufficient to support competitive new entry. However, we note that the forward period could be revisited or be updated to be more flexible considering the revised purpose of the new state-led capacity market and that delivery timelines for many resources have expanded substantially in the past ten years.

[23] Similar to current RPM processes, the auction administrator would prepare pre-auction reporting and parameters such as the volumes and maximum pricing offered under rate-authorized demand bids, capacity transfer limits, technology eligibility requirements if relevant under specific state programs, and any other

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forward voluntary auction would be 5-year and 15-year commitments for capacity and RECs, with each megawatt (MW) or REC sale being obligated to fulfill demand of a specified voluntary buyer or customer class designated by the relevant state regulatory authority.

After the forward auction, the auction administrator would conduct voluntary incremental auctions (each covering the two seasons within a 1-year delivery period), within which buyers and sellers could adjust their positions. The forward and incremental auctions would also support and complement the individual planning and contracting activities of states, utilities, and market participants, considering that capacity market pricing outcomes could meaningfully inform the timing and pricing of resource investment decisions.

A final mandatory spot auction would serve as a final backstop for meeting any unmet capacity needs (and offer a final opportunity to offload surplus positions). The prompt auction would take place a few months before the delivery period but would otherwise be much like the current RPM: the spot auction would be cleared through the administrative demand curve with a price cap set to a multiple of the Net Cost of New Entry (Net CONE).

## C. Product Definition

The voluntary forward market would be a multi-product market where buyers can procure unbundled capacity or RECs, the pricing of which may be further differentiated by term, REC class, location, or other eligibility criteria set by buyers.

The features of the product transacted in the state-led capacity market would include:

- **Capacity** (priced in $/MW-day UCAP): would continue to be defined and accredited by PJM, using methods similar to today (but that may be updated over time to align with evolving system reliability needs). The capacity product may have differential value depending on:
  - *Location*, with capacity in different LDAs having distinct locational value, with sellers potentially capturing higher prices in import-constrained areas;
  - *Term*, considering that 5-year commitments (open to both new and existing resources) and 15-year commitments (open to new resources only) may clear at different prices in the forward auction. Shorter-term bilateral and auction commitments would be under 1-year commitments;

parameters that may assist buyers and sellers in preparing their bids/offers. Also similar to current approaches, the auction administrator and the Independent Market Monitor (IMM) would conduct pre-auction activities such as all resource-specific processes including participant registrations; processing resource eligibility and establishing maximum qualified offer volumes; managing credit requirements; and applying market power mitigation parameters to firms failing market power tests. The auction administrator would then conduct the auction, clear the market, and publish auction clearing results.

  - *Season*, with different capacity prices applicable to summer and winter delivery seasons (while an annual commitment would be a simple average of the two, assuming the MW volumes are identical);
  - *Eligible Technologies*, which would only produce differentiated prices if some states or voluntary buyers specify that only a subset of technology classes are eligible to fulfill their demand (e.g. a state could specify that only non-emitting resources can fill a portion of their demand).

- **RECs** (priced in $/REC): would continue to be described and regulated according to individual states' laws and RPS rules and tracked by the current PJM Environmental Information Services (EIS) tracking system. RECs procured via the state-led capacity auction may have differentiated pricing depending on:
  - *State and Class of RECs*, considering that each state has distinct REC products and some states have defined multiple classes of RECs. Note that while each state is likely to purchase RECs only from resources qualifying under their individual state laws and rules, many renewable resources in PJM can qualify under multiple states' programs (e.g. wind in Illinois can qualify under New Jersey and District of Columbia (DC) REC programs). Eligibility requirements such as resource types and location are addressed by state rules.
  - *Term*, considering potentially different prices for 5-year commitments (new or existing) and 15-year commitments (new resources only) in the forward auction. Shorter-term bilateral and auction commitments would be under 1-year commitments;

In other words, the capacity and REC supported in the state-led capacity market are (nearly) equivalent to the products already in place today. The primary differences from status quo being that: (a) the capacity product would be seasonal rather than annual, in order to more accurately and cost-effectively manage differences in the seasonal supply-demand balance and enable stronger participation and fair remuneration of seasonally focused resources; (b) the capacity market would support multi-year commitments for 5-year and 15-year terms, so that the capacity market can become a relevant venue for multi-year hedging and enabling the development and financing of new supply resources; and (c) RECs would be possible to procure, alongside capacity, in a forward auction. Further, by allowing states the flexibility to define more specific technology and eligibility requirements (for both RECs and capacity), the state-led capacity market can become a more useful tool for states that wish to leverage the competitive marketplace for attracting resource entry while still aligning procurements with individual state policy goals.

# D. Buyer Participation

The state-led capacity market would enable PJM's diverse array of differently situated buyers to procure capacity and RECs needed to satisfy their long-term hedging needs, new capacity needs, and clean energy procurement goals. These buyers could be state agencies, utilities, local governments, LSEs seeking to fulfill a state procurement mandate or serve voluntary consumer

demand, companies fulfilling private sustainability goals, or large customers. Demand bids would be designed as price-quantity pairs for each product, with buyers able to specify the desired commitment term, location, whether the demand is for new resources only, and whether only certain technologies are eligible. A comprehensive description of additional demand bid parameters is summarized in Table 2. The sum of all demand volumes from all state and individual buyers would be aggregated into a market- wide demand for capacity and RECs.

As an example, we consider two types of buyers, a state "rate-authorized" buyer and a private buyer:

- **Rate-Authorized Buyer:** "Rate-authorized" buyers are defined as those whose relevant retail ratemaking authority has authorized them to procure RECs or capacity and pass on procurement costs to a defined class of consumers, typically through the energy supply portion of the customer bill. This class of buyer would include state agencies, utilities engaging in default service procurement, or their designees. These entities would not be subject to the same level of collateral obligations as private buyers (below), because their capability to pay is accomplished by passing costs through to retail rates.
- **Private Buyer:** A private buyer would be a competitive retail provider, large customer, or other buyer that does not have capability to pass procurement costs through to a defined set of customers' bills on a non-bypassable basis. These private buyers may wish to participate since the forward auction would enable them to hedge their demand positions, and (if desired) allow them to secure REC and capacity commitments from their preferred technology classes. Private buyers would have to put up collateral to cover their bids, since they do not have a guaranteed cost pass-through mechanism for a designated group of customers.

Table 2 below summarizes the components of a demand bid (left column) and provides two examples of how a rate-authorized buyer could use this demand structure to accomplish different policy goals. In the first example, the rate-authorized buyer wishes to secure 100 MW capacity hedge on behalf of customers located in the Mid-Atlantic Area Council (MAAC) region. The buyer further stipulates a preference for new capacity (under a 15-year commitment) to satisfy this demand but would accept existing capacity (under a 5-year commitment) so long as their demand is met. Since the buyer is only interested in capacity for hedging purposes (and not to meet green policy requirements), the demand bid is technology agnostic. The buyer offers to pay up to $330/MW-day for a 15-year commitment with a new resource (a price that the buyer deems attractive for a long-term commitment). However, if the 15-year product is too expensive compared to the state's willingness to pay for new supply, the buyer would opt instead for a 5-year hedge (that can be fulfilled with either new or existing capacity) with plans to try again the following year for new supply under a 15-year lock-in.

In the second example, a state with a clean energy goal seeks to attract new entry from resources that align with the state's policy goals. The state's REC demand can be filled by any resources under that state's RPS rules (including from out-of-state resources). The state also seeks to attract 100 MW of capacity in the MAAC region and stipulates that only non-greenhouse gas (GHG)-emitting supply is eligible to full the capacity requirement. This bid structure offers a powerful opportunity for a clean energy state to pursue a least-cost mix of in-state and out-of-state resources, even while ensuring that local reliability needs will be met. Depending on what supply resources offer at the lowest cost, this buy bid could be filled by different mixtures of supply resources such as: (a) new in-state hybrid solar+battery resources (which have relatively high capacity and REC value); or (b) imported wind RECs and planned new in-state demand response.

TABLE 2: HOW BUYERS CAN CUSTOMIZE DEMAND BIDS TO REFLECT POLICY PRIORITIES

| Bid Parameters | Bidding Options | Example Bid for a Hedging State | Example Bid for a Clean Energy State |
|---|---|---|---|
| **Product** | • Capacity: technology neutral, or buyer-specified eligible technologies<br>• RECs: one or multiple state-defined REC classes can be selected as eligible | • Capacity (technology neutral)<br>• No REC purchase | • Capacity (only non-GHG-emitting technologies elegible)<br>• RECs (class I qualified) |
| **Location** | • Capacity market LDAs | • MAAC (all sub-LDAs automatically eligible) | • Capacity in MAAC or sub-LDAs<br>• REC locational eligibility defined by state rules |
| **Season** | • Summer-only, or<br>• Winter-only, or<br>• Annual | • Annual | • Annual |
| **Term** | • 5-year<br>• 15-year | • 5-year, *or* 15-year | • 15-year (new only) |
| **Bid Linking** | • No linking: multiple bids can be submitted and clear independently<br>• Contingent bids: buyer wishes to clear one but not both bids | • Contingent bid: State wishes to clear a 5-year hedge or a 15-year new resource commitment, but not both | • No linking: State wishes to procure capacity and RECs separately or together |
| **New Resource Eligibility** | • New-only, or<br>• Both new and existing eligible | • New-only (for 15-year bid), else neutral (for 5-year hedge) | • New only |
| **Technology Eligibility** | • All types, or<br>• State-defined list of eligible technologies to align with state policy requirements | • All types | • State-define eligible technoligies (non-GHG-emitting supply) |
| **Bid Price & Volume** *(Reflects maximum price at which demand can clear)* | • Price-quantity pairs, or<br>• Sloping demand curve | • Bid 1: 100 MW, $300/MW-day (for 5-year hedge), *or*<br>• Bid 2: 100 MW, $400/MW-day (for 15-year new resource commitment)<br>*Reflects state goal to attract new supply (but if price for new is too high, then seek a hedge for a shorter term)* | • RECs: 450,000 RECs, $30/REC<br>• Capacity: 100 MW, $350/MW-day<br>*Reflects two distinct state goals to attract new resources to meet clean energy and clean capacity needs* |

# E. Seller Participation

New and existing supply of all technology classes would be eligible to participate as sellers in the state-led capacity market, though the market depth and attractiveness of pricing available to any one seller would depend on aggregate buyer preferences. All offers would need to be backed by physical assets, whether existing or proposed new-build resources (no financial-only sales offers would be allowed). Capacity qualification would follow the same approach as current RPM rules to designate which resources are mature enough to offer into the market as a new planned resources, as well as defining maximum seller UCAP ratings by season.[24] States' individual RPS and REC qualification rules would set eligibility standards for resources selling RECs (i.e., a resource can only offer to sell RECs under the state RPS programs for which it is qualified).

Sellers would make their sales offers in the format of price-quantity pairs, with prices reflecting the minimum price they will accept for the sale. Offers would be accepted subject to credit limits, product-specific offer volumes, and any applicable monitoring and mitigation provisions (see Section II.I). The offer format would include various features allowing differently situated sellers to express their flexibility to offer their resources into several different products (term, capacity versus RECs, RECs across multiple states); while at the same time allowing sellers the capability to ensure a total minimum revenue commitment as a pre-condition for clearing. Specific features of the seller offer format include:

- **Multiple Products:** Sellers can offer to sell multiple products for which their resources are eligible, while the offer submission and auction clearing will ensure that total cleared commitments cannot exceed any resource's maximum qualified volume across products. For example, consider a new resource developer that is qualified to sell 100 MW of RECs into eight separate states' Class A RPS programs. That seller can specify in their offer the willingness to clear under any of the eight programs (or select a subset). The auction clearing would allow the resource to clear RECs into one state program, or a mixture of different states' programs, but would ensure that the seller is not obligated to produce more than 100 RECs in total across all cleared volumes.
- **Season-Specific Capacity Volumes:** Sellers can specify different MW volumes in the summer and winter seasons. Sellers would not be obligated to offer at their maximum capacity rating in the forward auction, so as to help them make firm capacity commitments without being exposed to excess accreditation risk. Any unsold volumes could be sold later bilaterally or in

[24] As a further note, sellers would have the option to adjust their capacity sales volumes downward as a means of managing UCAP accreditation risks. Since the forward auctions are only expected to cover a modest portion of total demand in the footprint, sellers would not be required to offer their full possible UCAP volumes. Sellers that have accreditation less than sold volumes would need to purchase replacement capacity before the delivery period or in the mandatory spot auction; sellers that eventually receive higher capacity accreditations could sell surpluses in the spot auction.

later forward auctions for the same year and would be required to be offered in the final spot auction.

- **Product-Specific Offer Price format:** Sellers can specify their prices in up to three ways: (a) a $/MW-day minimum offer price for taking on a capacity commitment; (b) a $/REC minimum offer price for taking on a REC sales commitment; and/or (c) a $/year minimum total revenue requirement (e.g., relevant for a new resource that requires a total annual revenue commitment for capacity+REC sales in order to proceed with building the project, but that is indifferent as to whether the revenues come primarily from RECs or capacity).
- **Term:** Sellers can specify that their offer is eligible for 15-year or 5-year commitments in the forward market (or both) in the 3-year forward auction. A seller would be able to offer different prices for 5- versus 15-year commitments. Any sellers that fail to clear the forward auction would also be able to sell bilaterally or make sales for seasonal or one-year commitments in the incremental and spot auctions.
- **New Resource Eligibility:** New planned resources would be eligible to fulfill 15-year commitments and may fetch a pricing premium if enough buyers prioritize new supply in their demand bids. Existing and new resources would both be eligible to sell 5-year commitments.
- **State-Defined Technology Eligibility:** Some sellers will be eligible to qualify under a state-defined eligible technology classes. Sellers must affirmatively express their willingness to take on a state-specific capacity obligation in exchange for being eligible to receive any pricing premium that may apply for the preferred technology classes.[25]
- **Partial Clearing:** Sellers can specify whether the offer is eligible for partial clearing, or if the entire offer must be cleared on an all-or-nothing basis (e.g., relevant for resources making market entry and exit decisions).

This offer format would allow sellers flexibility to offer supply to a wide variety of potential buyers, with the clearing mechanism ensuring they clear in the highest-value combination of products without over-committing volumes. In Table 3, we describe options available under the seller offer format and give an example of a new hybrid solar-battery energy storage system (BESS) resource consisting of a 200 MW, 4-hour battery and a 200 MW solar photovoltaic (PV) generation resource that is eligible to sell both RECs and capacity. As a new resource, the seller wants to sell

[25] While sellers can be assumed to prefer eligibility for any potential pricing premium that may be available under specific states' programs, they would also need to be prepared to take on the additional obligations that may apply under specific state programs. The primary relevant obligation being that if the seller is unable to fulfill the capacity sales commitment, they would need to either: (a) replace the capacity with another state-qualified capacity resource; or (b) replace the obligation with a generic capacity resource in the same LDA and pay a penalty for non-fulfillment of the technology-specific requirement. These replacement transactions could be accomplished bilaterally or in a short-term auction, with non-delivery penalties/costs potentially being larger for resources that have been committed under a state-specific technology obligation.

capacity plus RECs under a 15-year commitment and must reach a total minimum revenue threshold in order to clear.

**TABLE 3: HOW SUPPLIERS CAN CUSTOMIZE SUPPLY OFFERS TO REFLECT TECHNOLOGY-SPECIFIC NEEDS**

| Offer Parameters | Offer Options | Example PV+BESS Offer |
|---|---|---|
| **Product** | • Capacity<br>• RECs: one or multiple state-defined REC classes | • Capacity + RECs |
| **REC Eligibility** | • State-defined REC classes | • Eligible under 5 distinct state programs (seller can clear in any of the 5 programs, as long as total volume is not exceeded) |
| **Capacity Technology Eligibility** | • Generic (all types)<br>• State-defined program eligibility (each state may define different eligibile technologies) | • Generic, *and*<br>• Eligible and offering to sell under three state-specific programs |
| **Location** | • Capacity market LDAs | • Capacity: Eastern Mid-Atlantic Counceil (EMAAC) (can also be used to fill demand in a parent LDA) |
| **Season** | • Separate summer and winter capacity sales volumes (REC volumes are annual) | • 260 MW UCAP Summer<br>• 200 MW UCAP Winter |
| **Term** | • 5-year, 15-year or both (different offer prices can be submitted for different terms) | • 15-year |
| **Offer Linking** | • No linking: multiple offers can be submitted and clear independently<br>• Linked offer: seller wishes to clear both capacity and RECs | • Linked offer: Seller must clear a joint offer for both capacity and RECs |
| **New Resource Eligibility** | • New or existing | • New |
| **Partial Clearing** | • Lumpy offer (seller stipulates that all or none of the offer must clear, typical for new resources)<br>• Rationable offer (seller can clear partial volumes, typical for existing) | • Lumpy (new resource offer) |
| **Offer Price & Volume** *(Reflects minimum price at which offer can clear)* | • Price-quantity pairs (multiple offer segments allowed)<br>• Up to 3 offer types: Capacity-only, REC-only, or total annual revenue requirement | • 1 offer segment<br>• Volume: 200 MW UCAP Winter; 260 MW Summer Capacity, 400,000 RECs<br>• Price: $48 million/year (total revenue requirement for capacity + REC sales) |

# F. Forward Auction Clearing and Price Setting

The forward auction format would follow a single-round, uniform clearing price format and be conducted annually for a delivery period beginning three years in the future. This format is similar to the current RPM clearing but would support lower cleared volumes for any individual year, support pricing for more products, and clear commitments for lock-in periods of either 5 years or 15 years.

The auction clearing and price setting algorithm would be designed to co-optimize procuring capacity and RECs simultaneously. The auction would be structured to maximize the market-wide benefits of trade: clearing products that customers value the most while minimizing the total market-wide resource supply cost. Auction clearing would be limited by constraints that ensure transmission limits are not violated, and that buyer bid and seller offer parameters are all respected. Clearing prices would be set at the intersection of supply and demand for each product.[26]

The clearing prices for each product, location, and term would be driven by the supply-demand fundamentals, with the lowest prices prevailing for any product with many suppliers and little demand while higher prices may prevail for products where states have expressed high willingness to pay but where few supply options are available. For example, generic capacity in the unconstrained RTO may clear at a lower price than a 15-year commitment that can only be filled by new resources of specific technology classes within a more expensive capacity area. Pricing of RECs between states is likely to be relatively uniform, considering that many sellers can qualify to sell RECs across multiple states' Class A REC programs (with supply-side substitutability allowing prices to naturally converge). However, states with idiosyncratic REC eligibility rules would clear at distinct prices (with "loose" rules producing lower prices and "tight" rules producing higher prices).

REC and capacity prices would also interact, with the relative supply-demand balance in the REC market influencing capacity market prices (and vice versa). The combination of REC and capacity market fundamentals would determine the most cost-competitive resource mix. For example, consider a state that (absent a state-led capacity market) might pursue separate processes for procuring renewables and supporting demand response (DR) programs to meet state goals. If the

[26] Mathematically: the auction-clearing objective function would be to maximize total cleared surplus (surplus = buyer bid price × quantity of cleared demand bids, minus seller offer price × quantity of cleared supply offers). Subject to constraints including respecting supply-demand balance (cleared supply ≥ cleared demand, applied separately for each product, location, and term); transmission capacity limits; seller offer volumes across products cannot exceed resource capability; and contingent/linked bid requirements respected. Clearing prices would be set by the shadow price on the supply-demand constraint for each distinct and separately priced product or sub-product.

same state places demand bids for state-qualified RECs and state-qualified capacity into the regional capacity market, the most cost-effective mix may sway heavily toward solar + BESS hybrid resources (while also clearing stand-alone wind, solar, BESS, and DR programs wherever they can out-compete hybrids on price for any individual product). In general, the co-optimized clearing format could help sellers to capture a sufficient revenue opportunity in one auction to proceed with a build decision, while helping states and customers to accomplish a lower combined resource procurement cost.

# G. Mandatory Capacity Showing and Spot Capacity Auction

State agencies and LSEs would have many opportunities to secure capacity commitments on a forward basis, including via the voluntary forward auctions, utility planning, bilateral contracting, and self-supply. However, considering that these forward planning activities are all voluntary, states would still need a mechanism for holding each other accountable for fulfilling total capacity requirements and preventing any one state from free riding on others' capacity commitments. The enforcement mechanism would be that, prior to each delivery year, all LSEs would be subject to either: (a) non-forward capacity showing (applicable for FRR entities that commit to meeting 100% of capacity obligations outside the auction, with a penalty applied for any under-delivered volumes); or (b) obligation to procure any unmet capacity needs via a mandatory spot auction. The non-forward showing and mandatory spot auction would be conducted approximately six months and three months prior to the delivery year start.

In preparation for mandatory showings and spot auction, all LSEs would be assigned any pre-committed and cleared volumes procured in the forward or incremental auctions. For capacity procured by a state agency on behalf of a class of customers in a retail choice state, each LSE serving that customer class would be awarded their pro-rata share of advance capacity commitments. Additionally, LSEs apply any self-supply or bilaterally purchased capacity commitments toward meeting their capacity requirements. Together, these prior commitments would make up an LSE's capacity supply plan.

For FRR entities, any unmet capacity obligations at the timeframe of the mandatory showing would be assigned a shortfall penalty equal to the spot capacity auction price cap.[27] FRR entities

[27] This capacity shortfall penalty should be set high enough to ensure that utilities and state regulators in states with vertically integrated planning have sufficient incentives to ensure they fulfill capacity obligations similar to their neighbors. A penalty consistent with the spot auction price cap will further ensure that there is no structural incentive to use the FRR mechanism opportunistically to avoid potential high prices that may apply in the spot auction under market-wide tight supply conditions.

with surplus capacity supply relative to their own needs would be free to sell that surplus bilaterally or within the spot capacity auction.

The spot capacity auction would be used to procure the remaining capacity requirements on behalf of any LSEs with unmet capacity requirements. Similar to the "net pool" auction clearing in the Midcontinent Independent System Operator (MISO) and New York Independent System Operator (NYISO) spot capacity auctions, all pre-scheduled supply and demand volumes in LSE supply plans would be accounted for when conducting the spot capacity auction, so as to ensure full and efficient use of the transmission infrastructure (including enabling counterflow deliverability where relevant). However, only a small volume of total capacity needs clear in the spot auction and be subject to the spot capacity price (e.g. 2–10% of the reliability requirement).[28] In expectations and on average, the spot market price and forward auction prices should tend to converge to the same level for the same product. However, forward auction prices would be substantially more stable compared to the more volatile spot market prices, a pattern that is observed in most commodity markets.[29]

In all voluntary forward auctions, the demand curve is a natural expression of state, LSE, and customer demand (aggregated from individual buy bids). However, in the spot auction, the demand curve would be an administratively set curve with a downward sloping shape and a price cap based on a multiple of Net CONE to ensure states have a sufficient incentive to do forward planning/contracting, self supply, and/or participate in the state-led forward auctions. Though the price cap and shape of the demand curve could be carried forward from the current RPM for purposes of continuity, many of the logical and economic principles behind the curve shape could be revisited considering the reduced role and importance of the spot market (compared to the forward auctions) in attracting new supply commitments.[30]

Note that while the spot capacity market would also clear REC products under the same clearing logic described in Section II.F above, all REC purchase and sale volumes would be voluntary in all auctions (including the final spot auction). REC transactions could continue bilaterally throughout

[28] For example, one state may pursue a strategy to hedge 90% of capacity needs via 15- and 5-year commitments in the forward auction; 8% in the incremental auctions under one-year terms (4% in each of the two auctions); and the remaining 2% in the spot auction (this volume being subject to variance with forecast error).

[29] Forward market prices, particularly for multi-year commitments, tend to be more stable because more buyers and sellers can offer at middling prices (making for relatively flat supply and demand curves that produce more stabilized pricing). However, spot capacity markets can be quite volatile in pricing, since there are few remaining supply options that can enter or exit prior to the delivery year (meaning that the market is either oversupplied and will produce a price near zero, or the market is under-supplied and will produce a price near the cap).

[30] For example, it is possible that a price cap based on a lower multiple of Net CONE may provide sufficient incentives for buyers to engage in forward contracting for new supply under longer-term commitments. The different purpose of the spot auction could also be a catalyst for transitioning the spot market demand curve toward one that is derived from marginal reliability impact as has been done in New England and MISO, so that capacity pricing is more aligned with reliability value across seasons, locations, and reserve margins.

the delivery year and until the final deadlines specified under individual states' RPS program requirements (typically a few months after the delivery year has concluded).

## H. Settlements

PJM would continue to handle settlements.[31] In all auctions, procurement costs would be allocated to the specific entities making the voluntary purchase or the designated customer groups on whose behalf any rate-authorized demand bids are submitted. The same customers receiving cost allocations would also be awarded the UCAP and RECs they purchased. Sellers would fulfill all forward commitments physically, but with provisions for buy-out and replacement for under-delivery within the defined product (e.g., same location, same eligibility).

Retail choice (i.e., customers switching their LSEs) would be enabled using mechanics similar to those utilized to accommodate daily switching under current capacity market rules. Capacity and REC purchase costs arising from the state-led capacity auction would create both a cost obligation and entitlement to receive the delivered product, assigned to a particular customer class (defined by electric distribution company (EDC) retail tariffs and any state-defined customer segments). These obligations would follow customers on a non-bypassable basis, even if a customer were to switch LSEs.

Some of the specifics on settlements for **capacity** product are:

- All capacity commitments (whether forward, spot auction, or self-commitment) face the same supply obligations and penalties (e.g., capacity performance) for non-delivery and poor performance.
- Additionally, any resource that has committed to delivering capacity subject to state-specific technology or new resource requirements could only replace those obligations with a similarly qualified replacement resource via bilateral transaction or centralized auction. If no qualified replacement resource exists, the seller would be subject to a state-specific non-delivery penalty (in addition to their obligation to replace the supply with a generic capacity purchase).
- Sellers would assume the effective load carrying capability (ELCC) capacity accreditation risk, considering they are the entities in the best position to manage and improve their capacity ratings. The scale of this risk will be substantially reduced by moving to a two-season capacity market (since seasonal ELCCs will be more stable than current annual ELCCs that are

[31] If PJM or a PJM affiliate is selected as the auction administrator, their role in implementing settlements would naturally follow. However, even if PJM is not selected as the auction administrator, we would still recommend that PJM is the natural entity to provide certain areas of implementation support including for settlements, assessing performance penalties, resource qualification processes, and managing credit requirements.

dominated by winter risk). Sellers will also be able to manage and avoid this risk by: (a) offering more conservative UCAP ratings into the forward capacity auctions; (b) developing resources that better complement the current resource mix as it changes over time; (c) investing in resource types with durable capacity ratings; (d) winterizing their resources to reduce cold-weather-driven deratings; and/or (e) retrofitting renewable resources with battery storage to enhance capacity value.

Some specifics of the **REC** product are:

- RECs must be physically delivered to PJM (via EIS) and then transferred to the voluntary state buyer or agency managing REC allocations on behalf of the relevant customer class.
- For resources that under-deliver RECs, the default approach would be to allow under-deliveries to be compensated by submitting REC purchases of the same class or otherwise face the state-specific and class-specific alternative compliance rate (ACP). However, individual states could override this default penalty with an alternative approach at their discretion.
- If a seller anticipates that their total annual REC volume will exceed their total annual obligation, then the excess RECs come into their PJM EIS account as usual and they may be sold bilaterally, sold into the subsequent auctions, or rolled over for use in future delivery periods (subject to individual States' banking rules).

Note that the common thread on jurisdictional control and coordination is that all penalty and compliance obligations affecting region-wide system reliability would be subject to a uniform system-wide approach to ensuring compliance (and penalizing non-fulfillment) and codified under the FERC-approved Tariff under which all states have agreed to participate. However, any penalty rates and compliance mechanisms affecting the achievement of state-specific goals on resource mix or RPS achievement would be set by individual states under state-specific regulations or laws (the specific values would not be included in the FERC-jurisdiction Tariff).

# I. Market Monitoring and Mitigation

The IMM would conduct market monitoring and mitigation, using concepts and approaches that, in the mandatory spot capacity auction, are similar to those applied under the current RPM. The IMM would be tasked with monitoring the competitiveness of all auctions, identifying and reporting misbehavior, and with providing independent advice to the State Board of Directors on recommended rule changes to improve the efficiency and effectiveness of the state-led capacity market.

Monitoring and mitigation activities would focus on preventing market participants from profitably engaging in the exercise of market power or other manipulative behaviors. The IMM

would conduct a pre-auction review of structural competitiveness for all markets. The voluntary forward auctions are likely to be highly competitive with far less opportunity to engage in manipulative withholding compared to the current RPM structure.[32] However, any firm identified as having the incentive and opportunity to profit from exercising market power would be subject to mitigation rules governing participation in the forward auctions, such as a voluntary or mandatory mitigation plan. The mandatory spot auction would incorporate must-offer requirements for capacity for all existing resources, with an offer price cap consistent with net going-forward costs (similar to current capacity market rules).

In addition to these pre-auction screens, the IMM would issue post-auction reports and one combined annual report reviewing the competitiveness of the forward auctions, spot auction, and bilateral market activities leading up to the compliance deadline. The report would assess whether there could be any need for additional mitigation measures or other changes to market design to address issues identified. The state Board would consider the outcomes from the IMM review in combination with other governance processes in developing future rule changes.

[32] It would be challenging for any supplier to engage in profitable withholding in most circumstances in the forward auctions considering that: (a) demand is entirely voluntary and reflects only a small share of total demand; (b) supply and demand curves would both be expected to be relatively flat, due to the multi-year nature of the commitments, meaning that even a large change in volume could produce only a small change in price. The spot auction would be mandatory for capacity, and so is more susceptible to withholding, requiring tighter mitigation rules.

# III. Examples of How Differently Situated States Would Participate

State agencies, and the LSEs they regulate, would transact through this new state-led capacity market on an entirely voluntary basis, with each state able to customize participation in alignment with their state regulatory model, hedging needs, and desire to use the regional marketplace to secure new resource investment. The extent to which and the nature of how states would use the regional market would be complementary to other resource planning processes, procurement efforts, and policies. States whose utilities engage in integrated planning and self supply could use the forward market primarily for informational purposes to guide their expectations on pricing and review of cost recovery for utility-proposed projects. Other states may rely primarily on competitive solicitations conducted by state agencies to secure supply contracts to meet their new resource needs and use the auctions only for residual needs. However, some states may wish to extensively utilize the regional state-led capacity market for attracting new supply investments or hedging capacity commitments for a subset of customers (e.g., residential class under retail choice), while allowing other customer segments (e.g., public power or commercial and industrial classes) to participate directly on a voluntary basis.

We present the following examples of four distinct participation approaches as examples which are summarized visually in Figure 3:

1. **State with Integrated Resource Planning:** This state regulatory model relies on vertically integrated utility planning, with commission-approved self-build and contract solicitations to meet supply needs. To manage costs and the timing of new entry, the utility in question uses the regional state-led capacity market on an as-needed basis to manage supply imbalances (making supplementary purchases at times to when it is cost effective to defer builds and capturing revenue from selling surpluses when they arise). In addition, the state regulatory commission uses the public pricing of 15-year commitments for new resources out of the voluntary forward auction for information purposes, to help benchmark the anticipated cost and timing of supply proposed by utilities.
2. **Capacity Hedging for Retail Choice Customers:** This is an example of a state that uses the regional capacity market primarily for hedging capacity on behalf of retail choice customers. This portfolio would consist of laddered 5-year procurements for the majority of the state's demand needs, with a smaller share left for residual one-year commitments under the incremental and spot auctions.
3. **State Procurement of New Capacity:** This example illustrates a state that is concerned with procuring new capacity that meets its demand but does not have a specific preference for clean resources. A portion of this portfolio would be procured via 15-year commitments for

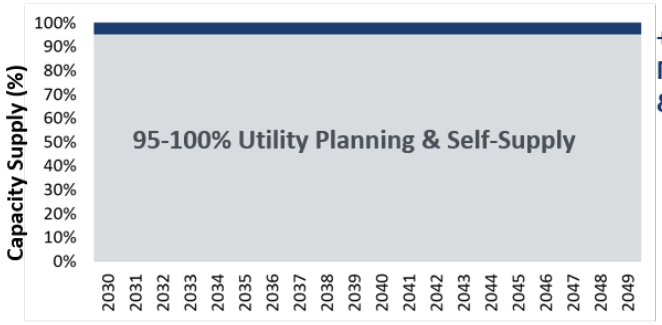
new capacity, with other needs met in 5-year and 1-year term capacity purchases. This state would not procure RECs.

4. **State Procurement of RECs and Preferred New Capacity**: This example illustrates a state that has a clean energy mandate and wishes to procure resources to meet their environmental goals at the lowest cost, while ensuring sufficient capacity supply for their overall demand. This state would procure both RECs and capacity from new resources, which have to be from the state's selected subset of required technologies, using the state-led capacity market to take advantage of co-optimization to procure RECs simultaneously. The balance of shorter-term capacity needs would be secured on a technology-agnostic basis.

This flexibility in participation approaches will allow differently situated states with diverse policies and regulatory models to capture the value where it could be most relevant (and opt out of participation otherwise).

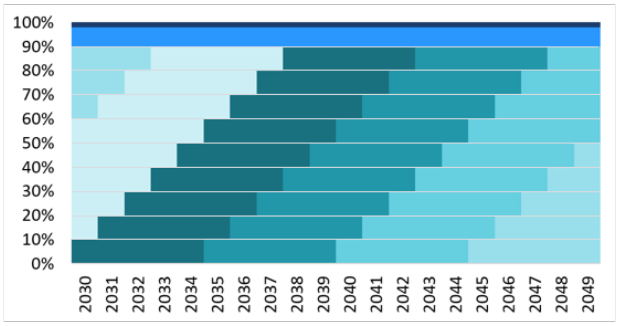
FIGURE 2: HOW STATES WITH DIFFERENT PREFERENCES COULD PARTICIPATE IN CAPACITY AUCTION

**1. State with Integrated Resource Planning.**




+/-5% Short-Term Market Purchases & Sales

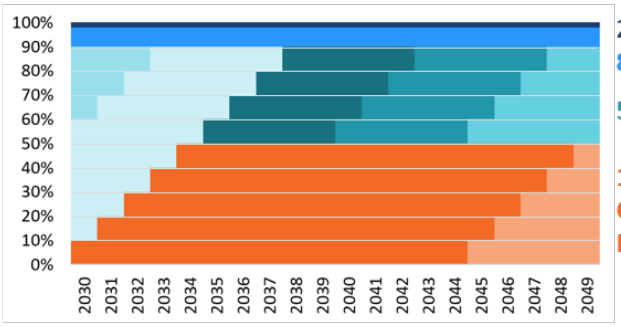
**2. Capacity Hedging for Retail Choice Customers**




2% Spot Auction
8% Incremental Auctions

90% Hedging Under Laddered 5-year Commitments

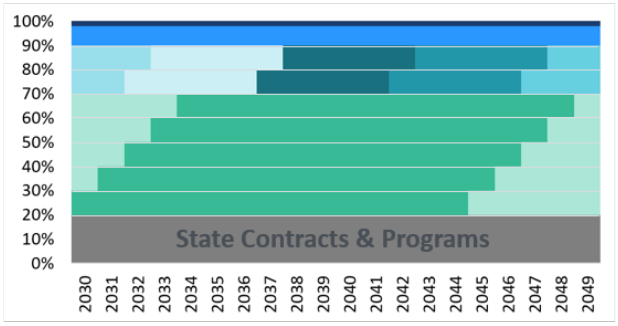
**3. State Procurement of New Capacity**




2% Spot Auction
8% Incremental Auctions
5-Year Hedging

15-Year New Resource Commitments (Share of Plan Grows Over Time)

**4. State Procurement of RECs and Preferred New Capacity**




2% Spot Auction
8% Incremental Auctions
5-Year Hedging
15-Year REC+Capacity Commitments with New Preferred Technologies

20% State Contracts and Programs (Non-Market)

# IV. Implementation Roadmap

The launch of the state-led capacity market would be a substantial undertaking and would require a hefty commitment of time and resources over several years. Figure 3 provides a high-level view on a possible implementation roadmap and timeline,[33] followed by an initial discussion of the logistical options and challenges that may expedite (or delay) a viable implementation plan.

FIGURE 3: INDICATIVE IMPLEMENTATION PLAN, WITH OPTIMISITIC TIMELINE

| Year 1 | Year 2 | Years 3-4 | Years 5+ |
|---|---|---|---|
| **Phase I: Market Design & Governance** | **Phase II: File Initial Tariff** | **Phase III: Market Launch** | **Phase IV: Ongoing Refinement** |
| 1. States sign letter of intent and commit start-up funding to launch market<br>2. Create non-profit organization tasked with market launch and implementation<br>3. State Board of Directors approves initial market design | 4. File state-approved market design, transition plan, and new governance structure with FERC | 5. Transition into new market with transitional auction schedule (enables orderly cutover from RPM to state-led market rules)<br>6. Anchor states test market potential with small initial volumes in voluntary forward auctions (and ramp up participation over time) | 7. Individual states revise regulatory processes and procurement targets over time to leverage state-led capacity market where desired<br>8. State Board of Directors monitors market effectiveness and updates market rules as needed |

**Phase I: Market Design & Governance**

1. **Letter of Intent.** Before committing material resources, the PJM States would work together to signal their mutual commitment and intent to launch a state-led capacity market. This letter of intent could be brief, but would need to be signed by the Governors of several (and ideally all) PJM States, and would potentially also require a co-signature or endorsement of PJM's Board of Directors to signal commitment to cooperation and follow-through.[34] To spur initial market launch, the letter of intent would specify how implementation costs would be funded, with options including: (a) philanthropic funding; (b) funding committed by specific sponsoring states; (c) funded indirectly via OPSI, with costs ultimately allocated to customers across the PJM footprint; and/or (d) implementation costs recovered by PJM through a line item charged to customers of a subset of sponsoring states. The letter also would need to

[33] We present an optimistic timeline that assumes the market is launched quickly, though a number of factors could delay implementation at any stage.

[34] For example, the letter of intent could be modeled after the Governors' agreement than launched the creation of the RGGI market, for which governance, design, and implementation were initiated with a brief Memorandum of Understanding signed by the Governors of the nine original participating states. See Regional Greenhouse Gas Initiative Memorandum of Understanding, December 20, 2005.

describe the intended eventual governance structure, and which sponsoring states' agencies would commit staff resources necessary for the earliest-stage implementation steps.

2. **Create Purpose-Built Non-Profit Entity.** The initial sponsoring state agencies would then create a purpose-built non-profit entity, whose sole responsibility is to launch and govern the new state-led capacity market. The Board of Directors of the new non-profit would be comprised of PJM State representatives (see Section II.A above). The Board would select an executive to lead the non-profit, and over time would approve other major decisions including the selection of the market administrator.[35] From there, the non-profit entity would become the driving force for defining organizational structure, sourcing legal and staffing needs, updating the financial plan, developing draft governing documents and initial market rules, and ensuring that the proposed market rules will align with states' requirements.

3. **Develop & Approve Initial Market Design.** The non-profit entity would be responsible for coordinating input from each PJM state into a consensus proposal and draft Tariff language for the new state-led capacity market. These documents would include language sufficient to codify the new governance structure; establish version one of all market rules; lay out auction schedules for use during the transition period and in the long term; and describe PJM's role and support responsibilities under the new market design. If legal and staff support are provided by PJM or a PJM affiliate (similar to the support that SPP has provided to launching the WRAP and Markets+ into FERC-ready filings), these efforts could be greatly streamlined and expedited.

**Phase II: File Initial Tariff**

4. **File with the FERC.** Once a complete Tariff is developed, it would be confirmed under the new governance structure (approved by the state-led capacity market's Board of Directors). The proposed Tariff would then move ahead to FERC filing and approval, with conforming changes to the existing PJM Tariff to remove duplicate rules that would no longer apply. Considering uncertainties in the timing of FERC approval or iterations that may be required, the transitional responsibilities and timelines would be described in a flexible manner and contingent on the timing of final FERC approval.

**Phase III: Market Launch**

5. **Initial Auctions and Transition Plan.** Upon FERC approval, the state-led capacity market would formally begin its operation and transition plan. Starting with the delivery year of market cutover, PJM would cease conducting BRAs under the previous RPM rules (but would continue to implement post-BRA activities including incremental auctions, settlements, and administration of penalties for all delivery years prior to cutover). After cutover to the state-

[35] Similar to the WRAP governance model described in Section II.A above, we envision the speediest and most effective implementation could be accomplished if PJM is selected as the market administrator.

led capacity market, the new auction administrator (which could be PJM or a PJM affiliate) would take on responsibility for supporting all future capacity auction delivery years. The multi-year transition period could conduct initial spot and forward auctions in the same auction year, but with outcomes relevant for different delivery years. The implications for sellers would need to be carefully considered, to avoid disruption in market transition and cutover (i.e., sellers should have certainty that a viable centralized marketplace where they can make capacity sales will exist in every year throughout the transition period).

6. **States Ramp into Participation.** We anticipate that most states would launch their participation in voluntary forward auctions in a gradual fashion, with modest volumes of demand for 15-year commitments with new resources, somewhat larger volumes for 5-year commitments, and a substantial portion left for spot auction procurement. The non-profit tasked with launching the market would dedicate staff resources to any state requesting support in developing their market participation plan and initial demand bids. The non-profit would also issue an aggregate "market opportunity report" as a public signal regarding the potential volume, location, and technologies developers should consider pursuing to fulfill state demand). We expect that the market will perform most successfully if several "anchor states" communicate their intent to procure specific target volumes in initial auction years, with a plan to ramp up participation over time as the market demonstrates the ability to attract supply at attractive prices.

**Phase IV: Ongoing Refinement**

7. **Individual State Regulatory Processes.** Once the basic structure of the state-led capacity market is in place and has been tested, state agencies could conduct individual dockets or reviews as necessary to determine most effective use of the state-led capacity market. This could include establishing policy around demand parameters as complementary to other state policies, whether design rules need to be modified to accommodate state needs, and what new products should be developed and listed.

8. **Ongoing Market Review and Updates.** In a regularized annual process, the state-led capacity market's Board of Directors would review market outcomes, IMM recommendations, and other proposals by stakeholders or the auction administrator, selecting which recommendations should be pursued under future Section 205 filings before the FERC.

# Appendix: Summary Design Proposal

TABLE 4: STATE-LED CAPACITY MARKET DESIGN FEATURES

| | Design Features to Achieve Goal |
|---|---|
| **Governance and Administration** | • Market is overseen by a new independent non-profit entity, which can either directly administer the state-led capacity market or appoint an administrator (PJM can be selected to administer a portion or the majority of market functions)<br>• State representatives comprise the Board of Directors of a non-profit entity which holds Section 205 filing rights of FERC-jurisdictional market rules (modeled on WRAP structure)<br>• Administration costs shared by participating states and voluntary buyers |
| **Product Definition** | • Capacity (sub-products by location, season, and (optionally) state-defined elegibility)<br>• RECs (sub-products defined by state and REC Classes)<br>• 15-year products for enabling new supply, and 5-year products for hedging<br>• Two seasonal delivery periods (with corresponding capacity definitions) |
| **Demand** | • State agencies, utilities, retail providers, cities, and other voluntary buyers<br>• Buyers submit demand bids specifying desired products (e.g., capacity or RECs), maximum price and maximum volume they are willing to procure, what supply technologies are eligible, term (5 or 15 years), and new vs. existing eligibility |
| **Supply** | • Only physical resources are eligible to sell (no financial-only sell offers)<br>• Eligibility to sell capacity is defined identically to the PJM capacity market; REC eligibility is defined by state RPS rules |
| **Bilateral Transactions** | • Centralized state-led market provides price transparency and reduces transaction costs<br>• Bilateral commitments, trading, and self-supply allowed at all timeframes |
| **Delivery and Performance Obligations** | • Forward auction creates financial and volume commitments for buyers and sellers ahead of delivery period<br>• Under-delivery relative to capacity obligations must be fulfilled via bilateral replacement or spot auction buy-out; under-delivery relative to REC obligations defined by state-specific penalty rules (e.g., penalized at the ACP) |
| **Spot Capacity Auction** | • Non-forward auction, used for final supply-demand balance (required for all entities not participating in FRR)<br>• Creates enforcement and penalty mechanism for any entity or state not fulfilling capacity obligations (up to maximum price at 1.5 × Net CONE) |
| **Settlements** | • Adminstrator manages credit requirements and settlements<br>• Procurement costs allocated to buyers (no settlements to non-participants). For "rate-authorized" demand bids submitted by state agencies, costs of which are allocated to a defined customer class determined by the state |
| **Monitoring and Mitigation** | • Pre-auction screens for firms with incentive and ability to exercise market power in any market or sub-market, with flagged firms subject to provisions preventing the exercise of market power<br>• IMM to issue monitoring and mitigation reports covering competitiveness of auctions and bilateral market, and reporting potential conduct violations for investigation to State agencies and FERC |

# List of Acronyms

| | |
|---|---|
| ACP | Alternative Compliance Rate |
| BESS | Battery Energy Storage System |
| BRA | Base Residual Auction |
| CFTC | Commodity Futures Trading Commission |
| $CO_2$ | Carbon Dioxide |
| CONE | Cost of New Entry |
| DC | District of Columbia |
| DR | Demand Response |
| EDC | Electric Distribution Company |
| EIS | Environmental Information Services |
| ELCC | Effective Load Carrying Capability |
| EMAAC | Eastern Mid-Atlantic Area Council |
| FEAM | Forward Energy Attribute Market |
| FERC | Federal Energy Regulatory Commission |
| FPA | Federal Power Act |
| FRR | Fixed Resource Requirement |
| GHG | Greenhouse Gas |
| IMM | Independent Market Monitor |
| ISO | Independent System Operator |
| LDA | Locational Deliverability Area |
| LSE | Load Serving Entity |
| MAAC | Mid-Atlantic Area Council |
| MISO | Midcontinent Independent System Operator |
| MOPR | Minimum Offer Price Rule |
| MW | Megawatt |
| NYISO | New York Independent System Operator |
| OPSI | Organization of PJM States, Inc. |
| PV | Photovoltaic |
| REC | Renewable Energy Certificate |
| RGGI | Regional Greenhouse Gas Initiative |
| ROSEI | Ralph O'Connor Sustainable Energy Institute |
| RPM | Reliability Pricing Model |
| RPS | Renewable Portfolio Standard |
| RSC | Regional State Committee |
| RTO | Regional Transmission Organization |
| SPP | Southwest Power Pool |
| UCAP | Unforced Capacity |
| WPP | Western Power Pool |
| WRAP | Western Resource Adequacy Program |

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