

2023 Critical Issue Fast Path (CIFP) - Resource Adequacy AMP and JPower USA Proposal

Executive Summary

For the October Filing, a phased implementation approach for market reform is needed to ensure stable market-based structures that can meet the reliability needs of the evolving resource mix while avoiding any unintended consequences with a rushed implementation of a complex design choices.

- This approach will provide new mechanisms in the long term that can begin to minimize the risk of participation in the PJM Capacity and Energy markets while providing incentives to be available and perform when needed even in the transition phase.
- The mechanism proposed herein addresses the realities of potential resource retirements leading to tightening reserve margins, changing resource mix toward increasing variable and intermittent resources, increasingly stringent environmental policy at state and federal level, load growth, evolving transmission infrastructure, and increasing Distributed Energy Resources (DERs).
- All elements in this approach satisfy the four directives from the PJM Board [letter](#) dated 02/24/2023.
- Many of the elements in this approach address issues raised in PJM's [Energy Transition in PJM: Resource Retirements, Replacements & Risks](#) whitepaper report.
- This approach provides a reasonable, achievable, and timely implementation plan for filing, technical design, and readiness in anticipation of the projected future challenges that will impact resource and energy adequacy.

For the indicative voting during Stage 4 of the CIFP, AMP and JPower are offering the following three options for consideration:

1. **AMP / JPower 1 (Transition)** – Transition rules in IMM Package 1.
2. **AMP / JPower 2 – (Staggered Filing Strategy)** – IMM's SCM with proposed modifications. Two explicit phases of implementation and filing. Transition rules in IMM Package 1 with additional market reforms in Phase I for operational transparency.
 - a. Phase I has a target filing date of 10/1/23, with anticipated FERC Order by 12/1/23.
 - b. Phase II has a target filing date of 12/31/23 (but no later than 2/1/2024), after a stakeholder process to develop the implementation details and evaluate proposed enhancements, with anticipated FERC order by 3/1/2024.
3. **AMP / JPower 3 (Phase I Only)** – Market reforms proposed in Phase I, only. Transition rules in IMM Package 1 with additional market reforms in Phase I for operational transparency.
 - a. Phase I has a target filing date of 10/1/23, with anticipated FERC Order by 12/1/23.
 - b. Stakeholders may indicate their willingness to endorse the proposed market reforms in Phase I, only, for Delivery Years 2025/2026 and 2026/2027.

Guiding Principles for Long Term Market Reform

AMP and JPower strongly believe in holistic discussions as the best way to achieve consensus on contentious items as it allows for the greatest opportunity for mutual gains. Nevertheless, the PJM Board has generally limited the scope of the items open for discussion, at this time, per its [letter](#) initiating the CIFP-RA process.

AMP and JPower still believes that any reform, both near-term and long-term, needs to adhere to long-standing guiding principles of capacity market design:

- A sustainable market design to procure all required capacity to maintain a formulaic reliability standard on behalf of all loads regardless of the season.

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- Reduce the administrative burden and rule complexity that promotes better transparency and understanding of the capacity market objectives and performance.
- Market signals that account for risk and supply choice preferences to minimize out of market costs.
- Recognize reliability attributes and delivery capability of the evolving generation mix of new and retiring resources as PJM goes through a transition in toward a system dominated by variable and intermittent resources.
- Recognize that extreme exogenous events are becoming a more frequent reality.
- Maintain financial and reliability linkages between the energy and ancillary service markets and the capacity market.
- Recognize the policy reality that states are mandating renewable targets that require LSEs to procure certain quantities of zero emitting capacity.

Phase I (DY 2025/2026 and DY 2026/2027) – Market Reforms in the current construct to address lessons learned from extreme weather events since January 2014.

- Per the schedule approved by FERC in [Docket No. ER23-1609](#), the 25/26 BRA is scheduled to be held in June 2024 and 26/27 BRA is scheduled to be held in December 2024.
- Transition rules in IMM Package 1:
 - Modified Capacity Performance structure (CP), based on Member-Supported Solution from May 2023.
 - Align CP Penalties and Stop Loss to LDA Clearing Price.
 - Maintain Status Quo Trigger Definition as approved by FERC in [Docket No. ER23-1996](#) on July 28, 2023, at the Primary Reserve Requirement (Reliability Requirement, not Extended Requirement).
- Additional Capacity Market Reforms in Phase I:
 - Include Net Exports in Balancing Ratio such that when PJM is exporting energy the Balancing Ratio declines to reflect PJM is not serving only its own native load paying for CP resources.
 - Modify triggers for curtailing non-firm exports that are not used for resource adequacy in external balancing authorities.
 - Possible additions of export triggers to include curtailment of all non-capacity backed exports, or consistent with the tariff curtailment of exports to ensure not going short the primary reserve requirement.
 - Institute that all committed capacity (including DR) has a must offer requirement on a daily basis into the energy market.
 - FRR Entities and their committed FRR Capacity Resources will face financial penalties on par with RPM resources and no longer have the option for “physical” penalty commitments to be made in subsequent years.
- Status Quo rules to be retained during Phase I:
 - Maintain Status Quo Capacity Must Offer rules into the RPM Capacity Market including categorical exemptions.
 - For the transition Delivery Years, retain the status quo accreditation, based on Average ELCC methodology for ELCC Resources up to the CIR level, for all resource types rather than making a change for a single year and then another change in the subsequent year.
 - Continue the evaluation in the Resource Adequacy Analysis Subcommittee (RAAS) of the Capacity Benefit Margin, including the Capacity Benefit of Ties (CBOT) and any other metric to determine the quantifiable impact of exporting capacity and energy-only resources during emergency conditions.
 - No modifications to the Market Seller Offer Cap or the Calculation of CPQR.

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Required Operational Improvements during Phase I to increase transparency and market efficiency.

- Reliability begins with a strong foundation in the Day-ahead and Real-time Energy Markets and Operations. The Capacity Market can ensure there are resources available to the system to ride through challenging load and weather conditions. It is in markets and operations where it is imperative that prices signals, and commitment and dispatch decisions based on accurate load forecasts efficiently utilize those resources committed by the capacity market. Absent prices and decisions consistent with the reliability needs in energy and ancillary service markets and operations, the capacity market cannot meet its underlying resource adequacy objectives.
 - As the system operator and in its role at Balancing Authority (BA) and Reliability Coordinator (RC), PJM is required to schedule, commit, and dispatch the resources needed to reliably meet load in all hours.
 - PJM should not expect Capacity Resources to self-schedule to meet any regional reliability needs. Any expectation of PJM of resources to self-schedule to meet reliability needs results in PJM's abdication of the responsibilities as BA and RC, inappropriately shifting those responsibilities to resource owners.
 - Capacity Resources are obliged to follow PJM dispatch instructions.
 - The portfolio of resources that PJM draws from are the Capacity Resources that it procures through the RPM Capacity Market and the assigned/committed FRR resources.
 - All qualified Capacity Resources offering into the energy market have limits on the way they can be used in operations, reflecting the physical attributes of each technology.
 - Those schedules, commitments, and dispatch of Capacity Resources must reflect the physical limits on the qualified and cleared Capacity Resources, including non-contract-related fuel access issues, start-times, and production profiles (for intermittent resources).
 - In the transition period, long lead time units are not required to operate or be subject to penalties until they have been committed and go through their notification and start cycle.
 - PJM to publicly post Load forecast risks such as manual intervention and changes to the load forecast and why those changes were made as soon as they are done.
 - Consequently, should a Capacity Resource not be picked up in economics, but PJM operations determine additional resources are needed to address a likely reliability condition, posturing Capacity Resources, up to and including committing resources that need to secure multi-day fuel packages or with long notification and start times, is appropriate.
 - Continue to address winterization and fuel supply issues as they pertain to energy and reserve market performance to other PJM stakeholder committees.

Phase II (DY 2027/2028) – Implement Modified Version of Sustainable Capacity Market (SCM) to improve capacity market for future needs of evolving resource mix.

- SCM Framework includes (refer to IMM memo with detailed overview – August 16):
 - Elimination of Capacity Performance paradigm (CP).
 - No more PAIs, including penalties and triggers.
 - No More CPQR.
 - Implementation of “Pay-As-You-Go compensation” (PAYG) based on hourly availability.
 - Availability accounts for forced, planned, and maintenance outages as outlined in SCM.
 - Incentives to be available and not just minimize forced outages but also minimize maintenance and the length of planned outages.

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- In the Delivery Year, a resource will receive at least its annual net ACR if it performs consistent with its expected annual availability across all hours of the year.
 - Risk Modeling on a locational and seasonal basis that is automatically incorporated into the model and market clearing mechanism, as this looks at hourly availability based on season, weather, and other conditions.
 - It is not just winter issues; it is also shoulder maintenance periods that can be of concern as PJM has observed in the past.
 - Improved Accreditation based on Modified Equivalent Availability Factor (MEAF).
 - More granular and dynamic hourly valuation of expected resource performance based upon availability which automatically and implicitly captures locational and seasonal factors.
 - MEAF capped at CIRs as set out in the prevailing ISA.
 - Biannual Testing Requirements
 - Modeling enhancements to model CETO/CETL hourly
 - Maintain the scheduling, commitment, and dispatch requirements of Phase I transition.
 - Maintain Demand Resources that are Capacity Resources energy market must offer requirement.
- Proposed Enhancements to SCM to explore during implementation process of the SCM.
 - Implement 2-year auction procurement horizon. Two Incremental Auctions.
 - Reduces the upward bias in load forecast error that has been present for decades.
 - May also work well with new PJM cluster study process in the queue and working with the investment community for future funding for new resources.
 - Should also work better than a prompt auction schedule with DR/DER programs, retail choice program timelines and EDC PLC processes.
 - Eliminates one Incremental Auction and the administrative burden associated with it.
 - The Base Residual Auctions will be back on schedule sooner.
 - Energy Must Offer Obligations.
 - No exemptions for Capacity Resources.

Implementation Timeline

Below is an illustration of the implementation timeline with a 2 Year Auction Horizon and elimination of one Incremental Auction. A final auction schedule would need to incorporate all tariff-required pre-auction activities.

If the SCM is implemented for 2027/2028 Delivery Year, then the Auction Schedule will be back on track sooner.

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		Phase I - Order on 12/1/2023			Phase II - Order on 3/1/2023		
Delivery Year	Auction	Auction Open Date	Order -> Auction (Months)	Auction Results (Months)	Auction Open Date	Order -> Auction (Months)	Auction Results (Months)
2025/2026	BRA	Jun-24	6	12			
	3rd IA	Feb-25		4			
2026/2027	BRA	Dec-24	12	18			
	3rd IA	Feb-26		4			
2027/2028	BRA				Jun-25	15	24
	3rd IA				Feb-27		4
2028/2029	BRA				Jun-26	27	24
	3rd IA				Feb-28		4
*** Back on Track for 27/28 DY							

The above timeline aligns with the projected tightening of PJM reserve margins in 2027, as illustrated below¹.

Table 1. Reserve Margin Projections Under Study Scenarios

Reserve Margin	2023	2024	2025	2026	2027	2028	2029	2030
Low New Entry								
2023 Load Forecast	23%	19%	17%	15%	11%	8%	8%	5%
Electrification	22%	18%	16%	13%	10%	7%	6%	3%
High New Entry								
2023 Load Forecast	26%	23%	21%	19%	17%	16%	17%	15%
Electrification	25%	22%	20%	18%	15%	14%	14%	12%

Resource Senior Task Force (RASTF) Tasks

Restart the RASTF to initiate a stakeholder process to finalize the implementation details for the SCM design with a target filing deadline of 12/31/23, but no later than 2/1/24.

Prior to a FERC filing, PJM and the IMM must provide stakeholders analysis of sensitivities and scenarios to allow evaluation of cost impacts.

Reliability and Energy Adequacy Start with Day-ahead and Real-time Markets and Operations

PJM Markets need reliability to survive. In the near-term, Capacity Market reforms need to be simple not complex, but energy market and operations reforms need to be significant in critical areas like Reserve Markets, Gas Electric Coordination, and DER Integration.

- Reliability starts with real-time market and system operations. Accurate load forecasts along with commitment and dispatch of resources based on realities of fuel and unit operations. Generators have

¹ PJM’s [Energy Transition in PJM: Resource Retirements, Replacements & Risks](#), February 24, 2023

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the incentive to operate so as to not leave money on the table and so long as prices are consistent with reliability and operational needs.

- Gas electric coordination is at its core a system operations issue to be managed.
- Realistic operating parameters that reflect physical realities are essential for efficient system operations.
- Proper accounting of reserves to ensure contingencies can be met is essential for reliability.
- Visibility of DERs to know the true energy balance needs by location is required.
- PJM's capacity market reforms do nothing to address the issues listed above.
- The Reliability Assessment Commitment (RAC) (after DA Market and before RT operations) commits additional resources to ensure they will be available to meet forecast demand.
 - Again, short-term demand forecasting is needed so that accurate and efficient RAC commitments are made.
- PJM must be willing to make such RAC commitments (again, with realistic operating parameters as part of this decision) and we (market participants) must be willing to incur some small amount of uplift as "insurance" against larger real-time problems that cost everybody more money.
 - ***PJM's proposed capacity market reforms do nothing to address these operational planning issues.***
 - These decisions are "lumpy" and "discrete" and thus will lead to uplift. Uplift is not a bad thing if is part of the overall objective of minimizing bid production cost and should be expected given the nature of generator operations.
- The Day-ahead Market commits resources to meet bid in demand. Load has the incentive to accurate bid in demand to avoid high RT prices and/or emergency condition because not enough demand was offered.
 - ***PJM's proposed capacity market reforms do nothing to address the load bidding accurately into the DA market.***
- The PJM Capacity Market ensures sufficient resources will be available to provide energy at all times under all forecast conditions, accounting for load forecast deviations and resource performance. Financially, the capacity market ensures an opportunity (not guarantee) to cover any needed going forward (avoidable) costs of resources to ensure they remain in service.
 - In this sense, the IMM's view that the capacity market exists to make the energy market work is the economic side of the reliability coin that says the energy market is working when we have enough resources to ensure energy balance and maintain sufficient reserves to meet contingencies and not overload transmission. This is what we mean by energy adequacy...and resource adequacy as it is understood today does not mean there will be energy adequacy for a variety of reasons.
 - The capacity market is only one of many sufficient conditions, not the only sufficient condition to make energy markets work and ensure reliability.

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The IMM's Sustainable Capacity Market (SCM) design is most consistent with operational needs of the system.

- The IMM's SCM market design provides the following benefits:
 - Places the burden of performance in each and every hour rather than in some unknown period in which there are other factors beyond the control of resources such as blown load forecast, poor situational awareness, and ignoring gas pipeline operating realities.
 - Commits needed resources to meet energy in each and every hour including during shoulder and maintenance periods as well as those periods with correlated outages rather than a single peak hour.
 - Provides a conceptually well-defined demand in every hour.
 - The Board directed the stakeholders to improve accreditation. This means modifying the current method for determining the availability measurement for all resource types. Changing the methodology will have impacts throughout all areas of the capacity construct and new methods have been introduced by both PJM and the IMM:
 - PJM is introducing a Marginal ELCC methodology to replace the existing Average ELCC.
 - The IMM is introducing a new method, Modified Equivalent Availability Factor (MEAF).
 - The IMM's proposed method, the MEAF, obviates the need for ELCC which is a great vertically integrated utility planning tool, with what really matters in real-time operations: availability during that hour. One resource's availability does not affect another resource's availability. There are no interactive effects like ELCC where the level of, and order of entry of resources affects the ELCC value. This makes the availability measure a better market tool.
 - Can determine availability by location unlike PJM's use of ELCC.
 - Is much easier to implement than the PJM proposal as it requires no seasonal components per se, but rather accounts for hourly load and availability variation to determine which resources are the last needed. This market clearing is simpler as well.
 - Leverages some of the PJM's risk modeling enhancements developed in the CIFP process and utilizes the input data that supports the current Average ELCC construct.