

# **RCSTF Challenge Review**

Danielle Croop Sr. Manger, Market Design RCSTF 5/20/2025





Refresh the challenges and solution space discussed and polled on in the RCSTF

Discuss a framework for translating this to the matrix

Refresh on uncertainty and ramping challenges



### **Day-Ahead Reserves**

Challenge	The Day-Ahead market does not consistently procure sufficient physical generation (energy and reserve commitments) to meet day-ahead forecasted load and reserve needs, which leads to out-of-market commitments. <b>(64% agree/ 79%H-M priority)</b>
Solution to explore	<ul> <li>A new Day-Ahead Energy Imbalance Reserves product (74% support)</li> <li>PJM's conceptual thinking around this challenge was discussed as the 'energy gap' – the difference between the physical generation (energy + reserves) compared to the forecasted load</li> <li>This is a Day-Ahead only need used to facilitate a reliable day-ahead Operating Plan</li> </ul>
Proposed Matrix	<ul> <li>Options tab for "Day-Ahead Reserves"</li> <li>Addressing the "energy gap" would be discussed as a component of the DA only reserve needs (other uncertainty needs may be discussed there too)</li> </ul>



# **Uncertainty & Ramping**

Challenge	PJM's markets do not value and procure ramping and flexibility needs to manage forecast uncertainty (i.e., load, wind, solar, interchange and forced outage rates). (98% agree/ 93%H-M priority)
Solution to explore	<ul> <li>New reserve products to manage forecasted ramping needs (91% support)</li> <li>PJM's conceptual thinking around this challenge is to ensure the systems net load ramping needs are appropriated reflected in the DA and RT markets. Ramping reserves will be needed in both the up and down direction to control for ramping variability</li> </ul>
Proposed Matrix	<ul> <li>Options tab for "10-min Unc. Res." (10-minute ramping/uncertainty reserves)</li> <li>Ramping needs will be explored in both the up reserve and down reserve directions in the matrix</li> </ul>



age growing operational challenge is to ensure the eds are appropriated reflected
s", "30 minute Reserves", and serves needs to manage

 The uncertainty on the PJM's system will be realized along different timelines and therefore we should explore different time horizon reserves



Challenge	The cost of advanced fuel arrangements and other availability measures to provide reserves in the next operating day may at times be unrecoverable through PJM's existing market constructs. <b>(81% agree/ 76%H-M priority)</b>
Solution to explore	<ul> <li>Other potential reforms to existing market rules around resource offers for providing reserve services to better align with resources capabilities and/or costs (87% support)</li> <li>PJM's conceptual thinking around this challenge is to allow resources to reflect costs for actions taken to be available for reserves and better account for resources capability to provide reserves.</li> </ul>
Proposed Matrix	<ul> <li>Design components added to the option tabs to address offers.</li> <li>Discussions around determining offer structures for reserves (addressing different products, on/offline, DA vs. RT, etc.)</li> <li>Design components added to the option tabs to address eligibility</li> </ul>



#### Contingency Reserves (SR/PR)

Challenge In addition to the RCSTF Phase 1 enhancement to the synchronized reserve deployment process, more changes are needed to address reserves performance, such as capability requirements, performance obligations, and penalties. (72% agree/ 72%H-M priority)

# Solution toOther potential reserve market reforms around the following areas:explorePerformance Obligation, Evaluation and Consequences of Non-Performance (65% support)

 Proposed
 Options tab for "SR PR" (Continuation of some of the phase 1 Matrix
 proposals)



#### **ORDCs & Additional Enhancements**

Solution to explore	<ul> <li>Evaluation of PJM's ORDCs (78% support)</li> <li>PJM's ORDCs are based on an old market design. Under Reserve Price Formation, PJM proposed a holistic re- design of PJM's reserve markets, including updates to our ORDCs.</li> </ul>
Proposed Matrix	<ul> <li>Design components added for "ORDC penalty factors" and "ORDC shape"</li> <li>Discussions around proposed modifications to the SR/PR ORDC and proposed demand curves for any new products being proposed.</li> </ul>

Solution to explore	•	Improvement to current commitment & dispatch tools (84% support)
Proposed Matrix	•	Not reflected in matrix at this time, but would be presentation updates to stakeholders on improvements explored/implemented



## **Advanced Commitments**

Challenge	The PJM energy and reserve markets cannot produce multi-day commitments or commitments before the day-ahead market, leading to out-of-market commitments to manage multi-day gas scheduling constraints and cold weather operating risks. (96% agree/ 81%H-M priority) PJM lacks clear and defined market rules for units scheduled before the day-ahead market (84% agree/ 70%H-M priority)
Solution to explore	MIC Issue Charge on Offer Capping for Advance Scheduled Resource <u>https://www.pjm.com/-/media/DotCom/committees-</u> groups/committees/mic/2025/20250305/20250305-item-02-2boffer- capping-for-advance-scheduled-resourcesissue-chargeclean.pdf
Proposed Matrix	<ul> <li>Future Options Tab for "Advanced Commitments" as conversations evolved to potential proposals in this space.</li> </ul>



#### **Overview of Identified Reforms**

#### **Challenges to be Addressed**

- The Day-Ahead Energy Market does not procure sufficient reserves to manage operational risk, leading to out-of-market reliability actions.
- PJM's markets do not procure flexibility to manage forecast uncertainty (i.e., load, wind, solar, interchange and forced outage rates).
- PJM's real-time dispatch engine does not account for flexibility and ramping needs forecasted in future intervals.
- PJM's ORDCs are based on an old market design.
- The cost of advanced fuel arrangements and other availability measures to provide reserves may at times be unrecoverable through PJM's existing market constructs.

#### **Proposed Solutions to Explore**

#### **Enhancements to Existing Reserve Markets**

- Updates to PJM's ORDCs
- Changes to resource offer rules into reserve markets to enable cost recovery
- IT SCED enhancements to better manage upcoming flexibility needs
- Performance evaluation and incentives to ensure alignment with operational needs
- Incentives to follow PJM dispatch
- Locational procurement of reserves for reliability

#### **New Reserve Products**

- Day-ahead reserve product(s) to better align with dayahead operational needs
- Ramping/uncertainty reserve products to manage growing operational uncertainty

#### **Uncertainty in PJM Markets**

Today, PJM ensures that we have sufficient reserves available to manage our uncertainty reserve needs through Day-Ahead Scheduling Reserves (DASR).

DASR = PJM Load Forecast x (Avg. Load Forecast Error + Avg. Gen. Forced Outage Rate)

DASR is used day-ahead in operations to pre-position the system for reliability in realtime. However, it is not reflected in PJM's markets. As the energy transition progresses, PJM anticipates **needing reserves to manage new and growing uncertainties, such and wind and solar forecast uncertainty, in addition to the load forecast and generator forced outage uncertainties** included in DASR today.

PJM sees a need to develop new market constructs to reflect these uncertainty reserve needs in its market.



PJM's Uncertainty Needs are Not Accurately Reflected in Our Existing Markets.

# PJM's markets do not procure flexibility to manage forecast uncertainty (i.e., load, wind, solar, interchange and forced outage rates).

- Reliability needs dictate that PJM manage uncertainties that are not reflected in its markets.
- This leads to a clear misalignment between PJM's operational needs and its market design.
- As more wind, solar and behind-the-meter generation enter the system, forecast uncertainty will grow, introducing new reliability risks, and exacerbating these existing issues.

CAISO, NYISO, MISO, SPP, and ERCOT have all designed their reserve markets to manage netload forecast uncertainty.