

Capacity Market Structure Review

Capacity and New Resource Integration Market Design

ICAPWG/MIWG

April 1, 2025

Agenda

- Background
- Today's Objective
- NYISO's Initial List of Priority Efforts
- Next Steps

Background

Background

- **The NYISO's objectives for the Capacity Market Structure Review (CMSR) project are to**
 - Identify market structures that will help facilitate New York's evolving grid consistent with policy goals and achieve the following objectives:
 - accurately value resources according to their contribution to maintaining bulk system reliability;
 - deliver transparent and predictable market outcomes;
 - operate cohesively with the Energy and Ancillary Services markets to meet the reliability requirements of the evolving grid;
 - provide appropriate, nondiscriminatory, price signals to existing and new resources;
 - function without unnecessary administrative complexity; and
 - provide an economically efficient, durable and stable market structure to facilitate investment.
 - Explore potential alternatives to the existing structure.
 - Determine if the existing structure or alternatives explored better meet the defined objectives.

Background - Project Timeline

■ Q1 – Identify key areas for potential structural improvement

- The NYISO has facilitated meetings with market sectors and the Market Monitoring Unit (MMU) and will use ICAPWG meetings to gather stakeholder feedback.
 - These discussions have covered areas for potential methods for evolving the installed capacity (ICAP) market structure.
- The NYISO presented a summary of the feedback received from the CMSR sector meetings and is today presenting the NYISO's initial proposed prioritized list of key methods for evolving the ICAP market structure.
 - This list is intended to inform the 2025 project prioritization process for selecting projects beginning in 2026.

■ Q2 – Initial recommendations

- If necessary, the NYISO will further refine the initial proposed prioritized list of key methods for evolving the ICAP market structure.
- The NYISO will collaborate with stakeholders and the MMU to identify potential high-level solutions for the key methods identified in Q1 and Q2.

■ Q3 – Refine proposals

- The NYISO will further analyze and refine the initial recommendations set forth in Q2.

■ Q4 – Final Report

- The NYISO will deliver a final report to stakeholders outlining an assessment of the current ICAP market and provide recommendations for alternative approaches when the NYISO and stakeholders identify ICAP market components that would benefit from improvement.

Today's Objective

Today's Objective

- **The objective of this presentation is to outline the NYISO's initial prioritized list of recommended topics for further exploration to evolve the ICAP market structure.**
 - This list is intended to inform the 2025 project prioritization process for selecting 2026 projects.

NYISO's Initial List of Priority Efforts

NYISO's Initial List of Priority Efforts

- **The NYISO is proposing the following efforts for consideration to evolve the ICAP market structure:**
 1. Demand Curve Reset (DCR) Process and Methodology Improvements
 2. Winter Reliability Capacity Enhancements (currently ongoing effort)
 3. Reliability Attribute-based Capacity Pricing for Transmission Security and Additional Attributes
 4. Improving Capacity Accreditation and Resource Adequacy Modeling
 5. Capacity Zone Redesign
- **The following slides provide additional detail regarding each proposed effort for consideration, except the ongoing Winter Reliability Capacity Enhancements project.**
 - For more information on the Winter Reliability Capacity Enhancements project, see the [01/30/2025 ICAPWG presentation](#).

DCR Process and Methodology Improvements

DCR Process and Methodology Improvements

■ Overview

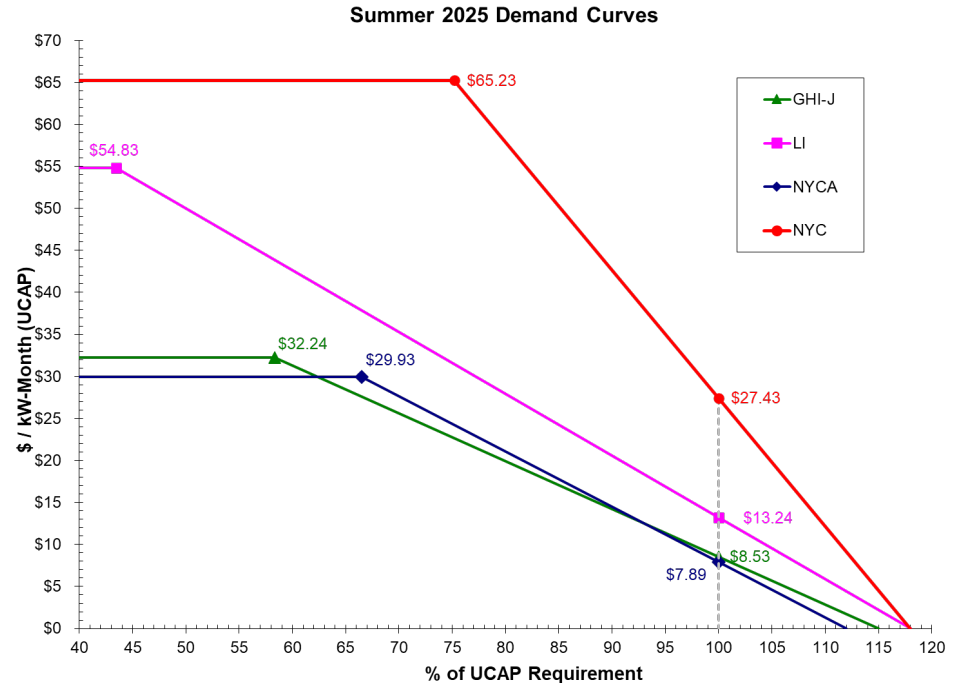
- This effort would examine alternative methodologies and processes for establishing the ICAP Demand Curves with the goal of reducing the complexity and resource-intensity of the DCR and ensuring the ICAP Demand Curves continue to provide efficient and transparent price signals for resource entry and exit.
 - Alternatives to explore could include, but are not limited to, leveraging existing publications of resource costs, changing the ICAP Demand Curve shapes and slopes, and/or using “empirical net cost of new entry (CONE)” to set reference point prices.
 - Multiple alternatives could be considered for simultaneous or staged implementation as part of this effort.

DCR Process and Methodology Improvements

- **Area for potential exploration: Leveraging existing publications of resource costs**
 - As part of each DCR, the DCR consultant estimates the capital costs of each potential peaking plant under evaluation.
 - These estimates have historically been the product of bottom-up engineering assessments, and the assumptions involved in these assessments have been the subject of significant stakeholder debate and evaluation.
 - Leveraging existing publications of resource costs in lieu of the bottom-up engineering assessments may reduce administrative complexity and improve the stability and predictability of the DCR process.
 - Organizations, such as NREL and EIA, regularly publish estimates of overnight capital costs for various resource classes that could be utilized for the DCR and/or as part of the annual update process to determine the curves for years 2-4 in the reset period.

DCR Process and Methodology Improvements

- **Area for potential exploration: Changing the ICAP Demand Curve shapes and slopes**
 - Each ICAP Demand Curve is comprised of a price cap, sloped section, and price floor.
 - This structure has remained unchanged since the implementation of the sloped demand curves in 2003.
 - Alternative shapes and slopes may more accurately value resources according to their contribution to reliability. They may also address stakeholder concerns that the current ICAP Demand Curve structure may result in wealth transfers to incumbent resources while inadequately incentivizing new resource entry.
 - Alternatives to explore could include a marginal reliability-based curve or a kinked curve



DCR Process and Methodology Improvements

- **Area for potential exploration: Using empirical net CONE to set reference point prices**
 - The ICAP Demand Curve reference point prices are set based on the net CONE of the applicable representative peaking plant.
 - In the current DCR process, assumptions related to financing, future net Energy and Ancillary Services revenues, and capital costs are used to determine the net CONE.
 - These assumptions may differ from conditions experienced by any single developer.
 - An alternative approach to setting the ICAP Demand Curve reference point prices could use historical market clearing prices at which actual new supply has entered the ICAP market in past capacity auctions (sometimes referred to as “empirical net CONE”).¹
 - Such an approach may result in more transparent and predictable market outcomes and may provide the benefit of linking the assumed net CONE of the demand curves to the prices at which real projects have opted to take on capacity obligations.

¹ For discussion of empirical net CONE, see [“PJM CONE 2026/2027 Report”](#) and [Complaint of Joint Consumer Advocates v. PJM Interconnection, L.L.C.](#), FERC Docket No. EL25-18-000, Attach. A (Declaration of Marc D. Montalvo).

DCR Process and Methodology Improvements

■ NYISO Priority

- The ICAP Demand Curves are the instruments by which the ICAP market signals the need for resource entry and exit.
- Predictable and robust ICAP Demand Curves allow the ICAP market to meet its objectives of providing appropriate price signals for resource entry and exit, delivering transparent and predictable market outcomes, and providing an economically efficient, durable and stable market structure to facilitate investment.
- Therefore, the NYISO recommends this topic as a top priority for further exploration.

Reliability Attribute-based Capacity Pricing for Transmission Security and Additional Attributes

Reliability Attribute-based Capacity Pricing for Transmission Security

■ Background

- The two tenets of power system reliability are resource adequacy and transmission security.
 - Resource adequacy is “the ability of the electric system to supply the aggregate electrical demand and energy requirements of the customers at all times, taking into account scheduled and reasonably expected unscheduled outages of system elements.”¹
 - Transmission security is “the ability of the electric system to withstand disturbances such as electric short circuits or unanticipated loss of system elements.”²
- In 2024, as part of the Valuing Transmission Security project, the NYISO discussed compensating resources based on their transmission security contributions as a potential enhancement to the ICAP market.

■ The ICAP market currently uses the Locational Minimum Installed Capacity Requirement (LCR) optimizer to optimize for sufficient resource adequacy in each Locality. The ICAP market indirectly accounts for transmission security through Transmission Security Limit (TSL) floor values that establish the lower bound on the LCR values.

- The ICAP market therefore currently only directly optimizes for a single attribute: resource adequacy.

¹ See NYSRC Reliability Rule & Compliance Manual, section 3.2.

² *Id.*

Reliability Attribute-based Capacity Pricing for Transmission Security

- **Some Resources may not contribute to transmission security or may exacerbate transmission security issues because their transmission security contribution is not reflected in their resource adequacy contribution.**
 - Special Case Resources and Energy Storage Resources are not assumed to contribute to transmission security requirements unless a transmission security violation is observed.
 - Large resources can increase the transmission security requirement, which is intended to maintain reliability if the largest two generation and/or transmission elements are lost.
- **Issues may arise when the NYISO optimizes only for resource adequacy:**
 - By compensating resources based on their resource adequacy value even when TSL floors are binding, the ICAP market may incentivize entry of capacity resources that do not meet transmission security needs, which may crowd out other capacity resources.
- **Explicitly pricing resource adequacy as well as transmission security may lead to lower consumer costs when co-optimized.**

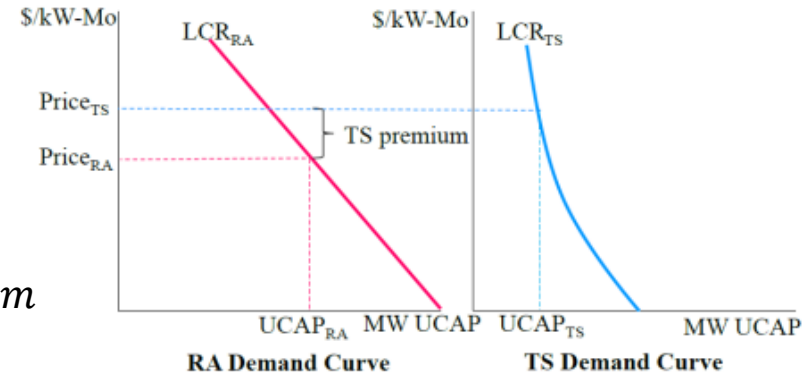
Reliability Attribute-based Capacity Pricing for Transmission Security

- **Area for potential exploration: Calculating separate resource adequacy and transmission security requirements for each Locality, which would be treated as two separate products in the ICAP market.**
- **Pricing transmission security may require the following steps (the first two steps are similar to those used to price resource adequacy):**
 - Create a transmission security demand curve.
 - Develop transmission security-based capacity accreditation methodologies and associated rules.
 - Establish a new ICAP market auction structure to solve the two products co-optimally.

Reliability Attribute-based Capacity Pricing for Transmission Security

- **Example of possible transmission security pricing methodology**
 - On September 24, 2024, the MMU presented an illustration of a spot auction utilizing two separate demand curves.
- **Under this example, a Resource would be paid according to the following formula:**

$$RA\ UCAPMW_x * Price + TS\ UCAPMW_x * TS\ Premium$$



Reliability Attribute-based Capacity Pricing for Additional Attributes

- Area for potential secondary exploration: Leveraging framework to co-optimize for Transmission Security to co-optimize for additional attributes.
- Additional attributes may include, but are not limited to:
 - Ramping
 - Inertia
 - Voltage Stability
 - Quick Cycling (Quick Start-up, Short Minimum down-time)

Reliability Attribute-based Capacity Pricing for Additional Attributes

- For this secondary effort, the NYISO would work with stakeholders to identify which additional attributes can be co-optimized in the ICAP market.
- These additional attributes may be valued in the energy or ancillary services markets but may present a “missing money problem”: the energy and ancillary services revenues may not attract and retain Resources that could provide these additional attributes.
- The need to maintain the reliability of the evolving grid may impact the consideration of additional attributes.
 - Ultimately the NYISO and its stakeholders would work to determine if the ICAP market is an appropriate market to value those identified reliability services.

Reliability Attribute-based Capacity Pricing

- **NYISO Priority**
 - Pricing transmission security explicitly may better represent reliability needs within the structure of the ICAP market.
 - Pricing for transmission security may incent investments that support reliability while delivering transparent, and predictable market outcomes. It may also support the objective to accurately value resources according to their contribution to maintaining bulk system reliability.
 - Therefore, the NYISO recommends the topic of co-optimizing an attribute-based ICAP market with transmission security as one of the attributes as a top priority for further exploration.
- **The NYISO also recommends a Phase 2 project to co-optimize an attribute-based capacity market considering additional attributes leveraging the transmission security framework.**
 - This phase could support the objective to operate cohesively with the Energy and Ancillary Services markets to meet the reliability requirements of the evolving grid while delivering transparent and predictable market outcomes.
 - Expanding the attribute-based capacity pricing into a design framework/platform may provide the NYISO and stakeholders the ability to consider a wide variety of future ICAP market attributes and reliability services.

Improving Capacity Accreditation and Resource Adequacy Modeling

Improving Capacity Accreditation and Resource Adequacy Modeling

■ Overview

- This effort would explore adjustments to marginal capacity accreditation and resource adequacy modeling processes that may improve ICAP market stability, enhance transparency and predictability, and support more informed decision-making by market participants.
 - Adjustments could include, but are not limited to, adopting an alternative marginal capacity accreditation calculation, utilizing additional historical input data into the resource adequacy model, and further refining the LCR setting process.

Improving Capacity Accreditation and Resource Adequacy Modeling

- **Area for potential exploration: Adopting an alternative marginal accreditation calculation**
 - The current capacity accreditation factor (CAF) calculation can be sensitive to relatively small changes in the base Installed Reserve Margin (IRM)/LCR model used to calculate CAFs.
 - One driver of this sensitivity may be the use of loss of load expectation (LOLE) in the CAF calculation.
 - To reduce LOLE, an incremental resource needs to be able to remove all outages in a day. If the incremental resource only partially relieves an outage, that partial reduction is not reflected as a LOLE reduction.
 - Calculating CAFs based on expected unserved energy (EUE) may produce more stable and predictable CAFs because the EUE captures any reduction in outages from the incremental resource.
 - This effort would evaluate if adopting an alternative marginal accreditation calculation based on EUE could produce more stable and predictable CAFs.

Improving Capacity Accreditation and Resource Adequacy Modeling

- **Area for potential exploration: Utilizing additional historical input data in the resource adequacy model**
 - The resource adequacy model currently uses a rolling 5-years of historical performance data when modeling internal New York Control Area (NYCA) resources.
 - Rolling on and off a year of resource performance data impacts both the IRM and LCRs as well as CAFs.
 - Utilizing more years of historical performance data may decrease some of the year-to-year variability in the IRM, LCRs, and CAFs.
 - As part of this effort, the NYISO would work with the New York State Reliability Council to evaluate the use of additional historical input data in the resource adequacy model.

Improving Capacity Accreditation and Resource Adequacy Modeling

- **Area for potential exploration: Further refining the LCR setting process**
 - At the end of 2023, the NYISO brought forward a proposed design for a new LCR optimization function.
 - After additional testing, the NYISO became concerned with the performance of the new LCR optimization function and recommended a pause in the project.¹
 - This effort would restart the LCR Optimizer Enhancements project and evaluate any additional changes that may be needed to the LCR Optimizer and LCR setting process.

¹ See [3/26/2025 ICAPWG presentation](#)

Improving Capacity Accreditation and Resource Adequacy Modeling

■ NYISO Priority

- The NYISO is concerned that the complexity and limited visibility into the resource adequacy models may reduce transparency and predictability of market outcomes and limit the ability of the ICAP market to provide an economically efficient, durable and stable market structure to facilitate investment.
- Therefore, the NYISO recommends this topic as a top priority for further exploration.

Capacity Zone Redesign

Capacity Zone Redesign

■ Overview

- This effort would explore changes to the capacity zone design to improve NYCA system reliability by strengthening locational price signals and streamlining capacity zone-related processes by reducing unnecessary complexity.
 - Adjustments to the current zonal structure and processes may include, but are not limited to:
 - Exploring alternatives to the deterministic test used in the New Capacity Zone (NCZ) study.
 - Modifying the frequency and flexibility of changing zonal boundaries.
 - Restructuring the interrelationship and classification of capacity zones.
 - As part of this effort, the NYISO may also explore alternative approaches to procuring and valuing capacity locationally, without relying on a zone-based structure.

Capacity Zone Redesign

- **Area for potential exploration: Alternatives to the deterministic NCZ test**
 - Capacity zonal boundaries are determined based on the results of a deterministic deliverability test that uses a static set of assumptions and system conditions related to load, generation, transmission, imports and exports on the NYCA system.
 - A shift to a probabilistic approach, as recommended in the 2023 State of the Market Report,¹ may improve the identification of transmission constraints and lead to more efficient and responsive capacity zone boundaries. This may allow for a better reflection of real-world system conditions.
 - The MMU suggests incorporating the transmission topology analysis from the annual IRM study into the probabilistic assessment to help identify areas with potential intra-zonal constraints and provide more accurate capacity zone boundaries.

¹For an overview of the MMU's proposal, see [2023 State of the Market Report](#).

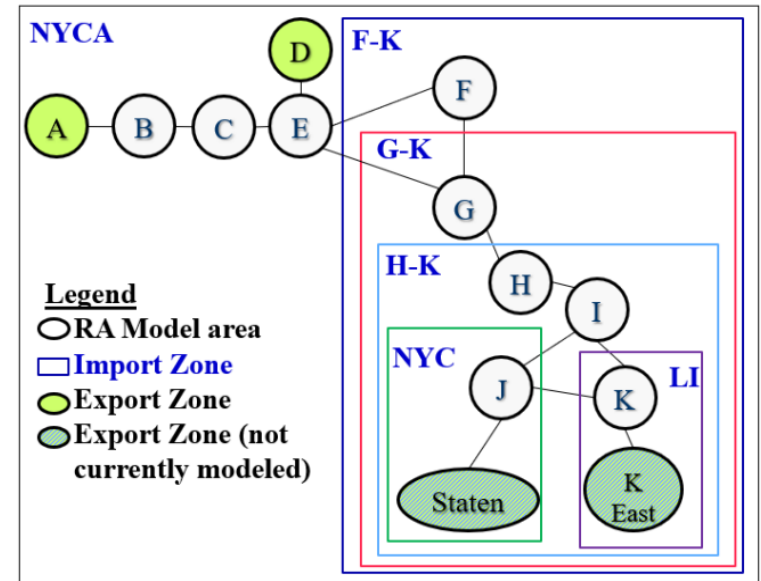
Capacity Zone Redesign

- **Area for potential exploration: Modifying the frequency and flexibility of changing zonal boundaries**
 - The current capacity zonal structure lacks a mechanism for removing existing zones and only permits the addition of new zones once every four years during the DCR process.
 - While the quadrennial NCZ study provides valuable long-term indicators for investment decisions, it may not fully capture the evolving NYCA system conditions in which a new capacity zone could be beneficial before the next study period.
 - As part of this exploration, the NYISO would (i) assess whether a more optimal zone-setting timeline may better balance the timely addressing of transmission needs with the maintenance of effective investment decision indicators and (ii) evaluate the benefits to locational price signals of modifying the zone-setting process to allow for zone elimination.

Capacity Zone Redesign

- **Area for potential exploration: Restructuring the interrelationship and classification of zones**
 - The current capacity zonal structure employs a nesting methodology, organizing capacity zones hierarchically with smaller, localized zones—each having its own procurement requirements and clearing prices—nested within larger regional zones.
 - In the 2023 State of the Market Report,¹ the MMU recommended that the NYISO further classify zones as either import- or export-constrained.
 - This classification may allow the NYISO to adapt ICAP requirements and demand curves based on zone type to more efficiently set price signals and address NYCA system reliability needs.

MMU's Illustration of Proposed Import and Export Zones



¹For an overview of the MMU's proposal, see [2023 State of the Market Report](#).

Capacity Zone Redesign

■ Priority

- The NYISO views the capacity zonal structure and zone-setting process as fundamental to establishing locational price signals. As a result, redesigning the capacity zones may incentivize efficient resource entry and exit to maintain NYCA system reliability.
- Therefore, the NYISO recommends this topic as a top priority for further exploration.

Next Steps

Next Steps

■ The NYISO plans to

- Return to the 4/9/2025 ICAPWG to further discuss the proposed DCR process and methodology improvements effort.
- Return to a mid April 2025 ICAPWG to further discuss the bifurcated ICAP market concept for new and existing resources.

Questions?

Appendix

Previous Presentations on CMSR

Date	Working Group	Topic/Link to Materials
1/22/25	ICAPWG/MIWG	<u>Project Kickoff</u>
2/4/25	ICAPWG/MIWG	<u>CMSR Sector Meeting Schedule</u>
2/25/25	ICAPWG/MIWG	<u>Review of Potential Methods for Evolving the ICAP Market Structure</u>
3/3/25	ICAPWG/MIWG	<u>CMSR Sector Meeting Feedback Summary</u>
3/26/25	ICAPWG/MIWG	<u>Capacity Market Structure Review</u>

Our Mission and Vision



Mission

Ensure power system reliability and competitive markets for New York in a clean energy future



Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation

