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Independent System Operator

Demand Curve Reset Process and Methodology Improvements Project Kickoff

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Previous ICAPWG Presentations

Date	Description
2025-01-22	Project Kickoff
2025-02-04	CMSR
2025-03-03	CMSR
2025-03-26	CMSR
2025-04-01	CMSR
2025-05-22	ICAP Demand Curve Reset Process and Methodology Improvements
2025-05-22	New Supply Analysis
2025-06-17	ICAP Demand Curve Reset Process and Methodology Improvements
2025-07-08	Capacity Zone Redesign
2025-07-08	Reliability-Based Attribute Capacity Pricing

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Agenda

- Today's Objective
- Status Update on the Capacity Market Structure Review (CMSR) Project
- Demand Curve Reset (DCR) Process and Methodology Improvements Project: Reasons for Prioritizing
- DCR Process and Methodology Improvements Project: Proposed Areas of Study
- Next Steps

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Today's Objective

- Provide an update on the results of the CMSR project
- Outline the scope of the DCR Process and Methodology Improvements project that has been prioritized for 2026.

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Status Update on Capacity Market Structure Review Project

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Background

- **The CMSR has prioritized four projects as areas for potential ICAP market improvement:**
  - Winter Reliability Capacity Market Enhancements (on going effort)
  - ICAP Demand Curve Reset Process and Methodology Improvements
  - Reliability-Based Attribute Capacity Pricing
  - Capacity Zone Redesign
- **The Winter Reliability Capacity Market Enhancements project is a market design proposal that has been developed in parallel with the CMSR. Its objective is to develop potential changes to the ICAP market that support efficient market outcomes as the New York Control Area (NYCA) trends towards increasing winter resource adequacy risk.** See 11/20/2025 MC presentation.
  - The 2025 project goal is Market Design Complete.
  - The NYISO is targeting a Q1 2026 filing to FERC of any proposed tariff revisions approved by stakeholders and the NYISO Board of Directors. The target implementation date is May 1, 2027 for the 2027-2028 Capability Year.

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Prioritized CMSR Projects

- **The DCR Process and Methodology Improvements project has been prioritized for 2026 for its potential to achieve all the CMSR objectives.[1]**
  - The NYISO has proposed to move forward with this project expeditiously because any proposed changes to the DCR process must happen within the 4-year reset cycle before the 2029 Demand Curve Reset process begins.
- **The Reliability Attribute-Based Capacity Pricing and Capacity Zone Redesign projects have been prioritized for their potential to achieve many of the CMSR objectives.[2] These projects will commence after the completion of the first two projects, Winter Reliability Capacity Market Enhancements and DCR Process and Methodology Improvements, that are on more time-sensitive schedules.**
    - Note: If one or both of the first projects is implemented, the potential impact on the ICAP market may change the issue statements of the Reliability Attribute-Based Capacity Pricing and Capacity Zone Redesign projects.

[1] See Slide 21.
[2] See id.

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DCR Process and Methodology Improvements Project: Reasons for Prioritizing

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DCR Process and Methodology Improvements Project: Reasons for Prioritizing

- **The DCR Process and Methodology Improvements project satisfies all the CMSR objectives. See Slide 21.**
- **This project has the potential to deliver transformational changes to the ICAP market in the face of evolving grid conditions.**
  - Improving the DCR methodology aims to enhance market efficiency and price signals.
  - Improving the DCR process aims to support transparency and confidence in market outcomes.

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Addressing Stakeholder Feedback

- **Stakeholder Feedback on the existing DCR process and methodology:[1]**
  - The DCR process is administratively complex and requires significant stakeholder effort with an extensive learning curve.
  - Price signals are not adequate for new investment when the ICAP Demand Curve anchors vary greatly from one reset to another.
  - The current methodology does not properly value a resources' reliability contribution and provides insufficient consideration of long-term reliability impacts.
  - The proxy unit's selection does not reflect realistic market entry.
- **The DCR Process and Methodology Improvements project seeks to address these concerns by considering the following:**
  - A streamlined DCR process to reduce contentious debates and the administrative burden for new entrants especially.
  - An improved process for anchoring demand curves to enhance the ability to forecast market outcomes.
  - An enhanced methodology for constructing demand curves with changes to curve shapes and slopes to improve locational compensation for a resource's reliability contribution.
  - Further refinements in categorizing the cost of new entry to incent the attraction and retention of resources with reliability attributes.

[1] This feedback was provided to the NYISO during CMSR ICAPWG discussions and sector meetings held in Q 1 2025. See 2/4/2025 and 3/3/2025 ICAPWG presentations.

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DCR Process and Methodology Improvements Project: Proposed Areas of Study

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DCR Process and Methodology Improvements Project: Proposed Areas of Study

- **The NYISO has identified four key areas for potential enhancements and further exploration with stakeholders:**
  1. Proxy Unit Definition
  2. Net Cost of New Entry (CONE) Estimates
  3. DCR Process Enhancements
  4. ICAP Demand Curve Shape and Slope

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Area of Study: Proxy Unit Definition

- NYISO seeks feedback from stakeholders on refining the current tariff definition of the peaking unit to incorporate reliability attributes that assist the NYCA in meeting its system needs.
- NYISO is considering refinements that clarify certain minimum operating characteristics a technology should possess to be eligible for consideration as the peaking unit for establishing the ICAP Demand Curves rather than prescribe a specific technology type(s).
- Specifically, the NYISO seeks feedback from stakeholders on adding the following considerations to the current peaking unit screening criteria:
  - Ability to assist in resolving transmission security needs and responding to reliability-driven dispatch.
  - Ability to provide existing Operating Reserves.
  - Ability to meet reliability needs reflected in the Capacity Accreditation Factor, i.e., firm fuel.

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Area of Study: Net CONE Estimates

- **The NYISO is considering if there is an opportunity to restructure the development of net CONE to improve predictability, transparency, and economic efficiency of the ICAP Demand Curves.**
- **The NYISO seeks stakeholder feedback on potential areas for improvement that include:**
  - Moving to the development of "long-run" gross CONE estimates.
    - Pro: A long-run gross CONE estimate incorporates data from years of previous DCRs, which may provide stability to CONE anchors and increase the ability to forecast future ICAP market outcomes.
    - Con: A long-run gross CONE estimate would maintain stale cost estimates for longer than the current 4-year cycle, which would anchor the ICAP demand curves on estimates that may no longer represent current market conditions.
  - Adjusting the net Energy and Ancillary Services (EAS) revenue offset calculation to compliment any corresponding changes to gross CONE and consider additional years (both historic and future) to the current 3-years of EAS revenues.

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Area of Study: DCR Process Enhancements

- Although the NYISO is evaluating a shift toward a more technology-agnostic approach for determining net CONE, periodic reviews of underlying assumptions and methodologies would remain important.
- The NYISO is considering a streamlined periodic review process to provide an opportunity for reviewing underlying assumptions and the basis for annual adjustments so that the curves remain aligned with market conditions and expectations over time.
- The NYISO seeks stakeholder feedback on potential enhancements that would seek to leverage the existing annual update process for formulaically adjusting certain values over time such as:
  - Inflationary indices or other cost trend-tracking publications (e.g., the Handy-Whitman Index) leveraged to adjust a long-run gross CONE's estimates annually.
  - Updates to certain financial parameters through tracking year-to-year changes in certain key market indicators.
- The NYISO also seeks stakeholder feedback on conducting such reviews less frequently than every four years to be less burdensome.

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Area of Study: ICAP Demand Curve Shape and Slope

- **The NYISO is considering exploring the modification of the current ICAP Demand Curve shapes and slopes to better reflect differing market and system conditions across capacity regions.**
- **The existing linear demand curves apply a "one size fits all" approach, which may not be appropriate given the diversity in reliability needs and market dynamics in various regions of New York.**
  - Improvements to the existing curves can provide for better alignment with the potential reliability value of additional capacity beyond minimum requirements.

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Area of Study: ICAP Demand Curve Shape and Slope (cont.)

- **The NYISO anticipates exploring the following aspects of the ICAP demand curves:**
  - Shape – the current linear shape may not optimally reflect the marginal reliability value of additional capacity and thus can cause consumers to be over or under paying for capacity.
  - Zero Crossing Point (ZCP)– The current ZCPs were largely established decades ago and may not be indicative of reliability needs or the value of incremental capacity.
  - Level of Excess – This value is currently set by the size of the proxy unit (200 MW for the 2025-2029 reset period). However, this limited margin beyond minimum requirements can create a scenario where market exit could lead to the inability to meet reliability requirements (particularly in Localities).
- **Early modeling of potential alternative ICAP Demand Curve shapes has shown significant potential improvement in capacity valuation and potential savings for consumers.**

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Next Steps

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Next Steps

- Target presenting the CMSR draft Issue Discovery Report at the 12/16/2025 ICAPWG meeting.
- Return to a future ICAPWG meeting with a detailed proposal of initial market designs enhancements for consideration in the DCR Methodology and Process Improvements project.

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Appendix: CMSR Objectives

CMSR Objectives

- **The NYISO's objectives for the 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.

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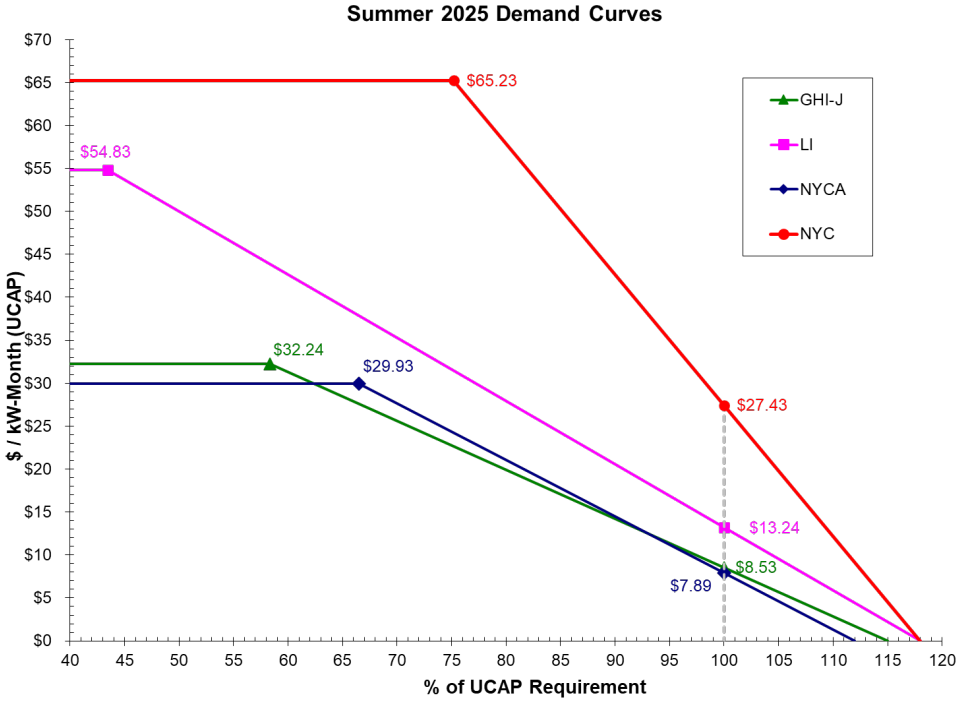
Appendix: Demand Curve Shapes 5/22/2025 ICAPWG

Overview

- 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.



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Overview (cont.)

- **Alternatives to explore could include leveraging a marginal reliability improvement (MRI) curve, such as used in ISO-NE and MISO and proposed for use in PJM, or a kinked curve, such as used in PJM currently.**
  - While these alternatives may more accurately value resources according to their contribution to reliability, they may also pose price predictability risks and increased investment risk due to steeper slopes.
    - These risks may vary by season and will need to be further evaluated when considering these alternatives

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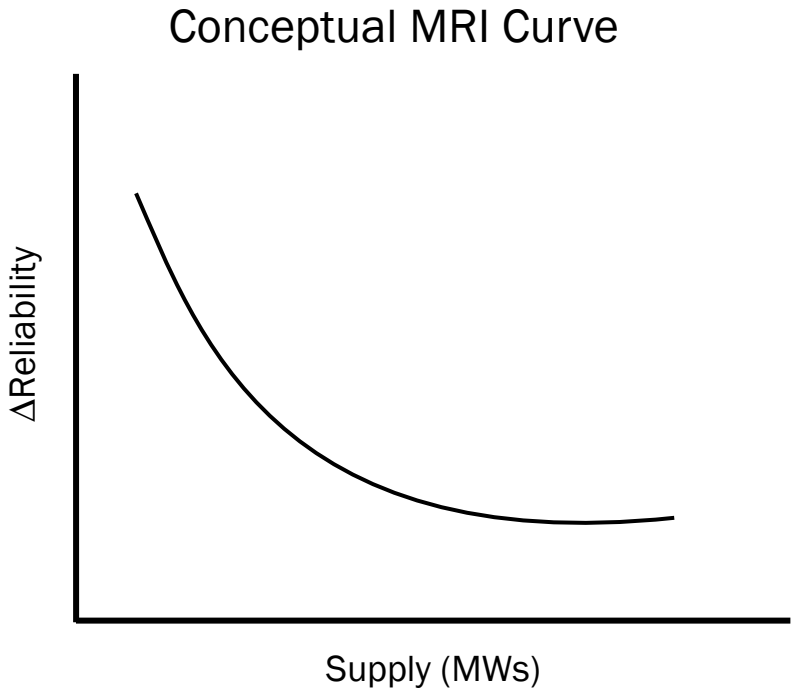
MRI Demand Curve - Overview

- **MRI Curve (used to derive an MRI Demand Curve)**
  - As supply is added to a system, the marginal reliability benefit provided by the next increment of supply decreases, producing a downward sloping convex MRI curve
    - Thus, as supply is added to the NYCA system, it has decreasing reliability value. This is reflected as a lower capacity price as supply increases using an MRI demand curve



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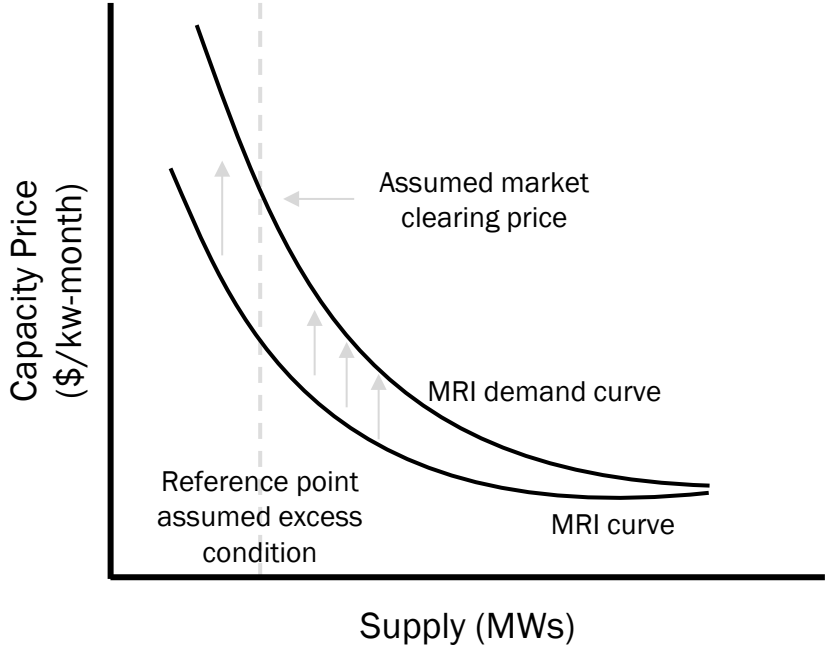
MRI Demand Curve – Overview (Cont.)

- **MRI Demand Curve**
  - An MRI demand curve can be produced by multiplying each MRI point on an MRI curve by a scaling factor
    - The scaling factor can be calculated by dividing the capacity price at the reference point assumed level of excess condition, as defined in MST 5.14.1.2.2, for the applicable season by the MRI at that supply condition
      - This ensures the peaking plant underlying the ICAP Demand Curve continues to be revenue sufficient when moving to an MRI demand curve

Conceptual MRI Demand Curve



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NYCA and Locality MRI Demand Curves

- **To help evaluate the potential use of MRI demand curves, the NYISO has developed example MRI curves for NYCA and the Localities utilizing the 2025-2026 Locational Minimum Installed Capacity Requirement (LCR) study model in GE MARS**
  - MRI curves were developed by adding increments of capacity to the at-criteria model and measuring the resulting Loss of Load Expectation (LOLE) and Expected Unserved Energy (EUE)
    - Other methodologies could be considered for creating MRI curves
- **The MRI curves were translated into seasonal MRI demand curves using seasonal scaling factors**
  - The scaling factor for each curve was calculated by dividing the market clearing price at the reference point assumed level of excess condition, as defined in MST 5.14.1.2.2, by the implied MRI at the reference point assumed excess condition for each season
    - The implied MRI was calculated by linearly interpolating between the MRIs on either side of the reference point assumed excess condition

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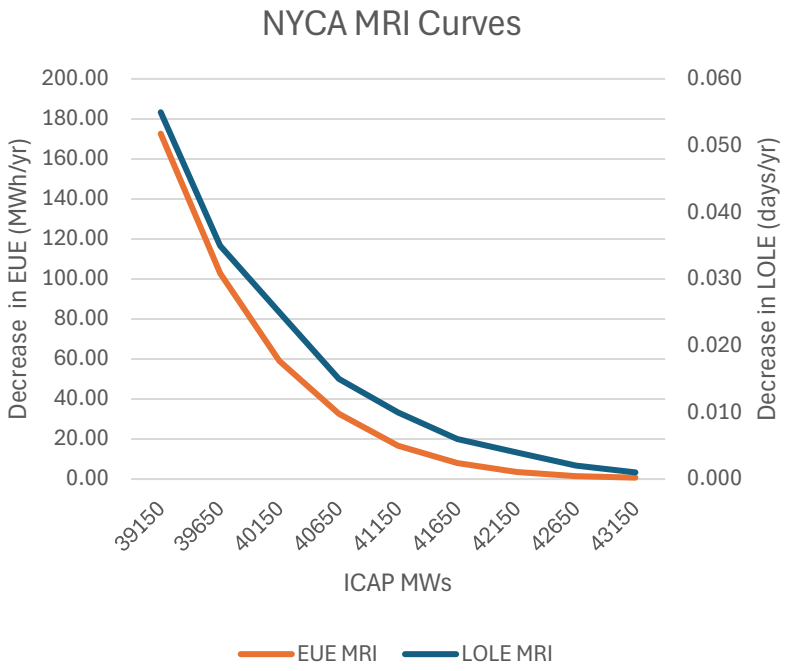
Example NYCA MRI Curve

ICAP (MW)	Capacity Adjustment (MW)	LOLE (days/yr)	- Δ LOLE (days/yr) per 500 MW [LOLE MRI]	EUE (MWh/yr)	- Δ EUE (MWh/yr) per 500 MW [EUE MRI]
38,148	-1000	0.231		675.9	
38,648	-500	0.155	0.076	398.7	277.20
39,148	0	0.100	0.055	226.1	172.61
39,648	500	0.065	0.035	123.2	102.89
40,148	1,000	0.04	0.025	64.1	59.10
40,648	1,500	0.025	0.015	31.4	32.70
41,148	2,000	0.015	0.010	14.7	16.70
41,648	2,500	0.009	0.006	6.7	8.00
42,148	3,000	0.005	0.004	3.2	3.50
42,648	3,500	0.003	0.002	1.7	1.50
43,148	4,000	0.002	0.001	1	0.70



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Example NYCA MRI Demand Curve Scaling Factors - LOLE

- **2025 Summer Demand Curve**

Reference Point Assumed Excess Condition (%)[1]	(a)	100.52%
ICAP Requirement (MW ICAP)	(b)	39,148
Reference Point Assumed Excess Condition (MW ICAP)	(c) = (a)*(b)	39,351
Assumed Capacity Price ($/kW-month ICAP) [2]	(d)	$5.48
Implied LOLE MRI per 500 MW ICAP (days/year) [3]	(e)	0.047
LOLE Scaling Factor	(f) = (d)/(e)	116.9

- **2025-2026 Winter Demand Curve**

Reference Point Assumed Excess Condition[4]	(a)	103.82%
ICAP Requirement (MW ICAP)	(b)	39,148
Reference Point Assumed Excess Condition (MW ICAP)	(c) = (a)*(b)	40,648
Assumed Capacity Price ($/kW-month ICAP) [2]	(d)	$2.95
Implied LOLE MRI per 500 MW ICAP (days/year) [3]	(e)	0.015
LOLE Scaling Factor	(f) = (d)/(e)	196.7

[1] Equal to "Level of Excess" for the applicable capacity zone from the 2025-2026 ICAP Demand Curve Parameters
[2] See Assumed Capacity Prices at Tariff Prescribed Level of Excess Conditions" for the applicable capacity zone from the 2025-2026 ICAP Demand Curve Parameters
[3] Calculated by linear interpolation using NYCA LOLE MRI curve
[4] Equal to "Level of Excess" plus "Ratio of Winter to Summer DMNCs" for the applicable capacity zone from the 2025-2026 ICAP Demand Curve Parameters

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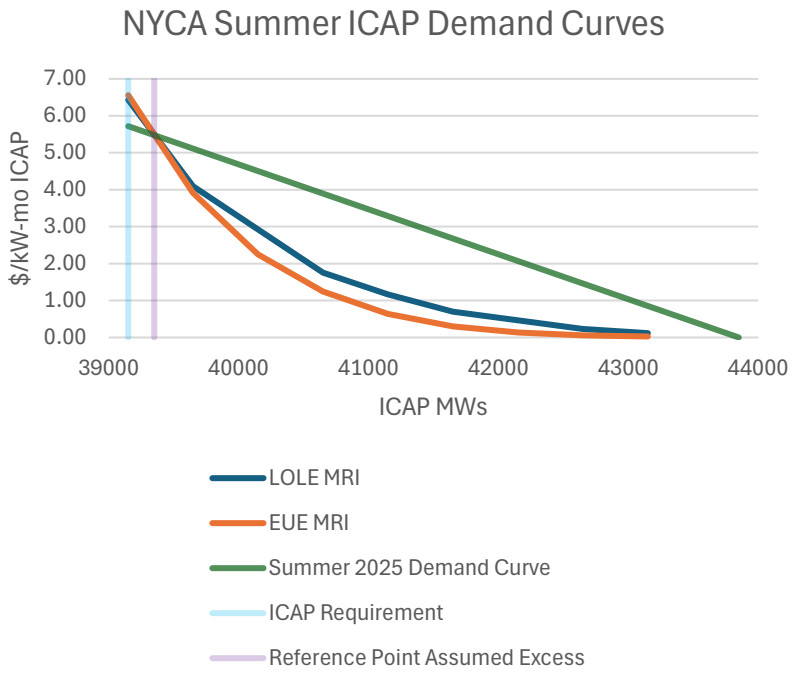
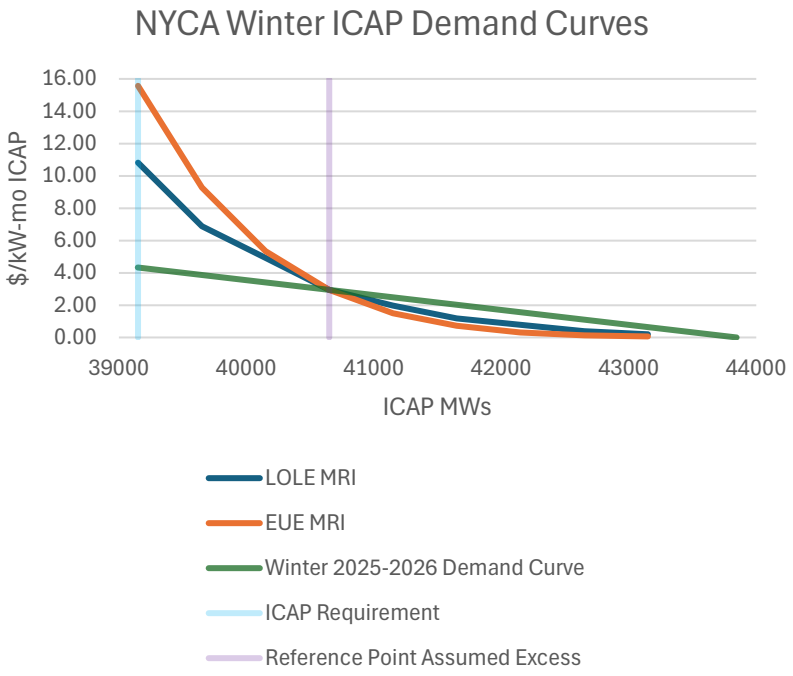
Example NYCA MRI ICAP Demand Curves





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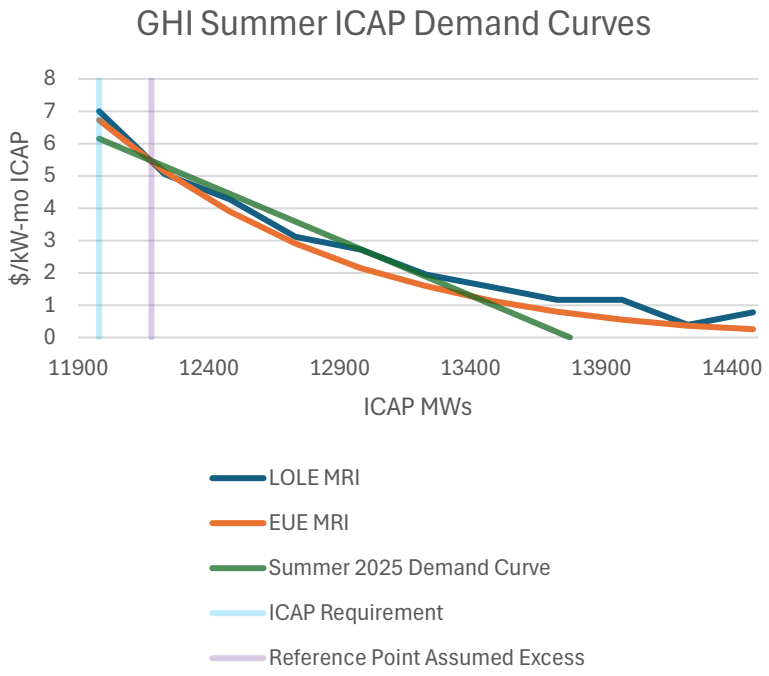
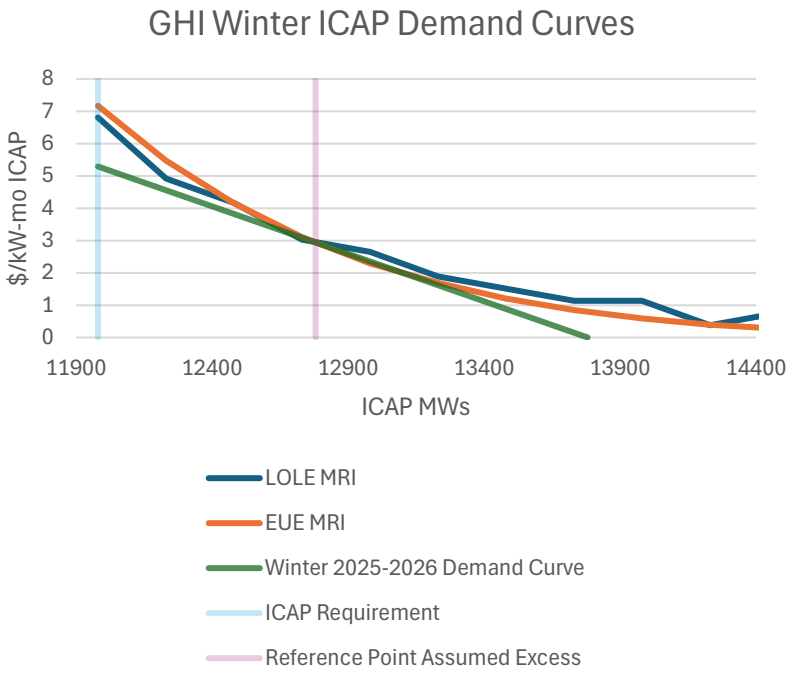
Example GHI MRI ICAP Demand Curves





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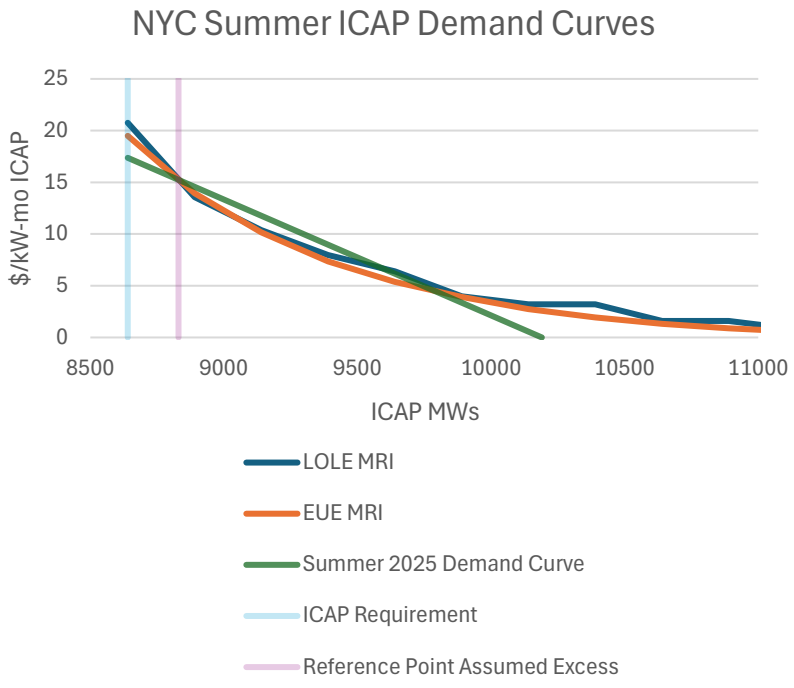
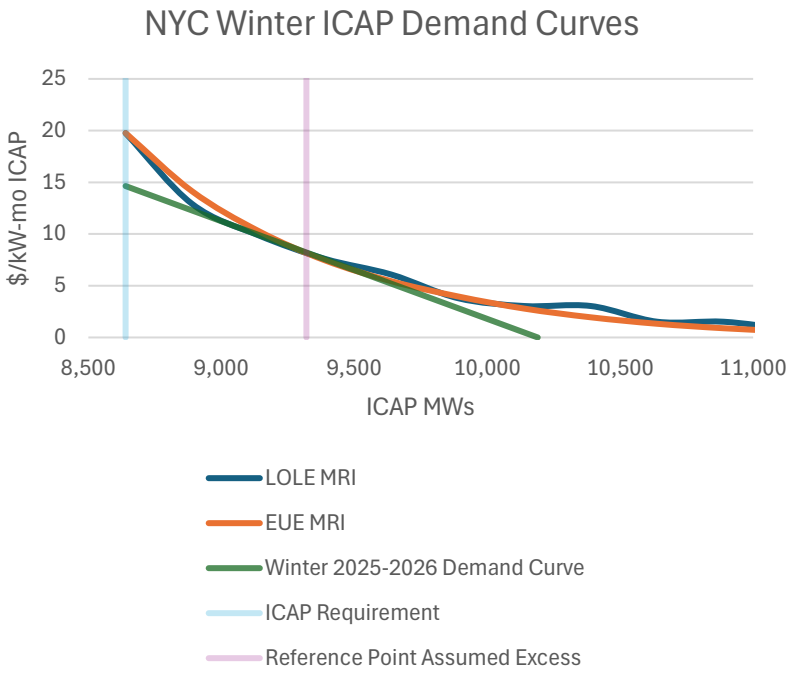
Example NYC MRI ICAP Demand Curves





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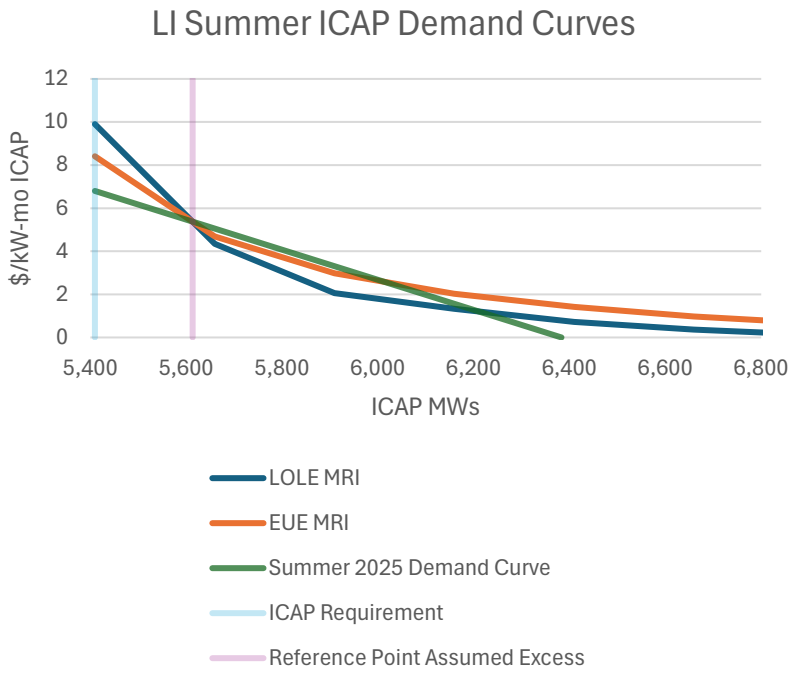
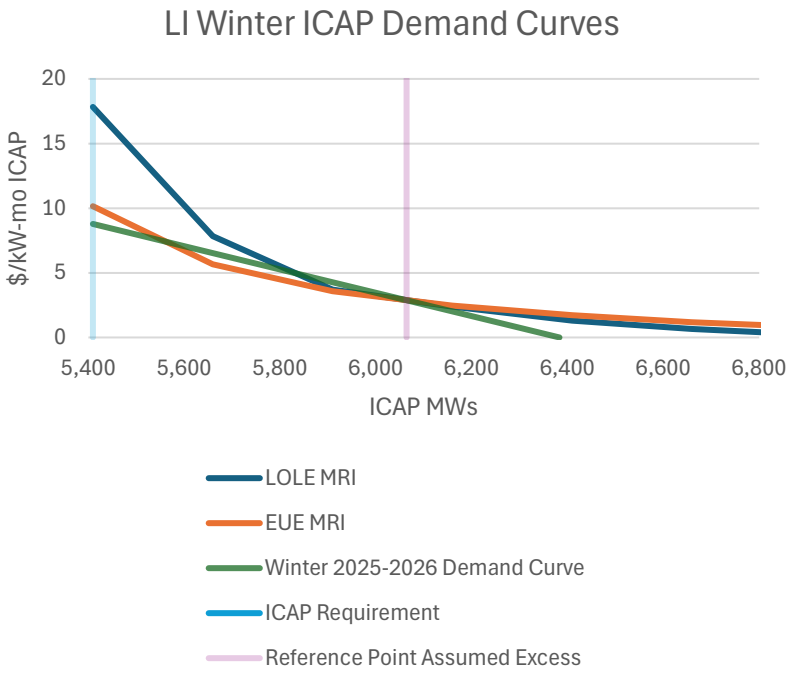
Example LI MRI ICAP Demand Curves





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MRI Demand Curve – Considerations and Further Evaluation

- **An MRI demand curve may more accurately value resources according to their reliability contribution by explicitly tying capacity prices to the marginal reliability improvement provided by resources.**
  - This could help the ICAP Demand Curves provide more efficient and transparent price signals for resource entry and exit based on the system's resource adequacy needs
- **However, MRI demand curves typically measure reliability improvement solely through improvement in LOLE or EUE.**
  - There may be additional reliability elements that should be captured in the shape and slope of the ICAP Demand Curves in order for the curves to continue to provide efficient incentives for resources to participate in the ICAP market during all months of the year
- **Before adopting an MRI demand curve in the ICAP market, the NYISO would need to consider how to measures MRI, supply side mitigation impacts, price stability impacts, and interactions with other ICAP market design changes such as enhancements resulting from the Winter Reliability Capacity Enhancements project.**

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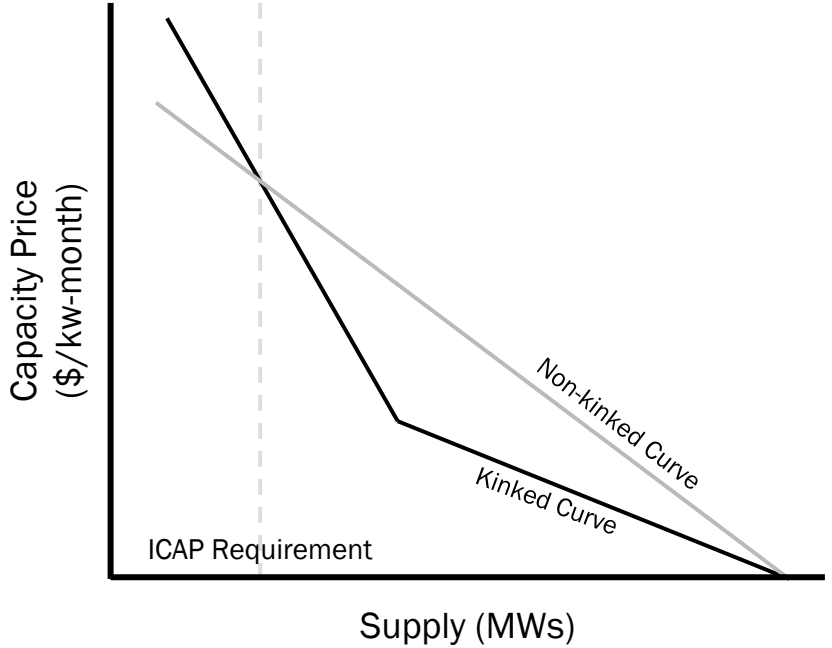
Kinked Demand Curves

- **A kinked demand curve is comprised of multiple downward sloping segments with different slopes**
  - Can be concave or convex
  - PJM has utilized a kinked demand curve in its capacity market since 2006
- **Convex kinked demand curves can be used to**
  - Approximate MRI demand curves
  - Provide price stability in the flatter portions of the curve
  - Mitigate over-procurement risks in the face of net CONE uncertainty when the slope is steeper near the reference point

Figure 4: Conceptual Convex Kinked Demand Curve



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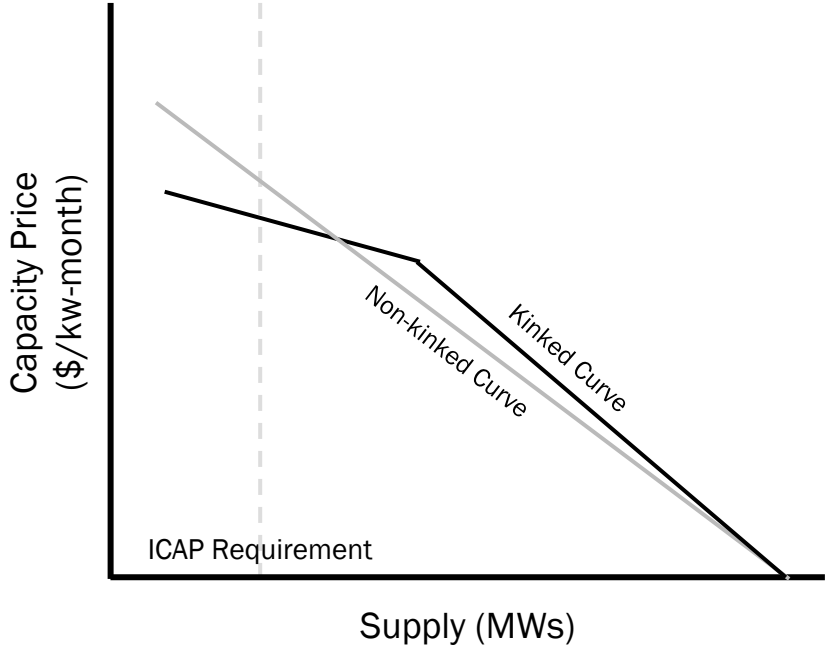
Kinked Demand Curves (cont.)

- **Concave kinked demand curves can be used to**
  - Reduce the reference point price by reducing the impact of the level of excess adjustment
  - Provide price stability in the flatter portions of the curve
- **NERA Economic Consulting (NERA) evaluated a convex kinked demand curve as part of the 2008-2011 and 2011-2014 DCRs**
  - NERA noted the potential price stability advantages of a kinked demand curve but did not recommend a kinked demand curve during those DCRs due to market power and regulatory risk concerns

Conceptual Concave Kinked Demand Curve



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Kinked Demand Curves – Considerations and Further Evaluation

- **Before adopting a kinked demand curve in the ICAP market, the NYISO would need to consider and evaluate:**
  - The appropriate point(s) at which the curve should be kinked
  - Price stability and market power concerns related to the steeper sections of the curves
  - Whether the zero-crossing point should be moved
  - Potential interactions with other ICAP market design changes such as enhancements resulting from the Winter Reliability Capacity Enhancements project

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Changing the ICAP Demand Curve Shapes and Slopes – Considerations

- Ultimately, direct adoption of an MRI demand curve or kinked curve may not be desirable when considering price predictability and transparency impacts.
- However, elements from an MRI curve or kinked curve could be utilized to better inform the shape and slope of the current linear demand curves in an effort to incent reliability at an efficient level for consumers.

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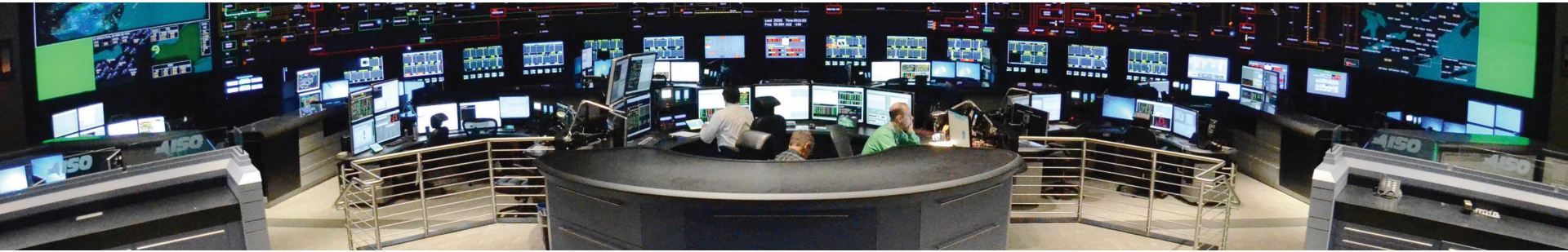
Our Mission and Vision

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



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