New York ISO
Independent System Operator

Winter Reliability Capacity Enhancements

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ICAPWG

August 13, 2024

Agenda

- Review Current Capacity Market Construct
- Evaluate market design features that could be updated or impacted by a more seasonally differentiated capacity market
- Solicit Stakeholder Feedback
- Next Steps

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Project Objective

- **This is an Issue Discovery project with the objective of identifying potential market impacts associated with a change to a winter-peaking/winter-risk system and the potential change to fully seasonal capacity markets**
  - The broader objective is to ensure the capacity market provides correct price signals all year as the power system evolves
  - The deliverable for this project will be a report and presentation delivered at a Q4 ICAPWG
- **This project will not be assessing the IRM model used to determine the ICAP requirement**
  - The NYSRC has separate initiatives to enhance the resource adequacy model to better account for winter reliability risks

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General Principles

- **Capacity Markets should provide efficient price signals for resources to be available at periods of highest system risk**
  - Resources should have the opportunity to be compensated based on their value to resource adequacy, whether the risk is capacity adequacy (MW) or energy adequacy (MWh)
  - Market inefficiencies may occur when capacity requirements are set based upon assumptions that do not align with the actual supply available in the auctions
- **The Capacity Markets should be transparent, predictable and stable for all time horizons**
  - Capacity is a forward product that should provide a signal for advanced commitment of resources
  - Market prices should reliably provide revenue adequacy for the proxy unit at the prescribed level of excess conditions

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Previous Discussions

Date	Working Group	Discussion Points and Links to Materials
February 7, 2024	ICAPWG	Winter Reliability Capacity Enhancements: Kick Off: https://www.nyiso.com/documents/20142/42807168/Winter_Reliability_Kick-Off_2.7.2024_ICAPWG.pdf/ba06ad1e-daff-c112-247d-7320a1a29b82
March 25, 2024	ICAPWG	Winter Reliability Capacity Enhancements https://www.nyiso.com/documents/20142/43716772/Winter_Reliability_March25_ICAPWG.pdf/ab3080ea-0caa-36a9-a99b-465123321420

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Review of Current Capacity Market Construct

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Review of Current ICAP Market

- **The ICAP market utilizes a Capability Year construct that begins May 1, and continues through April 30 of the following year**
  - Summer Capability Period (May 1 - October 31)
  - Winter Capability Period (November 1 - April 30)
- **Current ICAP market includes both annual and seasonal elements**
  - Seasonal elements include Seasonal DMNC and Peak Load Window, UCAP translation, derating factors, EFORd and demand curves
- **There is a single ICAP requirement applicable to an entire Capability Year (*i.e.*, it applies to both the Summer and Winter Capability Periods) that is based on forecasted annual peak load, which currently occurs in the Summer**

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Adapting to Changing Seasonal Risk

- **System resource adequacy risk, measured in loss of load expectation (LOLE), is currently concentrated in the Summer**
  - In IRM modeling, 98% of Loss of Load Event Days are in July and August
    - As modeled, no LOLE event days in the Winter
  - The NYSRC is evaluating changes to the IRM setting process, such as the modeling of winter fuel constraints, that may show increased winter risk
- **Anticipated changes to supply and load expected to increase winter risk***
  - New York may require three times the capacity of the current generation fleet to meet projected future electricity demands
  - Electric energy consumption is projected to increase significantly in response to the economic development and decarbonization energy policies

**2023-2024 System & Resource Outlook Study*

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Seasonal Capacity Market Considerations

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Annual ICAP Requirement

- **Determining the ICAP requirement is an annual process that sets an annual requirement**
  - Determined based on the annual forecasted peak load and annual Installed Reserve Margin (IRM) set by the NYSRC
- **The assumptions used in the IRM model are mostly based on summer conditions**
- **Improved modeling of winter risk is being evaluated by the NYSRC**
  - Updates to the modeling may include reflecting winter fuels constraints, winter peak loads and load profiles and winter transmission limits

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LCR Process

- **The NYISO uses the NYSRC-approved IRM data as the basis for determining annual locational capacity requirements (LCRs)**
  - The NYISO also respects the NYSRC-approved IRM value when setting the LCRs
- **LCR model uses the same inputs as the IRM model, and adds the following:**
  - Transmission Security Limits based on (summer) system topology
  - Net CONE curves are developed for the LCR optimizer to find the least-cost mix of supply, subject to limits
- **LCR model becomes the basis for capacity accreditation and (summer) peak load window**

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IRM/LCR Model Inputs

- **GE MARS model used for LCR evaluates 8,760 hours and can show winter risk**
  - However, those risks may be understated if the assumptions are inaccurate
- **IRM/LCR model mostly relies on summer values**
  - A winter peak load forecast is published but not modeled with the same fidelity as summer forecast
  - System topology and limits based on summer peak conditions
  - One forced outage rate (EFORd) is used for each generator for the whole year
- **IRM/LCR model uses both summer and winter ICAP values for resources**
  - Minimum of CRIS and DMNC for each generator
- **External Resources**
  - Annual External deliverability test
  - Annual UDR and EDR elections

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Capacity Accreditation

- **Accreditation is an annual process**
  - Resource Class Assignments (CARCs)
  - Capacity Accreditation Factors (CAFs)
  - Peak Load Window
- **Individual CAFs based on LOLE differential when adding a resource**
- **Under current construct, winter CAFs could only be considered if there is winter LOLE**

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Peak Load Window

- Established to capture hours of the day with the highest probability of experiencing a loss of load event
  - Summer and Winter hours
  - Posted by March 1 preceding the Capability Year
- Used in the determining the bidding requirements for Resources with Energy Duration Limitations, and the resource specific derating factors for intermittent and Limited Control RoR resources
- Winter PLW to be updated after winter modeling approaches are incorporated into the IRM/LCR model

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Deliverability

- **Interconnecting resources must be studied for deliverability to receive Capacity Resource Interconnection Service (CRIS)**
  - The deliverability test methodology uses summer peak load conditions, and is the basis for Summer CRIS and Import Rights
  - Winter CRIS is calculated as the product of Summer CRIS and the ratio of winter/summer Maximum Net Output

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External Capacity Purchases and Sales

- **Annual UDR elections**
  - Assumed to provide the same amount of capacity in all months of the capability year when setting the IRM and the Winter-Summer Ratio (WSR)
    - Except in the first month for UDRs from an External Control Area with a dissimilar capability year
- **Deliverability and import capacity limits are modeled using summer ratings**
  - Consistent with IRM model
- **External CRIS**
  - Bilateral supply contracts must be for all months of the Summer Capability Period, but need not include any of the Winter Capability Period

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ICAP Demand Curves

- **Demand curve reference points are set to recover the Annual Revenue Requirement of the proxy unit when at the prescribed level of excess**
  - Winter-Summer Ratio designed to adjust the reference point price to account for differing levels of capability available in each season
- **To better account for winter risk, it may be necessary to change the process for setting reference values**
  - Consider whether WSR is required in a market with distinct seasonal assumptions

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Capacity Market Mitigation

- **Current Supply-Side Mitigation (SSM) rules require Suppliers to have a must-offer obligation and an offer cap**
  - Each month, at the close of the certification period, the NYISO will determine if a Market Party and its Affiliate Entities (together, a "portfolio") are Pivotal Suppliers
  - To be a Pivotal Supplier, at least a portion of the suppliers' resources under common control are needed to meet the ICAP requirement in the Mitigated Capacity Zone
- **For any change to seasonality of capacity markets NYISO will need to consider whether changes should be made to SSM**
  - The purpose of SSM is to mitigate the effects of Market Participants with sufficiently large portfolios that have an incentive to withhold capacity to raise prices and increase portfolio-wide capacity revenue

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Allocation of ICAP Obligations to Load

- Transmission Districts annually assigned ICAP obligations based on annual peak load share
  - Transmission Owners and municipal electric utilities allocate ICAP tags to load
  - Single coincident peak hour occurring in July or August
- Expanding Peak Hours project proposing to assign ICAP based on more hours than the single coincident peak, but retain July – August restriction
- In a seasonal capacity market, a seasonal ICAP tag would provide a more efficient price signal to load

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Next Steps

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Next Steps

- Return to an ICAPWG to continue discussions and a draft report
- For any questions or comments please email mswider@nyiso.com

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Project Timeline

- **Q2-Q3**
  - Identify, review and research issues
  - Receive feedback from stakeholders
- **Q3-Q4**
  - Assess stakeholder feedback and finalize Issue Discovery report/presentation

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Appendix – Seasonal Demand Curves

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Seasonal Demand Curves

- The NYISO determines reference prices for demand curves based on the net CONE for a hypothetical new supply resource
- Historically, the NYISO has established annual demand curves that apply for the duration of each Capability Year. Beginning with the 2025/2026 Capability Year, the NYISO will establish seasonal demand curves that will apply for each Capability Period encompassed by a Capability Year
- The recent enhancements for the annual net CONE values to monthly values explicitly account for the differences in reliability risk in the summer and winter periods
  - The translation of annual values to monthly values also accounts for seasonal differences in the amount of capacity available to the market based on a ratio of the average historical value of capacity available during each season

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Seasonal Demand Curves (cont.)

- **Beginning with the demand curves applicable for the 2025/2026 Capability Year the translation of the annual values to monthly values in establishing the parameters of the demand curves will explicitly account for seasonal reliability risks**
  - Seasonal reliability risk quantified as the percentage of loss of load risk attributed to each Capability Period as identified from the results of the preliminary base case model approved by the New York State Reliability Council, L.L.C. ("NYSRC") for determining the NYCA Installed Reserve Margin for the Capability Year to which the demand curves apply
- **Enhancements also establish limits on the portion of the annual gross and net CONE values that can be allocated to each Capability Period as part of determining seasonal demand curves**
  - For the 2025-2029 period, the maximum allowable apportionment to one Capability Period is limited to no greater than 65% with a corresponding minimum allowable apportionment of 35%
  - The maximum and minimum allowable allocations to each Capability Period will be reviewed as part of each quadrennial review beginning with the 2029-2033 DCR
- **Changes approved by FERC in February 2024**
  - FERC Order (ER24-701-000)

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Our Mission & 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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