New York ISO
Independent System Operator

Granular Capacity Zones

Nikolai Tubbs, Associate Market Design Specialist,
Capacity Market Design

ICAPWG

August 29, 2024

Recap of last ICAPWG Presentation and Today's Meeting Objectives

- **At the last Installed Capacity Working Group (ICAPWG), the NYISO provided an overview of the New Capacity Zone (NCZ) Study (NCZ Study) framework and highlighted stakeholder concerns with the NCZ Study's framework.**
- **Today's meeting objectives:**
  - Discuss the purpose of the capacity market and the historic rationale for the current NYISO ICAP Market zonal structure, focusing on the principles used to determine new zonal boundaries.
  - Identify market constructs that may be impacted by more granular capacity zones.

New York ISO

Agenda

- Purpose of NYISO's ICAP Market
- Rationale for Current NYISO ICAP Market Zonal Structure and Principles Used to Determine New Zonal Boundaries
- Open Questions
- Next Steps
- Appendix
  - Project Timeline and Overview
  - Concerns Potomac Economics Identified in the NCZ Study
  - Previous Discussions

New York ISO

Purpose of the NYISO ICAP Market

New York ISO

Purpose of the NYISO ICAP Market

- **Benefits**
  - Maintains resource adequacy (RA)
  - Provides resources the opportunity to recover a portion of fixed costs
  - Provides market signals for investment (focus of this discussion)
- **Market signals for investment**
  - Potential Investors gain information such as:
    - Is it worth building a new plant?
    - Do I have the technology to build a plant that is competitive?
    - Where should I build a new plant?
- **For Discussion: How does the zonal structure of the current NYISO ICAP Market create the appropriate market signal (*i.e.*, what information, when acted upon by potential investors, promotes a robust capacity market)?**

New York ISO

Rationale for Current NYISO ICAP Market Zonal Structure and Principles Used to Determine New Zonal Boundaries

New York ISO

Rationale for Current NYISO ICAP Market Zonal Structure: Reliability Support

- Capacity zones identify electrical locations within the New York Control Area (NYCA) within which a minimum level of ICAP must be maintained.
- Creating capacity zones sends market signals that additional capacity will provide reliability benefits within the zone.
- Creating capacity zones based upon clear and transparent criteria establishes predictable, future market conditions.

New York ISO

Principles Used to Determine New Zonal Boundaries

- **The boundaries of any capacity zone are determined based on the ability of existing resources within the zone to meet the reliability needs of the zone in the near to intermediate future (e.g., five years).**
- **If the existing resources within a given zone are unable to satisfy the reliability needs of the zone, additional capacity must be imported.**
  - When interface constraints bind, capacity from outside the zone is unable to enter, increasing Loss of Load Expectation (LOLE) risk.
- **New capacity zones are determined based on the ability of existing generation within a zone to meet reliability needs considering available imports.**
  - If there is not enough capacity within the zone to maintain reliability, and interface constraints prevent importing the remaining MWs to avoid a LOLE, a new capacity zone sends a signal for new investment in generation within that location.

New York ISO

Principles Used to Determine New Zonal Boundaries

- **Example: 2013 Addition of the G-J Locality**
  - The impetus for creating G-J Locality was a binding Upstate New York – Southeastern New York Interface that limited capacity from being delivered to Zones G-K.
    - Depressed capacity prices resulted in generator retirements in Zones G and H; these retirements ultimately translated into higher Locational Capacity Requirement (LCR) values for Zones J and K.
  - Whether to include Zone K illustrates the principles used to determine new zonal boundaries.
    - Zone K was not included because existing export constraints (Zone K to Zone J) provided limited reliability benefits.
      - The ability of one zone's capacity to be fungible with that of another is an important criterion for creating an adequate boundary (i.e., how does the transfer of capacity from one zone to another affect total LOLE).
        - Zone K was much less fungible than Zone J as compared to Zones G,H, and I (i.e., adding capacity to Zone J provided greater reliability benefits to Zones G,H and I than adding it to Zone K).
  - Note: In the 2023 State of the Market Report (SOM Report), the Market Monitoring Unit (MMU) recommended expanding the G-J locality to include Zone K due to the increased transfer capability created by the Long Island Public Policy Transmission Need.

New York ISO

Principles Used to Determine New Zonal Boundaries

- **New boundary determinations therefore are a function of existing in-zone generation and the ability to import additional capacity to satisfy the applicable reliability need.**
  - Accurately measuring internal capacity and interface constraints is needed to send an accurate market signal.

New York ISO

Open Questions

New York ISO

Open Questions

- Moving to a more granular process and/or developing more granular zones may change a variety of existing processes and market constructs.
- Open questions previously discussed include
  - Timelines
  - NCZ Deliverability Test Alternatives
- Additional open questions also exist.

New York ISO

Timelines (previously discussed)

- **Is there value in creating zones on a sub four-year basis?**
- **Are there concerns with moving to a more granular timeline?**
  - Is there an interval within the 4-year bound that can balance costs and benefits?
- **Which NYISO processes support a sub four-year timeline? Which processes may need to be modified?**
  - The 2017 “On Ramps and Off Ramps” project attempted to develop a biennial zone creation and elimination process during the Reliability Planning Process (RPP) (between the Comprehensive Reliability Plan CRP and Reliability Needs Assessment RNA).
    - The NYISO proposed to use the most recently available RPP base case and conduct the Locality Assessment Process from Q4 of an even year into Q1 of an odd year so that NYISO Market Operations would have ample time to implement a new zone by May 1 of the following calendar year.
  - Demand curve reset and annual updates
  - Capacity Accreditation timeline
  - Installed Reserve Margin timeline

New York ISO

NCZ Deliverability Test Alternatives (previously discussed)

- **Can the NCZ deliverability test be improved? What are potential alternatives?**
  - Potomac Economics has recommended using a probabilistic model (GE MARS) to trigger zone creation.
    - Which inputs and/or assumptions, if any, in GE MARS require further scrutiny?
      - For example, do the Interface limits within GE MARS accurately represent the limits observed in actual operation?
    - What would trigger zone creation while using GE MARS?
      - Deliverability test uses First Contingency Incremental Transfer Capability (FCTIC) to measure additional headroom across an interface.
        - » Can GE MARS use this or something similar?

New York ISO

Zone Size

- What are the implications of developing zones that are geographically smaller than the current capacity zones (e.g., Staten Island subzone)?
- Increased zonal granularity has the potential to create overly burdensome implementation costs and/or degrade market stability and transparency if taken too far.
- Are there trade offs between zone and timeline granularity?
  - More zones with infrequent zone setting?
  - Fewer zones with more frequent zone setting?

New York ISO

LCRs

- Minimum LCRs would be needed for any new capacity zone addition.
- How would the addition of more granular capacity zones affect the following?
  - Nesting logic
  - TSL Floor calculations
  - Other

New York ISO

Import/Export Constrained Zones

- **What are the potential issues with creating import/export constrained zones?**
  - MMU recommends export constrained zones use parent demand curves, discounting capacity that is only partially deliverable to the parent zone
    - For example, if Zone A is designated an export constrained zone, a percentage of the price set by the NYCA demand curve would be paid to the resources in Zone A as a function of Zone A's capacity surplus.
  - MMU recommends import constrained zones act like current zones with resources receiving the highest clearing price of the import zones in which they are located
    - The SOM report states Net CONE would only be needed for import zones.
- **Can Import/Export zones be created without corresponding updates to the RA models?**
  - What are the implications of excluding new capacity zones in the RA models, creating requirements, and developing demand curves?

New York ISO

LSE Obligations

- **Load Serving Entities (LSEs) are required to purchase a portion of the total NYCA Unforced Capacity (UCAP) requirement.**
- **LSEs with load in a Locality also have a requirement to purchase a portion of the total UCAP requirement of the Locality.**
  - The LSE's purchase obligation is adjusted for Locality Exchange MW and Spot excess purchase obligations.
- **Would these values need to change under a more granular zonal configuration? If so, how?**
  - Locality Exchange MW?
  - Note: Spot excess purchase logic would likely remain the same.

New York ISO

Market Power

- **The ability to exercise market power may increase due to the reduction in size of the effective market area.**
  - Will existing tests for market power continue to work with more granular capacity zones?
- **Will the Pivotal Supplier threshold change with more granular capacity zones?**
  - Can the Pivotal Supplier threshold for a small capacity zone create undue burdens on ICAP Suppliers (such as offer cap and must-offer requirement)?

New York ISO

Demand Curves

- **Which elements of the demand curves would need to change with more granular zones and/or frequent zone creation/elimination?**
  - Annualized levelized embedded costs of a new peaking plant include
    - Construction/installation
    - Fixed operation and maintenance (O&M)
    - Miscellaneous Adjustments
  - Can more granular configurations use a parent zone's demand curve with slight modifications?

New York ISO

CRIS

- **What are the potential impacts on the ability of new units to acquire Capacity Resource Interconnection Service (CRIS) with more granular capacity zones?**
  - Will more granular capacity zones lead to System Deliverability Upgrade (SDU) avoidance?
- **What considerations related to CRIS must be reevaluated under a more granular construct?**
  - Any issues with expiration/transfer?

New York ISO

UDRs/EDRs

- Unforced Capacity Deliverability Rights (UDRs)/External-to-ROS Deliverability Rights (EDRs) are rights, measured in MWs, associated with incremental transmission projects. UDRs provide a controllable increase in transmission capability to a Locality. EDRs increase transfer capability over a Scheduled Line sinking in Rest of State (ROS).
  - External UDRs are associated with controllable interfaces between a Locality and an External Control Area.
- How does the creation of a more granular zone affect the ability of UDRs/EDRs to participate in the NYISO ICAP Market?

New York ISO

Additional Zonal Calculations

- **What values are calculated today that would need to be updated?**
  - Zonal Peak Load
    - Only applicable if zone size is smaller than Locational Based Marginal Pricing zones or the new capacity zone is comprised of multiple load zones (e.g., G-J Locality).
  - Equivalent Demand Forced Outage Rate (EFORd)
    - Derating Factors would remain largely unchanged under a more granular zonal structure but would need to be calculated for any new zone additions.
  - Capacity Accreditation Factors

New York ISO

Next Steps

New York ISO

Next Steps

- Return to a future ICAPWG to continue the discussion with stakeholders
- For any questions or comments please email ntubbs@nyiso.com

New York ISO

Appendix

Timeline and Project Overview

New York ISO

Timeline

- **Q1-Q2**
  - Stakeholder education on existing practices and market structure
- **Q2-Q3**
  - Identify and research issues
  - Discuss issues with stakeholders
- **Q3-Q4**
  - Assess stakeholder feedback and finalize Issue Discovery reports

New York ISO

Project Overview

- **The Granular Capacity Zones project is slated for 2024 Issue Discovery.**
- **Issues potentially addressed via more granular capacity zones primarily involve**
  - Capturing differences in the value of capacity where intra-zonal transmission constraints (import/export) exist
    - As a result, existing units that are not deliverable to the rest of their zone are overcompensated while new capacity additions are barred from entry due to elevated deliverability upgrades
- **<u>Eliminating barriers to entry and overcompensation will help promote power system reliability at the lowest cost to consumers.</u>**

New York ISO

Project Overview

- **The goals:**
  - Understand the considerations and potential impacts of creating a new process for evaluating what capacity zones are needed and explore the frequency that zones should be re-examined.
  - Evaluate what demand curves may be needed for export constrained regions.

New York ISO

Concerns Identified by Potomac Economics

Concerns Identified by Potomac Economics

- **Potomac Economics has identified possible issues with the NCZ and the deliverability test methodology including:**
  - NCZ Study is conducted every four years during the Demand Curve Reset Process.
    - This timing limits the addition of new information, potentially leading to prices not reflecting the locational value of resources.
  - Is the deliverability test an appropriate way to send an RA signal?
    - It is a Deterministic Model that has been criticized for producing dispatch conditions that would not be observed in actual operation.
      - Transmission flows modeled in the NCZ Study on interfaces other than those studied do not reflect the range of probabilistic outcomes that could impact that study set under certain conditions.
      - Imports are not probabilistic.
    - Ignores Byway Constraints
      - NCZ Study is not designed to detect constraints left off pre-defined lists.
    - Only creates a new zone when excess supply is not deliverable to another zone and not when there is an internal reliability need (i.e., supply shortage).

See Potomac Economics 2022 State of the Market Report

New York ISO

Concerns Identified by Potomac Economics:

NCZ Study/Deliverability Test Assumptions

- **Generation Assumptions**
  - CRIS
    - Proposed resources that have obtained CRIS are modeled whether or not they have been built, affecting the determination of SDUs
  - Treatment of retirements
    - New resources are potentially incentivized to delay entry to avoid SDUs since potential economic retirements are modeled as in service
  - UCAP Derating Factors (UCDF)
    - UCDF for dispatchable resources based on average zonal EFORd
    - UCDF for intermittent resources equal the average output for the resource type during “summer afternoon hours”
      - This assumption is potentially overestimating the level of intermittent dispatch
    - Inaccurate hourly weightings used in new UCDF calculation
      - These look to tie the hourly summer capacity factor of intermittent resources to the load shedding probability in each hour of the day to better reflect their output

*See Potomac Economics 2022 State of the Market Report

New York ISO

Concerns Identified by Potomac Economics:

NCZ Study/Deliverability Test Assumptions

- **Peak Load Assumptions**
  - Considers summer peak conditions only and utilizes a 5-year lookahead
    - The summer assumption does not address transmission limits under winter supply and demand conditions
    - This can lead to the unfair allocation of upgrade costs to solar and other resources with high summer availability

*See Potomac Economics 2022 State of the Market Report

Previous Discussions

New York ISO

Previous Discussions

Date	Working Group	Discussion Points and Links to Materials
February 2, 2024	ICAPWG	Project Kick Off - https://www.nyiso.com/documents/20142/42748388/4%20Granular%20Capacity%20Zones_Kick%20Off_2.2.2024_ICAPWG_Final.pdf/6741aa07-c79b-7405-68c9-d89c26a1f609
March 4, 2024	ICAPWG	Education Session #1: New Capacity Zone Study + Potomac Economics Identified Issues - https://www.nyiso.com/documents/20142/43315080/Granular%20Capacity%20Zones_3_4_2024_ICAPWG_ES1_6.pdf/29927c5b-ea88-9382-5ca3-209b48df4c4b

New York ISO

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

New York ISO