New York ISO
Independent System Operator

Capacity Accreditation

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ICAPWG

August 30, 2021

Agenda

- Background
- Guiding Principles
- Straw Proposal
- Tariff Changes
- Marginal vs. Average Market Example
- Schedule
- Next Steps
- Appendix

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Background

Background

- **The resource mix is evolving and the NYISO's markets need to continue to accurately value resources for the attributes they provide in meeting system reliability**
  - Specifically for the Installed Capacity (ICAP) Market, a review of how reliability contributions are valued in the market is needed
  - Currently, resources receive payment for their Unforced Capacity (UCAP) value, which is generally based on their historic availability or performance that is used to approximate the resource's reliability value
  - These resource reliability values are then used to meet system resource adequacy requirements
- **Properly valuing each resource's contribution to reliability is vital to ensuring an efficient and well functioning ICAP Market that supports reliability**
  - As the resource mix evolves to include more intermittent and energy duration limited resources, the reliability contribution of all resources can change over time
  - The reliability contribution of specific resources will become more dependent on the diversity and performance of the overall resource mix

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Background

- **At the August 5th ICAPWG, the NYISO reviewed the current capacity accreditation rules currently in effect for ICAP Suppliers**
  - In general, a resource's contribution to reliability is based on the specific resource's derating factor that considers historic availability or performance, but does not consider how reliability contribution could be effected by other resources
  - The Capacity Value study implemented in 2018 was the first attempt by the NYISO to measure the incremental capacity contribution of resources with Energy Duration Limitations (EDLs)
    - The study resulted in Duration Adjustment Factors (DAFs) for resources with different EDLs to account for the incremental reliability benefit that each resource provides
- **At the August 9th ICAPWG, the NYISO presented an initial Straw Proposal to address each of the elements that will be further discussed within the Capacity Accreditation project**
  - Further detail summarizing the Straw Proposal can be found on a later slide
- **The purpose of this presentation is to continue discussions to reiterate the NYISO's current Straw Proposal, address tariff changes that will be made, walk through a market example, and discuss the schedule moving forward**

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Guiding Principles

Guiding Principles

- **Since devising the Capacity Value study rules in 2018 that produced Duration Adjustment Factors for resources with Energy Duration Limitations, New York State established the Climate Leadership and Community Protection Act (CLCPA)**
  - The CLCPA includes mandates for a significant amount of intermittent power and energy storage resources
  - The NYISO believes that the current capacity accreditation rules are not sufficient to keep pace with the changes to the resource mix envisioned by the CLCPA
    - Four years, as established by the Capacity Value study, is not sufficiently frequent enough to properly value the reliability contribution of capacity suppliers given this rapid pace of change
    - Additionally, accurately determining a capacity supplier's reliability contribution is becoming more dependent on the relationship between a specific resource's capabilities and rapidly changing, overall resource mix
  - The NYISO believes that more resources (in addition to those with EDLs) should be evaluated for the incremental reliability contribution they provide in their capacity accreditation
    - This incremental reliability contribution is separate from the resource-specific derating factor

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Guiding Principles

- **In devising a new set of capacity accreditation rules the NYISO is considering the following guiding principles. Capacity accreditation rules:**
  - Should establish comparable capacity accreditation values for resource types with the similar characteristics
  - Should send efficient market signals to procure needed characteristics
  - Should consider the impact of other resources and the reliability of the resource fleet as a whole
  - Should be evaluated frequently enough to account for rapid changes in the resource mix or system conditions
  - Should be transparent, predictable, and understandable
  - Should be aligned with resource adequacy studies

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Guiding Principles

- **The NYISO is proposing to implement a revised study process to determine the incremental reliability contribution of capacity resource types in order to establish, and then update, capacity accreditation values**
  - This study would not replace resource-specific derating factors, though some derating factor calculations may need to be reexamined as part of this market design effort
- **Effective Load Carrying Capability (ELCC) or Marginal Reliability Improvement (MRI) studies are two potential vehicles to achieve this**
  - ELCC studies have been adopted by California ISO and PJM
    - An ELCC study measures the capacity contribution of resources in terms of equivalent "perfect" capacity
    - ELCC studies rely on loss of load expectation modeling currently in use by the IRM and LCR studies
    - ELCC studies are inherently technologically agnostic
  - The NYISO's MMU, Potomac Economics, has also put forward an MRI methodology
- **ELCC and MRI studies will produce capacity accreditation values that are dependent on the inputs that will be updated each time the study is run**
  - Inputs can include the resource mix, load levels and shapes, and changes to the transmission system
  - The NYISO anticipates that capacity accreditation values will change as these inputs are updated
  - This is a desired result for the NYISO's ICAP Market, and will result in capacity accreditation values that are better aligned with system needs and ICAP Market requirements

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Straw Proposal

Straw Proposal

- **There are six elements to the Straw Proposal that the NYISO believes that will be important to establish in the broader Buyer-Side Mitigation (BSM) proposal to demonstrate how reforming BSM will continue to result in just and reasonable ICAP Market outcomes**
  - Study Base
    - The NYISO proposes to use the IRM or LCR studies as a base for this study
  - As-found vs. At-criterion
    - The NYISO proposes to run this study at-criterion
  - Frequency
    - The NYISO proposes to perform this study annually
  - Resources
    - The NYISO proposes to evaluate all resource types to determine whether they should be subject to this study
  - Locations
    - The NYISO is proposing to perform this study for resource types at the capacity Locality level
  - Marginal vs. Average
    - The NYISO is proposing to use the marginal values produced from this study for each resource type when measuring the capacity accreditation of ICAP Suppliers

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Marginal vs. Average

- **The NYISO is proposing to use the marginal values produced from this study for each resource type when measuring the capacity accreditation of ICAP Suppliers**
  - The NYISO believes that using marginal capacity accreditation values will result in better market efficiency and properly signal which resource types are best suited to support grid reliability
  - The NYISO also believes using marginal capacity accreditation values best aligns with the NYISO's ICAP Market structure
- **Marginal values measure the incremental reliability contribution based on the addition of the "next" MW, while average values measure the incremental reliability contribution of the total fleet of a resource type**

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ICAP/UCAP Reference Price Translation

- **As part of this market design, the NYISO is proposing to adopt the MMU's recommendation to translate the ICAP Reference Price to a UCAP Reference Price using the derating factor of the peaking unit underlying each ICAP Demand Curve**
  - Currently, the ICAP Reference Price is converted to the UCAP Reference Price using the system-wide derating factor
    - Typically, the system-wide derating factor is higher than the derating factor for the peaking unit, which is a new plant
  - As more resources with high derating factors are added to the system, this would cause the UCAP Reference Price to increase significantly
    - This would cause the peaking unit at the prescribed level of excess to be paid more than the annual revenue requirement of the unit

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Tariff Changes

Tariff Changes

- **As a part of the Capacity Accreditation project, the NYISO has identified sections of MST 5.12 that will need to be revised as part of this proposal**
  - MST 5.12.14.3 currently contains language for the recurring 4-year study, and will be removed and replaced with the proposed new framework to address the capacity accreditation changes

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Marginal vs. Average Market Example

Market Example

- **The following is a representative example to describe how the ICAP Market would clear under both a marginal and average capacity accreditation methodology**
  - This is a hypothetical example that is intended to show the relationship between payments to resources and capacity accreditation methodologies
    - It is not intended to depict a specific future, or present how the NYISO proposes to value the capacity contribution of these resources
  - The example calculates the total capacity market payment to two classes of resources – one class that has a very similar marginal vs. average (Similar MVA) derating factor and one class that has a materially different (Different MVA) marginal vs. average derating factor
    - For the class of resources that has a very similar marginal vs. average (Similar MVA) derating factor, the example uses the same derating factor across both calculations, for simplicity
    - This example is not intended to forecast the types or amounts of resources that will eventually be affected by this capacity accreditation proposal, as the NYISO is planning to evaluate all resource types for inclusion under this eventual proposal
    - This example is simply showing how the market will clear for differently for resources, and how it impacts total cost
  - The example incorporates the MMU's proposal to translate the ICAP Reference Price to a UCAP Reference Price using the derating factor of the peaking unit underlying the ICAP Demand Curve

Market Example

- **The following assumptions are used in the representative example on the following slide:**
  - "NYCA-wide" with 30,000 MW peak load and 140% Installed Reserve Margin (IRM)
    - 140% IRM is relatively consistent with the High Renewable Phase 2 Results presented to ICS during 2020 for the 12,000 MW Renewable resource addition scenario[1]
  - ICAP Reference Point is $10.00
  - Zero Crossing Point is 112%
  - 35,000 MW of Similar MVA resources
  - 10,000 MW of Different MVA resources

Requirements & Demand Curve Parameters	
Peak Load (MW)	30,000
Installed Reserve Requirement (%)	140%
ICAP MW Requirement	**42,000**
ICAP Reference Point ($/kW-mo)	$10.00
Zero Crossing Point (%)	112%
Installed Capacity MW	
Similar MVA ICAP (MW)	**35,000**
Different MVA ICAP (MW)	**10,000**
Total ICAP MW	**45,000**

[1]: High Renewables Phase 2 Results Summary can be found at: https://nysrc.org/PDF/MeetingMaterial/ICSMeetingMaterial/ICS%20Agenda%20246/AI%209.1%20-%20Draft%20High%20Renewable%20Phase%202%20Summary%20(2).pdf

Market Example

- **This table converts ICAP MW to UCAP MW using different derating factors for marginal and average calculations**
  - Similar MVA resources have a 10% derating factor
    - In order to see the impact on the market from resources that have materially different derating factors under marginal and average calculations, Similar MVA resources are given the same derating factor under both scenarios
  - Different MVA resources have an 80% derating factor under the marginal methodology and a 60% derating factor under the average methodology

Installed Capacity MW	Marginal	Average
Similar MVA ICAP (MW)	35,000	35,000
Different MVA ICAP (MW)	10,000	10,000
Total ICAP MW	**45,000**	**45,000**
Unforced Capacity MW		
Similar MVA UCAP (10% DF) (MW)	31,500	31,500
Different MVA UCAP (80% or 60% DF)	2,000	4,000
Total UCAP MW	**33,500**	**35,500**
System Derating Factor	***26%***	***21%***

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Market Example

- **Using the system derating factor calculated on the previous table, the ICAP Requirement is converted to a UCAP Requirement and the clearing price is set using today's market rules**
  - *The one exception is the UCAP Reference Price, which is translated from the ICAP Reference Price using the derating factor of the peaking plant underlying the relevant ICAP Demand Curve (3.5%)
  - The following slide calculates payments to resources

Requirements & Demand Curve Parameters	Marginal	Average
Peak Load (MW)	30,000	30,000
Installed Reserve Requirement (%)	140%	140%
ICAP MW Requirement	**42,000**	**42,000**
ICAP Reference Point ($/kW-mo)	$10.00	$10.00
Zero Crossing Point (%)	112%	112%
System Derating Factor	*26%*	*21%*
Market Results		
UCAP Requirement (MW)	31,267	33,133
UCAP Reference Price ($-kW-mo)*	$10.36	$10.36
Clearing Point (% of Req.)	107%	107%
Clearing Price ($/kW-mo)	$4.19	$4.19

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Market Example

- **Total procurement costs between the marginal and average methodologies vary based on the difference in the derating factor for Different MVA resources**
  - Under both marginal and average, the clearing price is consistent due to the MMU's recommendation
  - This means that Similar MVA resources will receive similar capacity payments under both methodologies, avoiding a potential reliability issue due to retirements driven by low payments
  - Only Different MVA resources receive different capacity payments based on marginal vs. average, which will help to send needed investment signals for resource entry and retirement

Unforced Capacity MW	Marginal	Average
Similar MVA UCAP (10% DF) (MW)	31,500	31,500
Different MVA UCAP (80% or 60% DF)	2,000	4,000
Total UCAP MW	**33,500**	**35,500**
Market Results		
UCAP Reference Price ($-kW-mo)*	$10.36	$10.36
Clearing Price ($/kW-mo)	$4.19	$4.19
Total Procurement Cost (Monthly)	**$140,513,200**	**$148,902,048**
Total Payments to Similar MVA	*$132,124,352*	*$132,124,352*
Total Payments to Different MVA	*$8,388,848*	*$16,777,696*

Note: The full calculation can be found in the Appendix of this presentation

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Schedule

Schedule Overview

- **In order to complete the Capacity Accreditation project in the most efficient manner, the NYISO plans to roll out changes to the project in different phases**
  - Phase 1 will discuss tariff changes for the new framework through the end of 2021
  - Phase 2 will discuss more details on how capacity accreditation changes could be applied after the completion of Phase 1 and throughout 2022
  - Phase 3 will cover the implementation of the Capacity Value Study using the updated framework

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Phase 1 Overview

- **Within Phase 1 of the project, the NYISO plans to update the tariff with language for the new framework and bring it to a vote with stakeholders**
  - The NYISO will identify and discuss the various components outlined in the Straw Proposal
    - Study Base
      - The NYISO proposes to use the IRM or LCR studies as a base for this study
    - As-found vs. At-criterion
      - The NYISO proposes to run this study at-criterion
    - Frequency
      - The NYISO proposes to perform this study annually
    - Resources
      - The NYISO proposes to evaluate all resource types to determine whether they should be subject to this study
    - Locations
      - The NYISO is proposing to perform this study for resource types at the capacity Locality level
    - Marginal vs. Average
      - The NYISO is proposing to use the marginal values produced from this study for each resource type when measuring the capacity accreditation of ICAP Suppliers

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Phase 1 Planned Timeline

- **Late 2021:**
  - Review updates to Proposal and Tariff
    - Act on Proposal at the BIC and MC
  - Continue discussions into Phase 2

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Phase 2 Overview

- **Within Phase 2 of the project, the NYISO plans to establish new capacity accreditation study details**
  - The NYISO will continue detailed discussion on to address:
    - Which classes of resources will be evaluated
    - Which methodology is the correct approach (i.e., ELCC or MRI)
    - Resource specific derating factor evaluations
    - Peak Load Windows
    - Participation model rules for resource types (B/S/N; DMNC/CRIS)
    - Impacts on Planning Studies
  - Further elements may be added to the discussion as the project continues to develop over time

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Phase 2 Planned Timeline

- **Q4 2021**
  - Continue discussions with stakeholders following the completion of Phase 1
- **Early 2022**
  - Continue discussions with stakeholders
    - Run scenarios to inform process decisions
  - Draft updated tariff language, manuals, and/or procedures, as necessary, to include further details on the study
- **Summer 2022**
  - Act on additional tariff changes at the BIC and MC
  - File necessary details with FERC as a part of a new 205 or compliance
  - Begin implementation of Phase 3

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Phase 3 Overview

- **Within Phase 3 of the project, the NYISO plans to develop necessary software capabilities and implement the new capacity accreditation rules through the Capacity Value Study**
  - The study will be executed for each resource class and post new derating factors
  - Act on necessary revisions to the ICAP Manual

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Phase 3 Plans

- **Beginning in Summer 2022**
  - Discussions with stakeholders regarding revisions to ICAP Manual
  - Scope and develop necessary software revisions to support updated capacity accreditation approach
  - Implement software revisions
  - Execute Capacity Value Study and post derating factor values

Note: The NYISO has not determined when it can have all of the necessary software revisions implemented at this time.

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Next Steps

Next Steps

- **Please send additional feedback to ztsmith@nyiso.com**
- **September 9, 2021 ICAPWG**
  - The NYISO will review tariff changes related to both BSM and capacity accreditation

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Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system

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Questions?

Appendix

Requirements & Demand Curve Parameters	Marginal	Average
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