New York ISO
Independent System Operator

Capacity Accreditation: Market Design Summary

NYISO

ICAPWG/MIWG

November 08, 2022

Outline

- Previous Discussions
- Background
- Market Design Summary

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Previous Discussions

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Previous Discussions

Date	Working Group	Discussion Points and Links to Materials
August 5, 2021	ICAPWG	Review of Existing Capacity Accreditation Rules: https://www.nyiso.com/documents/20142/23590734/20210805%20NYISO%20-%20Capacity%20Accreditation%20Current%20Rules%20Final.pdf
August 9, 2021	ICAPWG	Capacity Accreditation Proposal: https://www.nyiso.com/documents/20142/23645207/20210809%20NYISO%20-%20Capacity%20Accreditation%20Straw%20Proposal.pdf
August 30, 2021 & August 31, 2021	ICAPWG	Capacity Accreditation Proposal: https://www.nyiso.com/documents/20142/24172725/20210830%20NYISO%20-%20Capacity%20Accreditation_v10%20(002).pdf
September 28, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/24925244/20210928_NYISO_-CMR_Final.pdf/769828a1-f224-0140-240b-0762ec18efec
October 18, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff Updates: https://www.nyiso.com/documents/20142/25440628/20211018%20NYISO%20-%20CMR%20v9.pdf/4475e775-159c-75c7-9cf8-7050dad9a363
October 29, 2021	ICAPWG	Comprehensive Mitigation Review Proposal and Tariff Updates: https://www.nyiso.com/documents/20142/25780701/20211029%20NYISO%20-%20CMR.pdf/ea8494b0-0860-b260-89b6-0c418d28a91d

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Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
November 2, 2021	ICAPWG	NYISO CMR Consumer Impact Analysis: https://www.nyiso.com/documents/20142/25835955/CIA%20-%20Comprehensive%20Mitigation%20Review.pdf/36d447d4-5b33-8ab1-2654-90a529ff1dfe Potomac CMR Consumer Impact Analysis: https://www.nyiso.com/documents/20142/25835955/MMU%20ICAP%20Accreditation%20Consumer%20Impact%20Analysis%201-02-2021.pdf/637ba21e-db75-a4c1-5b41-f770dd26e529
November 9, 2021	BIC	Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/25928340/5%20202111109%20NYISO%20-%20CMR%20v3.pdf/84d8b429-126c-68dd-0308-caa50886de92 Comprehensive Mitigation Review Approved Motion: https://www.nyiso.com/documents/20142/25928340/110921%20bic%20final%20motions.pdf/785d5869-1e04-9f97-e330-e2e632ae7a9c
November 17, 2021	MC	Comprehensive Mitigation Review Proposal and Tariff: https://www.nyiso.com/documents/20142/26119798/05%20CMR.pdf/11217ade-152a-74a2-d478-6b5ae5e21207 Comprehensive Mitigation Review Approved Motion: https://www.nyiso.com/documents/20142/26119798/111821%20MC_Final_Motions.pdf/bbf15d66-4108-7173-1596-9b20677914e6

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
January 20, 2022	ICAPWG	2022 Market Projects: https://www.nyiso.com/documents/20142/27799605/2022%20Projects%20Presentation.pdf/4553eb95-177d-7cbc-f2fe-7754b7c66644
February 3, 2022	ICAPWG	Improving Capacity Accreditation Plan: https://www.nyiso.com/documents/20142/28227906/Improving%20Capacity%20Accreditation%20Plan.pdf/92560e95-5703-4c57-45cb-7706c36f4656
February 24, 2022	ICAPWG	Improving Capacity Accreditation Project Kick Off: https://www.nyiso.com/documents/20142/28687884/Capacity%20Accreditation%20Kick%20Off%2002-24-22%20v7.pdf/5ab742c4-650b-5094-6a22-d41a2f29da6f MARS Review (GE Consulting): https://www.nyiso.com/documents/20142/28687884/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0224-v4.pdf/d302df1c-5607-16a8-ba01-fba700d5bbd1
March 3, 2022	ICAPWG	CMR Draft Deficiency Response: https://www.nyiso.com/documents/20142/28897222/CMR%20Deficiency%20Draft%20Responses%2003-03%20ICAPWG.pdf/0a3c8303-515e-7725-dee5-a9dda1398672

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Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
March 16, 2022	ICAPWG	Capacity Accreditation Resource Class Criteria, Resource-Specific Derating Factors, and Areas of Needed Change: https://www.nyiso.com/documents/20142/29177064/Capacity%20Accreditation%2003-16-22%20v7.pdf/b26e6a99-5f4e-29cc-c60c-47608c78c983
March 31, 2022	ICAPWG	Capacity Accreditation Representative Unit Modeling: https://www.nyiso.com/documents/20142/29607069/2%20CA%20Representative%20Unit%20Modeling%2003-31-22%20ICAPWG.pdf/1c3af8ac-625a-5066-3977-8c3d9ae0ddda ELCC and MRI Overview (GE): https://www.nyiso.com/documents/20142/29607069/3%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0331.pdf/08355c9a-d104-e1b6-6b8a-8266c61b74a3
April 19, 2022	ICAPWG	Capacity Accreditation Adjusted Resource Specific Derating Factors and External Resources: https://www.nyiso.com/documents/20142/30025560/04-19-22%20CA%20Adjusted%20Derating%20Factors%20and%20External%20Resources.pdf/5dd1f4b2-092d-6a6a-3b99-4d768ea6c5eb

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Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
April 28, 2022	ICAPWG	Preliminary Capacity Accreditation Resource Classes: https://www.nyiso.com/documents/20142/30276257/04-28-22%20Capacity%20Accreditation%20-%20Preliminary%20CARCs.pdf/c82c47c5-28c2-cf19-c602-16bf3cfc4aca Preliminary ELCC and MRI Results (GE): https://www.nyiso.com/documents/20142/30276257/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0428.pdf/3c761f16-7bc0-b469-b1e8-c2a69feb58ef
May 24, 2022	ICAPWG	Updated Preliminary CARCs and Annual Process to Establish CARCs: https://www.nyiso.com/documents/20142/30888946/3%2005-24-22%20Capacity%20Accreditation.pdf/cd61d855-f634-0fe8-6109-7d8c0547beda Additional Preliminary ELCC and MRI Results (GE): https://www.nyiso.com/documents/20142/30888946/2%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0524.pdf/0976330d-f4eb-4db3-2613-c8be9bafe452
June 16, 2022	ICAPWG	Sensitivity Scenarios and Seasonal CAFs: https://www.nyiso.com/documents/20142/31532822/2%20Capacity%20Accreditation%20v6.pdf/4ffe4fa9-bdaf-2c23-77be-d49ed04c5ea5

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Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
June 28, 2022	ICAPWG	Annual Peak Load Window (PLW) Review and Energy Duration Limitation Proposals: https://www.nyiso.com/documents/20142/31790818/06-28-22%20PLW%20and%20EDL%20Proposal.pdf/ffca7c8a-767e-3de1-9b46-404f661351b3 Revised Shape-based Resource Results and ELR Modeling Functionality in MARS (GE): https://www.nyiso.com/documents/20142/31790818/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0628.pdf/999c7dfa-0b5d-a6bc-a57a-b35a1cda5aa4
July 21, 2022	ICAPWG	Capacity Accreditation: Project Schedule Update: https://www.nyiso.com/documents/20142/32356084/7-21-2022%20ICAPWG%20Project%20Schedule.pdf/958ef86a-12de-32a1-c115-5c1af39abb54
July 28, 2022	ICAPWG	Capacity Accreditation: SCR CAF Results and Proposal: https://www.nyiso.com/documents/20142/32491922/2%207282022%20ICAPWG%20Capacity%20Accreditation.pdf/3f991228-5011-7cc2-cfd3-a7762fa8c8f6 Sensitivity Scenario Methodologies (GE): https://www.nyiso.com/documents/20142/32491922/3%20GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_0728.pdf/9fd89cbc-2baa-3c54-dc74-17c2e8cf588a

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Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
August 9, 2022	ICAPWG	Modeling Discussion and ICAP Manual Revision Process Options: https://www.nyiso.com/documents/20142/32687686/08-09-22%20Capacity%20Accreditation.pdf/1009a4dc-bb9f-17f3-bb34-908fd8d5704d
August 29, 2022	ICAPWG	Annual CAF Proposal, Winter PLW Assessment, and CAF Interaction with the ICAP Demand Curves: https://www.nyiso.com/documents/20142/32977661/Capacity%20Accreditation%2008292022%20ICAPWG.pdf/13c04d12-f77f-3184-15c4-8f0b22897f3d Compiled Preliminary CAF Results: https://www.nyiso.com/documents/20142/32977661/GE-Support%20for%20NYISO%20Capacity%20Accreditation%20Project_LCR-results.pdf/e9fdeb01-1ee0-7651-6a3f-0823aedcef1d
September 30, 2022	ICAPWG	Resource Specific Derating Factor Proposal for Performance-based Resources, CAF Interaction with ICAP Demand Curves, ISO Review of Peak Load Windows, and Modeling CAFs At Criteria vs Level of Excess: https://www.nyiso.com/documents/20142/33520089/9-30-2022%20ICAPWG%20Capacity%20Accreditation%20v3.pdf/0178b3b4-4398-ce4a-3197-224e24086c51 Capacity Value Results for 2022 LCR at LOE and 2022 RNA 2030 Base Case (GE): https://www.nyiso.com/documents/20142/33520089/GEEC-CapacityAccreditation-LOEandBaseRNA-results%20v5%20-%20clean.pdf/4e05032a-91c3-ff78-08a2-9202efead08a Consumer Impact Analysis Methodology: https://www.nyiso.com/documents/20142/33520089/CIA%20Methodology%20-%20Capacity%20Accreditation_Final.pdf/37c9b5f5-ab29-8eb0-afd2-fdc369f097f5

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
October 19, 2022	ICAPWG	Translation Factors for IRM/LCR Studies and Deliverability Testing, Sensitivity Scenario Update, and ICAP Market Resource Adequacy 5 Year Plan: https://www.nyiso.com/documents/20142/33857891/02a_10-19-22%20ICAPWG%20Capacity%20Accreditation.pdf/cae2063d-76d6-b4d3-25d5-fadd0c5e1f50 Compiled CAF Results (Excel file): https://www.nyiso.com/documents/20142/33857891/02b_10-19-22%20ICAPWG%20Compiled%20CAF%20Results.xlsx/cf5ad8f9-b4fb-9f44-9df2-672f9a190331 Capacity Accreditation - Consumer Impact Analysis: https://www.nyiso.com/documents/20142/33857891/03_Consumer%20Impact%20-%20Capacity%20Accreditation.pdf/1e9097c6-c0ae-b137-dd44-15ce1f5a7841
October 27, 2022	ICAPWG	Proposed Modeling Technique for Calculating CAFs and Summary of Initial ICAP Manual and Tariff Revisions: https://www.nyiso.com/documents/20142/34087499/10-27-22%20ICAPWG%20Capacity%20Accreditation%20v2.pdf/0f99ca34-8217-2eee-fb26-f6168a1fd9d8 ICAP Manual Revisions: https://www.nyiso.com/documents/20142/34087499/ICAP%20Manual%20Revisions%20for%20Discussion%20v3.pdf/f69334aa-da69-54dd-a805-9f2148439561 ICAP Manual Attachment Revisions: https://www.nyiso.com/documents/20142/34087499/ICAP%20Manual%20Attachments%20v2.pdf/e1e2ec96-4cfc-fb78-01de-c8a97e2ed449

Previous Discussions (cont.)

Date	Working Group	Discussion Points and Links to Materials
October 27, 2022	ICAPWG	Updated Compiled CAF Results (Excel file): https://www.nyiso.com/documents/20142/34087499/10-27-22%20ICAPWG%20Compiled%20CAF%20Results%20v3.xlsx/46982a75-2fac-fcc6-01a8-ae9161edb742 Capacity Value Results for 2022 RNA 2030 Cases and IRM 2023 PBC Cases (GE): https://www.nyiso.com/documents/20142/34087499/GEEC-CapacityAccreditation-RNA-and-2023-PBC-results%20v4.pdf/e700f32b-9ee0-0067-1872-8623a47a38c0

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Background

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Background

- **The NYISO has begun stakeholder discussions to (1) develop the implementation details and technical specifications for establishing Capacity Accreditation Factors (CAFs) and Capacity Accreditation Resource Classes (CARCs) and (2) propose necessary ICAP Manual revisions**
  - The NYISO has contracted with GE Energy Consulting to support the NYISO and its stakeholders in the development of the implementation details and technical specifications
- **The 2022 Improving Capacity Accreditation project deliverable is a Q3 Market Design Complete**
  - Completion of the project is delayed. The NYISO is now targeting a Q4 Market Design Complete

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Market Design Summary

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Definitions

- CAF – Capacity Accreditation Factor
- CARC – Capacity Accreditation Resource Class
- EDL – Energy Duration Limitation
- LCROR – Limited Control Run of River
- IPR – Intermittent Power Resource
- LOLE – Loss of Load Expectation
- PLW – Peak Load Window

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Capacity Accreditation Overview

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Capacity Accreditation Overview

- Starting with the Capability Year that begins in May 2024, Capacity Accreditation Factors (CAFs) will reflect the marginal reliability contribution of the ICAP Suppliers within each Capacity Accreditation Resource Class (CARC) toward meeting NYSRC resource adequacy requirements for the upcoming Capability Year
- Each ICAP Supplier will be assigned to a CARC and receive the applicable CAF for its assigned CARC and capacity region
- An ICAP Supplier's assigned CAF will be used in calculating the its Adjusted ICAP and, in turn, the UCAP the Supplier is qualified to supply to the NYCA
- The following slides cover the complete Market Design and implementation details for Capacity Accreditation

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Capacity Accreditation Annual Process

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Capacity Accreditation Annual Process

- The NYISO will annually establish CARCs for the upcoming Capability Year
- The NYISO will establish CARCs such that ICAP Suppliers that could enter the ICAP Market in the upcoming Capability Year would have a CARC to which they could be assigned
- To identify resource types that could enter the ICAP Market in the upcoming Capability Year, the NYISO will leverage and expand upon the review of resource additions for inclusion in the IRM preliminary base case
- Based on the identification of resources types that could enter the ICAP Market, the NYISO proposes to post the preliminary list of CARCs by September 30th of the year preceding the upcoming Capability Year
  - For example, the list posted in September 2025 would be for Capability Year 2026/27
- After receiving stakeholder feedback on the preliminary list of CARCs, the NYISO proposes to post the final list of CARCs by November 30th of the year preceding the upcoming Capability Year

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Capacity Accreditation Annual Process - Continued

- The NYISO will calculate preliminary CAFs for each CARC in December-January, following NYSRC approval of the final IRM model
- Final CAFs for each CARC will be publicly posted to the NYISO Installed Capacity Market web page by March 1st, following the approval of LCRs by the NYISO Operating Committee
- In March, each ICAP Supplier will be assigned to the applicable CARC and receive the applicable annual CAF for use in the upcoming Capability Year
  - An ICAP Supplier's assigned CARC and annual CAF will be available to the ICAP Supplier by the deadline listed in the ICAP Event Calendar
  - The annual CAF for an ICAP Supplier's assigned CARC and capacity region will be used to calculate its UCAP for both the Summer and Winter Capability Periods
  - The first auction for the Summer Capability Period begins at the end of March

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CARC Criteria and Assignment

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CARC Criteria and Assignment

- **The criteria that the NYISO will use to determine CARCs are specified in the tariff -- technology and operating characteristics that are expected to result in similar marginal reliability contributions**
- **In assigning a Resource to a specific CARC, a Resource's technology and operating characteristics will be assessed through the Resource's chosen participation model, elected EDL, and resource characteristics provided upon registration**
  - If additional resource characteristics are found to have an identifiable impact on a Resource's marginal reliability contribution, those characteristics will be used in determining a Resource's CARC assignment as the characteristics are incorporated into the IRM/LCR model
- **The combination of a Resource's chosen participation model, elected EDL, and resource characteristics will determine the exact CARC to which the Resource will be assigned**
  - The preliminary and final CARC lists will identify what combinations of participation models, EDL, and resource characteristics will lead to the assignment of a Resource to a specific CARC
    - Until the IRM/LCR model reflects the expected operations of SCRs in the NYISO's market, SCRs will be assigned to the 4-hour Energy Duration Limitation CARC

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CAF Modeling

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CAF Modeling

- The NYISO will use the Locational Minimum Installed Capacity Requirement study model ("LCR model") used to calculate the Locational Minimum Installed Capacity Requirements for the upcoming Capability Year, as approved by the NYISO Operating Committee, as the starting model to annually calculate the CAFs for each CARC
- Utilizing the LCR model, the ISO will calculate CAFs using the Marginal Reliability Improvement (MRI) technique

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CAF Modeling

- Under the MRI technique, the CAF for CARC c for capacity region a will be calculated as follows:

$$CAF_{ac} = \frac{\boldsymbol{LOLE_i - LOLE_{mc}}}{\boldsymbol{LOLE_i - LOLE_p}}$$

- *Where:*
  - $\boldsymbol{LOLE_i}$ = the starting loss of load expectation of the LCR model
  - $\boldsymbol{LOLE_{mc}}$ = the loss of load expectation of the LCR model with the addition of a 100 MW representative unit of the evaluated Capacity Accreditation Resource Class c to the applicable zone of capacity region *a* in the LCR model
  - $\boldsymbol{LOLE_p}$ = the loss of load expectation of the LCR model with the addition of 100 MWs of perfect capacity to the applicable zone of capacity region *a* in the LCR model
- Because the LCR model with the addition of the representative unit cannot have a smaller loss of load expectation than the LCR model with the addition of perfect capacity of the same size and in the same location, the MRI technique will produce a CAF less than or equal to 100 percent
  - Additionally, because the LOLE metric in the LCR model is an annual metric, the resulting CAFs will be annual CAFs

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CAF Modeling

- A CAF will be calculated for each CARC and each capacity region (Rest of State, G-J Locality (excluding Load Zone J), NYC Locality, or Long Island Locality) to the extent an Installed Capacity Supplier in the CARC exists or is projected to exist in the capacity region in the upcoming Capability Year
- In the LCR model, the representative units and perfect units will be added to the following zones when calculating the CAF for the applicable capacity region

Capacity Region	Applicable Zone
Rest of State	Zone F
G-J Locality (excluding Load Zone J)	Zone G
NYC Locality	Zone J
Long Island Locality	Zone K

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CAF Modeling

- **The representative unit for CARCs that are comprised of availability-based Resources will be modeled with no random forced outages or forced derates in the LCR model**
  - Availability-based Resources include Resources participating in the ICAP Market as Generators, Control Area System Resources, Energy Limited Resources, Capacity Limited Resources, Behind-the-Meter Net Generation Resources, Energy Storage Resources, and Distributed Energy Resources
- **The representative unit for CARCs that are comprised of Resources with the same EDL, will be modeled with the corresponding EDL and model type used to represent existing Resources with the corresponding EDL in the LCR model**
- **The representative unit for CARCs that are comprised of IPRs or LCROR Hydro will be modeled using weighted-average historic hourly production profiles of the existing Installed Capacity Suppliers in the CARC and evaluated capacity region**
  - If there are no existing Installed Capacity Suppliers in the CARC and evaluated capacity region, the ISO will use a representative hourly production profile based on the production of existing or simulated units

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Resource Specific Derating Factors

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Resource Specific Derating Factors

- Generally, a Resource's UCAP will be determined by combining the Resource's ICAP, CAF, and resource specific derating factor as illustrated below
  - UCAP = Adjusted ICAP x (1 – resource specific derating factor)
    - Where:
      - Adjusted ICAP = ICAP * CAF
      - ICAP = min(DMNC, CRIS)
    - So, UCAP = min(DMNC, CRIS) * CAF * (1 – resource specific derating factor)
- Because the representative unit for CARCs comprised of availability-based Resources will be modeled with no random forced outages or forced derates, availability-based Resources can continue to utilize their existing resource specific derating factor calculations without any adjustment or double accounting of unavailability due to the introduction of CAFs
- Because the representative unit for CARCs comprised of IPRs or LCROR Hydro Resources will be modeled using weighted-average historic hourly production profiles, the resource specific derating factor calculation for IPRs and LCROR will be updated, as shown on the following slide, to avoid double accounting of unavailability due to the introduction of CAFs

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Resource Specific Derating Factors

- **The resource specific derating factors for IPRs and LCROR Hydro Resources will be based on a comparison of the Resource's applicable average capacity factor for the Capability Period to the applicable average capacity factor for the same Capability Period of the representative unit used to calculate the Resource's CAF**
  - The resource specific derating factor will be calculated according to a ratio-based approach or a difference-based approach, depending on which approach will result in the smallest difference between a Resource's effective capacity value and CAF
    - Ratio-based approach:
      - UCAP = ICAP * CAF * (1 – resource specific derating factor)
      - Resource specific derating factor = 1 – Average Capacity Factor Ratio
      - Average Capacity Factor Ratio =

$$\frac{Average\ Capacity\ Factor\ of\ Resource}{Average\ Capacity\ Factor\ of\ Representative\ Unit}$$

    - Difference-based approach:
      - UCAP = ICAP * (CAF + Average Capacity Factor Difference)
      - Average Capacity Factor Difference = $Average\ Capacity\ Factor\ of\ Resource\ -\ Average\ Capacity\ Factor\ of\ Representative\ Unit$
  - Please refer to the revisions to Attachment J of the ICAP Manual for the detailed formulation of the resource specific derating factor calculation

[1] The measurement window for calculating an Average Capacity Factor for an upcoming Capability Period will be the hours within the Peak Load Window, applicable to the upcoming Capability Period, for the applicable months of the last two-like Capability Periods. The applicable months for calculating an Average Capacity Factor for a Summer Capability Period will be June, July, and August. The applicable months for calculating an Average Capacity Factor for a Winter Capability Period will be December, January, and February

Annual Peak Load Window Review

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Proposal for Annual Peak Load Window Review

- **The NYISO will annually review and establish the PLWs for the upcoming Capability Year**
- **The NYISO proposes the following annual process to determine the Summer PLW for the upcoming Capability Year:**
  - Following the approval of the final LCRs by the NYISO Operating Committee, the NYISO Resource Adequacy team will calculate the hourly LOLEs from the final LCR model
  - If the existing Summer PLW does not capture at least 90% of the Summer hourly LOLE, the new Summer PLW will start with the two consecutive hours with the highest percentage of LOLE in the Summer Capability Period
    - If the existing Summer PLW does capture at least 90% of the Summer hourly LOLE, the existing Summer PLW will be maintained for the upcoming Capability Year, subject to ISO review
  - Additional consecutive hours will be added in even increments, starting with the hours that capture the next highest concentration of LOLE, until the PLW captures at least 90% of the total hourly LOLE in the Summer Capability Period

Example Summer PLWs

Summer Hourly LOLE Distribution					
HB	2018	2019	2020	2021	2022
10	0%	0%	0%	0%	1%
11	0%	2%	2%	2%	4%
12	1%	4%	4%	4%	9%
13	4%	11%	12%	11%	9%
14	11%	19%	19%	19%	16%
15	19%	23%	22%	23%	20%
16	24%	23%	22%	23%	20%
17	24%	13%	11%	13%	11%
18	13%	5%	4%	5%	4%
19	4%	1%	2%	1%	3%
20	1%	0%	0%	0%	2%
21	0%	0%	0%	0%	1%
LOLE Captured by PLW	93%	92%	91%	92%	92%

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Proposal for Annual Peak Load Window Review

- **The NYISO proposes to maintain the existing winter PLW (HB 16-21) until winter modeling approaches and assumptions are incorporated into the IRM/LCR model**
  - Once winter modeling approaches and assumptions are incorporated into the IRM/LCR model, the NYISO will re-evaluate utilizing the proposed summer PLW process to determine the winter PLW
- **If the resulting PLWs of the prescribed annual process are inconsistent with the expected hours of reliability risk based on operating experience and/or expected grid conditions, the ISO may propose a different PLW for the upcoming Capability Year**
  - If the ISO proposes a PLW different than the PLW resulting from the prescribed annual process, the ISO-proposed PLW must be approved by the NYISO Operating Committee by March 1st
  - If the ISO-proposed PLW is not approved by the NYISO Operating Committee by March 1st, the PLW resulting from the prescribed annual process will be maintained for the upcoming Capability Year
- **The final PLWs for the upcoming Capability Year will be posted to the NYISO Installed Capacity Market web page by March 1st**

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Energy Duration Limitation Proposal

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EDL Proposal for Capacity Accreditation

- The NYISO is proposing to continue to allow Resources with a limited daily run-time less than 24 hours to elect a 2-, 4-, 6-, or 8-hour EDL
  - If the NYISO observes reliability needs extending past 8 hours, the NYISO will consider adding a 10-hour EDL election option
- Because the annually determined PLW may be shorter than the maximum allowable EDL, the NYISO is proposing the B/S/N requirements on the following slide for Resources with EDLs longer than the PLW
- The B/S/N requirements for Resources with EDLs less than or equal to the length of the annually determined PLWs will remain unchanged
- Derating factors for Resources with EDLs will continue to be calculated over the hours corresponding to each Resource's B/S/N obligation
- Initial DMNC tests will also be conducted over the hours corresponding to each Resource's B/S/N obligation

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EDL Proposal for Capacity Accreditation

- **A Resource with an EDL longer than the PLW will be required to bid to produce or inject energy, schedule a Bilateral Transaction, and/or notify the ISO of any outages for at least the Installed Capacity Equivalent (ICE) of UCAP Sold for all hours within the PLW and for each hour immediately preceding and following the PLW for the remaining hours of the Resource's EDL**
  - An Energy Storage Resource with an EDL longer than the PLW will be required to B/S/N the Resource's full withdrawal capability for all hours outside the B/S/N hours for energy injection
  - Ex. B/S/N requirement for energy production/injection for a Resource with an 8-hour EDL and 6-hour PLW

	PLW						
12	13	14	15	16	17	18	19
B/S/N							

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CAF Interaction with ICAP Demand Curves

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CAF Interaction with ICAP Demand Curves

- MST 5.14.1.2.2.3 requires that ICAP Demand Curve reference point prices be calculated in accordance with ISO Procedures
- Section 5.5 of the ICAP Manual details the current calculation of the ICAP Demand Curve reference point prices as follows:

$$RP_z = \frac{ARV_z * AssmdCap_z}{6 * DAF_z * [SDMNC_z * \left(1 - \frac{LOE_z - 1}{ZCPR_z - 1}\right) + WDMNC_z * \left(1 - \frac{LOE_z - 1 + WSR_z - 1}{ZCPR_z - 1}\right)]}$$

- MST 5.14.1.2 and 5.14.1.2.2.4 require that the ICAP Demand Curves be translated to UCAP terms in accordance with ISO Procedures
  - Currently, the conversion of ICAP to UCAP essentially involves two-steps: (1) multiplying by the applicable Duration Adjustment Factor (DAF) [this value is equal to 100% for Resources not subject to an Energy Duration Limitation]; and (2) multiplying by the applicable derating factor
  - The current reference point price formula accounts for part of the adjustment from ICAP to UCAP terms by including the applicable DAF
- The current ICAP Demand Curve reference point price calculation formula will need to be revised to remove use of the applicable DAF beginning with Capability Year 2024-2025
  - With implementation of Capacity Accreditation in Capability Year 2024-2025, DAFs will no longer apply
- Given that Capacity Accreditation Factors (CAFs) will not be determined until March for the upcoming Capability Year and ICAP Demand Curves are required to be posted by (or, in the case of the first year of each reset, filed by) November 30th prior to the start of each Capability Year, the NYISO does not propose to include use of the applicable CAF in determining the ICAP Demand Curve reference point prices
  - For example, the CAFs for Capability Year 2024-2025 will be determined in March 2024
- Instead, the NYISO proposes to account for the applicable CAF as part of translating the ICAP Demand Curves to UCAP terms
  - Under Capacity Accreditation, conversion of ICAP to UCAP essentially involves the following two steps: (1) multiplying by the applicable CAF; and (2) multiplying by the applicable derating factor

New York ISO

CAF Interaction with ICAP Demand Curves

- **As previously noted, the translation of ICAP to UCAP under Capacity Accreditation essentially requires accounting for both the applicable CAF and derating factor**
  - As part of the Comprehensive Mitigation Review proposal, the NYISO clarified that beginning with the Capability Year 2024-2025, the applicable derating factor to use is that of the peaking plant for each ICAP Demand Curve
- **Accounting for the applicable CAF in the ICAP to UCAP translation rather than as part of the ICAP Demand Curve reference point price calculation continues to produce UCAP reference point prices that are designed to provide revenue adequacy for the applicable peaking plant at the level of excess conditions assumed in establishing the ICAP Demand Curves**
  - Additionally, accounting for both the applicable CAF and derating factor as part of the required ICAP to UCAP translation avoids any potential for adverse impacts to the November 30th deadline to post (or file) updated (or new) curves

New York ISO

CAF Interaction with ICAP Demand Curves

- **Proposal Example - CAF incorporated into the ICAP to UCAP Translation:**
  - Given:
    - ICAP Demand Curve Monthly Reference Point Price (ICAP RP) = $8.87
      - Without CAF incorporated into the ICAP RP
    - Monthly Reference Point Price in UCAP = $\frac{ICAP\ RP}{CAF * (1 - derating\ factor)}$
  - Assume:
    - CAF = 90%
    - Derating Factor = 3%
  - Result:
    - Monthly Reference Point Price in UCAP = $\frac{\$8.87}{0.9 * (1 - 0.03)} = \frac{\$8.87}{0.873} = \$10.16$

New York ISO

CAF Interaction with ICAP Demand Curves

- **Status Quo Example - CAF incorporated into the ICAP Demand Curve Monthly Reference Point Price[1]:**
  - Given:
    - ICAP Demand Curve Monthly Reference Point Price w/o CAF (ICAP RP w/o CAF)= $8.87
    - Adjusted ICAP Demand Curve Monthly Reference Point Price (Adj. ICAP RP) = $\frac{ICAP\ RP\ w/o\ CAF}{CAF}$
    - Monthly Reference Point Price in UCAP = $\frac{Adj.\ ICAP\ RP}{(1 - derating\ factor)}$
  - Assume:
    - CAF = 90%
    - Derating Factor = 3%
  - Result:
    - Adj. ICAP RP = $\frac{\$8.87}{CAF}$ = $\frac{\$8.87}{0.9}$ =$9.86
    - Monthly Reference Point Price in UCAP = $\frac{\$9.86}{(1 - 0.03)}$ = $\frac{\$9.86}{0.97}$ = $10.16

[1] Illustrative example showing that the monthly reference point prices in UCAP will be the same, under the proposal to incorporate the CAF into the ICAP to UCAP translation, as the monthly reference point prices in UCAP that would result if procedures similar to the status quo could be maintained

Translation Factors for IRM/LCR Studies and Deliverability Testing

New York ISO

Translation Factors

- Translation factors are currently used as part of the ICAP-to-UCAP translation for 1) the shifting methodology carried out in the IRM/LCR studies and 2) modeling resources for deliverability studies
- The NYISO calculates translation factors for both Intermittent Power Resources and non-Intermittent Power Resources following ISO procedure and NYSRC Policy
- The current ISO procedure to calculate translation factors for Intermittent Power Resources utilizes the existing market UCAP calculation (detailed in Section 4.5 of the ICAP Manual) applied to the 5-year-historical production of the resource
- With the implementation of Capacity Accreditation, the market UCAP calculation for all Resources will reflect the use of marginal CAFs
  - Therefore, a separate ISO procedure will be required to calculate the translation factors for Intermittent Power Resources for use in the IRM/LCR and deliverability studies
    - The current ISO procedure for calculating translation factors for non-Intermittent Power Resources (i.e., using a blended average of the derating factors of non-Intermittent Power Resources) will not reflect the use of marginal CAFs. Therefore, the current ISO procedure for non-Intermittent Power Resources will be maintained

New York ISO

Proposed ISO Procedure

- **The NYISO is proposing an updated procedure to calculate translation factors for IPRs and LCROR Hydro for the purposes of the IRM/LCR studies and deliverability testing**
- **The proposed ISO procedure will follow the steps described below:**
  1) Calculate average hourly production factors by averaging the output of the resource in June, July, and August for a given hour across all 5 years of production data
  2) Calculate the hourly Loss of Load Risk by calculating the percentage of Loss of Load Events that exist in each hour
     - For this step, the NYISO will use the hourly LOLE distribution percentages of the most recently completed final IRM/LCR model
  3) Calculate the hourly weighted contribution by multiplying the results from steps 1) and 2) for each hour
     - The calculation will use full percentages (as shown in the example on the next slide)
  4) Calculate the weighted production factor by summing up the hourly weighted contributions from step 3)
  5) Calculate the unit-specific availability factor by dividing the weighted production factor from step 4) by the available ICAP of the resource
  6) Calculate the unit-specific translation factor as one minus the availability factor from step 5)

New York ISO

Proposed ISO Procedure – Example IPR

HB	1 Avg Hourly Production Factor (MW)	2 Hourly LOLE Distribution	3 Hourly Weighted Contribution (1)*(2)
0	5	0%	0.0
1	0	0%	0.0
2	0	0%	0.0
3	0	0%	0.0
4	0	0%	0.0
5	0	0%	0.0
6	0	0%	0.0
7	0	0%	0.0
8	0	0%	0.0
9	0	0%	0.0
10	5	1%	0.1
11	8	2%	0.2
12	10	6%	0.6
13	10	10%	1.0
14	10	18%	1.8
15	20	22%	4.4
16	20	22%	4.4
17	30	11%	3.3
18	30	4%	1.2
19	30	3%	0.9
20	40	1%	0.4
21	40	0%	0.0
22	30	0%	0.0
23	5	0%	0.0
		4 Weighted Production Factor	Sum = 18.21

5 IPR Unit Specific Availability Factor

Available ICAP = 100 MW
Weighted Production Factor = 18.21 MW
Availability Factor = 18.21/100 = 0.1821

6 IPR Unit Specific Translation Factor

Translation Factor = 1 – Availability Factor
Translation Factor = 1 – 0.18 = 0.8179

New York ISO

Translation Factors

- The NYISO is proposing revisions to OATT Attachment S to clarify the translation factor methodology used in deliverability studies for different resource classes
  - Revisions to OATT Attachment S will be voted on as part of the interconnection changes for the Internal Controllable Lines project
- The proposed ISO procedure to calculate the translation factors for IPRs and LCROR Hydro has been presented as part of the Capacity Accreditation project's ICAP Manual revisions
- The NYISO will bring the proposed ISO procedure to the NYSRC for approval, as the translation factor calculation relates to the IRM study procedures

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