New York ISO
Independent System Operator

Installed Capacity Manual Revisions

Sarah Carkner, Emily Conway, and Yvonne Huang

Capacity Market Design and ICAP Market Operations

ICAPWG Meeting

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Agenda

- Background
- Proposed Revisions for the Expanding Capacity Eligibility and Tailored Availability Metric rulesets
  - Includes revisions to the ICAP Manual and respective Attachments
- Proposed Revisions for Initial Wind UCAP %
- Next Steps
- Appendix

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Background

Background

- **The Expanding Capacity Eligibility rules value resources in the Capacity market based on the reliability benefit that the resource provides to the system**
  - The rules will allow resources with short durations that currently cannot participate in the Capacity market to be eligible for Capacity market participation
  - The Expanding Capacity Eligibility rules will become effective March 1, 2021 for implementation beginning with the Day-Ahead Market run for the operating day May 1, 2021
- **The Tailored Availability Metric rules enhance the methodology used to calculate the derating factors to better align with reliability of the system**
  - The Tailored Availability Metric rules were accepted by FERC on September 3, 2020, and will become effective March 1, 2021 for implementation beginning with the Day-Ahead Market run for the operating day May 1, 2021

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Purpose of Today's meeting

- Review proposed changes to the ICAP Manual and appropriate Attachments that are necessary to administer the proposed tariff revisions for Expanding Capacity Eligibility (ECE) and Tailored Availability Metric (TAM) rulesets
  - The rules changes applicable to ECE and TAM are anticipated to be implemented by May 1, 2021
- Review proposed changes to the initial UCAP % for wind resources
- A redlined version of the proposed changes to the ICAP Manual and appropriate Attachments are posted with today's meeting materials

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Proposed Revisions for ECE and TAM

Proposed Revisions to ICAP Manual

Proposed Revisions to ICAP Manual

- **The following sections of the ICAP Manual include revisions to accommodate the Expanding Capacity Eligibility ruleset:**
  - Sections 2.5, 4.1.1, 4.2, 4.5, and 4.8
    - Revisions to accommodate resources with Energy Duration Limitations
- **The following sections of the ICAP Manual include revisions to accommodate the Tailored Availability Metric ruleset:**
  - Sections 1, 4.5, and 4.5.1

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Proposed Revisions to ICAP Manual

- **Section 1 – Introduction**
  - Revisions have been made to replace the rolling 12-month average methodology with the Capability Period look-back methodology to determine UCAP as made under the Tailored Availability Metric
    - Further revisions on this are made to Section 4.5 and Attachment J

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Proposed Revisions to ICAP Manual

- **Section 2.5 – The NYCA Minimum Unforced Capacity Requirement**
  - Revisions have been made to account for the Adjusted Installed Capacity value associated with Installed Capacity Suppliers, which is based on the resource's corresponding Duration Adjustment Factor
    - The NYCA translation factor will be based on the total UCAP and Adjusted Installed Capacity of applicable Resources
    - Additional information on these terms is included in the Appendix

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Proposed Revisions to ICAP Manual

- **Section 4.1.1 – Energy Duration Limitations and Duration Adjustment Factors for Installed Capacity Suppliers**
  - Revisions have been made to specify the Energy Duration Limitations (EDL), Duration Adjustment Factors, MW count associated with resources with Energy Duration Limitations, and Peak Load Windows as further described in the NYISO Market Services Tariff
  - Additional information on the MW count of incremental penetration of resources with Energy Duration Limitations is included in the Appendix

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Proposed Revisions to ICAP Manual

- **Section 4.2 – DMNC and DMGC Procedures**
  - Revisions have been made to section 4.2.1 to specify that resources with an EDL must conduct their DMNC test within the applicable Peak Load Window
  - New subsections, 4.2.2.1 and 4.2.2.2, have been created to distinguish the rules for resources without and with EDLs
  - Revisions have been made to distinguish technology types for Energy Storage Resources for purposes of DMNC testing
    - Energy Storage Resources that utilize electrochemical technology will conduct a 1 hour DMNC test
    - Energy Storage Resources that do not utilize electrochemical technology will conduct a 4 hour DMNC test
  - New subsection 4.2.2.2 contains DMNC testing rules for resources with an EDL, including Energy Limited Resources
    - At registration and/or if the unit increases its elected EDL, the unit must sustain maximum output for the number of hours that correspond to its elected EDL
    - For following Capability Periods, the unit will conduct its DMNC test in accordance with its technology type

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Proposed Revisions to ICAP Manual

- **4.4.9 – Resources Capable of Supplying Unforced Capacity in New York**
  - Revisions have been made to reflect the change in the data used to calculate the amount of Unforced Capacity a Resource can supply
    - Under the new TAM rules, derating factors will be calculated based on data from the previous two like-Capability Periods

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Proposed Revisions to ICAP Manual

- **Section 4.4.10 – Resources not in Operation for the Past Two Like-Capability Periods**
  - Revisions have been made to reflect the change in the data used to calculate the amount of Unforced Capacity a Resource can supply
    - Under the new TAM rules, derating factors will be calculated based on data from the previous two like-Capability Periods

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Proposed Revisions to ICAP Manual

- **Section 4.5 – Calculation of the Amount of Unforced Capacity each Resource may Supply to the NYCA**
  - Revisions have been made to align a resource's Unforced Capacity with its Adjusted Installed Capacity value as follows:
    - $Adjusted\ Installed\ Capacity = Installed\ Capacity\ * Duration\ Adjustent\ Factor$
    - $Unforced\ Capacity = Adjusted\ Installed\ Capacity\ * (1 - derating\ factor)$

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Proposed Revisions to ICAP Manual

- **Section 4.5 – Calculation of the Amount of Unforced Capacity each Resource may Supply to the NYCA**
  - Revisions have been made to the Calculation Procedure to reflect the change in the data used to calculate the amount of Unforced Capacity a Resource can supply
    - Under the new TAM rules, derating factors will be calculated based on data from the previous two like-Capability Periods
  - Revisions have been made to reflect when a Resource is in an ICAP Ineligible State
    - Data for these Resources will be replaced with the most recent like-month
  - Revisions have been made to reflect the new methodology for calculating UCAP for Intermittent Power Resources

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Proposed Revisions to ICAP Manual

- **Section 4.5.1 – Calculation of UCAP for Intermittent Power Resources**
  - Revisions have been made to separate wind and solar resources from landfill gas resources
  - Wind and solar resources incorporate the Summer and Winter Peak Load Windows, as well as the hourly weighting methodology
    - A table has been included to show the hourly weighting percentages for the 6 and 8-hour Peak Load Windows for both Summer and Winter

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Proposed Revisions to ICAP Manual

- **Section 4.8 – Bidding, Scheduling, and Notification Requirements**
  - Revisions have been made to include the Bid, Schedule, Notify requirements for resources with an EDL
    - Resources with an EDL, excluding ESRs, must Bid, Schedule, or Notify during the Peak Load Window for the number of hours that correspond to its EDL
      - This includes applicable ELRs
    - ESRs with an EDL must Bid, Schedule, or Notify their full injection range for all hours during the Peak Load Window, and to Bid, or Notify for their full withdrawal range for all hours outside of the Peak Load Window

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Proposed Revisions to ICAP Manual Attachments

Proposed Revisions to ICAP Manual Attachments

- **The following ICAP Manual Attachments include revisions to accommodate the Expanding Capacity Eligibility ruleset:**
  - Attachments D, J, and M
- **The following ICAP Manual Attachments include revisions to accommodate the Tailored Availability Metric ruleset:**
  - Attachment J
- **Additionally, Attachment M includes proposed revisions to the CLR rules to align with existing practices**
  - Note that this is independent from the Expanding Capacity Eligibility design

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Proposed Revisions to ICAP Manual Attachment D

- **Attachment D – DMNC/PMPC Test Form**
  - Revisions have been made to distinguish the technology types for Energy Storage Resources for purposes of DMNC testing
    - DMNC testing for ESRs will be dependent on whether or not the resource utilizes electrochemical technology
    - NYISO is currently working through the revisions to the actual DMNC/PMPC Test Forms

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Proposed Revisions to ICAP Manual Attachment J

- **Attachment J – Unforced Capacity for Installed Capacity Suppliers**
  - Revisions have been made to sections 3.1, 3.2, and 3.7 to create subsections to distinguish the UCAP calculations for resources without and with Energy Duration Limitations
    - For example: Section 3.1.1 includes the procedure for resources that use GADS data that do not have an Energy Duration Limitation, and Section 3.1.2 includes the procedure for resources that use GADS data and have an Energy Duration Limitation
  - Revisions have been made to sections 3.1, 3.2, 3.3, 3.4, and 3.7 to account for changes to derating factors as a part of the Tailored Availability Metric

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Proposed Revisions to ICAP Manual Attachment J

- **Attachment J – Unforced Capacity for Installed Capacity Suppliers**
  - The UCAP calculations for resources without an Energy Duration Limitation will be calculated using existing methodologies over the last two like-Capability Periods
  - The UCAP calculations for resources with Energy Duration Limitations will be calculated during the applicable Peak Load Window for such resources over the last two like-Capability Periods
  - The UCAP calculations for wind and solar resources will be calculated over the appropriate weighted Peak Load Windows

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Proposed Revisions to ICAP Manual Attachment M

- **Attachment M – Procedure to Apply for a Capacity Limited Resource (CLR), Energy Limited Resource (ELR) or Ambient Condition-Dependent Classification**
  - Revisions have been made to align the CLR classification rules with existing practices
    - The revisions extend to examples of CLRs to better align with existing resources with CLR classification
  - Revisions have been made to the ELR classification to account for Energy Duration Limitation
    - This extends to the ICAP DAM bidding obligation and run-time limits associated with ELRs

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Proposed Revisions for Initial Wind UCAP %

Initial Wind UCAP %

Purpose

- **The purpose of this presentation is to obtain support and solicit inputs to proceed with updating the initial UCAP % for wind resource in the Installed Capacity Manual**
- **The following slides include:**
  - Background on the Current ICAP Manual
  - NYISO's Proposal
  - Results from Preliminary Analysis

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Background

- As specified in Section 4.5 of the ICAP Manual, new wind resources are assigned an initial UCAP % during the first year of operation; these numbers were based on the analysis done in 2005

Unforced Capacity Percentage – Wind			
	Zones A through J	Zone K (land-based)	Zone K (off-shore)
Summer	10%	10%	38%
Winter	30%	30%	38%

- These initial UCAP% was based on the analysis performed by GE Energy in 2005, using simulated wind production data and methodologies that are different from other UCAP calculations
- For existing wind resources, the UCAP % is based on the actual output during the Peak Hours from the previous equivalent Capability Period
  - Today, NYISO system has 1,739 MW of existing wind generation, all of which are onshore

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NYISO's Proposal

- **The NYISO propose to update the initial wind UCAP% as the current % is based on an analysis that is outdated and used simulated wind data**
- **For onshore wind, update the initial UCAP% using historical data and aligning with calculations for the existing**
  - Actual production data of onshore wind resources are available since 2013
  - Calculate the historical annual UCAP % per season, with the output during the 6 or 8 Peak Hours
  - NYISO considers using the 5-year historical average to establish the initial wind UCAP%
- **For offshore wind resources, the NYISO propose to update the initial UCAP% using updated simulated wind profiles, and aligning with the calculations for existing wind resources**
  - Currently, NYISO has simulated hourly profile of offshore wind for 2008-2012
  - NREL is in the process of updating the offshore wind profiles, expected in 6 months
  - Once updated data is available, the NYISO plans to apply the same methodology for onshore wind and establish the initial UCAP% for 6 and 8 Peak Hours for Zone J and K

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Onshore UCAP% with Historical Data

- The NYISO aggregated the historical production data* to the zonal level
- The NYISO then calculate the historical zonal level UCAP % using each year's ICAP and the Peak Load Window weighting factors proposed in the TAM rules filed on July 7, 2020
  - The ICAP for each year is based on the capabilities from the corresponding Gold Book
  - The Peak Load Window weighting factors from the TAM filing are shown in the table** below:

Hour Beginning	Summer Months: 6, 7, 8		Winter Months: 12, 1, 2	
	6 Peak Hour Weighting	8 Peak Hour Weighting	6 Peak Hour Weighting	8 Peak Hour Weighting
12		5%		
13	12.50%	10%		
14	18.75%	17.50%		5%
15	18.75%	17.50%		5%
16	18.75%	17.50%	18.75%	17.50%
17	18.75%	17.50%	18.75%	17.50%
18	12.50%	10%	18.75%	17.50%
19		5%	18.75%	17.50%
20			12.50%	10%
21			12.50%	10%

** The historical data is at the billing quality and also used in individual unit's UCAP% calculation.*

*** The weighting factors for all other hours during the year is set to zero.*

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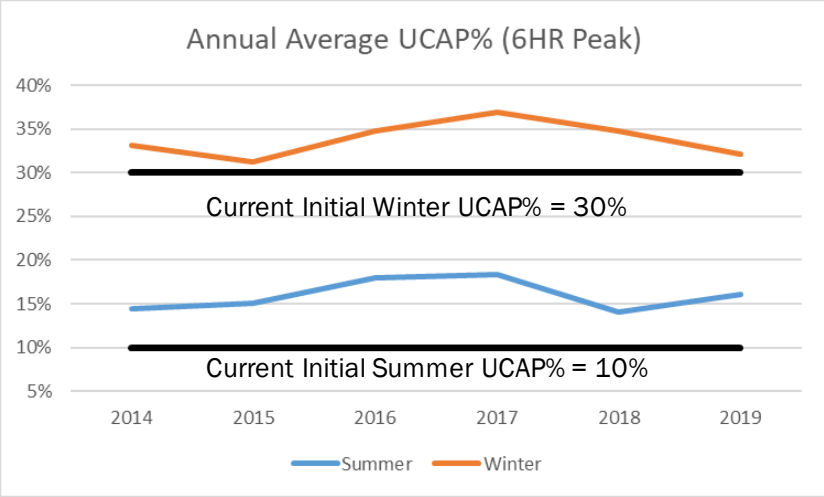
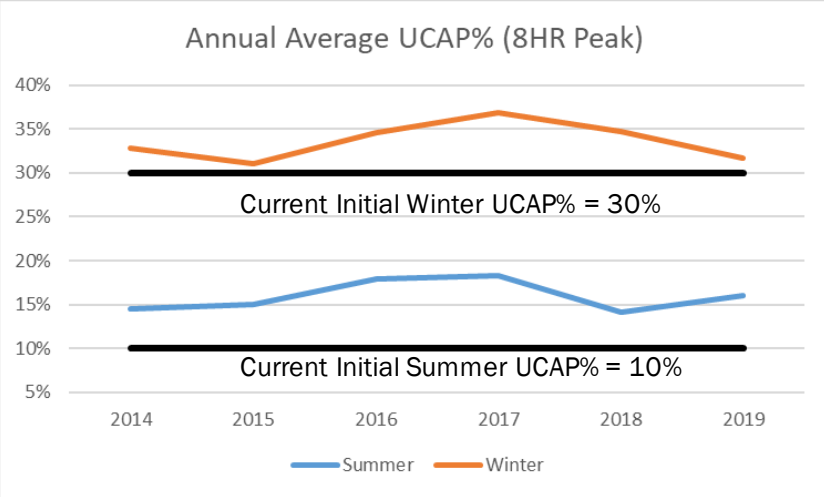
Annual Average of Onshore UCAP%



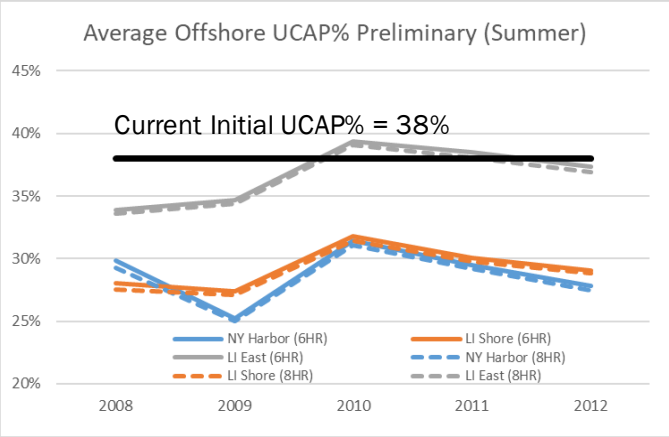


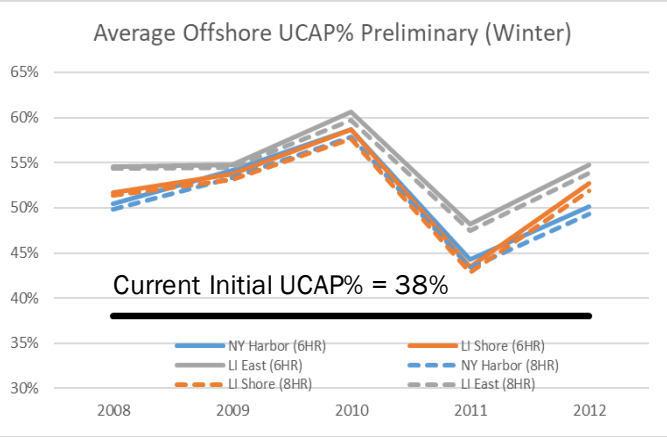
5-Yr Ave. UCAP%*	6-Hr Peak	8-Hr Peak
Summer	16%	16%
Winter	34%	34%

*System averages were established as little zonal differences were observed during the assessment.

Offshore UCAP% with Simulated Data

- Today there is no existing offshore wind on the NYISO system
- Simulated wind profiles for 2008-2012 were available as part of the April 2020 high renewable impact white paper for NY Harbor (Zone J), LI Shore and LI East (Zone K)
- NREL plans to release the updated offshore wind profiles for 2000-2019 in about 6 months
- Same methodology as onshore UCAP% is used for a preliminary assessment:





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Next Steps

- The NYISO plans to finalize the assessment for the onshore wind initial UCAP% with inputs from stakeholders
- The NYISO will return with the proposed ICAP Manual revision based on today's discussion
- The NYISO plans update the offshore wind initial UCAP% assessment once the updated data is available

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Next Steps

Next Steps

- The NYISO is seeking stakeholder feedback on the proposed ICAP Manual and Attachment revisions discussed today
- The NYISO will return to an upcoming ICAPWG to continue discussions on the topics discussed today

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Questions?

Appendix

MST 2 – Definitions

- **Adjusted Installed Capacity**
  - The amount of Installed Capacity a Resource may offer taking into account the Resource's applicable Duration Adjustment Factor
- **Duration Adjustment Factor**
  - The value of Installed Capacity, expressed as a percentage, for a Resource as specified in Section 5.12.14 of the ISO Services Tariff
- **Energy Duration Limitation**
  - For a Resource that is not capable of providing Energy for twenty-four hours each day, the number of consecutive hours per day that a Resource elects and is obligated, pursuant to Services Tariff Sections 5.12.1 and 5.12.7, to (i) schedule a Bilateral Transaction; (ii) Bid Energy in the Day-Ahead Market; or (iii) notify the ISO of any outages in the Day-Ahead Market as an Installed Capacity Supplier for the ICAP Equivalent of UCAP sold, as identified in Section 5.12.14 of the ISO Services Tariff
- **Peak Load Window**
  - The time period during which a Resource with Energy Duration Limitations must offer Energy in the Day-Ahead Market as specified in Section 5.12.14 of the ISO's Services Tariff

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Counting MWs

- **Every year, the NYISO will post the MW count of incremental Resources with Energy Duration Limitations so that all Market Participants are aware which set of Duration Adjustment Factors (i.e. capacity values) will be used in the following Capability Year**
  - The incremental MW count will be posted by July 15th to provide time for resources to elect their durations by August 1st
  - This timing also supports the IRM study process
- **The MW count will start for incremental penetration of resources with Energy Duration Limitations above the existing MW in service as of January 1st, 2019**
- **Once the MW penetration threshold has been met, the effective date of new Duration Adjustment Factors will be May 1st of the following Capability Year**
  - These values will continue to be effective notwithstanding the future MW count of incremental penetration of Resources with Energy Duration Limitations

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Counting MWs (cont.)

- **The objective of the MW Count is to capture the resources with Energy Duration Limitations that are eligible for capacity and are incremental to the As Found 2019 System**
- **The incremental MW count will include the following resources as of July 1:**
  - CRIS of additional Resources with Duration Limitations above the existing fleet in service by July Gen Status – CRIS of Resources with Duration Limitations Retired by July Gen Status + Demand Response (SCR and Capacity DR in DER Aggregations) July MW Sold – Existing SCRs (1309.1 MW)
  - Existing resources as of January 1, 2019 are reflected in the studies that form the basis of the values included in this market design

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Counting MWs (cont.)

Resources included in MW count	Resources included that do not impact MW count	Resources not included in MW count
CRIS of additional Resources that went into service after January 1, 2019 and have participated with an Energy Duration Limitation of 6 hours and less *This includes CRIS of units with an Offer Floor	SCR MW participating in the ISO Markets prior to January 1, 2019 that switch to the DER Participation Model	Existing CRIS of Resources in service and participating in the ISO Markets prior to January 1, 2019
CRIS of Resources with Duration Limitations Retired by July Gen Status		Resources participating with an Energy Duration Limitation longer than 6 hours **For purposes of counting toward the 1000 MW level. The NYISO is open to tracking additional information for future studies
Demand Response (SCR and Capacity DR in DER Aggregations) July MW Sold		
Existing SCRs (1309.1 MW)		

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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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