New York ISO
Independent System Operator

# Tailored Availability Metric


## Emily Conway

Associate Market Design Specialist


## ICS

April 28, 2020

# Agenda

- Background and Recap
- Availability-based Resources
- Wind and Solar Resources
- Next Steps
- Appendix

New York ISO

# Background and Recap

# A Grid in Transition – The Plan

- **Carbon Pricing**
- **Comprehensive Mitigation Review**
- **DER Participation Model**
- **Energy Storage Participation Model**
- **Hybrid Storage Model**

**Aligning Competitive Markets and New York State Clean Energy Objectives**

- **Enhancing Energy & Shortage Pricing**
  - Ancillary Services Shortage Pricing
  - Constraint Specific Transmission Shortage Pricing
  - Enhanced Fast Start Pricing
- **Review Energy & Ancillary Services Product Design**
  - More Granular Operating Reserves
  - Reserve Enhancements for Constrained Areas
  - Reserves for Resource Flexibility

**Valuing Resource & Grid Flexibility**

- **Enhancements to Resource Adequacy Models**
- **Revise Resource Capacity Ratings to Reflect Reliability Contribution**
  - Expanding Capacity Eligibility
  - Tailored Availability Metric
- **Capacity Demand Curve Adjustments**

**Improving Capacity Market Valuation**

New York ISO

# Recap

- The Tailored Availability Metric project is a part of the ongoing Performance Assurance effort, which was prompted by a 2017 Analysis Group report that identified areas where the NYISO could improve its market design in order to incentivize performance and reliability of capacity suppliers
- This initiative has focused on exploring modifications to the derating factor calculations to improve the measurement of the availability of a resource relative to peak load periods
- The scope of the project has included evaluating availability-based resources that use the EFORd or UOL as their derating factor, as well as wind and solar resources

New York ISO

# Recap

- 2020 Deliverable: Q2 Market Design Complete for a May 1, 2021 Implementation
- The proposal for the Tailored Availability Metric project passed at the April 8, 2020 BIC, and will be brought to the April 29, 2020 MC

New York ISO

# Availability-based Resources

# Analysis Recap

- **Initial analysis in 2019 evaluated breaking down the EFORd calculation into peak and non-peak hours**
  - Summer peak hours: HB 12-19
  - Winter peak hours: HB 14-21
- **A separate EFORd was calculated based off of all the events that occurred in peak hours of operation, and all events that occurred in non-peak hours**
  - Breaking up the EFORd calculation to analyze a discontinuous time series led to complications
  - Analysis concluded the current calculation captures the incentive to be available during peak hours
    - The driving force behind the EFORd calculation is service hours in relation to forced outage hours
    - For peaker units, long duration outages (e.g., 1 month) will drive the non-peak EFORd up, which will increase the AEFORd even under a weighting methodology
- **In response, the NYISO proposed weighting peak months more heavily in the calculation**
  - Peak months are currently weighted 25% in the existing Capability Period Average EFORd (AEFORd) calculation
    - Summer Peak months: June, July, and August
    - Winter Peak months: December, January, and February

New York ISO

# Analysis Recap

- **Further analysis requested by stakeholders evaluated placing a weighting percentage on peak months versus non-peak months of the calculation**
  - See Appendix for detailed tables
- **The NYISO considered that there is merit to placing a weighting on some months of the calculation**
  - The NYISO still believes it is important that resources are available in every month
  - Given the uncertainties that the New York grid faces with the potentially rapid changes to the resource mix, discounting current non-peak months may not be representative of the resource availability needs in the future
  - If stakeholders would like to further assess availability-based resources, it could be addressed in the future if it is prioritized in the project prioritization process

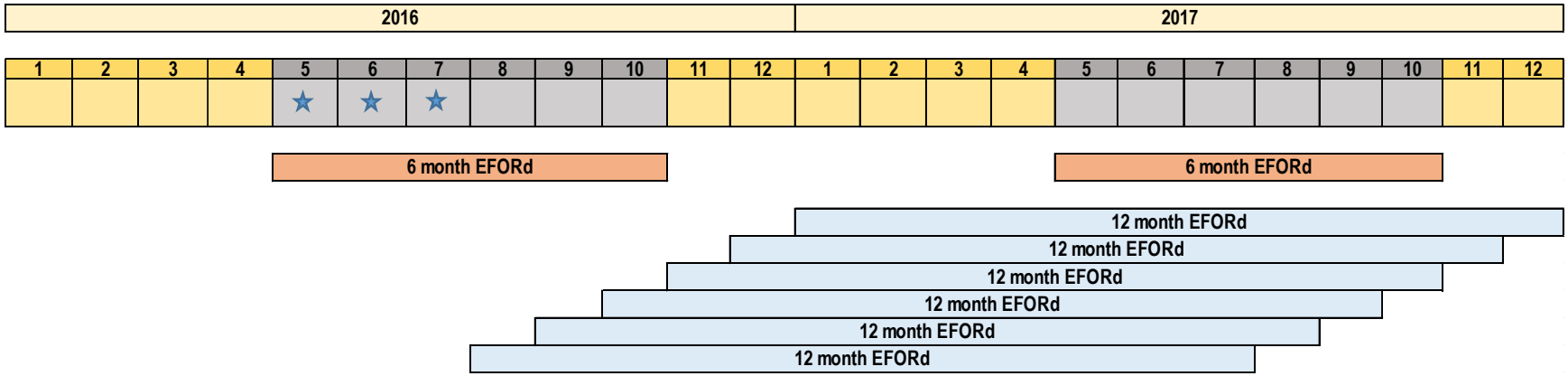
New York ISO

# Availability-based Resources Final Proposal

- **For availability-based resources that use the EFORd or UOL calculation for their derating factor, the NYISO is proposing to take the average of the previous 2-like Capability Period EFORds**
  - Under this construct:
    - A two year look-back would be consistent with the look-back time-frame used today
    - Outages directly effect their respective Capability Period (i.e. Winter outages are reflected in the Winter EFORd)
    - Respective peak months account for 50% of the calculation

New York ISO

# Final Proposal – Summer 2018 AEFORd Example




- The current calculation consists of 6 consecutive 12-month rolling average EFORds, and the proposed calculation takes the average of the previous 2-like Capability Period EFORds
  - The stars on May, June, and July of 2016 indicate the additional months for the Summer 2018 AEFORd example that would now be included in the proposed calculation

New York ISO

# Availability-based Resources Final Proposal

- **For new resources the class average will be used**
  - For example:
    - If a resource has recorded data for 1 Capability Period, the AEFORd will take the average of the calculated EFORd of the resource's actual data for 1 Capability Period and the class average for the missing Capability Period
- **For a resource that is in an ICAP ineligible state (e.g., Mothball, IIFO) the NYISO will look-back until historic "like" data is available**
  - For example:
    - For a Summer 2018 Capability Period AEFORd, if historic data was unavailable for months August – October 2016, the NYISO would replace the missing data from the next available historic year, *i.e.* August – October 2015
    - MST 5.12 has been updated to reflect this change

New York ISO

# Wind and Solar Resources

# Analysis Recap

- The following cases show the differences in the hourly LOLE percentages of the top 4 hours:

| | 2019 IRM Final Base Case | |
|---|---|---|
| HB | 8 Hour | 6 Hour |
| 12 | 7% | |
| 13 | 13% | 14% |
| 14 | 17% | 19% |
| 15 | 19% | 21% |
| 16 | 19% | 21% |
| 17 | 14% | 15% |
| 18 | 9% | 10% |
| 19 | 3% | |
| Top 4 Hours | 68% | 76% |

| | 2020 IRM Preliminary Base Case | |
|---|---|---|
| HB | 8 Hour | 6 Hour |
| 12 | 7% | |
| 13 | 13% | 14% |
| 14 | 17% | 19% |
| 15 | 19% | 21% |
| 16 | 19% | 21% |
| 17 | 13% | 15% |
| 18 | 9% | 10% |
| 19 | 4% | |
| Top 4 Hours | 68% | 76% |

| | High Renewables (12K) Case | |
|---|---|---|
| HB | 8 Hour | 6 Hour |
| 12 | 5% | |
| 13 | 11% | 12% |
| 14 | 16% | 18% |
| 15 | 18% | 20% |
| 16 | 19% | 21% |
| 17 | 16% | 18% |
| 18 | 9% | 10% |
| 19 | 5% | |
| Top 4 Hours | 69% | 78% |

- The High Renewables Case runs the 2020 Base Case with an additional 12,000 MW of renewable resources
  - 4,000 MW of solar, 4,000 MW of onshore wind, and 4,000 MW of offshore wind
- The whitepaper that describes the high renewable study can be found here:
  - http://nysrc.org/PDF/MeetingMaterial/ECMeetingMaterial/EC%20Agenda%20249/4.3%20High%20Renewable%20Resource%20Modeling%20White%20Paper%20v1.1%201-7-2020-Attachment%204.3.pdf

New York ISO

# Analysis Recap

- **Additional analysis assessed the hourly LOLE percentages for 4000 MW of onshore wind, offshore wind, and solar from the 2020 Base Case**
  - Analysis increased 4000 MW of each of the specific resource type to the 2020 IRM Base Case, and rebalanced to the 0.1 LOLE standard

| | 4000 MW Onshore Wind | |
|---|---|---|
| HB | 8 Hour | 6 Hour |
| 12 | 8% | |
| 13 | 13% | 14% |
| 14 | 17% | 19% |
| 15 | 18% | 21% |
| 16 | 18% | 21% |
| 17 | 14% | 15% |
| 18 | 9% | 10% |
| 19 | 4% | |
| Top 4 Hours | 67% | 76% |

| | 4000 MW Offshore Wind | |
|---|---|---|
| HB | 8 Hour | 6 Hour |
| 12 | 9% | |
| 13 | 16% | 18% |
| 14 | 20% | 23% |
| 15 | 19% | 22% |
| 16 | 18% | 20% |
| 17 | 11% | 13% |
| 18 | 5% | 6% |
| 19 | 2% | |
| Top 4 Hours | 68% | 77% |

| | 4000 MW Solar | |
|---|---|---|
| HB | 8 Hour | 6 Hour |
| 12 | 5% | |
| 13 | 9% | 10% |
| 14 | 15% | 17% |
| 15 | 18% | 20% |
| 16 | 20% | 23% |
| 17 | 16% | 18% |
| 18 | 11% | 12% |
| 19 | 7% | |
| Top 4 Hours | 68% | 78% |

New York ISO

# Wind and Solar Resources Final Proposal

- **The NYISO has proposed a recurring study every 4 years, that would result in hourly capacity value weightings across the Peak Load Window**
  - Weightings would be applied to the respective hourly production data
  - The study would run concurrently with the study for Expanding Capacity Eligibility
  - Each study could reset the top 4 hours within the Peak Load Window and percentages based on the percentages for Expanding Capacity Eligibility
- **The duration of the Peak Load Window is dependent on resources with duration limitations**
  - When the system reaches 1000 MW of duration limited resources and the window shifts from 6 hours to 8 hours, the Peak Load Window for wind and solar will also shift

New York ISO

# Wind and Solar Resources Final Proposal

- **At this time, the NYISO has proposed the following weightings across the 8-hour and 6-hour Peak Load Window (PLW)**
- **For a 6-hour PLW, the top 4 hours will receive a 75% weighting**
  - Weightings of the shoulder 2 hours will be equally weighted at 12.5% each
- **For an 8-hour PLW, the top 4 hours will receive a 70% weighting**
  - Weightings of the shoulder hours will be 3-tiered
    - In other words, the next top 2 hours will be weighted 20%, and the last 2 hours will be weighted 10%

New York ISO

# Wind and Solar Resources Final Proposal

- **Summer and Winter Capability Period months will receive the following set of weightings as shown in Table 1**
  - For the Winter PLW, the top 4 hours will remain consistent with methodology used today, and the top load hours from Expanding Capacity Eligibility (HB 16 – HB 19)
- **Under this construct, wind and solar resources will still have the opportunity to receive 100% performance factors if they perform in all hours of the Peak Load Window**

Table 1

| | Summer Peak Load Window | | Winter Peak Load Window | |
|---|---|---|---|---|
| HB | 6 Hour | 8 Hour | 6 Hour | 8 Hour |
| 12 | | 5.0% | | |
| 13 | 12.5% | 10.0% | | |
| 14 | 18.75% | 17.5% | | 5.00% |
| 15 | 18.75% | 17.5% | | 5.00% |
| 16 | 18.75% | 17.5% | 18.75% | 17.50% |
| 17 | 18.75% | 17.5% | 18.75% | 17.50% |
| 18 | 12.5% | 10.0% | 18.75% | 17.50% |
| 19 | | 5.0% | 18.75% | 17.50% |
| 20 | | | 12.5% | 10.0% |
| 21 | | | 12.5% | 10.0% |
| Top 4 Hours | 75% | 70% | 75% | 70% |

New York ISO

# Next Steps

# Next Steps

- **Proposed schedule:**
  - April 2020:
    - ✓ Seek stakeholder approval at BIC
    - Seek stakeholder approval at MC
  - May 2020:
    - Assuming stakeholder approval, seek Board of Directors approval
    - Assuming Board of Directors approval, file tariff revisions with FERC for a May 1, 2021 implementation

New York ISO

# Feedback/Questions?

The NYISO will consider input received during today's Working Group meeting and further input sent in writing to deckels@nyiso.com or econway@nyiso.com

New York ISO

# Appendix

# Additional Analysis Requested

- At the working group meeting on February 26th, stakeholders had requested additional analysis for availability-based resources that use the EFORd calculation
- The analysis included a hypothetical CC and GT unit and shows the change in the AEFORd with a full month outage in a peak month versus a full month outage in a non-peak month
  - Peak months, as defined by the stakeholder request, included months June, July, August, and September
  - The data of the nonpeak months (May and October) were requested to be weighted 25%

New York ISO

# Additional Analysis Requested

- **For the hypothetical CC unit:**
  - Service Hours for peak months ranged within 500-600 hours
  - Service Hours for nonpeak months ranged within 200-300 hours
  - For the non-peak outage case, a full month forced outage was recorded for the whole month of May
  - For the peak outage case, a full month forced outage was recorded for the whole month of July
- **For a full peak month outage, the AEFORd increased 4.8%**
- **For a full nonpeak month outage, the AEFORd decreased 11.3%**

| | CC | | |
|---|---|---|---|
| | EFORd | | |
| Month | Baseline | Non-peak Outage | Peak Outage |
| May | 8% | 100% | 8% |
| June | 4% | 4% | 4% |
| July | 4% | 4% | 100% |
| August | 4% | 4% | 4% |
| September | 4% | 4% | 4% |
| October | 9% | 9% | 9% |
| 6 Month EFORd | 4.3% | 20.6% | 21.1% |
| 6 Month Weighted EFORd | 3.8% | 9.3% | 26.0% |
| Delta | -0.5% | -11.3% | 4.8% |

New York ISO

# Additional Analysis Requested

- **For the hypothetical GT unit:**
  - Service Hours for peak months ranged within 200-300 hours
  - Service Hours for nonpeak months ranged within 100-150 hours
  - For the non-peak outage case, a full month forced outage was recorded for the whole month of May
  - For the peak outage case, a full month forced outage was recorded for the whole month of July
- **For a full peak month outage, the AEFORd increased 4.15%**
- **For a full nonpeak month outage, the AEFORd decreased 10.9%**

| | GT | | |
|---|---|---|---|
| | EFORd | | |
| Month | Baseline | Non-peak Outage | Peak Outage |
| May | 17% | 100% | 17% |
| June | 9% | 9% | 9% |
| July | 8% | 8% | 100% |
| August | 9% | 9% | 9% |
| September | 9% | 9% | 9% |
| October | 21% | 21% | 21% |
| 6 Month EFORd | 9.9% | 25.2% | 26.3% |
| 6 Month Weighted EFORd | 9.0% | 14.3% | 30.4% |
| Delta | -0.9% | -10.9% | 4.15% |

New York ISO

## 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

New York ISO