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Independent System Operator

Response to Stakeholder Questions and Feedback on 2022 RNA, 2022 Quarter 2 STAR and Reliability Planning Enhancements

Keith Burrell

Manager, Transmission Studies

ESPWG

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Agenda

Respond to stakeholder feedback on:

- Q2 Short-Term Assessment of Reliability (STAR) assumptions and methods
- 2022 Reliability Needs Assessment (RNA) assumptions and methods
- Proposed reliability planning process enhancements for considering generator availability in transmission security analyses

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2022 Quarter 2 Short-Term Assessment of Reliability (STAR)

DRAFT – FOR DISCUSSION PURPOSES ONLY

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Background

- The 2022 Q2 STAR key study assumptions were presented to stakeholders at the April 26th ESPWG/TPAS (here)
- The NYISO received a stakeholder comment that on the generator additions slide "N/A" was shown in the CRIS column for many future projects

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Update

- **Each STAR is an assessment and does not necessarily trigger a relook of all projects that now meet the inclusion rules.**
  - If a need is found, then we would look at projects that may now meet our inclusion rules and could solve the need
- **NYISO will review the "N/A" designation for CRIS to ensure it is appropriately reflected in the final Q2 STAR report**

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RNA Status Quo Scenario

Background

- **The 2022 RNA proposed scenarios are under the April 26, 2022 ESPWG [link]**
  - Scenarios are performed for information only and do not lead to solutions solicitation
- **One of the scenarios proposed is the "status-quo scenario"**
  - Removal of planned major transmission and generation projects assumed in the RNA Base Case based on application of the inclusion rules
  - Resource adequacy and transmission security for study year 2032 (year 10)
  - Provide insights into level of reliance on proposed projects

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Status-Quo Scenario Key Assumptions

Starting from the 2022 RNA 1st pass Base Case, study year 2032:

- Remove planned generation and transmission additions, except Western NY and AC Transmission Public Policy projects
- Remove all generation affected by the DEC Peaker Rule, regardless of compliance plans

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Proposed Enhancements to Transmission Security Practices in Reliability Planning

Background

- **At the May 5th TPAS/ESPWG (link here), the NYISO presented several proposed enhancements to transmission security practices in Reliability Planning**
  - It is important to bear in mind that the NYISO already considers resource unavailability in many of its planning models, including resource adequacy
  - The proposed changes would extend this treatment to transmission security

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Consistency with Markets

- **In consideration of the feedback on the transmission security assumptions:**
  - Regarding whether using the proposed inclusion of generator unavailability in the transmission security analysis is consistent with the treatment of these resources in the NYISO's market structures, we confirm that the approaches are consistent
  - The Transmission Security Limits (TSL) and the treatment of generator unavailability in the markets are aligned with these proposed planning changes

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Updated Nuclear Representation

- In consideration of stakeholder feedback, the NYISO agrees to incorporate the North American Electric Reliability Corporation (NERC) five-year class-average forced outage rate values (EFORd) for the nuclear units in the calculation of the reliability tipping point margins

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Dispatch of Wind in Transmission Security Analysis

- Reliability planning transmission security studies currently model land-based wind (LBW) at 0 MW, and no offshore wind (OSW) has been modeled previously.
- At the May 5, TPAS/ESPWG the NYISO proposed the following for wind (dispatch % of nameplate) based on the 3-sigma confidence interval:
  - LBW
    - Summer = 5%, Winter = 7%, Light Load = 8%
  - OSW
    - Summer = 10%, Winter = 13%, Light Load = 13%
- Several stakeholders expressed concern that the treatment of LBW and OSW may be too conservative

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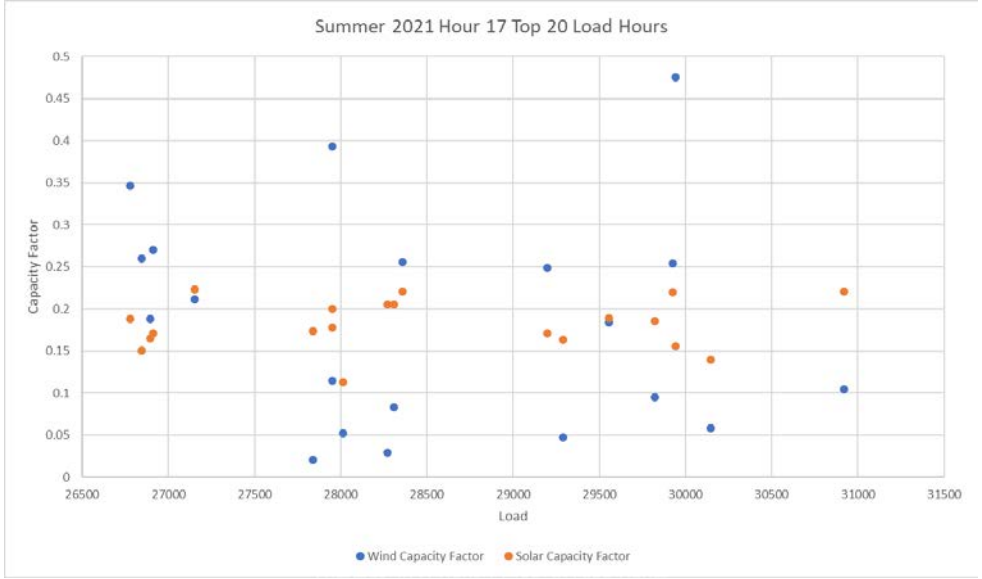
Correlation of Load, Wind, and Solar Resources

- Another concern expressed by stakeholders raised the different approaches to determining the dispatch of wind vs. the dispatch of solar
- The correlation of load to solar is clear and well known, while the lack of correlation between load and wind is also observed when evaluating NYISO historical data



- In a report by DNV-GL for ISO-NE, "Analysis of Stochastic Dataset for ISO-NE", dated 24 February 2021, DNV-GL states:
  - "Hourly, monthly, and annual average wind generation, solar generation, and load were compared with each other for each Load Zone. On an hourly basis, wind generation within each Load Zone did not appear to be correlated to solar generation, gross or net load. However, there was a moderate positive relationship between hourly gross load and solar generation, likely due to their very diurnally dependent profiles"

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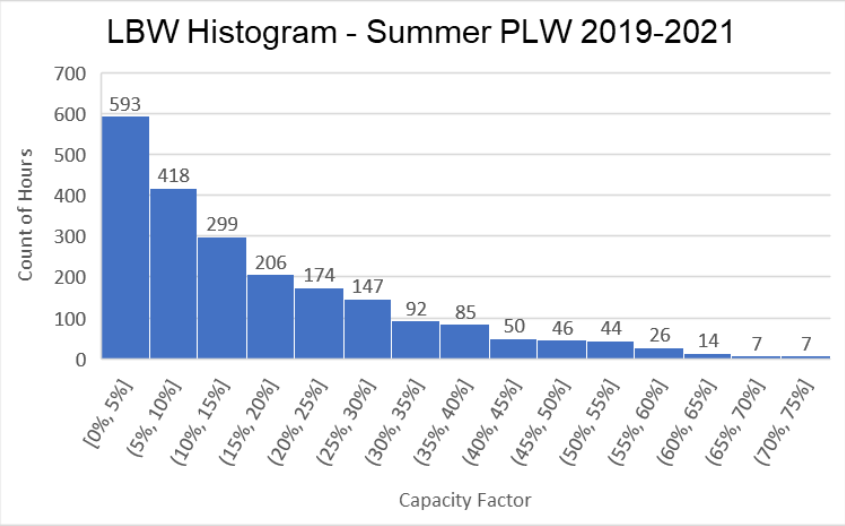
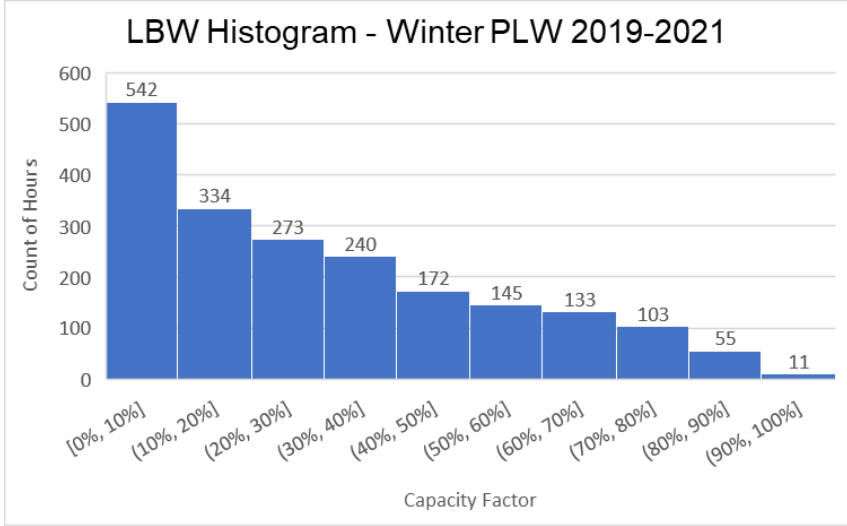
Land-Based Wind Histograms





- Dataset includes 3 years of NYISO historical LBW data
- For the summer PLW about 27% of the hours fall in the 0-5% nameplate range
  - 593 hours (on average about 200 hrs/yr)
- For the winter PLW about 25% of the hours fall in the 0-10% nameplate range
  - 542 hours (on average about 180 hrs/yr)

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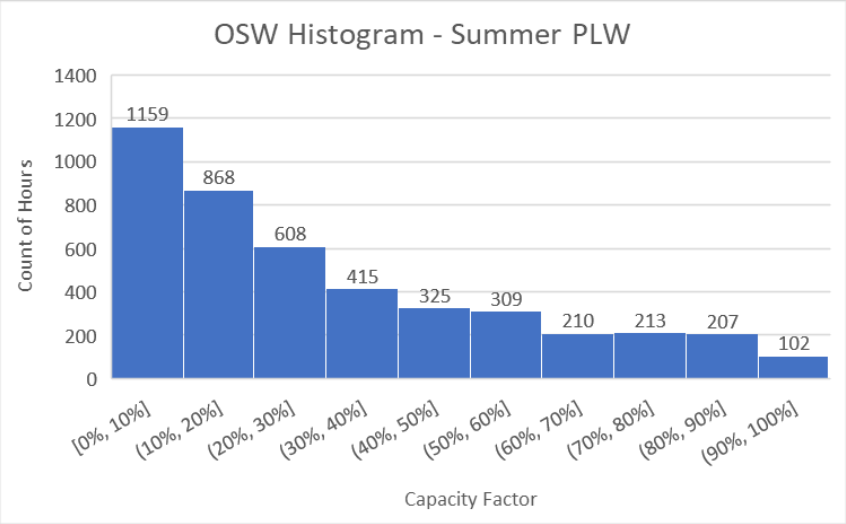
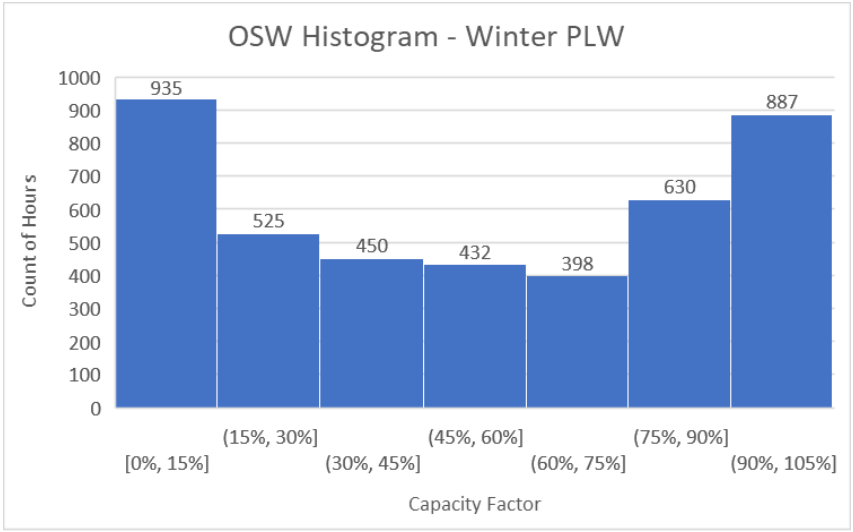
Off-Shore Wind Histograms





- Off-Shore wind data includes 6 years of NREL data
- For the summer PLW about 26% of the hours fall in the 0-10% nameplate range
  - 1,159 hours (average 190 hrs/yr)
- For the winter PLW about 22% of the hours fall in the 0-15% nameplate range
  - 935 hours (average 150 hrs/yr)

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Wind Probability of Exceedance

2019-2021 Data Over Historical Seasonal Peak Hours	P1	P5	P10	P15	P20	P25	P30	P33	P40	P50
Summer LBW HB16-18	0%	0%	0%	5%	5%	5%	5%	5%	10%	10%
Winter LBW HB18-20	0%	0%	5%	5%	10%	10%	10%	15%	20%	25%
Summer OSW HB16-18	0%	5%	5%	10%	10%	15%	15%	20%	20%	30%
Winter OSW HB18-20	0%	0%	5%	10%	15%	20%	30%	35%	45%	55%
Summer BTM Solar HB16-18	5%	5%	5%	10%	10%	10%	10%	15%	15%	20%
Winter BTM Solar HB18-20	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

- After consideration of stakeholder feedback, the NYISO will assume a P20 probability (80% probability of at least that output) for wind-based resources considering no correlation of wind resources to peak load
- For solar resources, a P50 matches closely to what the solar forecast considers for the peak hour, and continues to be the NYISO assumption due to the correlation of solar resources to load

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Updated Wind Dispatch Recommendations

- **In consideration of the wind data, the NYISO recommends the following dispatch percentages for LBW and OSW as these values are shown to be achieved with an 80% probability and also represents a significant portion of the hours in the dataset:**
  - LBW
    - Summer 5% nameplate
    - Winter 10% nameplate
    - Light Load 10% nameplate
  - OSW
    - Summer 10% nameplate
    - Winter 15% nameplate
    - Light Load 15% nameplate

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Solar Resources

- At the May 5 TPAS/ESPWG, the NYISO proposed no changes from existing practices to the approach for modeling solar generation
- Behind-the-meter solar reductions in load forecasts are included in the load forecasts published in the Load and Capacity Data report (Gold Book)
- Utility-scale solar resources are dispatched at the same capacity factor as the behind-the-meter resources for a given transmission security case

	Behind-the-Meter Solar PV (2022 Gold Book)										
Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Table I-9a: Solar PV Nameplate Capacity	4,269	5,152	6,071	6,926	7,740	8,500	9,162	9,705	10,068	10,302	10,484
Table I-9c: Solar PV Peak Reductions	985	1,113	1,216	1,314	1,386	1,421	1,423	1,416	1,379	1,315	1,261
Dispatch Percentage	23%	22%	20%	19%	18%	17%	16%	15%	14%	13%	12%

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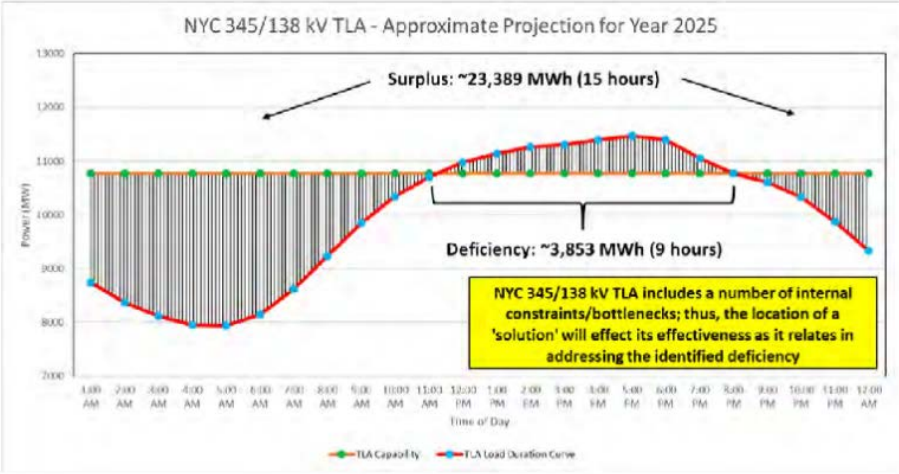
Battery Storage Model Process

- **At the May 5 TPAS/ESPWG, the NYISO proposed no changes to the approach for modeling battery storage resources from existing practices**
  - At the start of the analysis the base case models these resources at 0 MW
  - If a potential transmission security reliability need is observed, post-processing analysis is performed to understand the nature of the need and how the characteristics of battery storage resources may address the need



For example, in the 2020 RNA, the New York City 345/138 kV Transmission Load Area (TLA) had a MW deficiency of 700 MW in 2025. From the load duration curve the deficiency may be observed for about 9 hours. The surplus within the TLA was 15 hours (see 2020 RNA figure 27)

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Conclusion

- Based on stakeholder feedback, the NYISO intends to model generator availability in transmission security analyses in a manner that is consistent with the historical availability of these resource types, and in a manner that is consistent with the treatment of the availability of these types of resources in the NYISO's capacity markets.
- Assumptions of generator availability will continue to be assessed and revisited in future cycles of the Reliability Planning Process

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Questions?

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

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