

April, 10 2023

## Off Shore Wind Data Review – Summary of NYSRC Preliminary Findings

At the March 10, 2023 NYSRC Executive Committee meeting, the Extreme Weather WG presented a preliminary analysis of Off Shore Wind (OSW), which highlighted various issues that could have a significant impact on the design and reliability of the NYS power system. It is noted the NY Climate Leadership and Community Partnership Act (CLCPA) calls for the installation of 9,000 MW of OSW by 2035, increasing to 18,000 MW by 2050. NYSERDA and LIPA have already contracted approximately 4,500 MW, which is currently under development with anticipated near term in-service dates<sup>1</sup>.

At the February NYISO ICAP WG meeting, NYISO made available 21 years of hourly wind data at seven wind development sites, extending from New Jersey to Rhode Island prepared by its weather service provider DNV. Analysis of this data by NYSRC yielded the following preliminary findings<sup>2</sup>:

- 1) Wind lulls, defined as periods of each hour of wind output less than 20% for extended periods of 24 hours or longer, occur about 30 times per year on average. Wind lulls of 48 hours or longer occur on average about seven times per year, and wind lulls of 72 hours or longer occur on average two times per year.
- 2) About 70% of these wind lulls over the 21-year period occurred during the peak four month summer period from June to September.
- 3) OSW being developed off the coast of downstate NY is expected to exceed 4,500 MW by the mid to late-2020s. The magnitude of wind lulls observed reduces this output by up to 4,500 MW for the duration of the wind lull event. By 2035, NY plans to install 9,000 MW of OSW, which is expected to further increase the impact of wind lulls. It's worth noting that the largest contingency currently considered by NYISO for operating reserves is loss of 1,300 MW.
- 4) Large-scale OSW development is concentrated in the downstate NY region with limited transmission flexibility.
- 5) Wind lulls of up to 86 hours with an average energy output of less than 5% rated output occur simultaneously across all seven sites were observed in the DNV dataset.
- 6) Wind lull events are highly correlated interregional events extending from NJ to Rhode Island, thus the impact of wind lulls extends to OSW located in PJM and NE. Wind lulls frequently extend across the whole Northeast seaboard from NJ across downstate NY to Rhode Island/Massachusetts.
- 7) Similar to NY, policy makers from PJM and New England are also moving forward with large OSW policy proposals to address decarbonization, with proposals in each region totaling tens of thousands of MW, in addition to NY CLCPA plans for 9,000-18,000 MW between 2035-2050.
- 8) The reliability of the traditional interconnected power system design relies on diversity of forced outage rates and independence of outage events. Correlation of interregional wind

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<sup>1</sup> [New York's Offshore Wind Projects - NYSERDA](#)

<sup>2</sup> [Installed Capacity \(ICAP\) Working Group - NYISO](#)

lulls eliminates diversity of loss of power output events associated with OSW and alters this aspect of system design.

- 9) Wind lulls impact interregional OSW located in PJM, NY and NE simultaneously reducing the availability of reserve sharing and emergency assistance available for support from these neighboring control areas.
- 10) Preliminary findings have also identified periods of correlated OSW wind coincident with simultaneous solar lulls.
- 11) The implementation of the CLCPA will reduce diversification of alternate energy sources presently in the electric sector including natural gas and petroleum and will reduce diversification available to society as a whole as more end uses rely upon electricity. Electrification of the NY economy under is also projected to significantly increase electric load. Under CLCPA, electric load is projected to double in the next 20 years, which will substantially increase societal reliance on electricity as a reliable energy source.<sup>3</sup>
- 12) Mandatory time of use rates shifting load have been enacted by some utilities, notably LIPA, starting in 2024, with the intent of altering daily load cycle shapes to extend usage to hours traditionally non-peak hours<sup>4</sup>. It is anticipated additional utilities will follow this practice in the near term.

In summary, the initial NYSRC analysis of OSW data has highlighted important reliability considerations that NYISO should take into account in the near-term reliability assessments, retirement studies, and system adequacy reviews to ensure sufficiency of system design to handle OSW volume expected to become operational in the next five years.

Furthermore, the results of this analysis suggest it is important for NYISO and its weather service provider to conduct additional studies to identify correlations among decarbonized sources such as OSW, terrestrial wind, solar, and electric demand. This will be important to ensure sufficient backup to address wind lulls and other correlated loss of supply events as the renewable energy mix increases rapidly in the overall energy mix.

The NYSRC will support NYISO and NYS in conducting these near-term investigations and in taking associated actions to ensure reliability of the NY power system.

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<sup>3</sup> [Draft Scoping Plan - New York's Climate Leadership & Community Protection Act \(ny.gov\)](#)

<sup>4</sup> [Time of Use Rate Plans \(TOU\) - PSEG Long Island \(psegliny.com\)](#)

