New York ISO
Independent System Operator

Offshore Wind in Neighboring Systems

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Background

- The NYSRC Extreme Weather Working Group's earlier analysis found a correlation in wind lull events among offshore wind facilities in NYISO, ISO-NE, and PJM. This prompted concerns regarding the potential impacts of these correlated outages on the Installed Reserve Margin (IRM)
- Currently, there are two offshore wind facilities reflected in the IRM study
  - South Fork Wind (138 MW) in NYCA, and Vineyard Wind (885 MW) in ISO-NE
- This sensitivity analysis assesses the potential impact of wind profile correlation on reliability and capacity by modeling the Vineyard Wind facility using wind profiles

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Offshore Wind Modeling

- The Vineyard Wind facility was modeled in the 2025-2026 IRM Preliminary Base Case (PBC) within the ISO-NE system as a thermal unit in the Southeast Massachusetts area with a ISO-NE designated capacity rating of 278.06 MW (winter) 155.62 MW (summer)
- In the sensitivity analysis, when modeled with a wind output production profile, the Vineyard Wind facility's nameplate capacity of 885 MW is used in conjunction with the production output profile based on the raw wind shape profiles published by ISO-NE
  - 2024_celt_report.xlsx (live.com); Variable Energy Resource (VER) Data
- The revised modeling results in adding variable capacity to the ISO-NE system instead of modeling the Vineyard Wind facility with the stable output of a thermal unit as was done in the 2025-2026 IRM PBC

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Sensitivity Analysis Results

- **A parametric test case was run on the 2025-2026 IRM PBC (Test Case). The change in modelling of the Vineyard Wind facility had a minor impact on the IRM, reducing it by 0.05%**
  - Locational capacity requirements (LCRs) for Load Zones J and K, and the G-J Locality showed a similar minor reduction
  - The emergency operating procedures (EOP) calls increased slightly by 0.06 days/year
- **The external loss of load expectation (LOLE) for ISO-NE decreased by 0.014 event days per year**
  - This change in LOLE for ISO-NE can be attributed to an increase in yearly production of the Vineyard Wind facility when modeled as an offshore wind unit as compared to modeling the facility as a thermal unit
  - When modeled as a thermal unit, total production was 2,072,425 MWh, whereas, when modeled as an offshore wind unit, the yearly average production using the five years of historical offshore wind production profiles was significantly higher at 3,764,238 MWh
  - The LOLE for all other external zones remained unchanged

	2025-2026 IRM PBC	Test Case	Delta
NYCA	23.60%	23.55%	-0.05%
ZONE J	75.98%	75.95%	-0.04%
ZONE K	102.52%	102.47%	-0.05%
G-J Locality	87.54%	87.50%	-0.04%
EOP Calls	7.40	7.46	0.06
ISO	**2025-2026 IRM PBC LOLE**	**Test Case LOLE**	**Delta**
NYCA	0.100	0.100	0.0
PJM	0.121	0.121	0.0
ISO-NE	0.109	0.095	-0.014
Ontario (IESO)	0.128	0.128	0.0
Hydro Quebec (HQ)	0.103	0.103	0.0

	Thermal Unit	Wind Unit (5 Year Average)
Energy Production (MWh)	2,072,425	3,764,238

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Sensitivity Analysis Results – Perfect Correlation Scenario (PC)

- To model the potential impact of perfect correlation in the production profiles of NYCA and external offshore wind units, the Vineyard Wind facility was assigned the same wind shape as South Fork Wind, simulating identical production patterns across offshore wind units in NYCA and ISO-NE (Test Case_PC)
- The IRM and LCR results remain consistent with the previous analysis using the ISO-NE wind shapes
- The LOLE for ISO-NE experienced a slight incremental decrease of 0.015 event days per year due to a decrease in the modeled energy production of the Vineyard Wind facility when using the South Fork Wind shapes
  - The total energy production is slightly lower when the Vineyard Wind facility uses the South Fork Wind shapes, indicating a difference in production profiles between ISO-NE's offshore wind shapes and those for NYCA

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NYCA	23.60%	23.55%	-0.05%
ZONE J	75.98%	75.95%	-0.04%
ZONE K	102.52%	102.47%	-0.05%
G-J Locality	87.54%	87.50%	-0.04%
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ISO	2025-2026 IRM PBC LOLE	Test Case_PC LOLE	Delta
NYCA	0.100	0.100	0.0
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IESO	0.128	0.128	0.0
HQ	0.103	0.103	0.0

Wind Unit (5 Year Average)	South Fork Wind Shapes	ISO-NE Offshore Wind Shapes
Vineyard Wind Energy Production (MWh)	3,533,397	3,764,238

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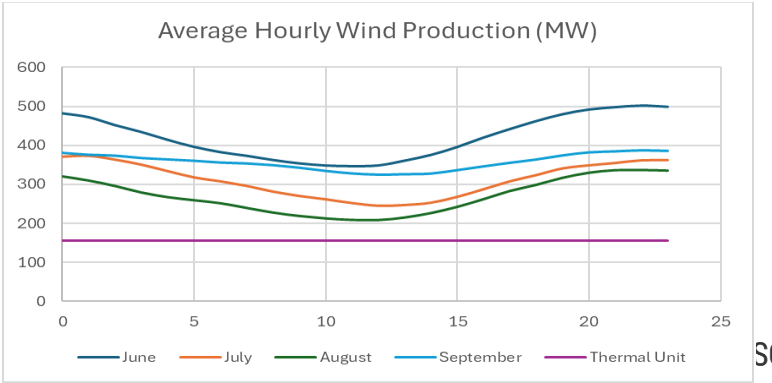
NYCA Monthly LOLE

- The sensitivity analysis modeling the Vineyard Wind facility using the ISO-NE offshore wind shapes identified a reduction in the NYCA monthly LOLE distribution in June, July, and September but an increase in August. The observed increase in August is primarily due to the lower average wind production observed during that month
  - The increase in LOLE in August is attributed to lower wind production during this period compared to other summer months, as shown in the average hourly production graph to the right
  - June, July, and September show decreases in LOLE, which can be attributed to the higher wind production observed during these months

Month	2025-2026 IRM PBC	Test Case	Delta
Jan	0.00000	0.00000	0.00000
Feb	0.00000	0.00000	0.00000
March	0.00000	0.00000	0.00000
April	0.00000	0.00000	0.00000
May	0.00000	0.00000	0.00000
June	0.00022	0.00011	-0.00011
July	0.07987	0.07952	-0.00035
August	0.01184	0.01326	0.00142
September	0.00806	0.00699	-0.00107
October	0.00000	0.00000	0.00000
November	0.00000	0.00000	0.00000
December	0.00000	0.00000	0.00000

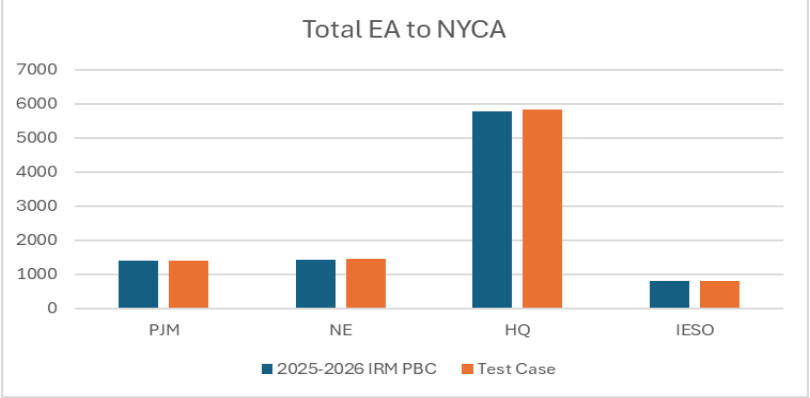


Emergency Assistance (EA)

- **The increased energy production of the Vineyard Wind facility observed in the sensitivity analysis using the ISO-NE offshore wind shapes, along with reduced LOLE for ISO-NE, resulted in changes to EA coming into NYCA**
  - EA from ISO-NE to NYCA increased by 51 MWh
- **Despite the increased capacity in ISO-NE's system resulting from the revised modeling of the Vineyard Wind facility, the level of EA from ISO-NE to NYCA did not increase significantly**
  - EA flow between ISO-NE and NYCA is bound by dynamic limits. The dynamic limits for EA from ISO-NE to NYCA are 50 MW in Bin 1, 540 MW in Bin 2, 1,000 MW in Bin 3, and 1,530 MW in Bin 4
  - The revised modeling for the Vineyard Wind facility effectively adds 280 MW of UCAP to ISO-NE, which is a minor adjustment relative to its total system capacity

*Bin Weighted Average EA

Zone	2025-2026 IRM PBC (EA MWh)	Test Case (EA MWh)	Delta (EA MWh)
HQ	1,386	1,411	+26
IESO	1,430	1,461	+31
ISO-NE	5,787	5,838	+51
PJM	805	816	+11



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Observations

- Modeling the Vineyard Wind facility as an offshore wind unit increases the effective capacity in ISO-NE, offering marginal benefits to the NYCA system. However, it is important to note that wind energy has variability in energy distribution that can impact system reliability
- The overall impact on system reliability of modeling the Vineyard Wind facility as an offshore wind unit can stem from increased ISO-NE capacity, the variable nature of wind energy, and/or correlations between offshore wind units in the NYCA and ISO-NE systems, making it difficult to isolate the individual impacts
- Moreover, offshore wind units in ISO-NE and NYCA are currently small compared to the total system capacity in each area, minimizing the impact of correlated wind events, if any, on reliability and the IRM in the near-term
- The NYISO will continue to collaborate with the NYSRC and the Extreme Weather Working Group to share findings and identify next steps

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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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