

NY Renewables – Overview and YTD Operation

Reposted in response to Stakeholder Feedback

Cameron McPherson

Operations Analysis & Services Analyst

MIWG

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Agenda

- **Overview of NY Wind**
- **Wind Curtailment Statistics**
- **Overview of NY BTM Solar**
- **Questions**

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Background on Metrics

- Unless otherwise stated, Wind data accounts for all wind plants installed in the NYCA.
- Unless otherwise stated, Wind and Solar Capacity Factors are inclusive of ALL hours in 2018 and do not adjust for periods of resource outages or derates.
- Behind-the-meter (BTM) Solar production and capacity factors are based on estimates from NYISO's Solar/PV monitoring vendor. They are influenced by the pitch and tilt of the sampled installations being used to scale up production estimates. They are not a direct measurement of solar production.
- Capacity Factors are calculated as follows:

$$\text{Capacity Factor} = \frac{\text{Total Generated Energy}}{(\text{Nameplate Capacity})(\text{Total Hours})}$$

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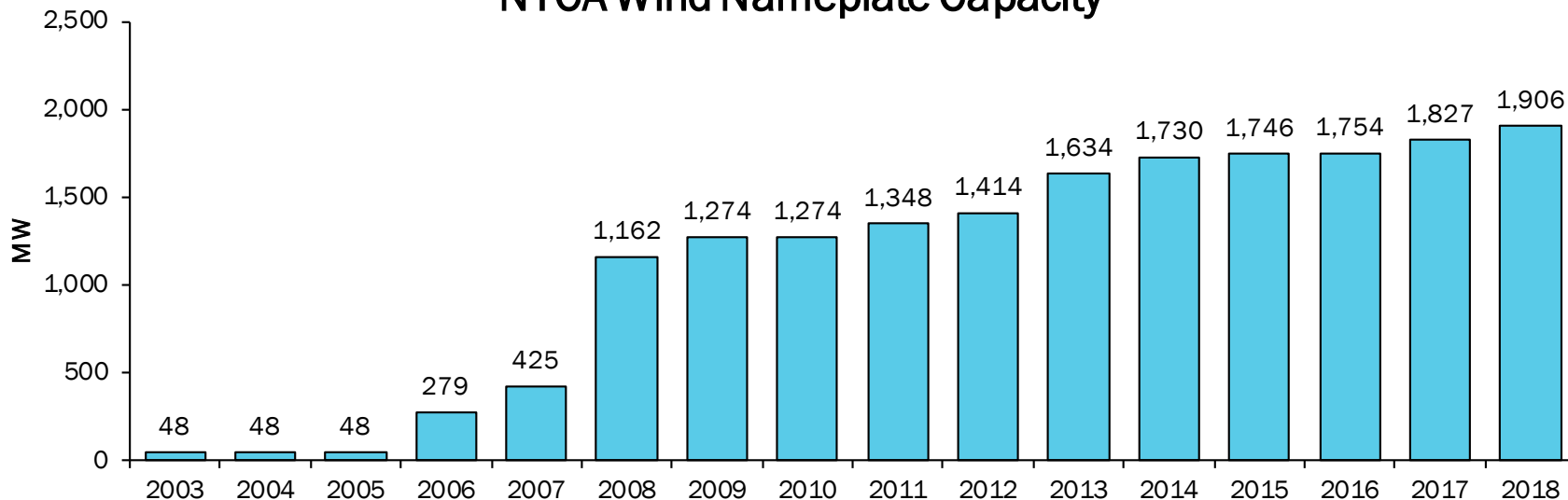
NYCA Wind

2018

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Overview

NYCA Wind Nameplate Capacity

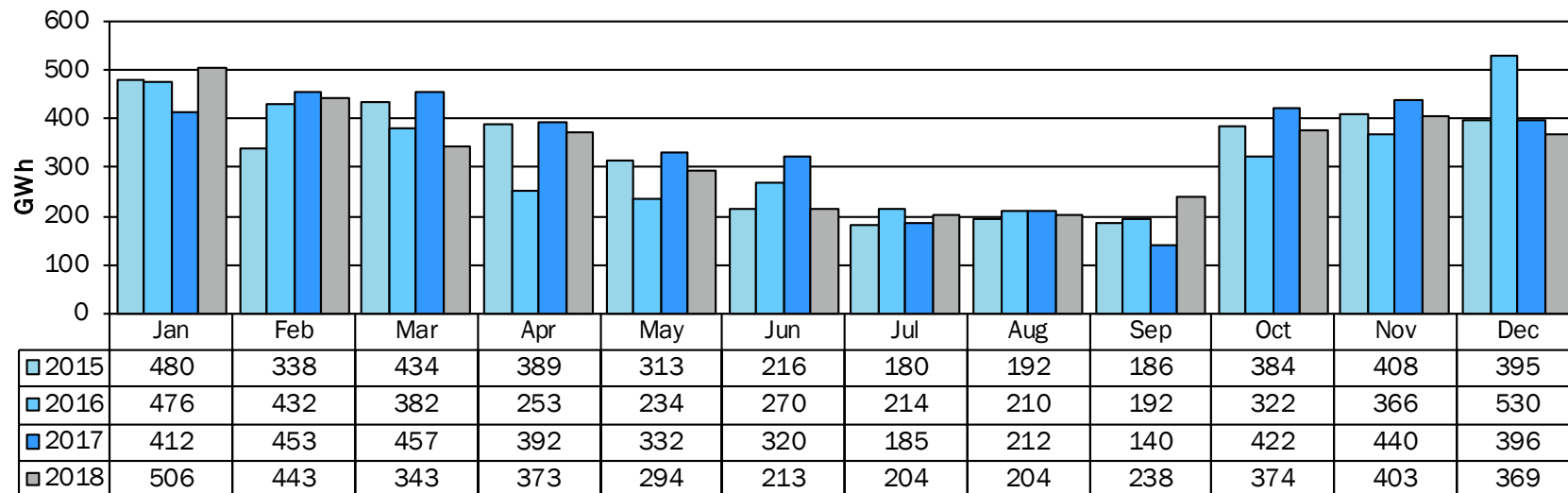


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NY wind generation profile

NYCA Wind Plants - Monthly Production

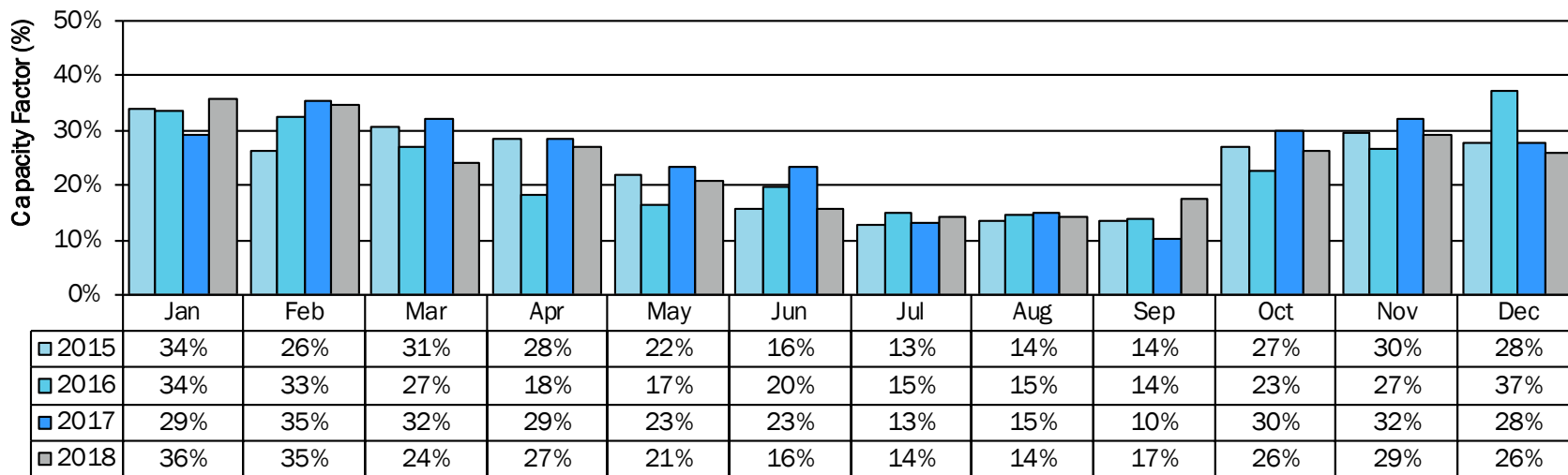


2015 2016 2017 2018

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NY wind Capacity Factor profile

NYCA Wind Generation – Monthly Capacity Factor

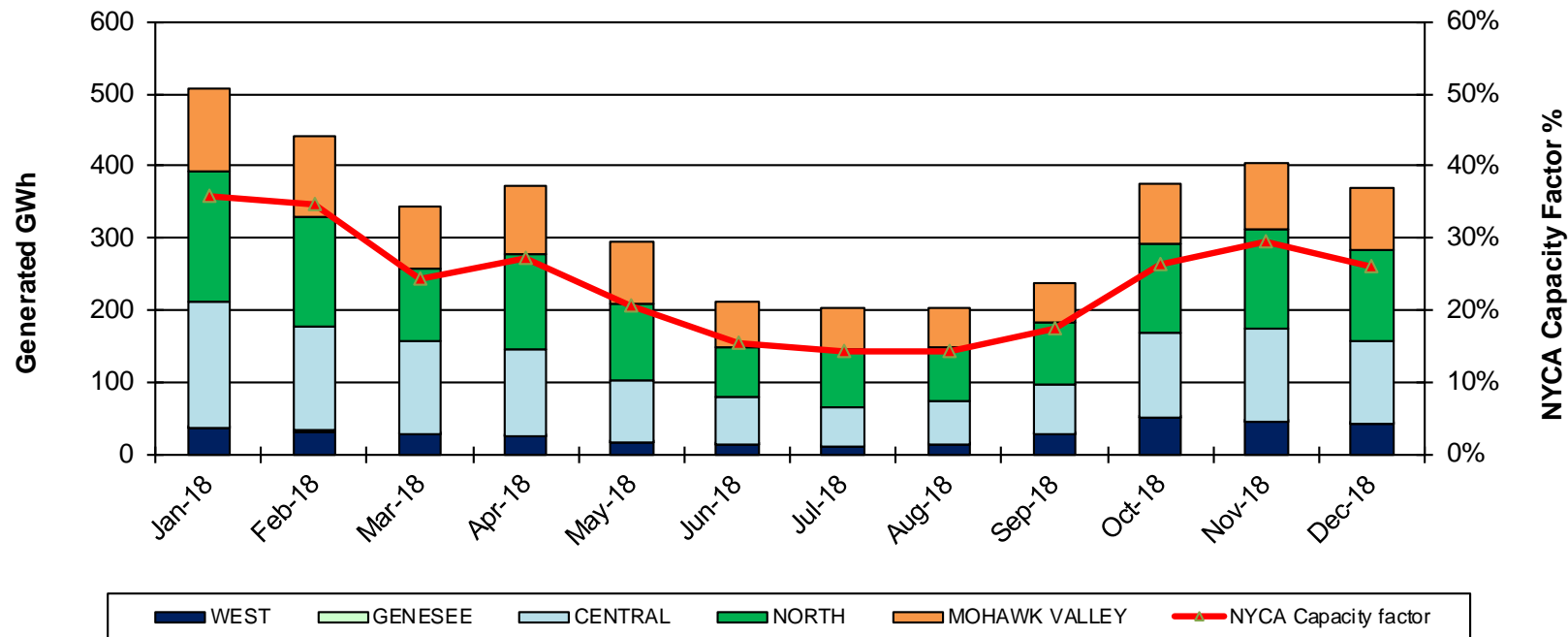


2015 2016 2017 2018

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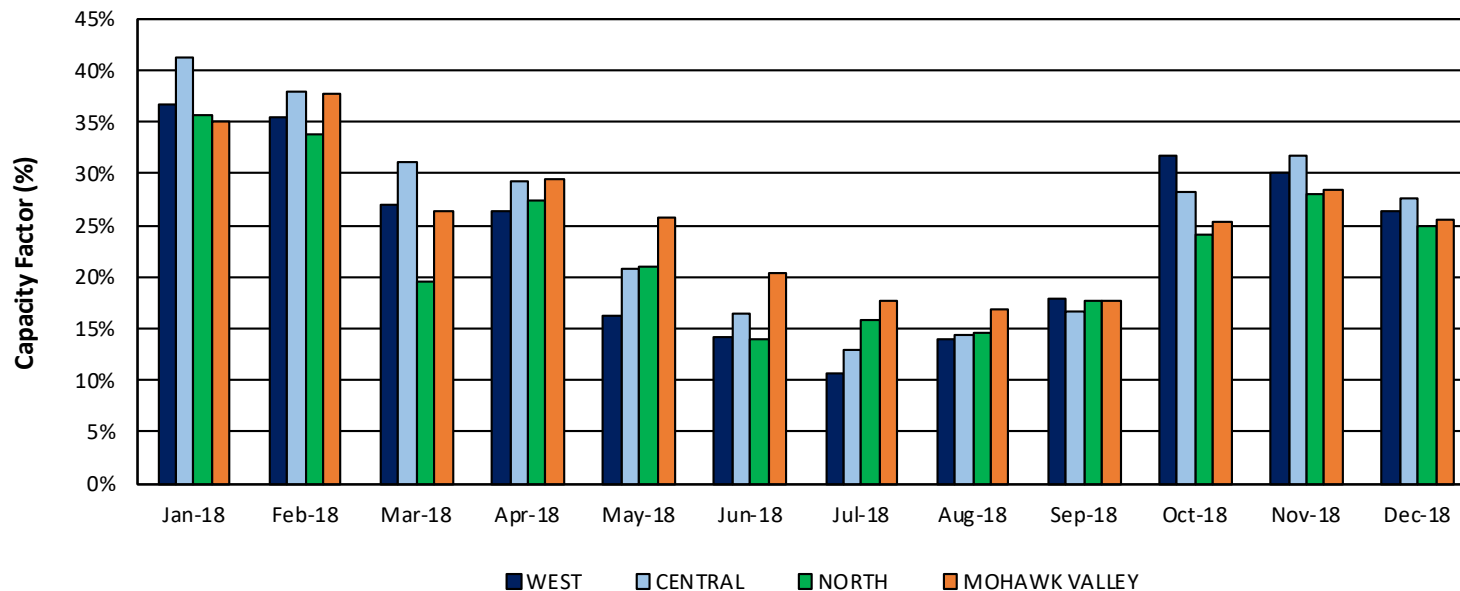
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Monthly Wind Production by Zone



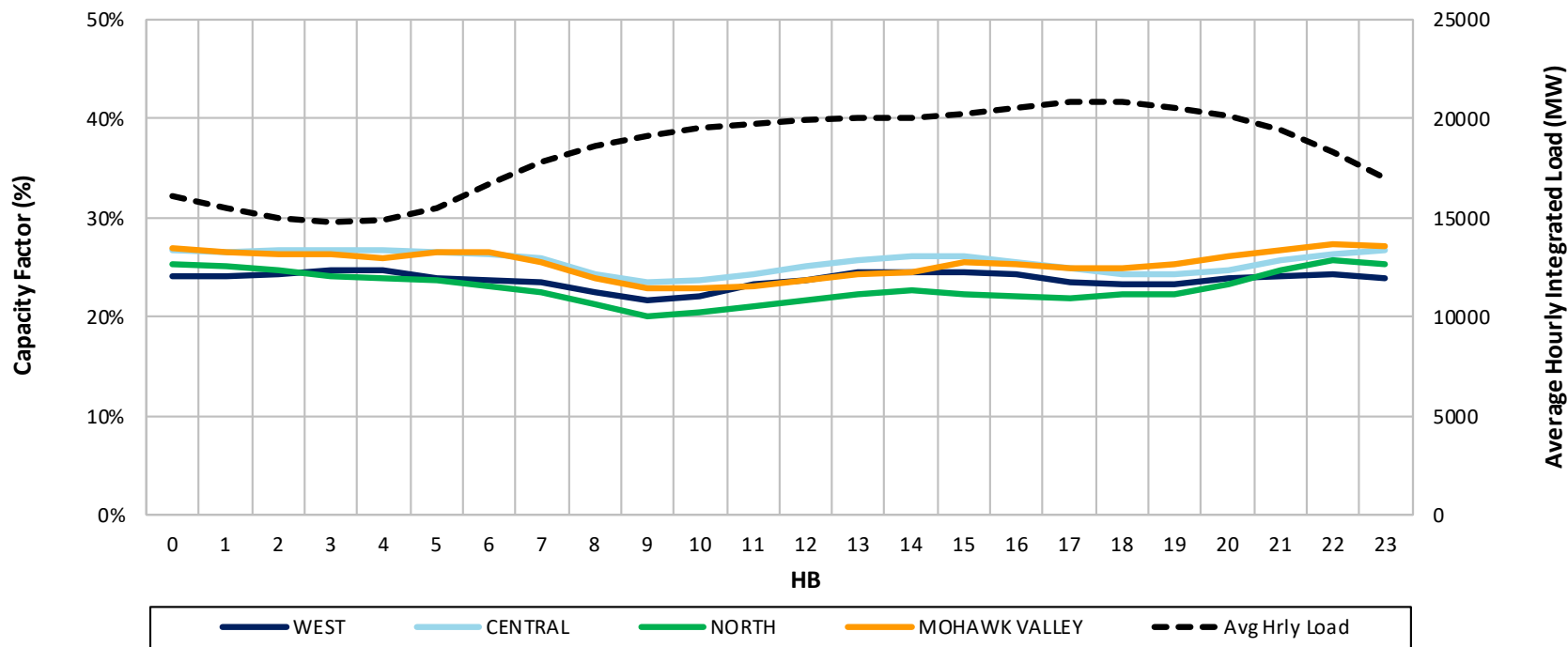
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Monthly Wind Capacity Factors by Zone



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2018 Average Hourly Wind Capacity Factors by Zone

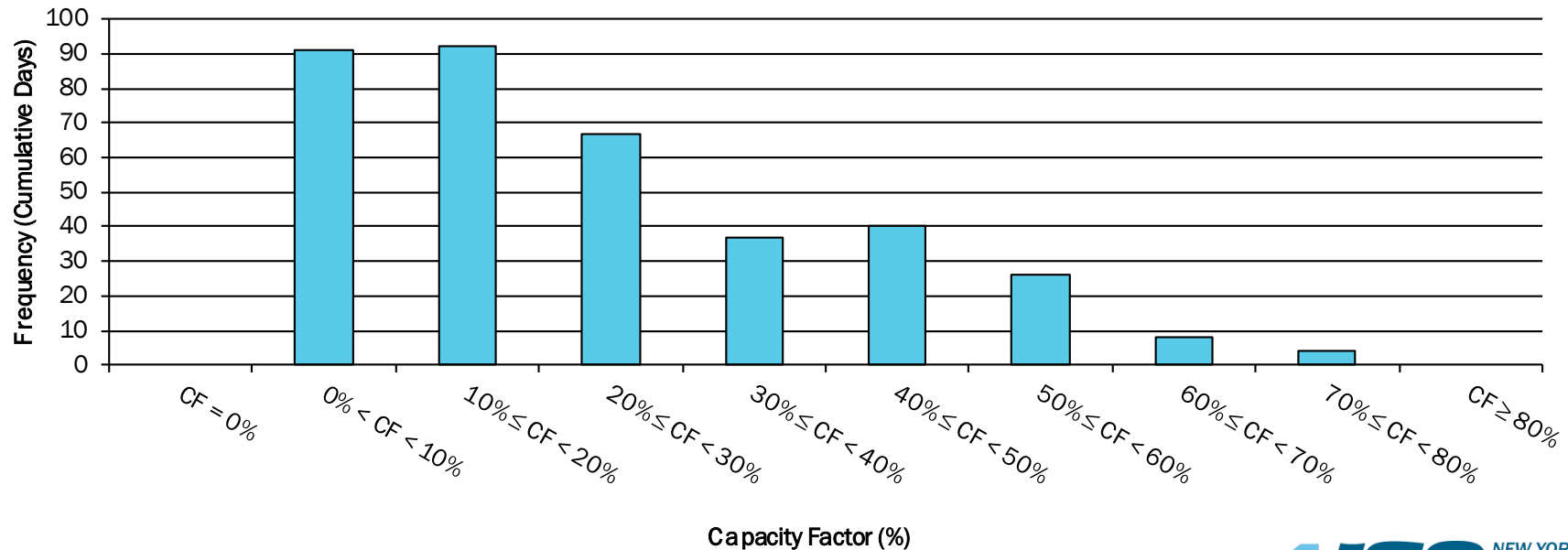


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NY wind 2018 Capacity Factor distribution

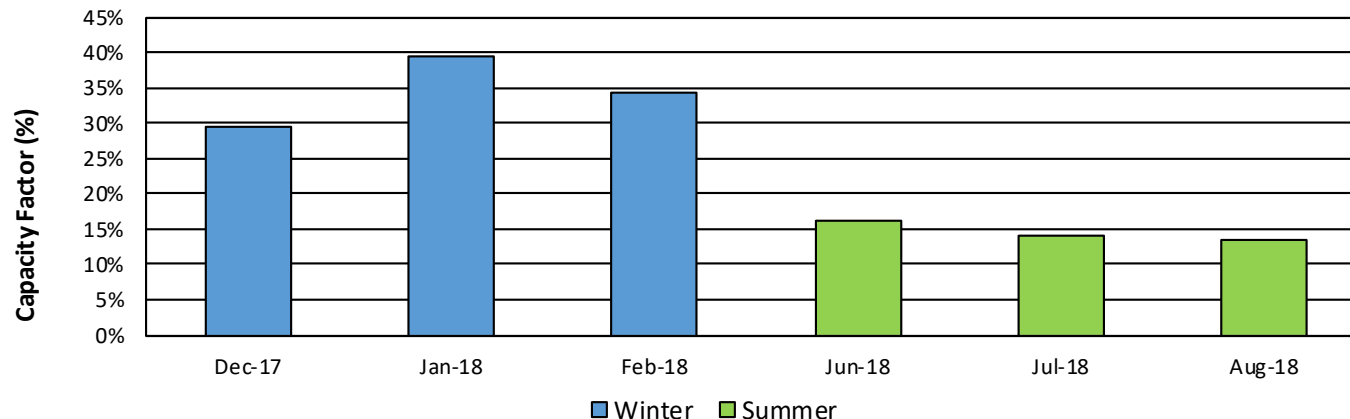
Daily Capacity Factor (CF) Distribution for 2018



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2018 Average Wind Capacity Factors over ICAP Months/Hours

Note: Analysis assumes the full availability of units for all hours assessed.

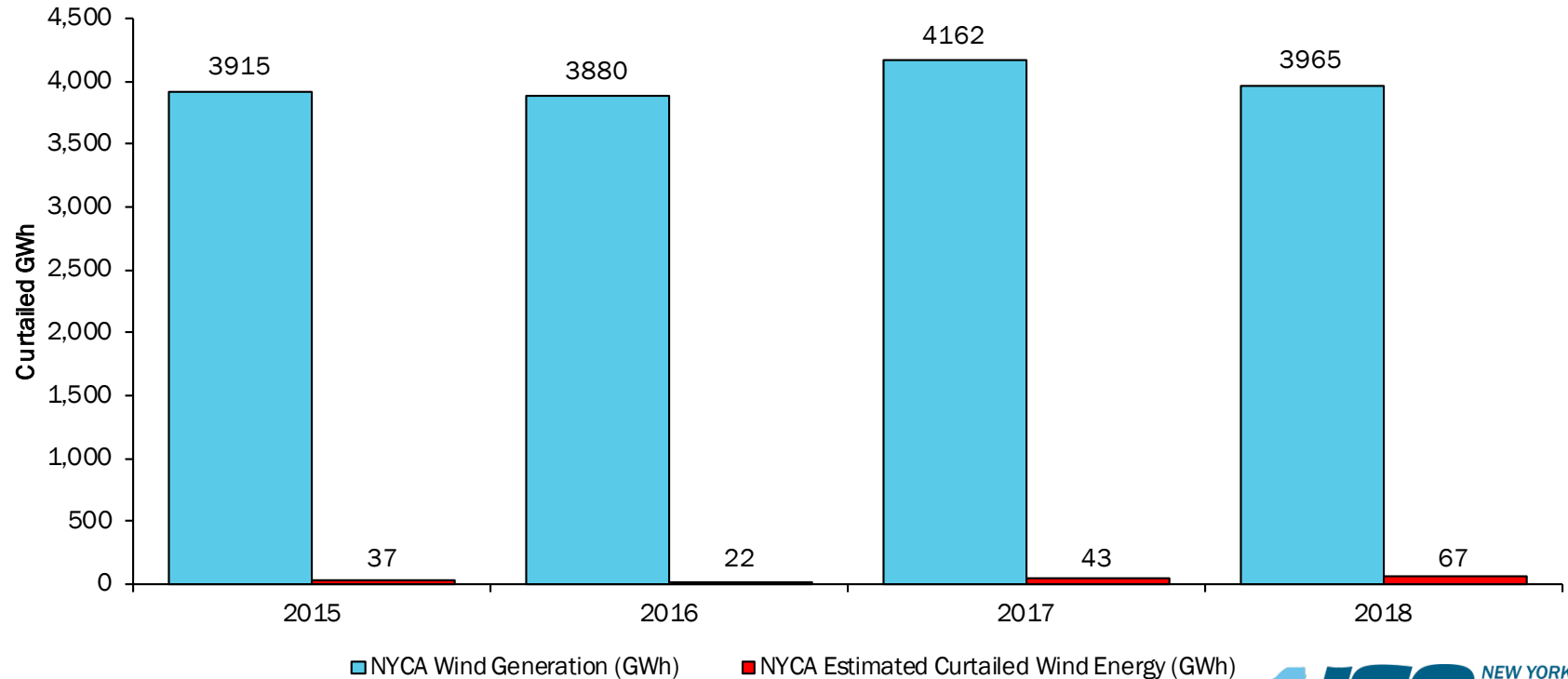


Season	Months	Hours	Average Wind Capacity Factor
Winter	December - February	16:00 until 20:00	34.4%
Summer	June - August	14:00 until 18:00	14.6%

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Economic Wind Curtailment

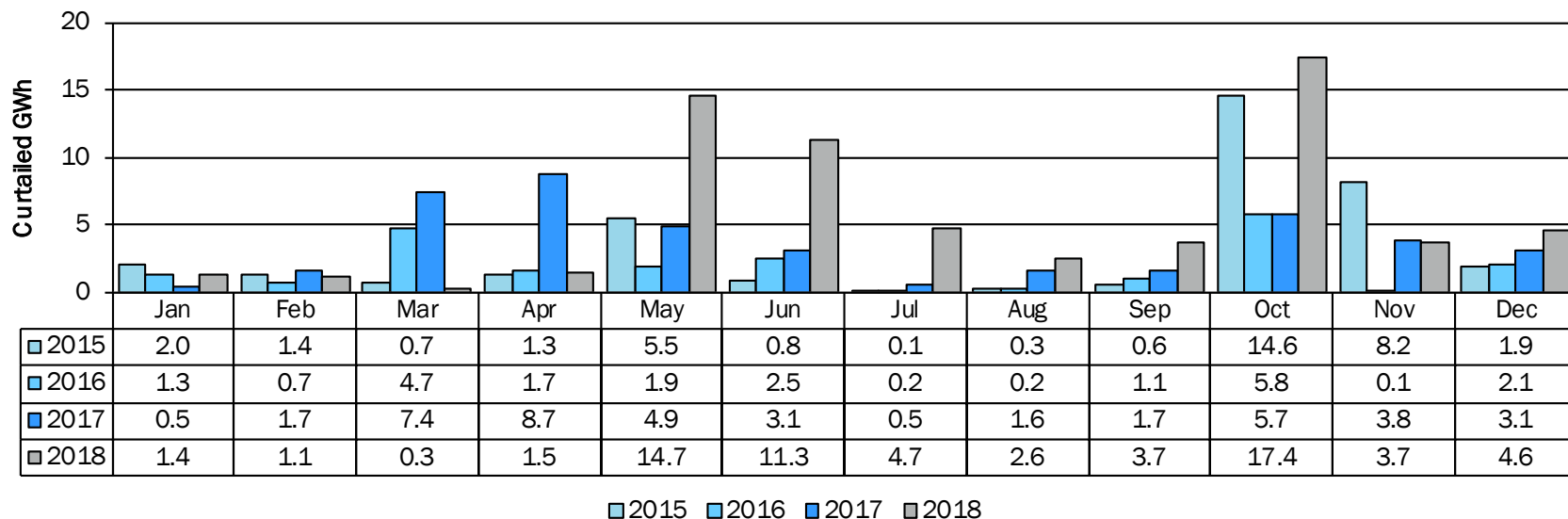
NYCA Wind Plants- Annual Production & Economic Curtailments



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NY Wind Economic Curtailment profile

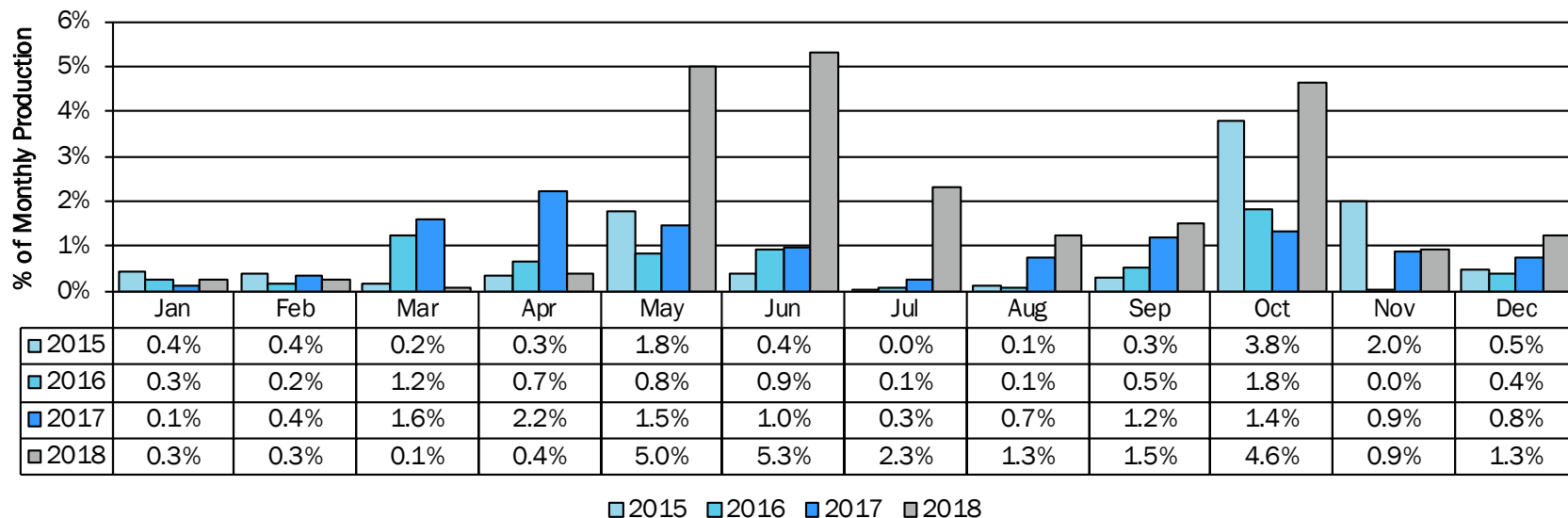
NYCA Wind Plants - Monthly Estimated Curtailed Energy



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NY Wind Economic Curtailment profile

NYCA Wind Plants - Monthly Estimated Curtailed Energy %

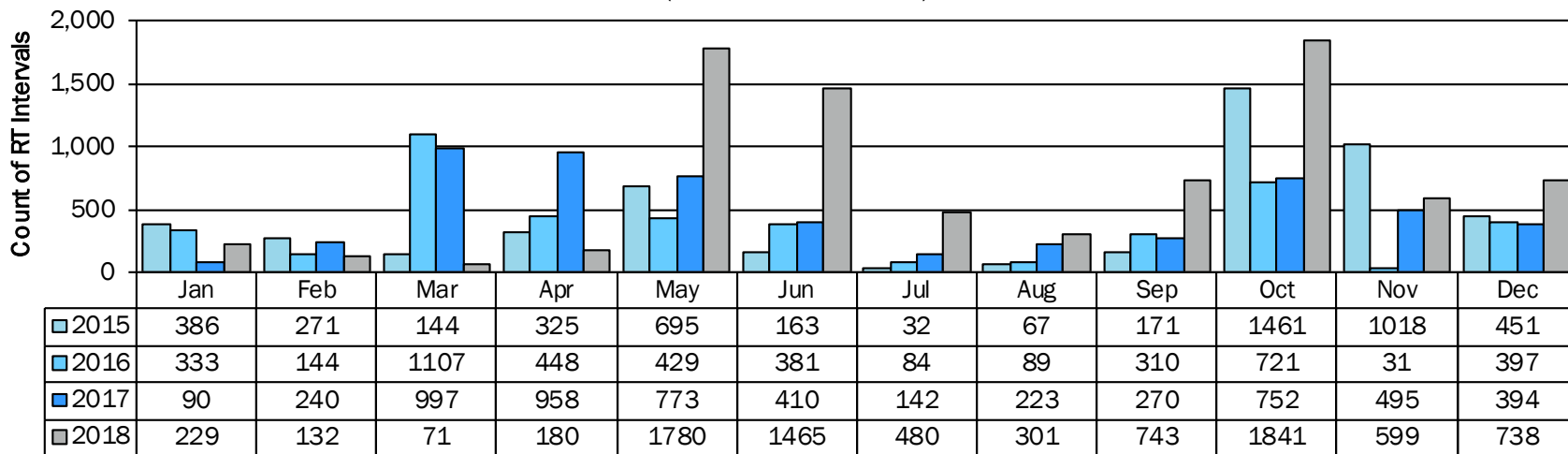


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NY Wind Economic Curtailment duration

NYCA Wind Plants - Monthly Estimated Curtailed Interval Count

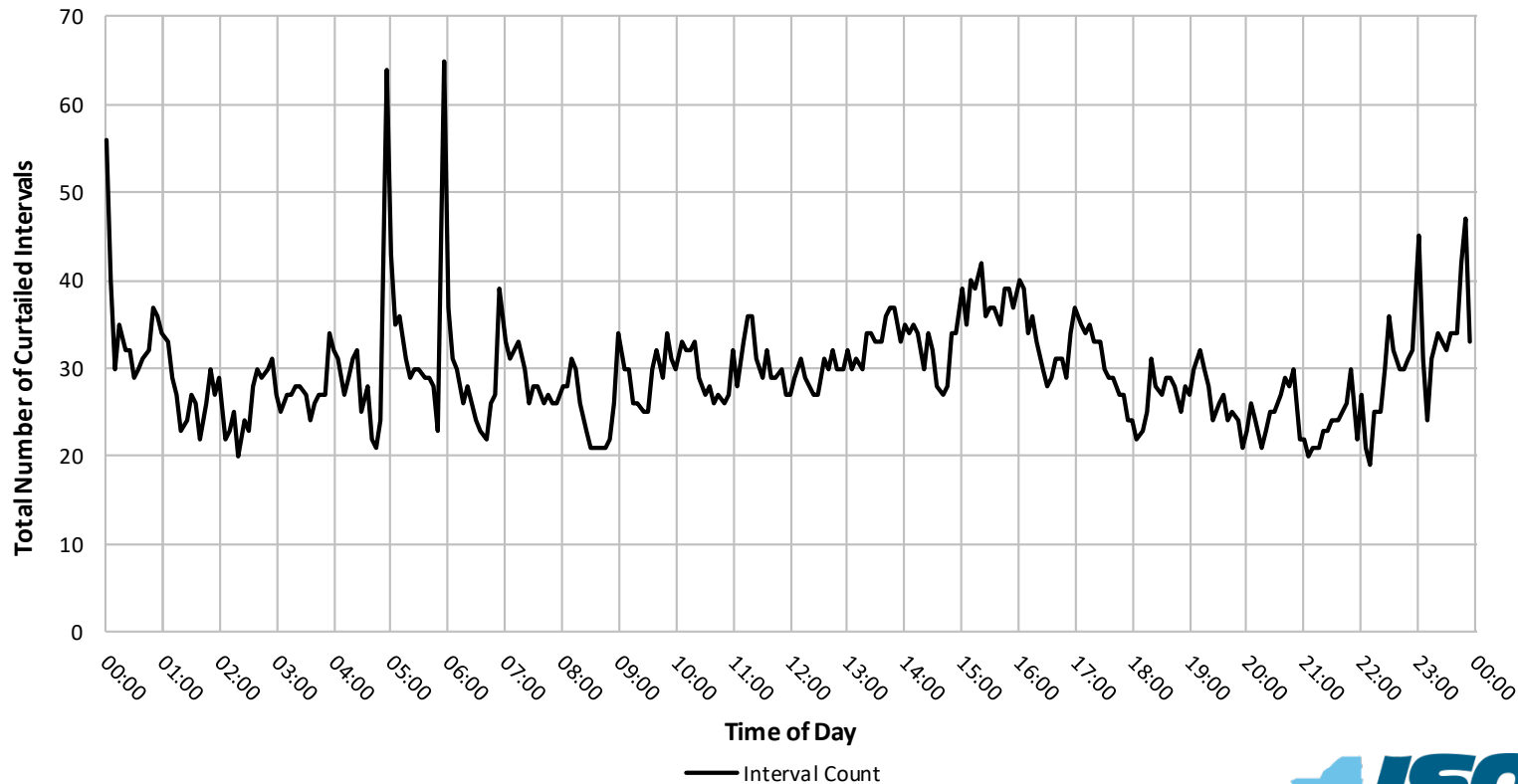
(12 Intervals = 1 Hour)



2015 2016 2017 2018

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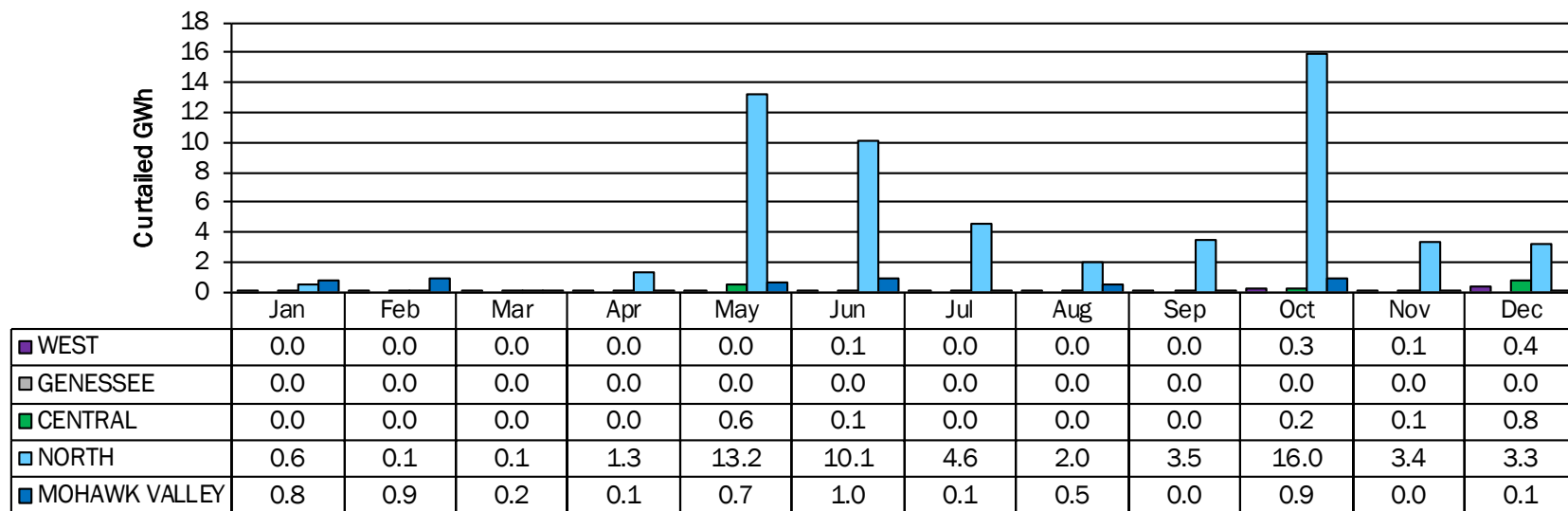
Count of Wind Curtailments by Time of Day (all of 2018)



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NY Zonal Economic Wind Curtailments

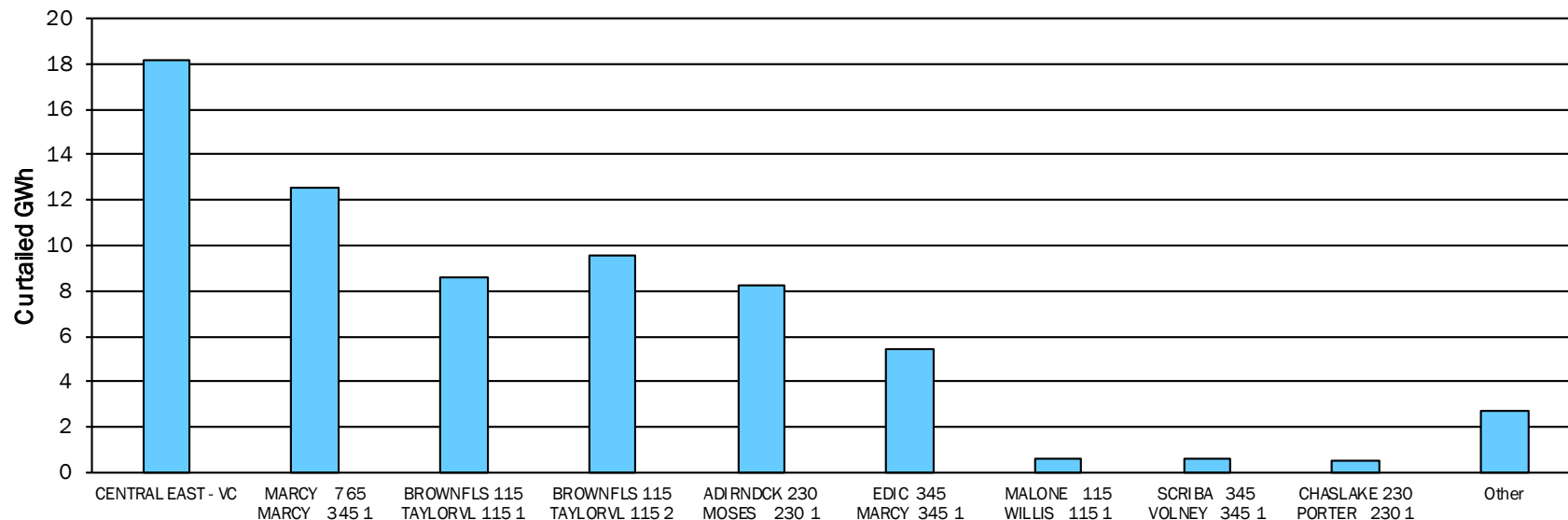
NYCA Zones- Monthly Estimated Curtailed Energy for 2018



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2018 NY Zonal Economic Wind Curtailments

NYCA Wind Plants-Annual Curtailed Energy by Constraint



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Behind the Meter (BTM) Solar

2018

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NY BTM Solar Overview

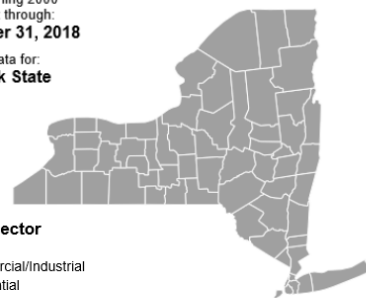
- NYSERDA provides a database of solar installation in the state (excluding non-NYSERDA projects on Long Island)
- <https://www.nyserdera.ny.gov/All-Programs/Programs/NY-Sun/Data-and-Trends>
- YTD BTM Solar Capacity is estimated to be 1,415 MWs

Data beginning 2000
and current through:
December 31, 2018

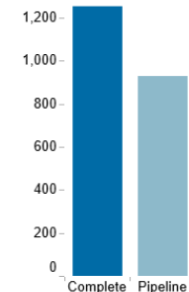
Showing Data for:
New York State

Project Sector

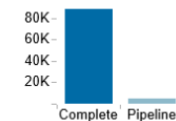
- (All)
- Commercial/Industrial
- Residential
- Small Commercial



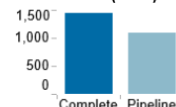
Total Capacity (MW DC)



Number of Projects

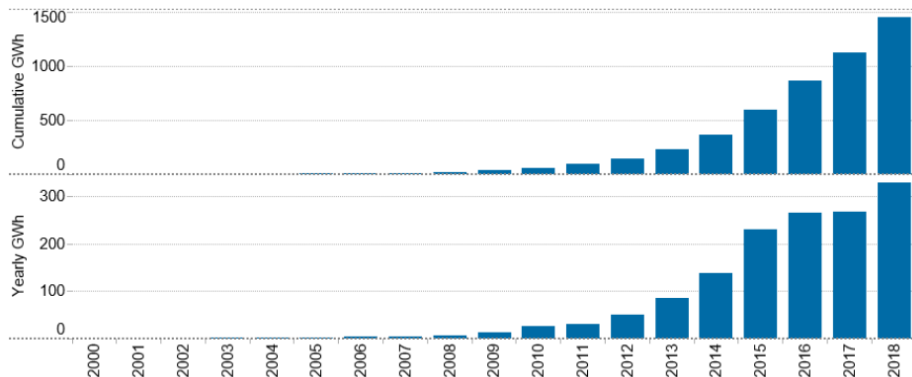


Expected Annual Production (GWh)



Annual Trends (Completed Projects Only)

Expected Annual Production (GWh)



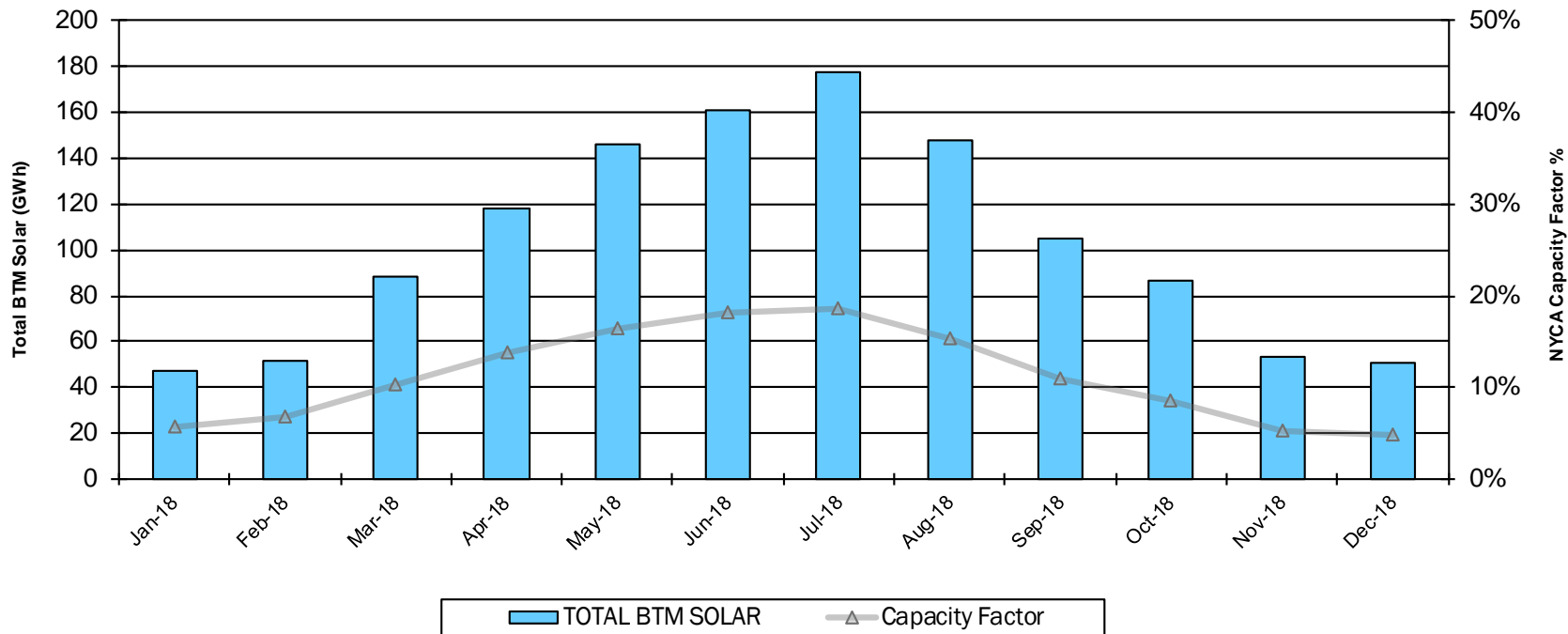
BTM Solar Data Monitoring

- The NYISO's Solar/PV monitoring vendor automatically monitors the power output in real-time of approximately 8,000 individual solar production sites across NY that are distributed substantially the same as the total BTM facilities in the state
- The installed BTM solar capacity is tracked using project completion statuses on NYSERDA's website in addition to non-NYSERDA sites separately reported by TO's
- BTM solar production, at the zonal level, is calculated by scaling up the vendor's readings to the estimated BTM solar installed capacity
- For more information on Solar Forecasting, review materials below from the 11/15/2018 Operations Committee meeting

https://www.nyiso.com/documents/20142/3723174/12_2018_OC_Solar_GridOps.pdf/9c656441-8219-7e89-8f03-d382c8ab2096

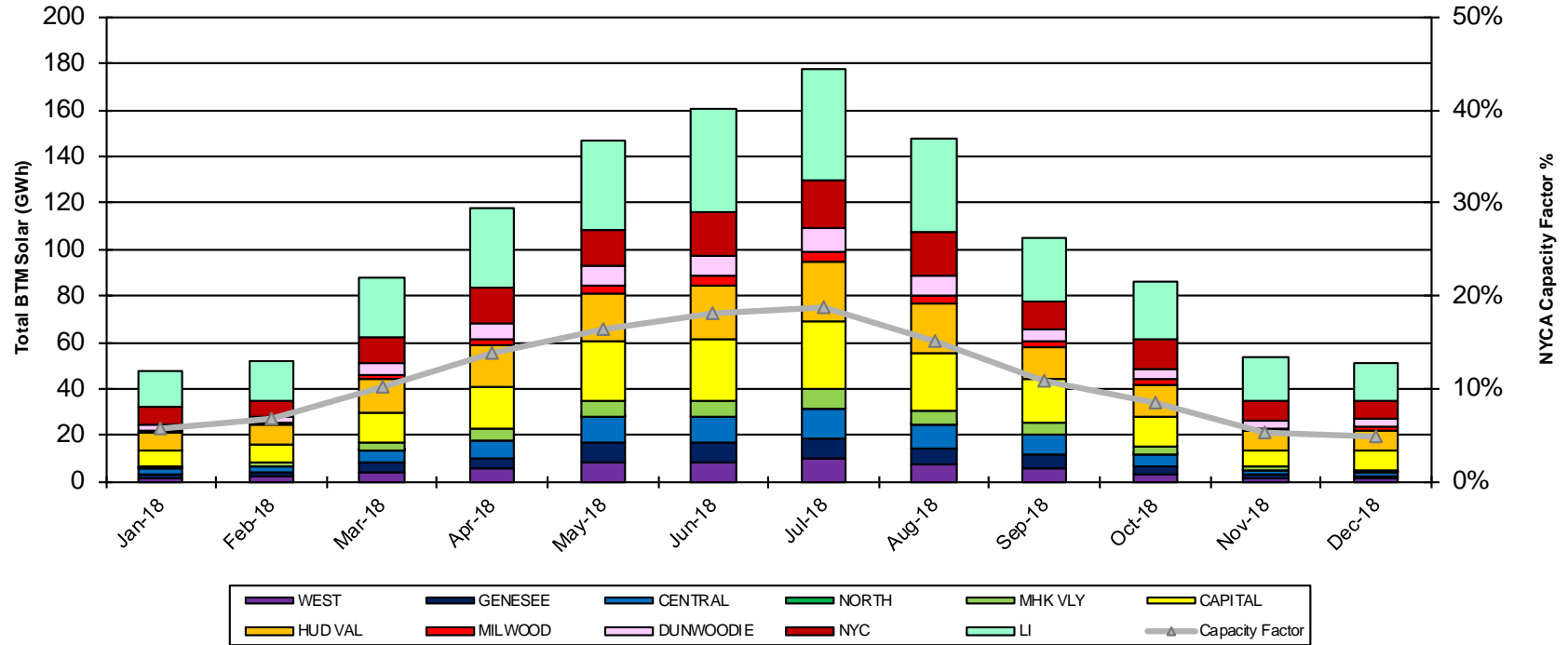
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Monthly BTM Solar Production



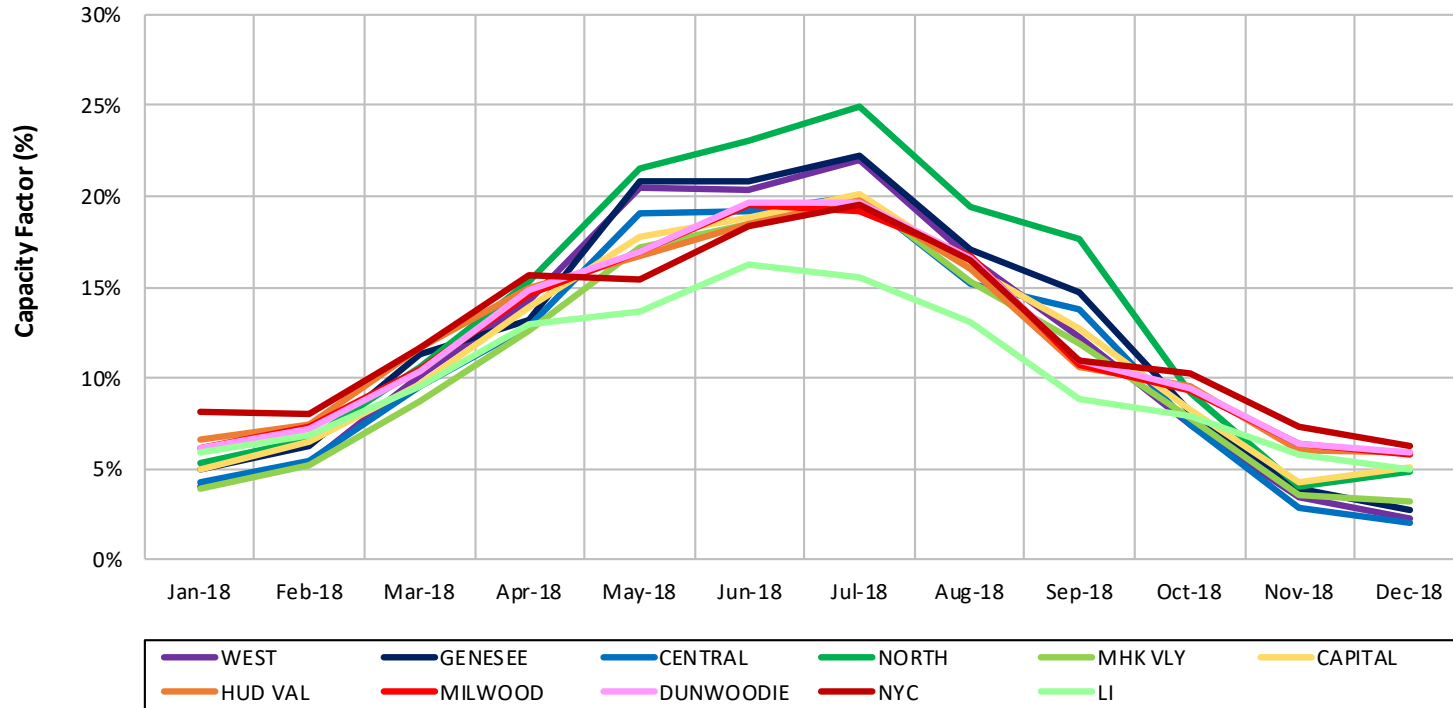
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Monthly BTM Solar Production by Zone



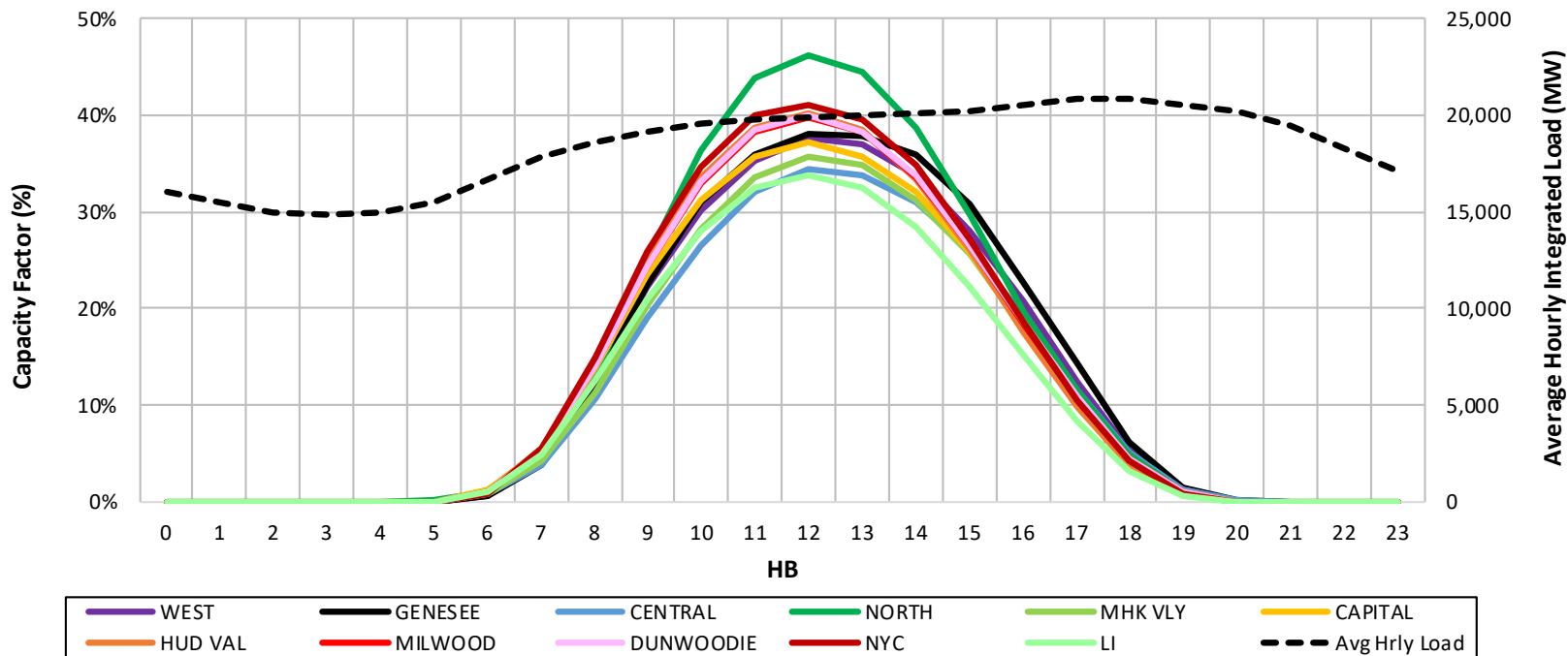
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Monthly BTM Solar Capacity Factors by Zone



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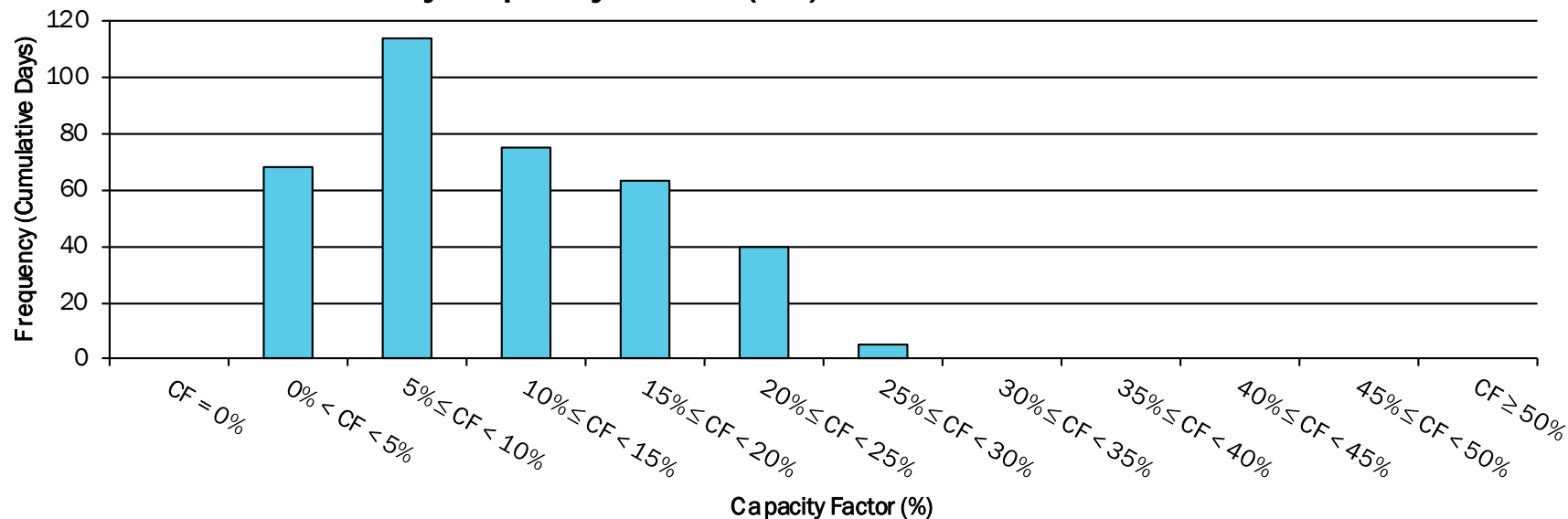
2018 Average Hourly BTM Solar Capacity Factors by Zone



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Solar Capacity Factor distribution

Daily Capacity Factor (CF) Distribution for 2018

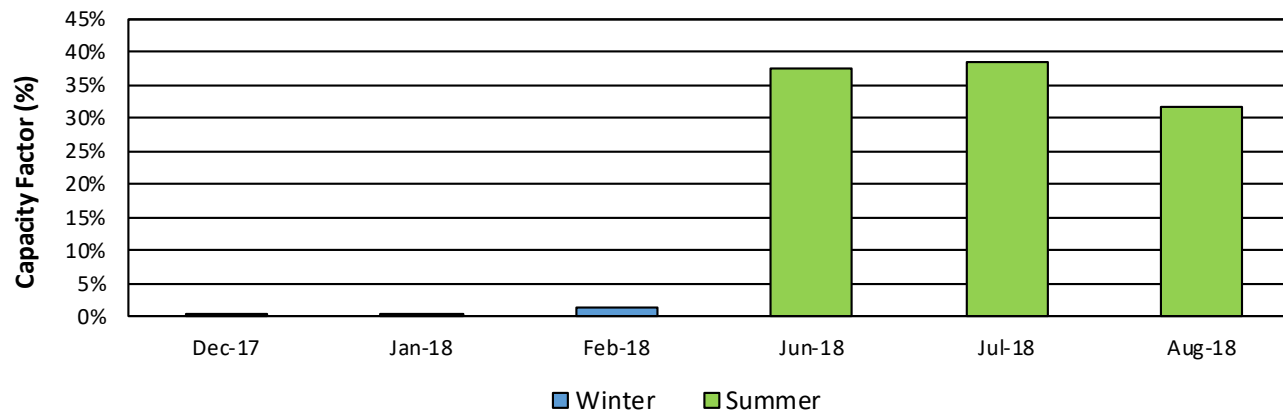


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2018 Average BTM Solar Capacity Factors over ICAP Months/Hours

Note: This analysis assumes the full availability of resources for all hours assessed.

Additionally, inverter efficiencies are not accounted for.



Season	Months	Hours	Average Solar Capacity Factor
Winter	December - February	16:00 until 20:00	0.6%
Summer	June - August	14:00 until 18:00	35.7%

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Questions?

We are here to help. Let us know if we can add anything.

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The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits 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 policy makers, stakeholders and investors in the power system



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