



NY Renewables – Overview and YTD Operation

Reposted in Response to Stakeholder Feedback – Slides and Tables with Green Titles are new

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Agenda

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

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 2019 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.
- All BTM solar production is measured in DC (direct current).
- Capacity Factors are calculated as follows:

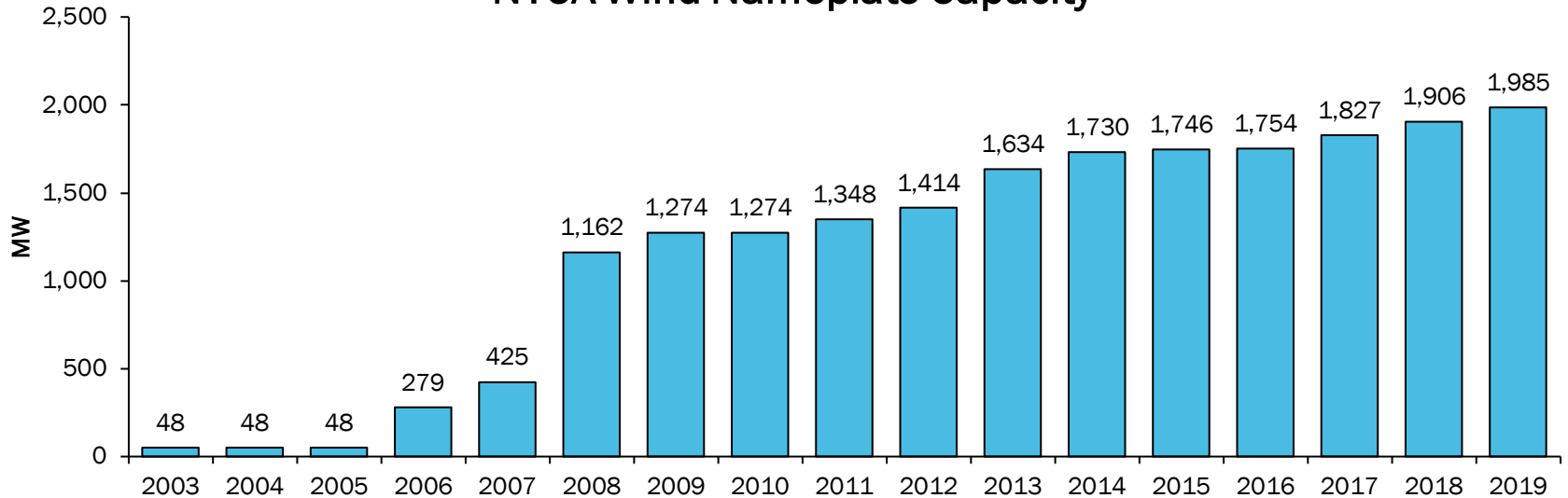
$$\text{Capacity Factor} = \frac{\text{Total Generated Energy}}{(\text{Nameplate Capacity})(\text{Total Hours})}$$

NYCA Wind 2019

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Overview

NYCA Wind Nameplate Capacity

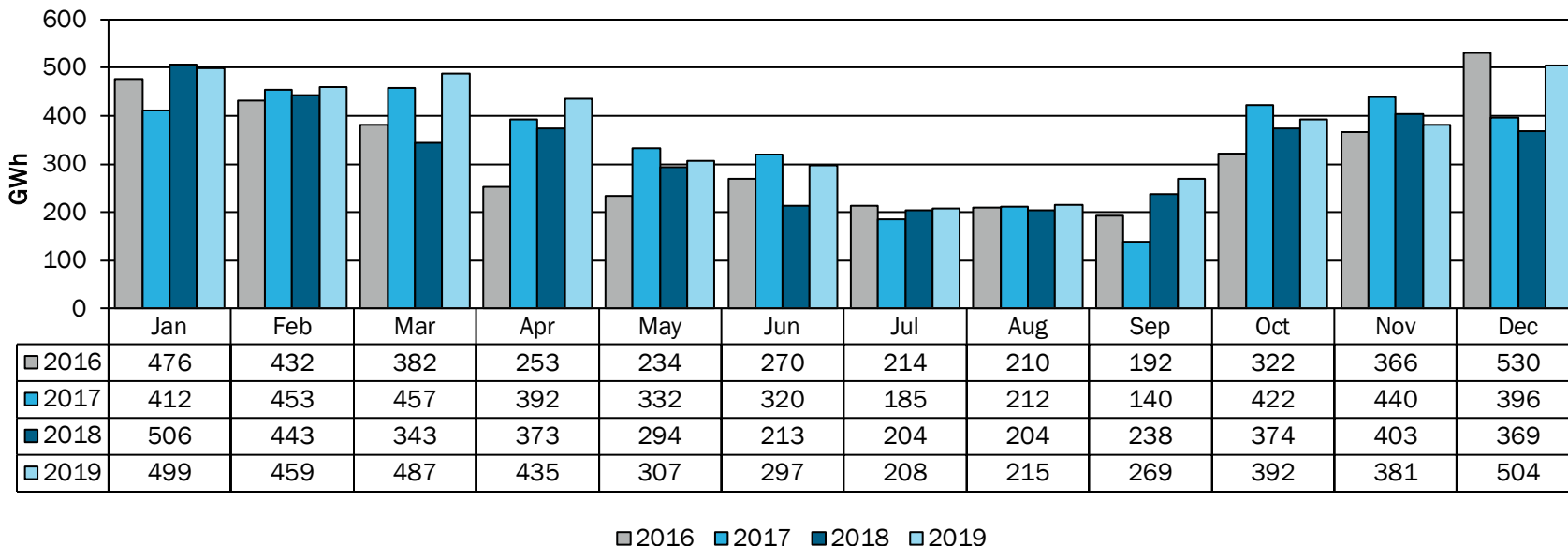


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NY Wind Generation

Total Annual Wind Production (GWh)			
2016	2017	2018	2019
3,880	4,162	3,965	4,453

NYCA Wind Plants - Monthly Production

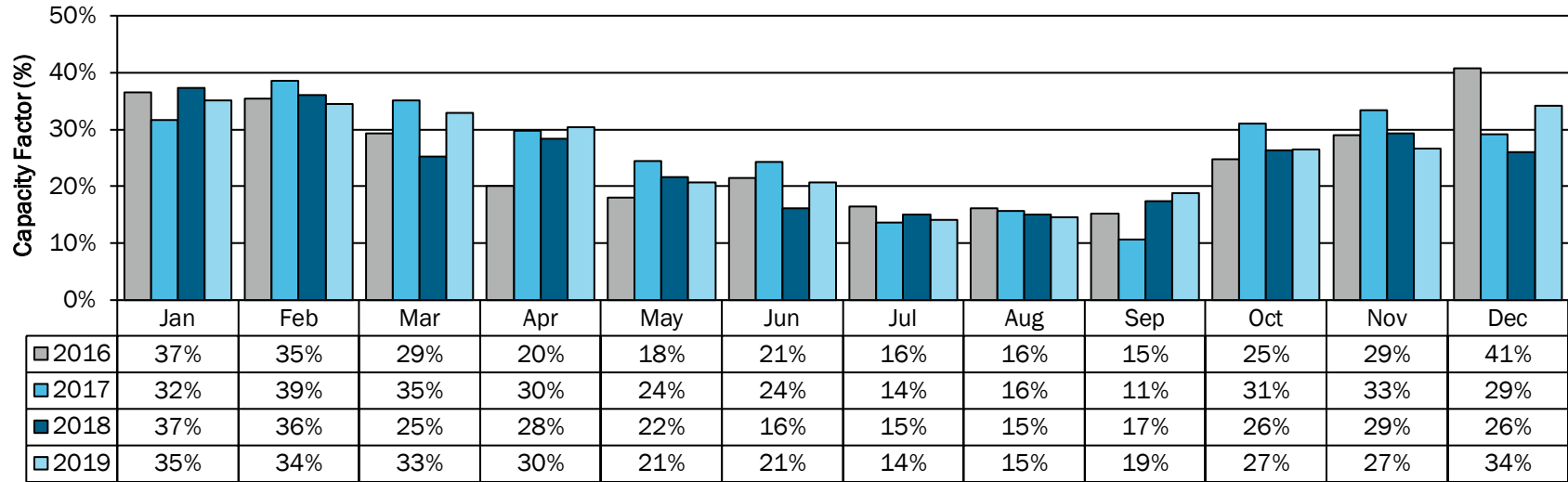


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NY Wind Capacity Factors

Annual Wind Capacity Factor			
2016	2017	2018	2019
25%	26%	24%	26%

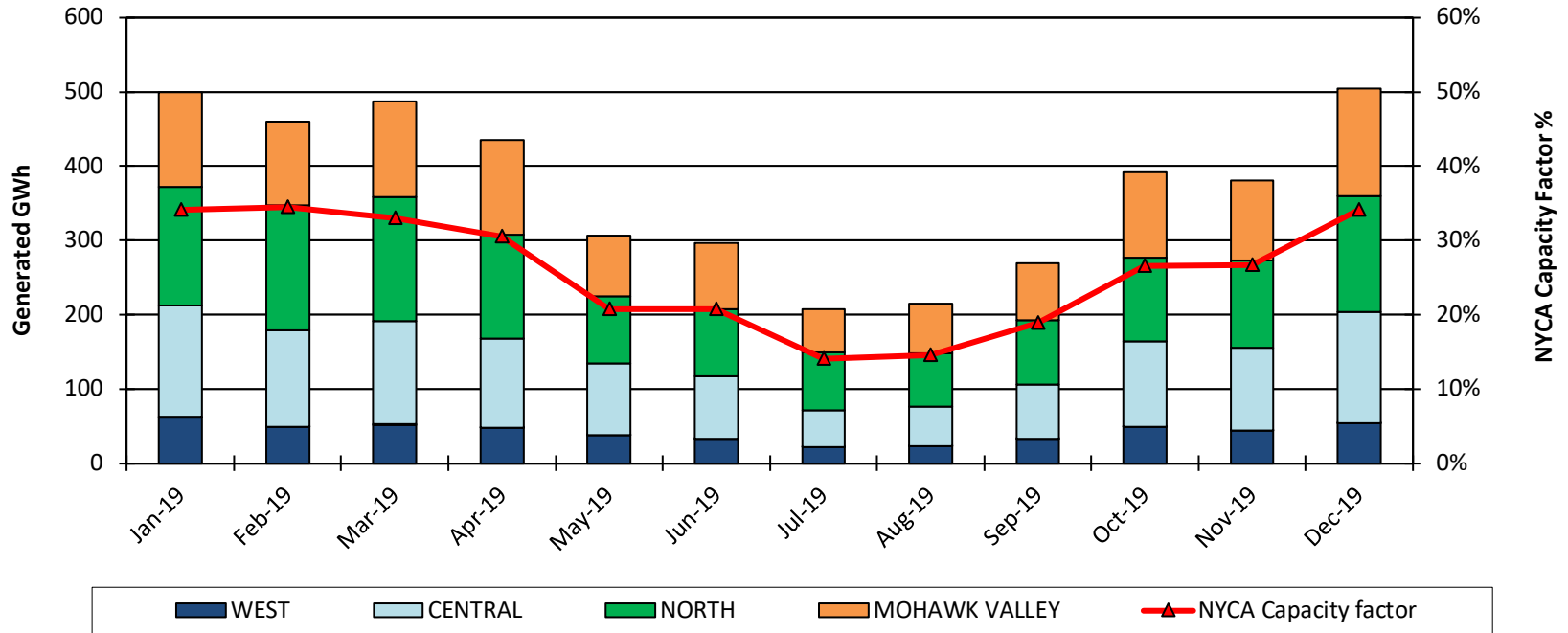
NYCA Wind Generation – Monthly Capacity Factor



■ 2016 ■ 2017 ■ 2018 ■ 2019

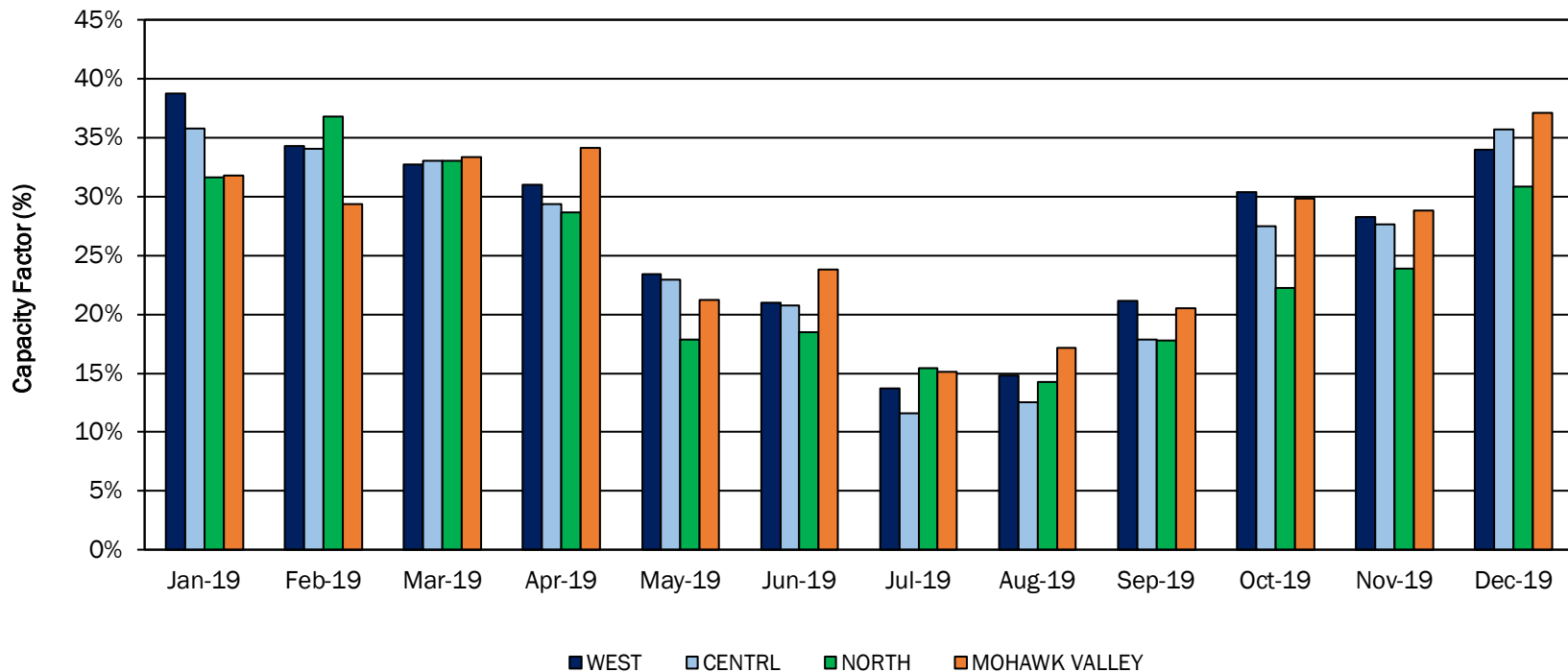
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Monthly Wind Production by Zone



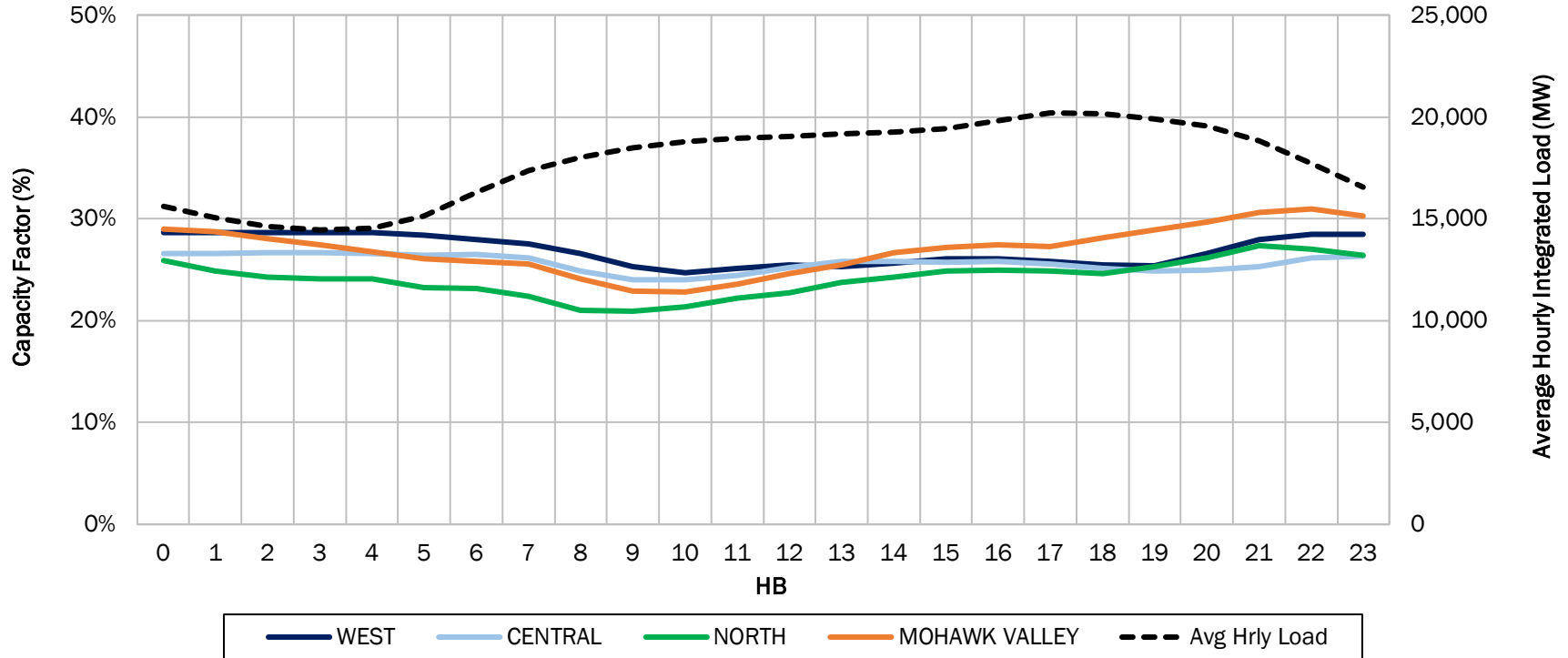
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Monthly Wind Capacity Factors by Zone



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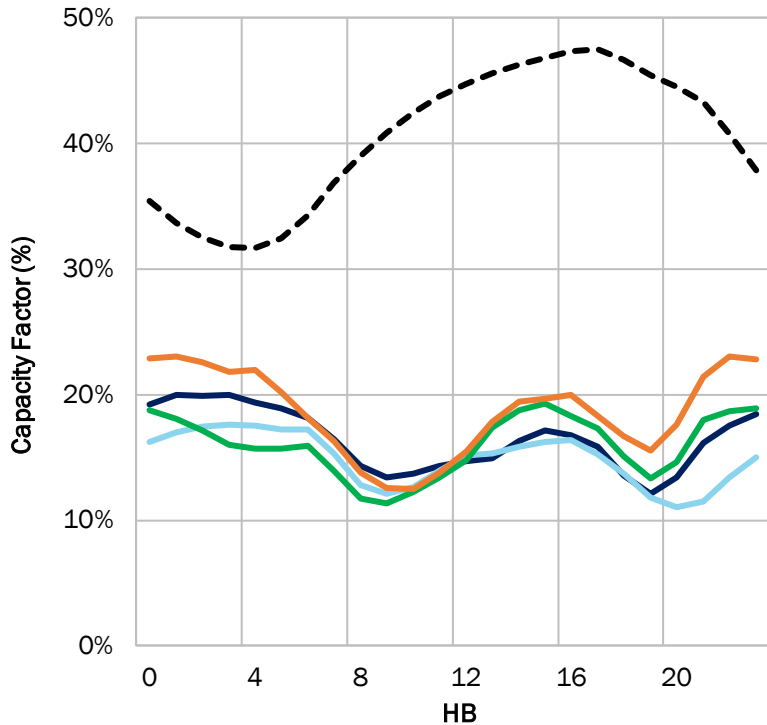
2019 Average Hourly Wind Capacity Factors by Zone



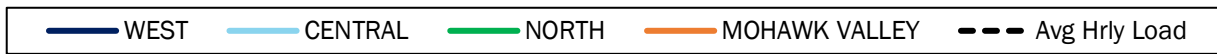
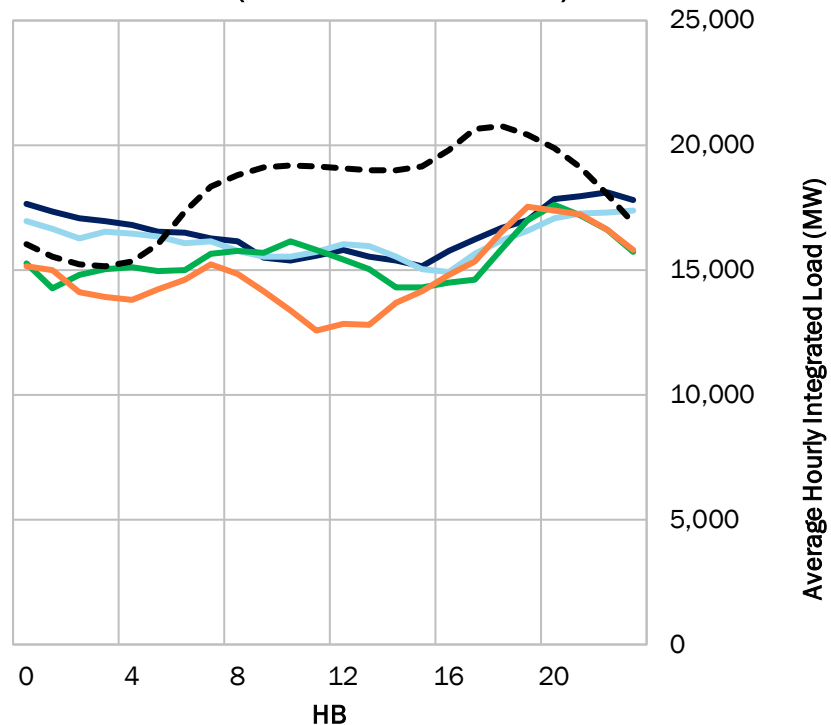
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2019 Seasonal Average Hourly Wind Capacity Factors by Zone

Summer Months (Jun 2019 - Aug 2019)

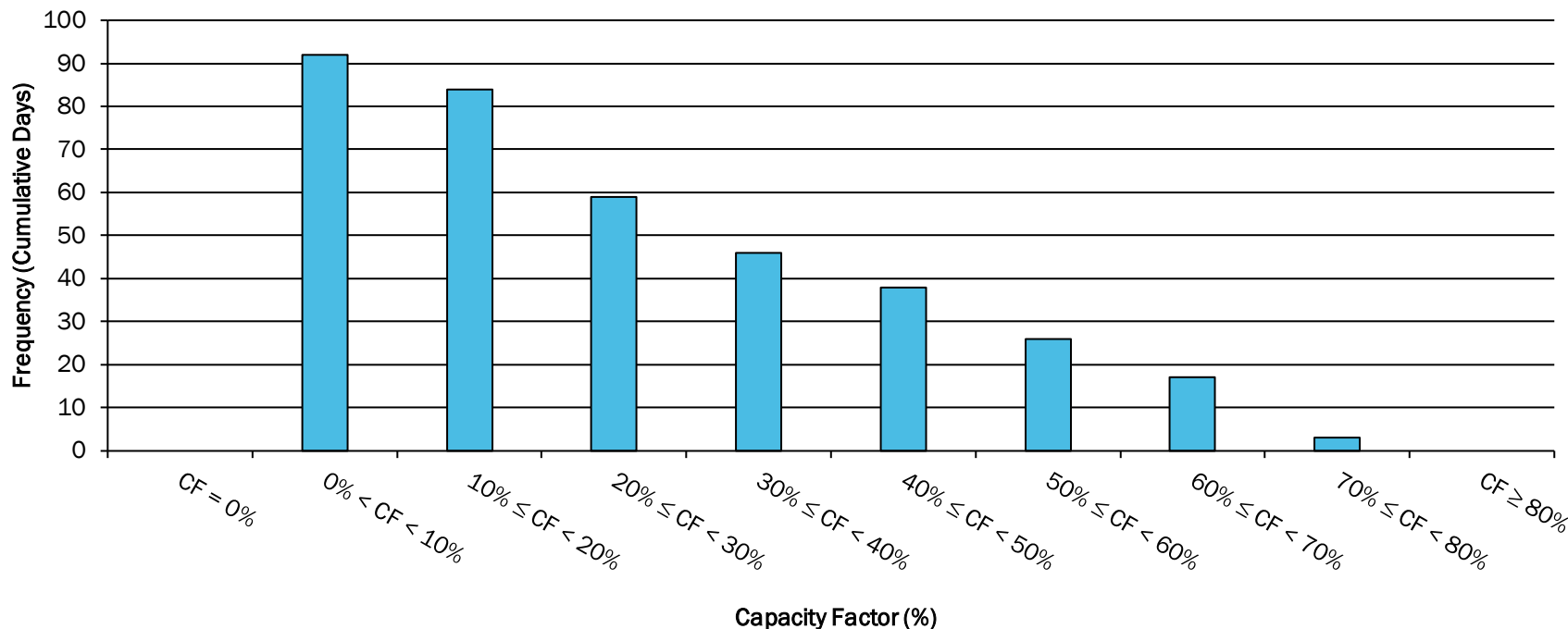


Winter Months (Dec 2018 - Feb 2019)



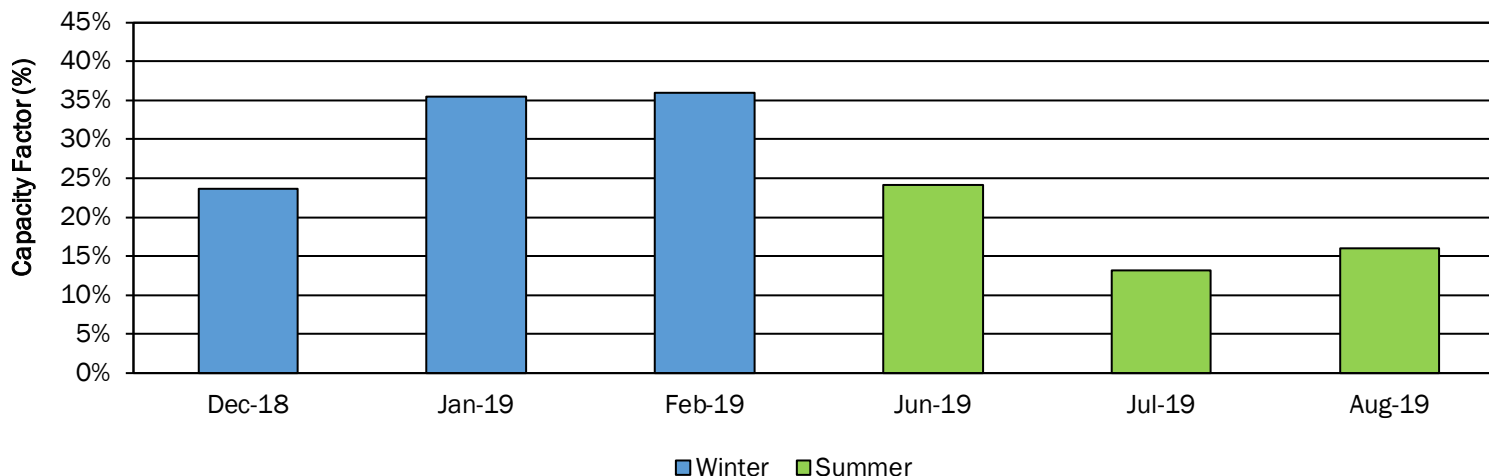
2019 NY Wind Capacity Factor Distribution

Daily Capacity Factor (CF) Distribution for 2019



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2019 Average Wind Capacity Factors over ICAP Months/Hours

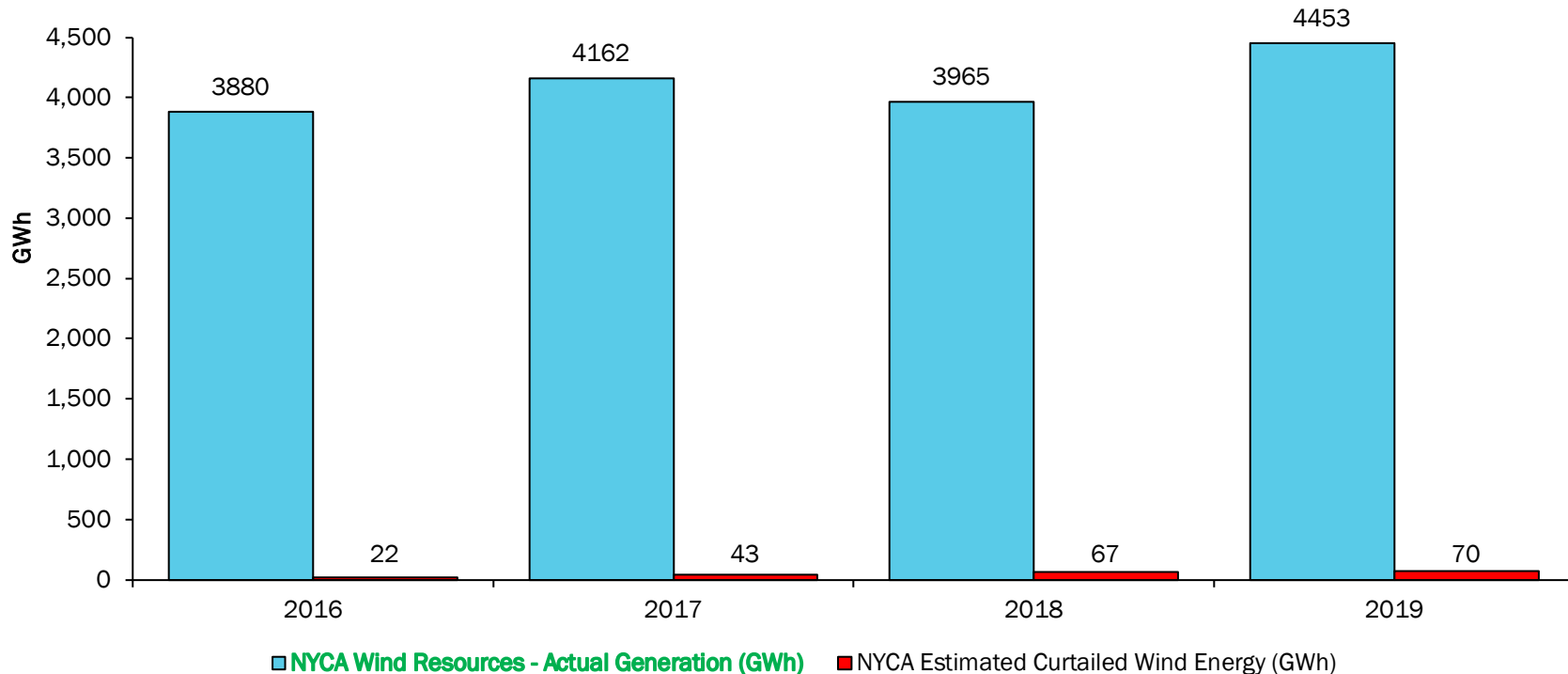


Season	Months	Hours	Average Wind Capacity Factor
Winter	December - February	16:00 until 20:00	31.55%
Summer	June - August	14:00 until 18:00	17.70%

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NY Economic Wind Curtailments

NYCA Wind Plants - Annual Production & Economic Curtailments

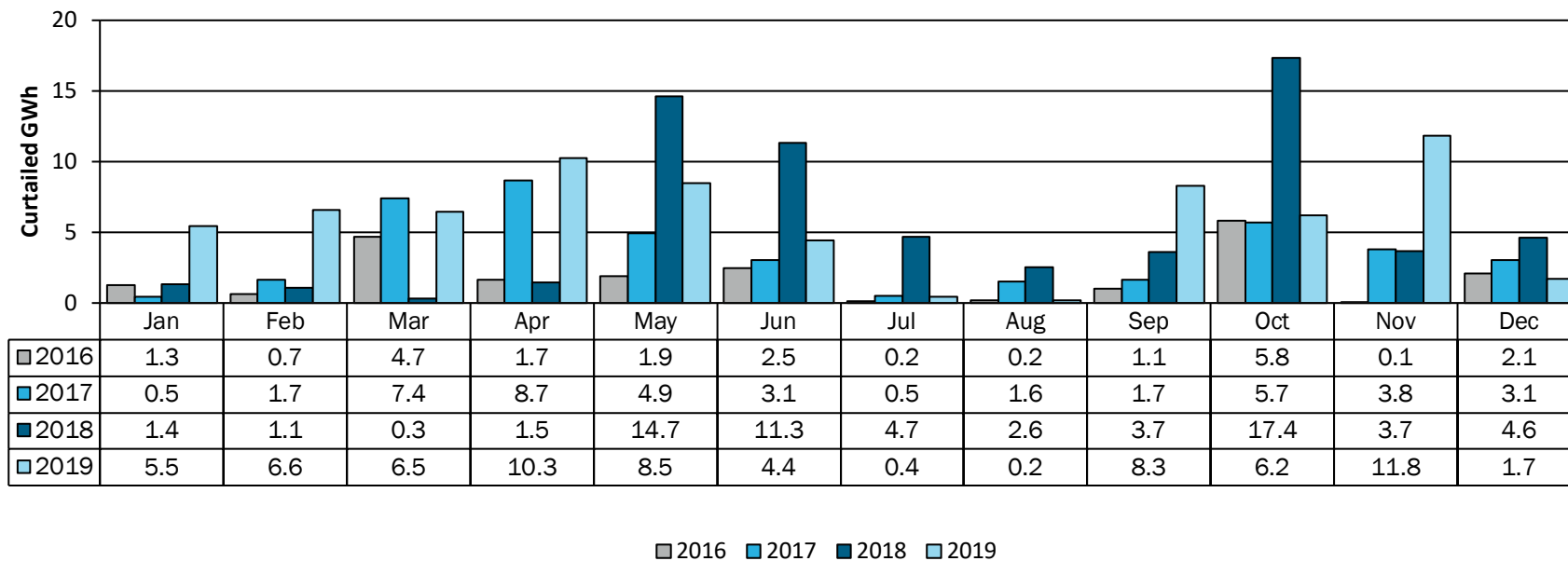


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NY Economic Wind Curtailments

Total Annual Wind Curtailments (GWh)			
2016	2017	2018	2019
22.1	42.6	66.9	70.5

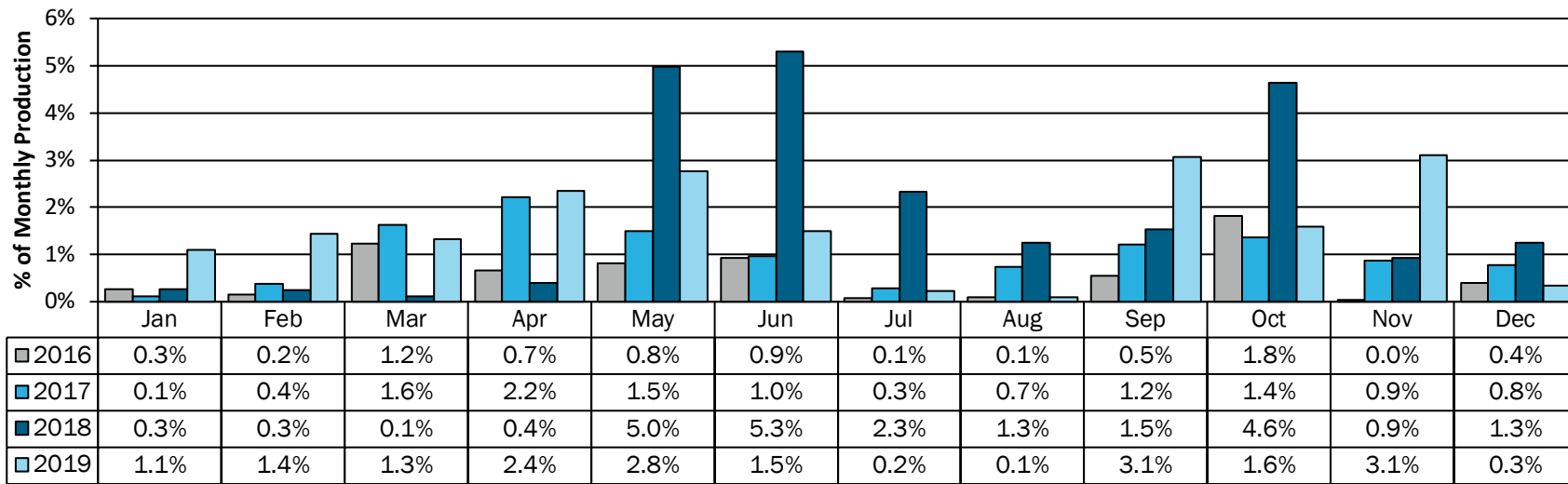
NYCA Wind Plants - Monthly Estimated Curtailed Energy



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NY Economic Wind Curtailments

NYCA Wind Plants - Monthly Estimated Curtailed Energy %

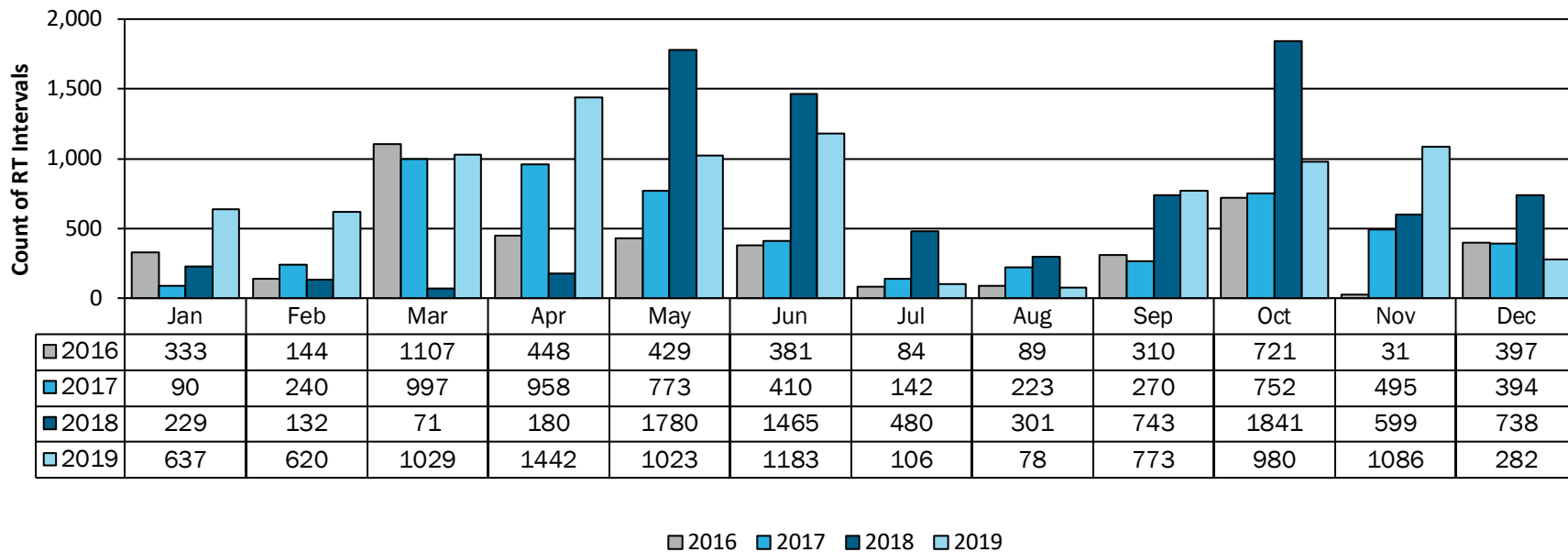


■ 2016 ■ 2017 ■ 2018 ■ 2019

NY Economic Wind Curtailments

NYCA Wind Plants - Monthly Estimated Curtailed Interval Count

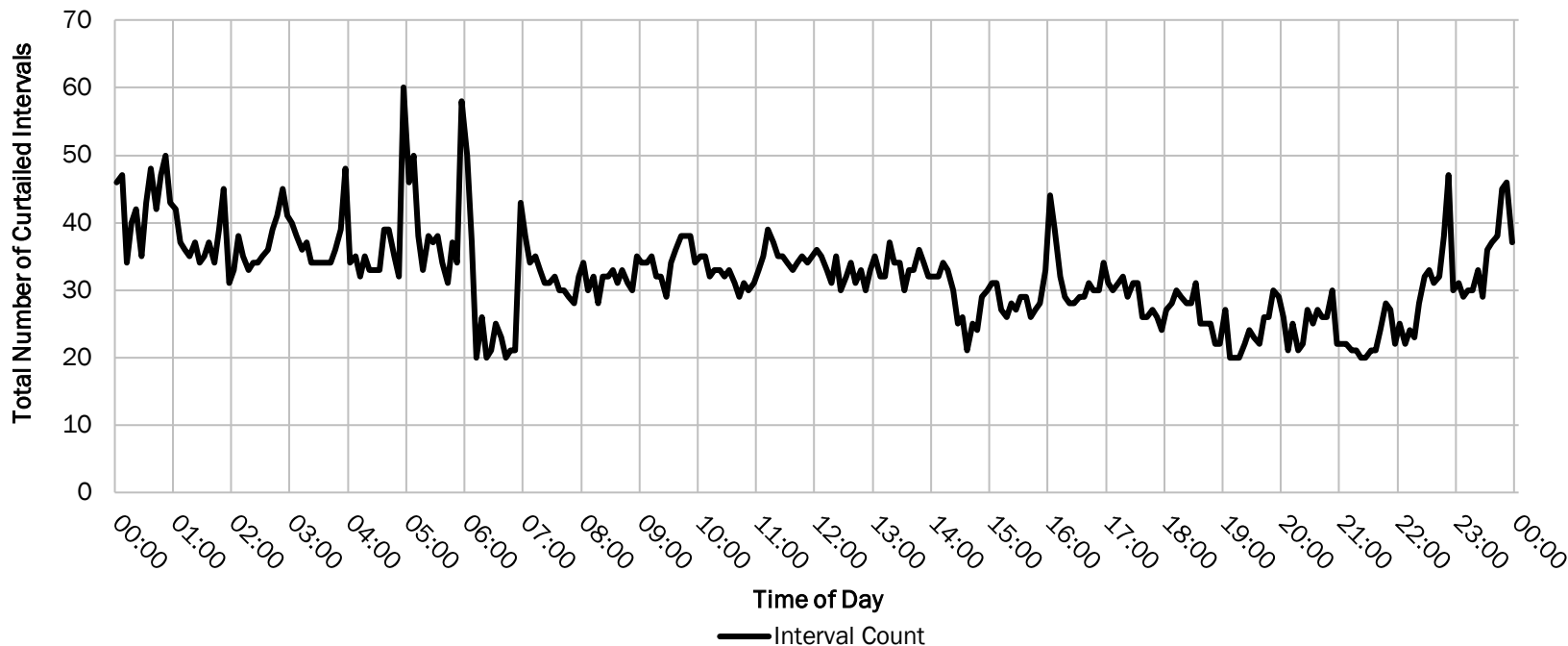
(12 Intervals = 1 Hour)



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NY Economic Wind Curtailments

Interval Count of Curtailments by Time of Day (all of 2019)

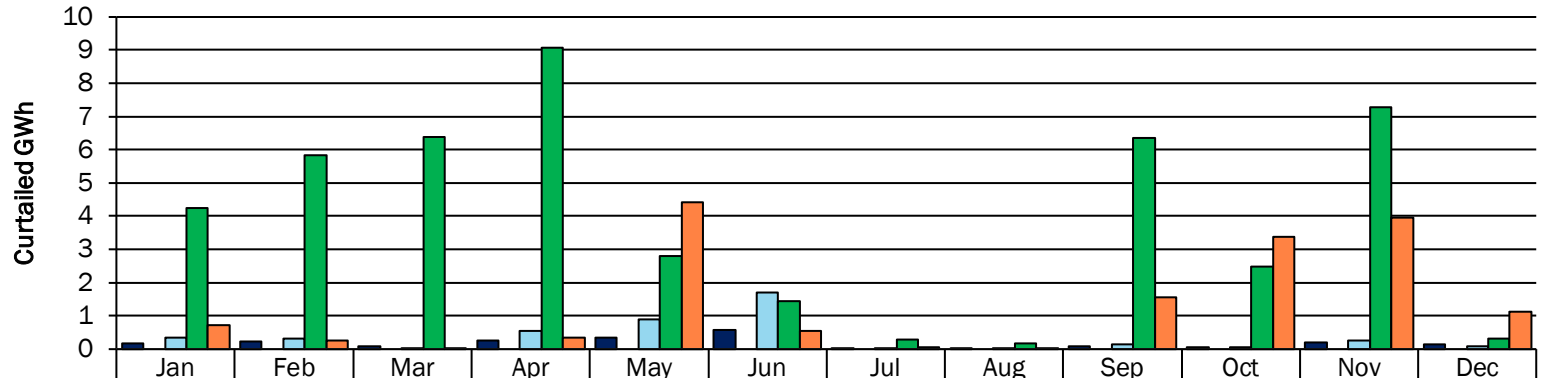


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NY Economic Wind Curtailments

Total Annual Estimated Curtailed Energy (GWh)				
West	Genesee	Central	North	Mohawk Valley
2.2	0.0	4.4	46.6	16.4

NYCA Zones - Monthly Estimated Curtailed Energy for 2019

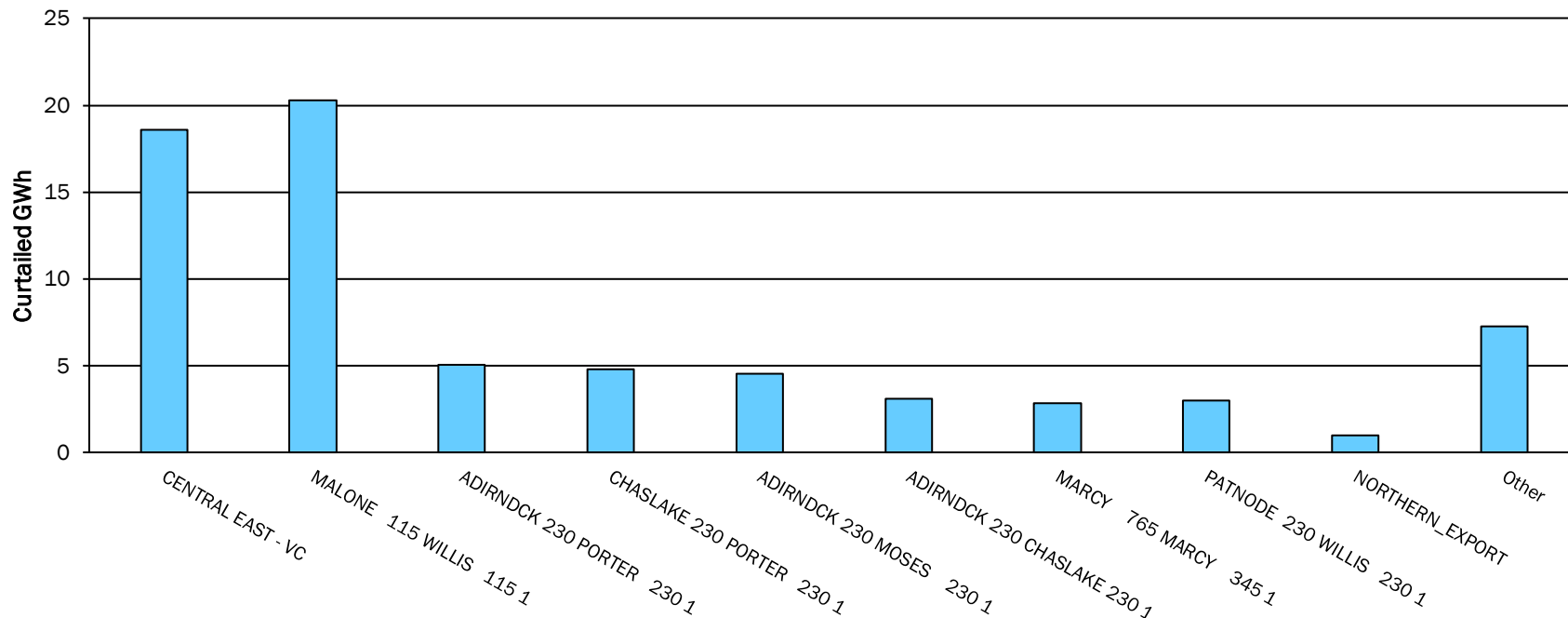


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
■ WEST	0.2	0.2	0.1	0.2	0.4	0.6	0.0	0.0	0.1	0.1	0.2	0.1
■ GENESSEE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
■ CENTRAL	0.3	0.3	0.0	0.5	0.9	1.7	0.0	0.0	0.2	0.1	0.2	0.1
■ NORTH	4.2	5.8	6.4	9.1	2.8	1.5	0.3	0.2	6.3	2.5	7.3	0.3
■ MOHAWK VALLEY	0.7	0.3	0.0	0.3	4.4	0.6	0.0	0.0	1.6	3.4	4.0	1.1

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NY Economic Wind Curtailments

NYCA Wind Plants 2019 - Annual Curtailed Energy by Constraint



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Behind the Meter (BTM) Solar 2019

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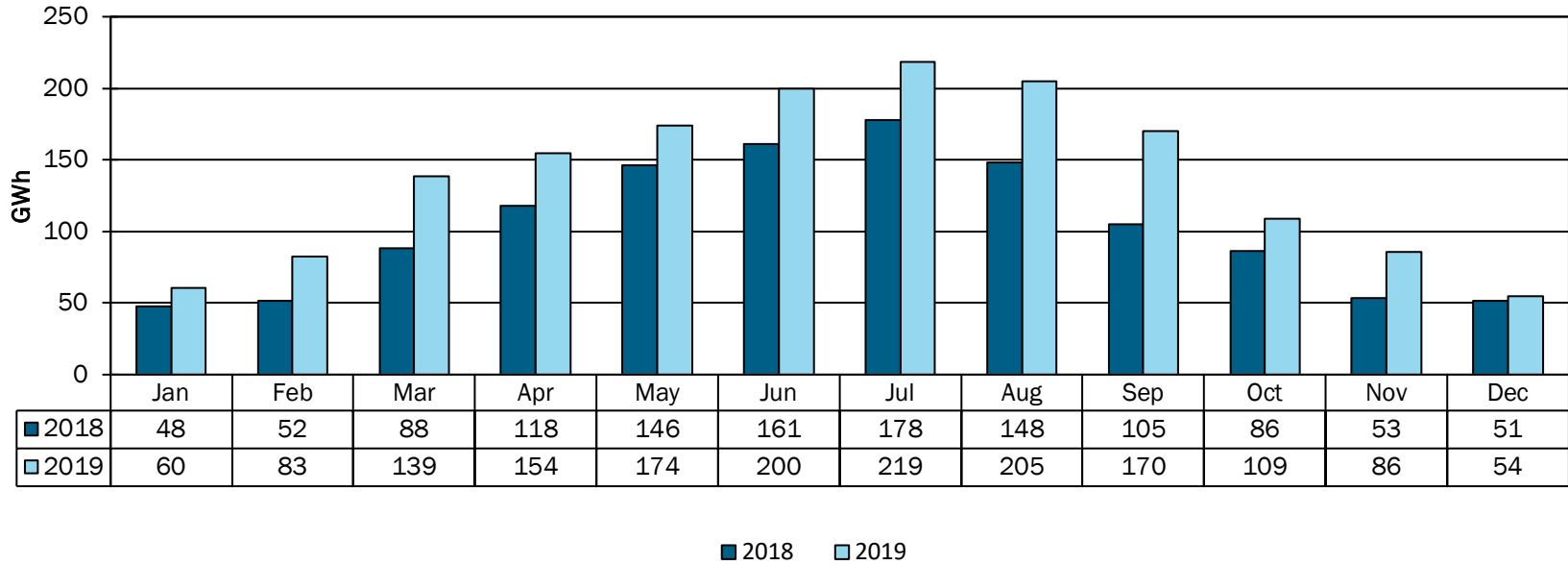
BTM Solar Data Monitoring

- **The NYISO's Solar/PV monitoring vendor automatically monitors the power output in real-time of solar production sites across NY that are distributed substantially the same as the total BTM facilities in the state**
 - There are approximately 9,032 individual solar production sites across NY representing 107 MWs
- **BTM solar production, at the zonal level, is calculated by scaling up the vendor's readings to the estimated BTM solar installed capacity**
- **At the end of 2019, BTM Solar Capacity was estimated to be 1,766 MWs**

NY BTM Solar Generation

Total Annual BTM Solar Production (GWh)	
2018	2019
1,234	1,652

NYCA BTM Solar - Estimated Monthly Production

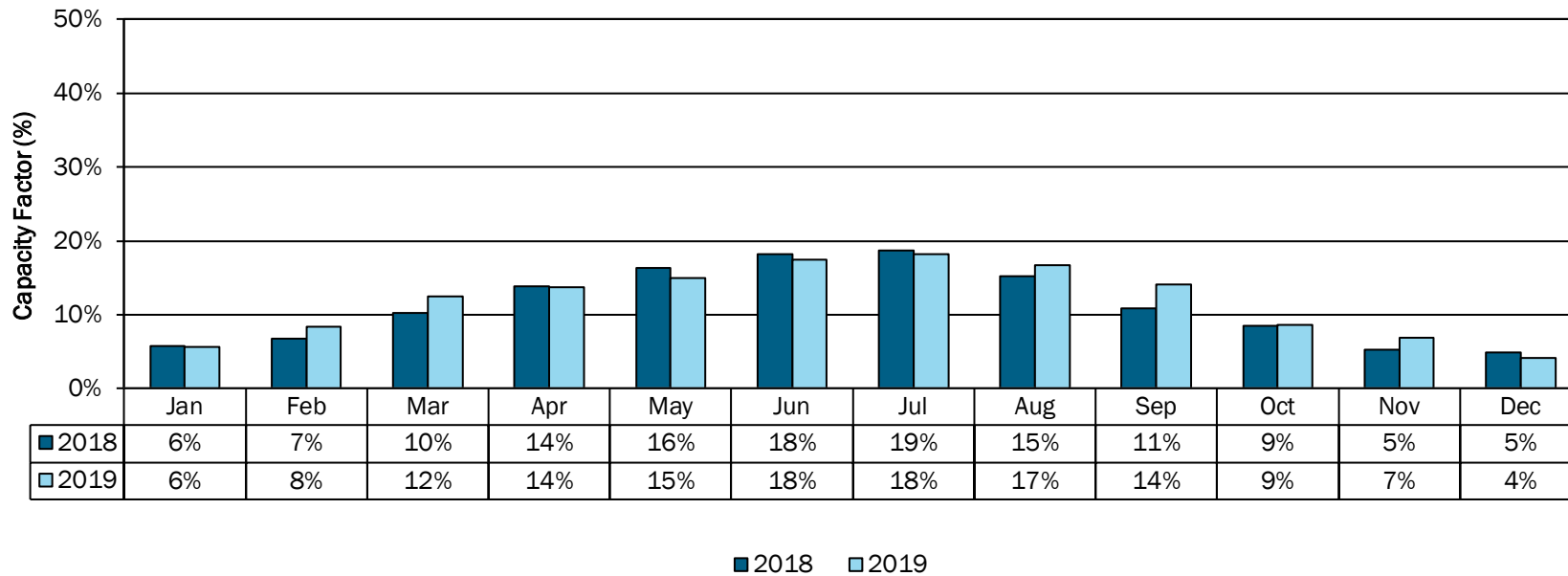


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NY BTM Solar Capacity Factors

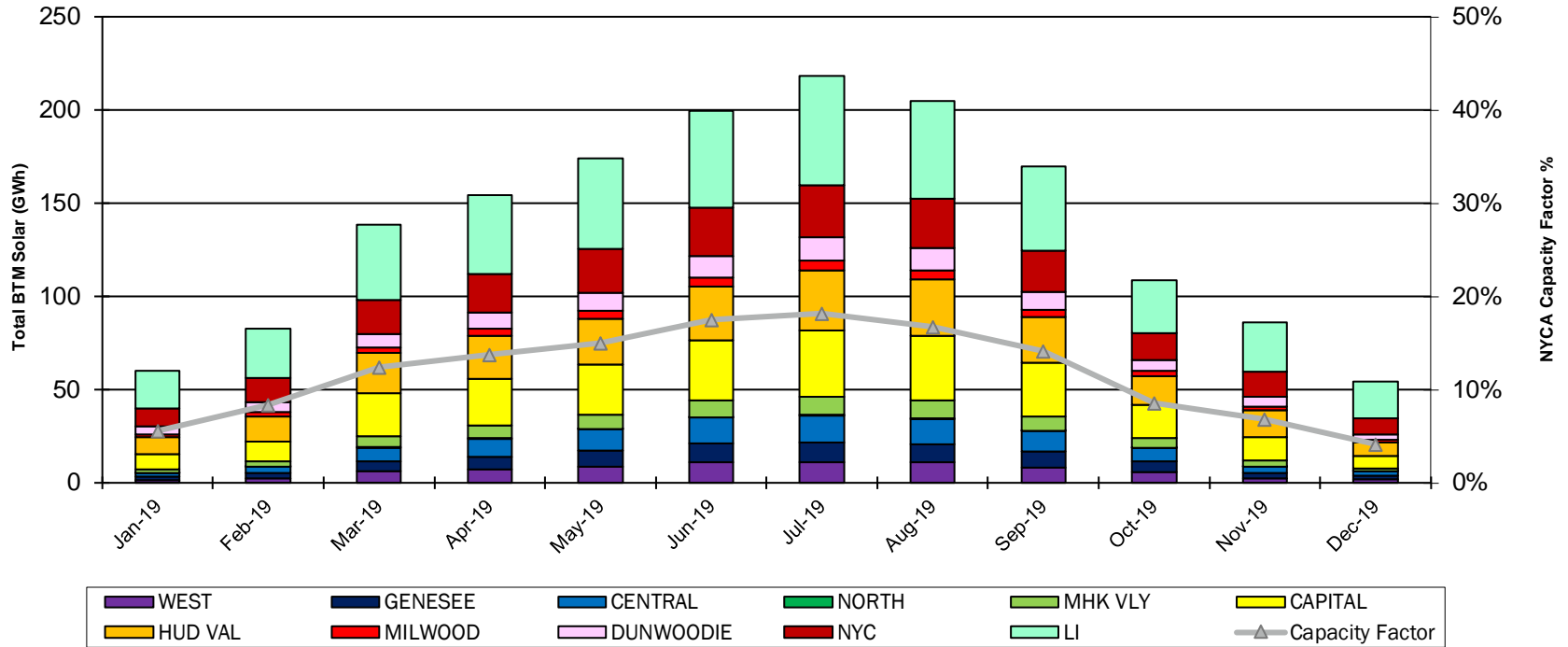
Annual BTM Solar Capacity Factor	
2018	2019
11%	12%

NYCA BTM Solar Generation - Estimated Capacity Factor



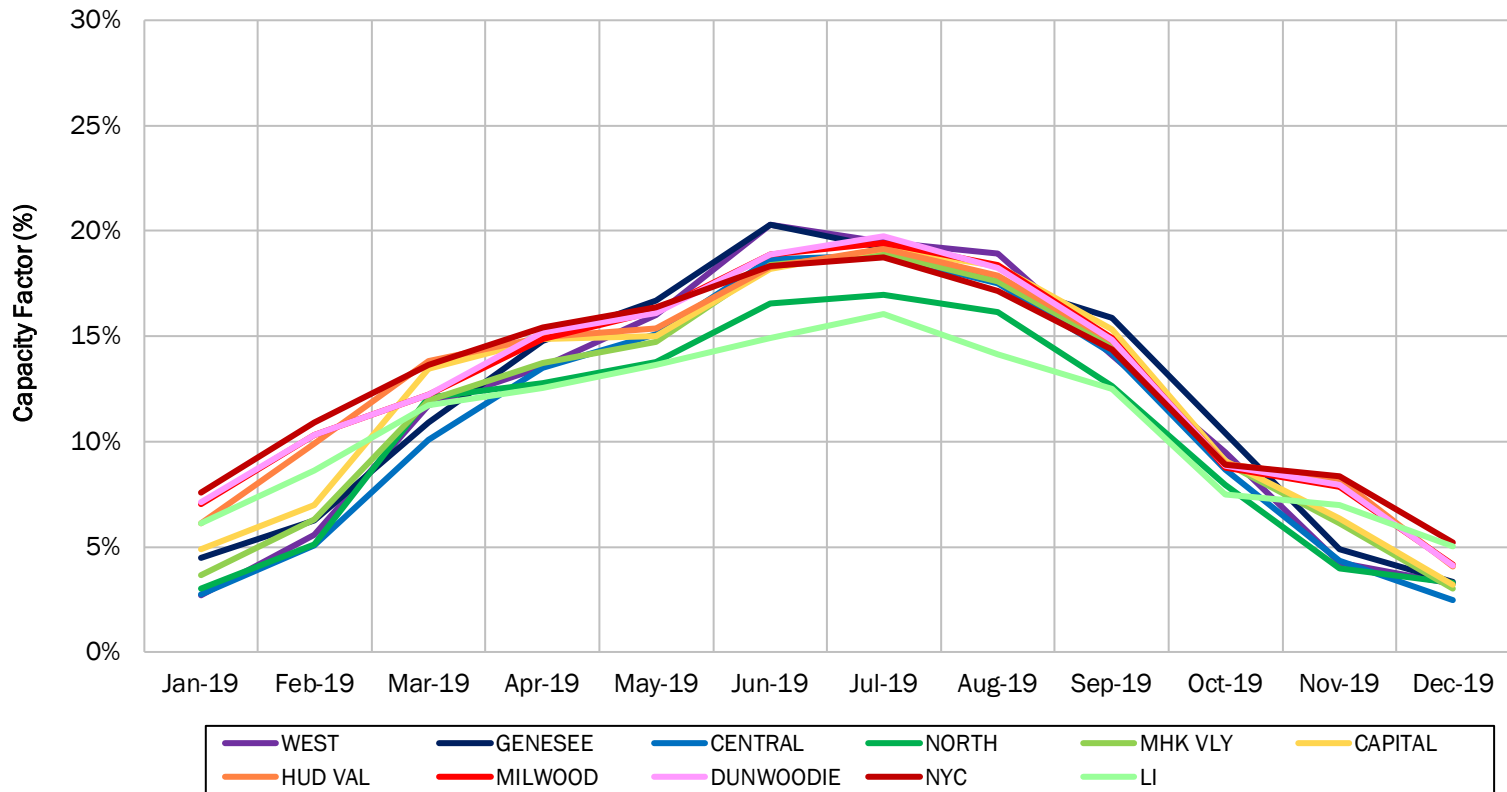
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Monthly BTM Solar Production by Zone



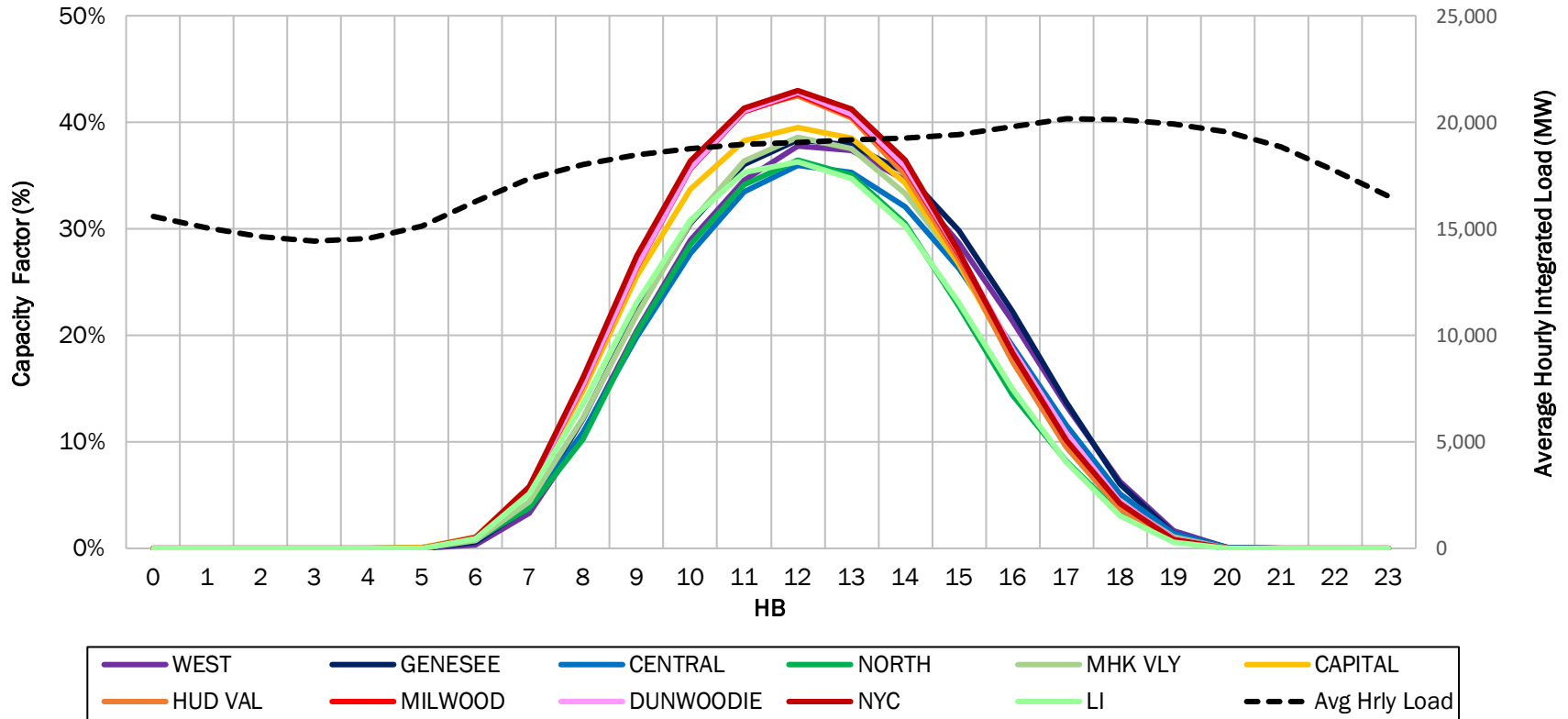
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Monthly BTM Solar Capacity Factors by Zone



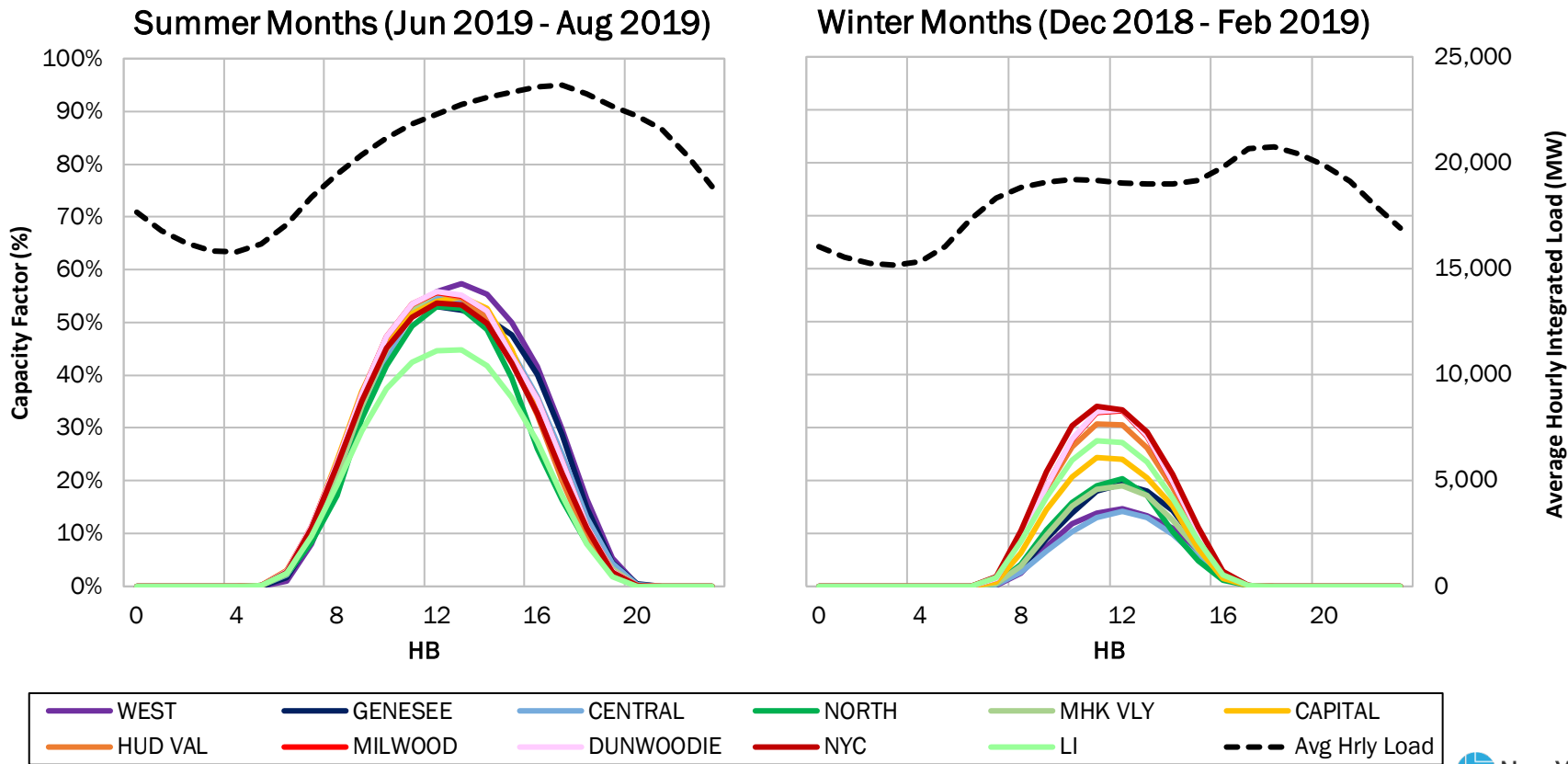
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2019 Average Hourly BTM Solar Capacity Factors by Zone

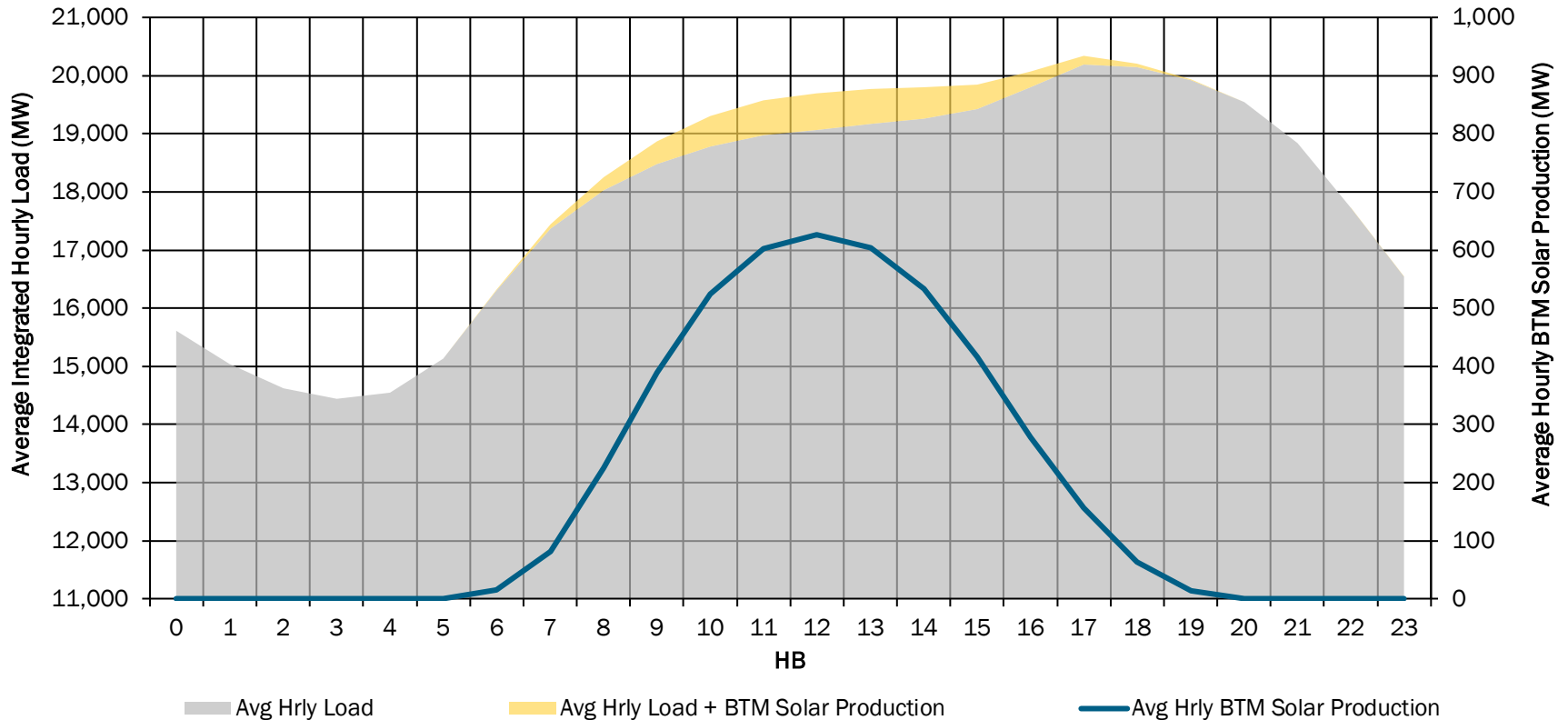


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2019 Seasonal Average Hourly BTM Solar Capacity Factors by Zone

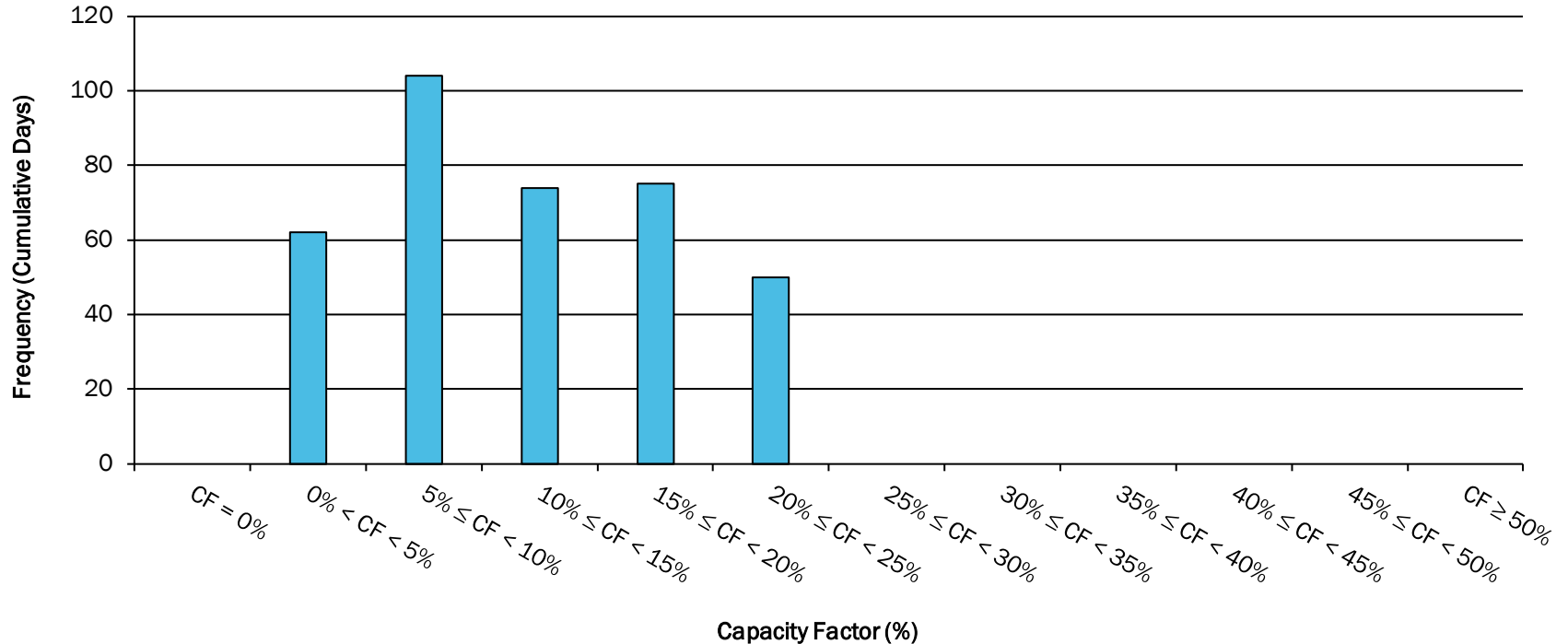


2019 Average Hourly Load with BTM Solar Production



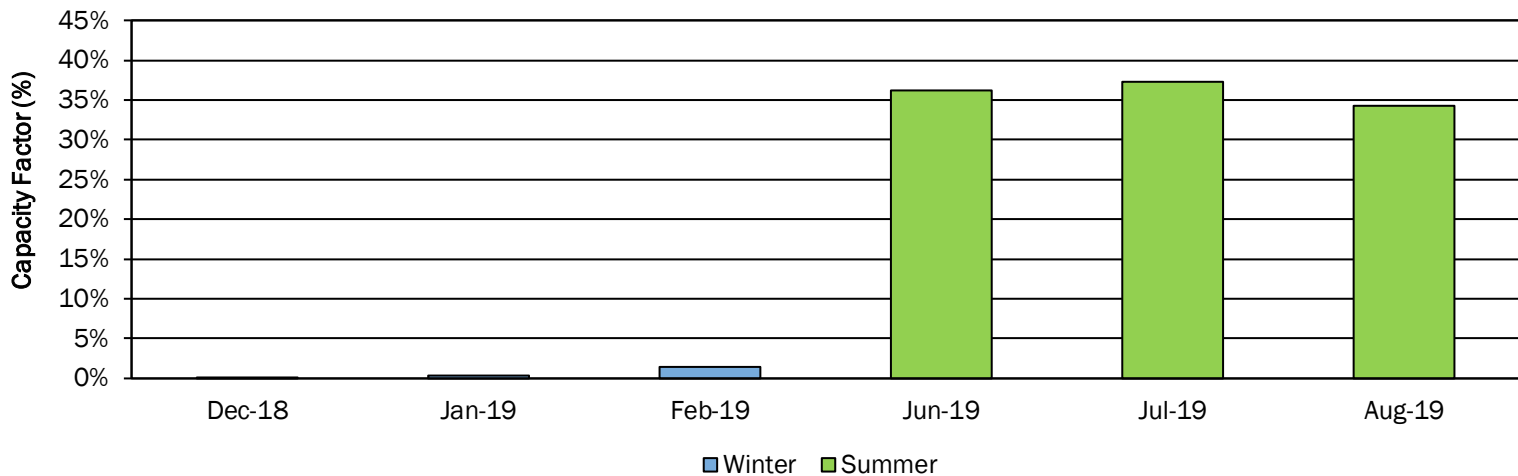
Solar Capacity Factor Distribution

Daily Capacity Factor (CF) Distribution for 2019



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2019 Average BTM Solar Capacity Factors over ICAP Months/Hours



Season	Months	Hours	Average Solar Capacity Factor
Winter	December - February	16:00 until 20:00	0.56%
Summer	June - August	14:00 until 18:00	35.92%

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Questions?

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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

