

# **Winter 2020-2021 Cold Weather Operations**

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Vice President, Operations

**NYISO Management Committee**

March 31, 2021, Rensselaer, NY

# Peak Loads

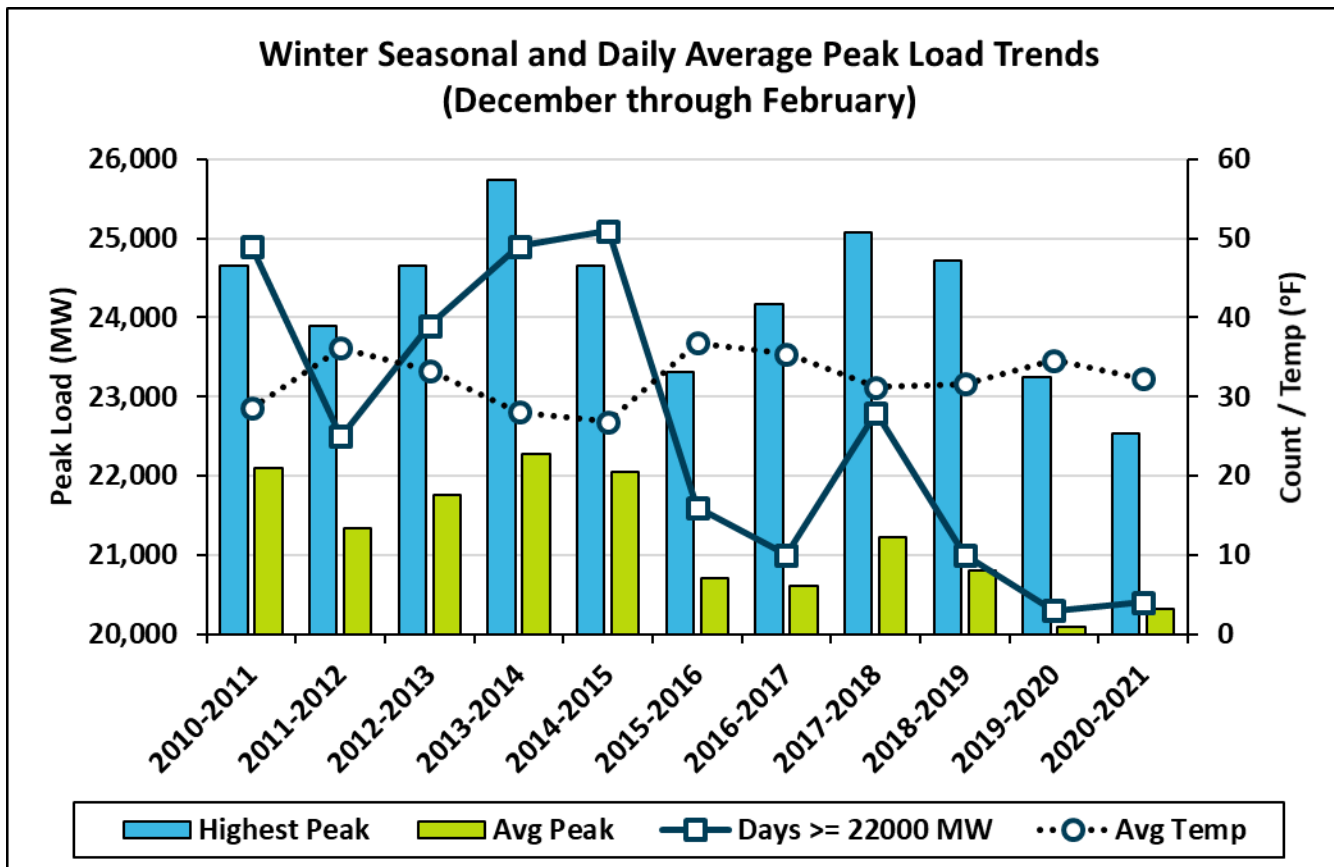
- **NYISO all-time Winter Electric Peak Load was 25,738 MW on January 7, 2014**
- **NYISO Seasonal 50-50 Load Forecast was 24,130 MW for Winter 2020/2021**
- **The Winter 2020/2021 Winter Actual Peak was 22,542 MW on Wednesday, December 16, 2020**

# Variable Winter Weather Prevailed

Average Temperatures and Departures from 1981 – 2010 Normals					
Station	December	January	February	Season	Coldest 2021
Islip	37.2 °F (+1.6 °F)	32.9 °F (+2.3 °F)	32.2 °F (-0.6 °F)	34.1 °F (+1.1 °F)	13 °F (2/8)
Central Park	39.2 °F (+1.7 °F)	34.8 °F (+2.2 °F)	34.2 °F (-1.1 °F)	36.0 °F (+0.9 °F)	14 °F (1/29)
Albany	29.9 °F (+1.4 °F)	23.3 °F (+0.7 °F)	23.7 °F (-2.2 °F)	25.6 °F (0.0 °F)	-7 °F (1/31)
Syracuse	33.8 °F (+4.4 °F)	27.2 °F (+3.6 °F)	25.1 °F (-0.8 °F)	28.7 °F (+2.4 °F)	-1 °F (2/12)
Buffalo	33.5 °F (+3.4 °F)	29.4 °F (+4.5 °F)	24.7 °F (-1.6 °F)	N/A	6 °F (2/17)

Data Source: NWS Local Offices ([www.weather.gov](http://www.weather.gov))

# Winter 2020 – 2021 Daily Peak Loads In Perspective



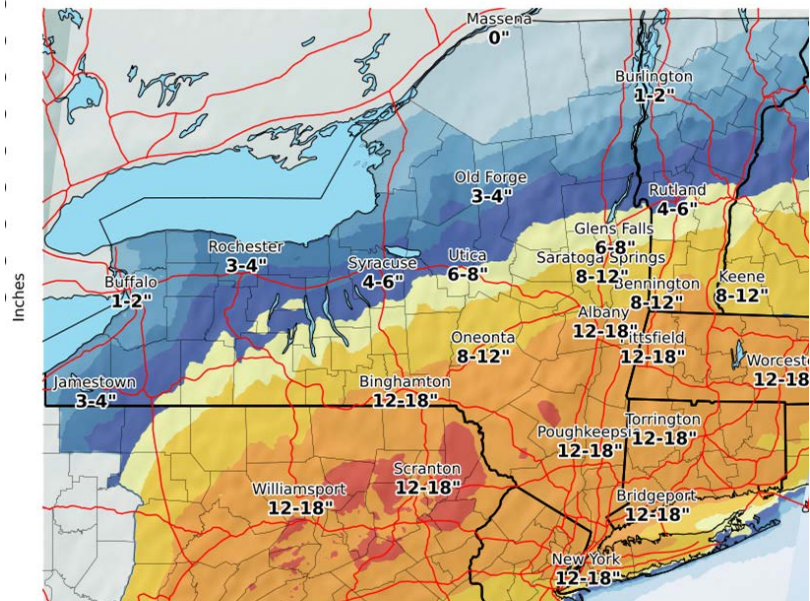
# **Cold Weather Conditions (12/15 – 12/19) Electric Peak**

- Widespread Winter Storm Warnings for Wednesday 12/16 projected high winds, deep snow, and cold temperatures. The NYISO worked with the TOs to recall certain transmission line outages, and participated in NPCC coordination calls with neighboring external market systems
- Actual snowfall accumulations exceeded in-day National Weather Service projections by as much as 1' - 2' in some central and eastern areas of New York State; resulting in the 8th largest snowstorm on record in Albany (the 4th largest in December)
- NYISO issued an SRE request for statewide capacity of Cricket Valley CC3 on 12/16/20
- NYISO issued an SRE request for statewide capacity of Bethlehem GS3 on 12/17/20
- NYISO weekly fuel surveys indicated sufficient alternate fuel inventory
- The day ahead 50/50 forecast for December 16 was 21,750MW and the 90/10 forecast was 22,280MW. The actual December 16 peak was 22,542 MW
- Minimum temperatures were 16°F in Syracuse, 10°F in Albany, 24°F in NYC

# Major Winter Snowstorm December 16-17 2020

## Expected Snowfall - Official NWS Forecast

Valid: 12/16/2020 04:00 PM - 12/17/2020 07:00 PM



**National Weather Service**  
Albany, New York  
12/16/2020 06:37 AM EST

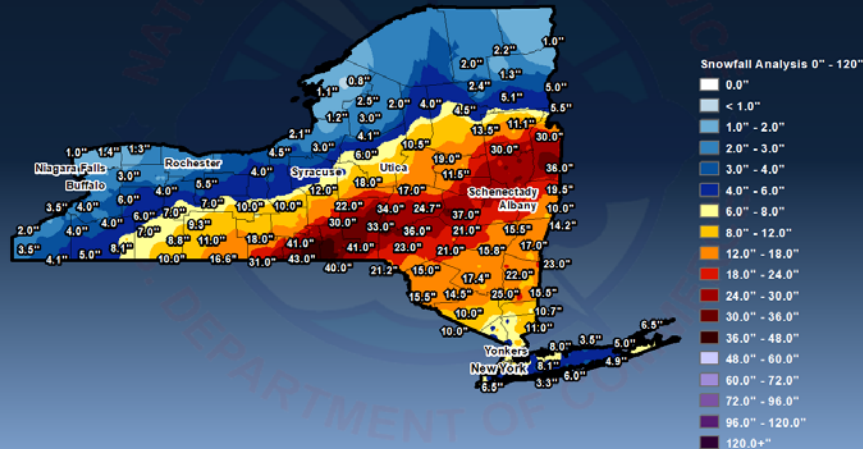
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## National Weather Service State of New York December 16-17, 2020 Major Winter Storm Snowfall Reports

Analysis Data Source: Regional Observations



This is an experimental product. Care should be taken in using the data. Unofficial observations are plotted. Values at interpolated locations may not represent actual reports at that location.

Created:  
12/17/2020 01:04PM

# Cold Weather Conditions (1/28 – 2/1) Coldest Weather

- Many Pipeline Critical Notices and tight tolerance OFOs along with LDC Alerts, Daily and Hourly OFOs, and LDC curtailments of Interruptible Transportation Services
- Transmission Owner & NPCC coordination calls
- NYISO issued an SRE for statewide capacity of Roseton 2 on 1/29 & 1/30
- Markets performed well. Imports that were scheduled Day Ahead were realized along with additional Real Time imports based on marginal pricing
- NYISO weekly fuel surveys indicated sufficient alternate fuel inventory
- 1/29/21 MAX temperatures were 21°F in Syracuse, 17°F in Albany, 25°F in NYC. The lowest daily NYCA average temperature of the season (16.7°F) was observed.

# Cold Weather (2/8 – 2/13) Additional Cold Weather

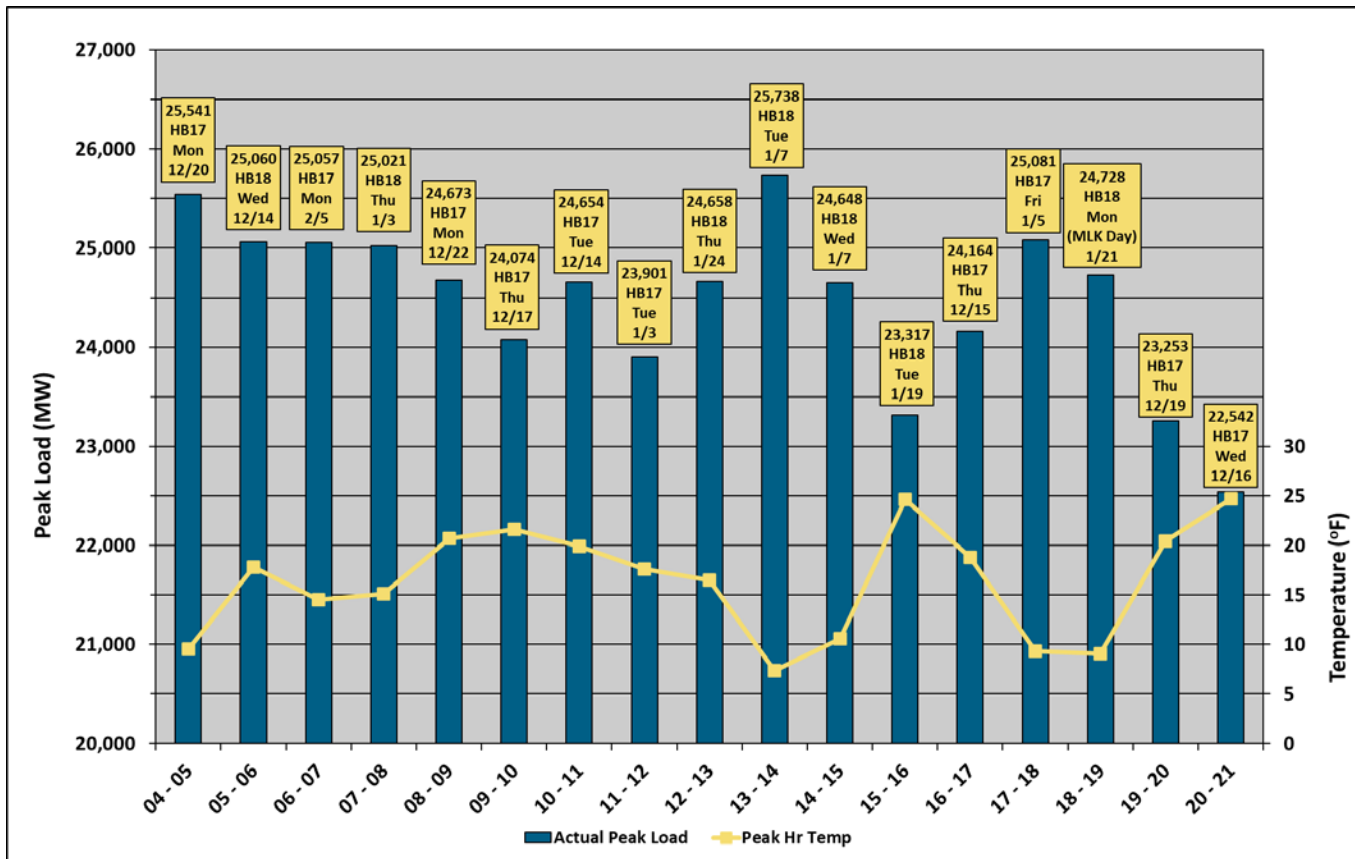
- **Pipeline Operations:**
  - Interstate Pipeline Critical Notices, daily OFOs and hourly OFOs
  - LDC Alerts, Daily & Hourly OFOs, and curtailments of Interruptible Transportation Services
  - A Transco Pipeline compressor forced outage in New Jersey resulted in pipeline service curtailments
- **Transmission Owner & NPCC coordination calls**
- **NYISO issued an SRE for Transmission Security for Empire CC 1 & 2 on 2/10/21**
- **NYISO weekly fuel surveys indicated sufficient alternate fuel inventory**
- **5 days in a row > 21,000 MW load (only occurrence this winter)**
- **2/8/21 MAX temperatures were 23°F in Syracuse, 22°F in Albany, 29°F in NYC. Lowest Low NYCA average temperature of 12.1°F**

# Temperature and Peak Load Statistics for Selected Periods

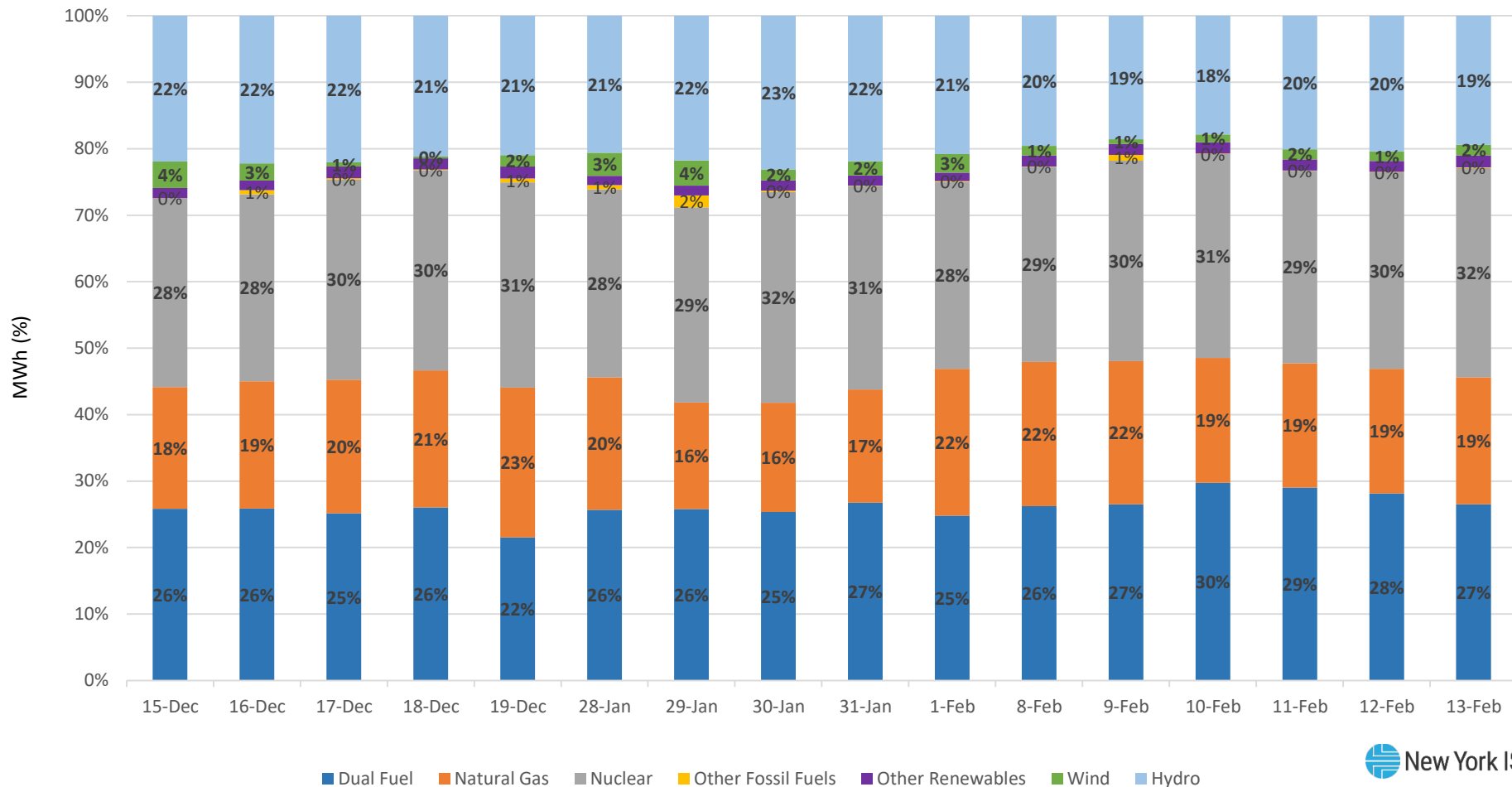
Date	DOW	AM Low Temp	Aft High Temp	HB18 Temp	Avg Temp	Peak Load (MW)	Approx COVID Impact
12/15/2020	Tue	29.9	34.1	29.4	30.9	21,268	-0.8%
12/16/2020	Wed	21.1	26.5	24.5	24.0	<b>22,542</b>	
12/17/2020	Thu	22.4	27.9	25.9	25.1	22,023	
12/18/2020	Fri	22.1	28.6	23.7	23.8	21,900	
12/19/2020	Sat	16.1	30.4	28.7	23.4	20,648	
1/28/2021	Thu	23.9	27.3	22.9	24.4	22,080	0.2%
1/29/2021	Fri	12.3	21.3	19.3	16.7	22,499	
1/30/2021	Sat	13.0	27.9	25.1	18.9	20,848	
1/31/2021	Sun	13.6	22.9	21.4	18.1	21,280	
2/1/2021	Mon	20.7	28.5	28.4	25.4	21,579	
2/8/2021	Mon	12.1	25.9	23.1	19.3	21,747	0.0%
2/9/2021	Tue	19.3	29.5	26.8	24.6	21,462	
2/10/2021	Wed	19.9	29.4	27.6	24.7	21,197	
2/11/2021	Thu	21.5	28.6	26.0	24.2	21,475	
2/12/2021	Fri	12.7	23.7	22.9	18.9	21,292	
2/13/2021	Sat	17.0	24.5	24.3	21.3	20,463	

All temperatures listed represent the NYCA load-weighted composite values.

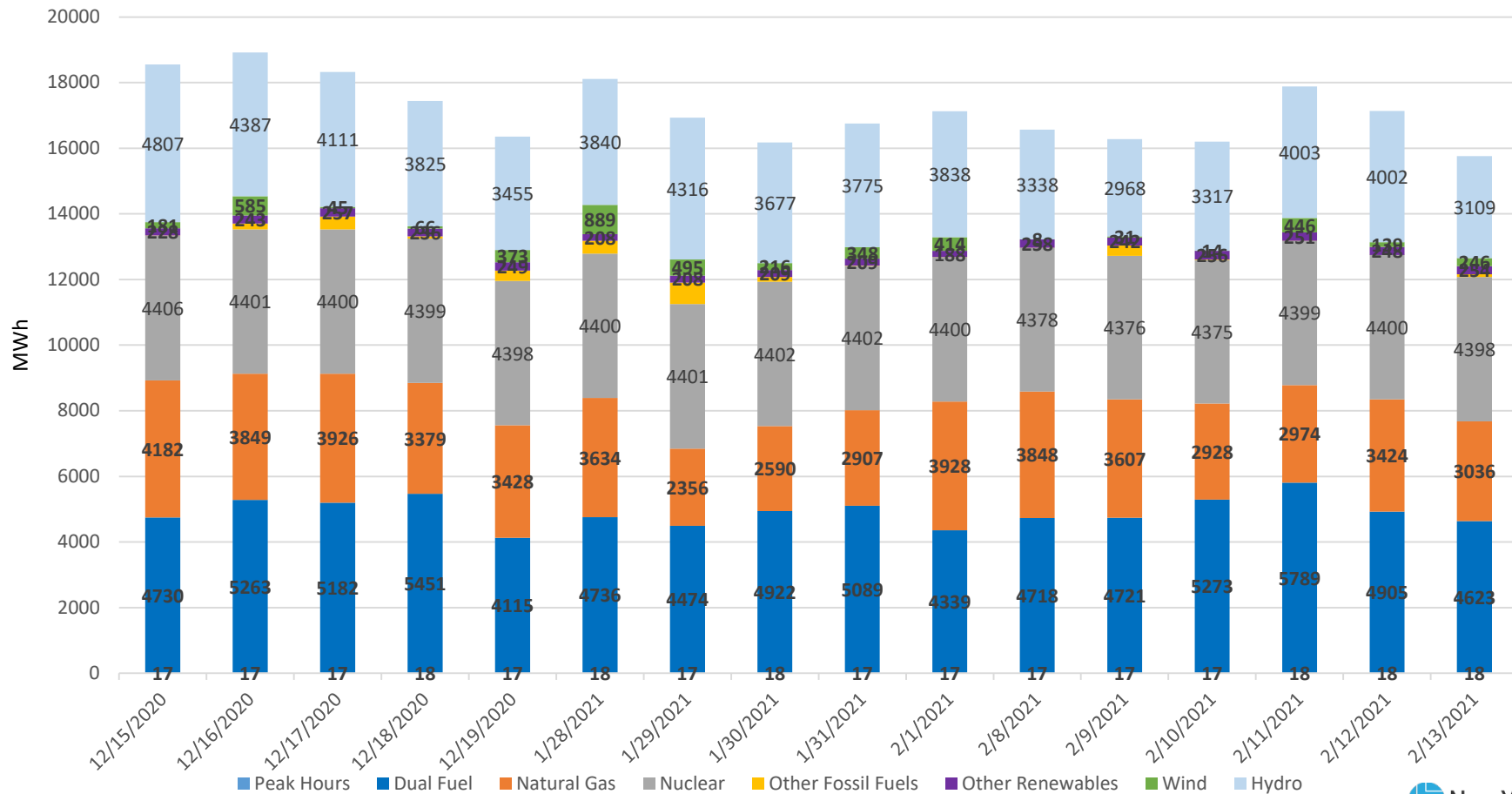
# Winter Peak Loads in MW: 2004-05 to 2020-21



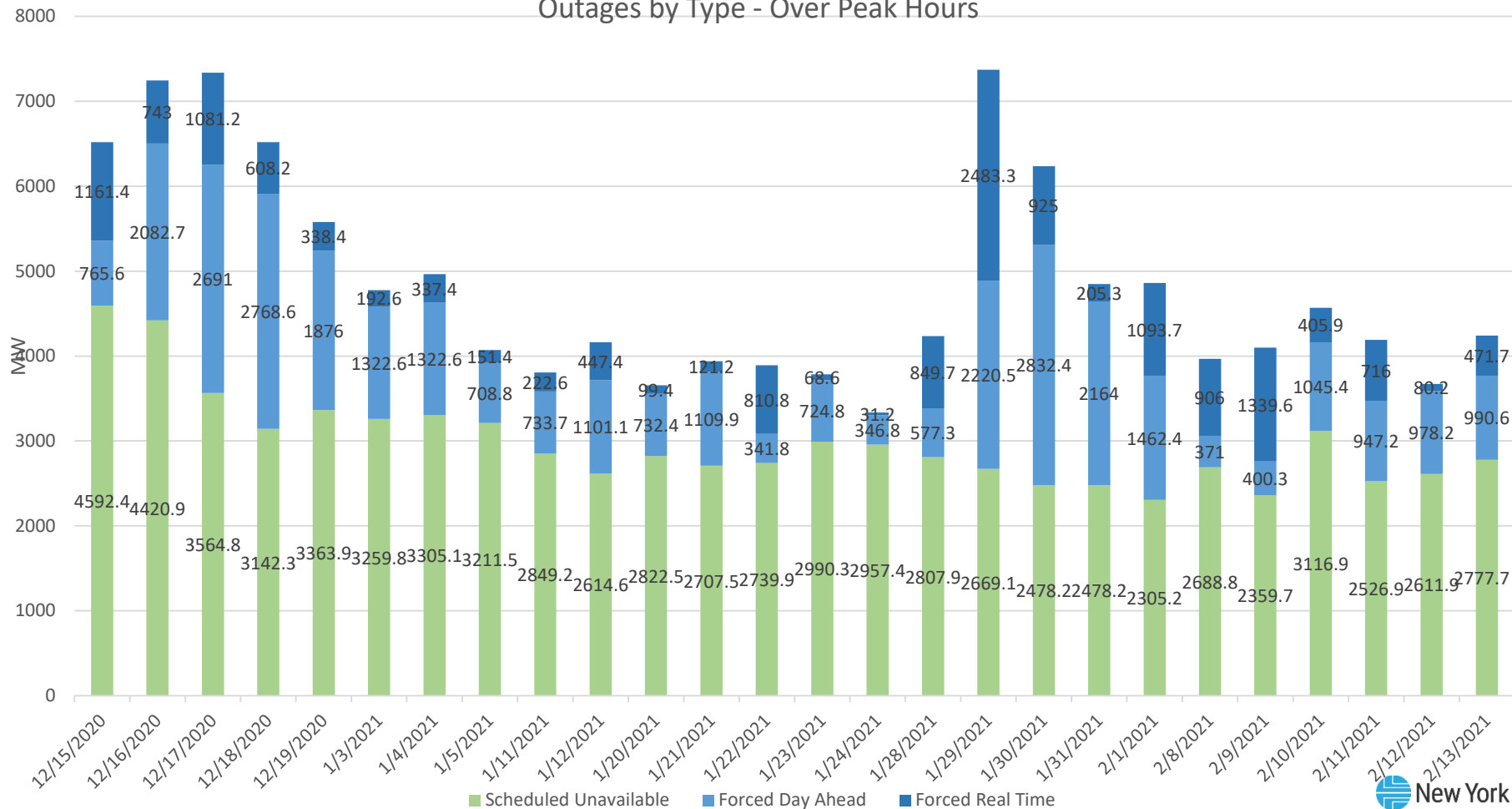
# Total Actual Generation by Fuel Mix Across Day



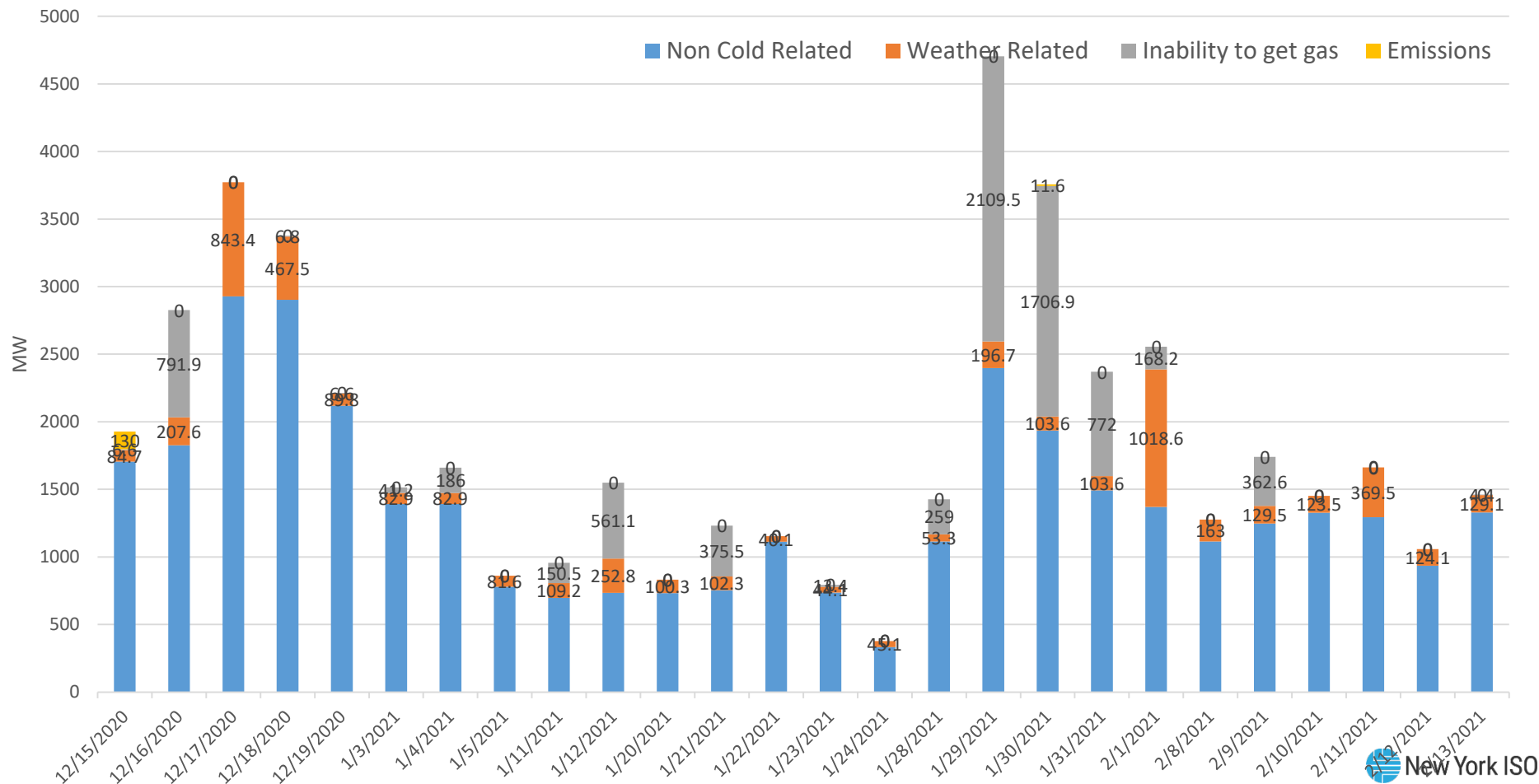
## Total Actual Generation by Fuel Mix During Peak Hours



# Outages by Type - Over Peak Hours



# Thermal and Hydro Forced Outages and Forced Derates by Category



# Operations

- Met operating criteria throughout the winter
- Market systems worked well
- No need for Demand Response
- No need for Emergency actions (voltage reduction, public appeals, etc.)
- No need for emergency purchases

# Transmission Infrastructure Performance

## ■ Continuing Forced Outages

- B and C lines from NJ to NYC, Hudson-Farragut 345 kV B3402 and Marion-Farragut 345 kV C3403
- One Phase Angle Regulator (PAR) at the Ontario border, L33P St. Lawrence – Moses

## ■ Other impactful outages throughout the season (not all occurring concurrently)

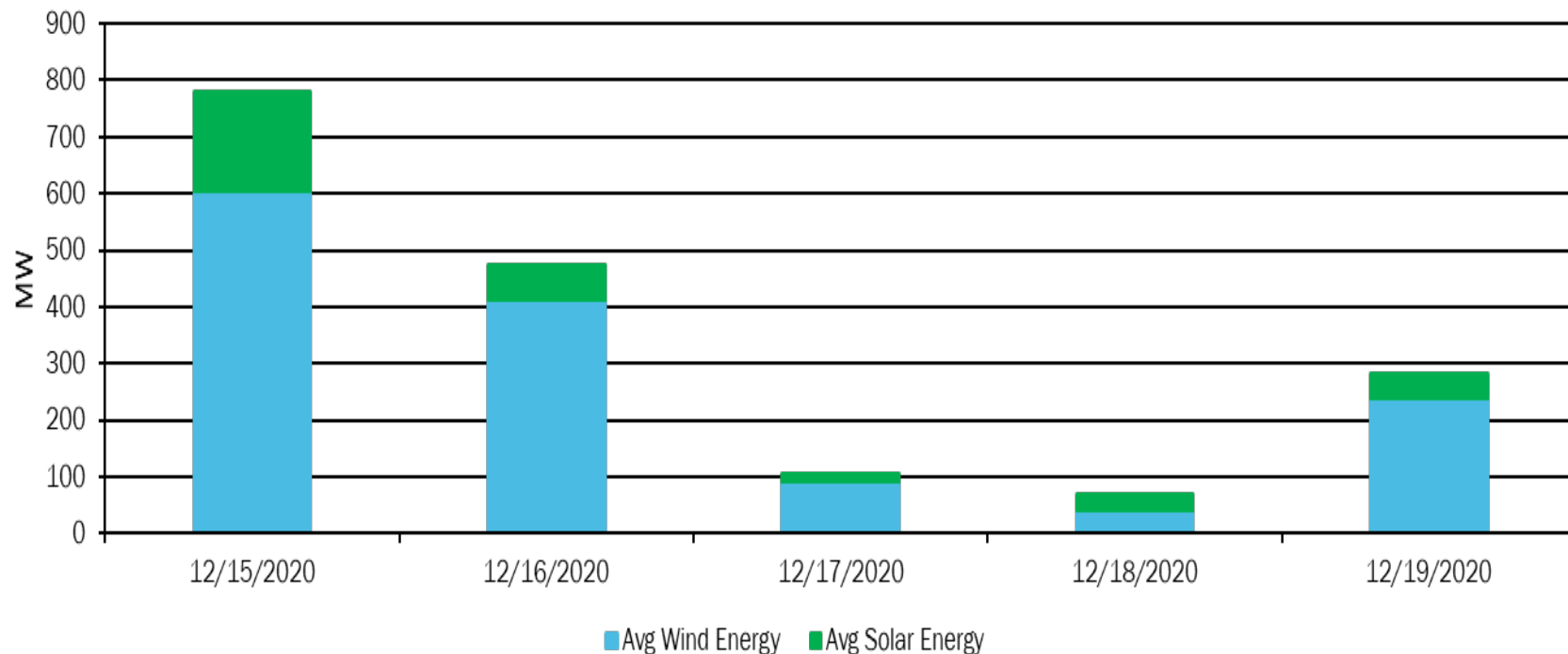
- Newbridge 345kV/138kV Bk 1
- Sprainbrook-E. Garden City 345kV Y49
- Shor\_NPX-Shoreham 138kV Cross Sound Cable
- Pleasantville-Dunwoodie 345kV W89
- Moses-Adirondack 230kV MA1
- Neptune-Duffy Ave 345kV
- New Scotland 345kV 77 bus
- Sand Bar – Plattsburg 115kV PV20

# Gas System NY

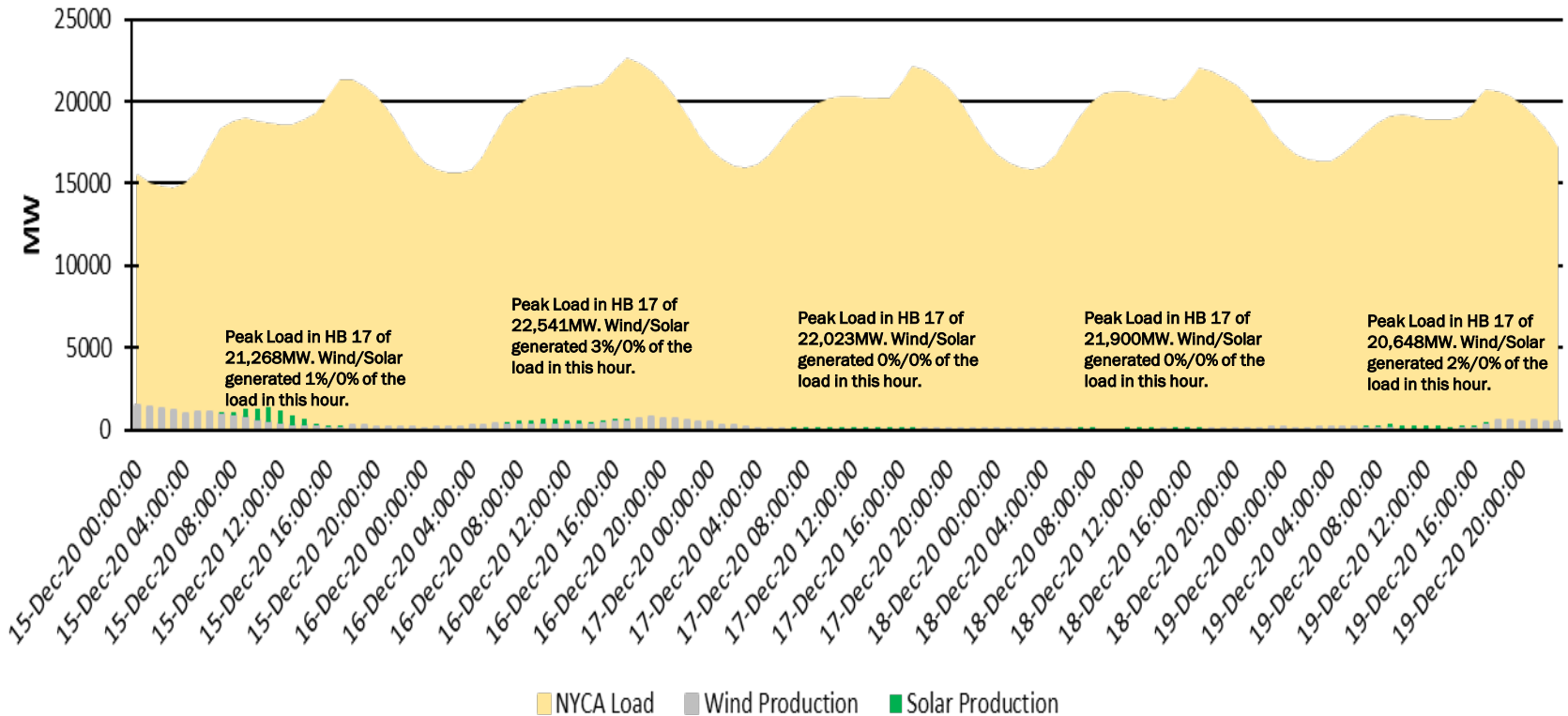
- The interstate and gas LDC pipelines all remained in-service
- Gas Pipelines and Gas LDCs issued many of the following
  - Gas Alerts
  - Daily OFOs (Operational Flow Orders)
  - Hourly OFOs
  - Interruption of Transportation Services (Interruptible Gas Customers will not be able to get Gas)
- In many cases these notices were issued with enough lead time (before the Day Ahead market closes at 5am the prior day) to properly account for the impacts in Day Ahead market solution
- NY experienced a high number of OFO conditions during Winter 2021 including many days not identified as cold weather timeframes in this presentation.

# Daily Wind & Solar Production

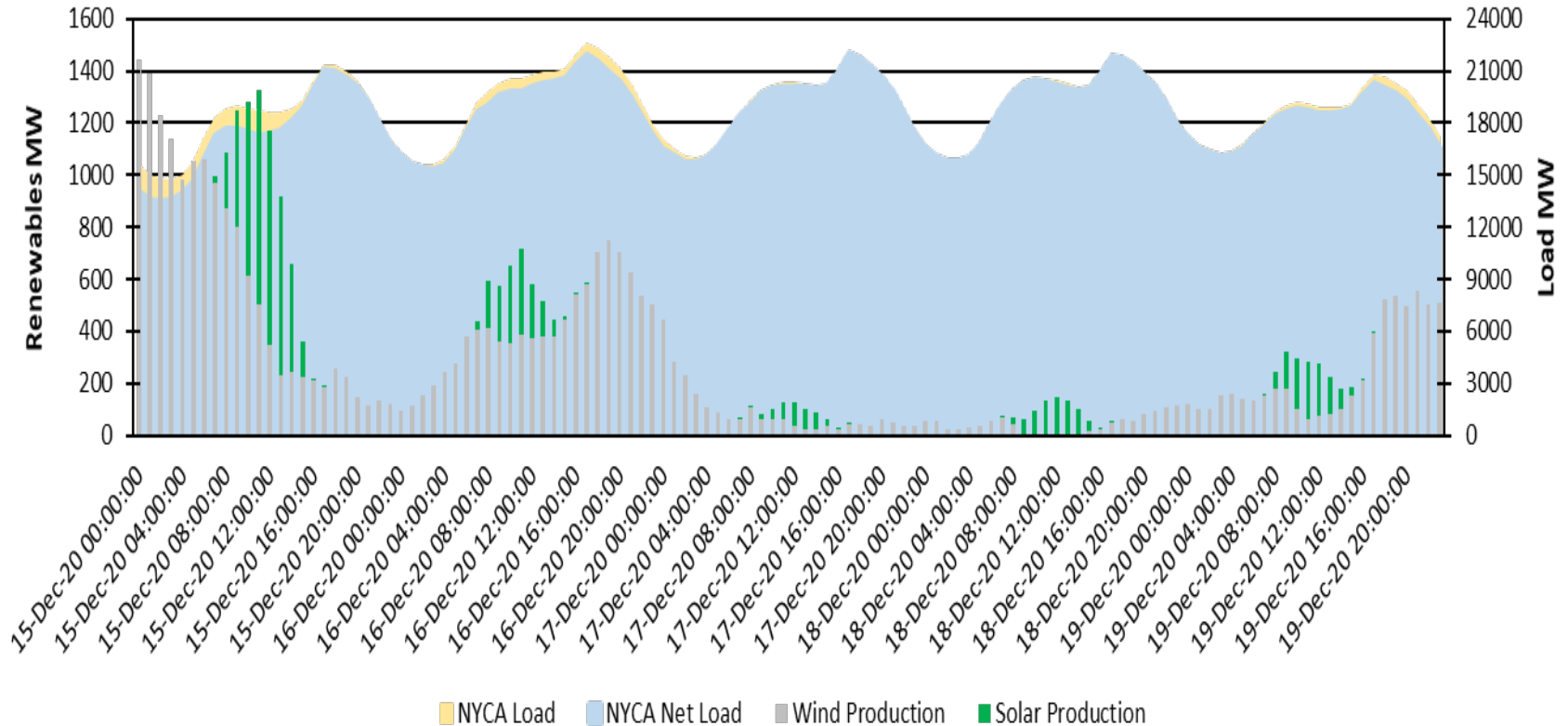
## 12/15/2020 - 12/19/2020



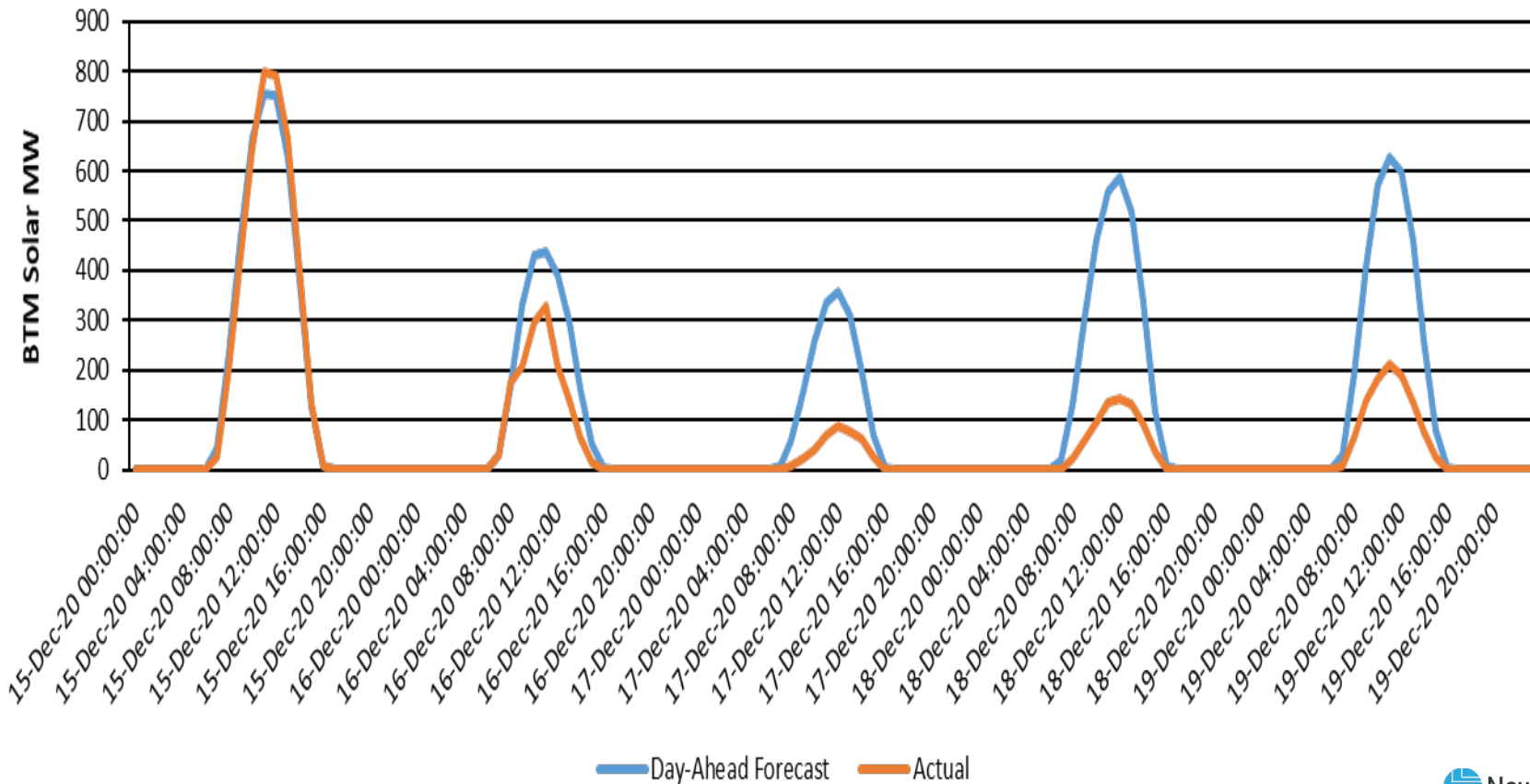
# Hourly Wind & Solar Production 12/15/2020 - 12/19/2020



## Hourly Wind & Solar Production 12/15/2020 - 12/19/2020

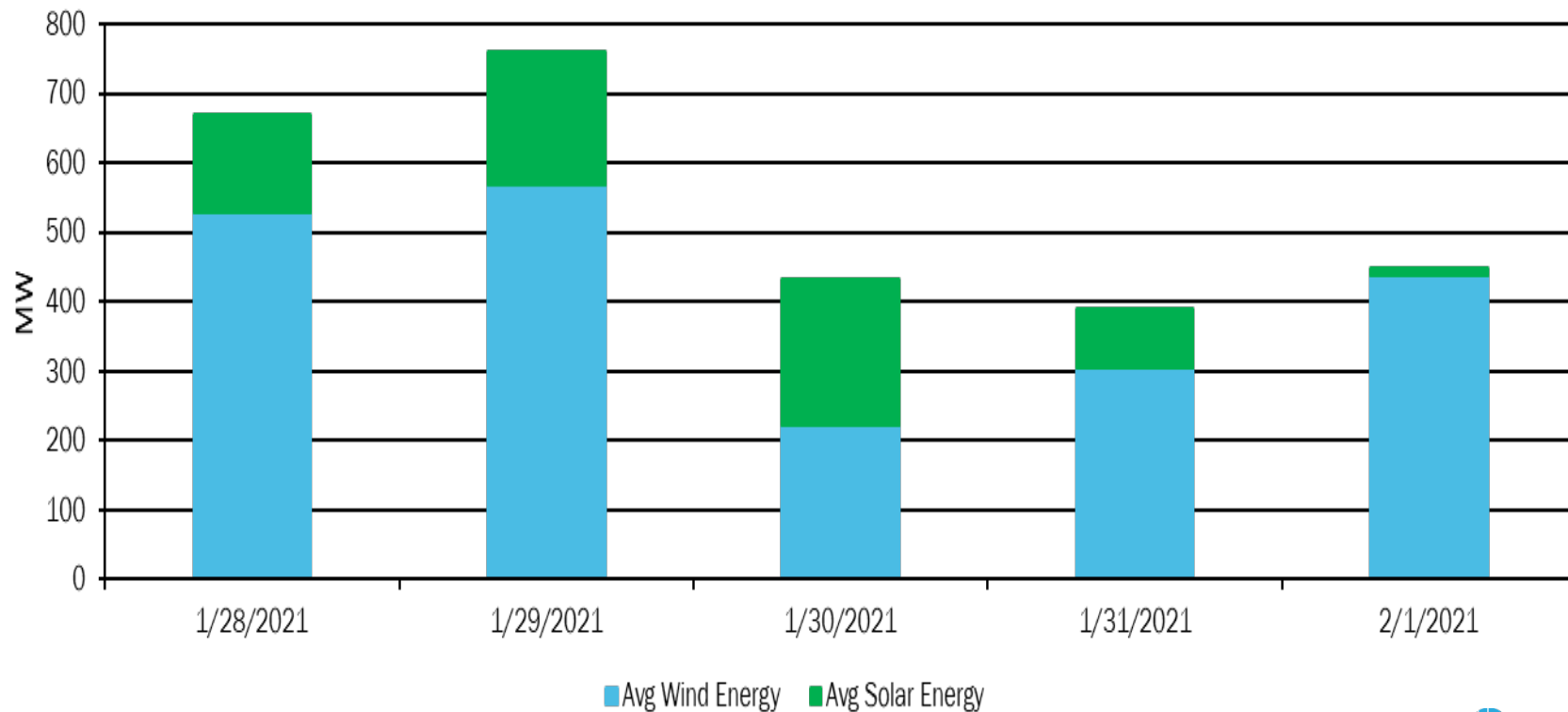


## NYCA BTM Solar Profile (~2,132 MW) 12/15/2020 - 12/19/2020

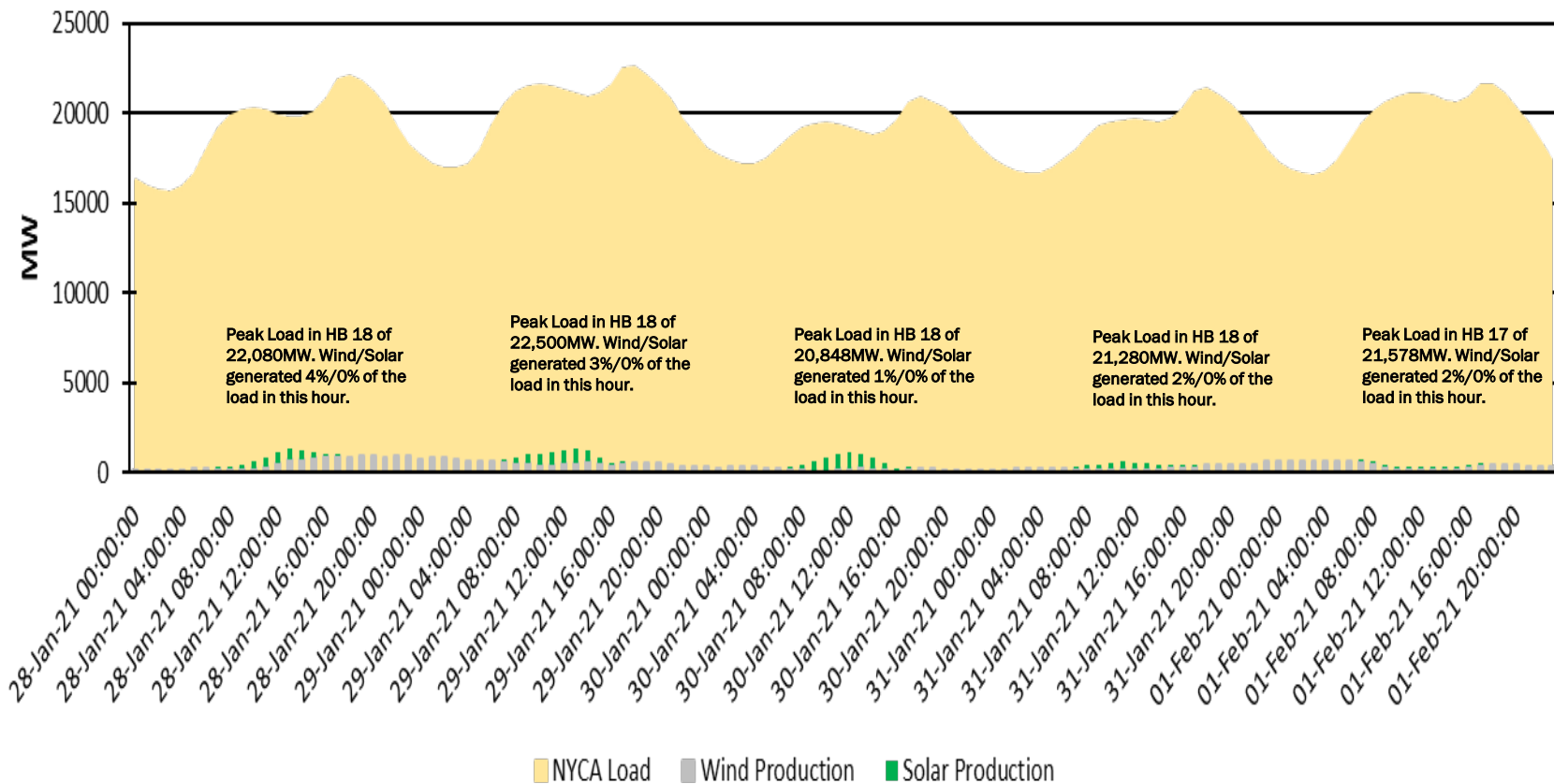


# Daily Wind & Solar Production

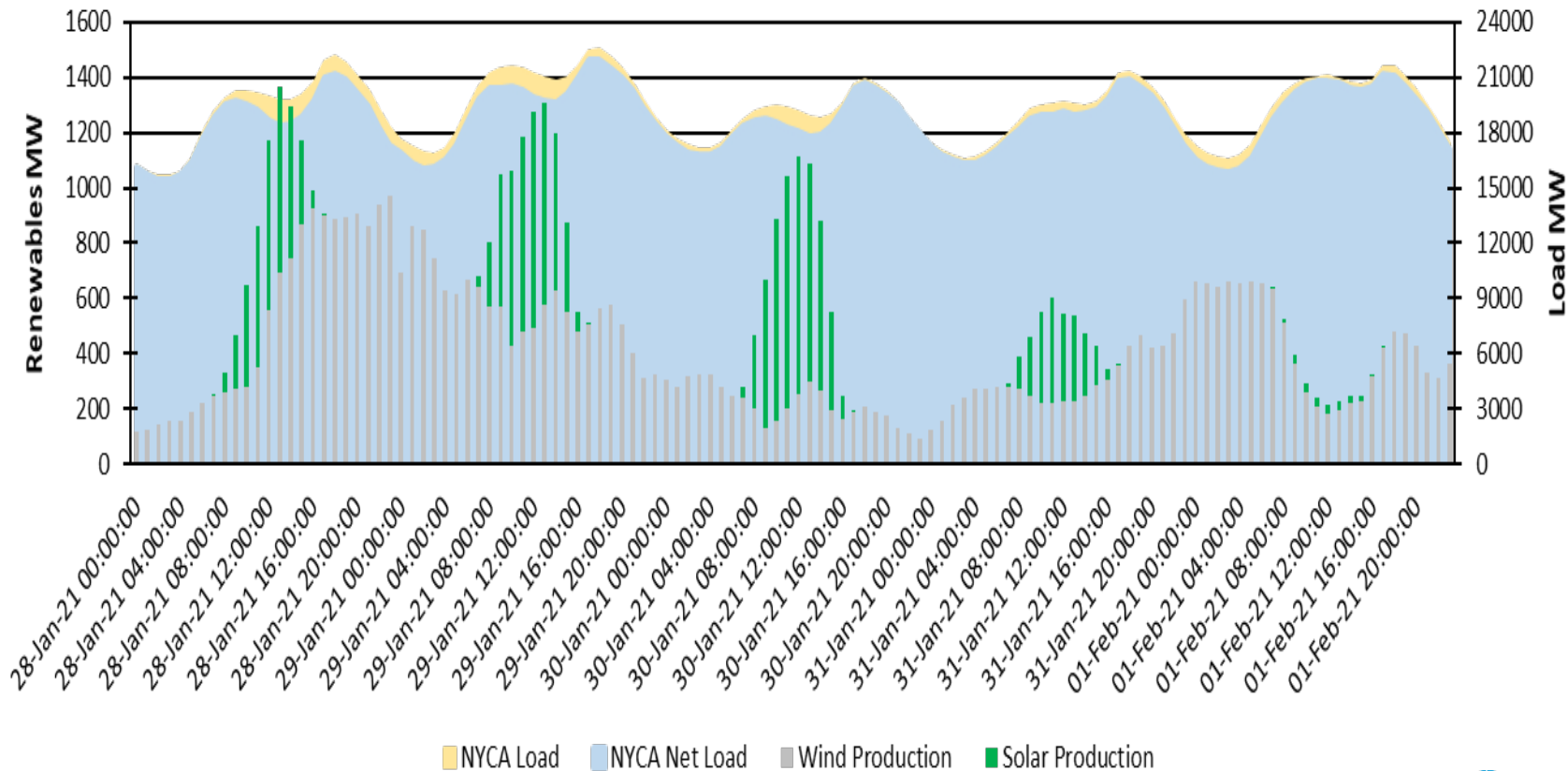
## 1/28/2021 - 2/1/2021



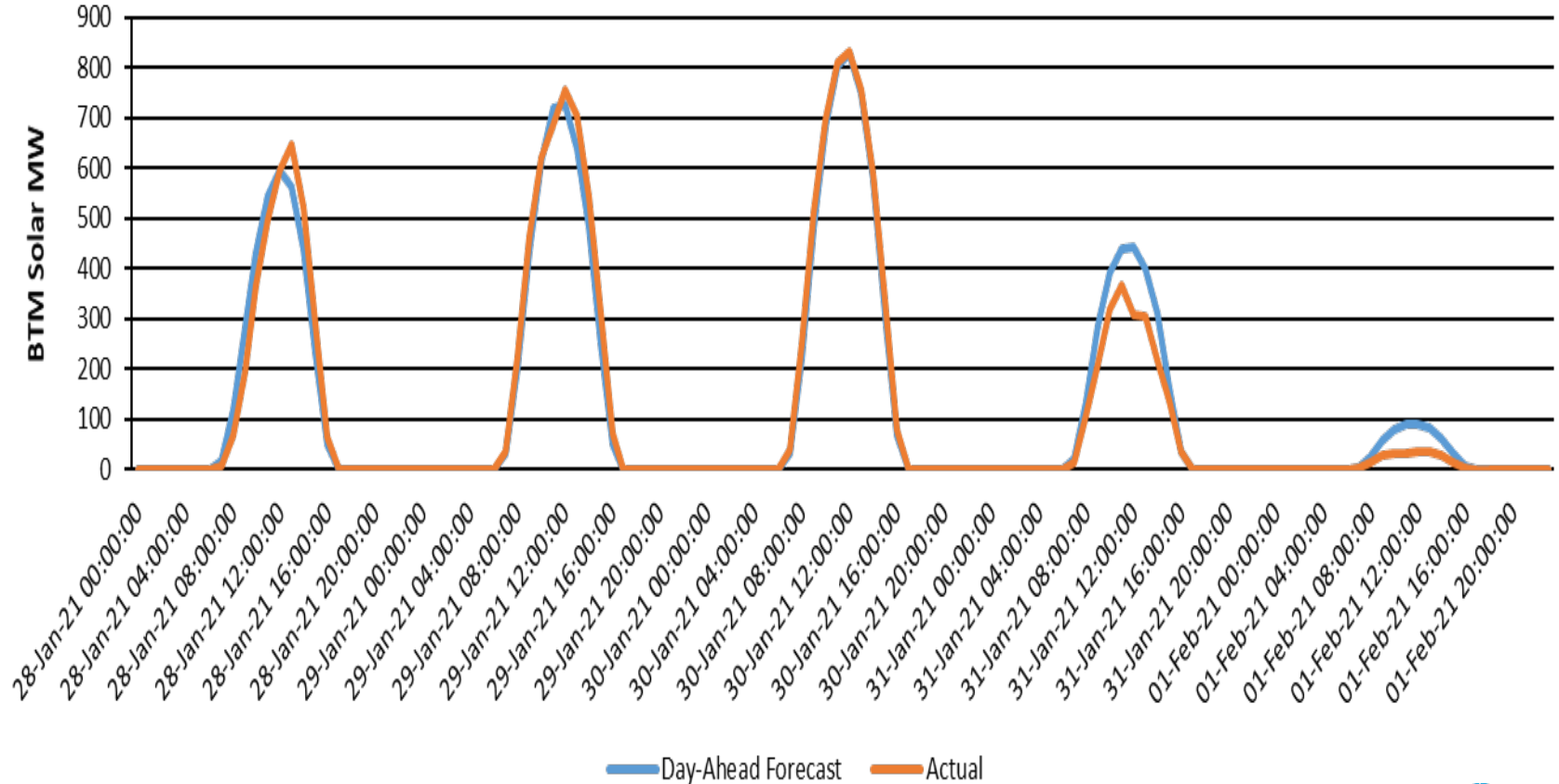
# Hourly Wind & Solar Production 1/28/2021 - 2/1/2021



## Hourly Wind & Solar Production 1/28/2021 - 2/1/2021

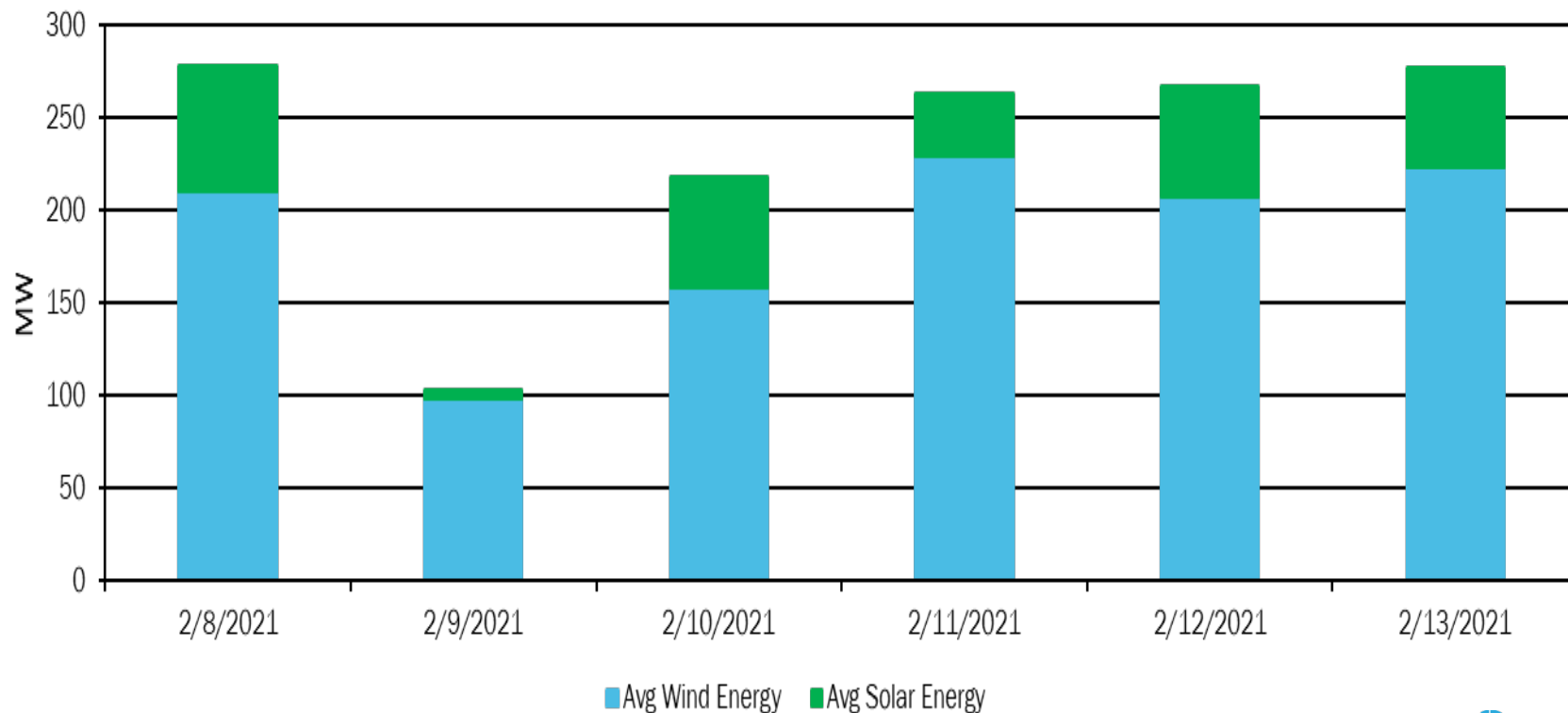


## NYCA BTM Solar Profile (~2,163 MW) 1/28/2021 - 2/1/2021

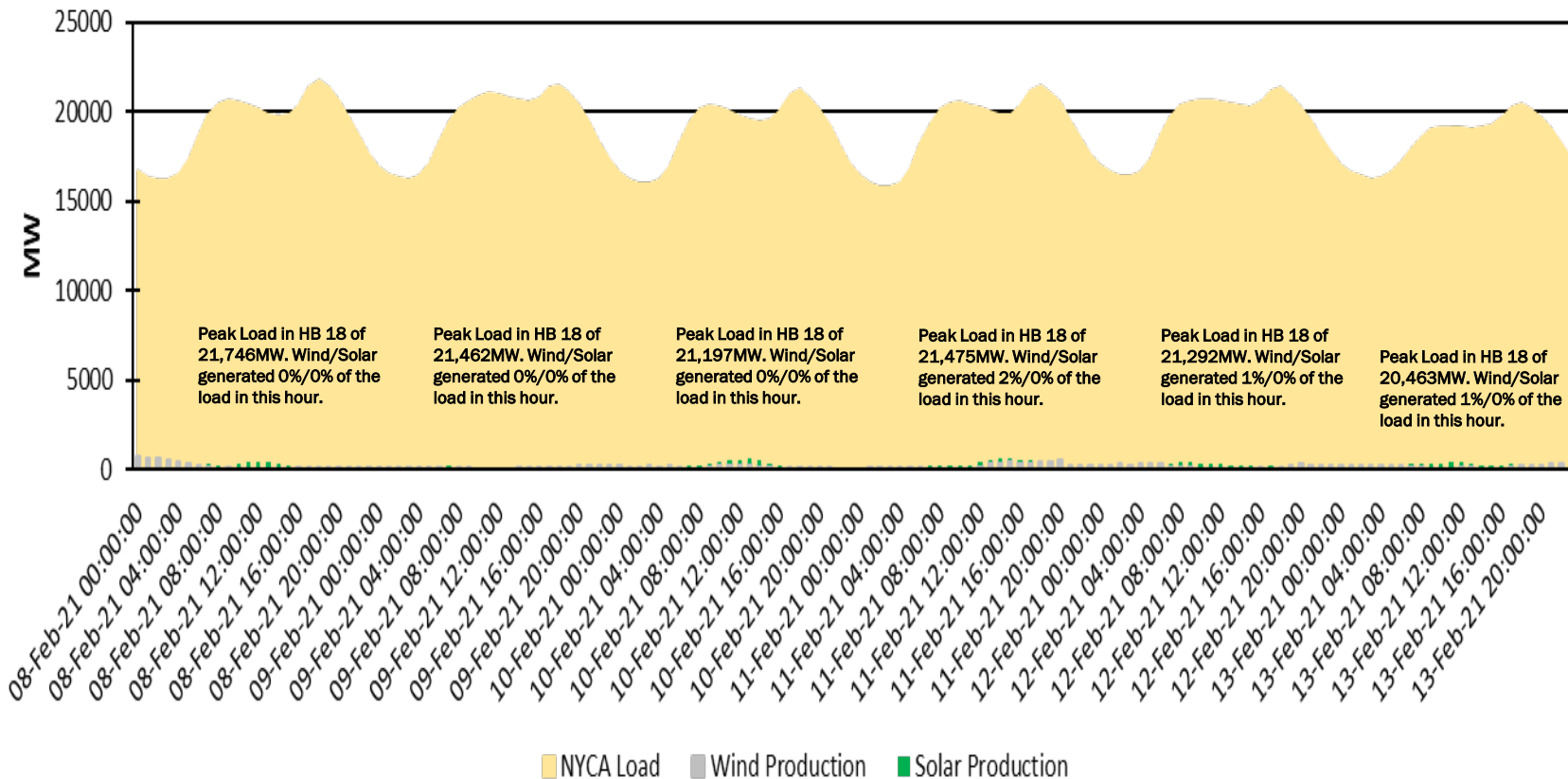


# Daily Wind & Solar Production

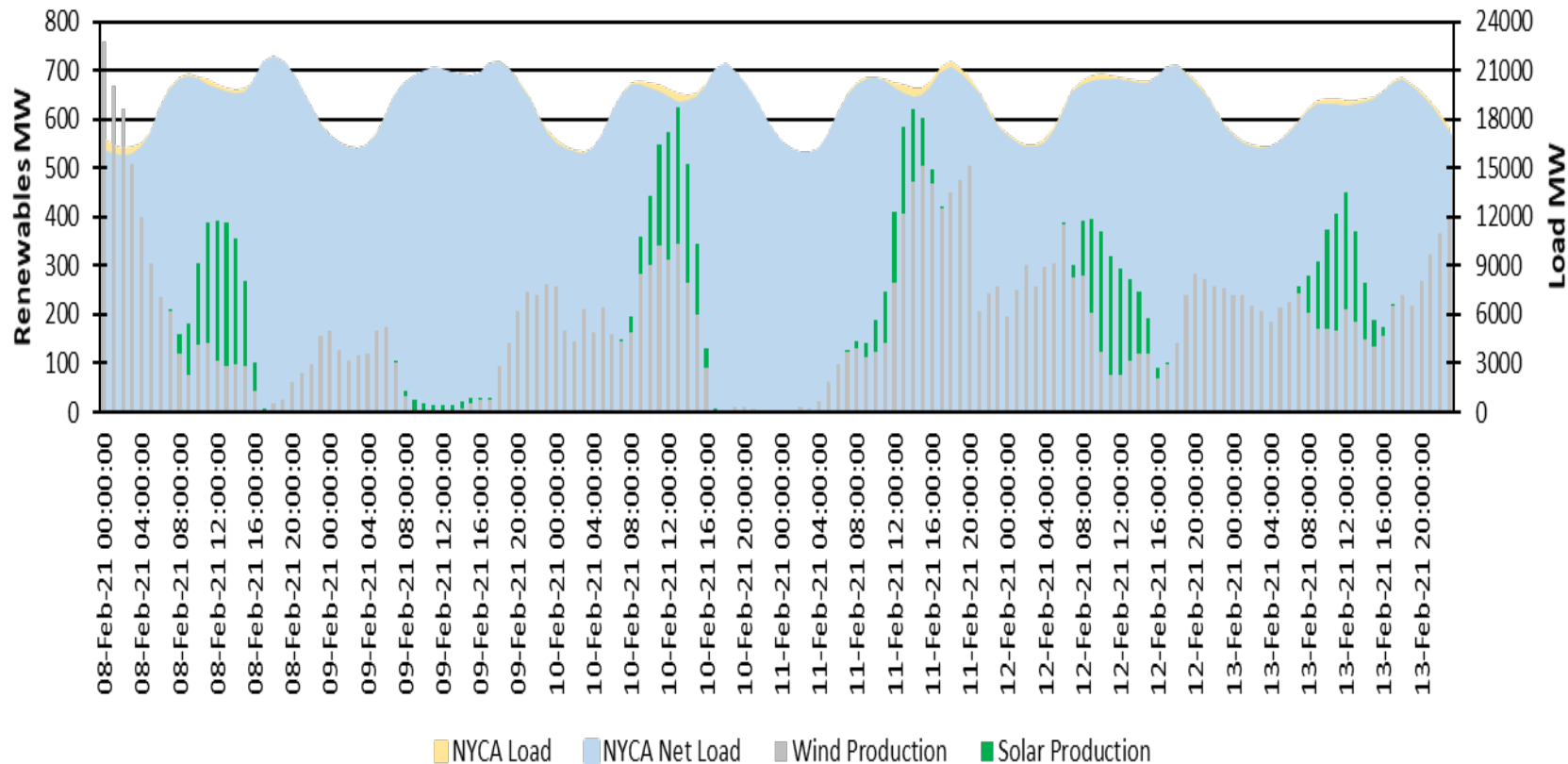
## 2/8/2021 - 2/13/2021



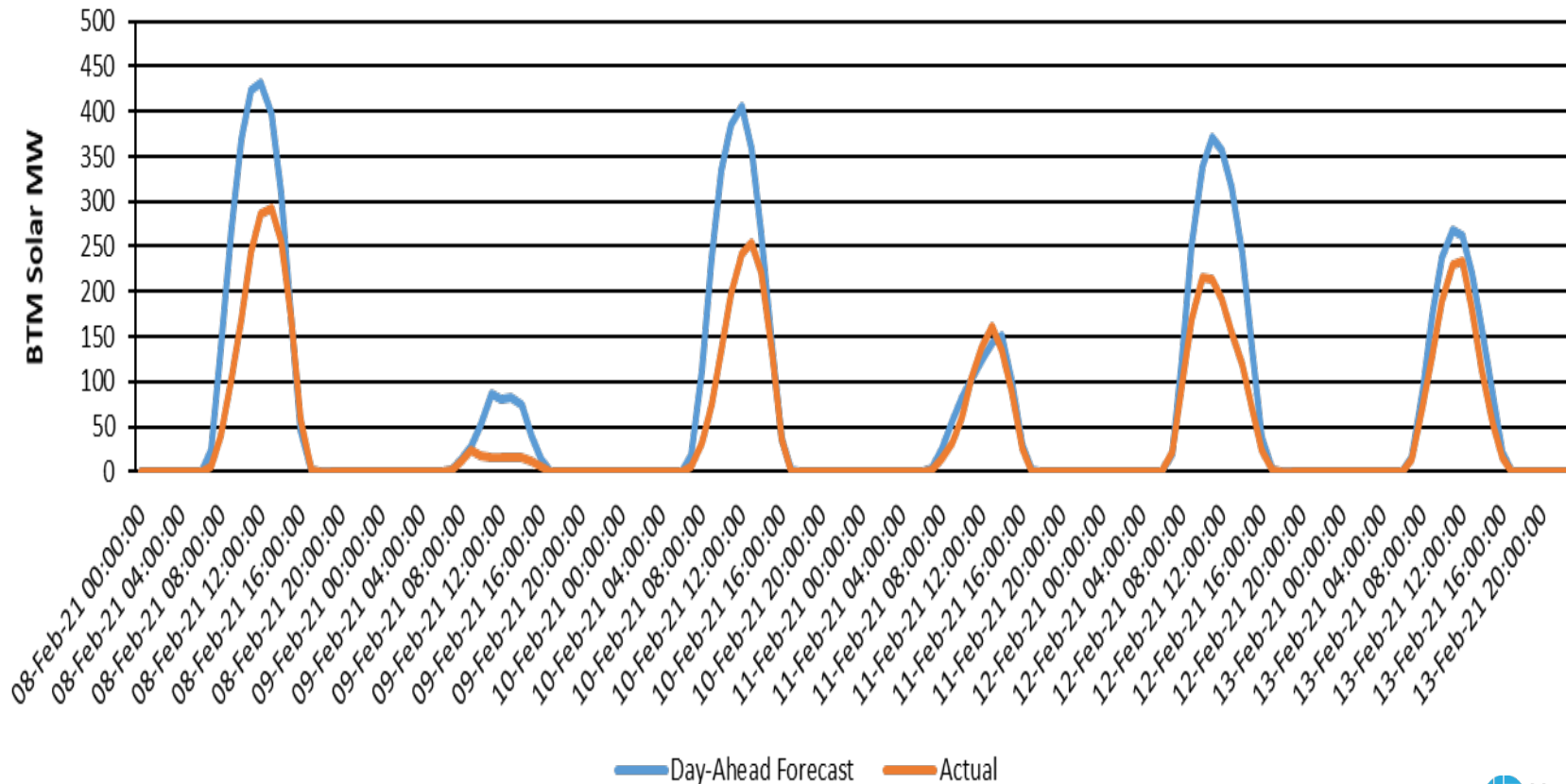
# Hourly Wind & Solar Production 2/8/2021 - 2/13/2021



## Hourly Wind & Solar Production 2/8/2021 - 2/13/2021

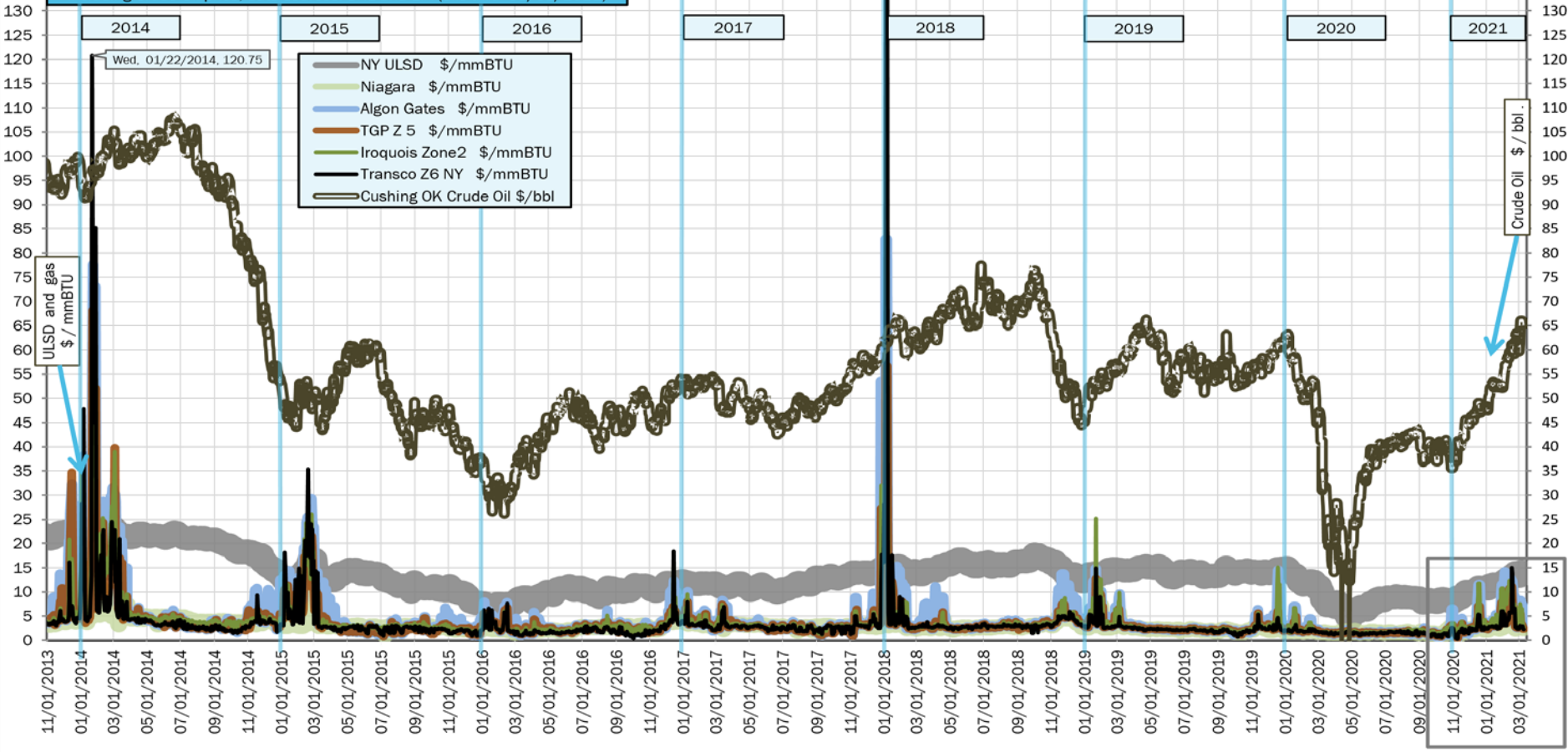


## NYCA BTM Solar Profile (~2,191 MW) 2/8/2021 - 2/13/2021



# NYISO Fuel Prices November 2013 thru March 10, 2021

including Crude Oil price, data sources: SNL and EIA (oils thru 03/08/2021)

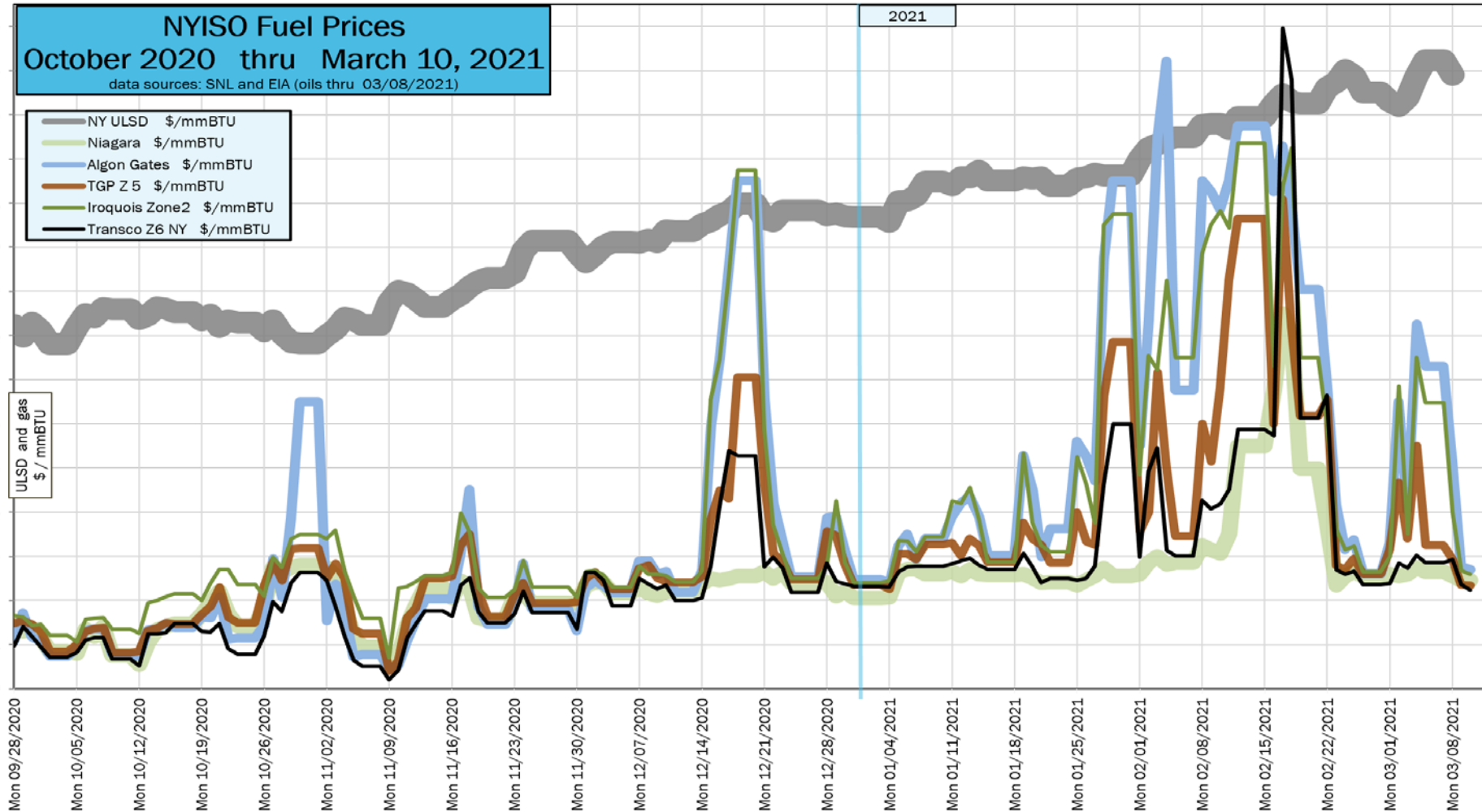


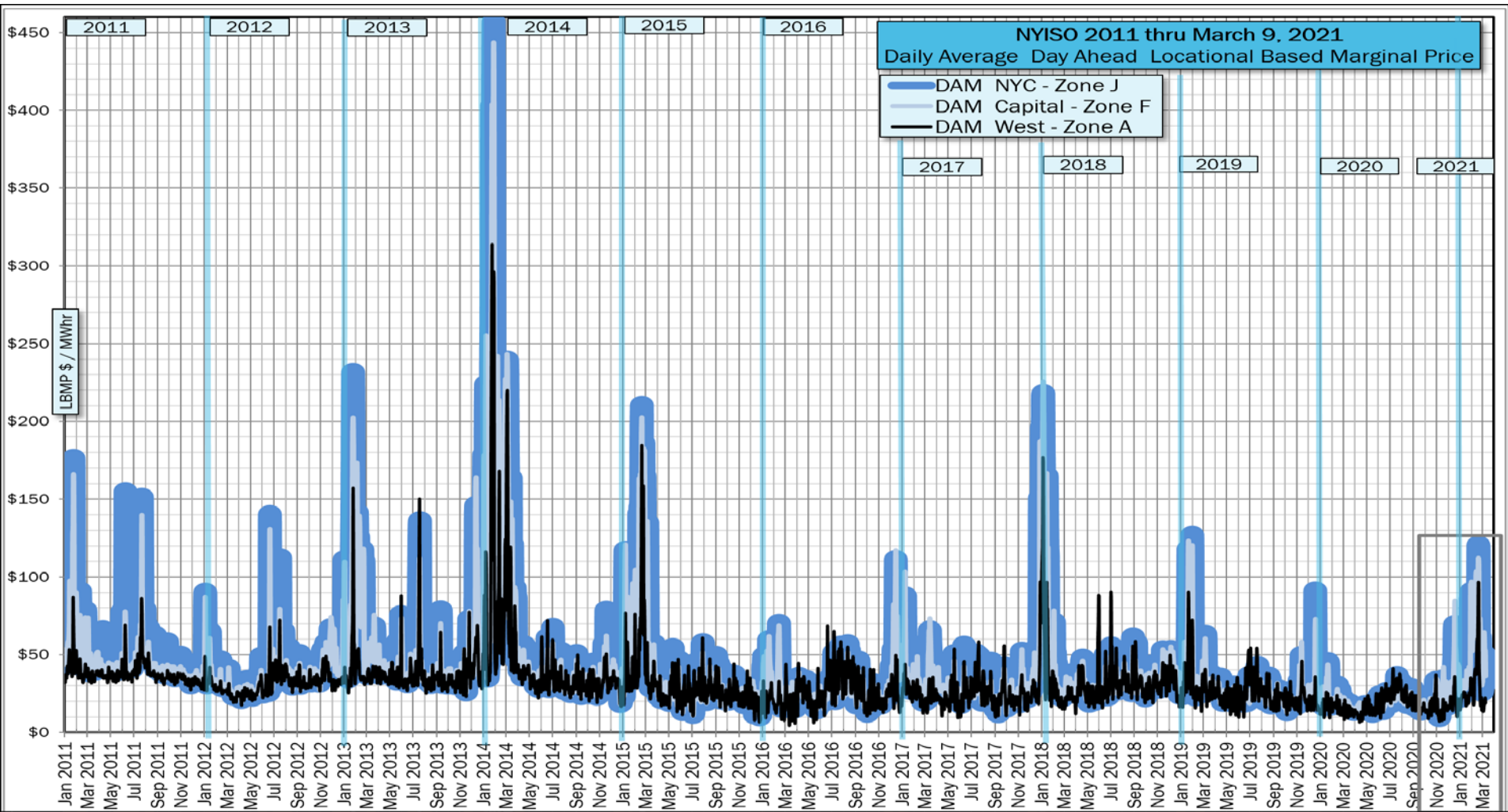
# NYISO Fuel Prices October 2020 thru March 10, 2021

data sources: SNL and EIA (oils thru 03/08/2021)

- NY ULSD \$/mmBTU
- Niagara \$/mmBTU
- Algon Gates \$/mmBTU
- TGP Z 5 \$/mmBTU
- Iroquois Zone2 \$/mmBTU
- Transco Z6 NY \$/mmBTU

ULSD and gas  
\$/ mmBTU



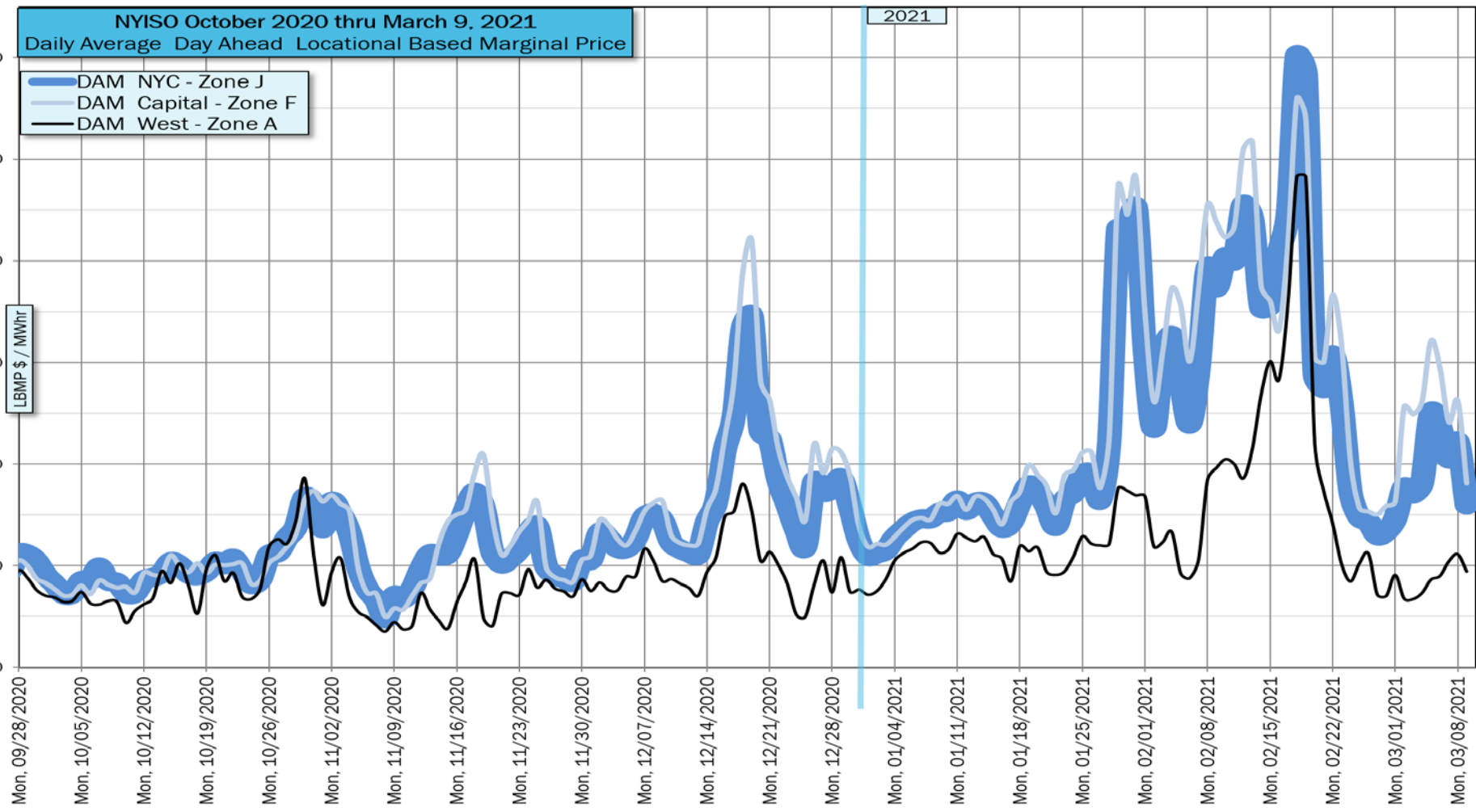


NYISO October 2020 thru March 9, 2021  
Daily Average Day Ahead Locational Based Marginal Price

- DAM NYC - Zone J
- DAM Capital - Zone F
- DAM West - Zone A

LBMP \$ / MWhr

2021



# Fuel and Energy Security

- New York did not experience any long duration, severe cold weather this season
- As presented at the 11/12/20 NYISO Operating Committee meeting, the NYISO is continuing to monitor input assumptions and cold weather operating experiences in the Fuel and Energy Security analysis. Fuel and Energy Security analysis updates will be presented at the April Operating Committee meeting.
- The NYISO is aware of the FERC-NERC joint inquiry into February 14-18 cold weather events in ERCOT & SPP. The NYISO intends to fully review all findings and consider best practices and recommendations as appropriate.

# Questions?

# 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

