New York ISO
Independent System Operator

Winter 2023-2024 Cold Weather Operations

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Key Observations from Winter 2023/24

- Winter 2023-2024 temperatures were above average with minimal short duration cold weather events
- Moderate fuel prices (natural gas, LNG, distillate fuel, etc.) were in place for much of the season
- Stored fuel burned in short duration periods of cold weather. Operations will continue to monitor replenishment in preparation for winter 2024/25
- Continued examples of limited flexibility on the gas system to start and operate generators on gas without a Day Ahead Schedule for energy or reserves
- Estimated supply mix for the peak hour (1/17/24 HB 18): 26% natural gas, 14% oil, 17% hydro, 20% imports, 14% nuclear, 8% wind, 1% other renewables

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Peak Loads

- NYCA all-time Winter Electric Peak Load was 25,738 MW on January 7, 2014
- NYCA Seasonal Peak Forecast was 24,220 MW for Winter 2023-2024
- This Winter's Actual Peak (to date) is 22,754 MW on Wednesday, January 17, 2024

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Above Normal Winter Temperatures Prevailed

Average Temperatures and Departures from 1991 – 2020 Normals					
Station	December	January	February	Season	Coldest
Islip	42.2 °F (+5.1 °F)	35.1 °F (+3.2 °F)	36.1 °F (+2.8 °F)	37.8 °F (+3.7 °F)	17 °F (1/20, 1/21, 1/22)
Central Park	44.6 °F (+5.5 °F)	37.0 °F (+3.3 °F)	39.9 °F (+4.0 °F)	40.5 °F (+4.3 °F)	17 °F (1/17)
Albany	37.6 °F (+7.2 °F)	30.1 °F (+5.7 °F)	33.8 °F (+7.0 °F)	33.8 °F (+6.6 °F)	7 °F (1/20, 1/21, 1/22)
Syracuse	38.6 °F (+8.2 °F)	29.6 °F (+5.5 °F)	34.5 °F (+9.0 °F)	34.2 °F (+7.5 °F)	7 °F (1/20, 2/20)
Buffalo	39.4 °F (+8.0 °F)	29.4 °F (+3.9 °F)	34.8 °F (+8.4 °F)	34.5 °F (+6.7 °F)	6 °F (1/17, 1/20)
Plattsburgh	32.4 °F (+6.0 °F)	24.3 °F (+5.1 °F)	27.7 °F (+6.7 °F)	28.1 °F (+5.9 °F)	-4 °F (1/20)

Data Source: NWS Local Offices (www.weather.gov)

Legend: Below Normal Above Normal

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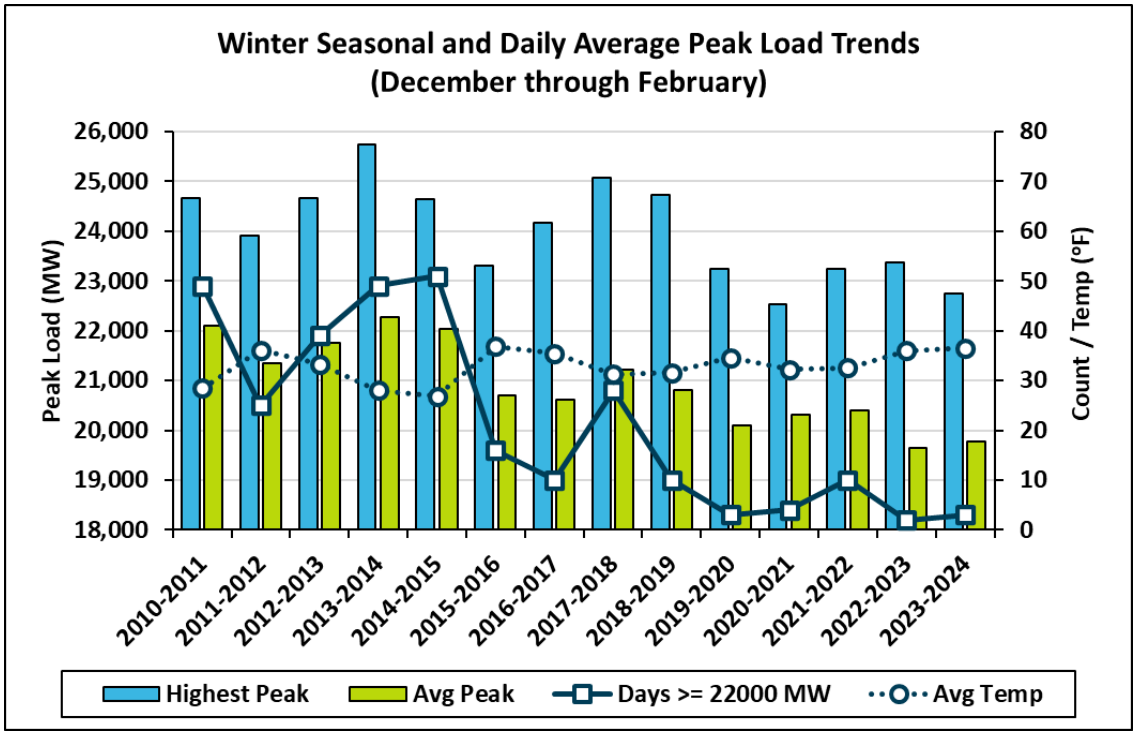
Winter 2023 – 2024 Daily Peak Loads In Perspective



- Second highest Winter average hourly temperature (36.5°F) since 2010 – 2011
  - 2015 – 2016: 36.8°F
- Winter 2023 – 2024 peak load (22,754 MW) occurred on January 17th
  - Second lowest winter season peak since 1997 – 1998 after 2020 – 2021 (22,542 MW)
  - Third winter season peak less than 23,000 MW since 1997 – 1998
- Peak load exceeded 22,000 MW only two other times
  - 1/18 (22,314 MW)
  - 1/19 (22,157 MW)
- Second time the season average peak load was below 20,000 MW since 2010 – 2011
  - 2022 – 2023 was the other season

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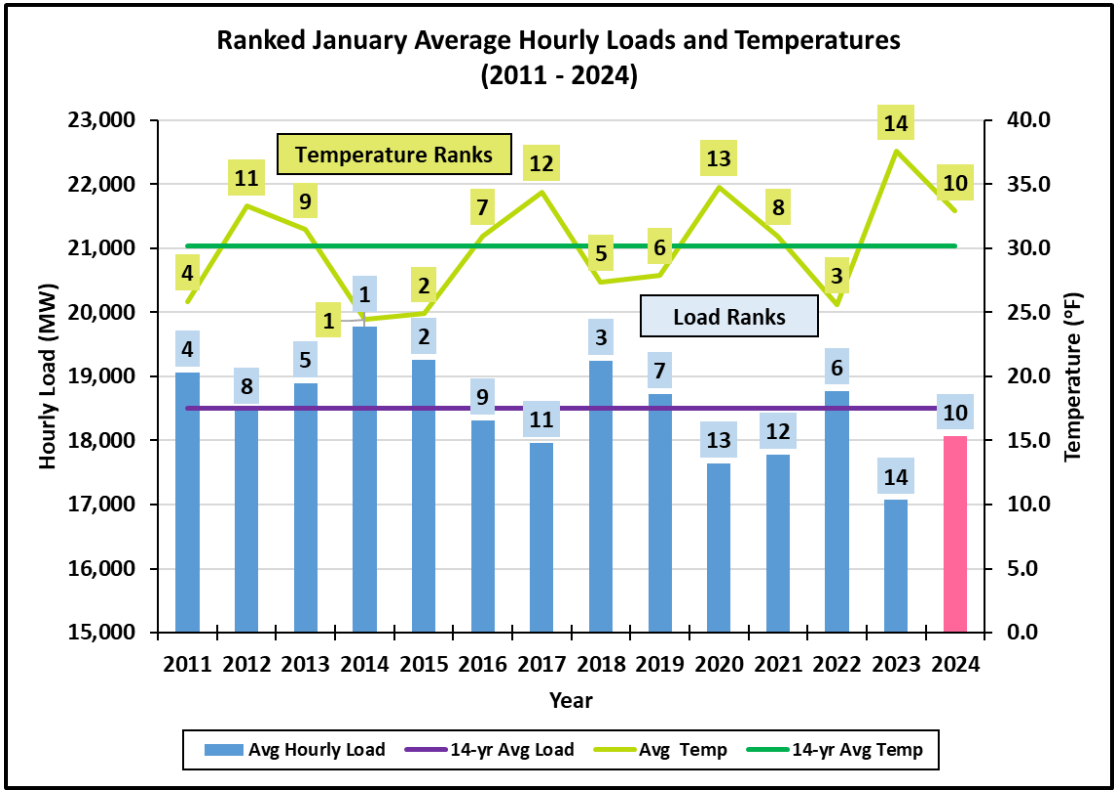
January 2024 Hourly Average Loads In Perspective



- **Average temperature: 32.9 ⁰ F**
  - Fifth highest average hourly temperature since 2011
- **Average Hourly Load: 18,075 MW**
  - Fifth lowest average hourly load since 2011
- **Peak Hourly Load: 22,754 MW (1/17)**
  - Winter 2023 – 2024 peak to date
  - Second lowest winter season peak since 1997 – 1998 behind 2020 – 2021 (influenced by COVID)
- **Three days above 22,000 MW in January 2024**
  - 2011 – 2023 Average: 11 January days above 22,000 MW

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Cold Weather Conditions (1/14 – 1/22) Electric Peak

- The above average temperatures experienced this winter returned to seasonal or a bit below for the week of January 14th.
- 1/17/24 - The forecast peak temperature index was 21.4°F. Partly to mostly sunny, windy and cold with lake effect snow.
- Forecast highs were in the upper-teens to lower-20s upstate and mid-20s downstate. Overnight lows were mainly in the lower- to mid-teens upstate and lower-20s downstate.
- The Actual peak on 1/17/24 and peak of the winter was 22,754 MW, HB18, ~94% of the winter 2023/2024 baseline forecast.
- Most severe Operational Flow Orders (OFOs) during the period:
  - Con Ed 1/20th Hourly OFO, 1/17/24 and 1/20/24-1/22/24 04:00 - 10:00
  - NG Downstate 5% Over-Burn Daily OFO, 1/16/24 10:00 – 1/23/24 10:00
  - NG Upstate East Gate Interruption, 1/20/24 10:00 – 1/21/24 10:00
- SREs – 1/20/24, Northport 3, HB00-20 and 1/22/24, Bowline 2, HB15-23 for statewide capacity

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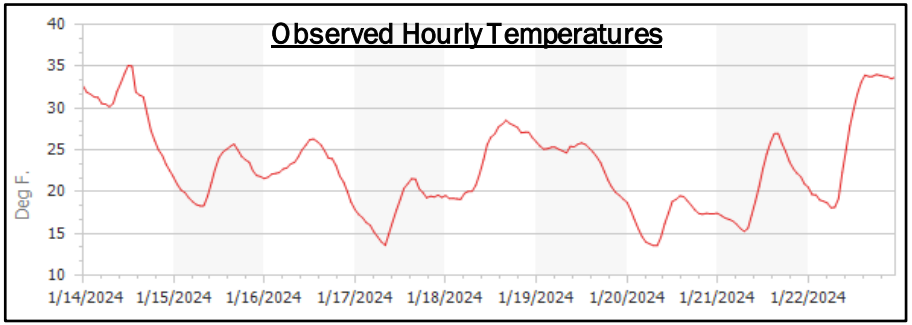
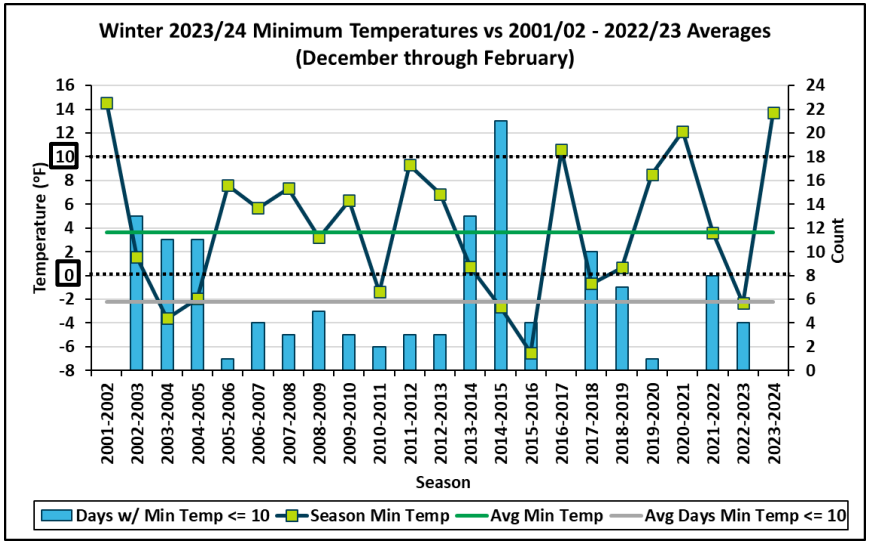
NYCA Temperature and Peak Load Statistics for January 14 – 22, 2024

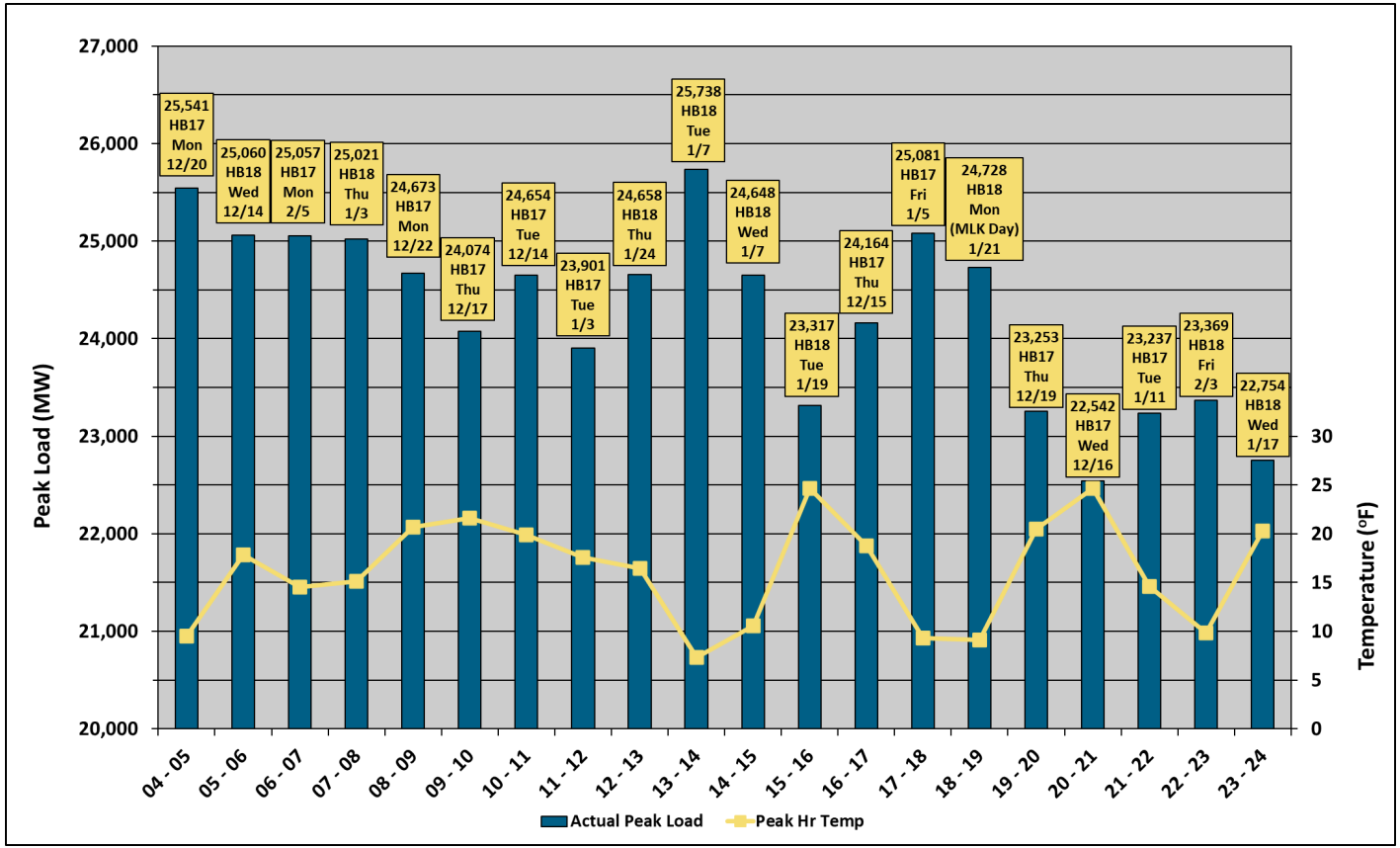
- Coldest stretch of the 2023 – 2024 winter season, but still milder than typical coldest winter days/periods
- Minimum temperature (13.7 ºF) occurred on Saturday January 20th and was the lowest of the season
  - Highest minimum since the 2001 – 2002 season
  - Average season minimum: 3.6 ºF (2001 – 2002 to 2022 – 2023)
- Third time with a winter season minimum temperature above 10 ºF since the 2001 – 2002 season
  - Average season: 6 days with a minimum temperature ≤ 10 ºF

Date	DOW	AM Low Temp	Aft High Temp	HB18 Temp	Avg Temp	Peak Load (MW)
1/14/2024	Sun	30.1	35.7	28.1	30.5	20,107
1/15/2024	Mon	18.8	25.8	24.4	22.4	21,506
1/16/2024	Tue	21.8	26.7	24.4	23.6	21,995
1/17/2024	**Wed**	**14.6**	**21.9**	**20.3**	**18.5**	**22,754**
1/18/2024	**Thu**	**19.5**	**28.4**	**28.2**	**24.4**	**22,314**
1/19/2024	**Fri**	**24.8**	**25.4**	**22.6**	**24.0**	**22,157**
1/20/2024	Sat	**13.7**	19.9	18.1	17.1	21,984
1/21/2024	Sun	15.7	27.1	25.1	20.8	21,735
1/22/2024	Mon	19.1	34.2	34.2	27.4	21,749





Winter Peak Loads in MW: 2004 – 2005 to 2023 – 2024



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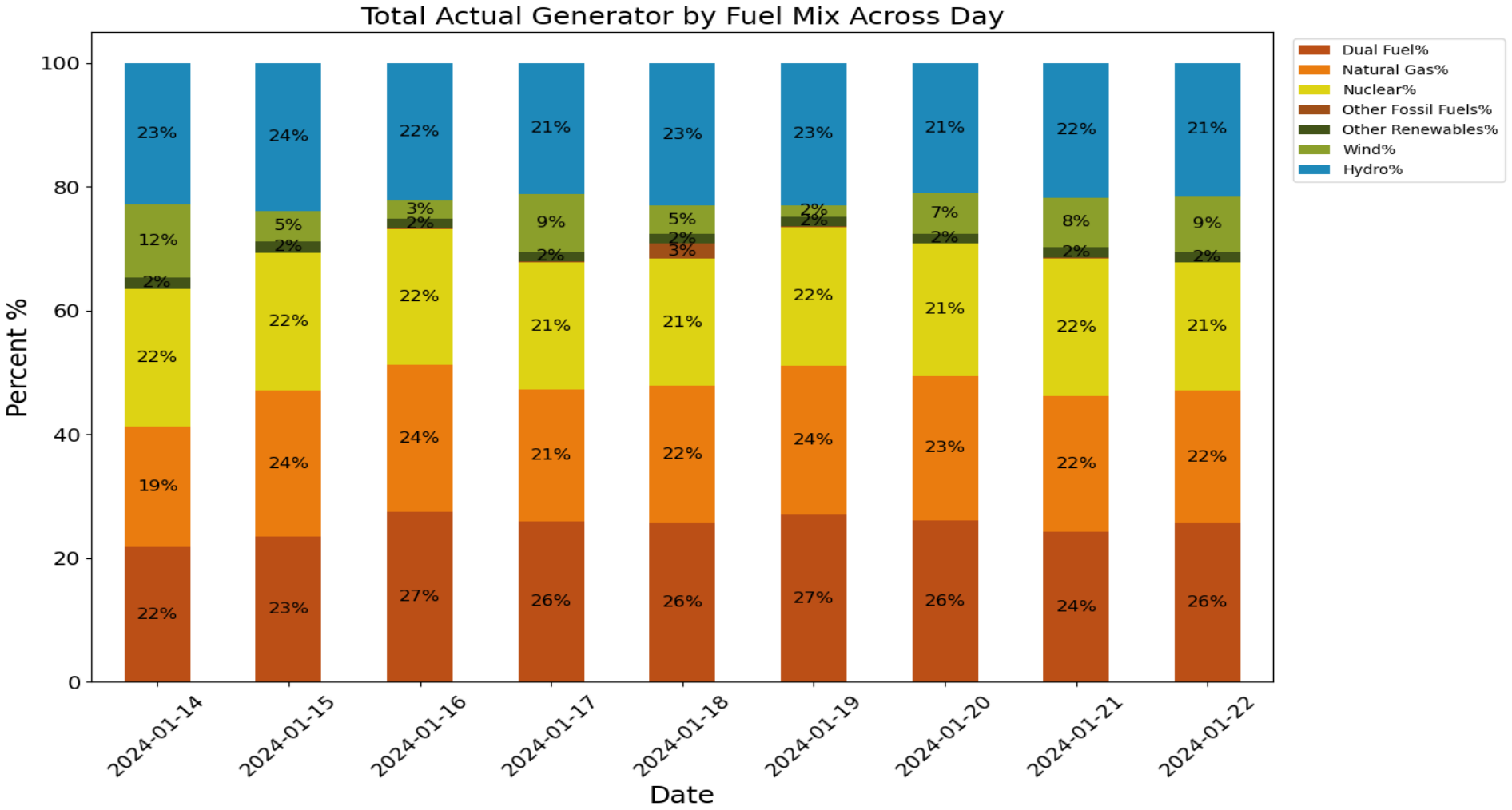
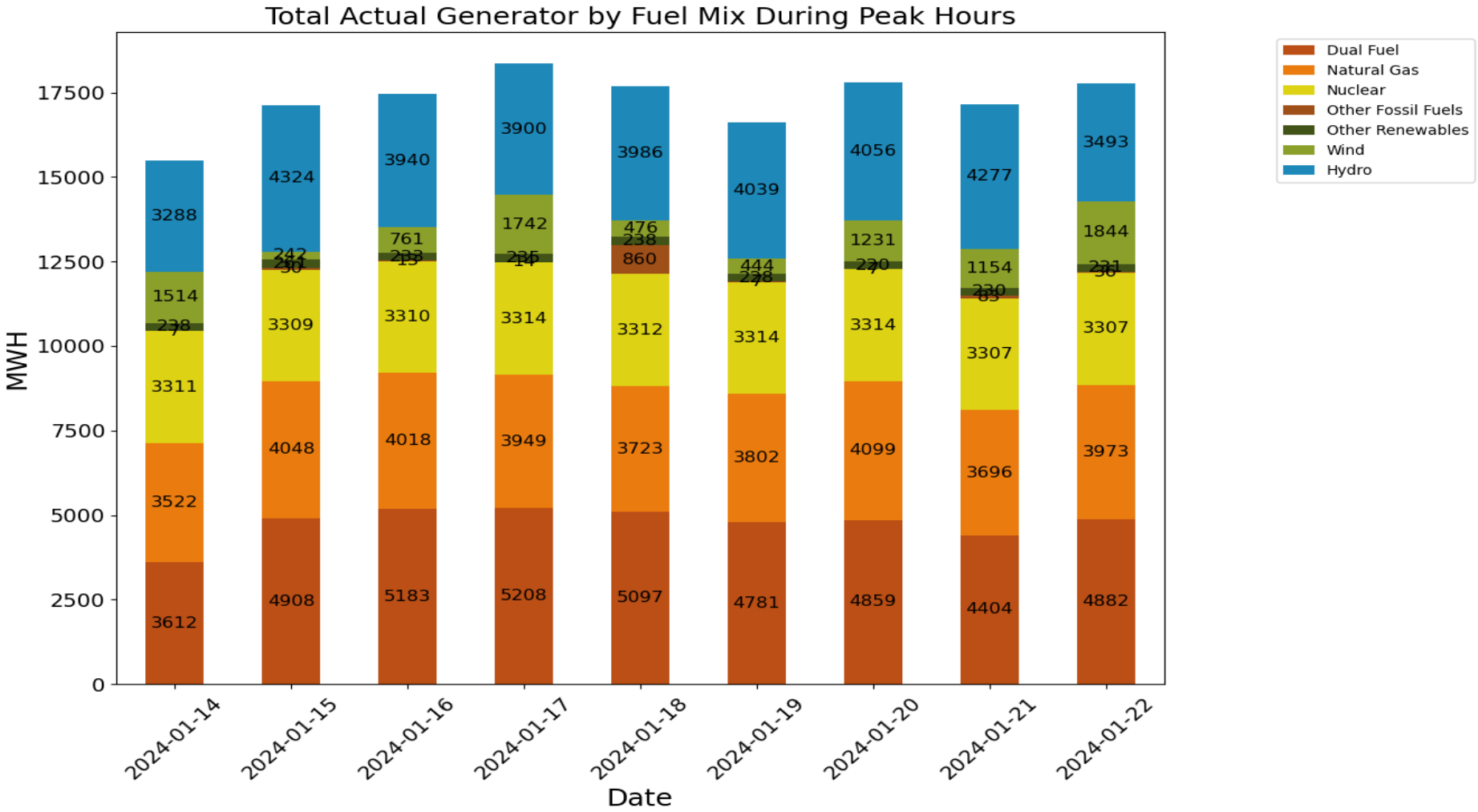
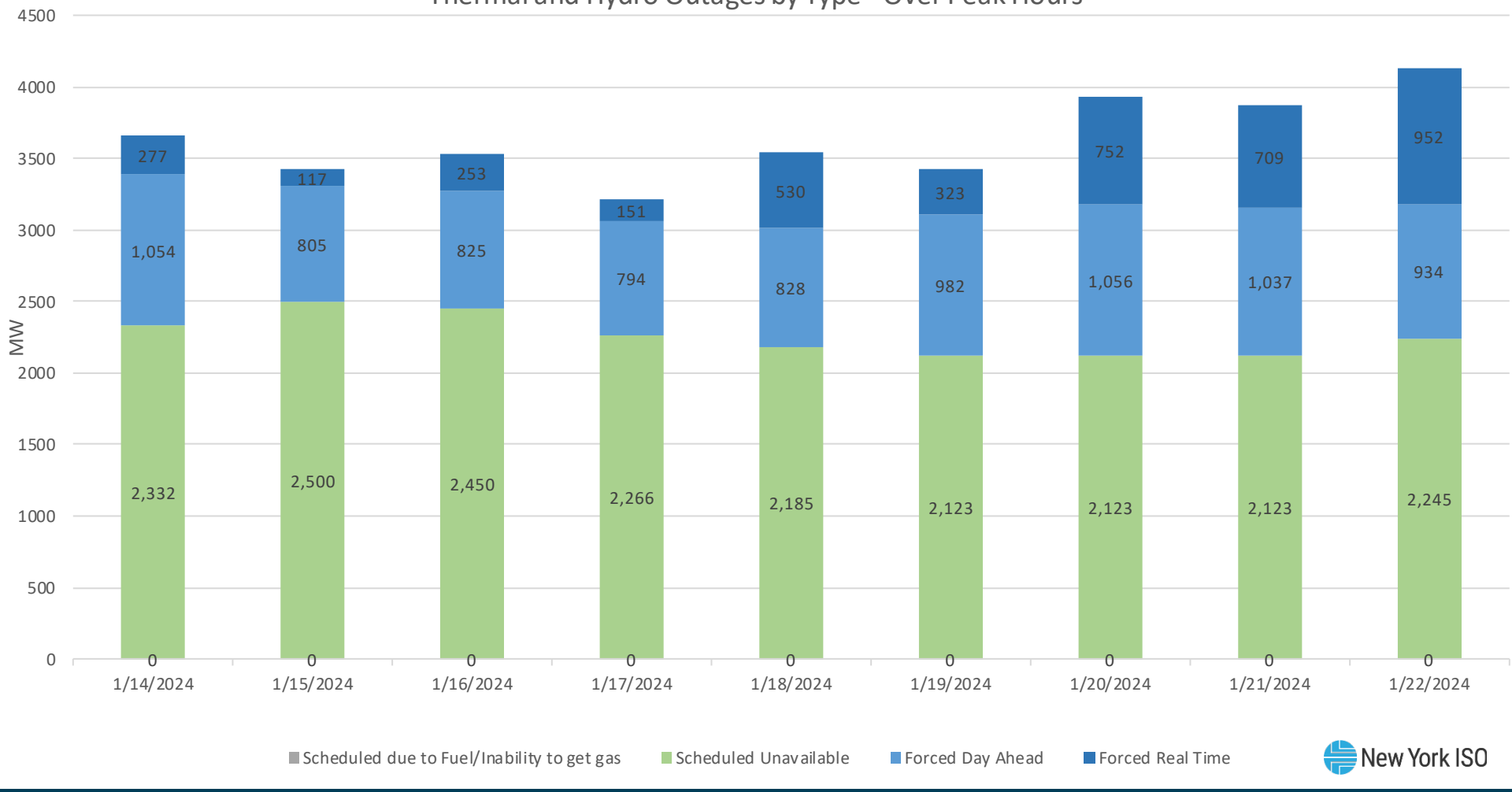
Generation Mix, Outage Data, and Fuel Inventory/Burn





Thermal and Hydro Outages by Type - Over Peak Hours



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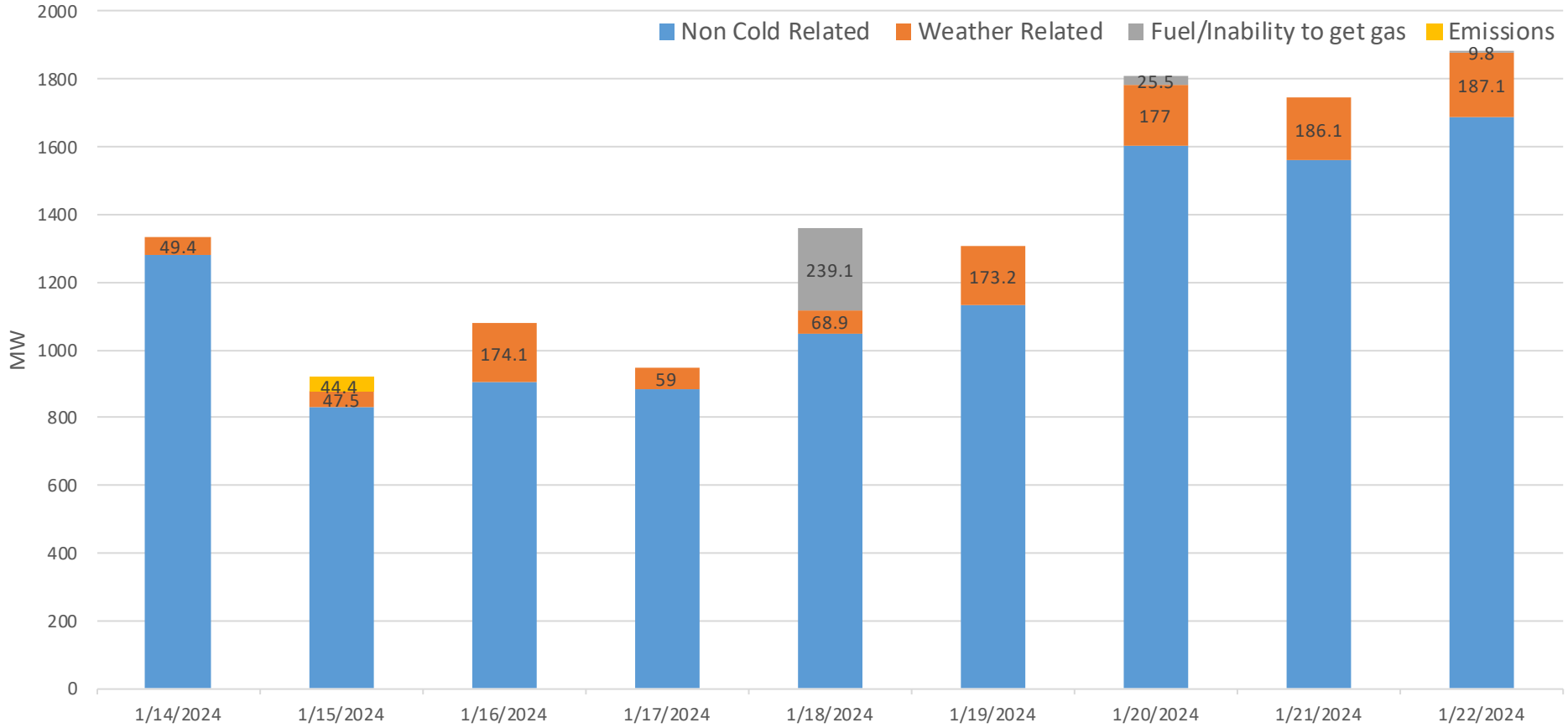
Thermal and Hydro Forced Outages and Forced Derates by Category



In the November 29, 2023 Management Committee presentation," 2023-24 Winter Assessment & Winter Preparedness" based on 60 months of history the projection was 2,750MW of Hydro and Thermal Forced outages

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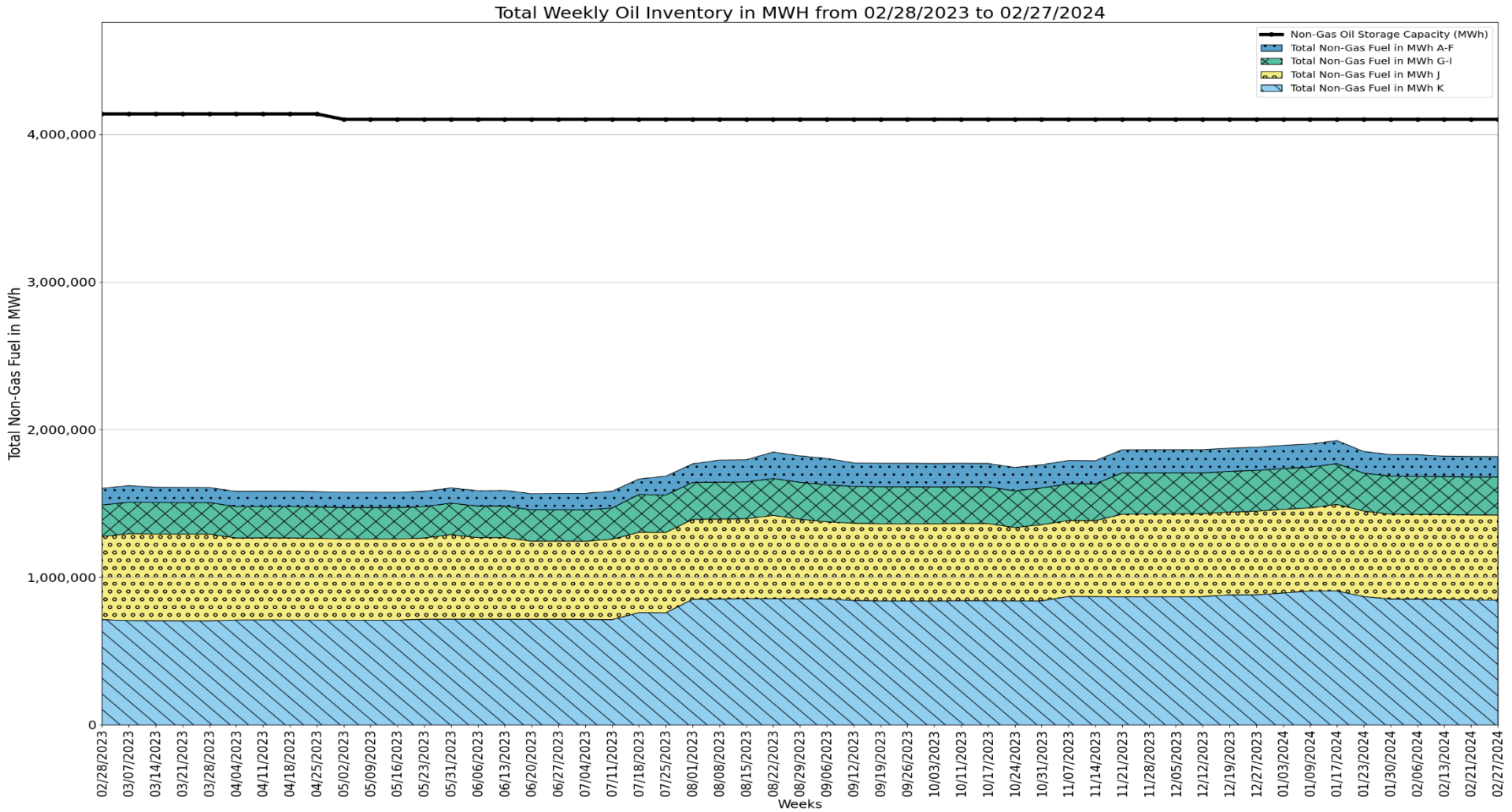

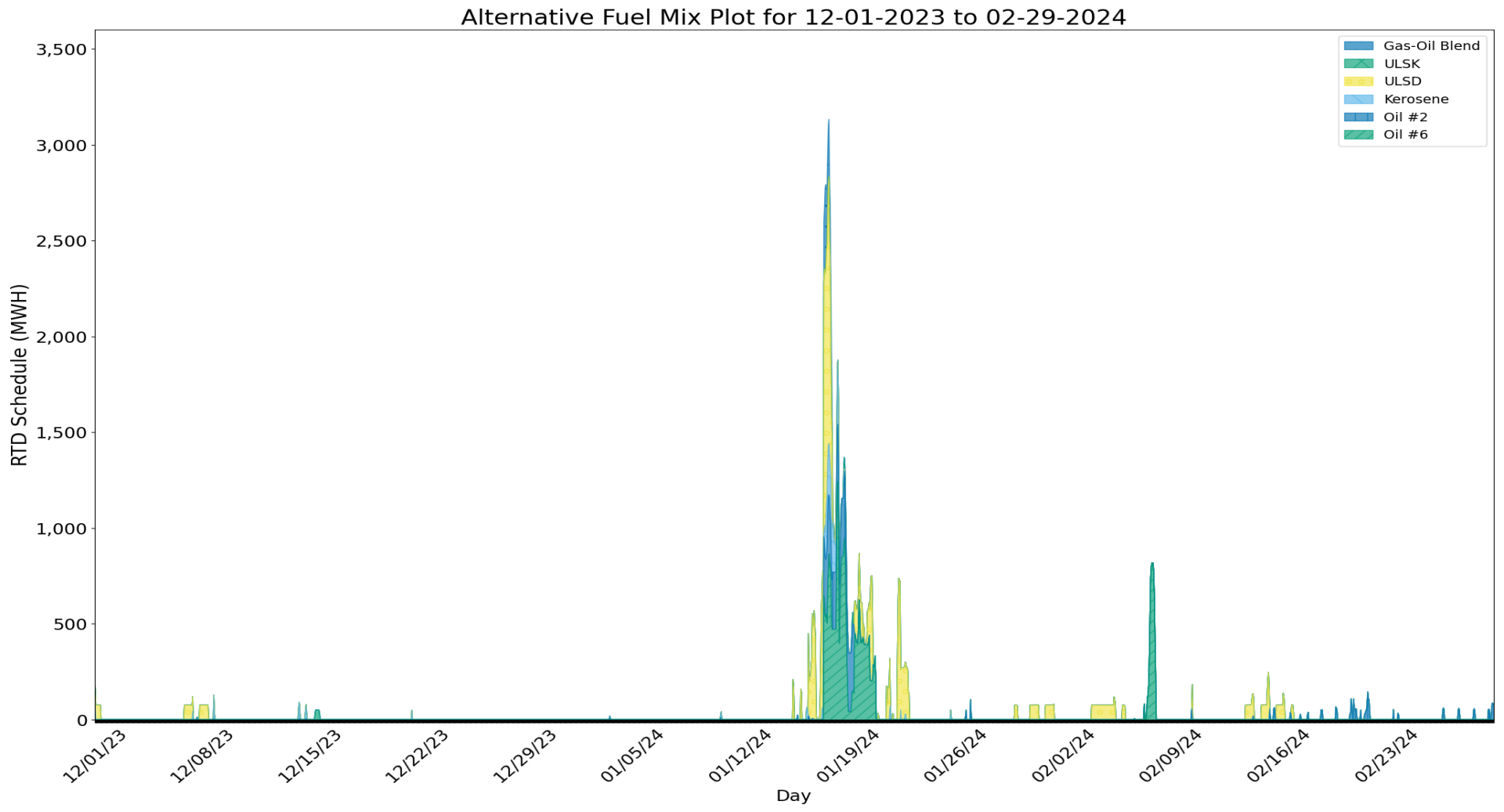

Major Takeaways

Operations

- The NYISO worked with the TOs to recall certain transmission line outages, and participated in NPCC coordination calls with neighboring external market systems
- NYISO weekly fuel surveys indicated sufficient alternate fuel inventory
- NYISO met operating criteria throughout the winter
- No need for NYISO to call Demand Response
- No need for emergency actions (voltage reduction, public appeals, etc.)

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Transmission Infrastructure Performance

- **Continuing Forced Outages**
  - Hudson-Farragut 345 kV B3402
  - Marion-Farragut 345 kV C3403
- **Other impactful outages throughout the season (not all occurring concurrently)**
  - Dunwoodie-Shore Rd 345kV Y50
  - Dunwoodie-Motthaven 345kV 71
  - Sprainbrook-W 49th St345kV M51
  - Adirondack- Lake-Porter 230kV 12
  - Moses-Willis 230kV MW2

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Gas System NY

- 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 5 am the prior day) to properly account for the impacts in Day Ahead Market solution
- NY experienced a high number of OFO conditions, including many days not identified as cold weather timeframes in this presentation

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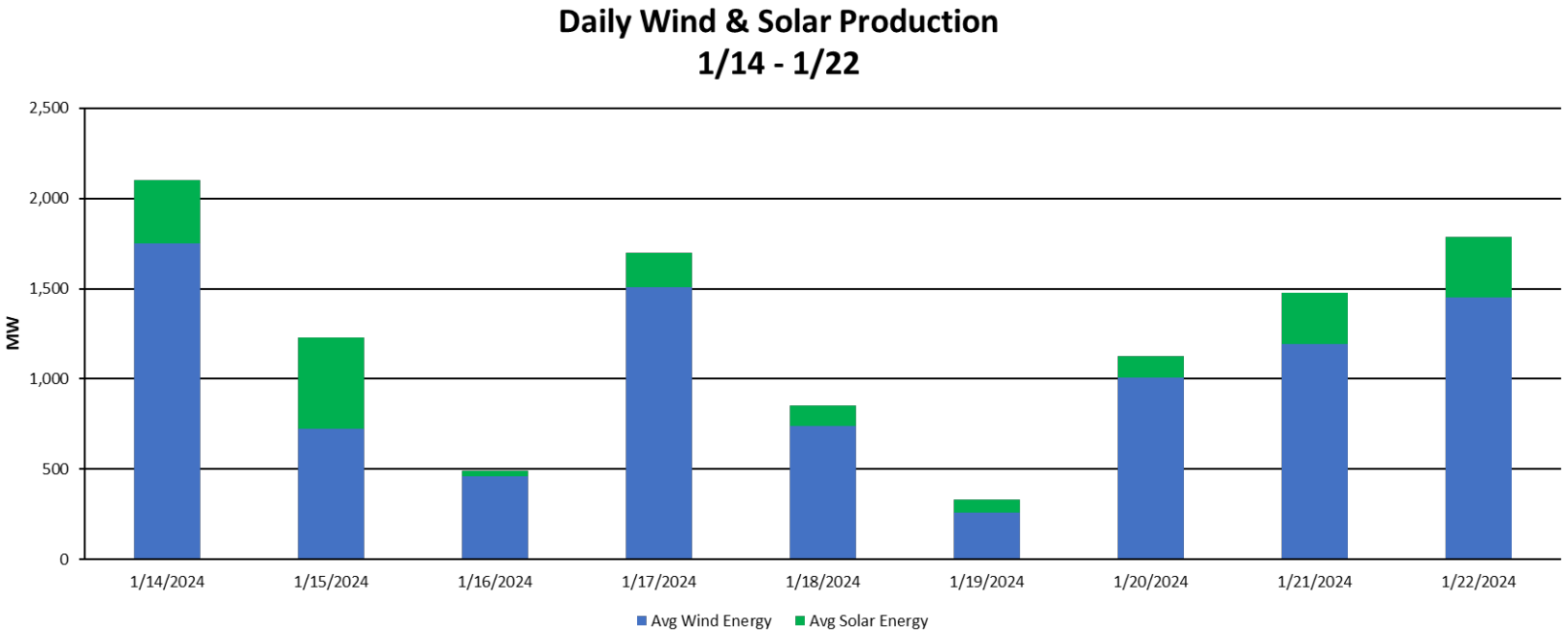
Intermittent Generation Data

1/14 – 1/22 Renewable Chart #1



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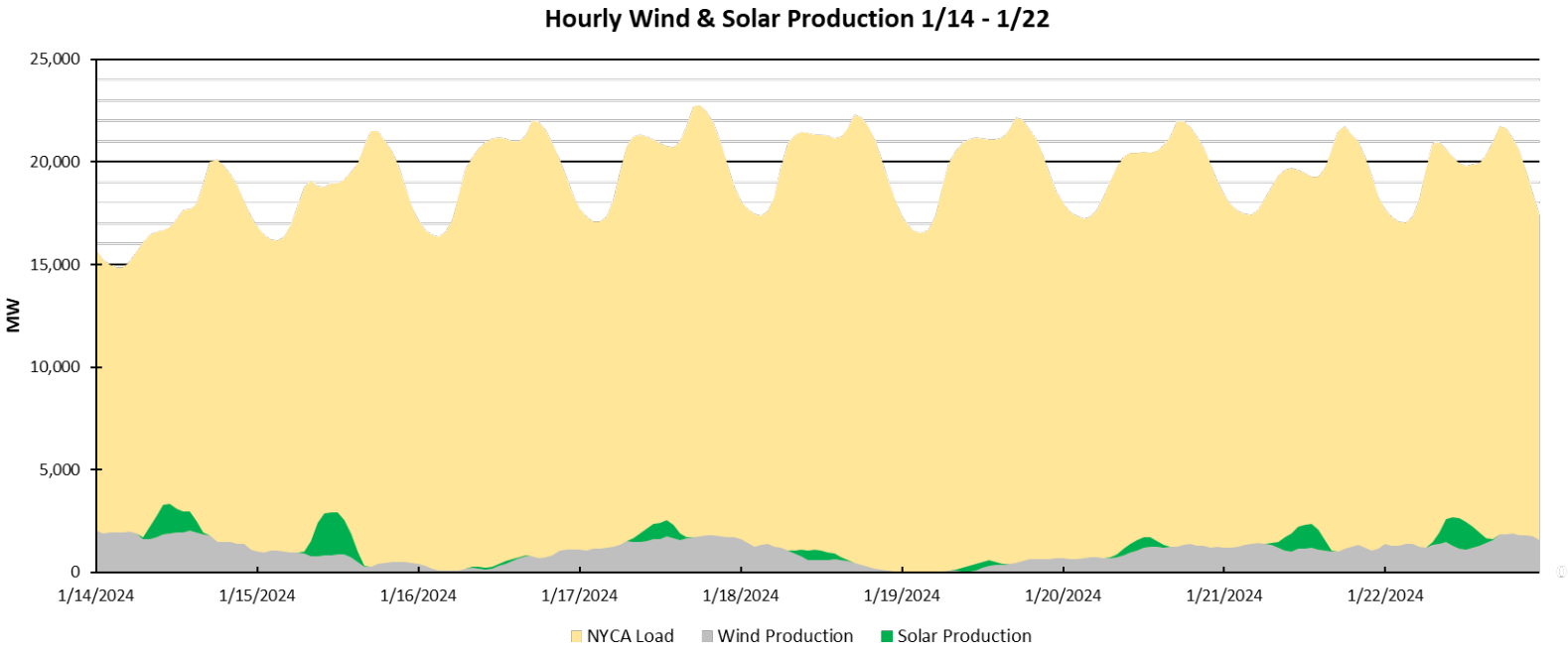
1/14 – 1/22 Renewable Chart #2b



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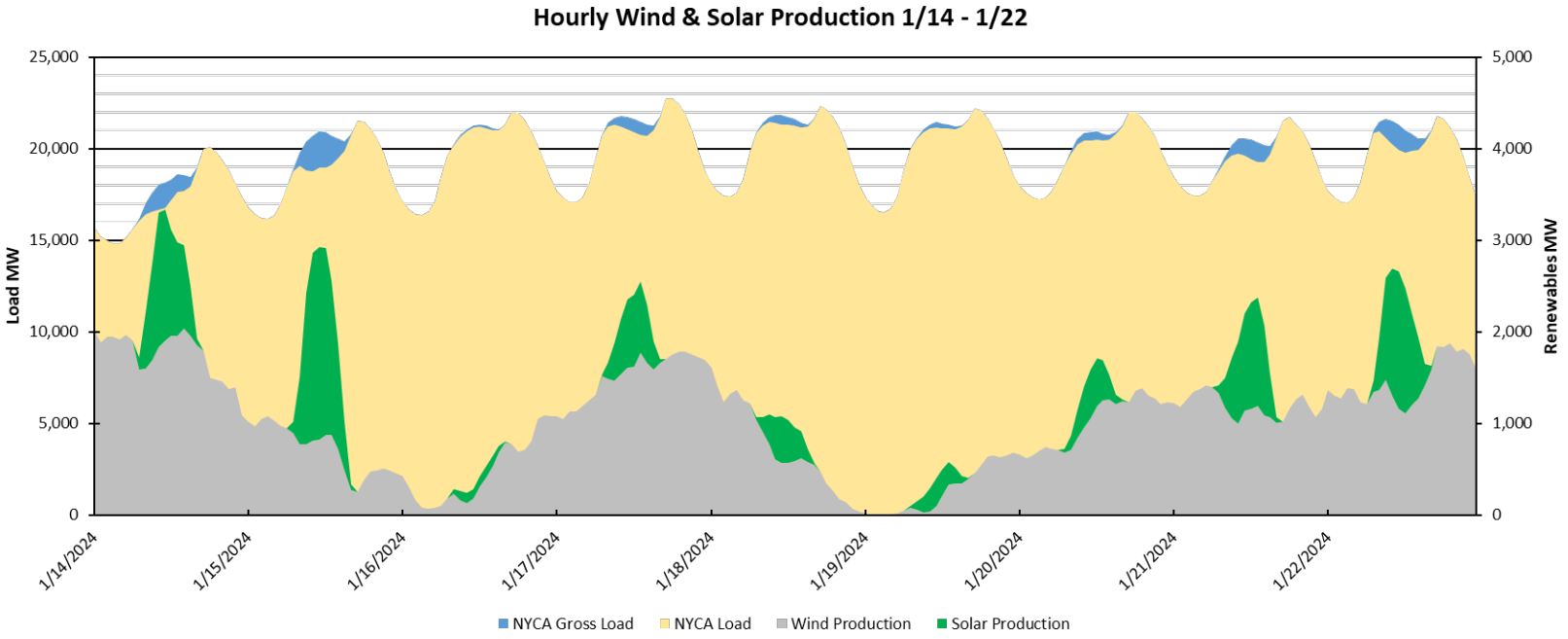
1/14 – 1/22 Renewable Chart #3a



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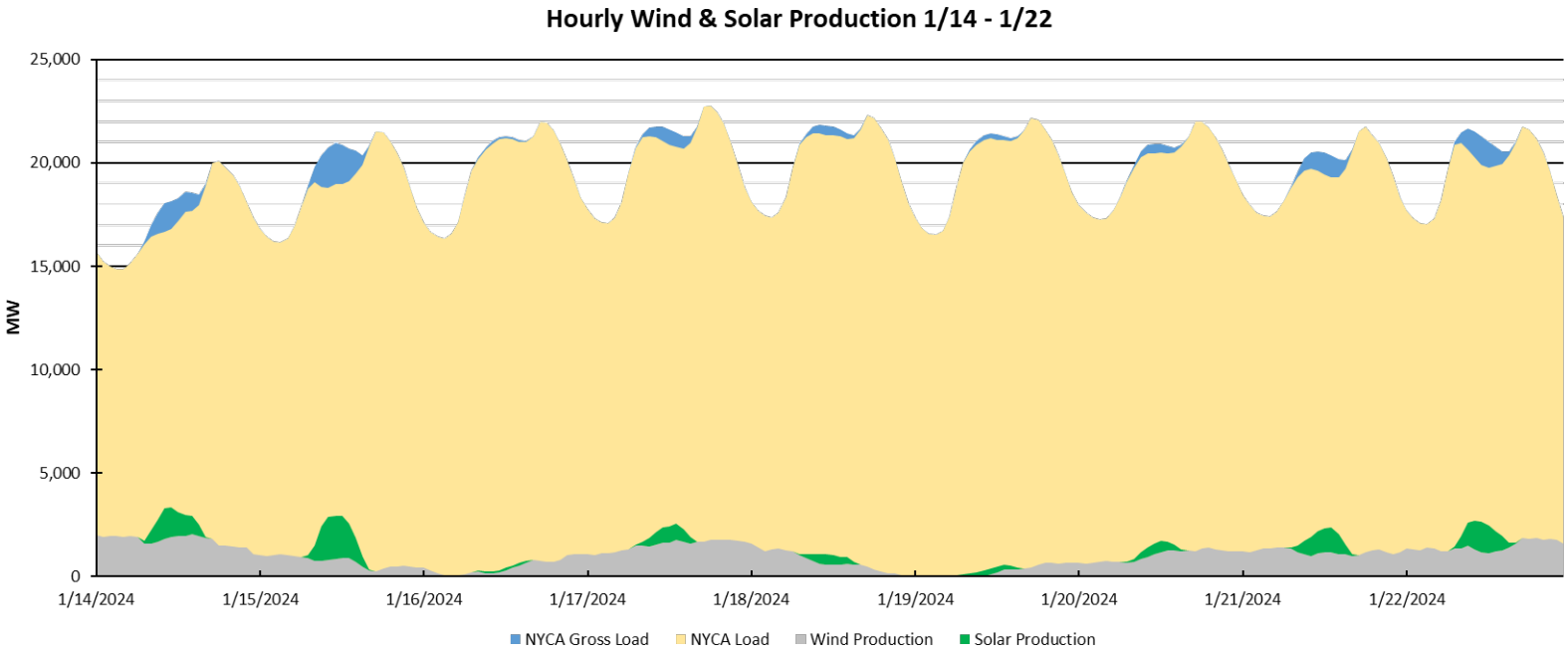
1/14 – 1/22 Renewable Chart #3b



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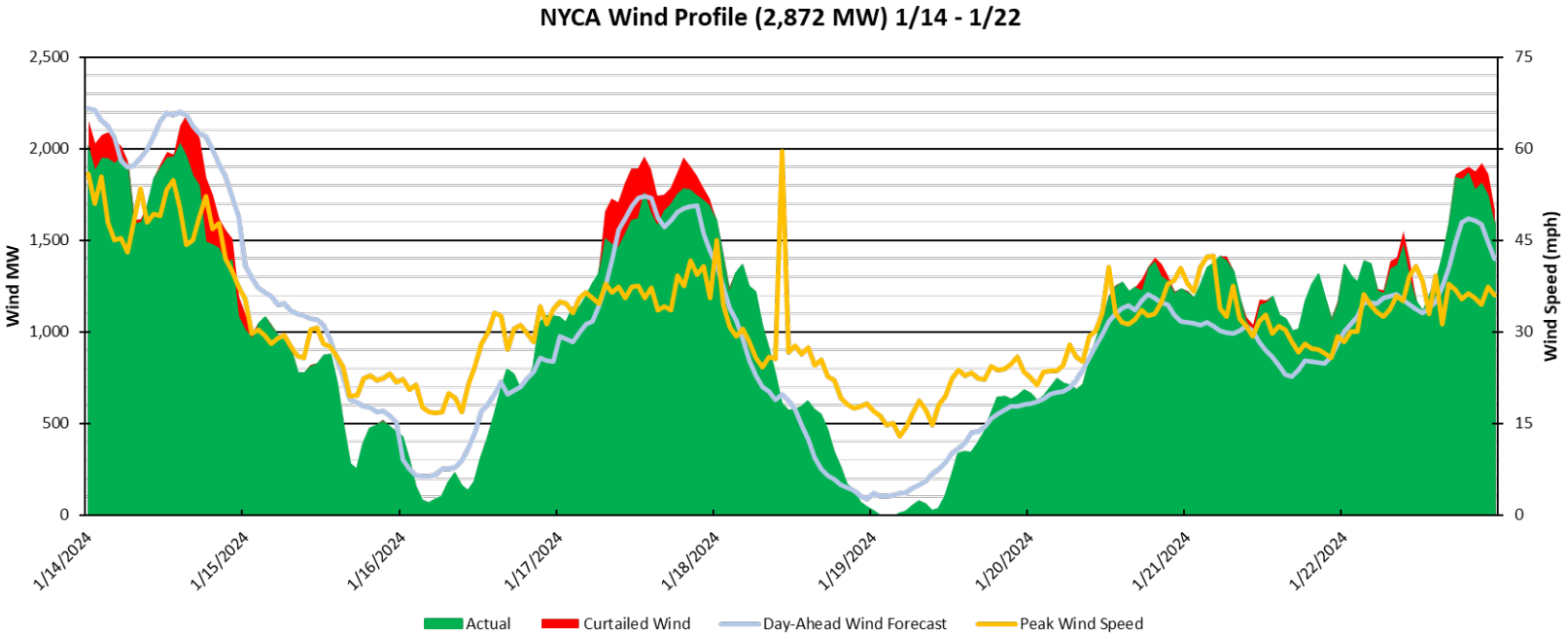
1/14 – 1/22 Wind Chart



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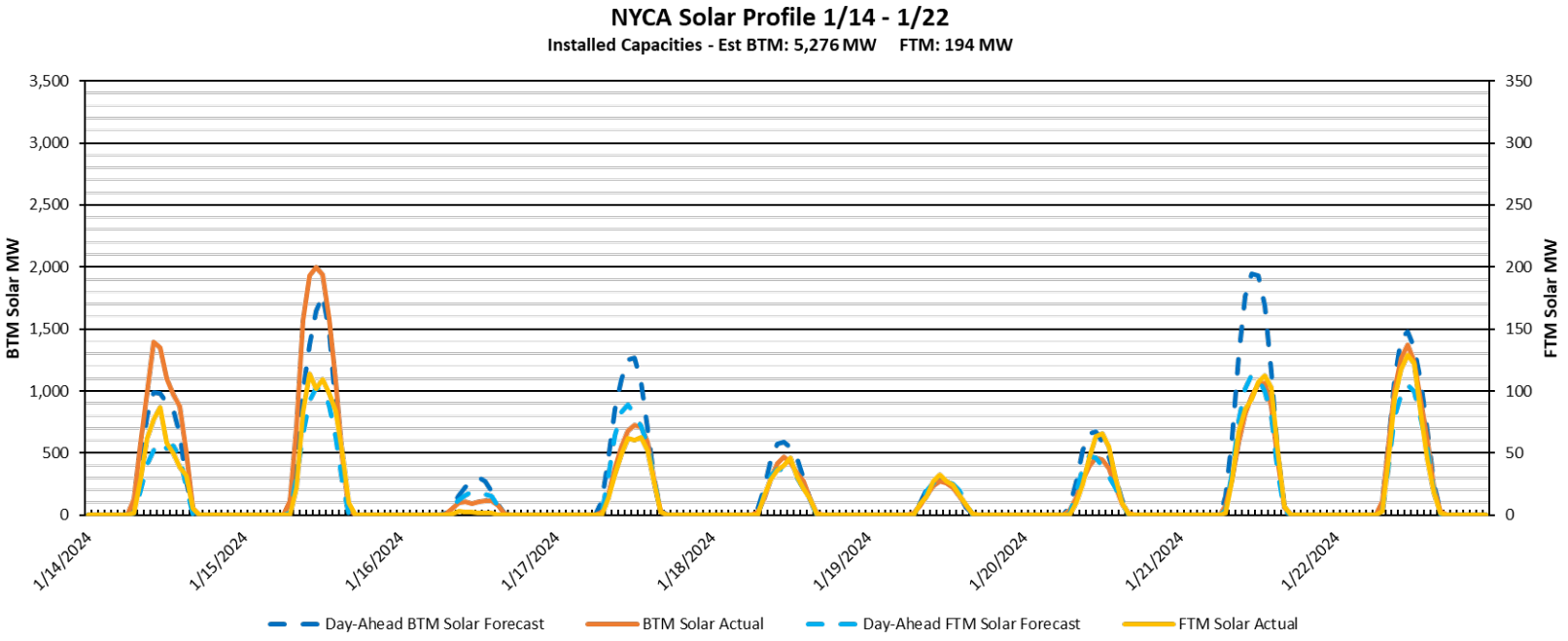
1/14 – 1/22 Solar Chart



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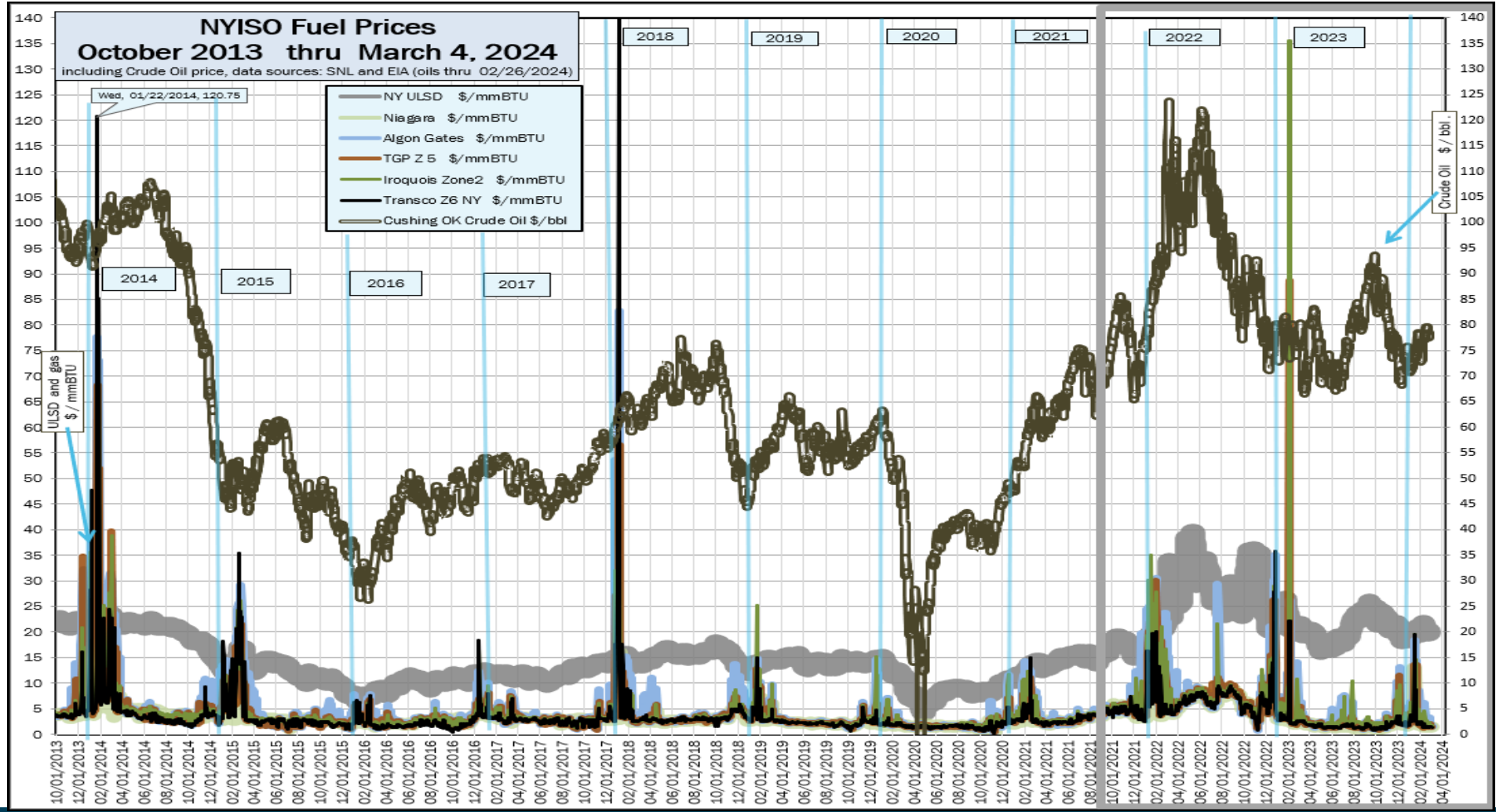
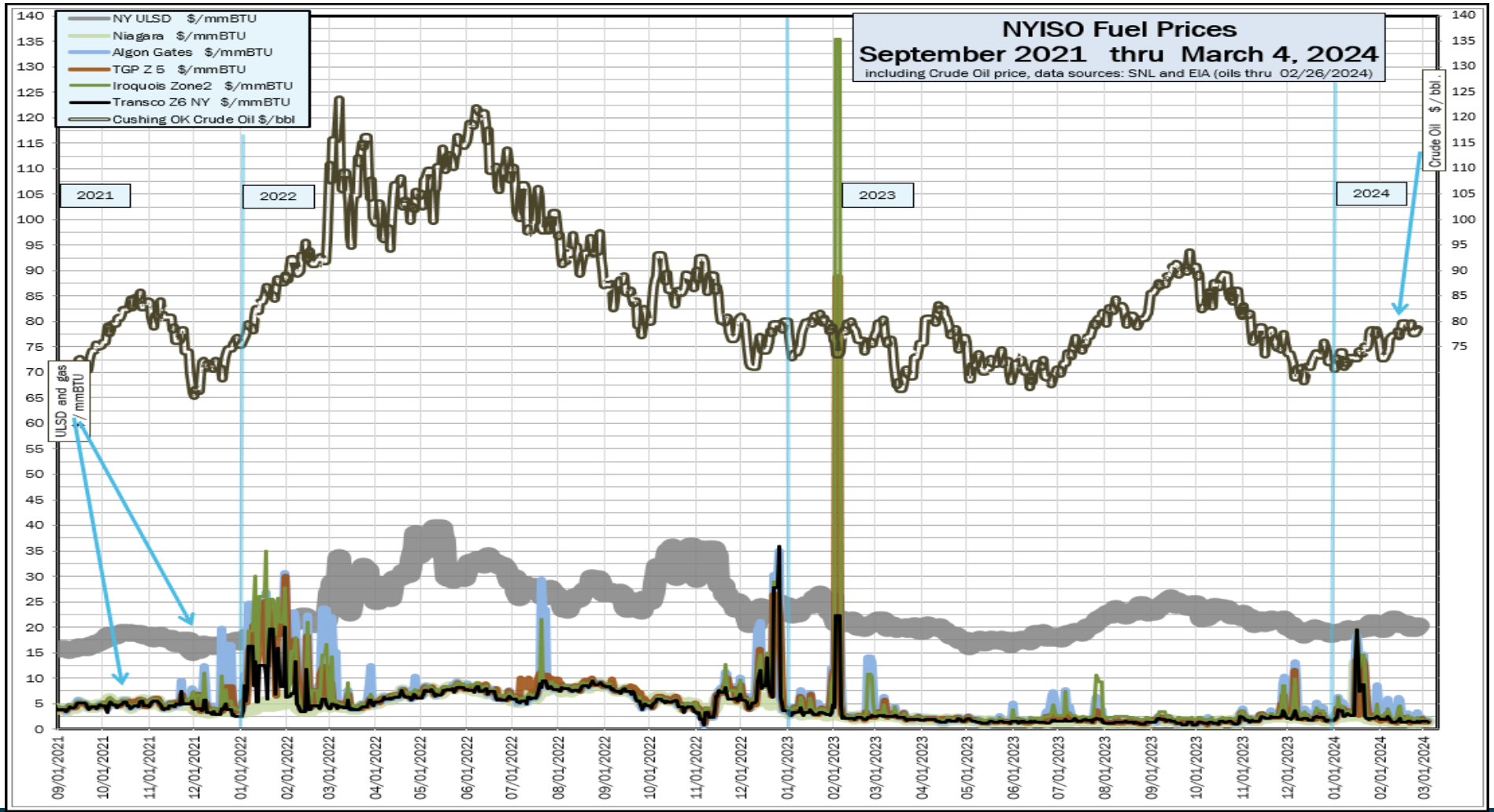
Fuel and Energy Prices





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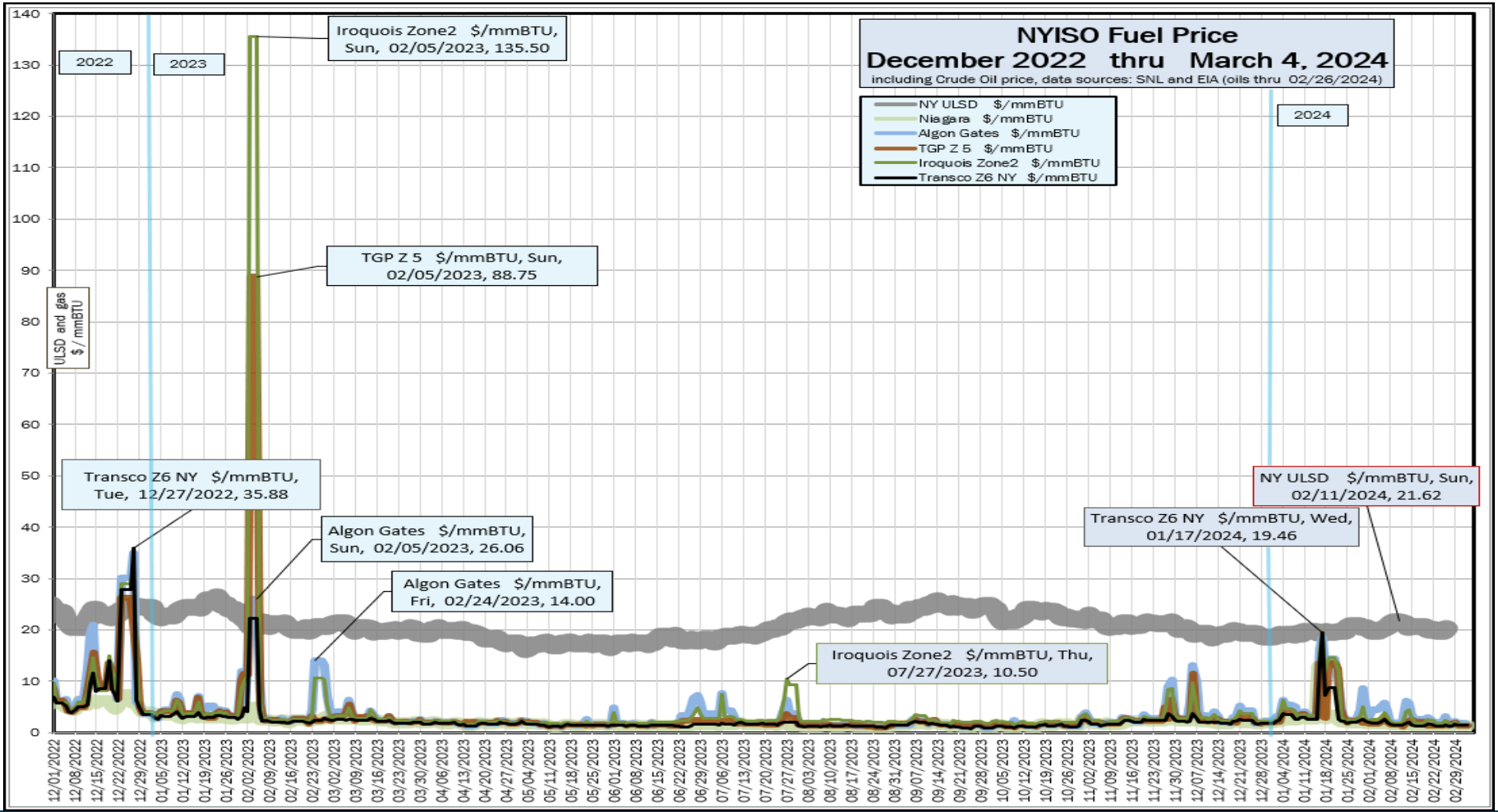

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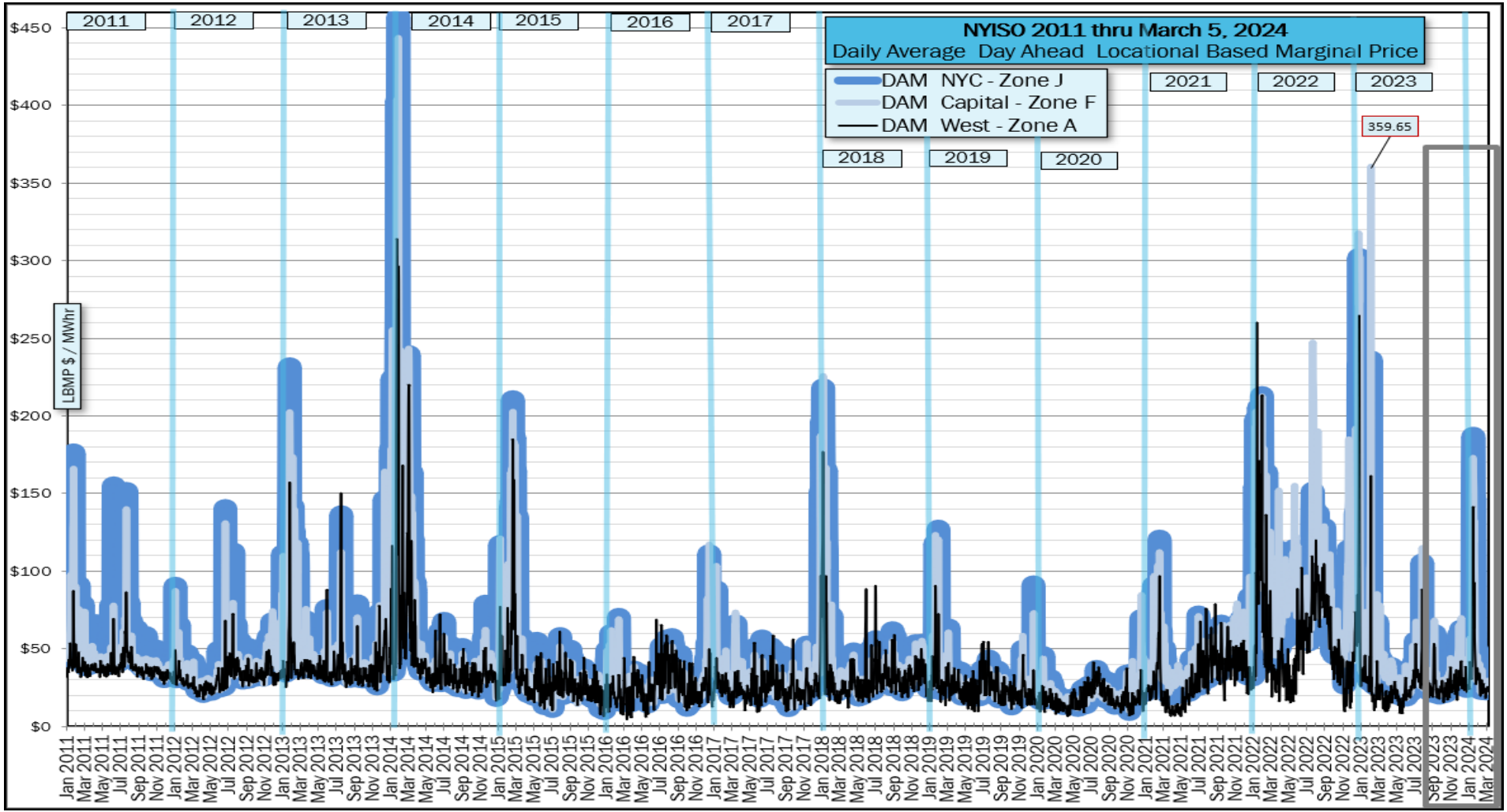

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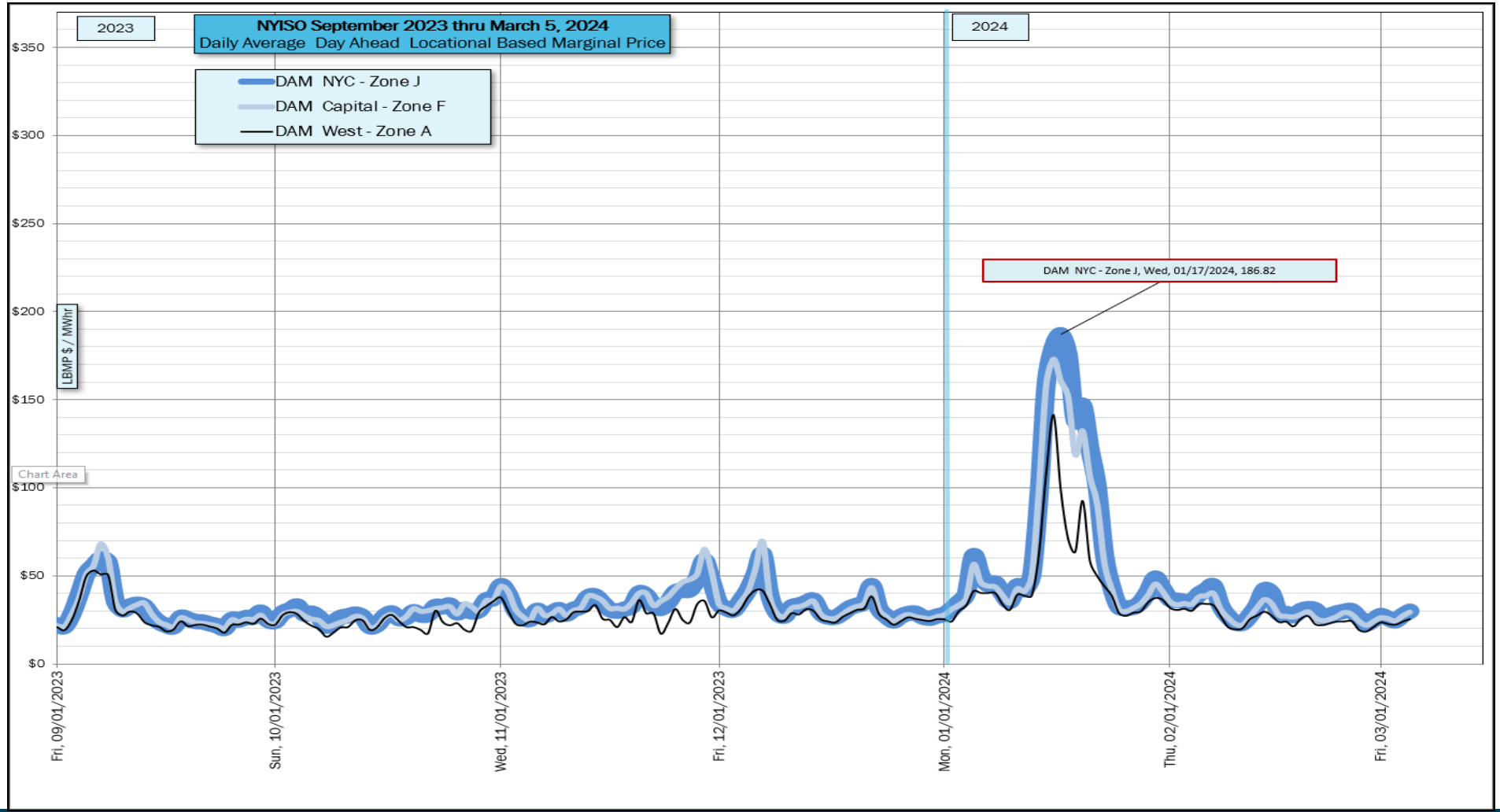

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Questions?