



# Winter 2024 - 25 Assessment & Winter Preparedness

---

Aaron Markham

Vice President, Operations

**NYSRC EC**

November 15, 2024. Albany, NY

# Agenda

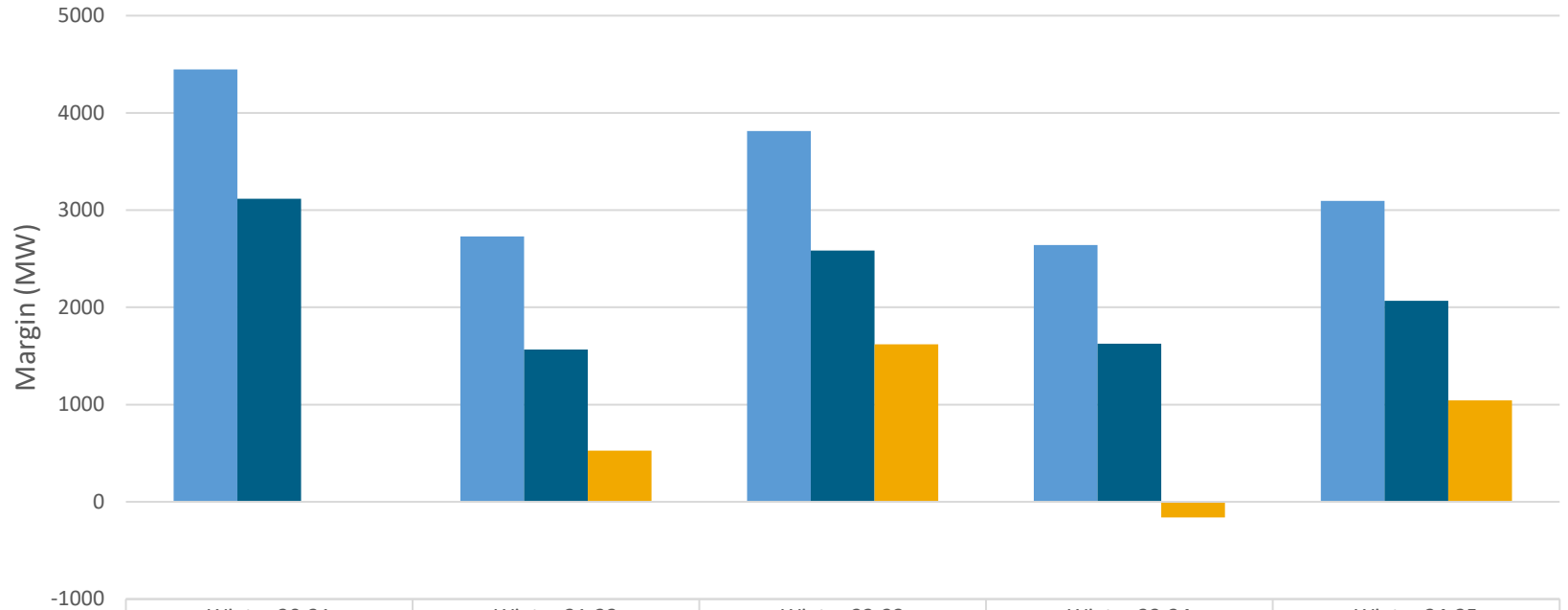
- **Key Observations**
- **Winter 2024-25 Capacity Assessment**
- **Winter 2024-25 Preparedness**
- **Infrastructure Updates**
- **Appendix A: Regional and Local Fuel Inventories & Fuel Prices**
- **Appendix B: Near Term Fuel and Energy Security Assessment**

# Key Observations – 2024-25 Winter Assessment

- **The NYISO expects sufficient winter capacity margins assuming all firm fuel generation available under normal and extreme weather conditions**
  - 3,094 MW - capacity margin for 50-50 peak forecast conditions
  - 2,069 MW - capacity margin for 90-10 peak forecast conditions
  - 1,045 MW - capacity margin for 99-1 peak forecast conditions
- **Future reductions in winter capacity margins, disruptions in fuel supplies or other winter operational concerns may result in operational challenges given the reliance on firm fuel generation during extreme cold weather events.**

\* Non-firm fuel generation capacity includes gas fired generation capacity without firm gas transportation contract arrangements. All other generation types are considered firm

## Winter Capacity Margins



	Winter 20-21	Winter 21-22	Winter 22-23	Winter 23-24	Winter 24-25
Baseline - Only Firm Fuel	4447	2730	3812	2641	3094
90/10 - Only Firm Fuel	3118	1566	2583	1625	2069
99/1 - Only Firm Fuel		525	1619	-161	1045

## 2024-25 Winter Capacity Assessment & Comparison

Line	Item	2023-24	2024-25		
		Baseline Forecast	Baseline Forecast	90th Percentile Forecast	99th Percentile Forecast
1a	Winter Generation Capacity <sup>1</sup>	39,668	40,562	40,562	40,562
1b	SCR - ICAP Values	802	802	802	802
1c	Net Purchases & Sales	1,589	759	759	759
<b>1</b>	<b>Total Capacity Resources</b>	<b>42,058</b>	<b>42,123</b>	<b>42,123</b>	<b>42,123</b>
<b>2</b>	<b>Assumed Unavailable Capacity (Gen + SCR)<sup>2</sup></b>	<b>-6,083</b>	<b>-6,090</b>	<b>-6,090</b>	<b>-6,090</b>
<b>3 = 1 + 2</b>	<b>Net Capacity Resources</b>	<b>35,975</b>	<b>36,032</b>	<b>36,032</b>	<b>36,032</b>
<b>4</b>	<b>Peak Load Forecast</b>	<b>24,220</b>	<b>23,800</b>	<b>24,825</b>	<b>25,849</b>
<b>5</b>	<b>Operating Reserve Requirement</b>	<b>2,620</b>	<b>2,620</b>	<b>2,620</b>	<b>2,620</b>
<b>6 = 4 + 5</b>	<b>Total Capacity Requirement</b>	<b>26,840</b>	<b>26,420</b>	<b>27,445</b>	<b>28,469</b>
<b>7 = 3 - 6</b>	<b>Capacity Margin</b>	<b>9,135</b>	<b>9,612</b>	<b>8,587</b>	<b>7,563</b>

1. Reflects the 2024 Gold Book existing capacity plus projected and actual additions and deactivations during 2024-25

2. Derates: 1861 MW for wind, 434 MW for Hydro, 2601 MW for thermal units, 900 MW for FTM solar, 11 MW for Energy Storage, and 221 MW for SCRs.

- 2023-24 actual peak load was 22754 MW on Wednesday, 17 January 2024 at HB18
- The all-time winter peak was 25738 MW, set on Tuesday, 07 January 2014

## Winter Capacity Assessment – Firm Fuel Scenarios

Line	Item	2024-25 Baseline Forecast	2024-25 90th Percentile Forecast	2024-25 99th Percentile Forecast
<b>1a</b>	<b>Available Generation Capacity Resources</b>	40,562	40,562	40,562
<b>1b</b>	<b>SCR - ICAP Values</b>	802	802	802
<b>1c</b>	<b>Net ICAP External Imports</b>	759	759	759
<b>1</b>	<b>NYCA Resource Capability</b>	<b>42,123</b>	<b>42,123</b>	<b>42,123</b>
<b>2</b>	<b>Total Projected Capacity Outages</b>	<b>-6,090</b>	<b>-6,090</b>	<b>-6,090</b>
<b>3 = 1 + 2</b>	<b>Net Installed Capacity Resources</b>	<b>36,032</b>	<b>36,032</b>	<b>36,032</b>
<b>4</b>	<b>Load Forecast</b>	23,800	24,825	25,849
<b>5</b>	<b>Operating Reserve Requirement</b>	2,620	2,620	2,620
<b>6 = 3 - 4 - 5</b>	<b>Capacity Margin</b>	<b>9,612</b>	<b>8,587</b>	<b>7,563</b>
<b>7a</b>	<b>Subtract All Gas Only Units and Duct Burner Capabilities<sup>1,2,3</sup></b>	<b>8,851</b>	<b>8,851</b>	<b>8,851</b>
<b>7 = 6 - 7a</b>	<b>Capacity Margin, Loss of Gas</b>	<b>761</b>	<b>-264</b>	<b>-1,288</b>
<b>8a</b>	<b>Add Back Units with Firm Gas Contracts</b>	<b>2,333</b>	<b>2,333</b>	<b>2,333</b>
<b>8 = 7 + 8a</b>	<b>Expected Capacity, Loss of Non-Firm Gas Case</b>	<b>3,094</b>	<b>2,069</b>	<b>1,045</b>

1. Loss of Gas values may change, values shown based upon partial results of 2024 Fuel Survey

2. Duct Burner derates account for approximately 400 MW

3. 692 MW of non firm gas capability is in Zones A-E where 5494 MW is in Zones F-K

The baseline, 90th percentile, and 99th percentile Winter NYCA Peak Day daily average temperatures are 14 °F, 6 °F, and -1 °F respectively. Based on partial results of the 2024-25 Fuel Survey, some firm generation could be unavailable at temperatures corresponding with high load forecasts.

- 90-10 daily average temperature: 1069 MW

- 90-10 daily minimum temperature: 3980 MW

- 99-1 daily average temperature: 3980 MW

- 99-1 daily minimum temperature: 8674 MW



## 2024 Emergency Operating Procedures

Procedure	Effect	2024 MW Value
Emergency Demand Response Programs	Load Impact	13
Voltage Reductions	Load Impact	611
Voluntary Industrial Curtailment	Load Impact	267
General Public Appeals	Load Impact	74
Emergency Purchases	Additional Resources	As Available
Thirty Minute Reserves to Zero	Allow Operating Reserve to Decrease to Largest Single Contingency	1,310
<b>Total Emergency Operating Procedures</b>		<b>2,275</b>

Note: The procedures listed above are not an exhaustive list of operator actions available to avoid load shed.

# Winter 2024-25 Operational Preparedness

- ISO Operations is monitoring regional fuel supplies. US Energy Information Administration (EIA) indicates oil inventories both regionally and throughout the United States are better than last year but still below historical averages.
- Seasonal and weekly fuel surveys indicate oil and dual fuel capability generation have sufficient start-of-winter oil inventories (but lower than past years' inventories). See Appendix B “Total weekly oil inventory in MWh”
- ISO Operations has surveyed most generating stations to discuss past winter operations, preparations for the upcoming winter, including last dual fuel operation, cold-weather preventative maintenance, fuel procurement arrangements, and fuel switching capabilities.
- ISO Operations' coordination of transmission and generation maintenance outages helps mitigate the reliability impact of such outages during extreme cold weather periods.



# Winter 2024-25 Operational Preparedness

- Participated in various communications and coordination efforts with NERC, state agencies (DPS, NYSERDA), other ISOs/RTOs, and the natural gas industry, including Interstate Natural Gas Association of America (INGAA), Natural Gas Supply Association (NGSA), Northeast Gas Association (NGA), NY pipelines, and NY LDCs
- NERC Project 2021-07 Extreme Cold Weather Grid Operations, Preparedness, and Coordination is a 2 phase project looking to address the key recommendations from the *Federal Energy Regulatory Commission (FERC), NERC, and Regional Entity Joint Staff Inquiry into the February 2021 Cold Weather Grid Operations* resulting in changes to the EOP-011, EOP-012, and TOP-002 Standards that went into effect October, 1, 2024.

# Winter Storm Uri/Elliott Response

- The NYISO continues to monitor and evaluate important events and ongoing industry actions in response to potential winter reliability concerns such as the *FERC, NERC, and Regional Entity joint inquiry into the December 2022 Winter Storm Elliott Grid Operations*.

The following factors enhanced reliability in NY during the event:

- diverse fuel/energy resource mix in NY including dual fuel capability
  - low temperature conditions were aligned with NYISO's forecast design criteria for the winter capability period and reasonable load forecast performance along with responsible efforts of generators and transmission owners
  - Interconnections with neighboring control areas allowed for the import/export of energy
- NYISO led a review of load shedding processes/procedures and coordination of the gas-electric critical infrastructure survey with the New York Transmission Owner Planning Working Group (TOPWG)
  - Defined and implemented Tariff modifications to support Critical Electric System Infrastructure Load (CESIL) being excluded from NYISO Demand Response Programs

# Gas-Electric Coordination

- **A communications protocol is in place with NY state agencies to improve the speed and efficiency of generator requests to state agencies for emissions waivers if needed for reliability**
  - Protocol was leveraged in January 2018 and proved effective in facilitating communications between parties
- **An emergency communications protocol is in place to communicate electric reliability concerns to pipelines and gas LDCs during tight electric operating conditions**
  - Cooperative process with interstate pipelines and LDCs for providing OFO information to the NYISO
- **FERC Order No. 787**
  - The NYISO modified its Code of Conduct (ISO OATT Att F) per the Order to accommodate pipeline requests for reliability information
- **Participated in NAESB Joint WEQ, WGQ, RMQ Business Practices Subcommittee meetings to effectuate improved communication and coordination protocols, particularly those that occur during critical periods of operation.**

# Situational Awareness

- **Formation of the Energy Security team in the Grid Transition department**
- **Control Room gas-electric support**
- **Video boards**
  - Northeast interstate pipeline system is displayed
  - Operational Flow Orders are displayed with readily detectable visualization techniques
  - Continuously enhancing weather displays to analyze potential impacts on NY generation and loads
- **A web-based, fuel survey “portal” provides generator fuel information to the operators**
  - Updated weekly by generators
  - Updated daily during cold weather conditions, upon request by the NYISO
- **Efforts such as Energy Assessments help identify and quantify risk further in advance of real time.**

# Other Winter Operational Challenges

- **Intra-day Gas Procurement-** Gas-only fired generating resources are likely to be unavailable for operation if not scheduled in the ISO's day-ahead energy market due to the difficulty in procuring intra-day gas
- **Alternate Fuel Replenishment-** Generator burn rates of alternative fuels can exceed replacement rates during extreme cold weather conditions
- **Emissions Limitations-** Use of alternate distillate fuels by oil or dual fuel capable generation may be further restricted by emission limits
- **Retail Gas LDC Priority -** Gas Local Distribution Company (LDC) retail gas demand has priority over electric power generation

# Generation Additions

Station Name	Nameplate MW
Pattersonville Solar	20
Rock District Solar	20
Mohawk Solar	91
Morris Ridge Solar EC	177
SunEast Scipio Solar	18
North Side Solar	180
Watkins Glen Solar	50
Trelinia Solar EC	80
KCE NY 6	20
Ball Hill Wind	107
BlueStone Wind	112
Stillwater Solar	20
Albany County Solar 1	20
Albany County Solar 2	20
<b>Total Additions</b>	<b>935</b>

\*Includes new capacity since Winter 2023-24 and nameplate capacity of resources expected in before December 15, 2024.

# Generation Deactivations

Station Name	Nameplate MW
Freeport 1-4	-6
Northport GT	-16
Port Jefferson GT 01	-16
Coxsackie GT	-22
<b>Total Deactivations</b>	<b>-60</b>

\*Generation deactivations include capacity changes since Winter 2023-24

# Transmission Operations

Equipment	Voltage (kV)	Status
Hudson-Farragut B3402	345	Out-of-Service
Marion-Farragut C3403	345	Out-of-Service
Marcy STATCOM	345	Out-of-Service
Marcy South Series Capacitors	345	Out-of-Service
Moses-Willis MW1	230	Out-of-Service w/ Recall
Willis-Patnode WPN-1	230	Out-of-Service w/ Recall
Adirondack-Porter 12	230	Out-of-Service w/ Recall

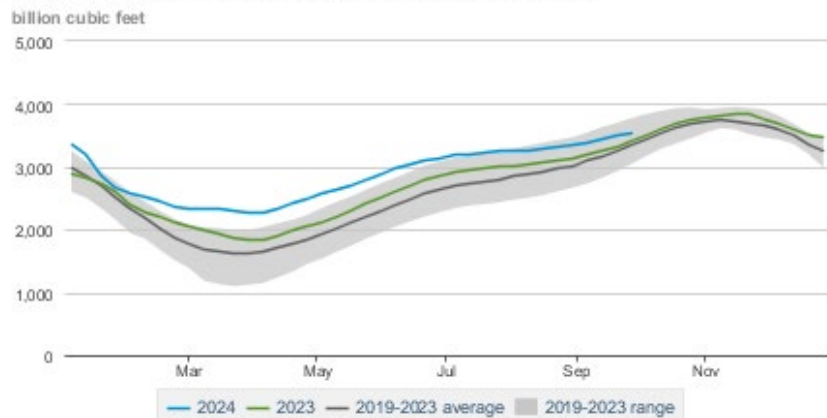


# Appendix A

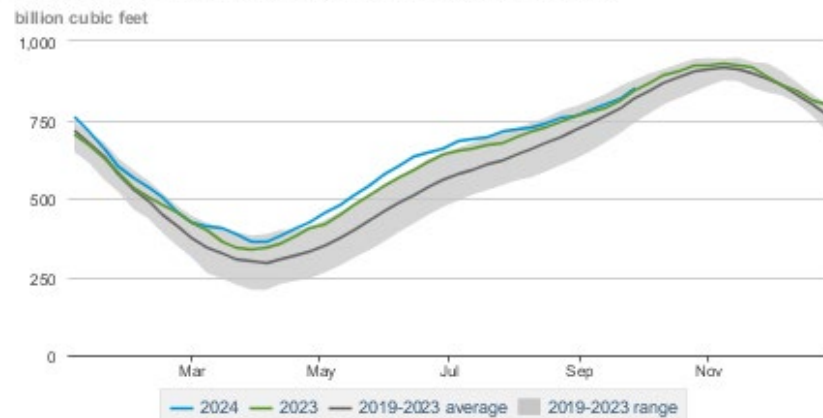
## Regional and Local Fuel Inventories & Fuel Prices

# Natural gas underground storage levels

## Lower 48 weekly working gas in underground storage



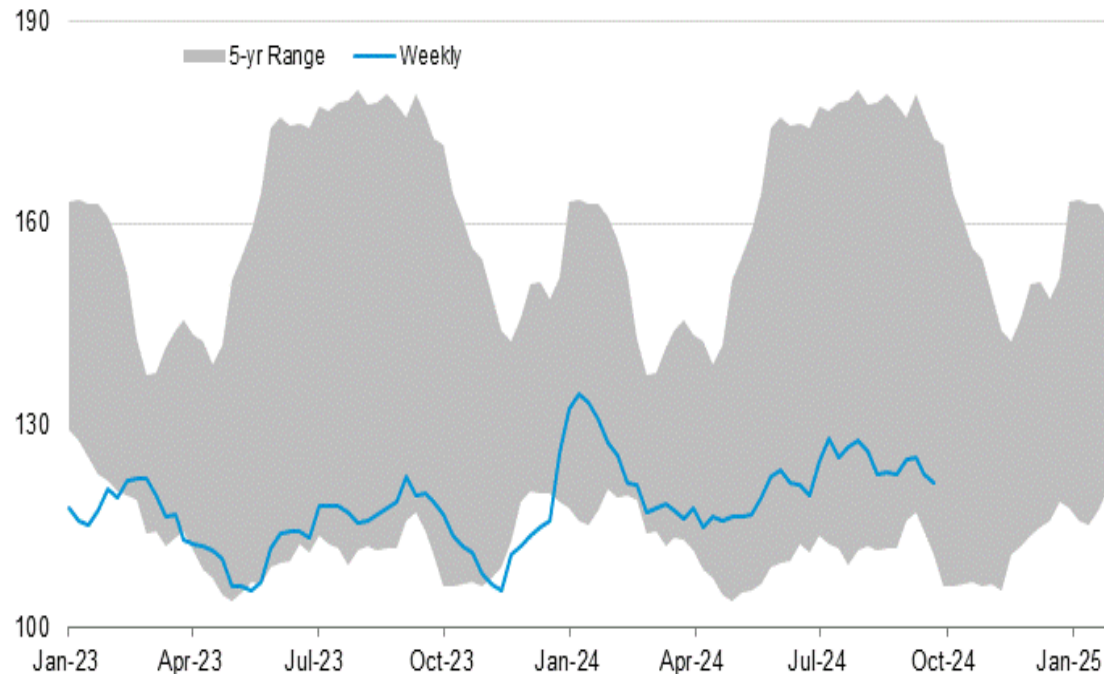
## East region weekly working gas in underground storage



# Distillate Inventories

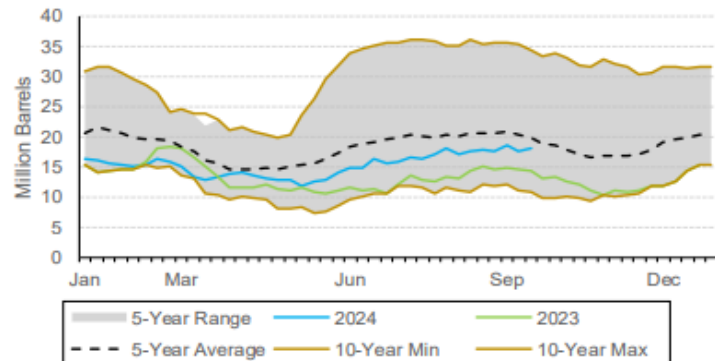


U.S. distillate stocks  
million barrels

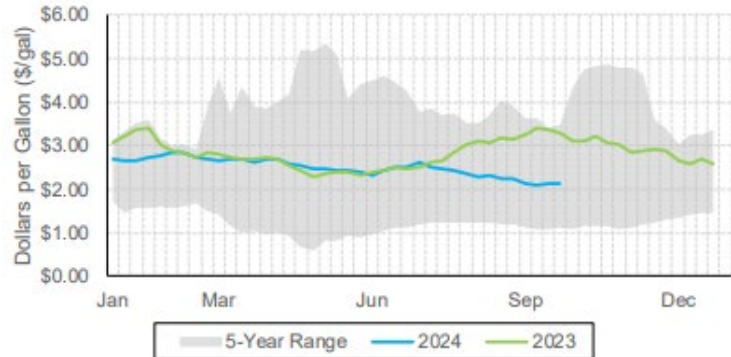


Data source: U.S. Energy Information Administration

PADD 1B: Distillate (0 - 15 ppm S) Weekly Stocks



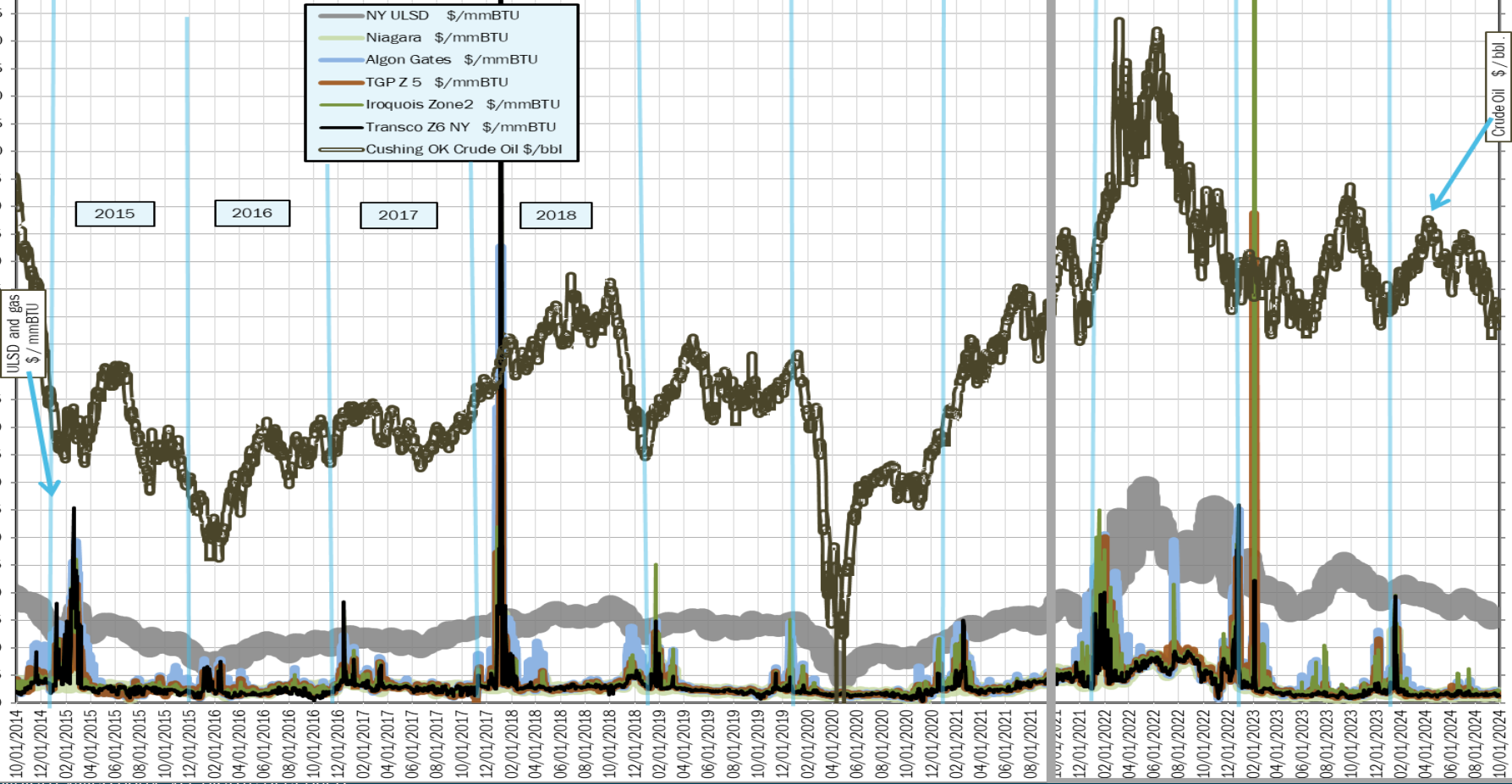
Ultra-low Sulfur Diesel New York Harbor  
Average Weekly Spot Prices

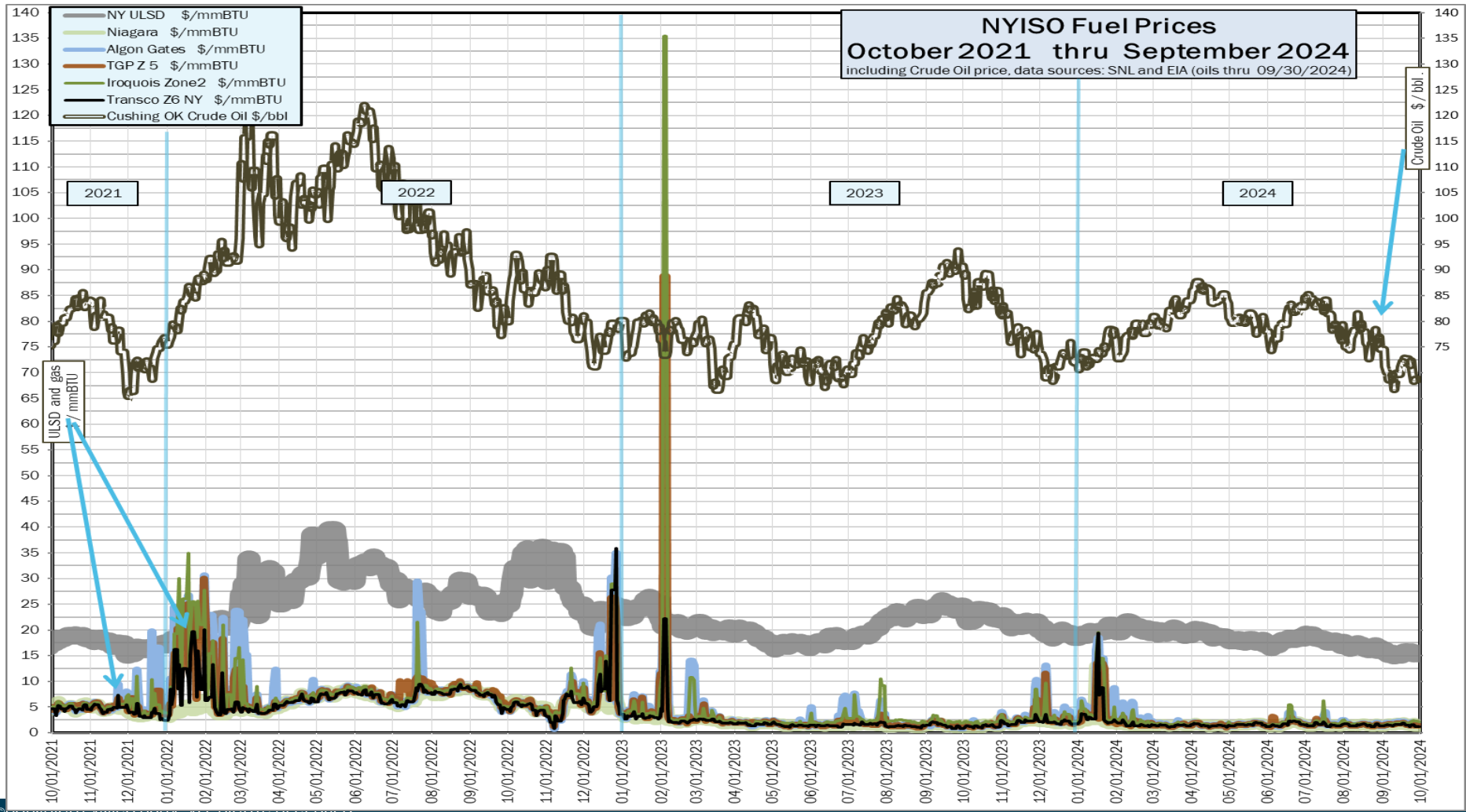


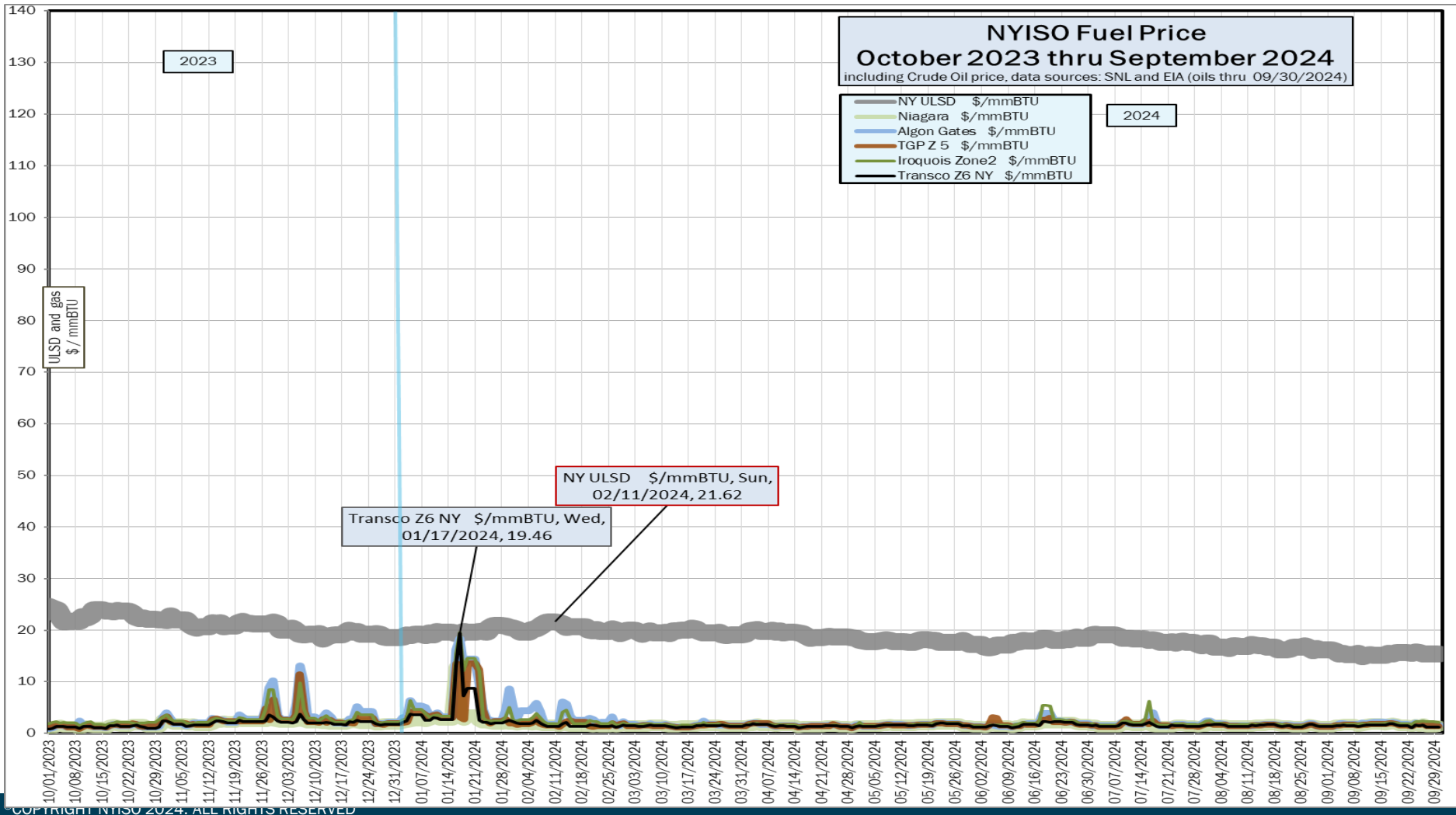
# NYISO Fuel Prices October 2014 thru September 2024

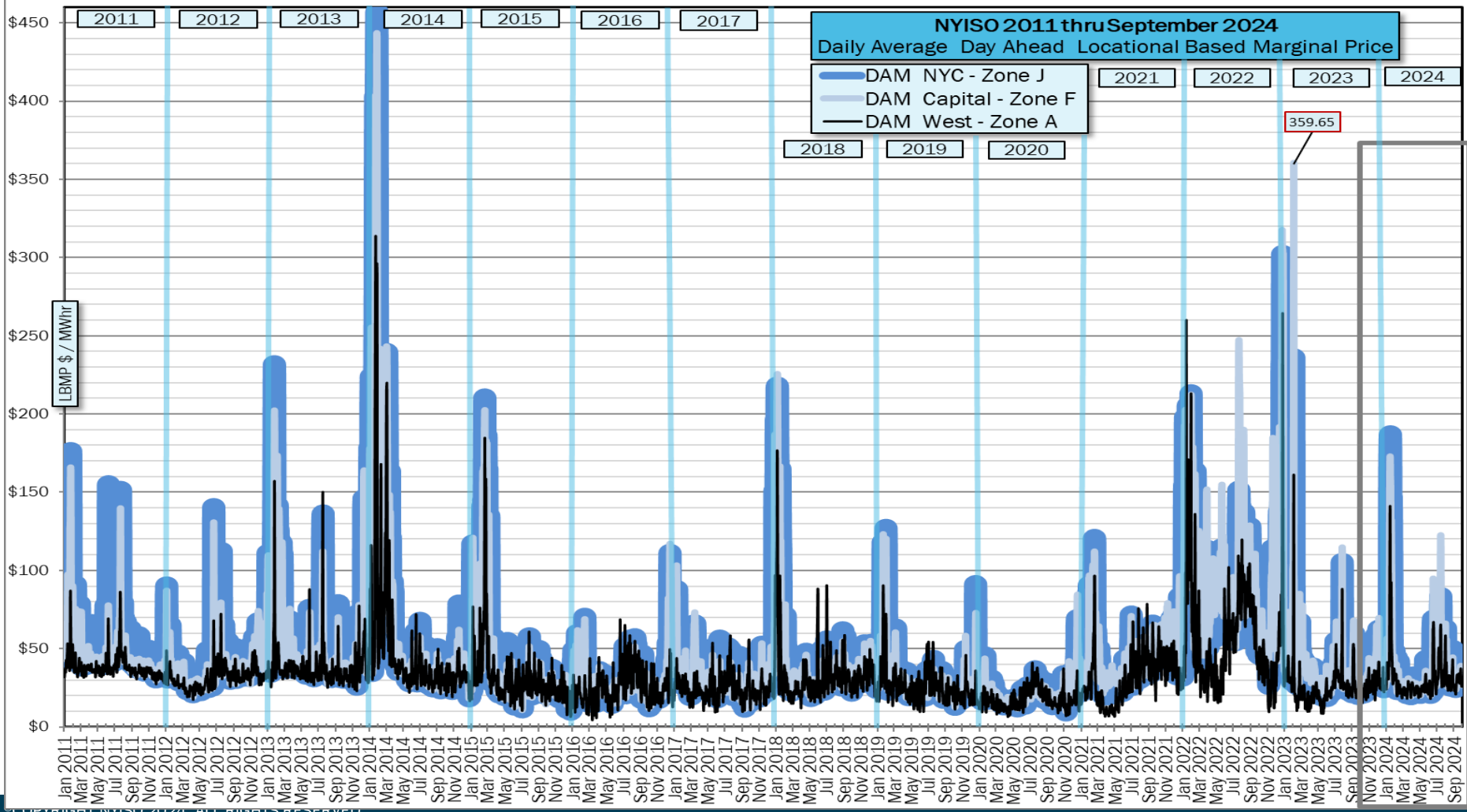
Including Crude Oil price, data sources: SNL and EIA (oils thru 09/30/2024)

- NY ULSD \$/mmBTU
- Niagara \$/mmBTU
- Algon Gates \$/mmBTU
- TGP Z 5 \$/mmBTU
- Iroquois Zone2 \$/mmBTU
- Transco Z6 NY \$/mmBTU
- Cushing OK Crude Oil \$/bbl







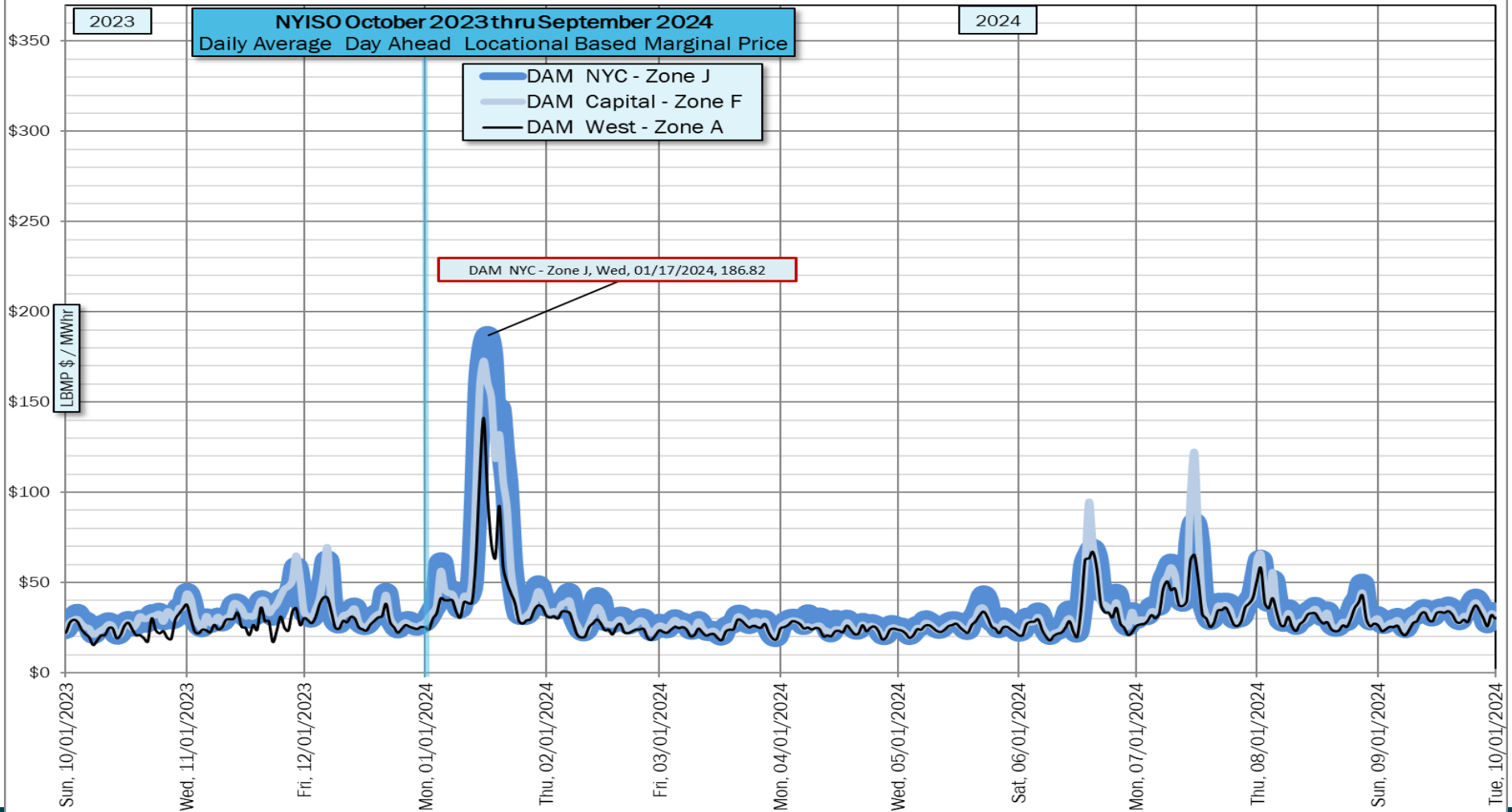


**NYISO October 2023 thru September 2024**  
Daily Average Day Ahead Locational Based Marginal Price

2024

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

DAM NYC - Zone J, Wed, 01/17/2024, 186.82





# Appendix B

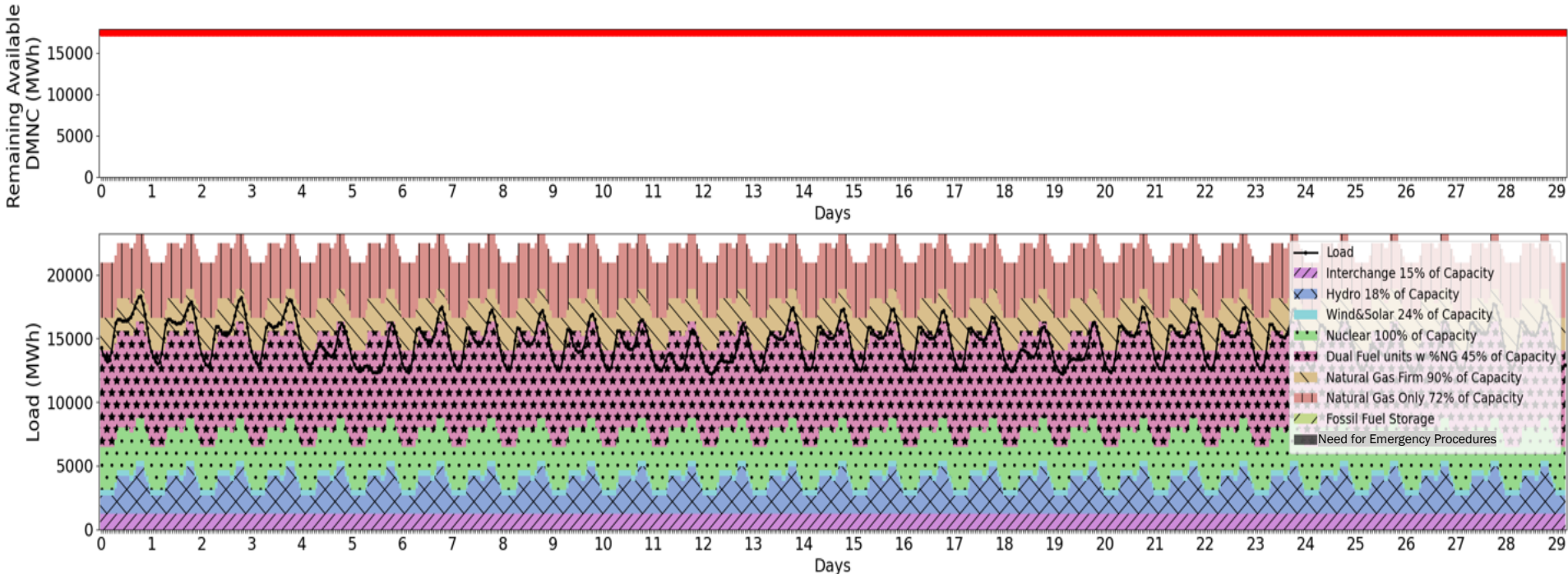
# Near Term Fuel and Energy Security Assessment

# Operations Internal Energy Assessment Tool

- **Different from the Analysis Group (“AG”) Fuel and Energy Security (FES) model, this Internal Energy Assessment tool gives NYISO the ability to:**
  - Observe the reported fuel inventory levels and scheduled replenishments
  - Monitor the load forecast up to 30 days in the future
  - Apply commitment/dispatch assumptions to monitor fuel/energy shortfalls
  - Model scenarios and disruptions similar to the FES studies

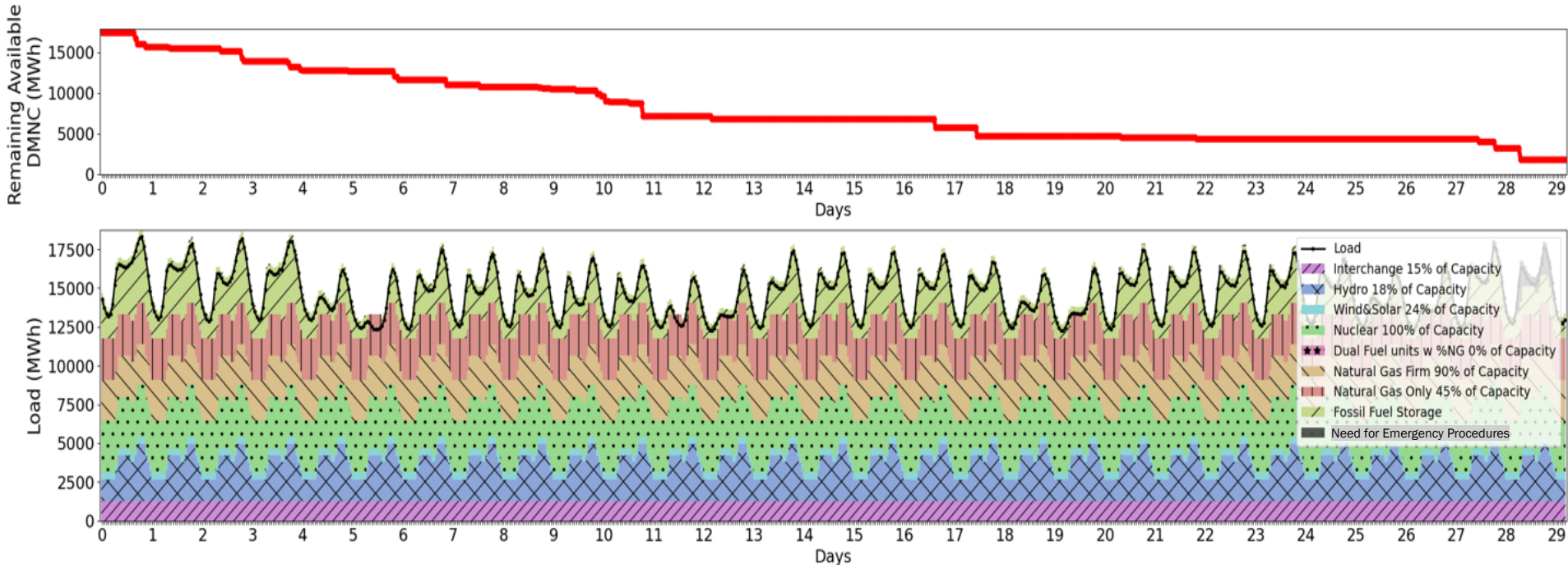
# Internal Energy Assessment Tool – Forecast (Typical Spring or Fall Day)

- No/minor scheduled deliveries (1.74 million MWh)
- Low shoulder season loads (Peak hourly demand = 18,318 MW)
- Gas available for firm and gas only units, 50% dual fuel capable MWs from gas



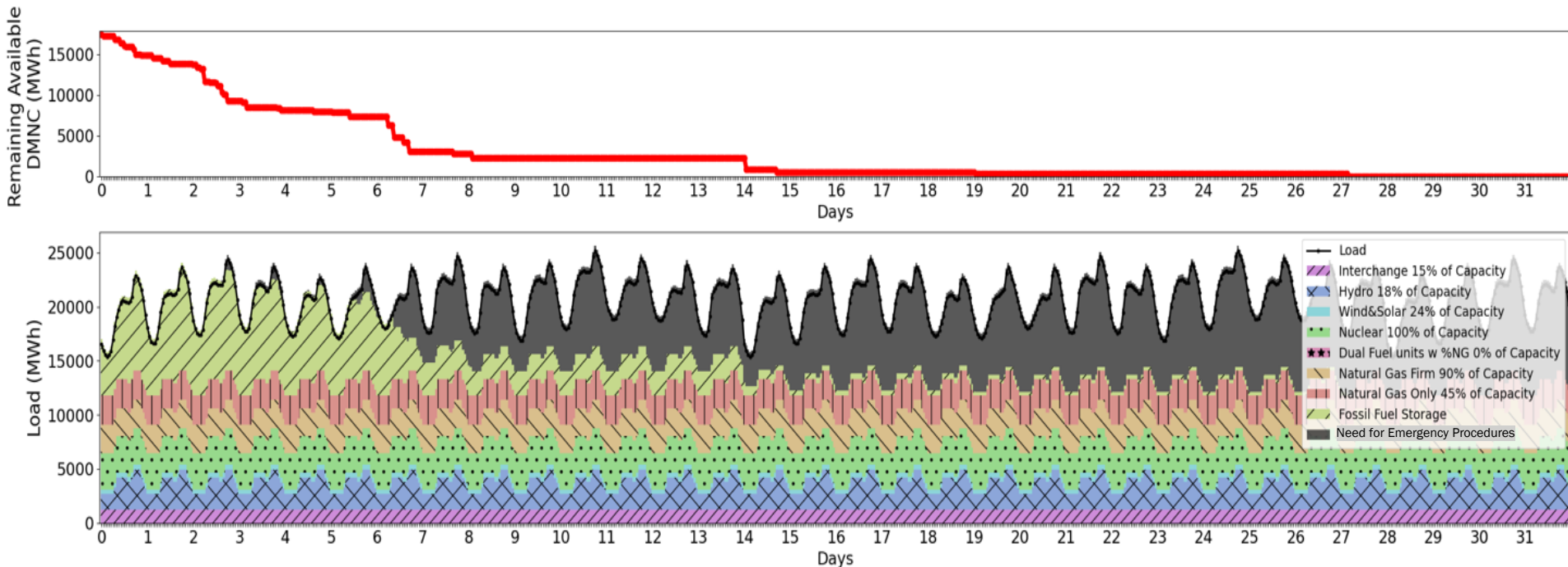
# Internal Energy Assessment Tool – Forecast, limited gas availability

- No/minor scheduled deliveries (1.74 million MWh)
- Low shoulder season loads (Peak hourly demand = 18,318 MW)
- **Limited gas only generation (4,500 MW), no gas for dual fuel units**



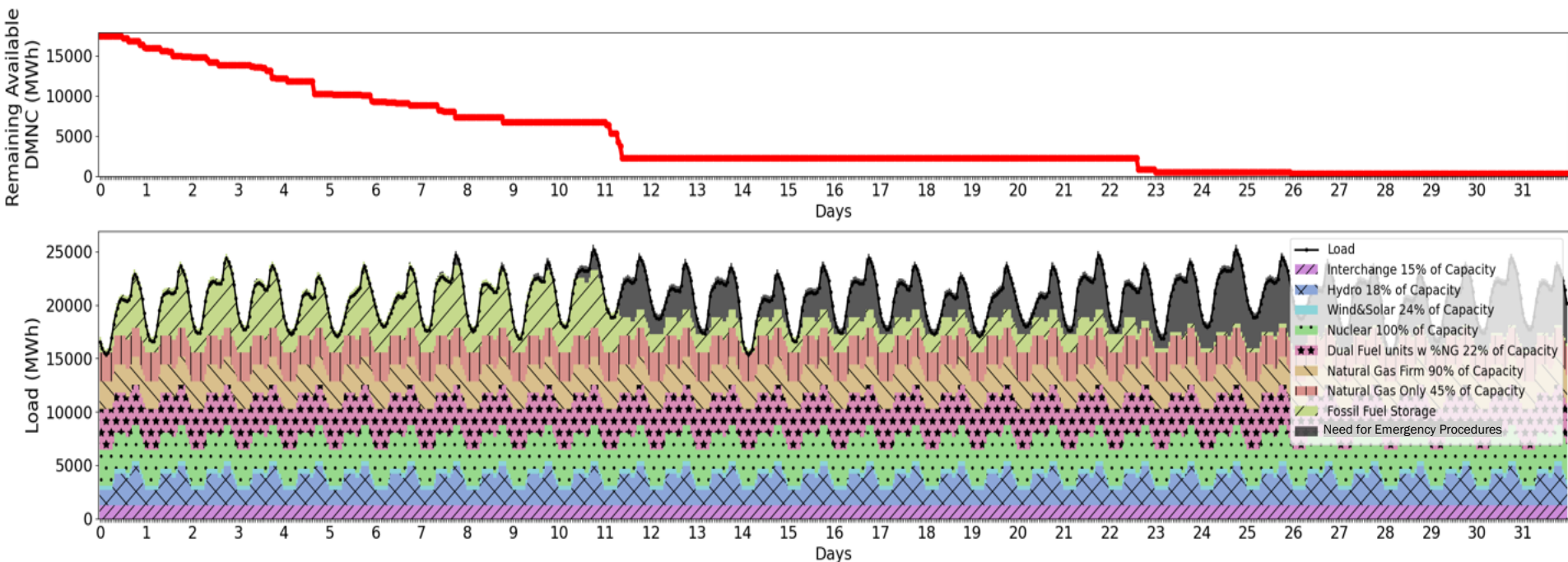
# Internal Energy Assessment model – Extreme Cold, limited gas availability

- No/minor scheduled deliveries (1.74 million MWh)
- **Extreme Cold Weather Load Forecast (Similar to 17-18, - 25,200 MW)**
- Limited gas only generation (4,500 MW), no gas for dual fuel units



# Internal Energy Assessment model – Extreme Cold, some gas for DF units

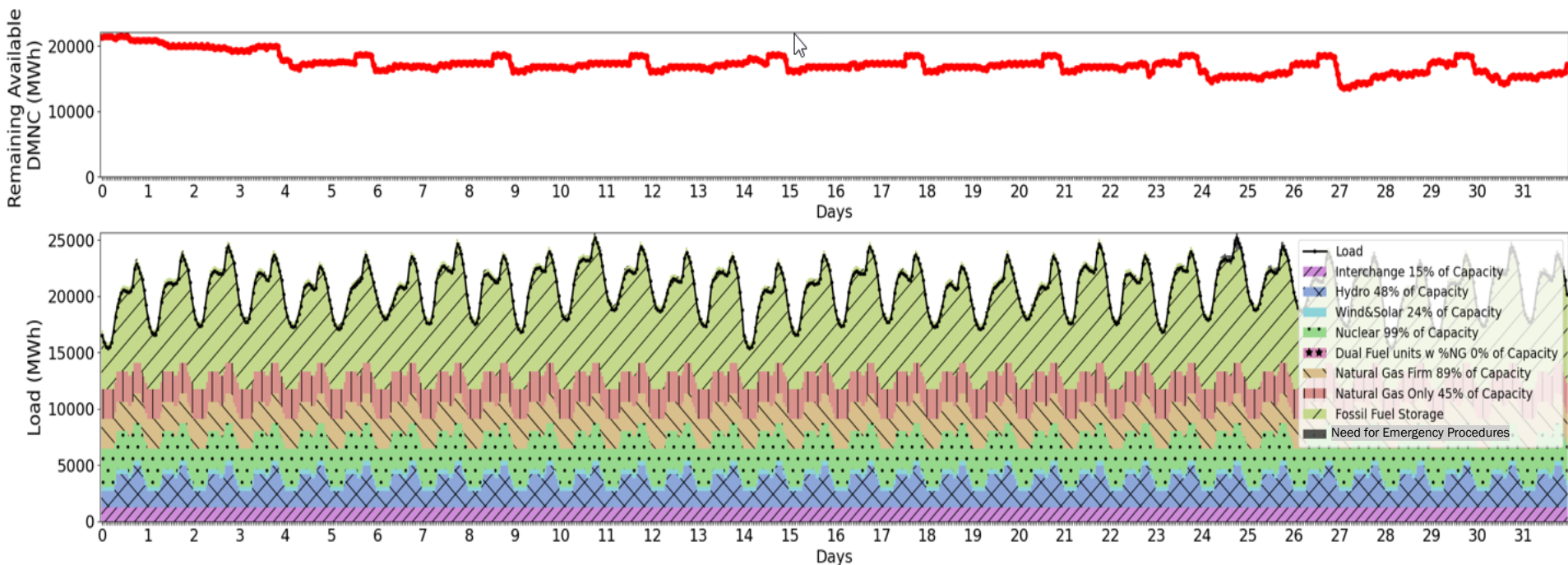
- No/minor scheduled deliveries (1.74 million MWh)
- Extreme Cold Weather Load Forecast (Similar to 17-18, - 25,200 MW)
- Gas available for firm and gas only units, 25% dual fuel capable MWs from gas



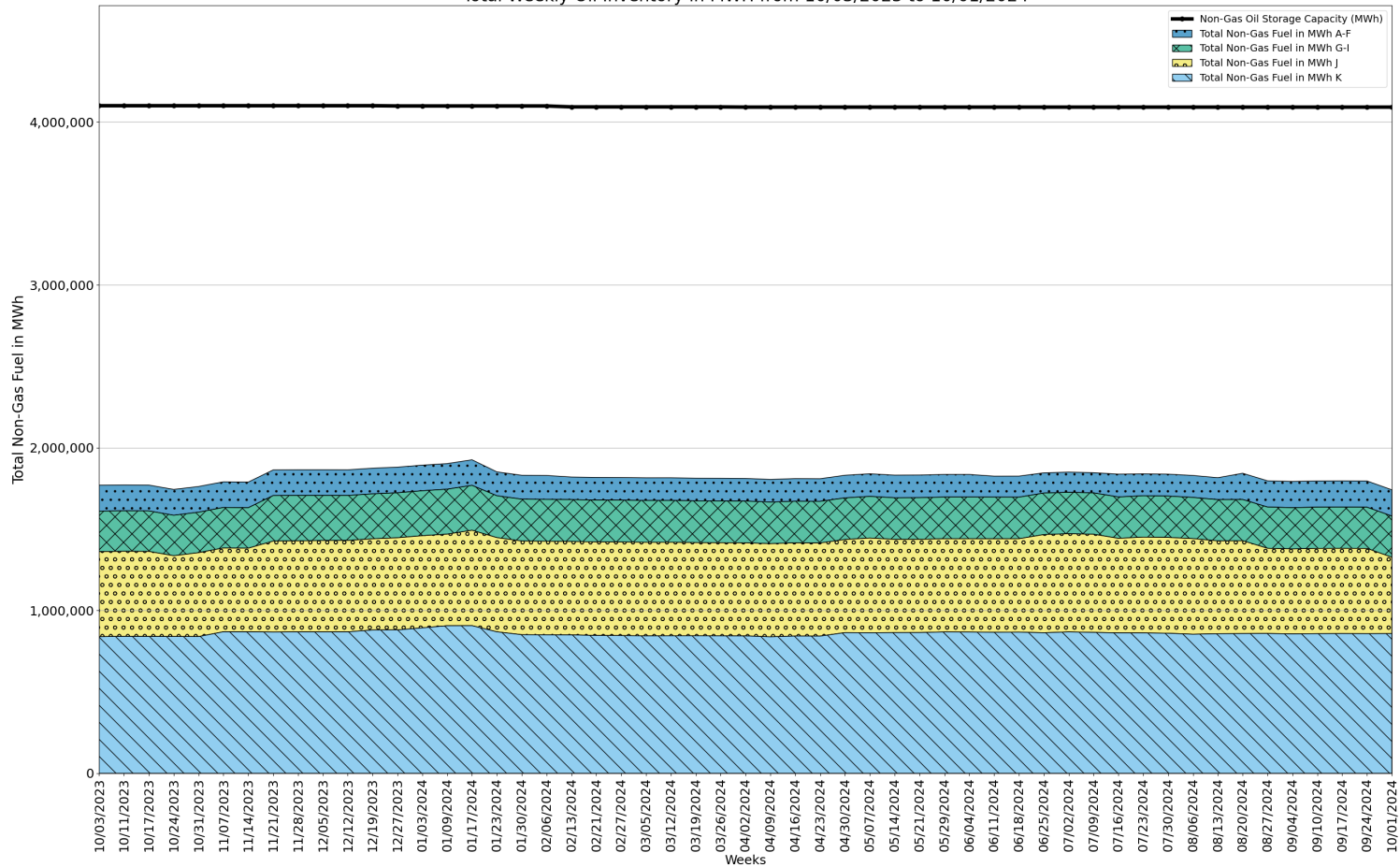


# Internal Energy Assessment model – Extreme Cold, limited gas availability

- **GFER survey refill assumptions similar to AG FES models**
- **Extreme Cold Weather Load Forecast (Similar to 17-18, - 25,200 MW)**
- **Limited gas only generation (4,500 MW), no gas for dual fuel units**



Total Weekly Oil Inventory in MWh from 10/03/2023 to 10/01/2024





# 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