New York ISO
Independent System Operator

2026 Load Forecast Uncertainty Model Updates

Akin Aroge

Demand Forecasting & Analysis

NYSRC ICS

June 4, 2025

Agenda

- **Background and Summary**
- **Review of Summer 2024 and Winter 2024-2025 Weather**
- **Winter Base Load Forecast Uncertainty Update**
  - Winter weather variable
  - Regression model estimation
  - 2026 Winter Load Forecast Uncertainty results

New York ISO

Background and Summary

- Based on an analysis of Summer 2024 and Winter 2024-25 weather data, the NYISO has determined that the base winter Load Forecast Uncertainty (LFU) model should be updated. A single set of base winter LFU multipliers is calculated at the New York Control Area (NYCA) level. The NYISO recommends that the 2026-2027 Installed Reserve Margin (IRM) Study use this updated set of base winter multipliers.

- Since zonal peak day temperatures were below normal during the 2024 NYCA summer peak day, there is no update to the summer LFU models and multipliers. The NYISO recommends that the 2026-2027 IRM Study continue to use the Zones A to E, Zones F&G, Zones H&I, Zone J, and Zone K summer multipliers currently in effect. The NYISO plans to update the summer LFU models and multipliers during the spring of 2026 for the 2027-2028 IRM Study.

New York ISO

Review of Summer 2024 and Winter 2024-2025 Weather

- Seasonal peak weather conditions were evaluated for Summer 2024 and Winter 2024-2025 by LFU area (Zones A to E, Zones F&G, Zones H&I, Zone J, Zone K) and at the NYCA level

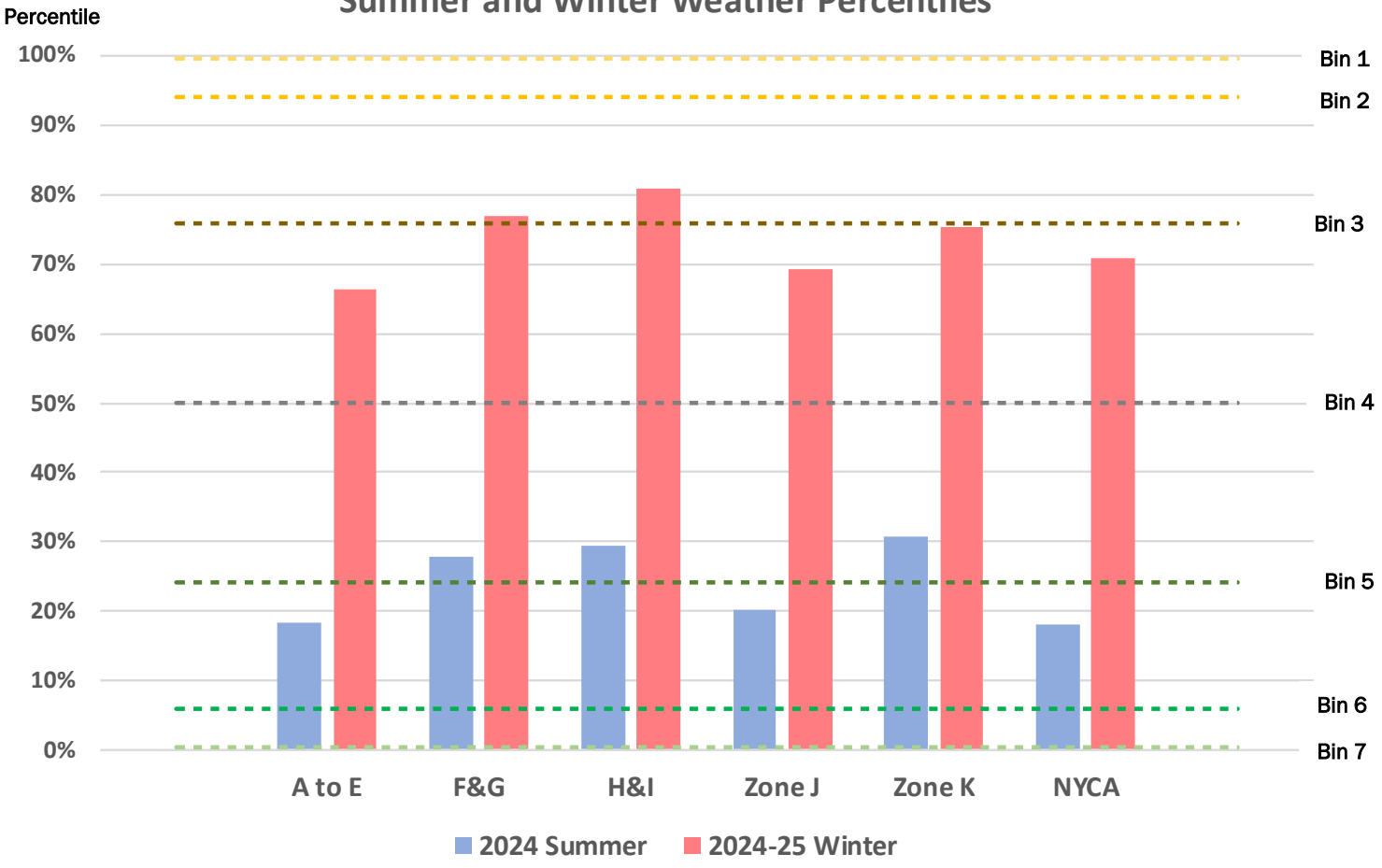
- Percentiles were calculated based on a 20-year distribution of Cumulative Temperature & Humidity Index (CTHI) for summer and HDD55 (Heating Degree Days at a 55-degree set point) for winter

Summer and Winter Coincident Peak Day Weather						
Area	**A to E**	**F&G**	**H&I**	**Zone J**	**Zone K**	**NYCA**
Average CTHI	81.8	84.4	85.1	85.6	85.0	83.7
Summer 2024 CTHI	79.5	83.0	83.8	83.5	83.6	81.5
Summer 2024 Percentile	18%	28%	29%	20%	31%	18%
Average HDD 55	45.4	43.1	38.2	35.0	35.1	40.0
Winter 2024-25 HDD 55	48.4	48.5	44.0	38.3	39.6	43.6
Winter 2024-25 Percentile	66%	77%	81%	69%	75%	71%

Coincident Peaks: 7/8/2024 and 1/22/2025

New York ISO

Summer and Winter Weather Percentiles



New York ISO

Winter Base LFU Update

New York ISO

Overview – Winter Base LFU Update

1. Winter Weather Variable
2. Regression Model Estimation
3. 2026 LFU Results

Winter Weather Variable

New York ISO

Winter Variable Computation

$$Wind\ Chill, WC = f(DB, WS)$$

- DB = *Dry Bulb Temperature (°F)*
- WS = *Wind Speed (mph)*

$$WC = 35.74 + 0.6215(DB) - 35.75(WS^{0.16}) + 0.4275(DB)(WS^{0.16})$$

https://www.weather.gov/ama/windchill

$$X_{Mor} = Avg(X_{HB06}\ to\ X_{HB11})$$
$$X_{Aft} = Avg(X_{HB12}\ to\ X_{HB17})$$

$$X = Dry\ Bulb\ or\ Wind\ Speed$$

In-Day Var for day i, $v_i = 0.15DB_{mor_i} + 0.35DB_{aft_i} + 0.35WC_{aft_i} + 0.15WC_{eve_i}$

Winter Variable for day $i = 0.8v_i + 0.1v_{i-1} + 0.1v_{i-2}$

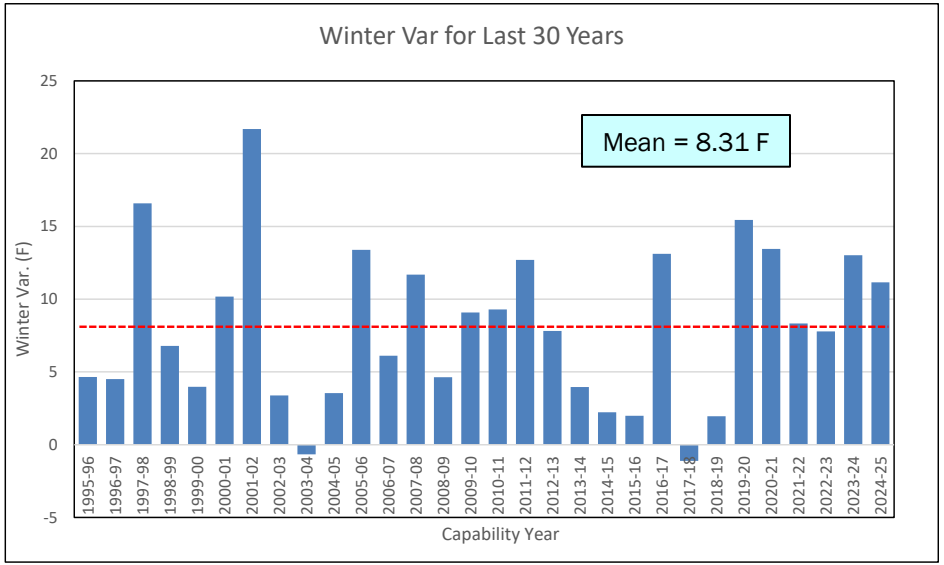
New York ISO

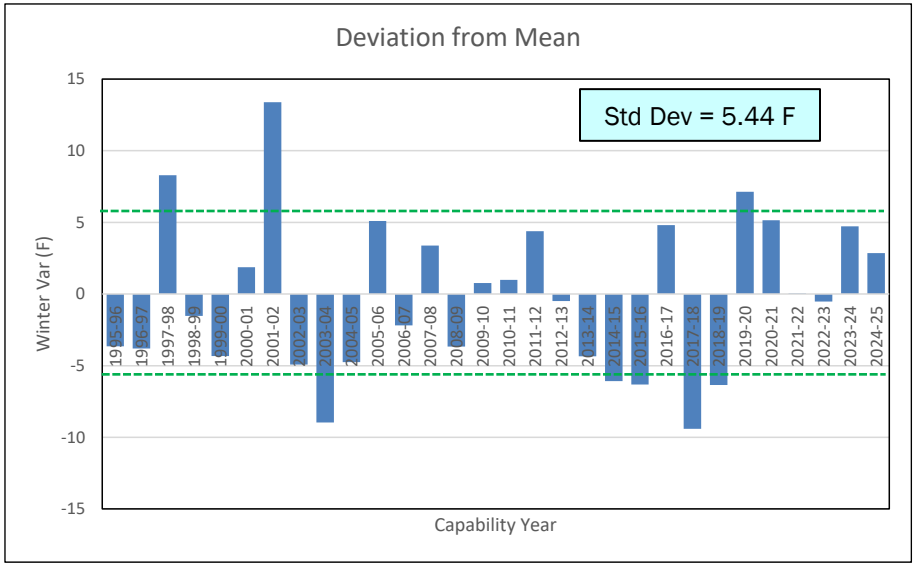
Winter Design Conditions

- Use seasonal minimum values
- 30 years for standard deviation
- 20 years for mean

New York ISO

Winter Variable Trend





New York ISO

Regression Model Estimation

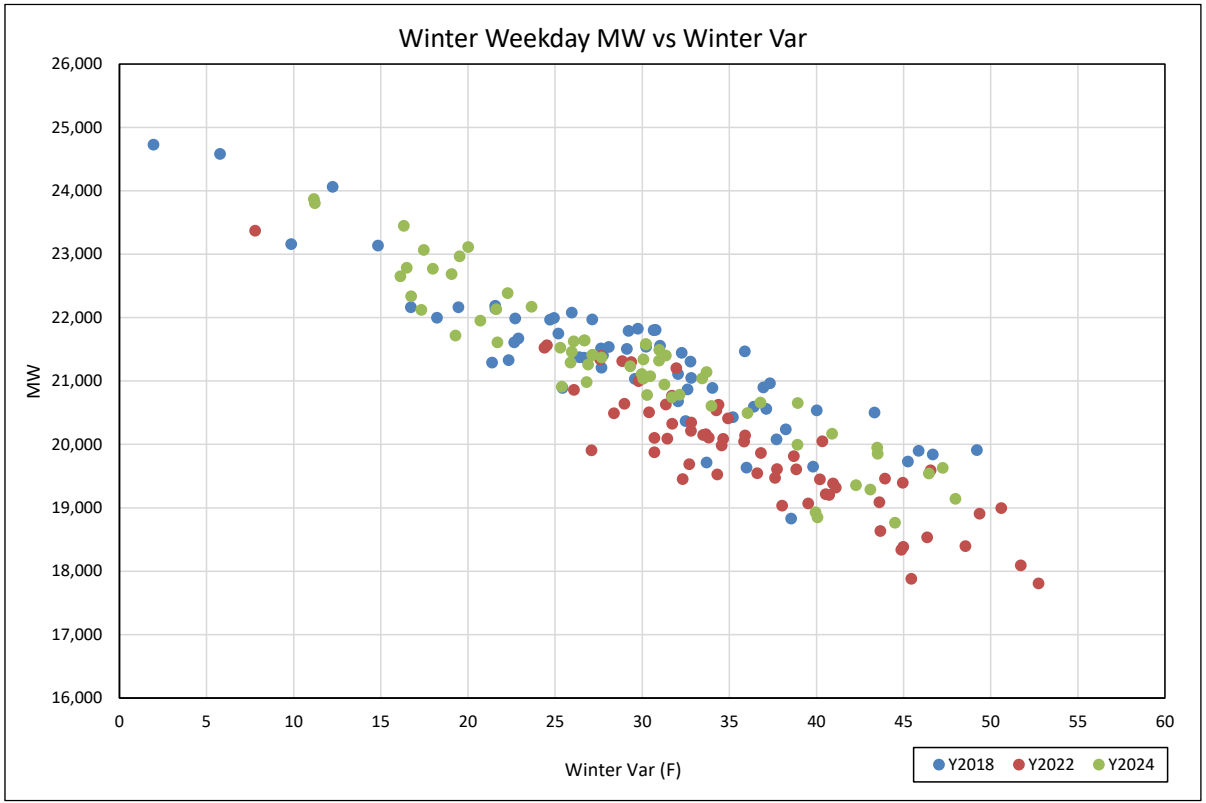
New York ISO

Model Specifications

- Years: 2018-2019, 2022-2023, and 2024-2025 winters (with binaries)
- Months: December to February
- Days: Weekdays (Monday & Friday binaries), no Holidays
- 2nd order polynomial of Winter Variable
- Total observations - 186

New York ISO

Daily Peak Values vs Winter Variable For Model Years



New York ISO

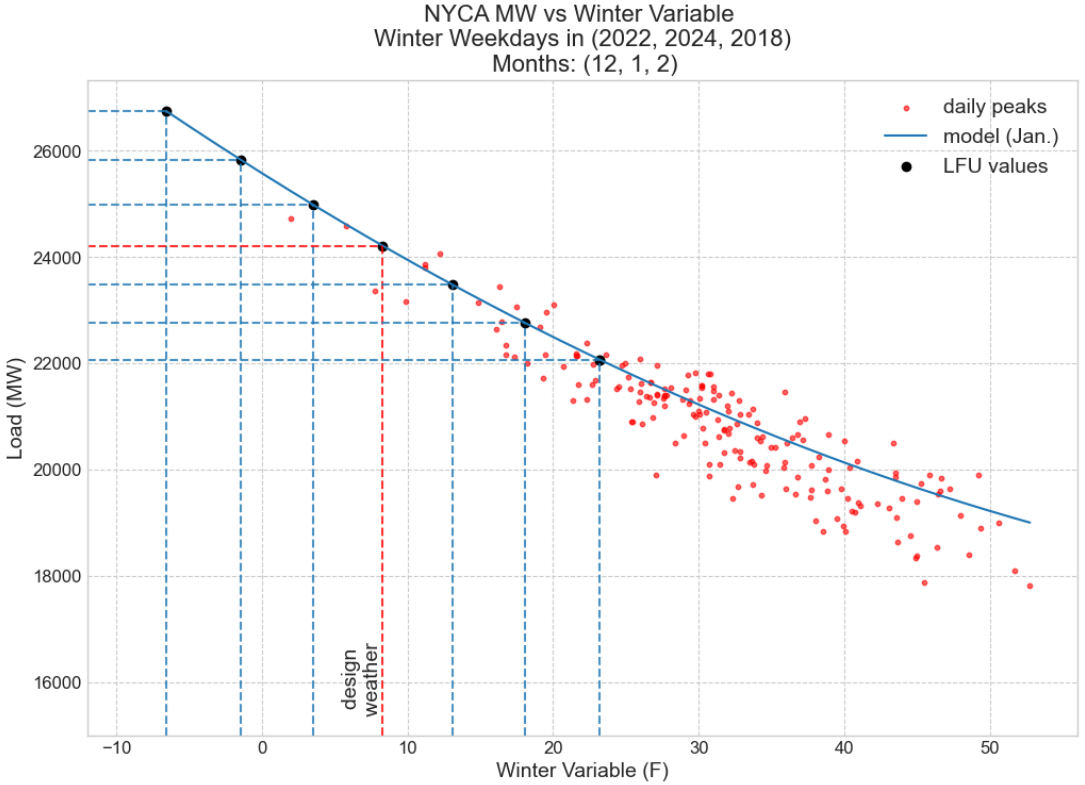
LFU Model & Results

Regression Statistics	
Multiple R	0.970
R Square	0.940
Adjusted R Square	0.938
Standard Error	320.81904
Observations	186

ANOVA

	df	*SS*	*MS*	*F*
Regression	6	289003534	48167256	468
Residual	179	18423549	102925	
Total	185	307427084		

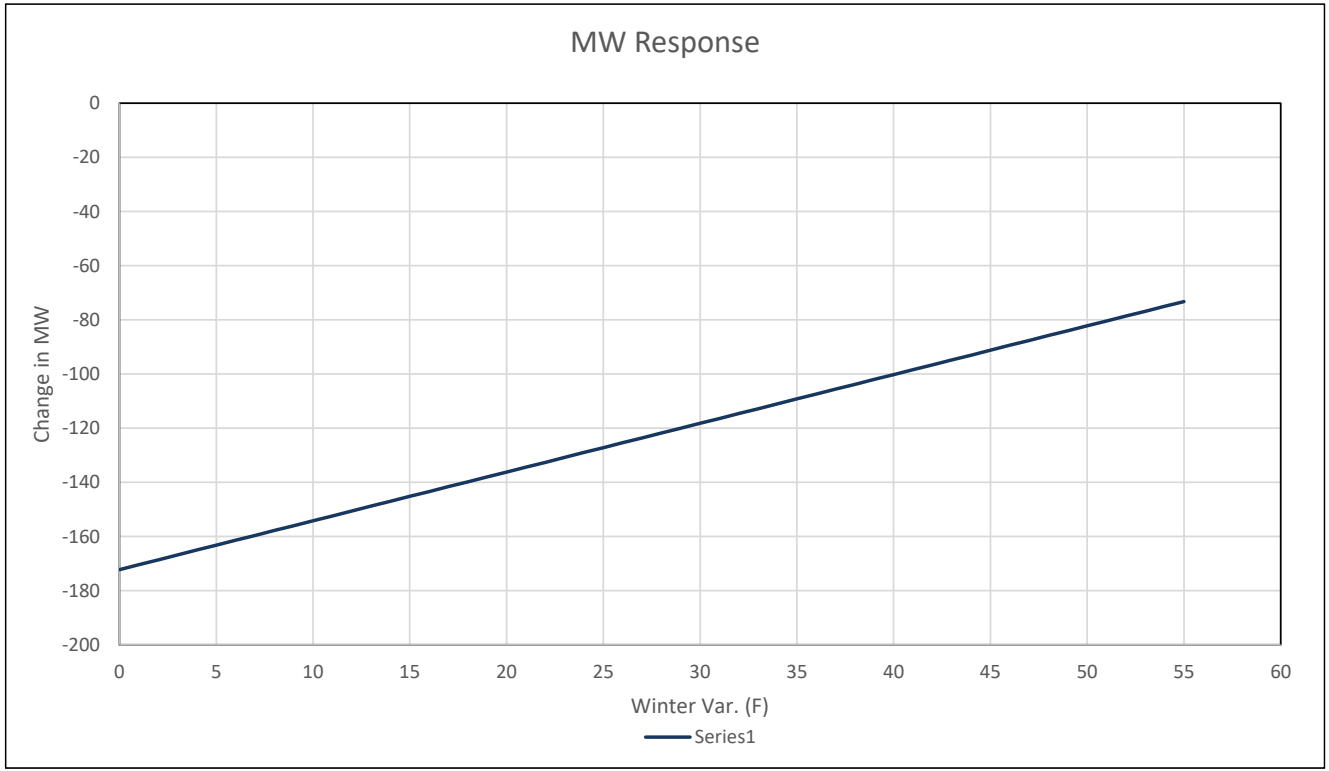
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	25842	189	136.5	0.0000
Y2022	-604.70	53.15	-11.4	0.0000
Jan	-263.04	60.34	-4.4	0.0000
Feb	-706.14	60.02	-11.8	0.0000
Holiday	-625.14	113.00	-5.5	0.0000
WinVar	-172.17	11.79	-14.6	0.0000
WinVarSq	0.90	0.19	4.8	0.0000



New York ISO

Winter Peak Load Response to Weather

MW/Degree F vs Winter Var F



New York ISO

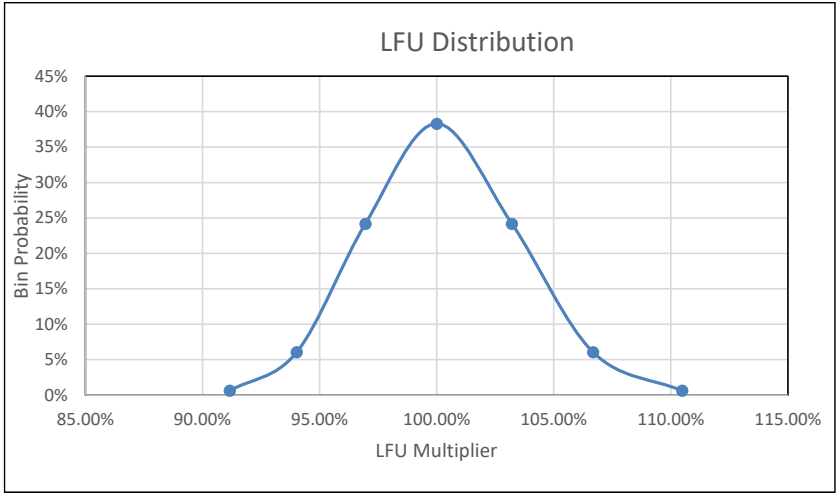
2026 Winter LFU Results

New York ISO

Recommended 2026 LFU Values

LFU Design Values

Bin	Bin z	Bin Prob	Bin Temp	Bin MW	LFU 2026	LFU 2024	Difference
1	-2.74	0.621%	-6.57	26,750	110.48%	110.24%	0.24%
2	-1.79	6.060%	-1.44	25,829	106.68%	106.37%	0.31%
3	-0.89	24.173%	3.49	24,990	103.22%	102.79%	0.43%
4	0.00	38.292%	8.31	24,211	100.00%	99.40%	0.60%
5	0.89	24.173%	13.13	23,474	96.96%	96.13%	0.83%
6	1.79	6.060%	18.05	22,764	94.02%	92.92%	1.10%
7	2.74	0.621%	23.18	22,071	91.16%	89.88%	1.28%



New York ISO

Questions?

New York ISO

Our Mission and 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

New York ISO