

# ***Operations Performance Metrics Monthly Report***



## ***May 2024 Report***

## **Operations & Reliability Department New York Independent System Operator**

Prepared by NYISO Operations Analysis and Services, based on settlements initial invoice data collected on or before June 8, 2024.

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## May 2024 Operations Performance Highlights

Monthly Peak Load	Monthly Minimum Load	Summer 2024 Peak	All-time Summer Peak
05/22/2024 HB 17 21,777 MW	05/05/2024 HB 04 11,987 MW	05/22/2024 HB 17 21,777 MW	07/19/2013 HB 16 33,956 MW

- 53.8 hours of Thunderstorm Alerts were declared
- 0.0 hours of NERC TLR level 3 curtailment
- A geomagnetic storm of the highest alert level, K9, impacted New York from May 10 – May 12, 2024. Some of the actions taken during the event included operating in the Alert State, restoring out of service transmission elements, extending commitment of generators, solving the system to 90% of established ratings and solving Thunderstorm Alert cases.

Installed Wind, Solar and Energy Storage Resource Nameplate Values:

Land-Based Wind	Behind-the-Meter Solar	Front-of-the-Meter Solar	Energy Storage Resource (ESR)
2,736 MW	5,548 MW	304 MW	63 MW

Estimated production cost savings associated with the Broader Regional Market initiatives:

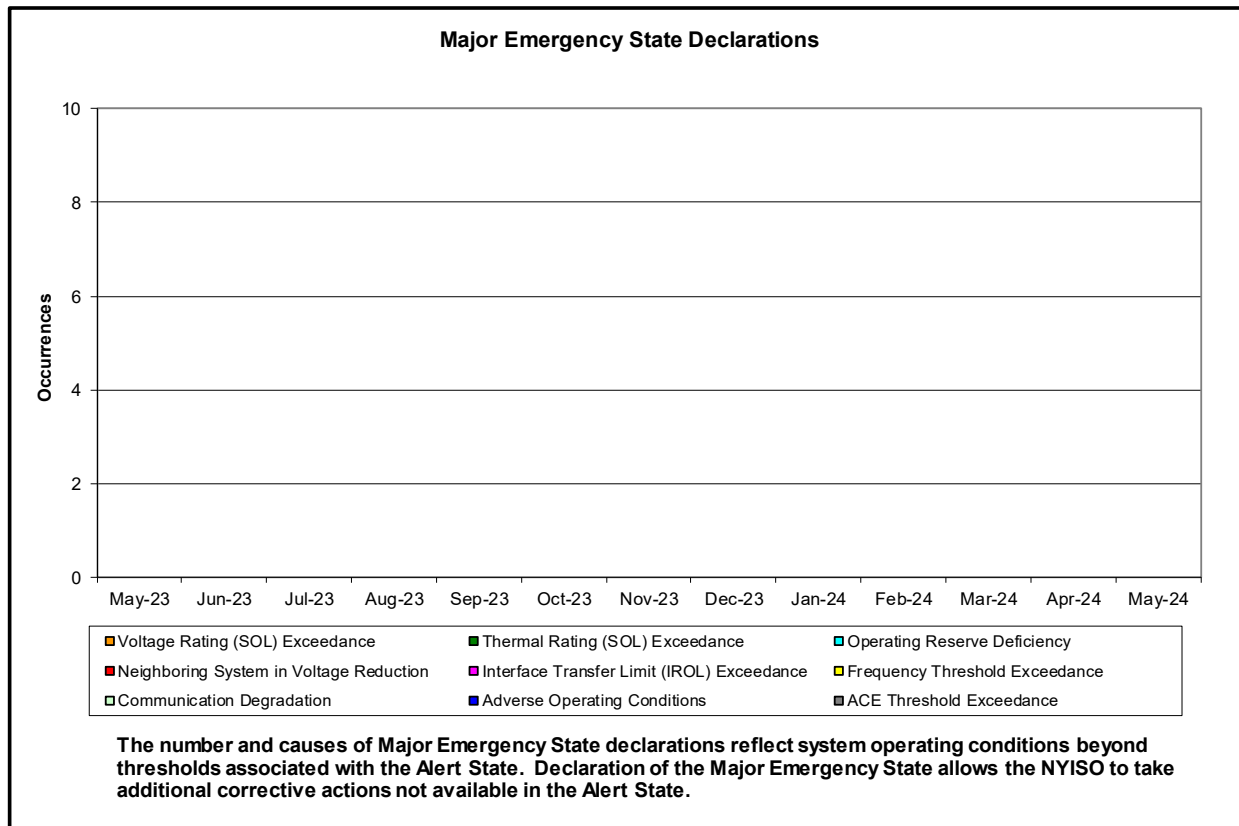
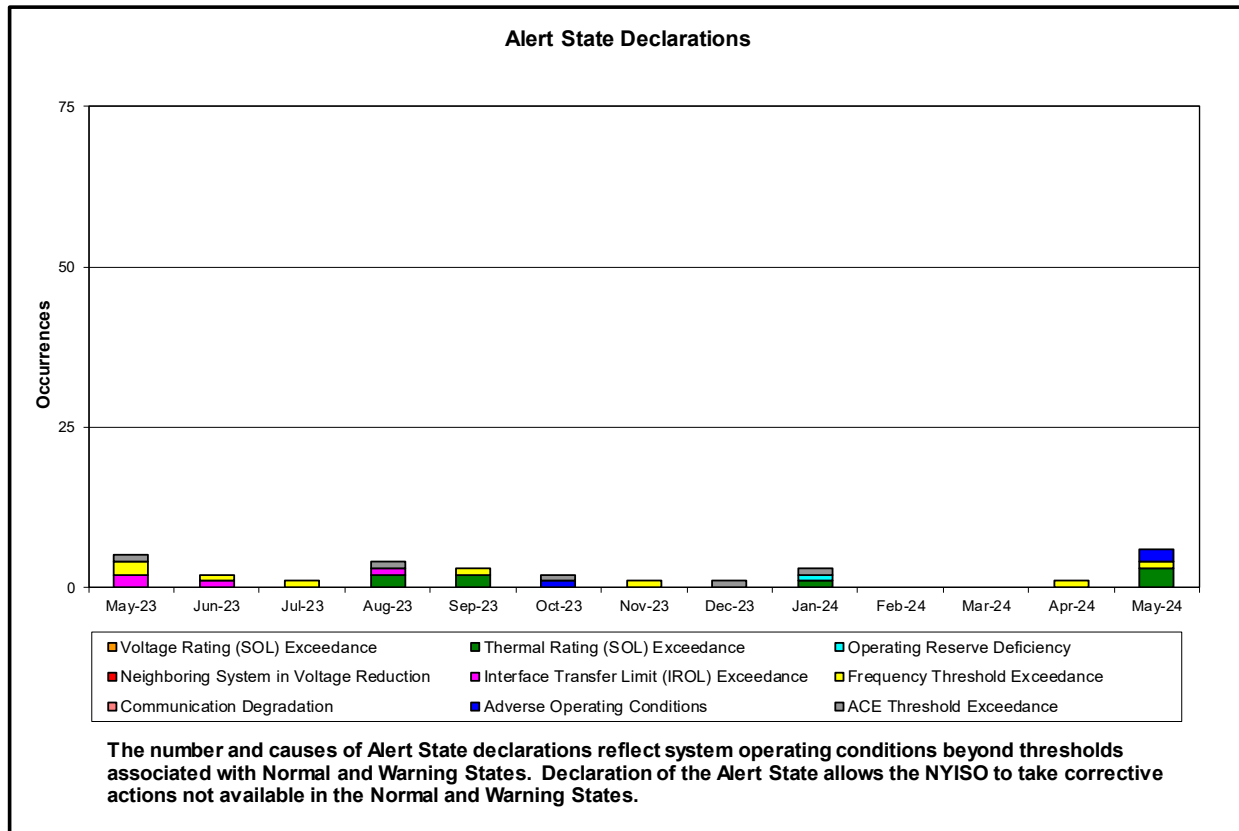
	Current Month Value (\$M)	Year-to-Date Value (\$M)
<b>NY Savings from PJM-NY Congestion Coordination</b>	(\$0.64)	(\$2.53)
<b>NY Savings from PJM-NY Coordinated Transaction Scheduling</b>	(\$0.16)	\$0.67
<b>NY Savings from NE-NY Coordinated Transaction Scheduling</b>	(\$0.10)	\$3.48
<b>Total NY Savings</b>	<b>(\$0.90)</b>	<b>\$1.62</b>
<b>Regional Savings from PJM-NY Coordinated Transaction Scheduling</b>	\$0.42	\$3.59
<b>Regional Savings from NE-NY Coordinated Transaction Scheduling</b>	\$0.08	\$0.60
<b>Total Regional Savings</b>	<b>\$0.50</b>	<b>\$4.19</b>

- Statewide uplift cost monthly average was (\$0.37)/MWh.
- The following table identifies the Monthly ICAP spot market prices and the price delta.

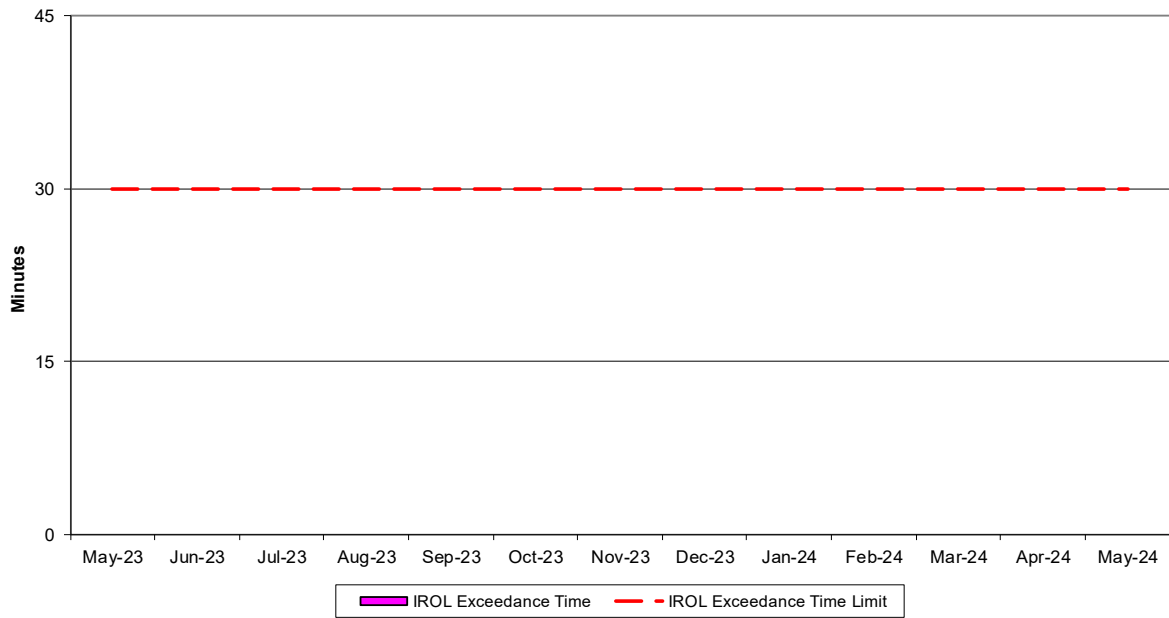
Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
June 2024 Spot Price	\$4.14	\$4.14	\$14.24	\$4.77
May 2024 Spot Price	\$4.27	\$4.27	\$14.33	\$4.78
Delta	(\$0.13)	(\$0.13)	(\$0.09)	(\$0.01)

- Price change in NYCA was driven by an increase in ICAP. Price change in NYC was driven by an increase in SCR MWs.

## Reliability Performance Metrics

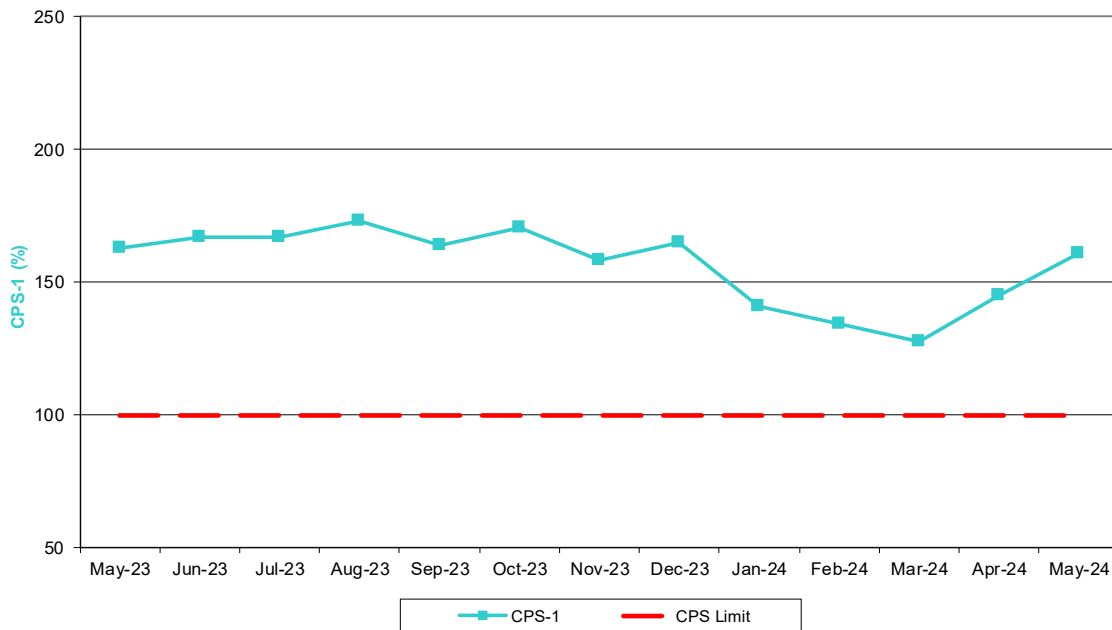


### NERC IROL Time Over Limit



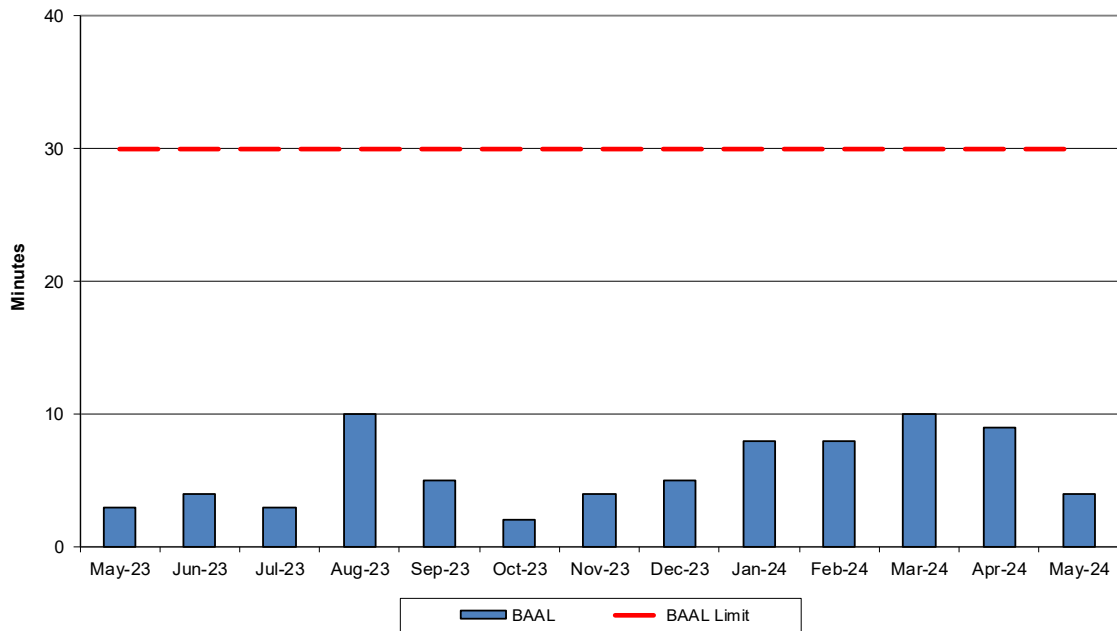
For IROL exceedances leading to Major Emergency State declarations, the maximum IROL exceedance time is identified. IROL exceedances of less than thirty minutes are considered NERC compliant.

### NERC Control Performance Standards



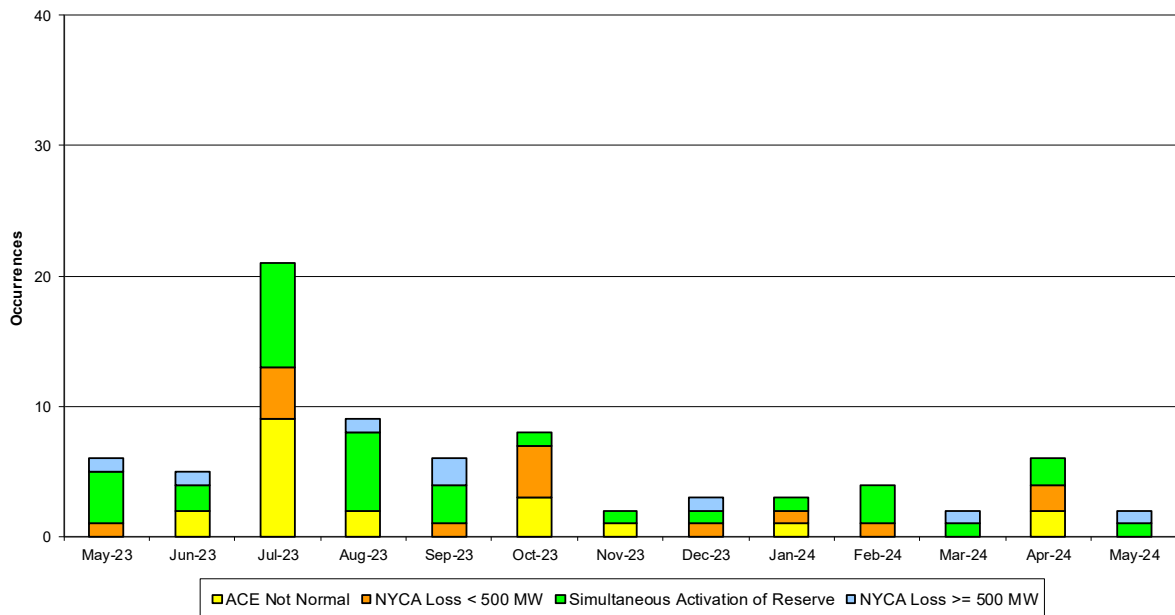
The value of NERC Control Performance Standards (CPS-1) is an indicator of the NYISO Area resource and demand balancing. Values exceeding the identified threshold are NERC compliant.

### NERC Balancing Authority ACE Limit Standard



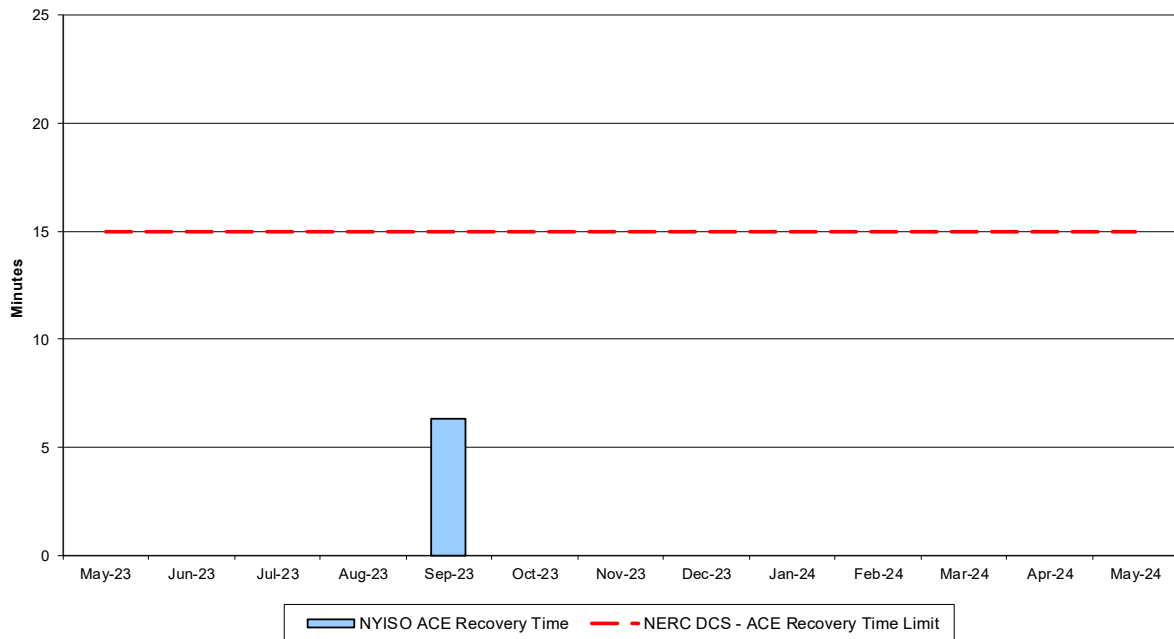
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

### Reserve Activations



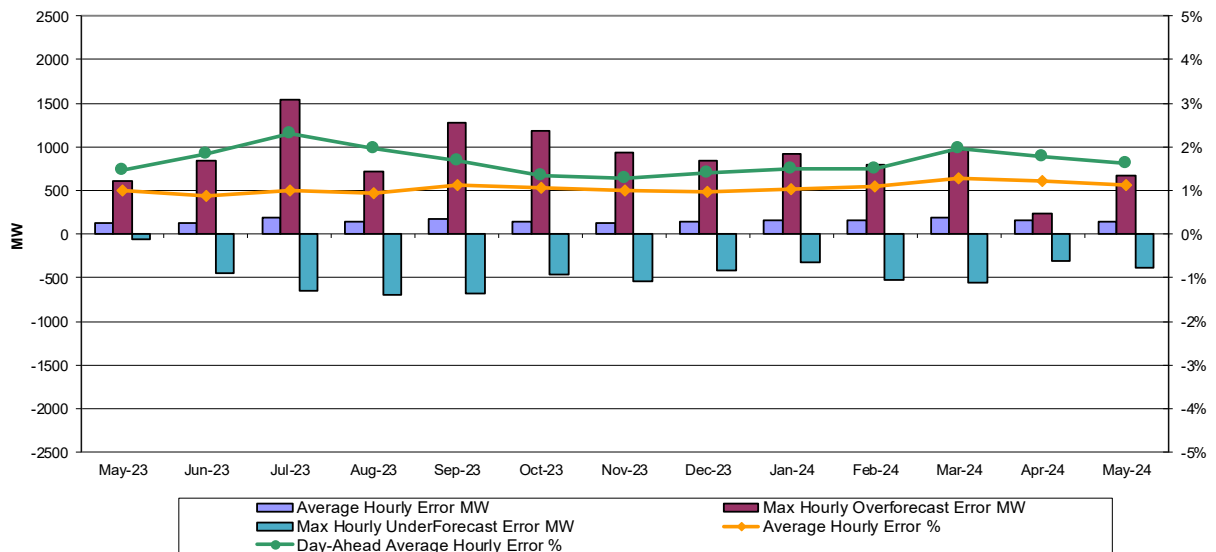
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

### DCS Event Time to ACE Recovery



For NYISO initiated NERC Reportable Disturbances, the maximum ACE recovery time is identified. Recovery times of less than 15 minutes are considered NERC compliant.

### Load Forecast Performance

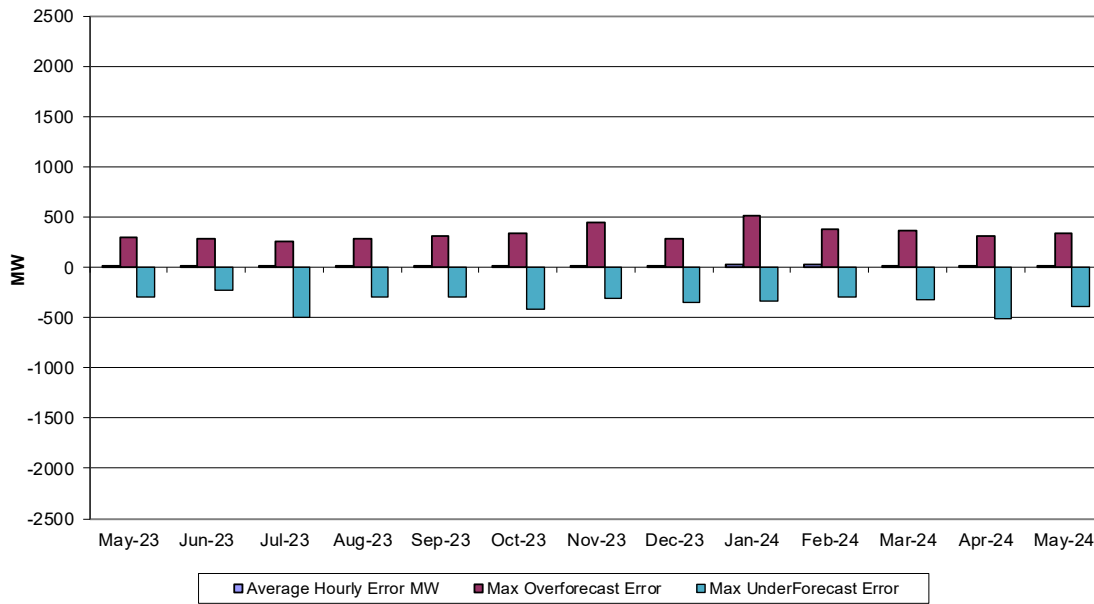


**Hourly Error MW** - Value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.

**Average Hourly Error %** - Average value of the ratio of hourly average error magnitude to hourly average actual load demand.

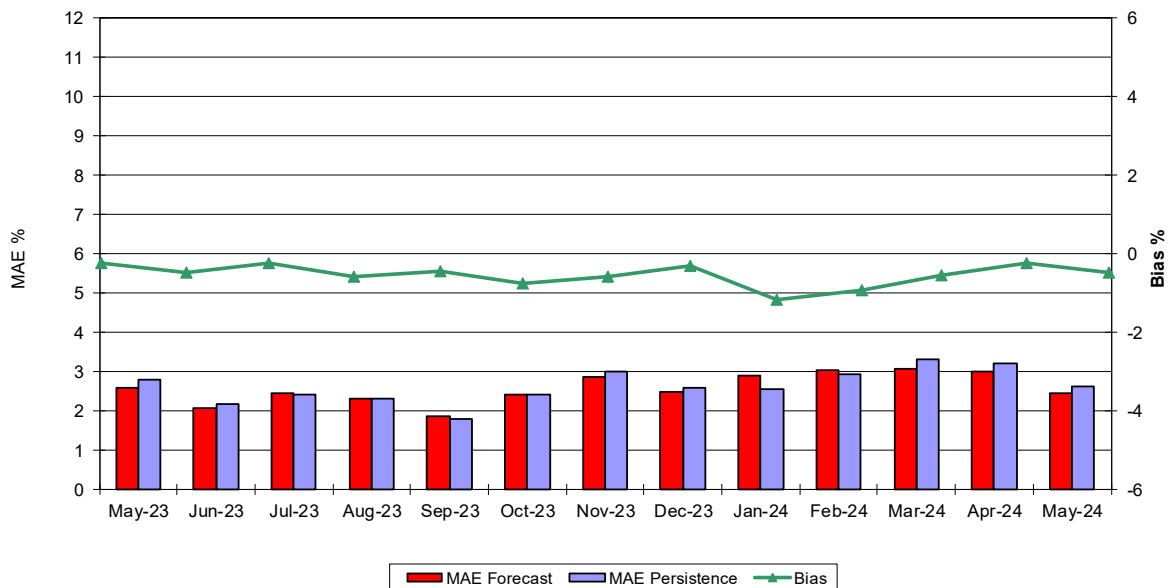
**Day-Ahead Average Hourly Error %** - Average across all hours of the month of the absolute value of the difference between actual load demand and the Day-Ahead forecast load demand, divided by the actual load demand.

### Wind Forecast Performance Hour Ahead MW Error



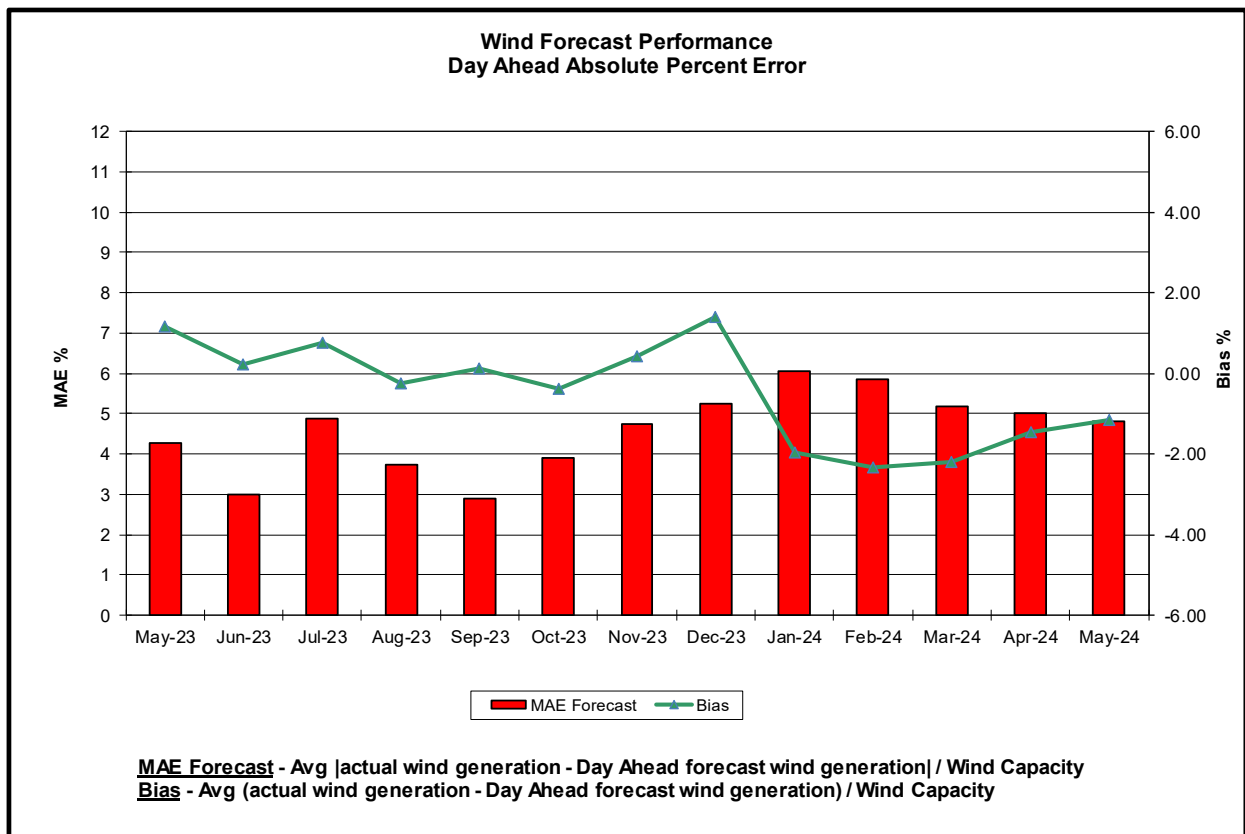
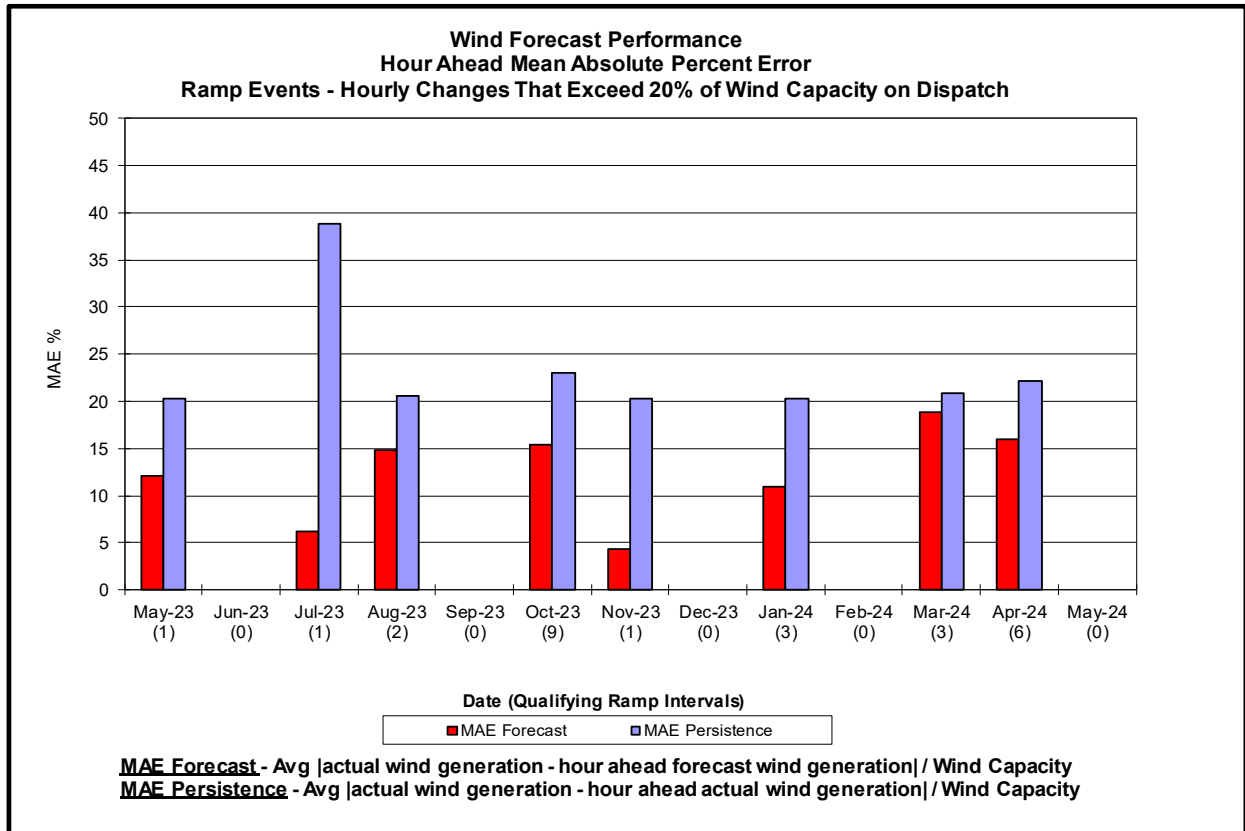
**Hourly Error MW** - Value of the difference between the hourly average actual wind generation and the average hour ahead forecast wind generation.

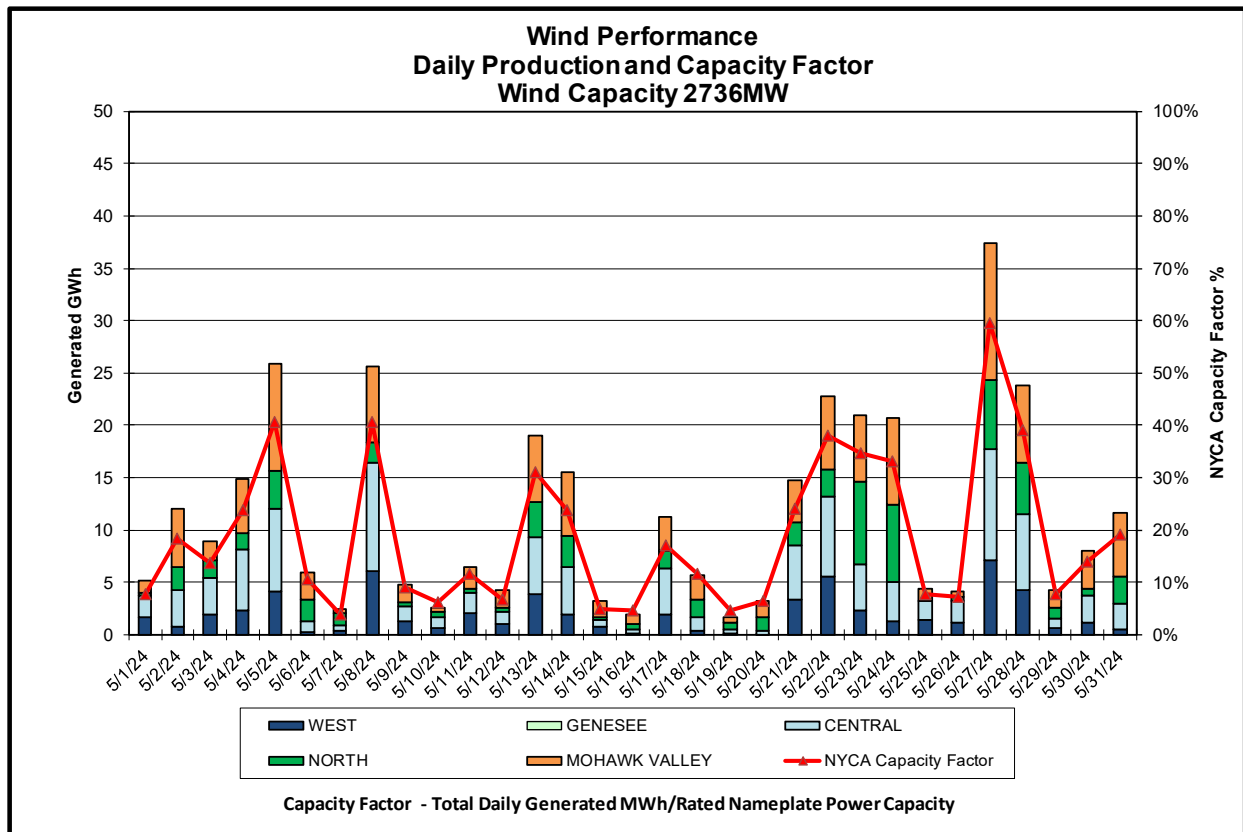
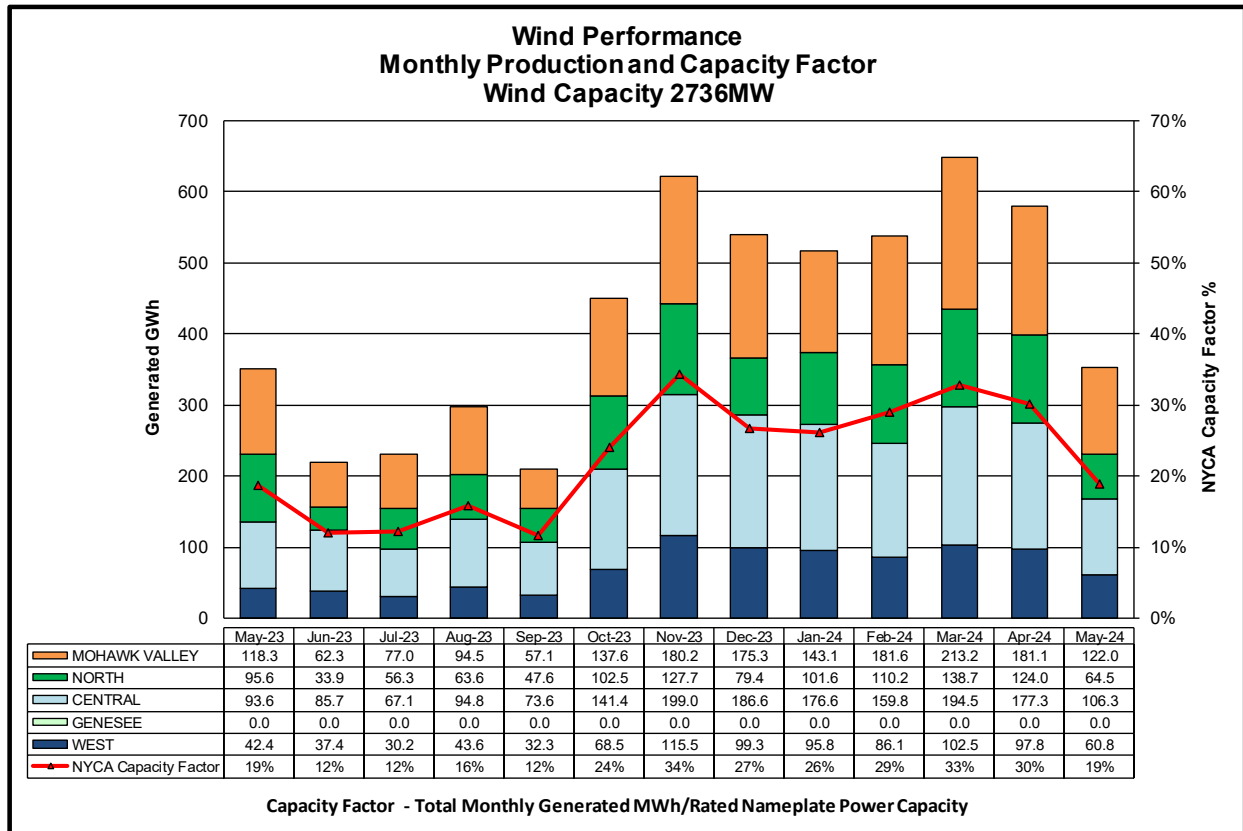
### Wind Forecast Performance Hour Ahead Percent Error

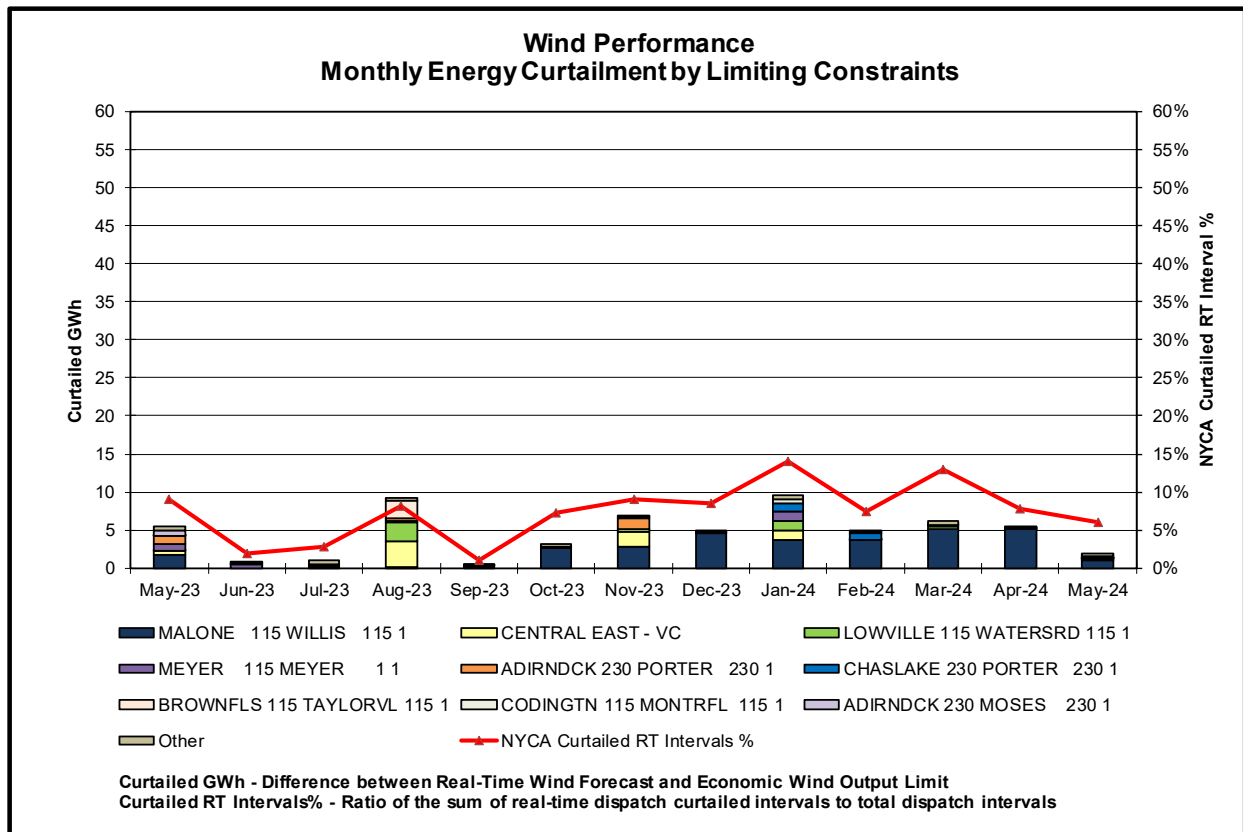
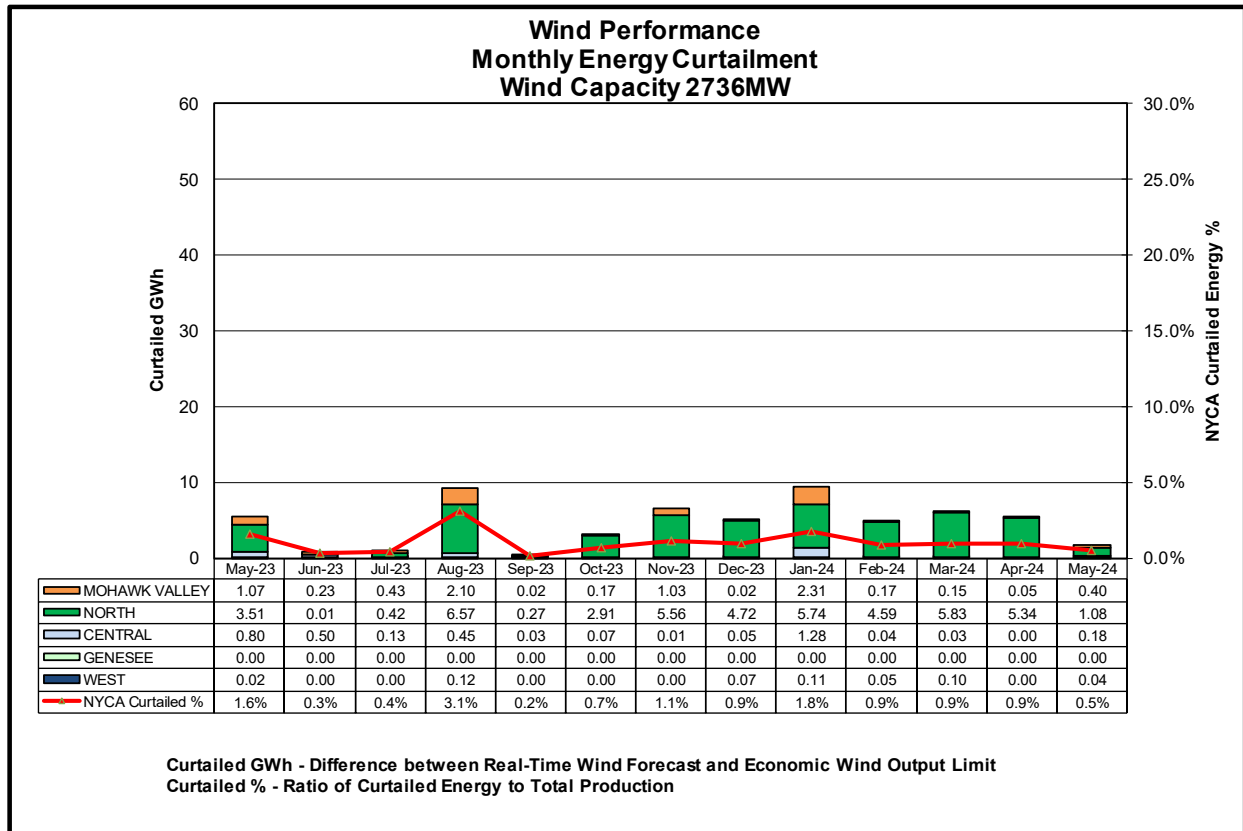


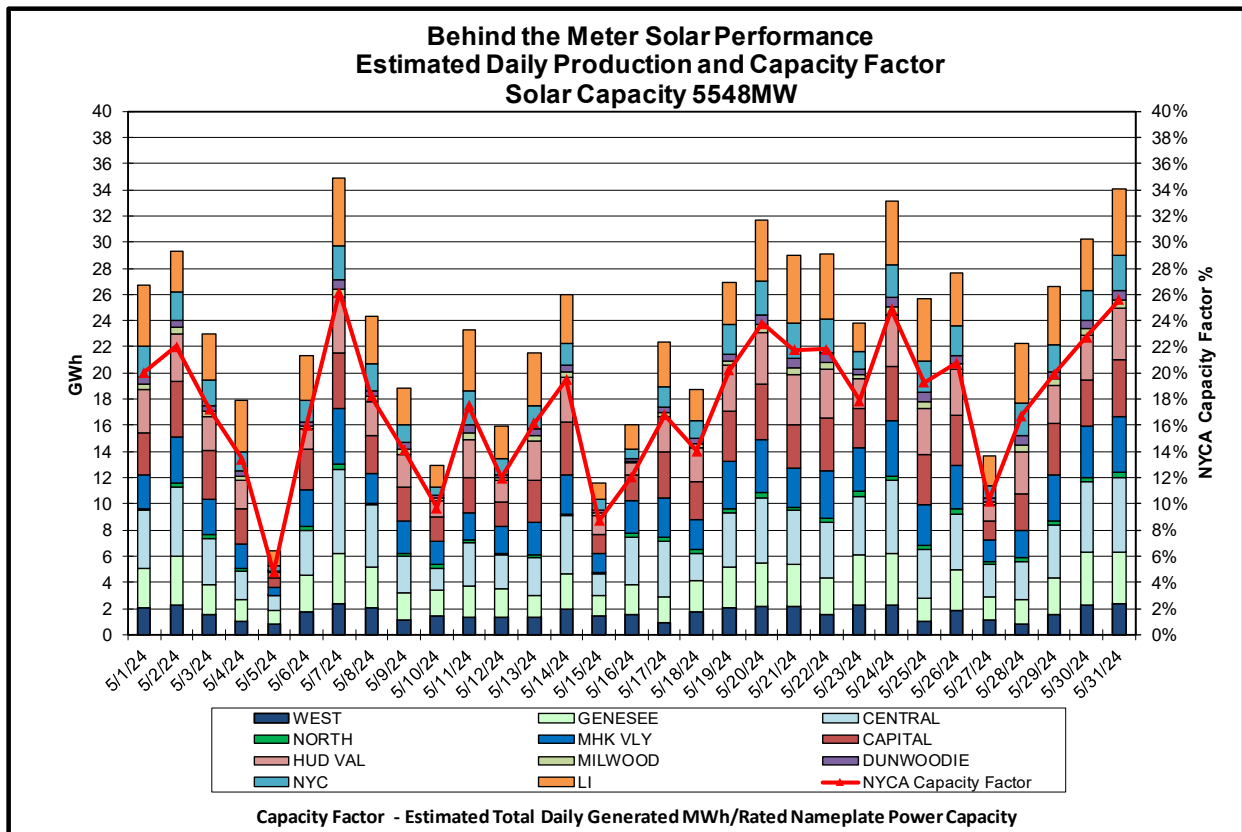
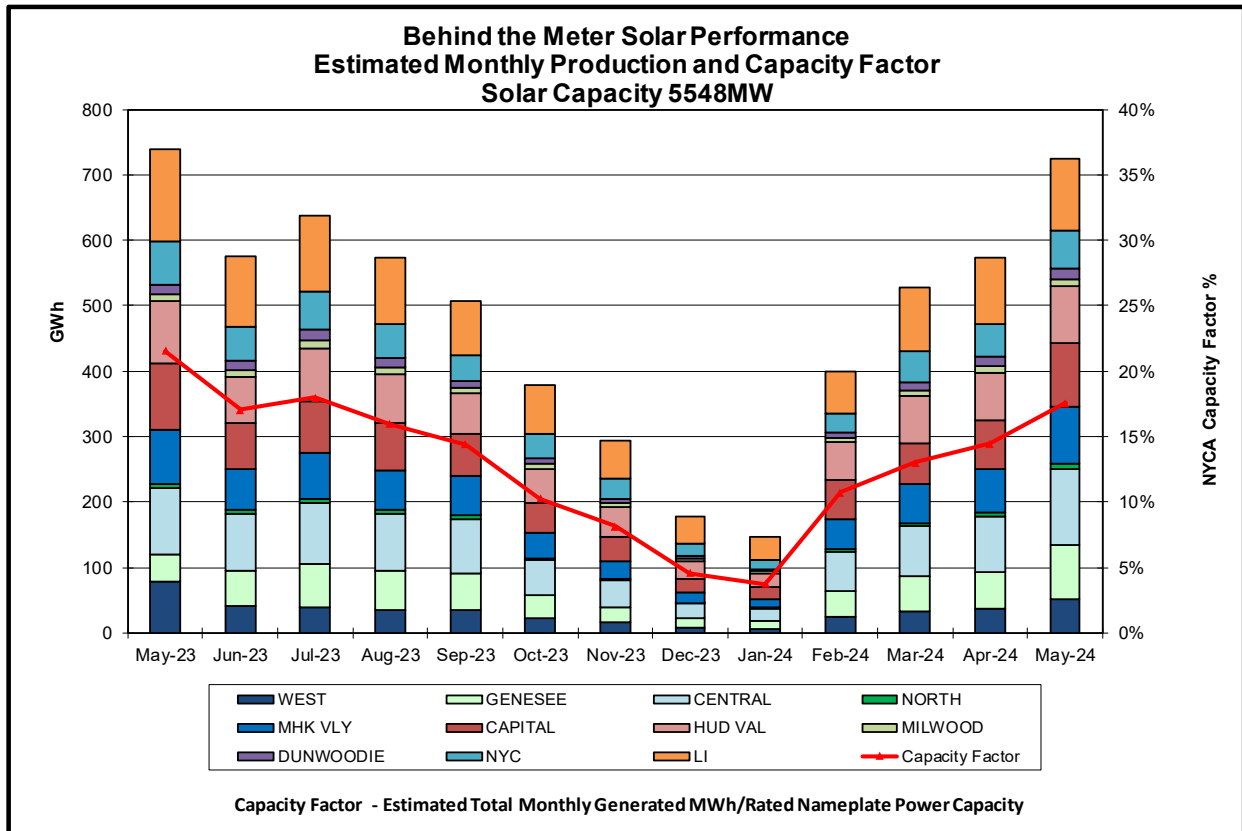
**MAE Forecast** - Avg |actual wind generation - hour ahead forecast wind generation| / Wind Capacity  
**MAE Persistence** - Avg |actual wind generation - hour ahead actual wind generation| / Wind Capacity  
**Bias** - Avg (actual wind generation - hour ahead forecast wind generation) / Wind Capacity



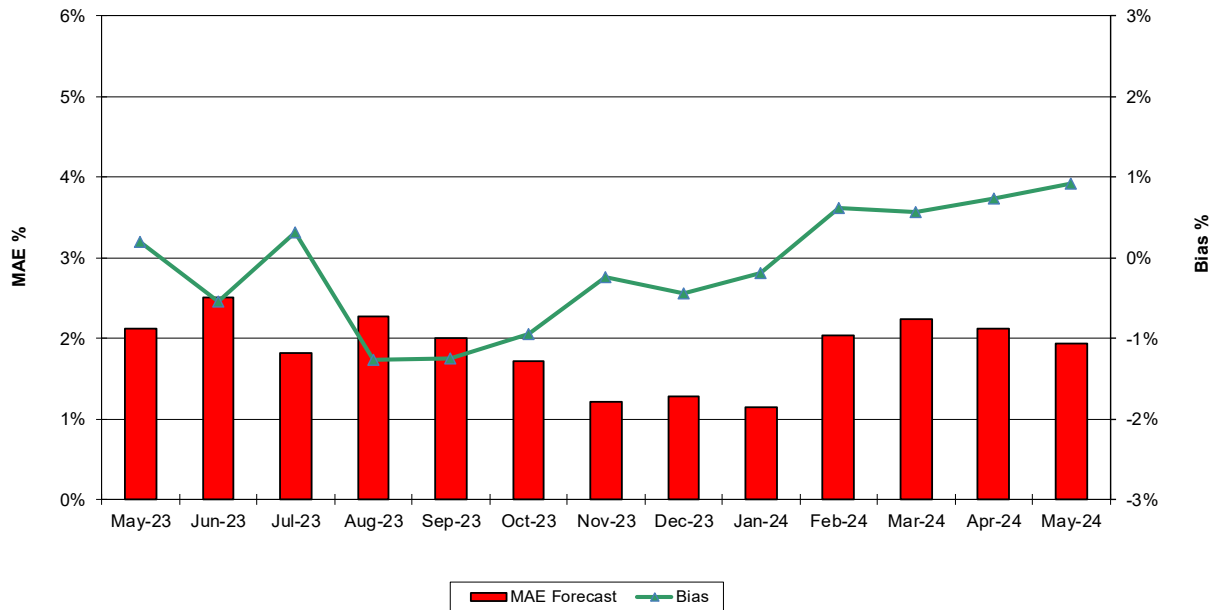






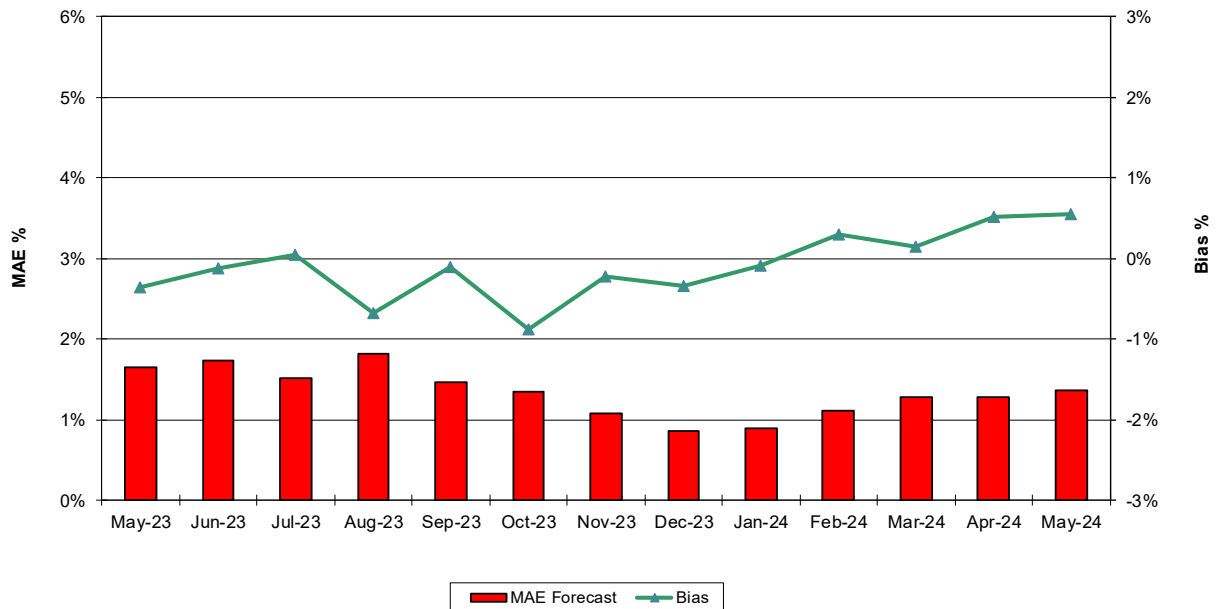


### Behind the Meter Solar Forecast Performance Day Ahead Percent Error



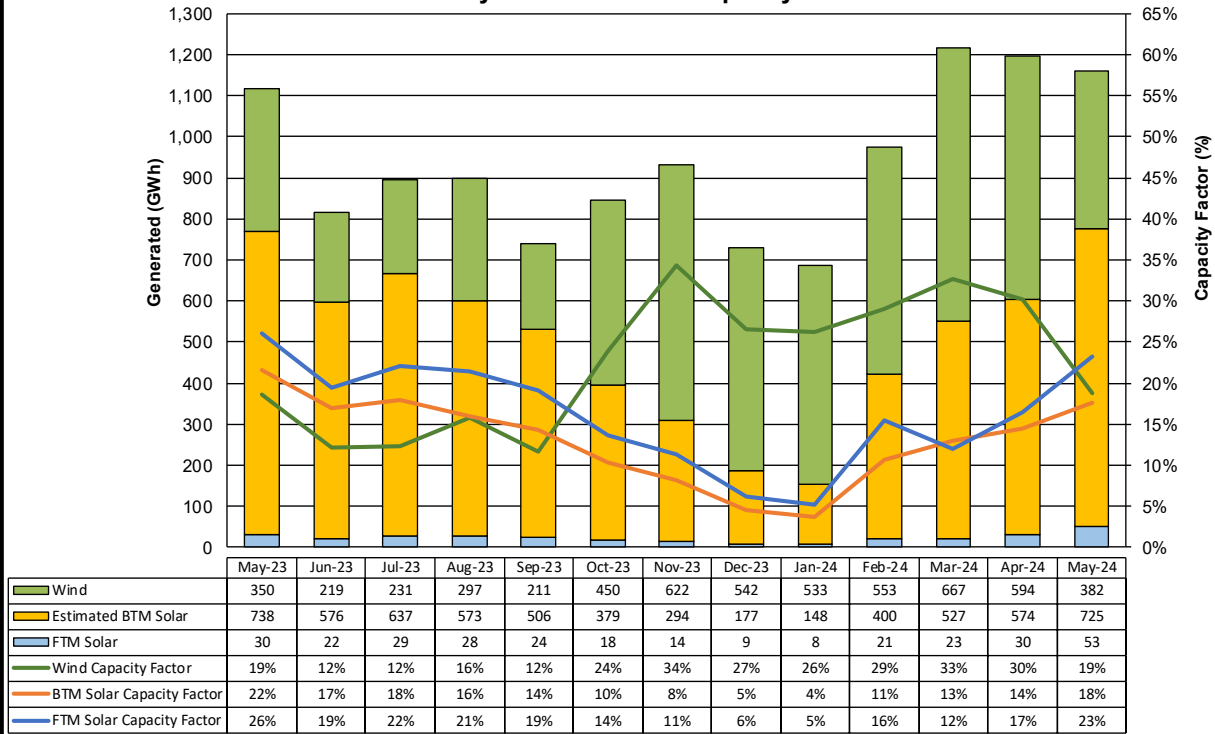
**MAE Forecast** - Avg |est. actual solar generation - Day Ahead forecast solar generation| / Solar Capacity  
**Bias** - Avg (est. actual solar generation - Day Ahead forecast solar generation) / Solar Capacity

### Behind the Meter Solar Forecast Performance Hour Ahead Percent Error



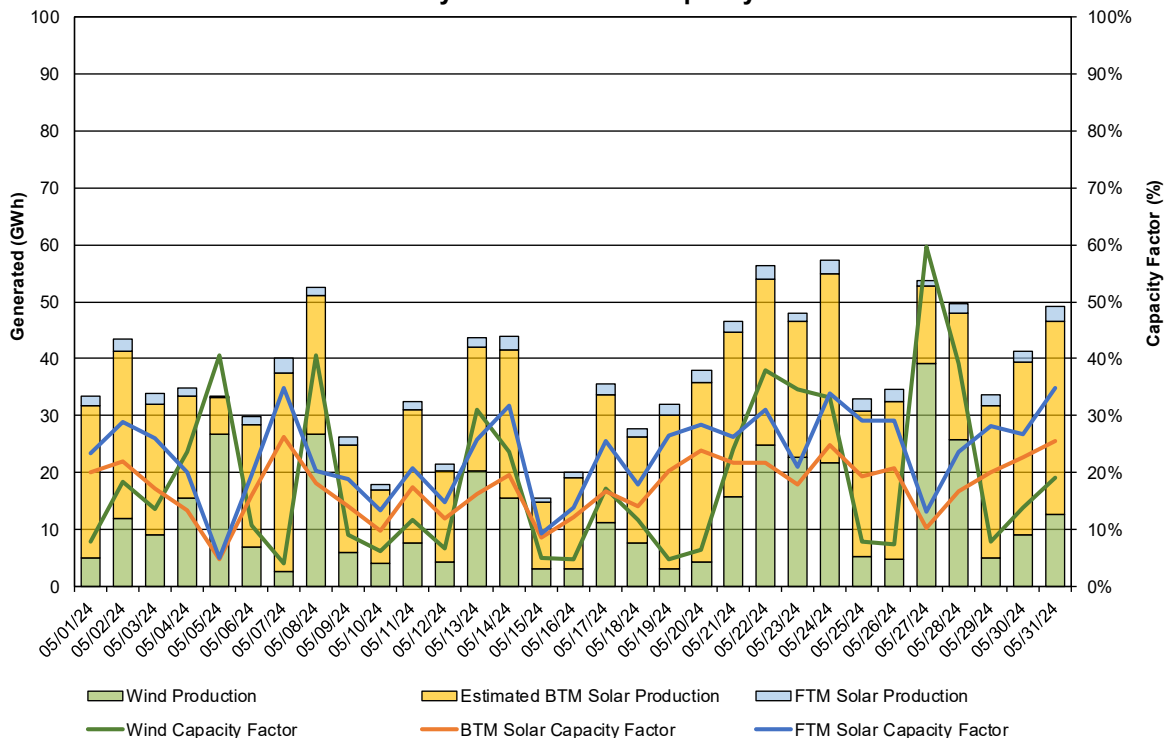
**MAE Forecast** - Avg |est. actual solar generation - Hour Ahead forecast solar generation| / Solar Capacity  
**Bias** - Avg (est. actual solar generation - Hour Ahead forecast solar generation) / Solar Capacity

### Net Wind and Solar Performance Total Monthly Production and Capacity Factors

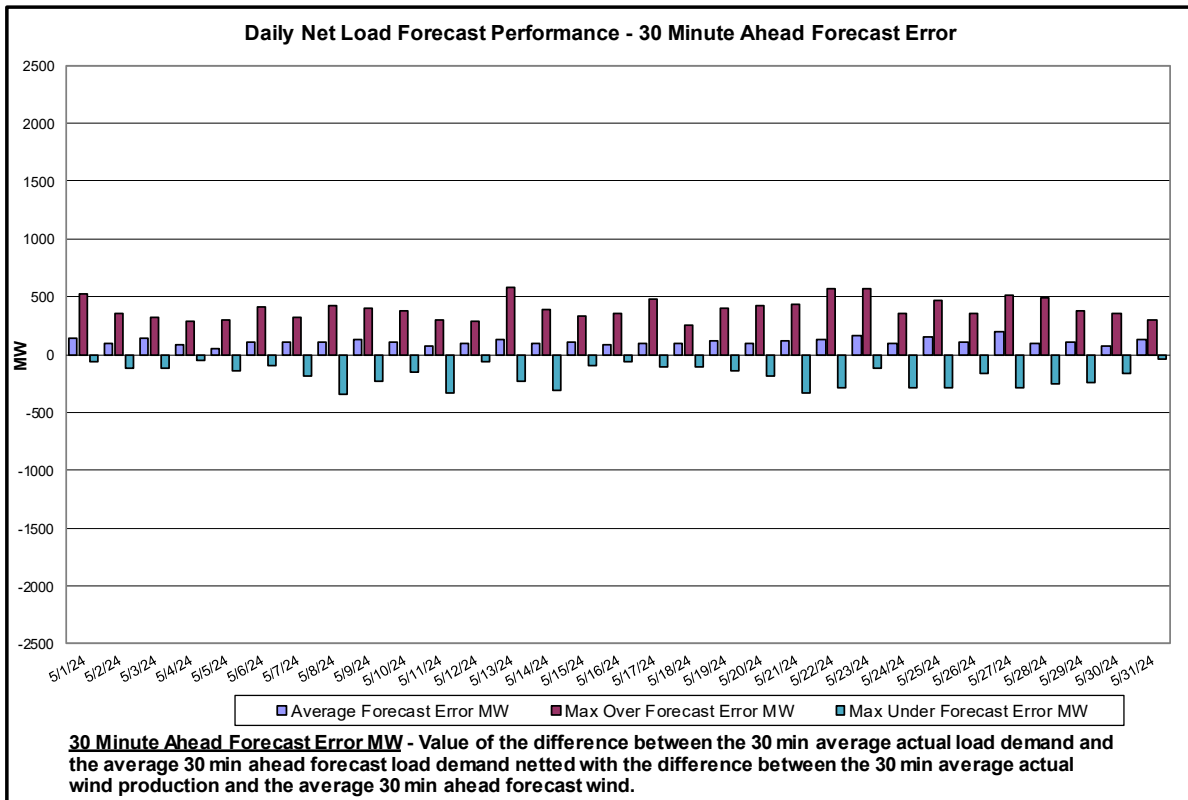
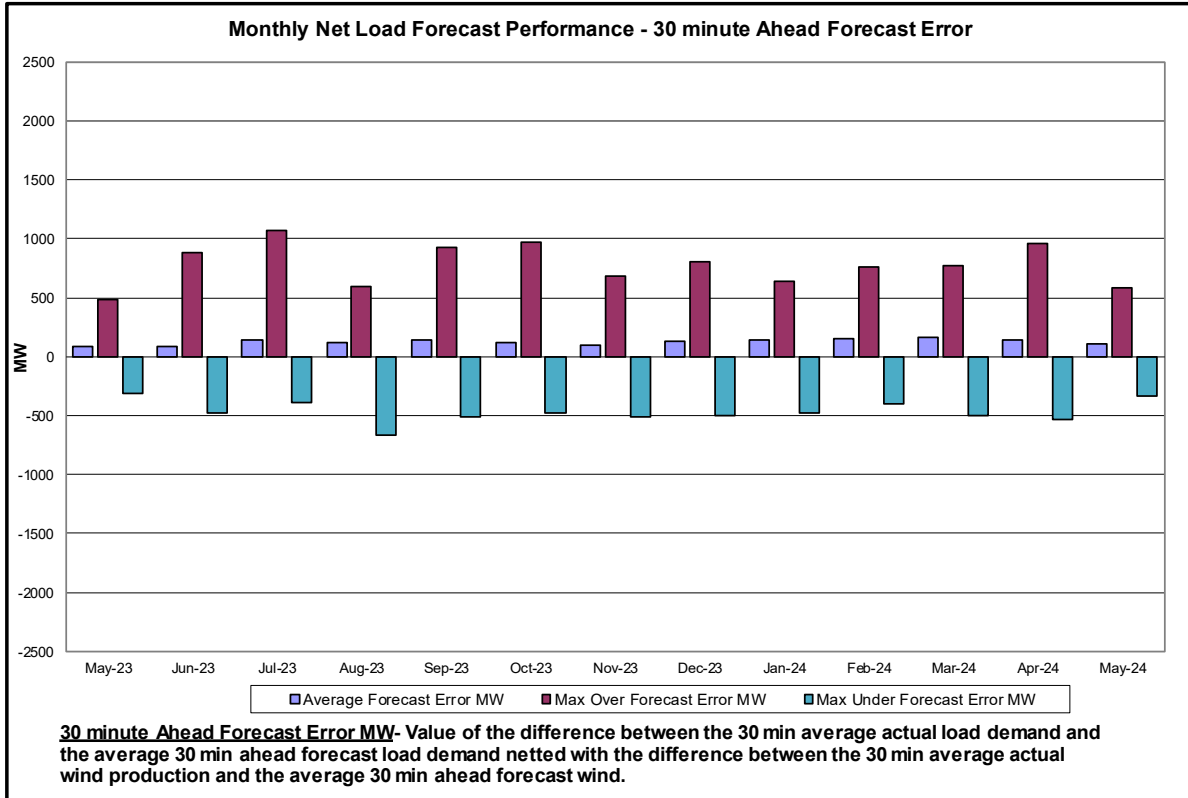


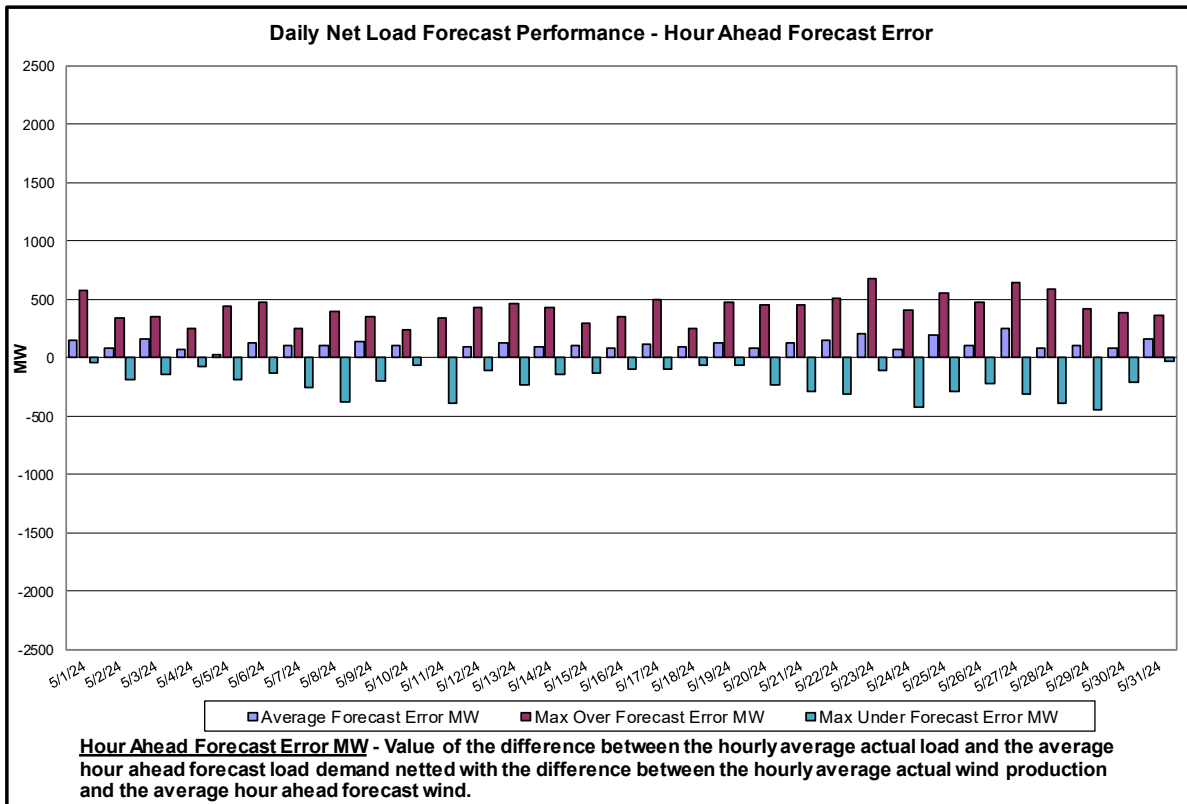
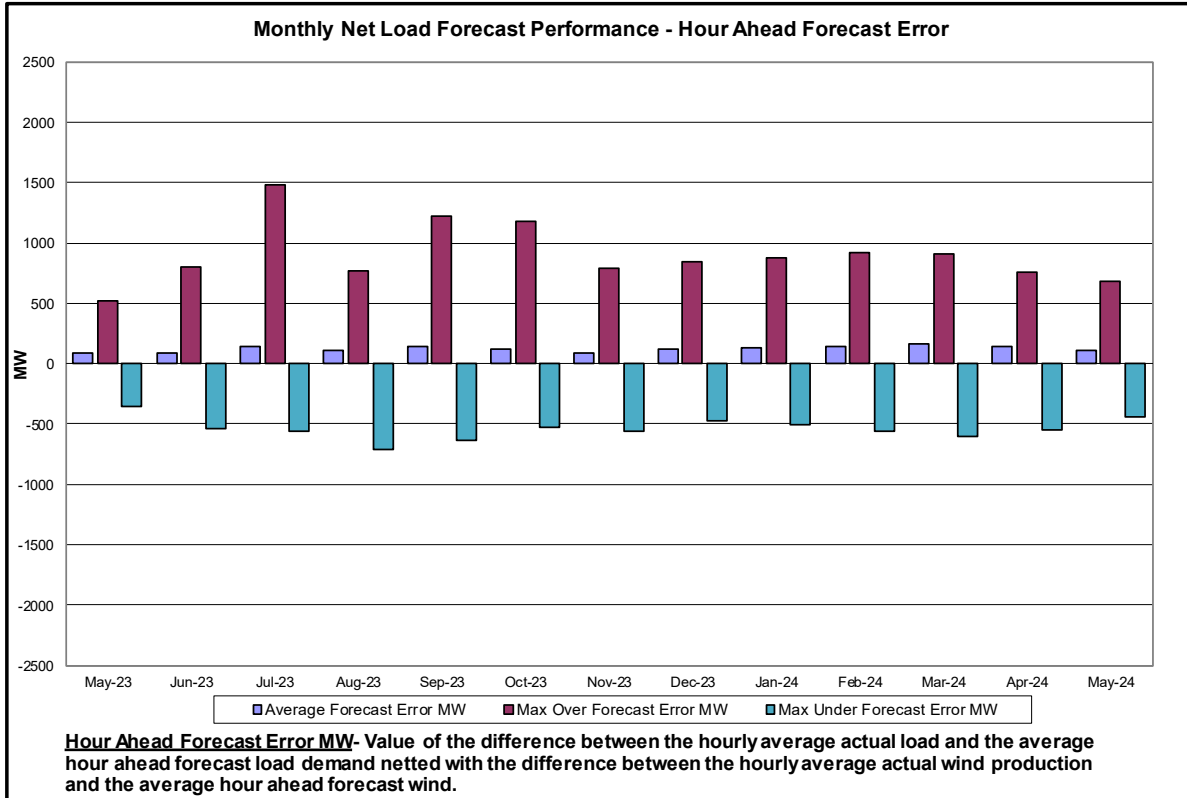
Capacity Factor - Total Monthly Generated MWh/Rated Nameplate Power Capacity

### Net Wind and Solar Performance Total Daily Production and Capacity Factors

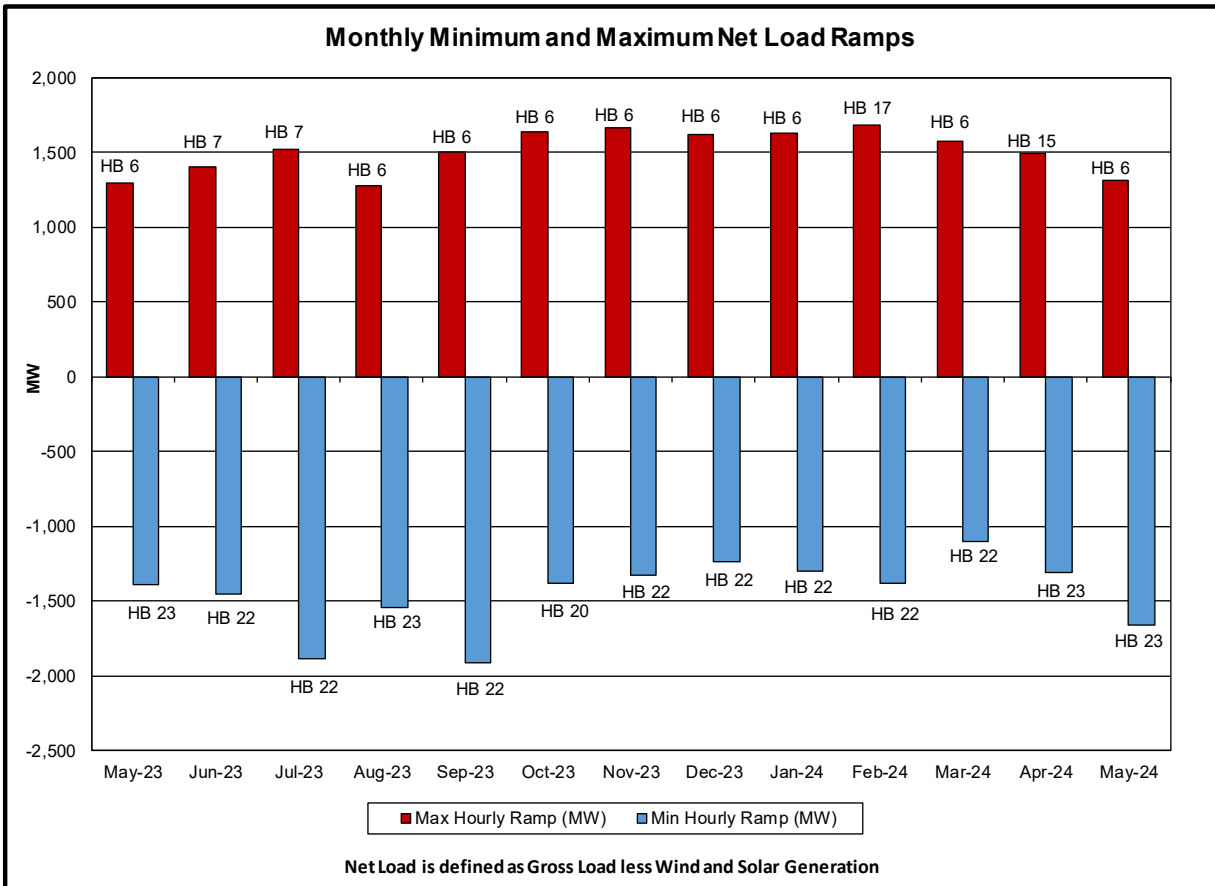
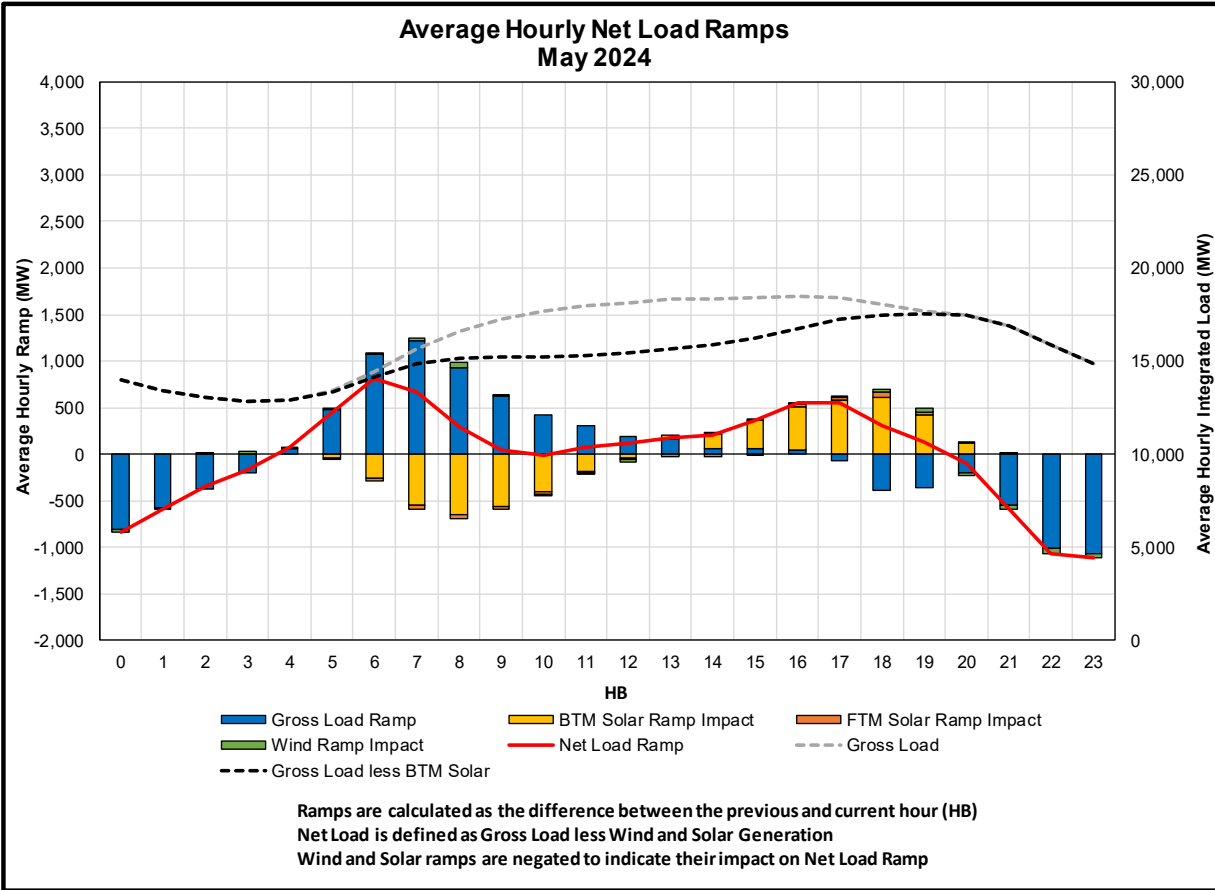


Capacity Factor - Total Daily Generated MWh/Rated Nameplate Power Capacity

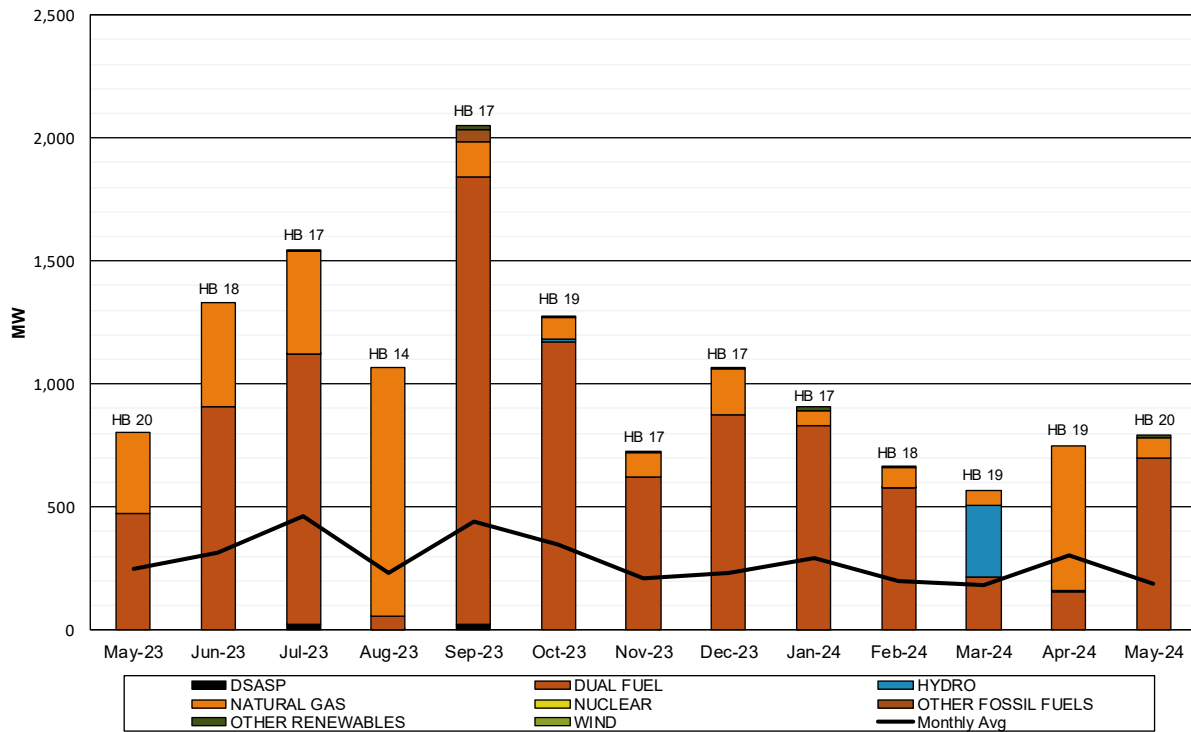








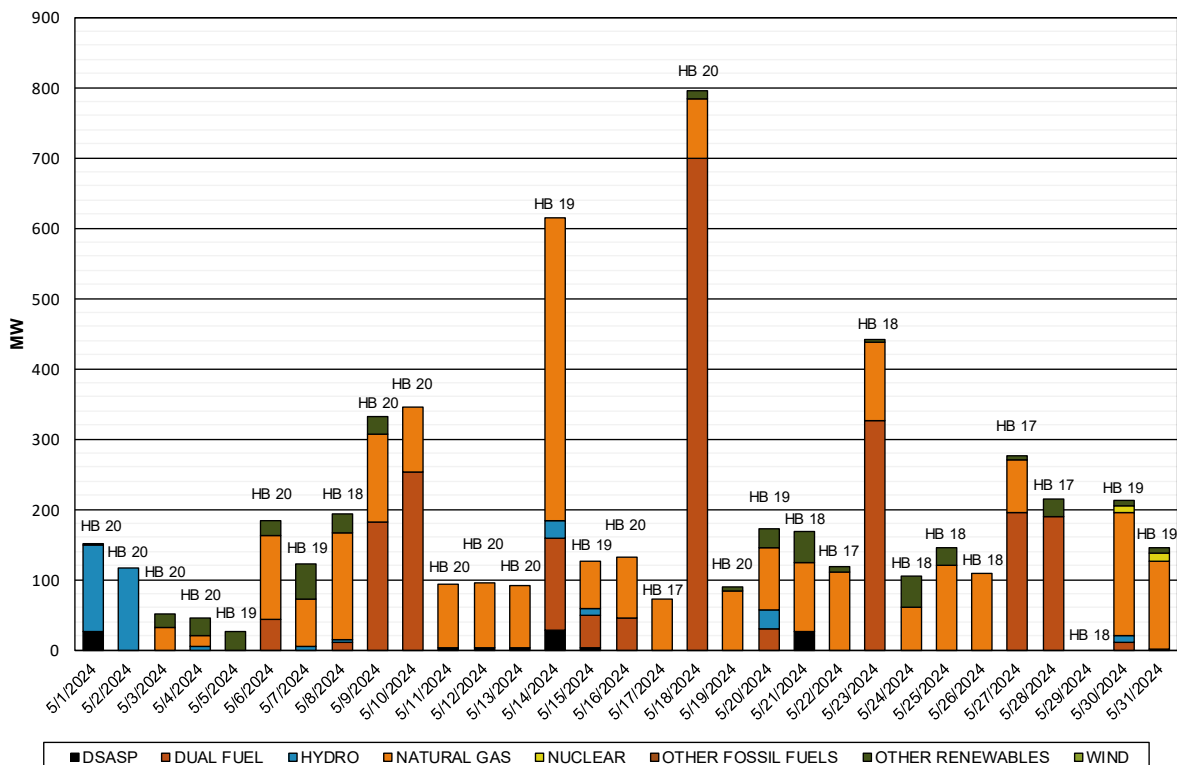
### Monthly Maximum Day-Ahead Market Capacity Unavailable In Real Time



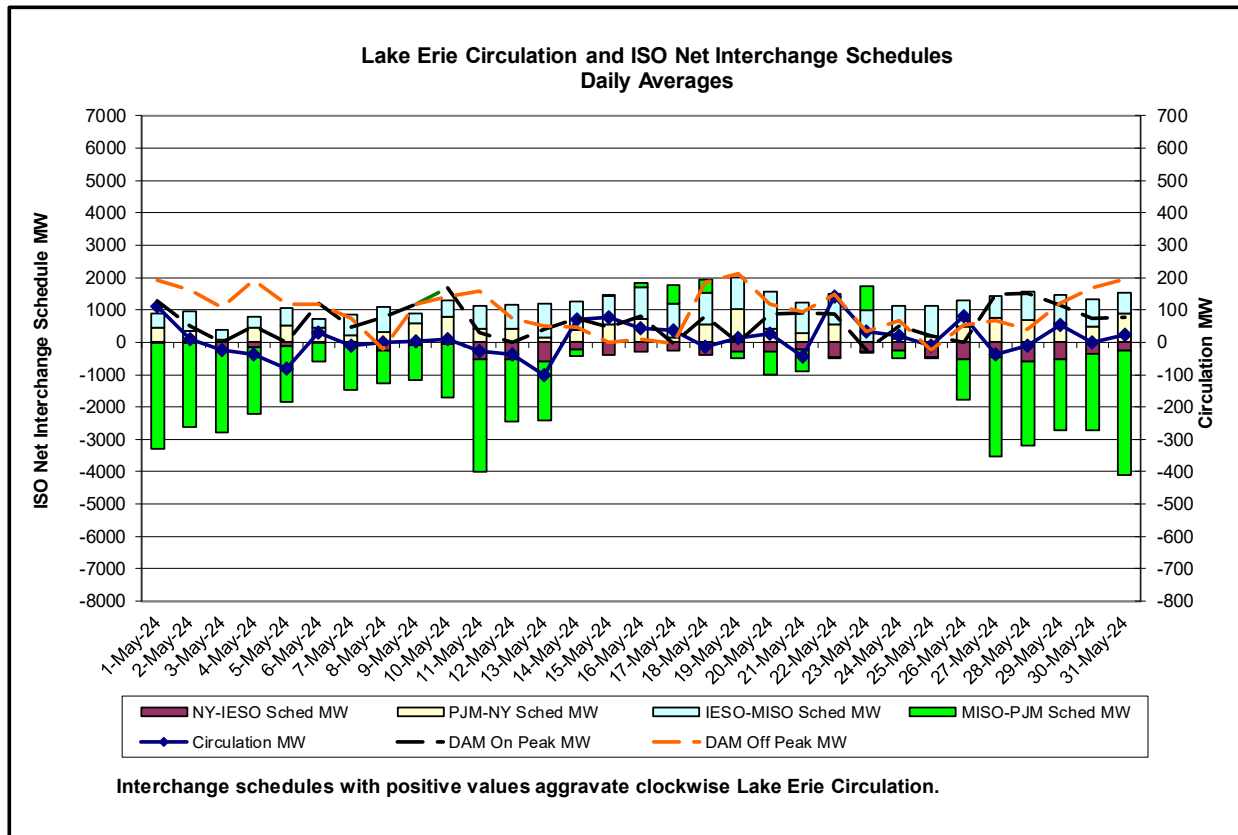
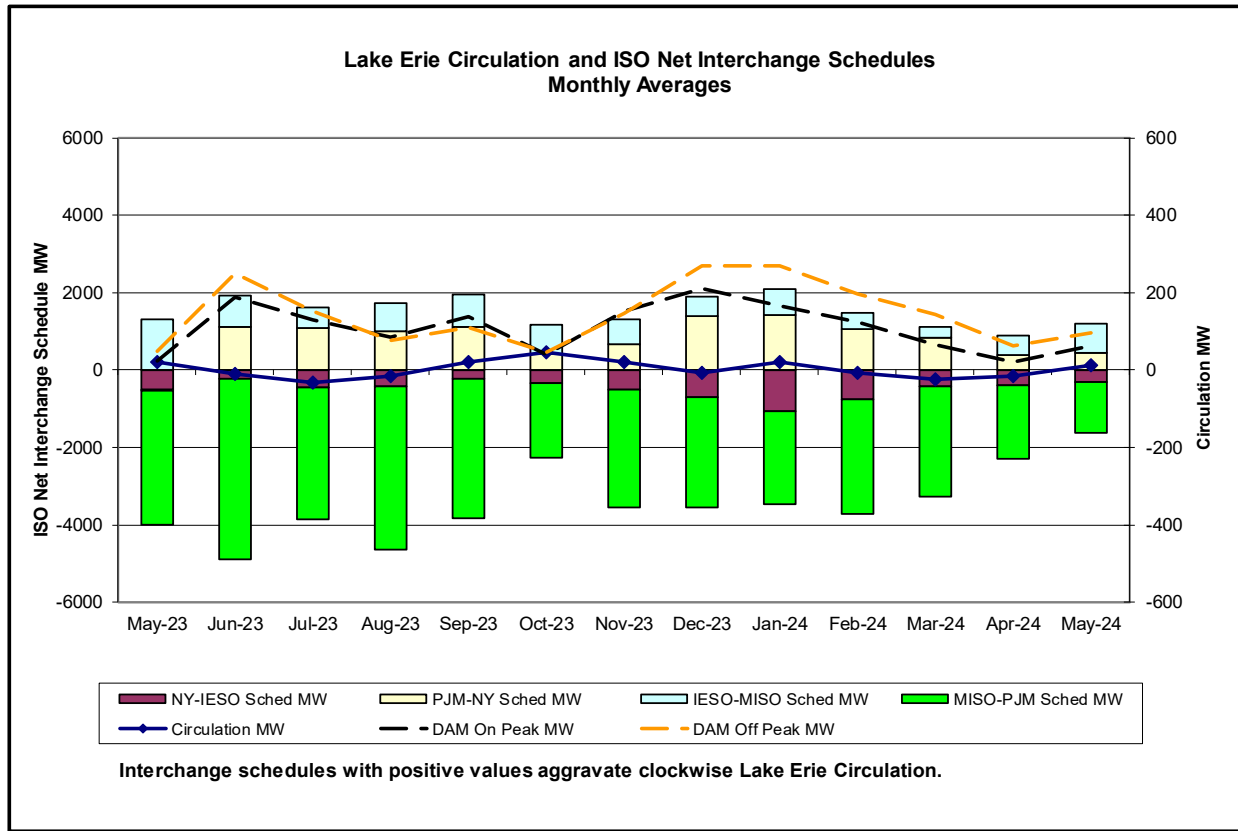
Unavailable Capacity is calculated as the difference of Day-Ahead Market (DAM) capacity relative to Real-Time (RT) capacity during RT peak load hour.

The Monthly Maximum is the day with the largest observed deficit during RT peak load hour.

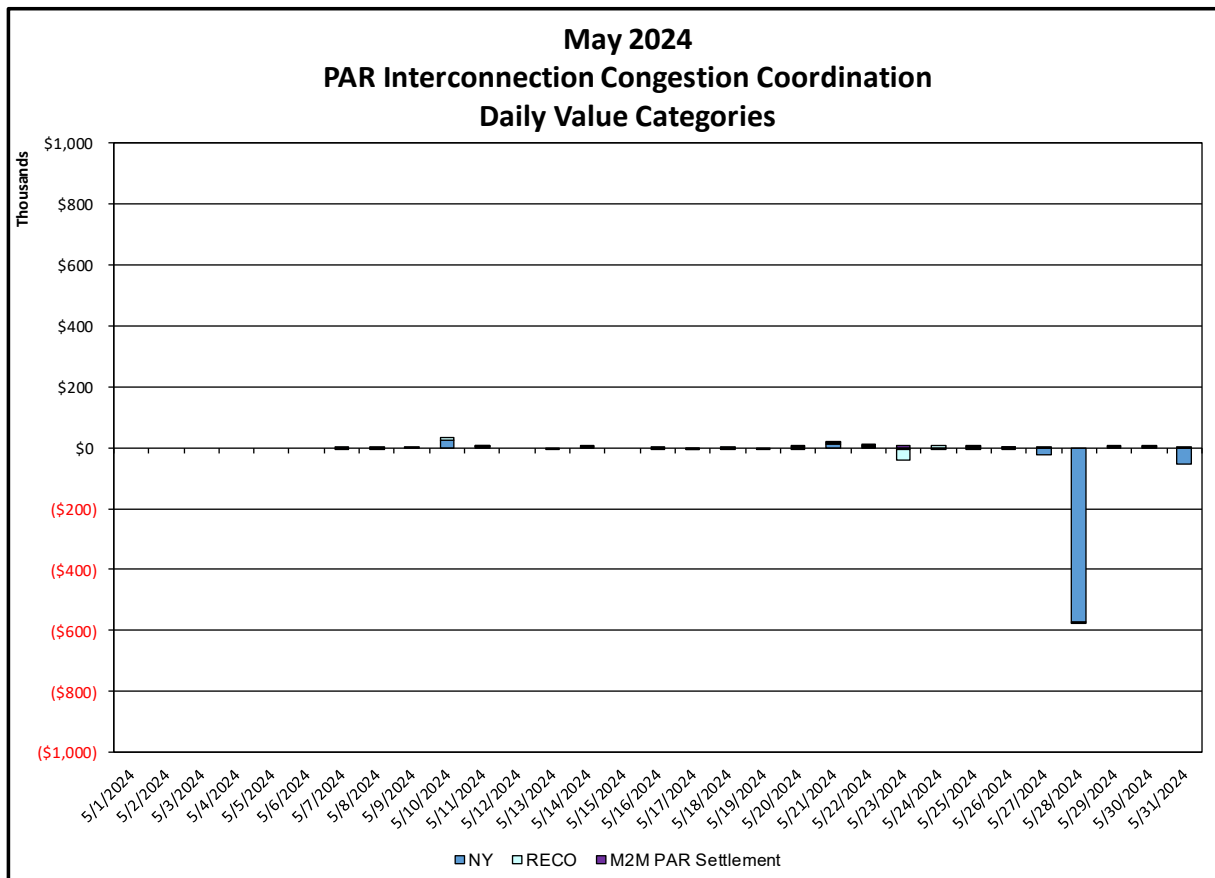
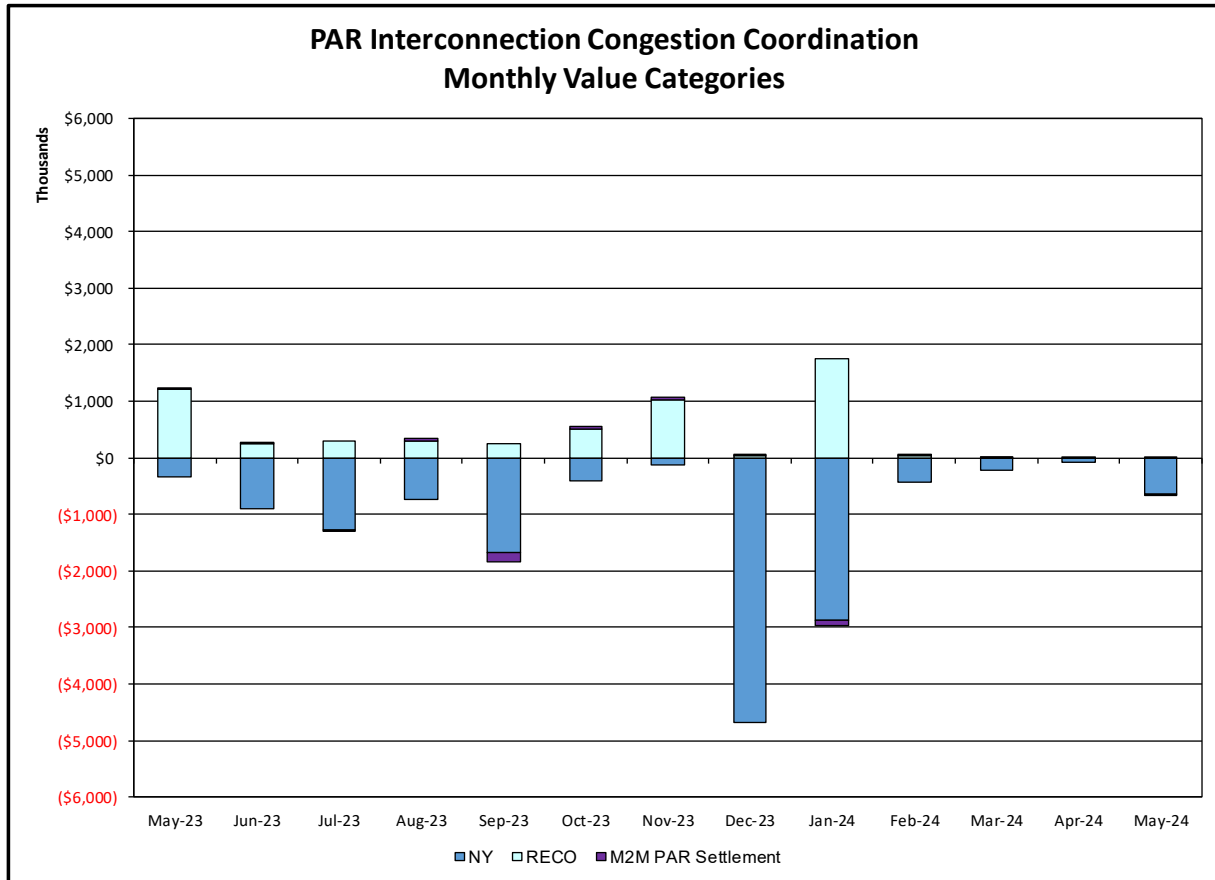
### Daily Day-Ahead Market Capacity Unavailable In Real Time



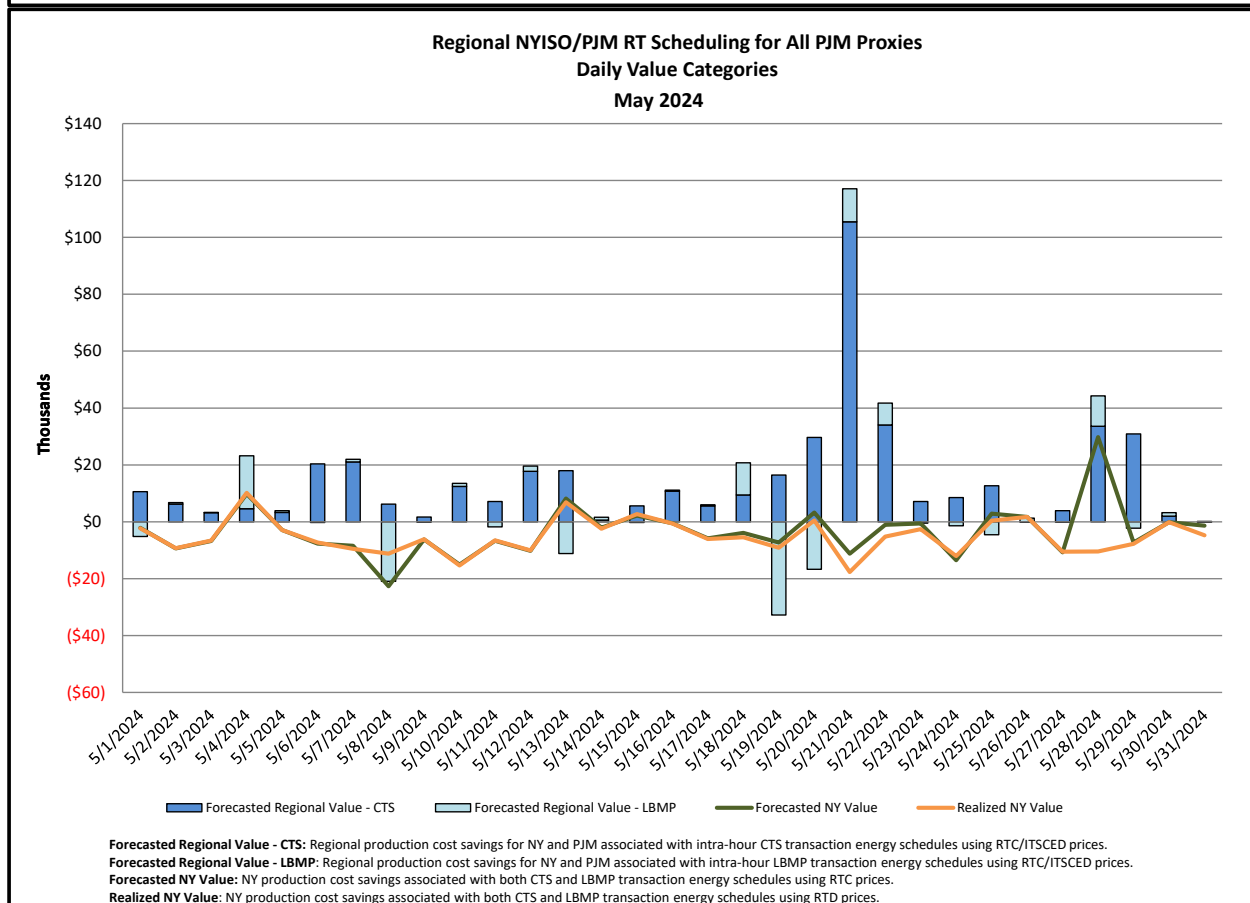
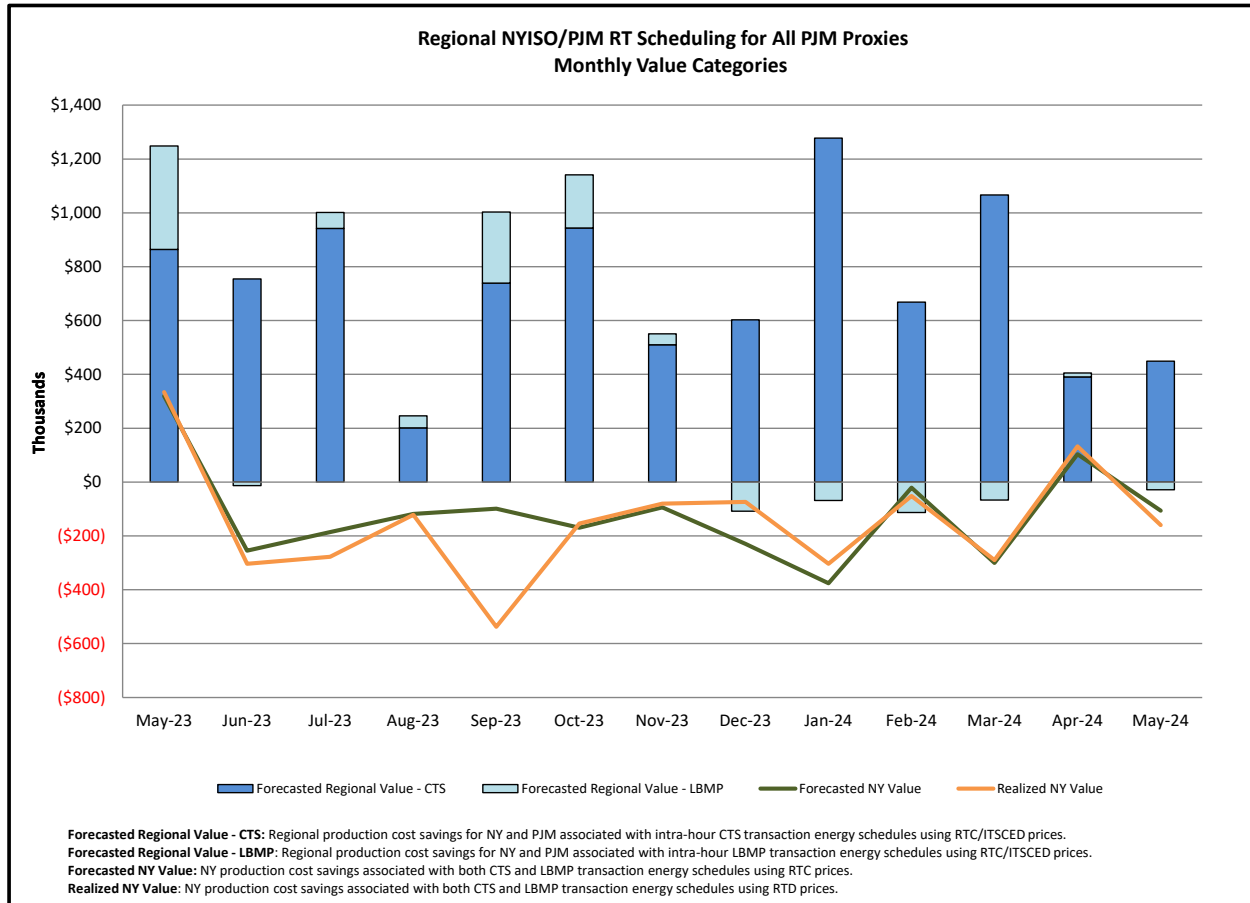
Unavailable Capacity is calculated as the difference of Day-Ahead Market (DAM) capacity relative to Real-Time (RT) capacity during RT peak load hour.



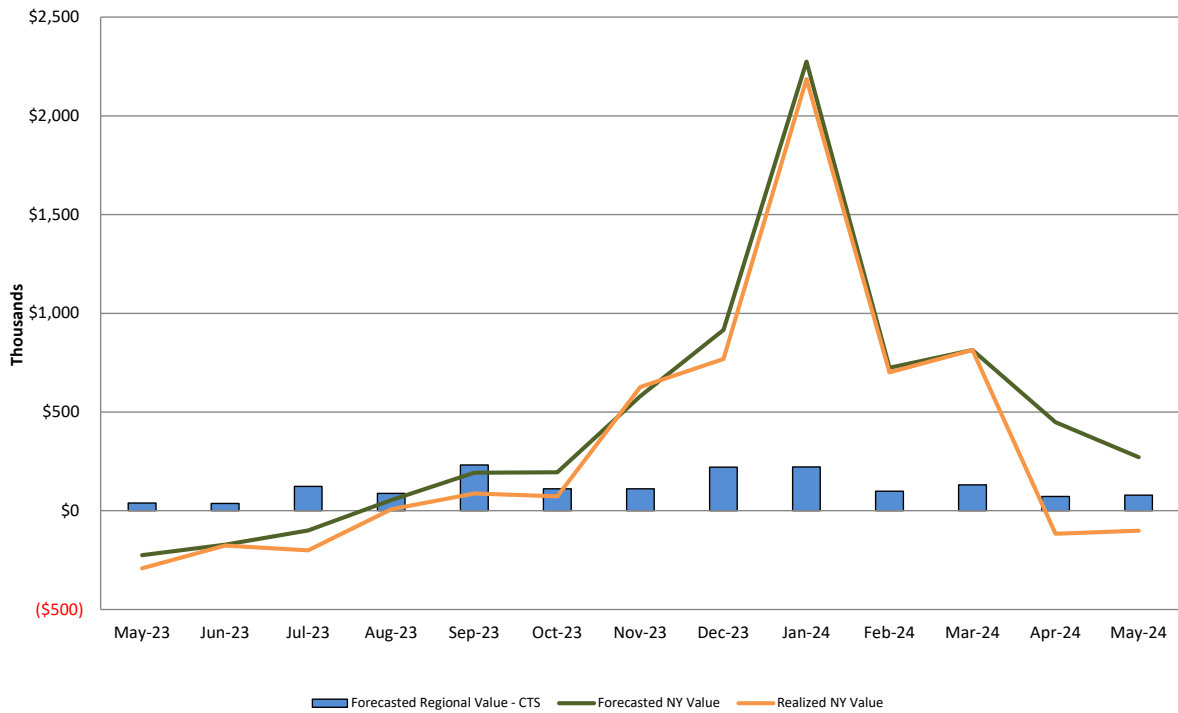
## Broader Regional Market Performance Metrics



<b><u>PAR Interconnection Congestion Coordination</u></b>	
<b><u>Category</u></b>	<b><u>Description</u></b>
<b>NY</b>	Represents the value NY realizes from Market-to-Market PAR Coordination when experiencing congestion. This is the estimated savings to NY for additional deliveries into NY
<b>RECO</b>	Represents the value of PJM's obligation to deliver 80% of service to RECO load over Ramapo 5018. This is the estimated reduction in NYCA congestion due to the PJM delivery of RECO over Ramapo 5018.
<b>M2M PAR Settlement</b>	Market-to-Market PAR Coordination settlement on coordinated flowgates. Through April 2017 this value was included in the NY and RECO categories. The positive sign convention indicates settlement to NY while the negative indicates settlement to PJM.

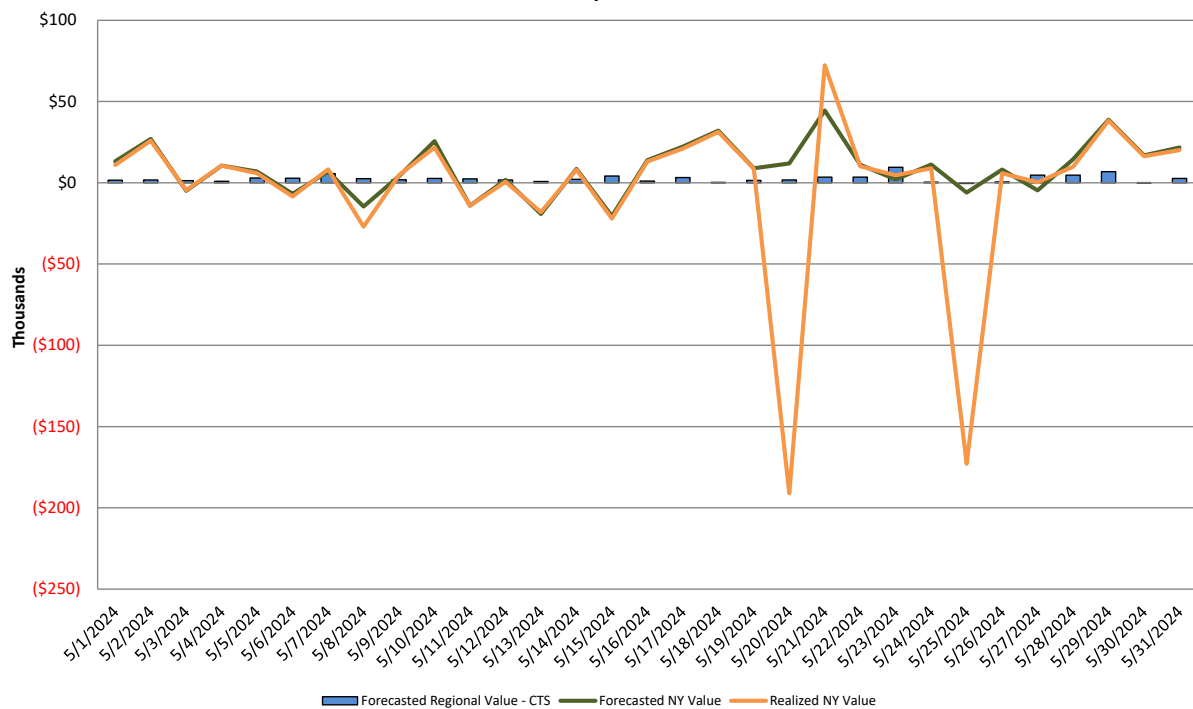


### Regional NYISO/NE RT Scheduling for ISO-NE AC Monthly Value Categories



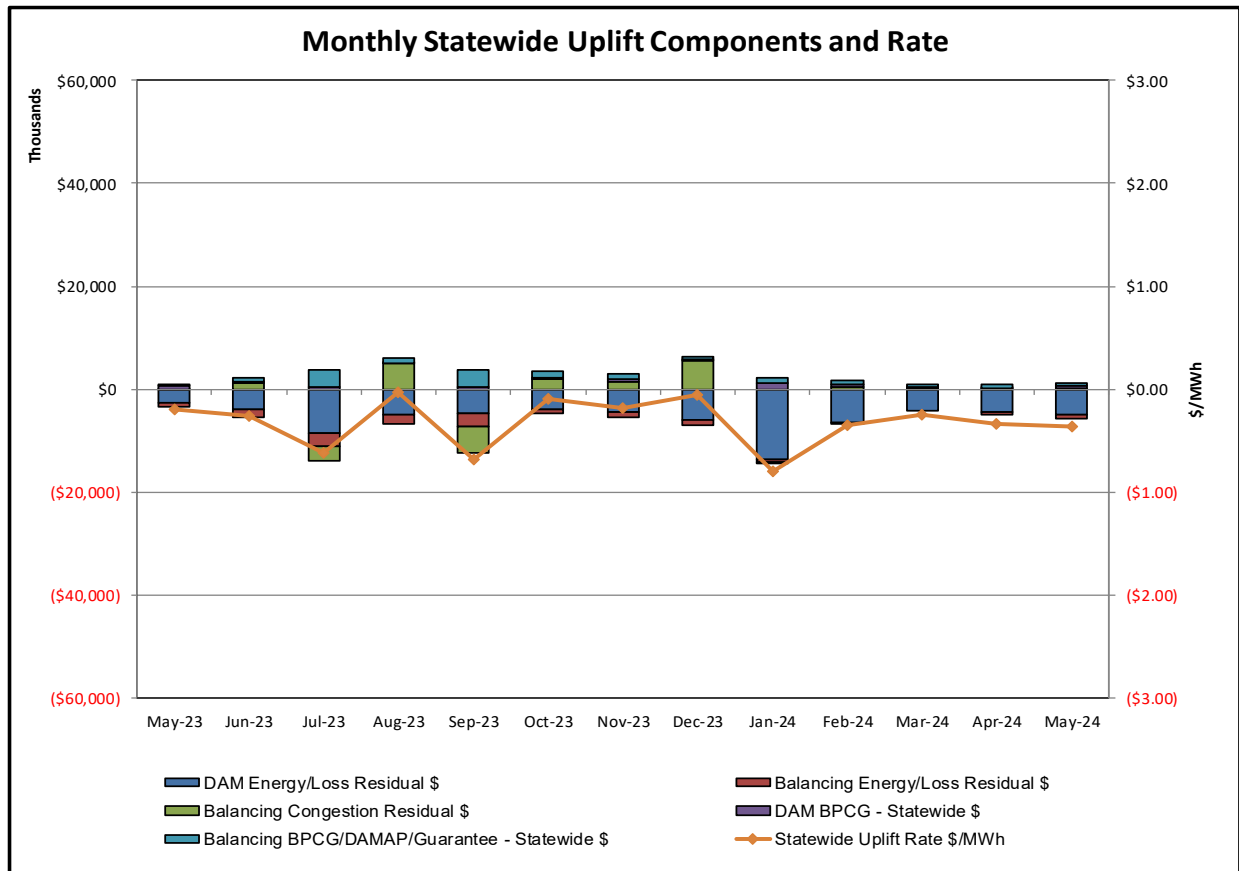
**Forecasted Regional Value - CTS:** Regional production cost savings for NY and NE associated with intra-hour CTS transaction energy schedules using RTC prices and NE forecasted prices.  
**Forecasted NY Value:** NY production cost savings associated with CTS transaction energy schedules using RTC prices.  
**Realized NY Value:** NY production cost savings associated with CTS transaction energy schedules using RTD prices.

### Regional NYISO/NE RT Scheduling for ISO-NE AC Daily Value Categories May 2024

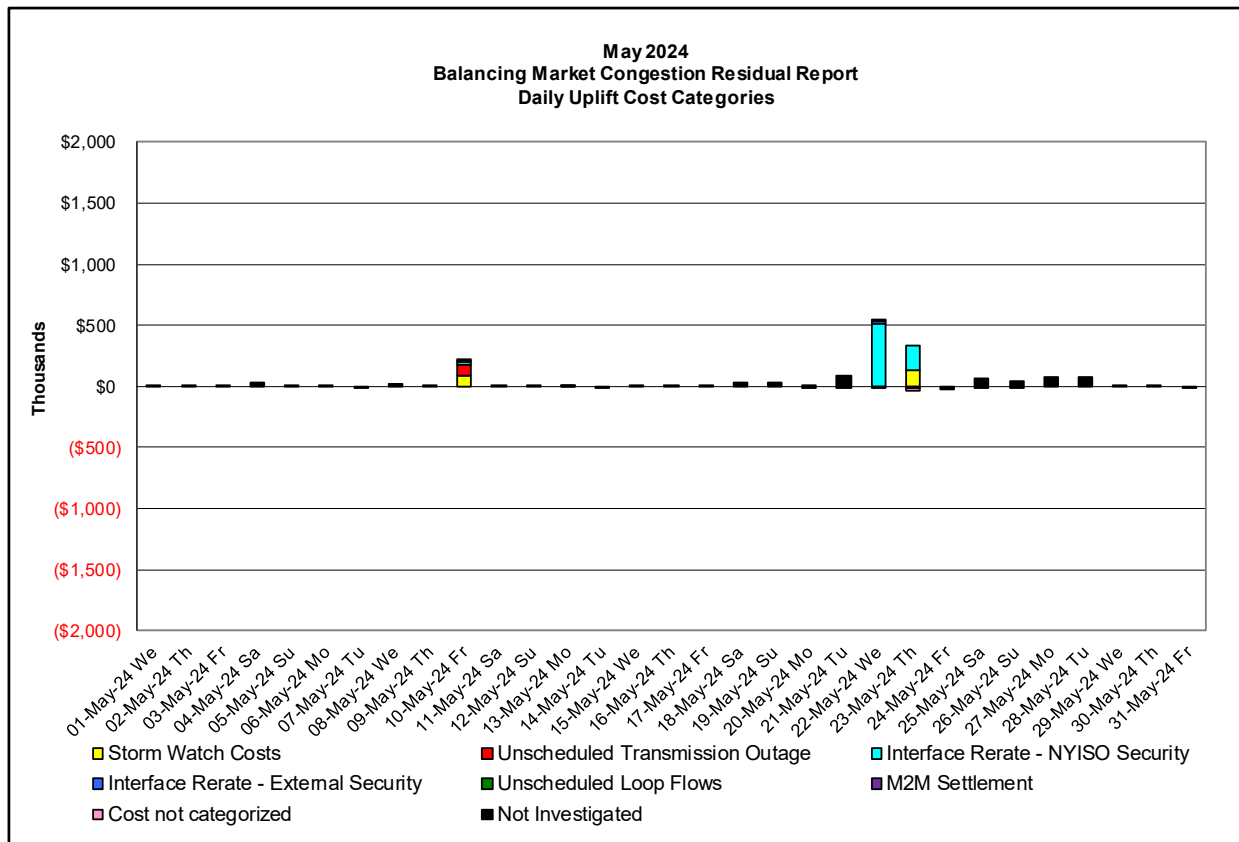
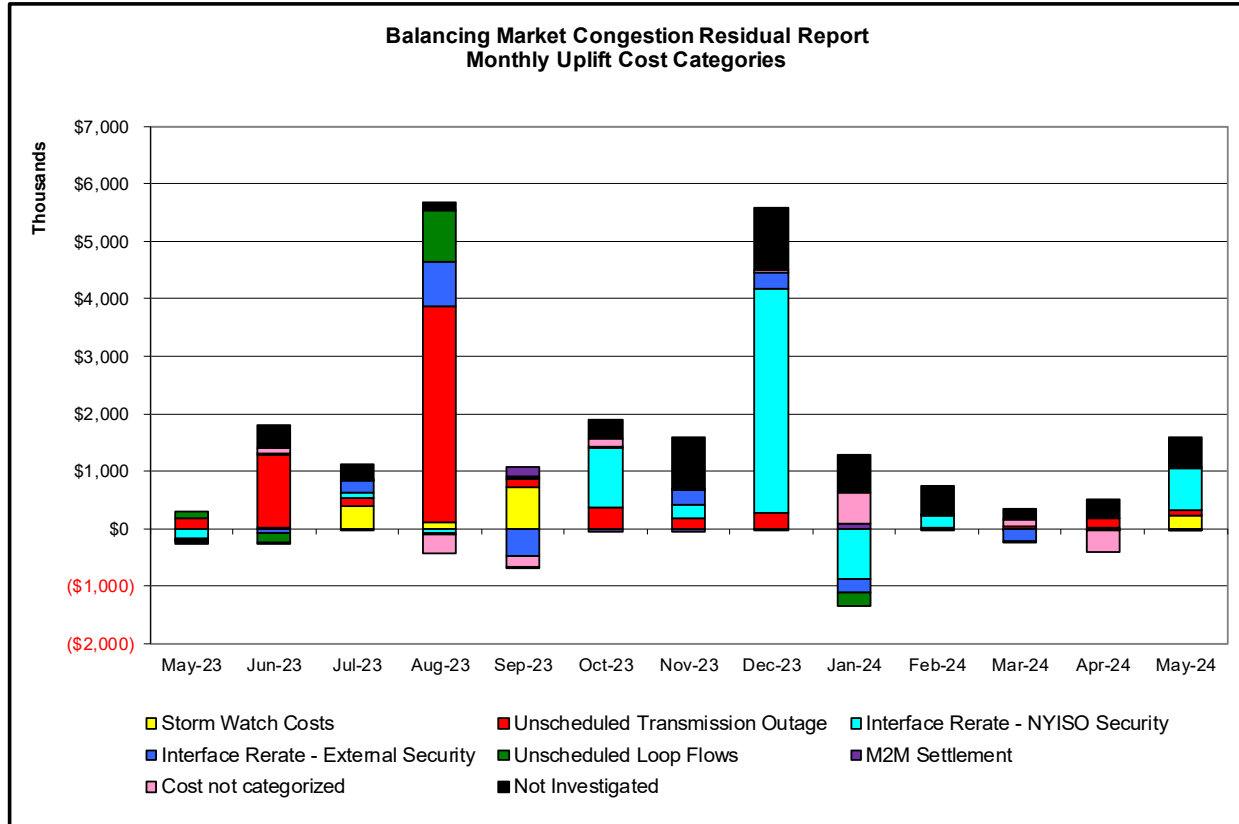


**Forecasted Regional Value - CTS:** Regional production cost savings for NY and NE associated with intra-hour CTS transaction energy schedules using RTC prices and NE forecasted prices.  
**Forecasted NY Value:** NY production cost savings associated with CTS transaction energy schedules using RTC prices.  
**Realized NY Value:** NY production cost savings associated with CTS transaction energy schedules using RTD prices.

## Market Performance Metrics







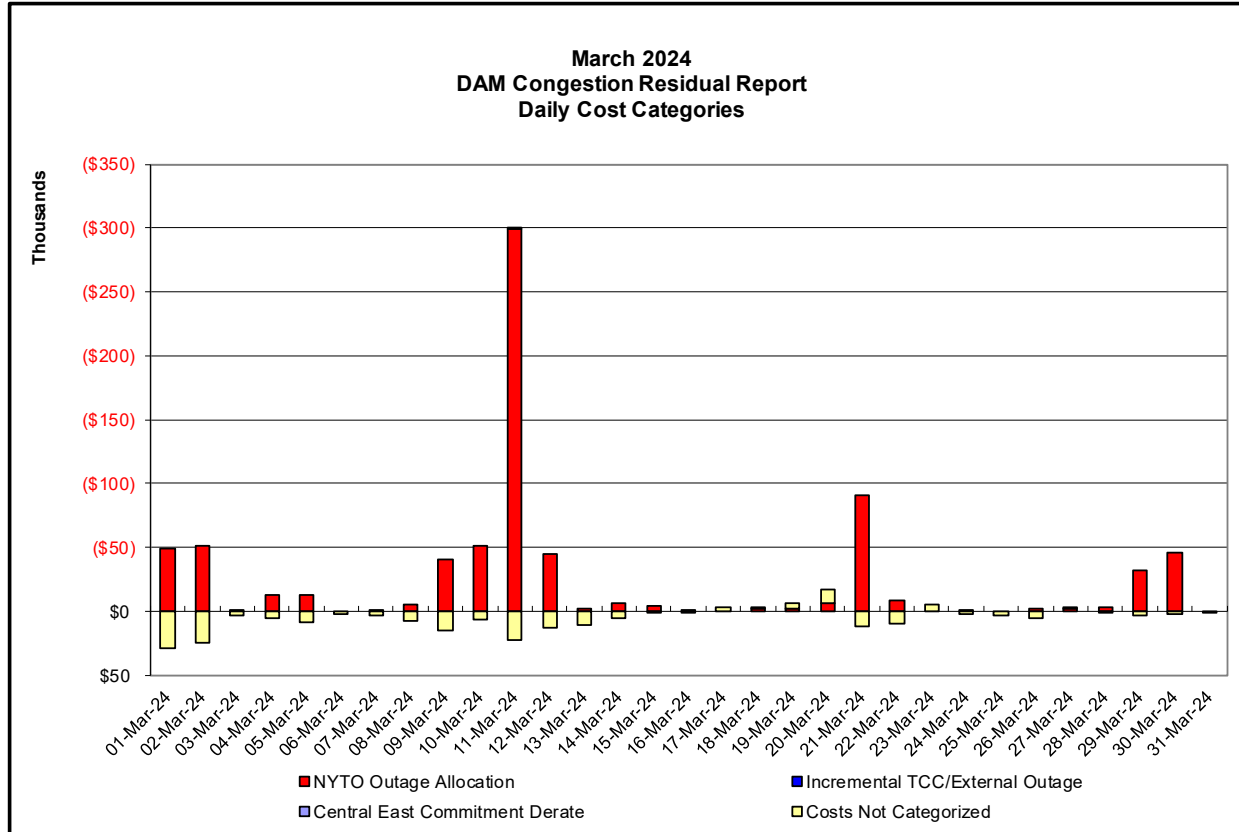
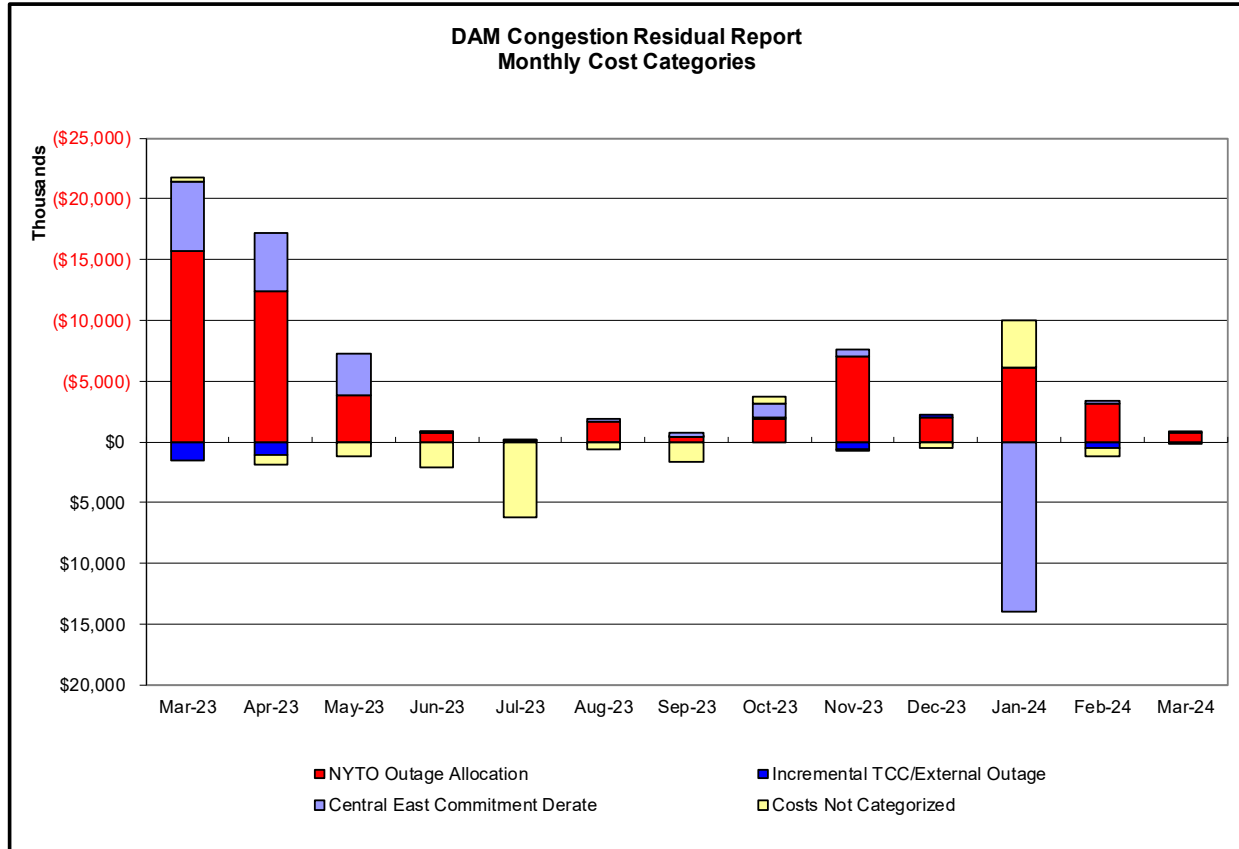
Day's investigated in May: 10, 22, 23			
Event	Date (yyyymmdd)	Hours	Description
	5/10/2024	17-20	Thunder Storm Alert, Buchanan North 345/138kV (#TA5)
	5/10/2024	17-19	Forced Outage East Garden City - Newbridge 138kV (#463)
	5/10/2024	11, 17-19	Forced Outage Valley Stream - East Garden City 138kV (#261)
	5/10/2024	11	Derate Dunwoodie-ShoreRd 345kV (#Y50) I/o NEPTUNE HVDC TIE LINE
	5/10/2024	18	Derate GordonRd-Rotterdam 230kV (#31) I/o SIN:GORDONRD 30 & TR-G1
	5/10/2024	18	Derate N.Troy-Sycaway 115kV (#16) I/o BUS:ROTTDAM 99H&31&38&BK&G3&C
	5/10/2024	19, 20	Derate Scriba-Volney 345kV (#20) I/o Scriba-Volney 345kV (#21)
	5/10/2024	18	Derate ShoreRd 345/138kV (#BK2) I/o NEPTUNE HVDC TIE LINE
	5/10/2024	19	NE AC Active DNI Ramp Limit
	5/10/2024	18	NE AC-NY Scheduling Limit
	5/10/2024	19	PJM AC Active DNI Ramp Limit
	5/22/2024	20	NYCA DNI Ramp Limit
	5/22/2024	8	Derate Barrett-Freeport 138kV (#459)
	5/22/2024	20-21	Derate Chases Lake-Porter 230kV (#11) I/o SIN:MSU1&7040& HQ GN&LD PROXY
	5/22/2024	17-18	Derate East Garden City-Valley Stream 138kV (#262) I/o BUS:BARRETT 292&459&G2
	5/22/2024	8-16, 18-22	Derate East Garden City-Valley Stream 138kV (#262) I/o SCB:NEWBRDG(1380)461&BK6+4&R1
	5/22/2024	8-16, 18-22	Derate Freeport-Newbridge 138kV (#461)
	5/22/2024	21	Derate Malone-Willis 115kV (#1-910) I/o Moses-Willis 230kV (#MW1)
	5/22/2024	7-16	Derate West 49th St-Sprainbrook 345kV (#M52)
	5/22/2024	17-20	HQ CEDARS-NY Scheduling Limit
	5/23/2024	7-13	Thunder Storm Alert, Buchanan North 345/138kV (#TA5)
	5/23/2024	0, 1, 7	Derate Barrett-Freeport 138kV (#459)
	5/23/2024	18	Derate Chases Lake-Porter 230kV (#11) I/o SIN:MSU1&7040& HQ GN&LD PROXY
	5/23/2024	12, 13	Derate East Garden City-Newbridge 138kV (#462)
	5/23/2024	10-12	Derate East Garden City-Newbridge 138kV (#462) I/o SCB:EGDNCTY(1380) 465&361
	5/23/2024	9, 10	Derate East Garden City-Valley Stream 138kV (#262)
	5/23/2024	0, 1, 7, 10-13	Derate East Garden City-Valley Stream 138kV (#262) I/o SCB:NEWBRDG(1380)461&BK6+4&R1
	5/23/2024	10-13	Derate Freeport-Newbridge 138kV (#461)
	5/23/2024	9	Derate Freeport-Newbridge 138kV (#461) I/o SCB:EGDNCTY(1330)262&467&BK2
	5/23/2024	18, 19	Derate Malone-Willis 115kV (#1-910) I/o Moses-Willis 230kV (#MW1)
	5/23/2024	0, 1, 7-13	Derate Scriba-Volney 345kV (#20) I/o Scriba-Volney 345kV (#21)

### Real-Time Balancing Market Congestion Residual (Uplift Cost) Categories

Category	Cost Assignment	Events Types	Event Examples
Storm Watch	Zone J	Thunderstorm Alert (TSA)	TSA Activations
Transmission Outage Mismatch	Market-wide	Changes in DAM to RTM transfers related to transmission outage mismatch	Forced Line Outage, Unit AVR Outages, Early Line Return from Outage
Interface/Facility Rerate - NYISO Security	Market-wide	Changes in DAM to RTM transfers not related to transmission outage	Interface/Facility Rerates due to RTM voltages
Interface Rerate - External Security	Market-wide	Changes in DAM to RTM transfers related to External Control Area Security Events	TLR Events, External Transaction Curtailments
Unscheduled Loop Flows	Market-wide	Changes in DAM to RTM unscheduled loop flows impacting NYISO Interface transmission constraints	DAM to RTM Lake Erie Loop Flows exceeding +/- 125 MW
M2M Settlement	Market-wide	Settlement result inclusive of coordinated redispatch and Ramapo flowgates	

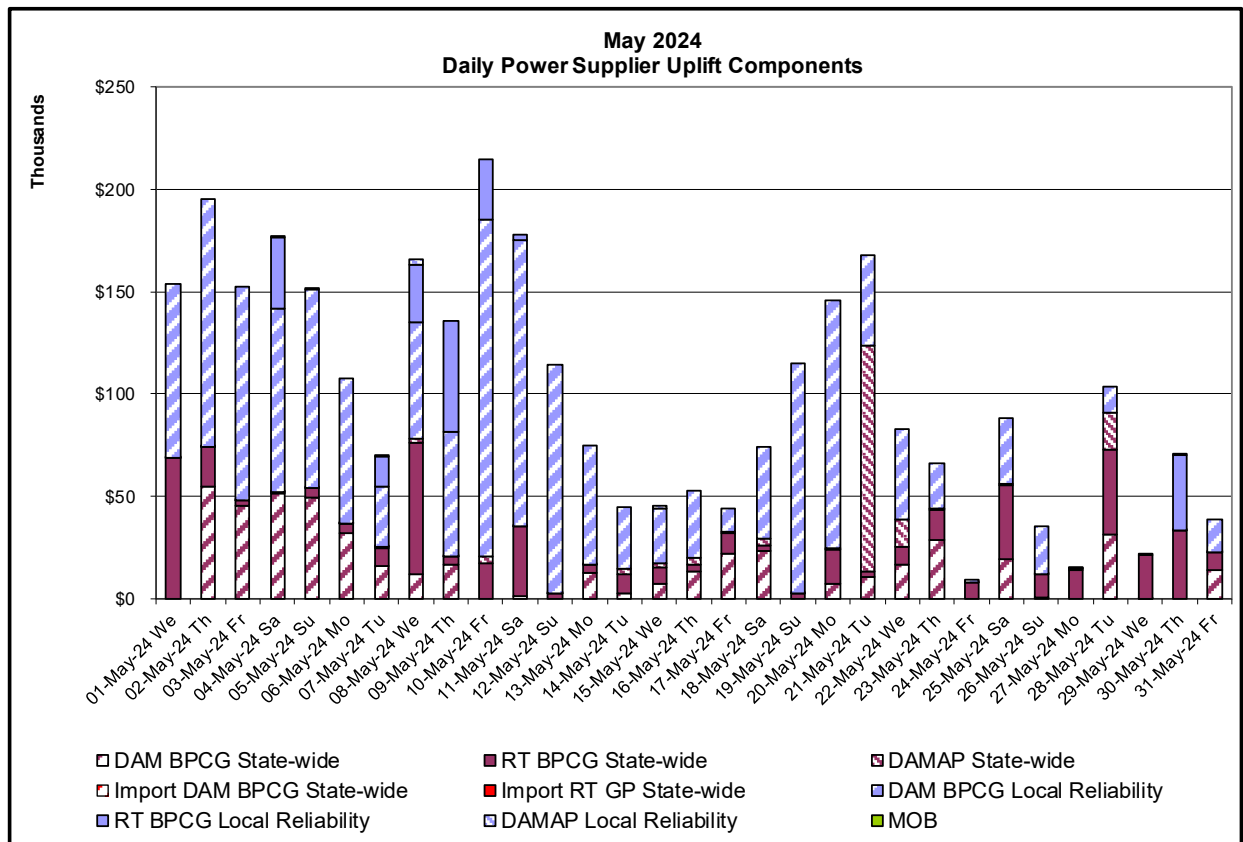
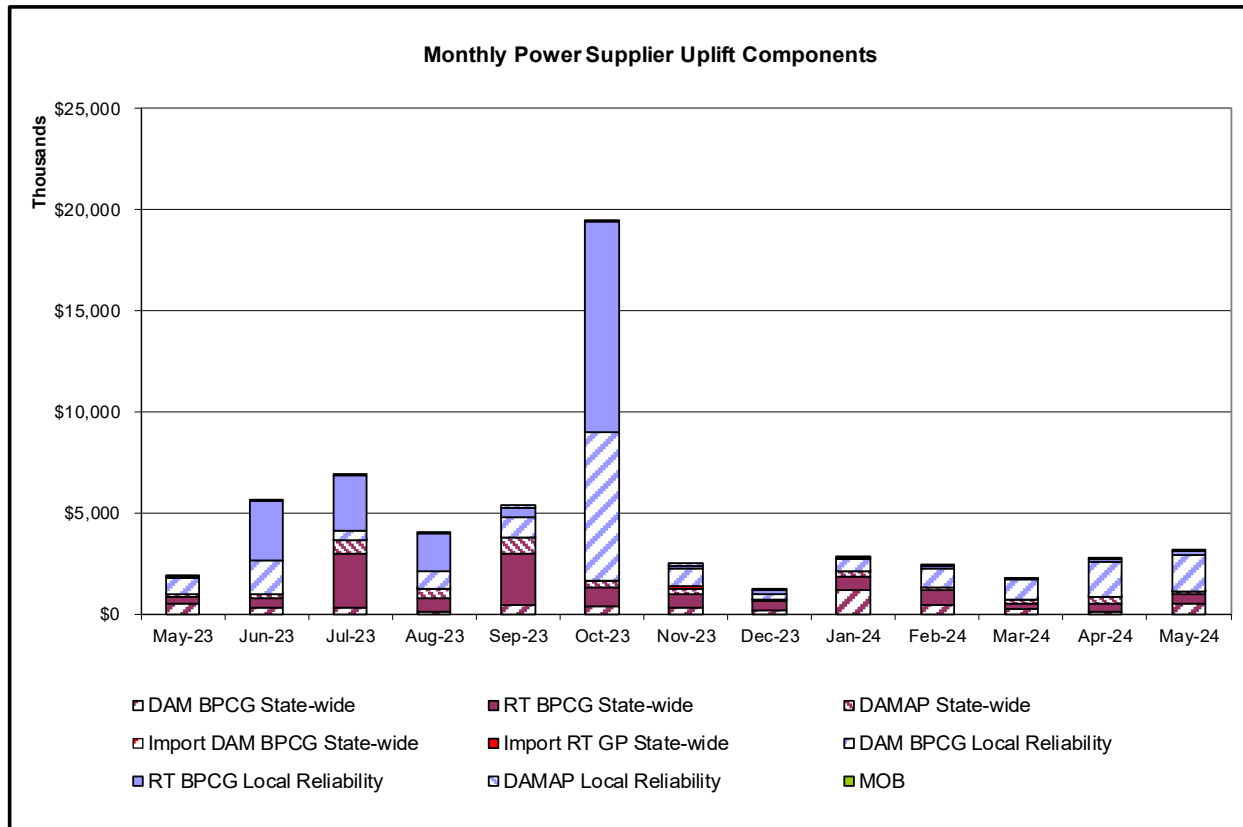
#### Monthly Balancing Market Congestion Report Assumptions/Notes

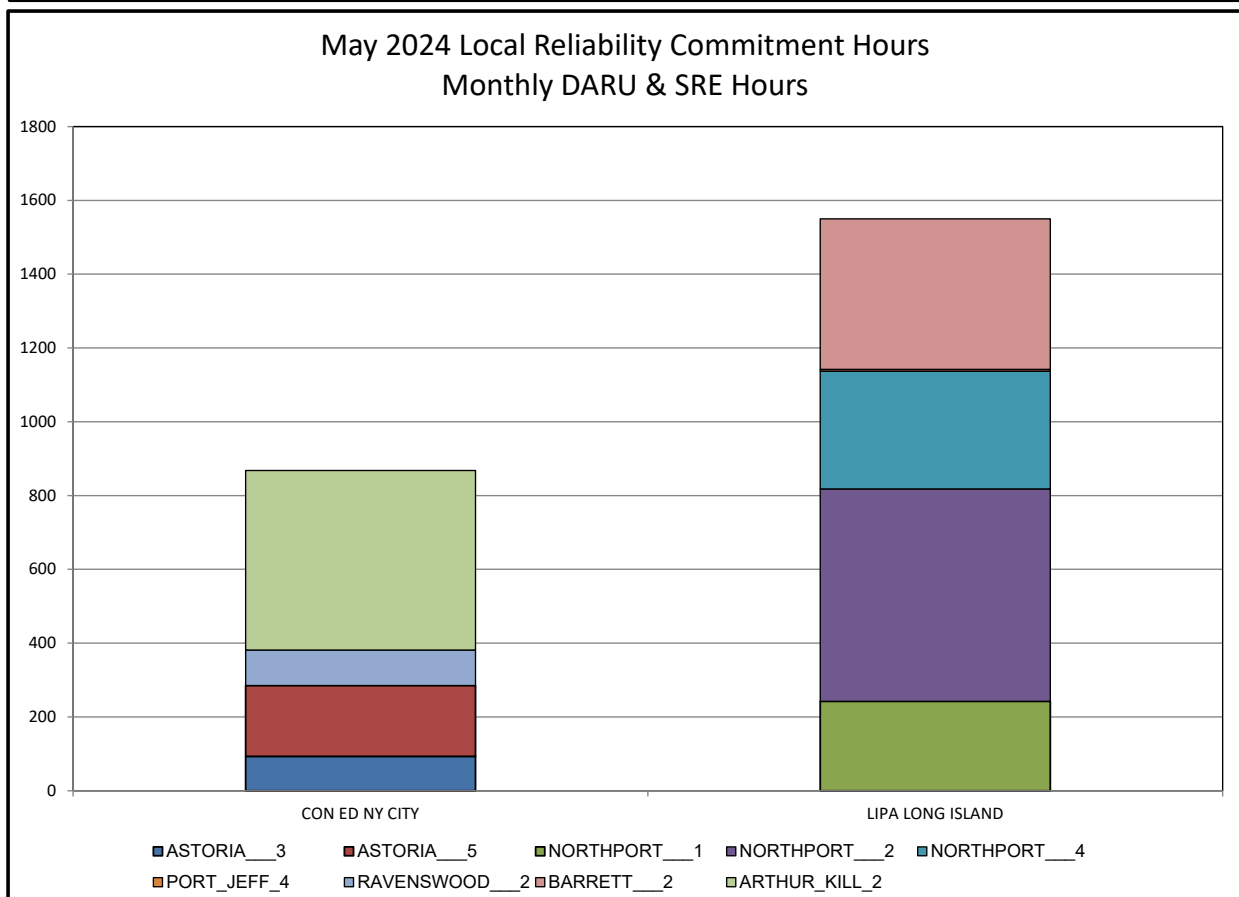
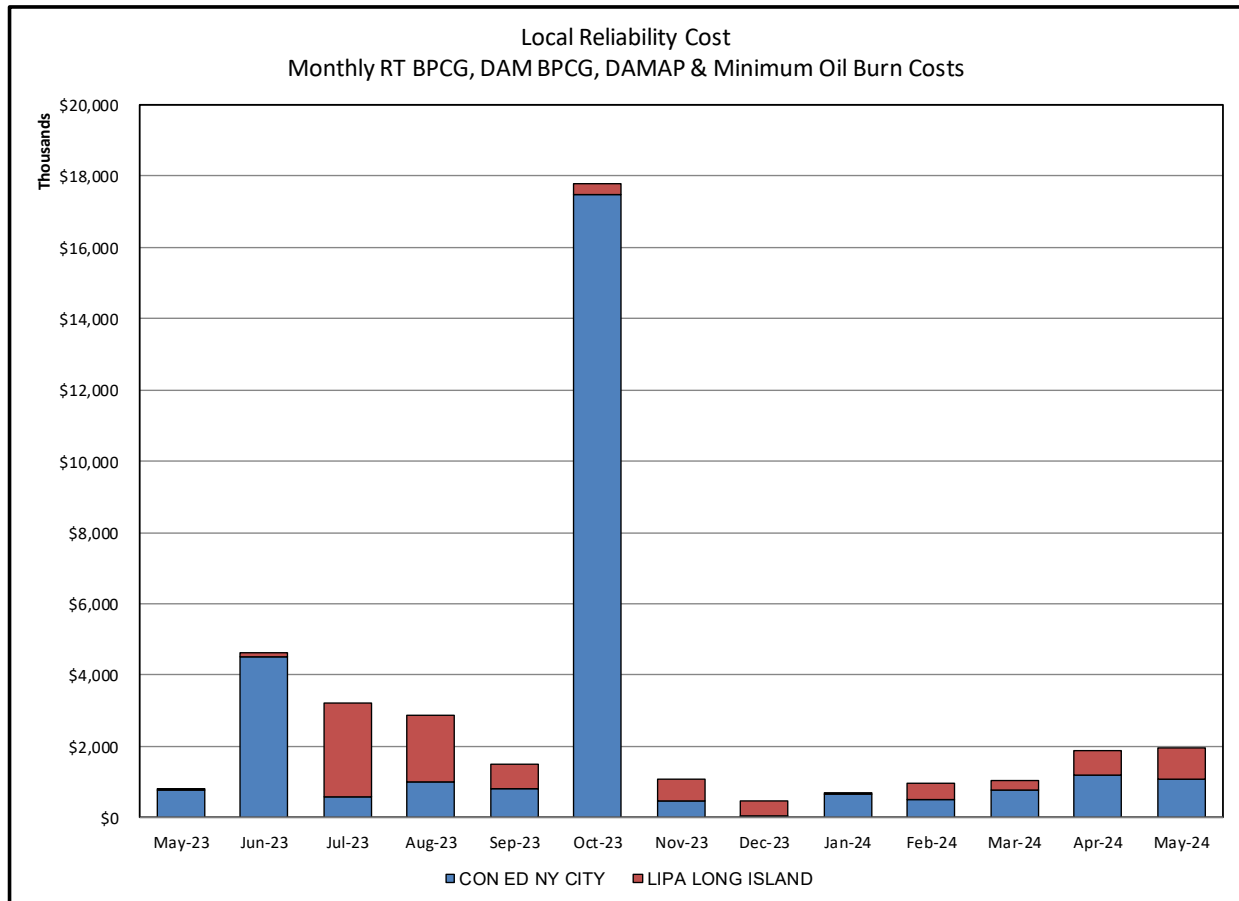
- 1) Storm Watch Costs are identified as daily total uplift costs
- 2) Days with a value of BMCR less M2M Settlement of \$100K/HR, shortfall of \$200K/Day or more, or surplus of \$100K/Day or more are investigated.
- 3) Uplift costs associated with multiple event types are apportioned equally by hour

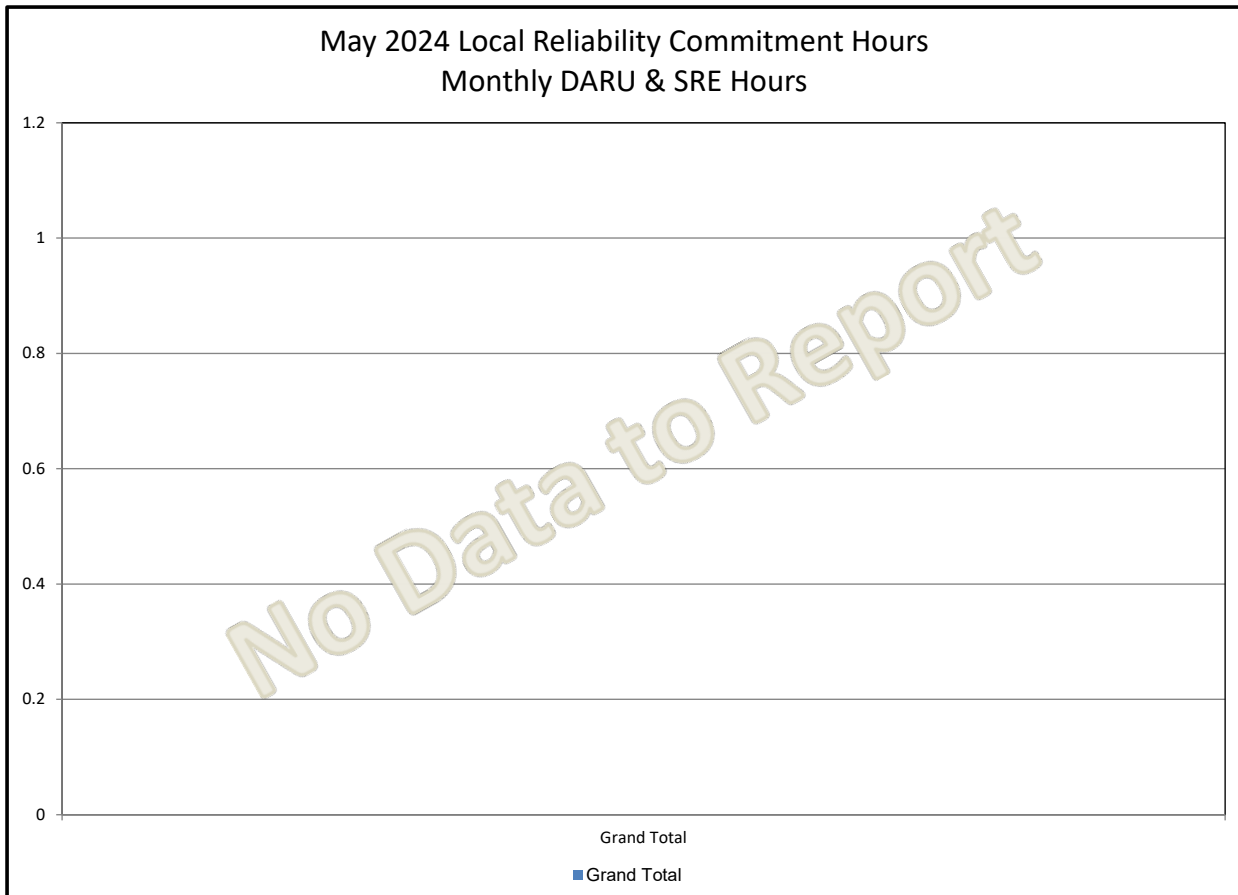
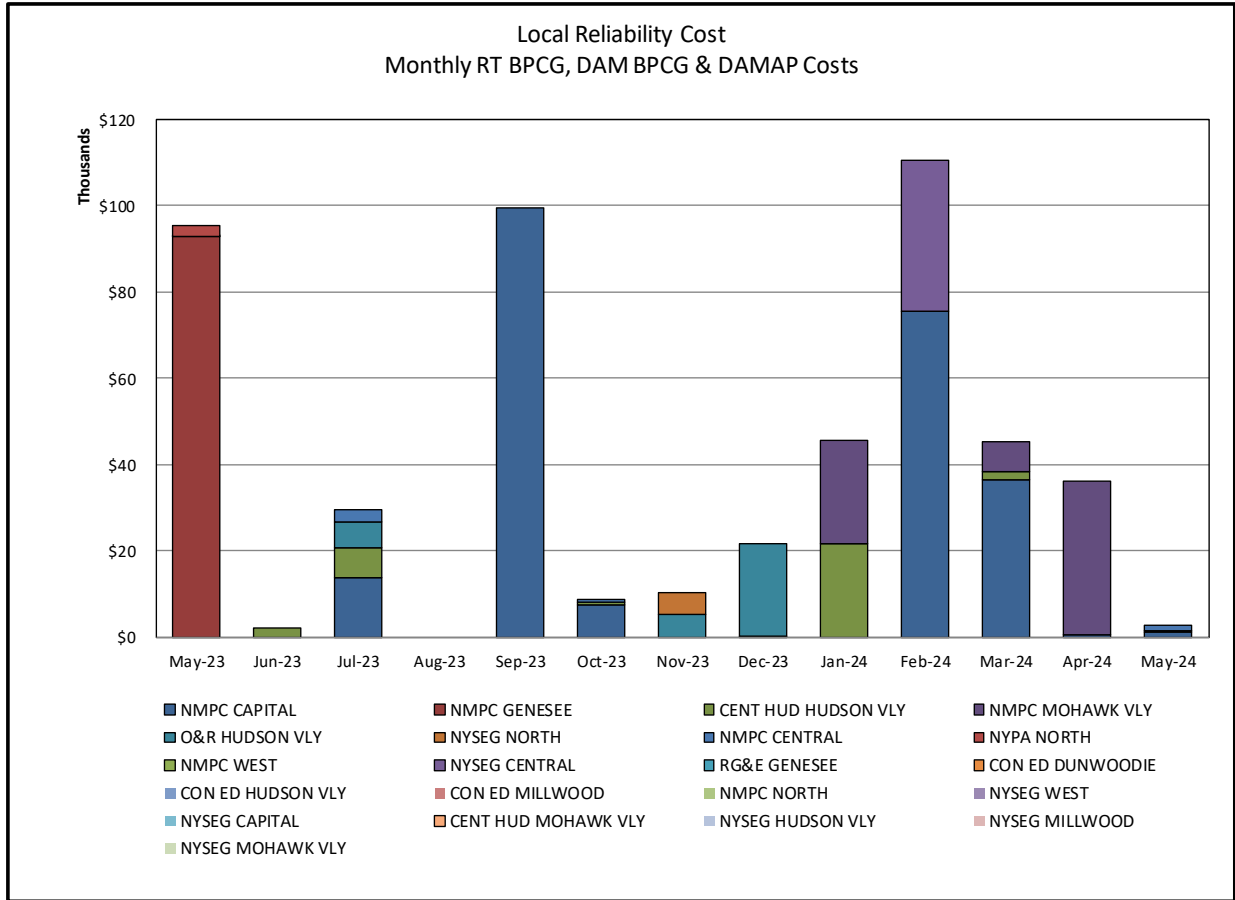


### Day-Ahead Market Congestion Residual Categories

<u>Category</u>	<u>Cost Assignment</u>	<u>Events Types</u>	<u>Event Examples</u>
NYTO Outage Allocation	Responsible TO	Direct allocation to NYTO's responsible for transmission equipment status change.	DAM scheduled outage for equipment modeled in-service for the TCC Auction.
Incremental TCC/External Outage Impacts	All TO by Monthly Allocation Factor	Allocation associated with transmission equipment status change caused by change in status of external equipment or change in status of equipment associated with Incremental TCC.	Tie line required out-of-service by TO of neighboring control area.
Central East Commitment Rerate	All TO by Monthly Allocation Factor	Changes in the DAM Central East_VC limit as compared to the TCC Auction limit, which are not associated with transmission line outages.	

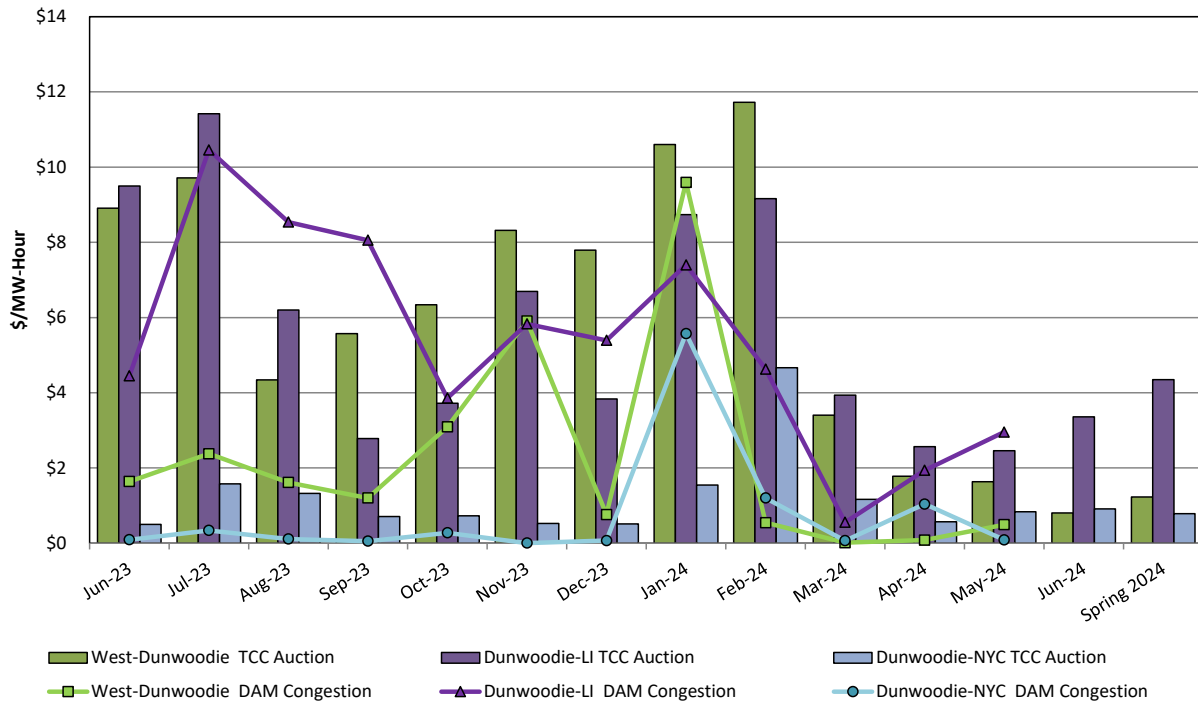






## TCC & Day Ahead Market Selected Internal Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average  
with Spring 2024 Centralized TCC Auction Six-Month Average



## TCC & Day Ahead Market West to Dunwoodie Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average  
with Spring 2024 Centralized TCC Auction Six-Month Average

