

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



## ***December 2021 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 January 11, 2022.

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## December 2021 Operations Performance Highlights

- Peak load of 21,146 MW occurred on 12/20/2021 HB 17
- All-time winter capability period peak load of 25,738 MW occurred on 01/07/2014 HB 18
- 0 hours of Thunderstorm Alerts were declared
- 42 hours of NERC TLR level 3 curtailment
- To reduce risks from COVID-19, the NYISO continues to take several actions to maintain critical business operations and protect the health and well-being of our employees and stakeholders.
- NEETNY (NextEra) commissioned a New York Control Center to facilitate operation of the company's Western NY Public Policy Project assets associated with the new Dysinger 345kV station.

The following table identifies the estimated production cost savings associated with the Broader Regional Market initiatives.

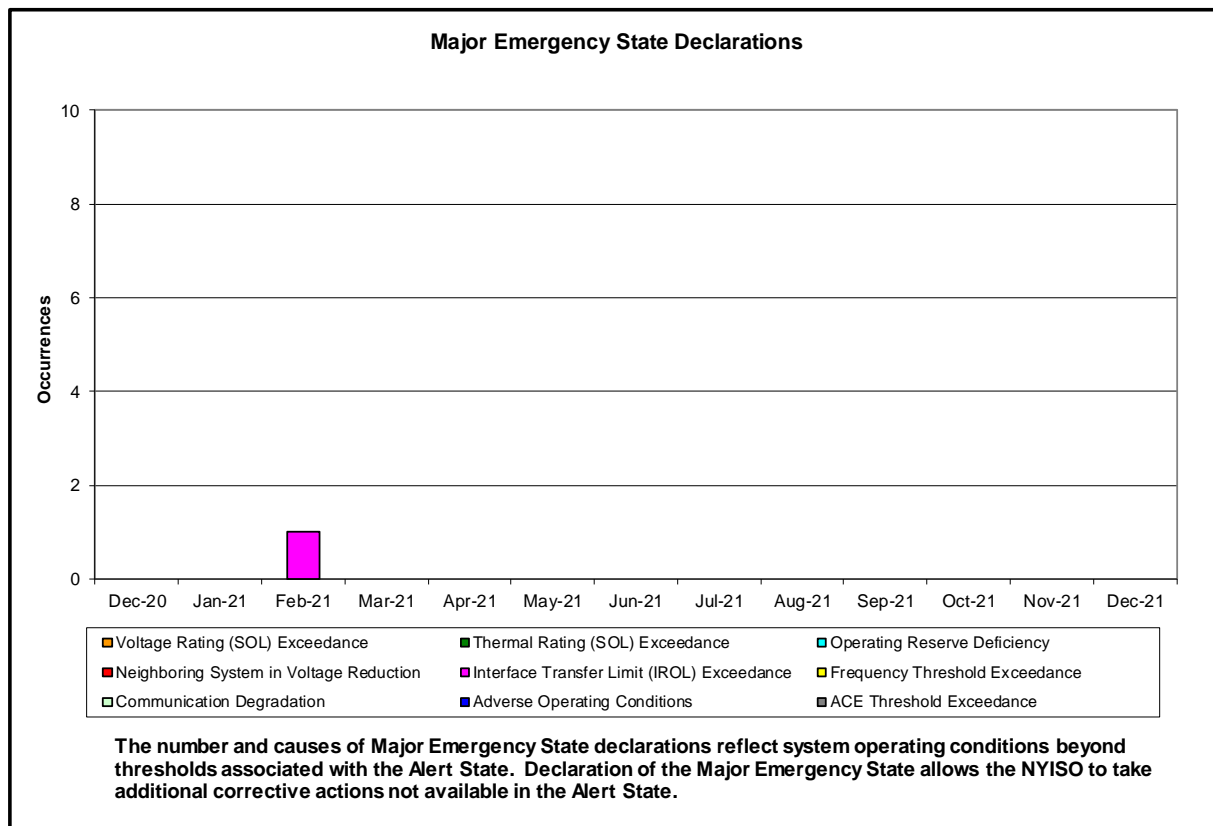
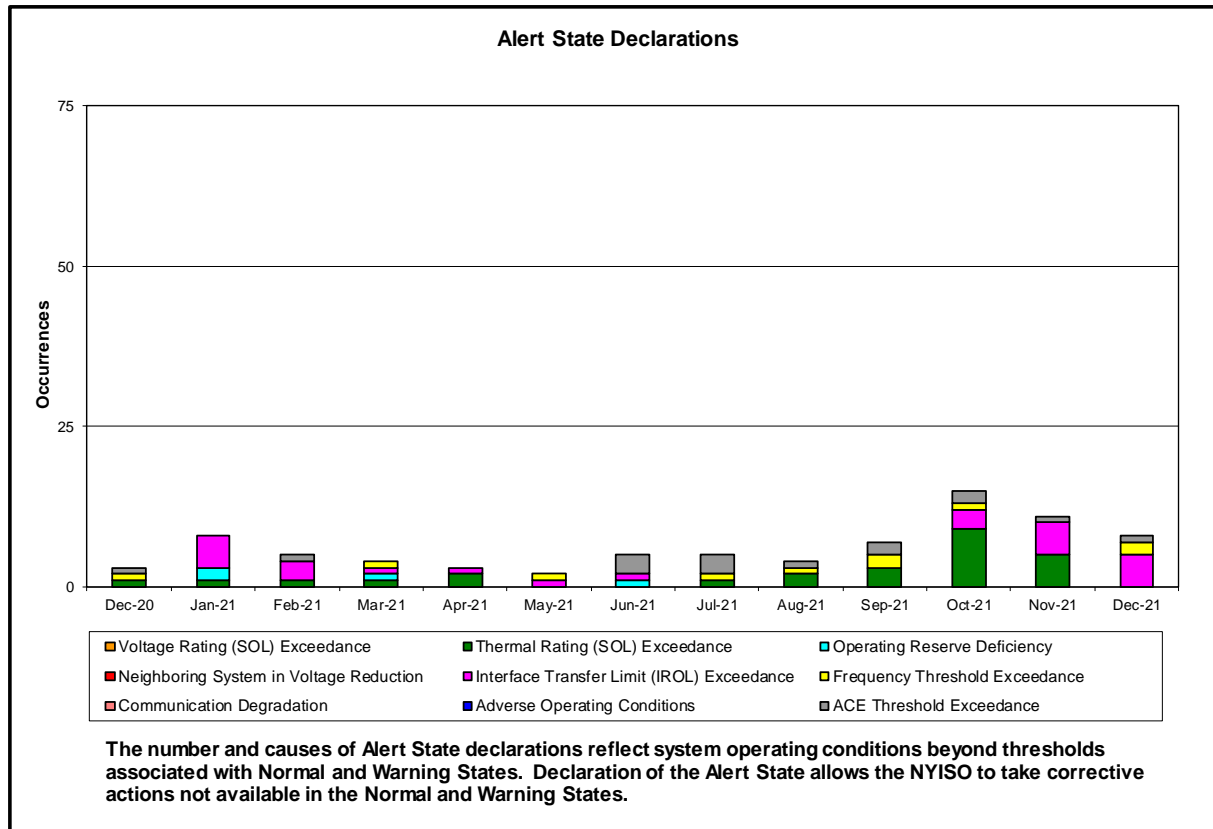
	Current Month Value (\$M)	Year-to-Date Value (\$M)
<b>NY Savings from PJM-NY Congestion Coordination</b>	\$2.16	\$18.38
<b>NY Savings from PJM-NY Coordinated Transaction Scheduling</b>	\$0.26	\$1.12
<b>NY Savings from NE-NY Coordinated Transaction Scheduling</b>	\$0.34	\$0.45
<b>Total NY Savings</b>	<b>\$2.76</b>	<b>\$19.94</b>
<b>Regional Savings from PJM-NY Coordinated Transaction Scheduling</b>	\$0.33	\$5.67
<b>Regional Savings from NE-NY Coordinated Transaction Scheduling</b>	\$0.08	\$0.43
<b>Total Regional Savings</b>	<b>\$0.42</b>	<b>\$6.10</b>

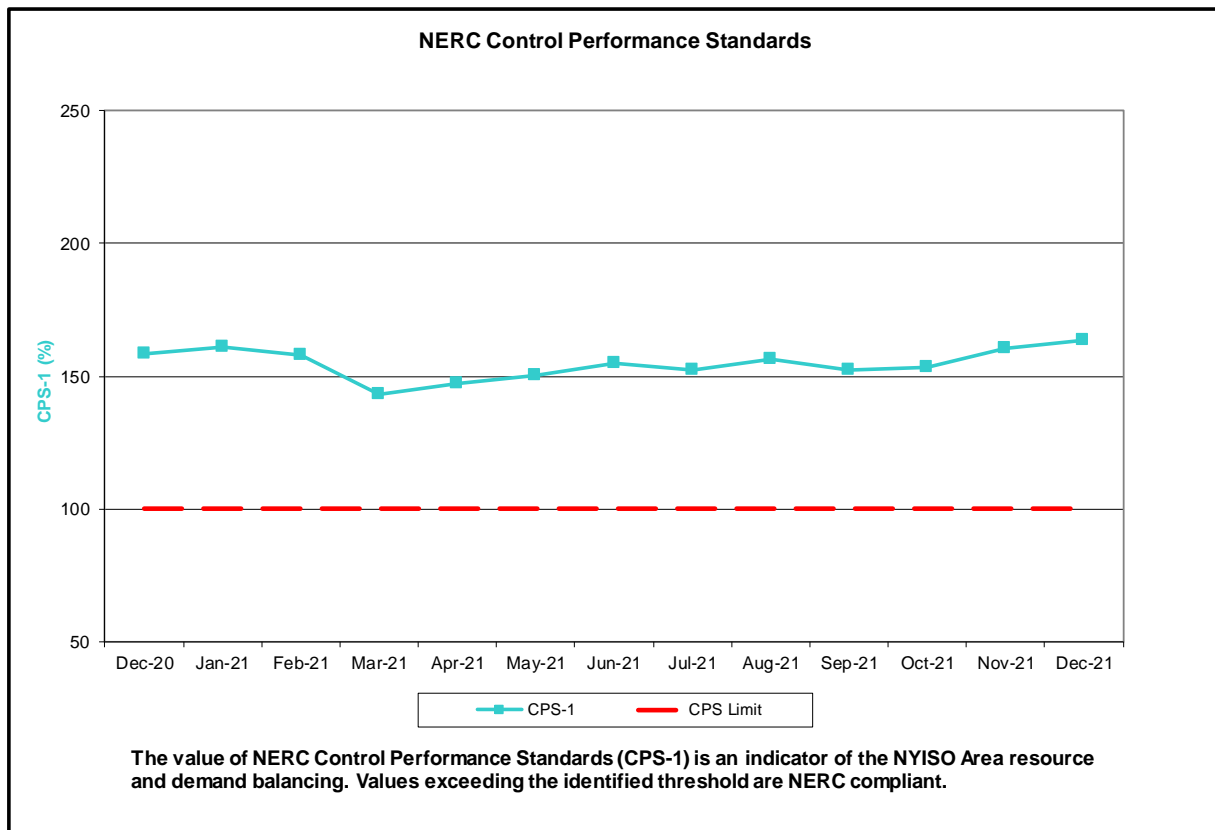
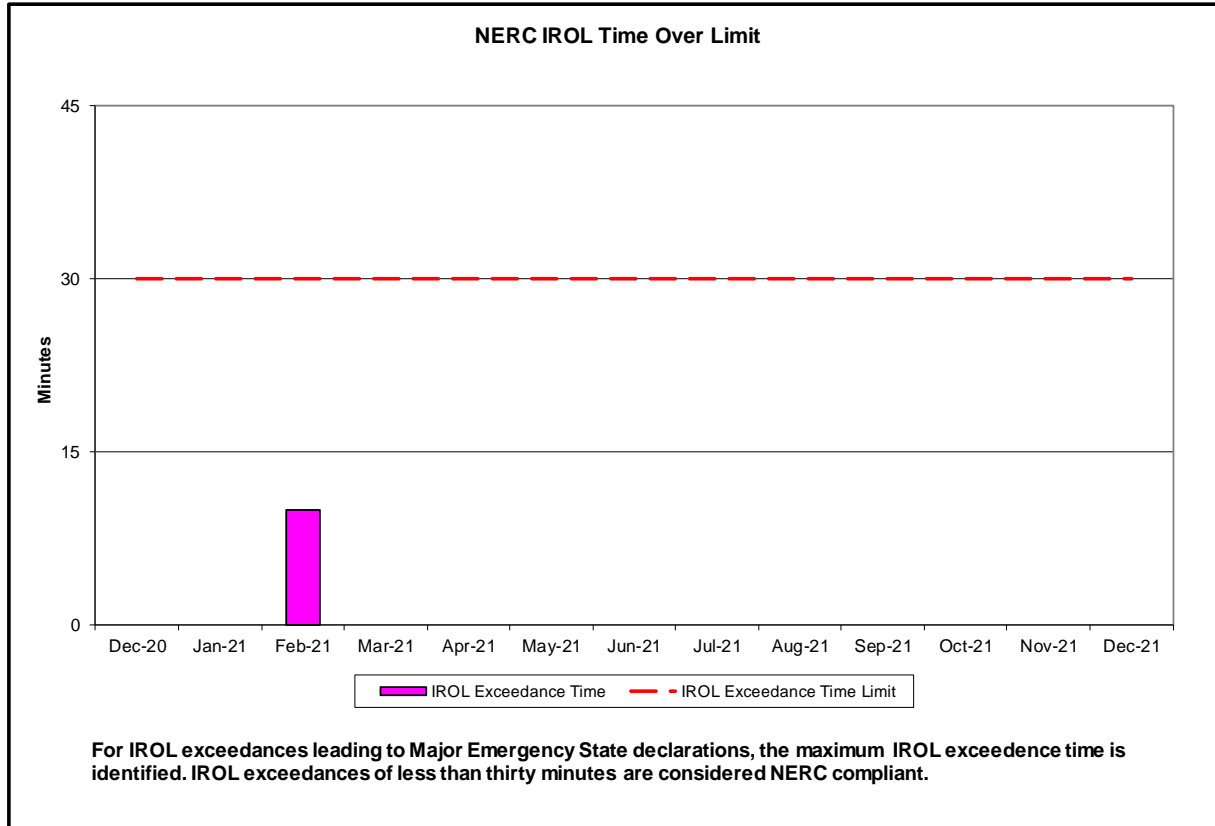
- Statewide uplift cost monthly average was (\$0.53)/MWh.
- The following table identifies the Monthly ICAP spot market prices and the price delta.

Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
January 2022 Spot Price	\$3.82	\$3.82	\$3.82	\$3.82
December 2021 Spot Price	\$2.95	\$2.95	\$2.95	\$2.95
Delta	\$0.87	\$0.87	\$0.87	\$0.87

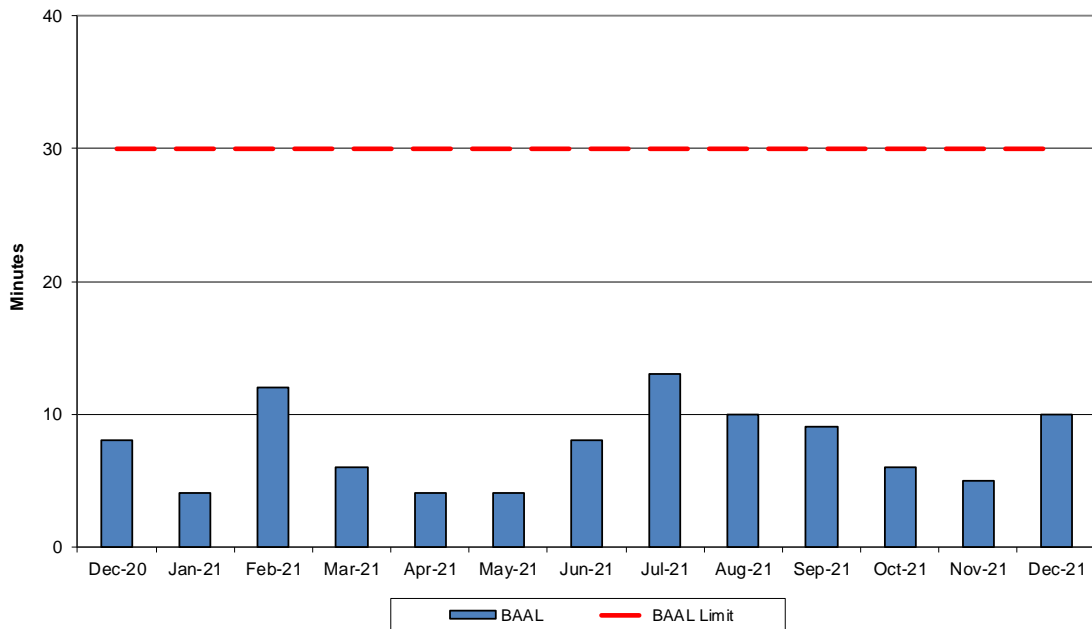
- NYCA experienced \$0.87 clearing price increase due to a decrease in net Imports. The clearing price for Lower Hudson Valley, New York City, and Long Island zones were set by NYCA.

## Reliability Performance Metrics



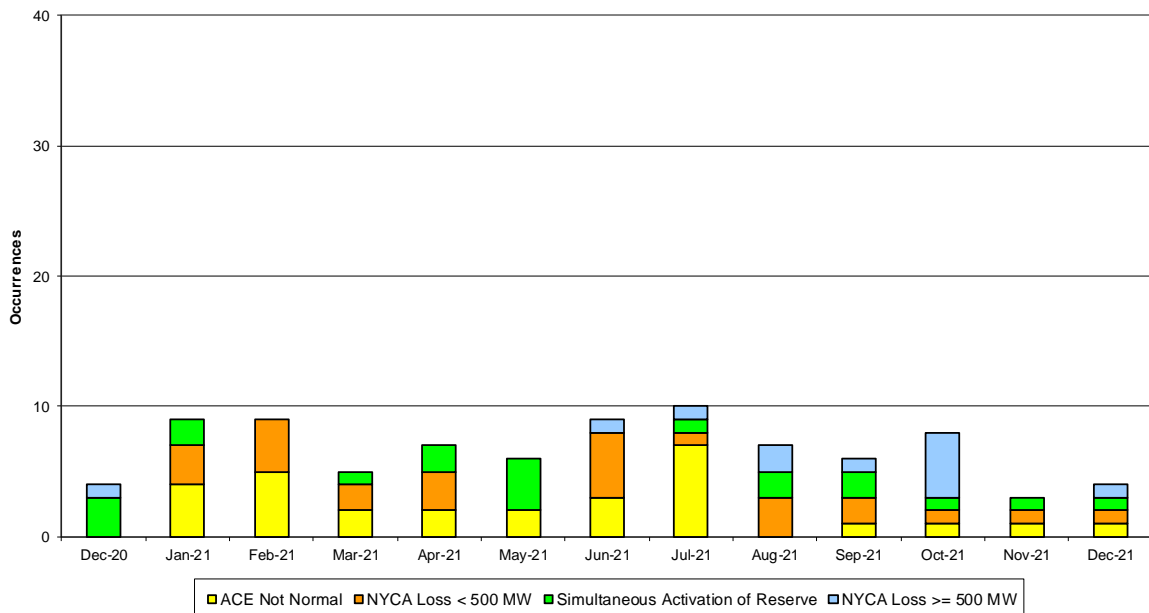


### NERC Balancing Authority ACE Limit Standard



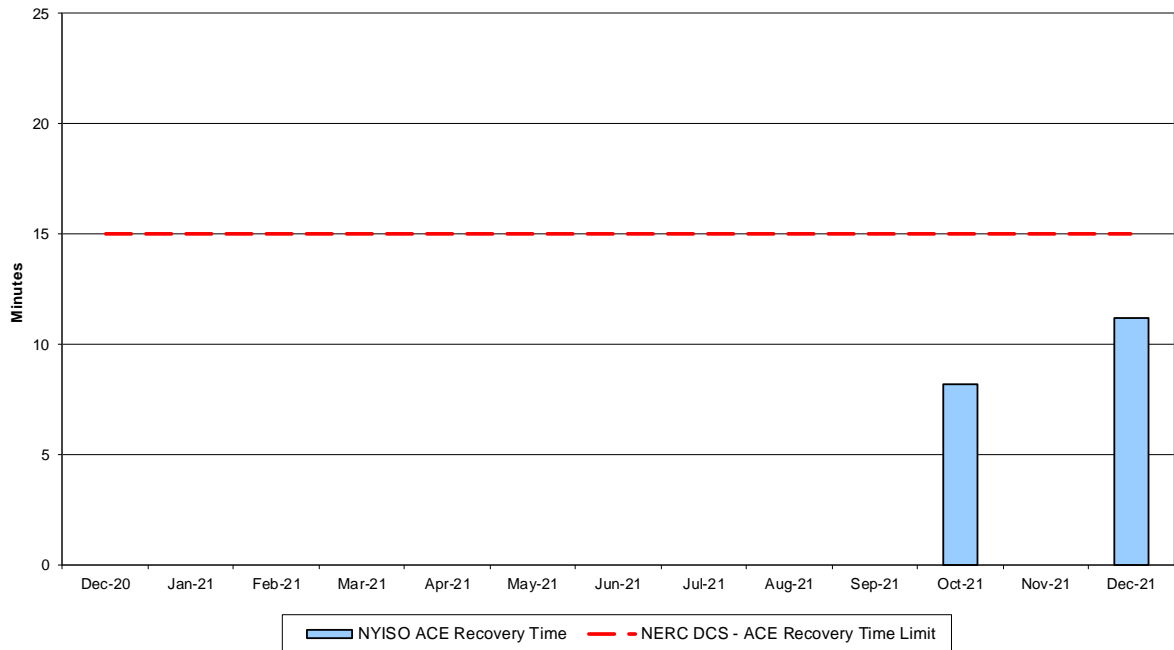
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

### Reserve Activations



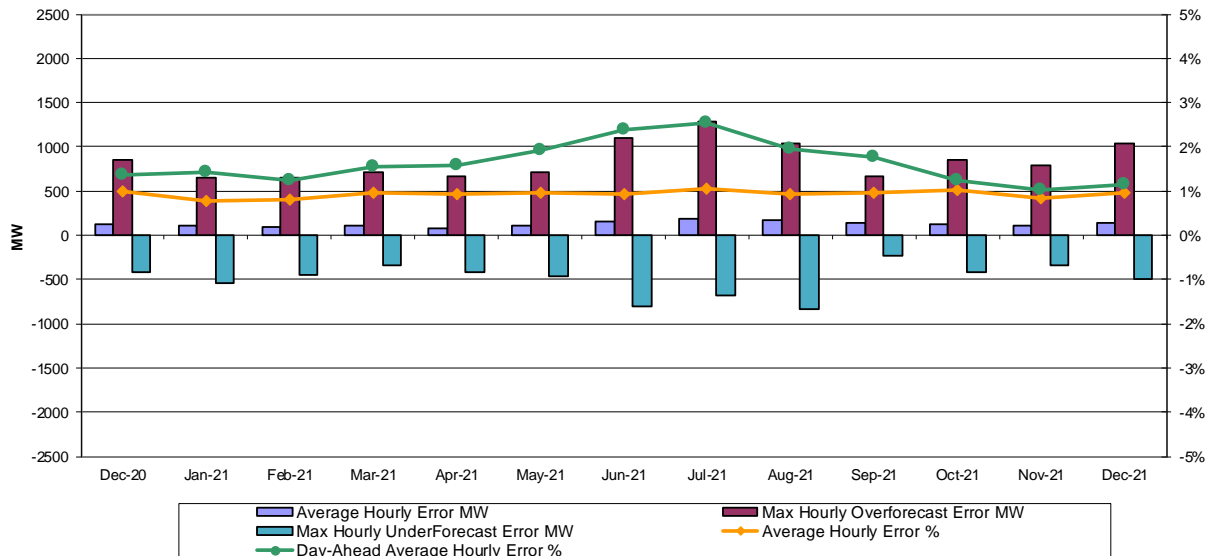
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

### 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

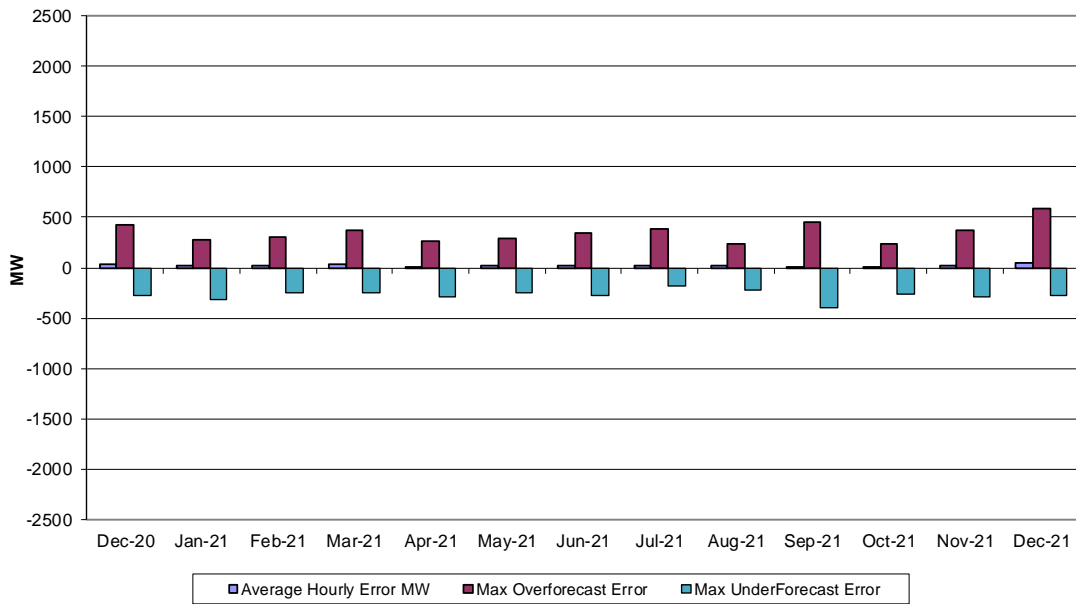


**Hourly Error MW** - Value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.

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

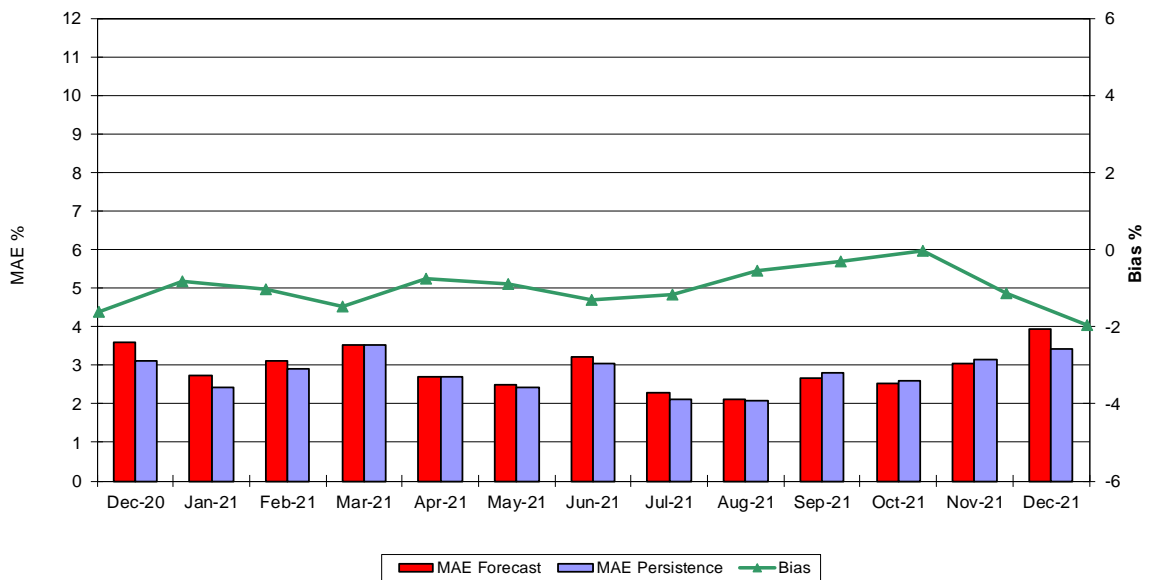
**Day-Ahead Average Hourly Error %** - Average across all hours of the month of the absolute value of the difference between actual load demand and the Day-Ahead forecast load demand, divided by the actual load demand.

### Wind Forecast Performance Hour Ahead MW Error

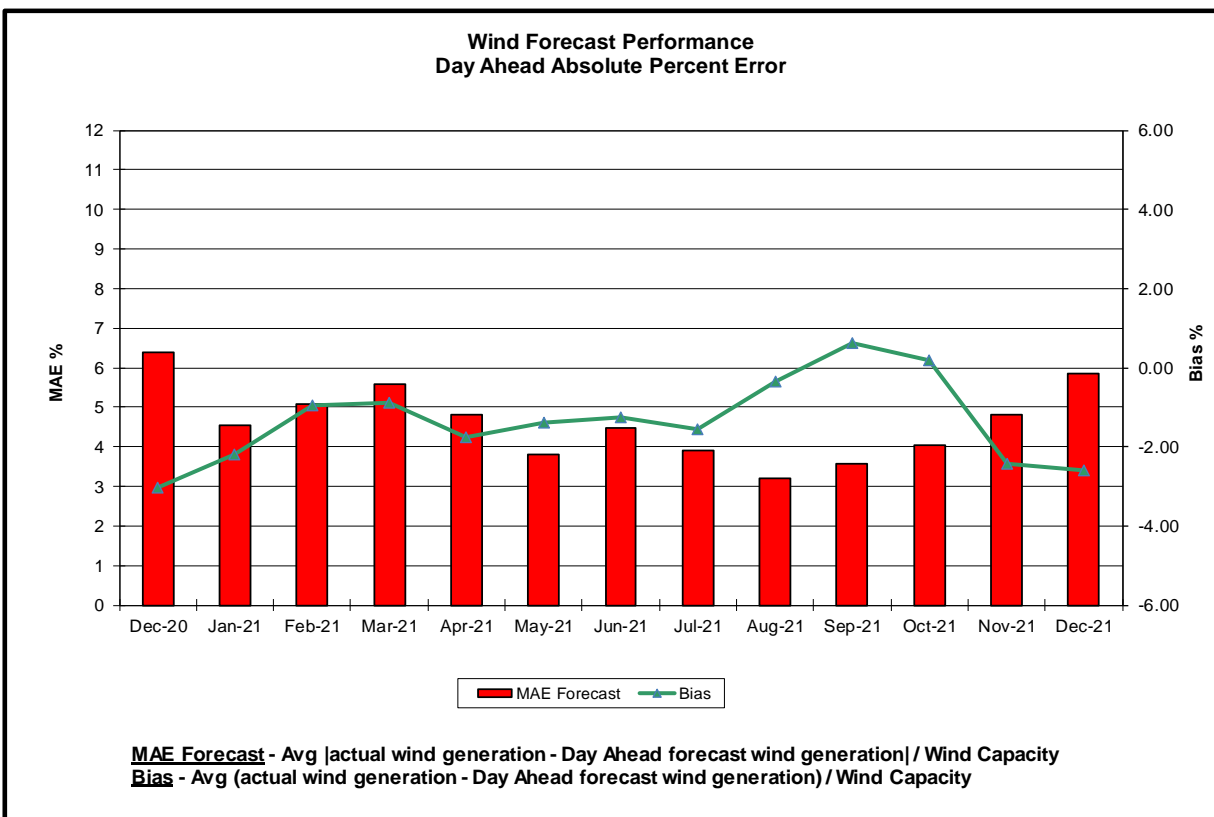
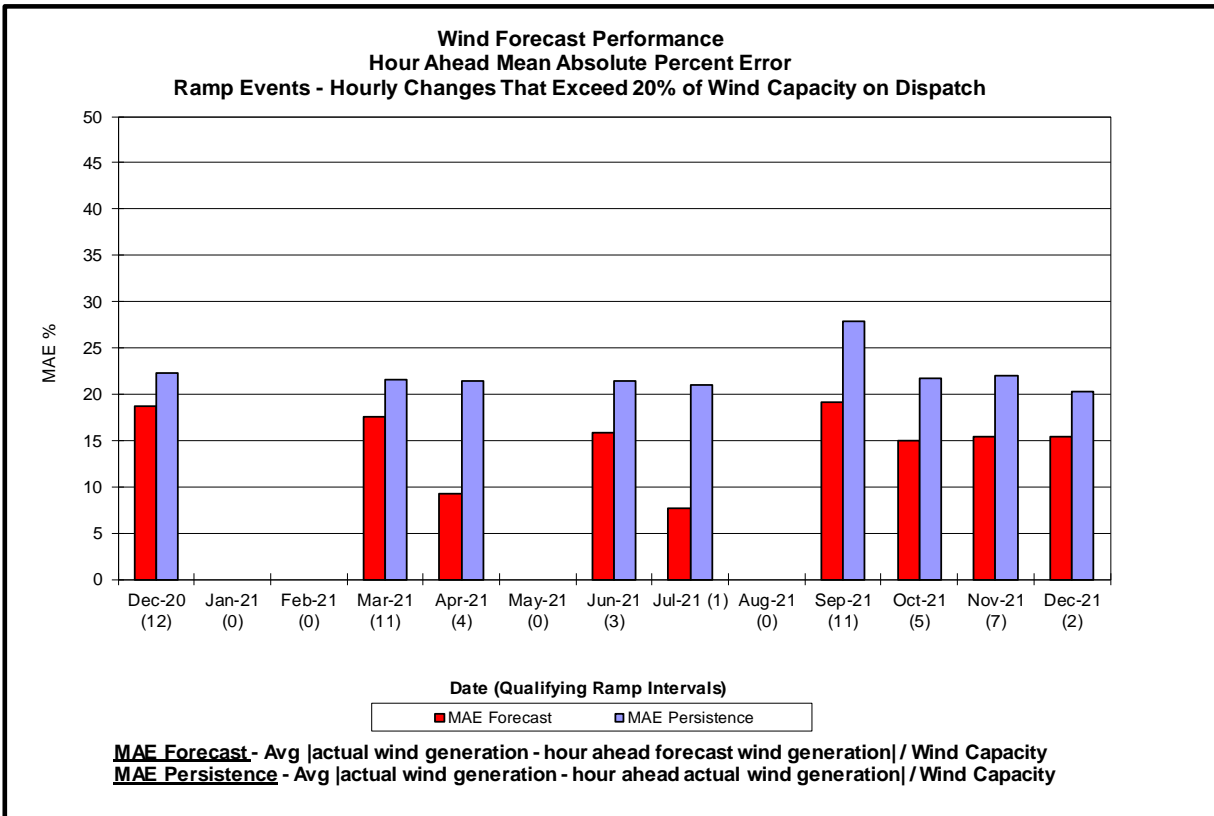


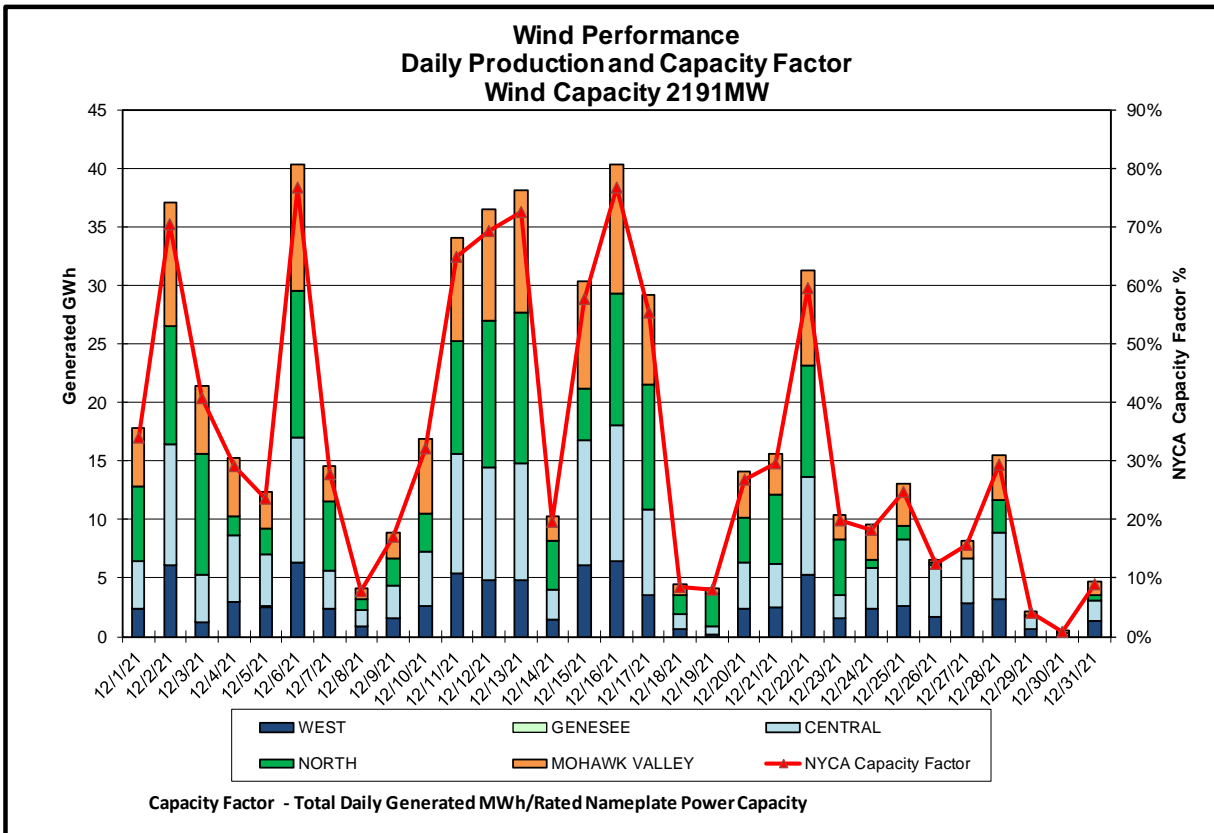
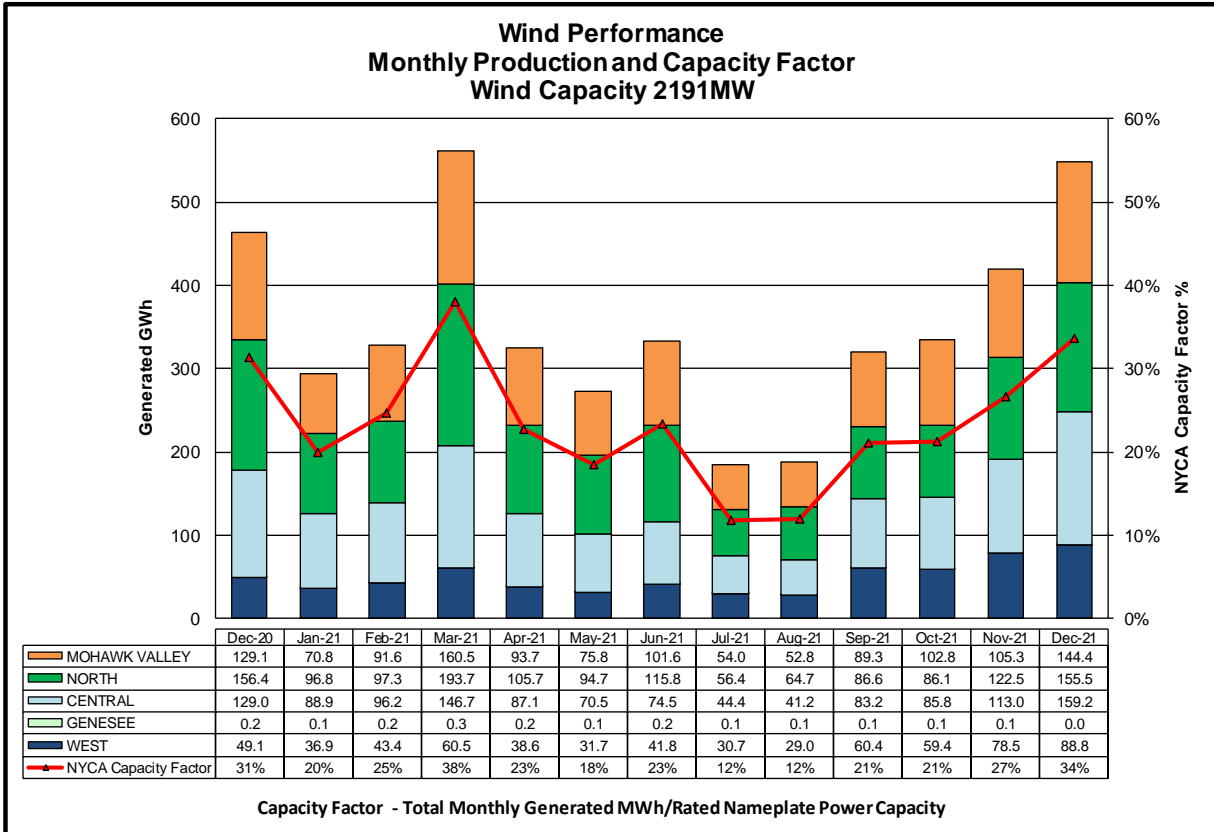
**Hourly Error MW** - Value of the difference between the hourly average actual wind generation and the average hour ahead forecast wind generation.

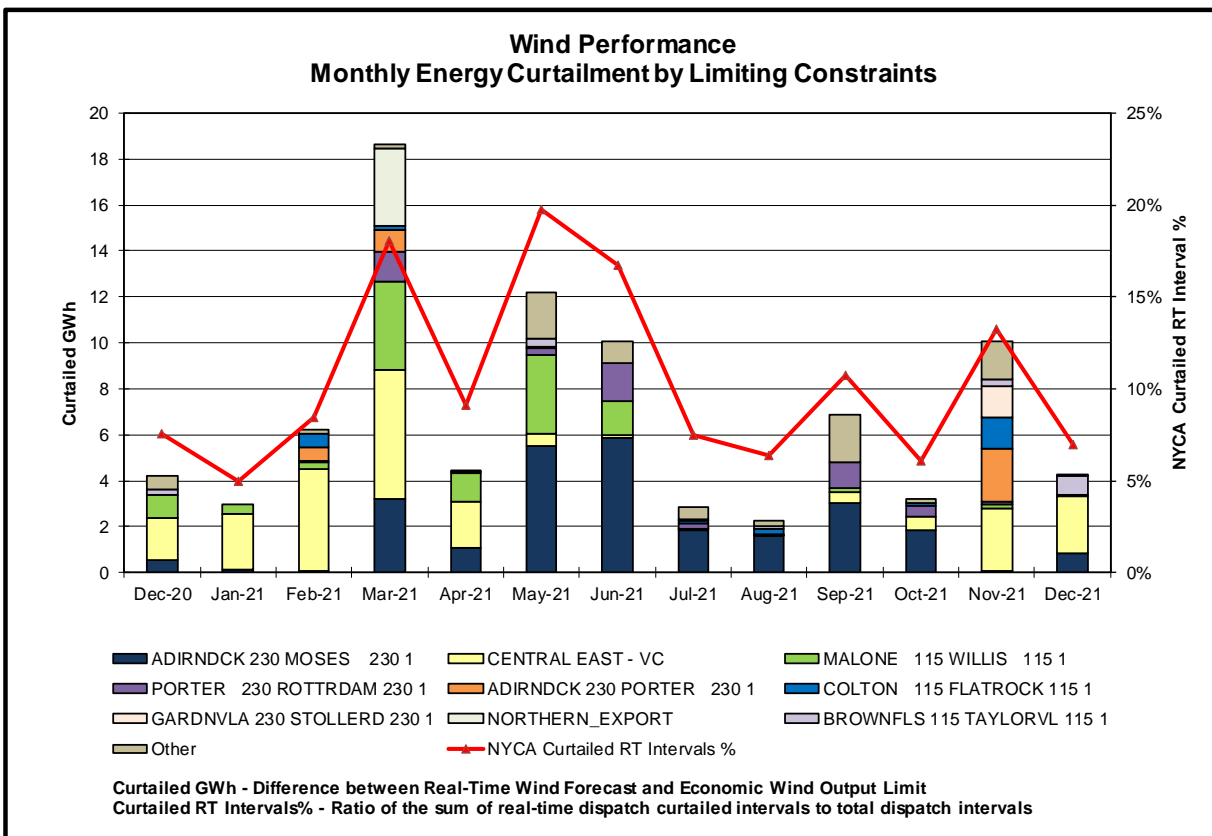
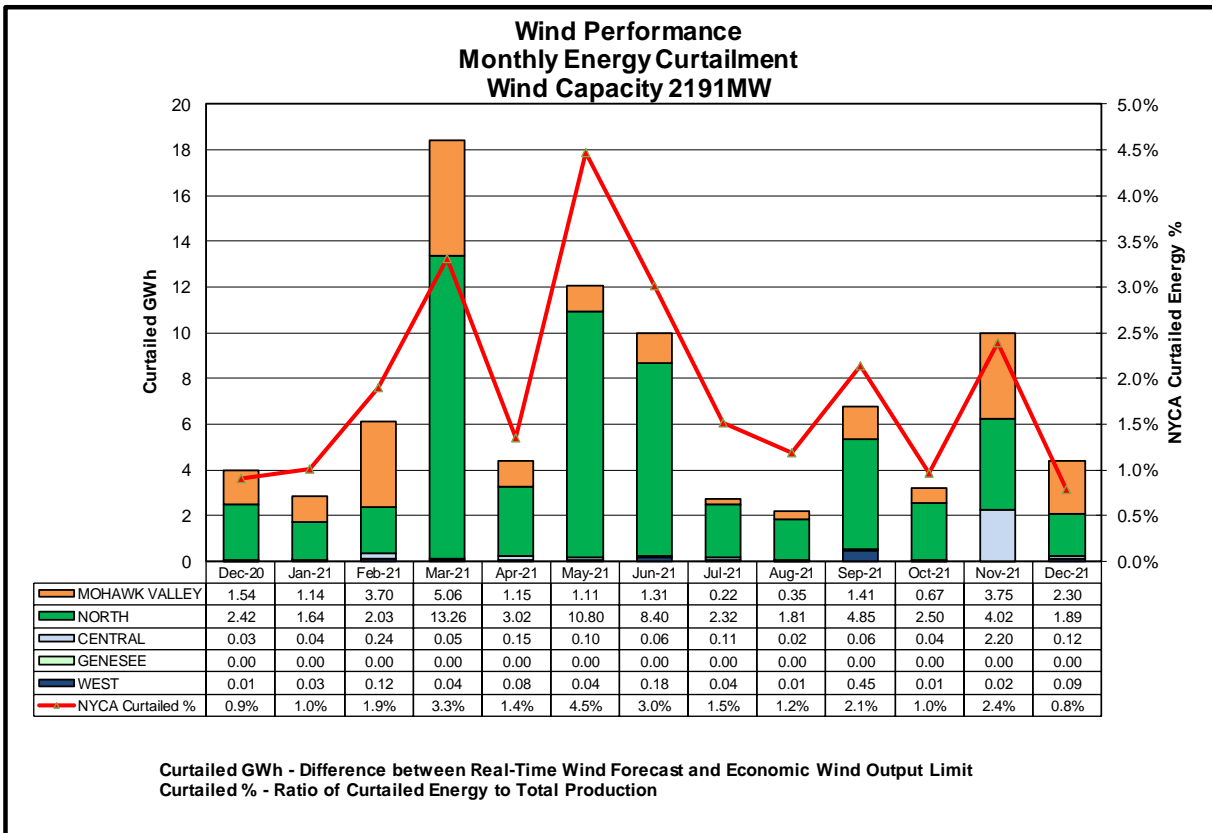
### Wind Forecast Performance Hour Ahead Percent Error

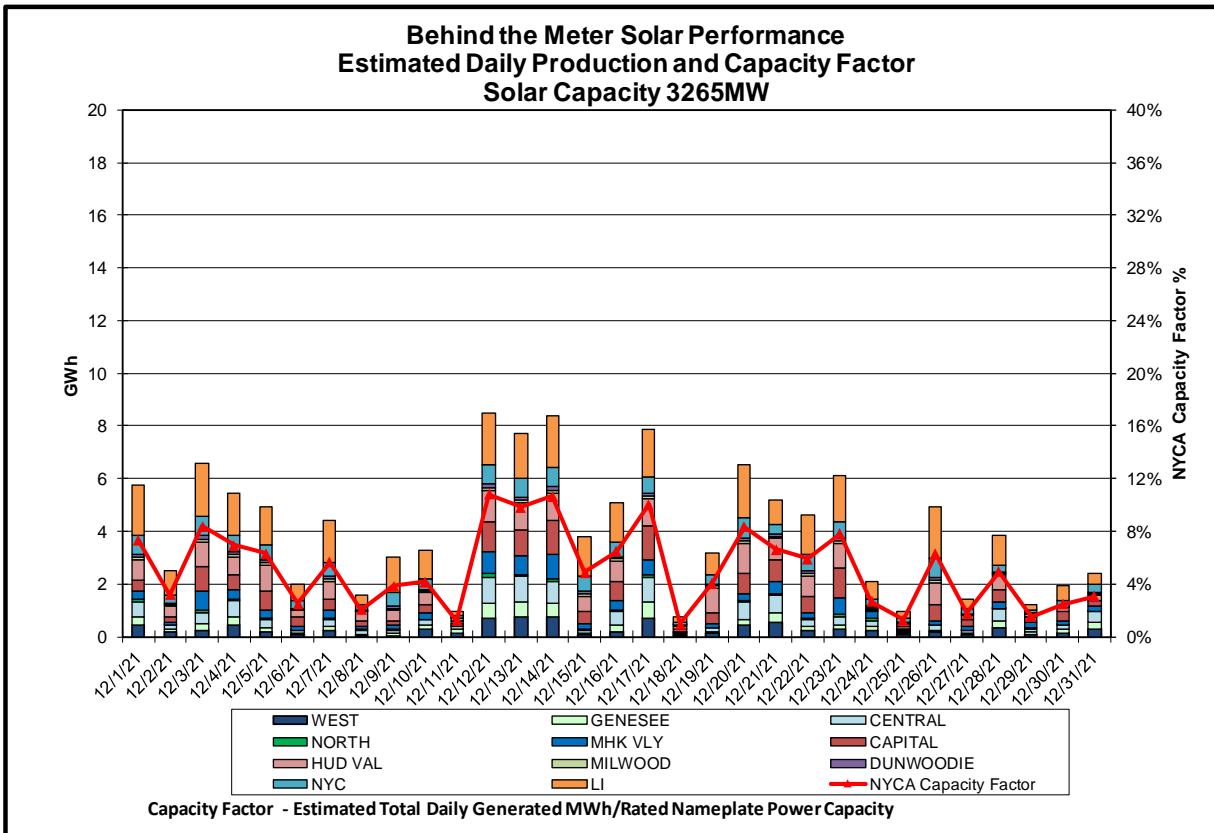
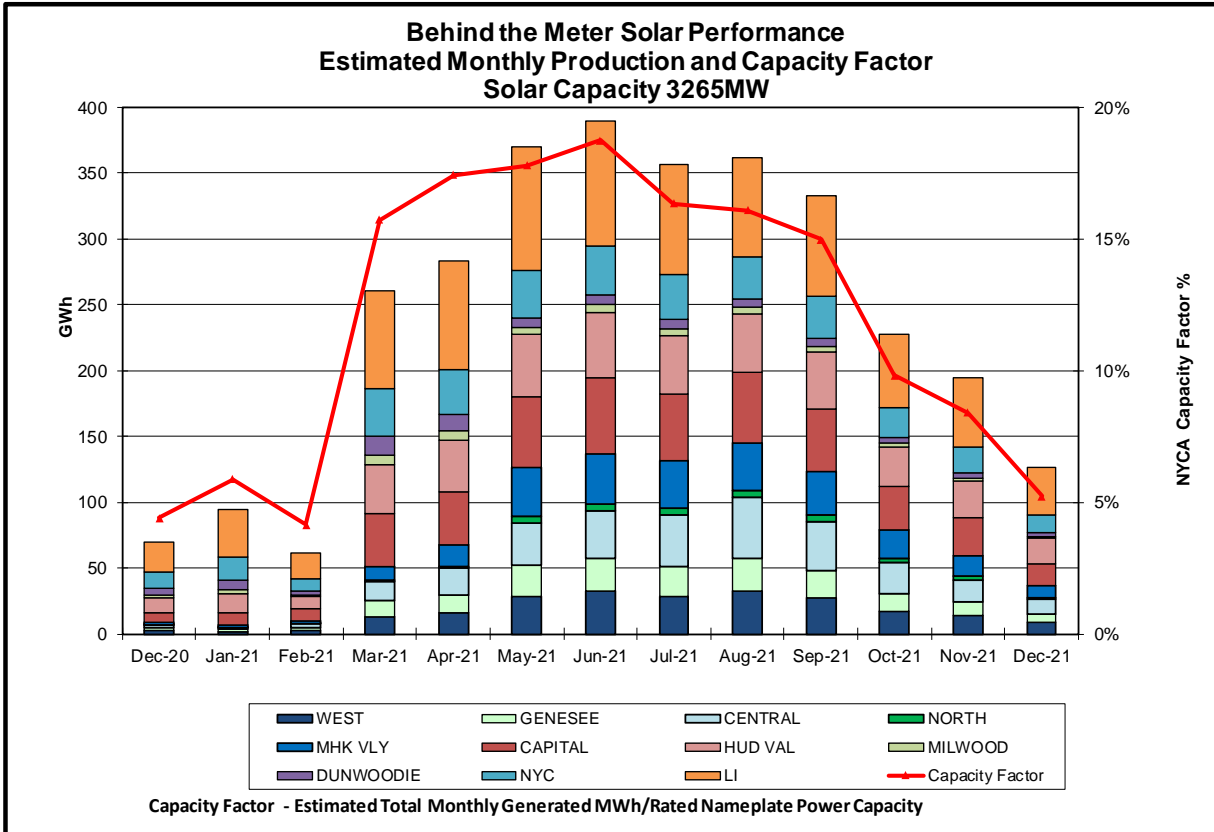


**MAE Forecast** - Avg |actual wind generation - hour ahead forecast wind generation| / Wind Capacity  
**MAE Persistence** - Avg |actual wind generation - hour ahead actual wind generation| / Wind Capacity  
**Bias** - Avg (actual wind generation - hour ahead forecast wind generation) / Wind Capacity

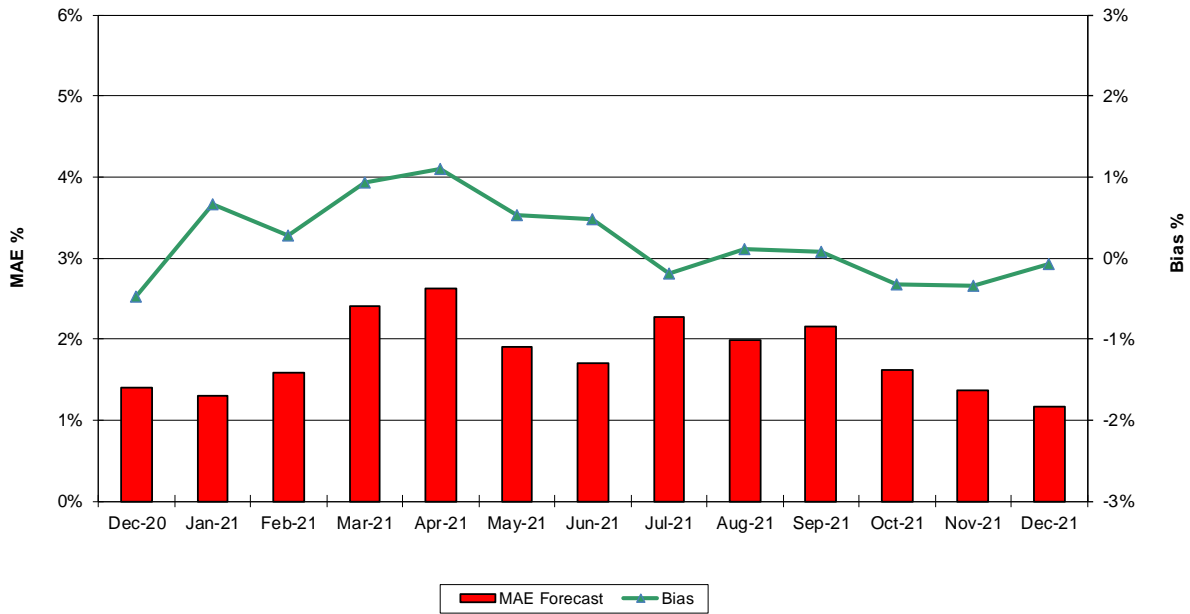






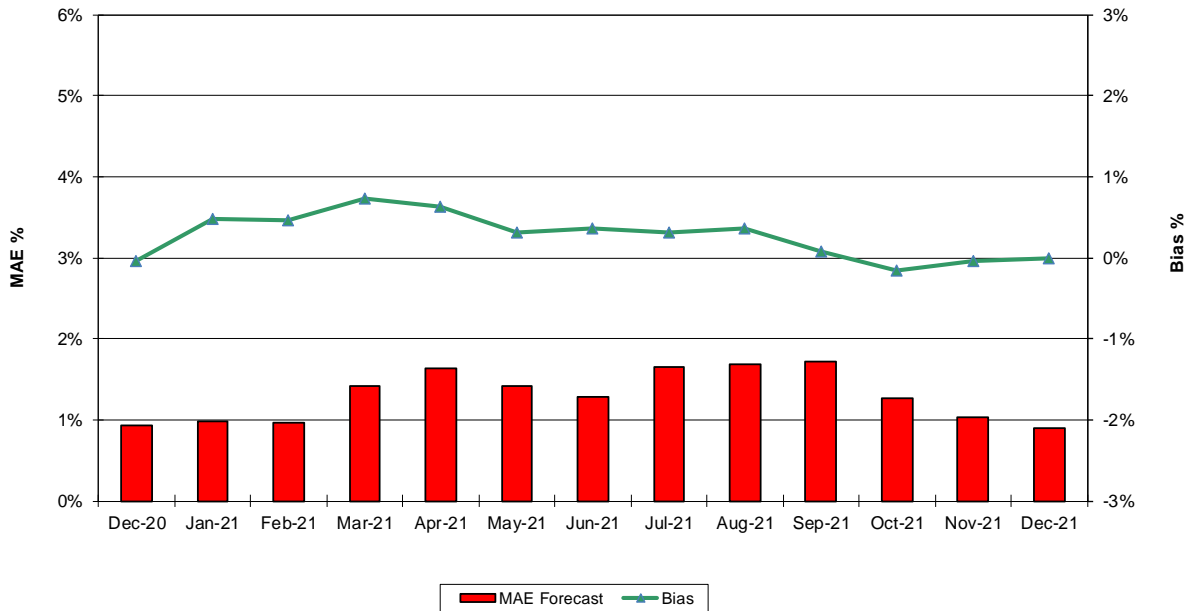


### Behind the Meter Solar Forecast Performance Day Ahead Percent Error

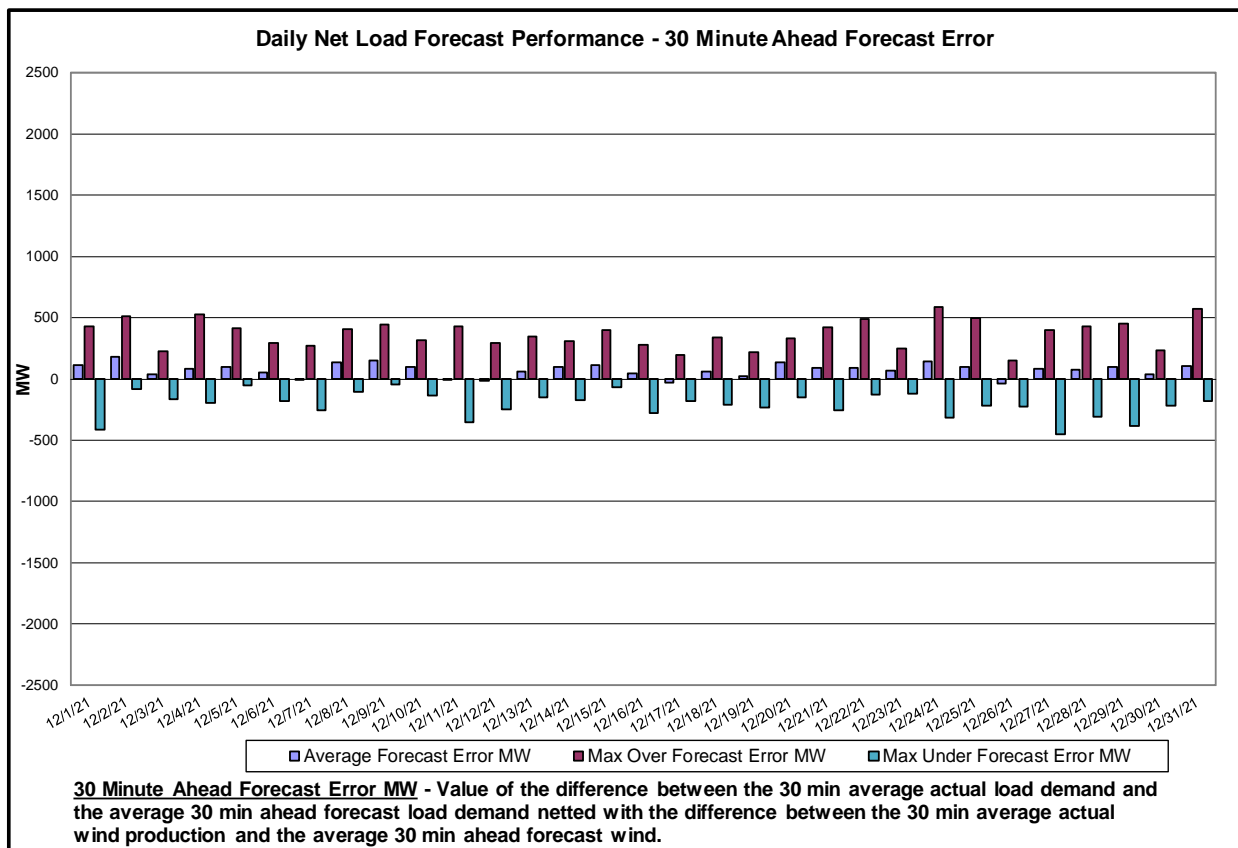
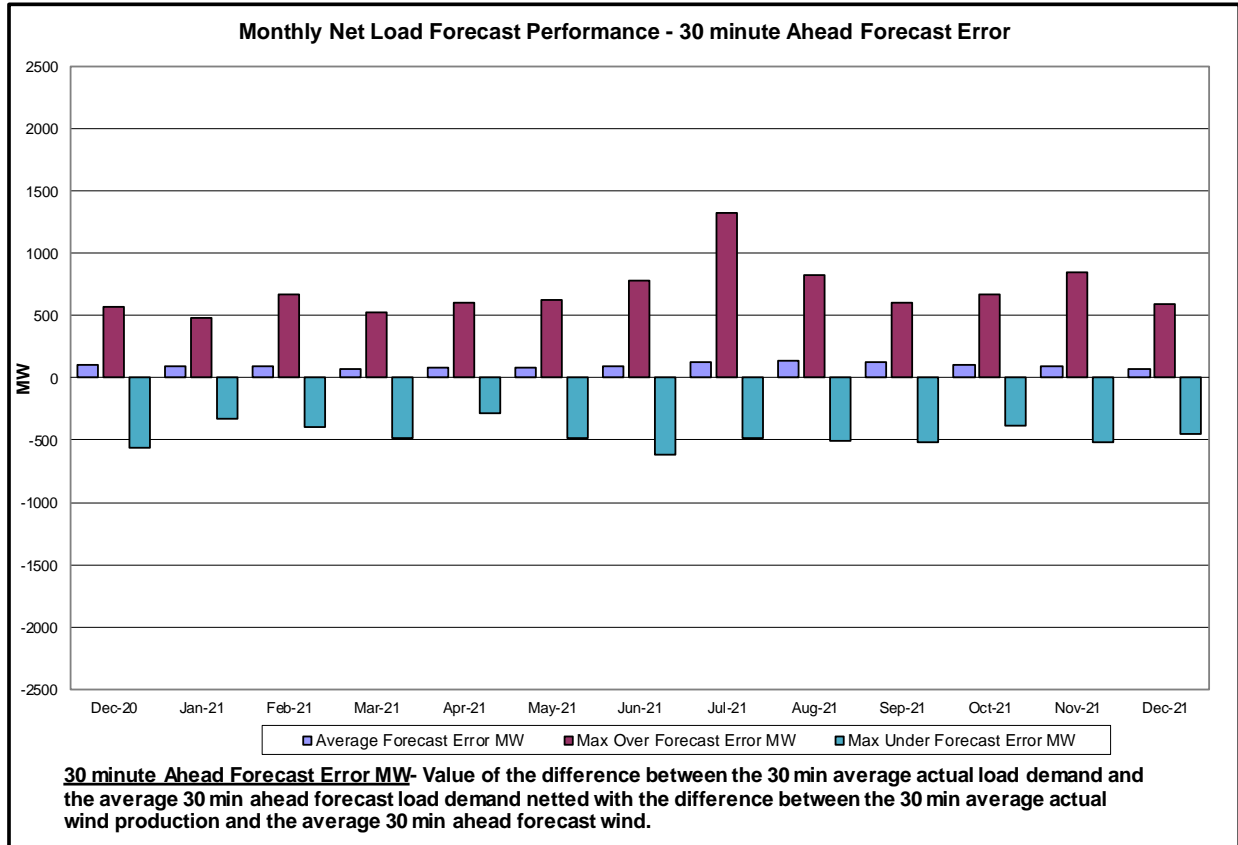


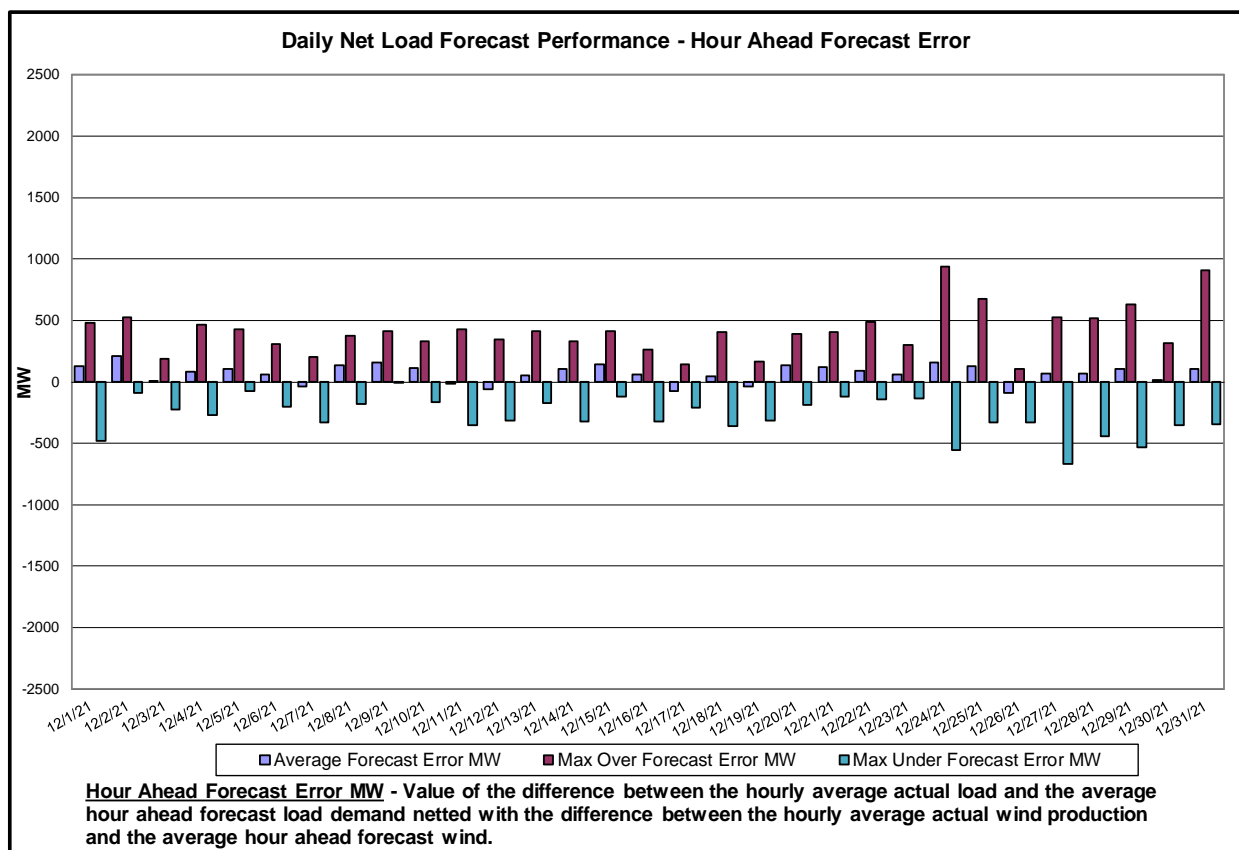
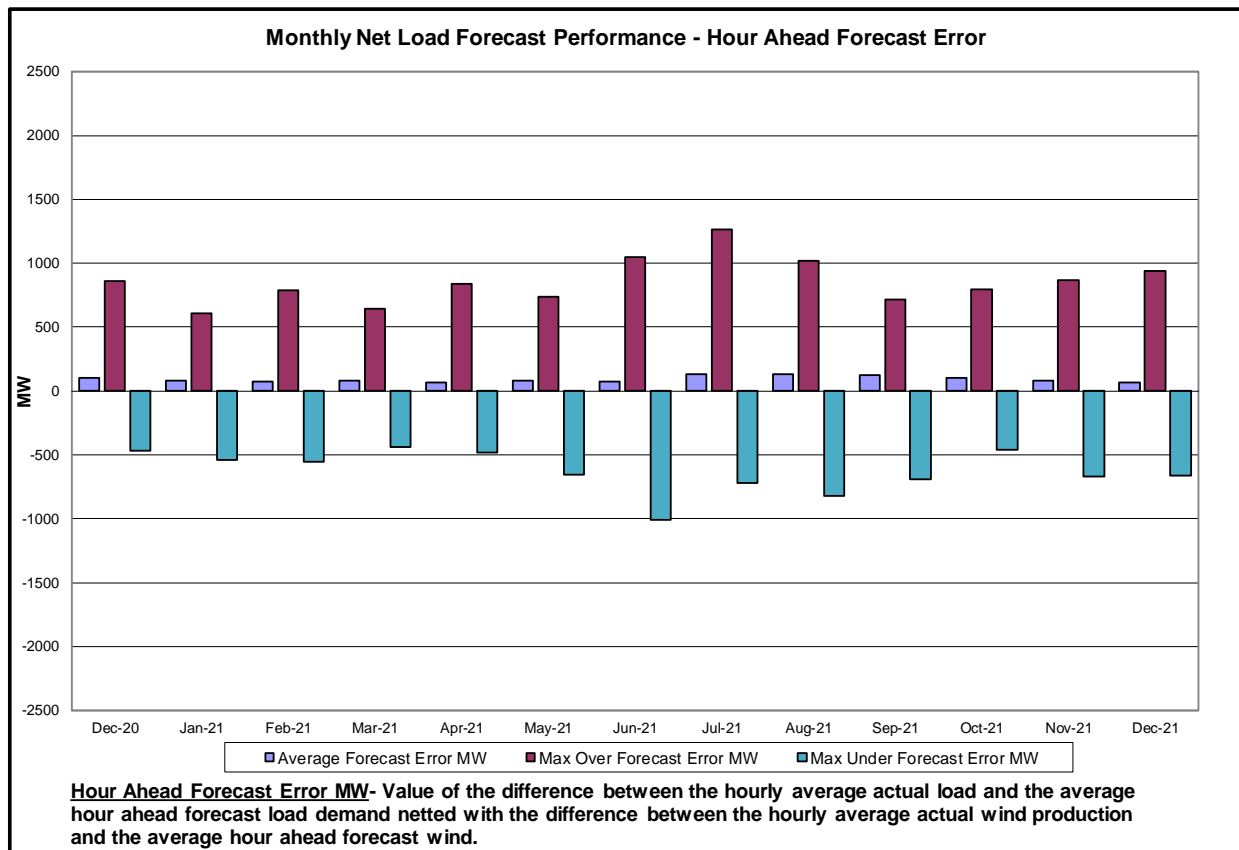
**MAE Forecast** - Avg |est. actual solar generation - Day Ahead forecast solar generation| / Solar Capacity  
**Bias** - Avg (est. actual solar generation - Day Ahead forecast solar generation) / Solar Capacity

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

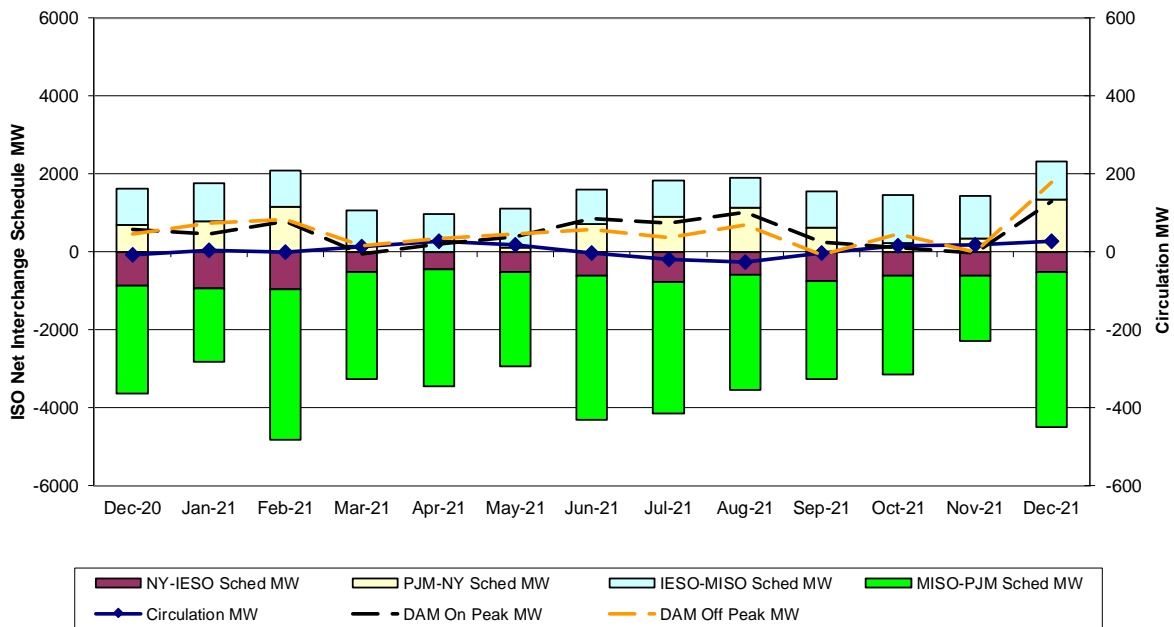


**MAE Forecast** - Avg |est. actual solar generation - Hour Ahead forecast solar generation| / Solar Capacity  
**Bias** - Avg (est. actual solar generation - Hour Ahead forecast solar generation) / Solar Capacity



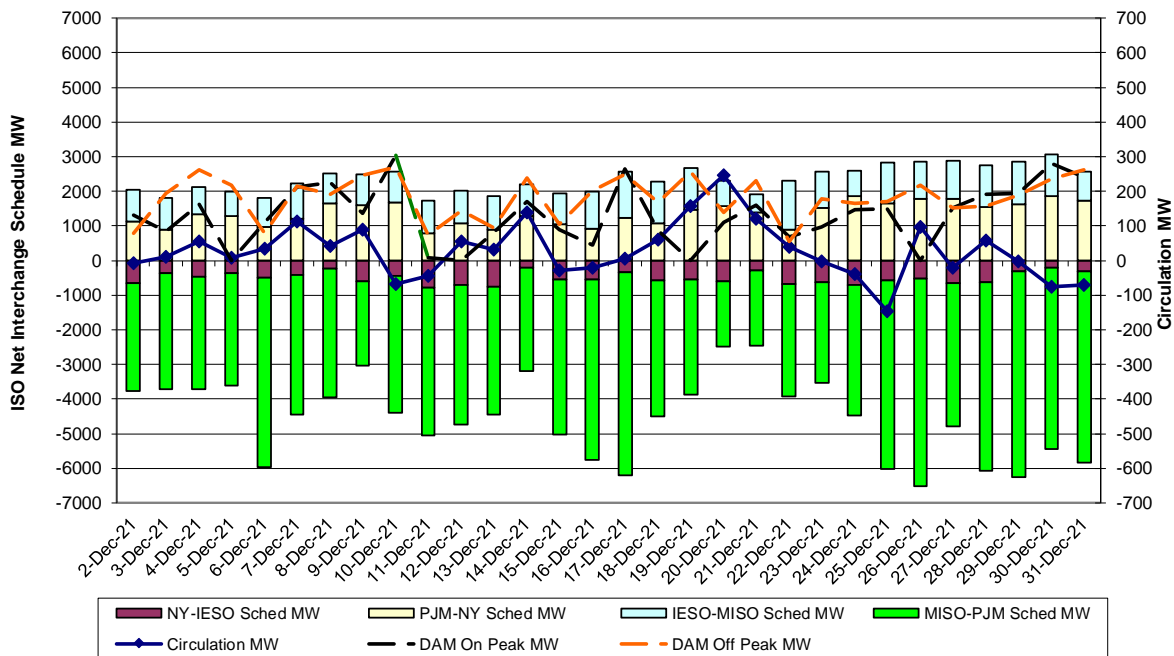


**Lake Erie Circulation and ISO Net Interchange Schedules  
Monthly Averages**



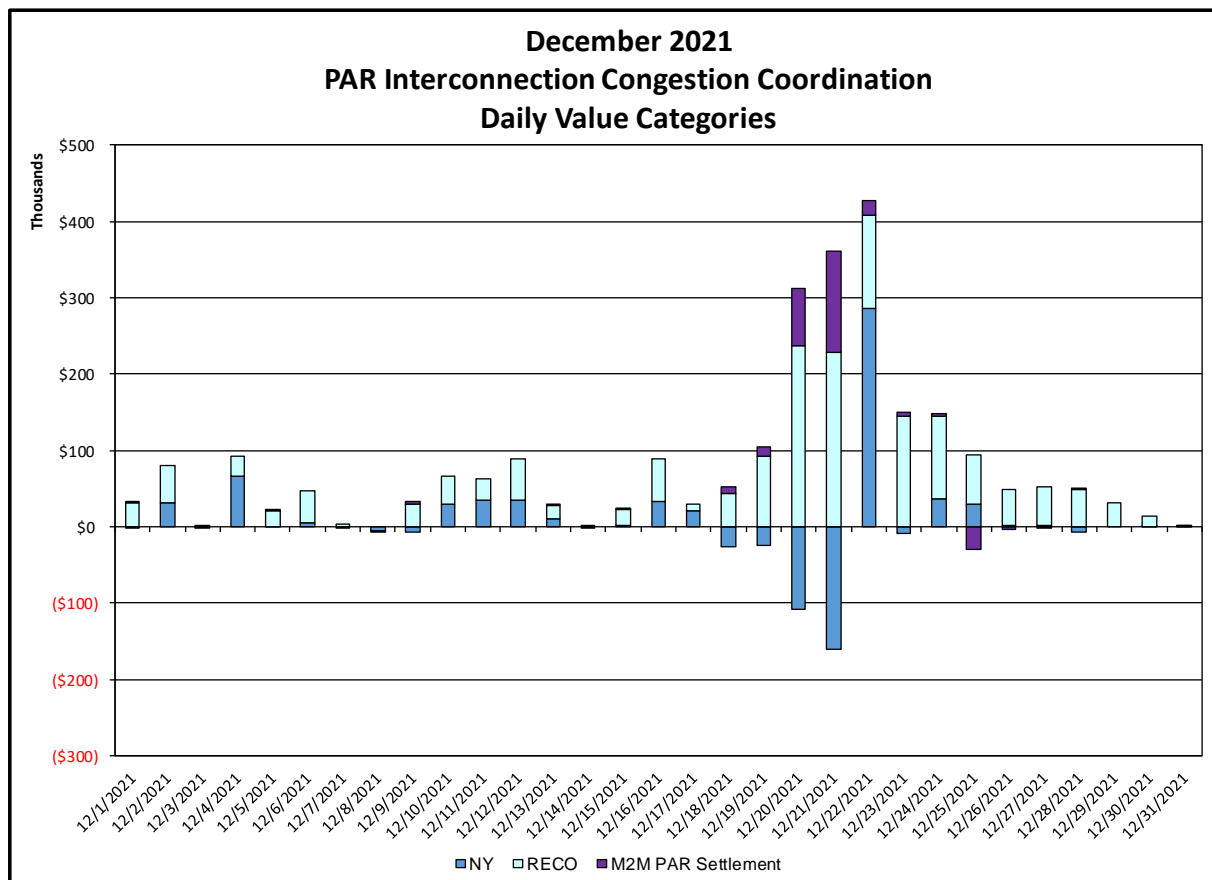
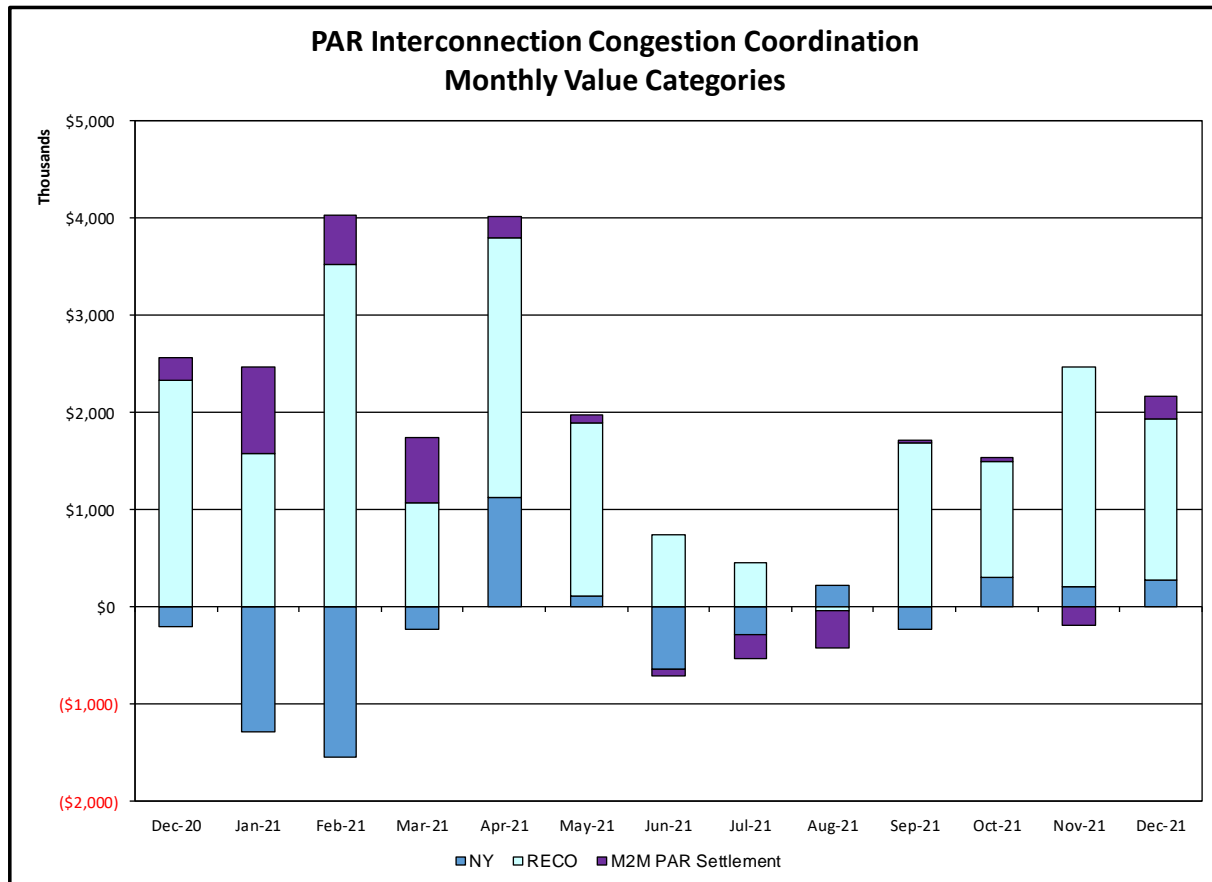
Interchange schedules with positive values aggravate clockwise Lake Erie Circulation.

**Lake Erie Circulation and ISO Net Interchange Schedules  
Daily Averages**

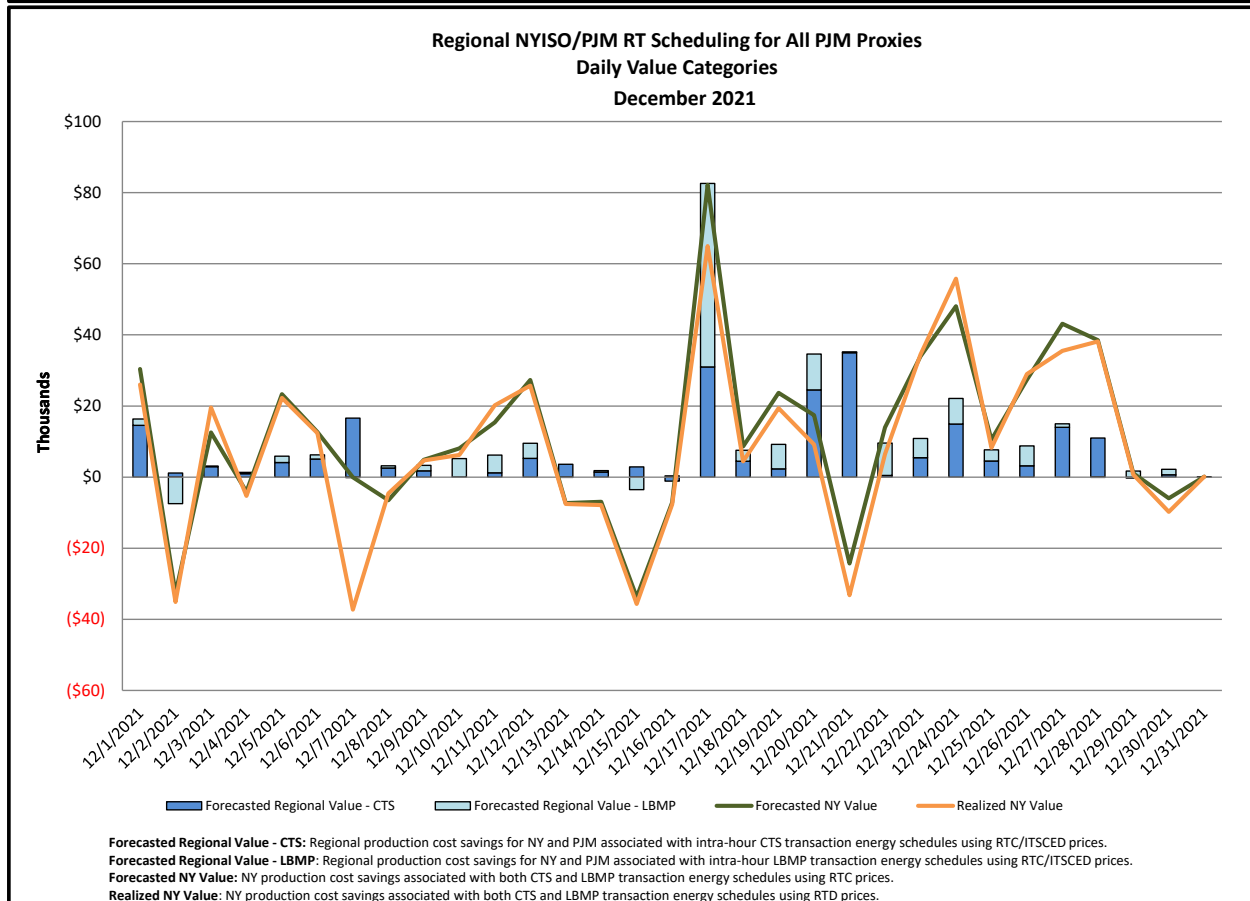
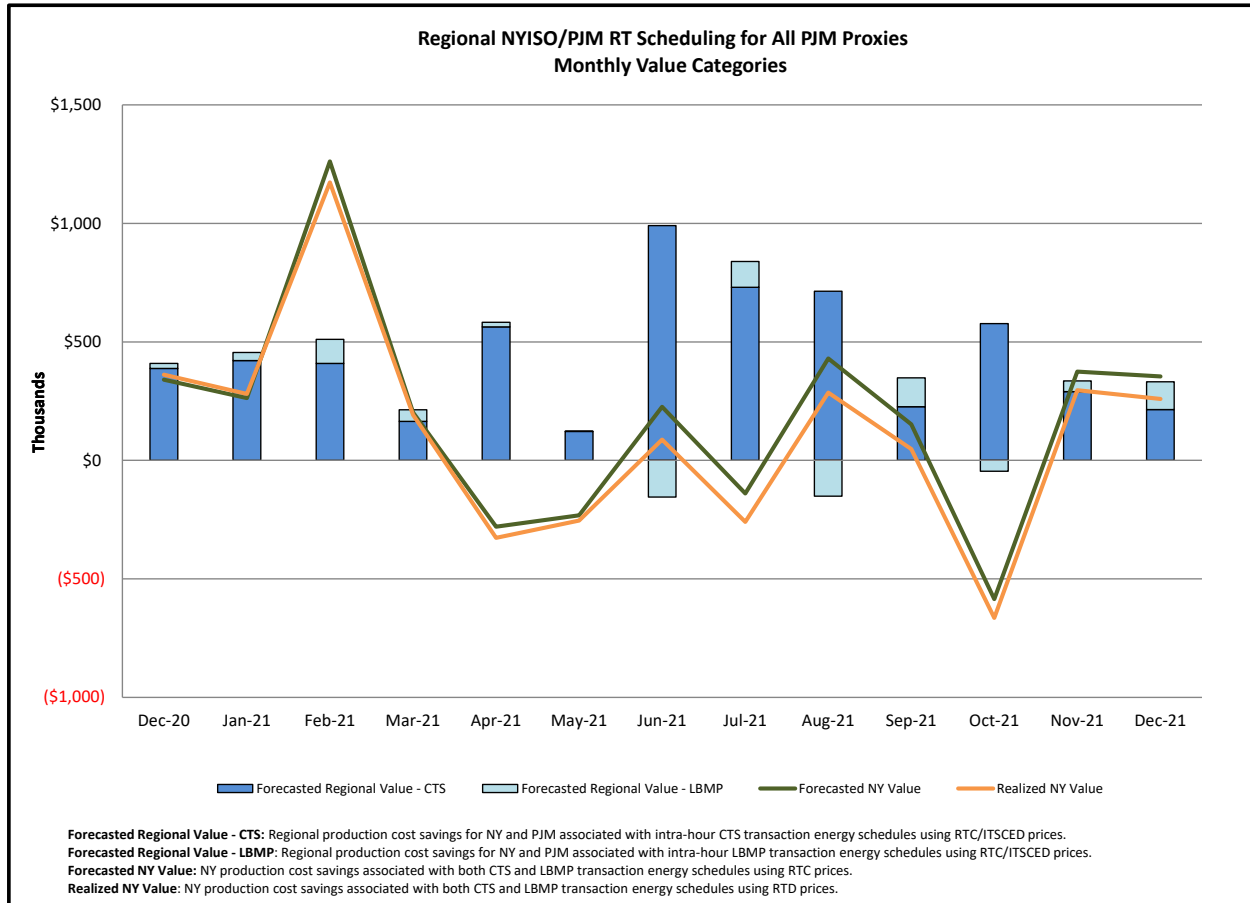


Interchange schedules with positive values aggravate clockwise Lake Erie Circulation.

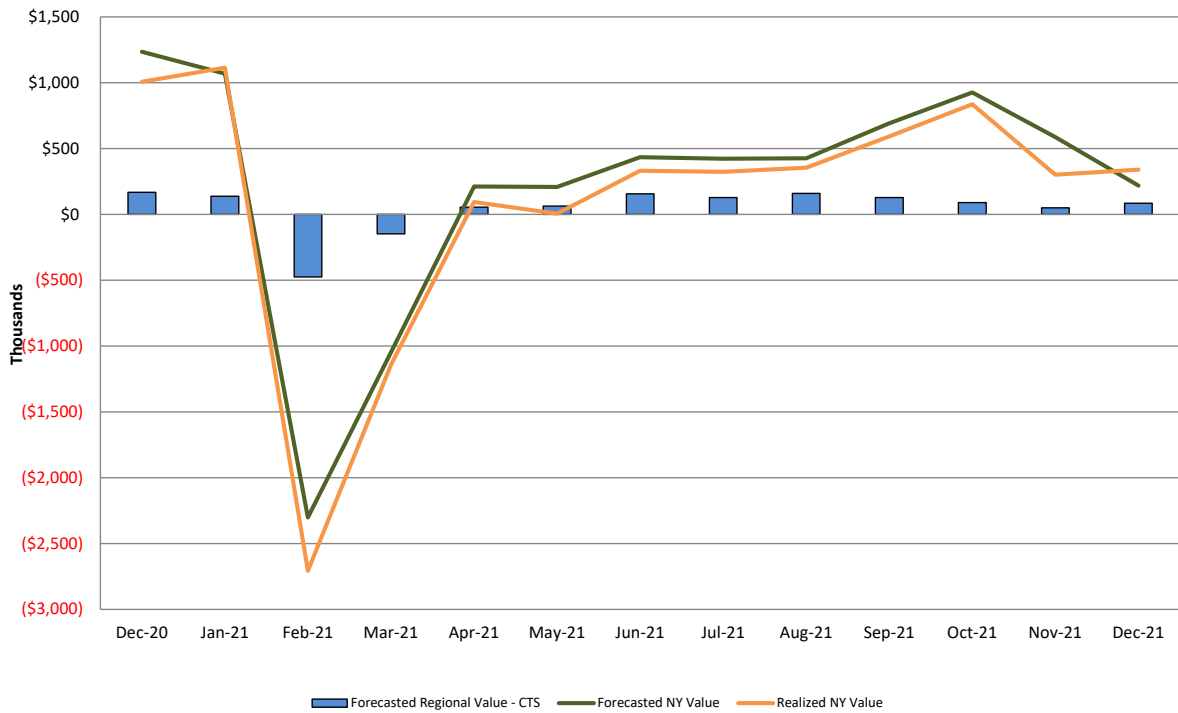
## Broader Regional Market Performance Metrics



<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.

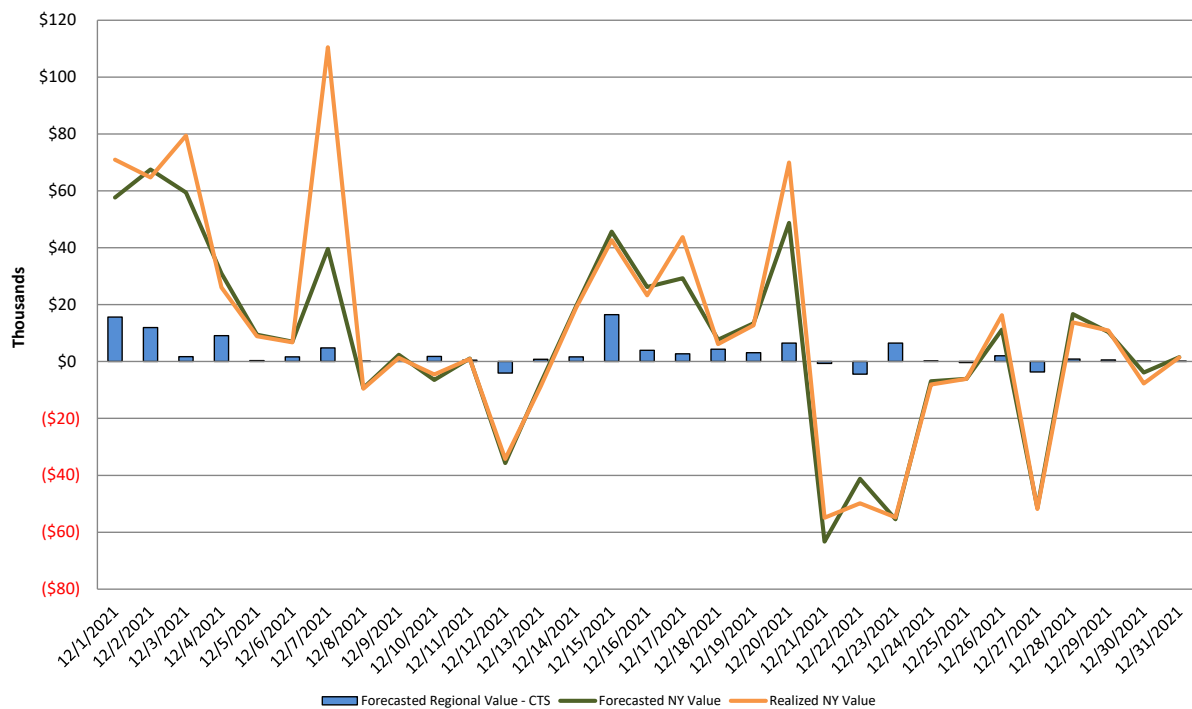


### Regional NYISO/NE RT Scheduling for ISO-NE AC Monthly Value Categories



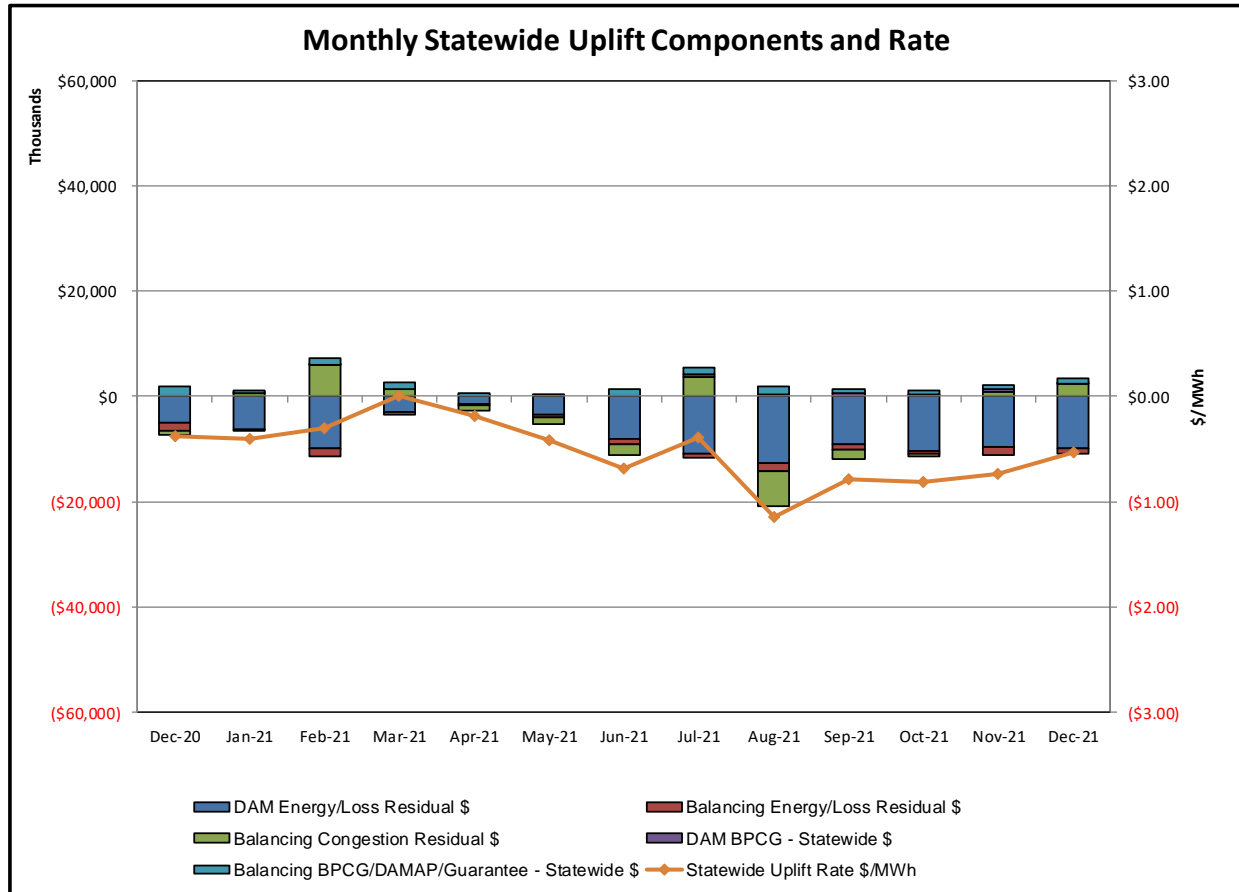
**Forecasted Regional Value - CTS:** Regional production cost savings for NY and NE associated with intra-hour CTS transaction energy schedules using RTC prices and NE forecasted prices.  
**Forecasted NY Value:** NY production cost savings associated with CTS transaction energy schedules using RTC prices.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

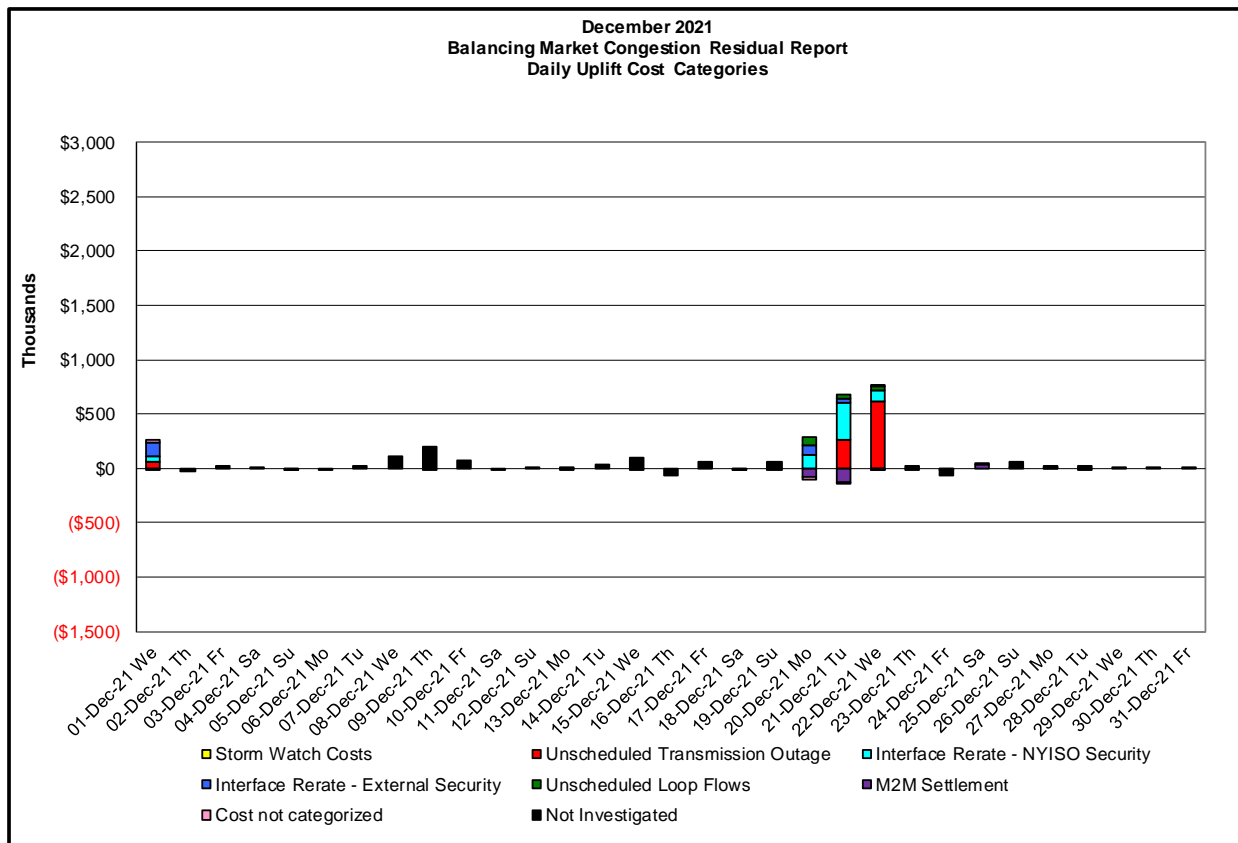
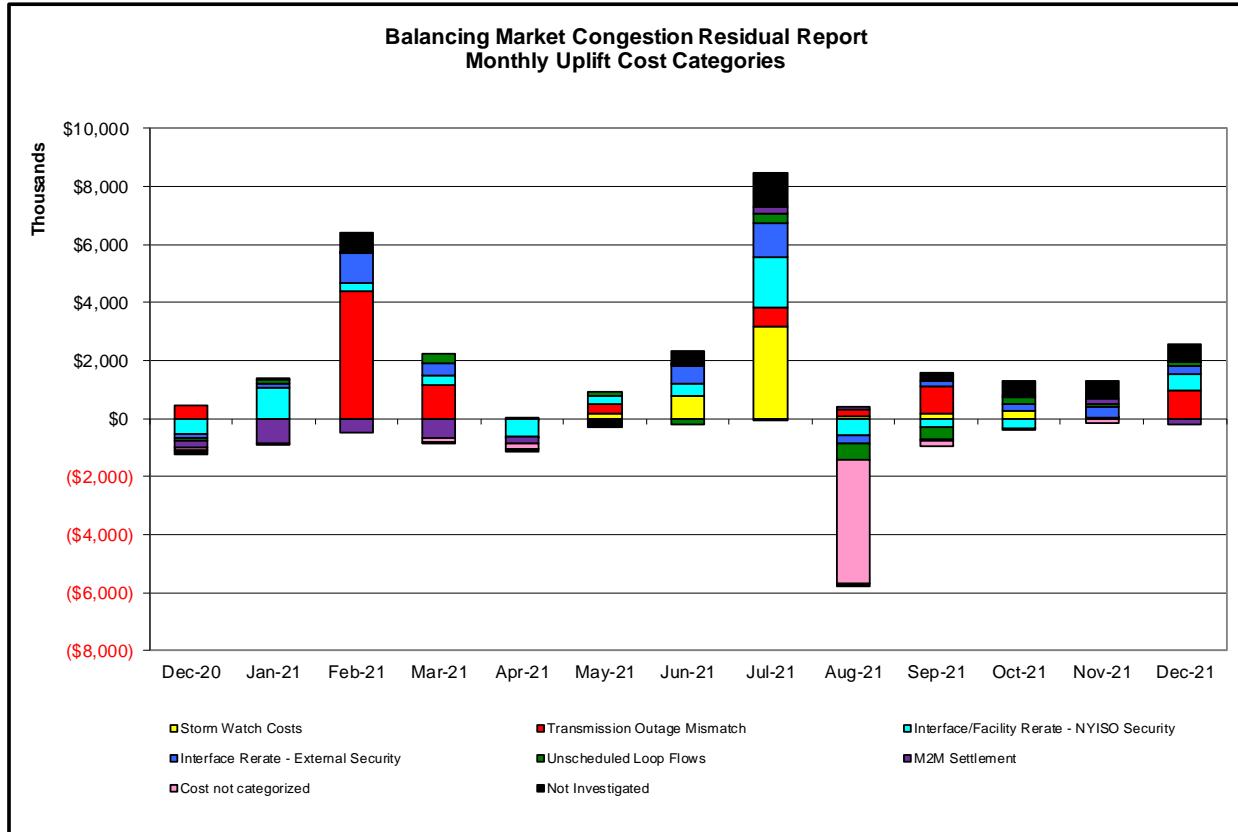
### Regional NYISO/NE RT Scheduling for ISO-NE AC Daily Value Categories December 2021



**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

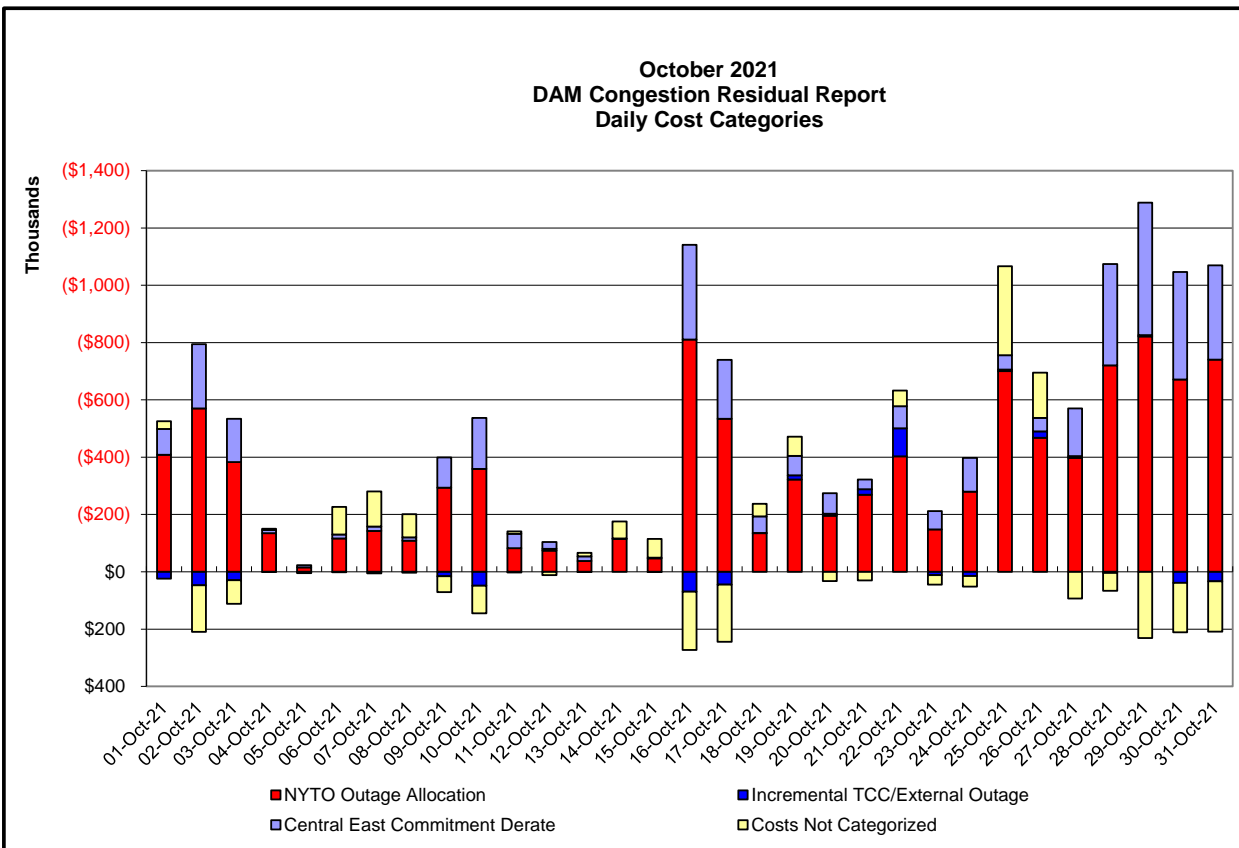
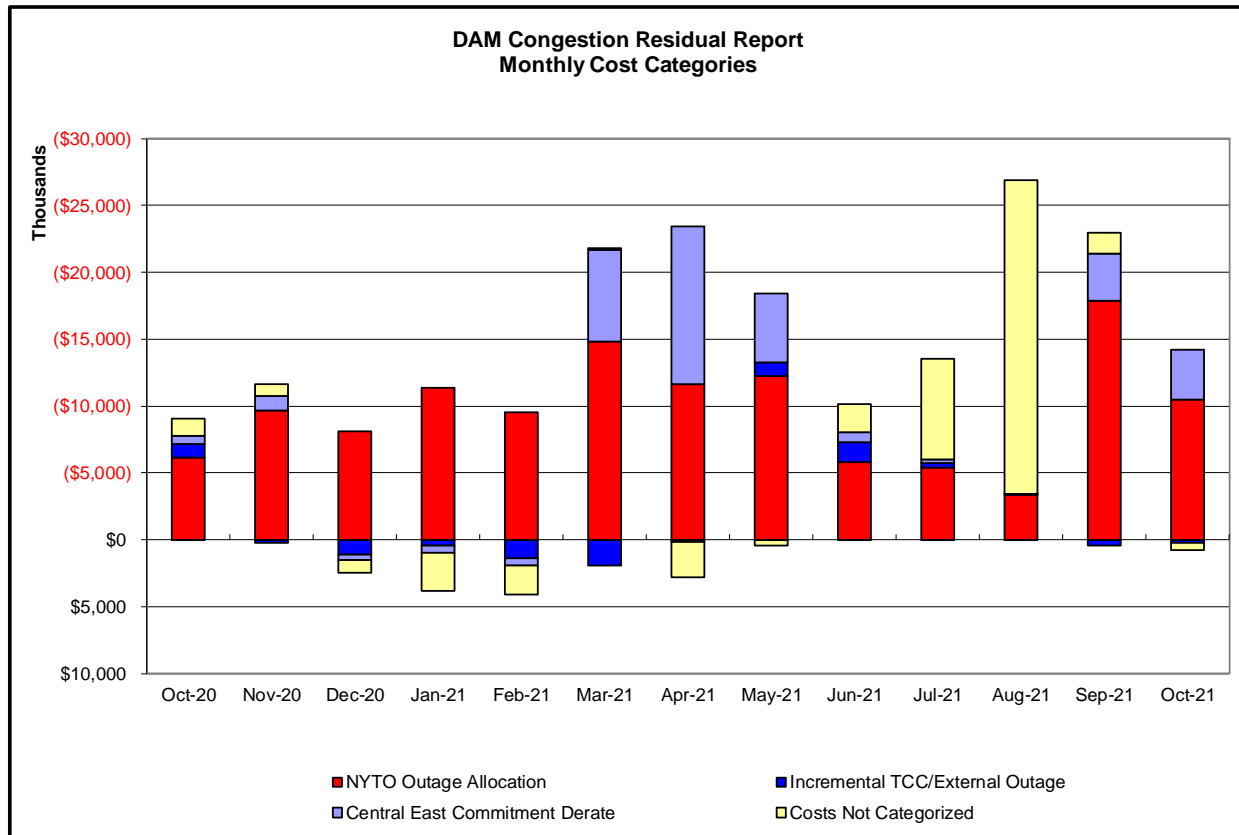




Day's investigated in December: 1, 20, 21, 22			
Event	Date (yyyymmdd)	Hours	Description
	12/1/2021	1, 3, 4	Forced Outage Marcy-Massena 765kV (#MSU1)
	12/1/2021	12	NYCA DNI Ramp Limit
	12/1/2021	4	Derate Adirondack-Porter 230kV (#12) I/o ChasesLake-Porter 230kV (#11)
	12/1/2021	10-13, 21-22	NE AC-NY Scheduling Limit
	12/1/2021	13	NE AC Active DNI Ramp Limit
	12/1/2021	0, 1	HQ Cedars-NY Scheduling Limit
	12/1/2021	13	HQ Chat Active DNI Ramp Limit
	12/20/2021	9, 18, 21, 23	NYCA DNI Ramp Limit
	12/20/2021	9, 15, 18-23	Derate Central East
	12/20/2021	2, 3, 6	Uprate Central East
	12/20/2021	9, 21-23	NE AC Active DNI Ramp Limit
	12/20/2021	6	IESO AC Active DNI Ramp Limit
	12/21/2021	17-23	Extended Outage Gilboa-Fraser 345kV (#GF5-35)
	12/21/2021	0, 22	NYCA DNI Ramp Limit
	12/21/2021	0-6, 8	Derate Central East
	12/21/2021	4, 5	NE AC Active DNI Ramp Limit
	12/21/2021	0, 11, 13-15, 19, 20	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	12/22/2021	0-11	Extended Outage Gilboa-Fraser 345kV (#GF5-35)
	12/22/2021	0-18	Forced Outage Hopatcon-Ramapo 500kV (#5018)
	12/22/2021	9, 10	Derate Gowanus-Goethals 345kV (#26)
	12/22/2021	17-19	Mortimer-Sweden 115kV (#113) I/o Niagara-Sta255 345kV (#NH2)
	12/22/2021	22	Uprate Central East
	12/22/2021	22	IESO AC Active DNI Ramp
	12/22/2021	6	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	12/22/2021	15, 18	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; West

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

<u>Category</u>	<u>Cost Assignment</u>	<u>Events Types</u>	<u>Event Examples</u>
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	
<u>Monthly Balancing Market Congestion Report Assumptions/Notes</u>			
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 Derate	All TO by Monthly Allocation Factor	Reductions in the DAM Central East_VC limit as compared to the TCC Auction limit, which are not associated with transmission line outages.	

