

Operations Performance Metrics Monthly Report



July 2022 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 August 8, 2022.

Table of Contents

- ♦ **Highlights**
 - *Operations Performance*
- ♦ **Reliability Performance Metrics**
 - *Alert State Declarations*
 - *Major Emergency State Declarations*
 - *IROL Exceedance Times*
 - *Balancing Area Control Performance*
 - *Reserve Activations*
 - *Disturbance Recovery Times*
 - *Load Forecasting Performance*
 - *Wind Forecasting Performance*
 - *Wind Performance and Curtailments*
 - *BTM Solar Performance*
 - *BTM Solar Forecasting Performance*
 - *Net Wind and Solar Performance*
 - *Net Load Forecasting Performance*
 - *Lake Erie Circulation and ISO Schedules*
- ♦ **Broader Regional Market Performance Metrics**
 - *PAR Interconnection Congestion Coordination Monthly Value*
 - *PAR Interconnection Congestion Coordination Daily Value*
 - *Regional Generation Congestion Coordination Monthly Value*
 - *Regional Generation Congestion Coordination Daily Value*
 - *Regional RT Scheduling - PJM Monthly Value*
 - *Regional RT Scheduling - PJM Daily Value*
- ♦ **Market Performance Metrics**
 - *Monthly Statewide Uplift Components and Rate*
 - *RTM Congestion Residuals Monthly Trend*
 - *RTM Congestion Residuals Daily Costs*
 - *RTM Congestion Residuals Event Summary*
 - *RTM Congestion Residuals Cost Categories*
 - *DAM Congestion Residuals Monthly Trend*
 - *DAM Congestion Residuals Daily Costs*
 - *DAM Congestion Residuals Cost Categories*
 - *NYCA Unit Uplift Components Monthly Trend*
 - *NYCA Unit Uplift Components Daily Costs*
 - *Local Reliability Costs Monthly Trend & Commitment Hours*
 - *TCC Monthly Clearing Price with DAM Congestion*
 - *ICAP Spot Market Clearing Price*
 - *UCAP Awards*

July 2022 Operations Performance Highlights

- July 2022 peak load of 30,505 MW occurred on 7/20/2022 HB 17
- Summer 2022 capability period peak load to date of 30,505MW occurred on 7/20/2022 HB 17
- All-time summer capability period peak load of 33,956 MW occurred on 07/19/2013 HB 16
- 29.9 hours of Thunderstorm Alerts were declared
- 0 hours of NERC TLR level 3 curtailment
- EDRP/SCR resources activated in Zone F on 7/19/2022 from HB16-22.
- EDRP/SCR resources activated in Zone F on 7/20/2022 from HB15-22.

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

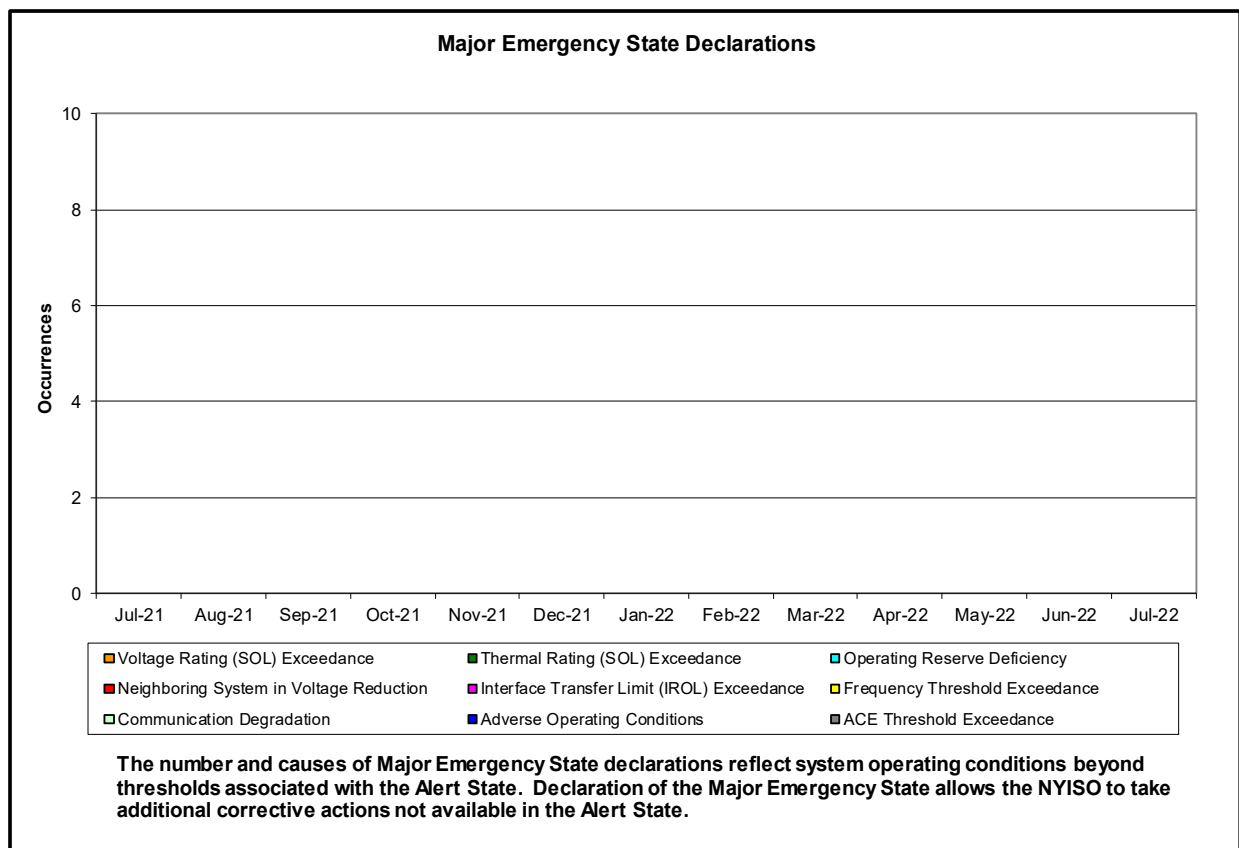
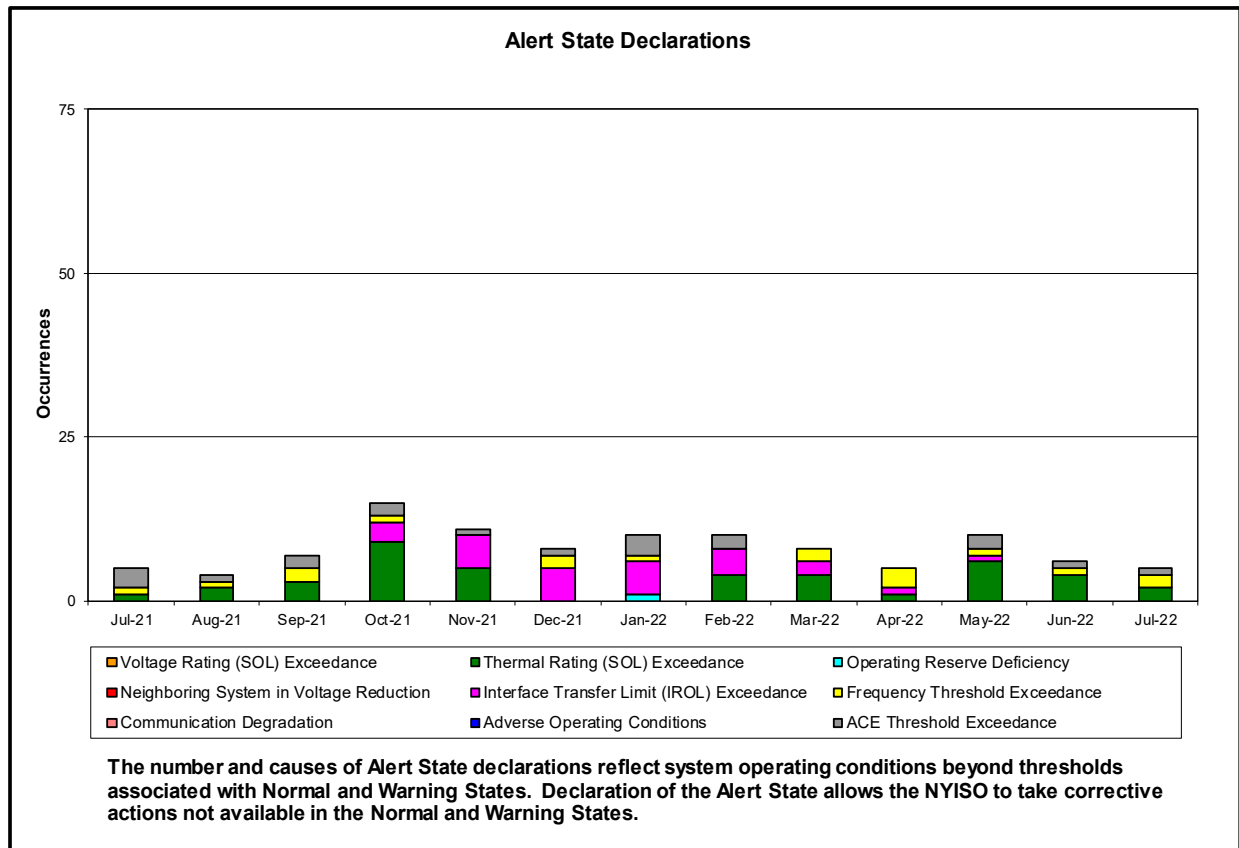
	Current Month Value (\$M)	Year-to-Date Value (\$M)
NY Savings from PJM-NY Congestion Coordination	(\$0.39)	\$22.76
NY Savings from PJM-NY Coordinated Transaction Scheduling	\$1.97	\$0.29
NY Savings from NE-NY Coordinated Transaction Scheduling	\$1.96	\$5.64
Total NY Savings	\$3.53	\$28.69
Regional Savings from PJM-NY Coordinated Transaction Scheduling	\$1.14	\$4.22
Regional Savings from NE-NY Coordinated Transaction Scheduling	\$0.36	\$2.53
Total Regional Savings	\$1.50	\$6.75

- Statewide uplift cost monthly average was (\$2.12)/MWh.
- The following table identifies the Monthly ICAP spot market prices and the price delta.

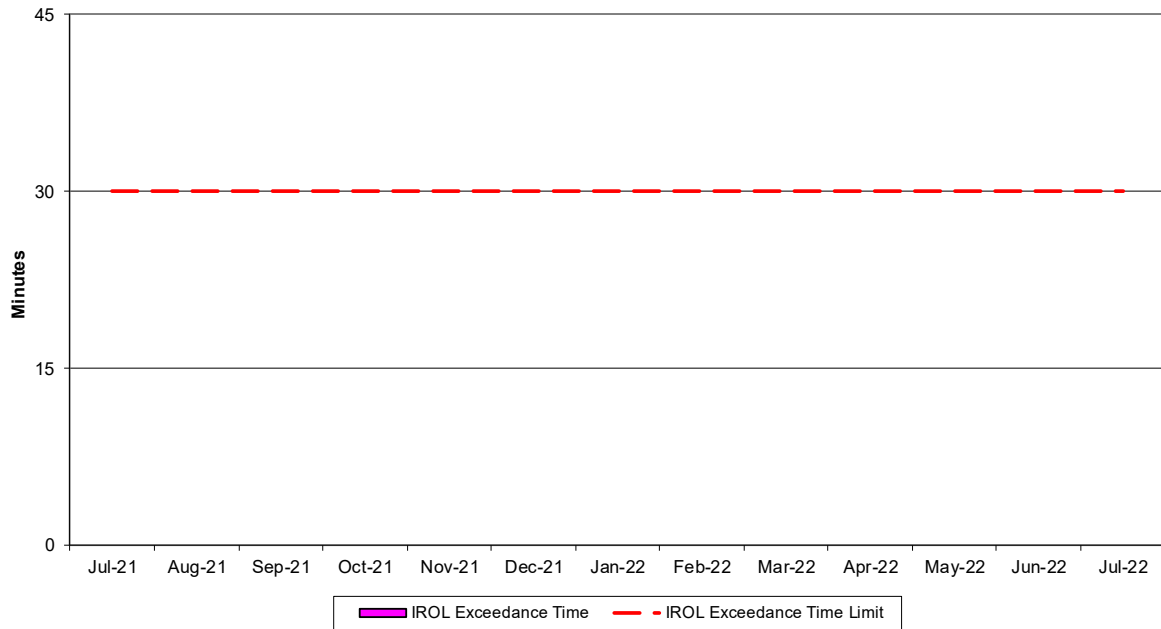
Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
August 2022 Spot Price	\$3.47	\$3.74	\$4.41	\$6.71
July 2022 Spot Price	\$3.32	\$3.32	\$3.55	\$6.71
Delta	\$0.15	\$0.42	\$0.86	\$0.00

- All localities (except LI) experienced an increase in clearing price due to an increase in unoffered MWs in New York City.

Reliability Performance Metrics

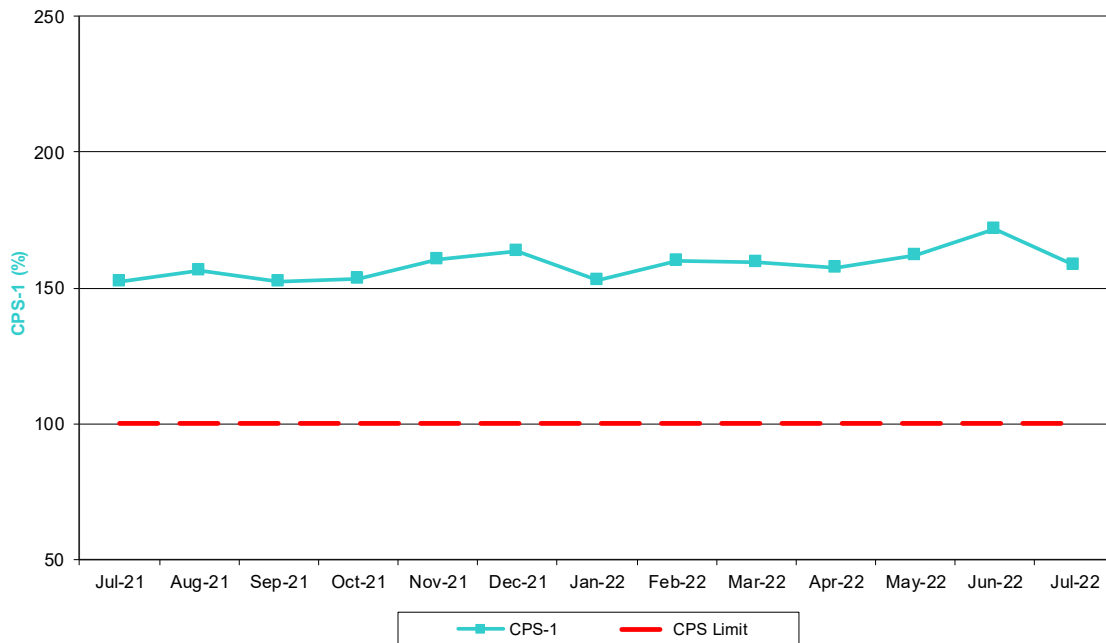


NERC IROL Time Over Limit



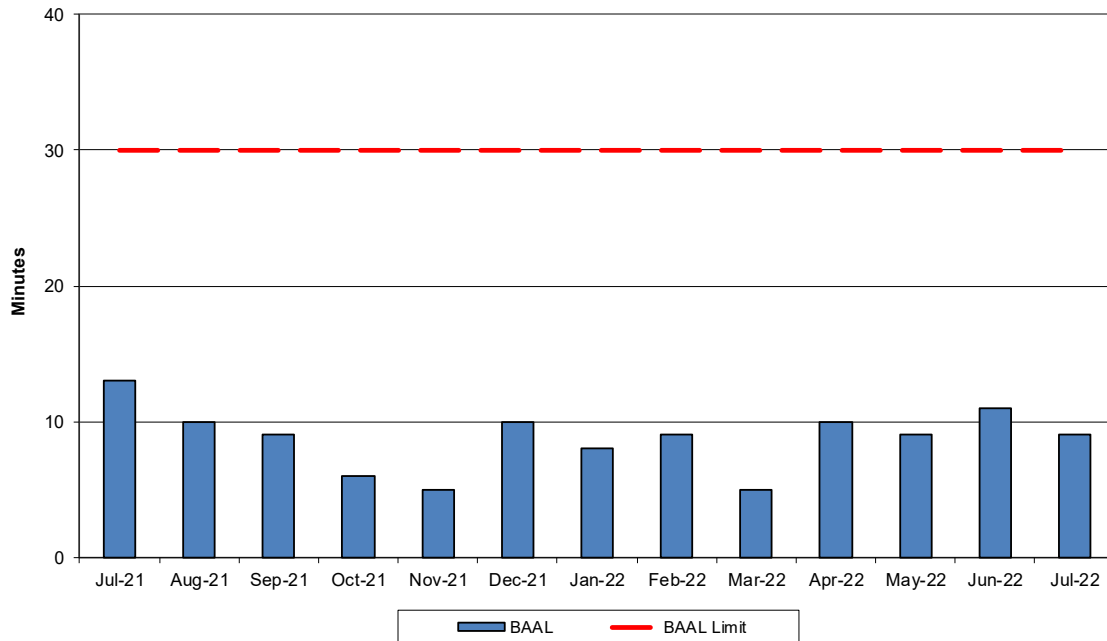
For IROL exceedances leading to Major Emergency State declarations, the maximum IROL exceedance time is identified. IROL exceedances of less than thirty minutes are considered NERC compliant.

NERC Control Performance Standards



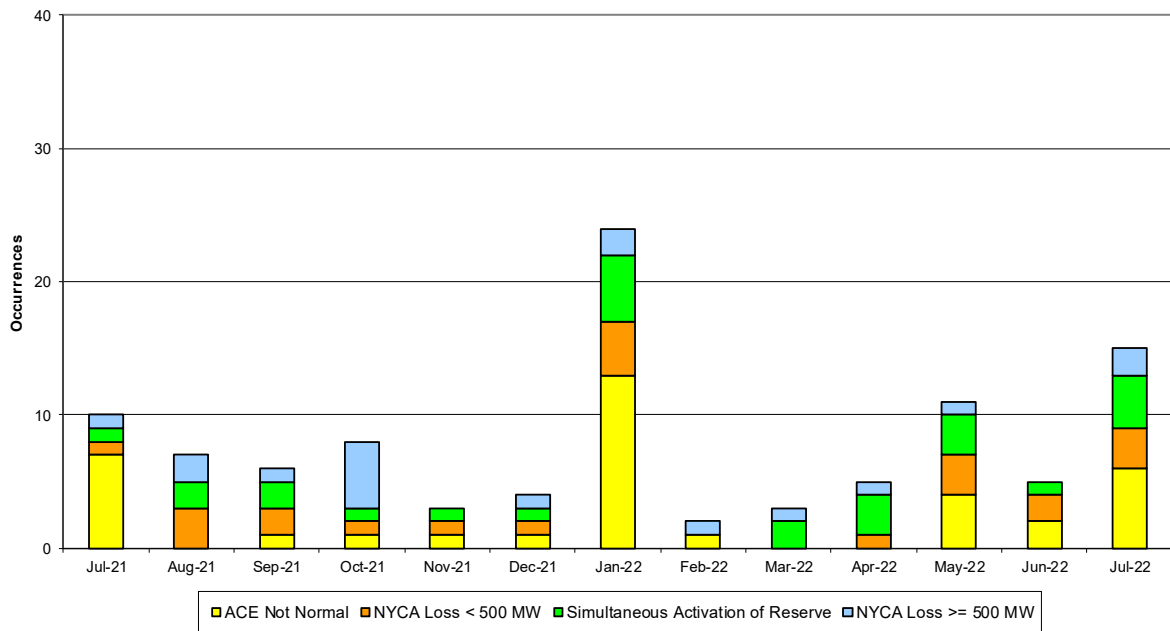
The value of NERC Control Performance Standards (CPS-1) is an indicator of the NYISO Area resource and demand balancing. Values exceeding the identified threshold are NERC compliant.

NERC Balancing Authority ACE Limit Standard



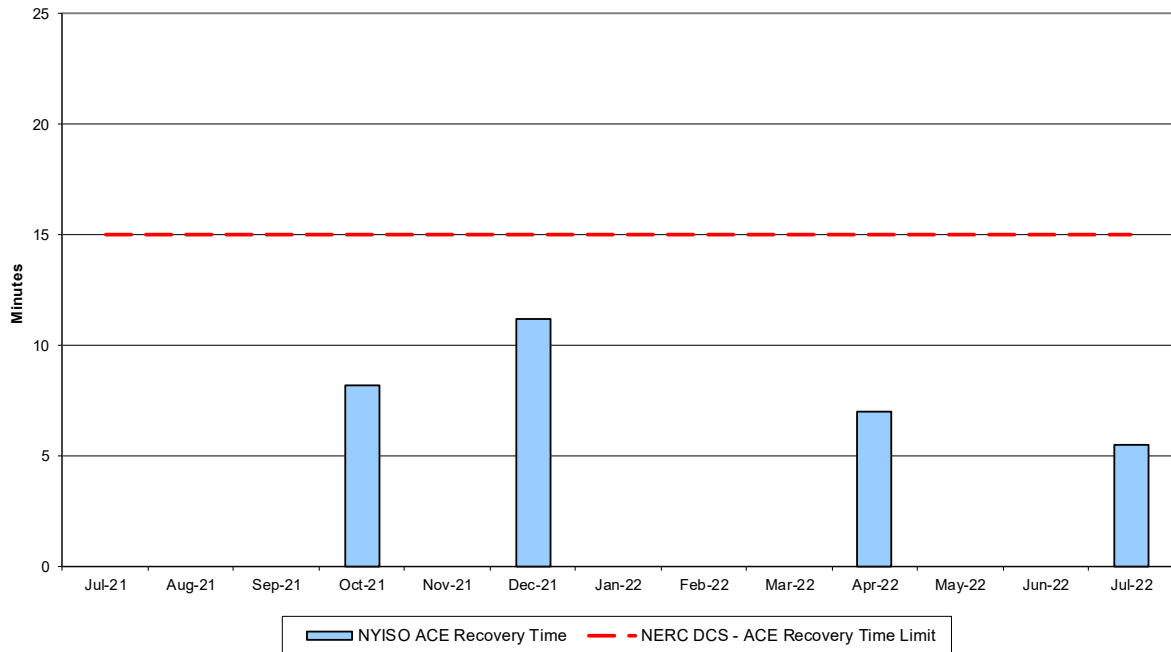
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

Reserve Activations



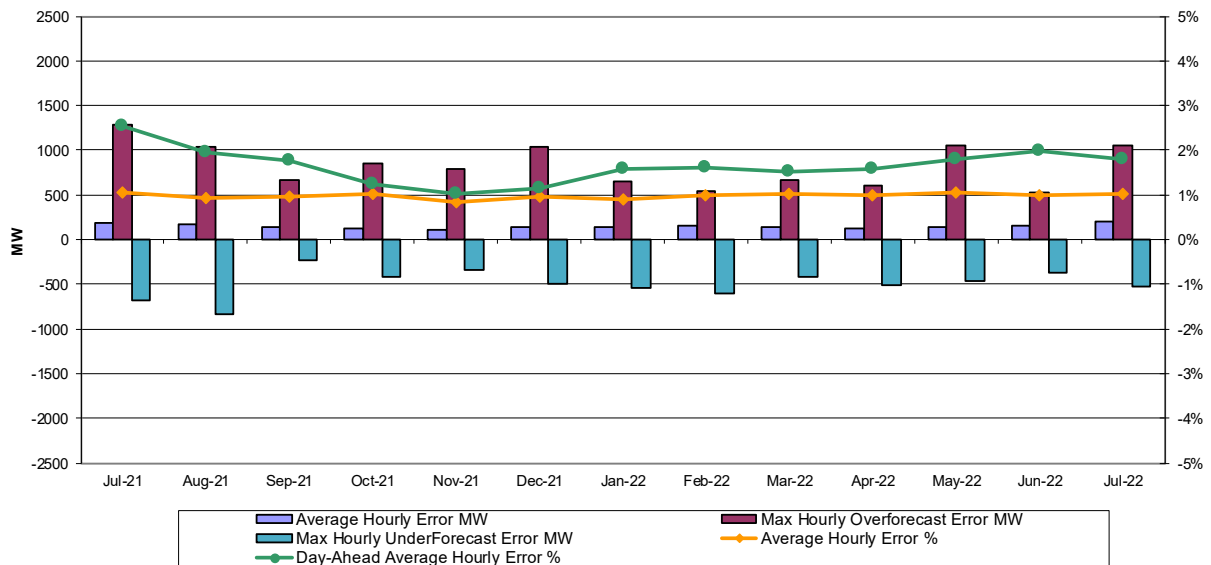
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

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

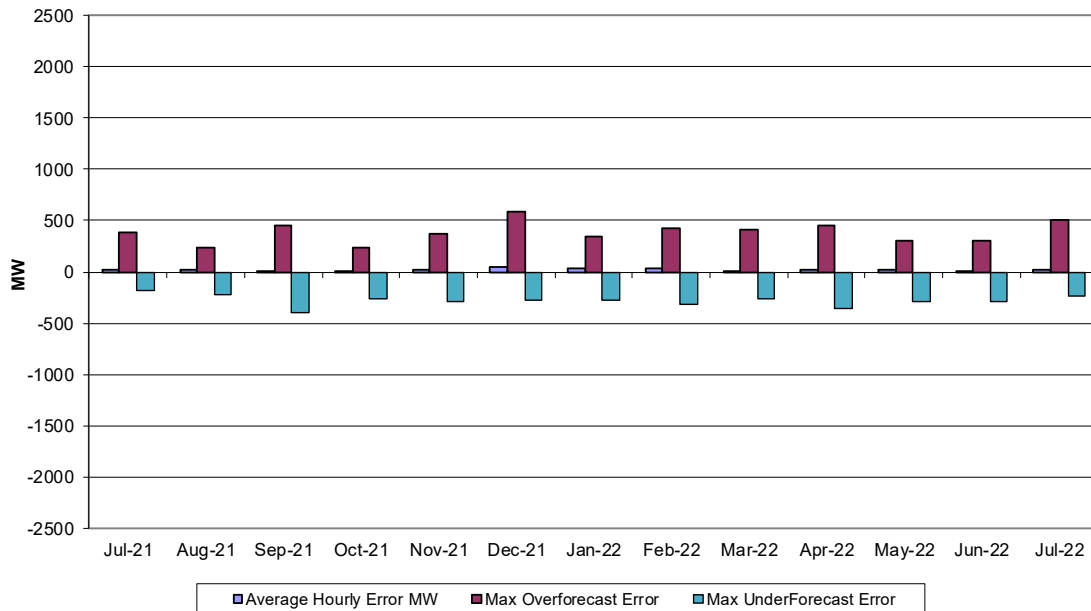


Hourly Error MW - Value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.

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

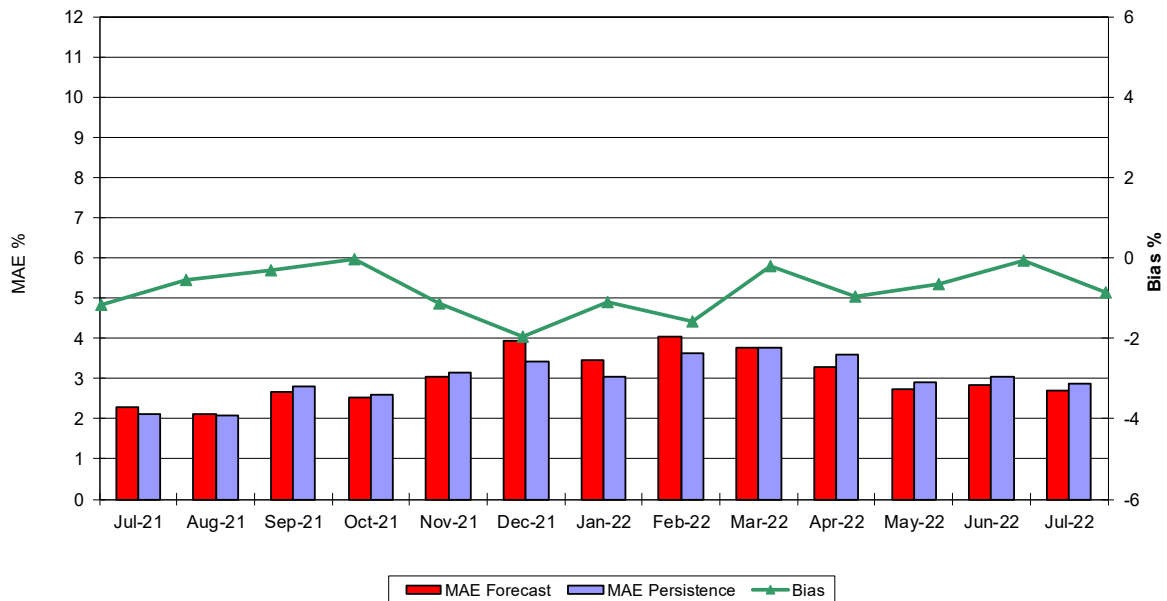
Day-Ahead Average Hourly Error % - Average across all hours of the month of the absolute value of the difference between actual load demand and the Day-Ahead forecast load demand, divided by the actual load demand.

Wind Forecast Performance Hour Ahead MW Error

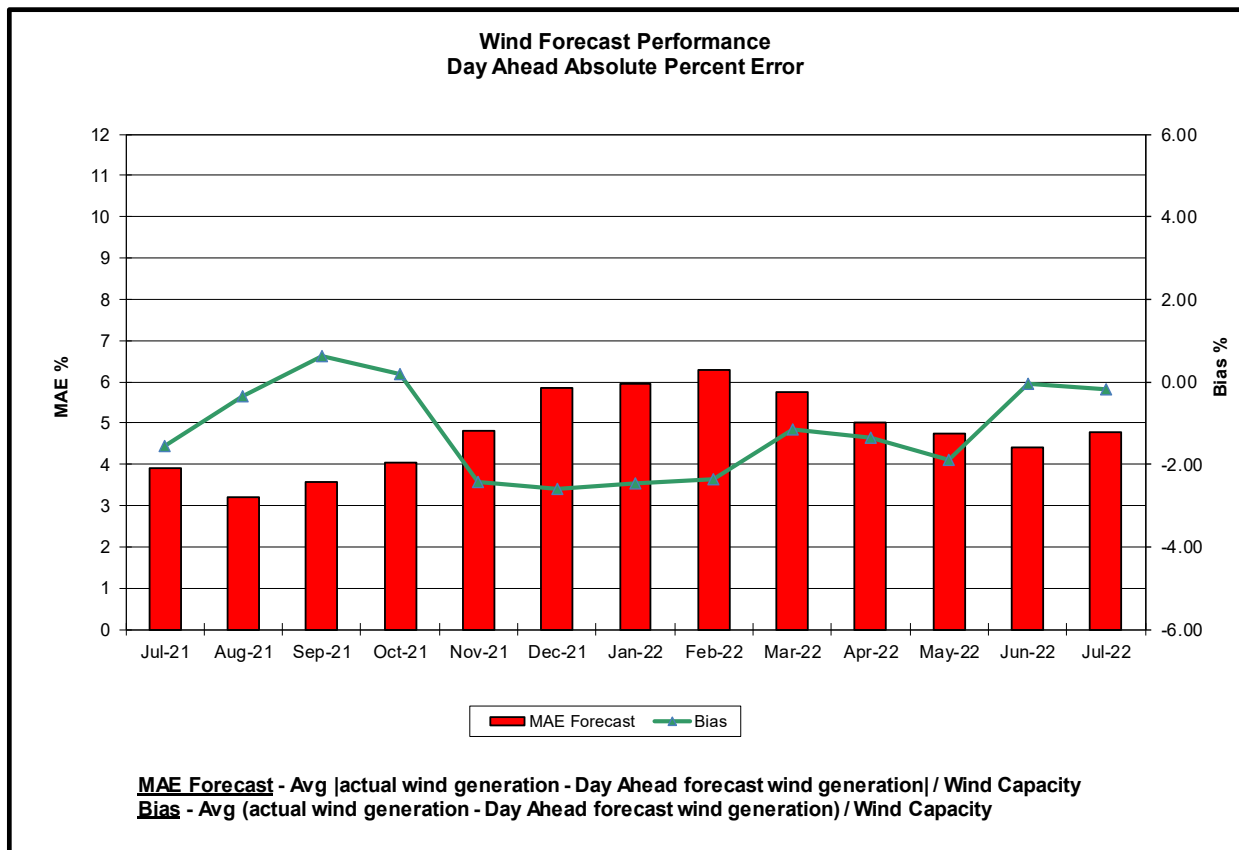
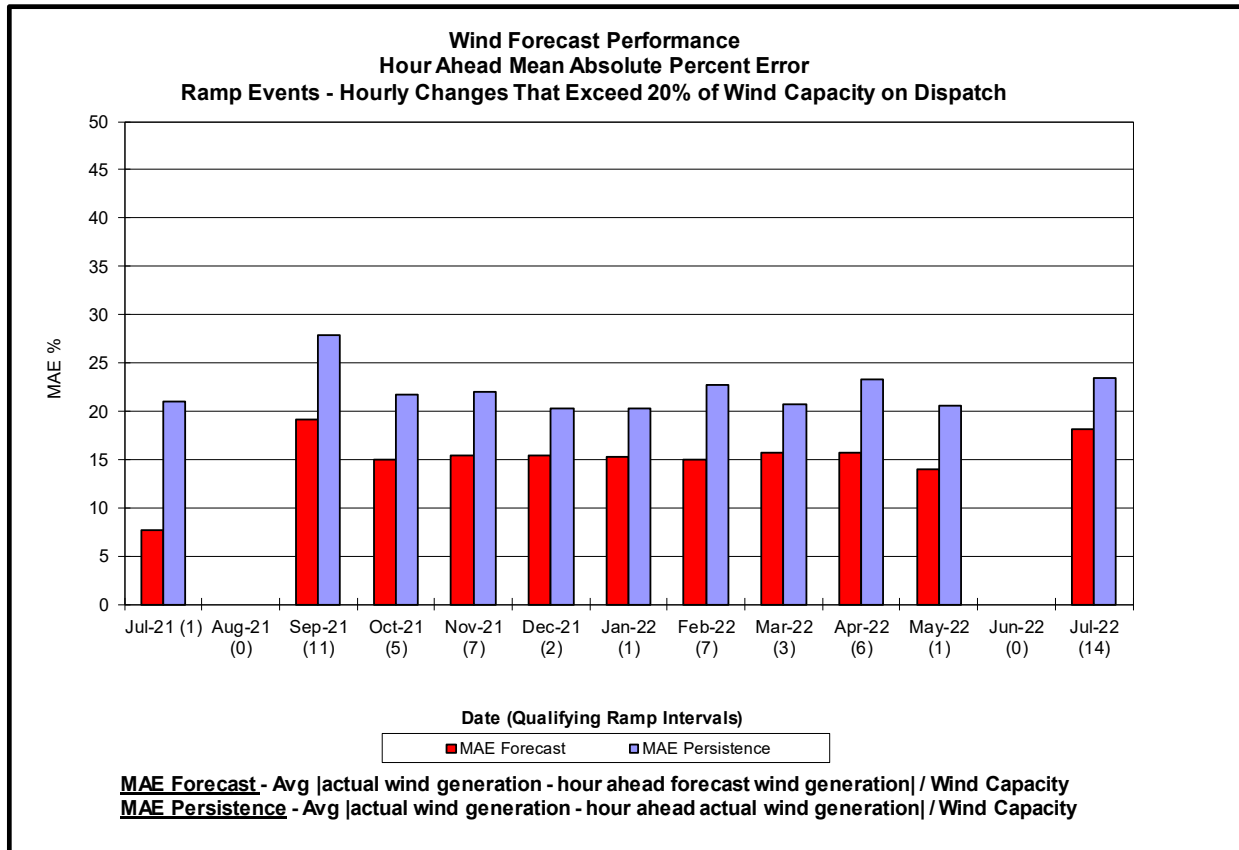


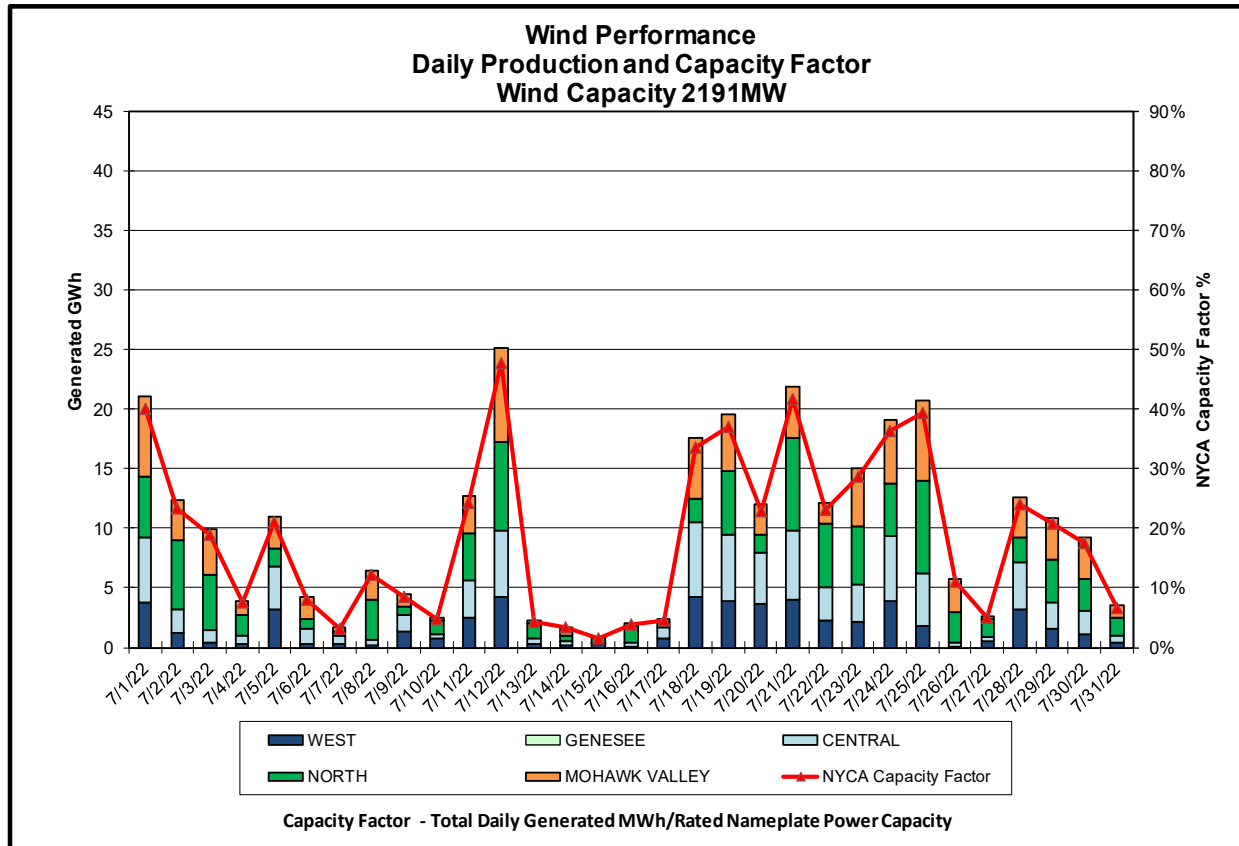
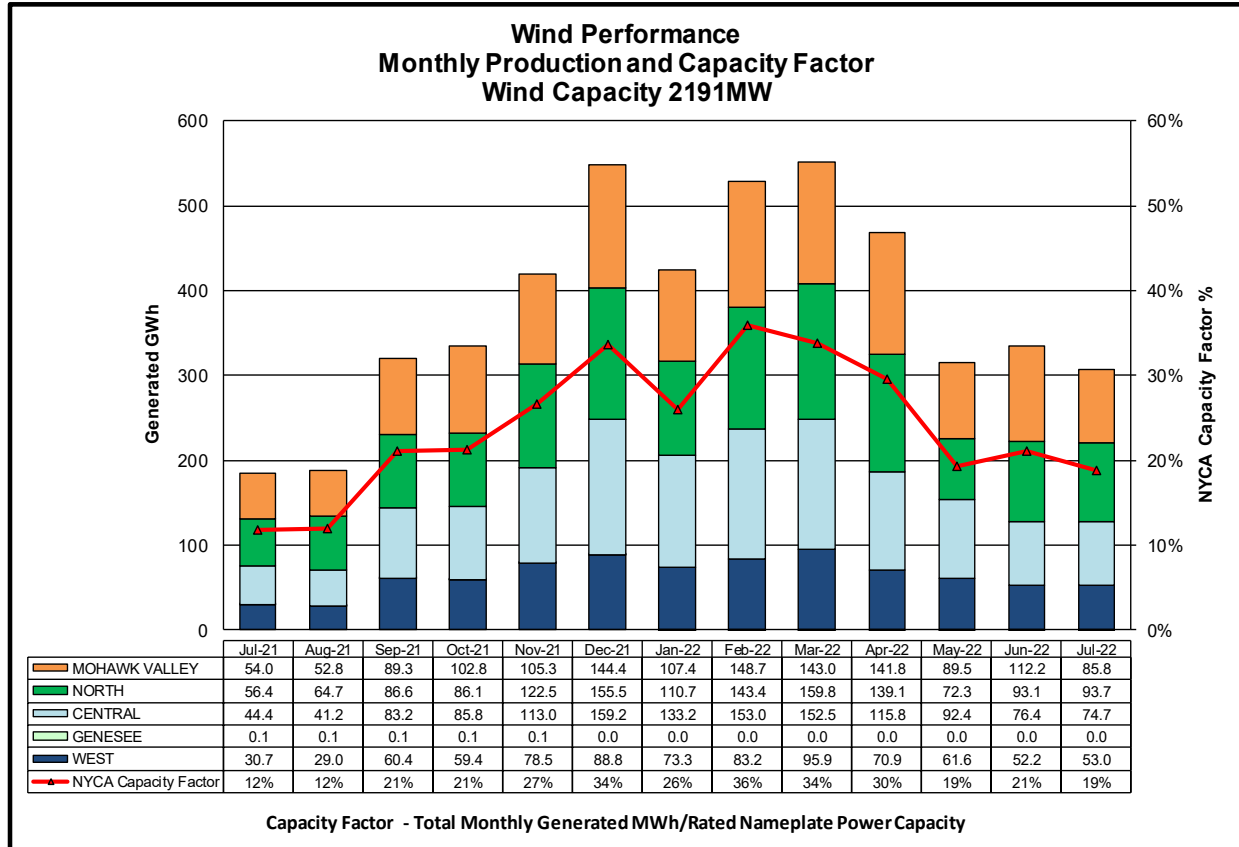
Hourly Error MW - Value of the difference between the hourly average actual wind generation and the average hour ahead forecast wind generation.

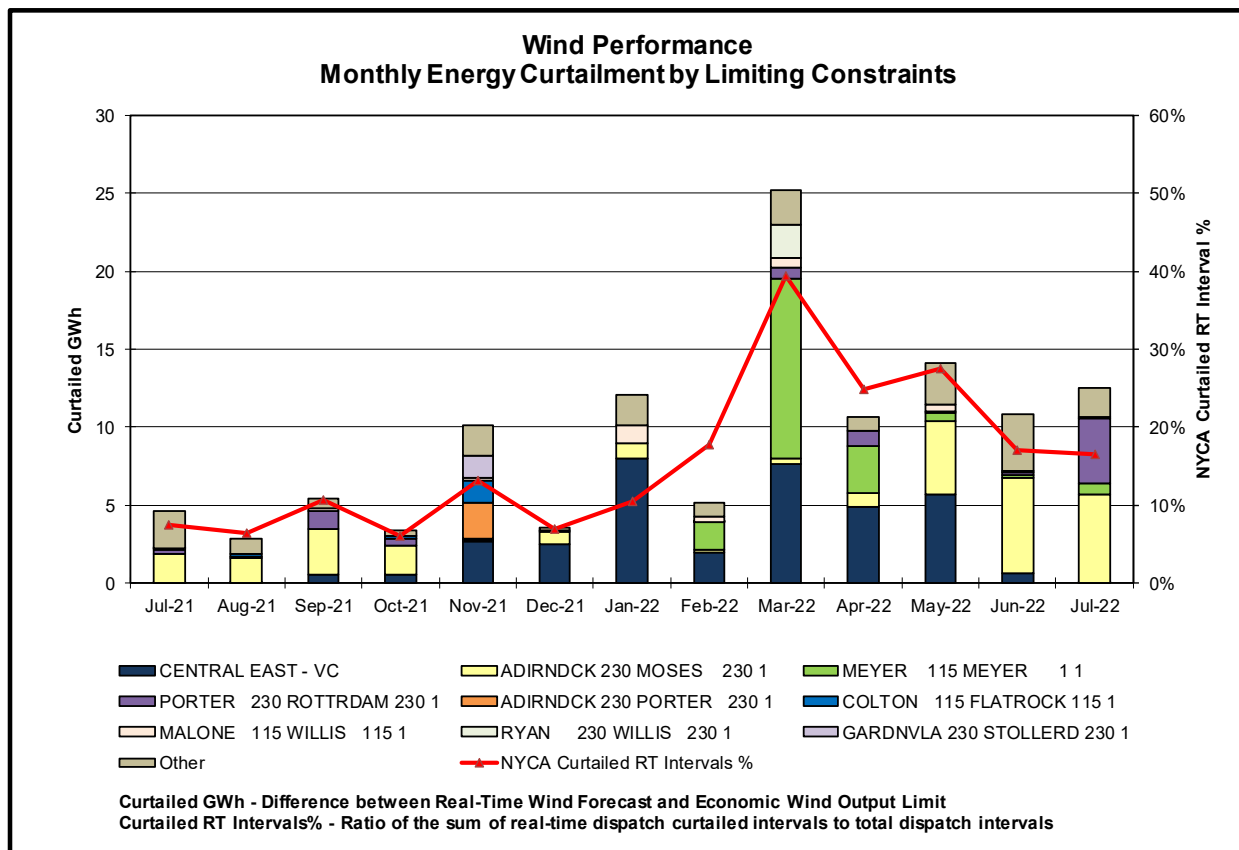
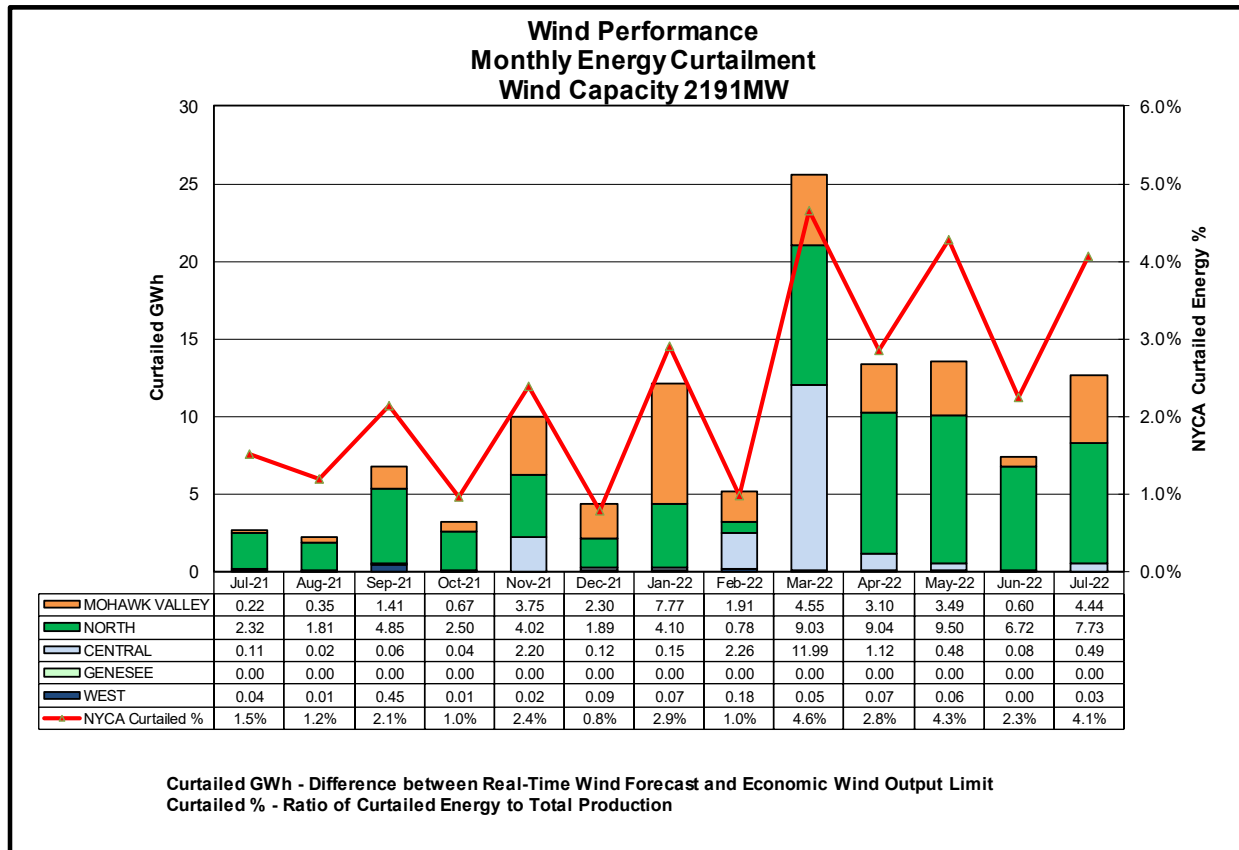
Wind Forecast Performance Hour Ahead Percent Error

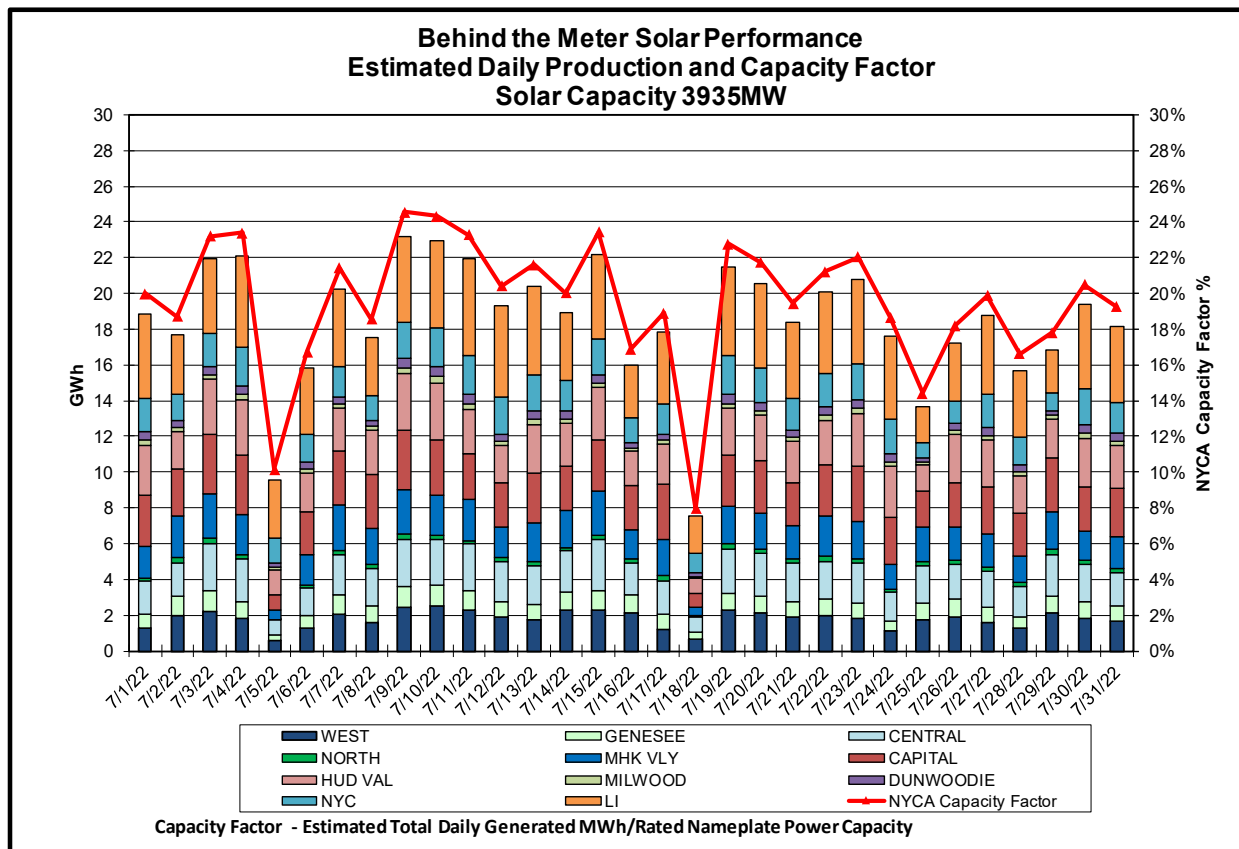
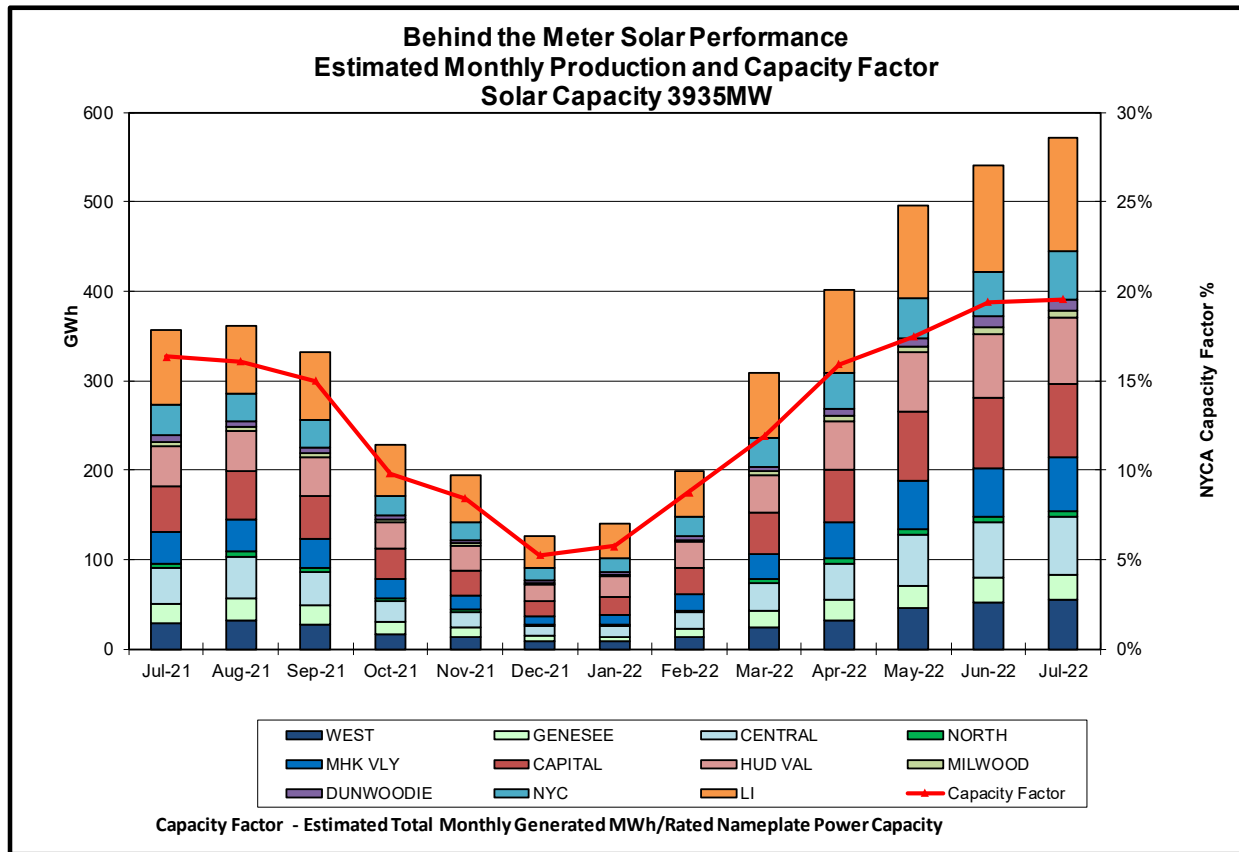


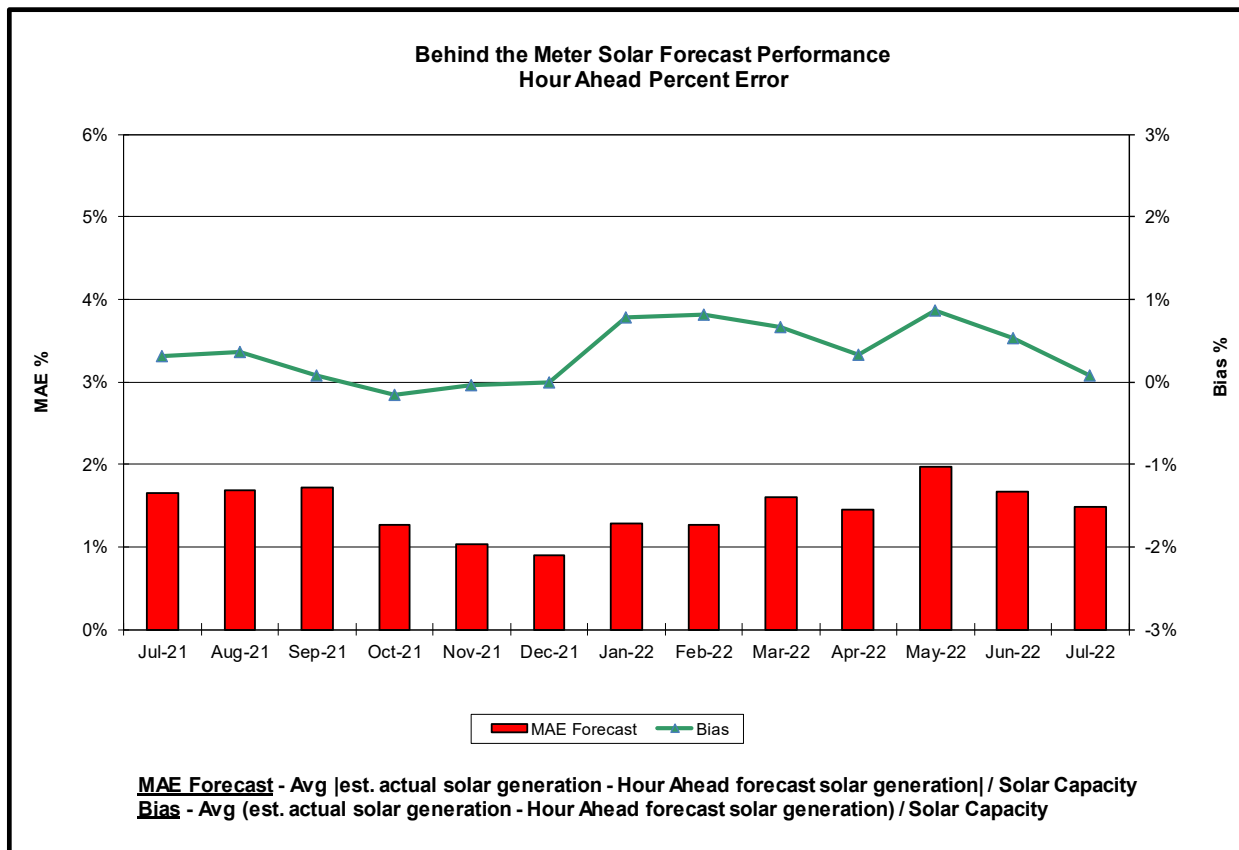
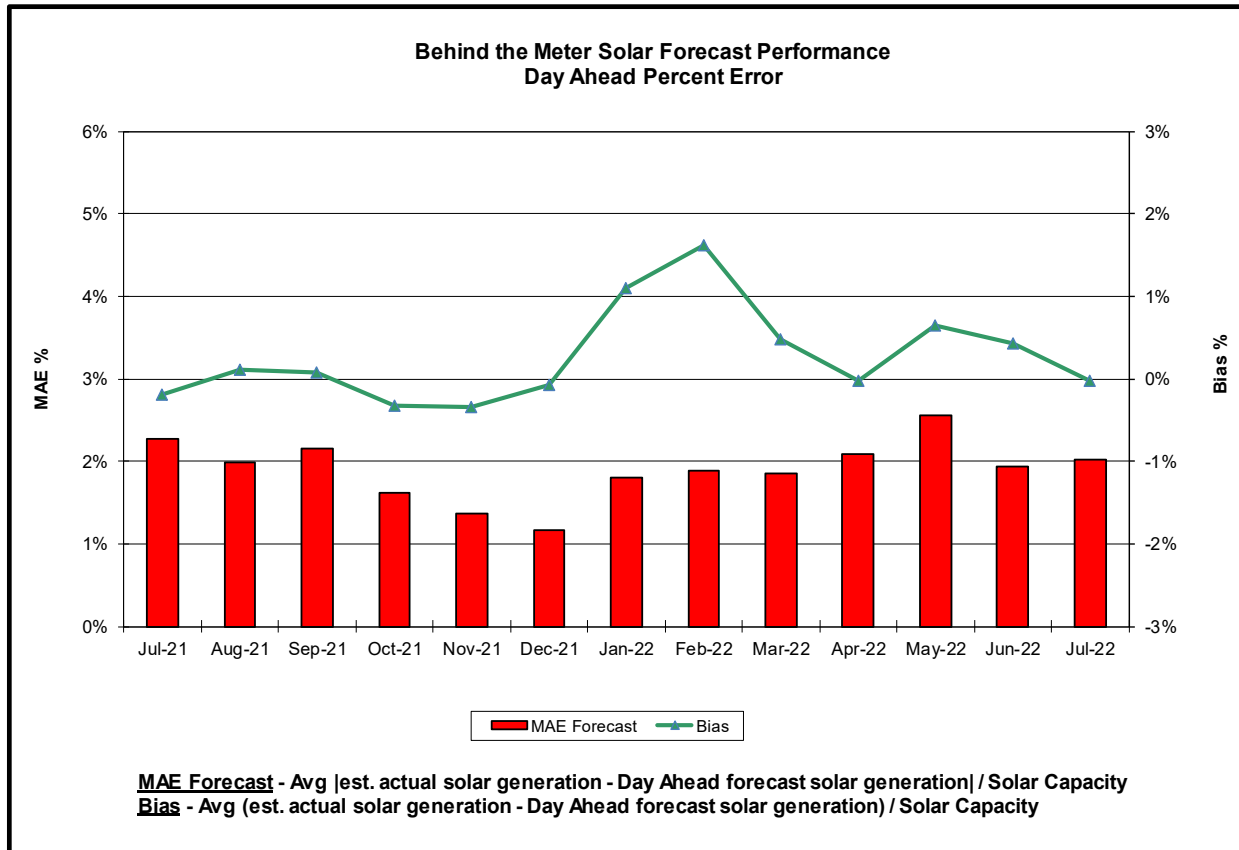
MAE Forecast - Avg |actual wind generation - hour ahead forecast wind generation| / Wind Capacity
MAE Persistence - Avg |actual wind generation - hour ahead actual wind generation| / Wind Capacity
Bias - Avg (actual wind generation - hour ahead forecast wind generation) / Wind Capacity

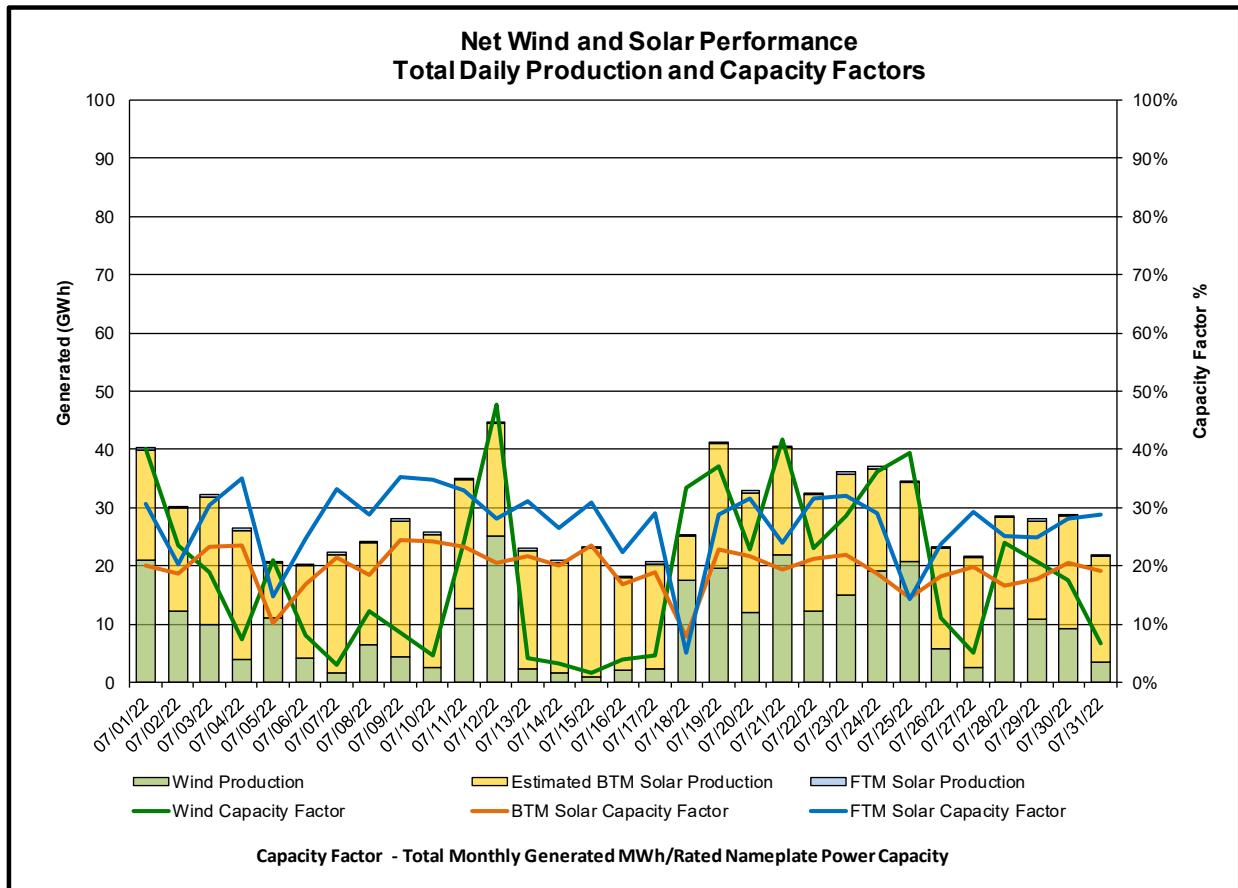
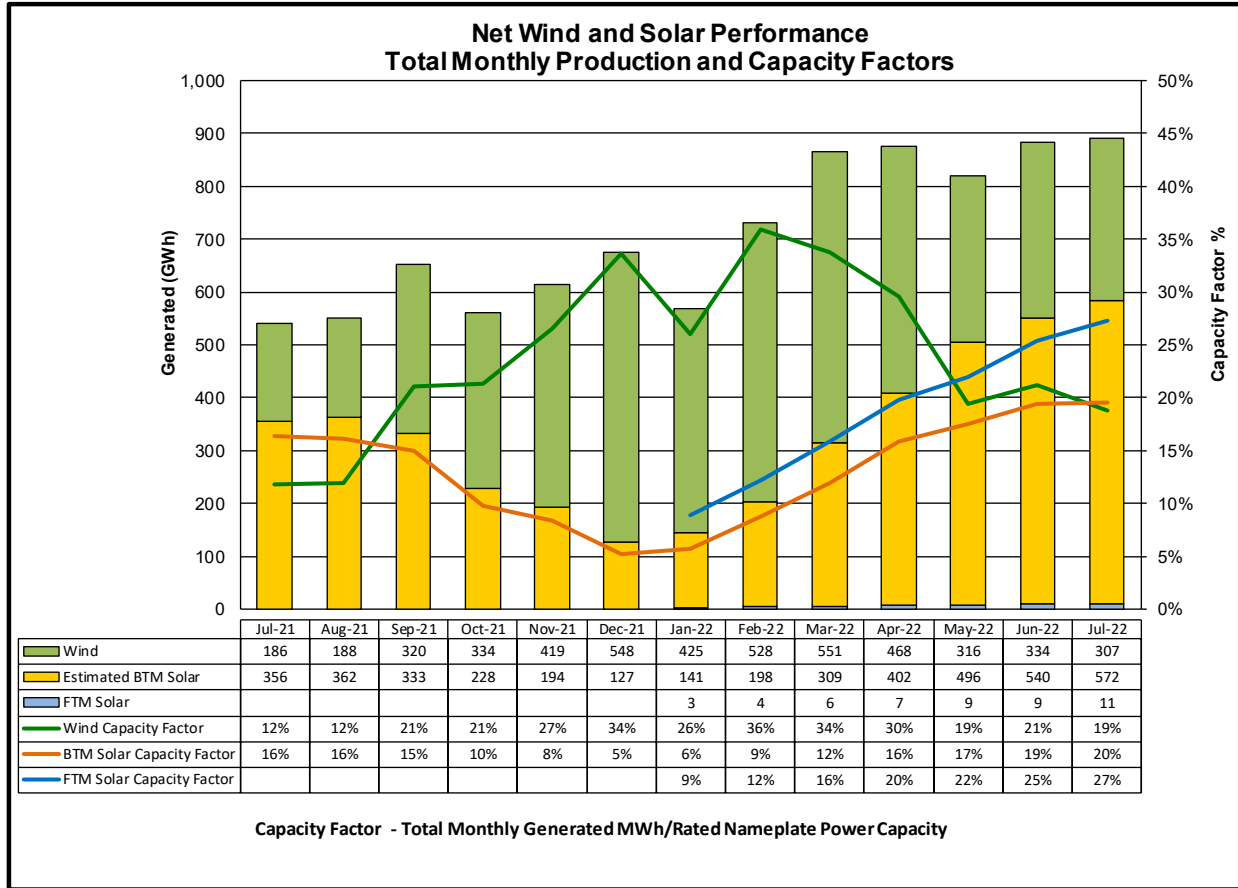


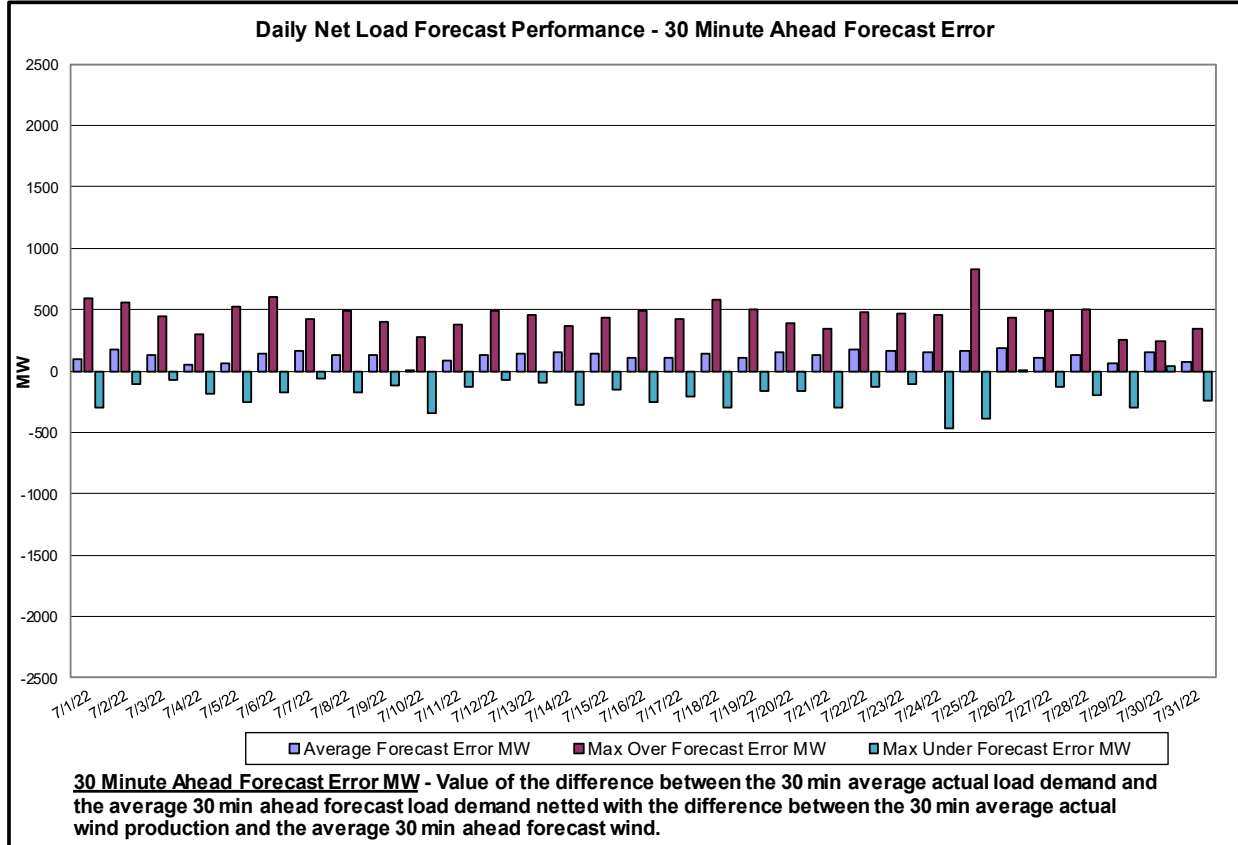
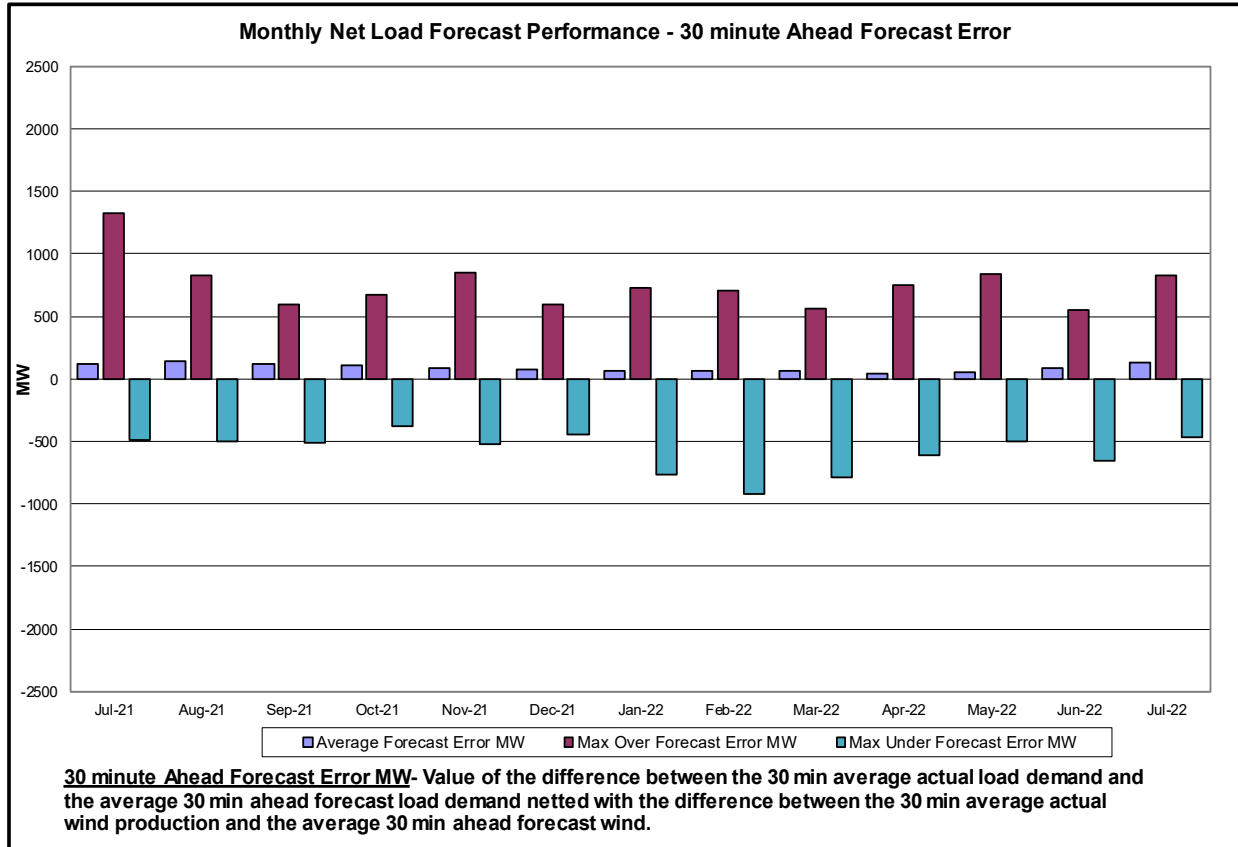


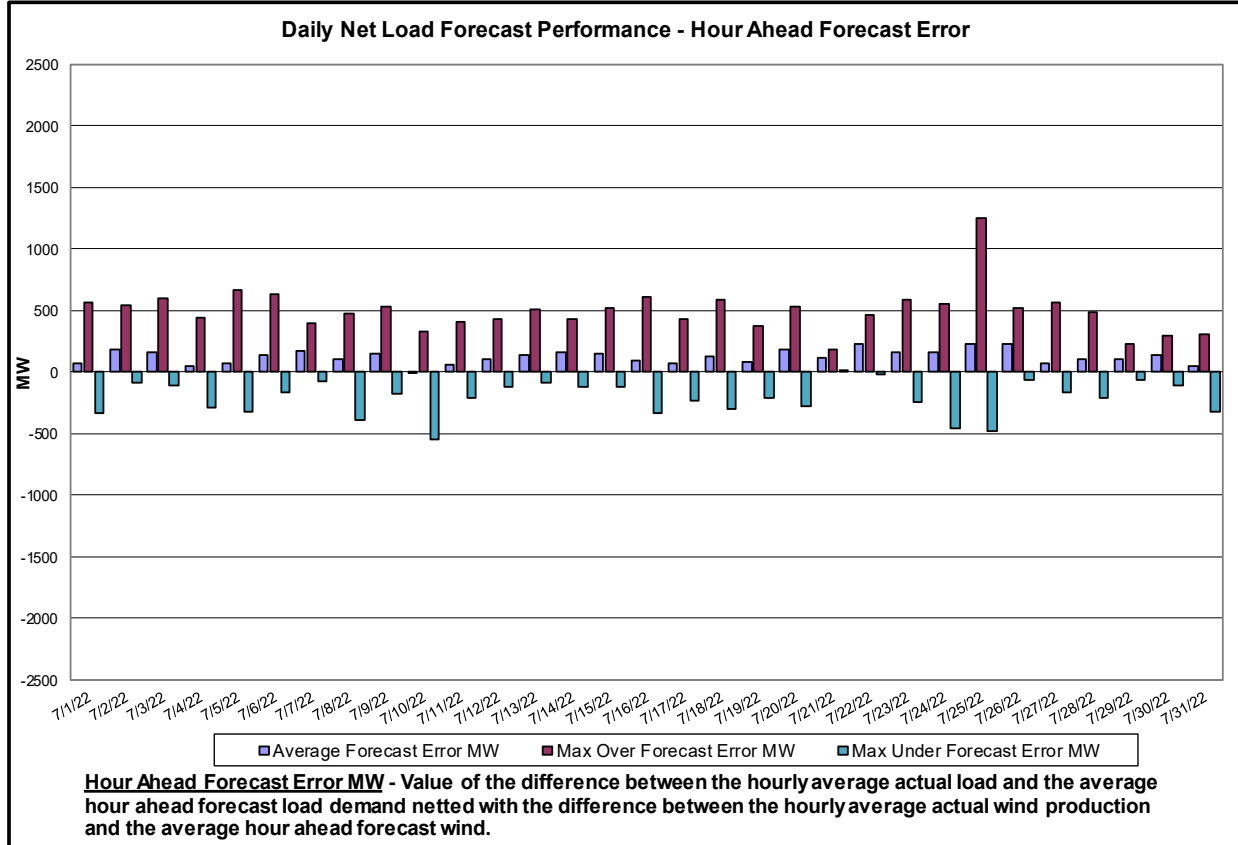
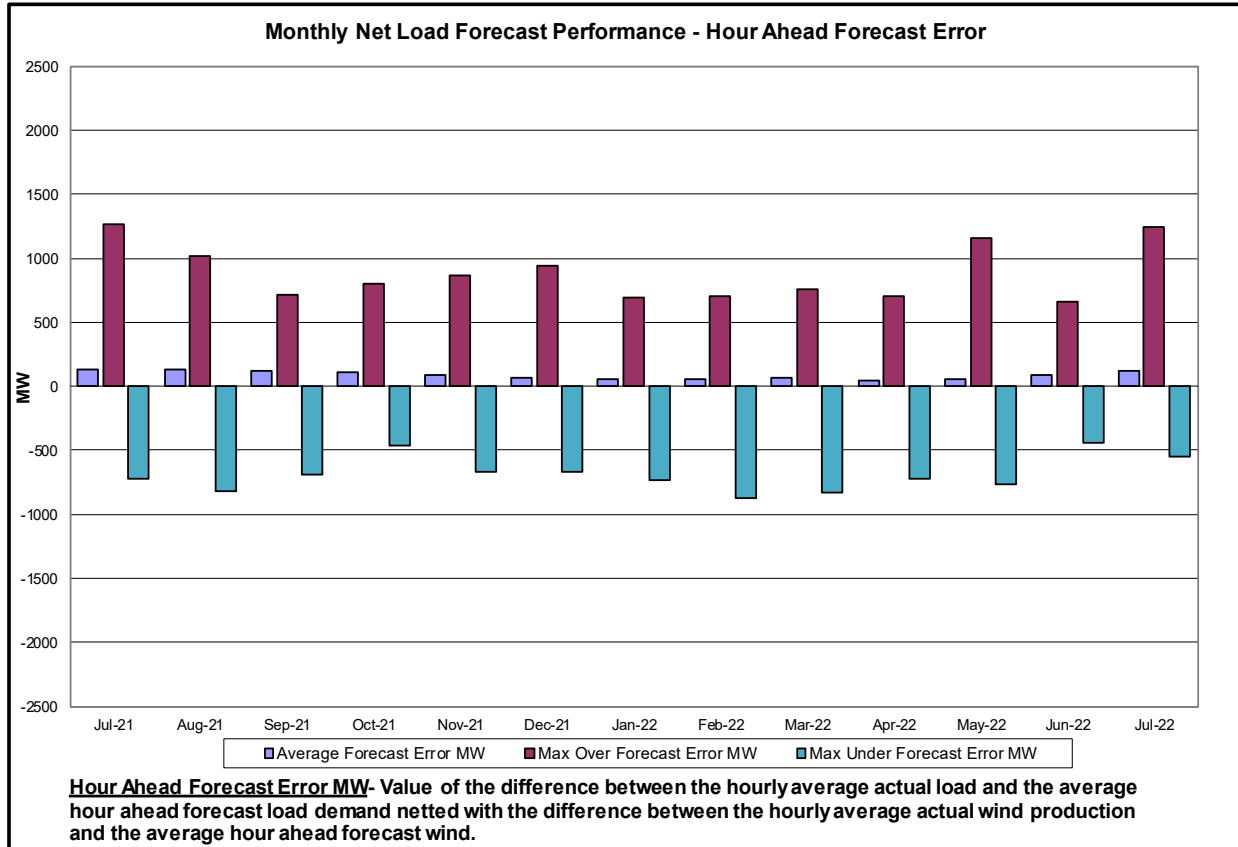


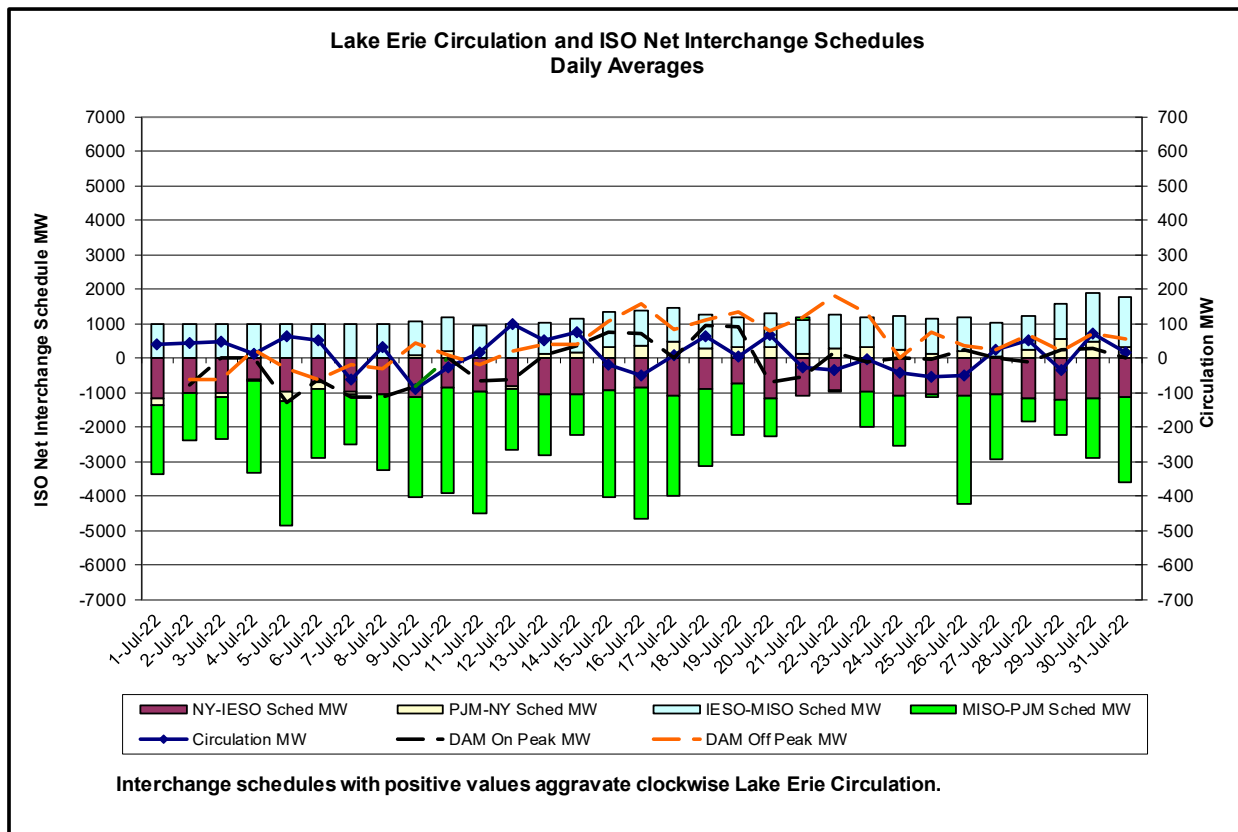
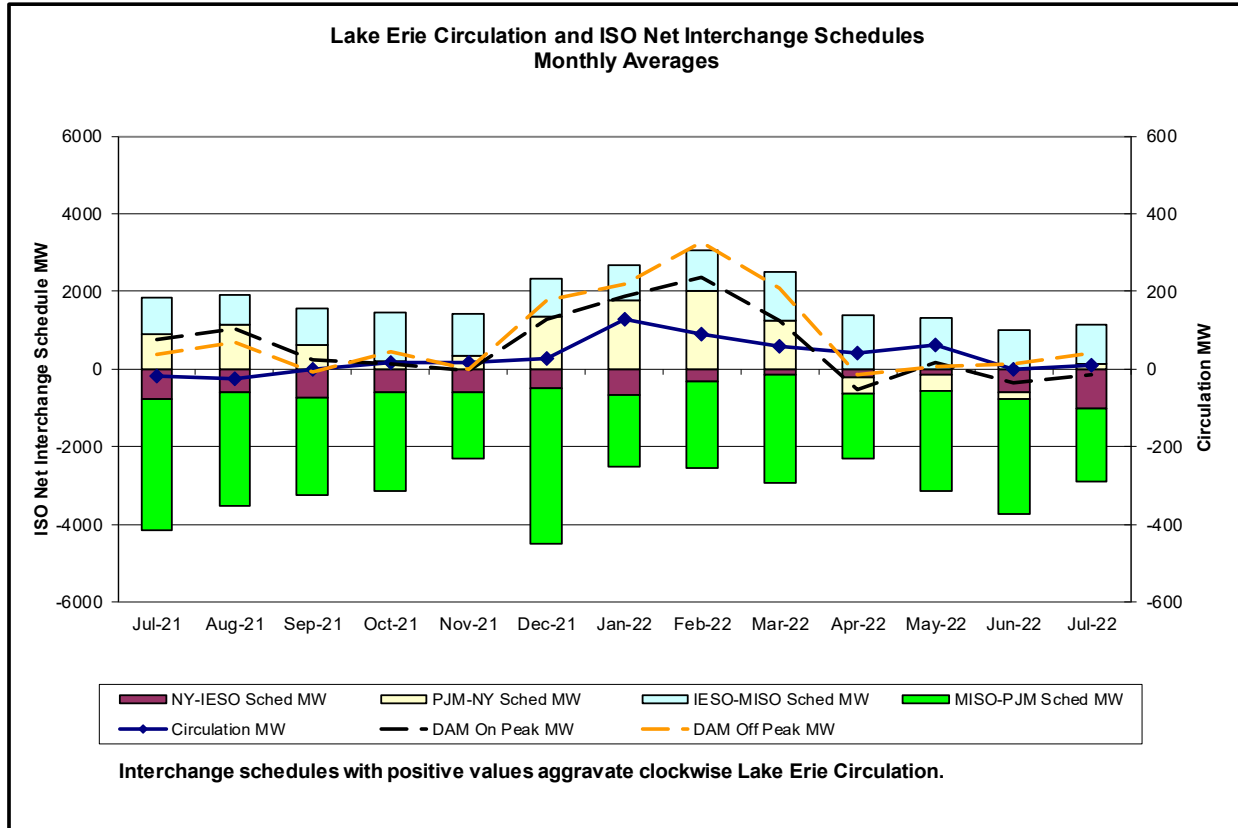




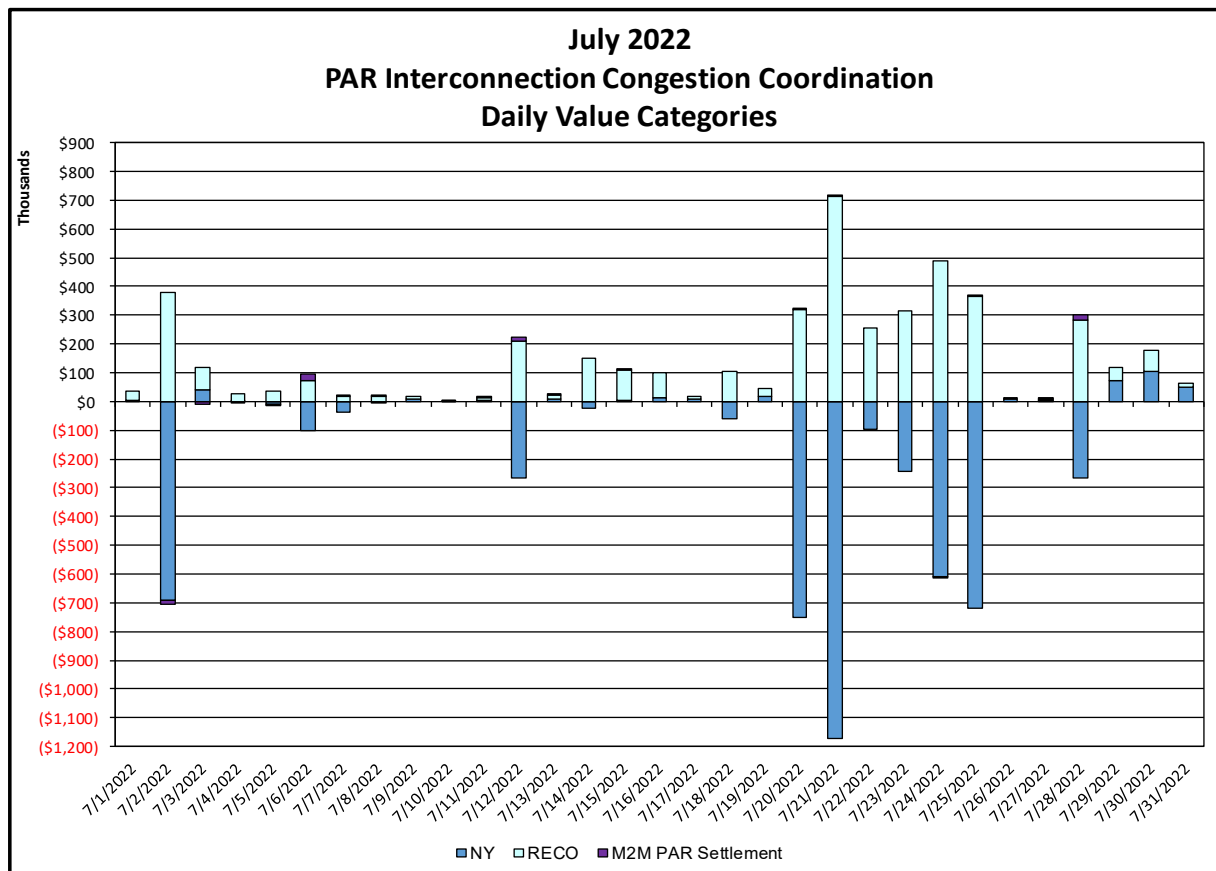
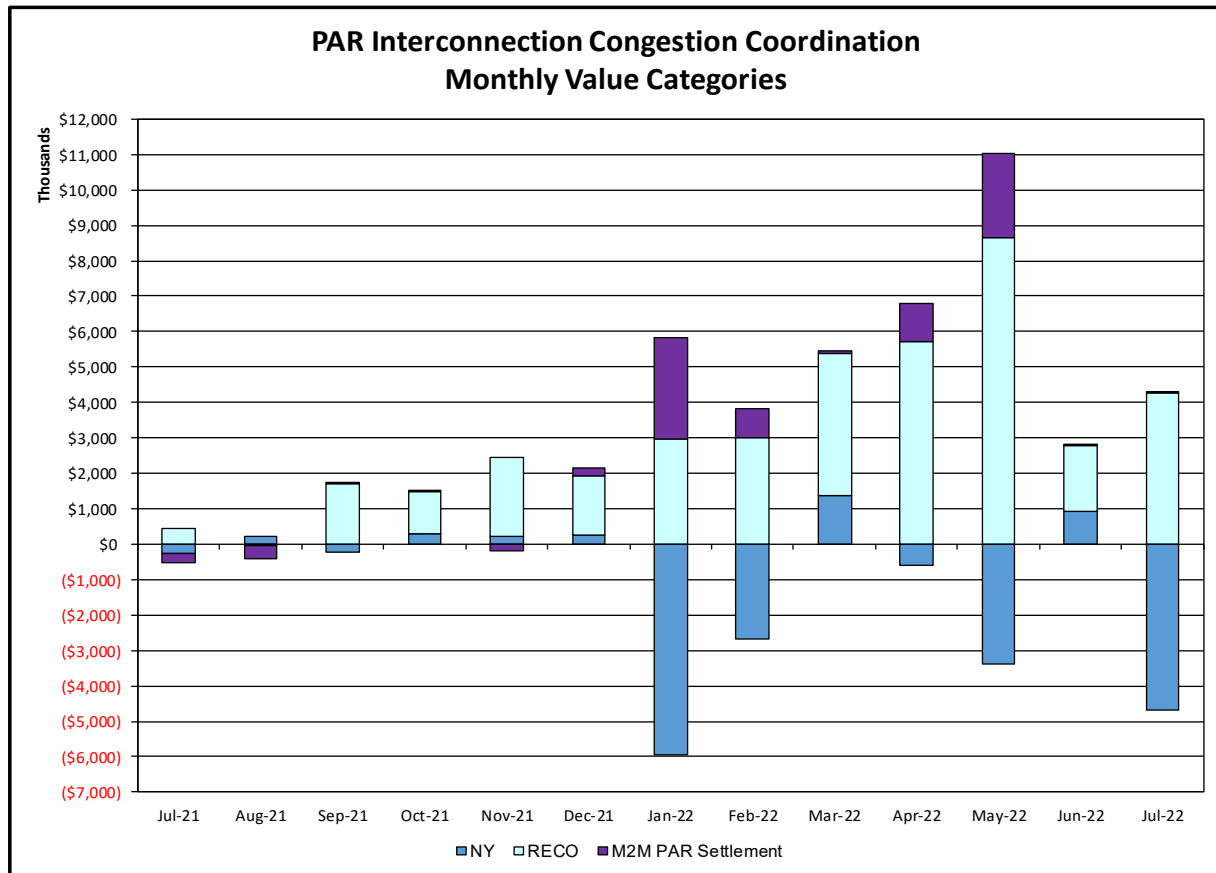




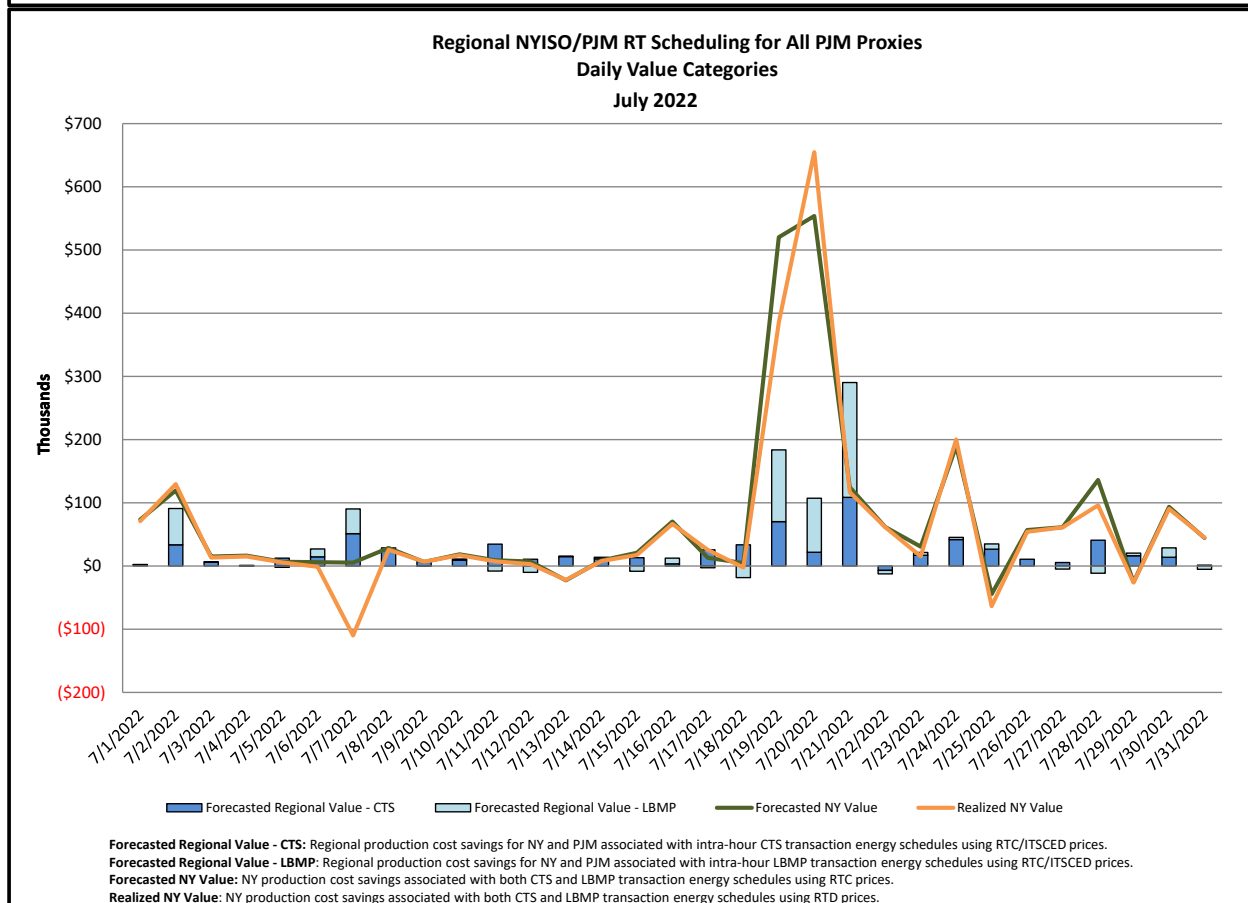
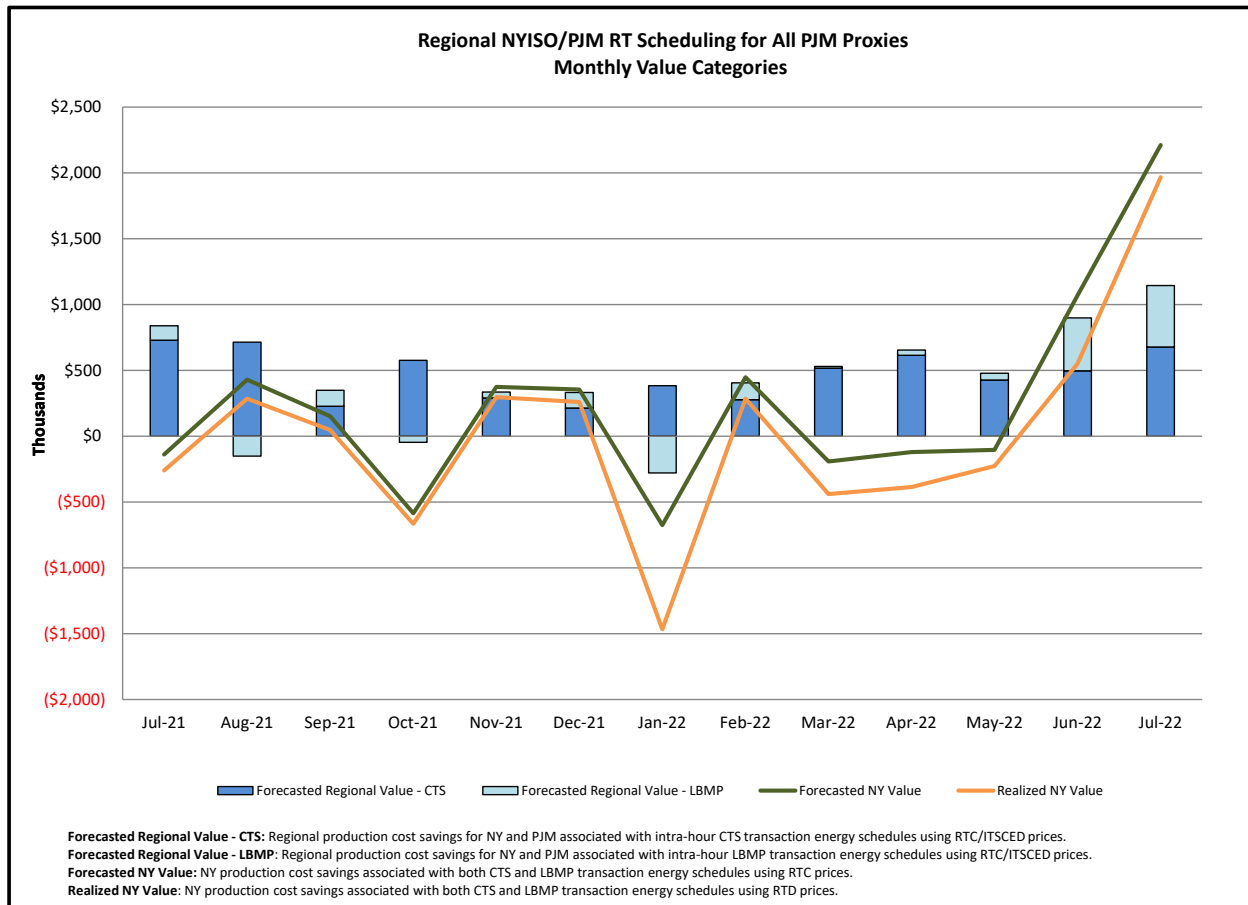




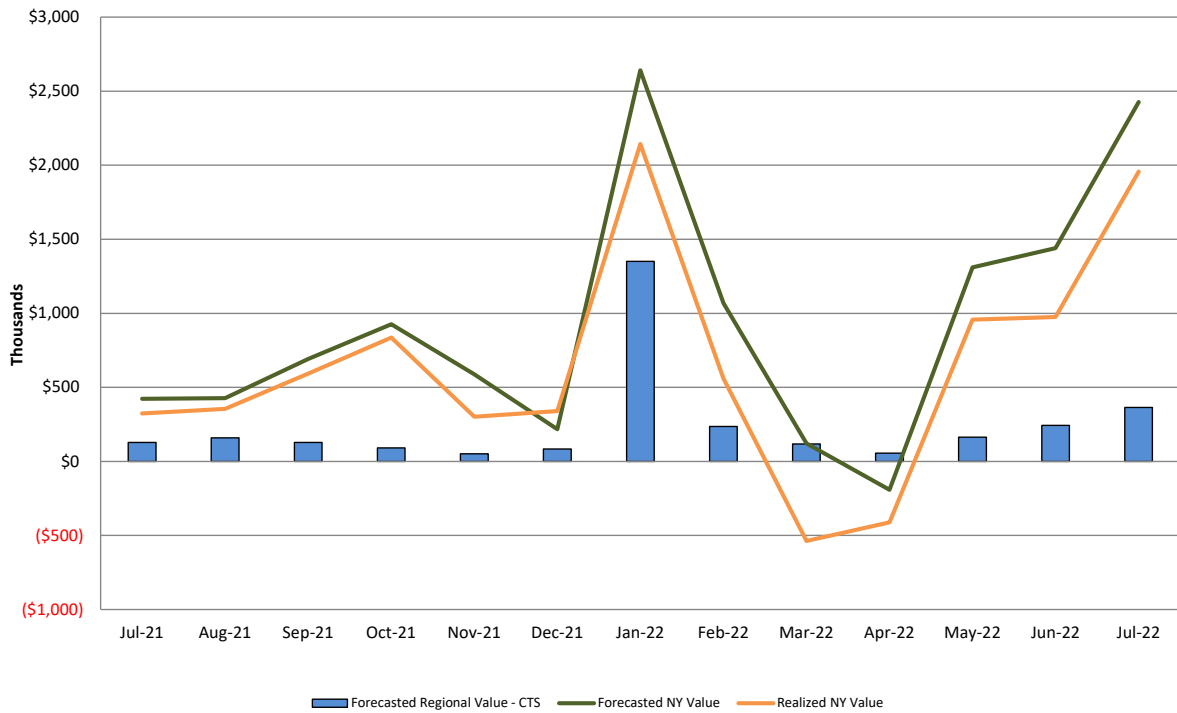
Broader Regional Market Performance Metrics



<u>PAR Interconnection Congestion Coordination</u>	
<u>Category</u>	<u>Description</u>
NY	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
RECO	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.
M2M PAR Settlement	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.

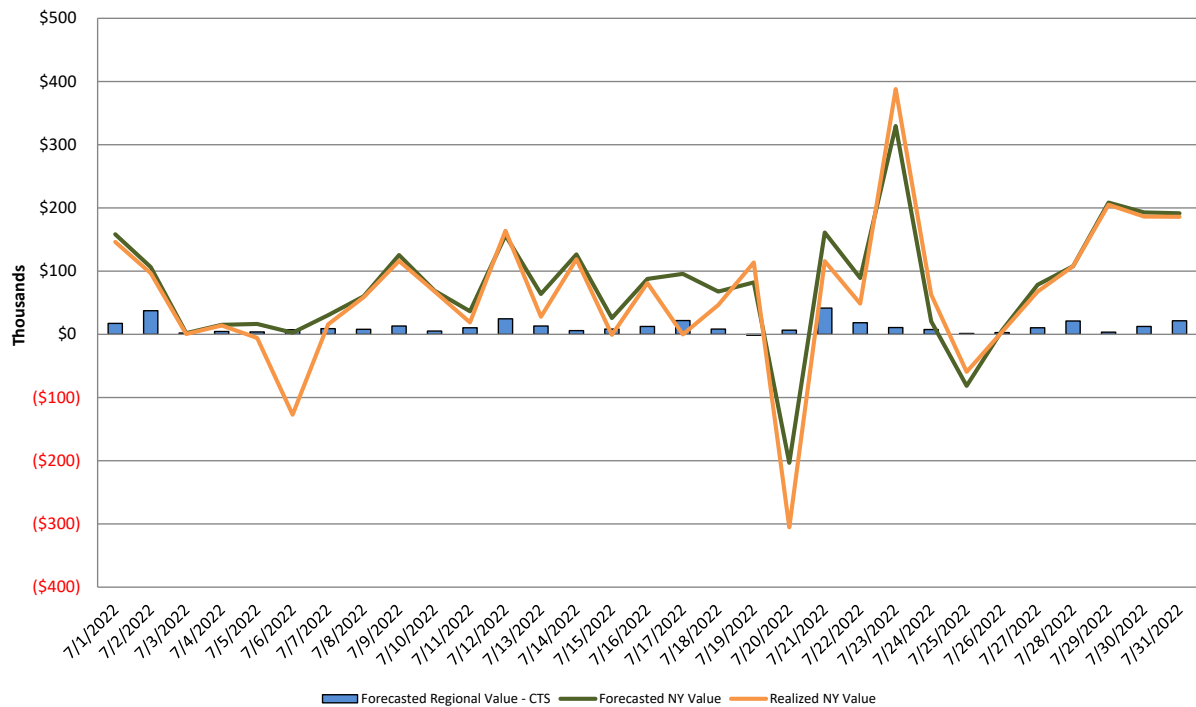


Regional NYISO/NE RT Scheduling for ISO-NE AC Monthly Value Categories



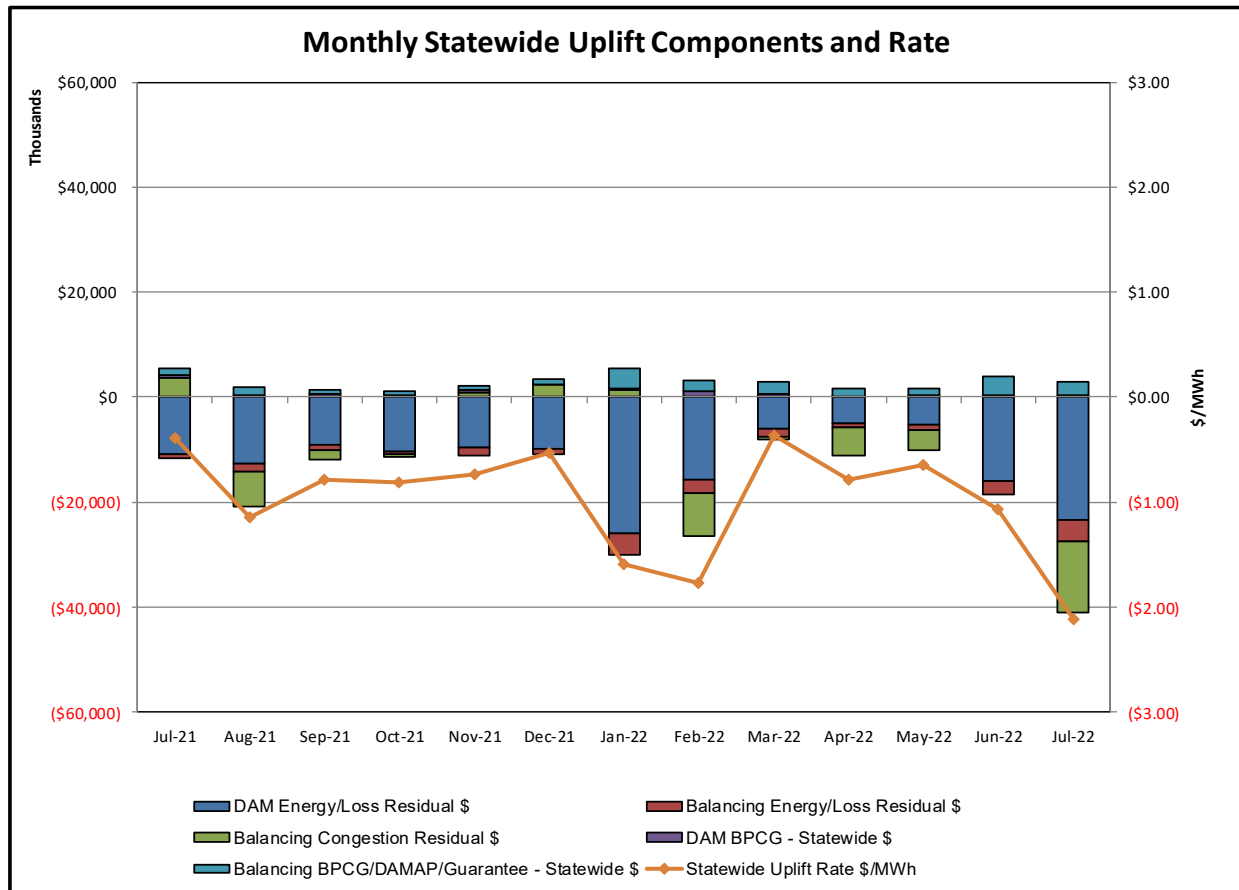
Forecasted Regional Value - CTS: Regional production cost savings for NY and NE associated with intra-hour CTS transaction energy schedules using RTC prices and NE forecasted prices.
Forecasted NY Value: NY production cost savings associated with CTS transaction energy schedules using RTC prices.
Realized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

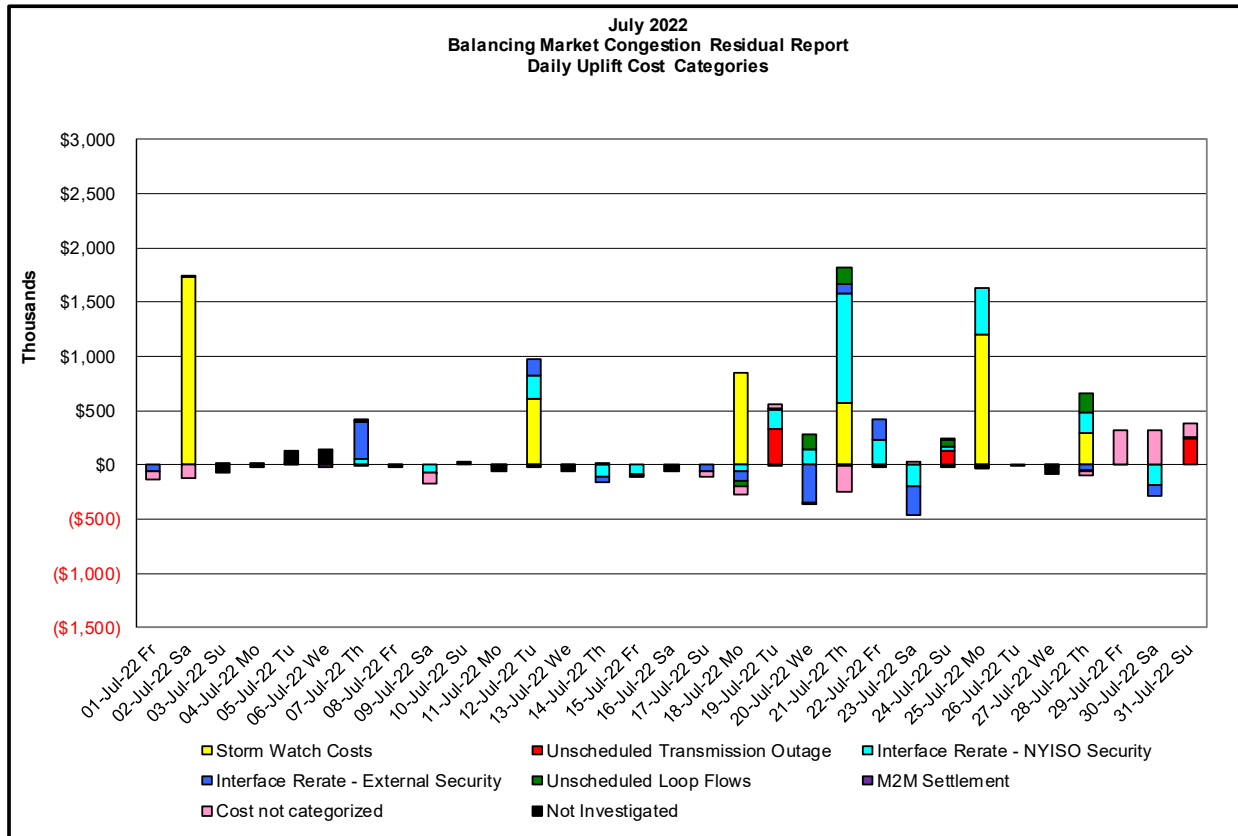
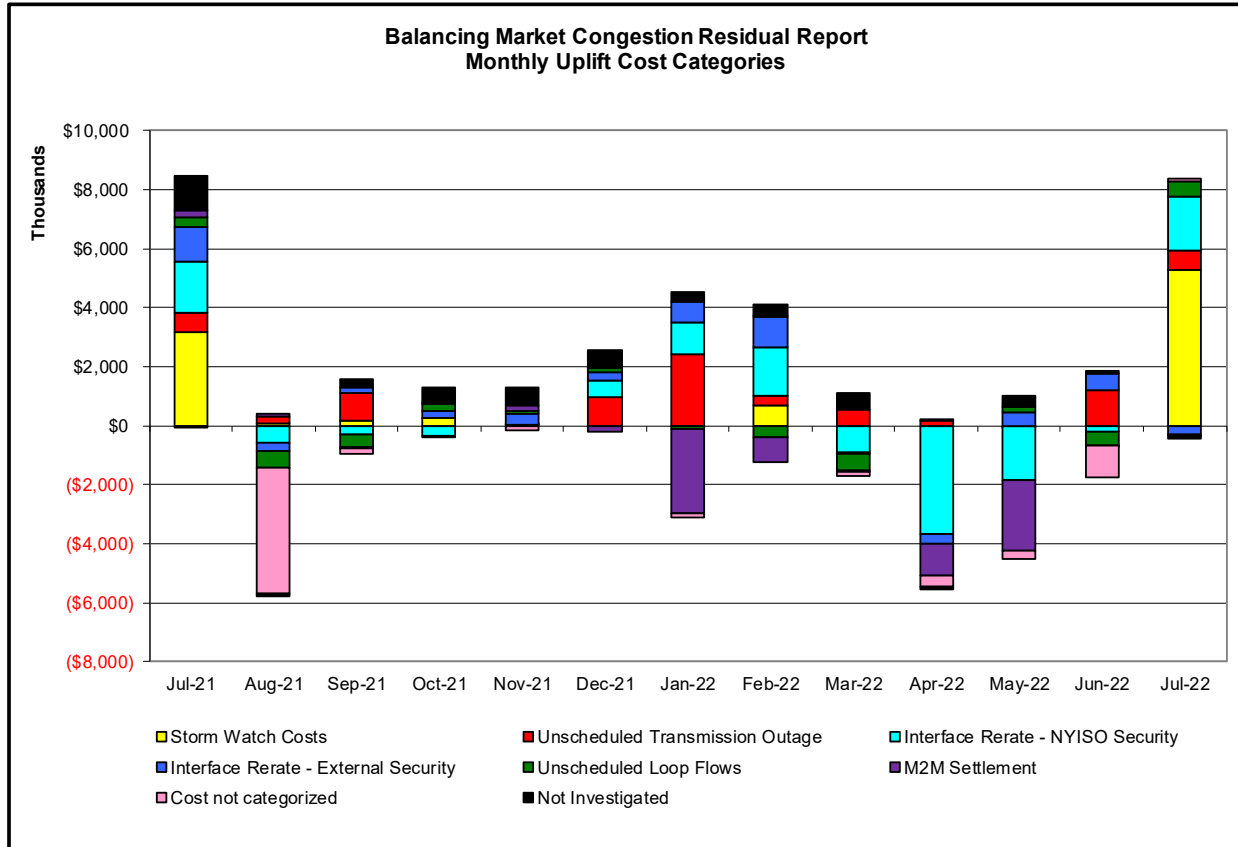
Regional NYISO/NE RT Scheduling for ISO-NE AC Daily Value Categories July 2022



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





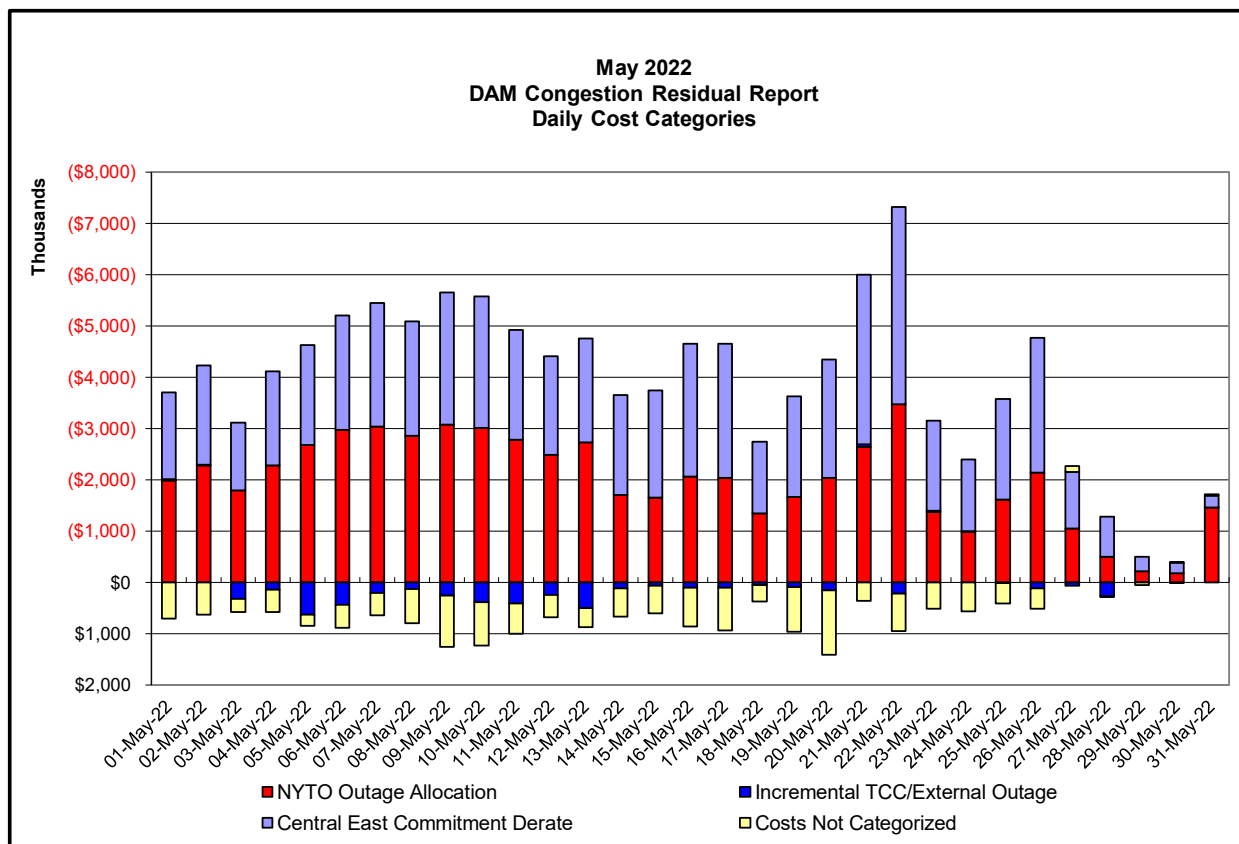
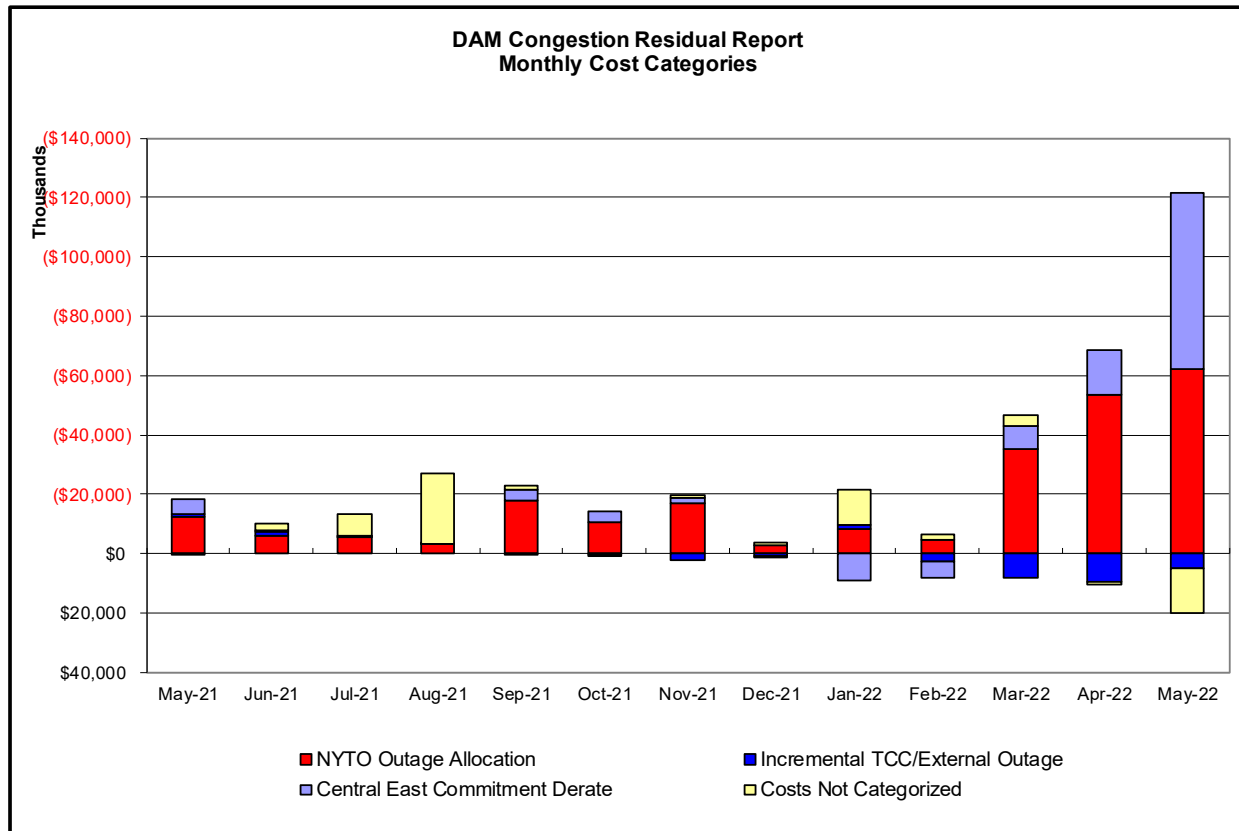
Day's investigated in July: 1,2,7,9,12,14,15,17,18,19,20,21,22,23,24,25,28,29,30,31		
Event	Description	July Dates
	Thunder Storm Alert, Buchan North 138kV (#BKTA5)	12,25
	Thunder Storm Alert, Chestor-Shoemaker 138kV (#27)	2,12,18,21,25,28
	Thunder Storm Alert, HQ CHAT-NY Scheduling Limit	28
	Thunder Storm Alert, PleasantValley-Leeds 345kV (#92)	2,12,18,21,25,28
	Forced Outage Brownfalls-Taylorville 115kV (#4)	19
	Forced Outage Kentave-Greenwood 138kV (#31232)	31
	Forced Outage Porter-Watkin 115kV (#5)	24
	Derate Central East	30
	Derate Gowanus-Greenwood 138kV (#42232) I/o TWR:GOETHALS 22 & 21	30
	Derate Pleasant Valley-Leeds 345kV (#92) I/o Leeds-HurlyAve 345kV (#301)	30
	Derate Porter-Rotterdam 230kV (#30) I/o BUS: NSCTLD#77 14&2&93&BK2&C1&3	18-22,29
	Derate Rainey-Vernon 138kV (#36311)	20,21,24,28
	NYCA DNI Ramp Limit	7,12,14,18-22,24,25,28-30
	Uprate Astoria-Hellgate 138kV (#24052) I/o SIN:HELLGATE 24051&15055L&BK1	23,24,28
	Uprate Chestor-Shoemaker 138kV (#27) I/o TWR:Ramapo 76&77&BK1112	9,14,15,28
	Uprate E179th-Hellgate 138kV (#15055)	9
	Uprate Freeport-Newbridge 138kV (#461)	19
	Uprate Freshkills-Willowbrook 138kV (#29211)	23
	Uprate Freshkills-Willowbrook 138kV (#29212)	21,24
	Uprate Goethals-Gowanus 345kV (#25)	28
	Uprate Goethals-Gowanus 345kV (#26)	28
	Uprate Pleasant Valley-Leeds 345kV (#92) I/o Athens-Pleasant Valley 345kV (#91)	28,29
	Uprate Porter-Rotterdam 230kV (#30) I/o BUS: NSCTLD#77 14&2&93&BK2&C1&3	18,24,25,28
	HQ CEDARS - NY Scheduling Limit	20-22
	HQ CHAT - NY Scheduling Limit	1,7,9,12,14,15,17,20,21,23,25,28
	HQ CHAT ACTIVE DNI Ramp Limit	7
	IESO AC ACTIVE DNI Ramp Limit	12,14,25
	NE AC - NY Scheduling Limit	20,22,23
	NE AC ACTIVE DNI Ramp Limit	1,12,17-24,30
	NE NNC1385-NY Scheduling Limit	7,24,28
	PJM AC - NY Scheduling Limit	1
	PJM AC ACTIVE DNI Ramp Limit	7,20-22,30,31
	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East	18-25,28
	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; West	7,19-21,24,28

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	

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 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.	

