

Operations Performance Metrics Monthly Report



April 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 May 8, 2021.

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April 2021 Operations Performance Highlights

- Peak load of 17,623 MW occurred on 04/22/2021 HB 20
- All-time winter capability period peak load of 25,738 MW occurred on 1/7/2014 HB 18
- 1.28 hours of Thunder Storm Alerts were declared
- 0 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.
- NYISO began securing Brentwood-Pilgrim 69kV (#768) & Elwood-Pulaski 69kV (#670) facilities on LI in the Real-Time Market on 04/13/2021 and in the Day-Ahead Market execution occurring on 04/14/2021 for the 04/15/2021 market day.
- Unit 3 at the Indian Point Energy Center (IP-3), a nuclear generating facility, was deactivated on 04/30/2021 HB23.

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

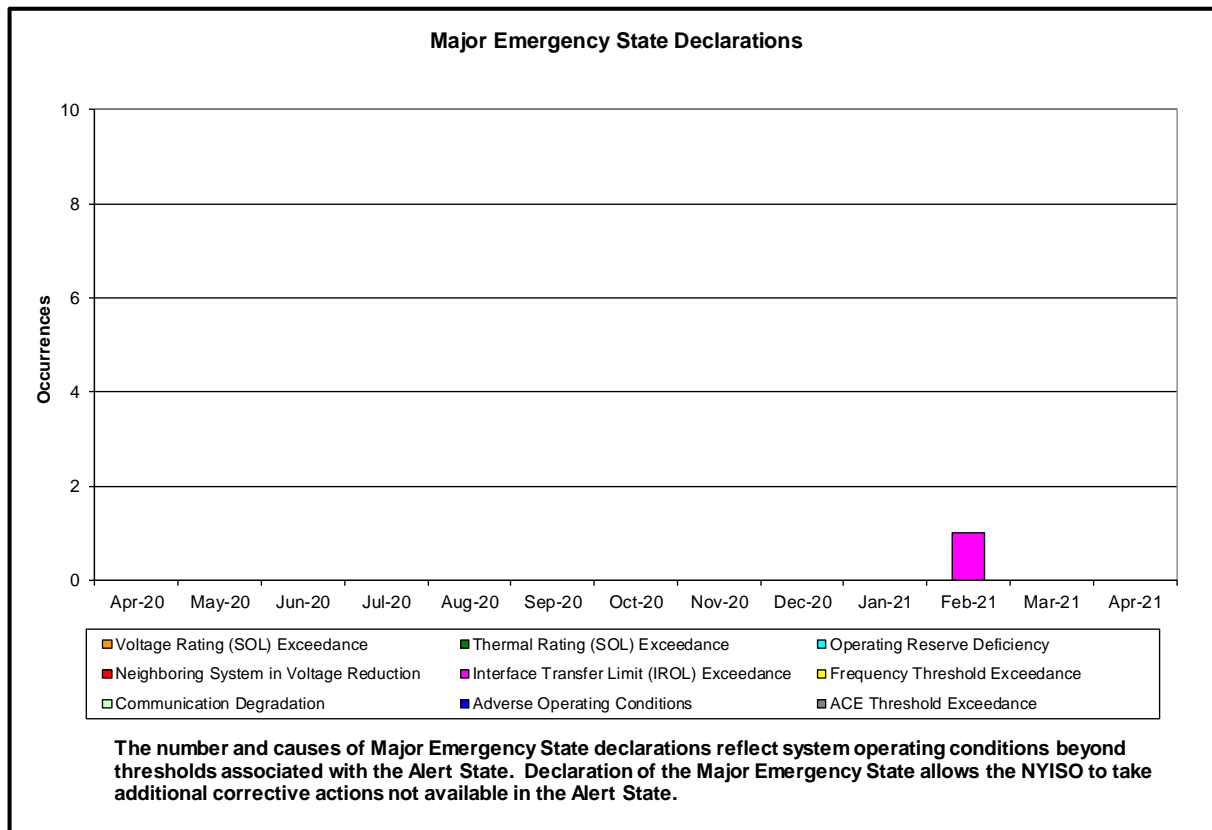
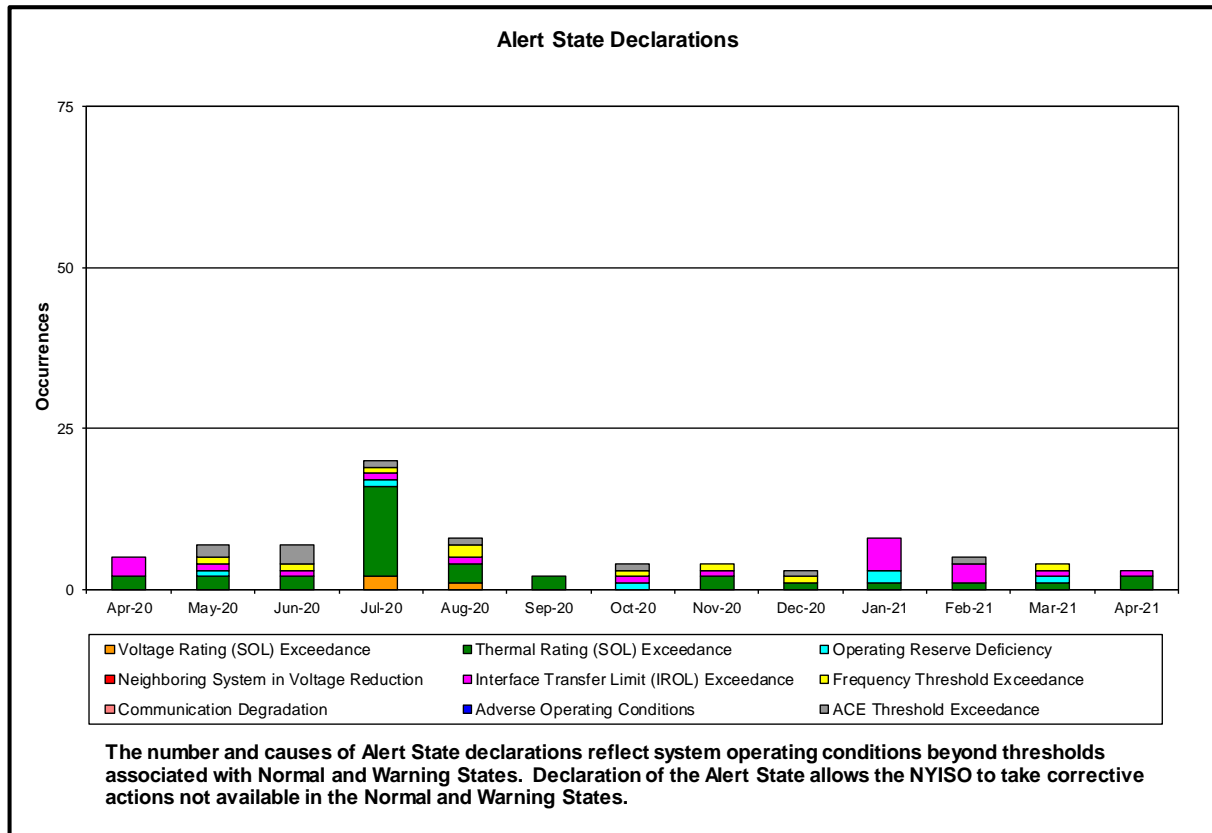
	Current Month Value (\$M)	Year-to-Date Value (\$M)
NY Savings from PJM-NY Congestion Coordination	\$4.01	\$9.19
NY Savings from PJM-NY Coordinated Transaction Scheduling	(\$0.33)	\$1.32
NY Savings from NE-NY Coordinated Transaction Scheduling	\$0.09	(\$2.64)
Total NY Savings	\$3.78	\$7.87
Regional Savings from PJM-NY Coordinated Transaction Scheduling	\$0.58	\$1.76
Regional Savings from NE-NY Coordinated Transaction Scheduling	\$0.05	(\$0.43)
Total Regional Savings	\$0.64	\$1.33

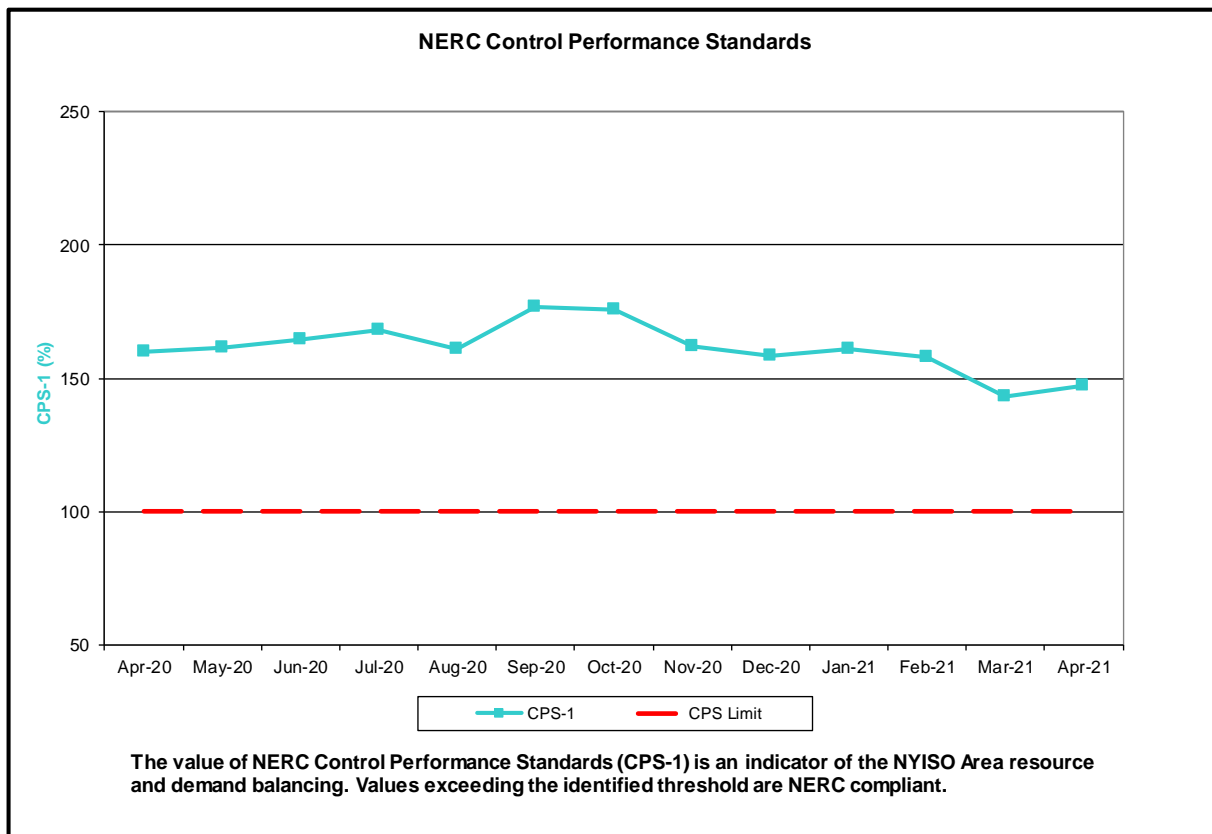
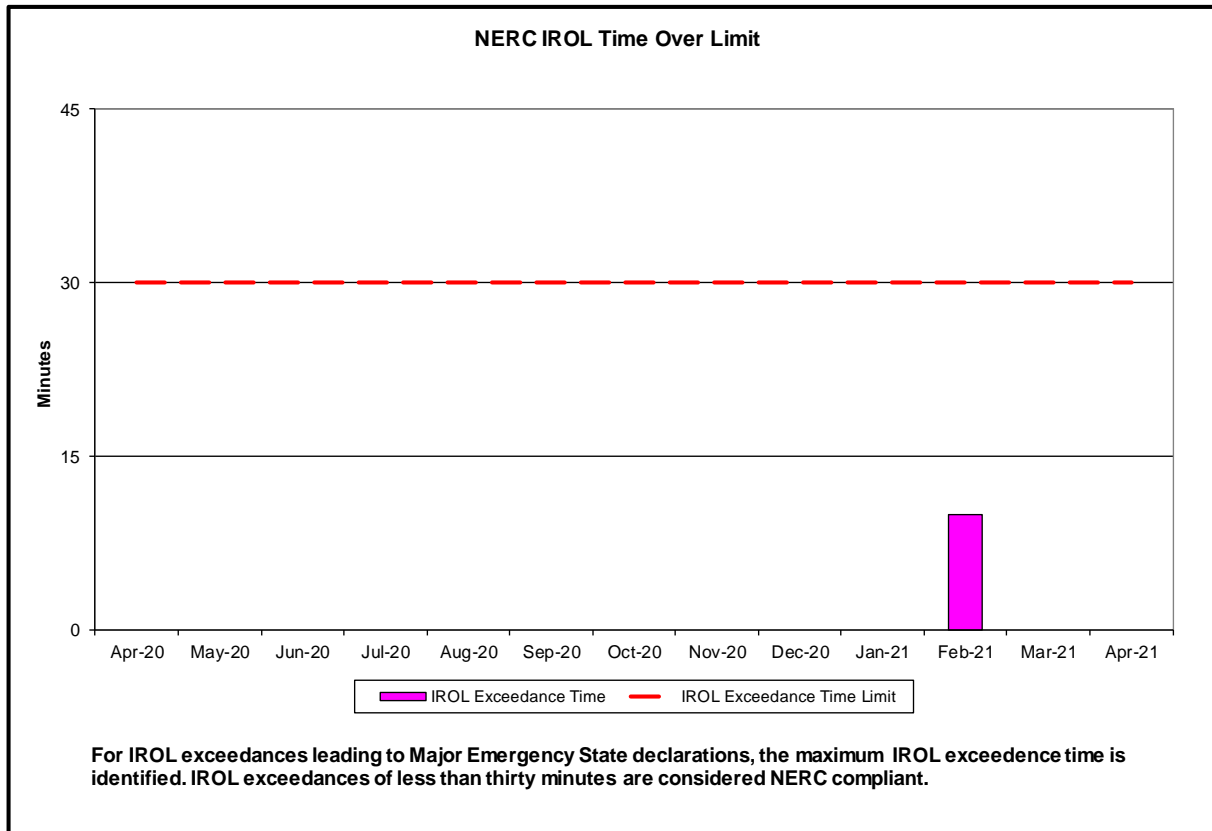
- Statewide uplift cost monthly average was (\$0.18)/MWh.
- The following table identifies the Monthly ICAP spot market prices and the price delta.

Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
May 2021 Spot Price	\$5.35	\$5.35	\$5.35	\$9.53
October 2020 Spot Price	\$2.03	\$2.03	\$18.15	\$5.21
Delta	\$3.32	\$3.32	(\$12.80)	\$4.32

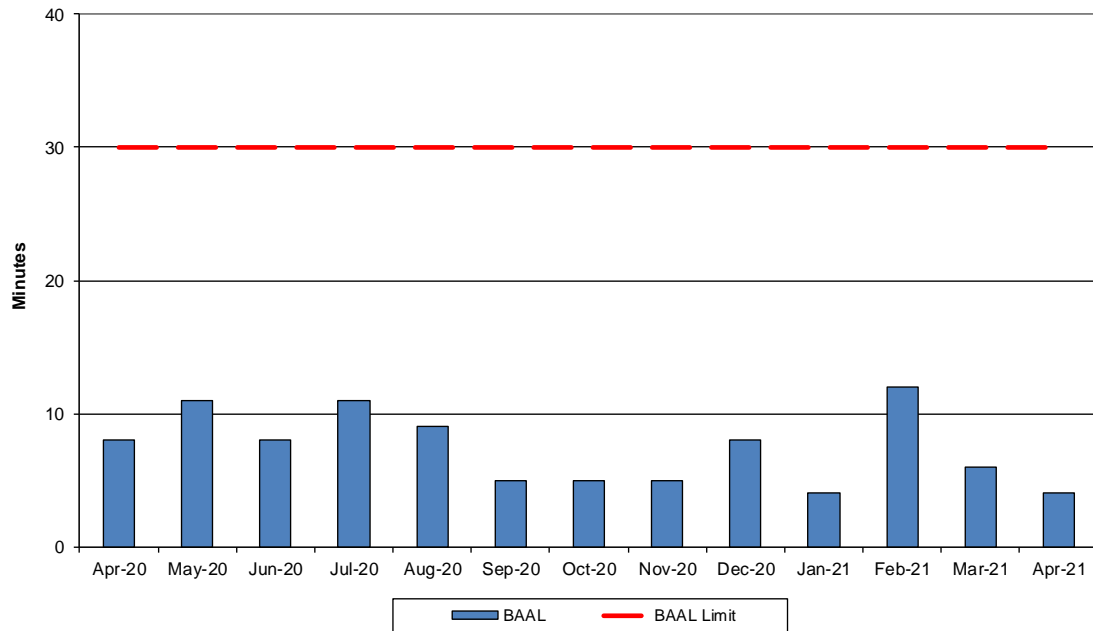
- Price changes from October 2020 to May 2021 are driven by changes in supply as well as Capability Year inputs such as demand curve parameters, Locational Capacity Requirements, the Installed Reserve Margin and the load forecast.

Reliability Performance Metrics



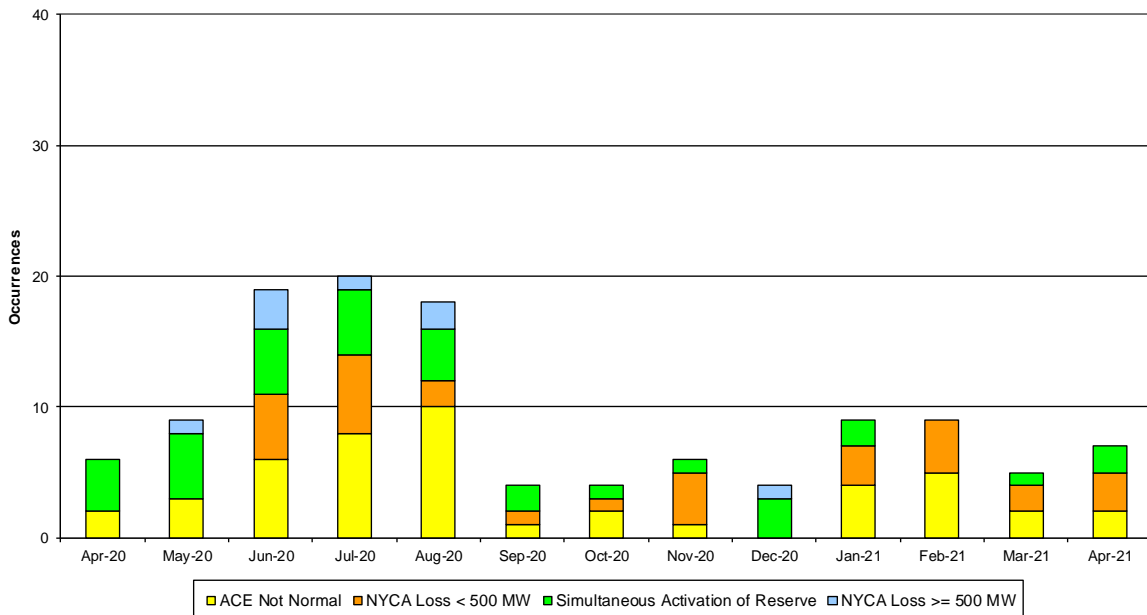


NERC Balancing Authority ACE Limit Standard



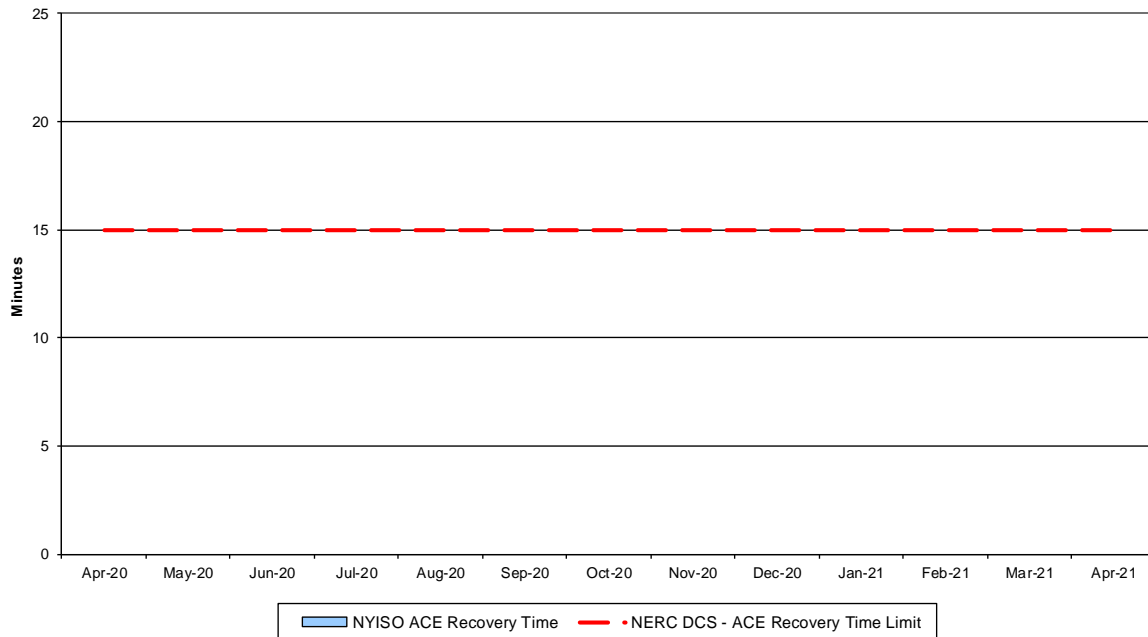
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

Reserve Activations



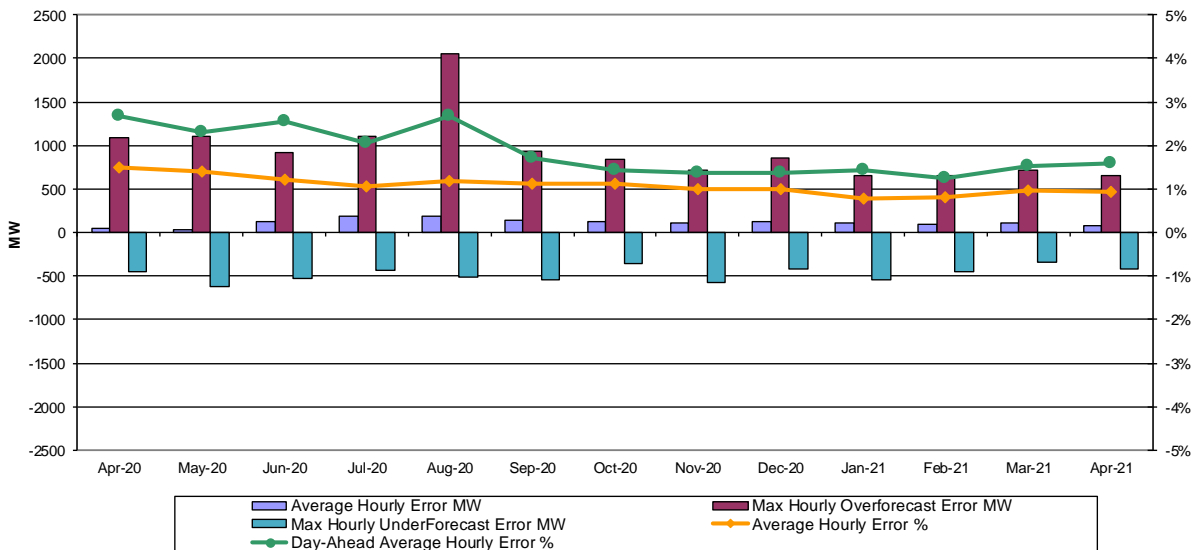
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

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

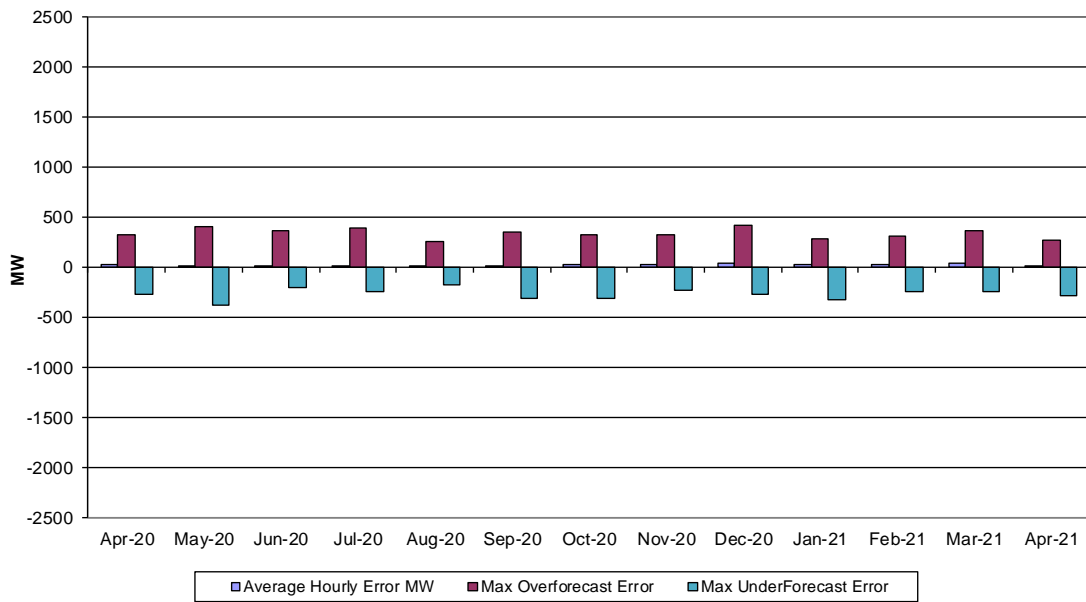


Hourly Error MW - Value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.

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

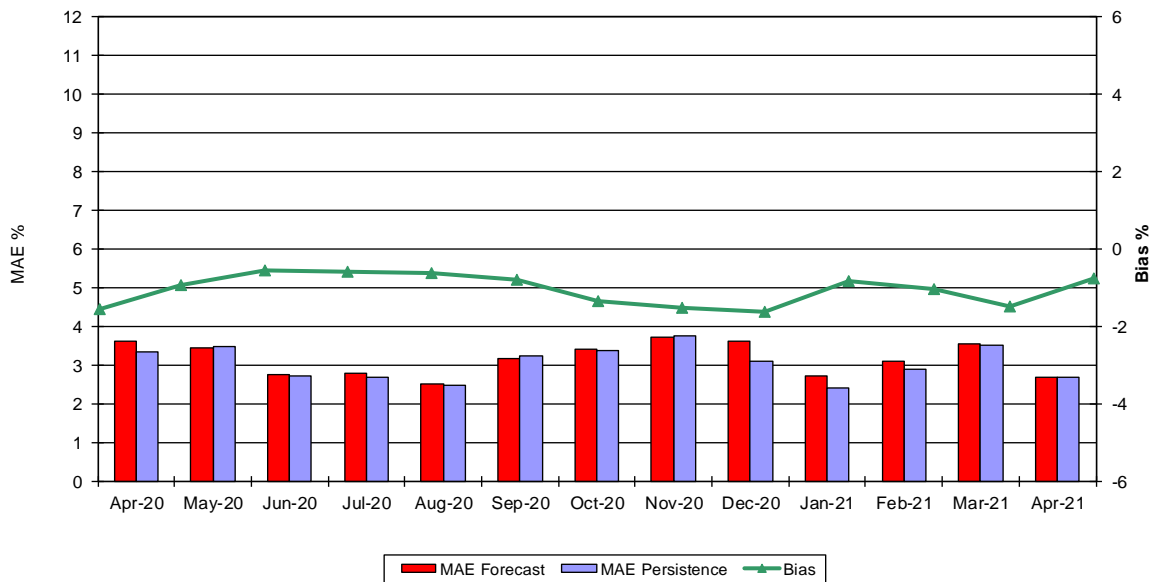
Day-Ahead Average Hourly Error % - Average across all hours of the month of the absolute value of the difference between actual load demand and the Day-Ahead forecast load demand, divided by the actual load demand.

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.

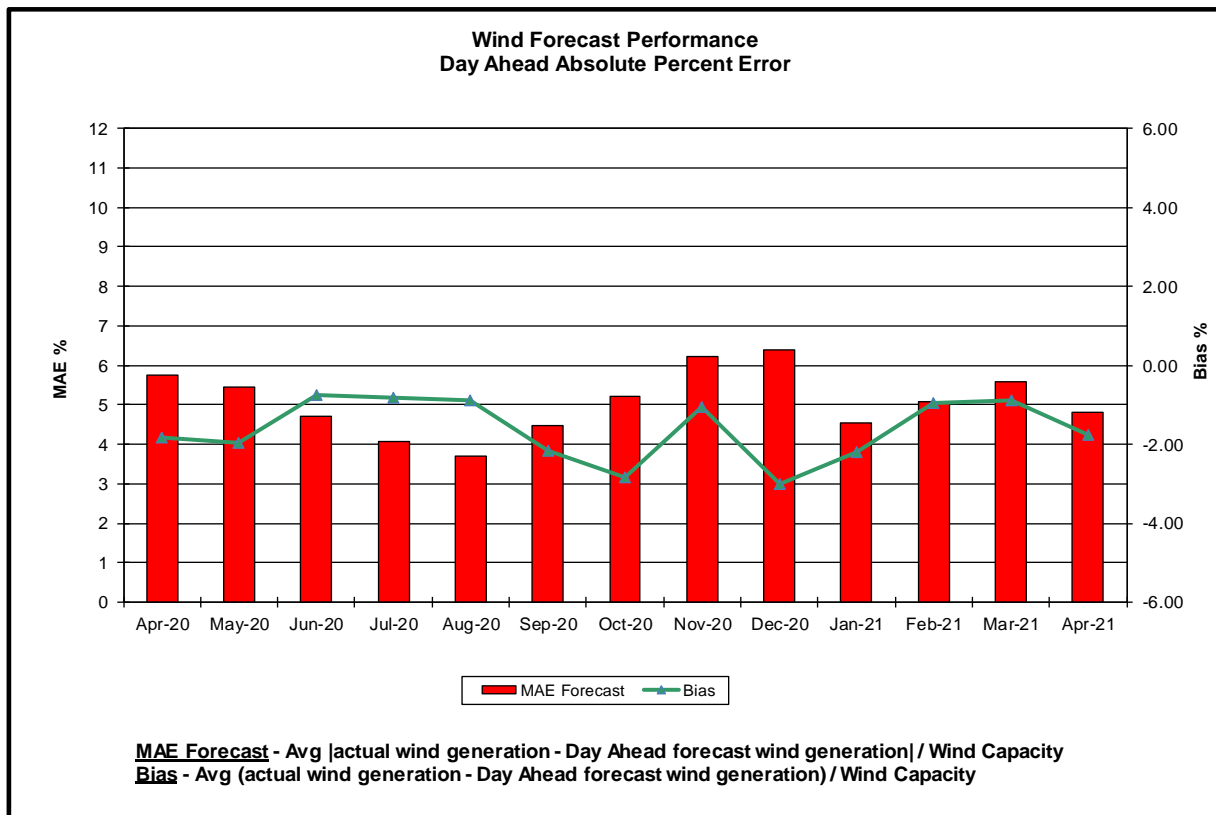
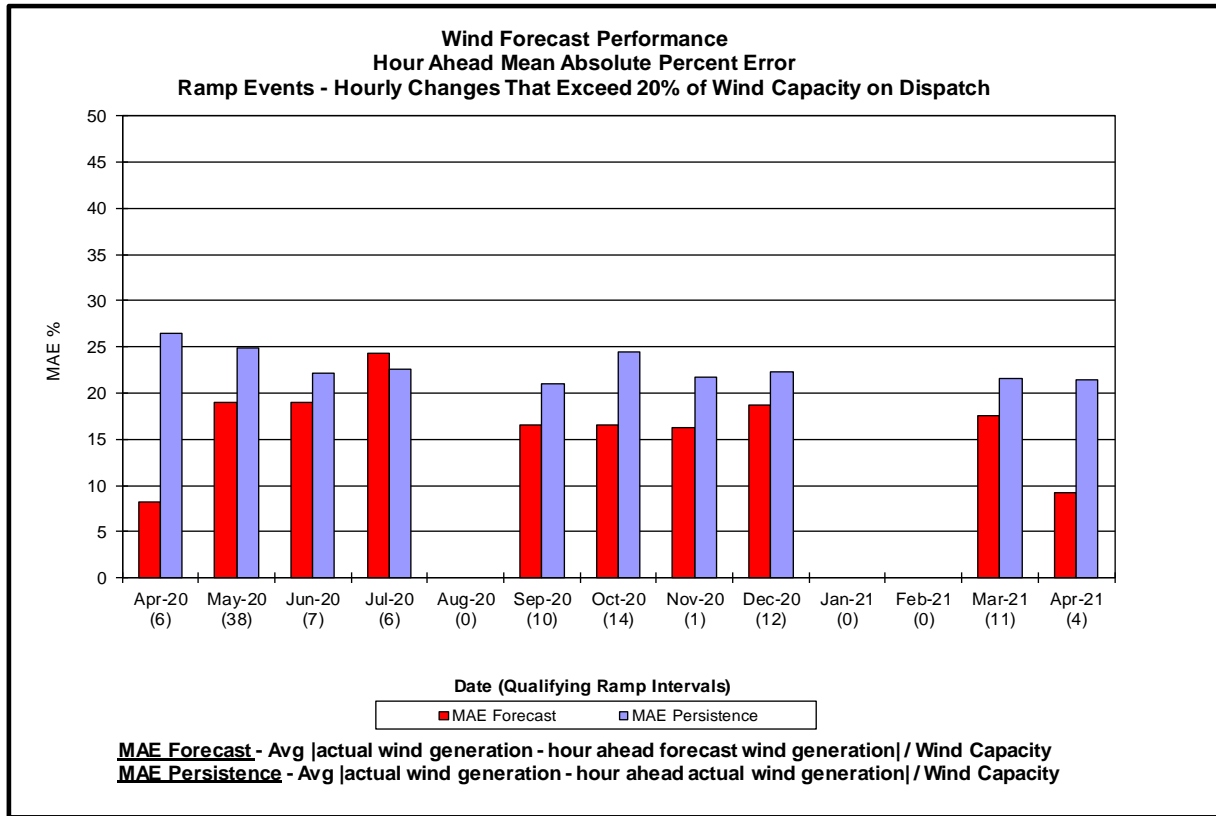
Wind Forecast Performance Hour Ahead Percent Error

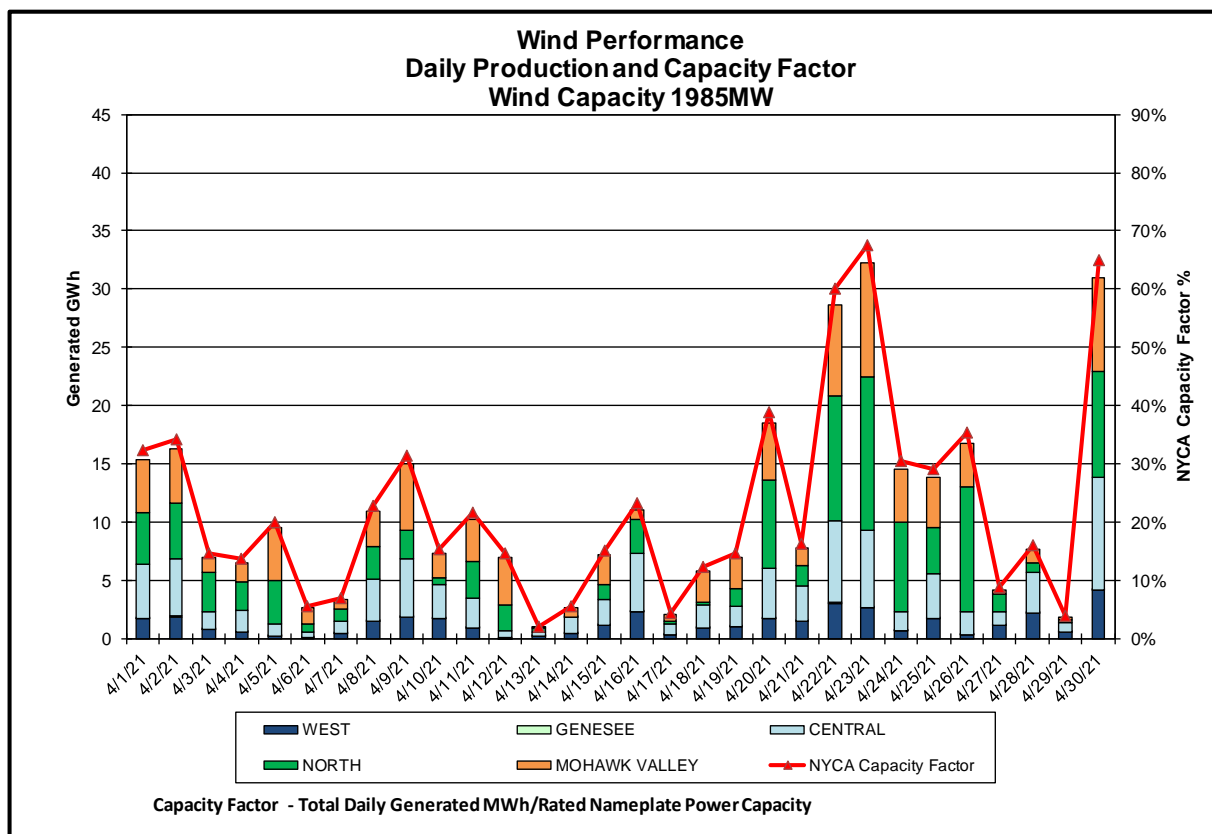
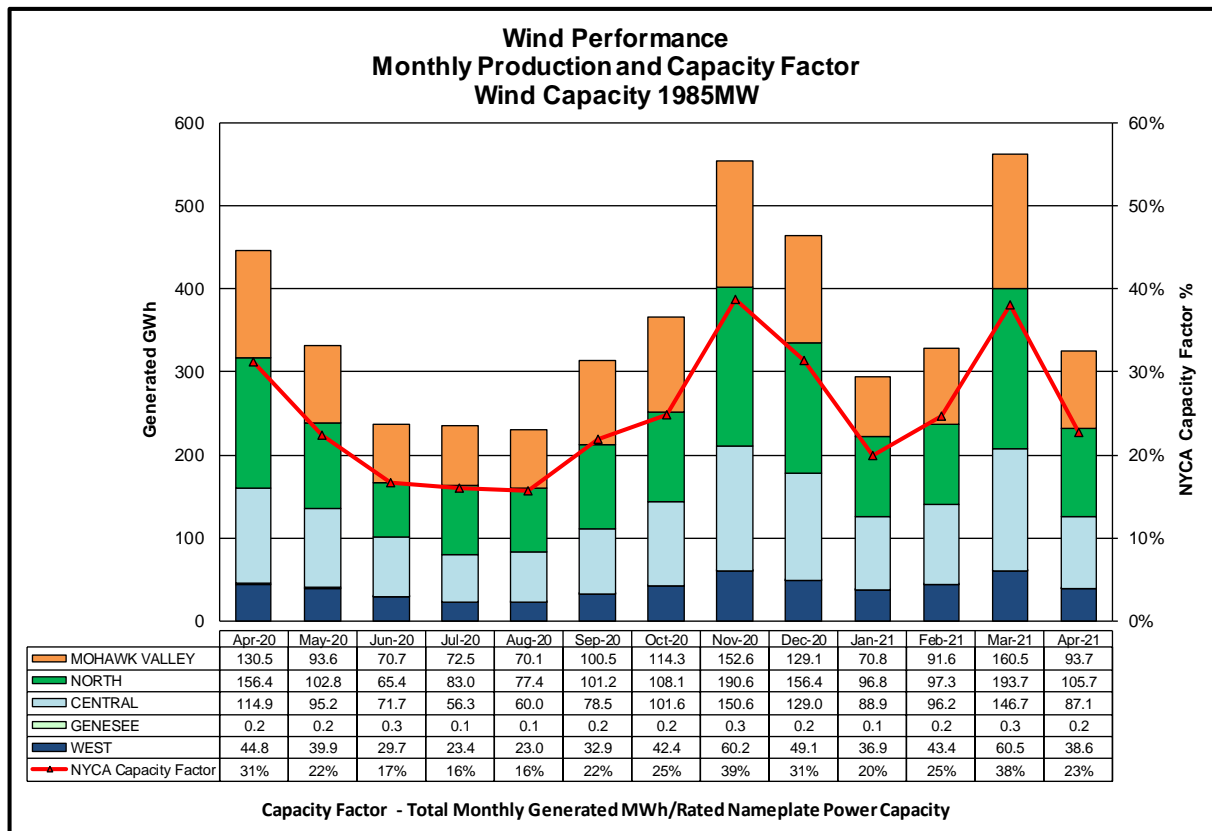


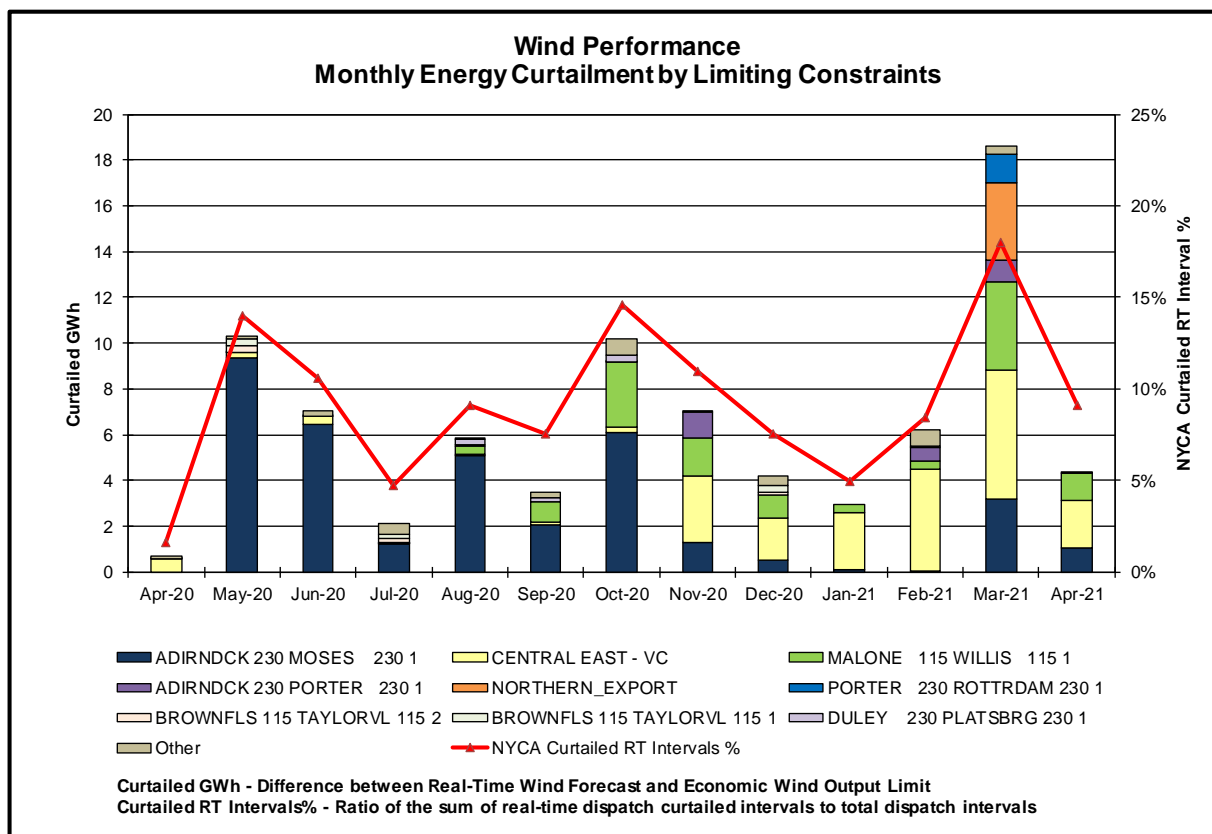
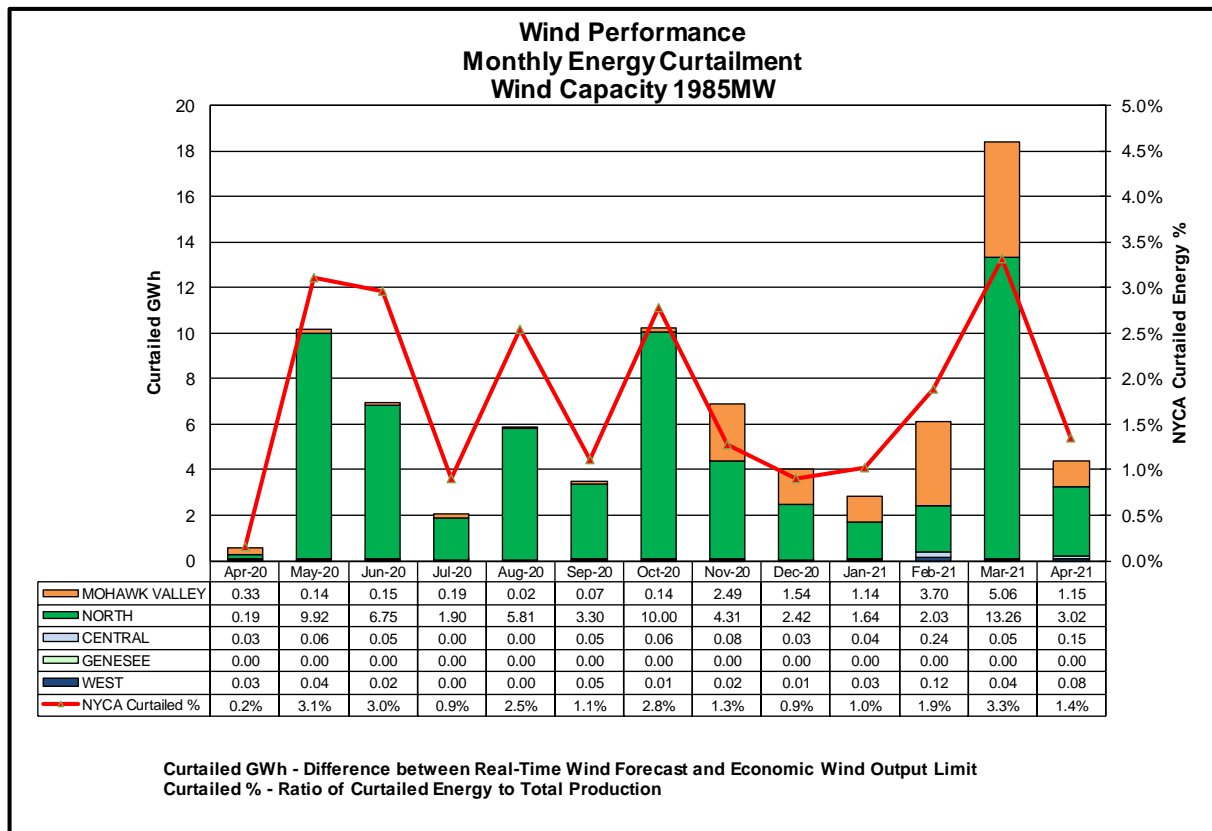
MAE Forecast - Avg [actual wind generation - hour ahead forecast wind generation] / Wind Capacity

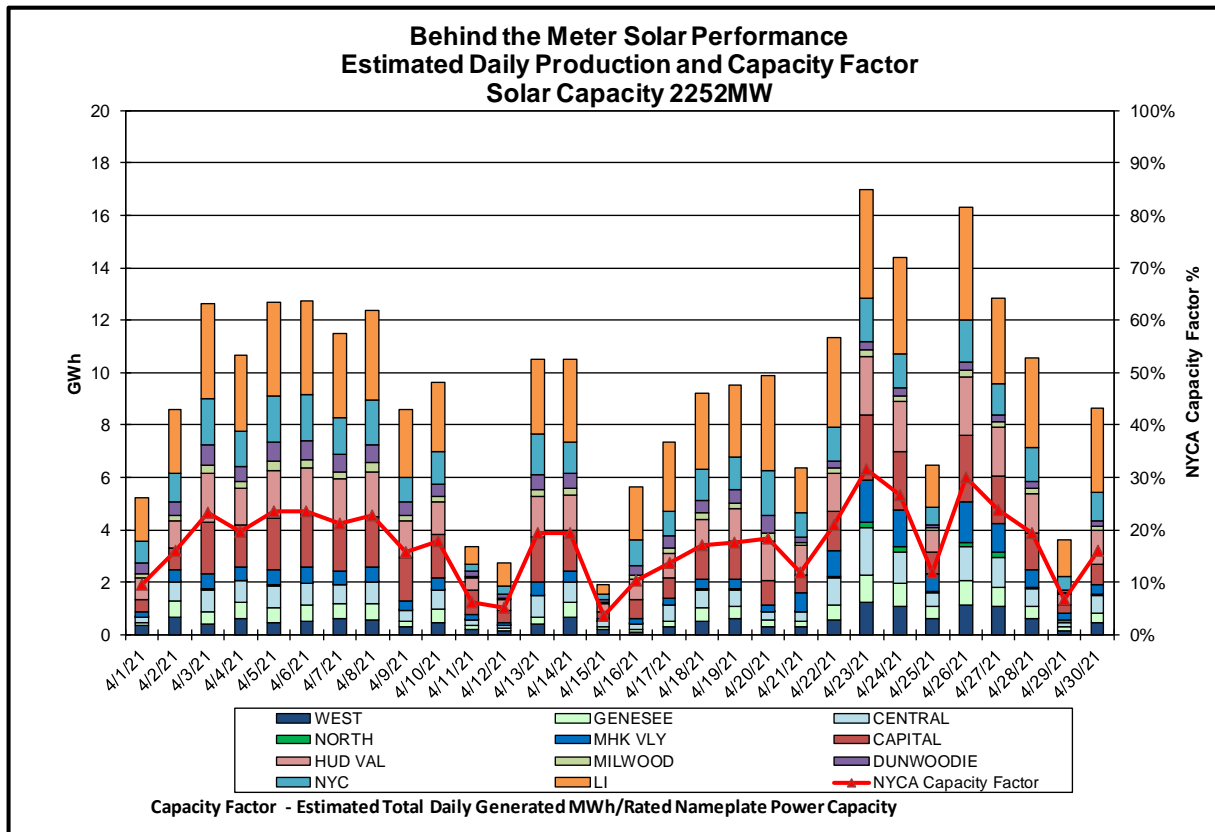
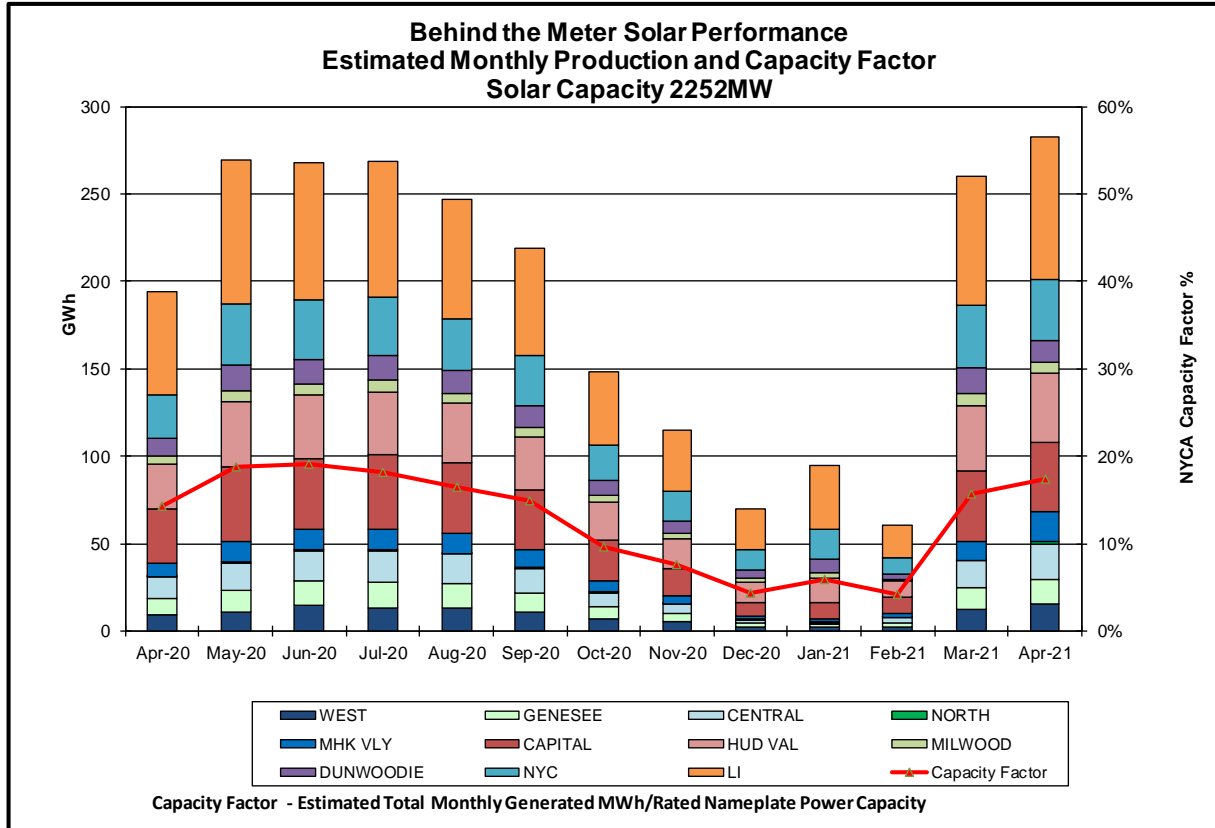
MAE Persistence - Avg [actual wind generation - hour ahead actual wind generation] / Wind Capacity

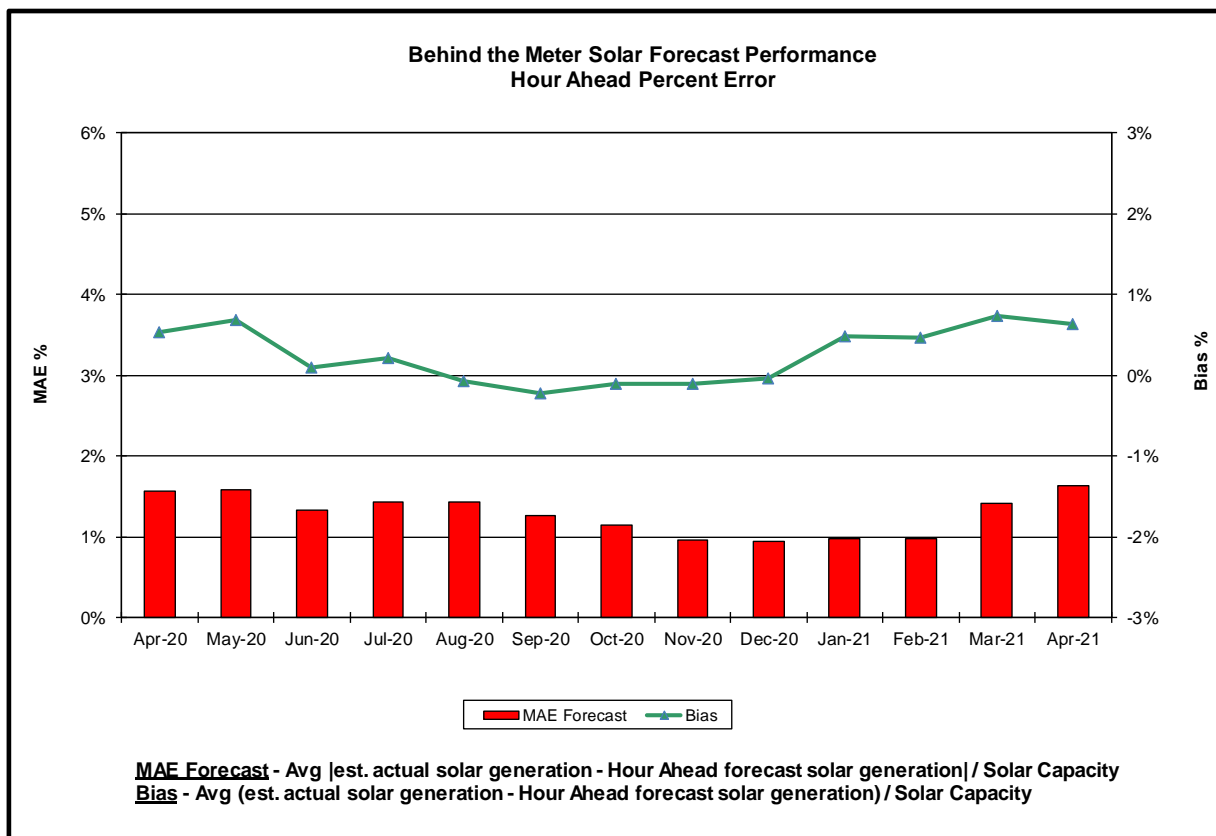
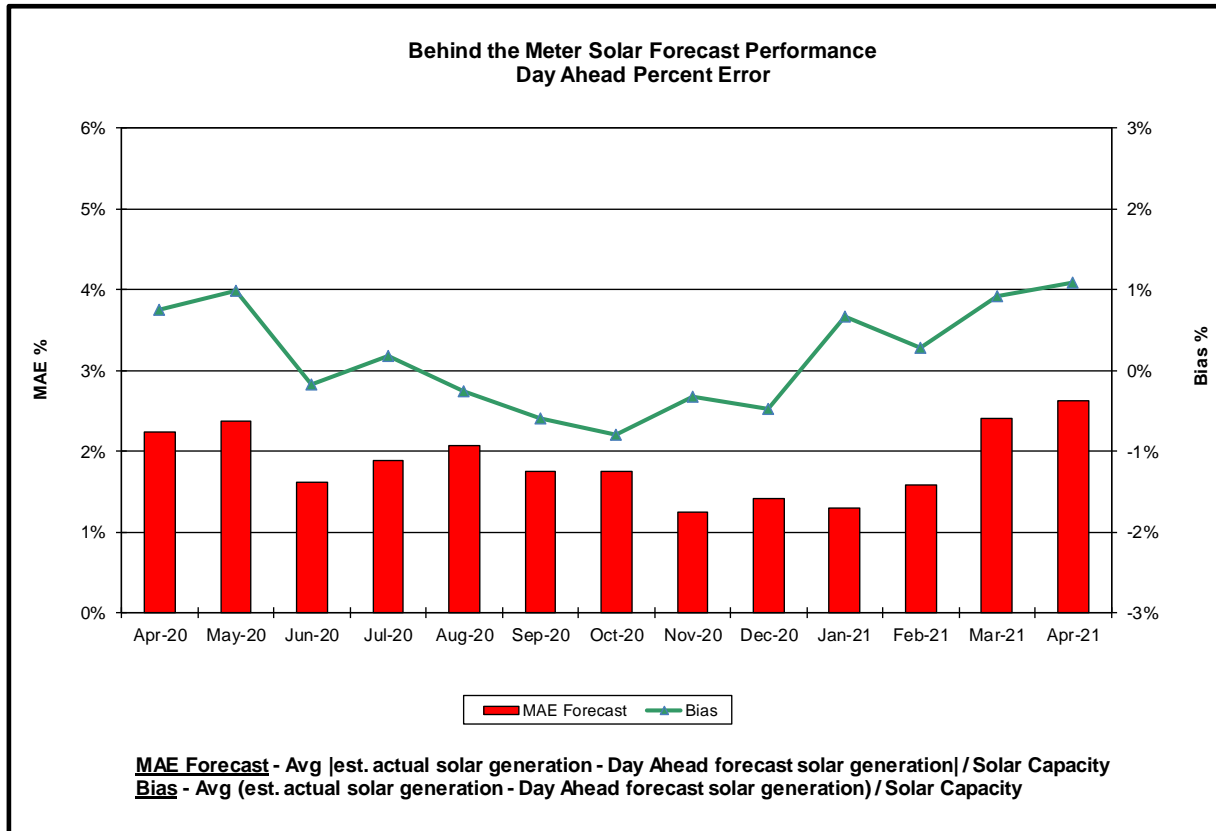
Bias - Avg (actual wind generation - hour ahead forecast wind generation) / Wind Capacity

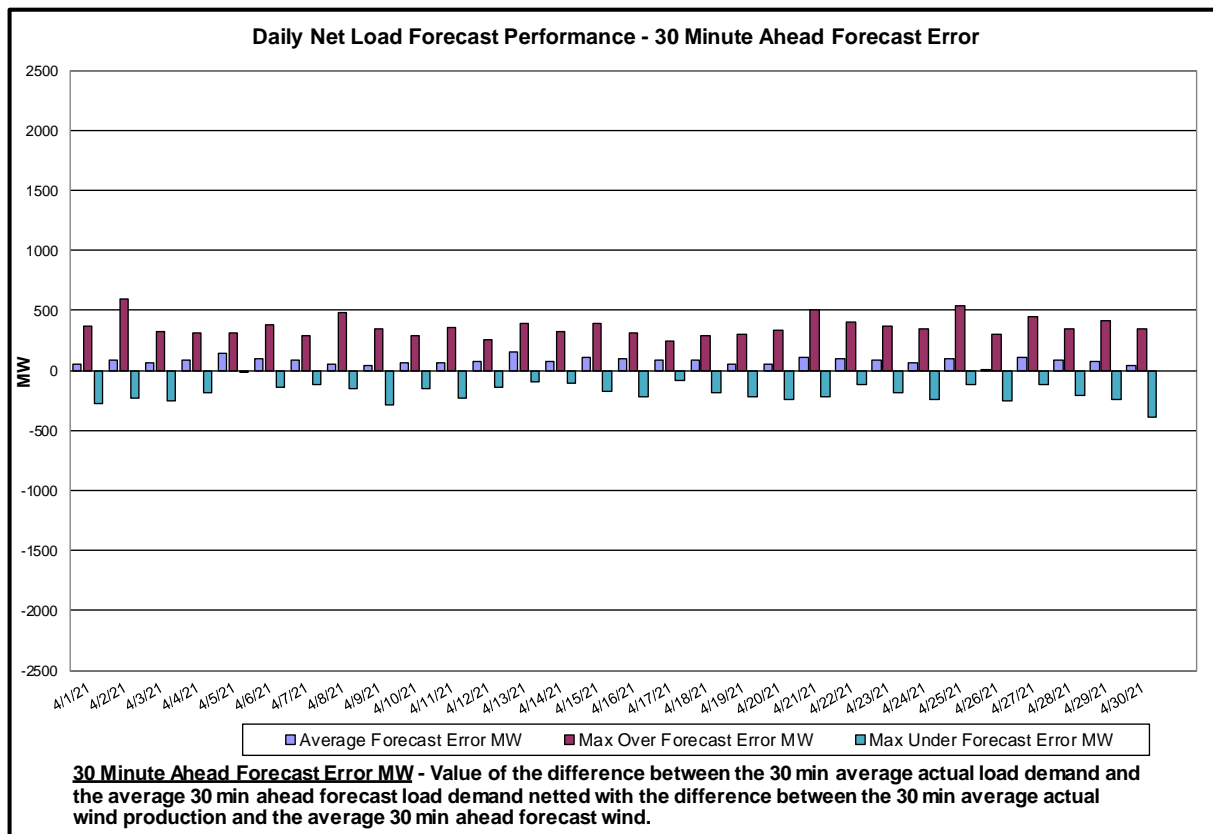
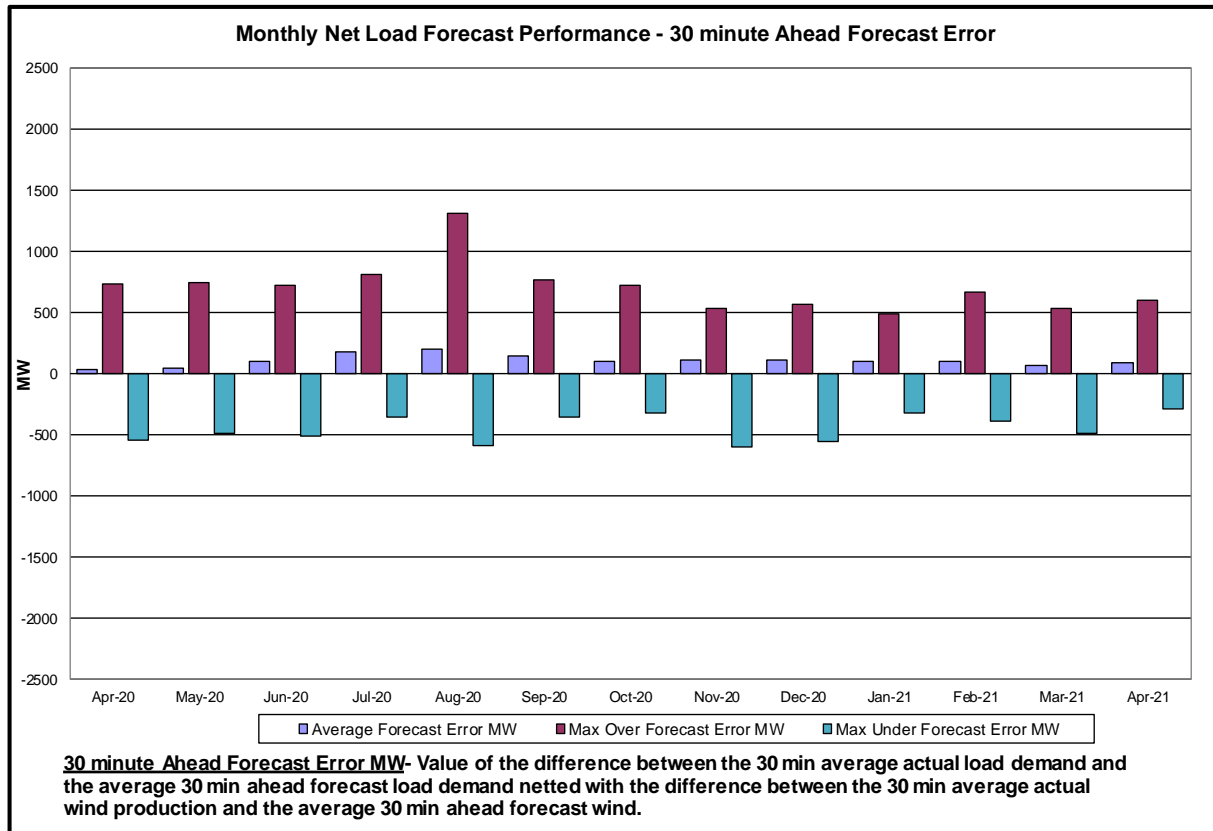


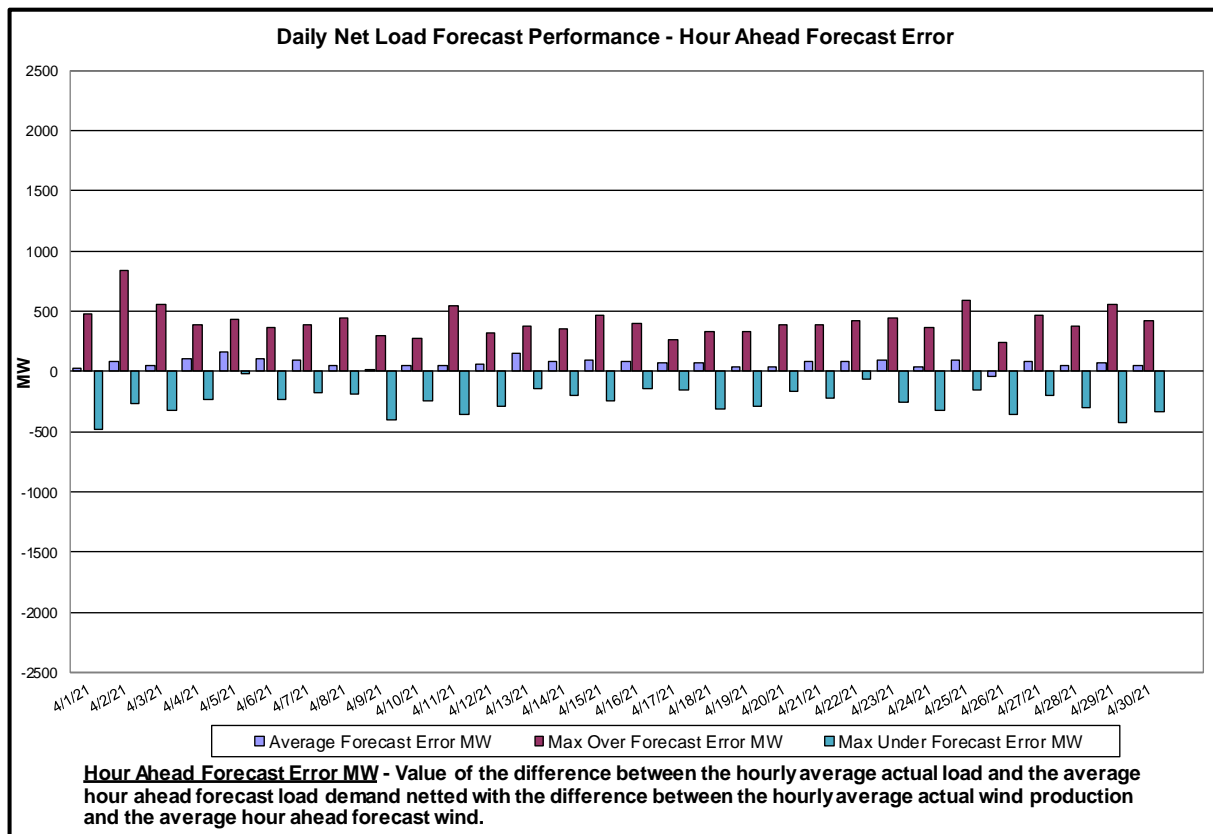
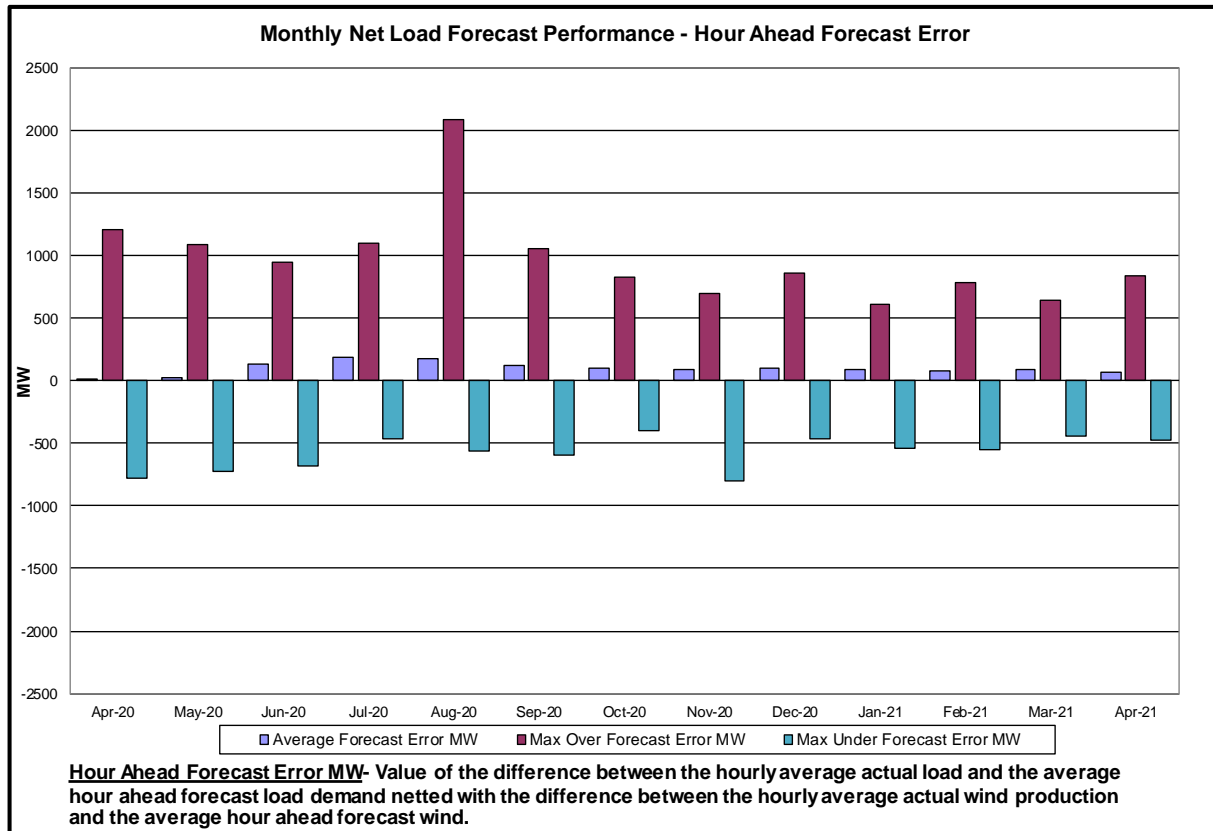


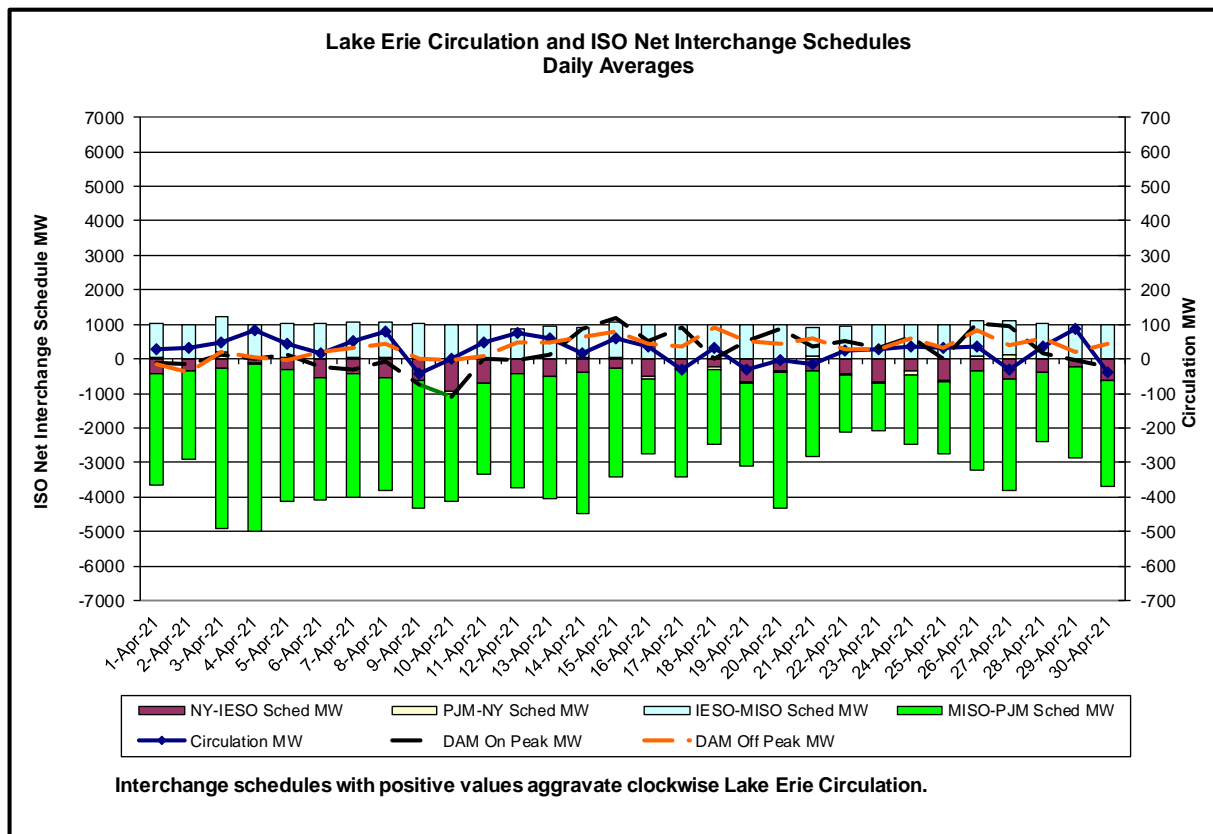
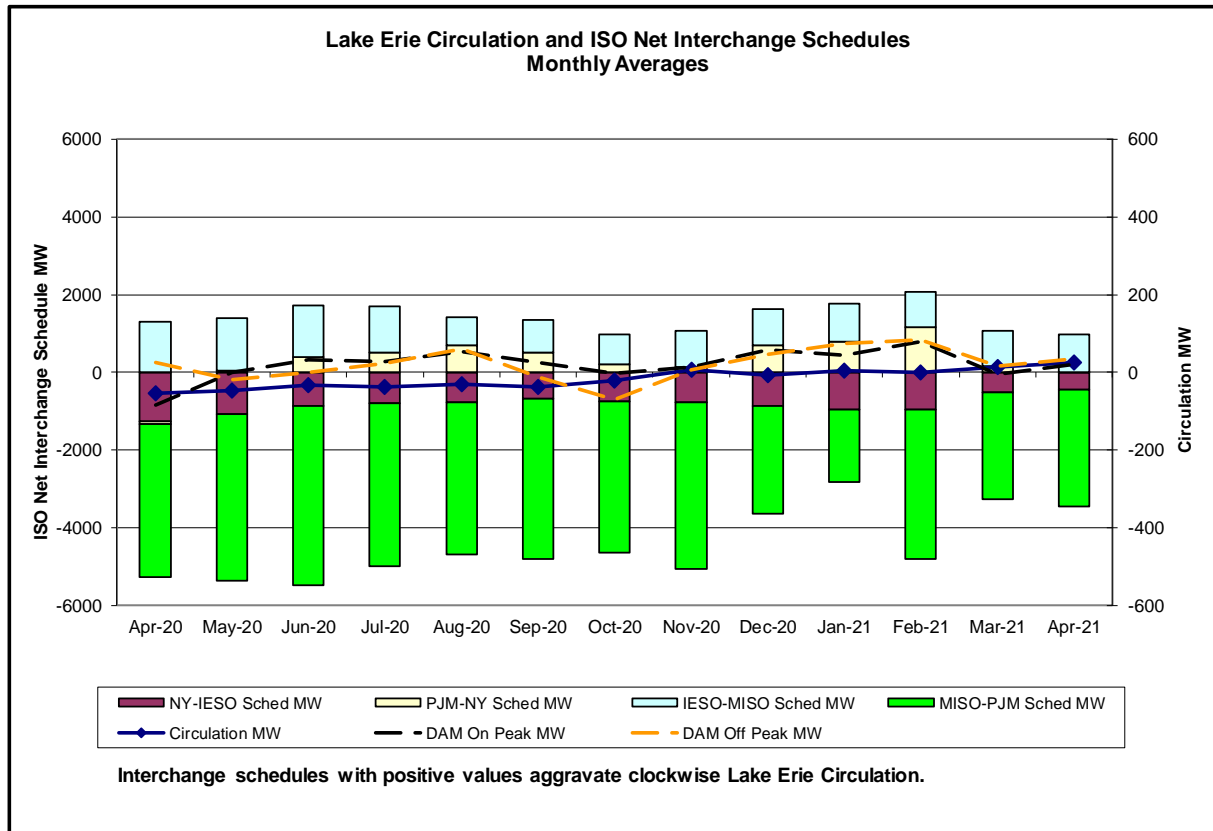




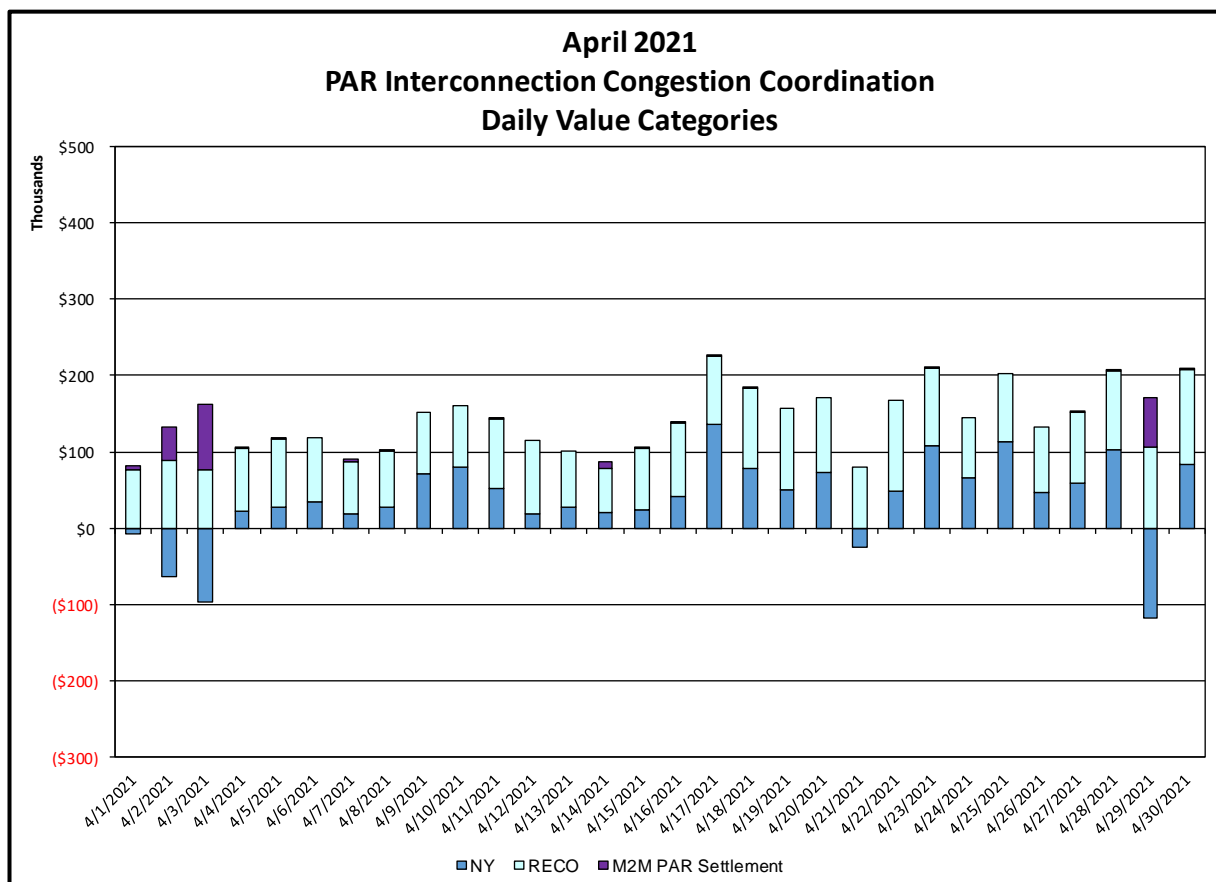
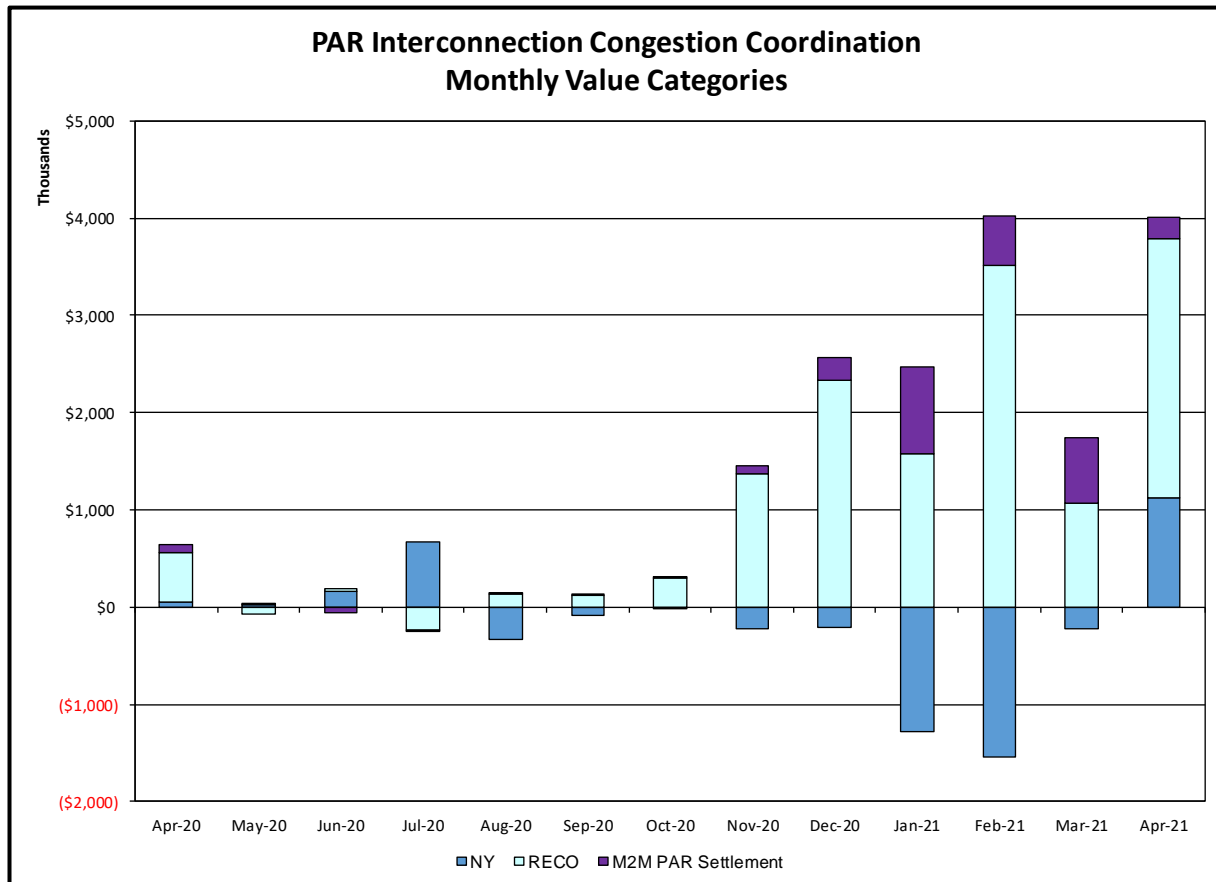






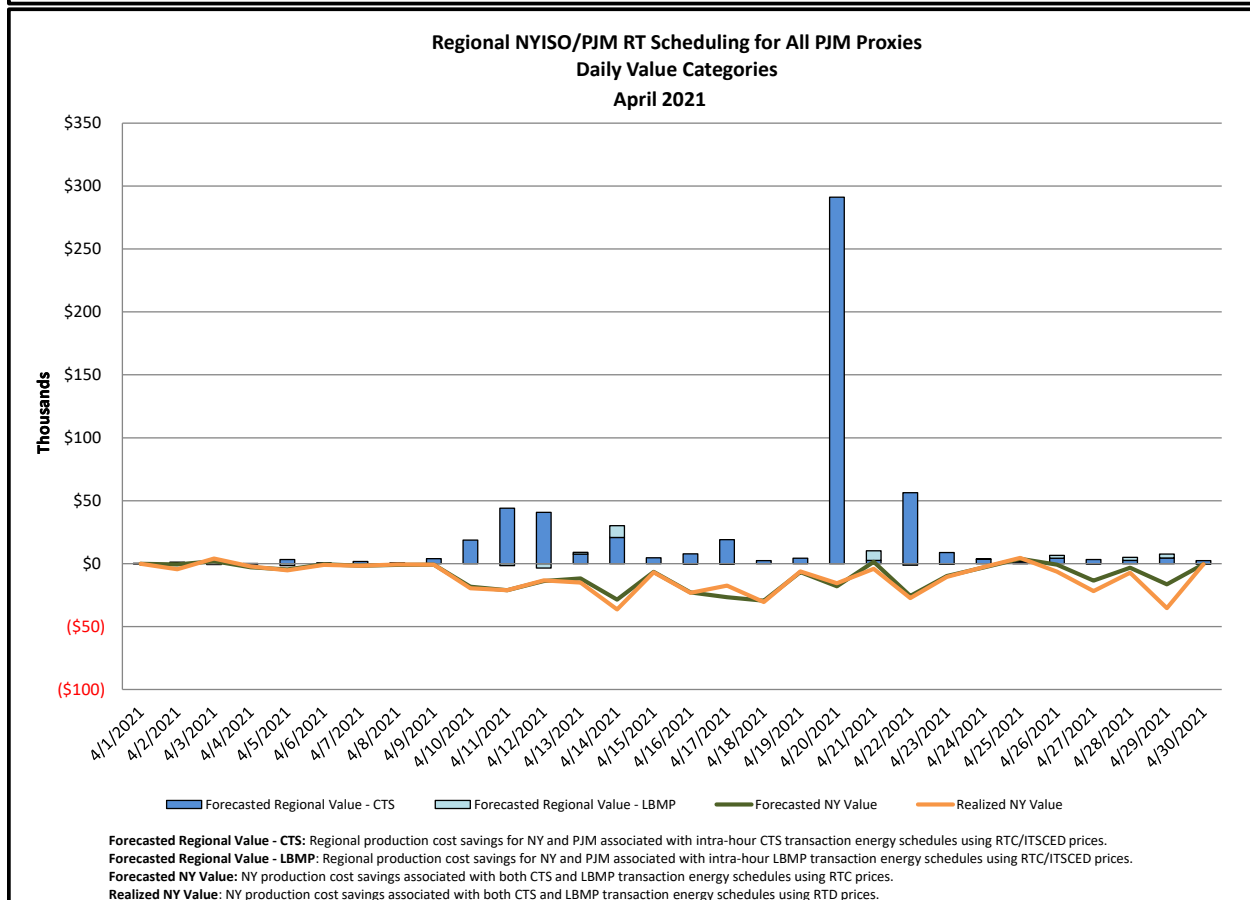
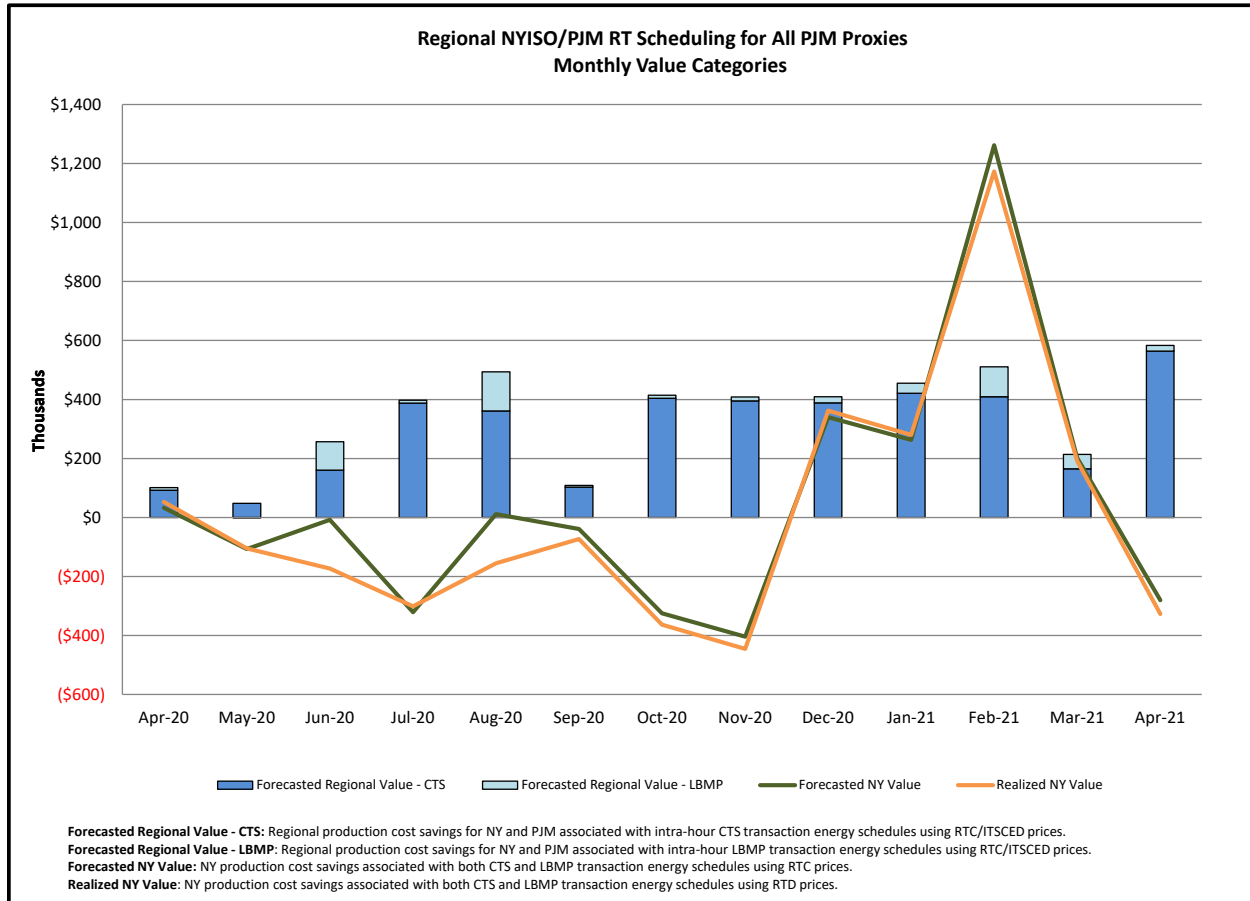


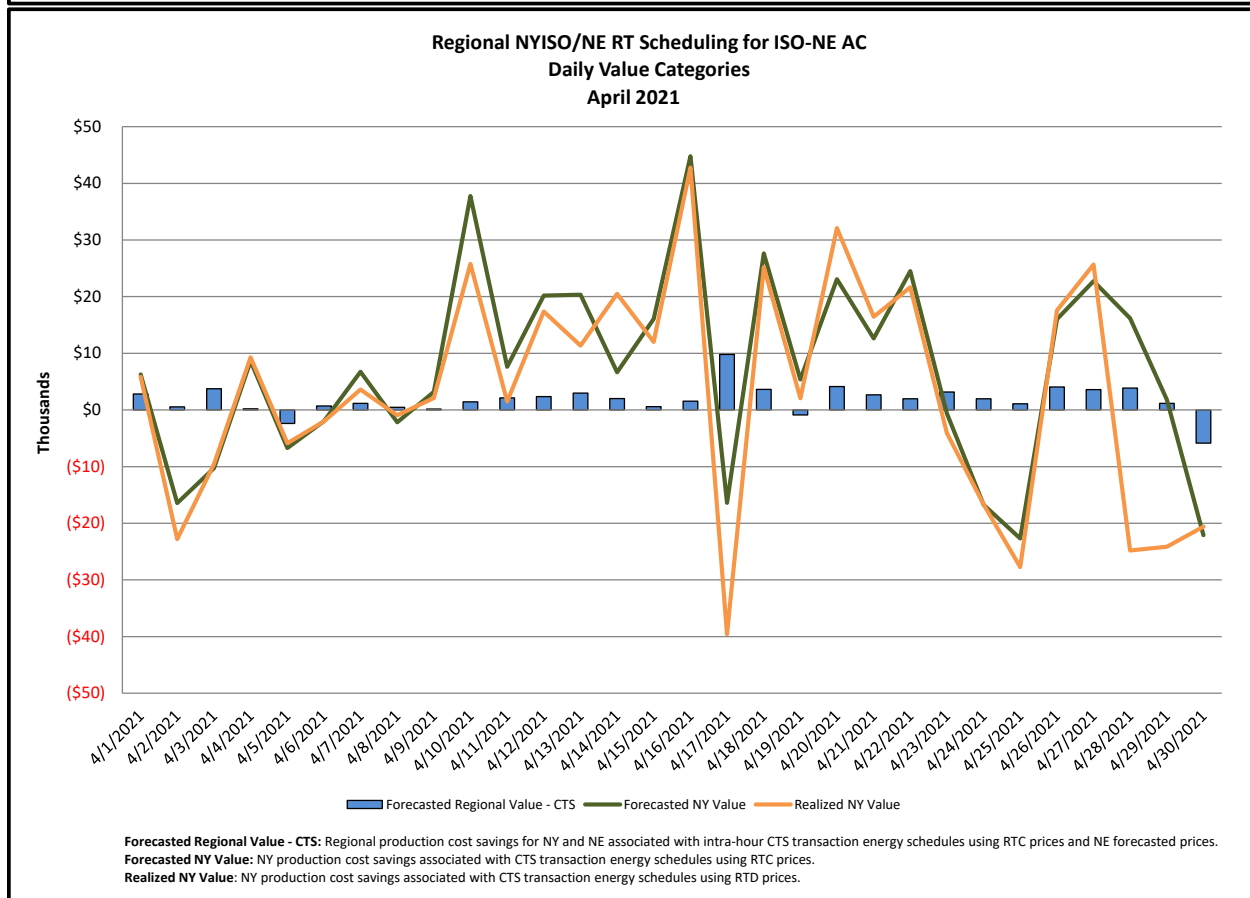
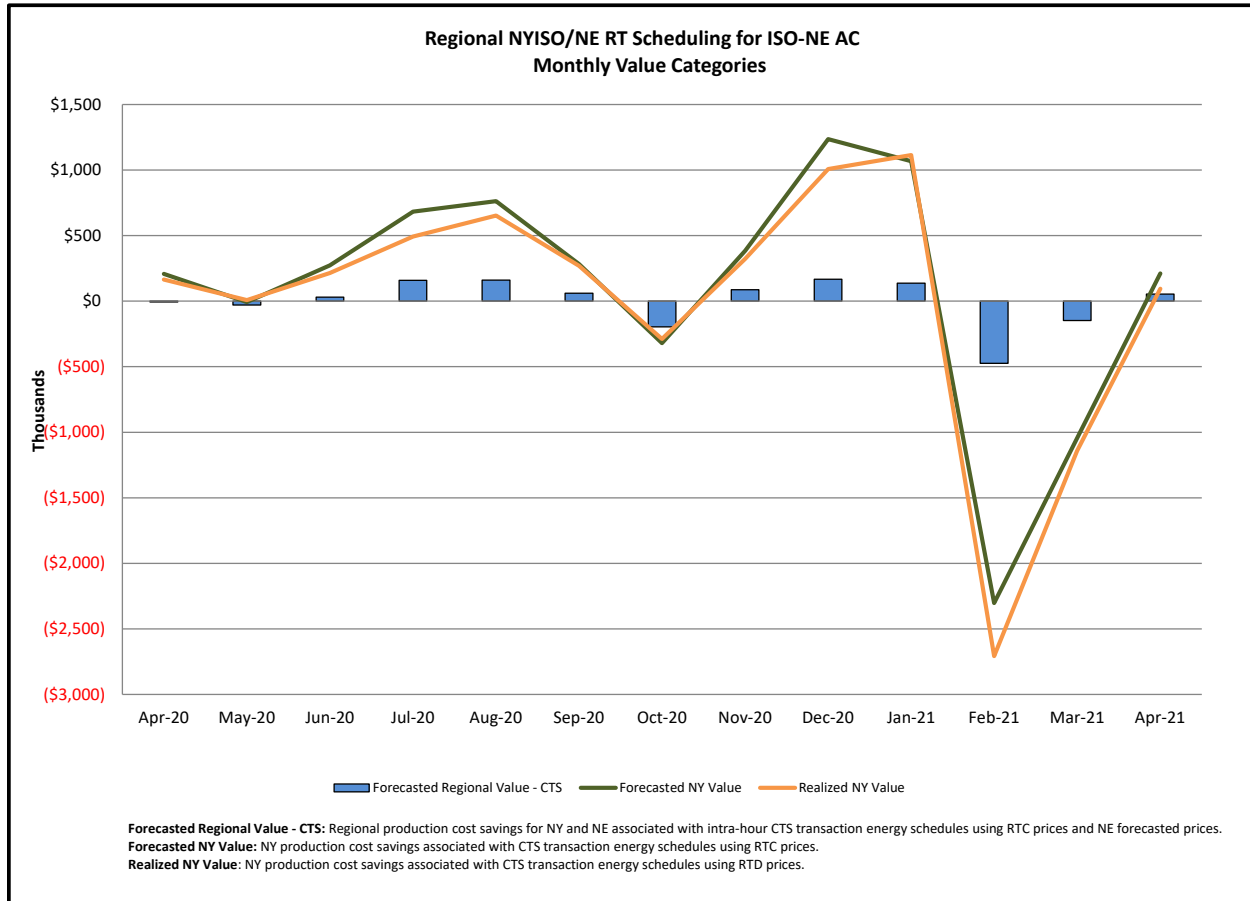
Broader Regional Market Performance Metrics



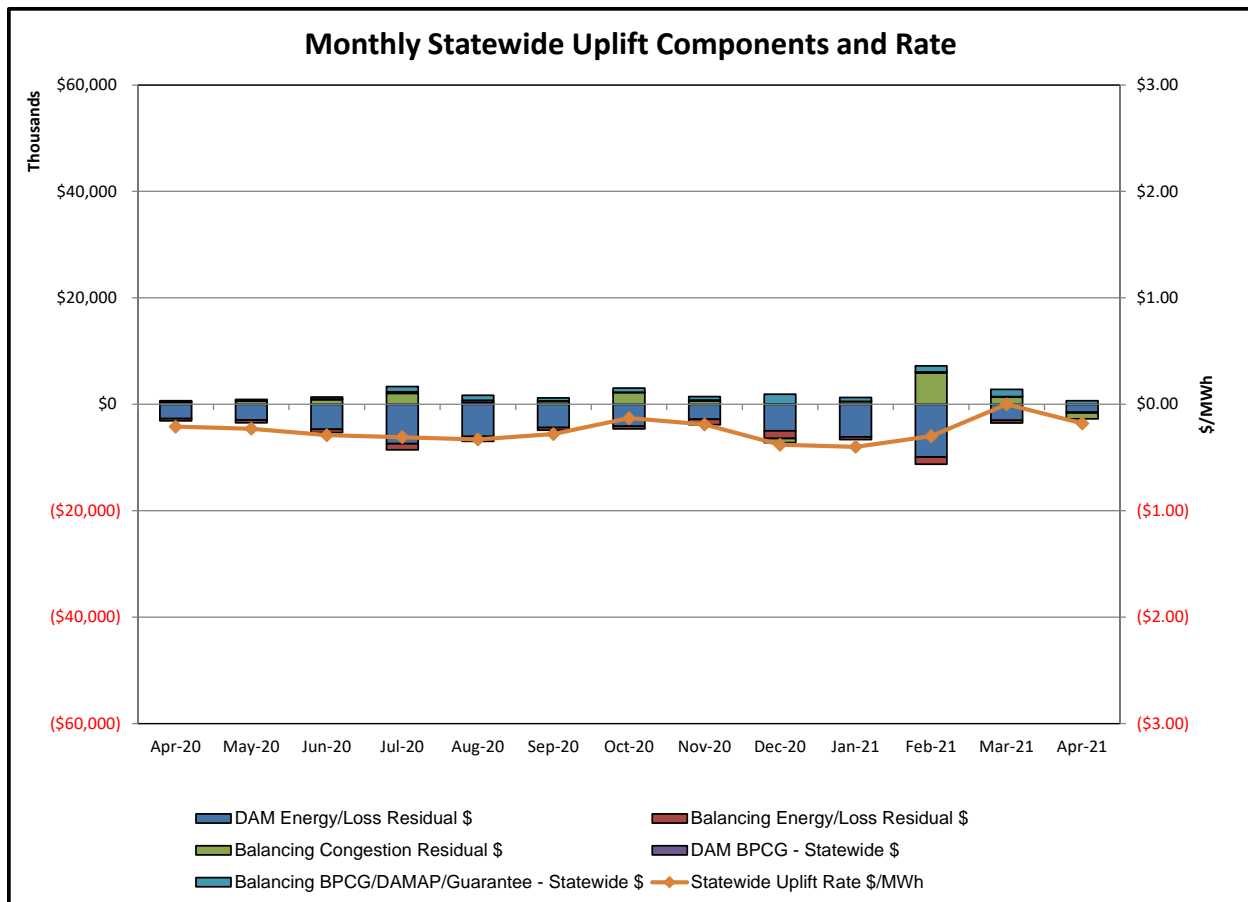
PAR Interconnection Congestion Coordination

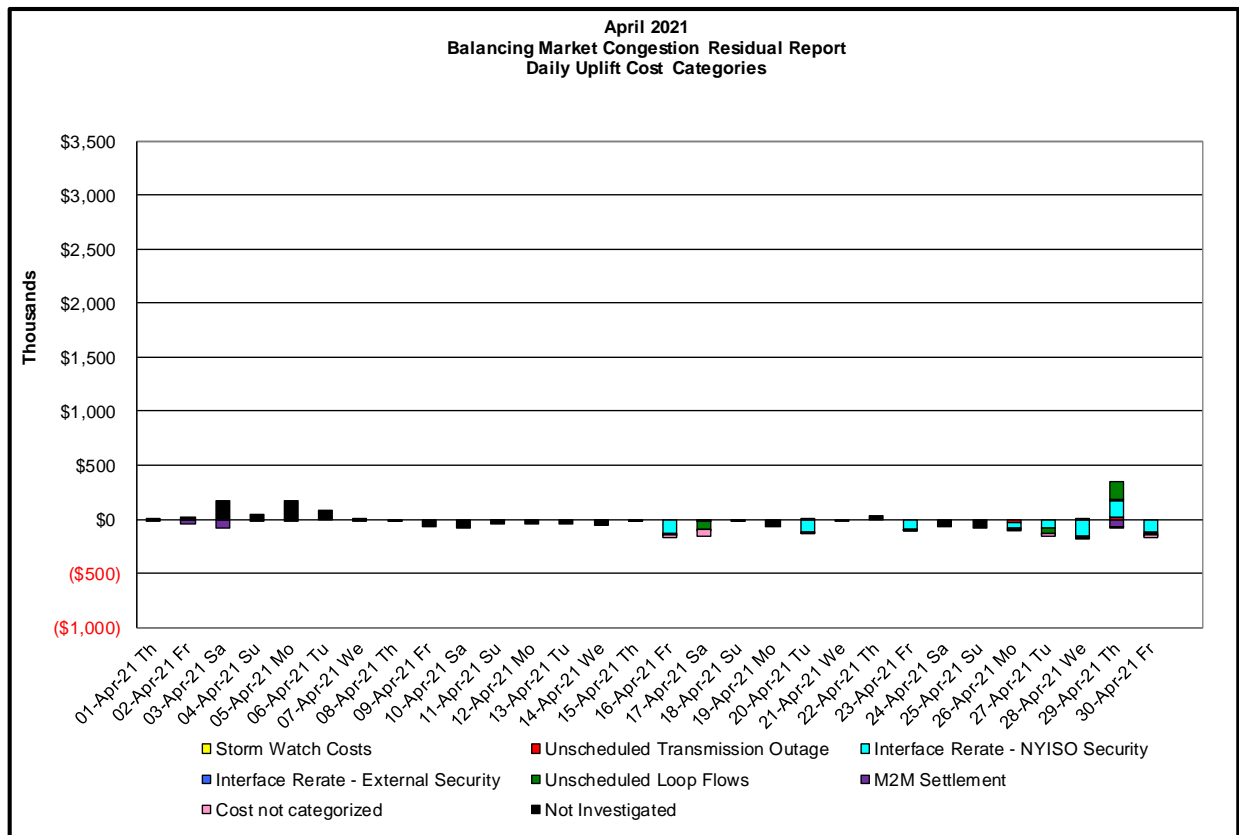
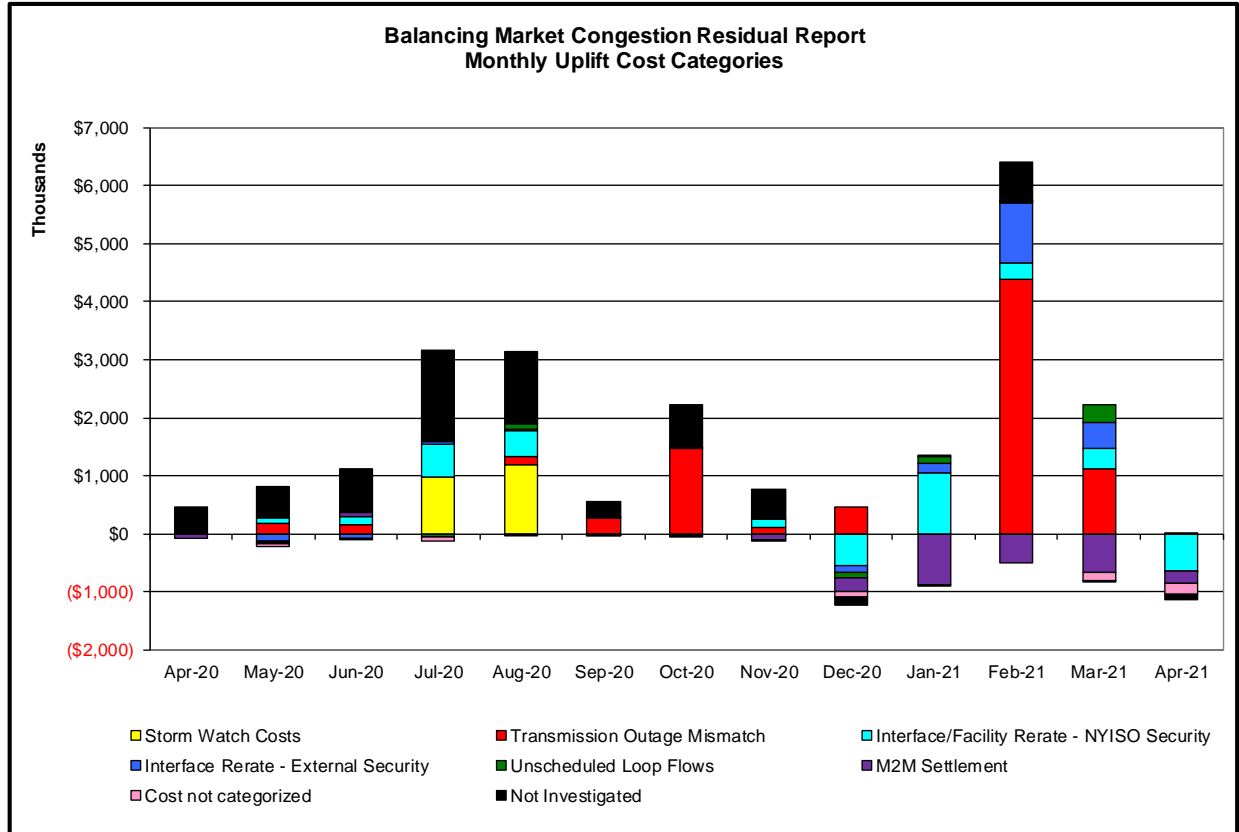
<u>Category</u>	<u>Description</u>
NY	Represents the value NY realizes from Market-to-Market PAR Coordination when experiencing congestion. This is the estimated savings to NY for additional deliveries into NY
RECO	Represents the value of PJM's obligation to deliver 80% of service to RECO load over Ramapo 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.





Market Performance Metrics





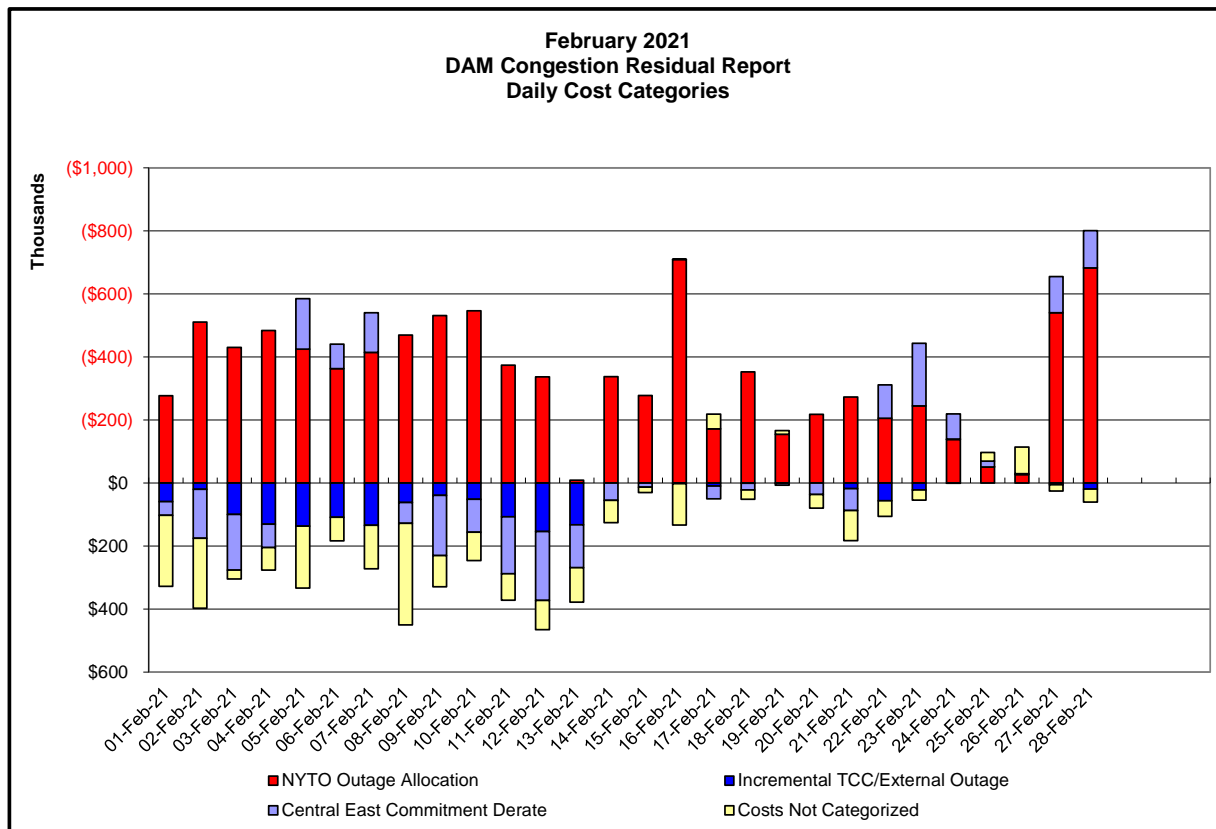
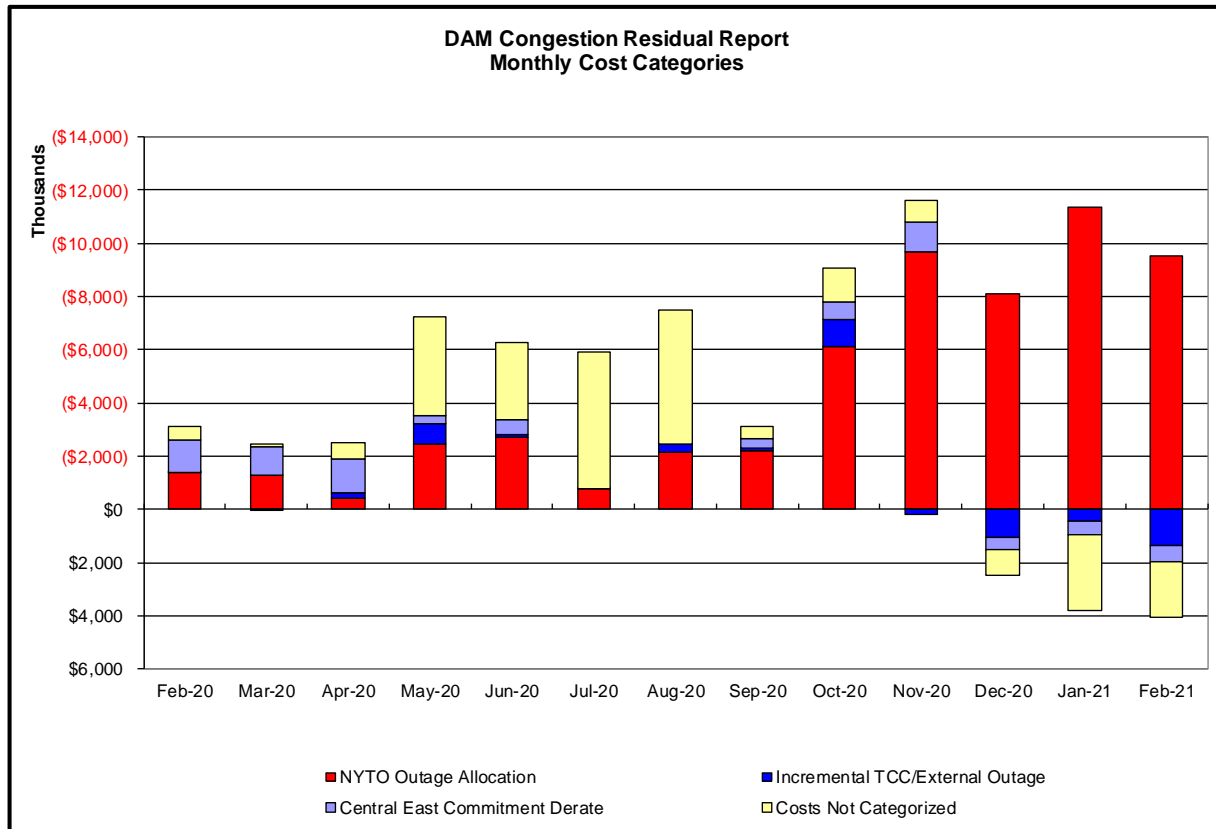
Day's investigated in April: 16,17,20,23,26,27,28,29,30			
Event	Date (yyyymmdd)	Hours	Description
	4/16/2021	11-15,17-21	Uprate Central East
	4/16/2021	13	NE_AC DNI Ramp Limit
	4/16/2021	13,20	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/17/2021	5	NYCA DNI Ramp Limit
	4/17/2021	5,21	NE_AC DNI Ramp Limit
	4/17/2021	2,3,5,11-13,22,23	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/20/2021	7,10,13-16,18	Uprate Central East
	4/20/2021	0,10,13,14	Uprate Lake Success - Shore Rd 138kV (#368)
	4/20/2021	14	Uprate Northport-Pilgrim 138kV (#672) I/o SCB:CRICKVLY(1) 398&CC3
	4/20/2021	14	Uprate Northport-Pilgrim 138kV (#672) I/o SCB:CRICKVLY(2) 398&CC2
	4/20/2021	3	Derate Central East
	4/20/2021	3	Derate Elwood-Pulaski 69kV (#670) I/o TWR:HOLTSVILLE 881& 882& 880
	4/20/2021	10	NE_NNC1385 - NY Scheduling Limit
	4/20/2021	0,1,10	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/23/2021	5,7	NYCA DNI Ramp Limit
	4/23/2021	0,2,9-17,21-23	Uprate Central East
	4/23/2021	0,2,10,11,13-15	Uprate EastGardenCity -ValleyStream 138kV (#262) Base Case
	4/23/2021	11	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/26/2021	18-21	Early return to service of North Port-Pilgrim 138kV (#672)
	4/26/2021	0,4,6,9,13,18-21	Uprate Central East
	4/26/2021	13,20,21	Uprate EastGardenCity -ValleyStream 138kV (#262) Base Case
	4/26/2021	0,13,19-21	Uprate Lake Success - Shore Rd 138kV (#368)
	4/26/2021	9	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/27/2021	0,6,7,9-12,16,17	Uprate Central East
	4/27/2021	10,11	Uprate EastGardenCity -ValleyStream 138kV (#262) Base Case
	4/27/2021	10	Uprate Lake Success - Shore Rd 138kV (#368)
	4/27/2021	18-20	Uprate Northport-Pilgrim 138kV (#672) I/o Northport-Pilgrim 138kV (#679)
	4/27/2021	7,9-11,19,20	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/28/2021	7-11,13,15-18,21-23	Uprate Central East
	4/28/2021	15-18	Uprate Northport-Pilgrim 138kV (#672) I/o Northport-Pilgrim 138kV (#679)
	4/28/2021	12,14	Derate Cricket Valley-Pleasant Valley 345kV (#F83) I/o Cricket Valley-Pleasant Valley 345kV
	4/28/2021	14	NE_NNC1385 - NY Scheduling Limit
	4/28/2021	12,22,23	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/29/2021	16	Forced outage of Edic-Fraser 345kV (#EF24-40)
	4/29/2021	9-13,15,16,19-21	Derate Cricket Valley-Pleasant Valley 345kV (#F83) I/o Cricket Valley-Pleasant Valley 345kV
	4/29/2021	7,23	Uprate Central East
	4/29/2021	15	NE_NNC1385 - NY Scheduling Limit
	4/29/2021	9-13,20,21	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/30/2021	6-11,16-23	Uprate Central East
	4/30/2021	16	NE_AC DNI Ramp Limit
	4/30/2021	1,2,6,7	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East

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.	

