

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



## ***May 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 June 8, 2022.

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## May 2022 Operations Performance Highlights

- Peak load of 27,046 MW occurred on 5/31/2022 HB 17
- All-time summer capability period peak load of 33,956 MW occurred on 07/19/2013 HB 16
- 13.7 hours of Thunderstorm Alerts were declared
- 40.2 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.
- The major portions of the Western NY Public Policy project were placed in service May 26<sup>th</sup>, including Dysinger-East Stolle Rd 345kV (#DES1) and PAR, and East Stolle Rd-Five Mile Rd 345kV (#29).
- Construction and commissioning delays have resulted in the new Gordon Rd 345kV substation not being available for service for summer 2022. The Edic-New Scotland 345kV (#14) was restored to service on May 27<sup>th</sup> for the summer period.

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

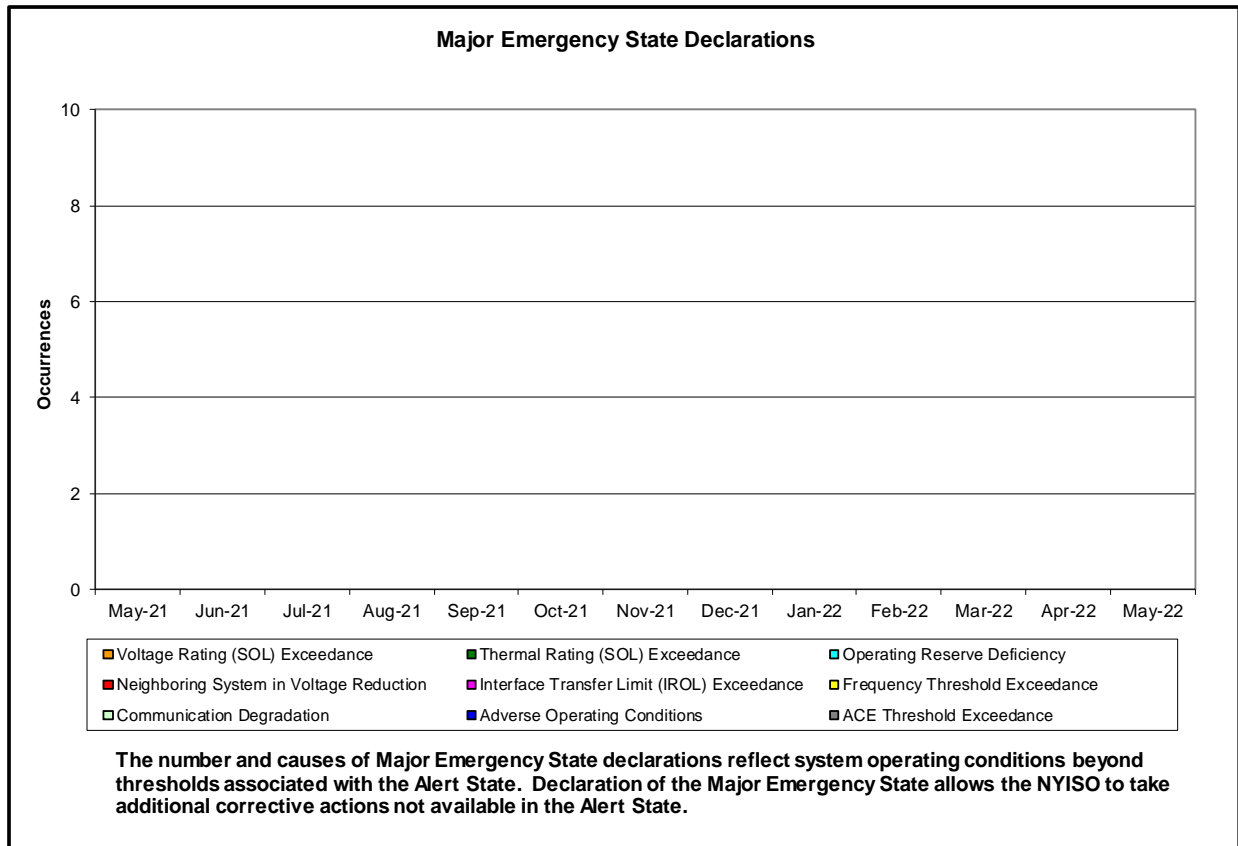
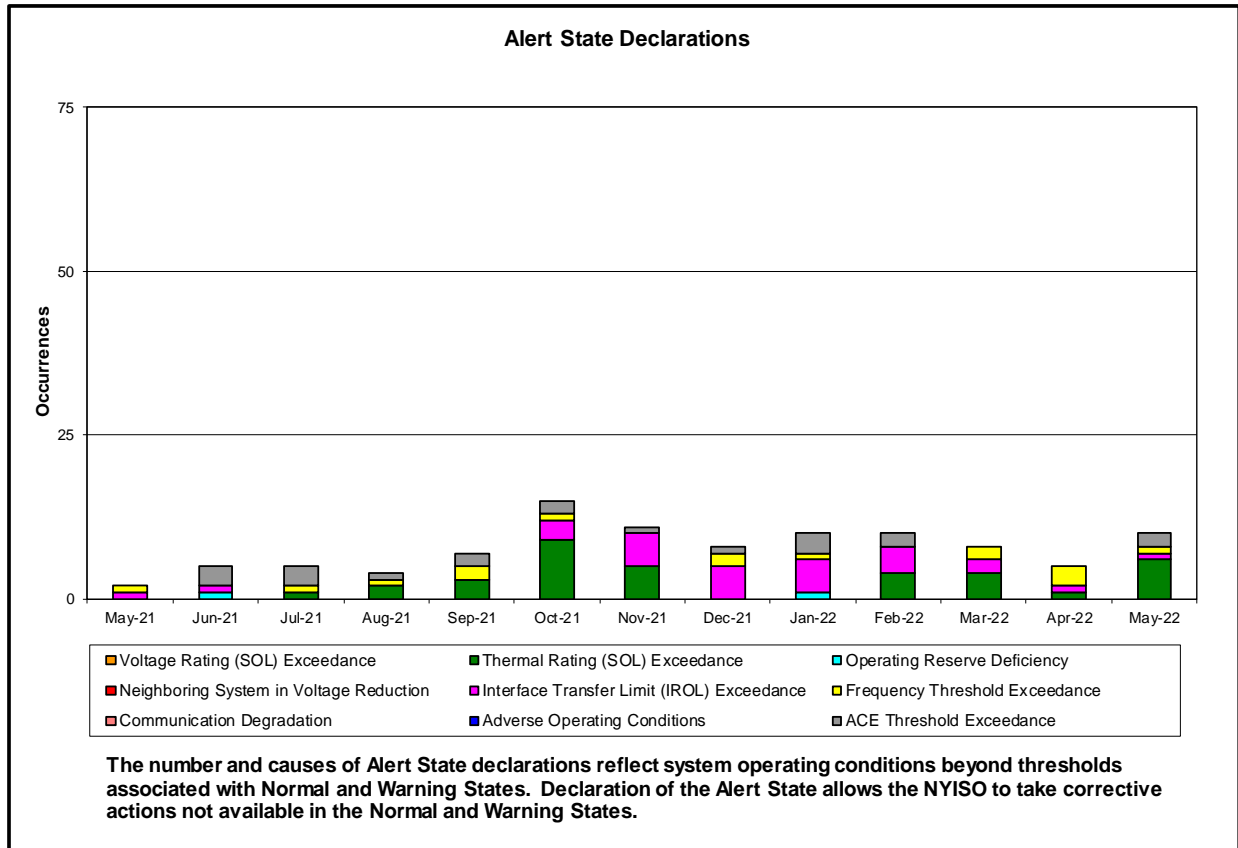
	Current Month Value (\$M)	Year-to-Date Value (\$M)
<b>NY Savings from PJM-NY Congestion Coordination</b>	\$7.68	\$20.36
<b>NY Savings from PJM-NY Coordinated Transaction Scheduling</b>	(\$0.23)	(\$1.14)
<b>NY Savings from NE-NY Coordinated Transaction Scheduling</b>	\$0.96	\$2.69
<b>Total NY Savings</b>	<b>\$8.41</b>	<b>\$21.91</b>
<b>Regional Savings from PJM-NY Coordinated Transaction Scheduling</b>	\$0.48	\$2.98
<b>Regional Savings from NE-NY Coordinated Transaction Scheduling</b>	\$0.16	\$1.92
<b>Total Regional Savings</b>	<b>\$0.64</b>	<b>\$4.90</b>

- Statewide uplift cost monthly average was (\$0.65)/MWh.
- The following table identifies the Monthly ICAP spot market prices and the price delta.

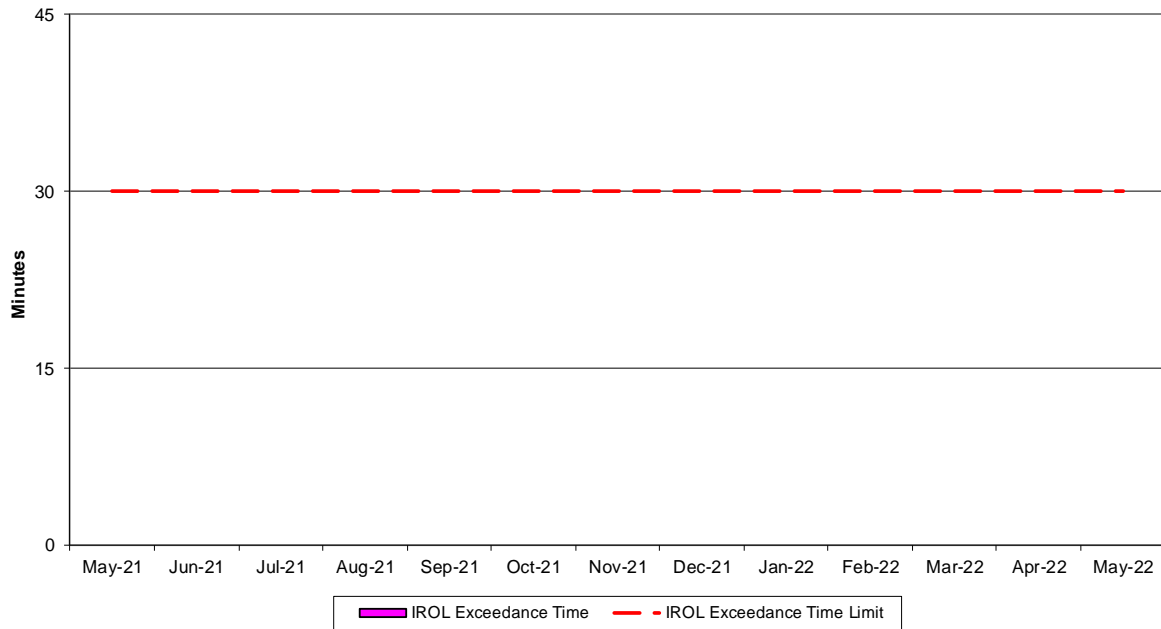
Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
June 2022 Spot Price	\$3.33	\$3.33	\$3.51	\$6.74
May 2022 Spot Price	\$2.72	\$3.46	\$3.70	\$5.93
Delta	\$0.61	(\$0.13)	(\$0.19)	\$0.81

- The increase in NYCA clearing price was due to a decrease in net Imports. The decreases in clearing prices for Lower Hudson Valley(\$3.33) and New York City(\$3.51) were due to decreases in unoffered MWs. The Long Island clearing price increase is attributed to an increase in unoffered MWs.

## Reliability Performance Metrics

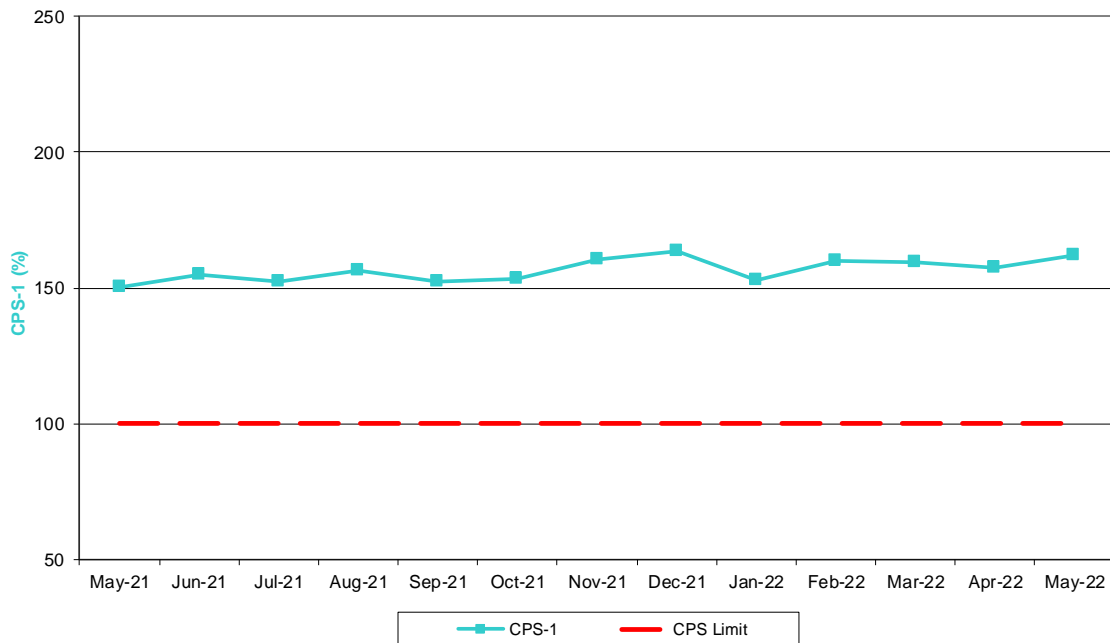


### NERC IROL Time Over Limit



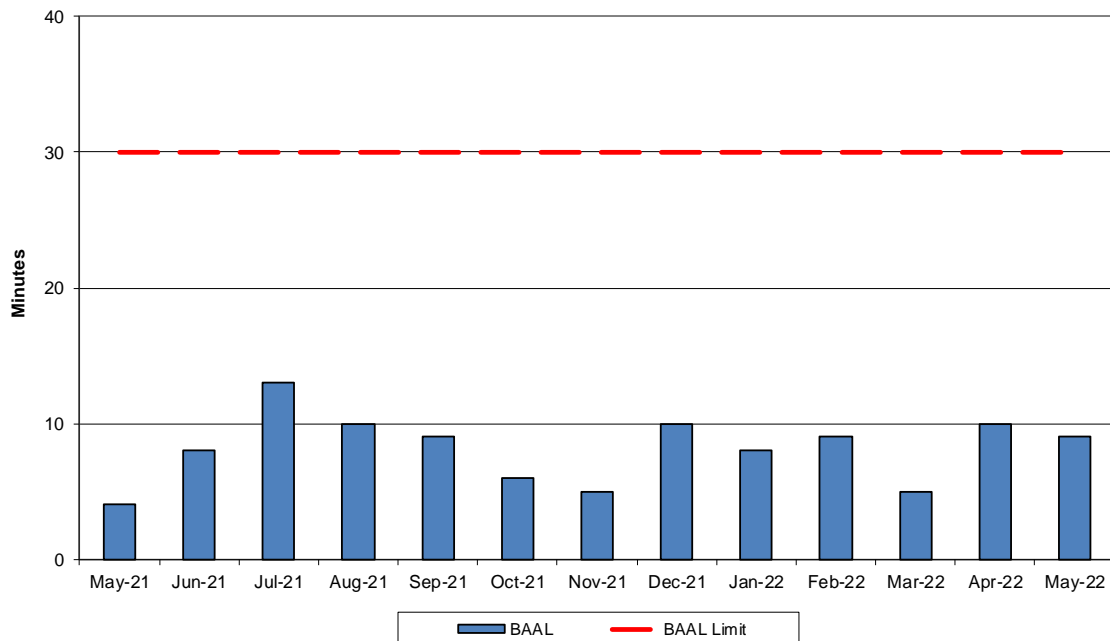
For IROL exceedances leading to Major Emergency State declarations, the maximum IROL exceedance time is identified. IROL exceedances of less than thirty minutes are considered NERC compliant.

### NERC Control Performance Standards



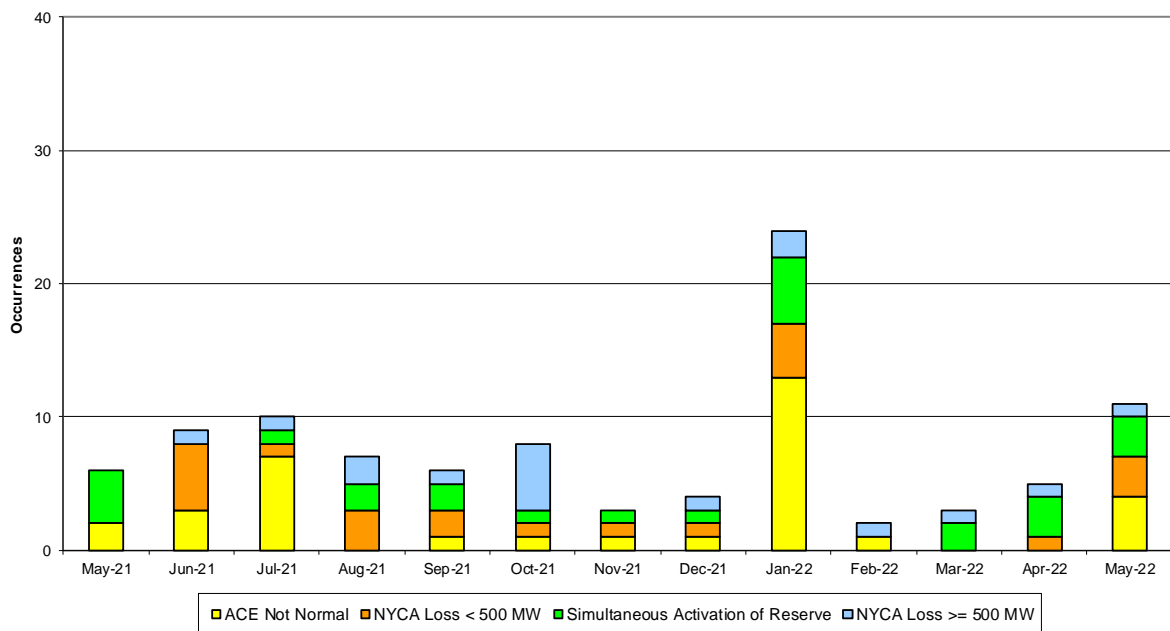
The value of NERC Control Performance Standards (CPS-1) is an indicator of the NYISO Area resource and demand balancing. Values exceeding the identified threshold are NERC compliant.

### NERC Balancing Authority ACE Limit Standard



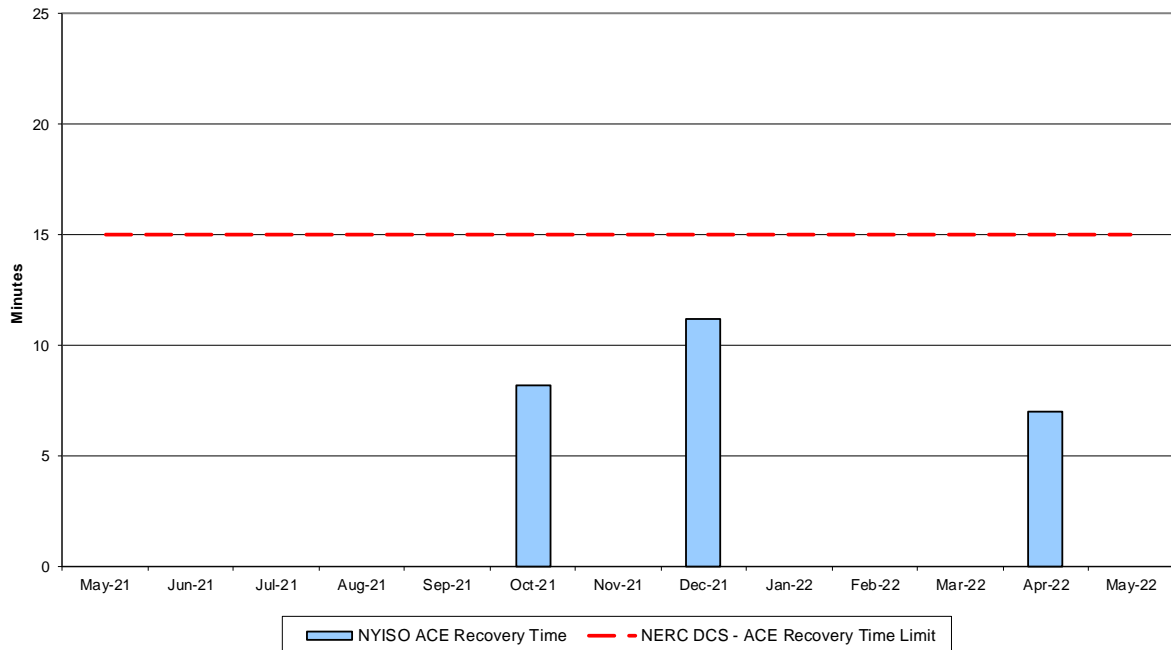
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

### Reserve Activations



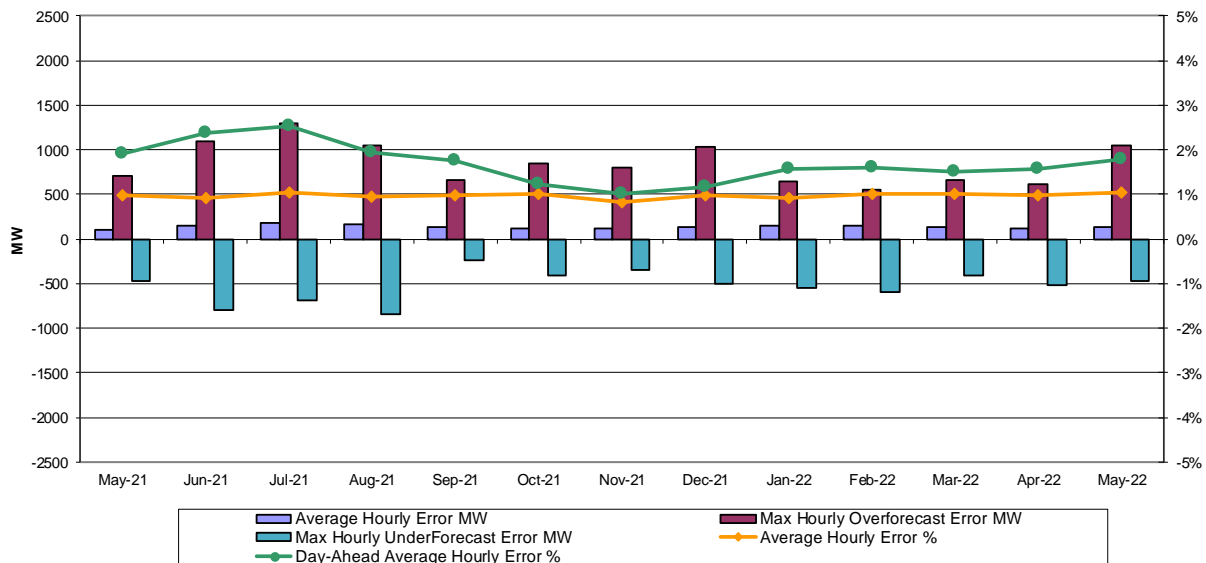
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

### 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

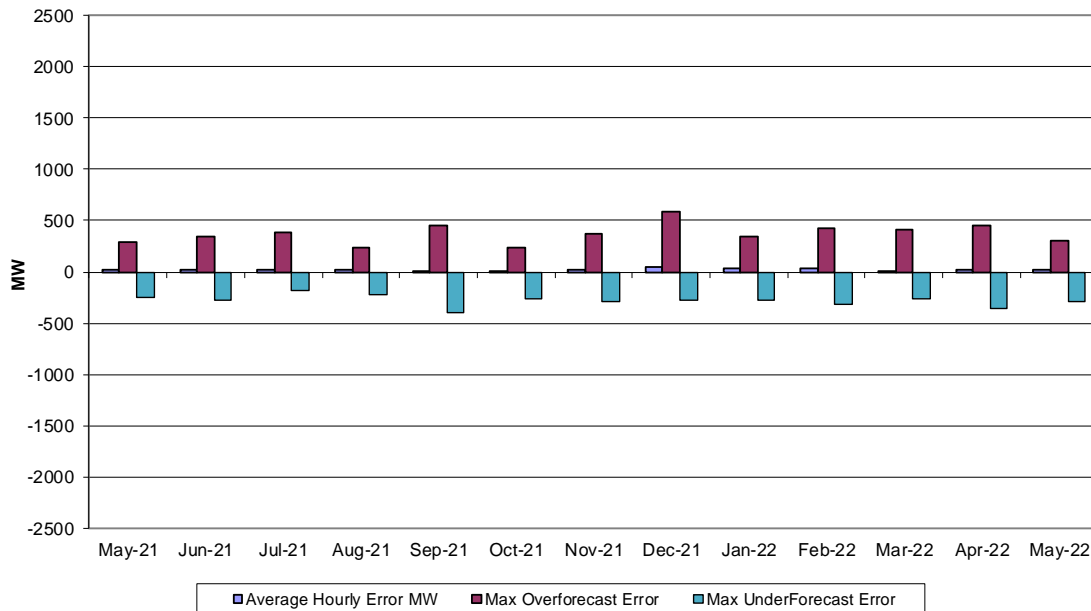


**Hourly Error MW** - Value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.

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

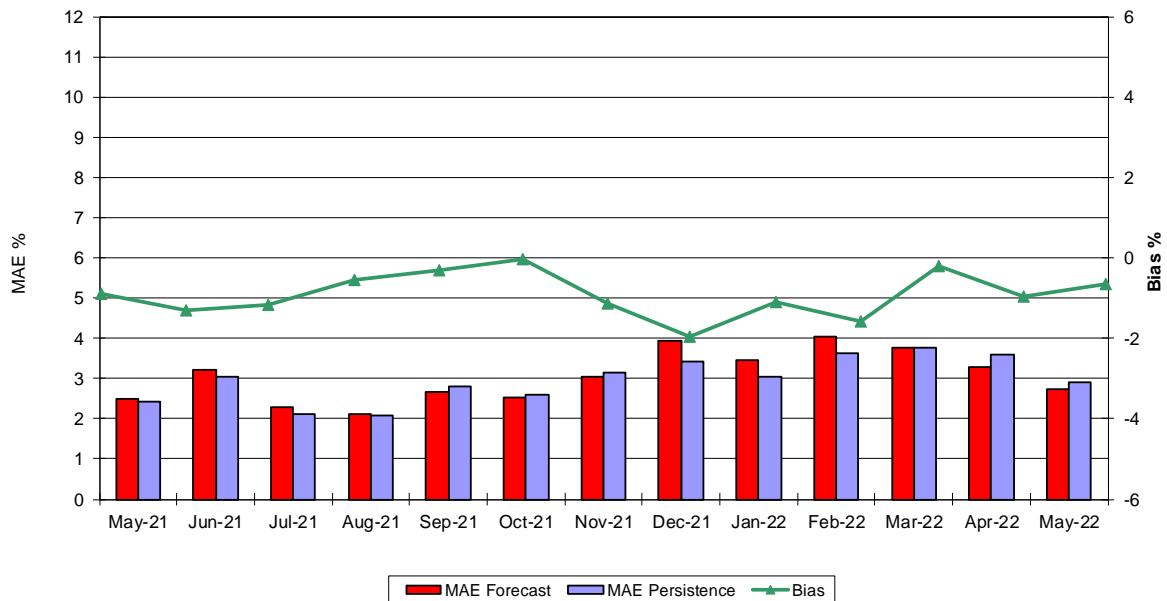
**Day-Ahead Average Hourly Error %** - Average across all hours of the month of the absolute value of the difference between actual load demand and the Day-Ahead forecast load demand, divided by the actual load demand.

### Wind Forecast Performance Hour Ahead MW Error



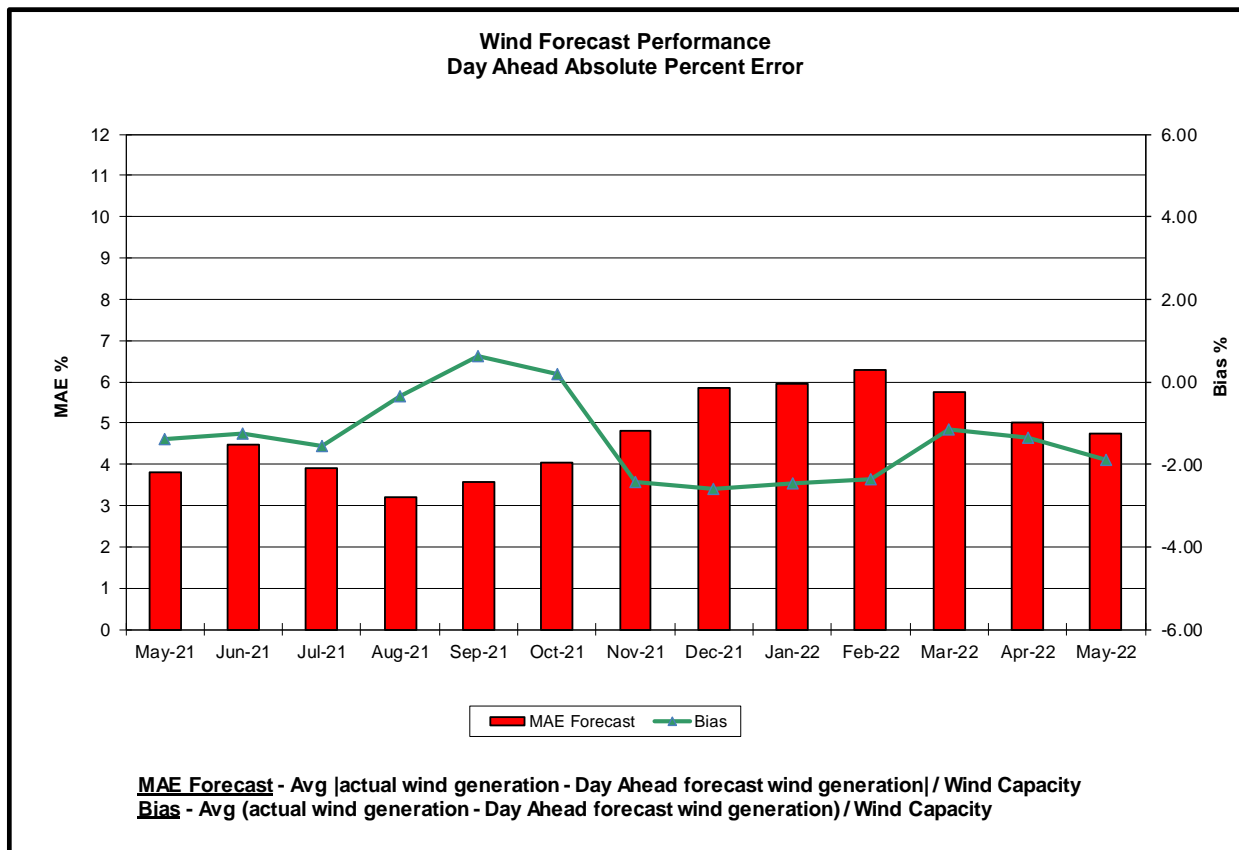
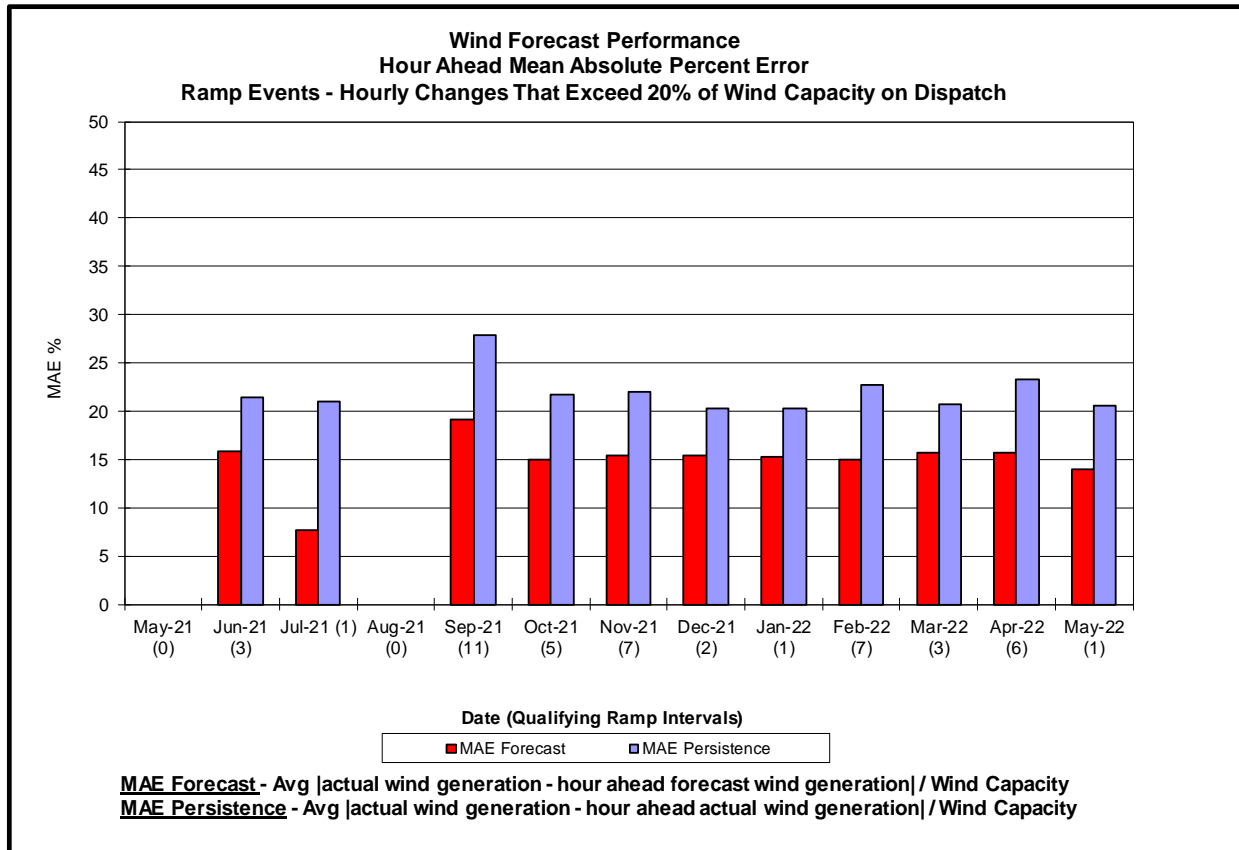
**Hourly Error MW** - Value of the difference between the hourly average actual wind generation and the average hour ahead forecast wind generation.

### Wind Forecast Performance Hour Ahead Percent Error

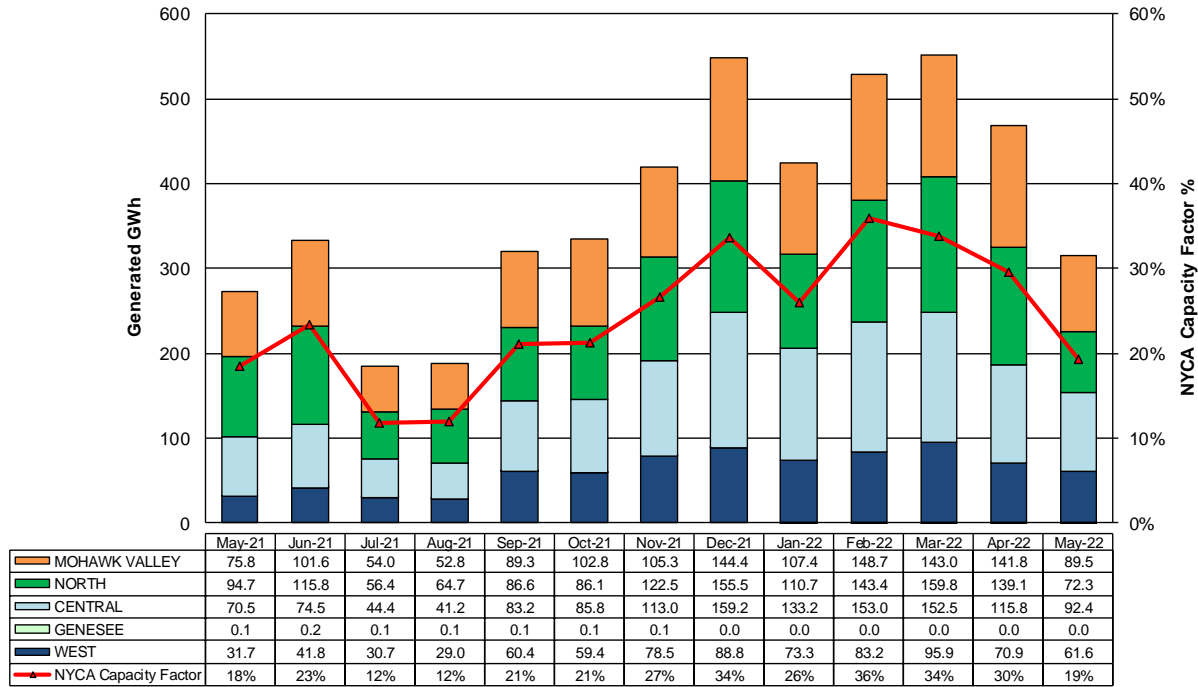


**MAE Forecast** - Avg |actual wind generation - hour ahead forecast wind generation| / Wind Capacity  
**MAE Persistence** - Avg |actual wind generation - hour ahead actual wind generation| / Wind Capacity  
**Bias** - Avg (actual wind generation - hour ahead forecast wind generation) / Wind Capacity



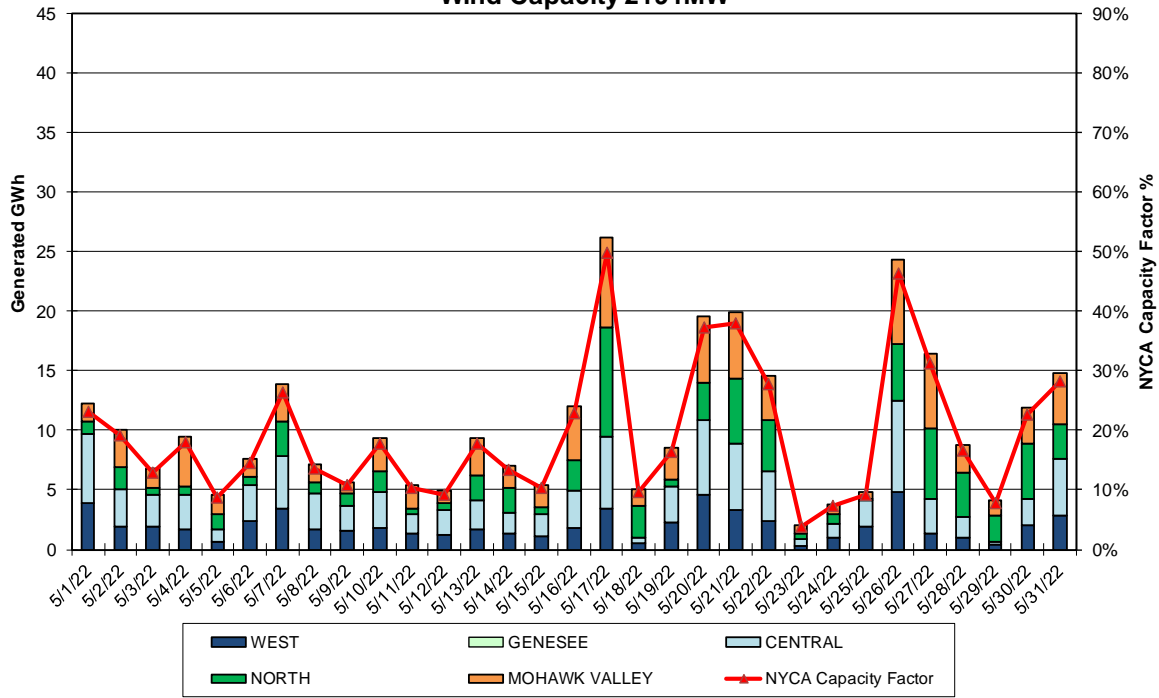


### Wind Performance Monthly Production and Capacity Factor Wind Capacity 2191MW

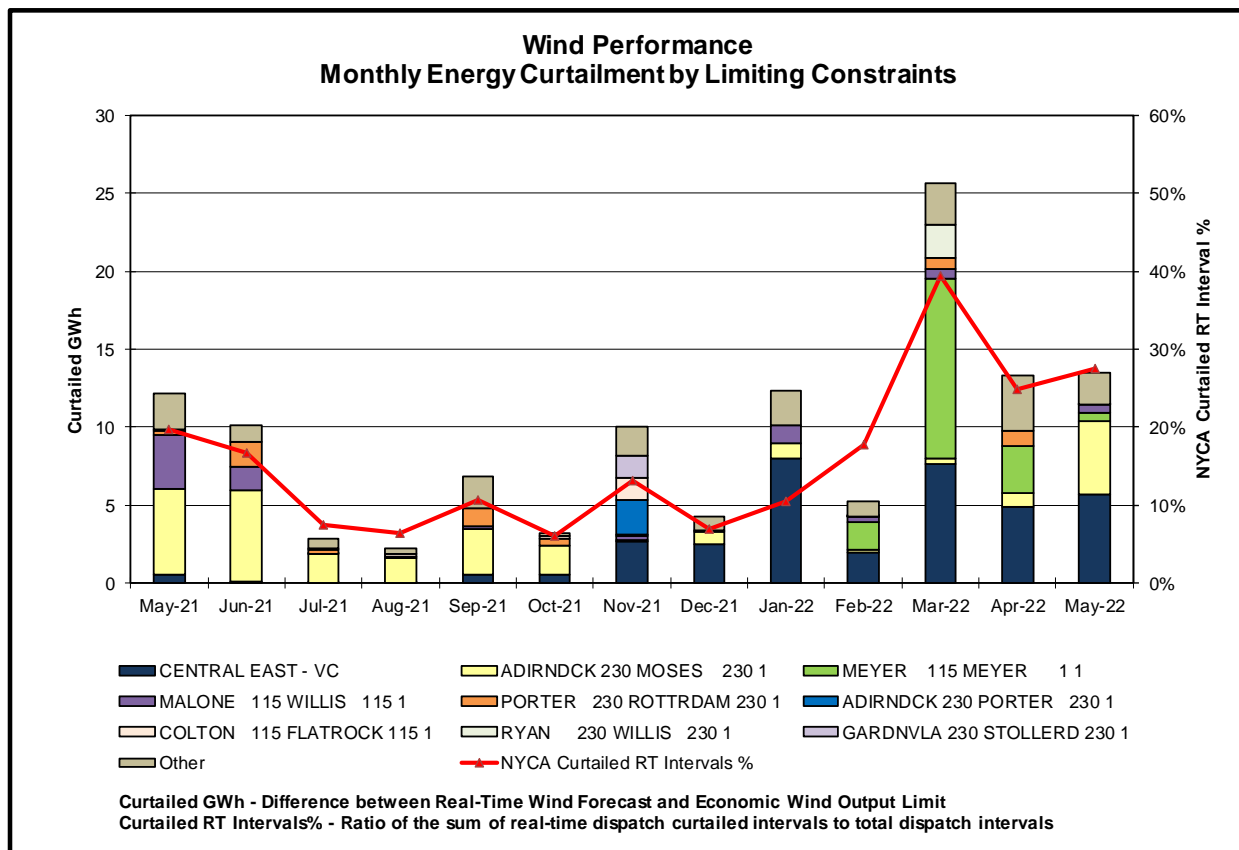
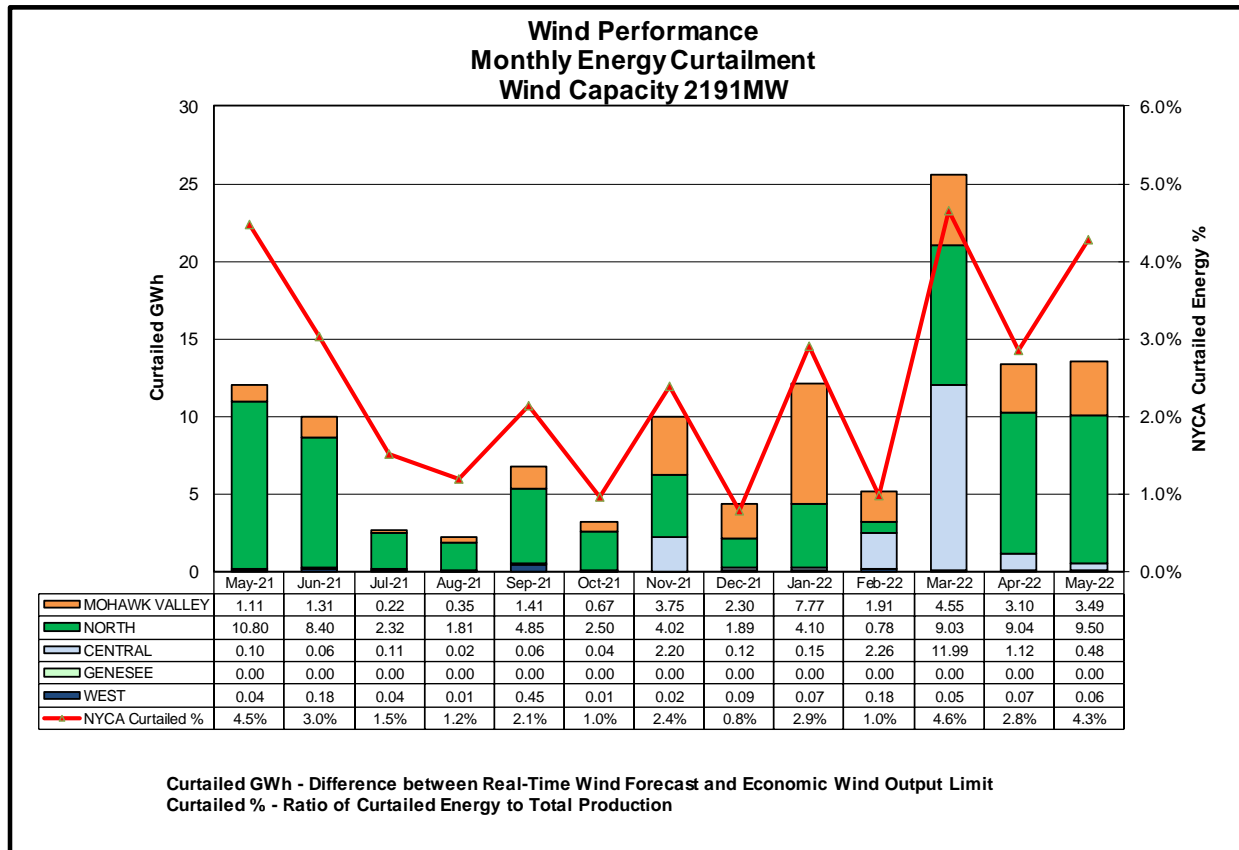


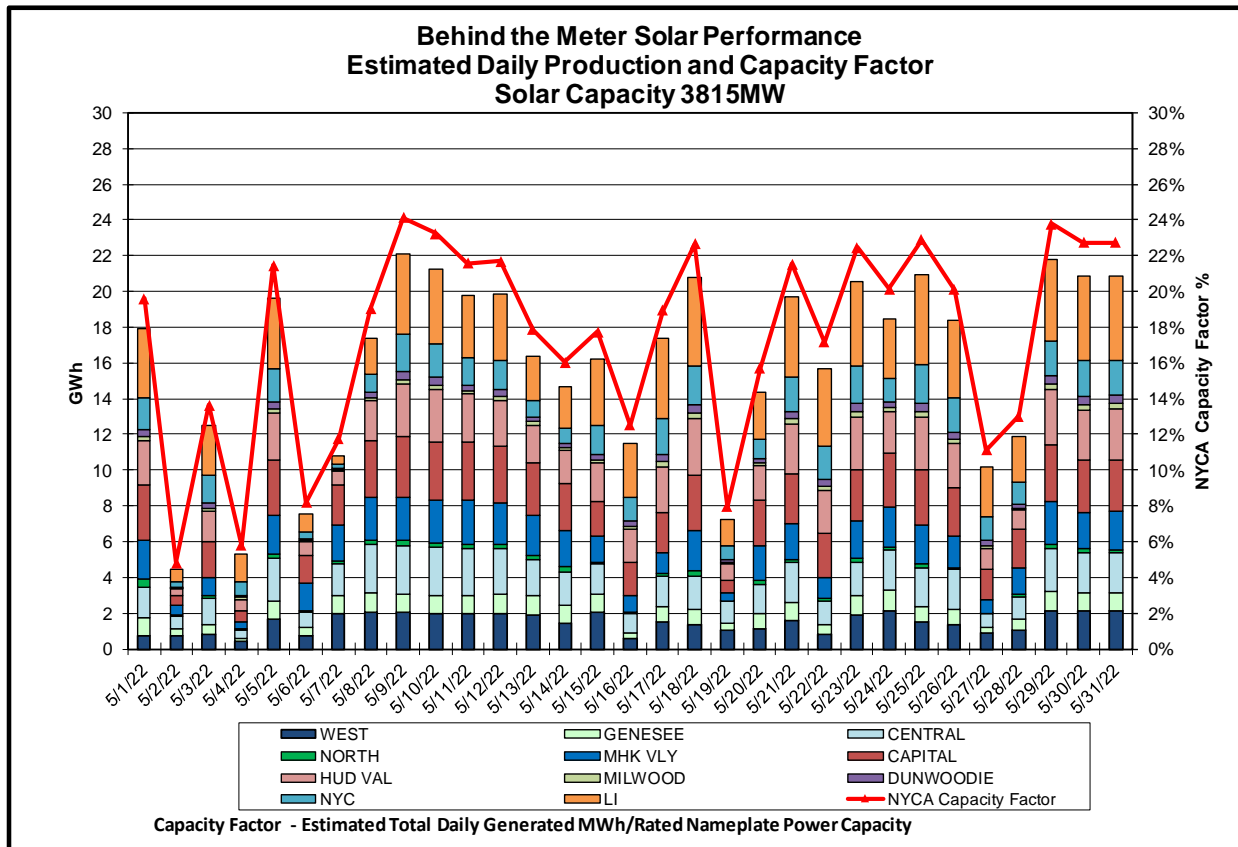
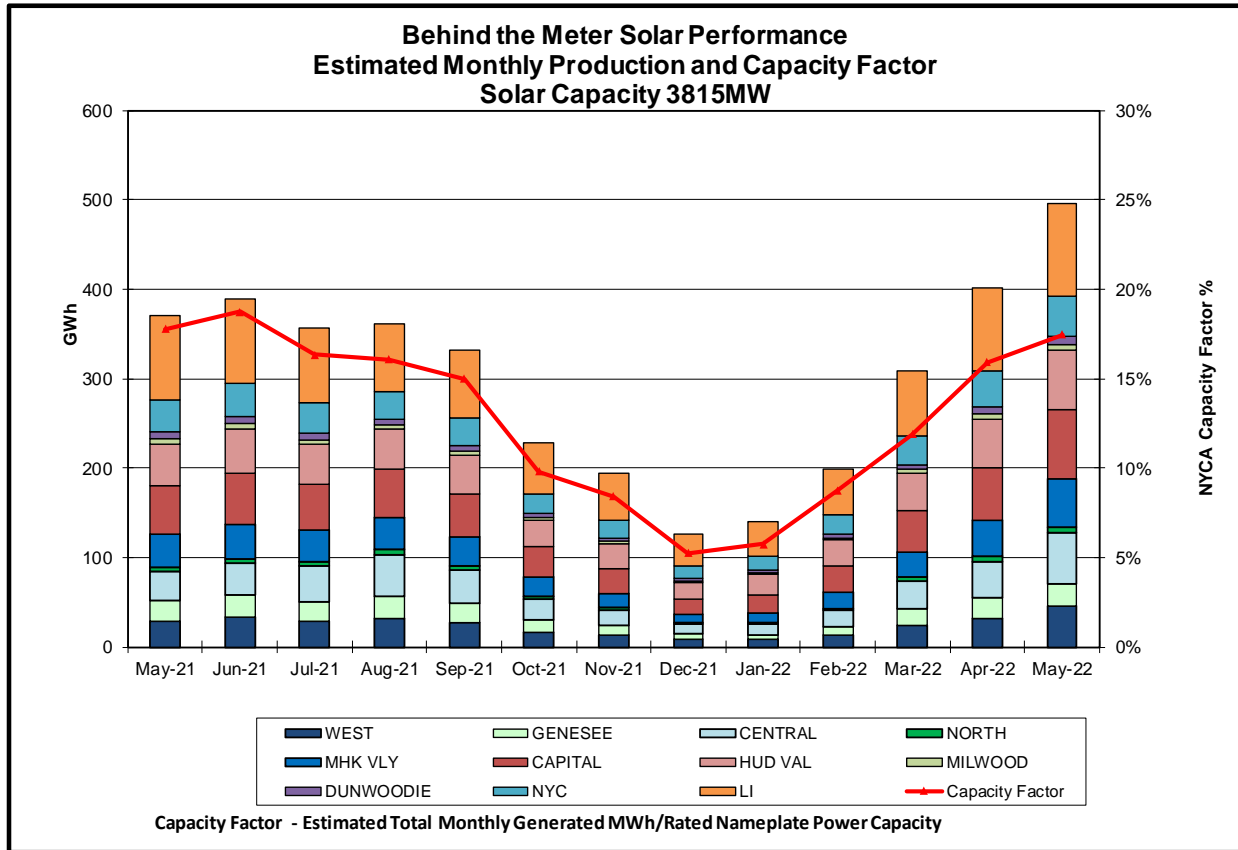
Capacity Factor - Total Monthly Generated MWh/Rated Nameplate Power Capacity

### Wind Performance Daily Production and Capacity Factor Wind Capacity 2191MW

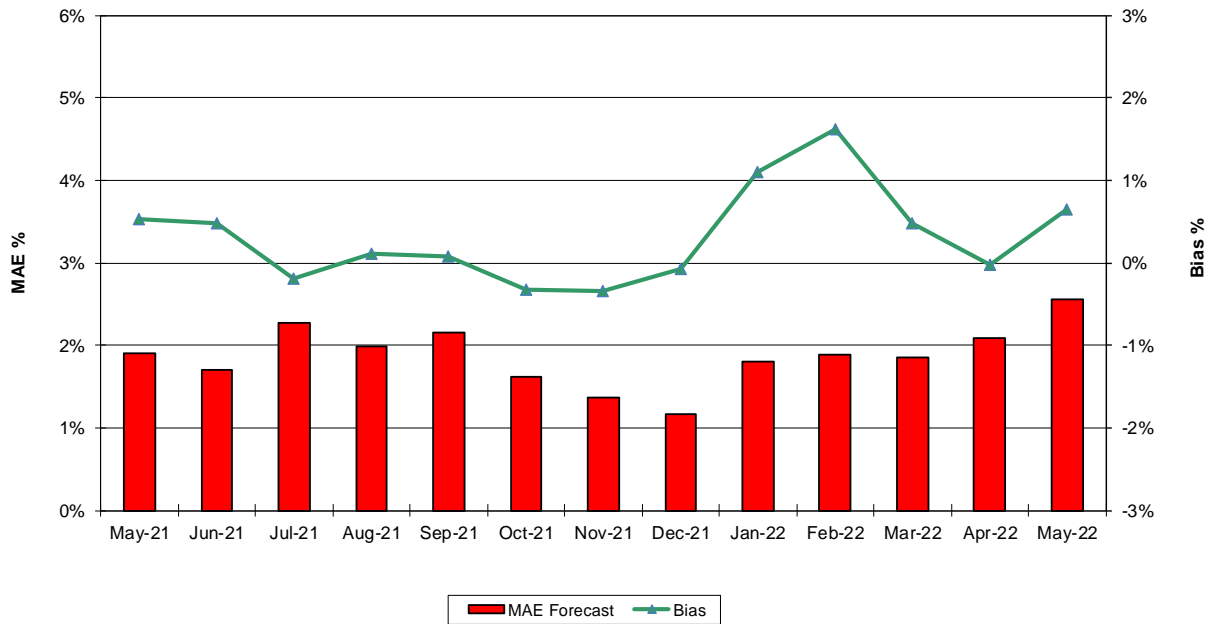


Capacity Factor - Total Daily Generated MWh/Rated Nameplate Power Capacity



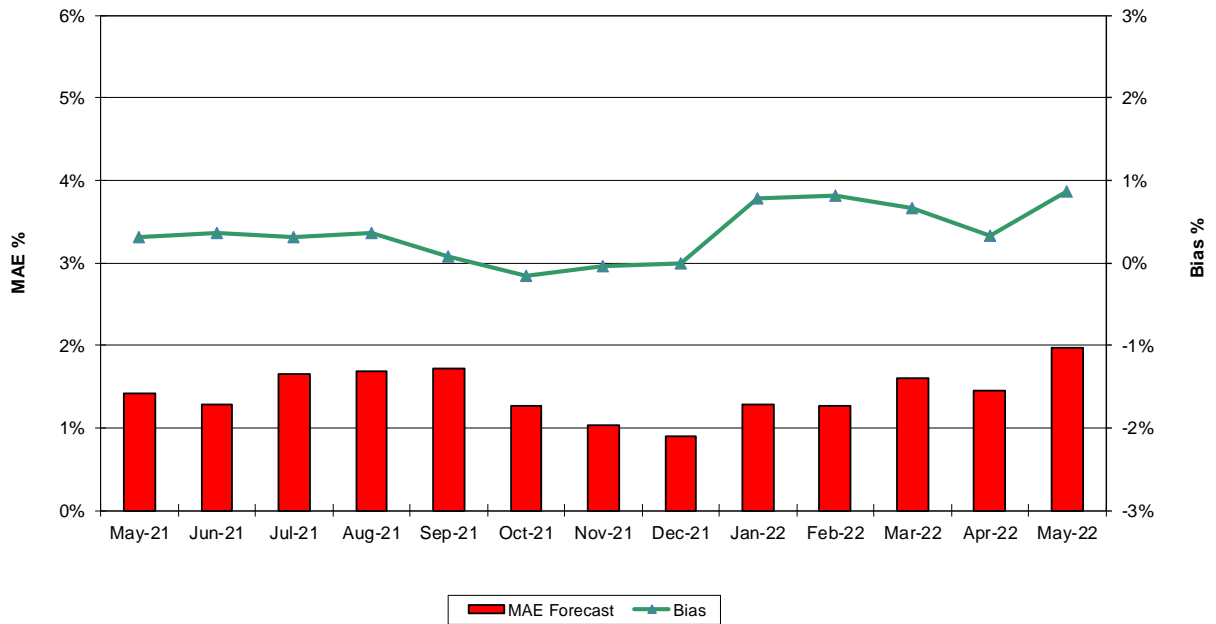


### Behind the Meter Solar Forecast Performance Day Ahead Percent Error

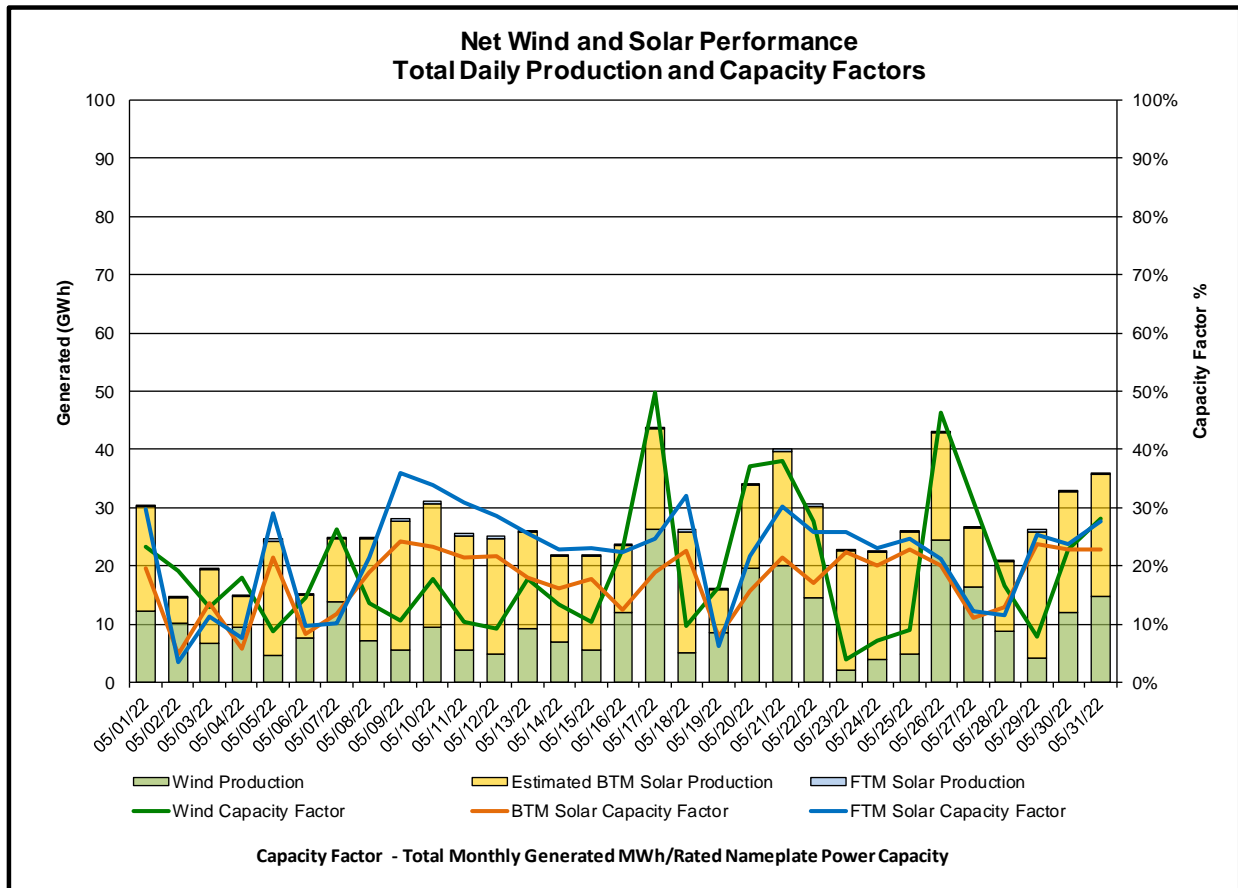
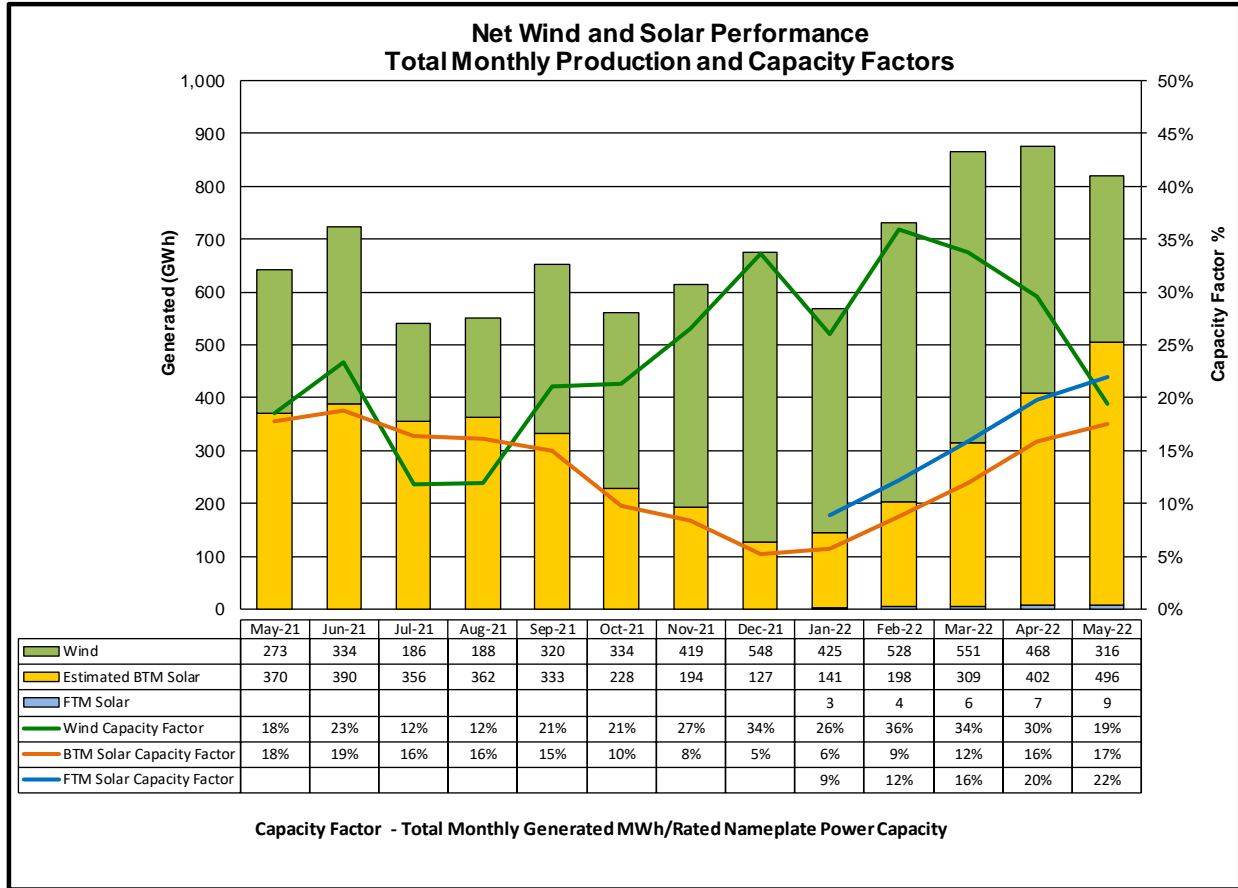


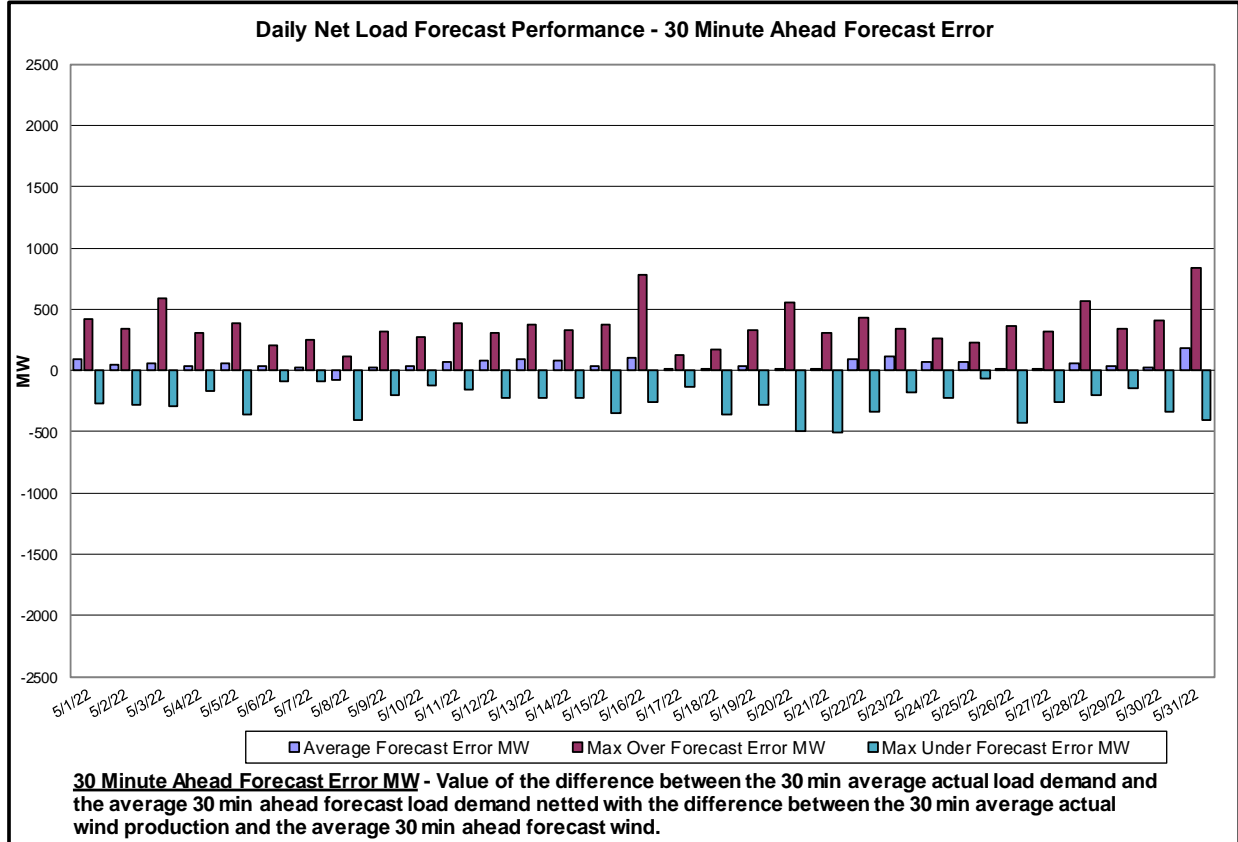
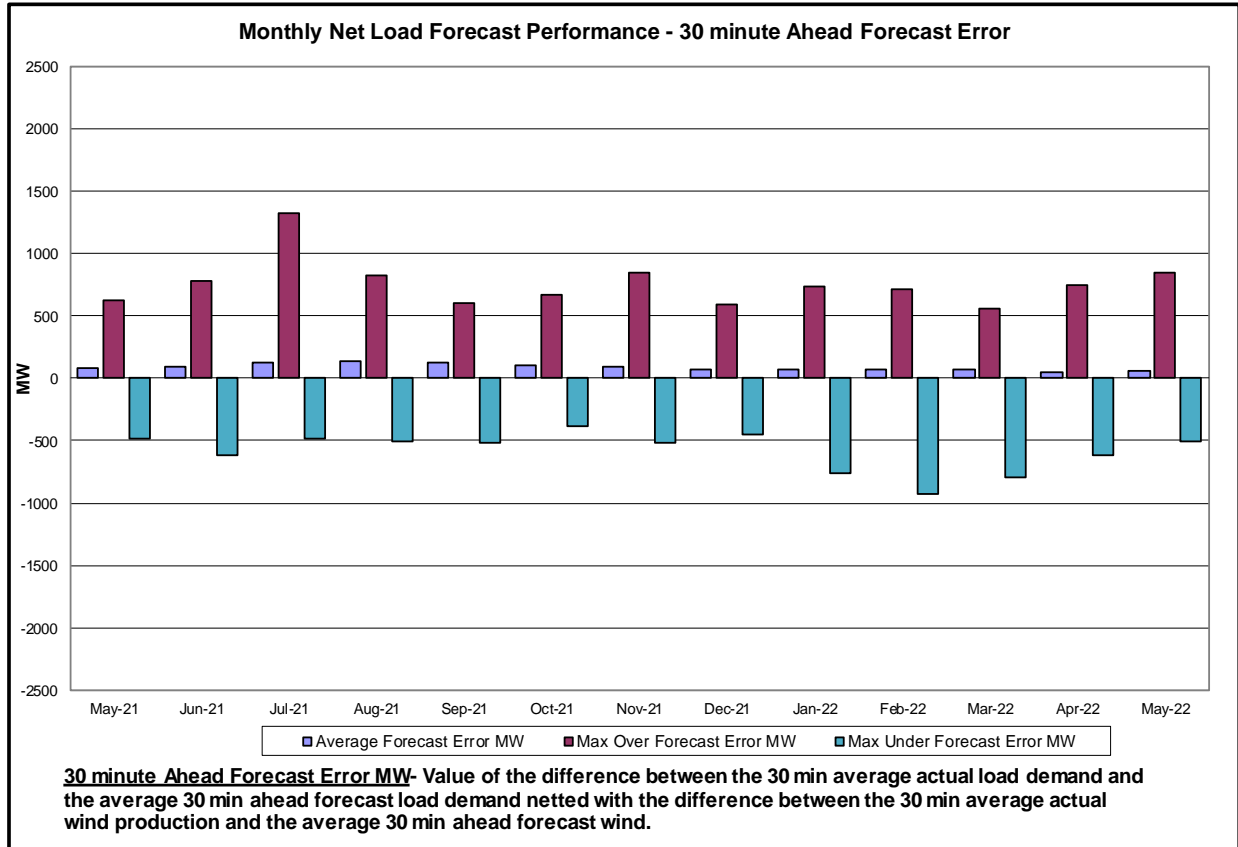
**MAE Forecast** - Avg |est. actual solar generation - Day Ahead forecast solar generation| / Solar Capacity  
**Bias** - Avg (est. actual solar generation - Day Ahead forecast solar generation) / Solar Capacity

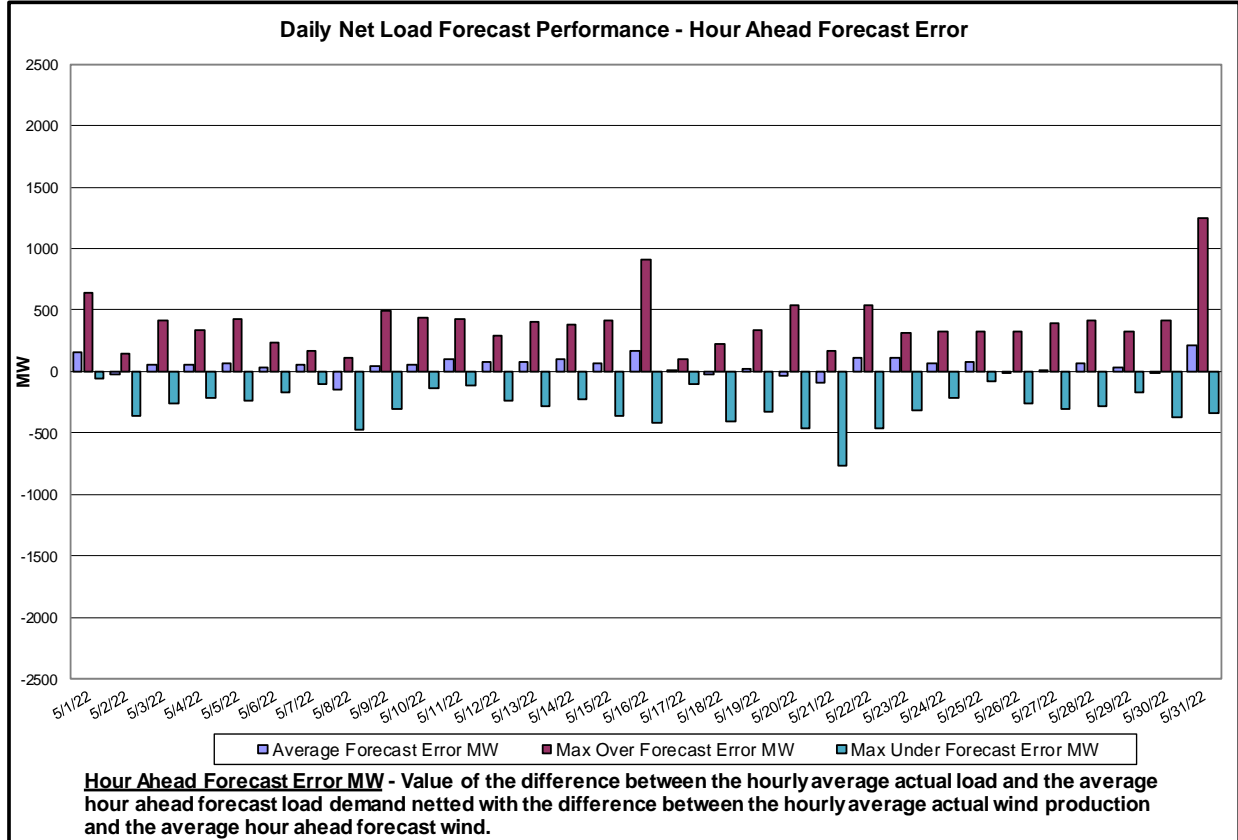
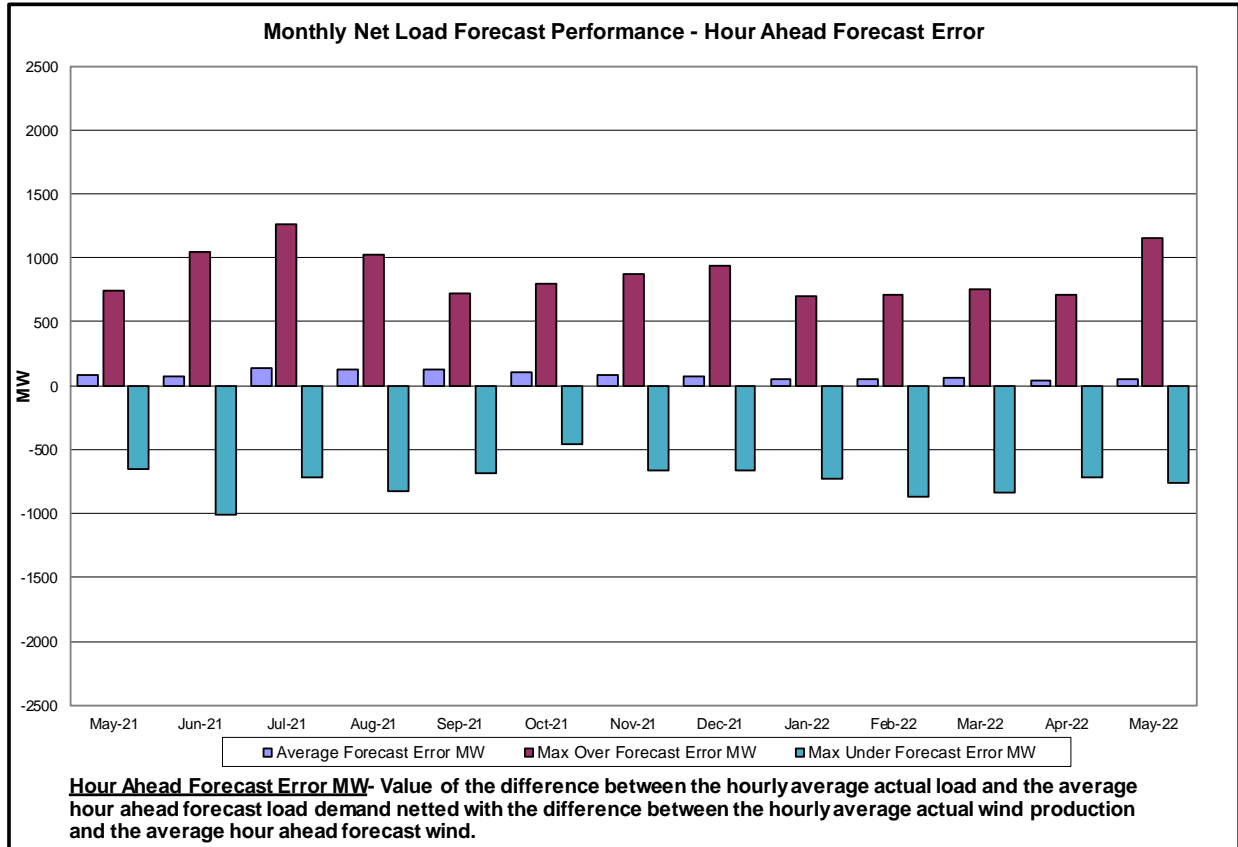
### Behind the Meter Solar Forecast Performance Hour Ahead Percent Error



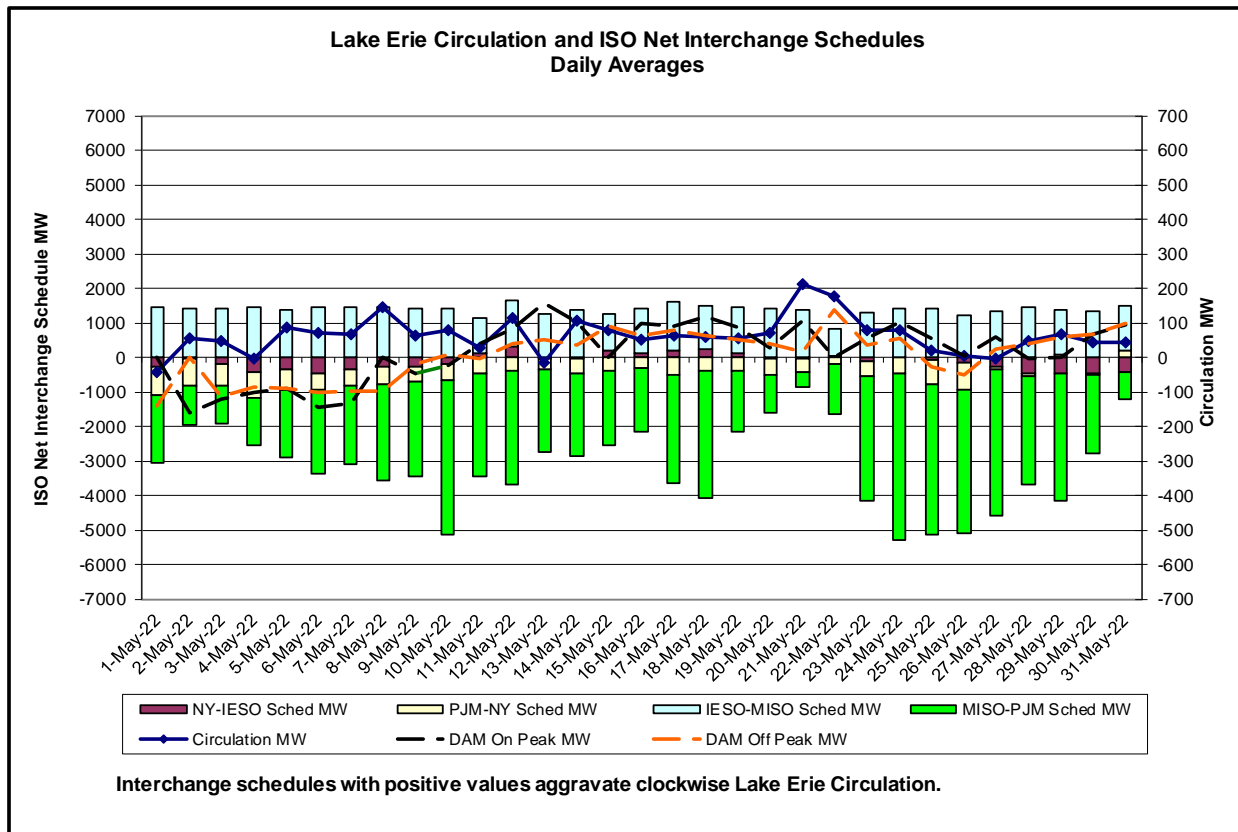
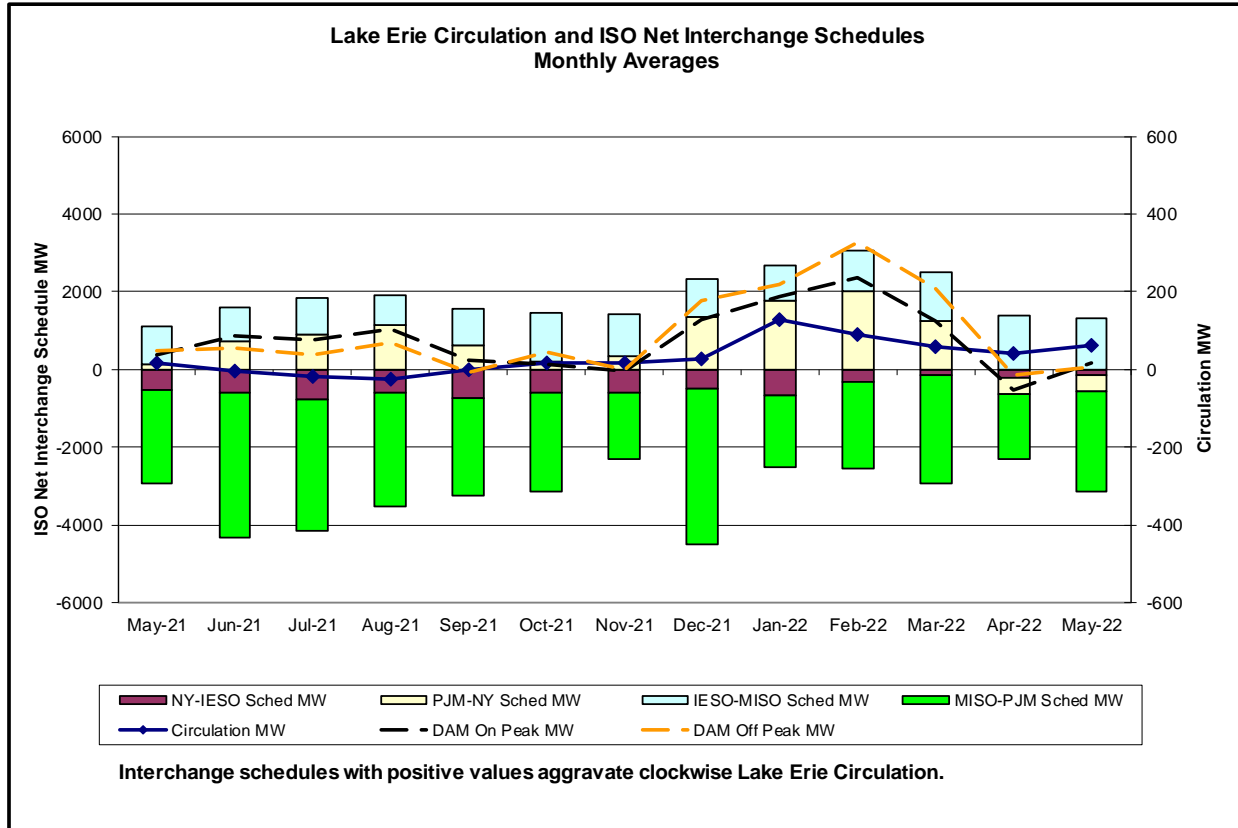
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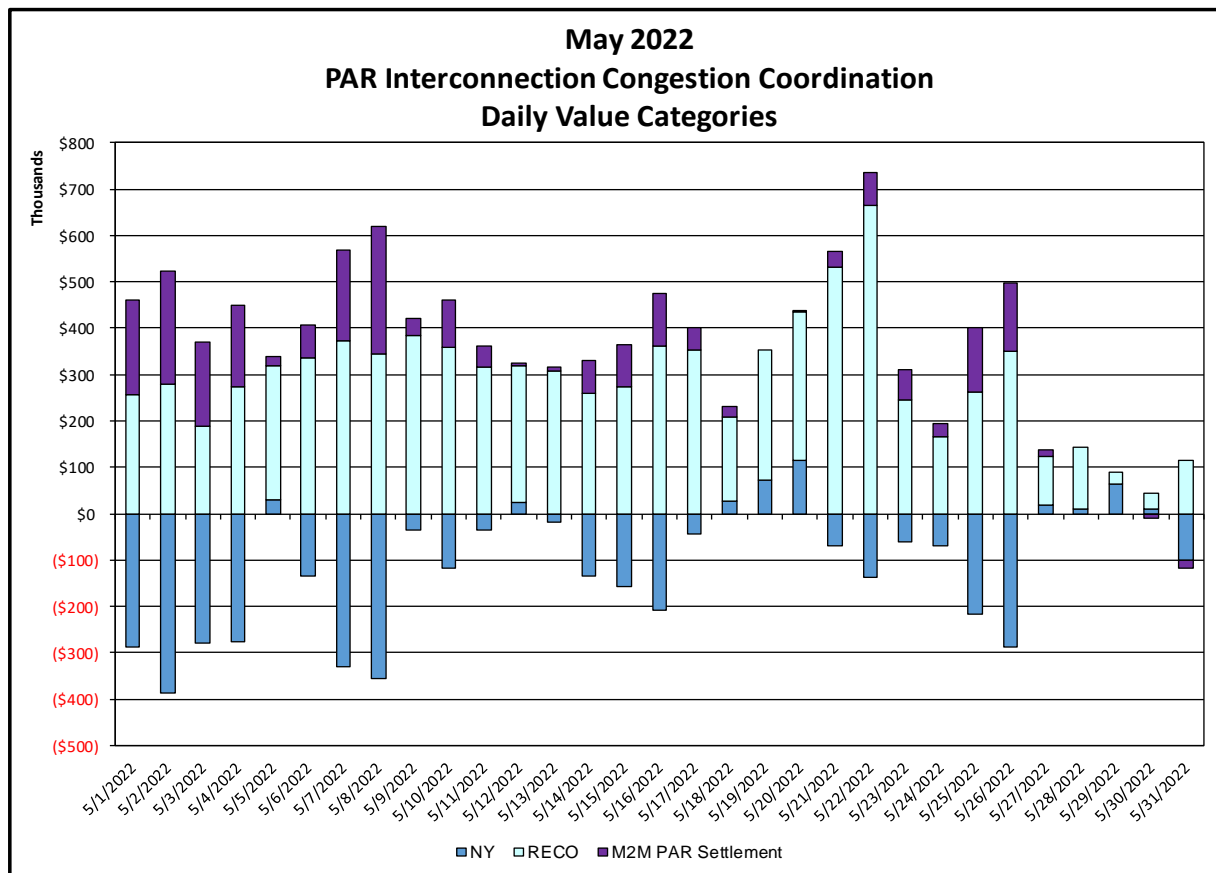
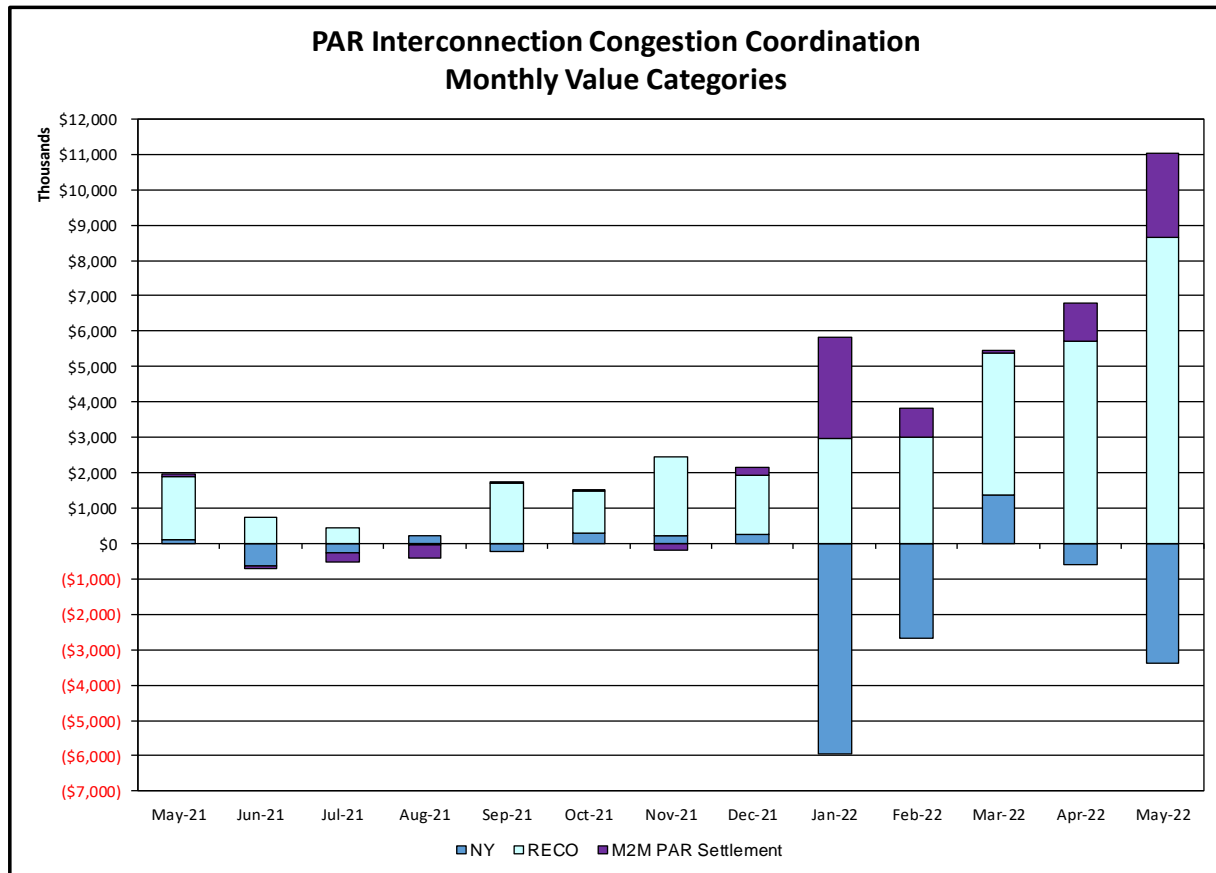








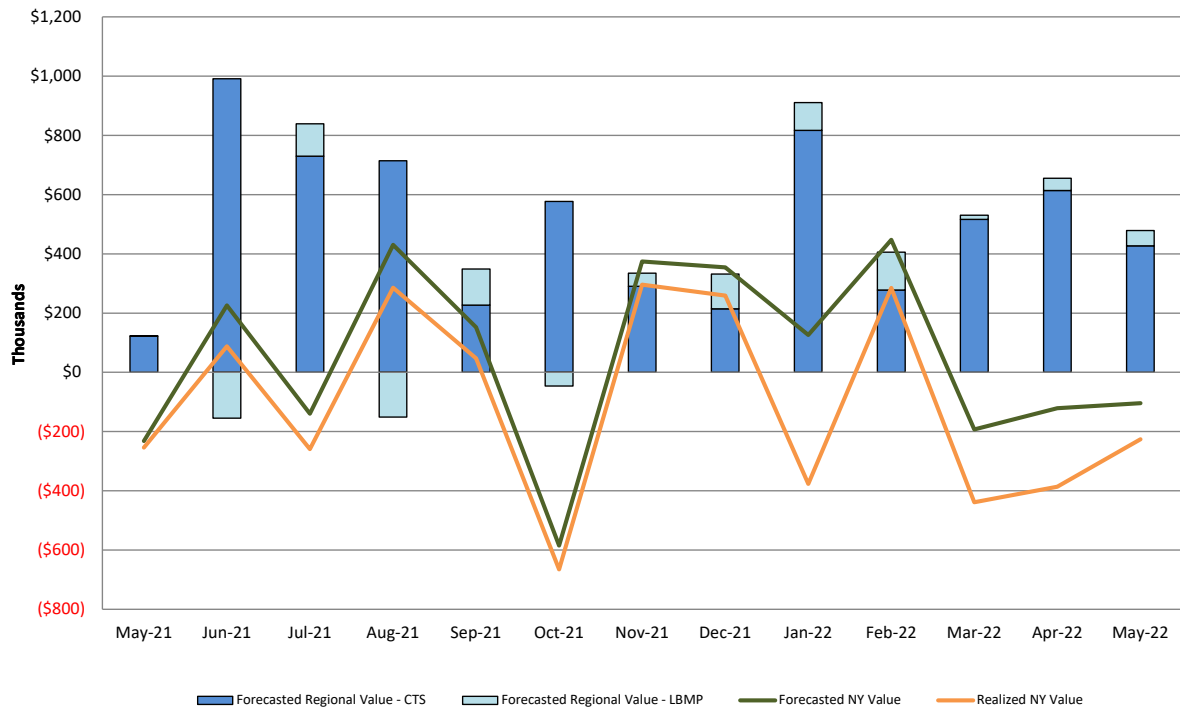
## Broader Regional Market Performance Metrics



### PAR Interconnection Congestion Coordination

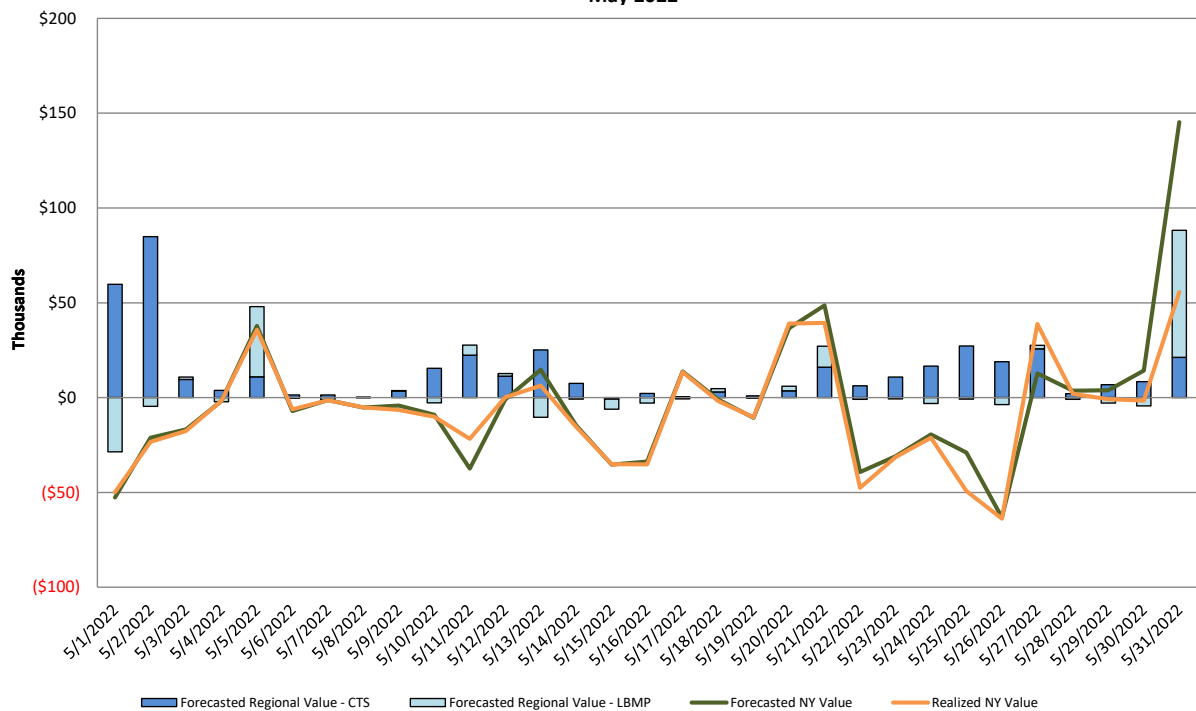
<u>Category</u>	<u>Description</u>
NY	Represents the value NY realizes from Market-to-Market PAR Coordination when experiencing congestion. This is the estimated savings to NY for additional deliveries into NY
RECO	Represents the value of PJM's obligation to deliver 80% of service to RECO load over Ramapo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

### Regional NYISO/PJM RT Scheduling for All PJM Proxies Monthly Value Categories



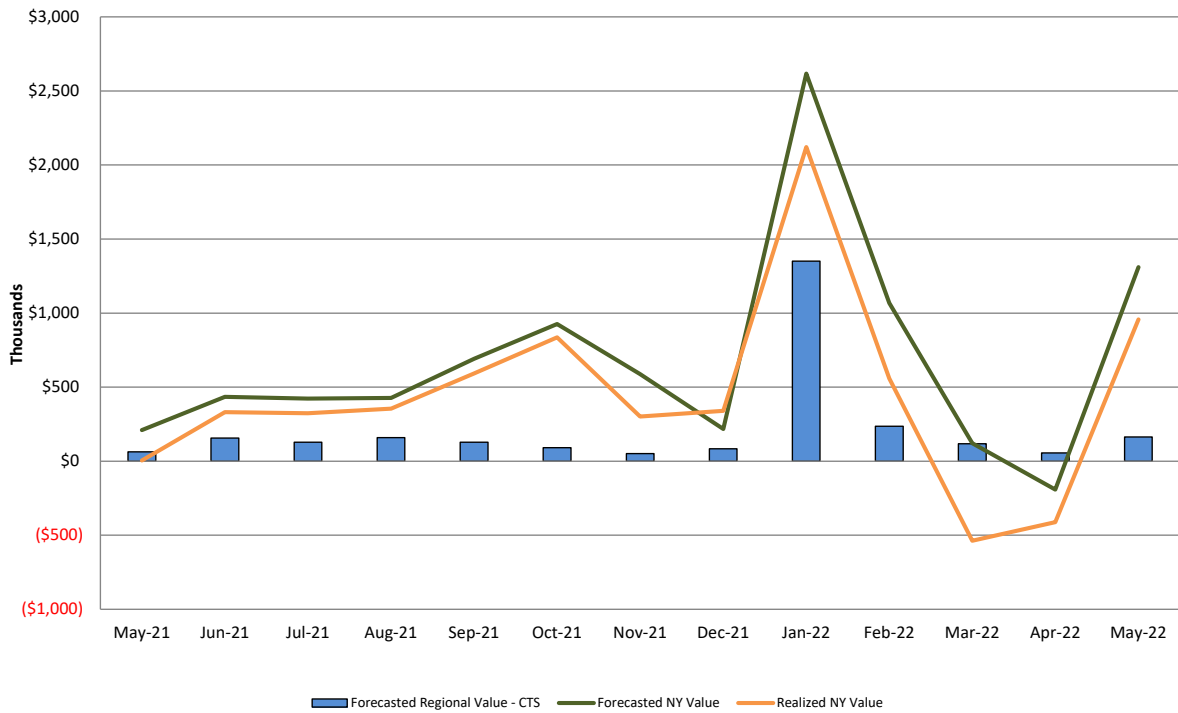
**Forecasted Regional Value - CTS:** Regional production cost savings for NY and PJM associated with intra-hour CTS transaction energy schedules using RTC/ITSCEd prices.  
**Forecasted Regional Value - LBMP:** Regional production cost savings for NY and PJM associated with intra-hour LBMP transaction energy schedules using RTC/ITSCEd prices.  
**Forecasted NY Value:** NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTC prices.  
**Realized NY Value:** NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTD prices.

### Regional NYISO/PJM RT Scheduling for All PJM Proxies Daily Value Categories May 2022



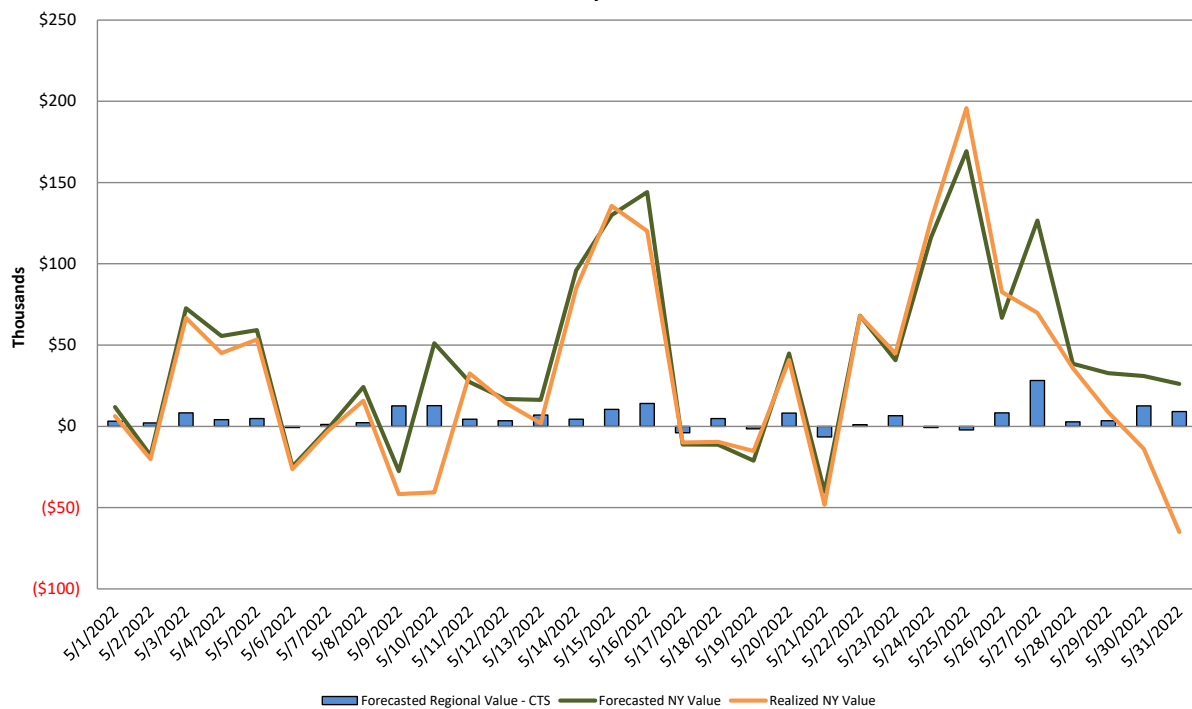
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**Forecasted Regional Value - LBMP:** Regional production cost savings for NY and PJM associated with intra-hour LBMP transaction energy schedules using RTC/ITSCEd prices.  
**Forecasted NY Value:** NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTC prices.  
**Realized NY Value:** NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTD prices.

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



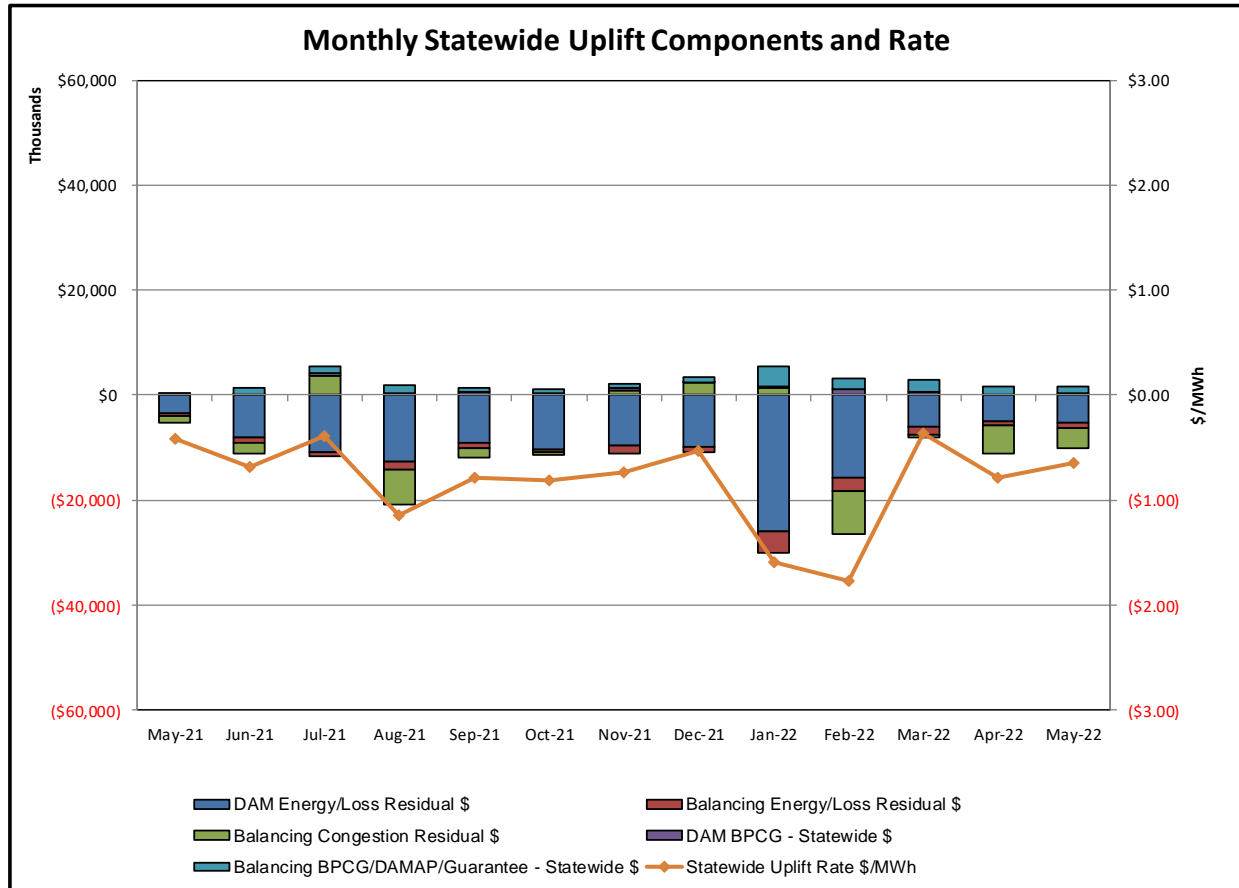
**Forecasted Regional Value - CTS:** Regional production cost savings for NY and NE associated with intra-hour CTS transaction energy schedules using RTC prices and NE forecasted prices.  
**Forecasted NY Value:** NY production cost savings associated with CTS transaction energy schedules using RTC prices.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

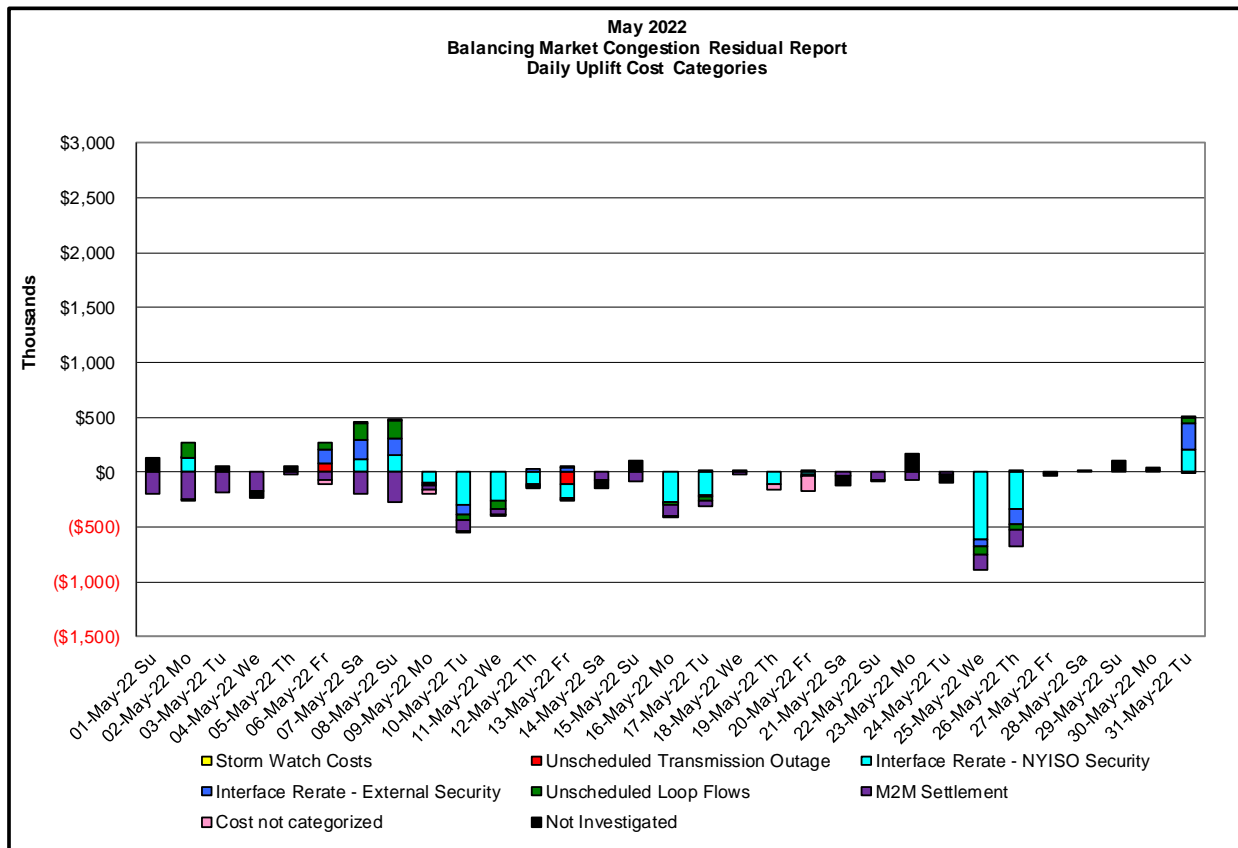
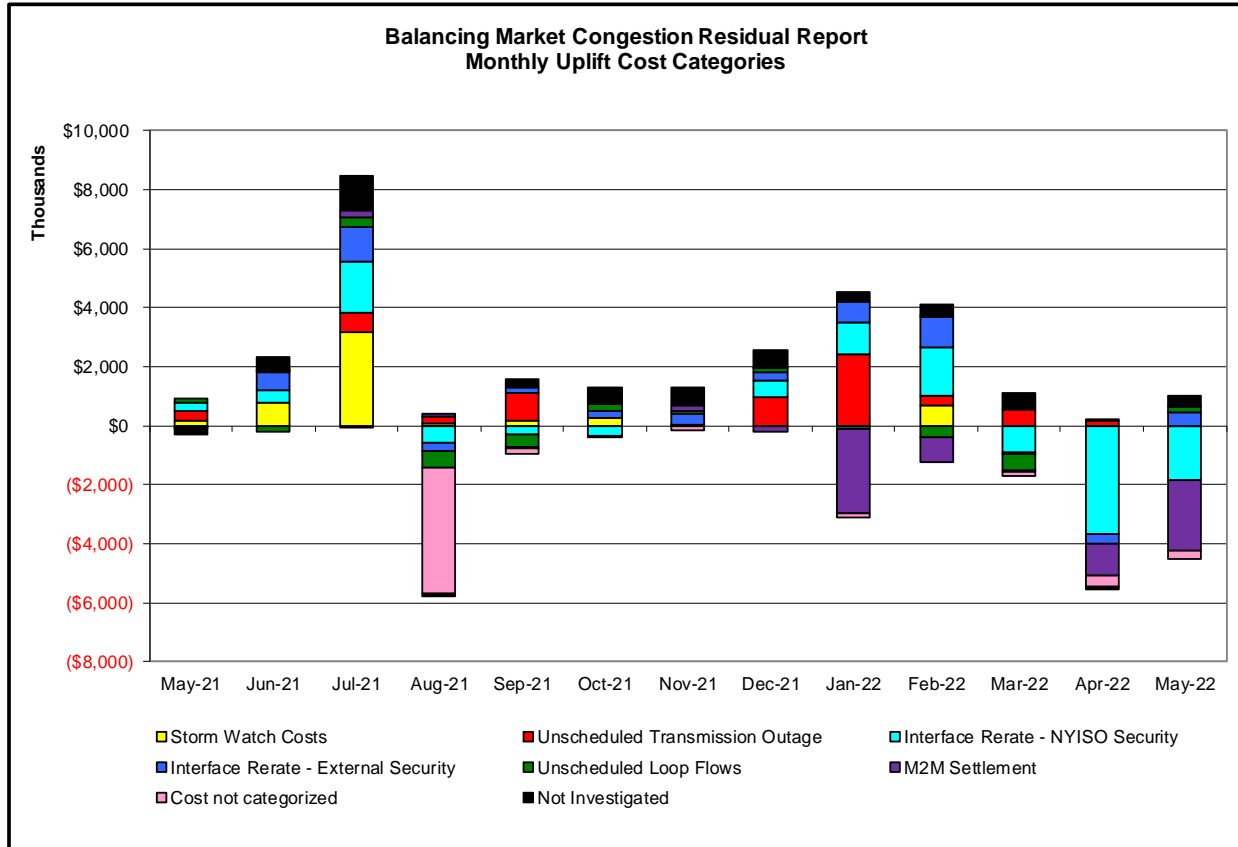
### Regional NYISO/NE RT Scheduling for ISO-NE AC Daily Value Categories May 2022



**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 May: 2,6,7,8,9,10,11,12,13,16,17,19,20,25,26,31		
Event	Description	May Dates
	Early return to service Edic-Fraser 345kV (#EF24-40)	13
	Forced outage Pierce Brook-Five Mile Rd 345kV (#37)	6
	Derate Central East	2,6-9,17
	Derate Chester-Shoemaker 138kV (#27) I/o TWR:RAMAPO (76&77&BK1112)	31
	Derate East 13th St.-Farragut 345kV (#45) I/o SCB:SPBK(RS3):W75&99941	31
	Derate Elwood-Northport 138kV (#678)	31
	Derate Goethals-Gowanus 345kV (#26) I/o Goethals-Freshkills 345kV (#21)	20
	Derate Gowanus-Greenwood 138kV (#42231) I/o TWR:GOETHALS (#22&21)	31
	Derate Greenbush-Regeneron 115kV (#9)	31
	Derate Greenbush-Regeneron 115kV (#9) I/o SEABROOK	31
	Derate Lake Success-ShoreRd 138kV (#367) I/o ShoreRd-Lake Success (#368)	31
	Derate Lake Success-ShoreRd 138kV (#368) I/o ShoreRd-Lake Success (#367)	31
	Derate Northport-Pilgrim 138kV (#672)	31
	Derate Porter-Rotterdam 230kV (#30) I/o SEABROOK	31
	Derate West 49th St.-Springbrook 345kV (#M52) I/o SCB:SPBK(RS3):W75&99941	31
	NYCA DNI Ramp Limit	3,16,17,26,31
	Uprate Central East	2,3,6,9-13,16,17,19,20,25,26
	Uprate Cricket Valley-Pleasant Valley 345kV (#F83) I/o Cricket Valley-Pleasant Valley 345kV (#F84)	9-13,16,17
	Uprate Dunwoodie-Shore Rd 345kV (#Y50)	2,3,10,13,16,17,25
	Uprate East 179th St-Hellgate 138kV (#15053/15054)	16
	Uprate Freshkills-Willowbrook 138kV (#29211)	11,16,25,31
	Uprate Gowanus-Greenwood 138kV (#42232) I/o SCB:Gowanus(2):(41&42231&R4)	25
	Uprate Hudson Ave-Plymouth St 138kV (#32078)	16
	Uprate NiagaraBlvd-Packard 115kV (#181-922)	31
	Uprate NiagaraBlvd-Packard 115kV (#181-922) I/o GARDNVLA-GIRDLERD 115kV (#705)	31
	Uprate NiagaraBlvd-Packard 115kV (#181-922) I/o TWR:PACKARD (#77&78)	31
	Uprate Pleasant Valley-Leeds 345kV (#92) I/o Leeds-Hurlave 345kV (#301)	17,19,20
	HQ_CEDARS-NY Scheduling Limit	31
	HQ_CHAT-NY Scheduling Limit	12,19,31
	IESO_AC-NY Scheduling Limit	12,13,31
	NE_AC Active DNI Ramp Limit	3,10,13,16,17,20,25,26,31
	NE_AC-NY Scheduling Limit	9,10,31
	NE_NNC1385 - NY Scheduling Limit	17,26,31
	PJM_AC-NY Scheduling Limit	2,6-8,10,13,20,26
	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East	2,3,6-13,16,17,20,25,26,31
	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; West	2,10-13,26,31

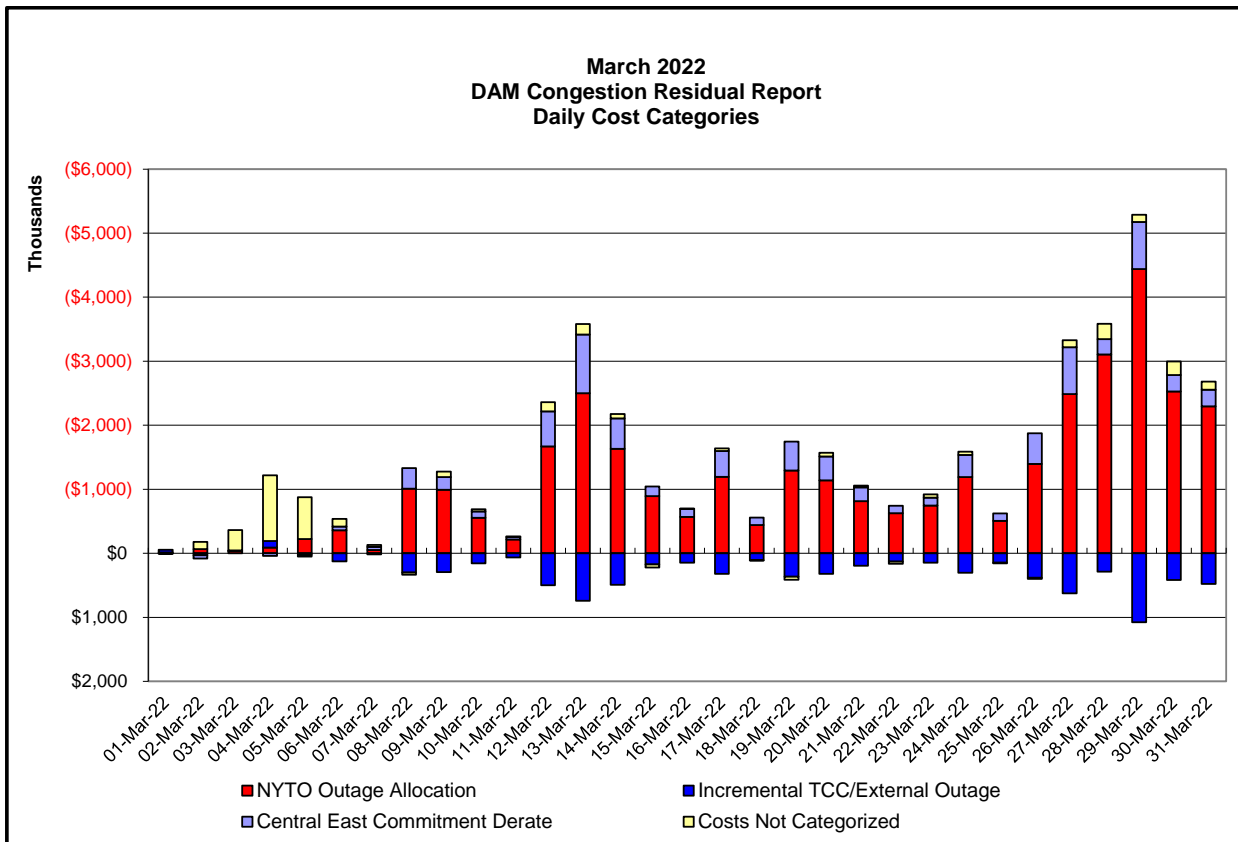
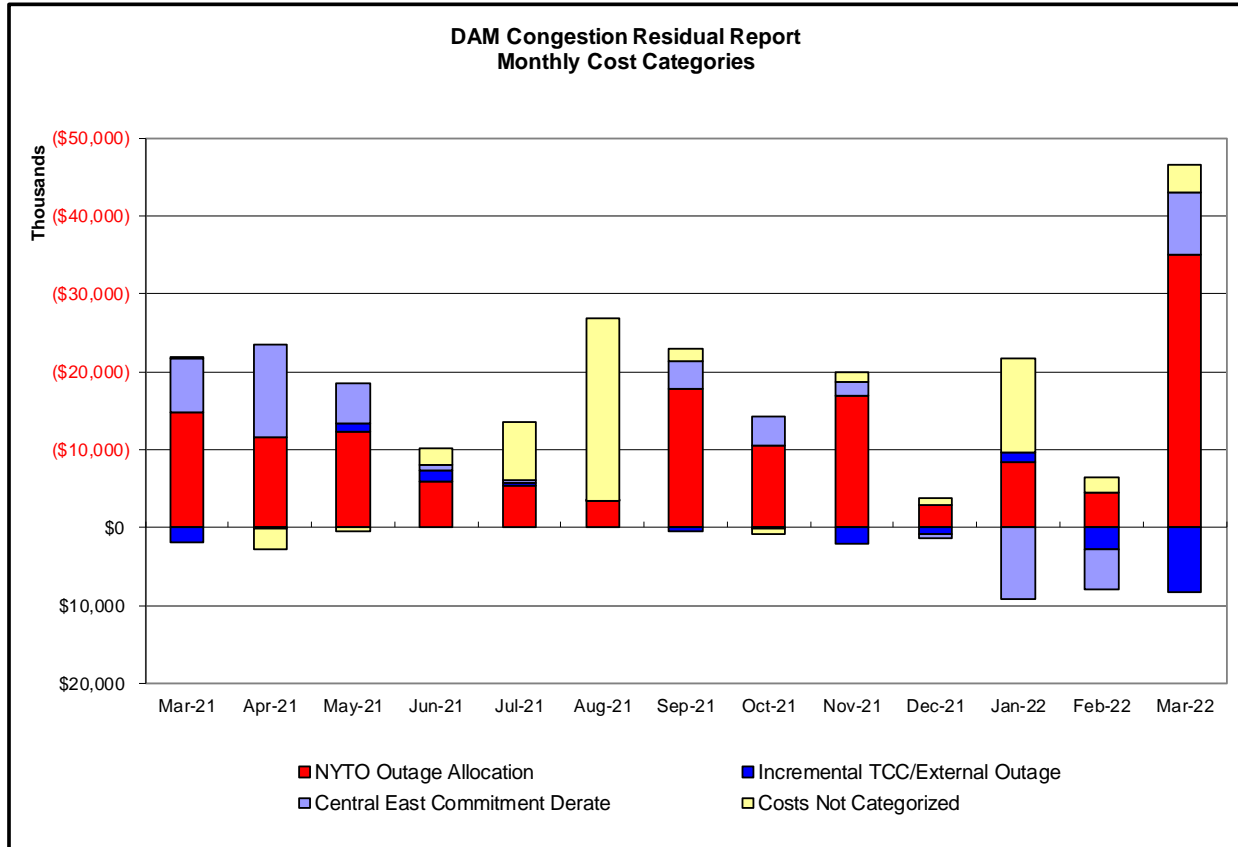


### Real-Time Balancing Market Congestion Residual (Uplift Cost) Categories

<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.	

