

Operations Performance Metrics Monthly Report



April 2019 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 08, 2019.

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*
 - *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*

April 2019 Operations Performance Highlights

- Peak load of 18,777 MW occurred on 04/01/2019 HB 20
- All-time winter capability period peak load of 25,738 MW occurred on 1/7/2014 HB 18
- 3.5 hours of Thunder Storm Alerts were declared
- 1 hour of NERC TLR level 3 curtailment
- NYISO achieved a wind energy record of 1,651MW on 04/26/2019 HB20 providing 10% of the state's electrical demand in that hour.
- On 04/15/2019 the series reactor on the Erie East-South Ripley 230kV (#69) line was placed in service.
- The following table identifies the estimated production cost savings associated with the Broader Regional Market initiatives.

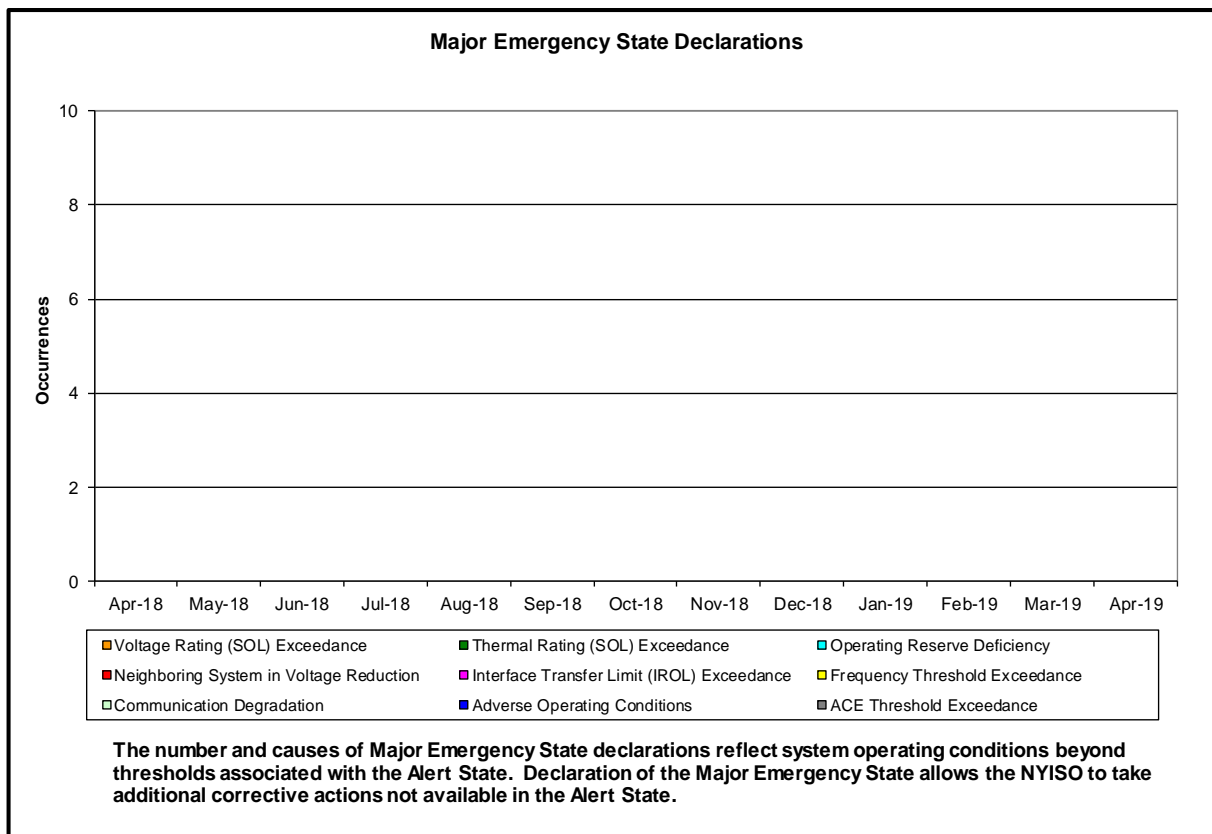
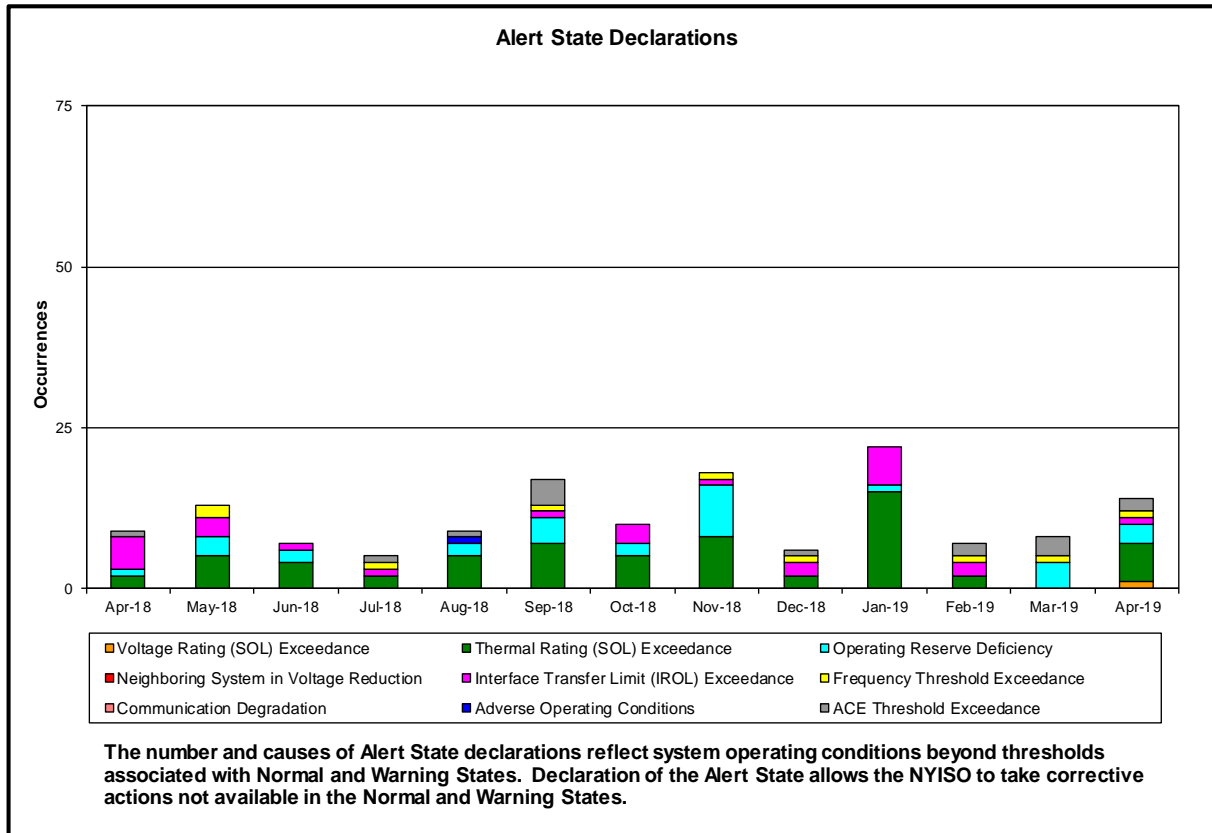
	Current Month Value (\$M)	Year-to-Date Value (\$M)
NY Savings from PJM-NY Congestion Coordination	\$0.12	\$5.18
NY Savings from PJM-NY Coordinated Transaction Scheduling	(\$0.11)	\$0.19
NY Savings from NE-NY Coordinated Transaction Scheduling	\$0.03	(\$0.01)
Total NY Savings	\$0.04	\$5.36
Regional Savings from PJM-NY Coordinated Transaction Scheduling	\$0.58	\$1.94
Regional Savings from NE-NY Coordinated Transaction Scheduling	\$0.04	\$0.23
Total Regional Savings	\$0.62	\$2.17

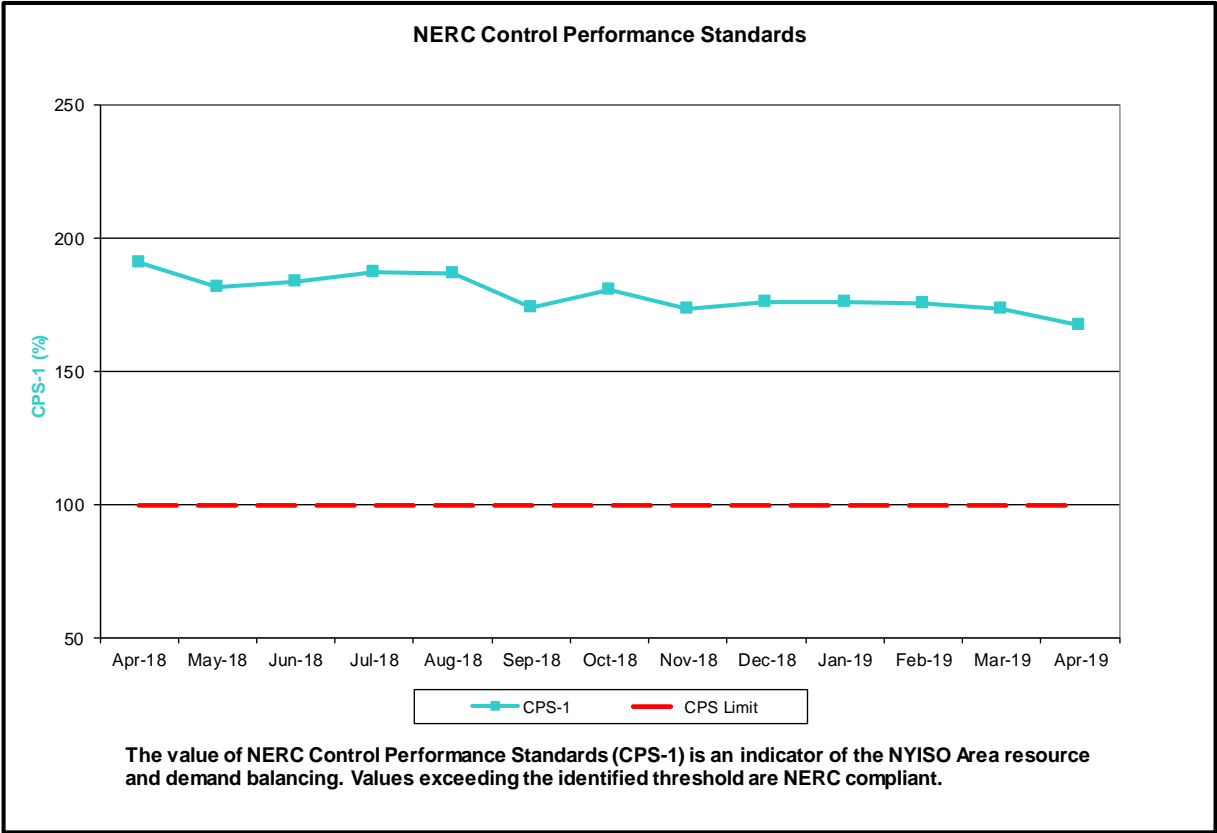
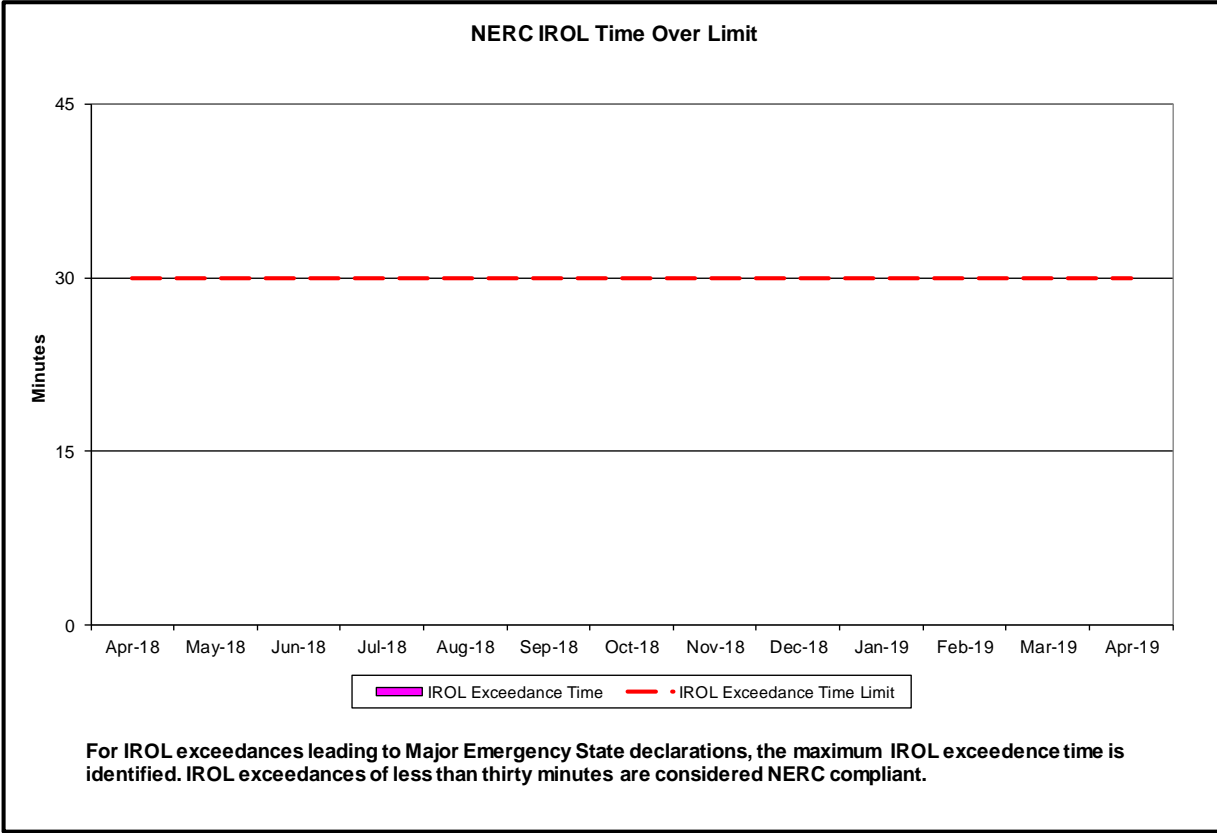
- Statewide uplift cost monthly average was (\$0.35)/MWh
- The following table identifies the Monthly ICAP spot market prices by locality and changes from the end of the prior Summer Capability period.

Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
May 2019 Spot Price	\$1.14	\$5.43	\$13.92	\$5.98
October 2018 Spot Price	\$2.52	\$8.84	\$8.84	\$6.57
Delta	(\$1.38)	(\$3.41)	\$5.08	(\$0.59)

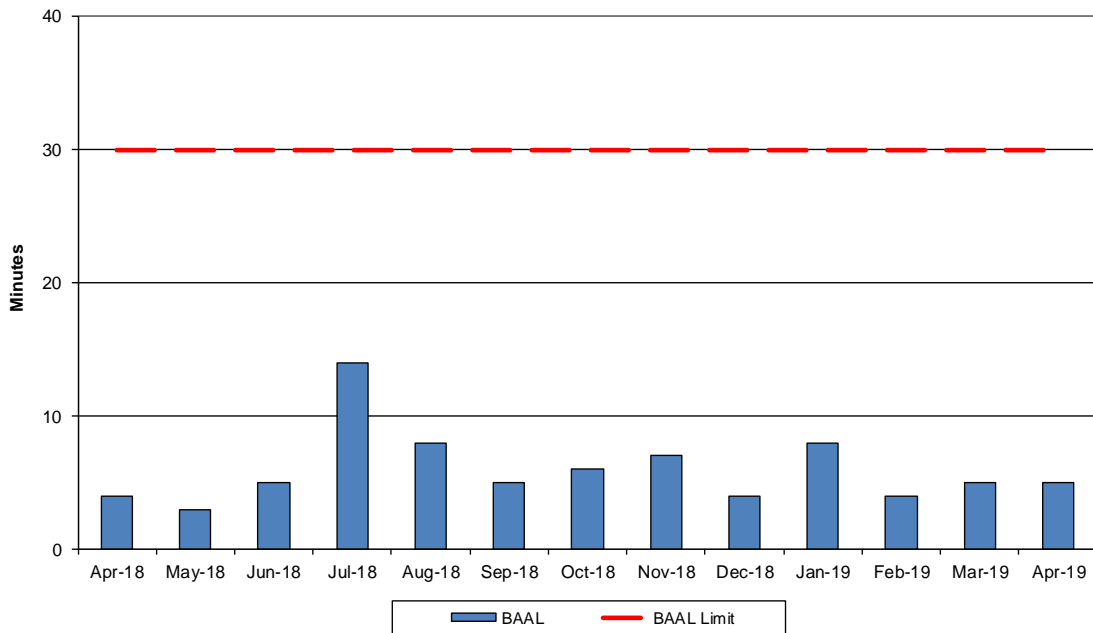
- Price changes from October 2018 to May 2019 are driven by changes in supply as well as Capability Year inputs such as demand curve parameters, Locational Capacity Requirements, the Installed Reserve Margin and the load forecast.

Reliability Performance Metrics



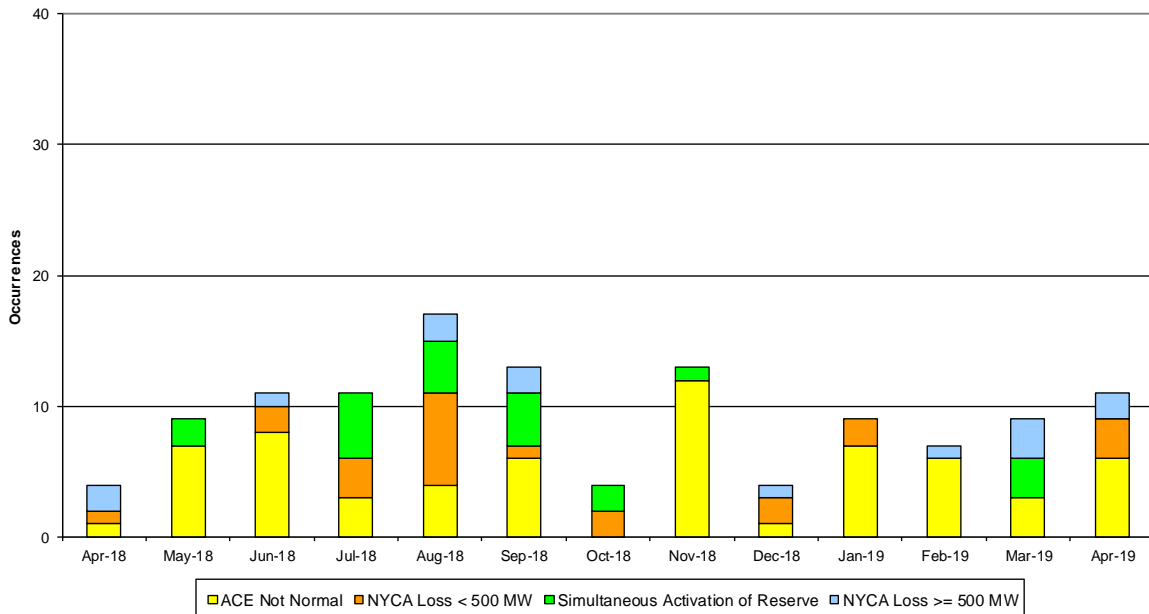


NERC Balancing Authority ACE Limit Standard

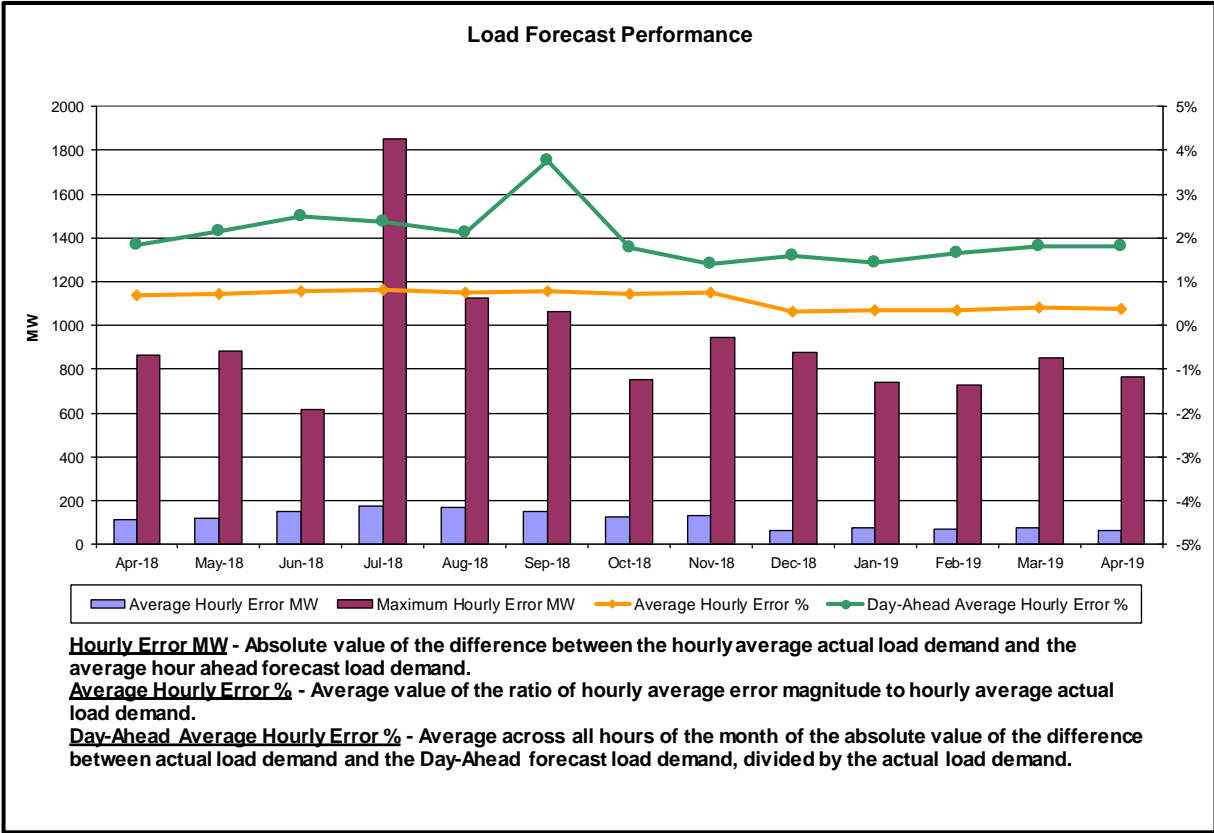
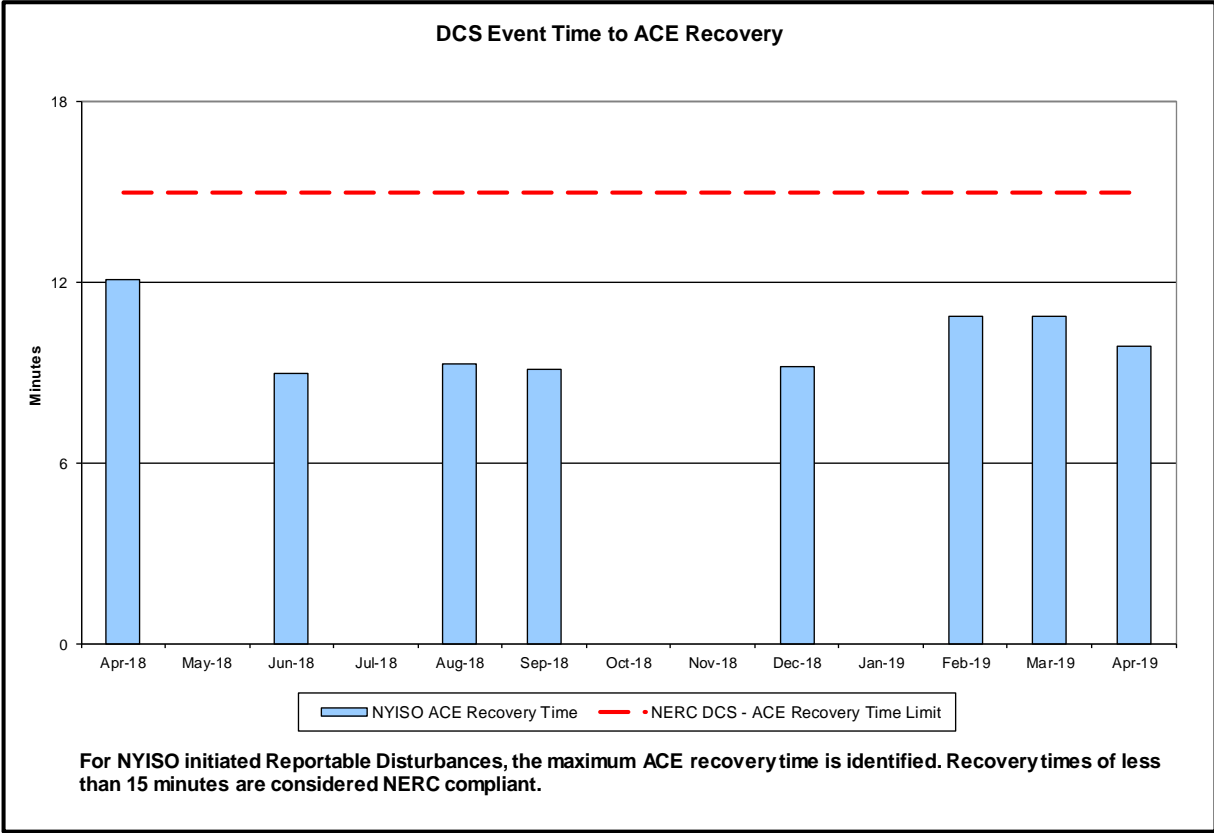


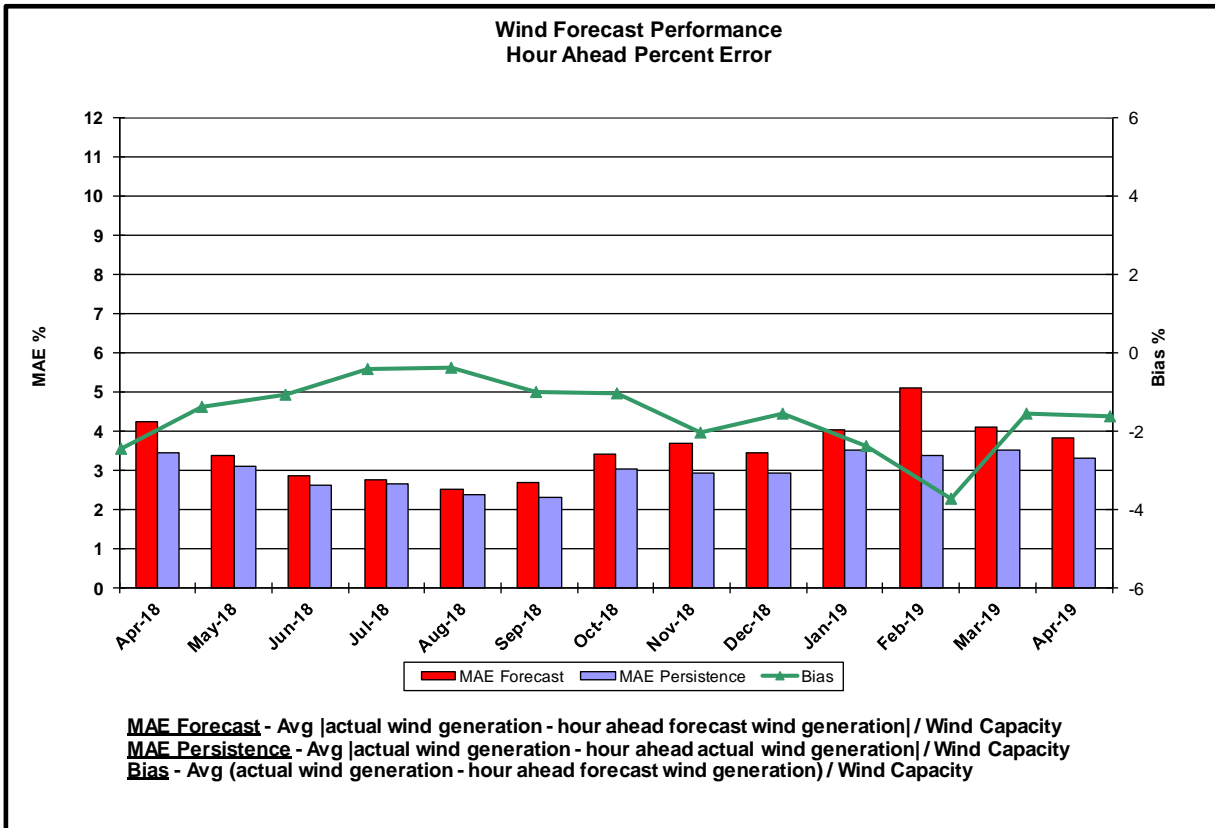
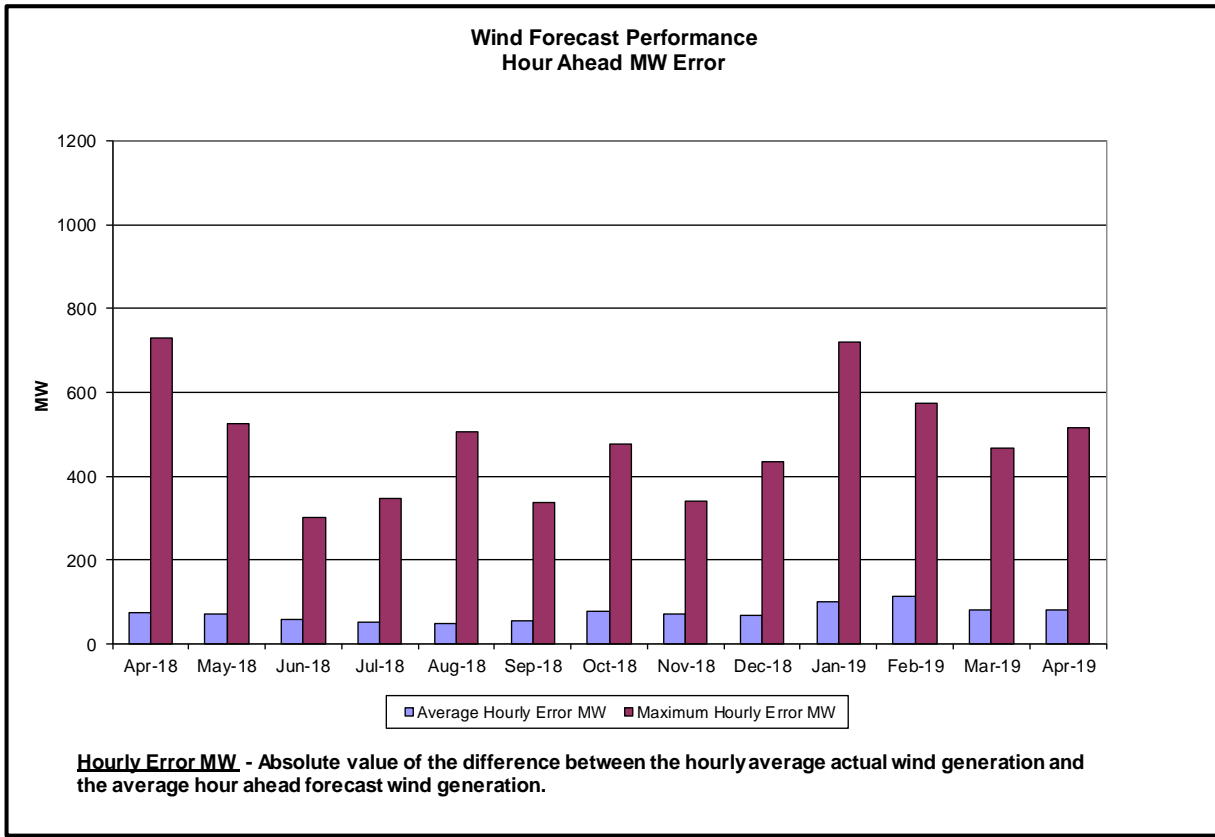
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

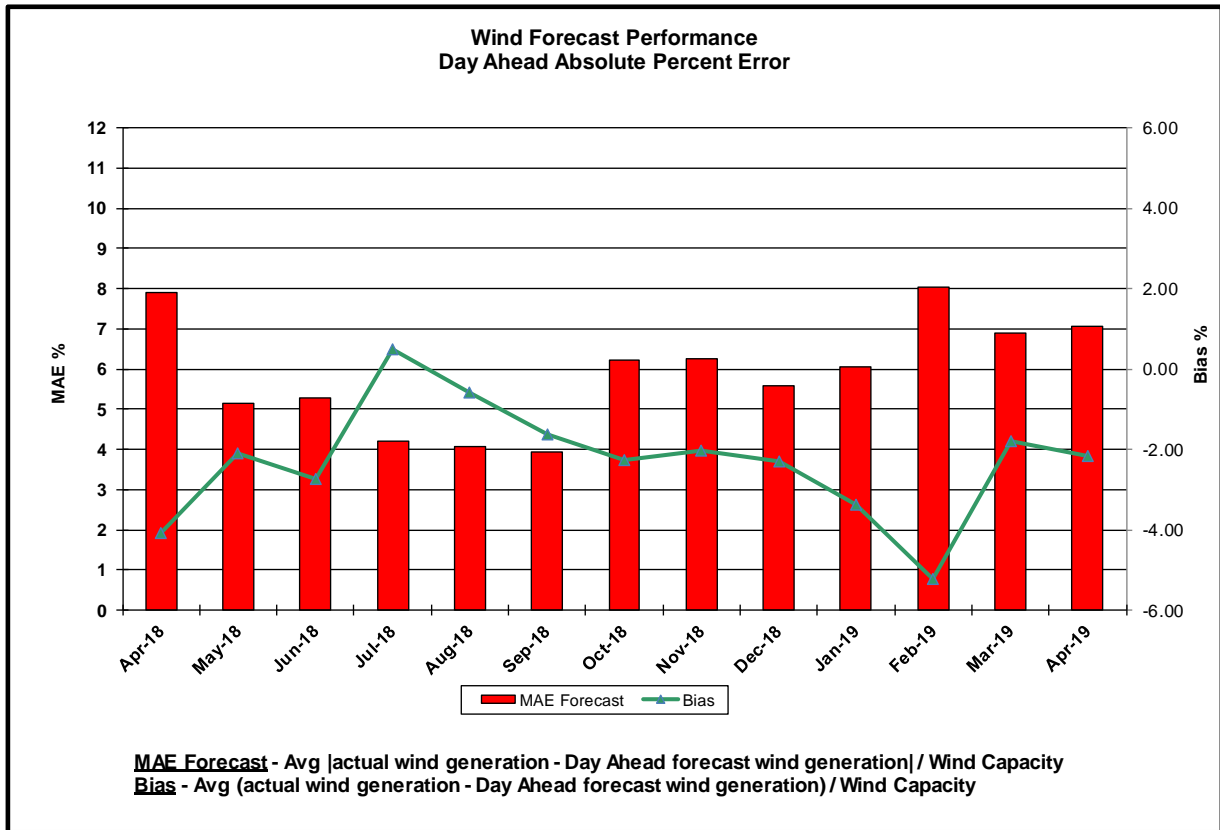
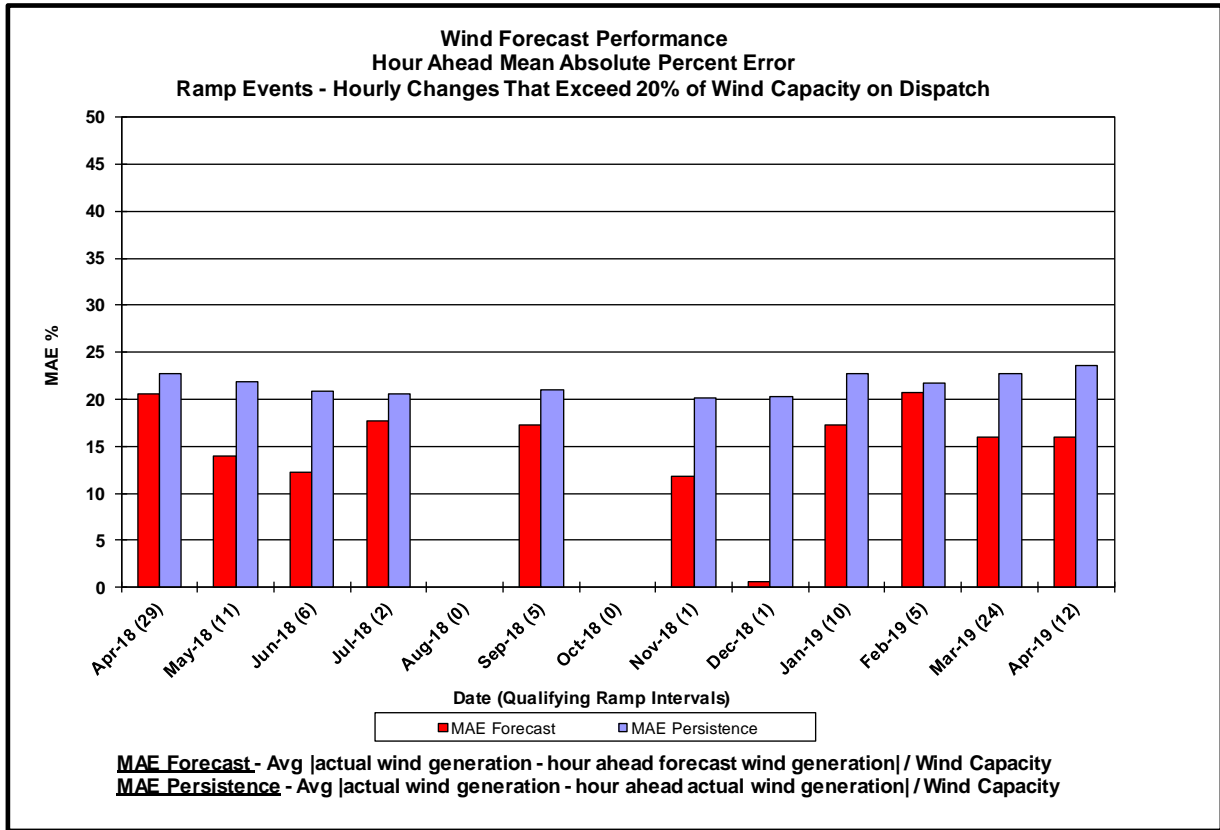
Reserve Activations

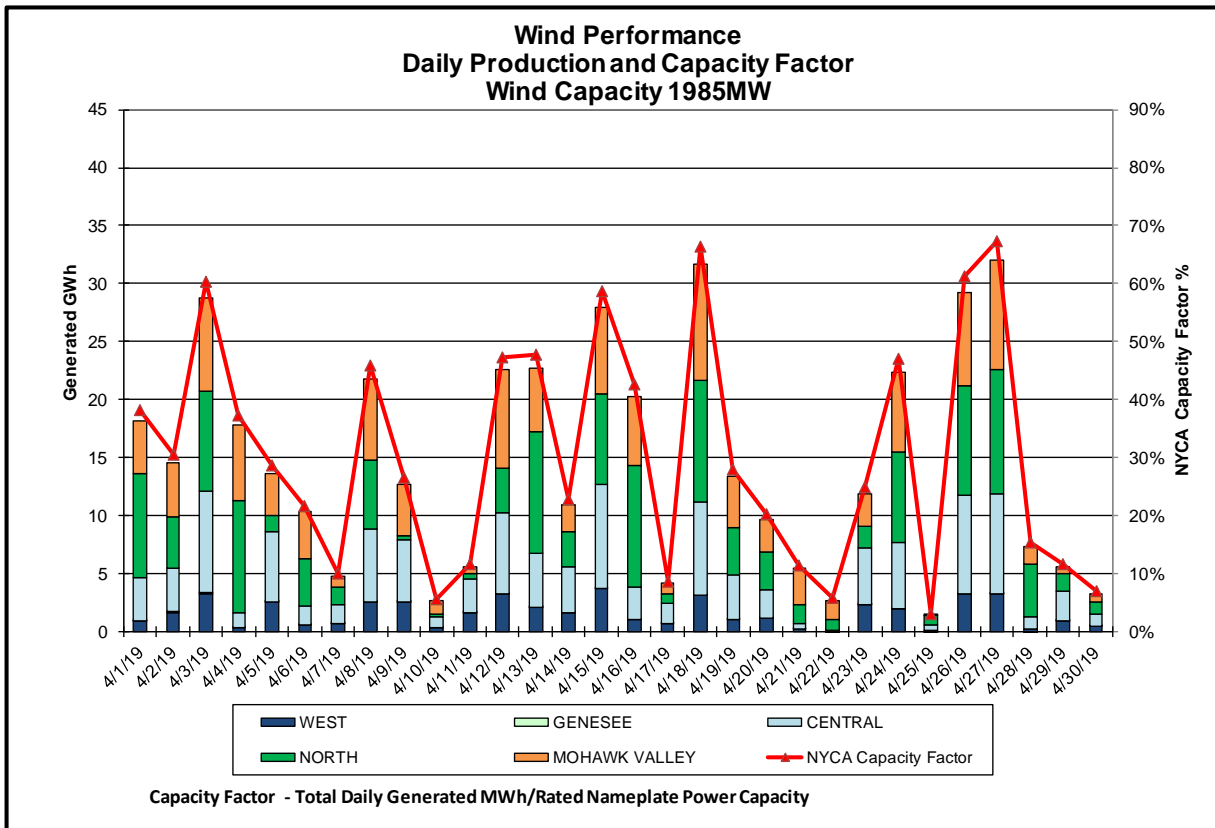
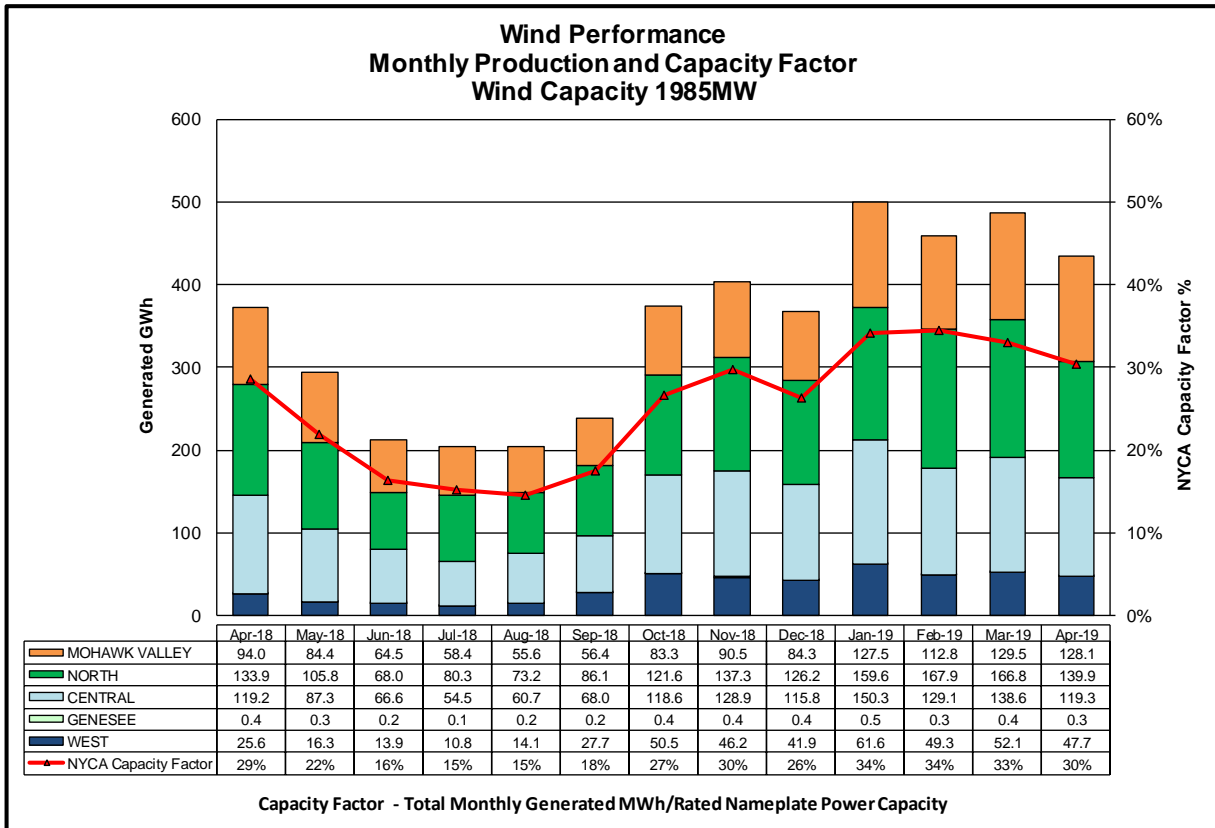


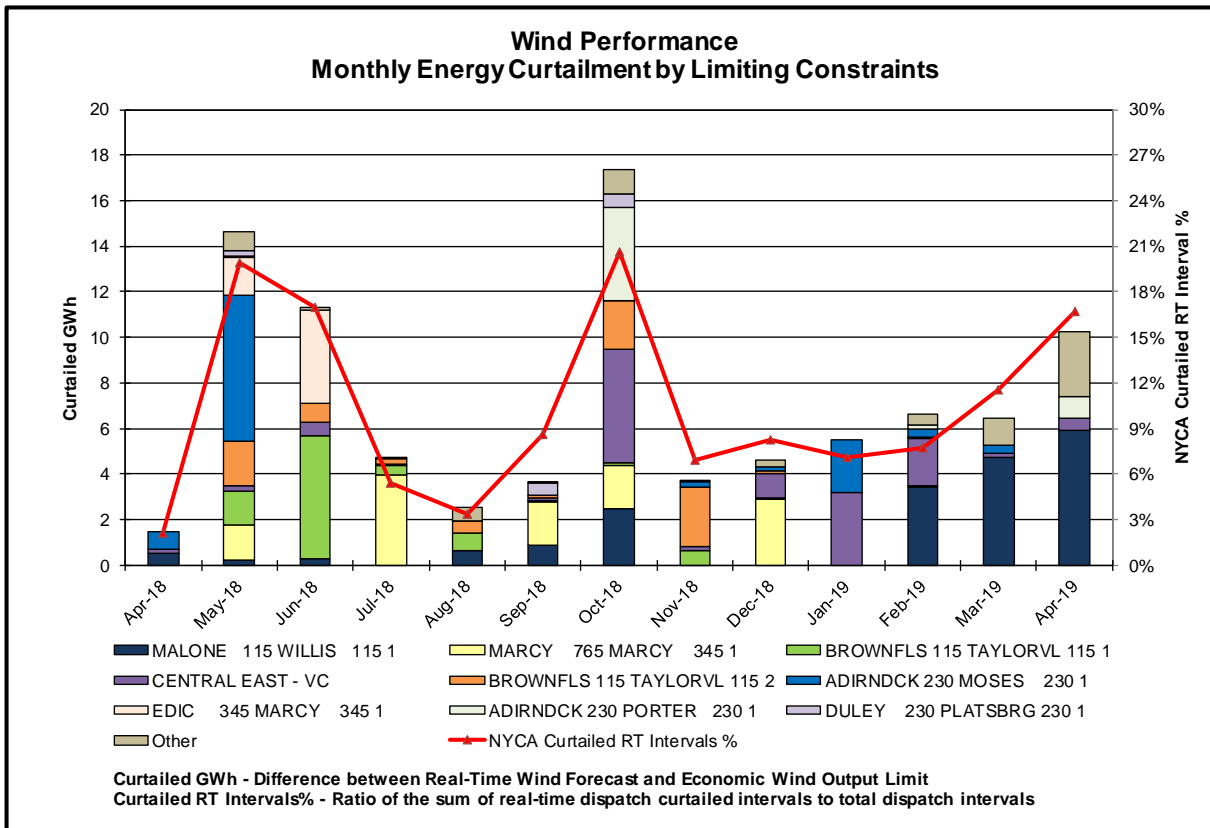
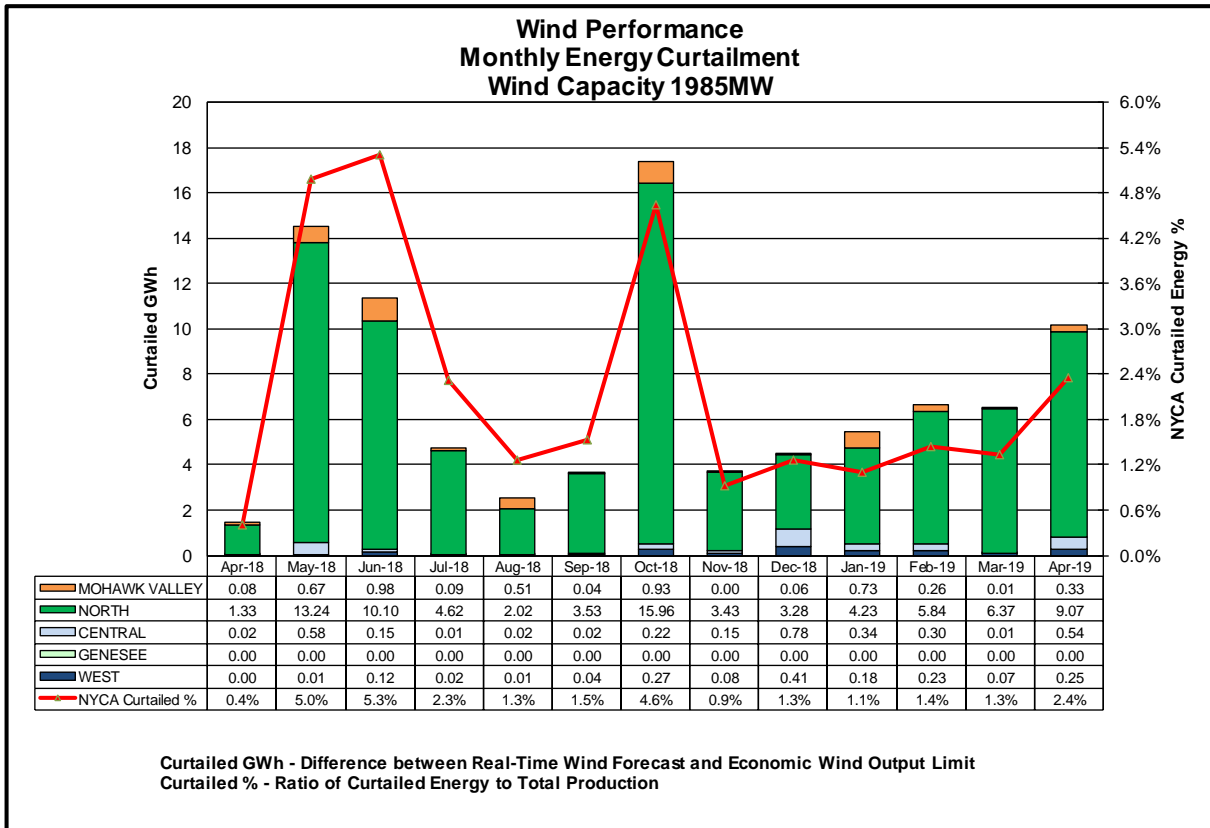
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

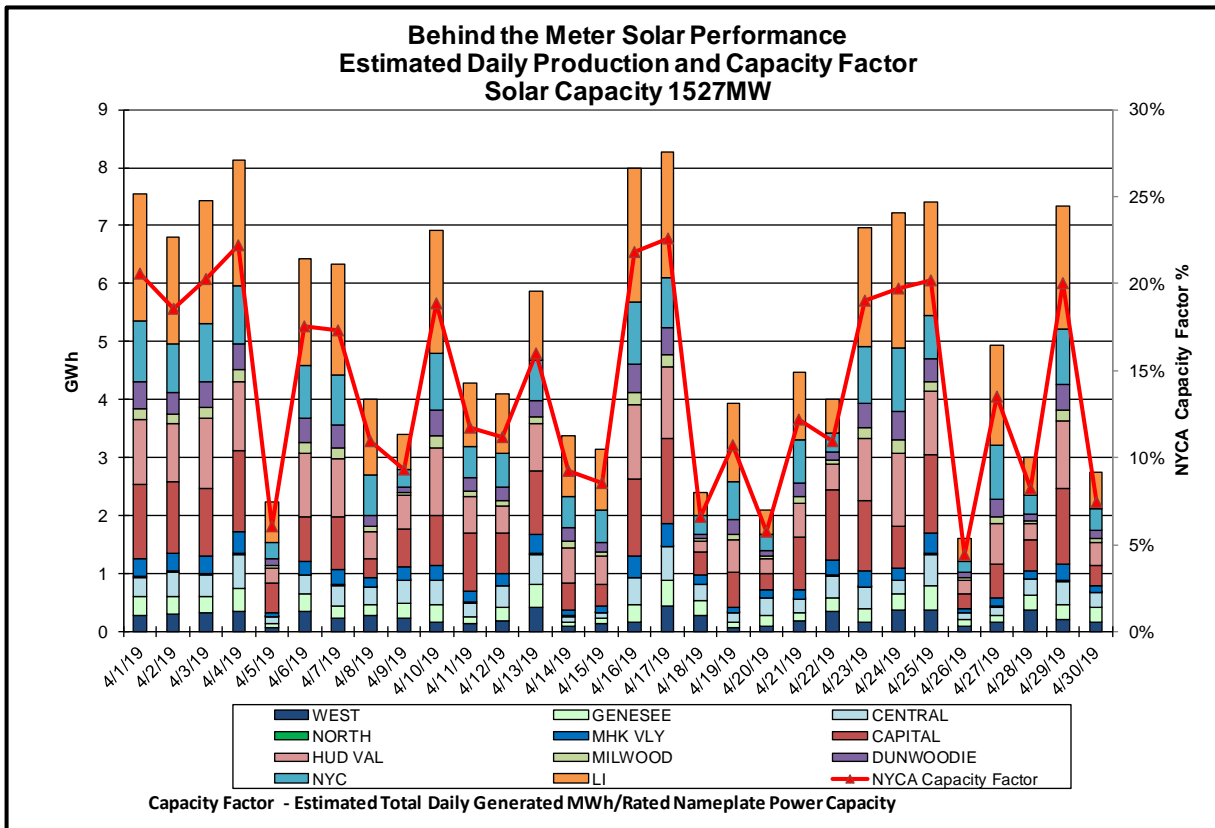
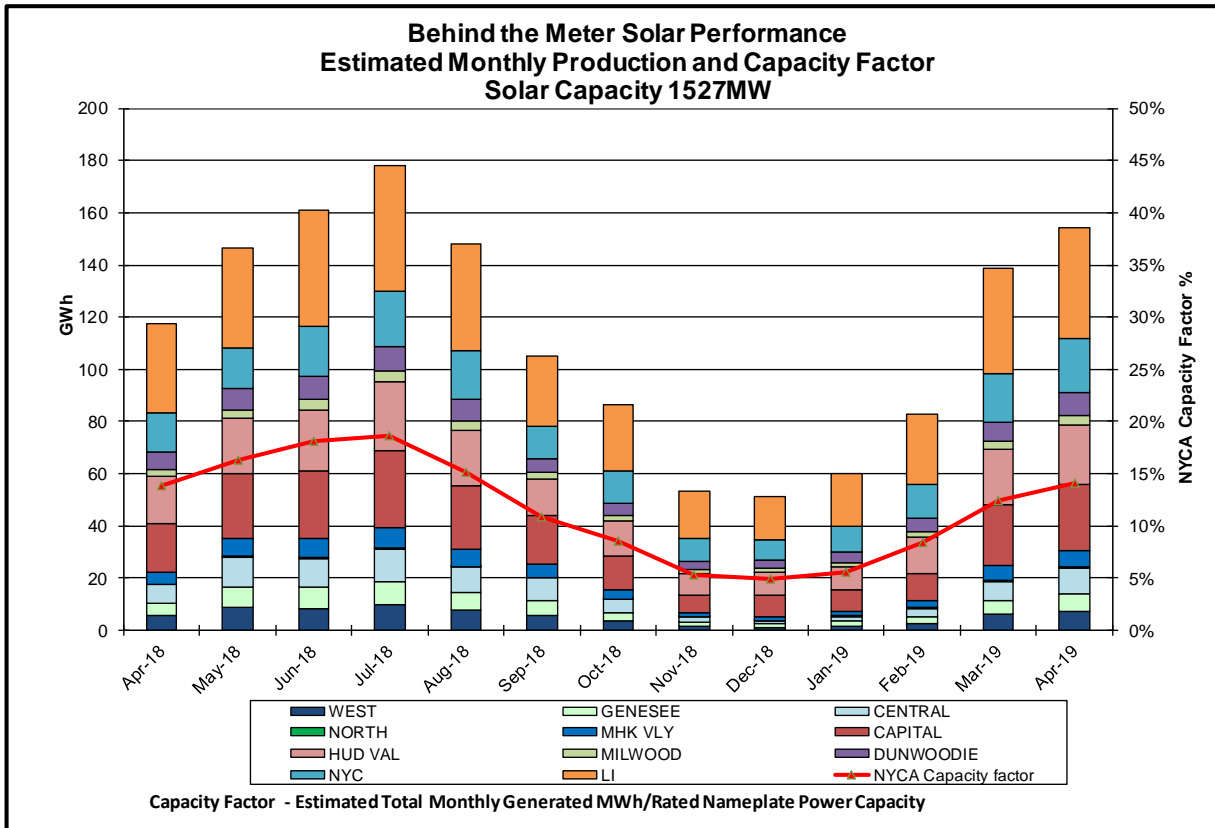


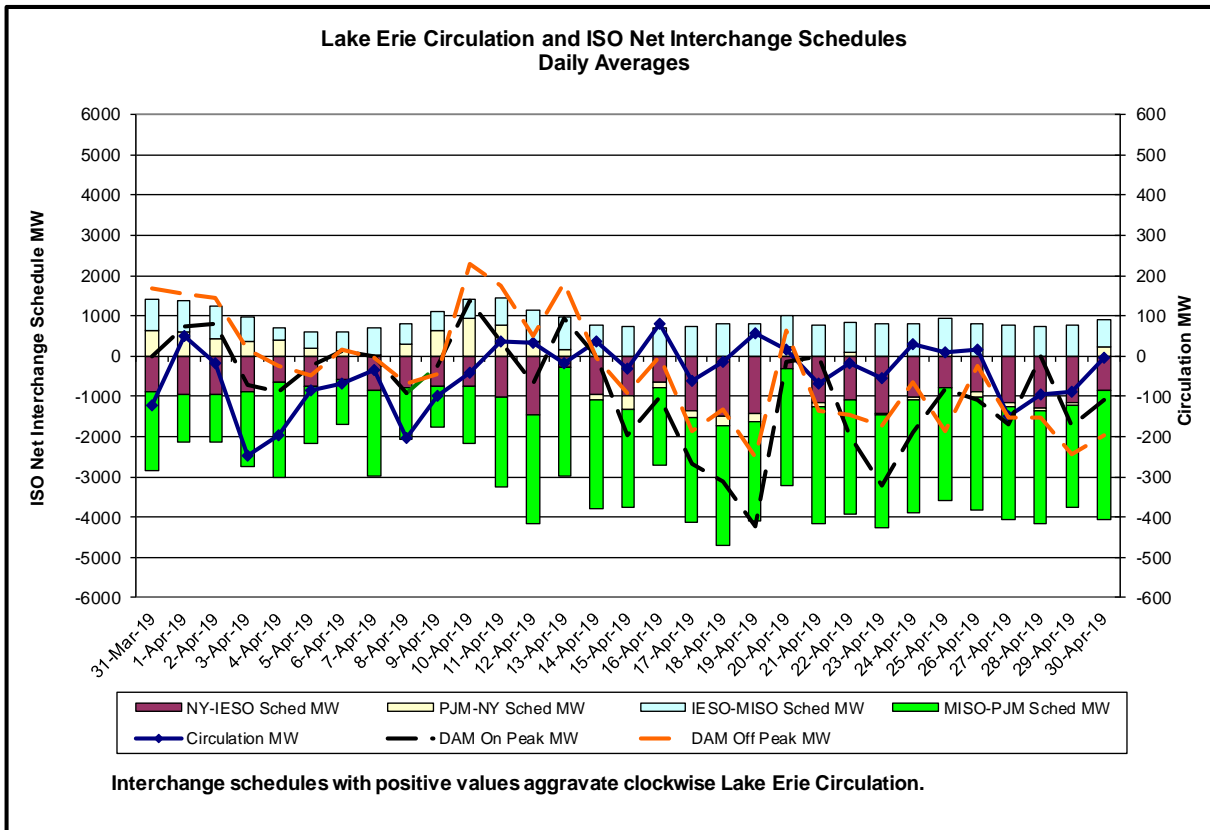
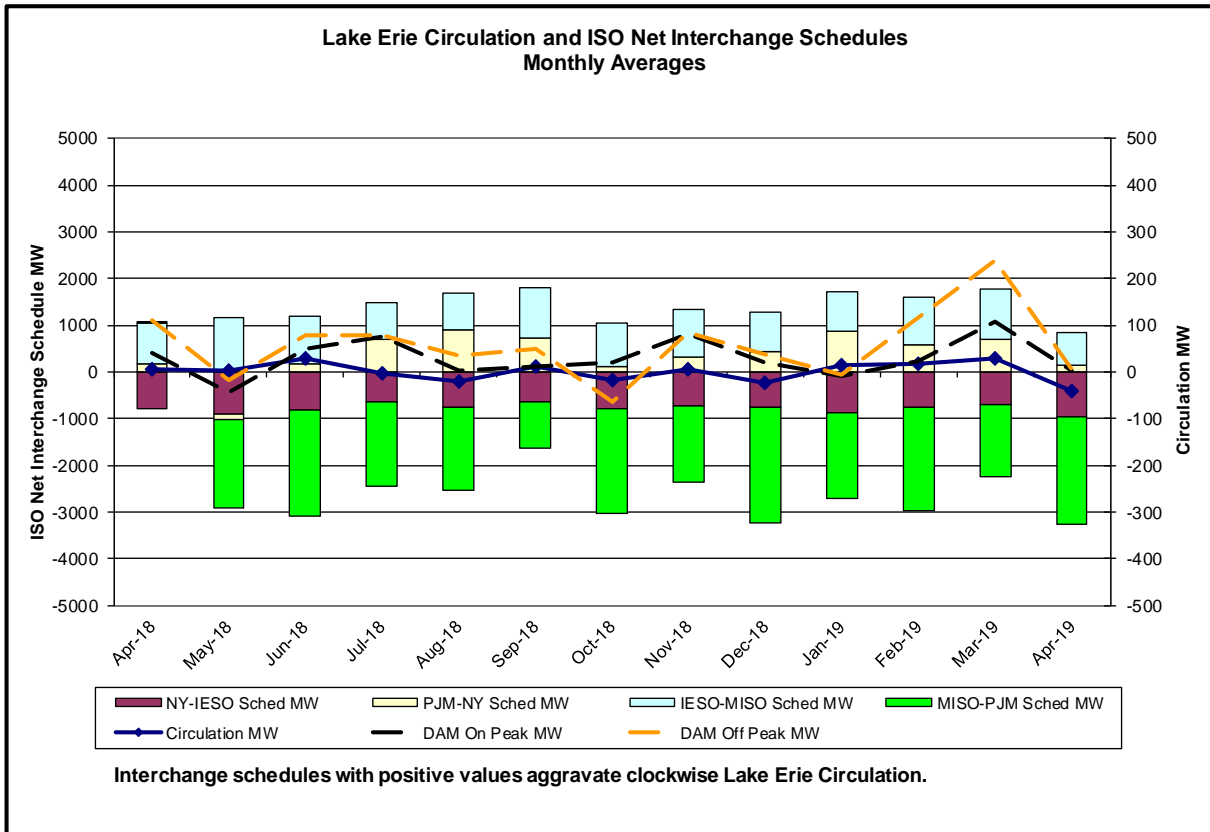




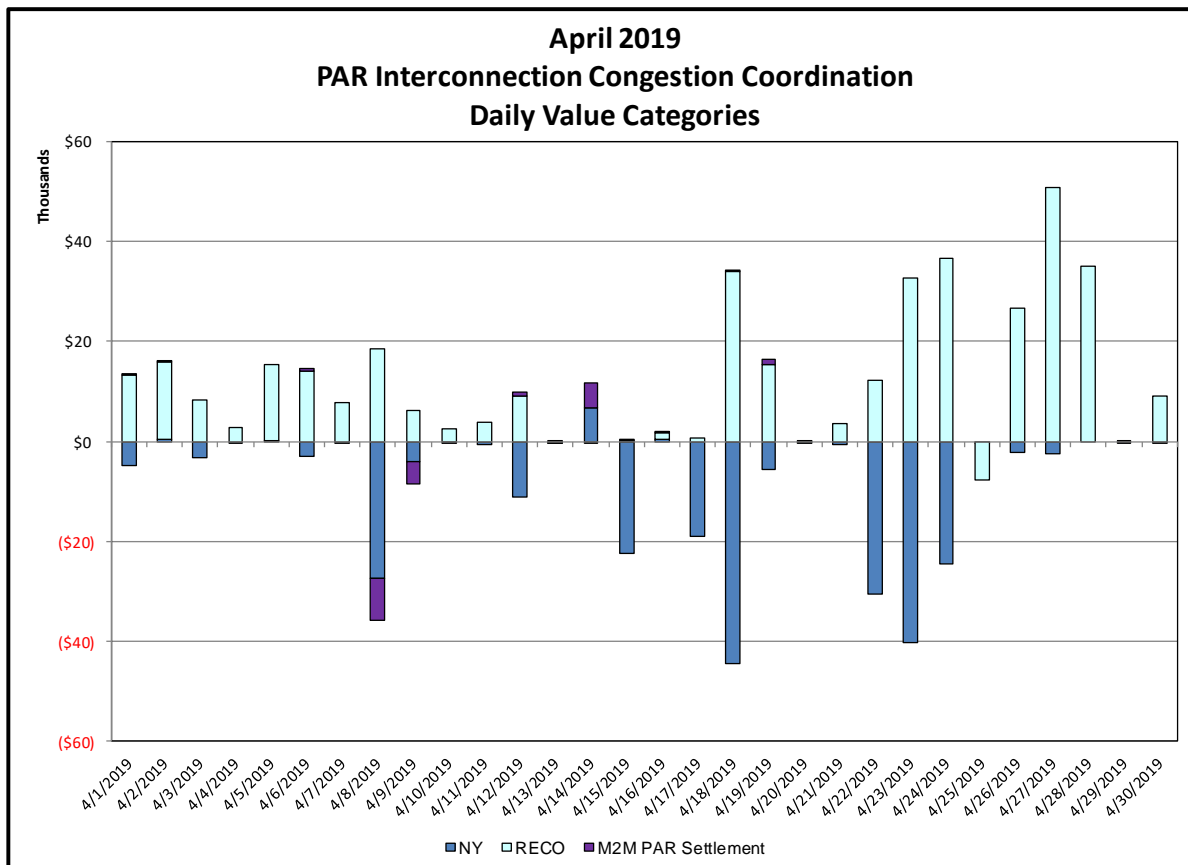
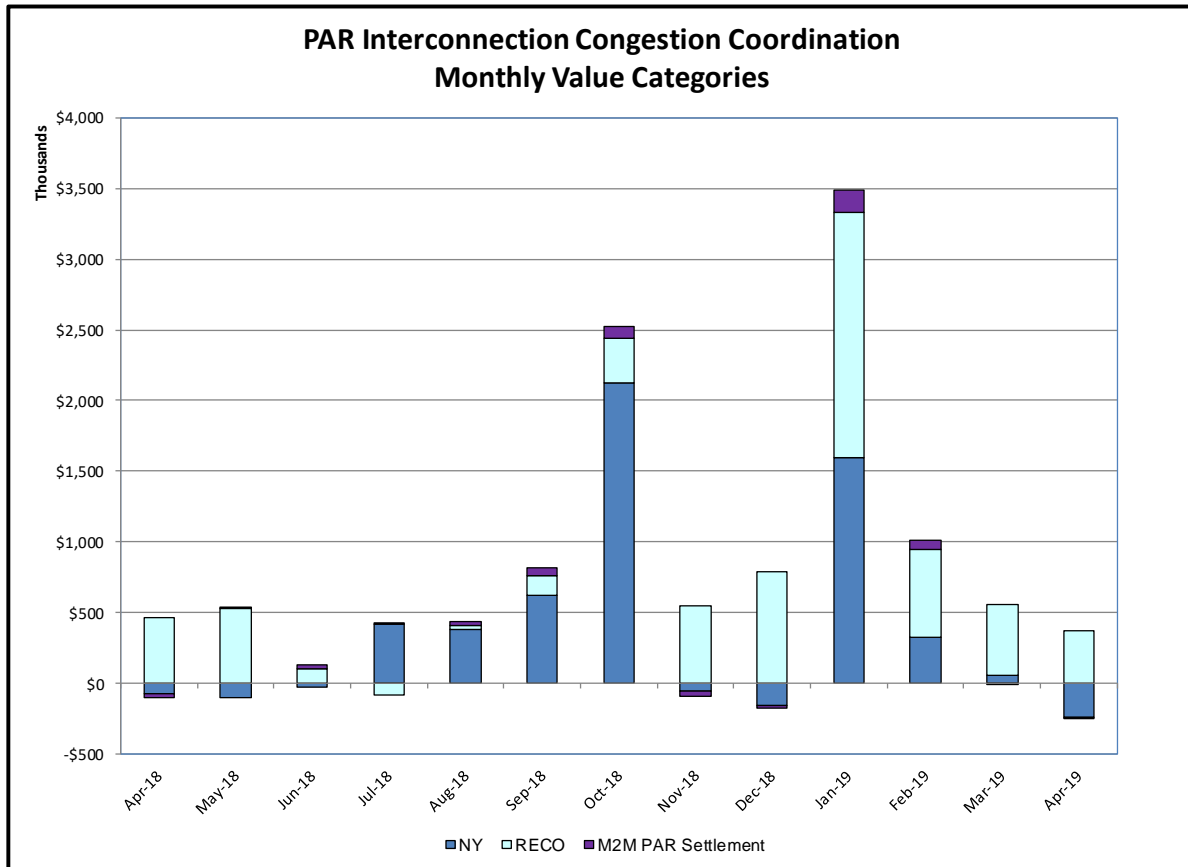






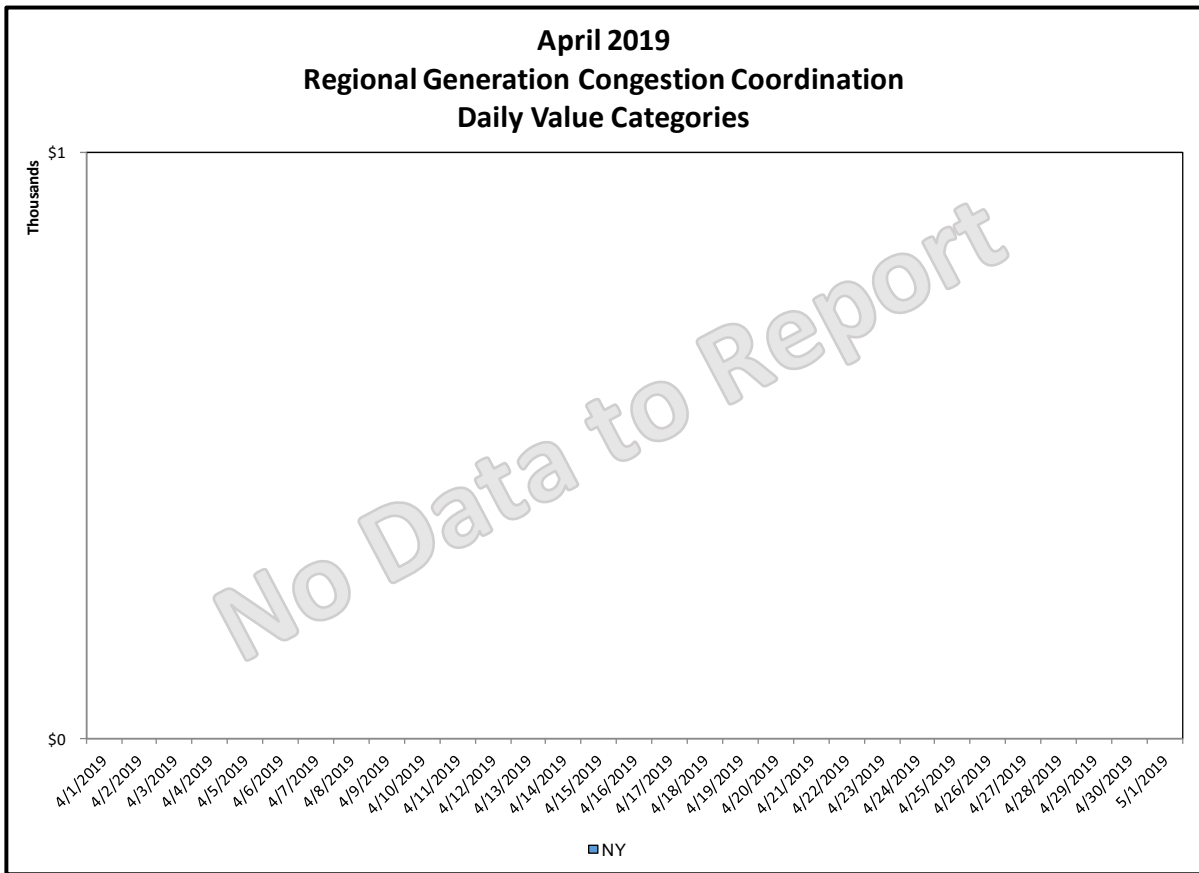
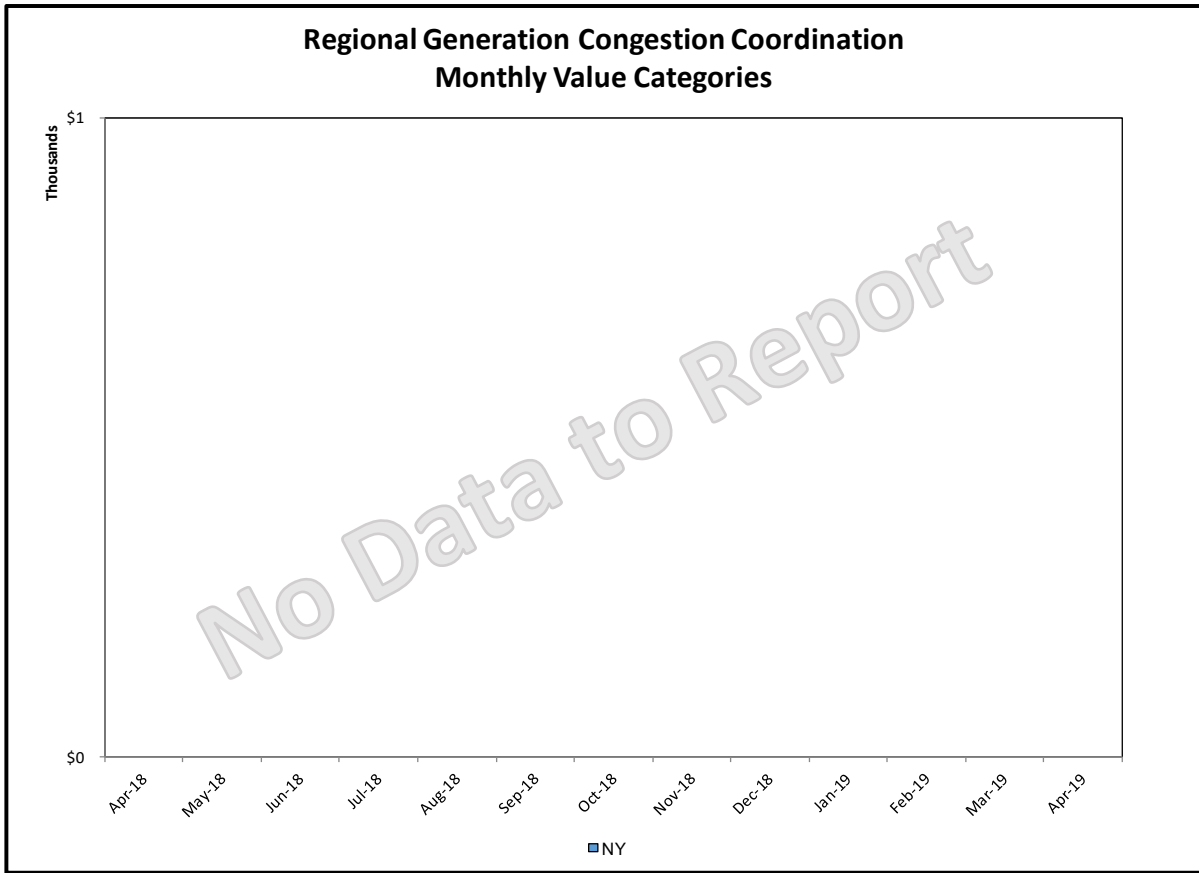


Broader Regional Market Performance Metrics



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.



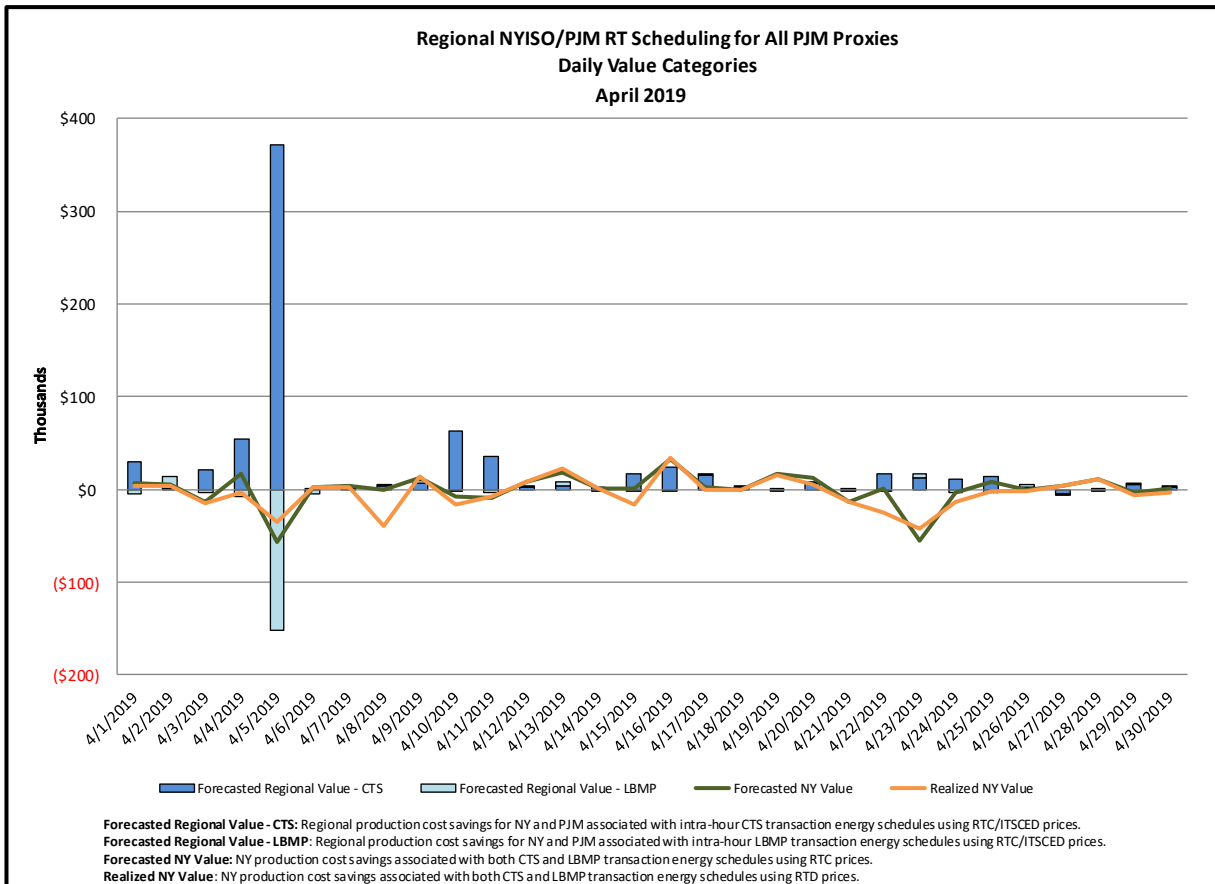
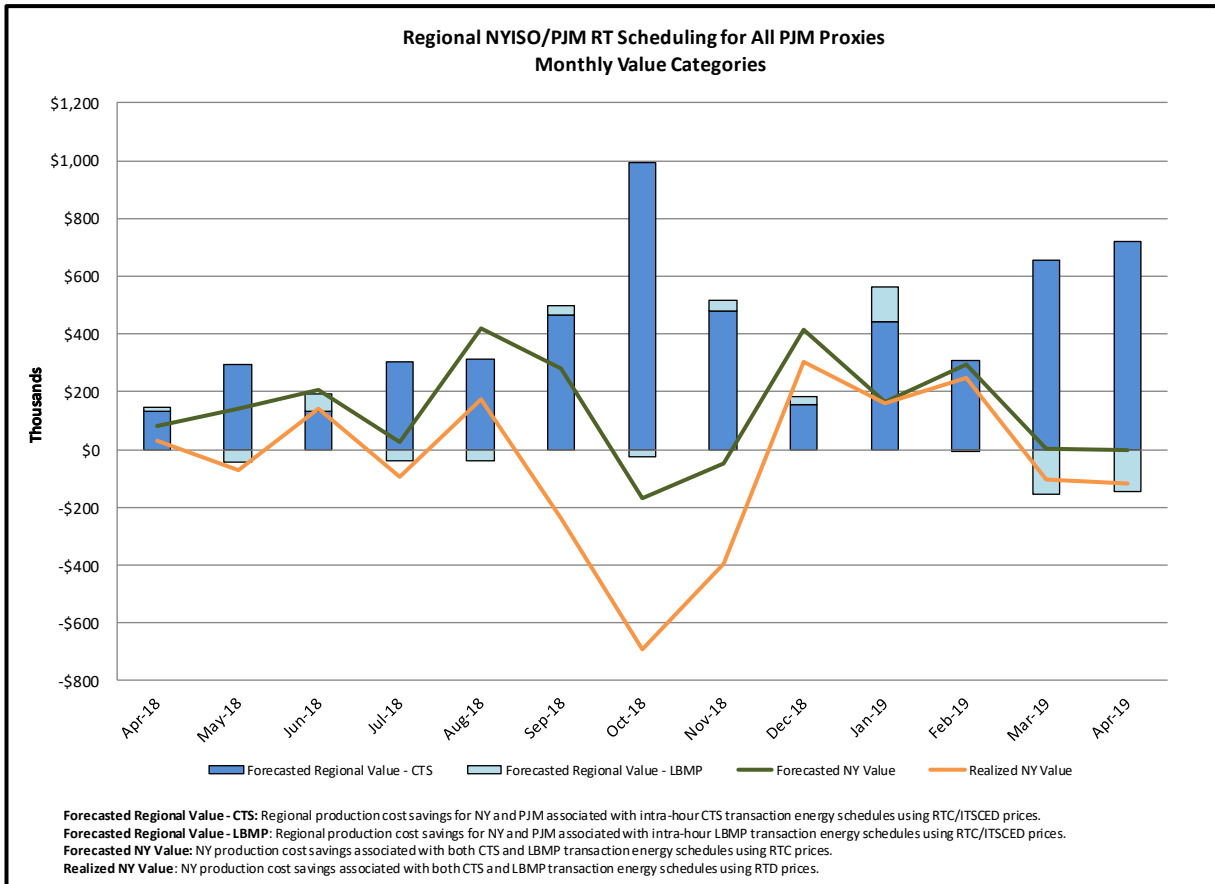
Regional Generation Congestion Coordination

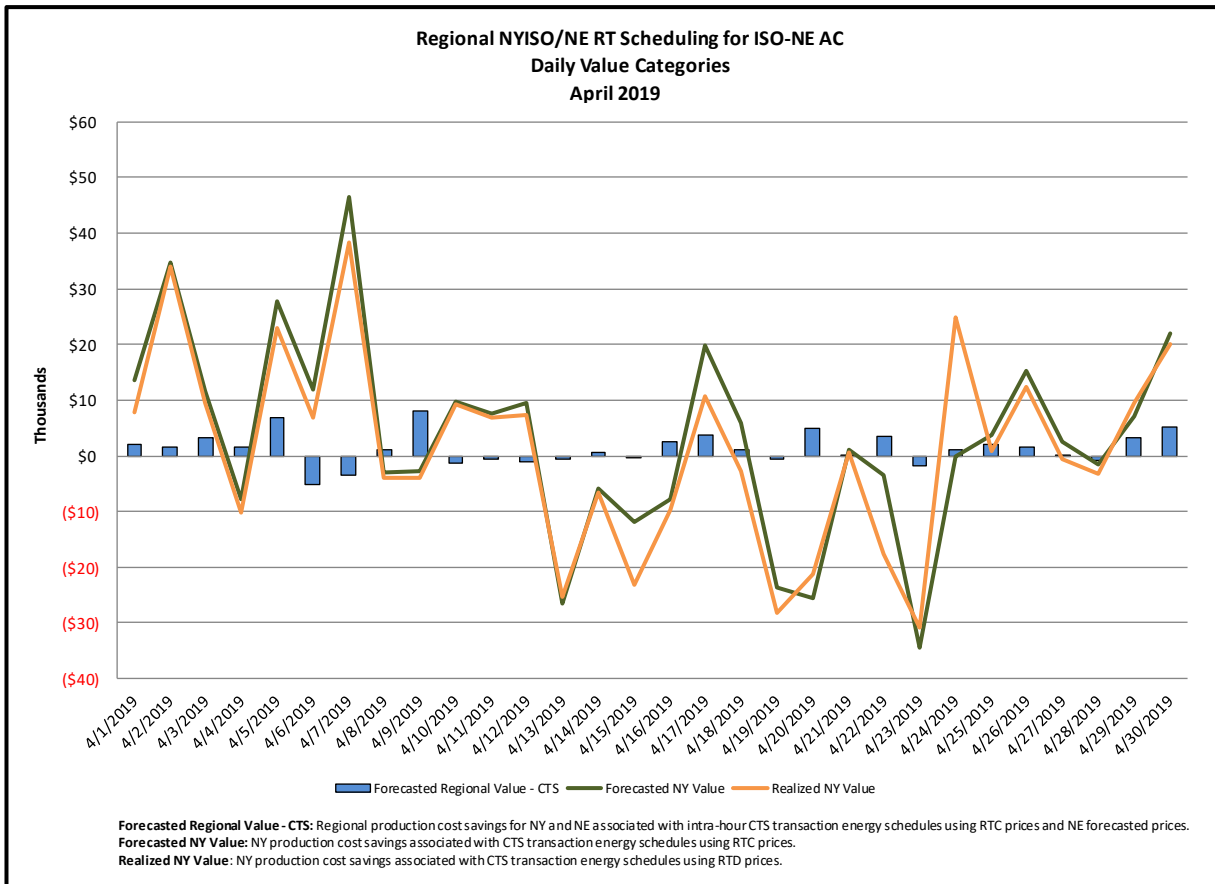
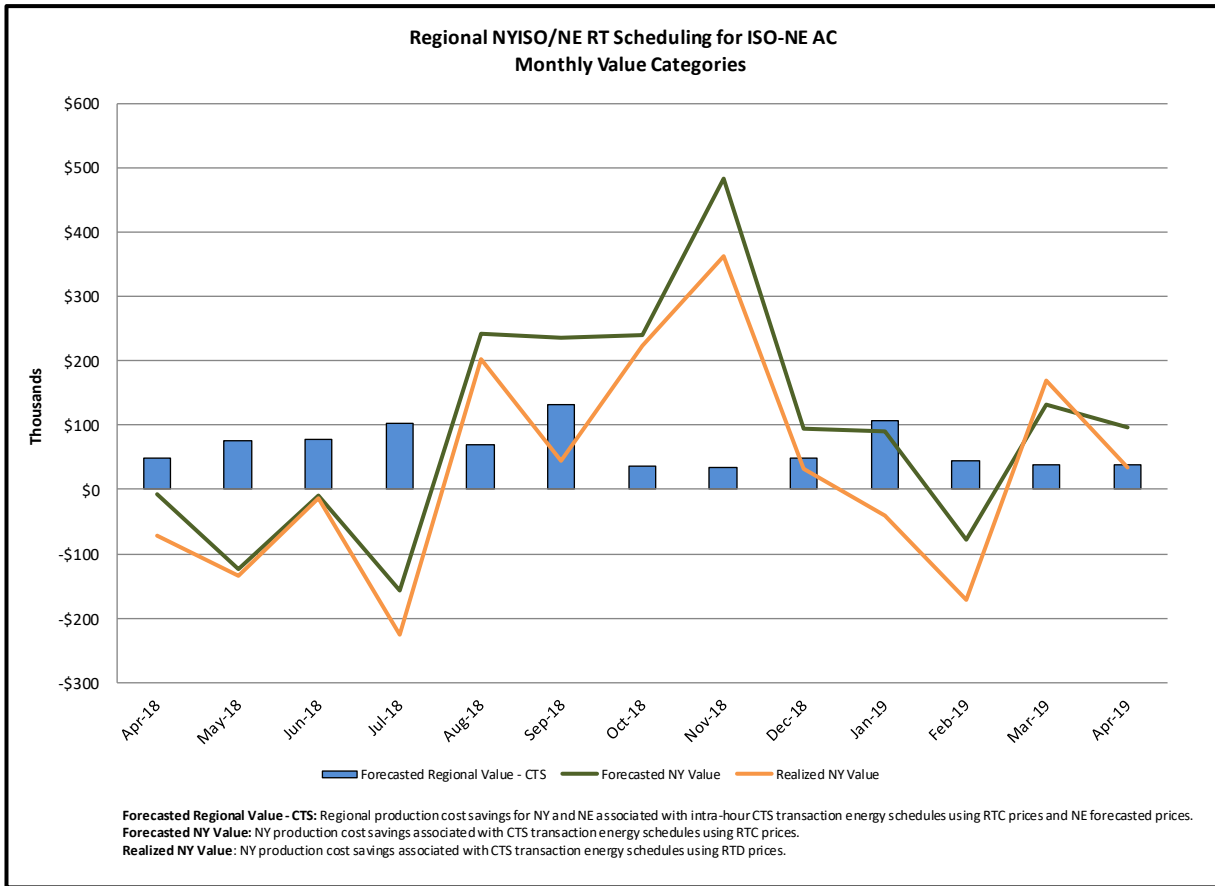
Category

NY

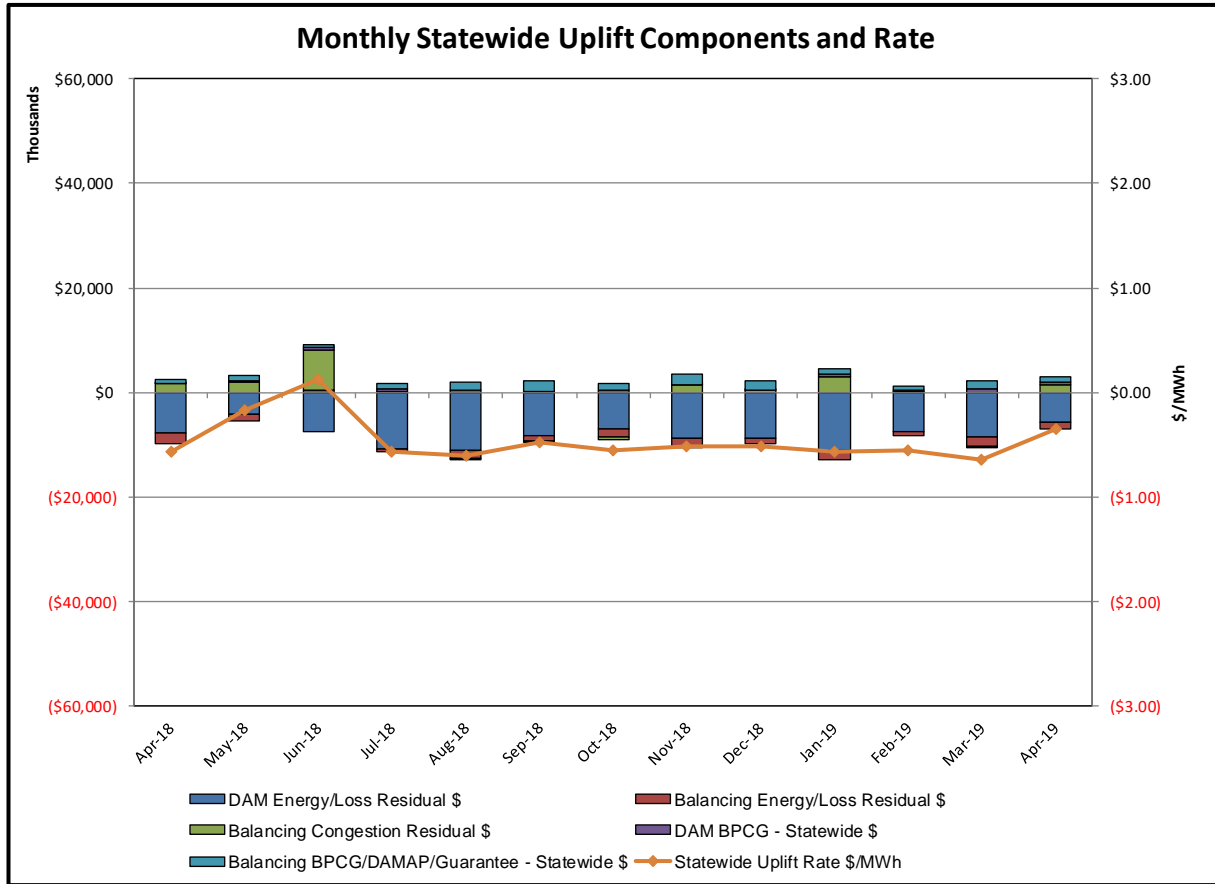
Description

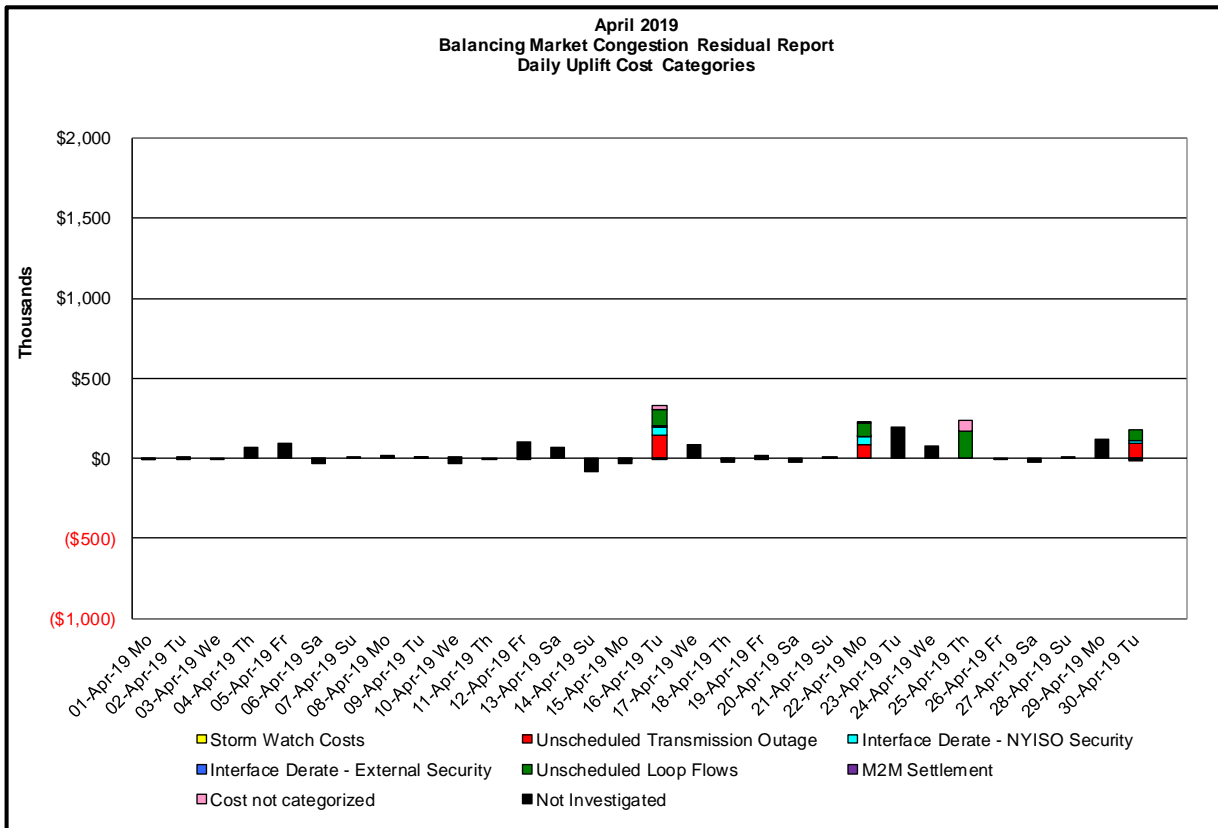
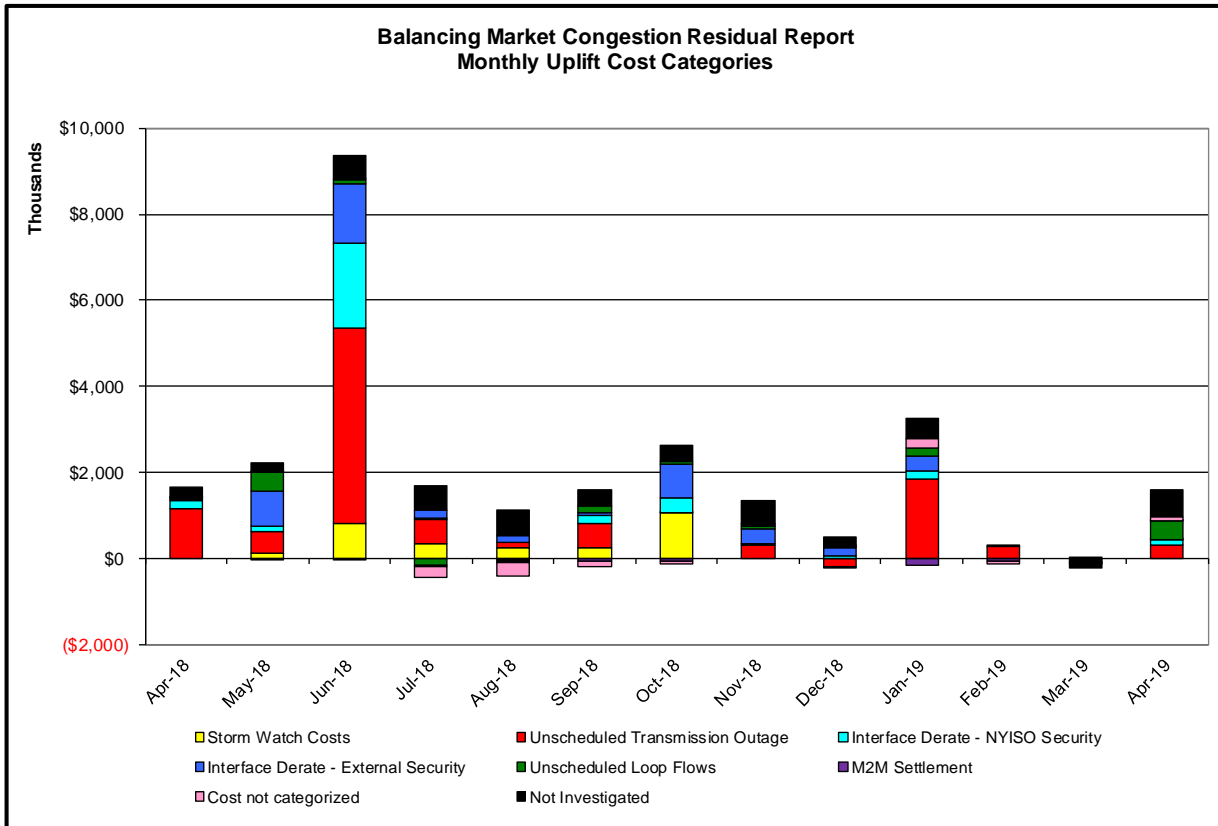
NYISO savings that result from PJM payments to NYISO when PJM's transmission use (PJM's market flow) is greater than PJM's entitlement of the NY transmission system and NYISO is incurring Western or Central NY congestion. Additionally, NYISO savings may result from the more efficient regional utilization of PJM's generation resources to directly address Western or Central NY transmission congestion.





Market Performance Metrics





Day's investigated in April:16,22,25,30

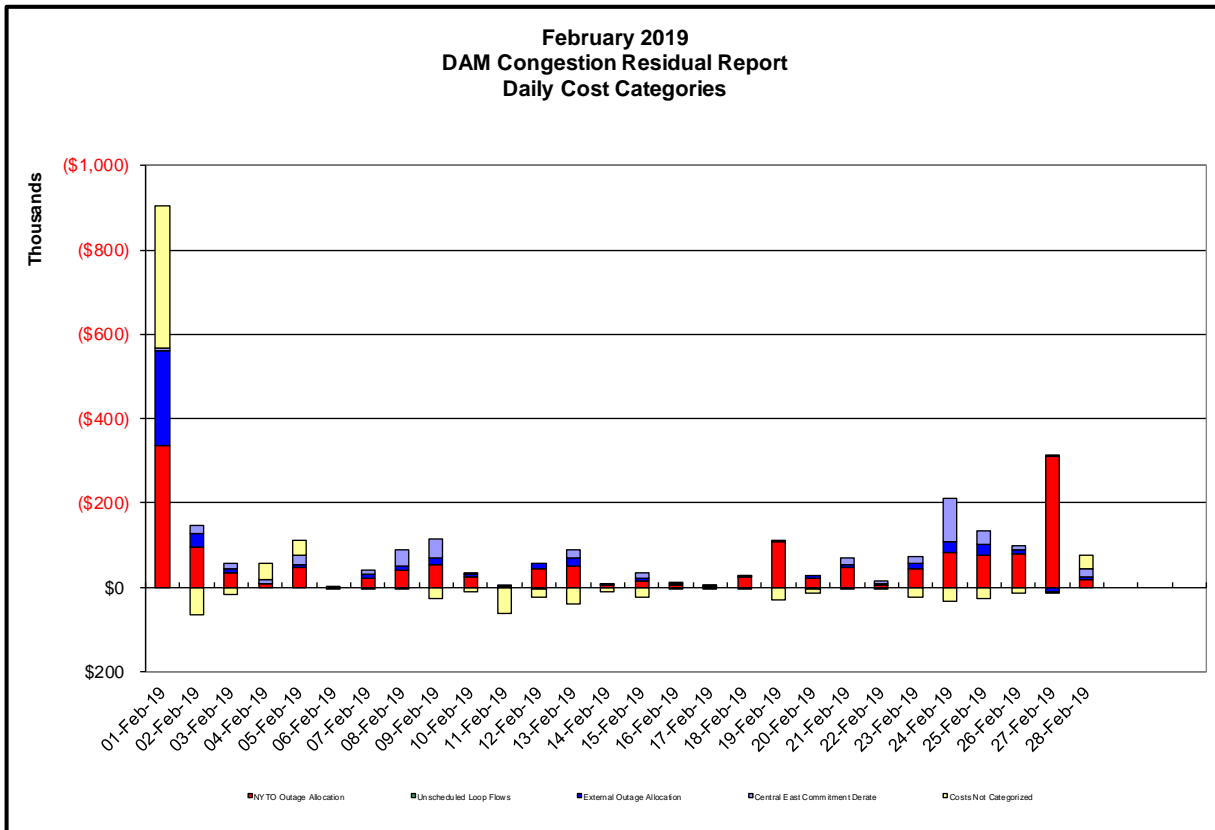
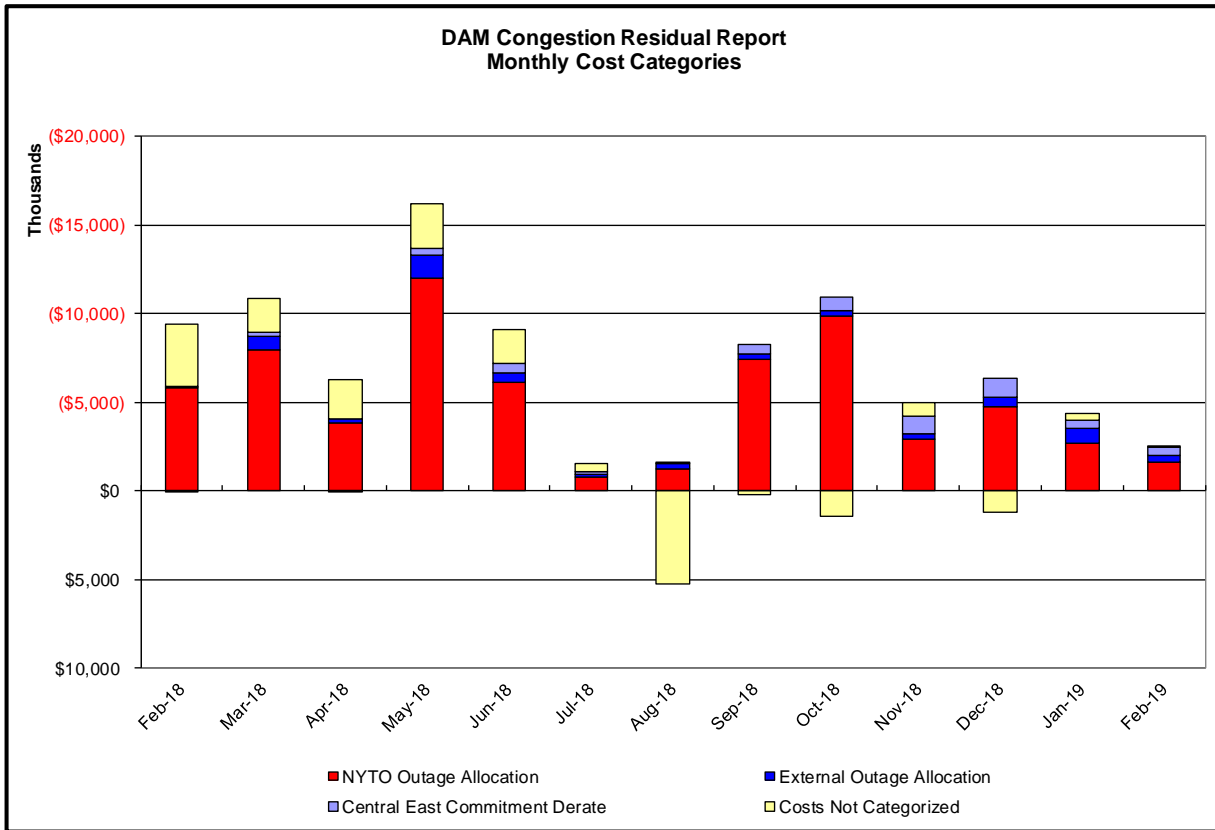
Event	Date (yyyymmdd)	Hours	Description
	4/16/2019	0,4-19	Extended Outage Dunwoodie-Shore Rd 345kV (#Y50)
	4/16/2019	9,10	Derate Central East
	4/16/2019	0,5-7,9-16	Derate Patnode-Willis 230kV (#WPN-1)
	4/16/2019	15	PJM_AC-NY Scheduling Limit
	4/16/2019	5-7,9,10	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/16/2019	6,10,11,16-19	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; West 115kV
	4/22/2019	8-12,14	Forced Outage Long Road-Gardenville 115kV (#180)
	4/22/2019	10	NYCA DNI Ramp Limit
	4/22/2019	8,14,15,20	Derate Central East
	4/22/2019	18	NE_AC-NY Scheduling Limit
	4/22/2019	10	PJM_AC DNI Ramp Limit
	4/22/2019	8,14	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Central East
	4/22/2019	8-12,14	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; West 115kV
	4/25/2019	6,7,9-14,16,17	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; West 115kV
	4/30/2019	7,12,13	Forced Outage Long Road-Grand Island 115kV (#182)
	4/30/2019	21,22	Extended Outage Langner Road-Gardenville 115kV (#180)
	4/30/2019	13	NYCA DNI Ramp Limit
	4/30/2019	12,13	Derate Niagara Blvd-packard 115kV (#193) for I/o Packard-Sawyer 230kV (#78)
	4/30/2019	15	IESO_AC DNI Ramp Limit
	4/30/2019	7,16,21	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; West 115kV

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
Unscheduled Transmission Outage	Market-wide	Reduction in DAM to RTM transfers related to unscheduled transmission outage	Forced Line Outage, Unit AVR Outages
Interface Derate - NYISO Security	Market-wide	Reduction in DAM to RTM transfers not related to transmission outage	Interface Derates due to RTM voltages
Interface Derate - External Security	Market-wide	Reduction 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	

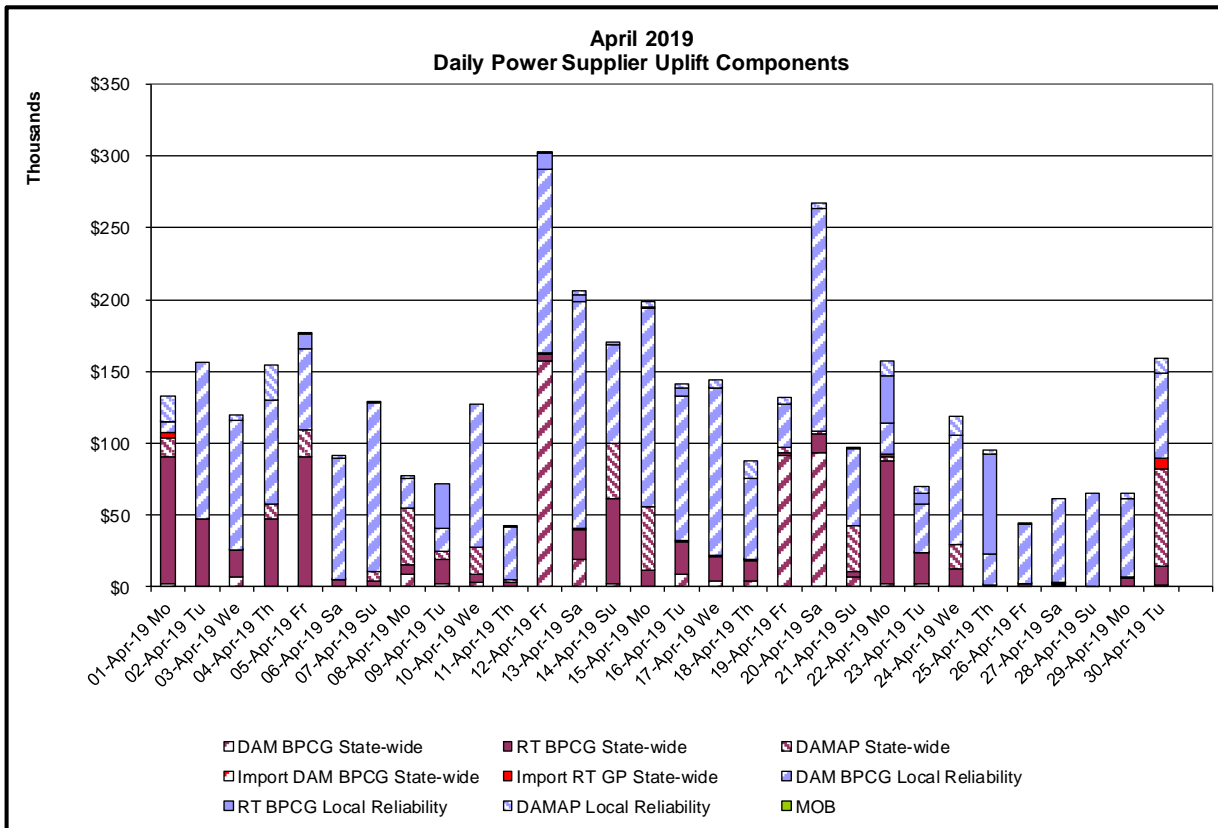
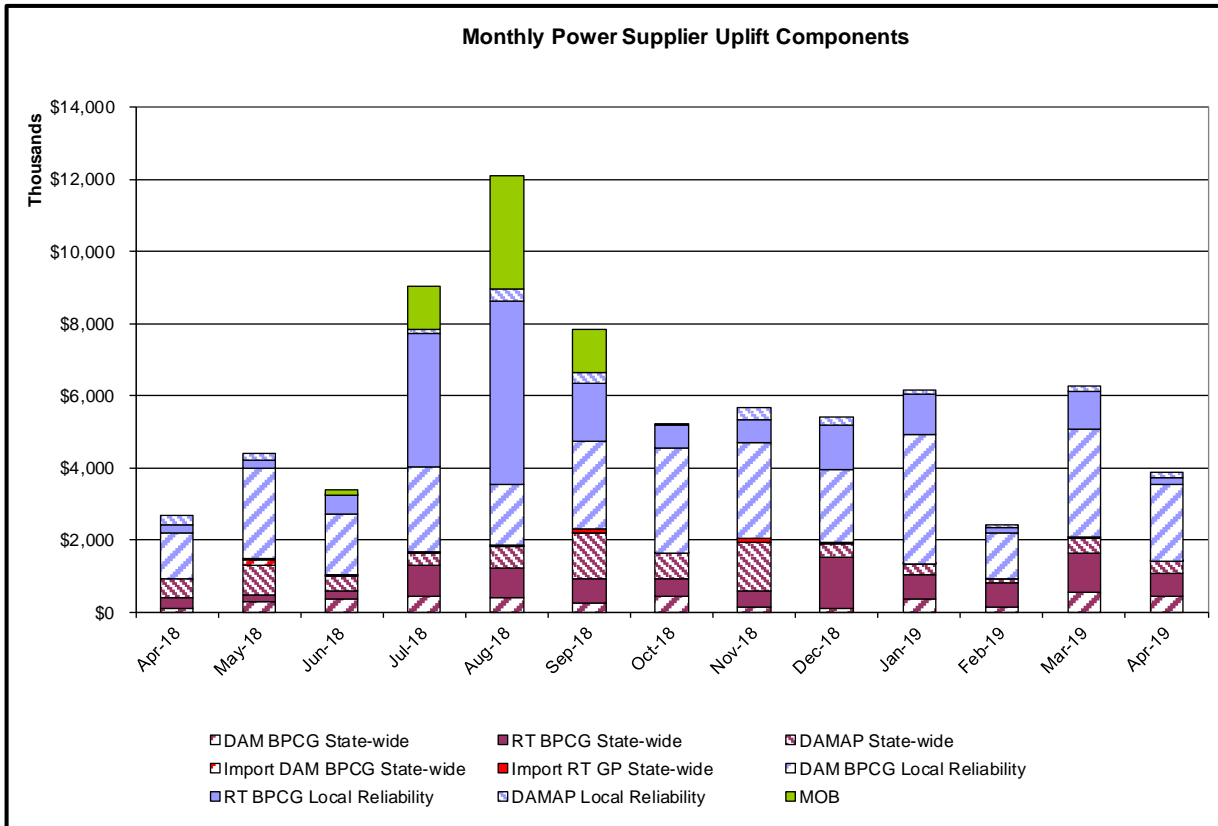
Monthly Balancing Market Congestion Report Assumptions/Notes

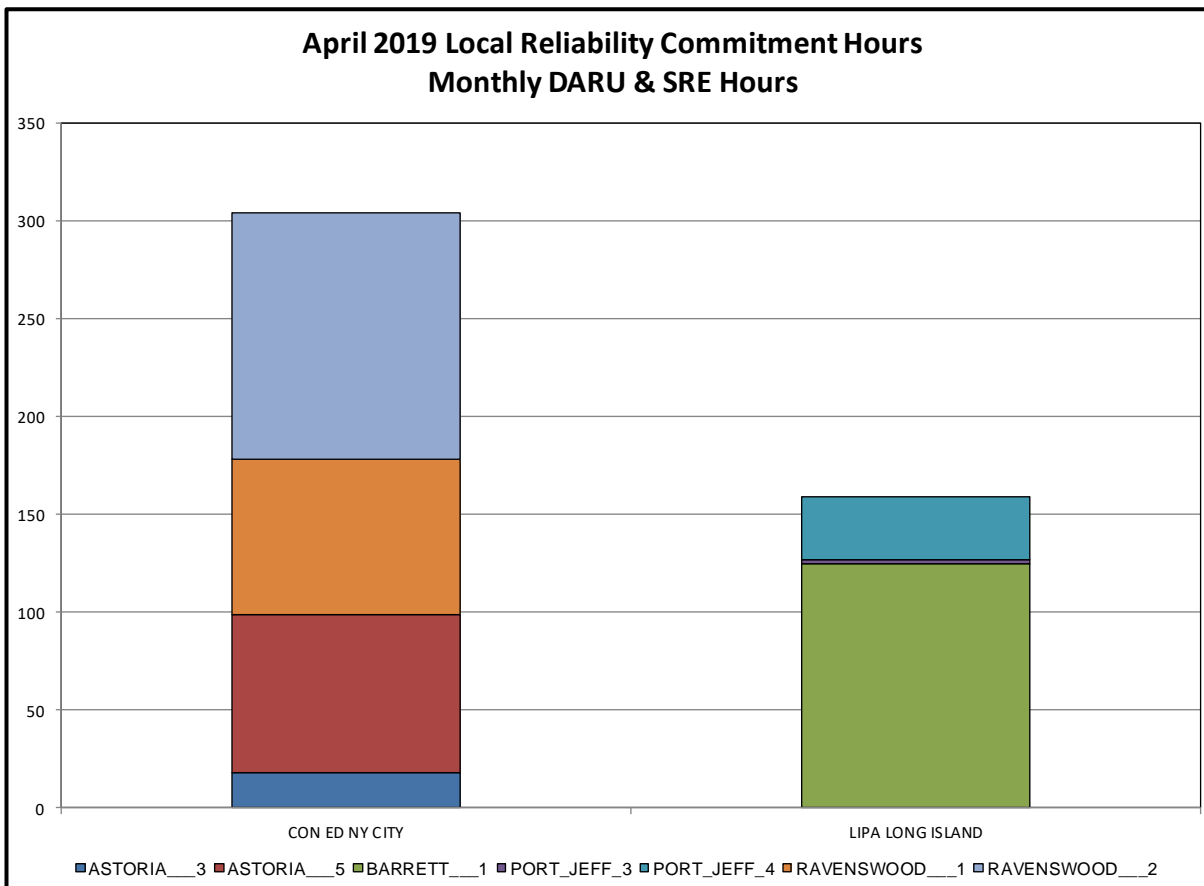
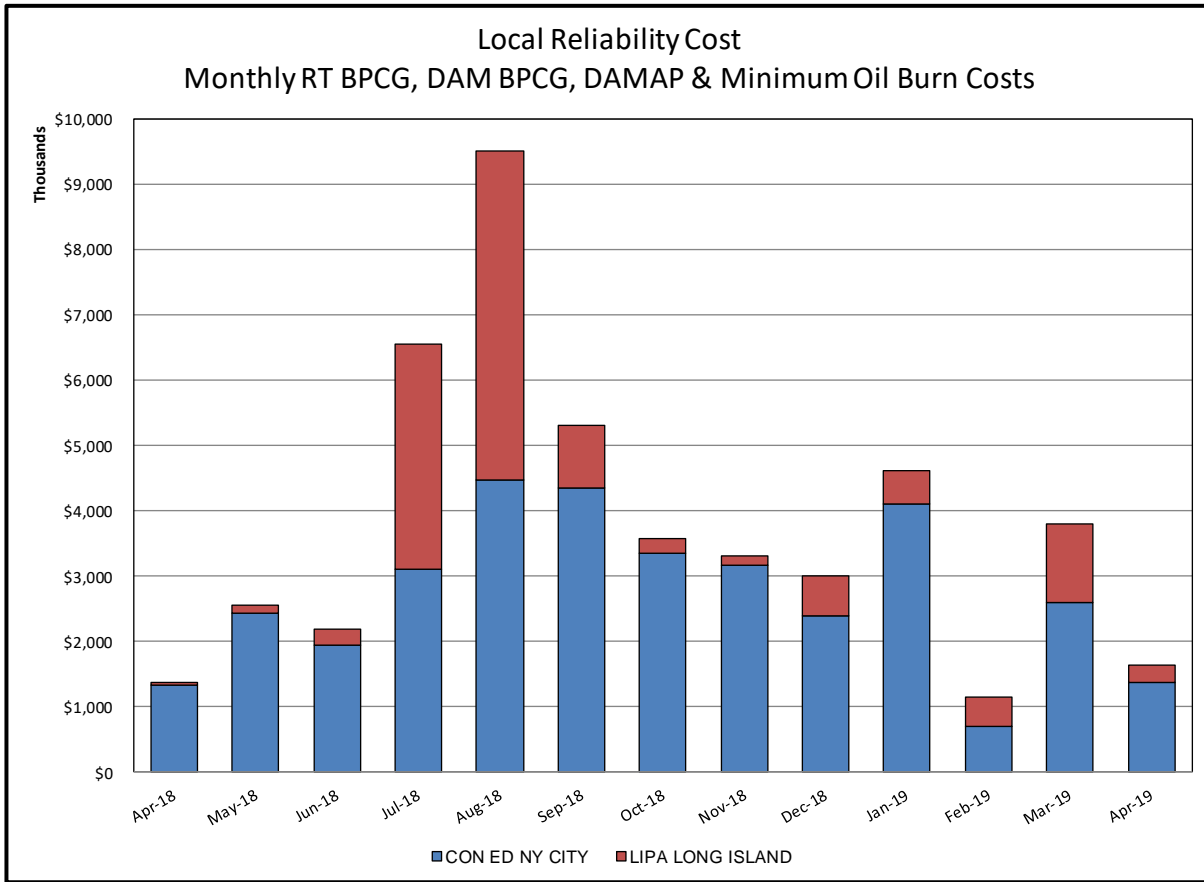
- 1) Storm Watch Costs are identified as daily total uplift costs
- 2) Days with a value of BMCR less M2M Settlement of \$100K/HR, shortfall of \$200K/Day or more, or surplus of \$100K/Day or more are investigated.
- 3) Uplift costs associated with multiple event types are apportioned equally by hour

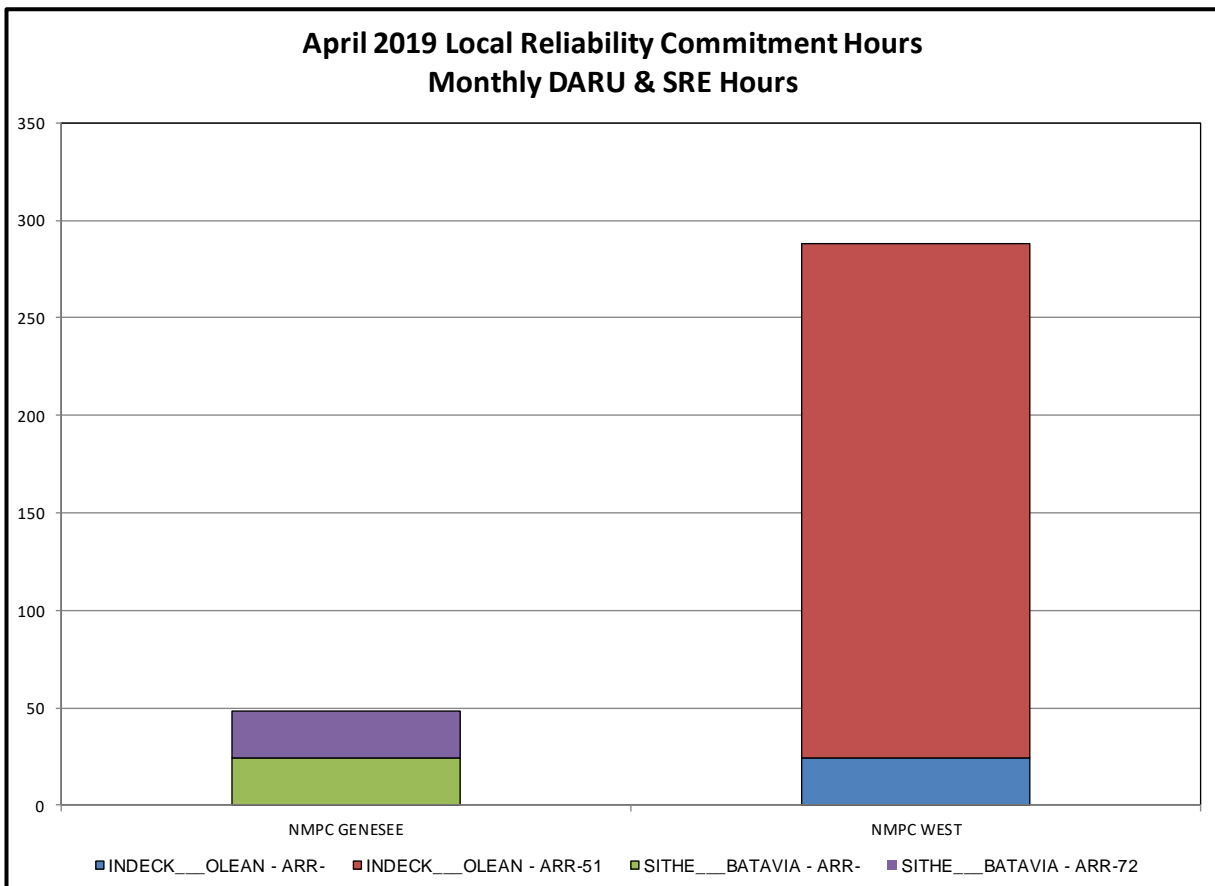
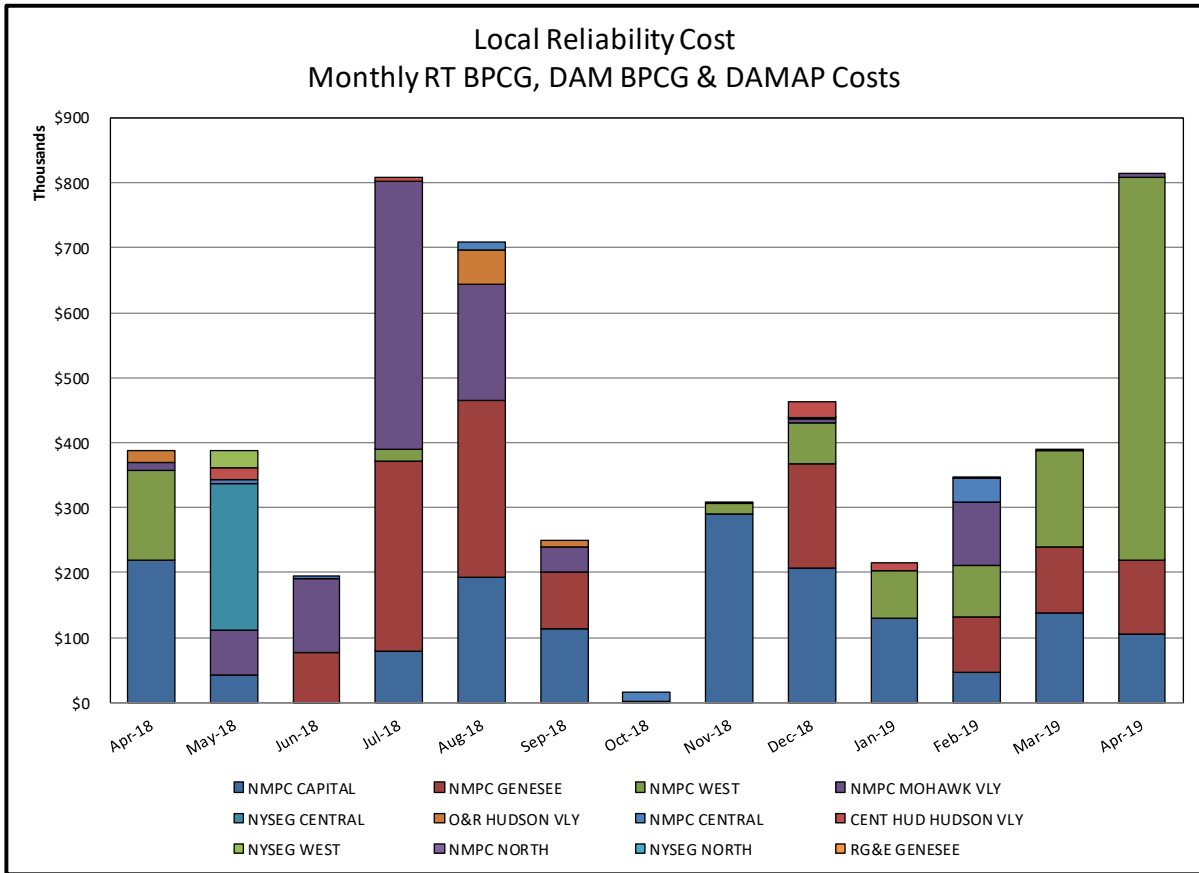


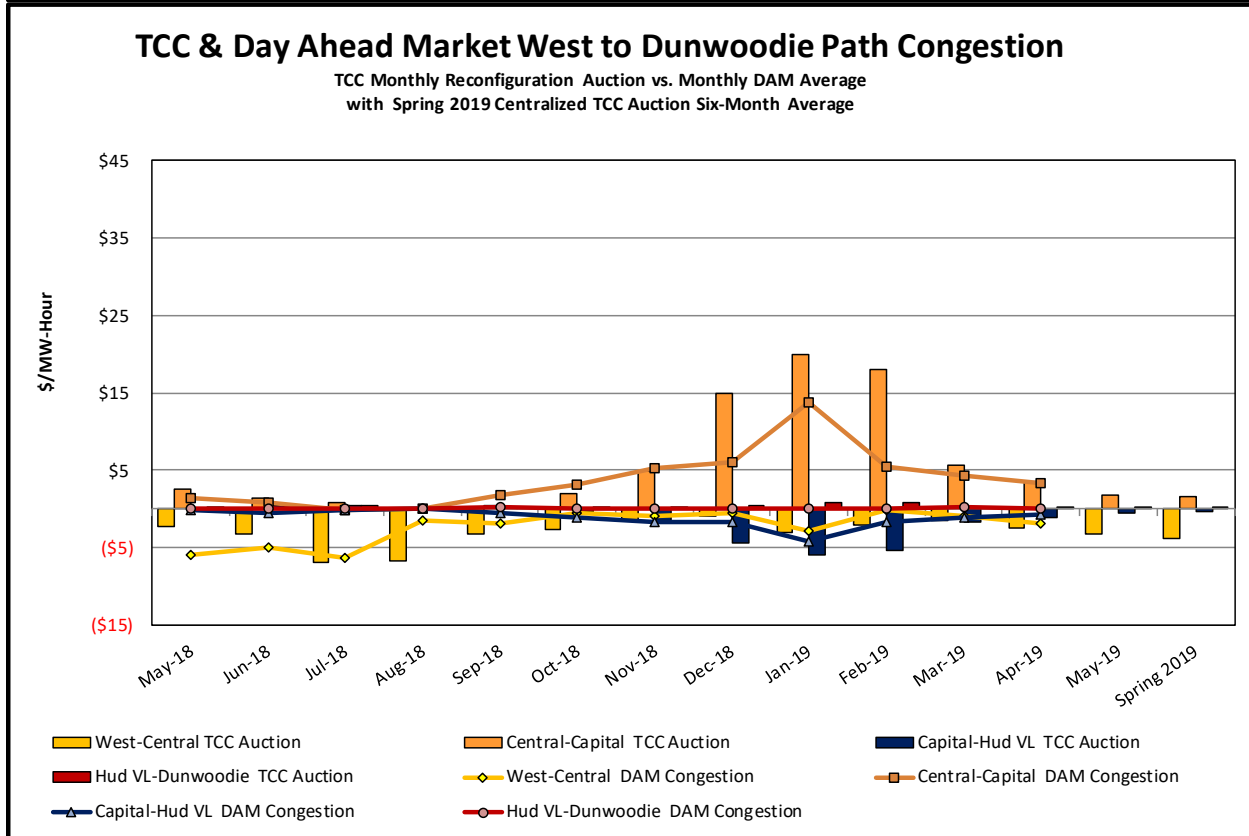
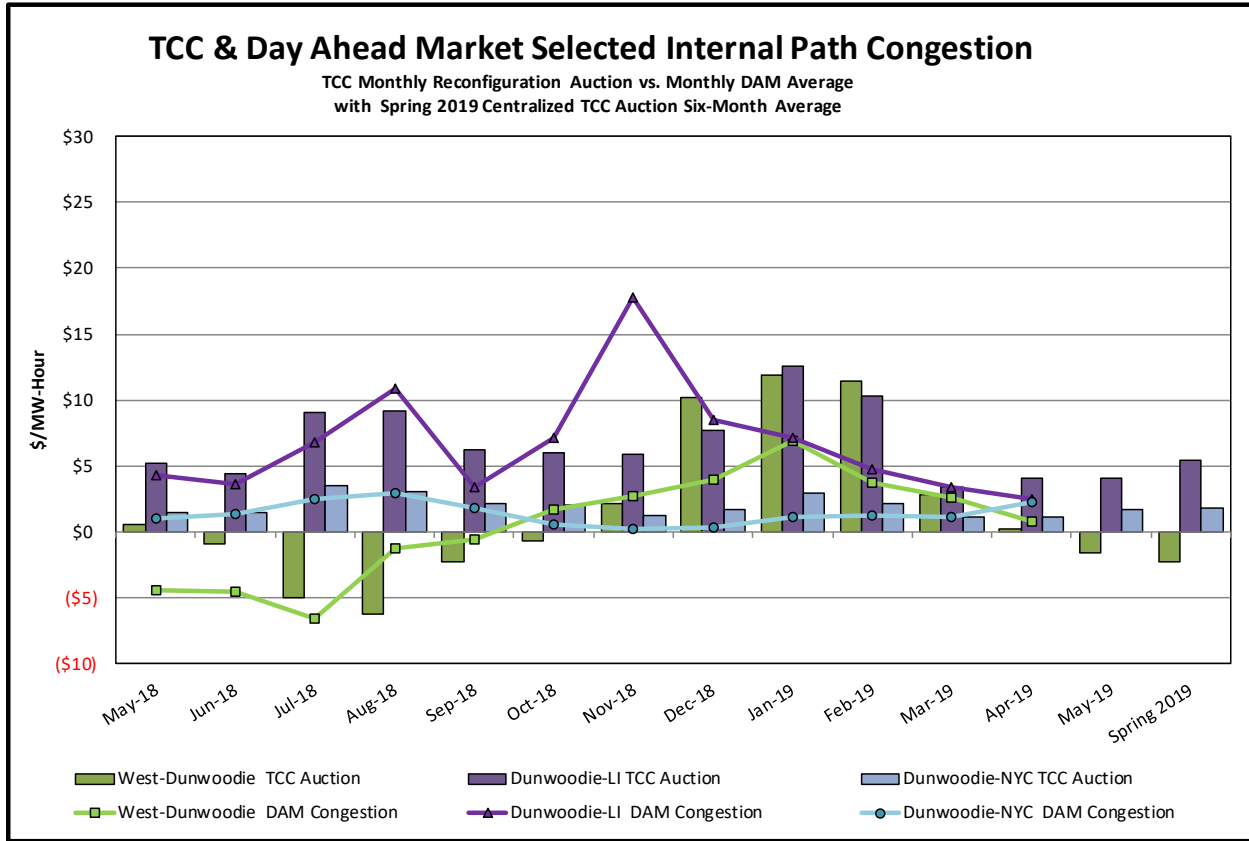
Day-Ahead Market Congestion Residual Categories

<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.
External Outage Allocation	All TO by Monthly Allocation Factor	Direct allocation to transmission equipment status change caused by change in status of external equipment.	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.	



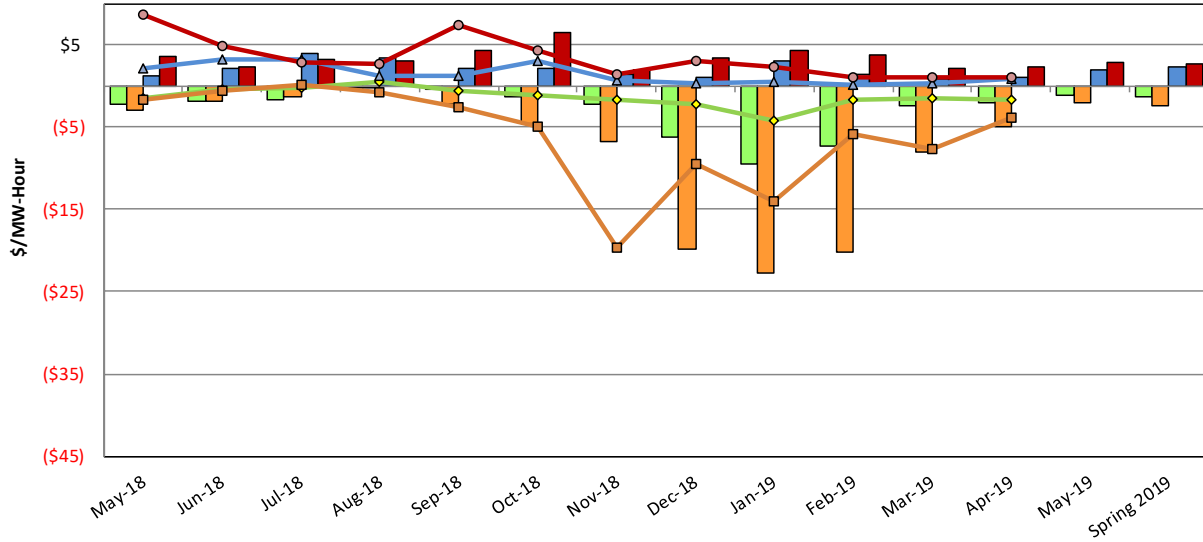






TCC & Day Ahead Market Selected External Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average
with Spring 2019 Centralized TCC Auction Six-Month Average



- PJM-Central TCC Auction
- NE-Central TCC Auction
- OH-Central TCC Auction
- HQ-Central TCC Auction
- ◆ PJM-Central DAM Congestion
- NE-Central DAM Congestion
- ▲ OH-Central DAM Congestion
- HQ-Central DAM Congestion

