

Operations Performance Metrics Monthly Report



December 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 January 9, 2020.

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December 2019 Operations Performance Highlights

- Peak load of 23,253 MW occurred on 12/19/2019 HB 17
- All-time winter capability period peak load of 25,738 MW occurred on 1/7/2014 HB 18
- 0 hours of Thunder Storm Alerts were declared
- 15 hours of NERC TLR level 3 curtailment
- NYISO achieved a wind energy record of 1,675MW on 12/14/2019 HB23 providing 11% of the state’s electrical demand in that hour.
- The following table identifies the estimated production cost savings associated with the Broader Regional Market initiatives.

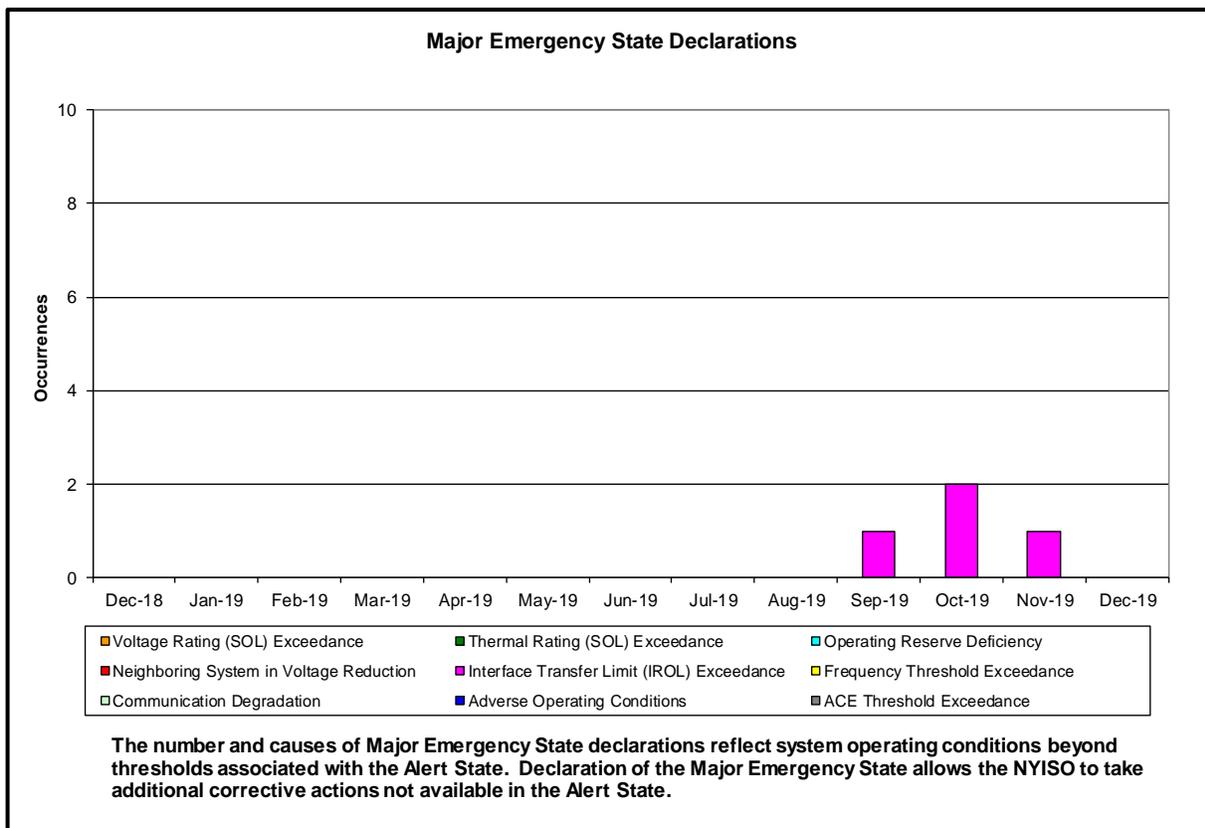
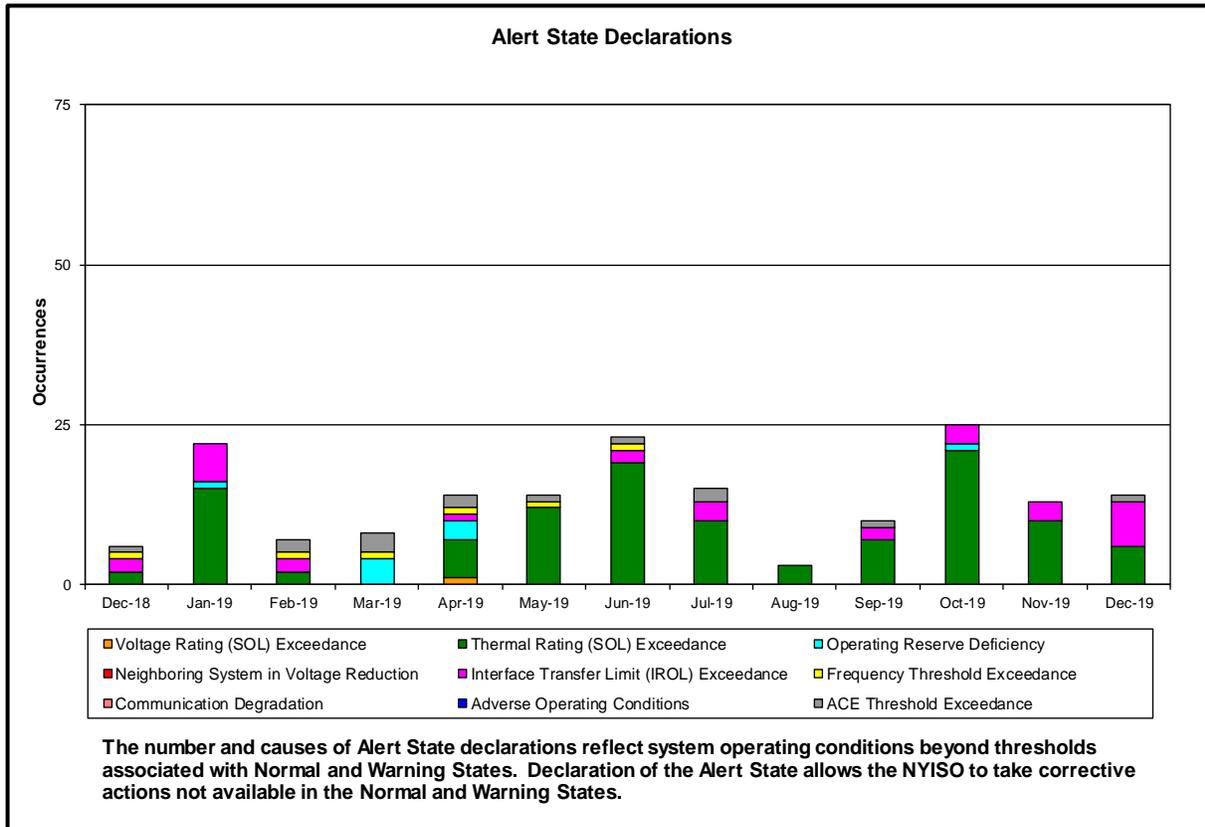
| | Current Month Value (\$M) | Year-to-Date Value (\$M) |
|--|---------------------------|--------------------------|
| NY Savings from PJM-NY Congestion Coordination | \$1.44 | \$9.80 |
| NY Savings from PJM-NY Coordinated Transaction Scheduling | (\$0.30) | (\$2.62) |
| NY Savings from NE-NY Coordinated Transaction Scheduling | \$0.12 | \$1.32 |
| Total NY Savings | \$1.26 | \$8.50 |
| Regional Savings from PJM-NY Coordinated Transaction Scheduling | \$0.32 | \$6.05 |
| Regional Savings from NE-NY Coordinated Transaction Scheduling | \$0.02 | \$0.60 |
| Total Regional Savings | \$0.34 | \$6.65 |

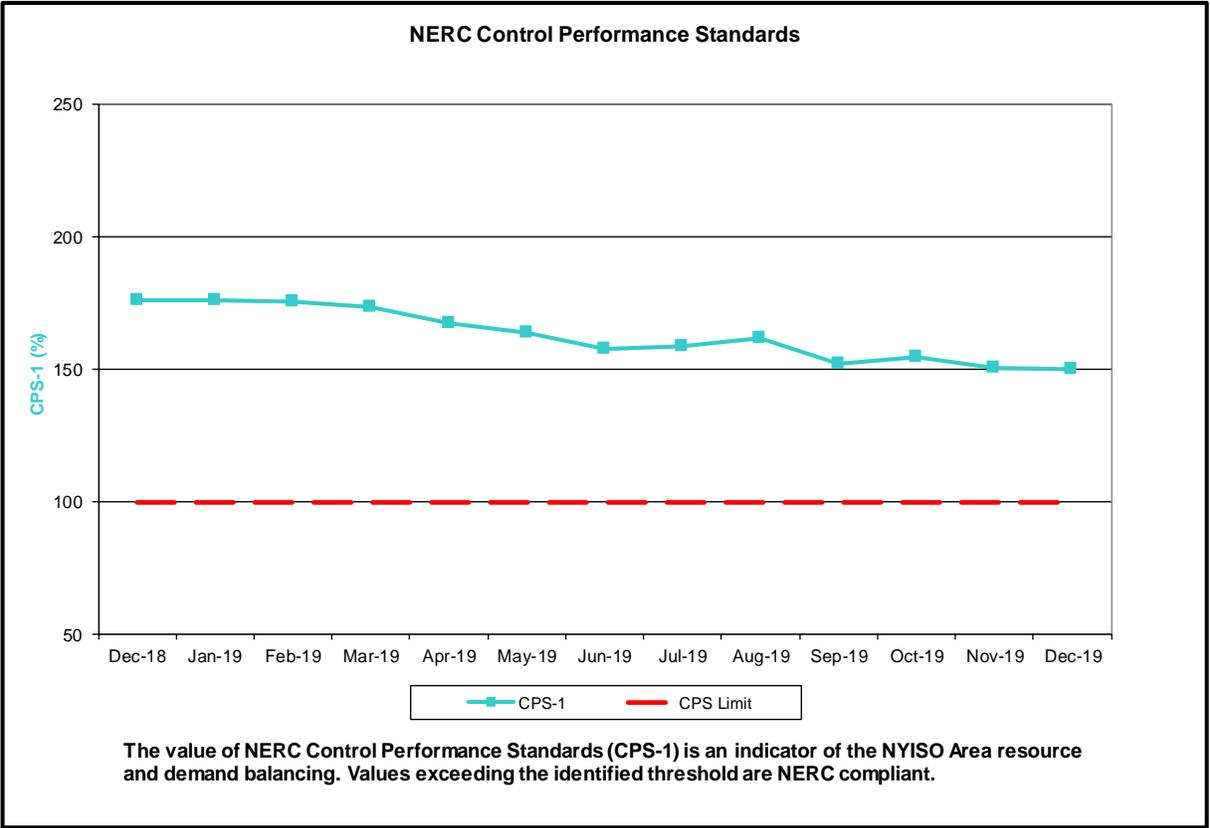
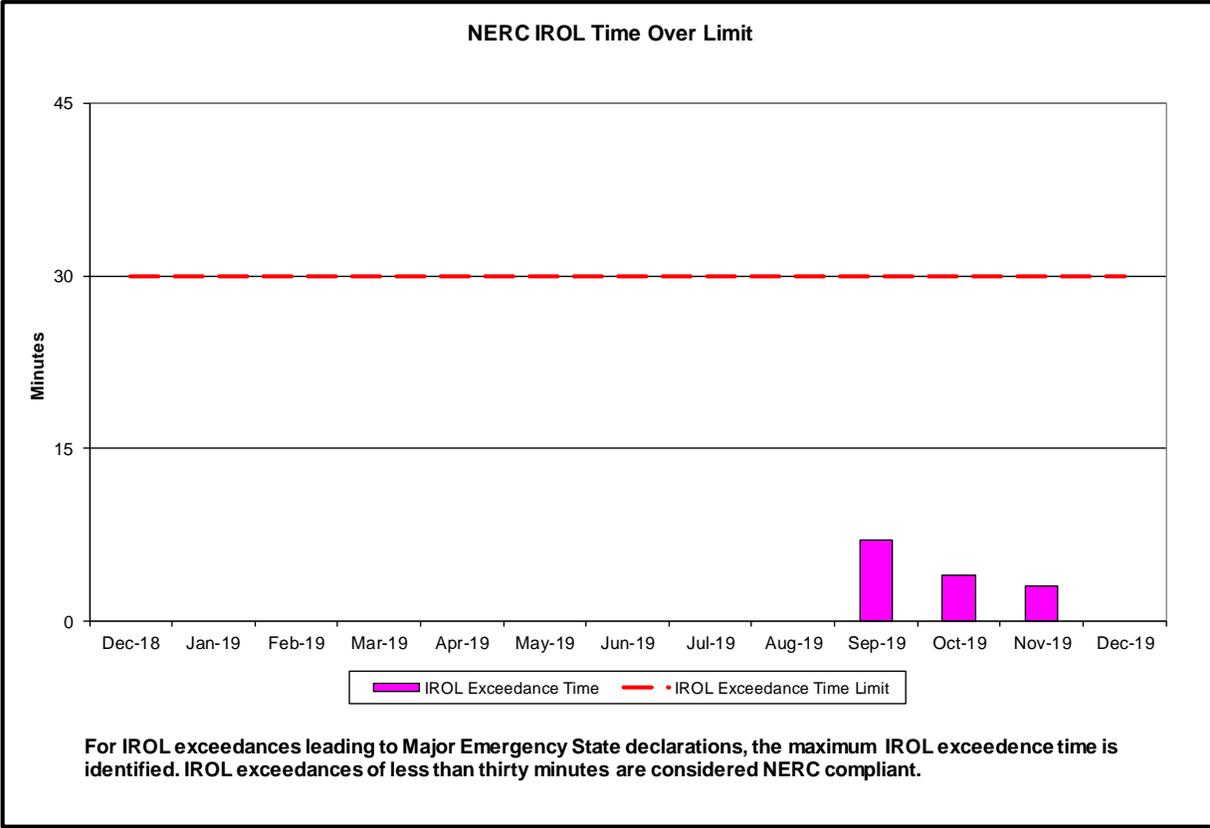
- Statewide uplift cost monthly average was (\$0.35)/MWh
- The following table identifies the Monthly ICAP spot market prices and the price delta.

| Spot Auction Price Results | NYCA | Lower Hudson Valley Zones | New York City Zone | Long Island Zone |
|----------------------------|--------|---------------------------|--------------------|------------------|
| January 2020 Spot Price | \$0.09 | \$0.09 | \$3.71 | \$0.09 |
| December 2019 Spot Price | \$0.03 | \$0.03 | \$3.99 | \$0.03 |
| Delta | \$0.06 | \$0.06 | (\$0.28) | \$0.06 |

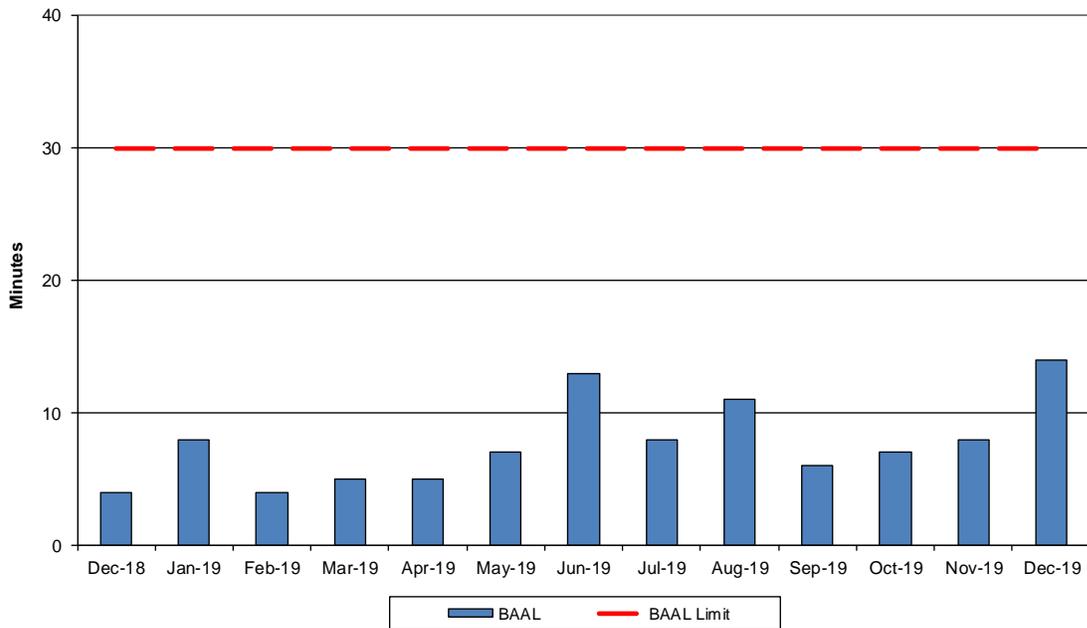
- NYC - Price decreased \$0.28 due to an increase in Generation UCAP available.

Reliability Performance Metrics



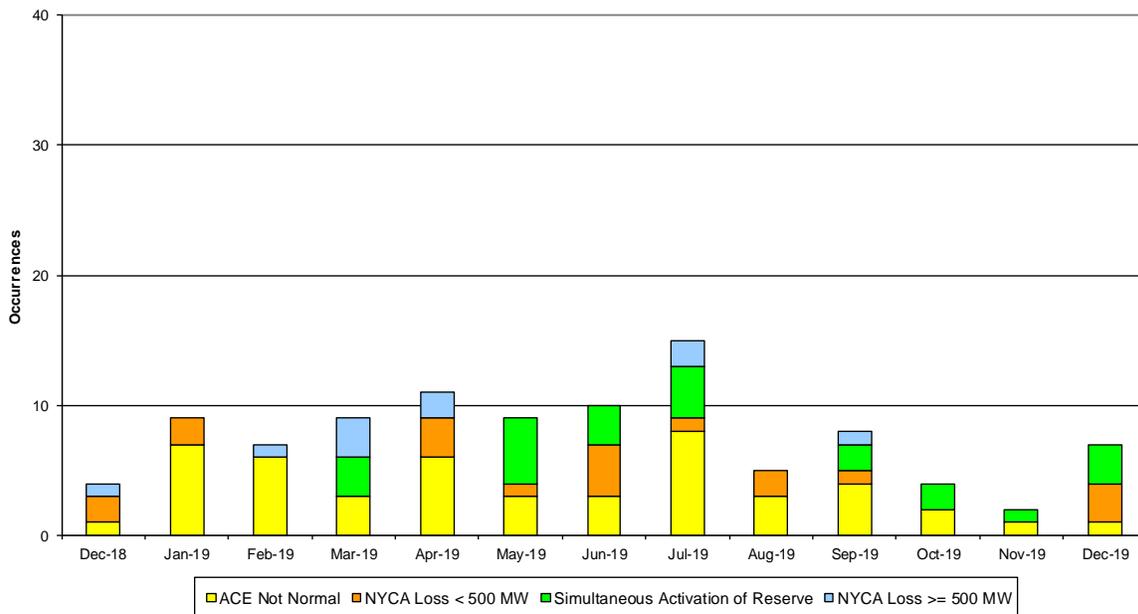


NERC Balancing Authority ACE Limit Standard

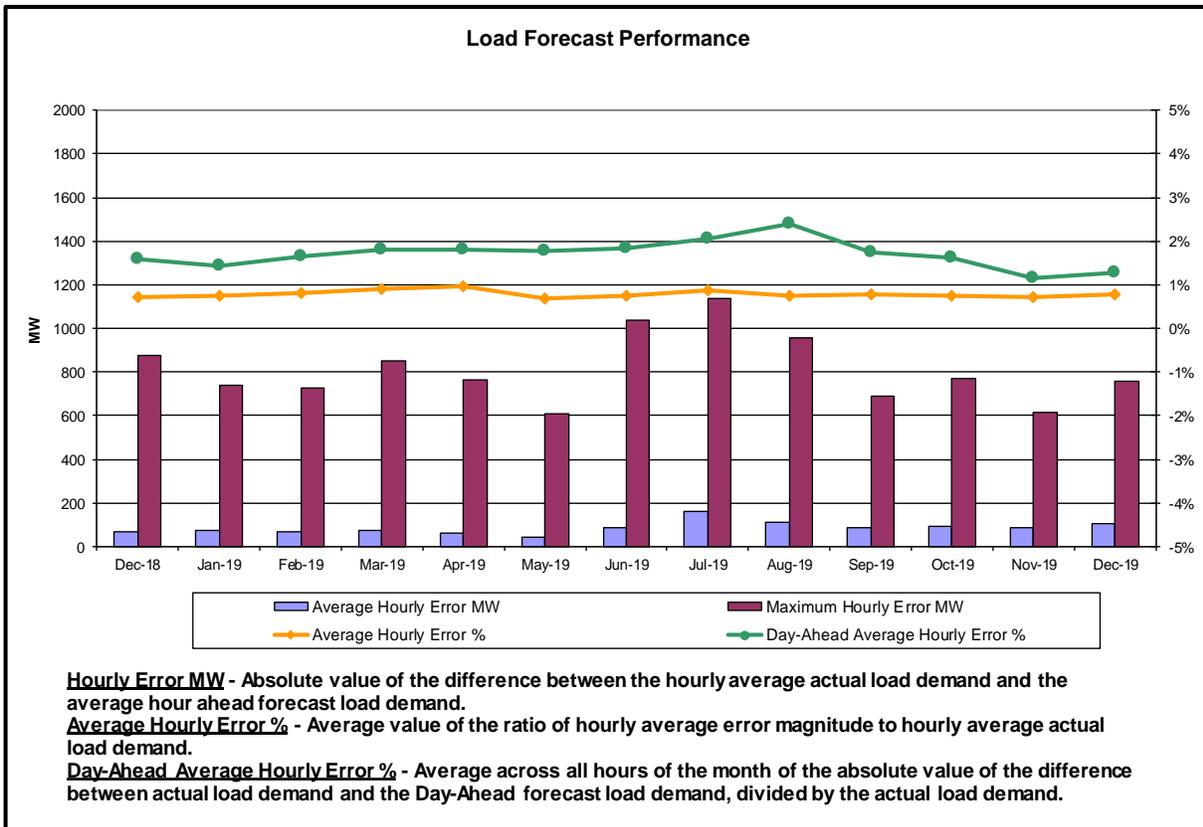
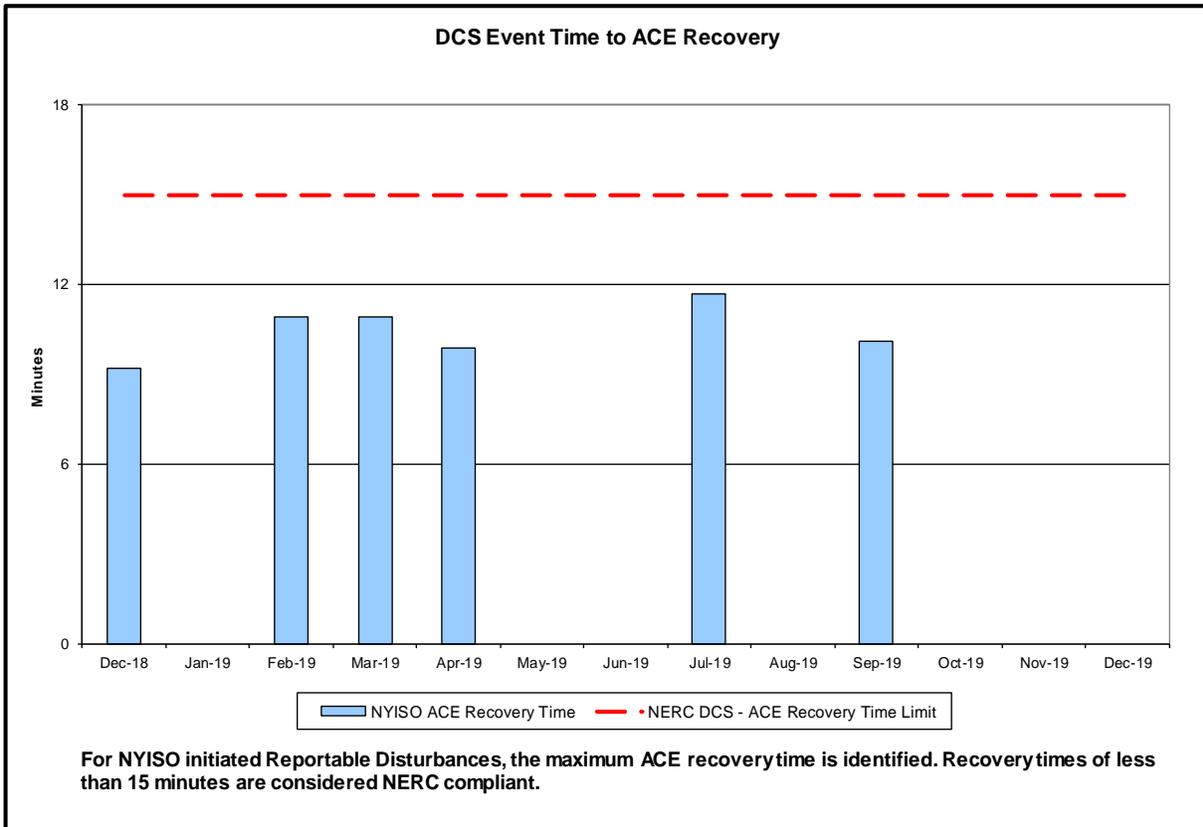


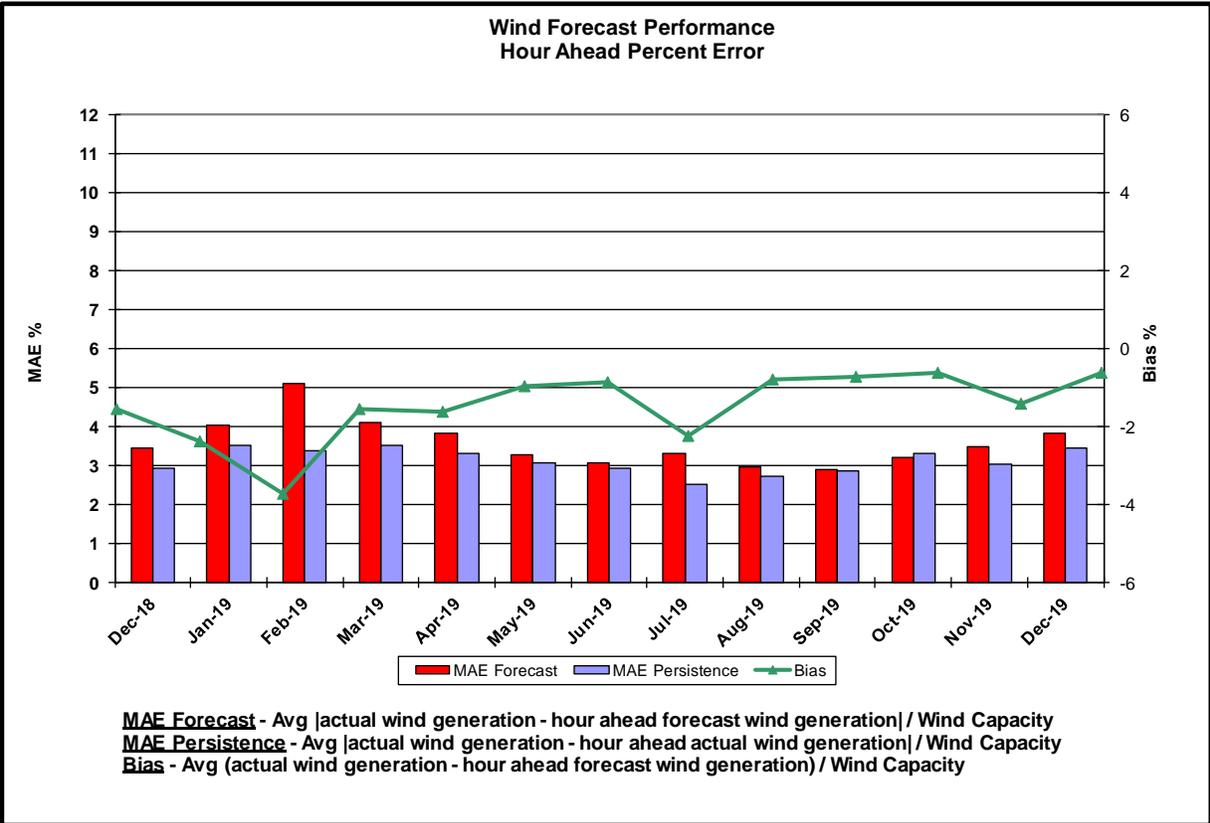
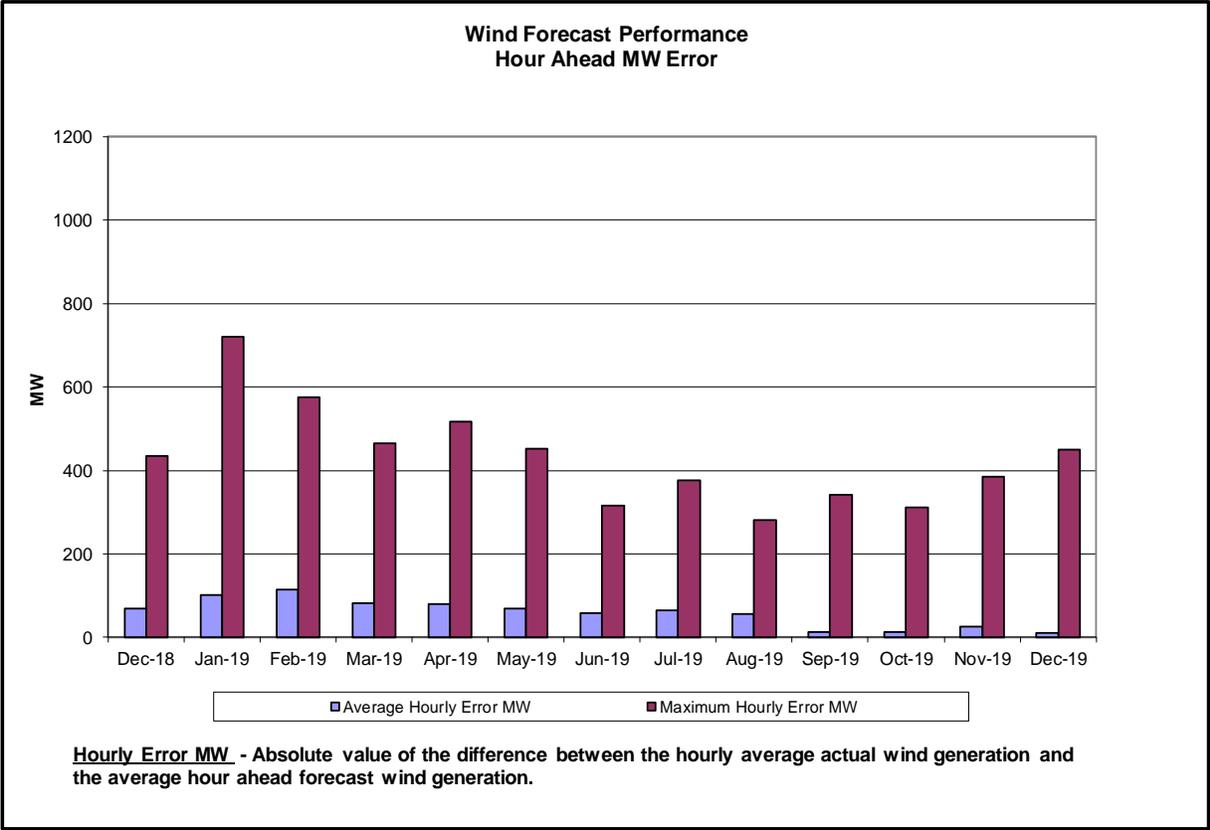
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

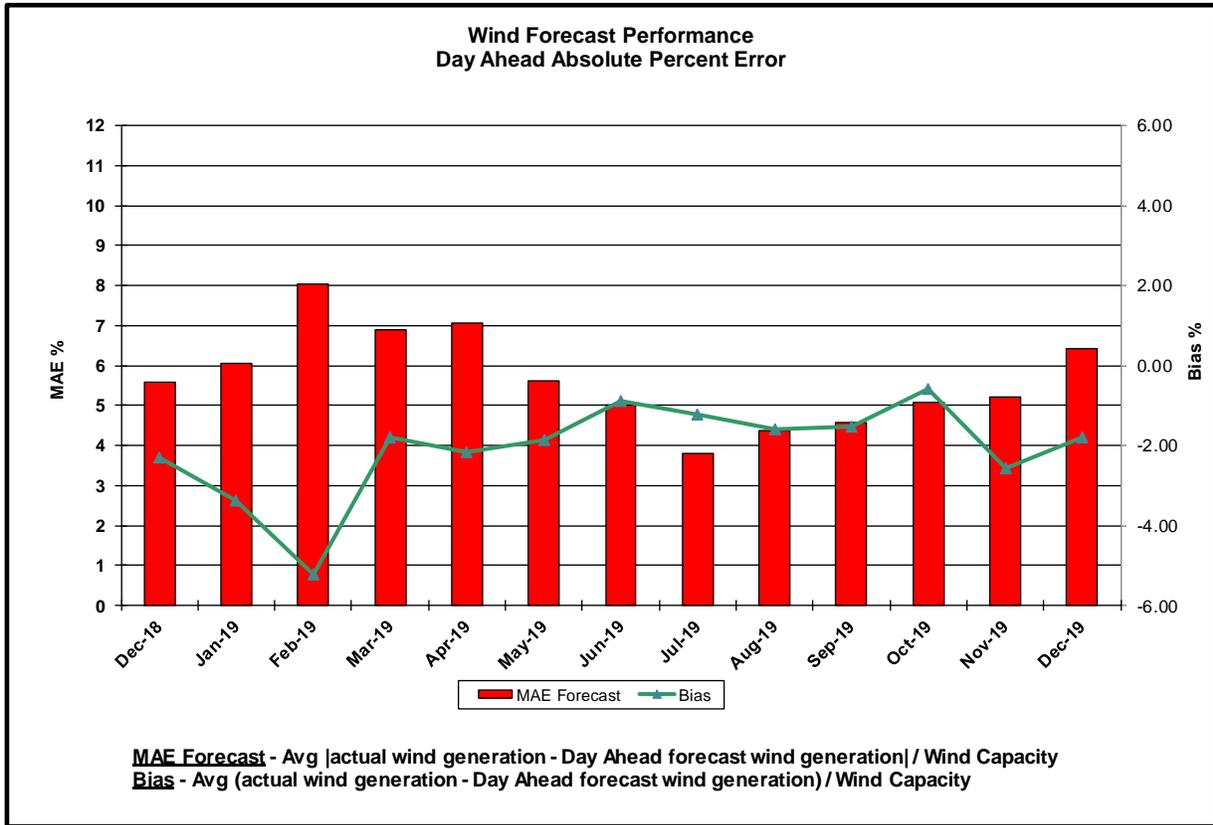
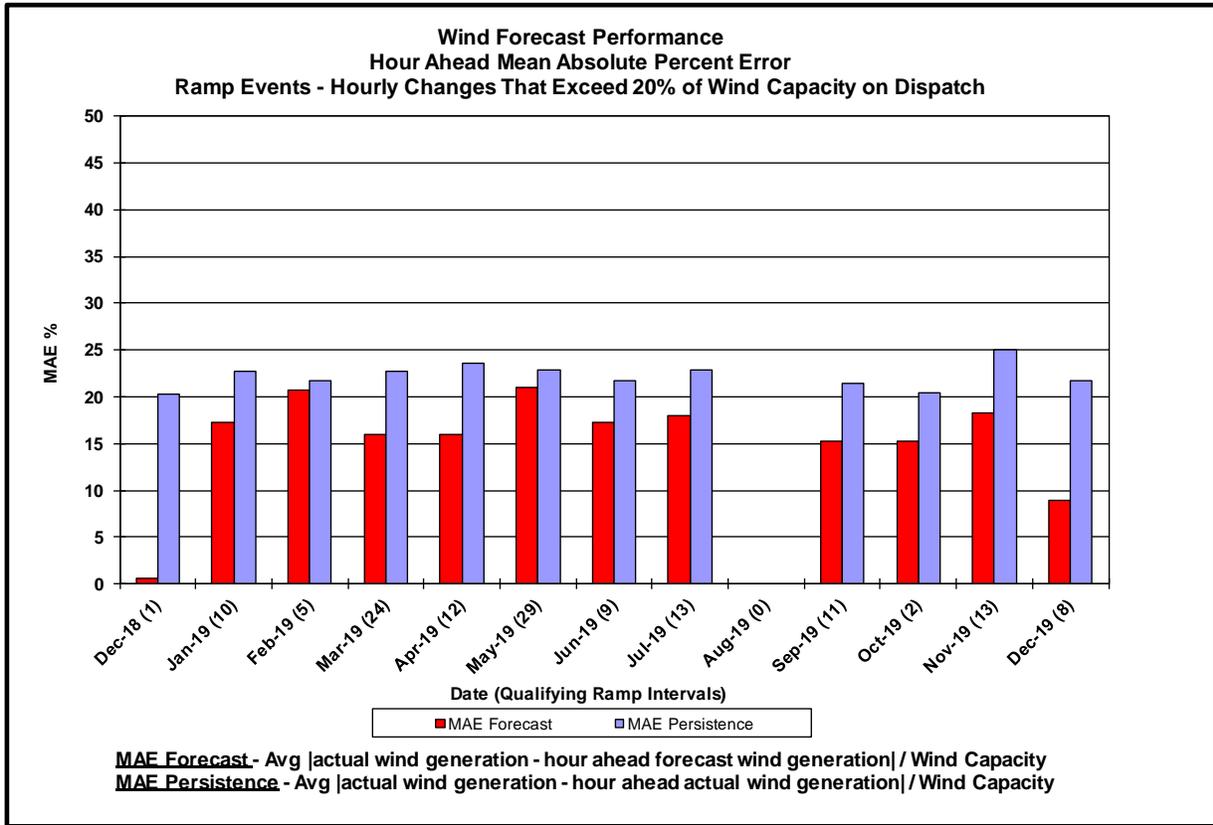
Reserve Activations

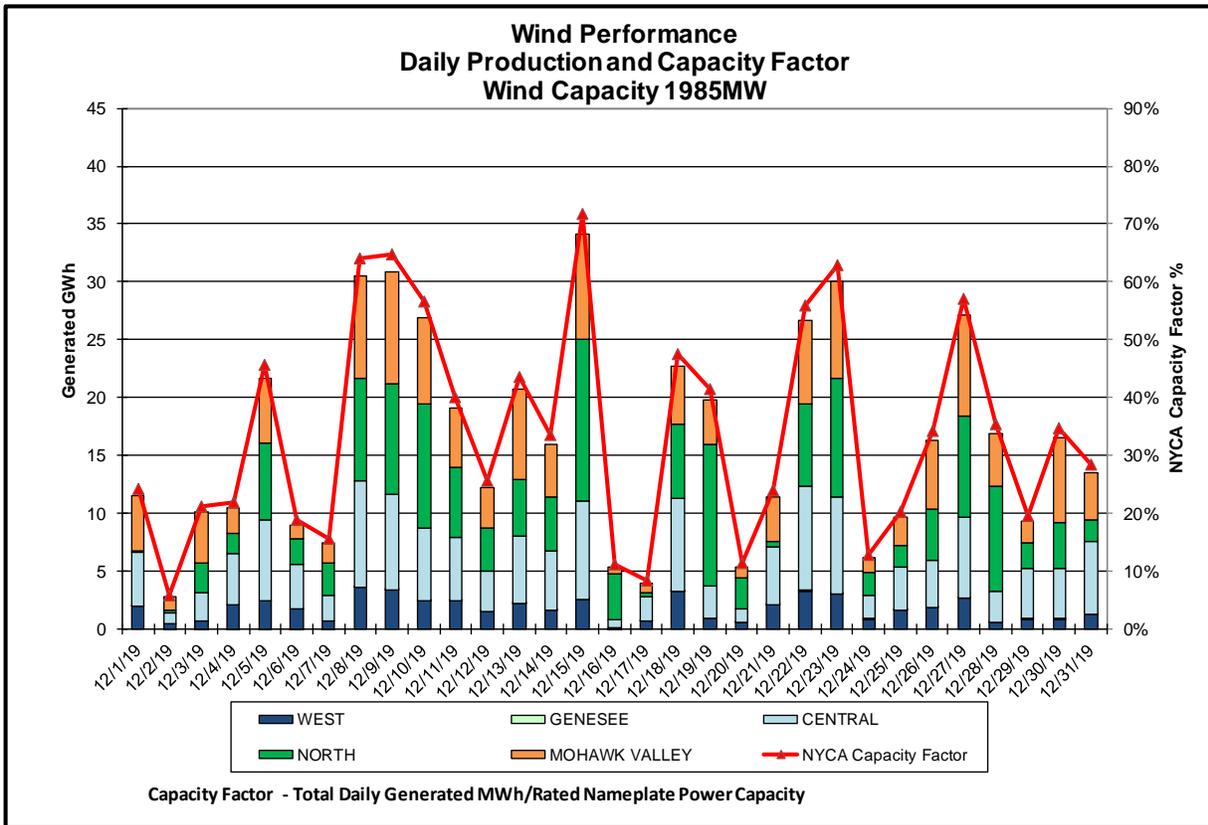
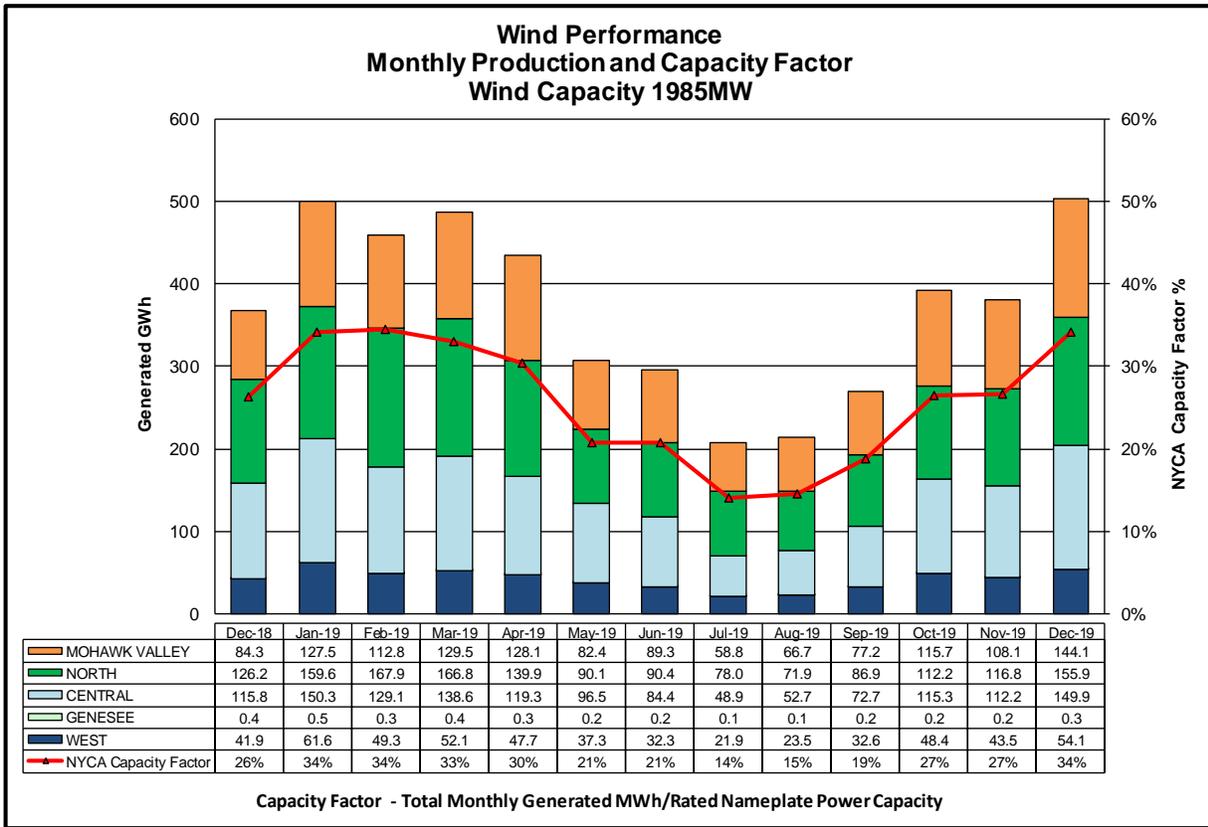


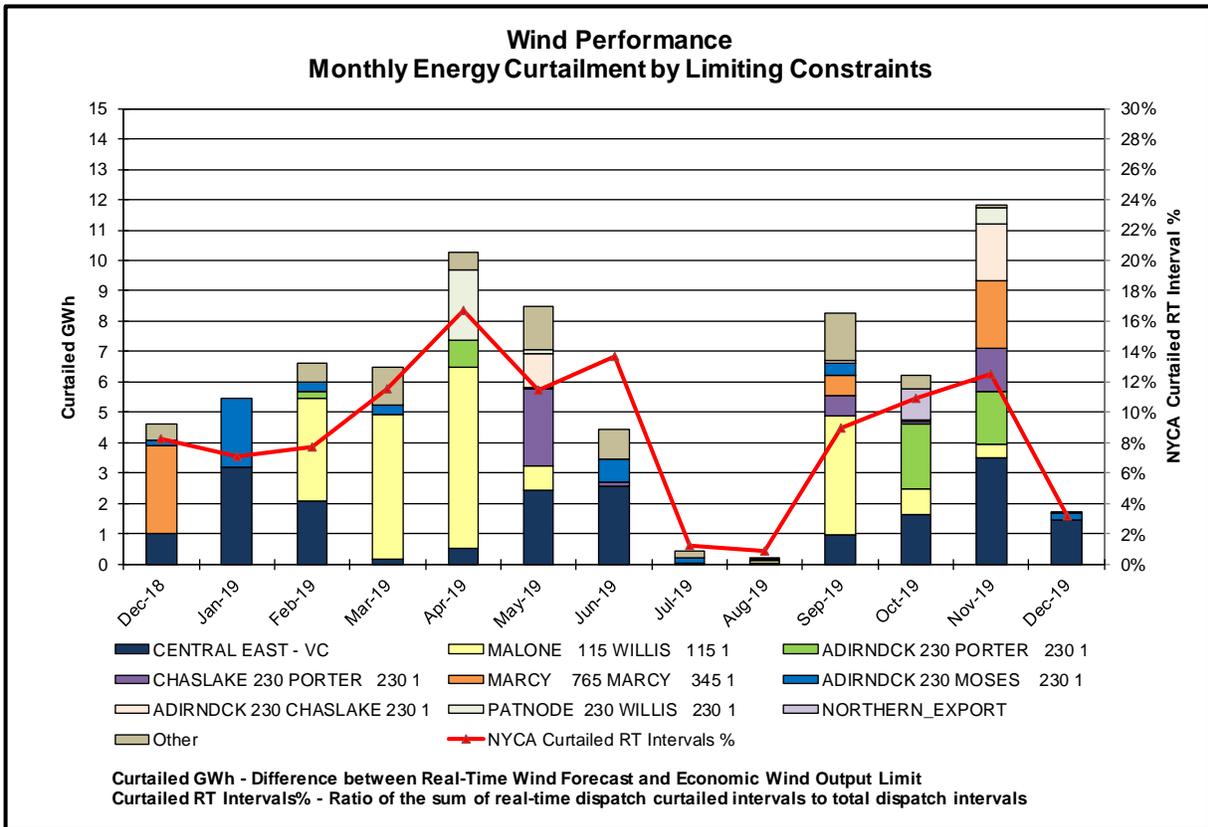
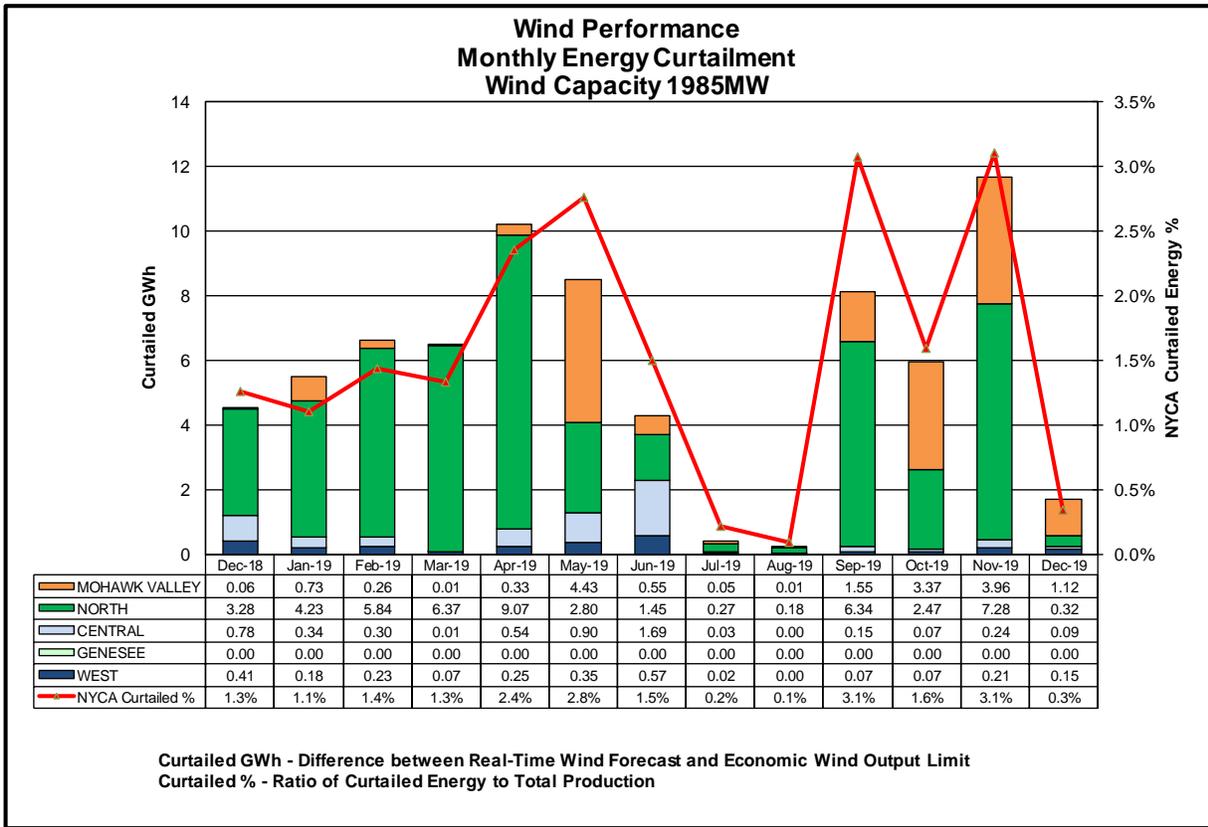
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

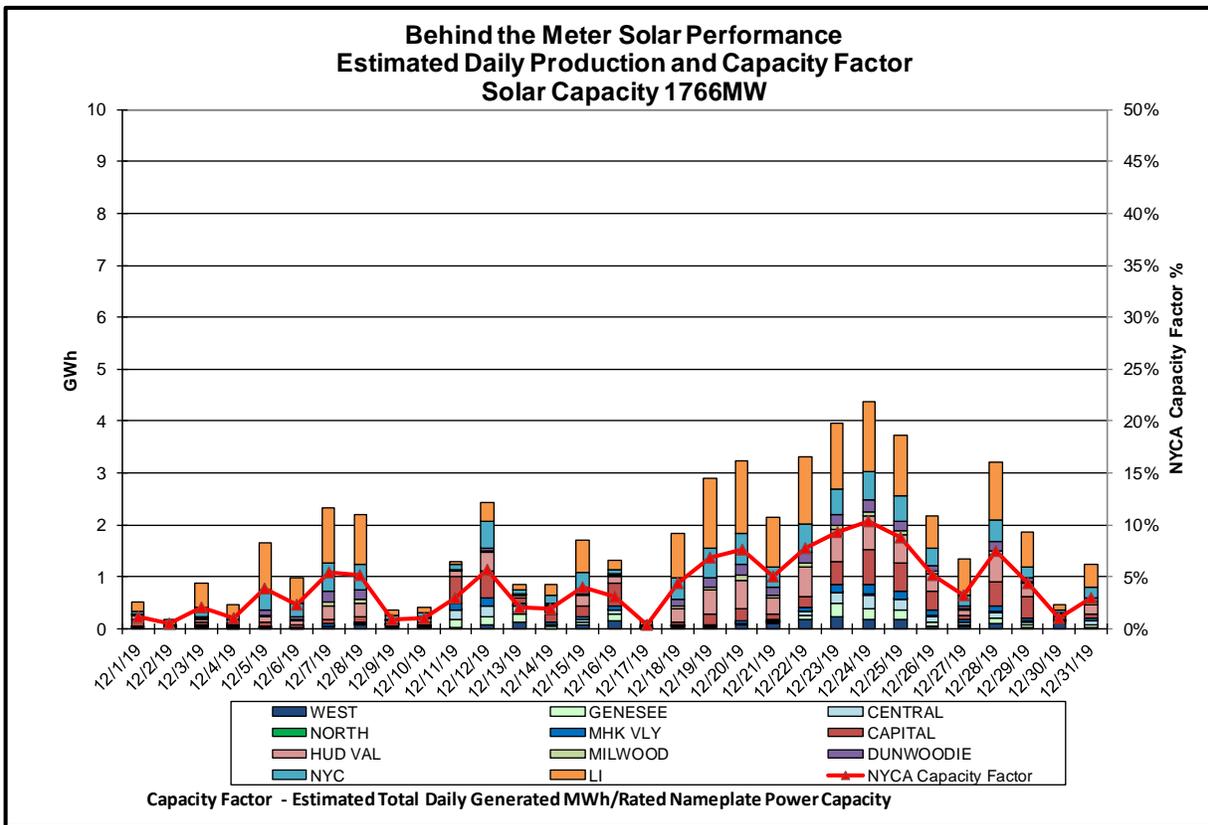
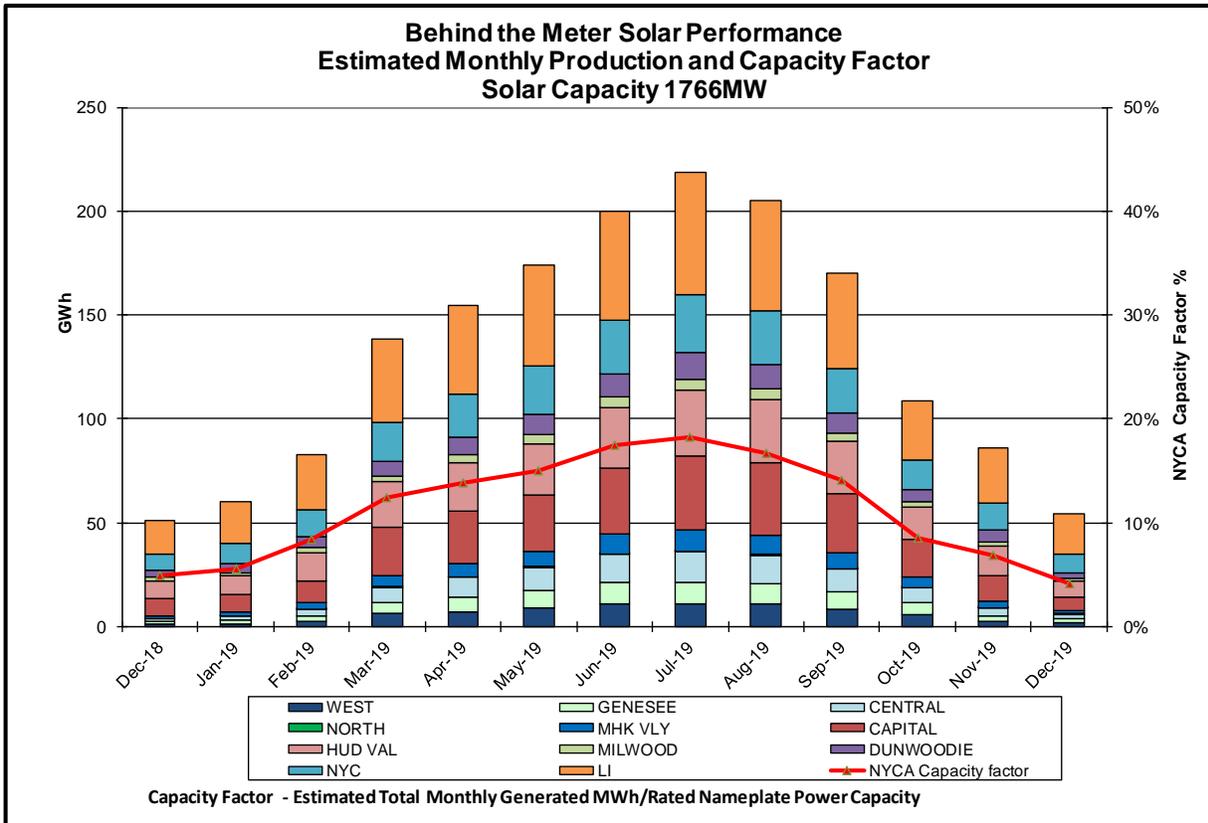


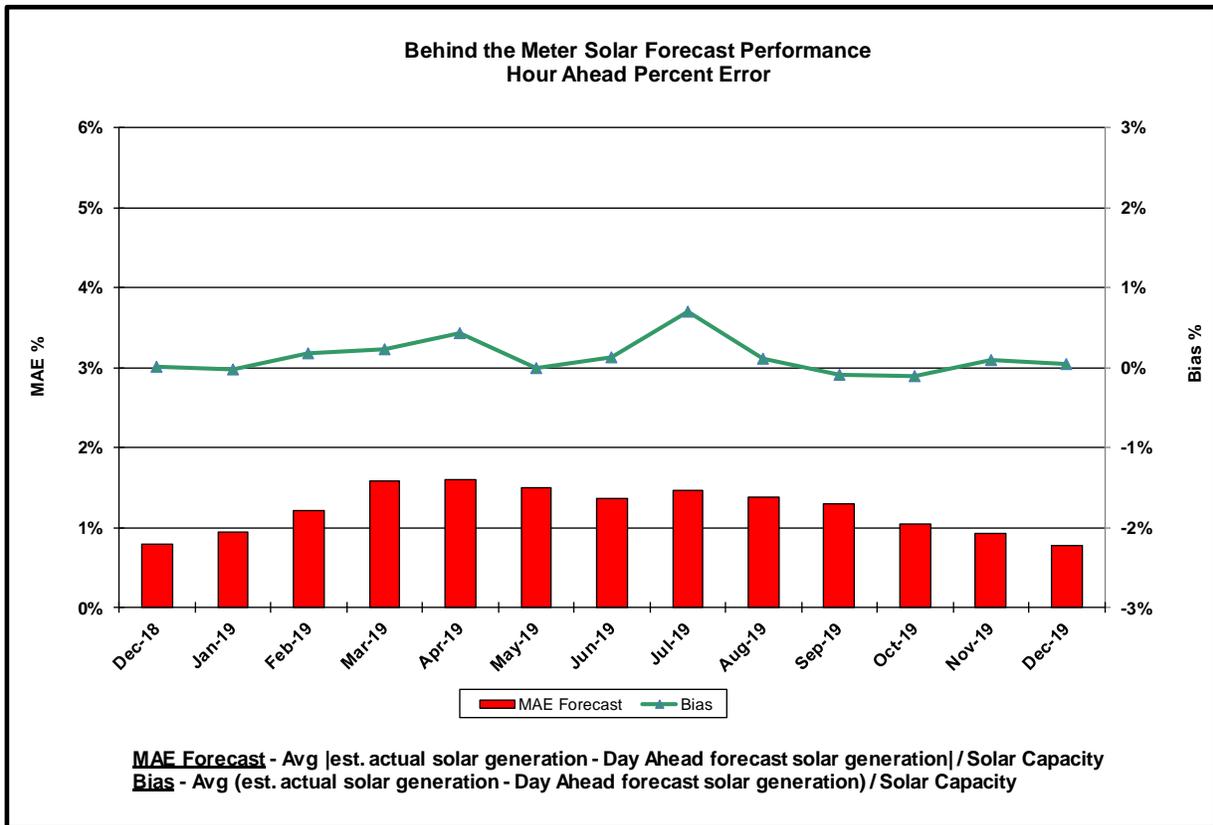
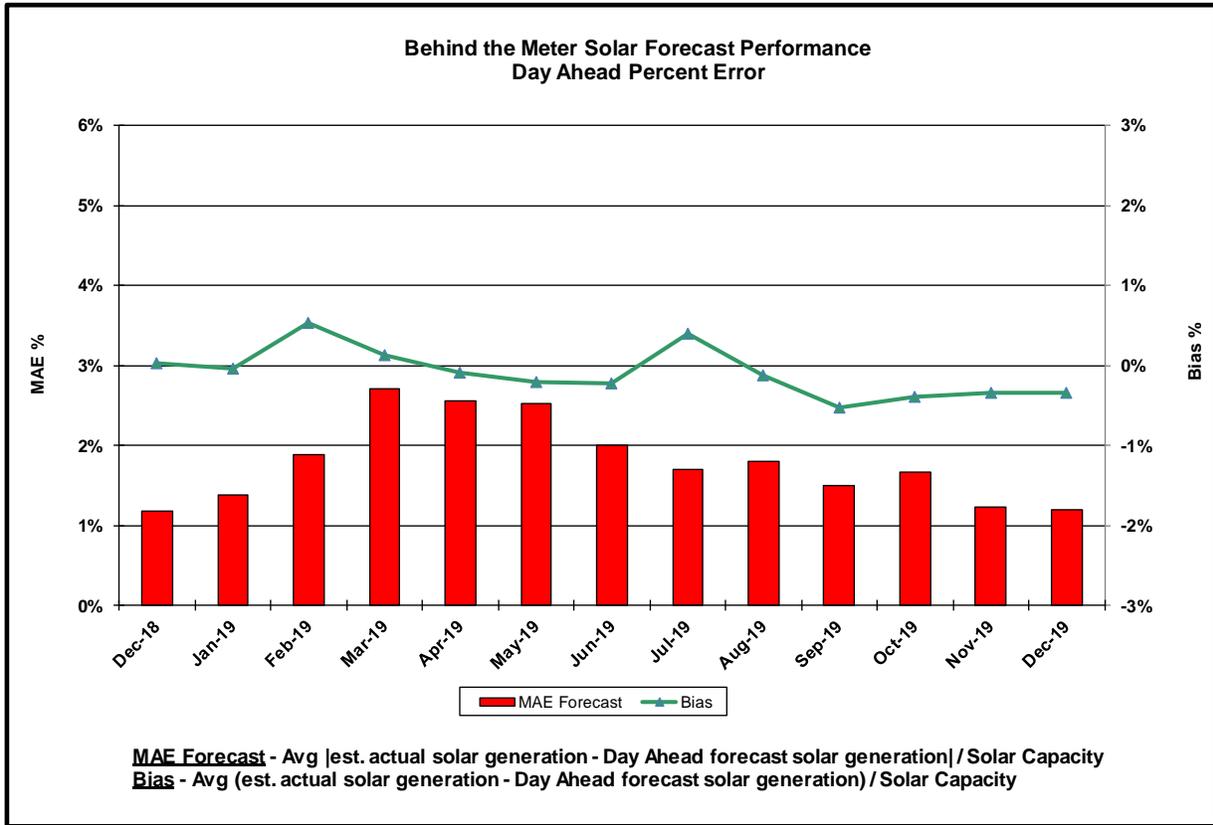


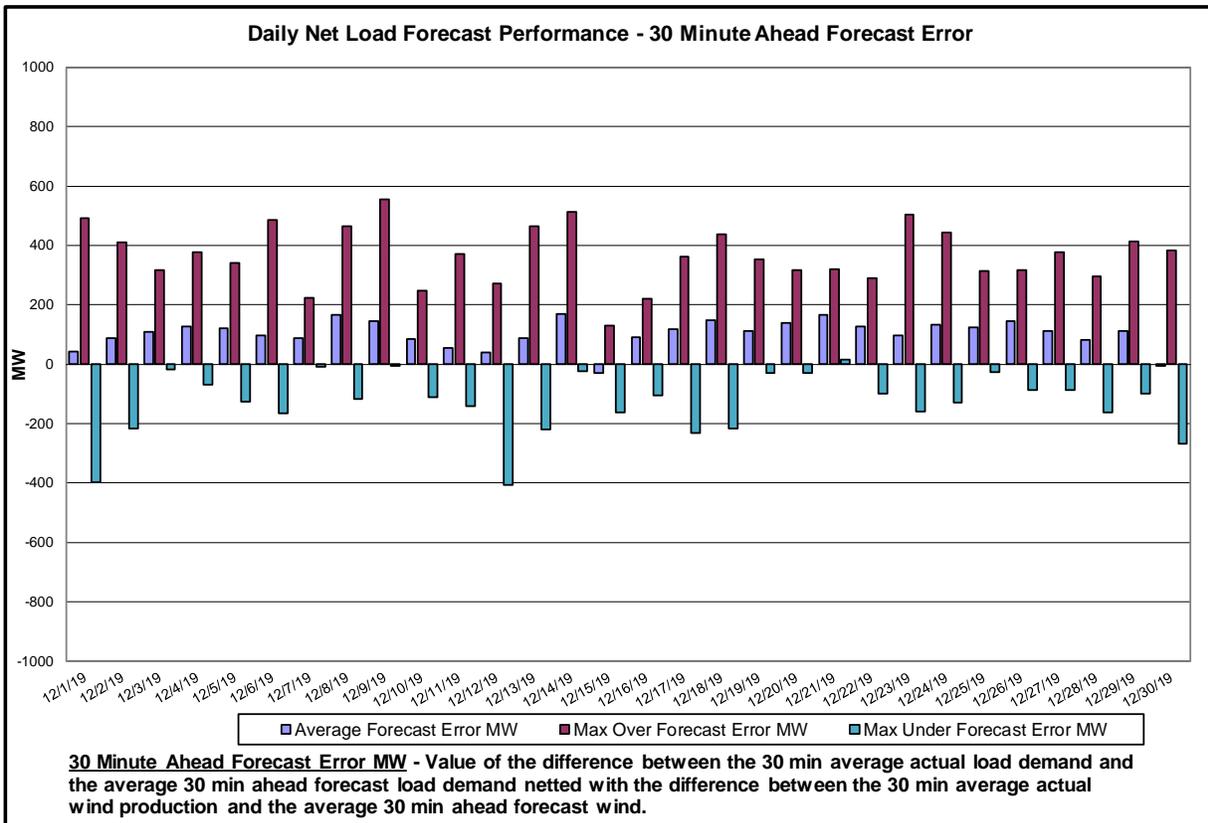
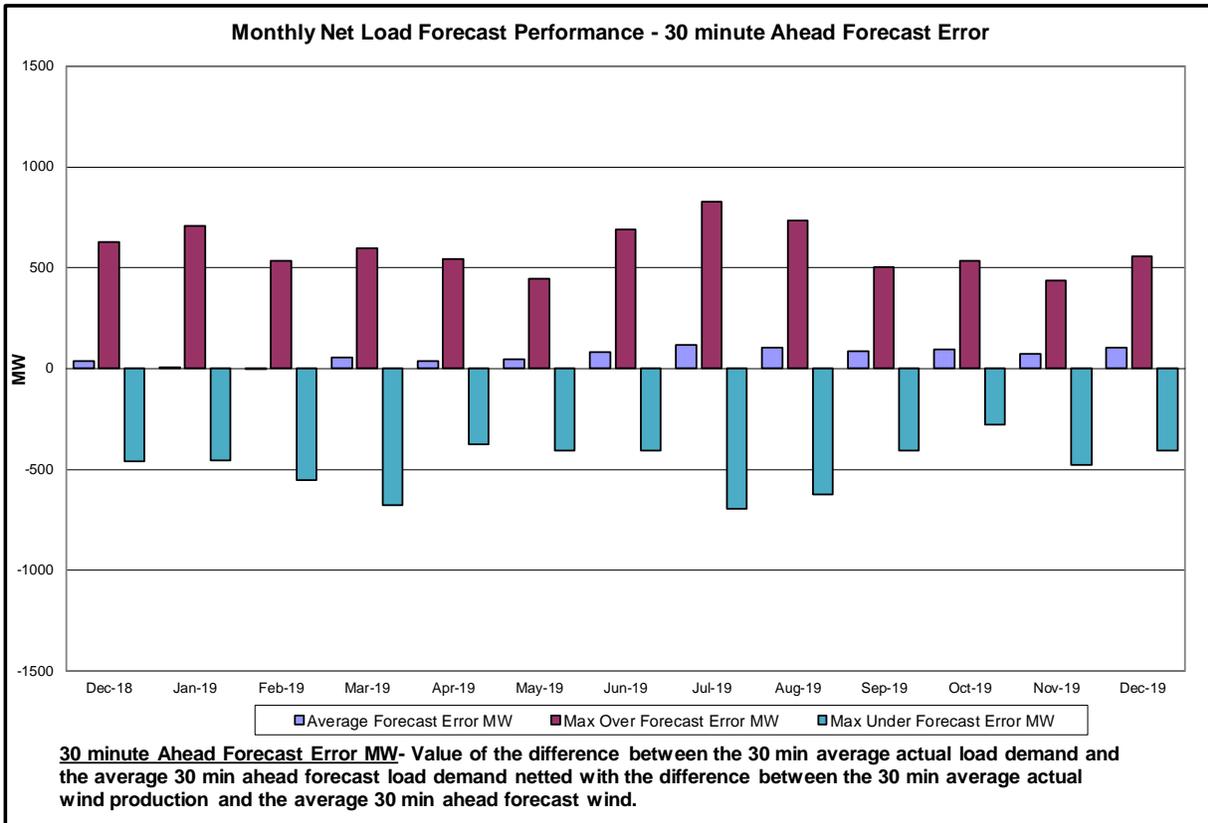


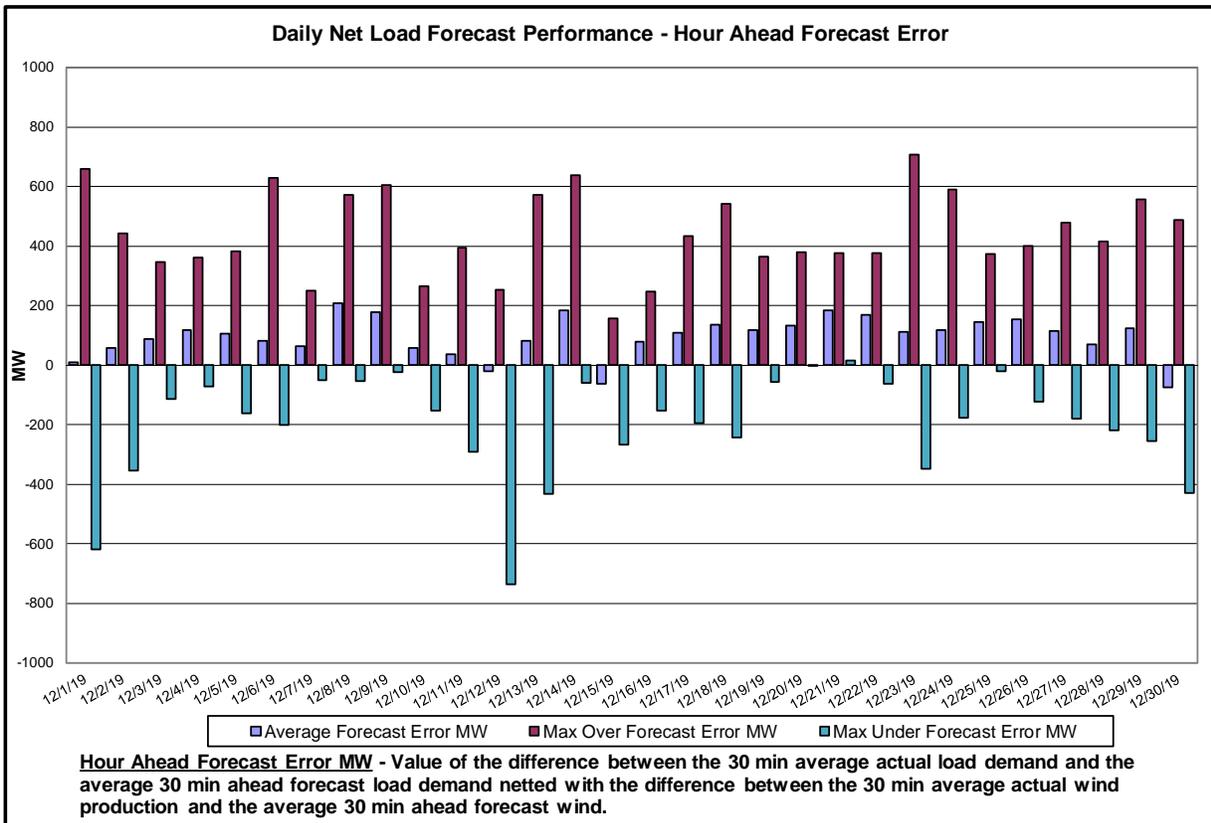
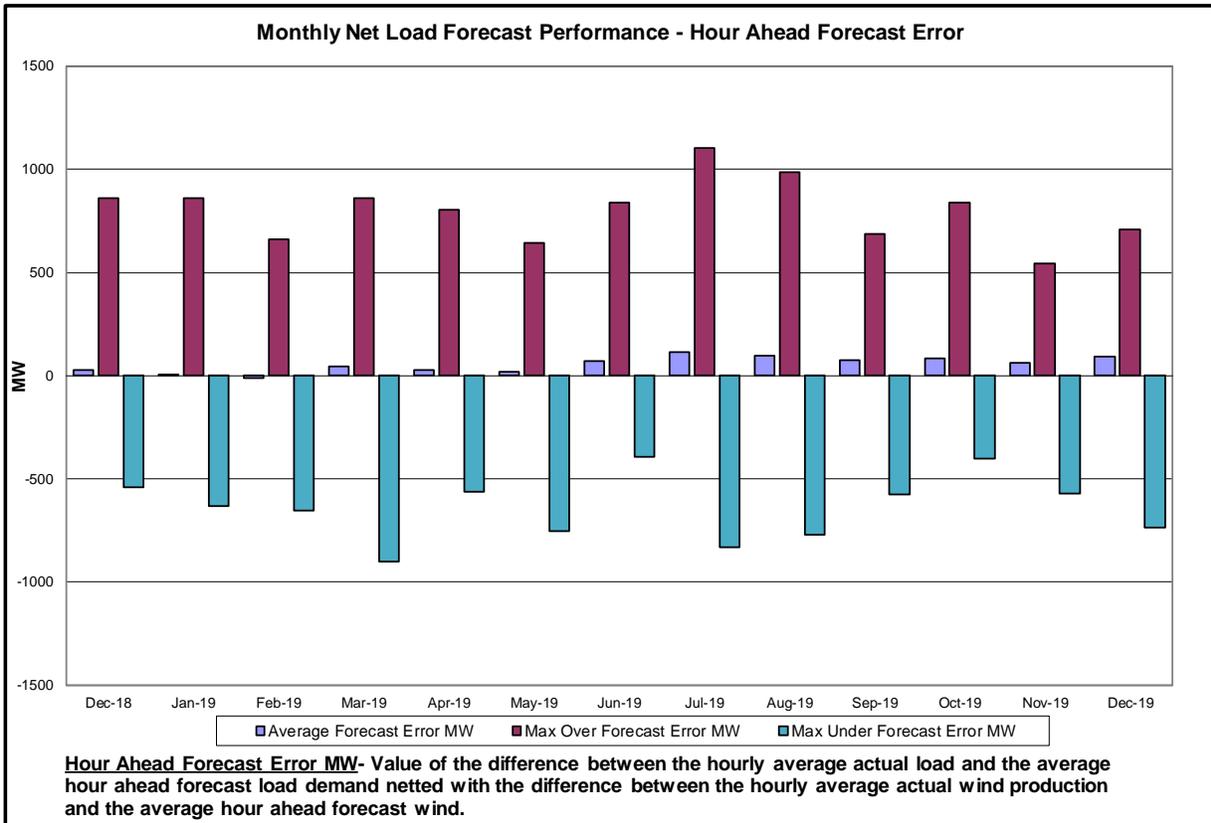


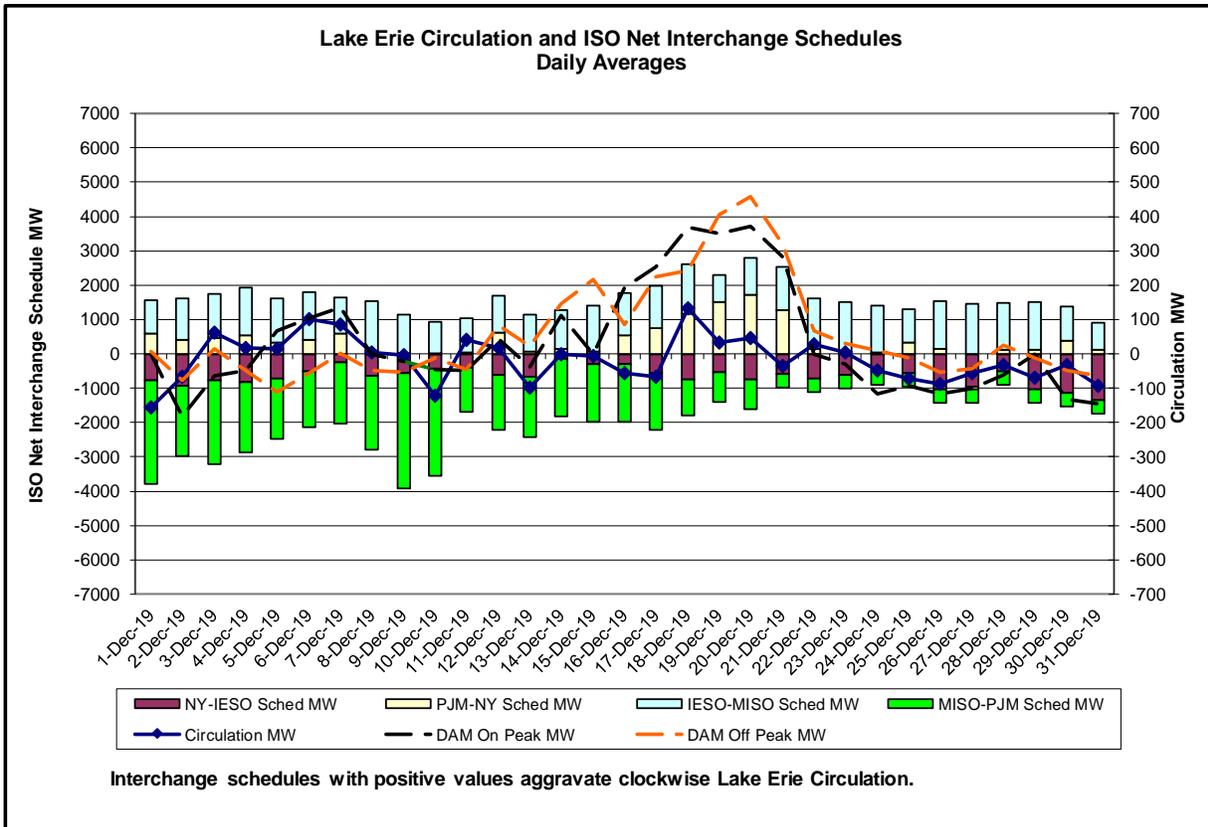
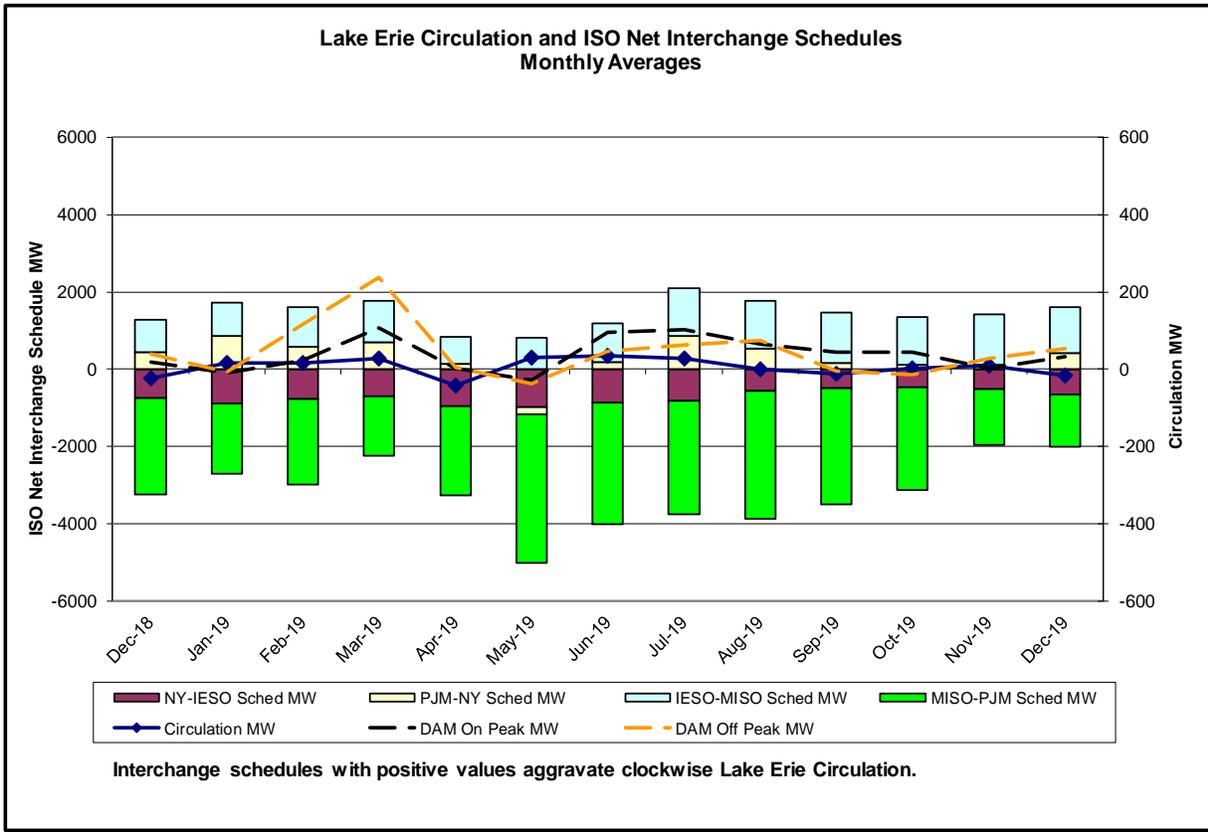




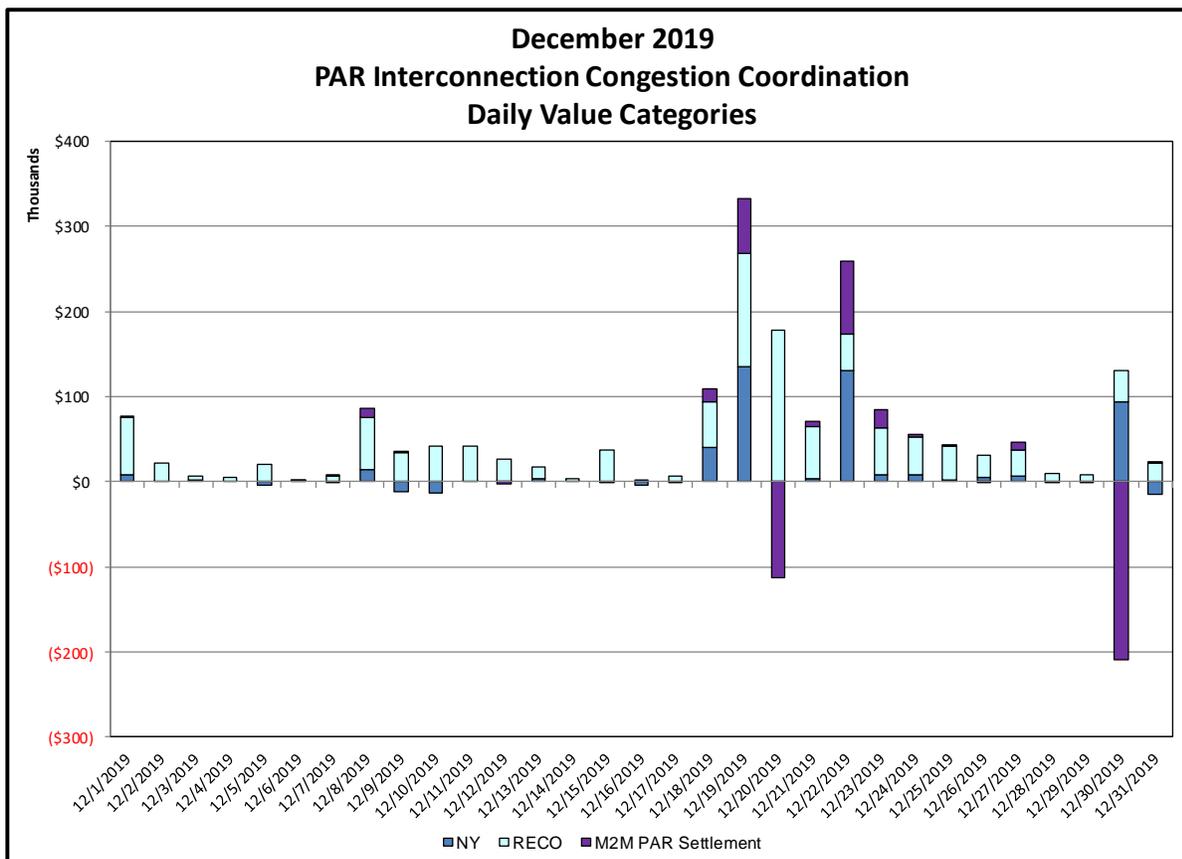
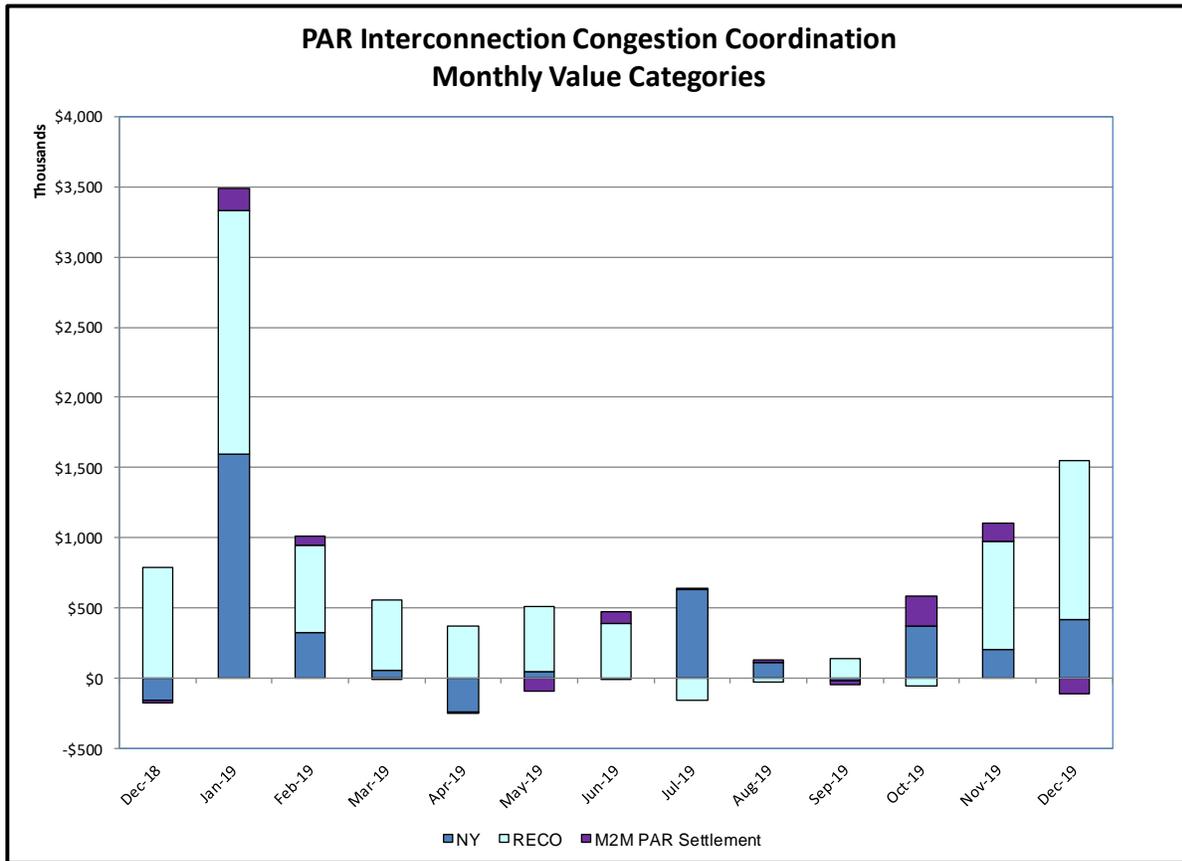






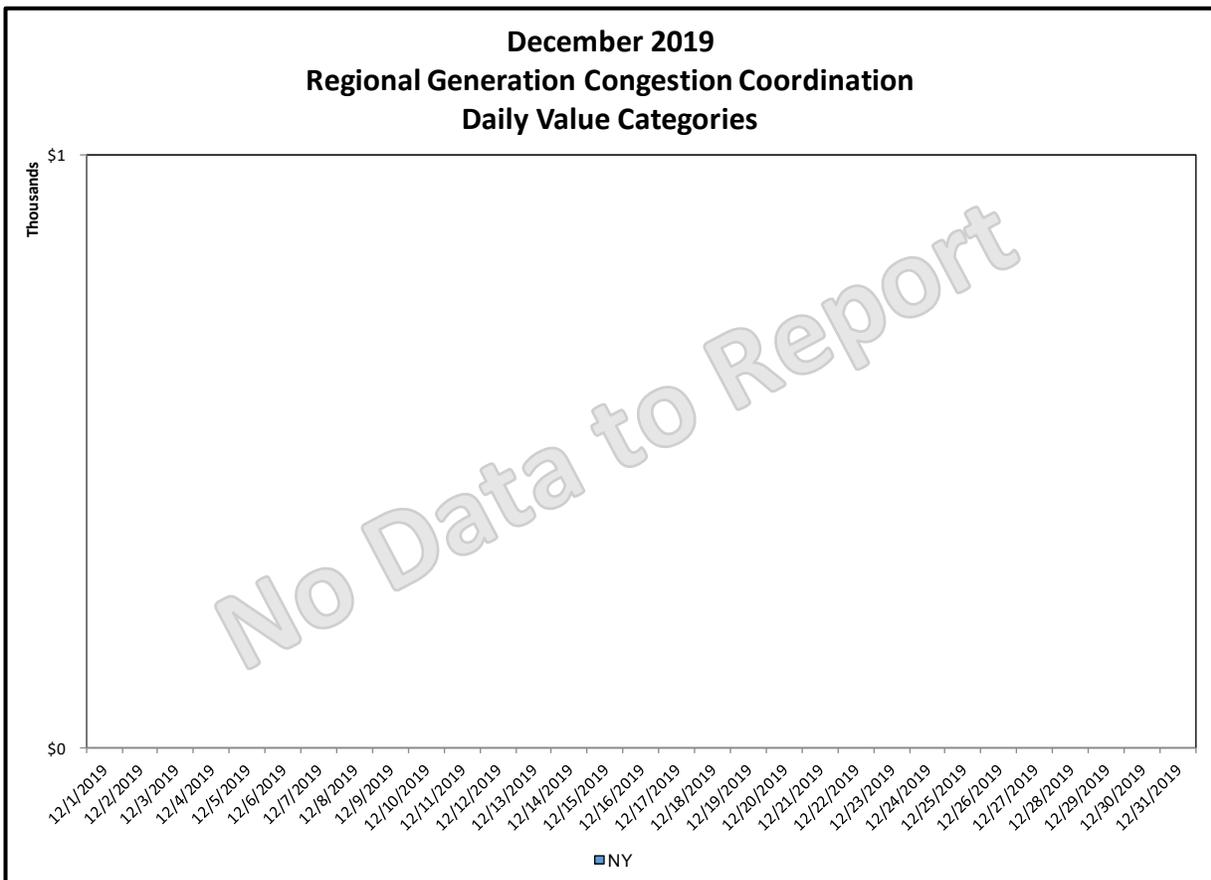
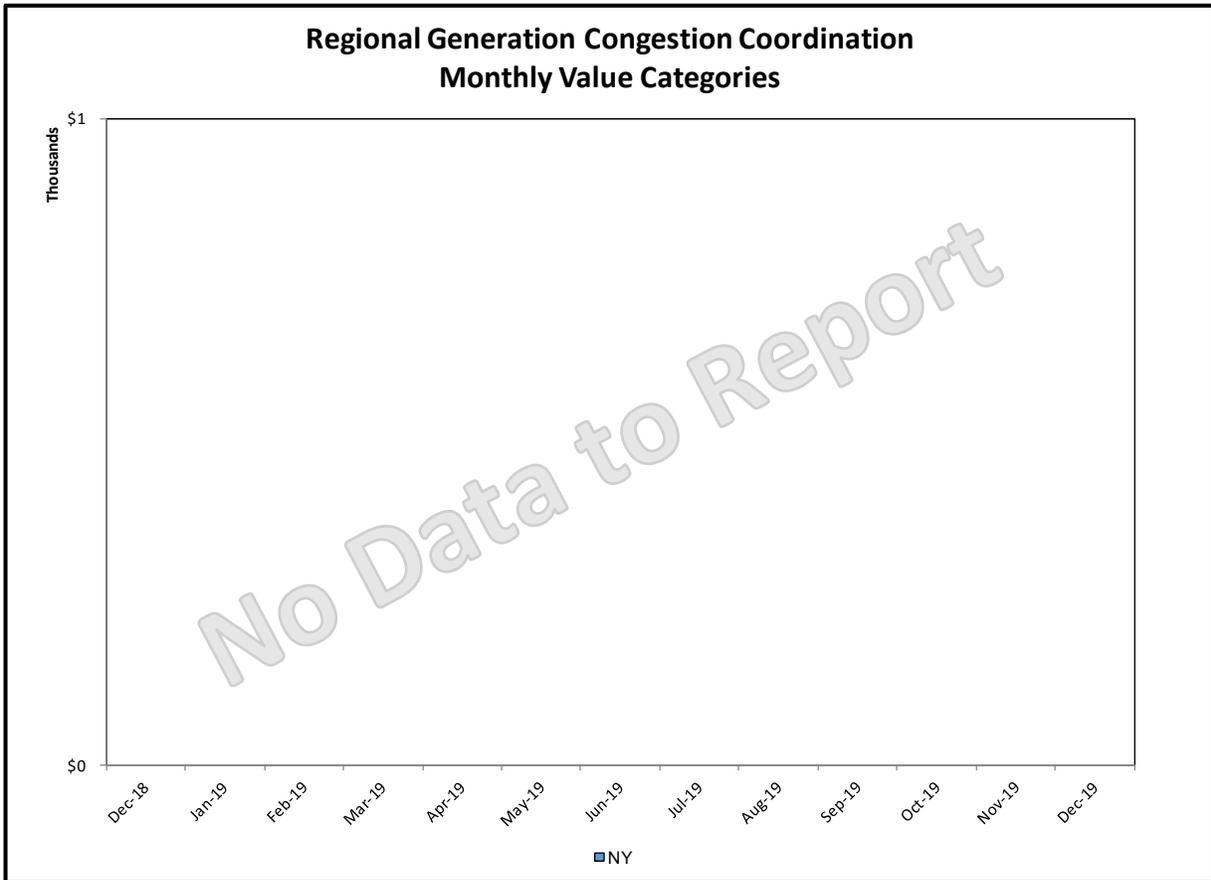


Broader Regional Market Performance Metrics



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. |



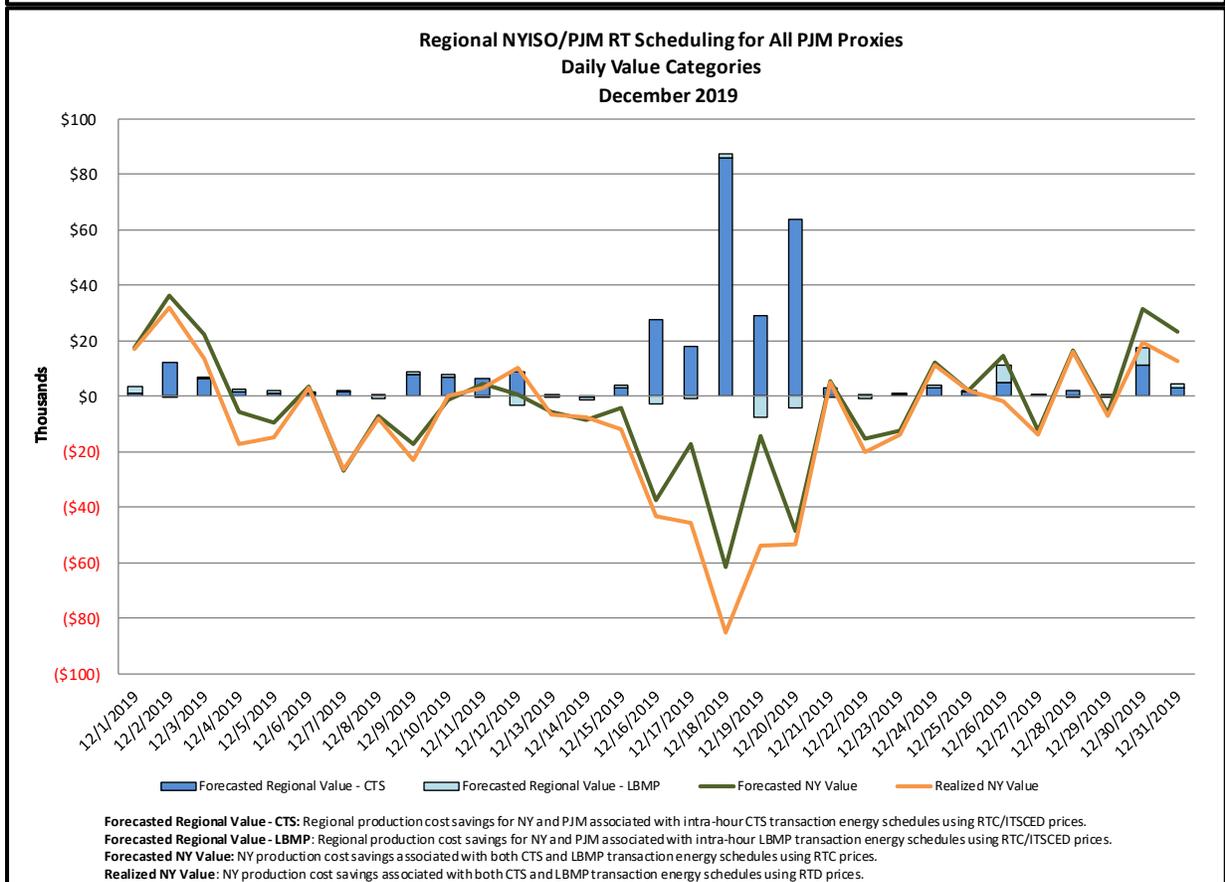
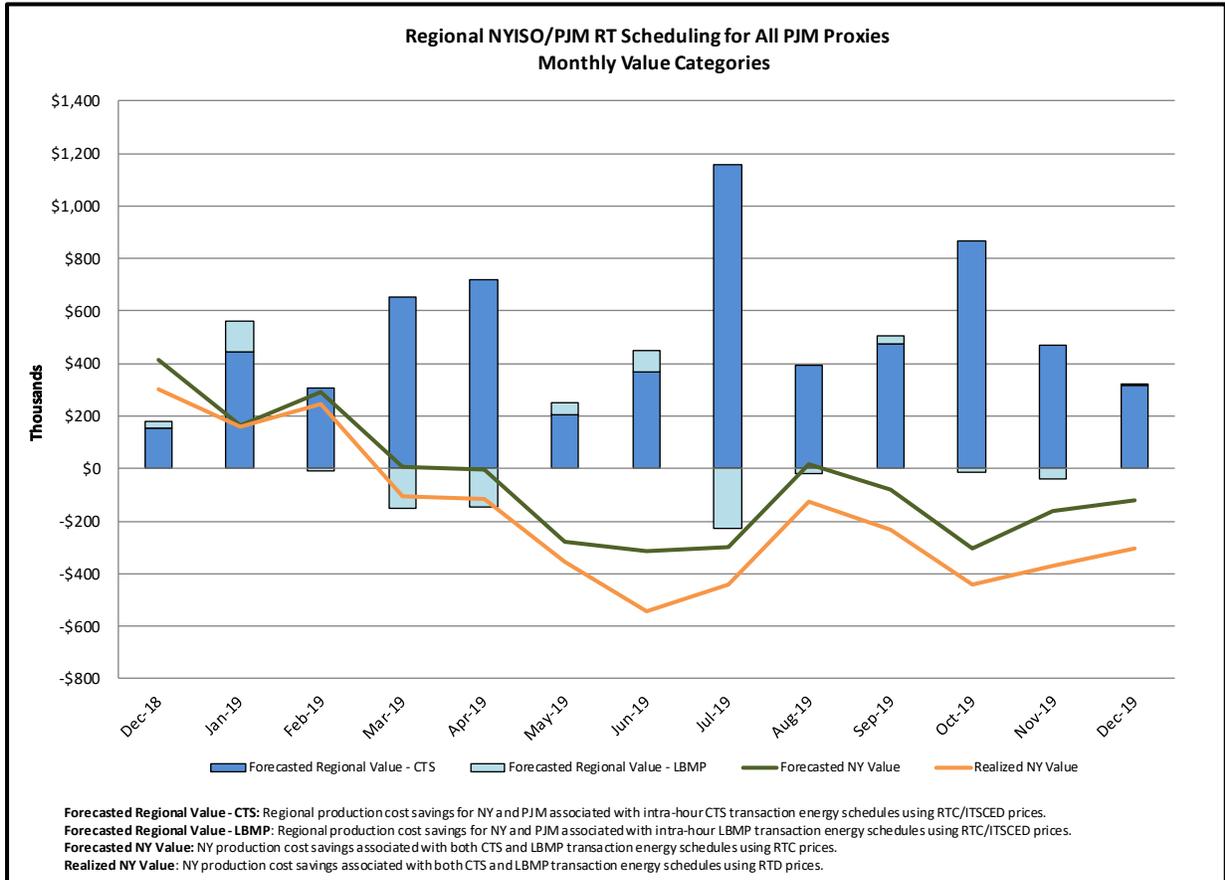
Regional Generation Congestion Coordination

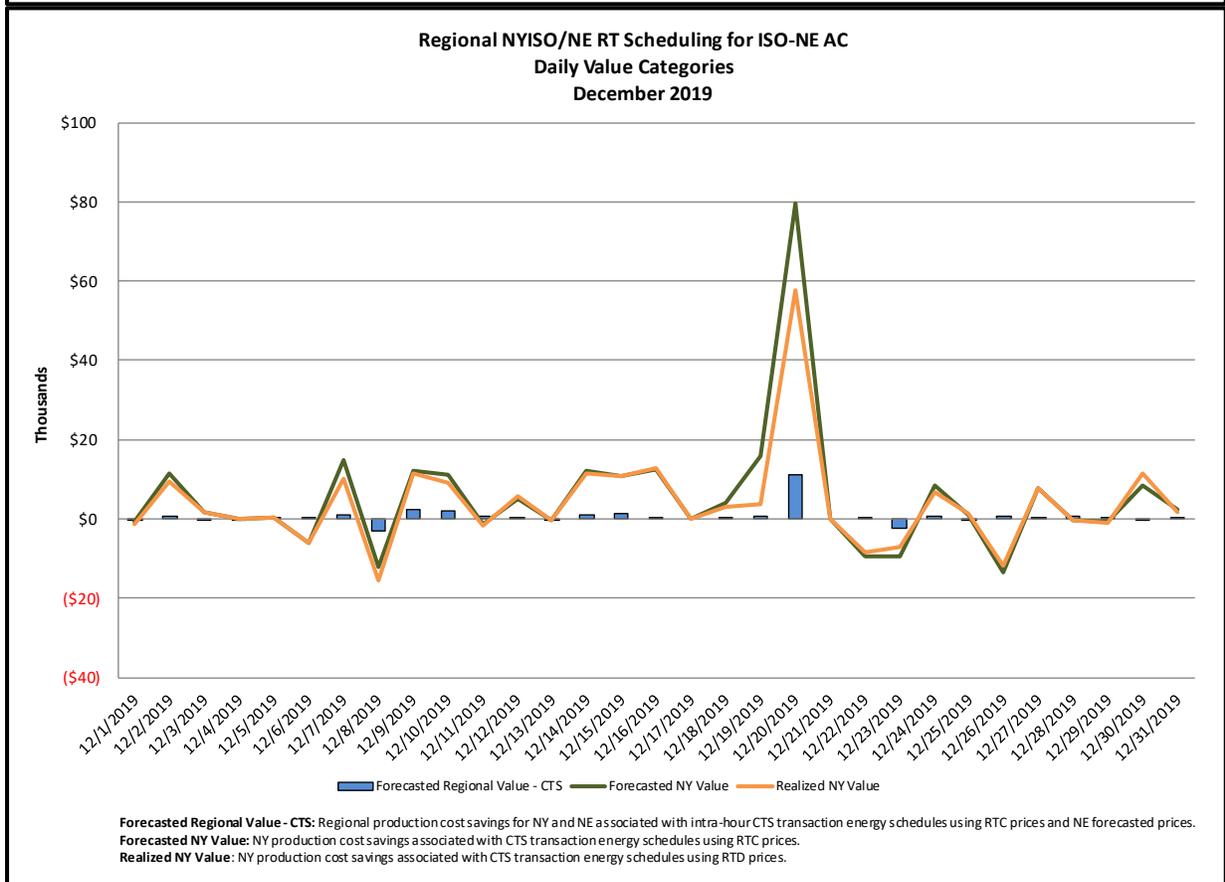
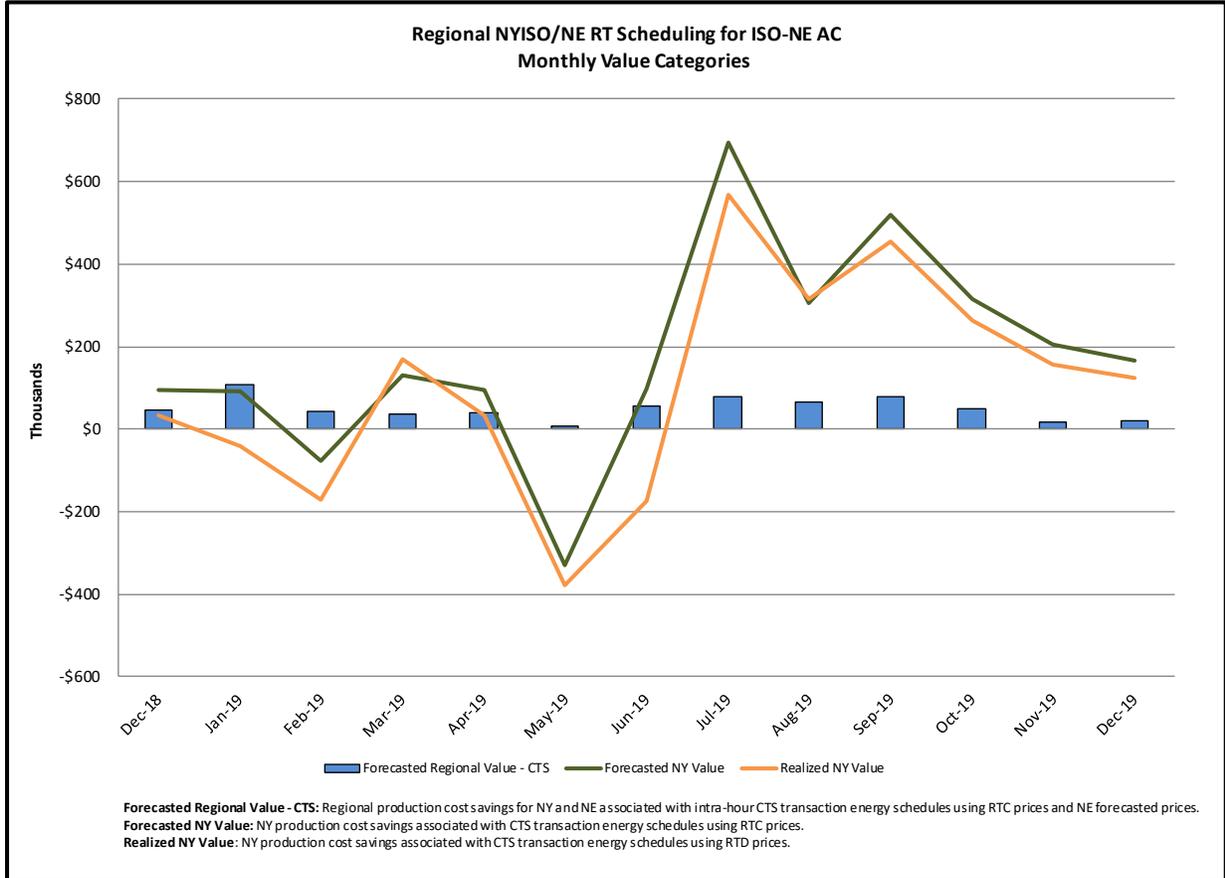
Category

NY

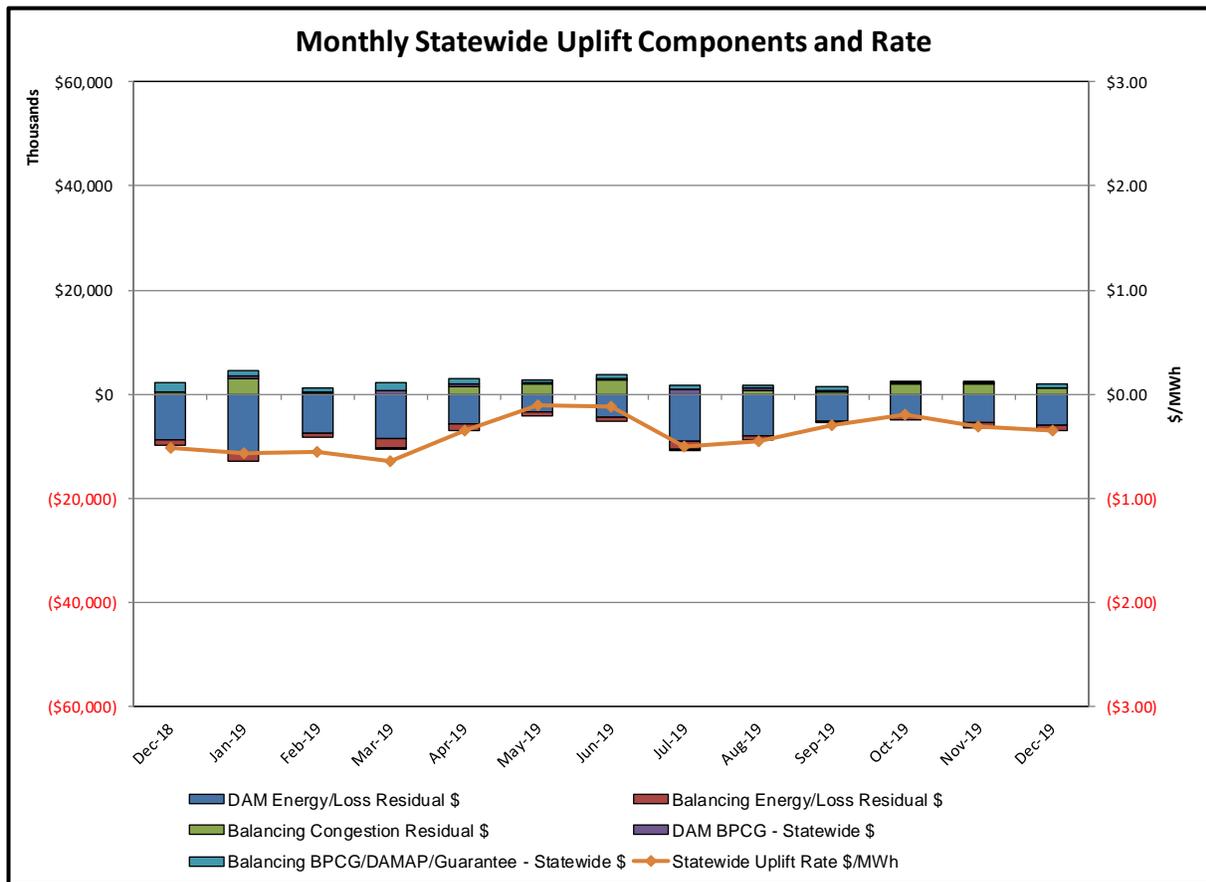
Description

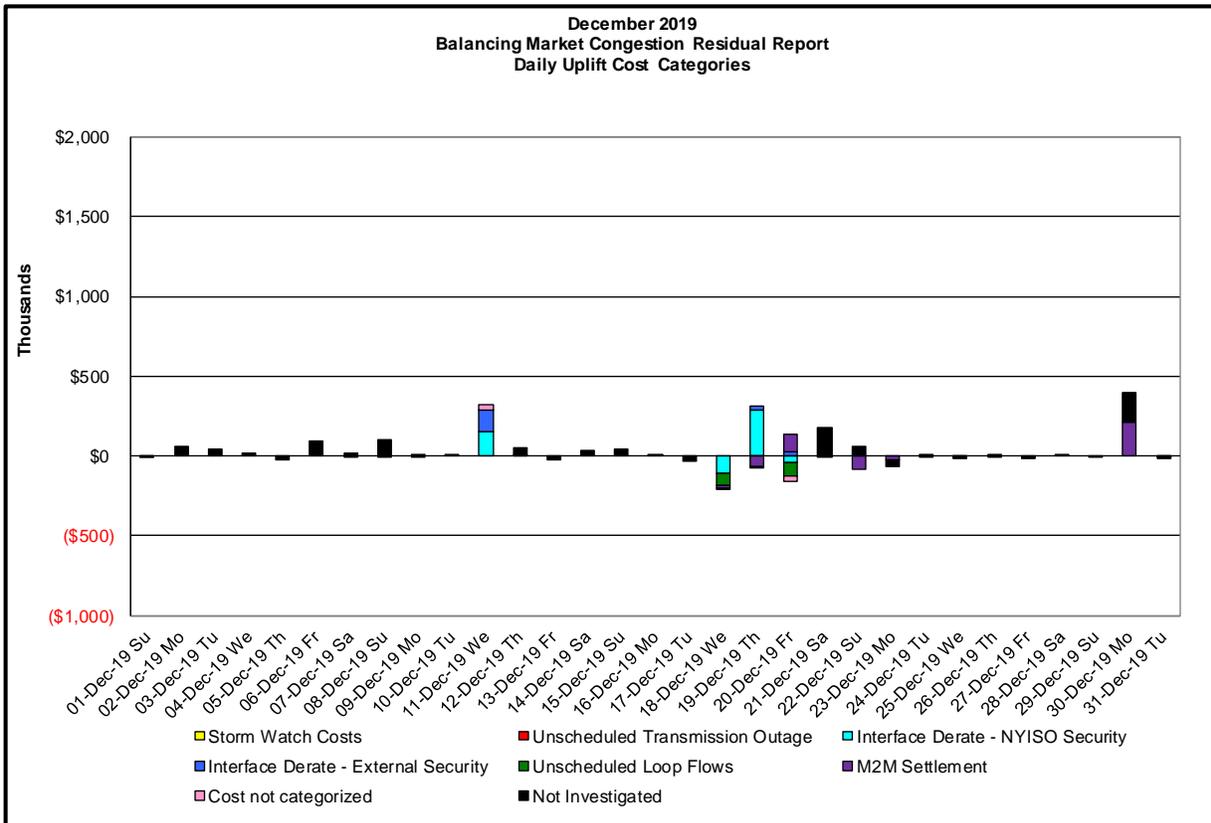
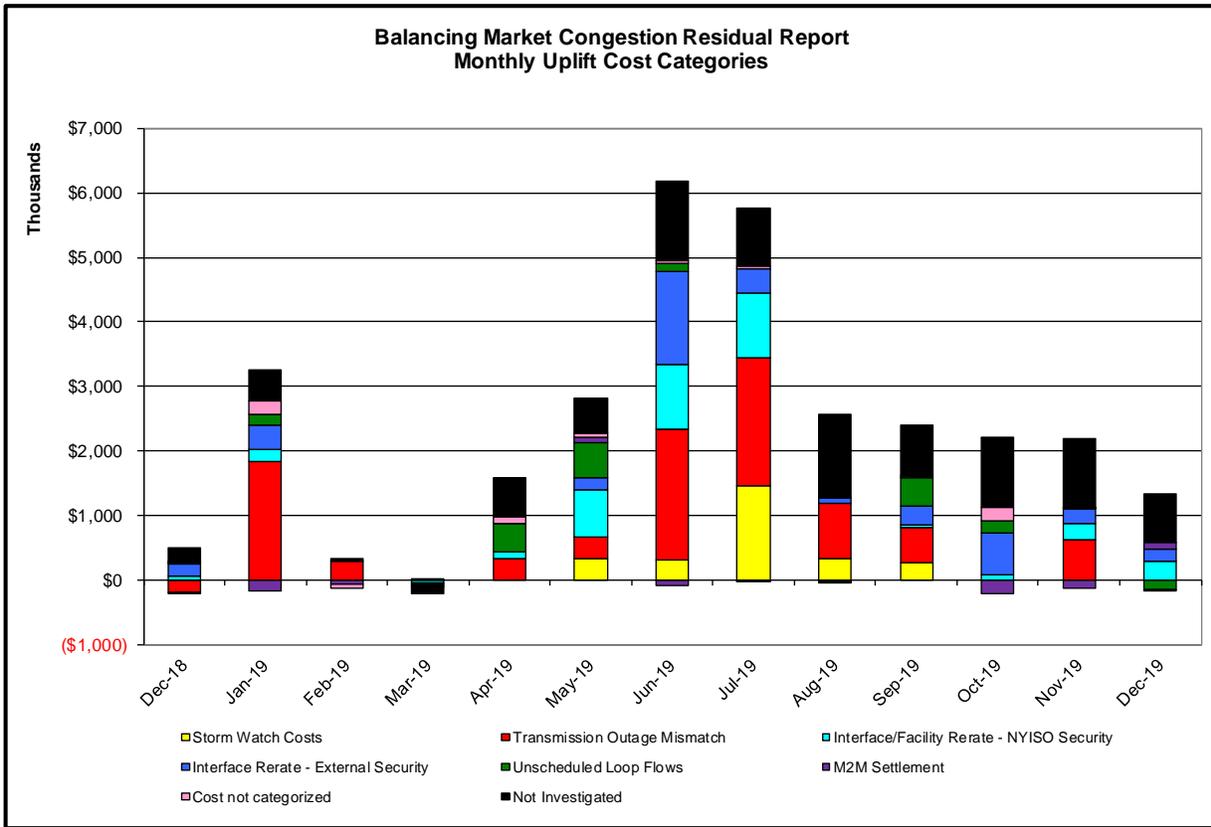
NYISO savings that result from PJM payments to NYISO when PJM's transmission use (PJM's market flow) is greater than PJM's entitlement of the NY transmission system and NYISO is incurring Western or Central NY congestion. Additionally, NYISO savings may result from the more efficient regional utilization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





Market Performance Metrics





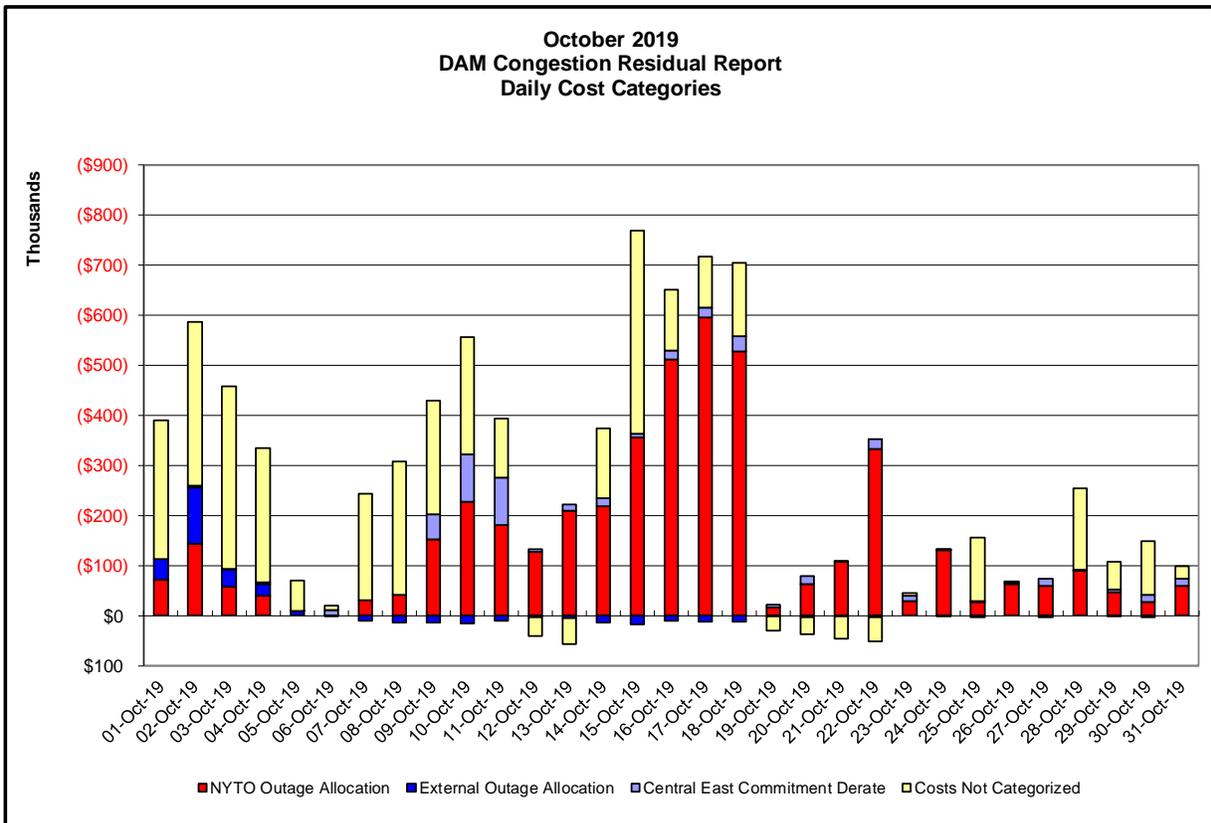
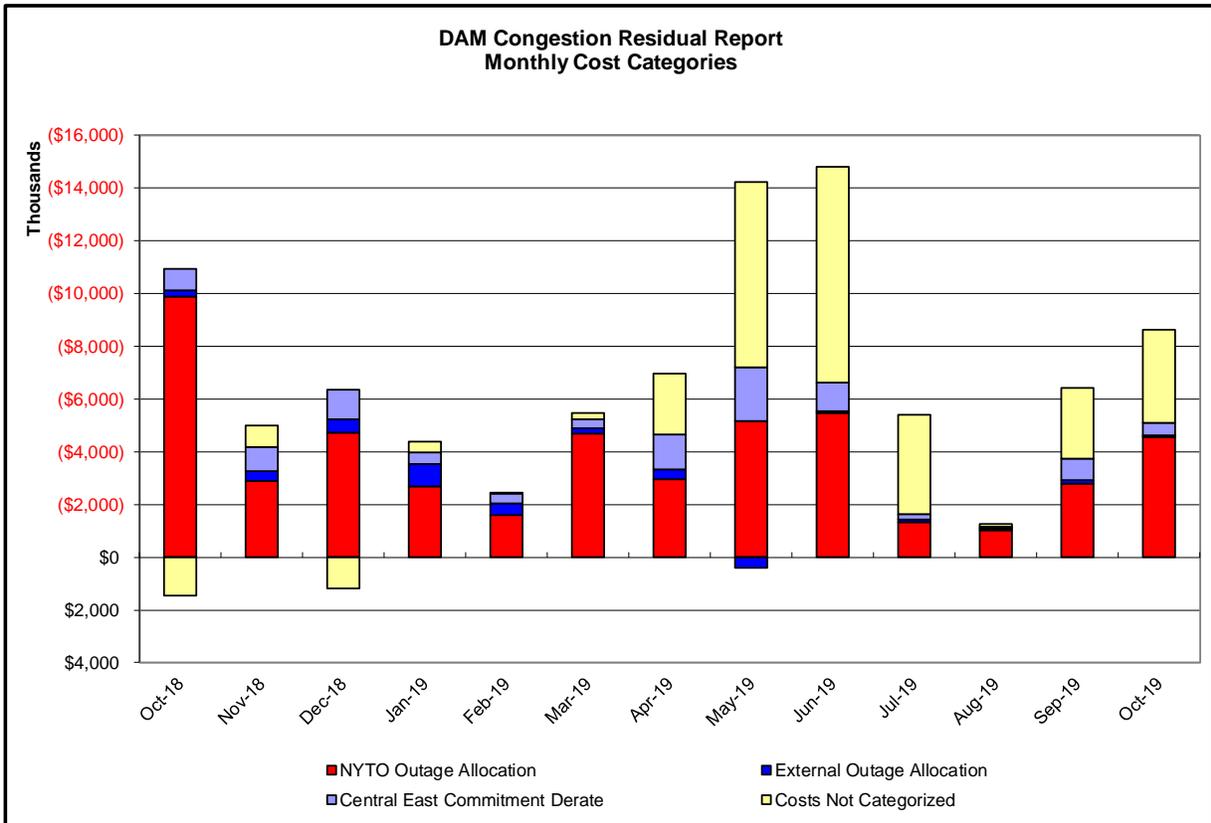
| Day's investigated in December: 11,18,19,20 | | | |
|---|-----------------|-------------------------|---|
| Event | Date (yyyymmdd) | Hours | Description |
| | 12/11/2019 | 11,16,20 | Derate C.Islip-Happauge 138kV (#889) for I/o TWR:HOLTSVILLE 881& 882& 880 |
| | 12/11/2019 | 11 | IESO_AC - NY Scheduling limit |
| | 12/18/2019 | 5,6,10,12-16,21-23 | Uprate Central East |
| | 12/18/2019 | 17 | Derate C.Islip-Happauge 138kV (#889) for I/o TWR:HOLTSVILLE 881& 882& 880 |
| | 12/18/2019 | 10 | NYCA DNI Ramp Limit |
| | 12/18/2019 | 10,12-16,21-23 | Lake Erie Circulation DAM-RTM exceeds +/-125MW; Central East |
| | 12/19/2019 | 13 | Uprate Central East |
| | 12/19/2019 | 0,7,8,15-22 | Derate East 13th Street-Farragut 345kV (#46) for I/o SCB DUNWOOD 5 W/ W90&W74 OOS |
| | 12/19/2019 | 0-2,15-22 | Derate C.Islip-Happauge 138kV (#889) for I/o TWR:HOLTSVILLE 881& 882& 880 |
| | 12/19/2019 | 21,22 | HQ_CEDARS - NY Scheduling limit |
| | 12/20/2019 | 9,18 | NYCA DNI Ramp Limit |
| | 12/20/2019 | 0,5,9,11,12,14,15,18,20 | Uprate Central East |
| | 12/20/2019 | 3,4,18 | Derate C. Islip-Hauppauge 138kV (#889) for TWR:HOLTSVILLE 881& 882& 880 |
| | 12/20/2019 | 17,19 | Derate Niagara-Rochester 345kV (#NR2) I/o NIAGARA_-KINTIGH_345_NS1-38 |
| | 12/20/2019 | 0-4,13,17,19 | HQ_CEDARS - NY Scheduling limit |
| | 12/20/2019 | 12 | NE_NNC1385 - NY Scheduling Limit |
| | 12/20/2019 | 11 | PJM_AC - NY Scheduling Limit |
| | 12/20/2019 | 5,9,11-15,18,20 | Lake Erie Circulation DAM-RTM exceeds +/-125MW; Central East |
| | 12/20/2019 | 18-21 | 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 | |

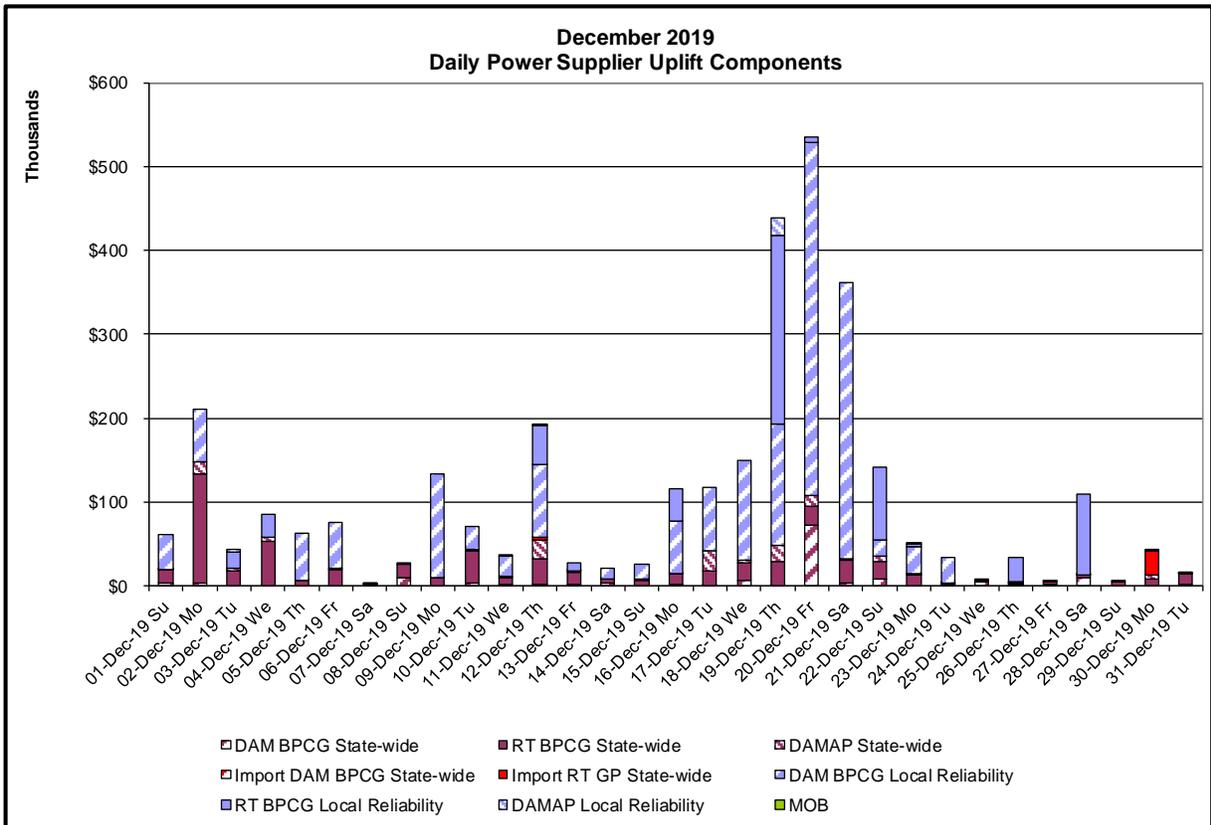
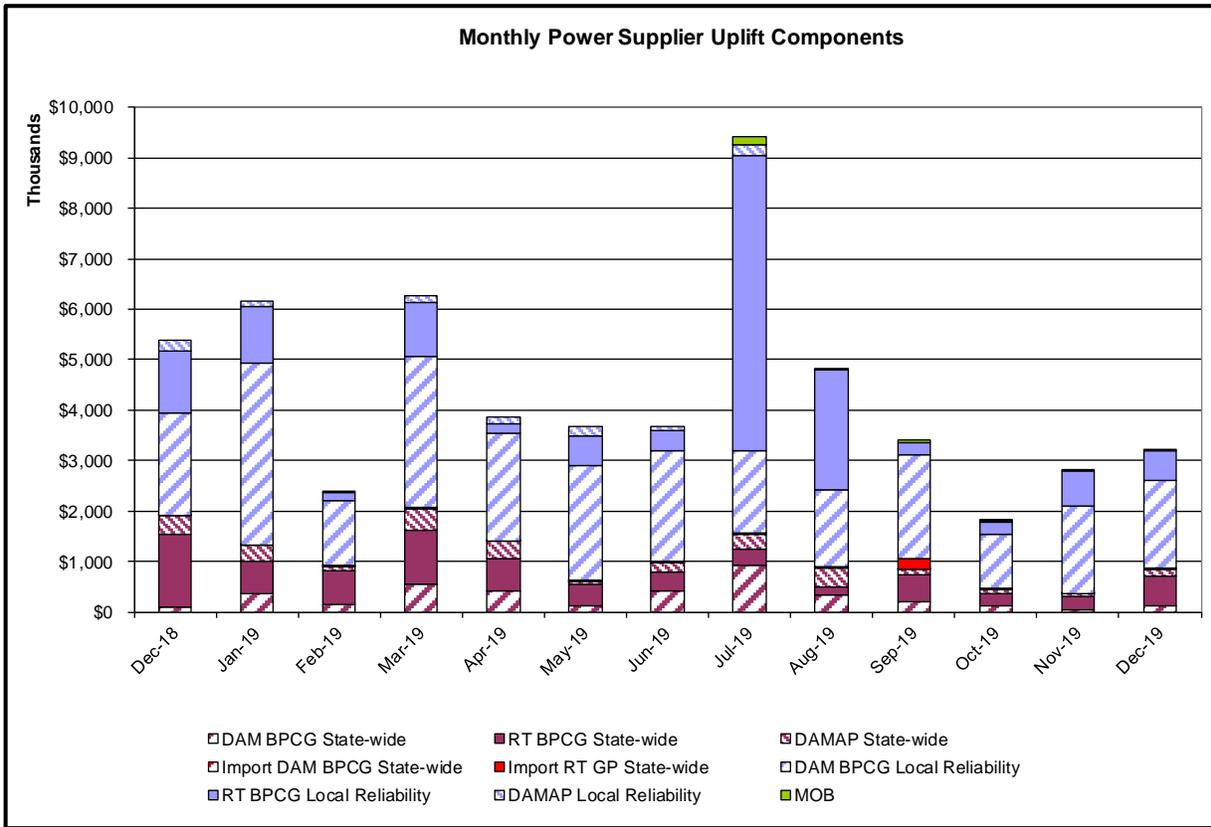
Monthly Balancing Market Congestion Report Assumptions/Notes

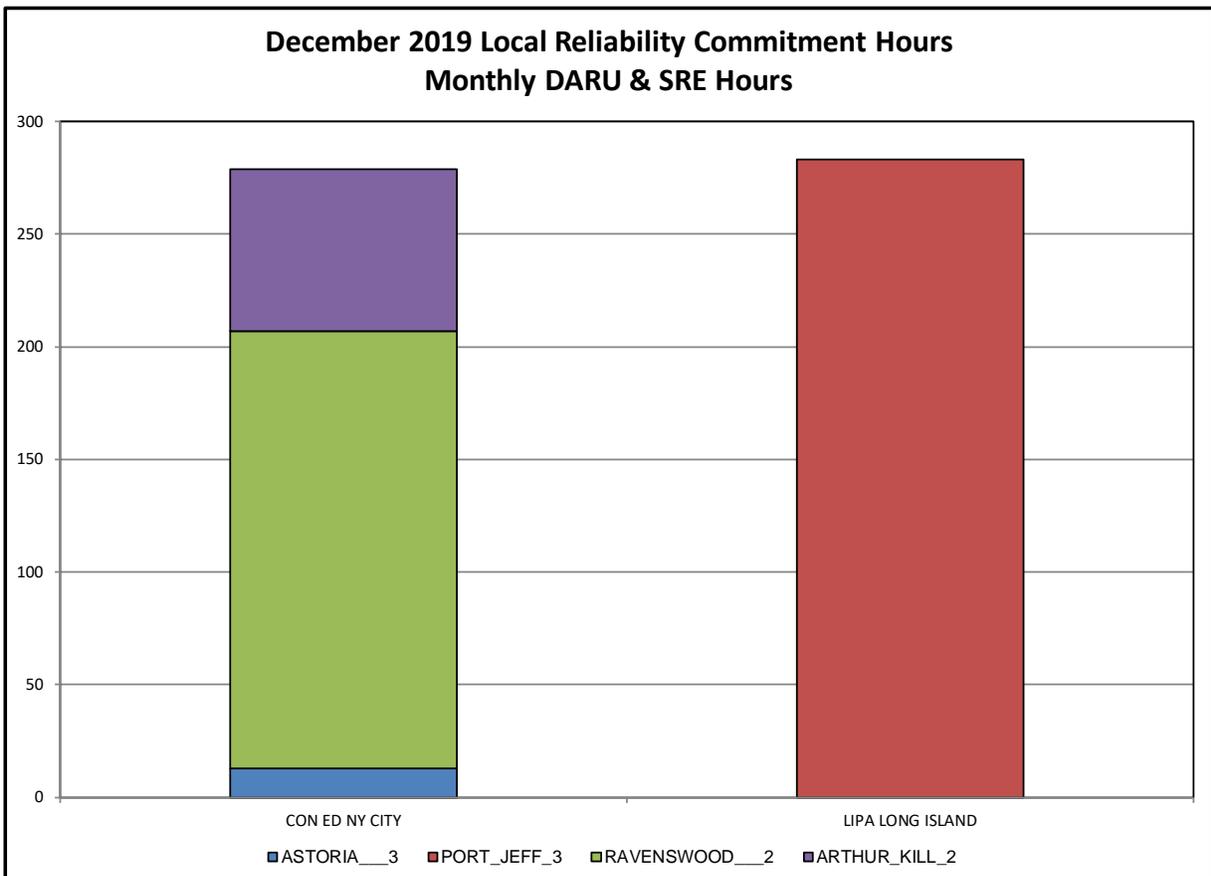
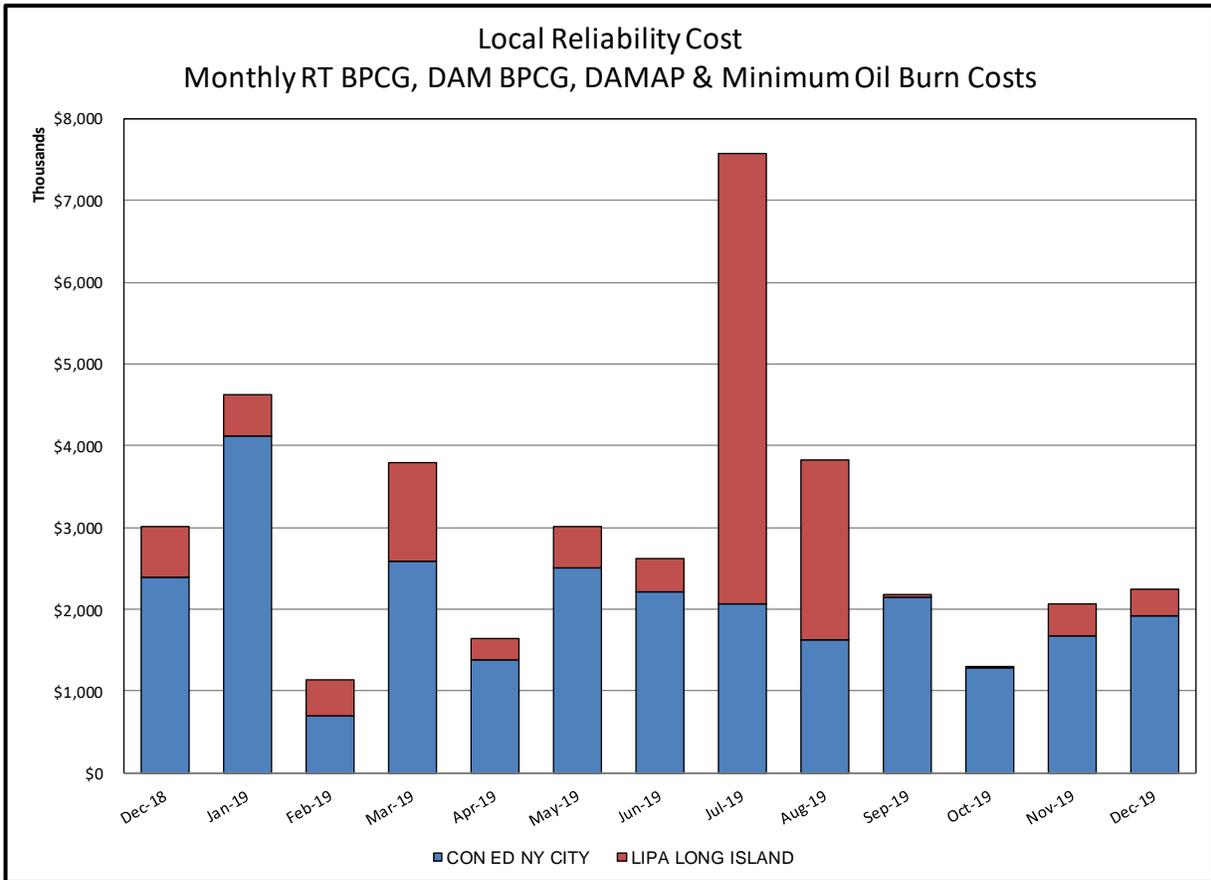
- 1) Storm Watch Costs are identified as daily total uplift costs
- 2) Days with a value of BMCR less M2M Settlement of \$100K/HR, shortfall of \$200K/Day or more, or surplus of \$100K/Day or more are investigated.
- 3) Uplift costs associated with multiple event types are apportioned equally by hour

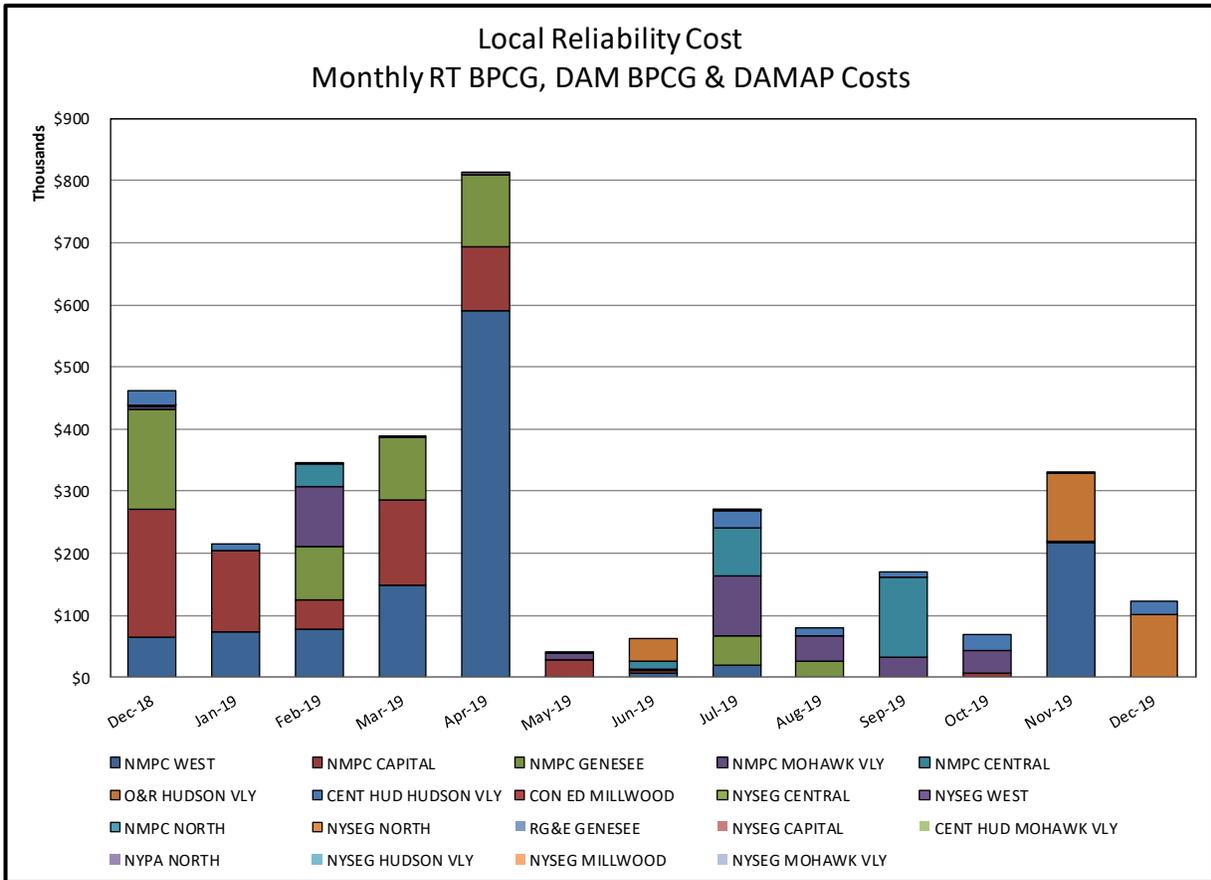


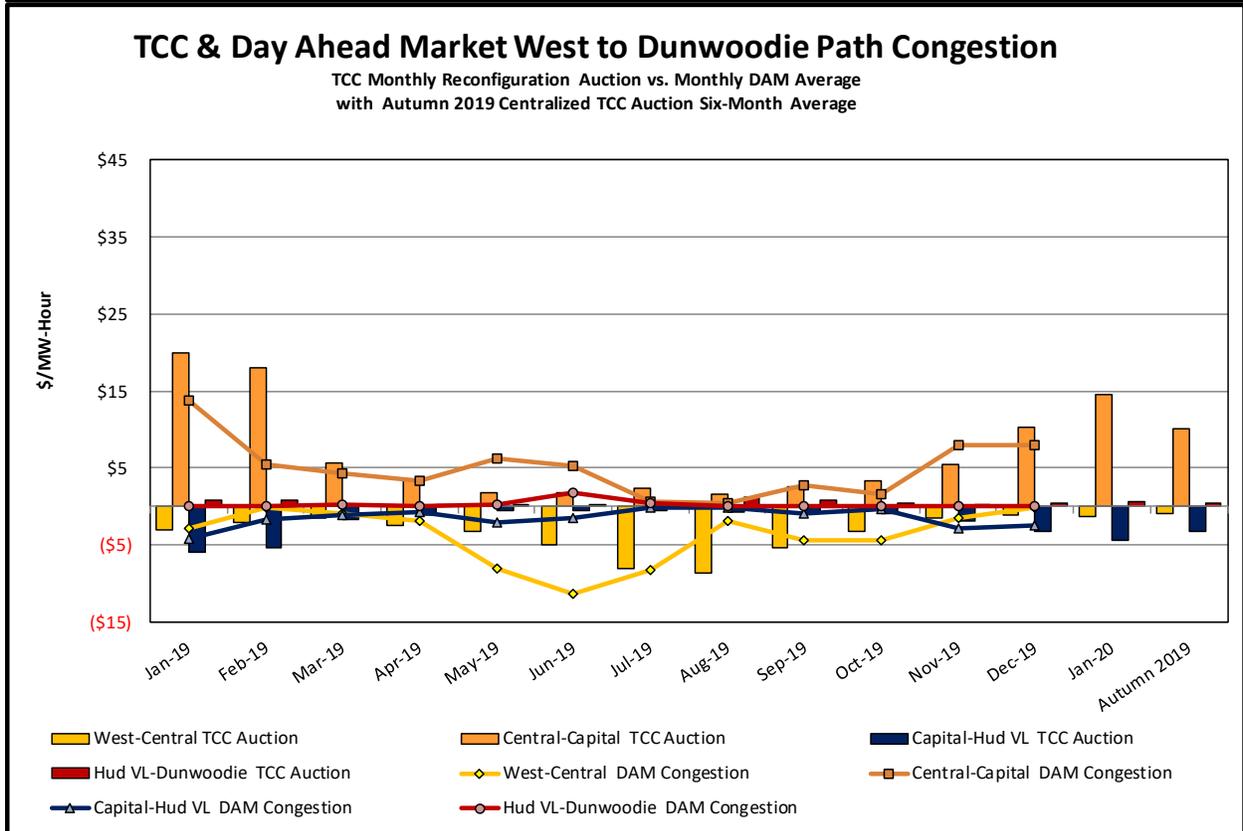
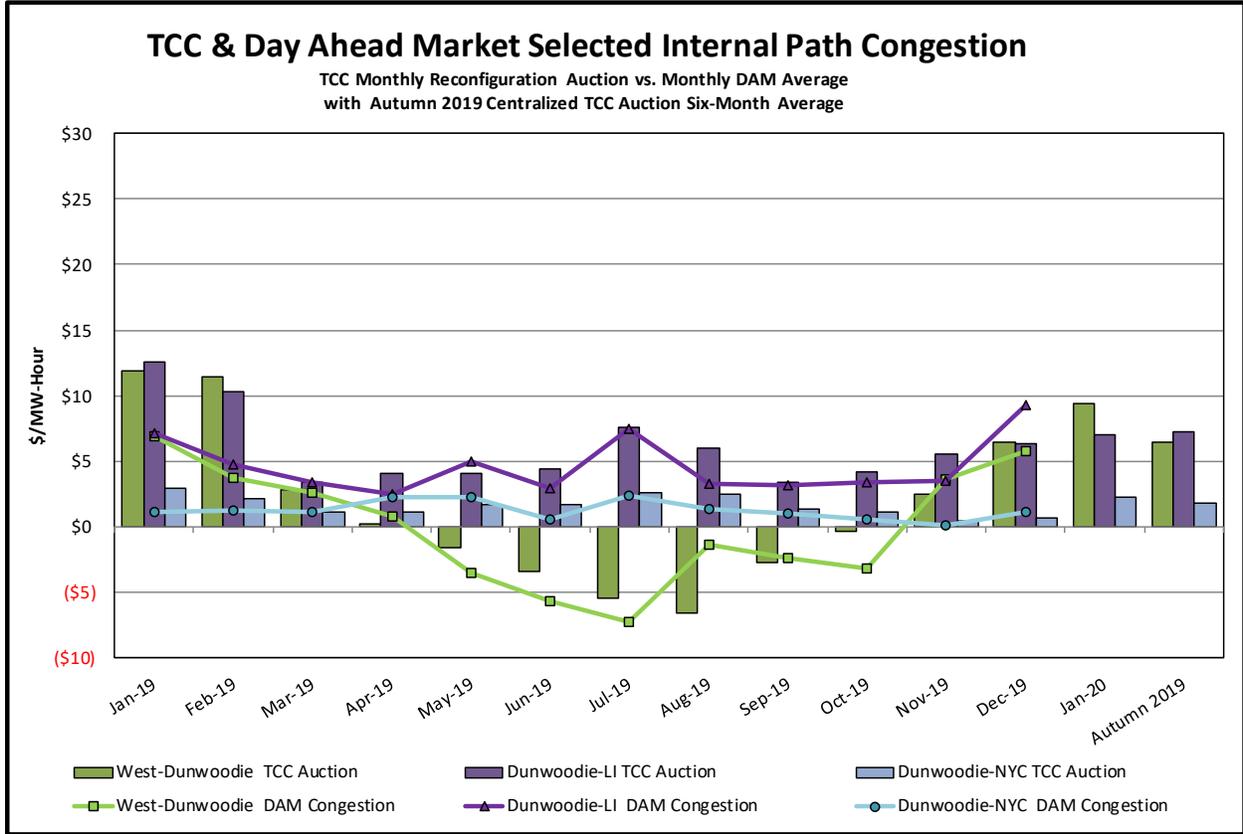
Day-Ahead Market Congestion Residual Categories

| <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. | |



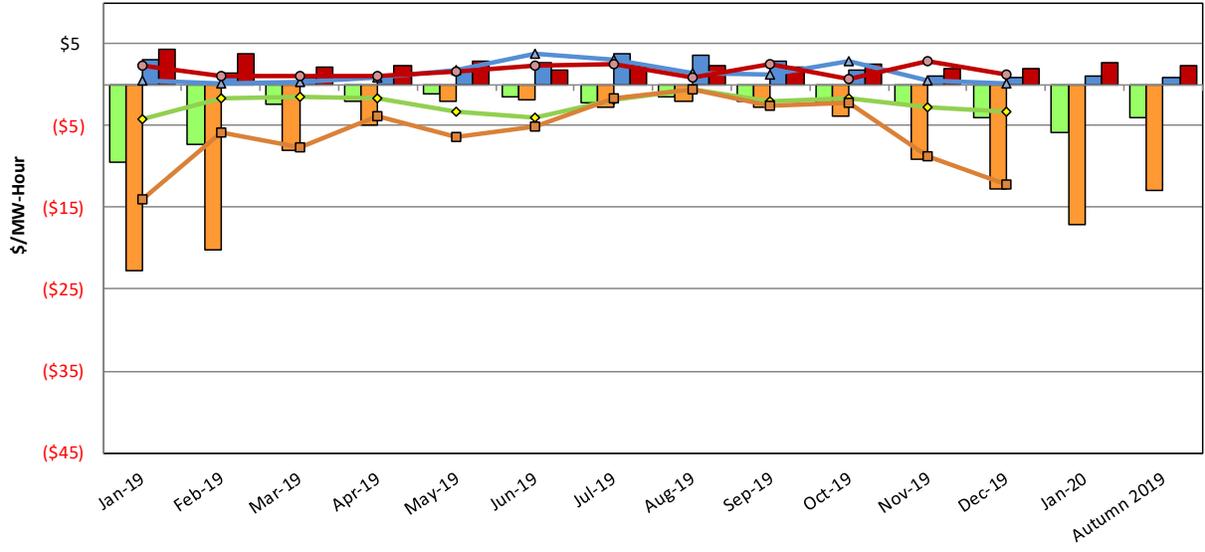






TCC & Day Ahead Market Selected External Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average
with Autumn 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

