



Monthly Report

April 2019

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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.

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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.

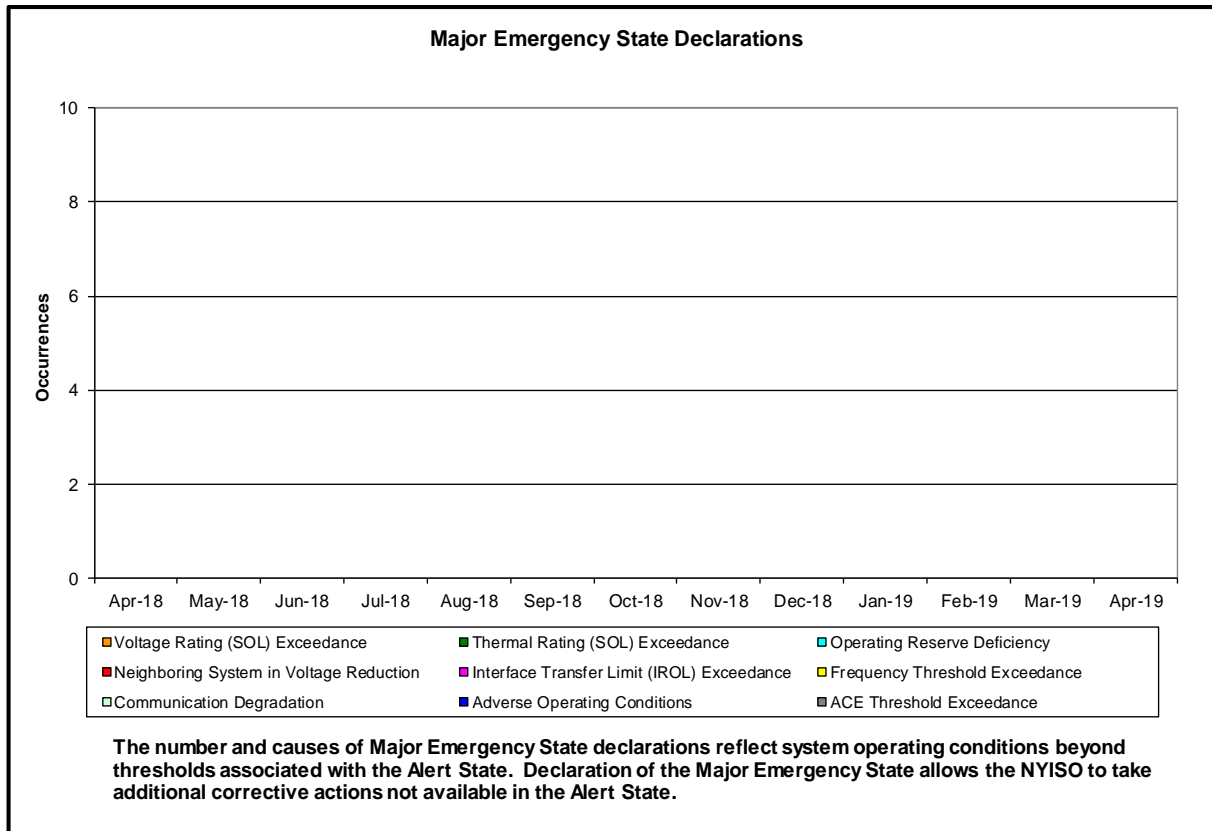
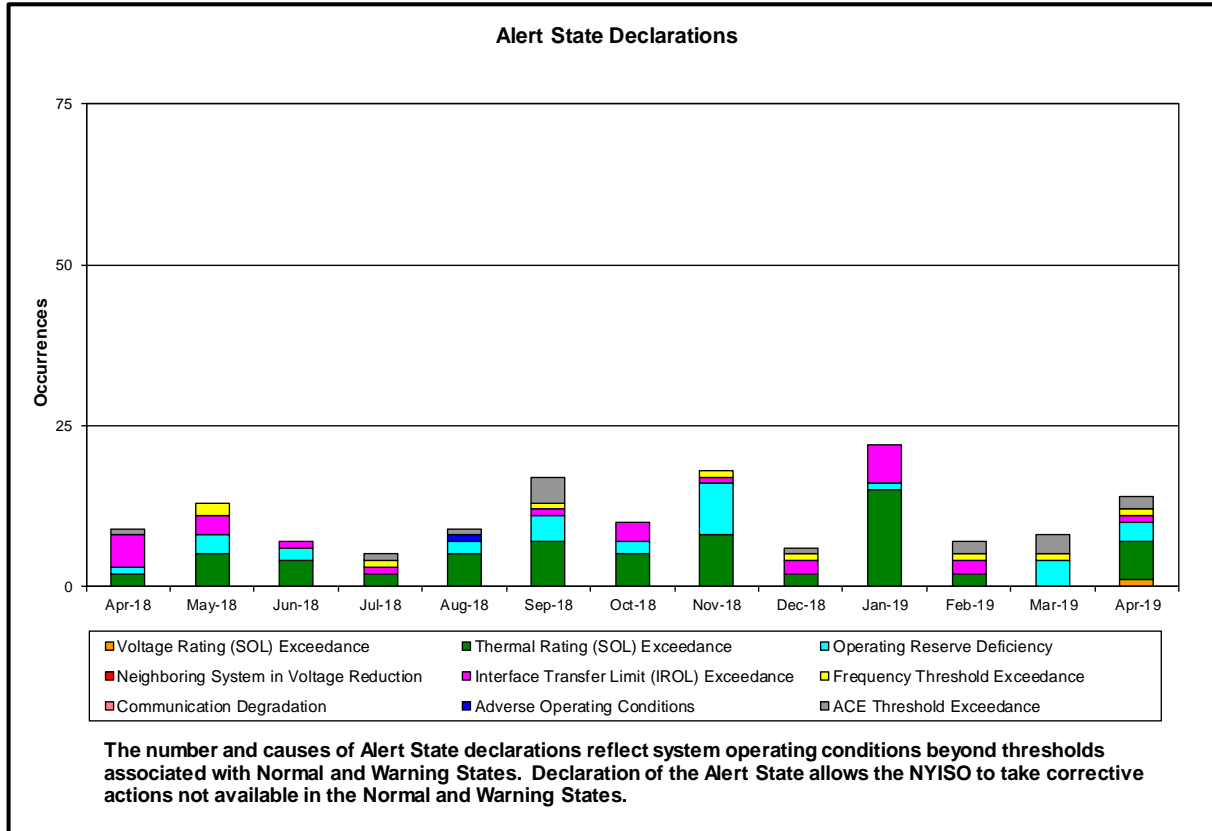
| | Current Month Value (\$M) | Year-to-Date Value (\$M) |
|--|---------------------------|--------------------------|
| NY Savings from PJM-NY Congestion Coordination | \$0.12 | \$5.18 |
| NY Savings from PJM-NY Coordinated Transaction Scheduling | (\$0.11) | \$0.19 |
| NY Savings from NE-NY Coordinated 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 |

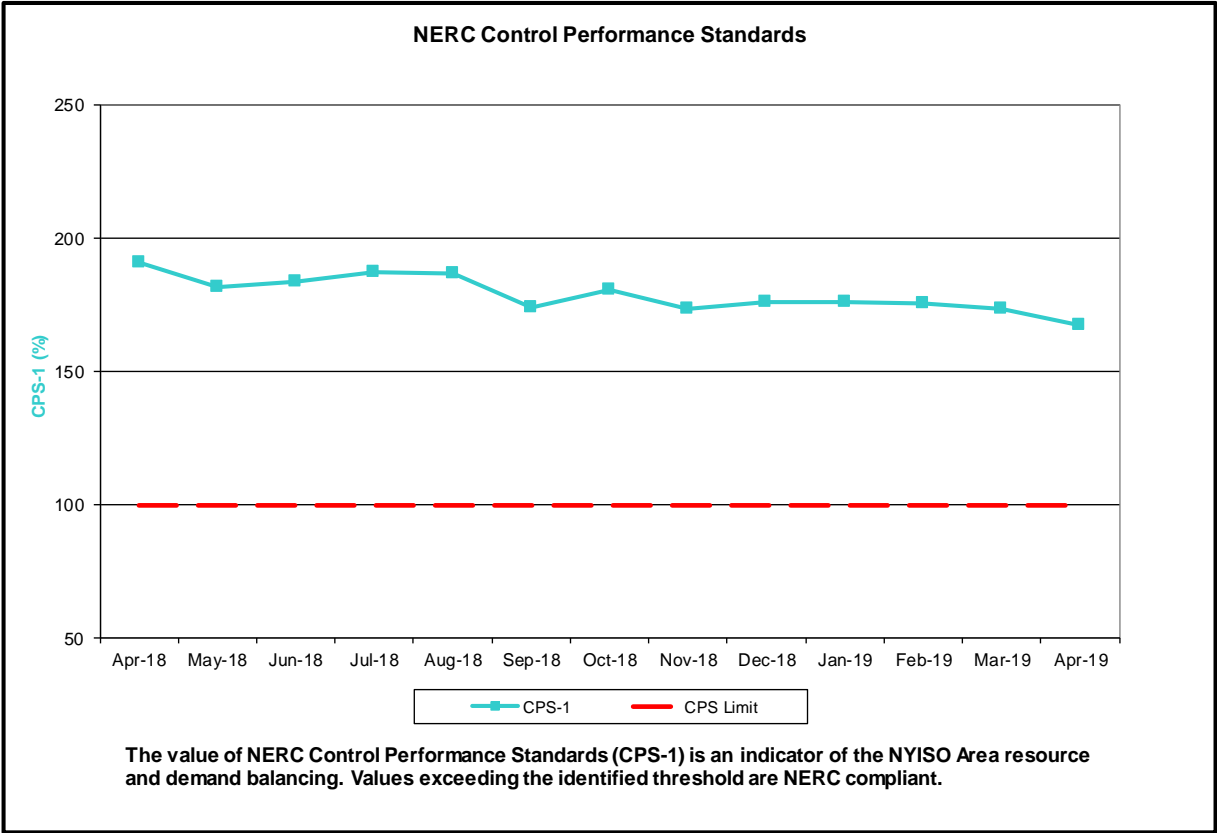
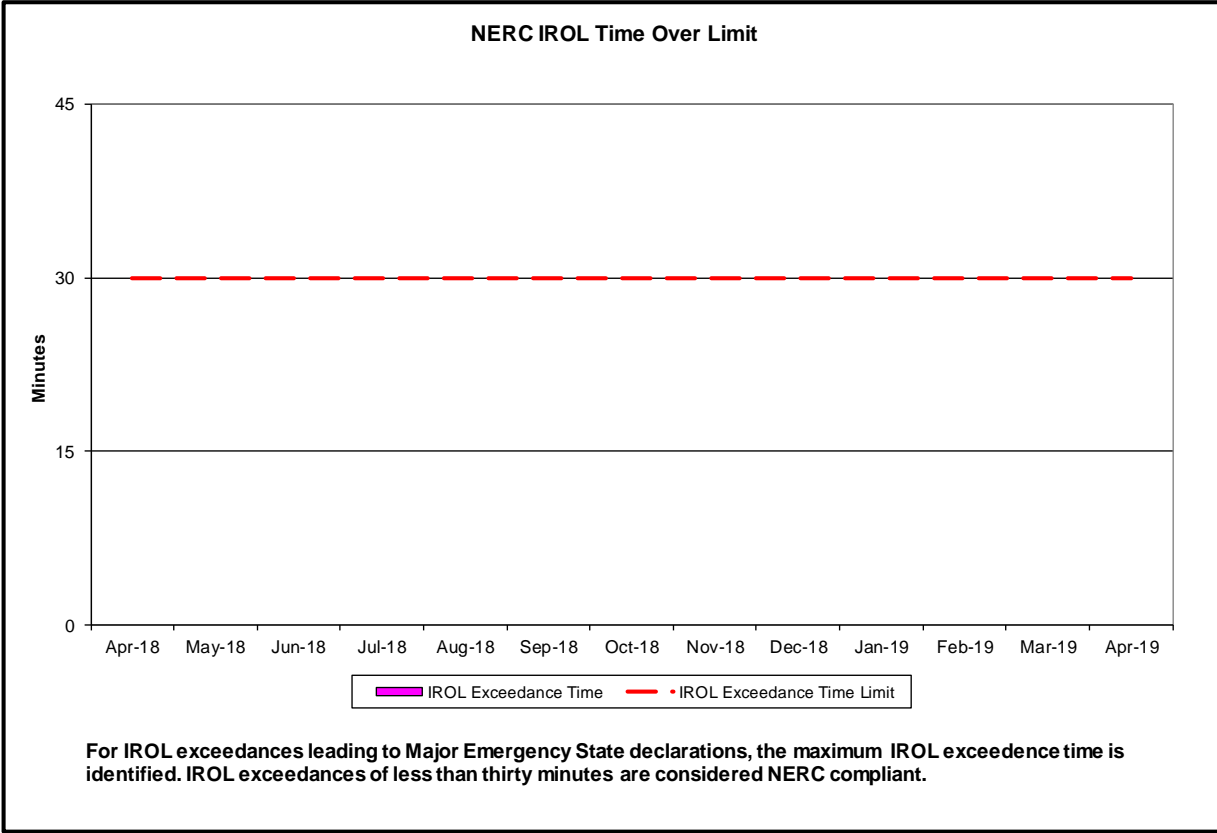
- Statewide uplift cost monthly average was (\$0.35)/MWh
- The following table identifies the Monthly ICAP spot market prices by locality and changes from the end of the prior Summer Capability period.

| 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) |

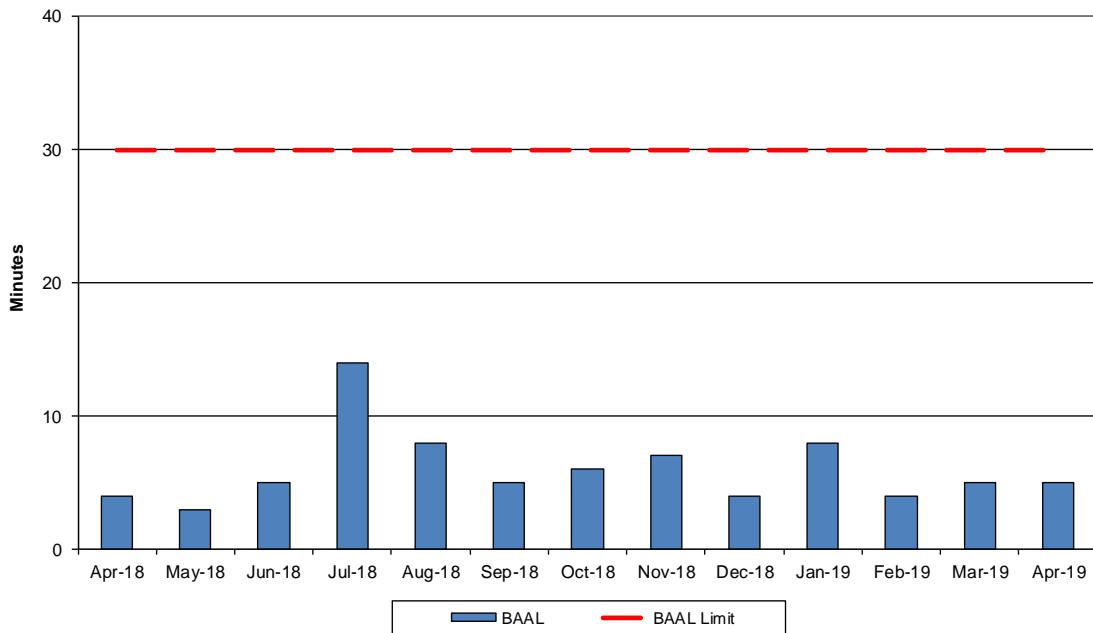
- Price changes from October 2018 to May 2019 are driven by changes in supply as well as Capability Year inputs such as demand curve parameters, Locational Capacity Requirements, the Installed Reserve Margin and the load forecast.

Reliability Performance Metrics



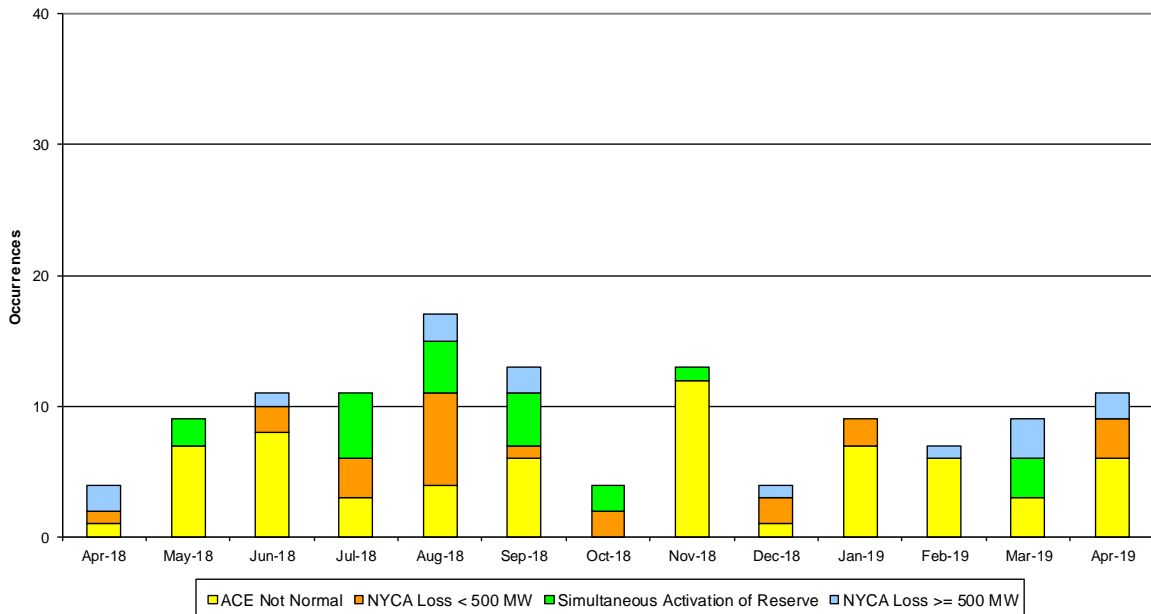


NERC Balancing Authority ACE Limit Standard

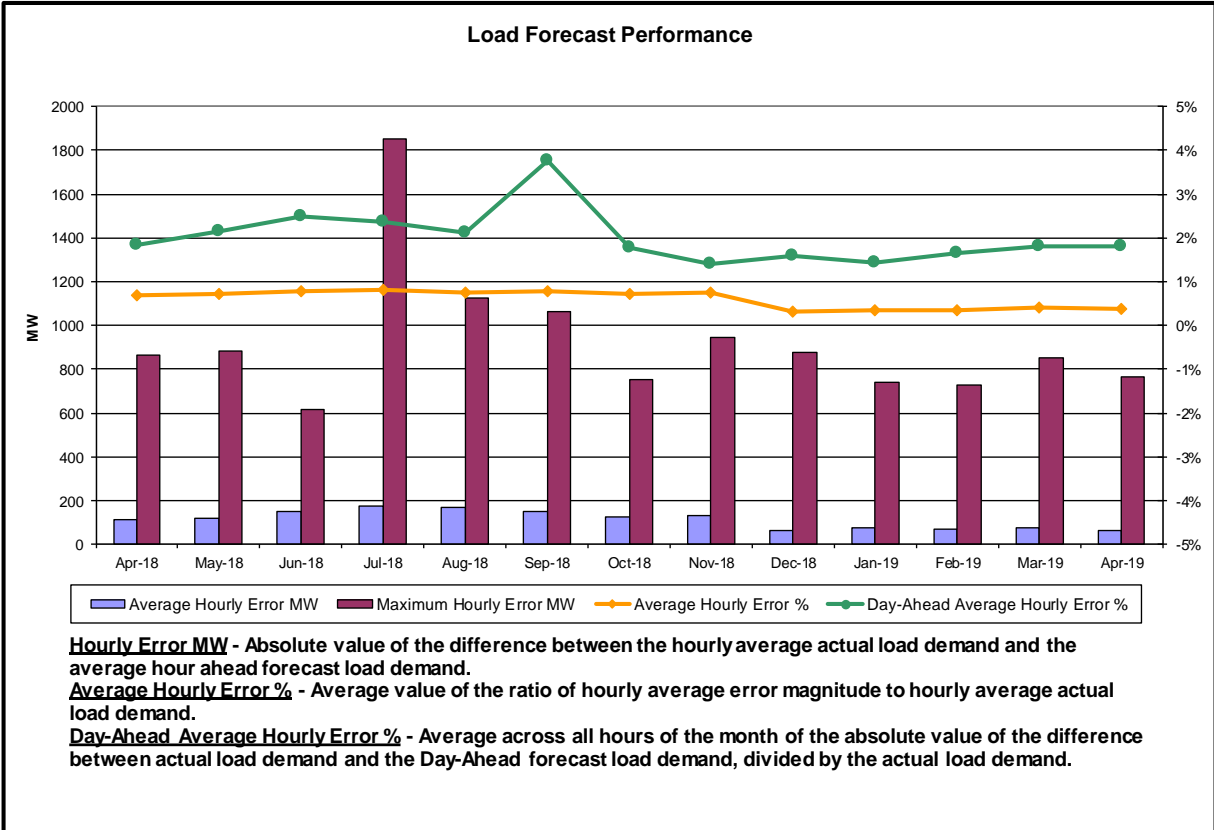
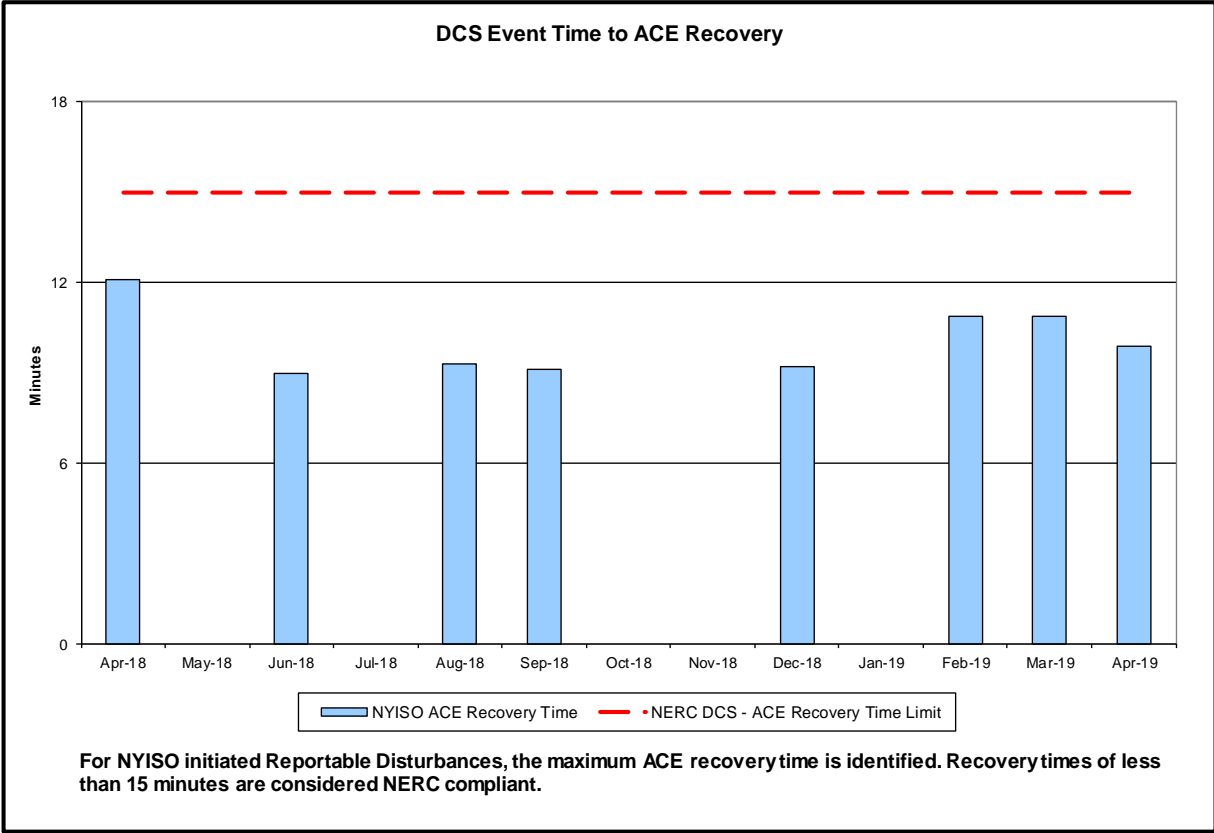


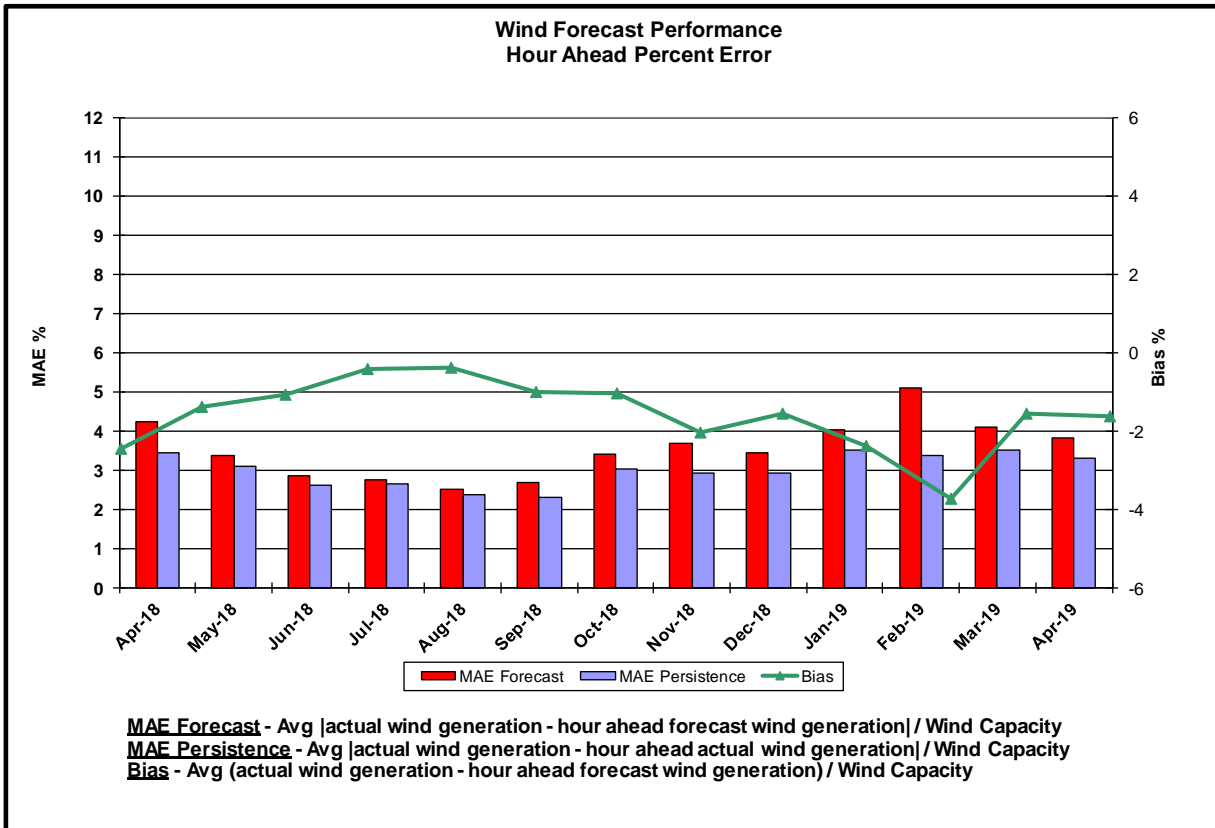
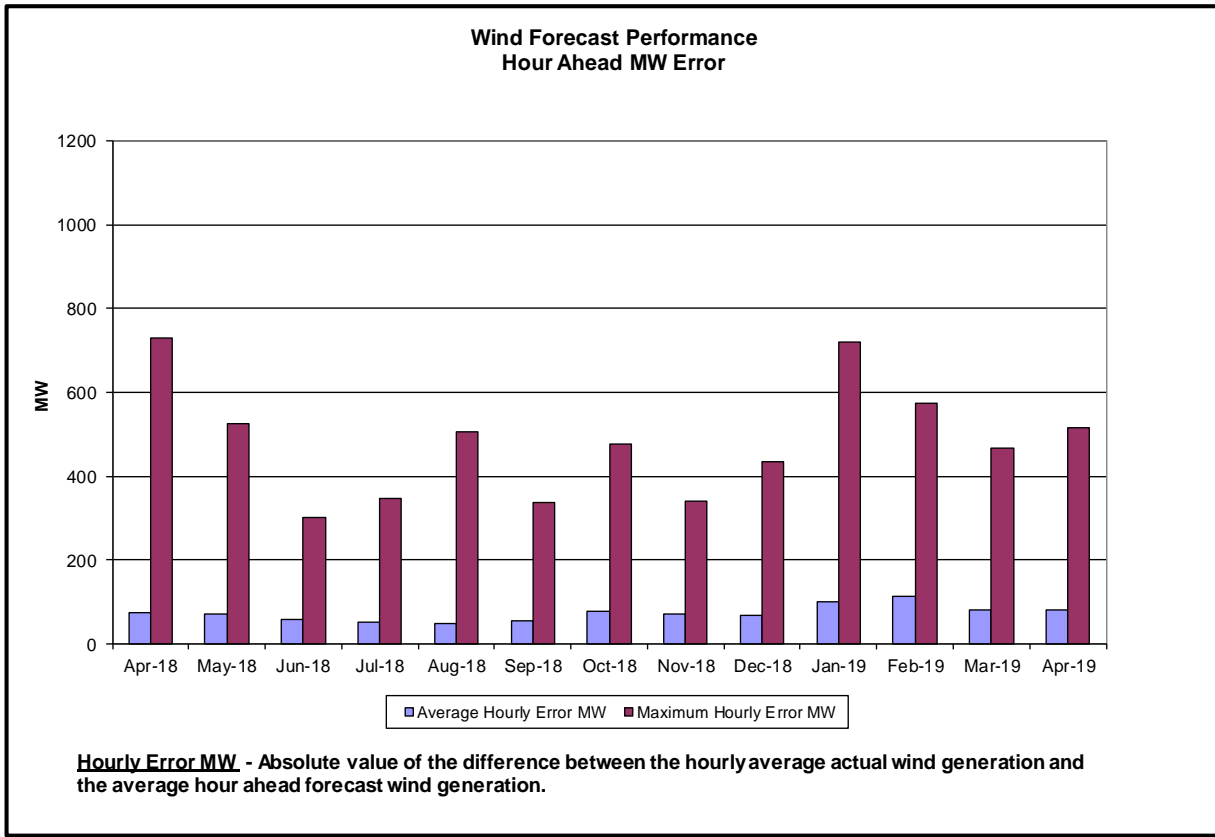
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

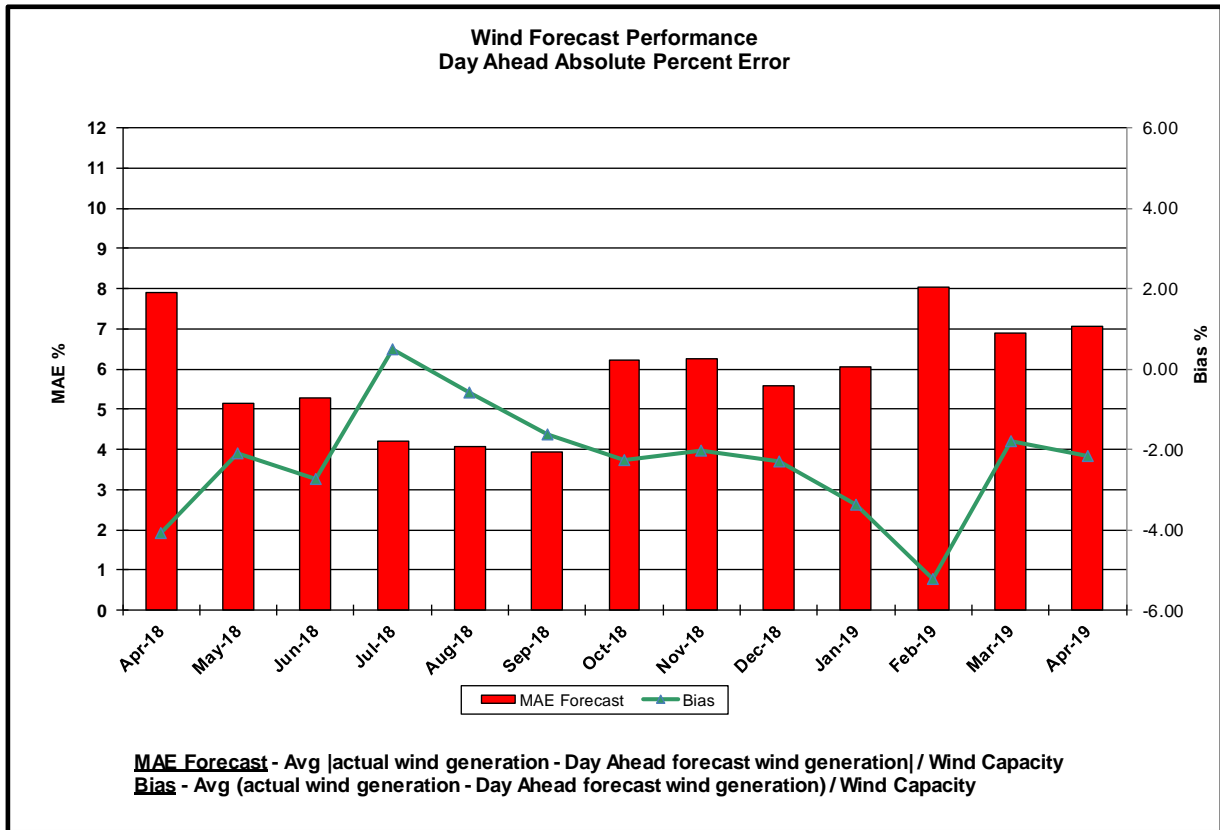
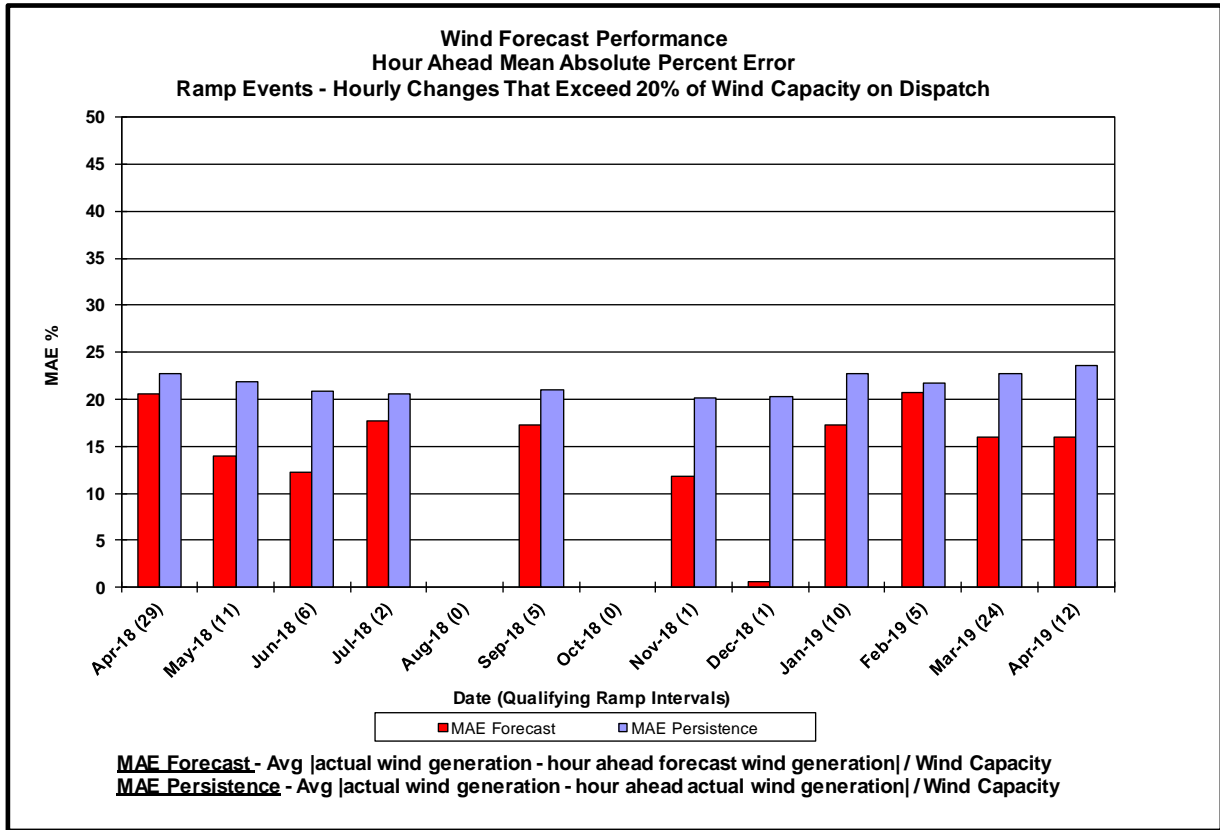
Reserve Activations

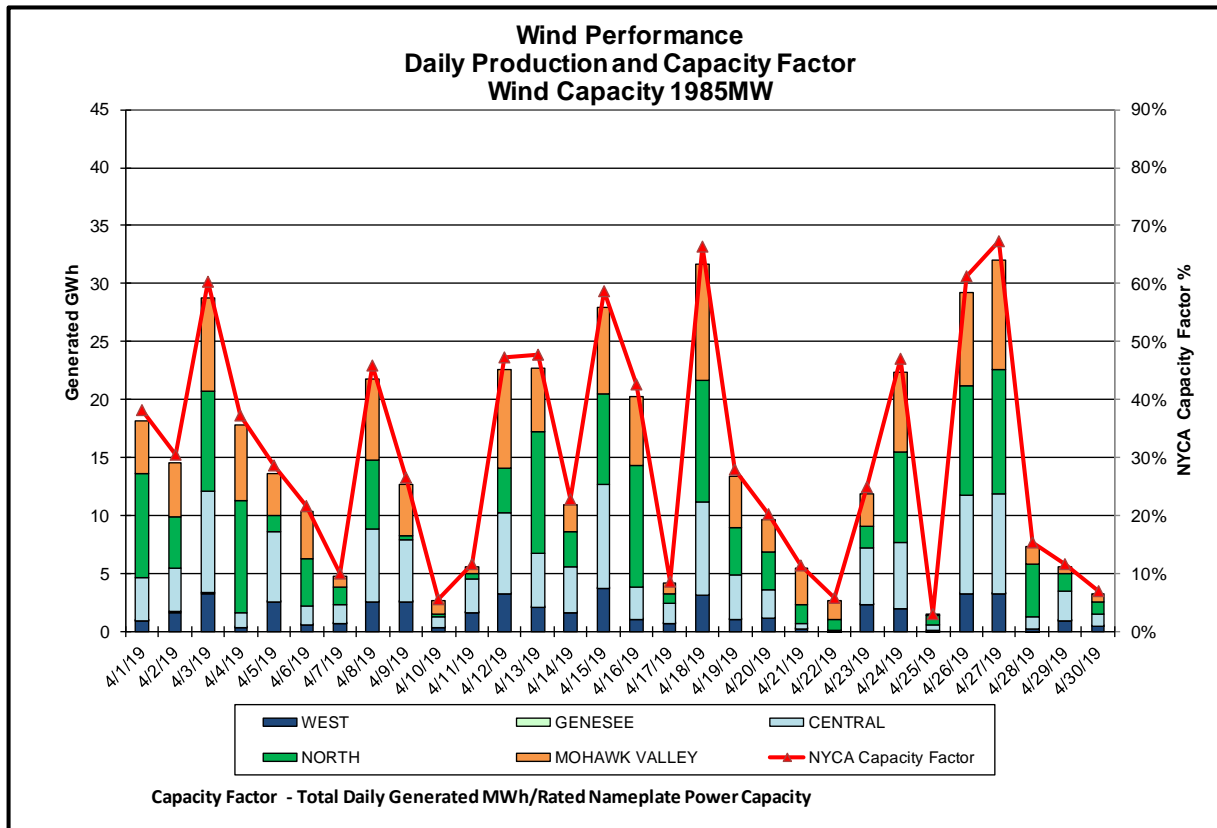
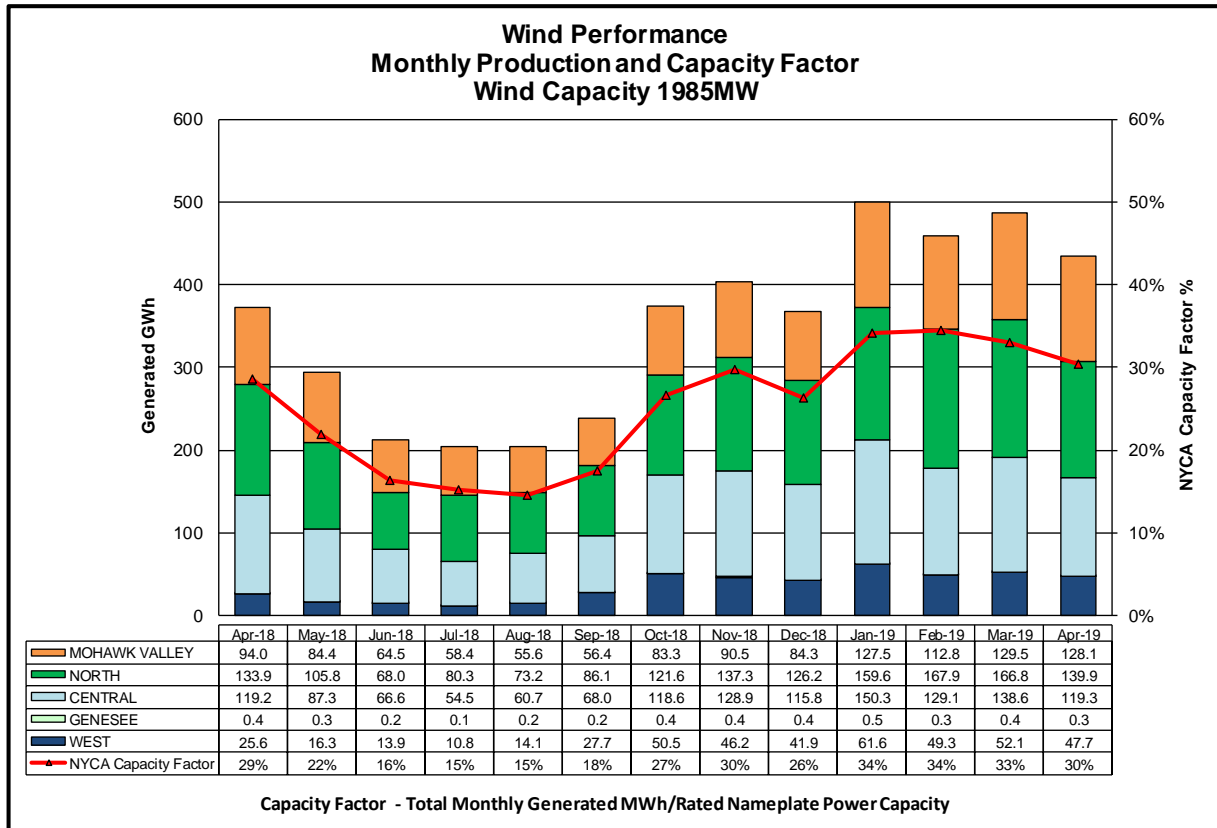


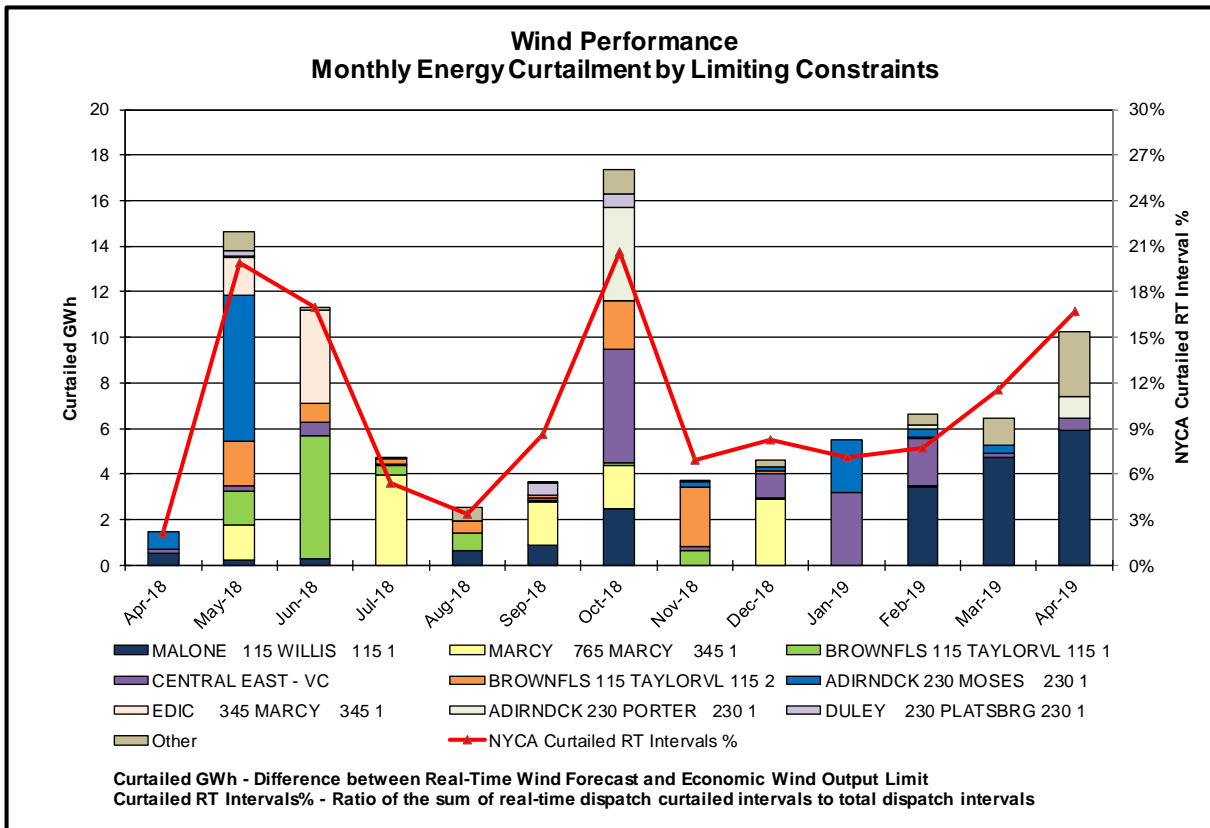
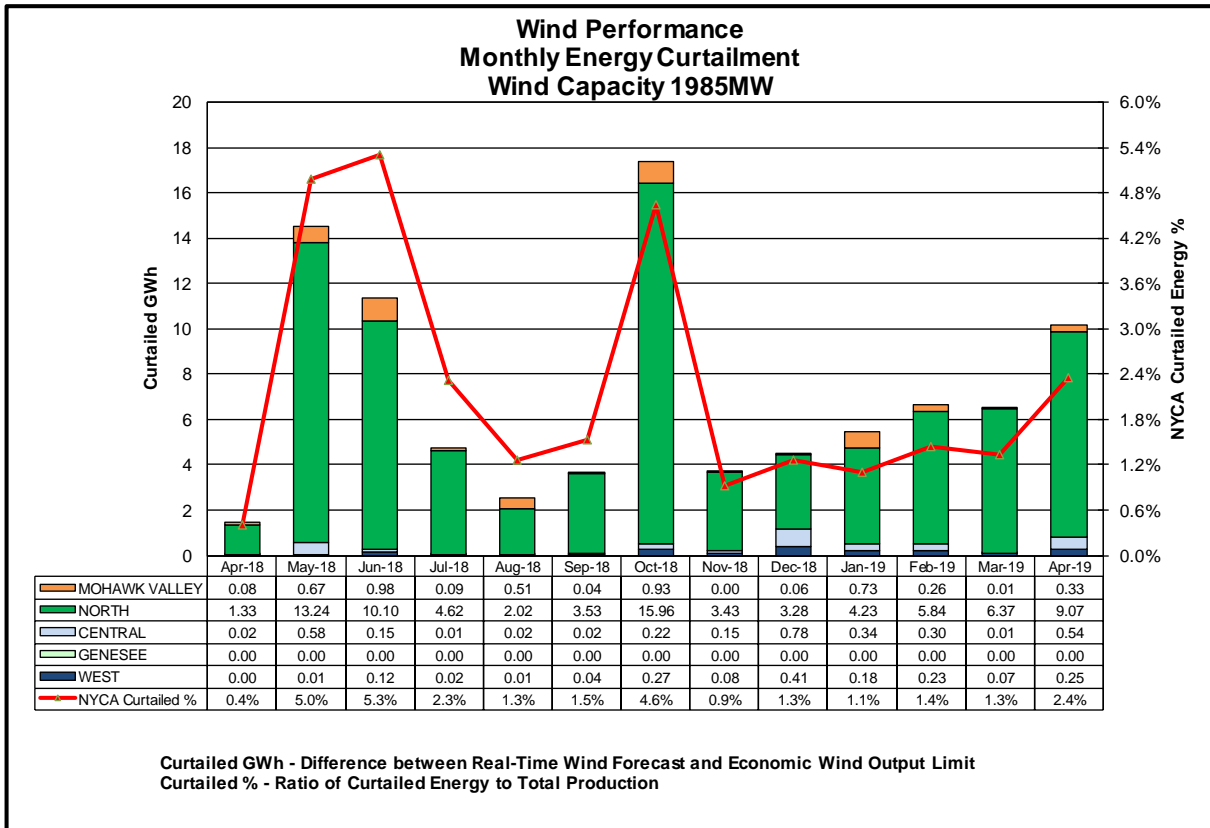
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

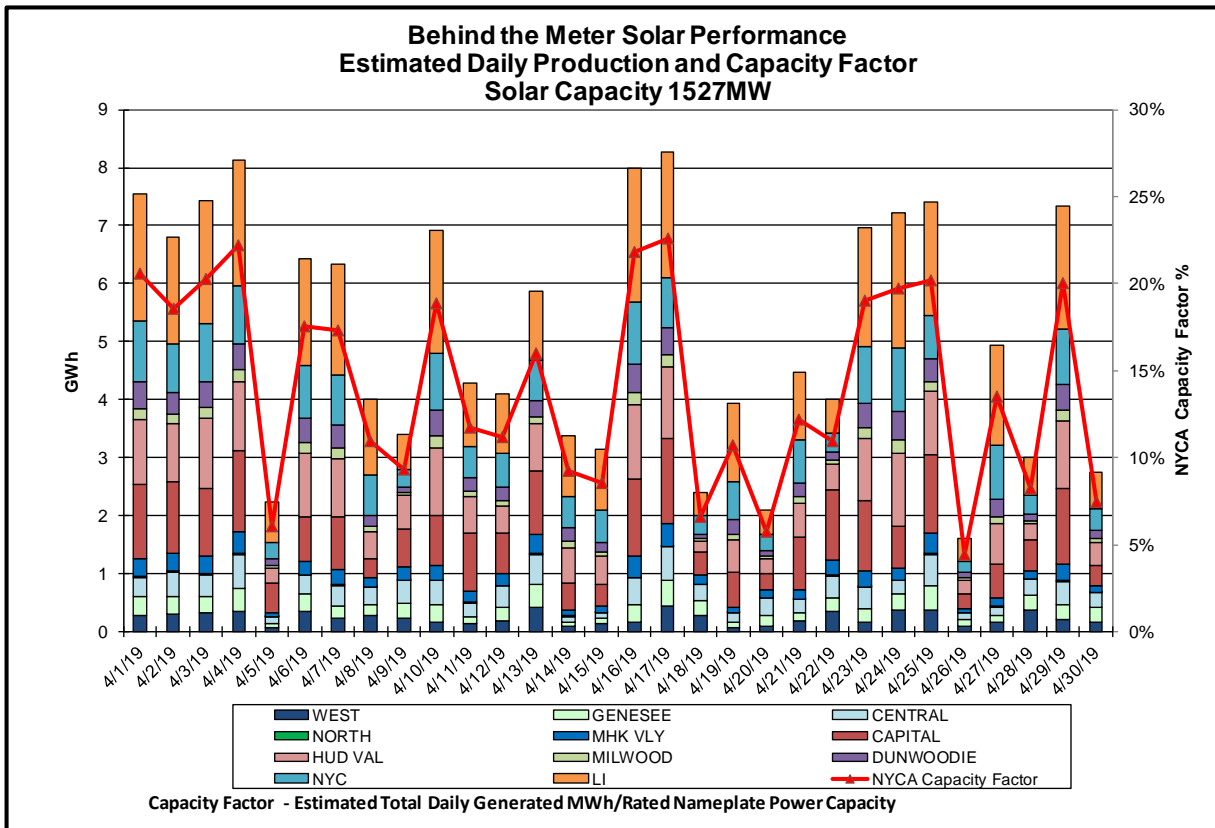
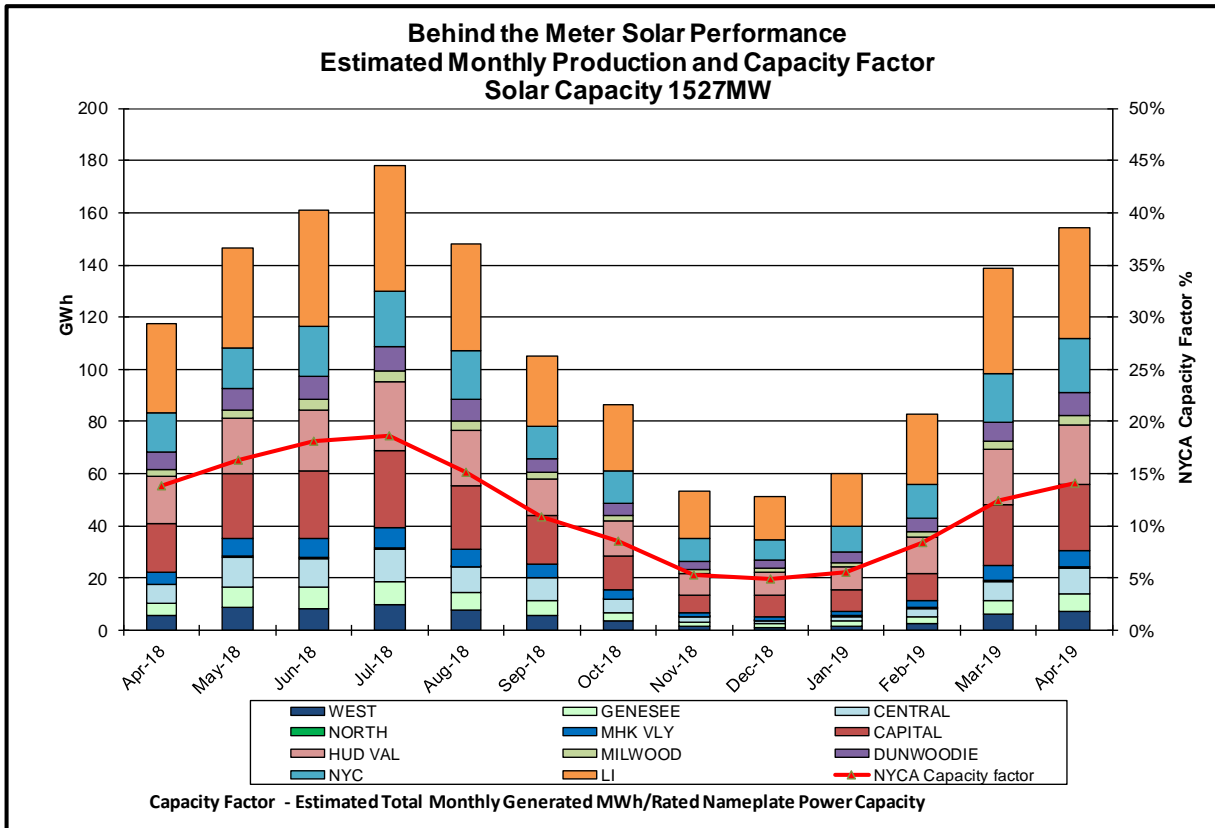


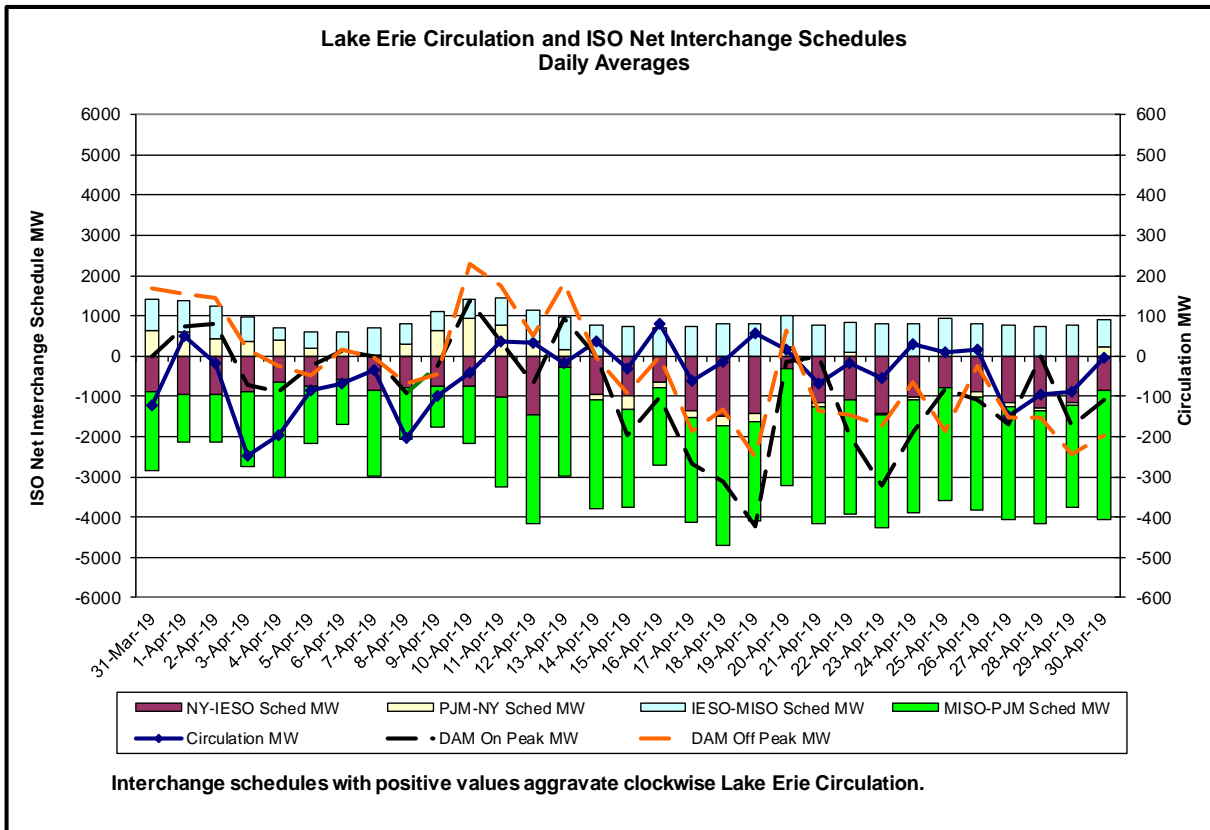
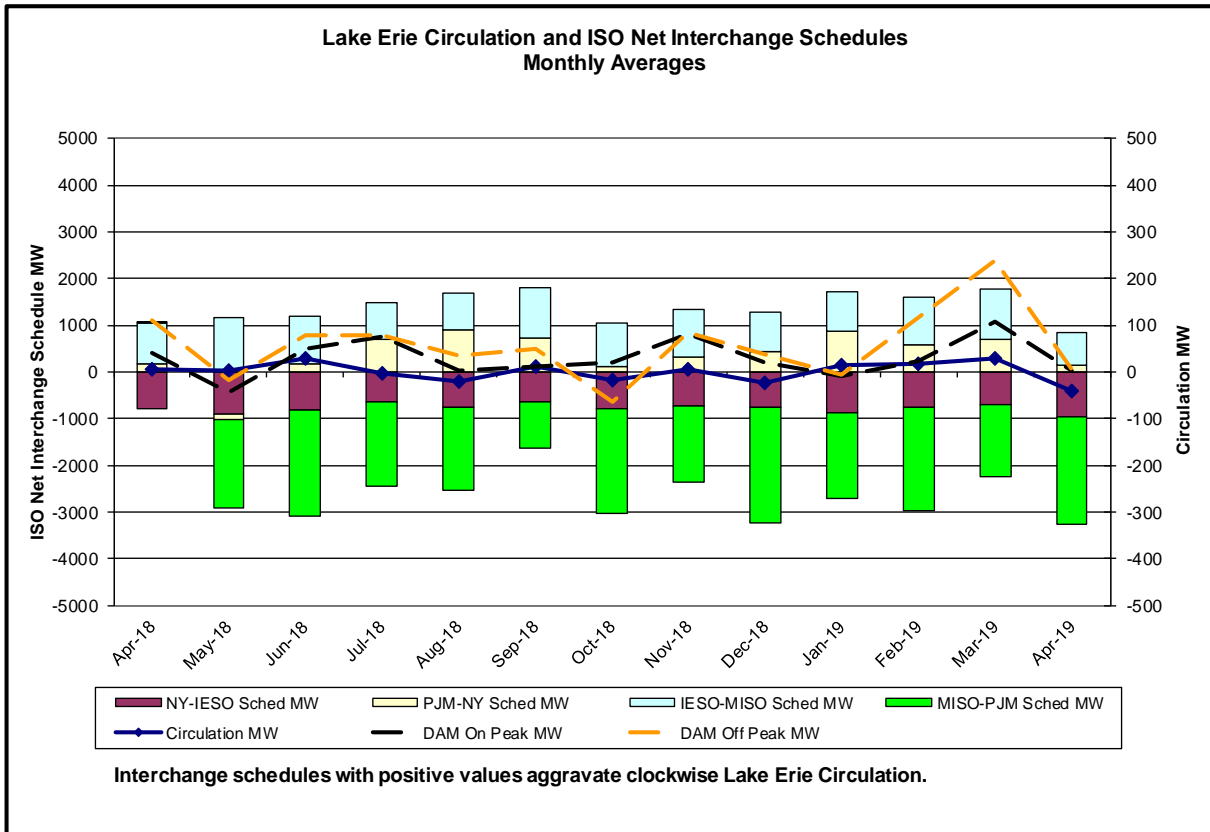




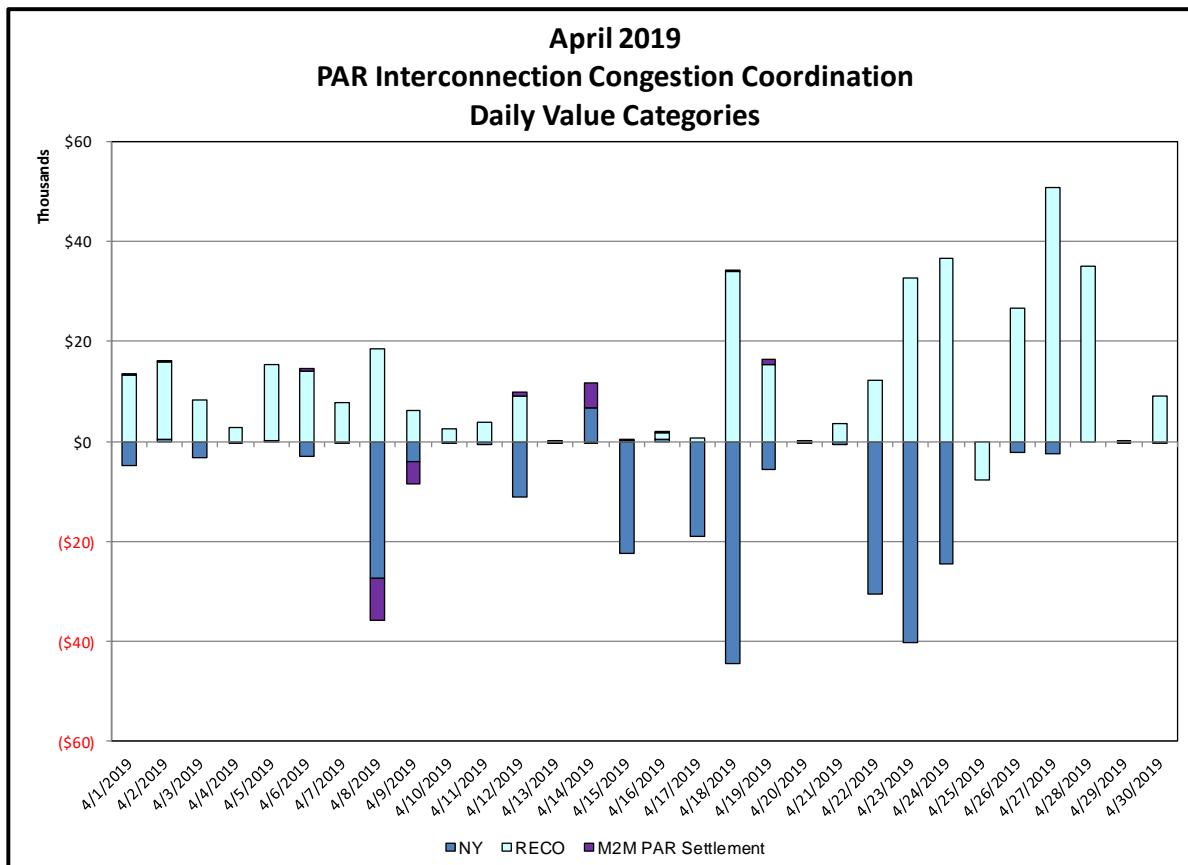
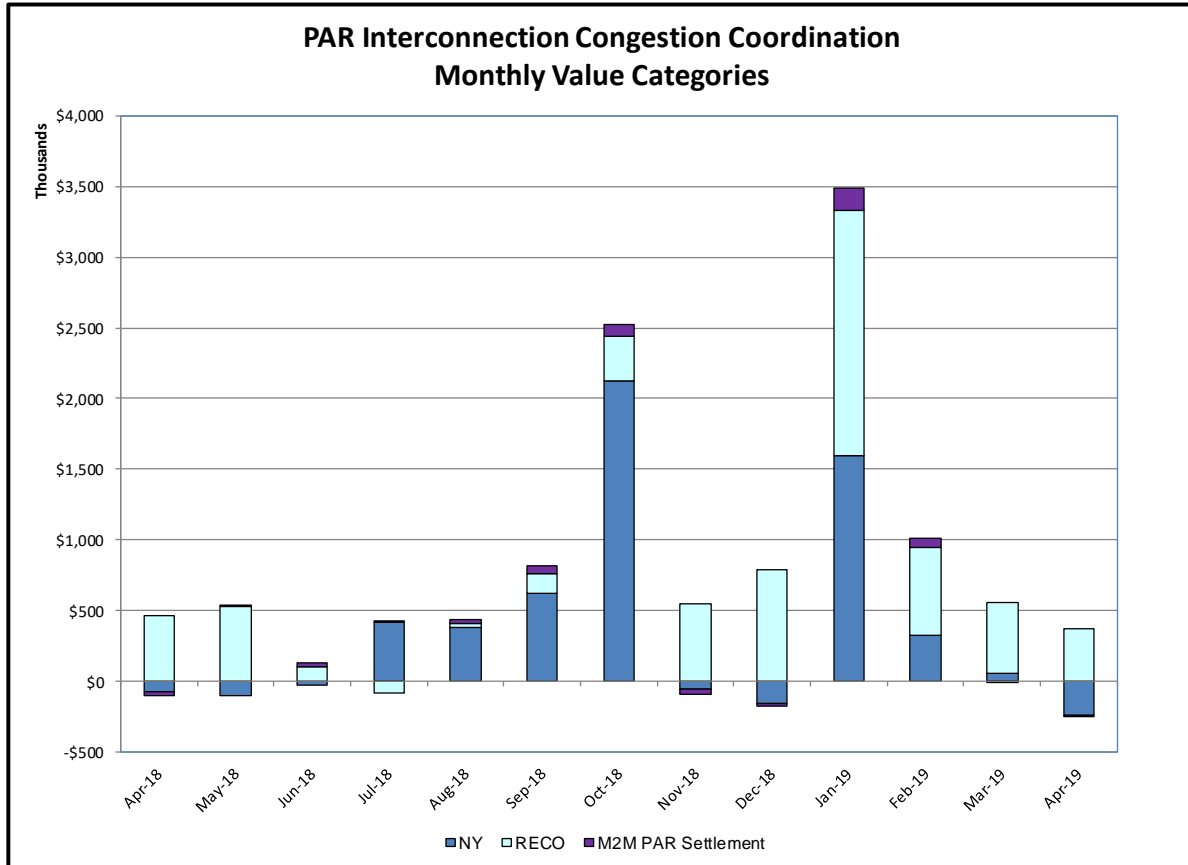






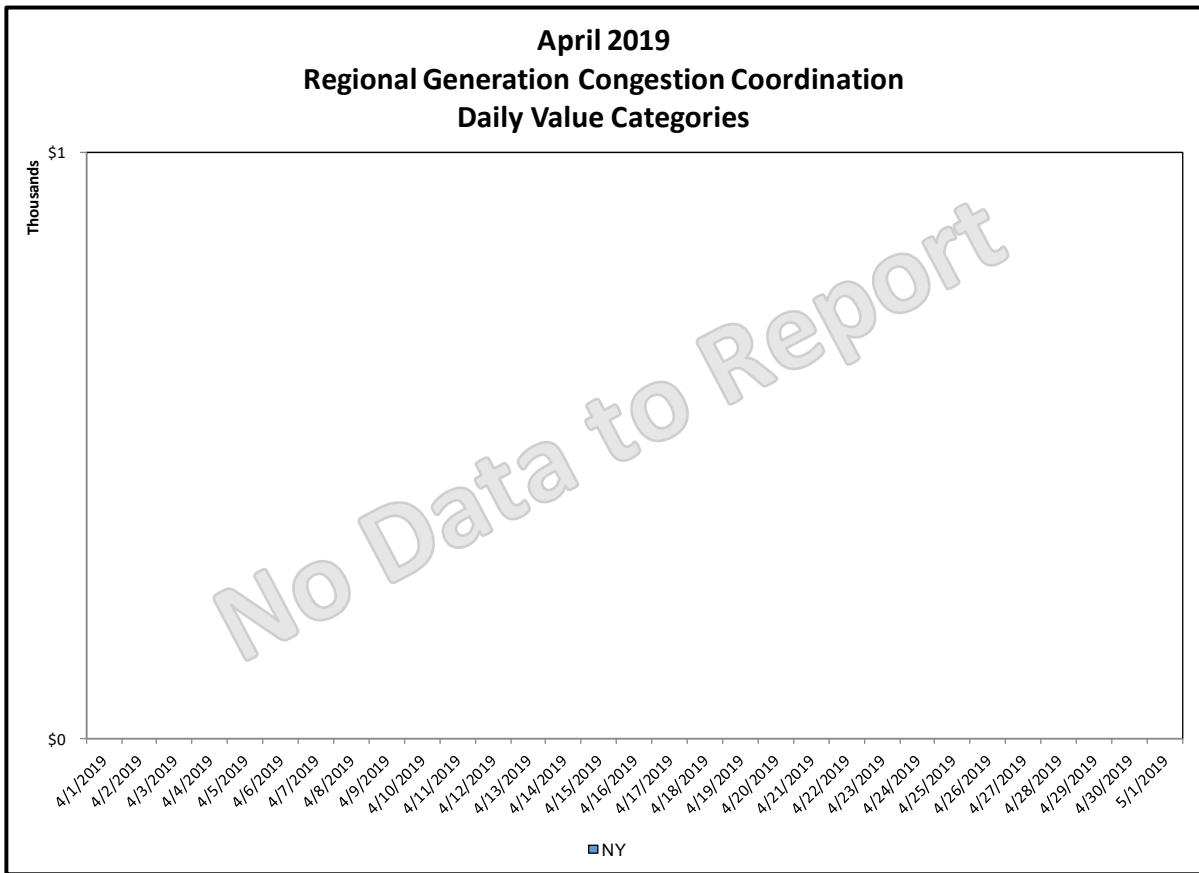
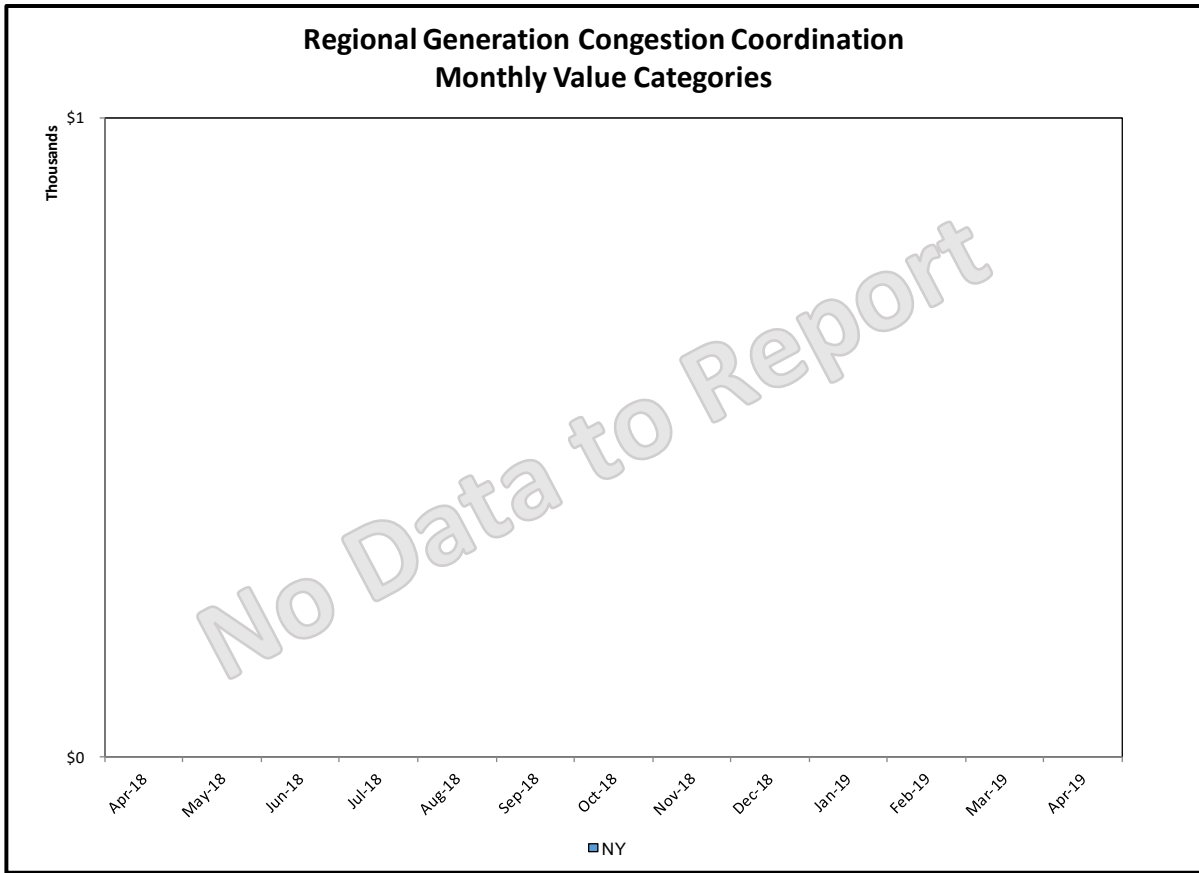


Broader Regional Market Performance Metrics



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. |



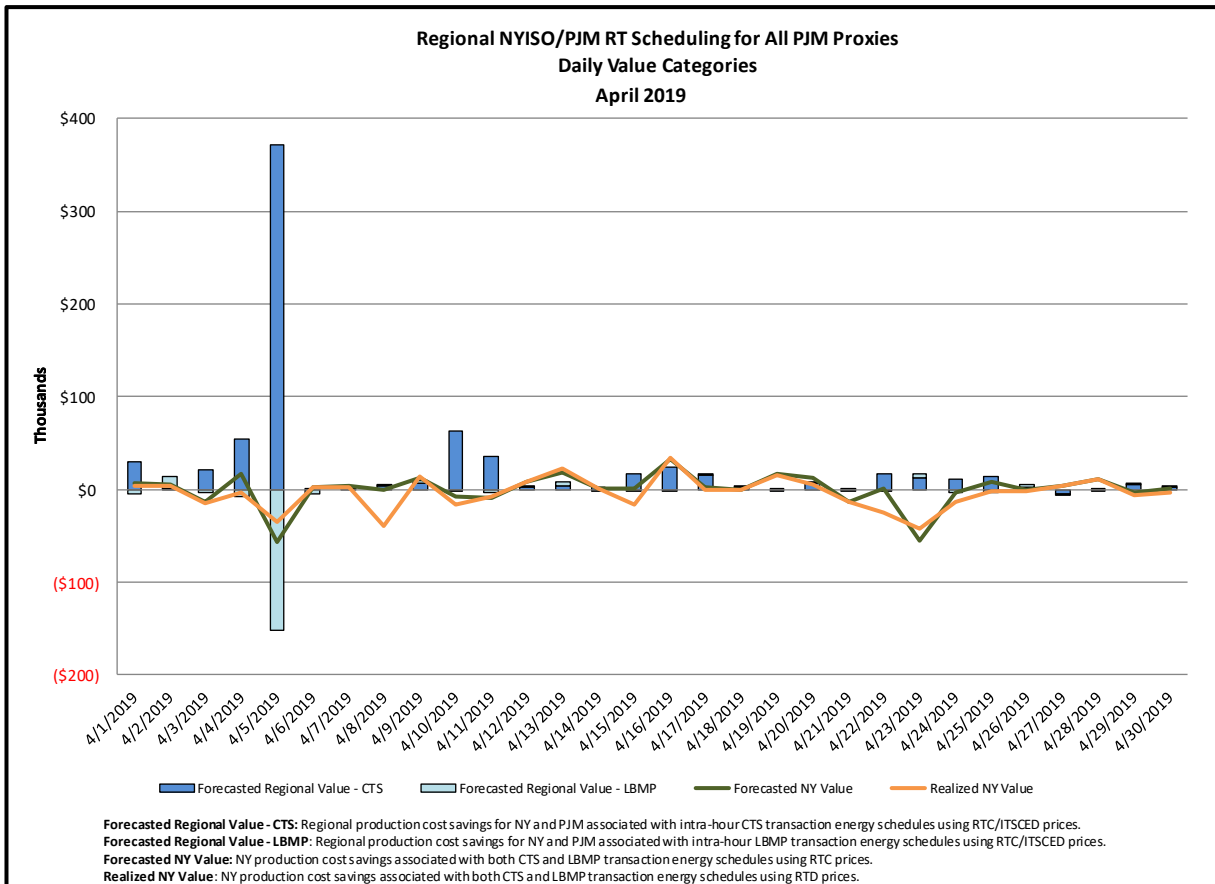
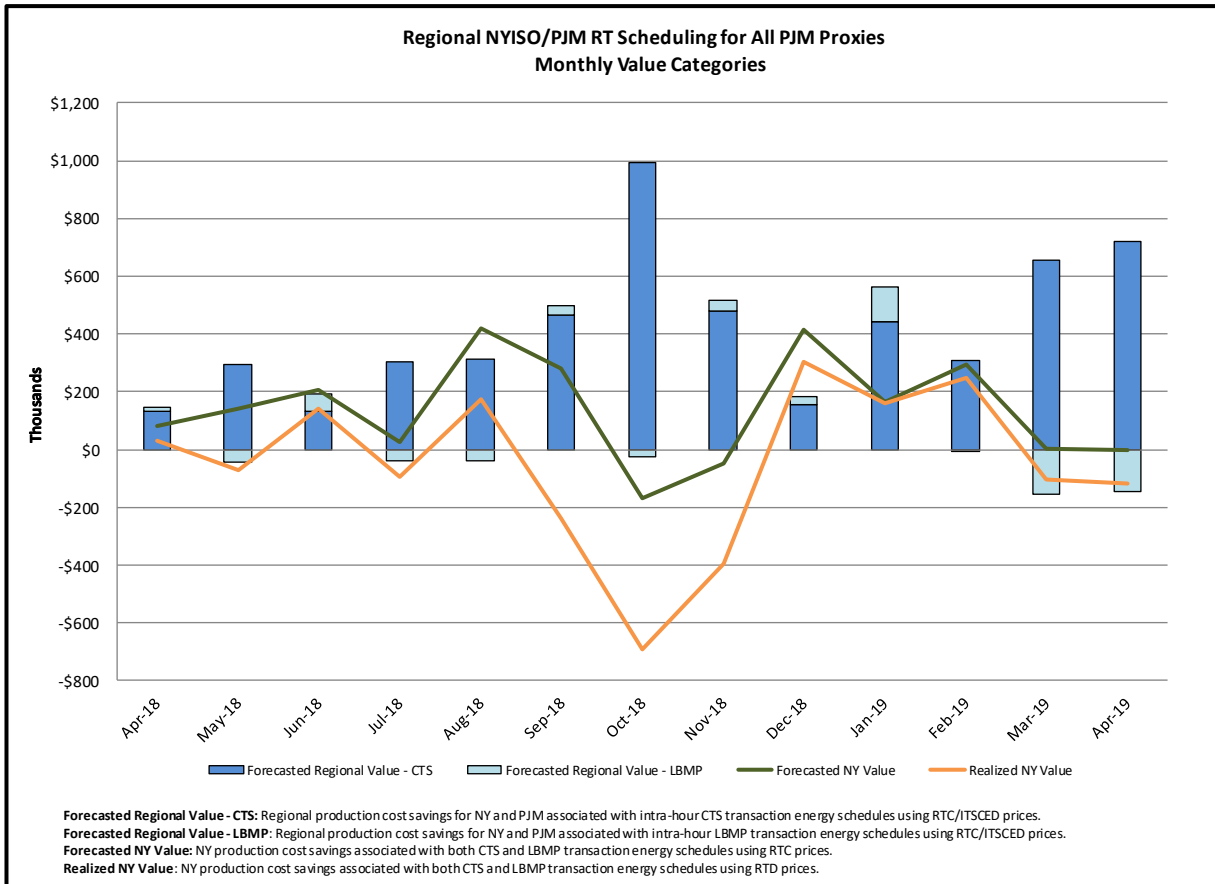
Regional Generation Congestion Coordination

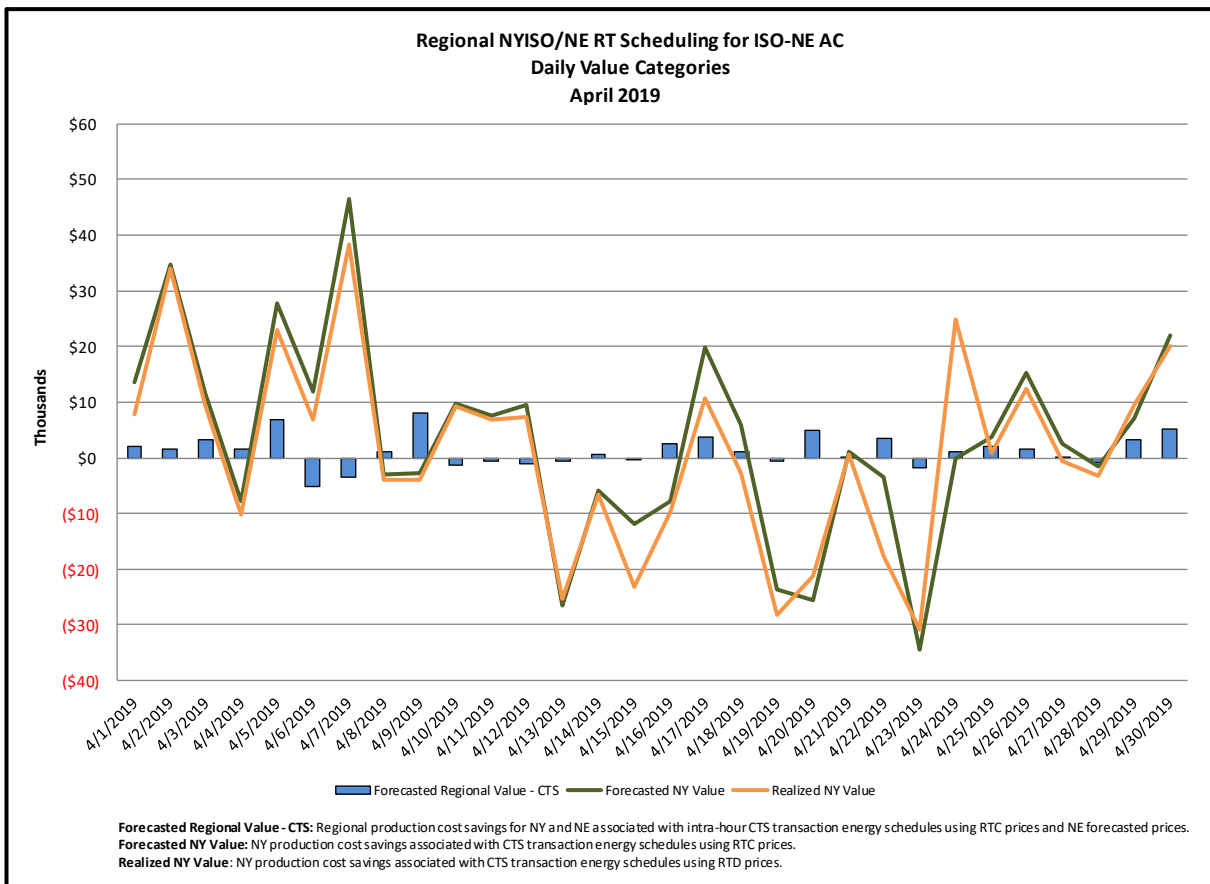
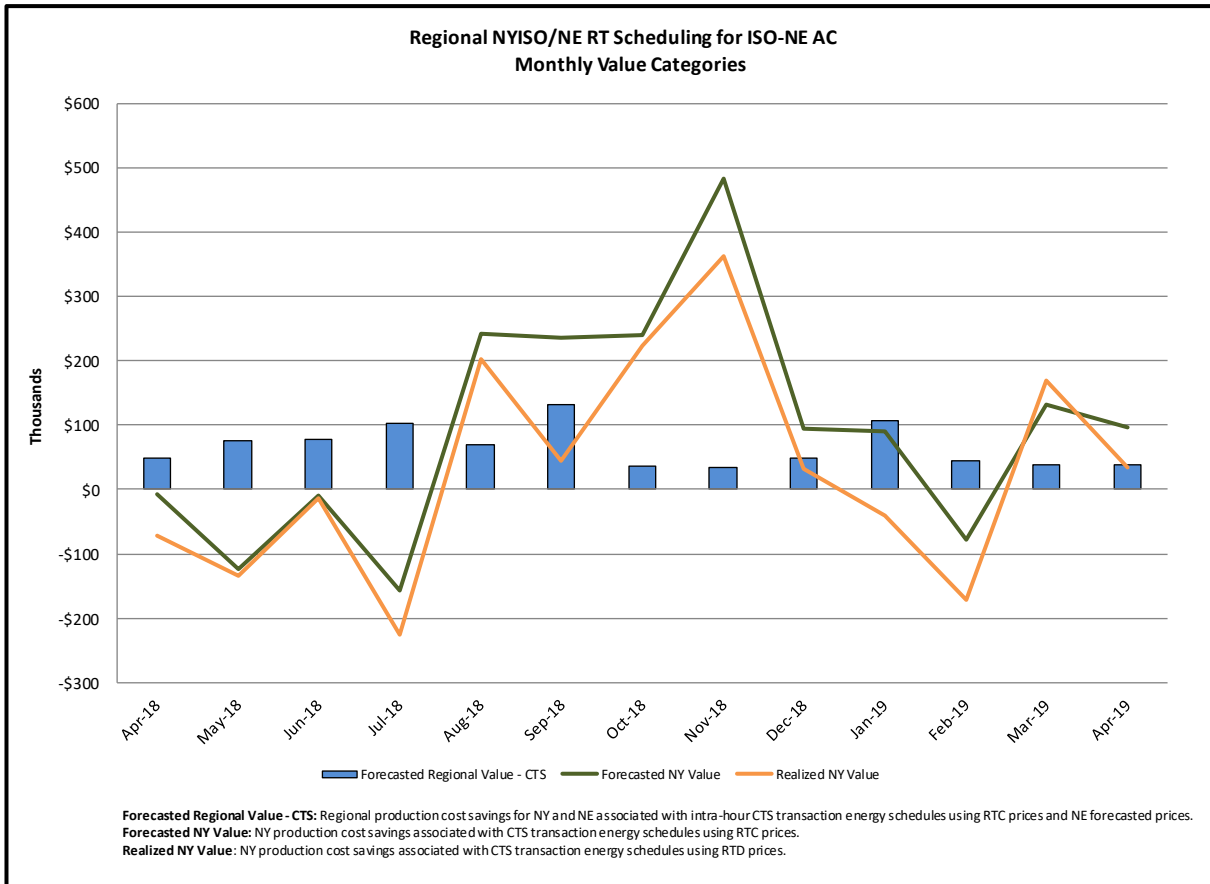
Category

NY

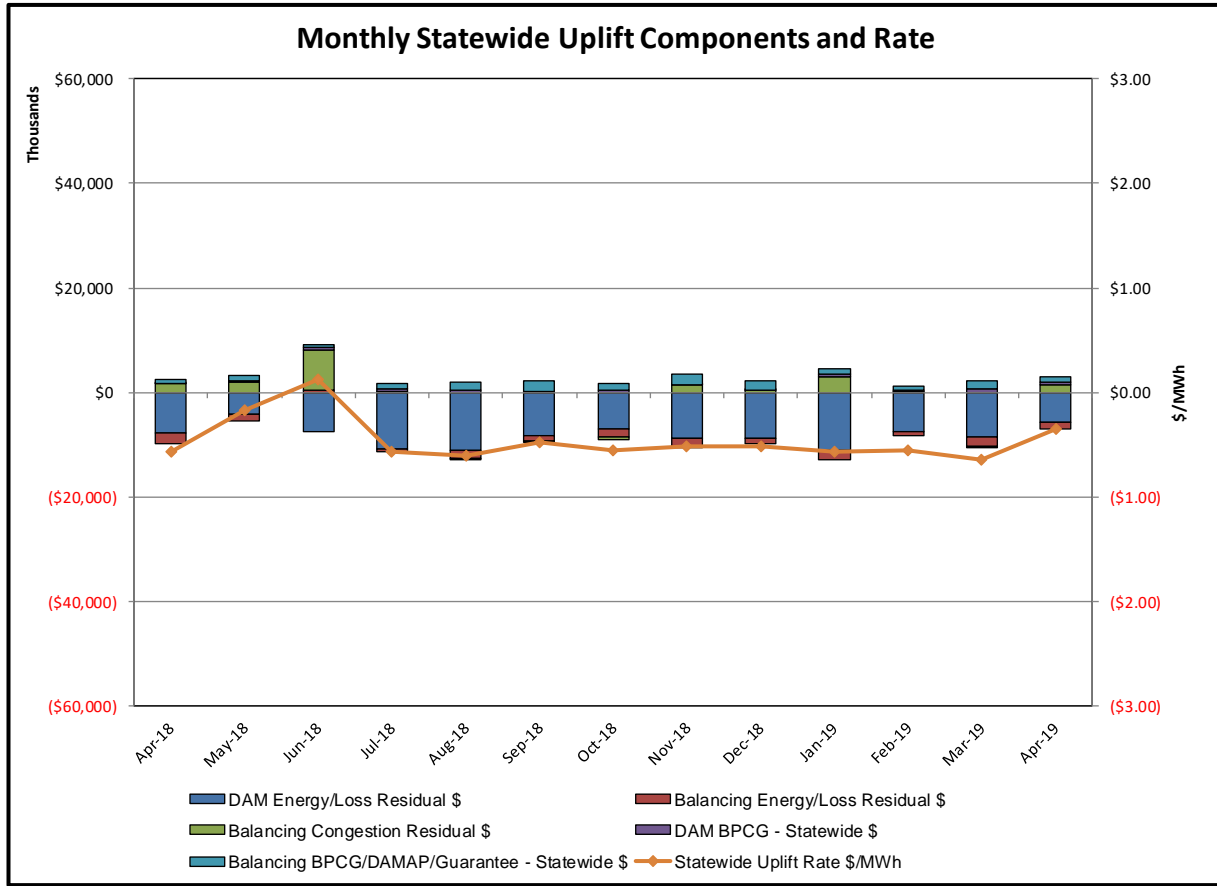
Description

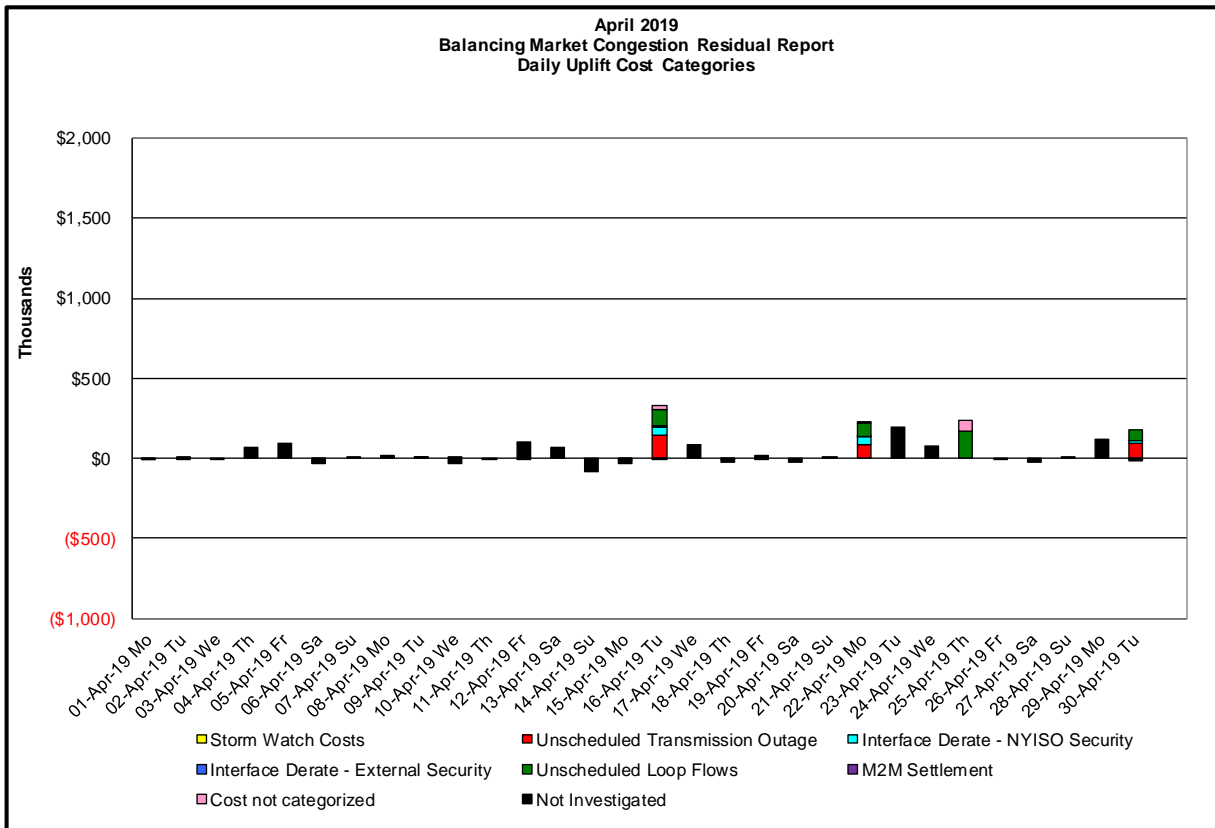
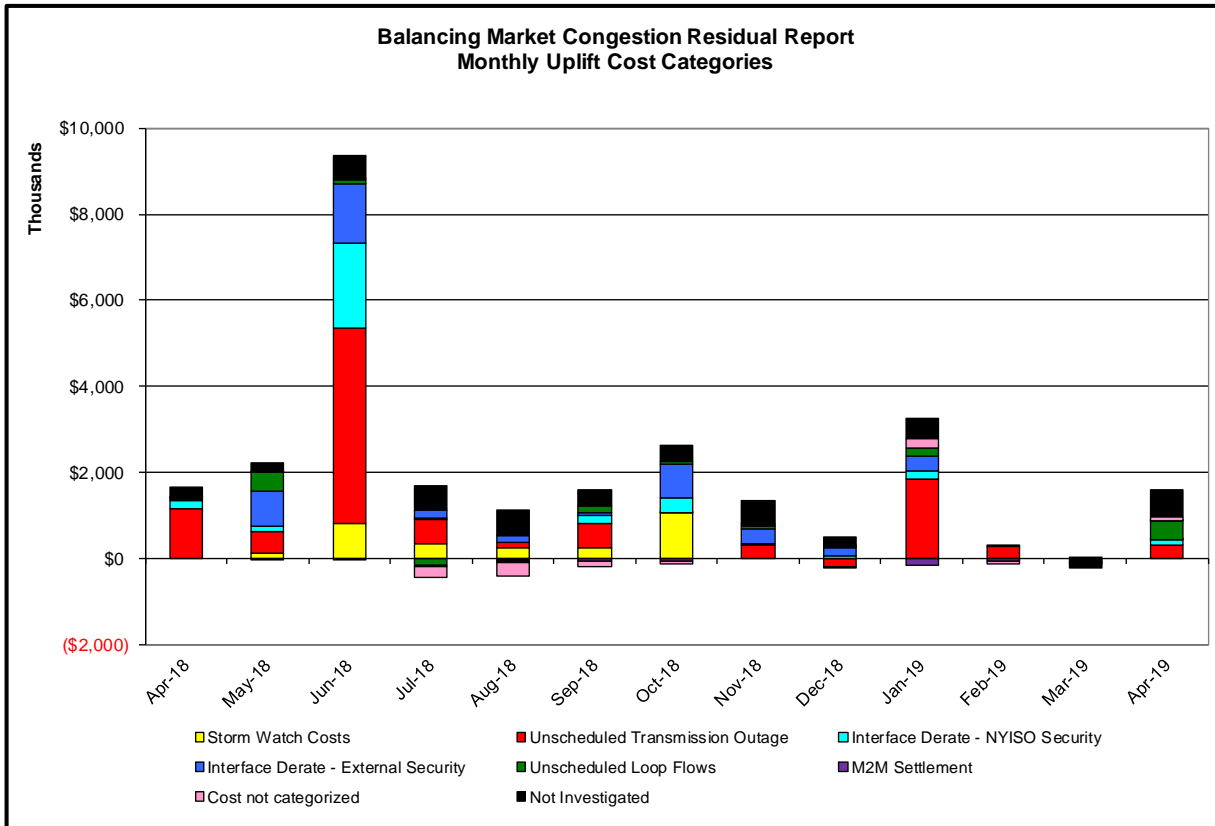
NYISO savings that result from PJM payments to NYISO when PJM's transmission use (PJM's market flow) is greater than PJM's entitlement of the NY transmission system and NYISO is incurring Western or Central NY congestion. Additionally, NYISO savings may result from the more efficient regional utilization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

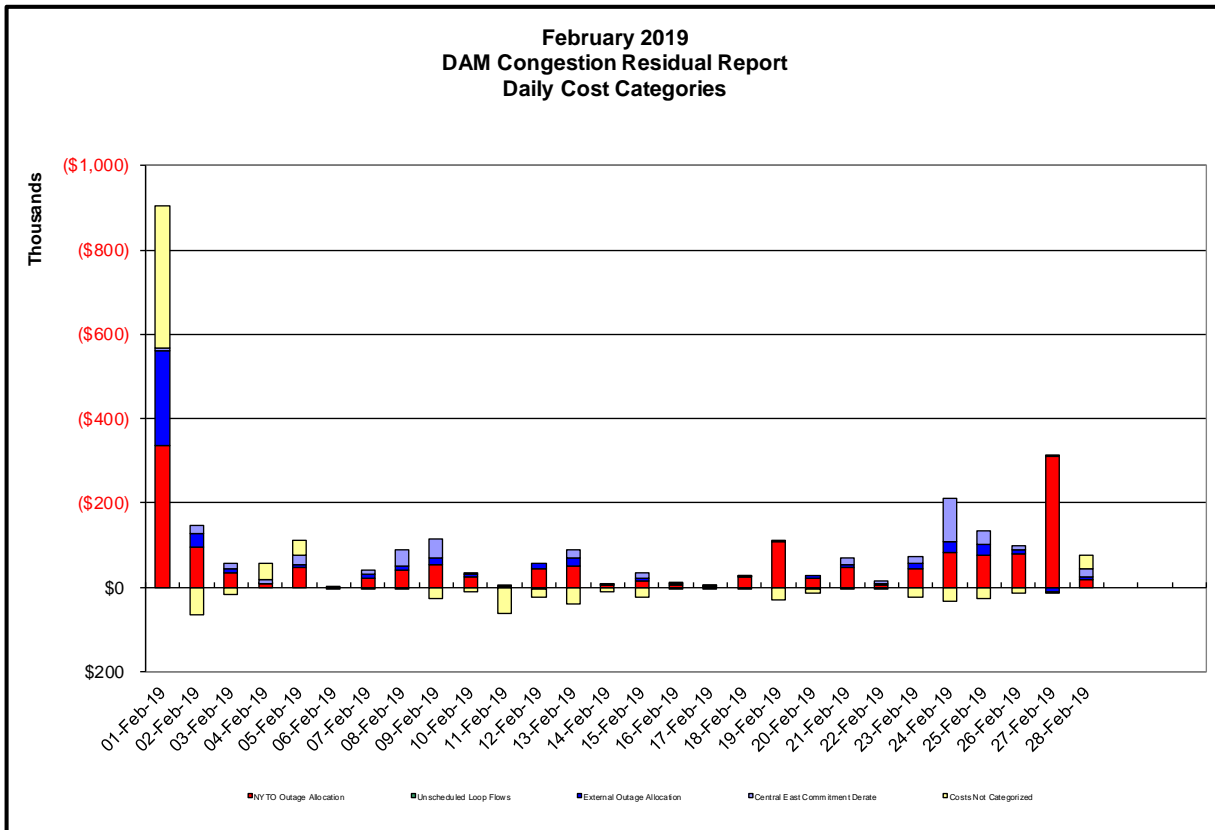
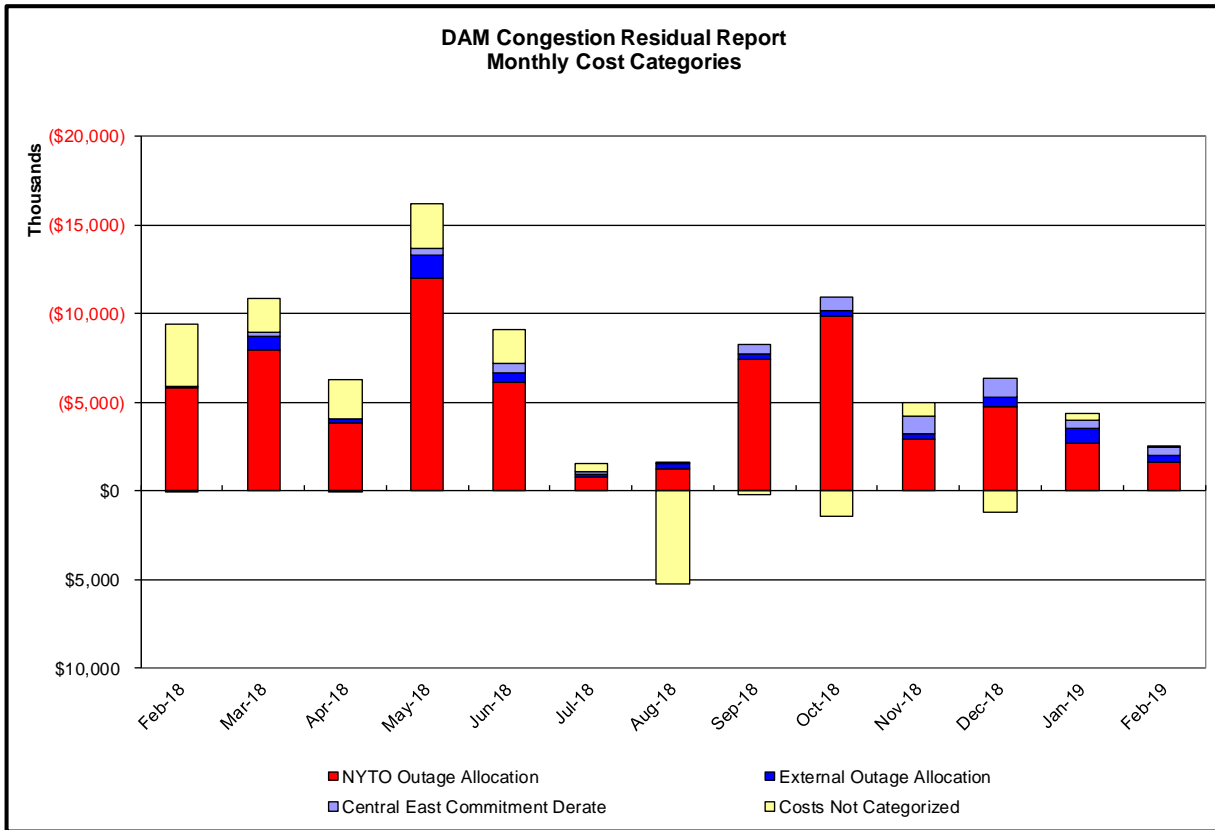
| Event | Date (yyyymmdd) | Hours | Description |
|-------|-----------------|----------------|---|
| | 4/16/2019 | 0,4-19 | Extended Outage Dunwoodie-Shore Rd 345kV (#Y50) |
| | 4/16/2019 | 9,10 | Derate Central East |
| | 4/16/2019 | 0,5-7,9-16 | Derate Patnode-Willis 230kV (#WPN-1) |
| | 4/16/2019 | 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 | |

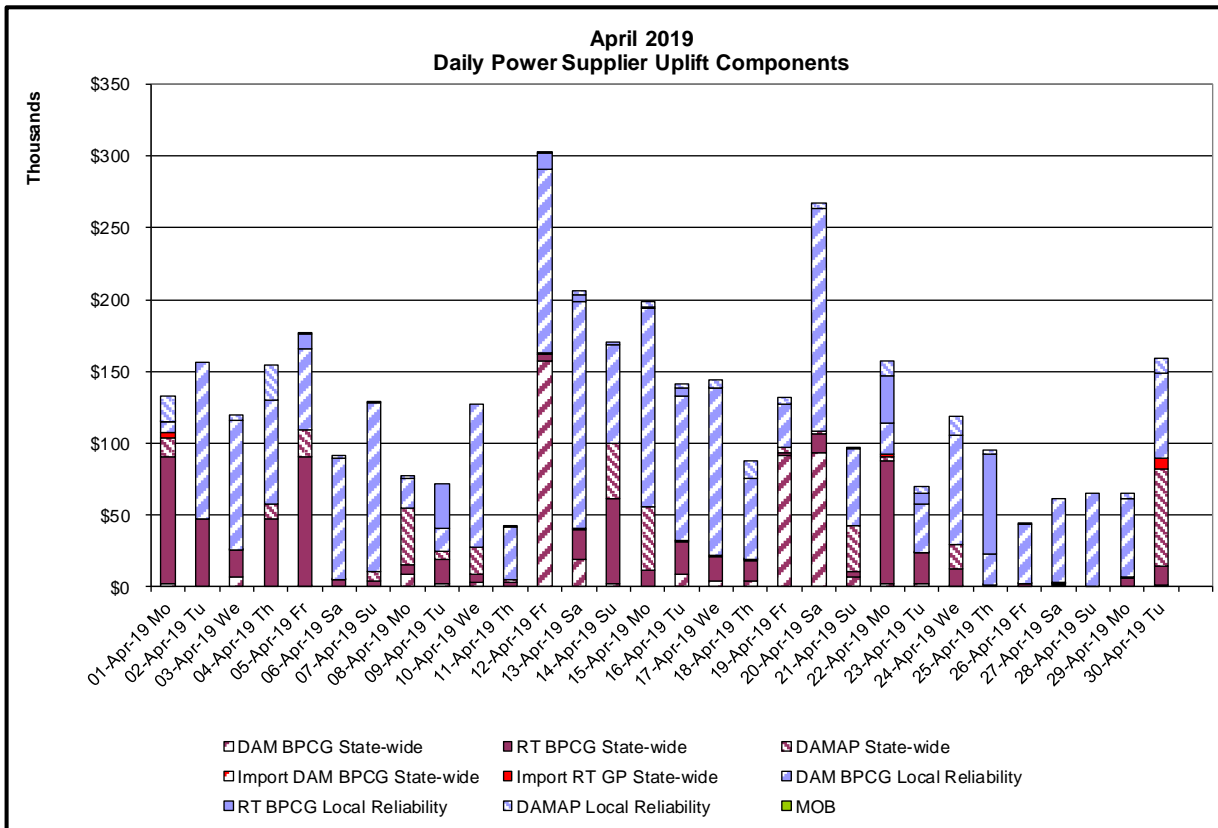
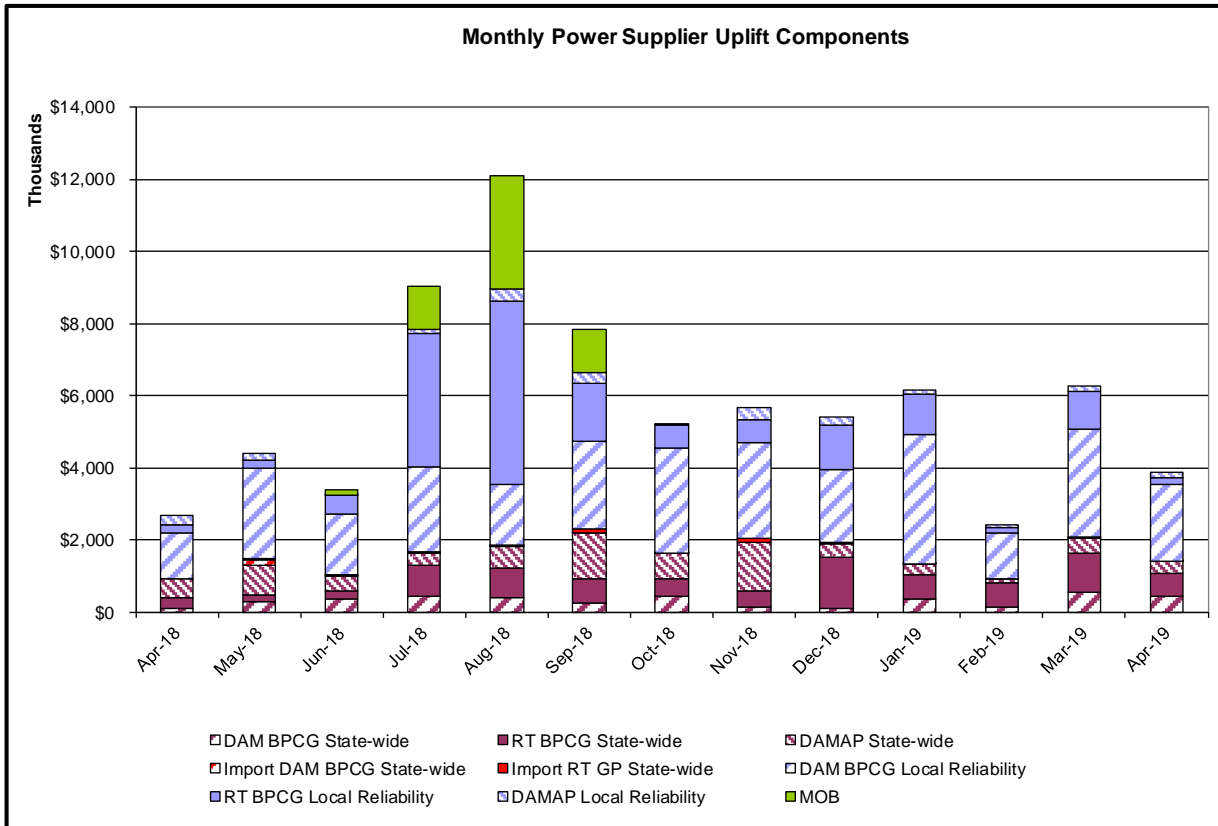
Monthly Balancing Market Congestion Report Assumptions/Notes

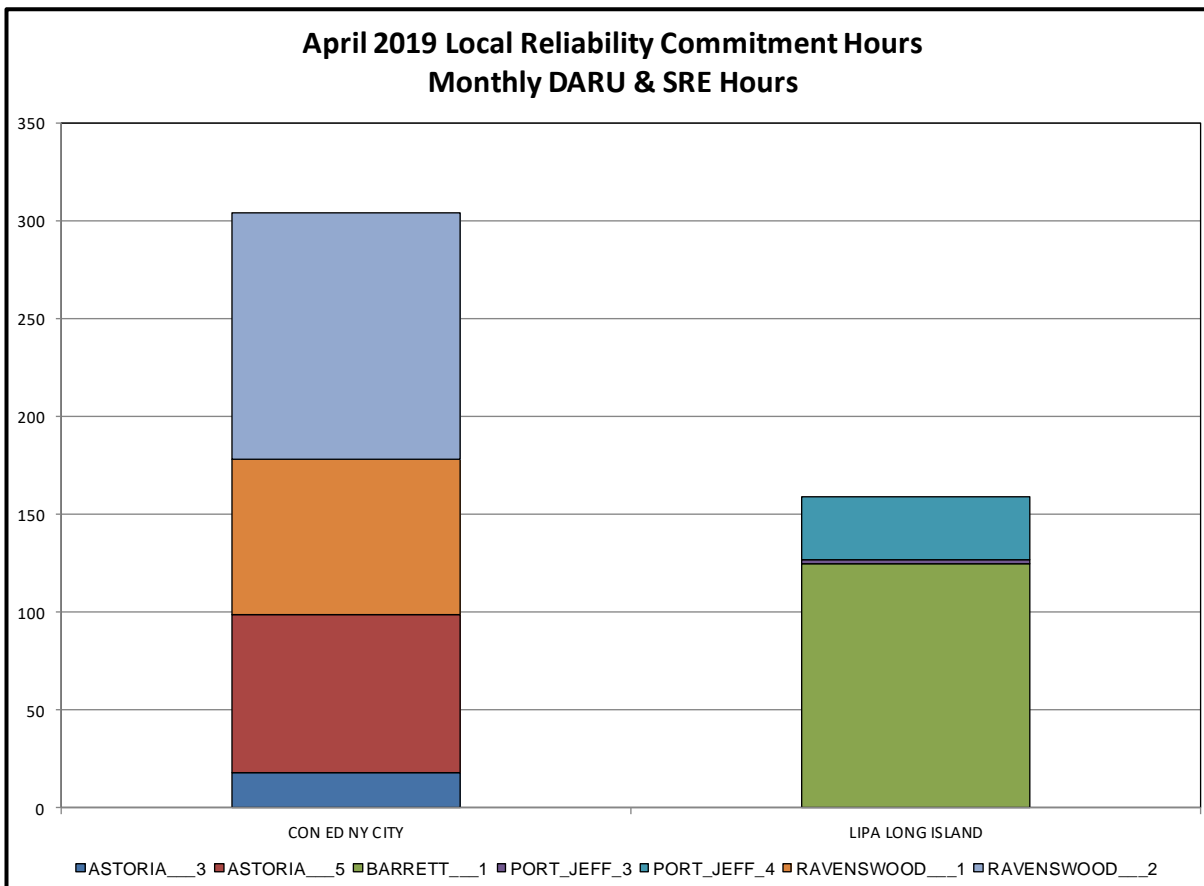
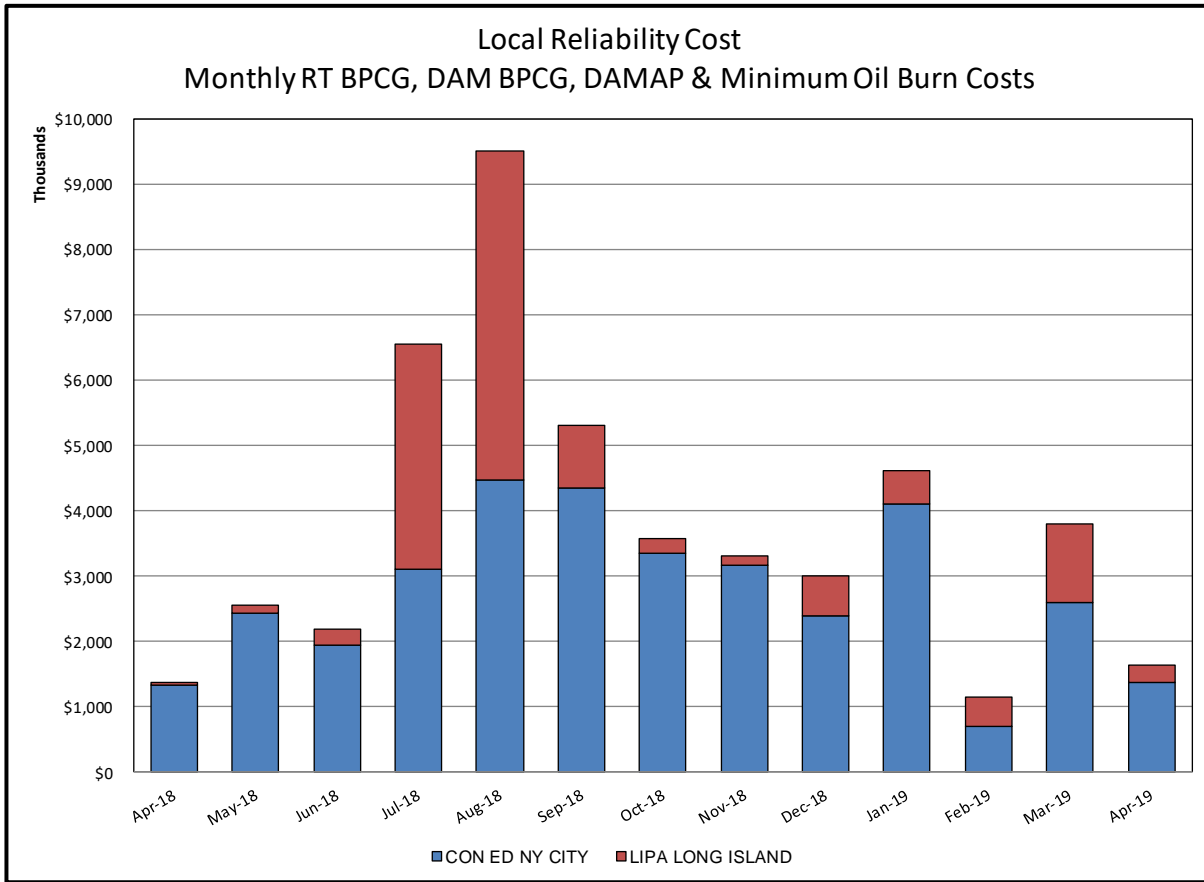
- 1) Storm Watch Costs are identified as daily total uplift costs
- 2) Days with a value of BMCR less M2M Settlement of \$100K/HR, shortfall of \$200K/Day or more, or surplus of \$100K/Day or more are investigated.
- 3) Uplift costs associated with multiple event types are apportioned equally by hour

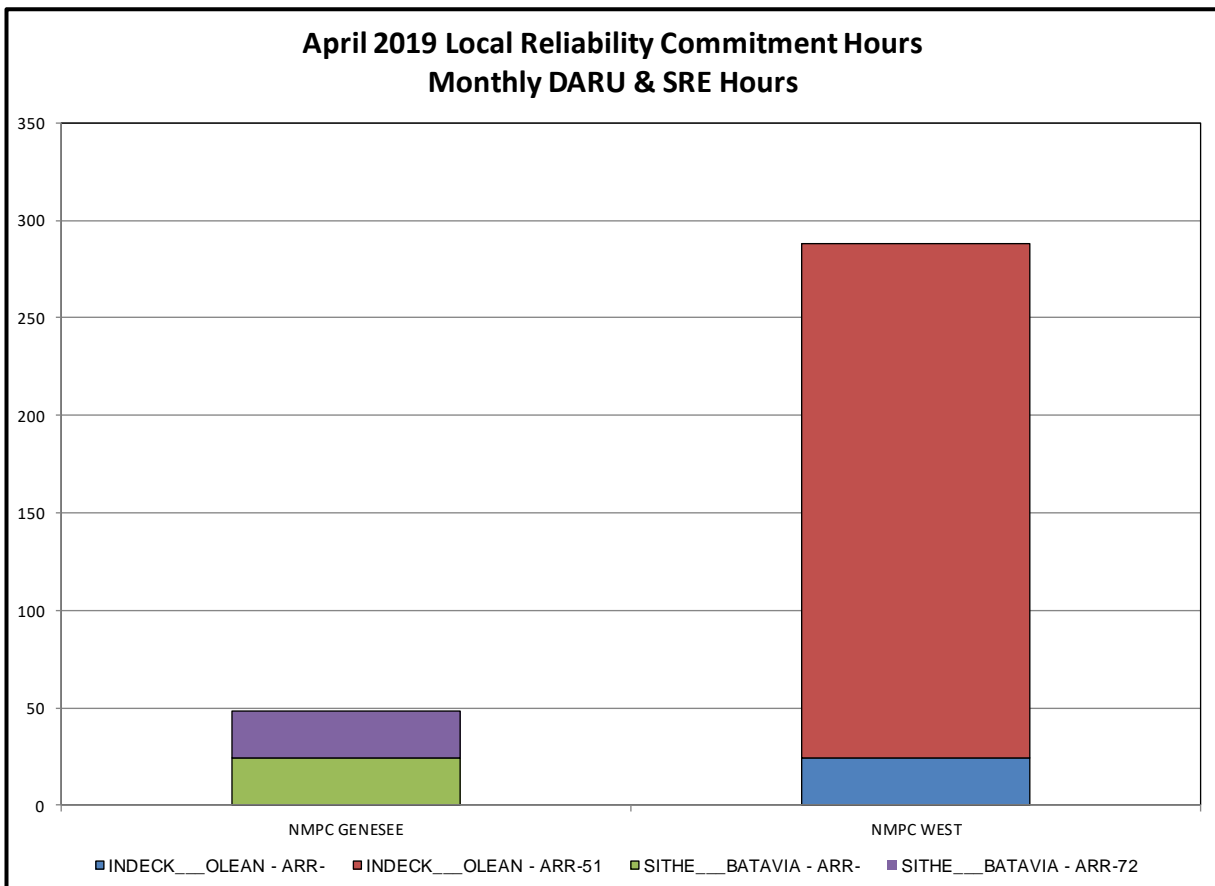
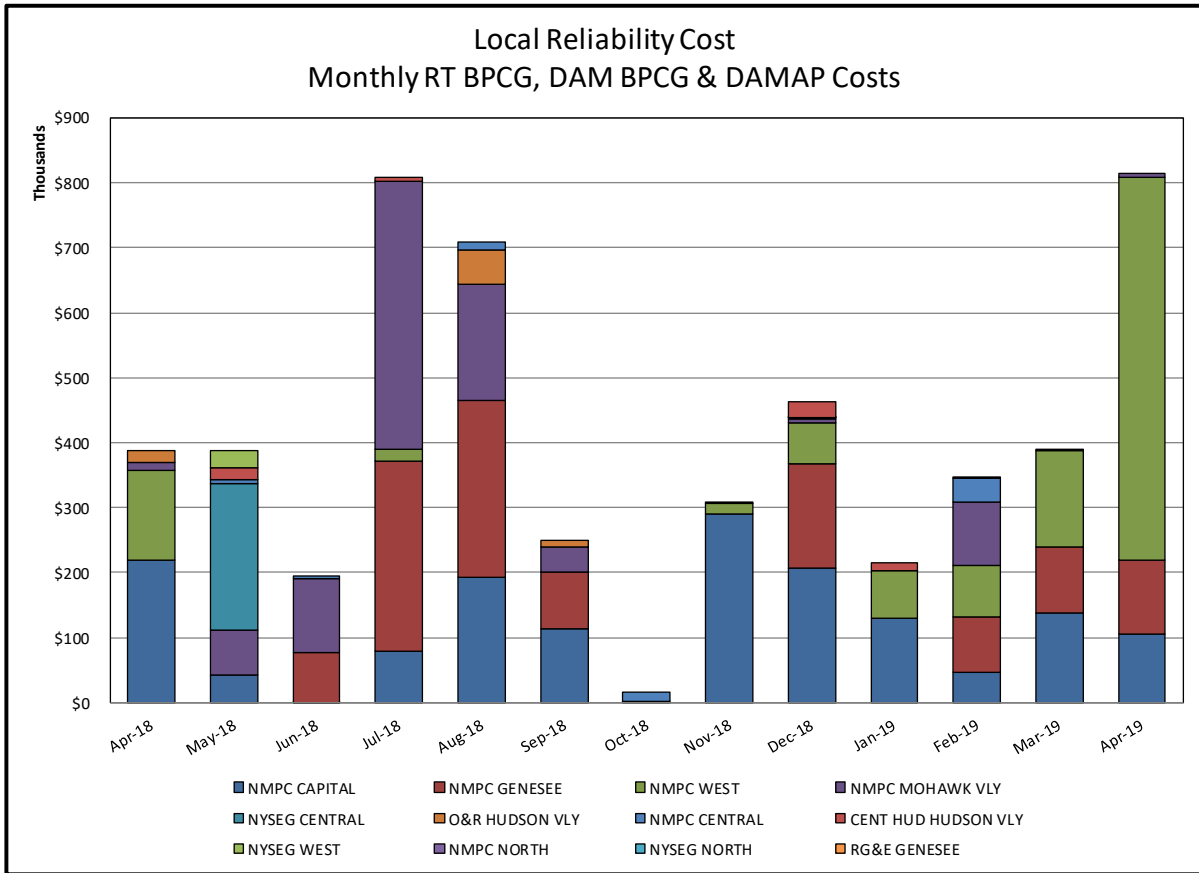


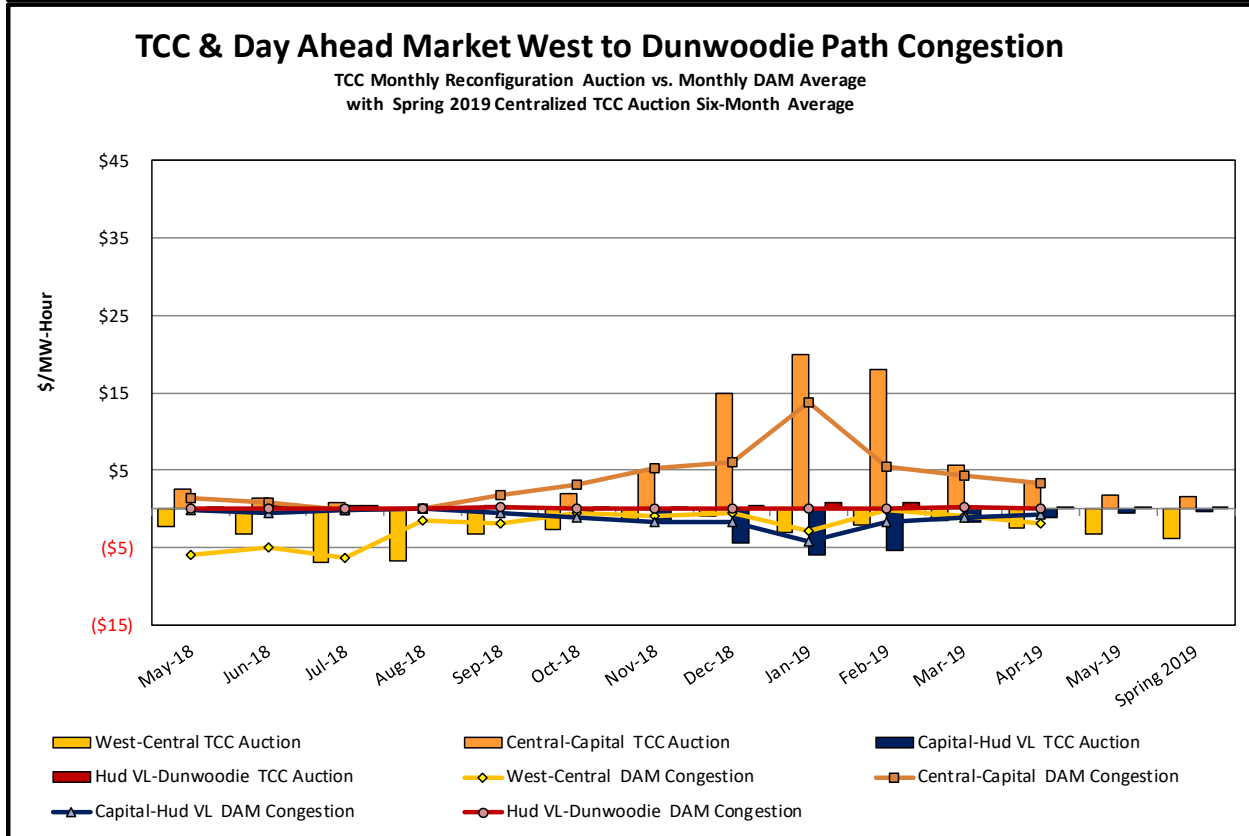
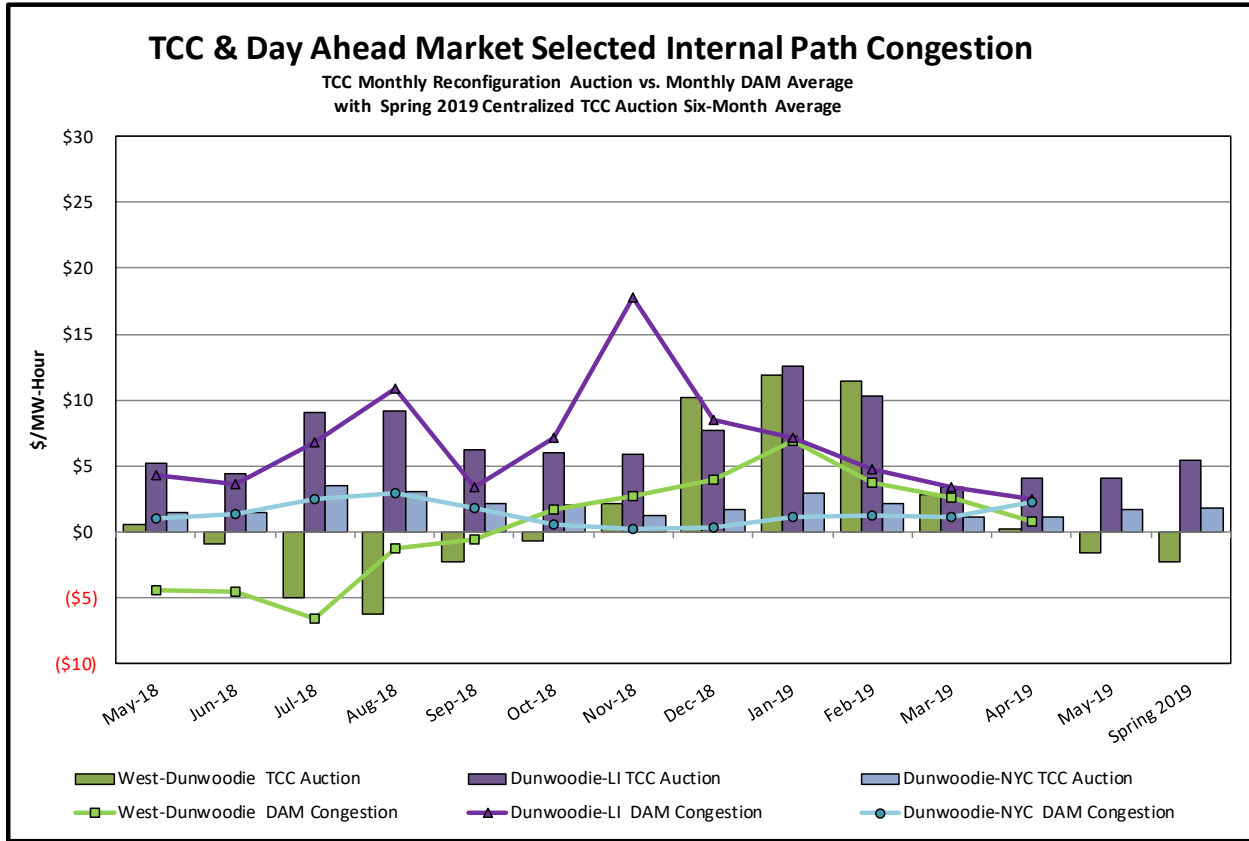
Day-Ahead Market Congestion Residual Categories

| <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. | |



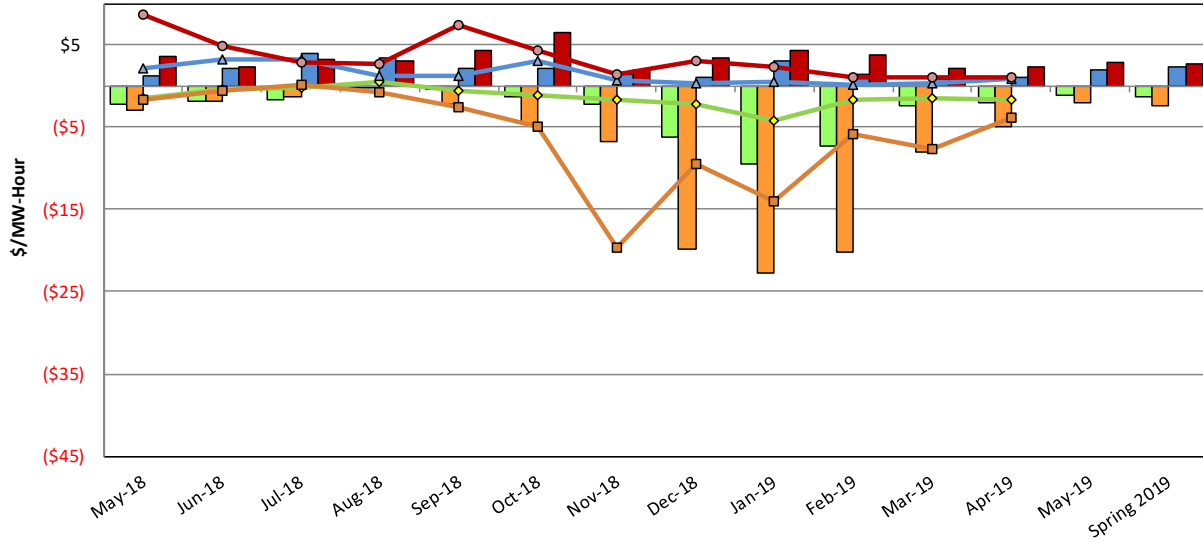




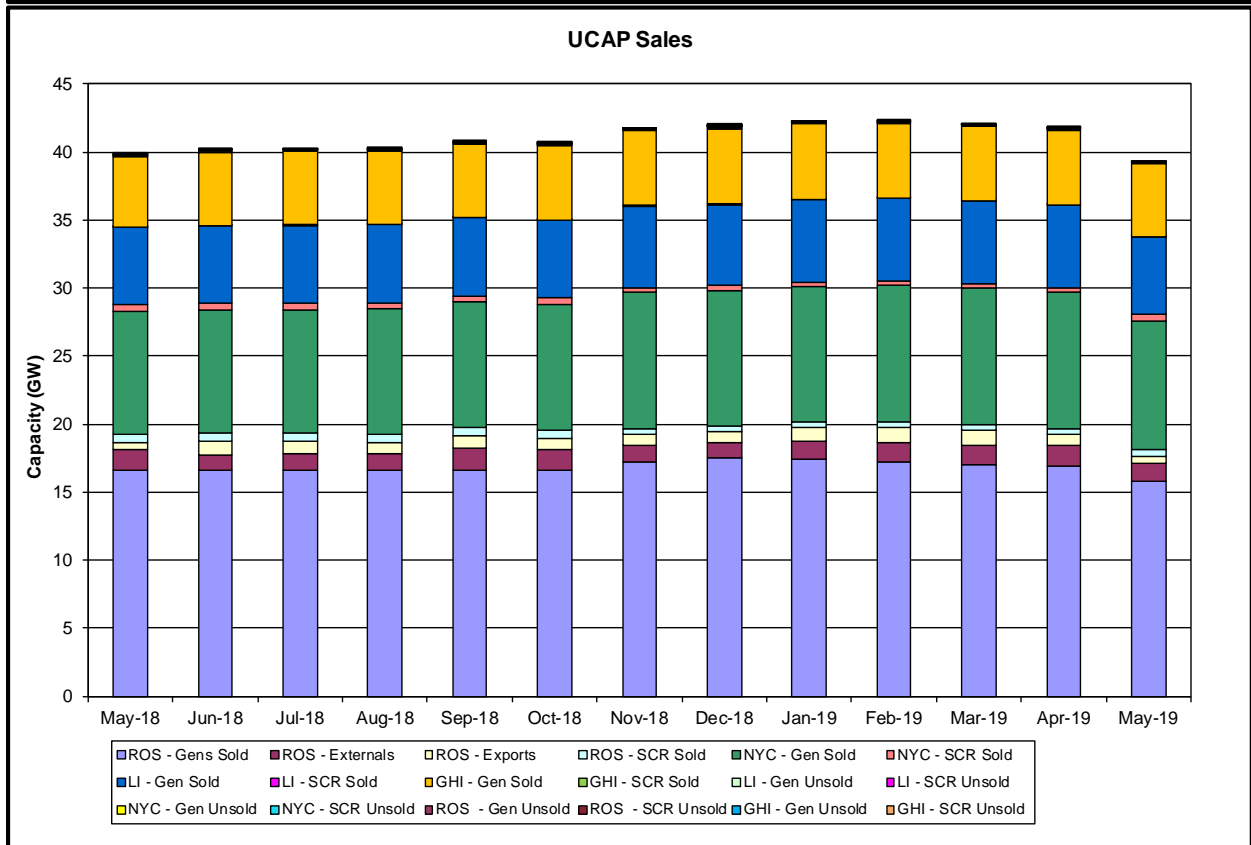
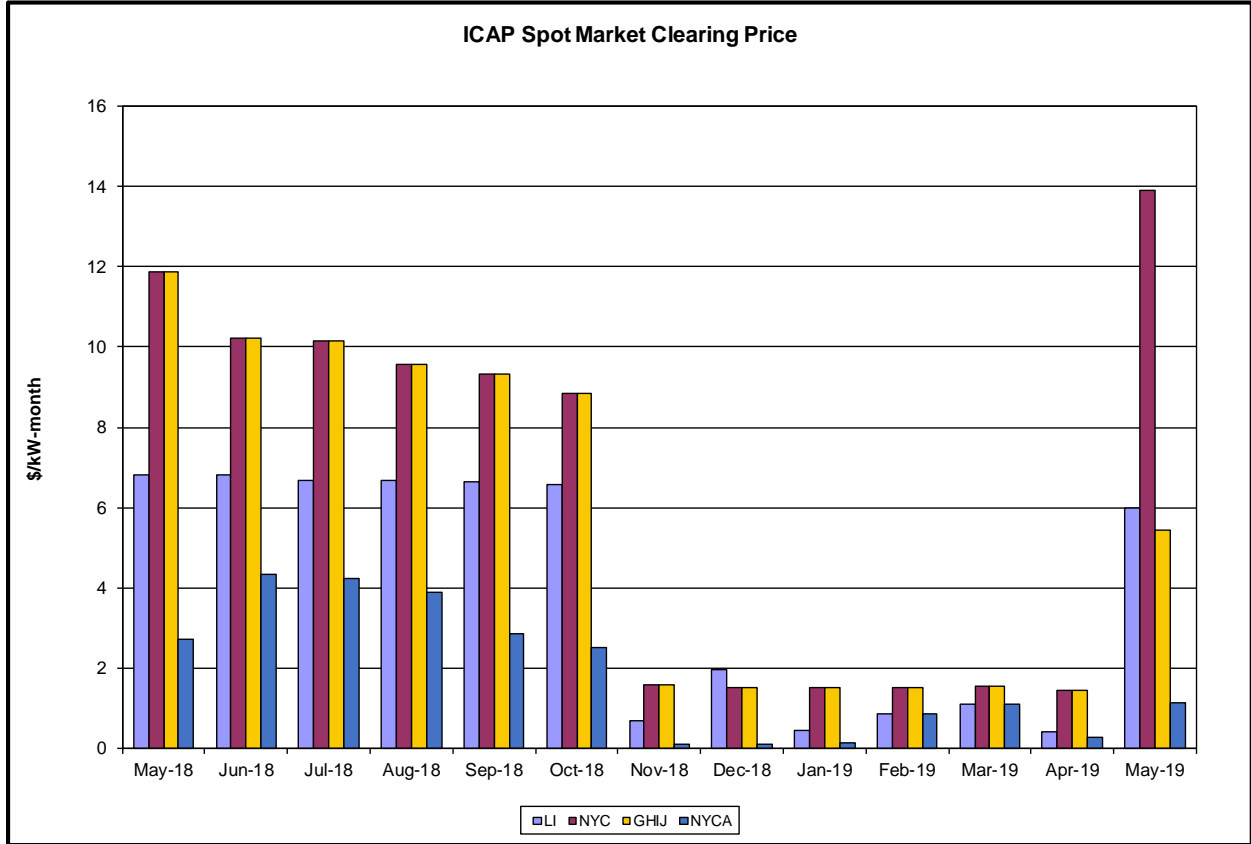


TCC & Day Ahead Market Selected External Path Congestion

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

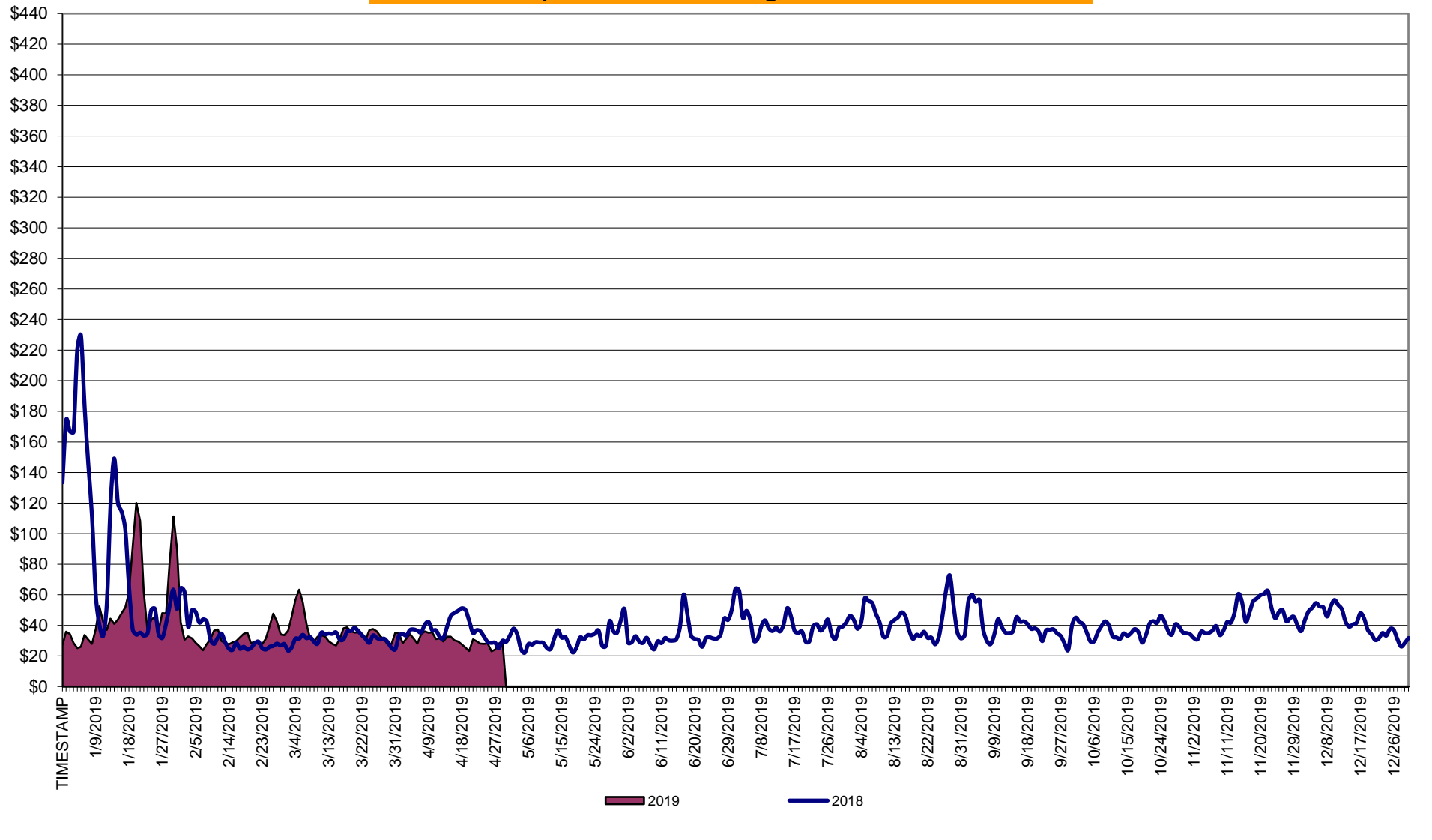


Market Performance Highlights

April 2019

- LBMP for April is \$28.01/MWh; lower than \$34.91/MWh in March 2019 and \$35.00/MWh in April 2018.
 - Day Ahead and Real Time Load Weighted LBMPs are lower compared to March.
- April 2019 average year-to-date monthly cost of \$40.12/MWh is a 27% decrease from \$54.82/MWh in April 2018.
- Average daily sendout is 371 GWh/day in April; lower than 411 GWh/day in March 2019 and 390 GWh/day in April 2018.
- Natural gas prices were lower and distillate prices were higher compared to the previous month.
 - Natural Gas (Transco Z6 NY) was \$2.37/MMBtu, down from \$2.93/MMBtu in March.
 - Natural gas prices are down 15.1% year-over-year.
 - Jet Kerosene Gulf Coast was \$14.63/MMBtu, up from \$14.08/MMBtu in March.
 - Ultra Low Sulfur No.2 Diesel NY Harbor was \$14.72/MMBtu, up from \$14.18/MMBtu in March.
 - Distillate prices are down 1.5% year-over-year.
- Uplift per MWh is higher compared to the previous month.
 - Uplift (not including NYISO cost of operations) is (\$0.15)/MWh; higher than (\$0.33)/MWh in March.
 - Local Reliability Share is \$0.20/MWh, lower than \$0.31/MWh in March.
 - Statewide Share is (\$0.35)/MWh, higher than (\$0.64)/MWh in March.
 - TSA \$ per NYC MWh is \$0.01/MWh.
- Total uplift costs (Schedule 1 components including NYISO Cost of Operations) are higher than March.

Daily NYISO Average Cost/MWh (Energy & Ancillary Services)*
2018 Annual Average \$44.92/MWh
April 2018 YTD Average \$54.82/MWh
April 2019 YTD Average \$40.12/MWh



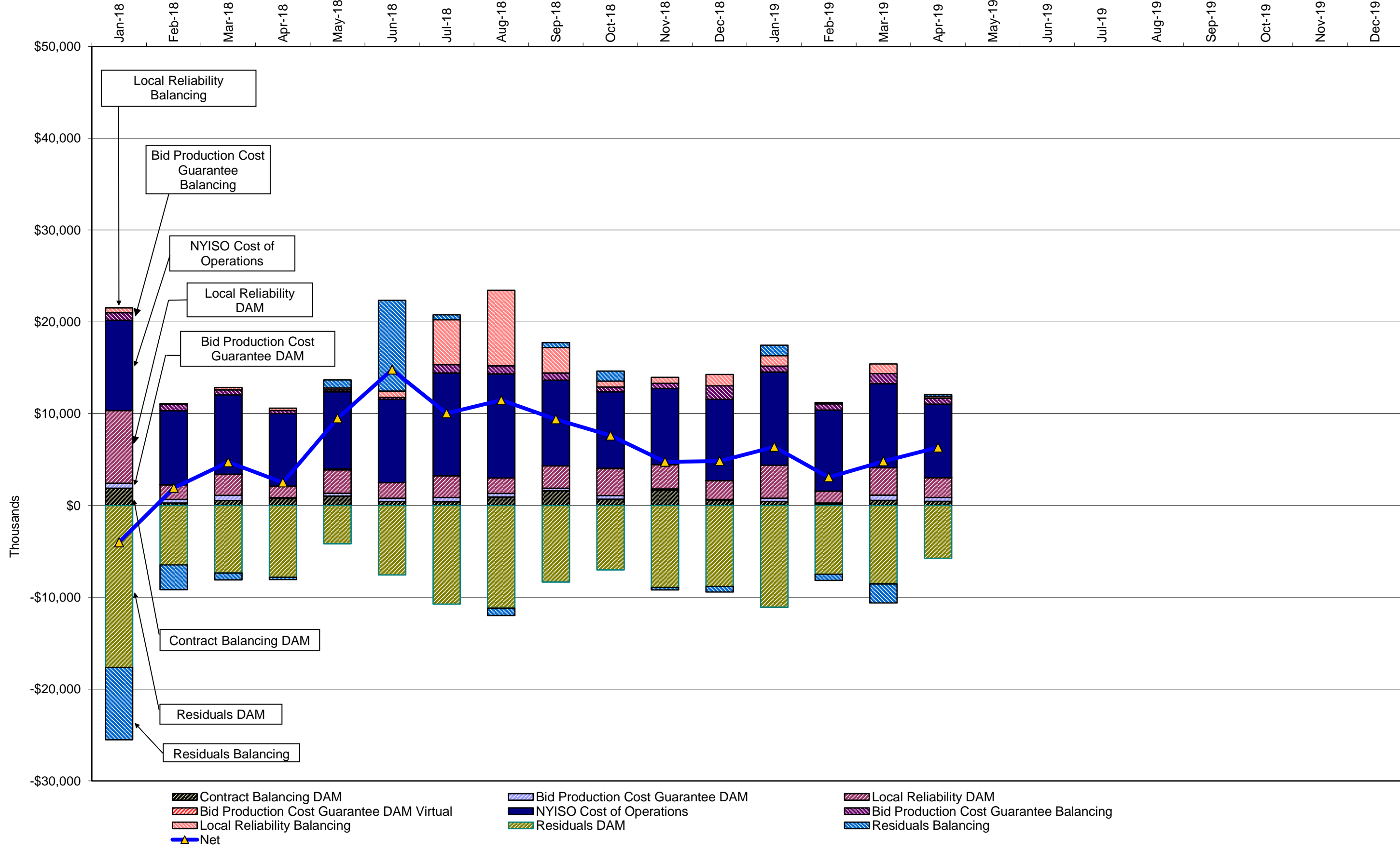
* Excludes ICAP payments.

NYISO Average Cost/MWh (Energy and Ancillary Services) *
from the LBMP Customer point of view

| 2019 | <u>January</u> | <u>February</u> | <u>March</u> | <u>April</u> | <u>May</u> | <u>June</u> | <u>July</u> | <u>August</u> | <u>September</u> | <u>October</u> | <u>November</u> | <u>December</u> |
|---------------------------------|----------------|-----------------|--------------|--------------|--------------|--------------|--------------|---------------|------------------|----------------|-----------------|-----------------|
| LBMP | 50.93 | 33.51 | 34.91 | 28.01 | | | | | | | | |
| NTAC | 0.51 | 0.69 | 0.98 | 1.16 | | | | | | | | |
| Reserve | 0.54 | 0.51 | 0.55 | 0.63 | | | | | | | | |
| Regulation | 0.13 | 0.11 | 0.10 | 0.33 | | | | | | | | |
| NYISO Cost of Operations | 0.68 | 0.68 | 0.69 | 0.69 | | | | | | | | |
| FERC Fee Recovery | 0.08 | 0.09 | 0.09 | 0.10 | | | | | | | | |
| Uplift | (0.25) | (0.44) | (0.33) | (0.15) | | | | | | | | |
| Uplift: Local Reliability Share | 0.32 | 0.11 | 0.31 | 0.20 | | | | | | | | |
| Uplift: Statewide Share | (0.57) | (0.55) | (0.64) | (0.35) | | | | | | | | |
| Voltage Support and Black Start | 0.37 | 0.37 | 0.38 | 0.38 | | | | | | | | |
| Avg Monthly Cost | 52.99 | 35.51 | 37.38 | 31.16 | | | | | | | | |
| Avg YTD Cost | 52.99 | 44.93 | 42.54 | 40.12 | | | | | | | | |
| TSA \$ per NYC MWh | 0.00 | 0.00 | 0.01 | 0.01 | | | | | | | | |
| 2018 | <u>January</u> | <u>February</u> | <u>March</u> | <u>April</u> | <u>May</u> | <u>June</u> | <u>July</u> | <u>August</u> | <u>September</u> | <u>October</u> | <u>November</u> | <u>December</u> |
| LBMP | 99.55 | 33.83 | 29.91 | 35.00 | 28.78 | 32.53 | 39.58 | 42.56 | 38.70 | 35.85 | 43.15 | 40.31 |
| NTAC | 0.71 | 0.58 | 0.88 | 1.09 | 0.88 | 1.00 | 0.93 | 0.72 | 0.40 | 0.36 | 1.18 | 0.93 |
| Reserve | 0.92 | 0.65 | 0.64 | 0.81 | 0.68 | 0.57 | 0.49 | 0.51 | 0.52 | 0.80 | 0.66 | 0.54 |
| Regulation | 0.15 | 0.15 | 0.16 | 0.12 | 0.14 | 0.16 | 0.09 | 0.09 | 0.09 | 0.16 | 0.17 | 0.17 |
| NYISO Cost of Operations | 0.65 | 0.65 | 0.66 | 0.65 | 0.66 | 0.67 | 0.67 | 0.66 | 0.66 | 0.63 | 0.63 | 0.63 |
| FERC Fee Recovery | 0.08 | 0.10 | 0.09 | 0.10 | 0.09 | 0.09 | 0.06 | 0.06 | 0.08 | 0.09 | 0.09 | 0.08 |
| Uplift | (0.92) | (0.50) | (0.31) | (0.45) | 0.05 | 0.30 | (0.13) | (0.02) | (0.11) | (0.30) | (0.27) | (0.29) |
| Uplift: Local Reliability Share | 0.59 | 0.14 | 0.19 | 0.12 | 0.22 | 0.18 | 0.44 | 0.59 | 0.37 | 0.27 | 0.25 | 0.23 |
| Uplift: Statewide Share | (1.52) | (0.64) | (0.51) | (0.57) | (0.17) | 0.12 | (0.57) | (0.61) | (0.48) | (0.56) | (0.52) | (0.52) |
| Voltage Support and Black Start | 0.40 | 0.41 | 0.42 | 0.41 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.40 | 0.40 | 0.40 |
| Avg Monthly Cost | 101.54 | 35.87 | 32.45 | 37.74 | 31.70 | 35.73 | 42.12 | 45.01 | 40.76 | 38.00 | 46.01 | 42.78 |
| Avg YTD Cost | 101.54 | 72.85 | 60.06 | 54.82 | 50.20 | 47.70 | 46.64 | 46.37 | 45.75 | 45.03 | 45.11 | 44.92 |
| TSA \$ per NYC MWh | 0.00 | 0.00 | 0.04 | 0.00 | 0.08 | 0.39 | 0.21 | 0.14 | 0.33 | 0.75 | 0.00 | 0.00 |

* Excludes ICAP payments.
Market Mitigation and Analysis
Prepared: 5/8/2019 11:49 AM

NYISO Dollar Flows - Uplift - OATT Schedule 1 components - Data through April 30, 2019



DAM Contract Balancing amounts are for payments made to generating units to make them whole for being dispatched below their Day-Ahead schedule, as a result of out-of-merit dispatches.
 DAM Bid Production Cost Guarantees for Virtual Transactions are included in the chart and are shown from the inception of Virtual Transactions. These values are small and cannot be identified on the chart.
 DAM residuals consist of both energy and loss revenue collections and payments. By design, there is a net over collection of revenues due to the difference between the marginal losses paid to generation and the average losses charged to loads.

NYISO Markets Transactions

| 2019 | <u>January</u> | <u>February</u> | <u>March</u> | <u>April</u> | <u>May</u> | <u>June</u> | <u>July</u> | <u>August</u> | <u>September</u> | <u>October</u> | <u>November</u> | <u>December</u> |
|--|----------------|-----------------|--------------|--------------|------------|-------------|-------------|---------------|------------------|----------------|-----------------|-----------------|
| Day Ahead Market MWh | 15,299,458 | 13,391,383 | 13,527,834 | 11,811,029 | | | | | | | | |
| DAM LSE Internal LBMP Energy Sales | 57% | 57% | 59% | 59% | | | | | | | | |
| DAM External TC LBMP Energy Sales | 6% | 5% | 3% | 1% | | | | | | | | |
| DAM Bilateral - Internal Bilaterals | 29% | 30% | 30% | 31% | | | | | | | | |
| DAM Bilateral - Import/Non-LBMP Market Bilaterals | 5% | 5% | 5% | 5% | | | | | | | | |
| DAM Bilateral - Export/Non-LBMP Market Bilaterals | 1% | 1% | 2% | 2% | | | | | | | | |
| DAM Bilateral - Wheel Through Bilaterals | 2% | 2% | 2% | 2% | | | | | | | | |
| Balancing Energy Market MWh | -322,442 | -323,188 | -261,217 | -218,482 | | | | | | | | |
| Balancing Energy LSE Internal LBMP Energy Sales | -120% | -126% | -138% | -178% | | | | | | | | |
| Balancing Energy External TC LBMP Energy Sales | 65% | 67% | 82% | 113% | | | | | | | | |
| Balancing Energy Bilateral - Internal Bilaterals | -4% | -1% | -3% | 2% | | | | | | | | |
| Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals | 0% | 0% | 0% | 0% | | | | | | | | |
| Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals | 3% | 7% | 6% | 7% | | | | | | | | |
| Balancing Energy Bilateral - Wheel Through Bilaterals | -45% | -47% | -47% | -44% | | | | | | | | |
| Transactions Summary | | | | | | | | | | | | |
| LBMP | 63% | 62% | 61% | 60% | | | | | | | | |
| Internal Bilaterals | 29% | 30% | 30% | 31% | | | | | | | | |
| Import Bilaterals | 5% | 5% | 6% | 6% | | | | | | | | |
| Export Bilaterals | 1% | 2% | 2% | 2% | | | | | | | | |
| Wheels Through | 1% | 1% | 1% | 1% | | | | | | | | |
| Market Share of Total Load | | | | | | | | | | | | |
| Day Ahead Market | 102.2% | 102.5% | 102.0% | 101.9% | | | | | | | | |
| Balancing Energy + | -2.2% | -2.5% | -2.0% | -1.9% | | | | | | | | |
| Total MWh | 14,977,016 | 13,068,195 | 13,266,617 | 11,592,547 | | | | | | | | |
| Average Daily Energy Sendout/Month GWh | 449 | 436 | 411 | 371 | | | | | | | | |

| 2018 | <u>January</u> | <u>February</u> | <u>March</u> | <u>April</u> | <u>May</u> | <u>June</u> | <u>July</u> | <u>August</u> | <u>September</u> | <u>October</u> | <u>November</u> | <u>December</u> |
|--|----------------|-----------------|--------------|--------------|------------|-------------|-------------|---------------|------------------|----------------|-----------------|-----------------|
| Day Ahead Market MWh | 15,153,751 | 12,643,854 | 13,521,386 | 12,158,686 | 12,721,073 | 13,983,384 | 16,839,994 | 17,195,447 | 14,432,632 | 13,548,828 | 13,506,134 | 14,450,460 |
| DAM LSE Internal LBMP Energy Sales | 59% | 57% | 58% | 60% | 61% | 61% | 65% | 65% | 61% | 57% | 58% | 56% |
| DAM External TC LBMP Energy Sales | 4% | 3% | 2% | 2% | 2% | 1% | 1% | 2% | 3% | 6% | 6% | 6% |
| DAM Bilateral - Internal Bilaterals | 29% | 31% | 32% | 30% | 29% | 30% | 26% | 25% | 28% | 29% | 30% | 30% |
| DAM Bilateral - Import/Non-LBMP Market Bilaterals | 5% | 5% | 5% | 5% | 5% | 5% | 4% | 4% | 5% | 5% | 2% | 5% |
| DAM Bilateral - Export/Non-LBMP Market Bilaterals | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 2% | 2% | 2% |
| DAM Bilateral - Wheel Through Bilaterals | 1% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 2% |
| Balancing Energy Market MWh | -149,619 | -299,377 | -386,811 | -72,862 | -29,539 | -354,112 | -80,438 | -44,732 | -210,436 | -314,885 | -304,277 | -428,748 |
| Balancing Energy LSE Internal LBMP Energy Sales | -147% | -101% | -128% | -208% | -458% | -113% | -123% | -75% | -82% | -105% | -100% | -94% |
| Balancing Energy External TC LBMP Energy Sales | 74% | 24% | 37% | 189% | 564% | 29% | 129% | 209% | 14% | 30% | 18% | 27% |
| Balancing Energy Bilateral - Internal Bilaterals | 9% | 5% | 0% | -11% | 29% | 5% | 18% | 23% | 7% | 2% | 3% | 3% |
| Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 10% | 0% |
| Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals | 22% | 9% | 6% | 34% | 51% | 3% | 14% | 25% | 3% | 0% | 0% | 0% |
| Balancing Energy Bilateral - Wheel Through Bilaterals | -58% | -36% | -15% | -103% | -287% | -23% | -138% | -281% | -42% | -27% | -31% | -36% |
| Transactions Summary | | | | | | | | | | | | |
| LBMP | 63% | 59% | 59% | 62% | 63% | 61% | 66% | 68% | 64% | 63% | 64% | 61% |
| Internal Bilaterals | 30% | 32% | 33% | 30% | 29% | 31% | 27% | 25% | 28% | 30% | 31% | 31% |
| Import Bilaterals | 5% | 5% | 6% | 5% | 5% | 5% | 4% | 4% | 5% | 5% | 3% | 5% |
| Export Bilaterals | 2% | 2% | 2% | 2% | 2% | 1% | 1% | 1% | 1% | 2% | 2% | 2% |
| Wheels Through | 1% | 1% | 1% | 1% | 1% | 2% | 1% | 1% | 2% | 1% | 1% | 1% |
| Market Share of Total Load | | | | | | | | | | | | |
| Day Ahead Market | 101.0% | 102.4% | 102.9% | 100.6% | 100.2% | 102.6% | 100.5% | 100.3% | 101.5% | 102.4% | 102.3% | 103.1% |
| Balancing Energy + | -1.0% | -2.4% | -2.9% | -0.6% | -0.2% | -2.6% | -0.5% | -0.3% | -1.5% | -2.4% | -2.3% | -3.1% |
| Total MWh | 15,004,132 | 12,344,477 | 13,134,575 | 12,085,824 | 12,691,534 | 13,629,272 | 16,759,556 | 17,150,715 | 14,222,196 | 13,233,943 | 13,201,857 | 14,021,712 |
| Average Daily Energy Sendout/Month GWh | 463 | 426 | 413 | 390 | 397 | 445 | 529 | 537 | 458 | 399 | 411 | 425 |

+ Balancing Energy: Load(MW) purchased at Real Time LBMP.

* The signs for the detail section intuitively reflect the direction of power flow eliminating the use of double negatives when Balancing Energy is negative.

Notes: Percent totals may not equal 100% due to rounding.

Virtual Transactions are not reflected in this chart.

NYISO Markets 2019 Energy Statistics

| | <u>January</u> | <u>February</u> | <u>March</u> | <u>April</u> | <u>May</u> | <u>June</u> | <u>July</u> | <u>August</u> | <u>September</u> | <u>October</u> | <u>November</u> | <u>December</u> |
|--|----------------|-----------------|--------------|--------------|------------|-------------|-------------|---------------|------------------|----------------|-----------------|-----------------|
| <u>DAY AHEAD LBMP</u> | | | | | | | | | | | | |
| Price * | \$45.01 | \$30.66 | \$32.34 | \$25.97 | | | | | | | | |
| Standard Deviation | \$25.67 | \$12.86 | \$9.30 | \$6.32 | | | | | | | | |
| Load Weighted Price ** | \$46.88 | \$31.53 | \$33.14 | \$26.57 | | | | | | | | |
| <u>RTC LBMP</u> | | | | | | | | | | | | |
| Price * | \$40.86 | \$29.74 | \$31.04 | \$25.07 | | | | | | | | |
| Standard Deviation | \$23.02 | \$10.79 | \$8.48 | \$7.53 | | | | | | | | |
| Load Weighted Price ** | \$42.39 | \$30.32 | \$31.62 | \$25.54 | | | | | | | | |
| <u>REAL TIME LBMP</u> | | | | | | | | | | | | |
| Price * | \$39.54 | \$30.13 | \$31.46 | \$24.47 | | | | | | | | |
| Standard Deviation | \$26.03 | \$13.77 | \$12.54 | \$17.27 | | | | | | | | |
| Load Weighted Price ** | \$41.24 | \$30.80 | \$32.06 | \$25.06 | | | | | | | | |
| Average Daily Energy Sendout/Month GWh | 449 | 436 | 411 | 371 | | | | | | | | |

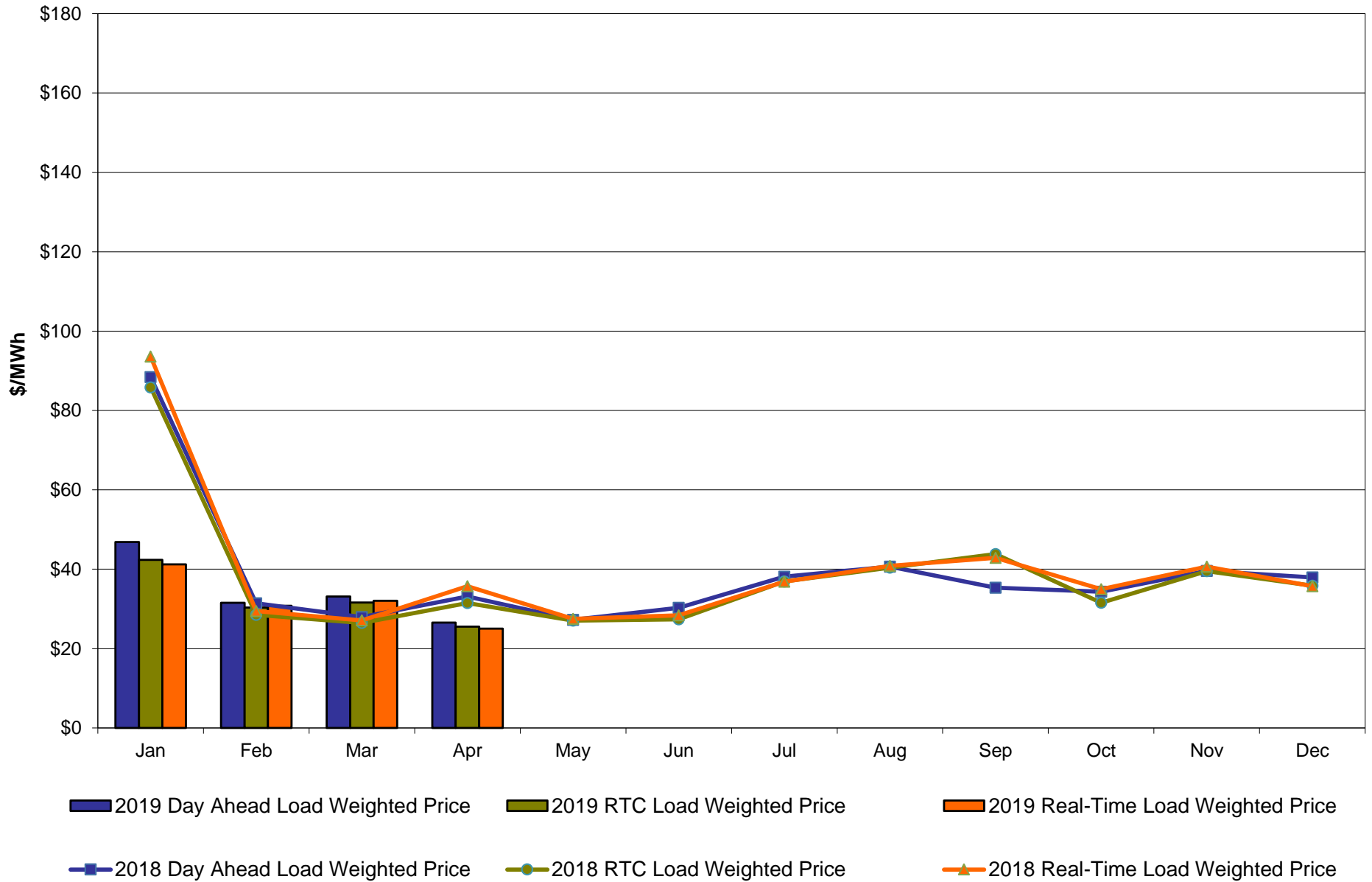
NYISO Markets 2018 Energy Statistics

| | <u>January</u> | <u>February</u> | <u>March</u> | <u>April</u> | <u>May</u> | <u>June</u> | <u>July</u> | <u>August</u> | <u>September</u> | <u>October</u> | <u>November</u> | <u>December</u> |
|--|----------------|-----------------|--------------|--------------|------------|-------------|-------------|---------------|------------------|----------------|-----------------|-----------------|
| <u>DAY AHEAD LBMP</u> | | | | | | | | | | | | |
| Price * | \$83.53 | \$30.37 | \$27.37 | \$32.40 | \$25.97 | \$28.41 | \$35.73 | \$38.00 | \$33.28 | \$33.27 | \$38.36 | \$36.88 |
| Standard Deviation | \$58.94 | \$12.38 | \$6.34 | \$9.06 | \$9.22 | \$11.42 | \$15.25 | \$16.51 | \$12.01 | \$9.24 | \$11.36 | \$11.61 |
| Load Weighted Price ** | \$88.42 | \$31.44 | \$27.95 | \$33.14 | \$27.26 | \$30.27 | \$38.14 | \$40.64 | \$35.33 | \$34.33 | \$39.55 | \$37.96 |
| <u>RTC LBMP</u> | | | | | | | | | | | | |
| Price * | \$81.65 | \$27.73 | \$25.99 | \$30.80 | \$25.40 | \$26.06 | \$34.65 | \$38.13 | \$39.52 | \$30.92 | \$38.37 | \$35.01 |
| Standard Deviation | \$60.83 | \$11.96 | \$8.99 | \$14.30 | \$20.37 | \$12.78 | \$17.44 | \$20.05 | \$61.50 | \$13.43 | \$17.24 | \$12.27 |
| Load Weighted Price ** | \$85.85 | \$28.54 | \$26.46 | \$31.47 | \$27.08 | \$27.35 | \$36.93 | \$40.40 | \$43.83 | \$31.55 | \$39.53 | \$35.84 |
| <u>REAL TIME LBMP</u> | | | | | | | | | | | | |
| Price * | \$87.94 | \$28.50 | \$26.49 | \$34.53 | \$25.57 | \$26.31 | \$34.34 | \$38.07 | \$38.15 | \$33.88 | \$39.18 | \$34.74 |
| Standard Deviation | \$87.41 | \$17.36 | \$12.25 | \$26.57 | \$23.49 | \$24.34 | \$18.44 | \$27.21 | \$46.81 | \$37.42 | \$26.15 | \$17.44 |
| Load Weighted Price ** | \$93.59 | \$29.49 | \$27.09 | \$35.72 | \$27.47 | \$28.38 | \$36.84 | \$40.87 | \$42.87 | \$34.94 | \$40.63 | \$35.70 |
| Average Daily Energy Sendout/Month GWh | 463 | 426 | 413 | 390 | 397 | 445 | 529 | 537 | 458 | 399 | 411 | 425 |

* Average zonal load weighted prices.

** Average zonal load weighted prices, load weighted in each hour.

NYISO Monthly Average Internal LBMPs 2018- 2019

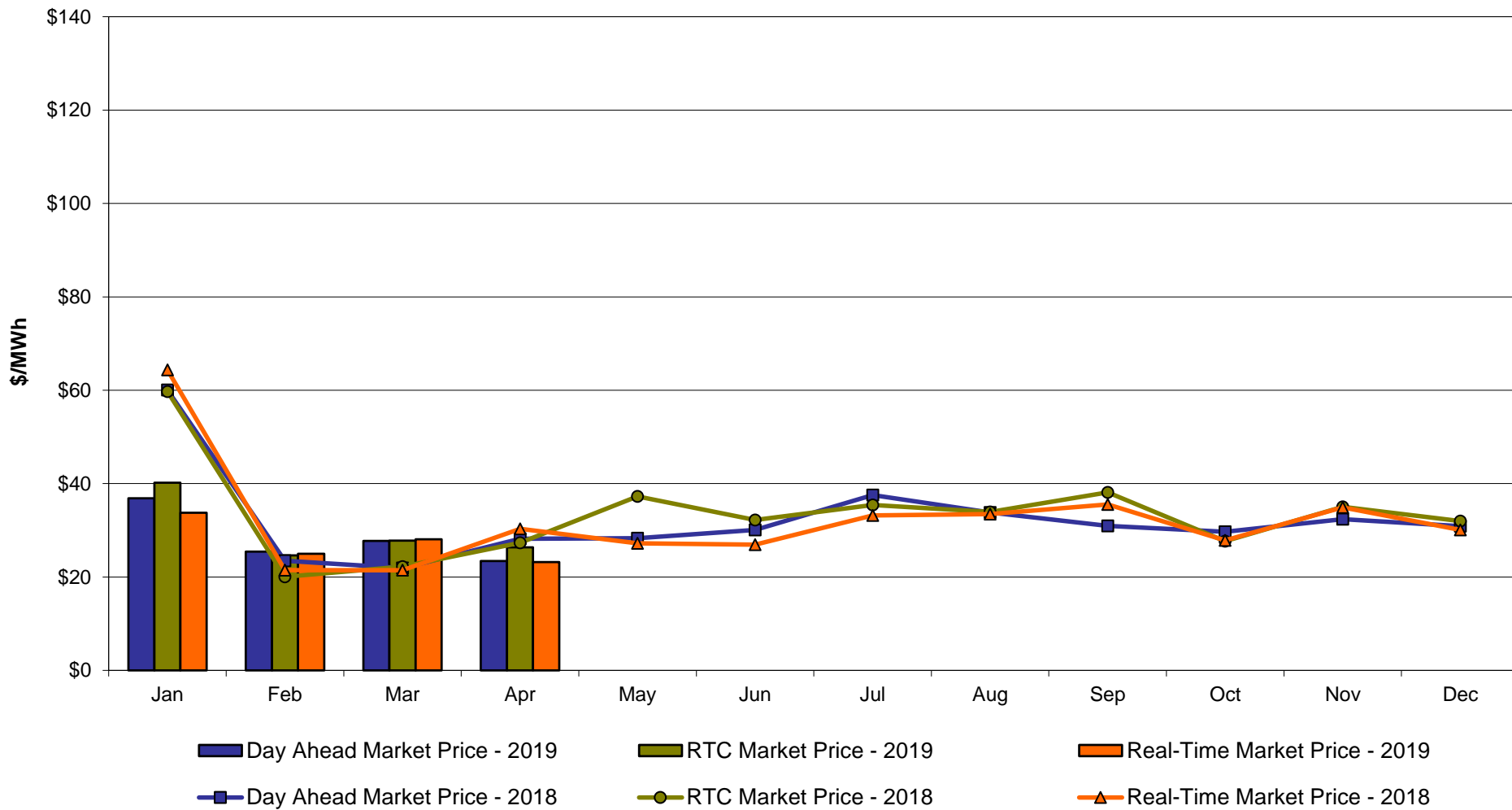


April 2019 Zonal LBMP Statistics for NYISO (\$/MWh)

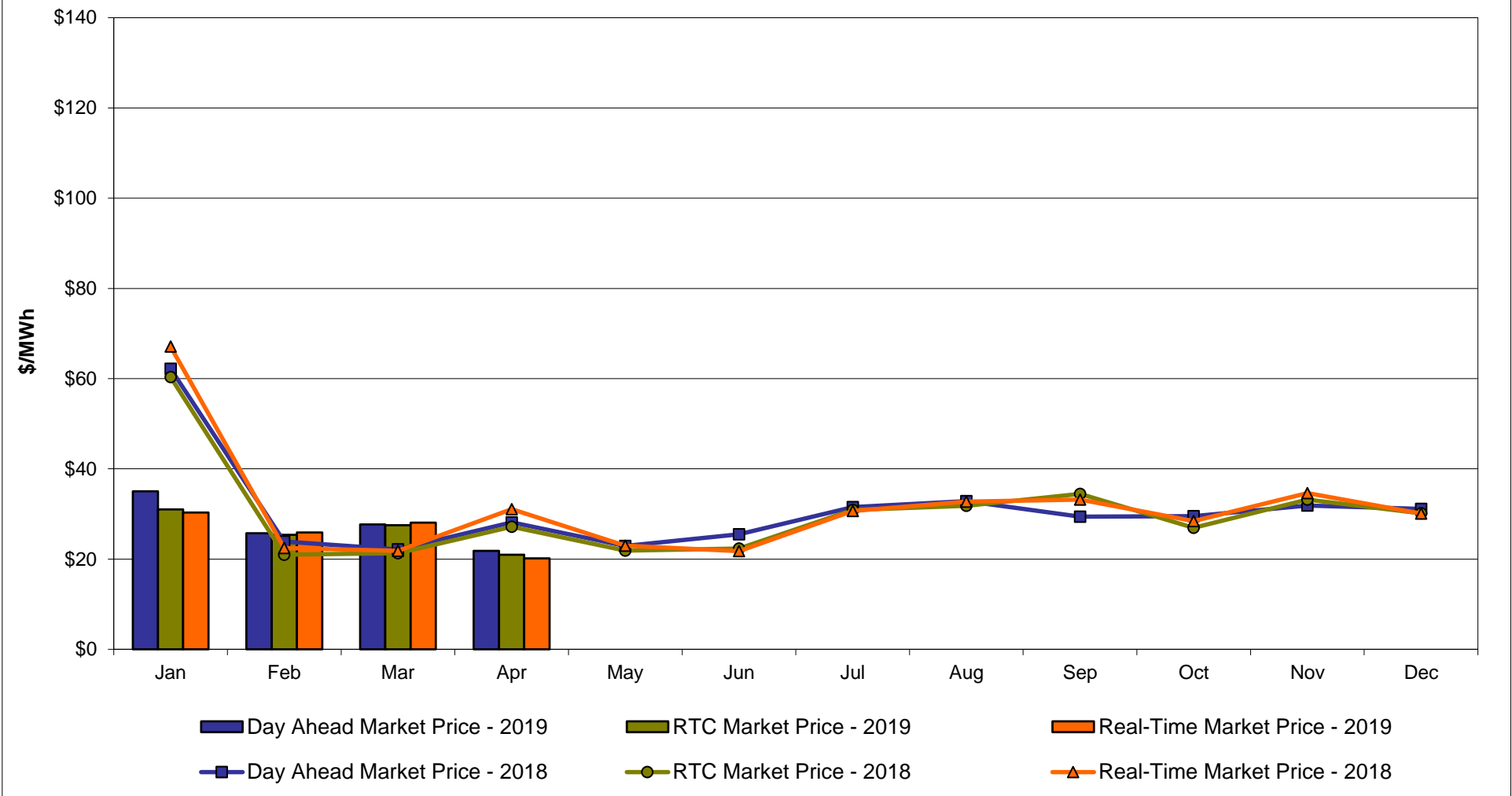
| | <u>WEST Zone A</u> | <u>GENESEE Zone B</u> | <u>NORTH Zone D</u> | <u>CENTRAL Zone C</u> | <u>MOHAWK VALLEY Zone E</u> | <u>CAPITAL Zone F</u> | <u>HUDSON VALLEY Zone G</u> | <u>MILLWOOD Zone H</u> | <u>DUNWOODIE Zone I</u> | <u>NEW YORK CITY Zone J</u> | <u>LONG ISLAND Zone K</u> |
|------------------------------|------------------------------------|--|--|---------------------------|-------------------------------------|--|---|--|---|---|---|
| <u>DAY AHEAD LBMP</u> | | | | | | | | | | | |
| Unweighted Price * | 23.40 | 21.03 | 19.05 | 21.82 | 21.89 | 26.03 | 25.94 | 26.18 | 26.29 | 28.82 | 29.41 |
| Standard Deviation | 8.14 | 6.38 | 5.85 | 6.14 | 6.23 | 5.94 | 6.44 | 6.58 | 6.60 | 6.93 | 7.82 |
| <u>RTC LBMP</u> | | | | | | | | | | | |
| Unweighted Price * | 26.33 | 19.69 | 18.88 | 20.96 | 20.98 | 24.45 | 24.20 | 24.32 | 24.39 | 26.61 | 30.27 |
| Standard Deviation | 17.53 | 7.11 | 7.26 | 7.07 | 7.13 | 6.93 | 6.64 | 6.68 | 6.68 | 8.75 | 25.33 |
| <u>REAL TIME LBMP</u> | | | | | | | | | | | |
| Unweighted Price * | 23.20 | 19.05 | 18.07 | 20.18 | 20.27 | 24.64 | 24.07 | 24.19 | 24.26 | 26.91 | 28.75 |
| Standard Deviation | 20.90 | 16.28 | 15.89 | 16.42 | 16.56 | 18.96 | 18.05 | 18.14 | 18.16 | 20.03 | 23.61 |
| | <u>ONTARIO IESO Zone O</u> | <u>HYDRO QUEBEC (Wheel) Zone M</u> | <u>HYDRO QUEBEC (Import/Export) Zone M</u> | <u>PJM Zone P</u> | <u>NEW ENGLAND Zone N</u> | <u>CROSS SOUND CABLE Controllable Line</u> | <u>NORTHPORT- NORWALK Controllable Line</u> | <u>NEPTUNE Controllable Line</u> | <u>LINDEN VFT Controllable Line</u> | <u>HUDSON Controllable Line</u> | <u>Dennison Controllable Line</u> |
| <u>DAY AHEAD LBMP</u> | | | | | | | | | | | |
| Unweighted Price * | 20.08 | 19.71 | 19.67 | 24.05 | 26.47 | 29.34 | 27.93 | 28.84 | 28.80 | 28.60 | 18.85 |
| Standard Deviation | 5.28 | 5.87 | 5.85 | 6.00 | 5.51 | 7.75 | 6.70 | 7.79 | 6.94 | 6.90 | 5.76 |
| <u>RTC LBMP</u> | | | | | | | | | | | |
| Unweighted Price * | 18.74 | 19.25 | 19.25 | 23.95 | 26.05 | 29.95 | 29.71 | 29.48 | 25.96 | 26.03 | 18.83 |
| Standard Deviation | 6.72 | 7.25 | 7.25 | 8.36 | 7.76 | 25.54 | 25.54 | 25.68 | 7.20 | 7.25 | 7.98 |
| <u>REAL TIME LBMP</u> | | | | | | | | | | | |
| Unweighted Price * | 18.78 | 18.46 | 18.46 | 22.94 | 25.20 | 28.48 | 27.83 | 28.06 | 26.43 | 26.51 | 17.90 |
| Standard Deviation | 15.68 | 15.89 | 15.89 | 16.97 | 18.47 | 23.36 | 24.26 | 23.30 | 19.67 | 19.79 | 16.33 |

* Straight LBMP averages

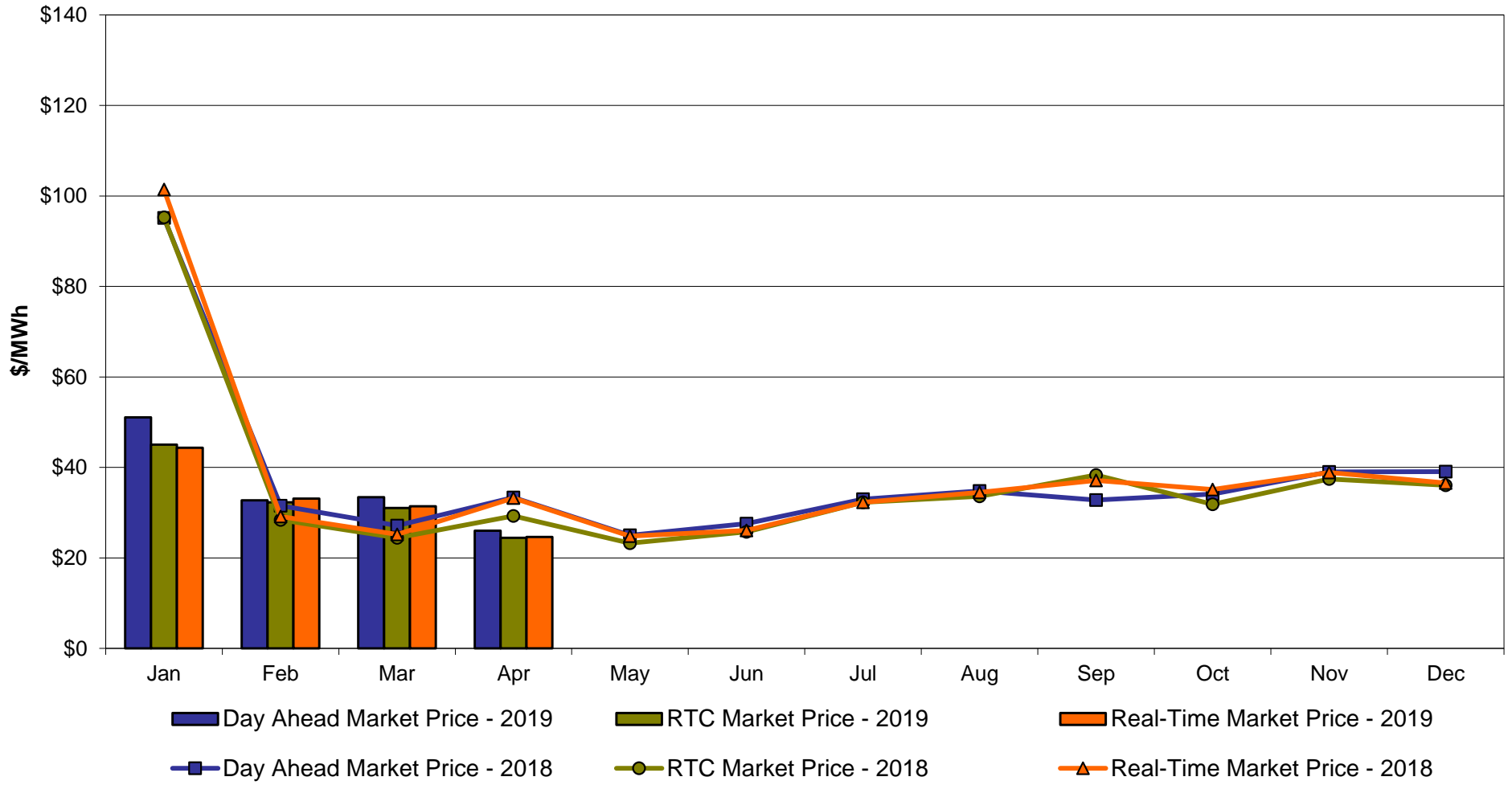
**West Zone A
Monthly Average LBMP Prices 2018 - 2019**



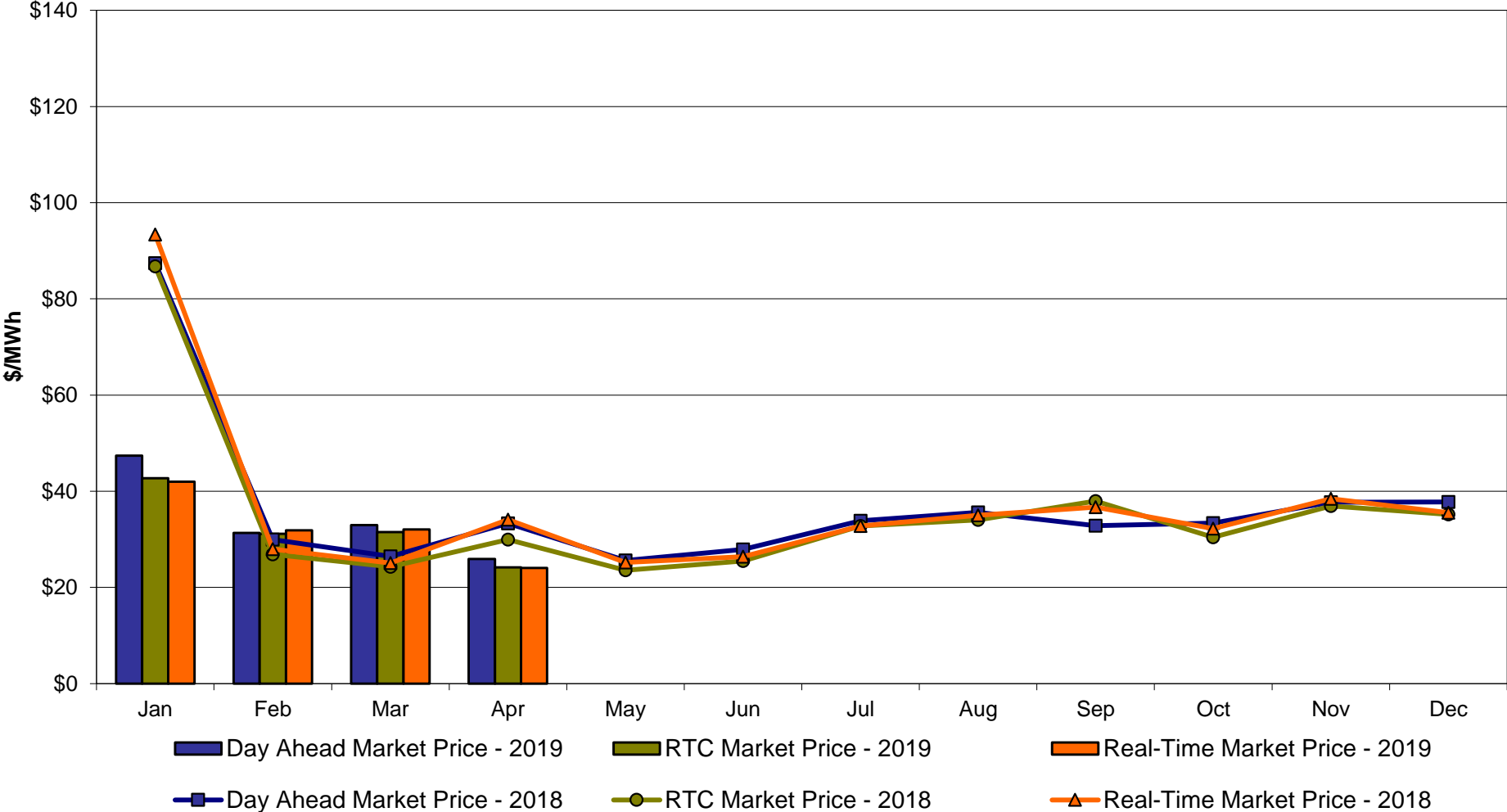
**Central Zone C
Monthly Average LBMP Prices 2018 - 2019**



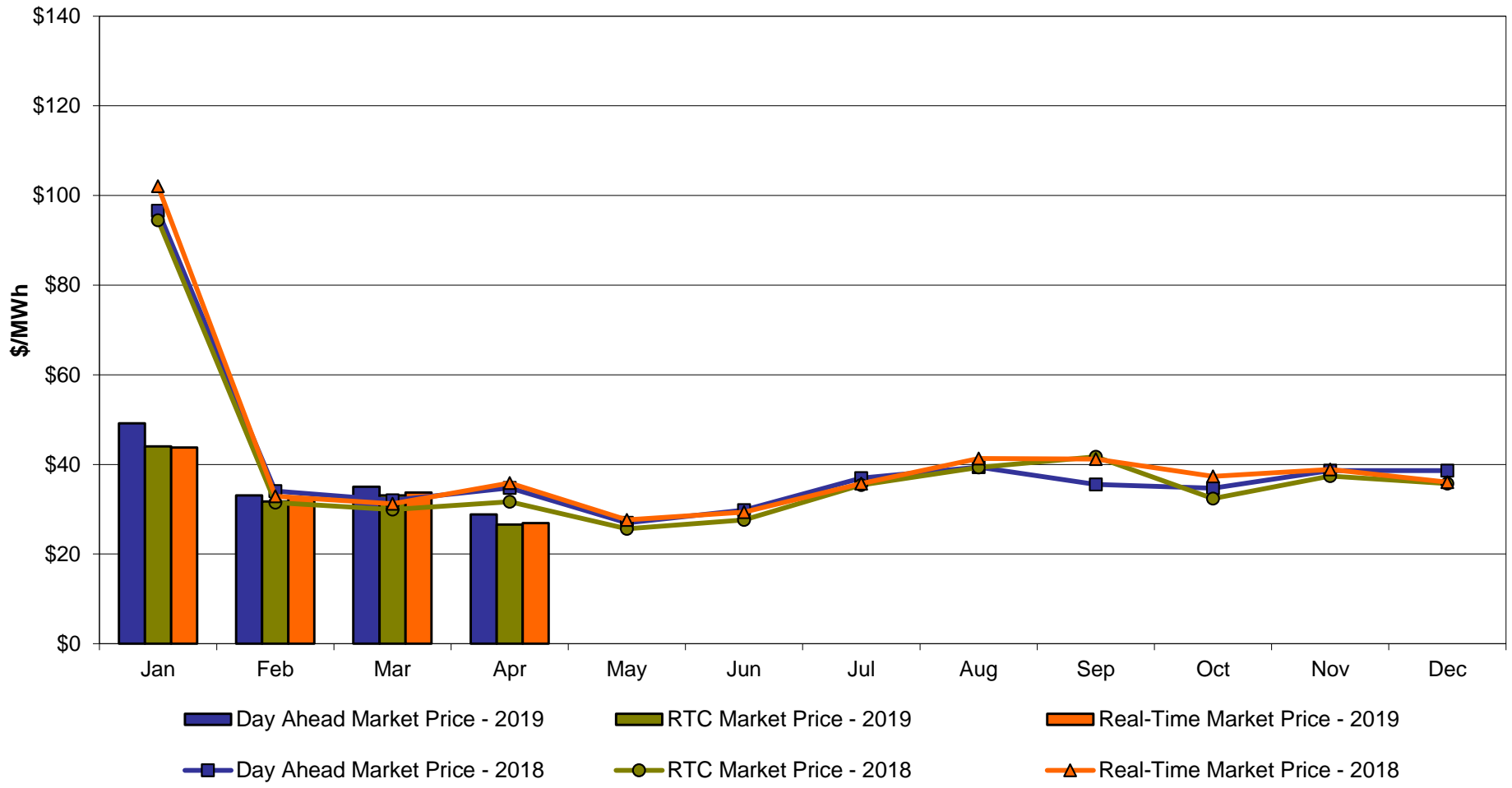
Capital Zone F Monthly Average LBMP Prices 2018 - 2019



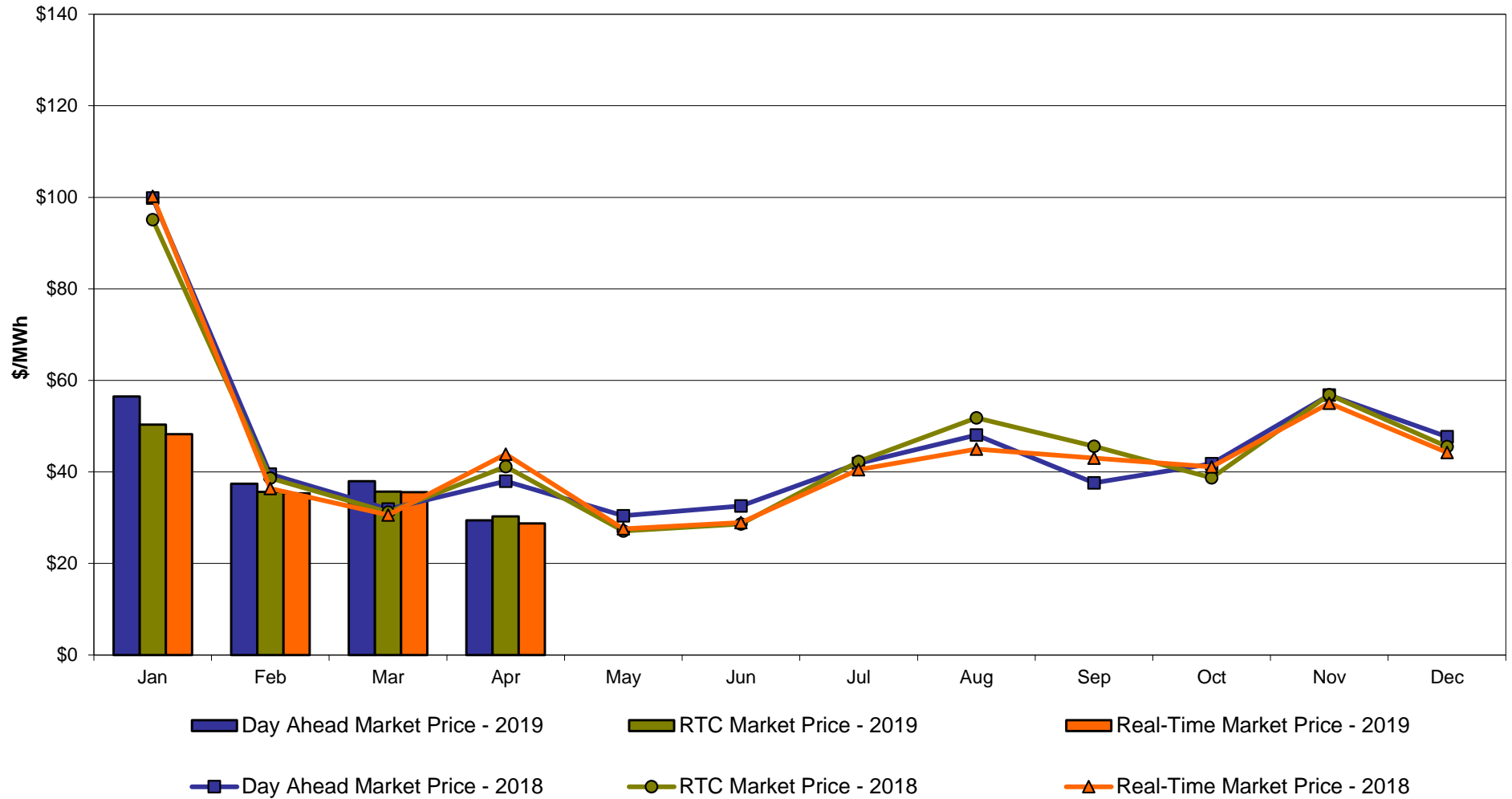
Hudson Valley Zone G Monthly Average LBMP Prices 2018 - 2019



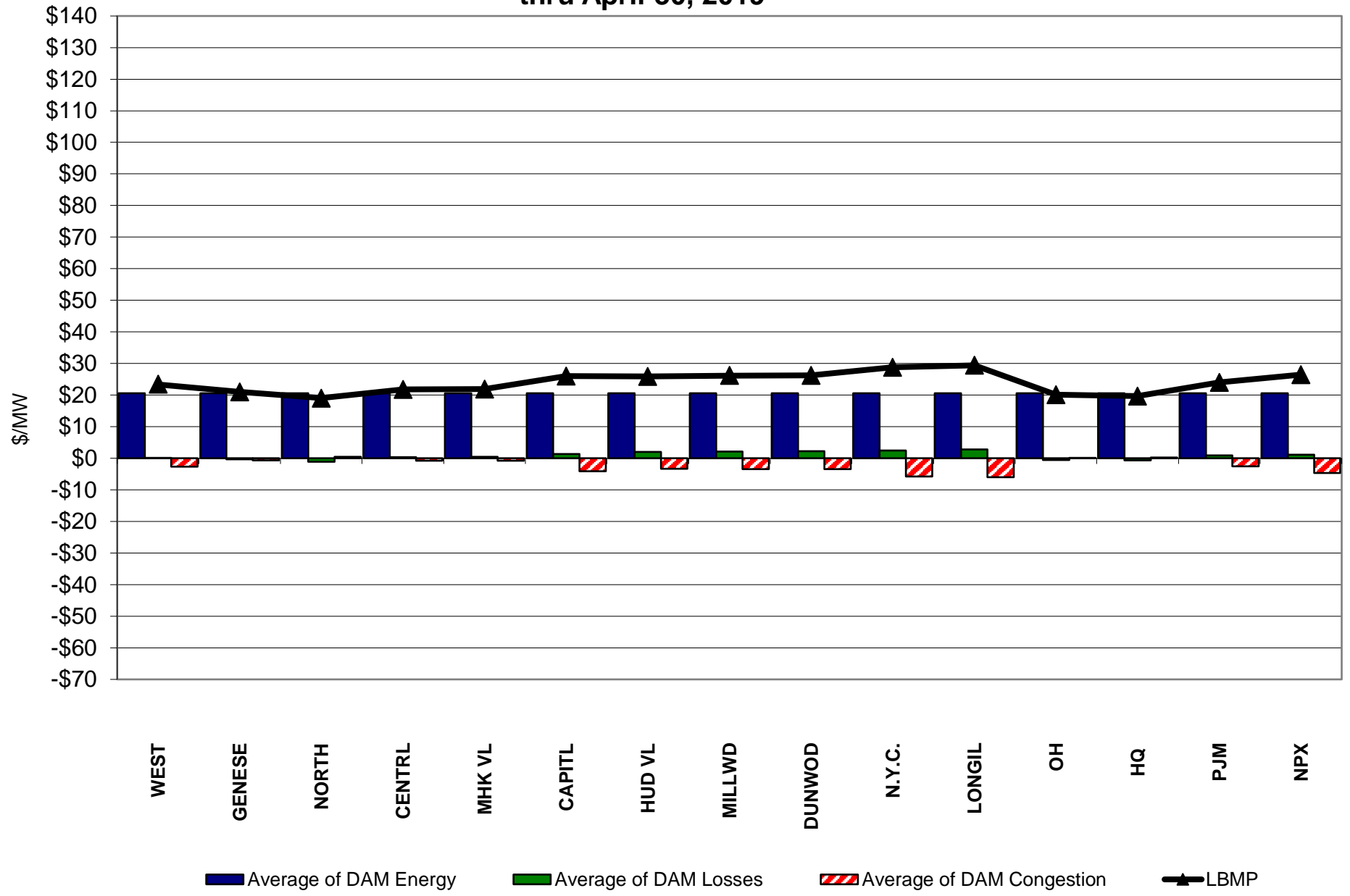
NYC Zone J Monthly Average LBMP Prices 2018 - 2019



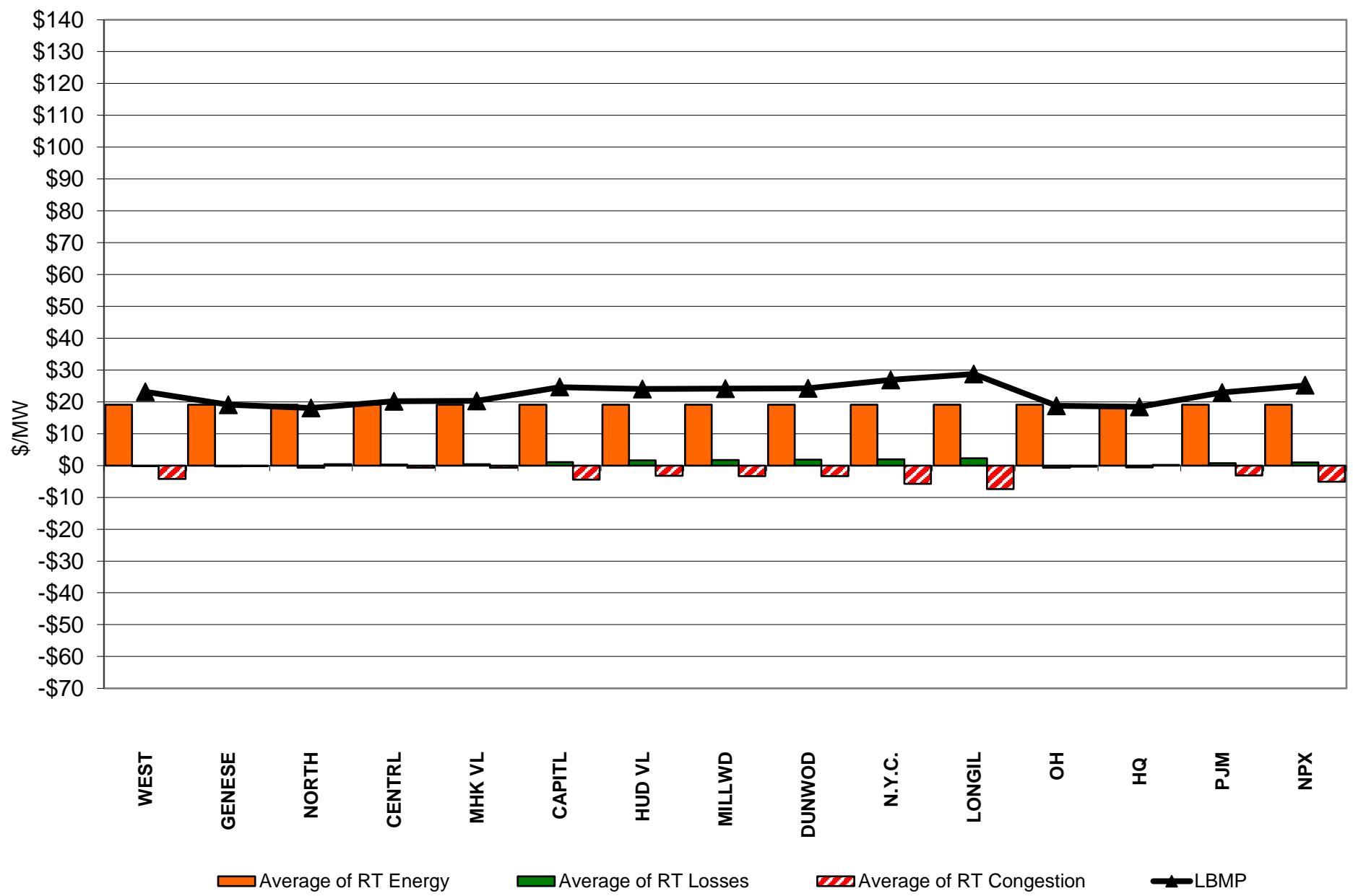
Long Island Zone K Monthly Average LBMP Prices 2018 - 2019



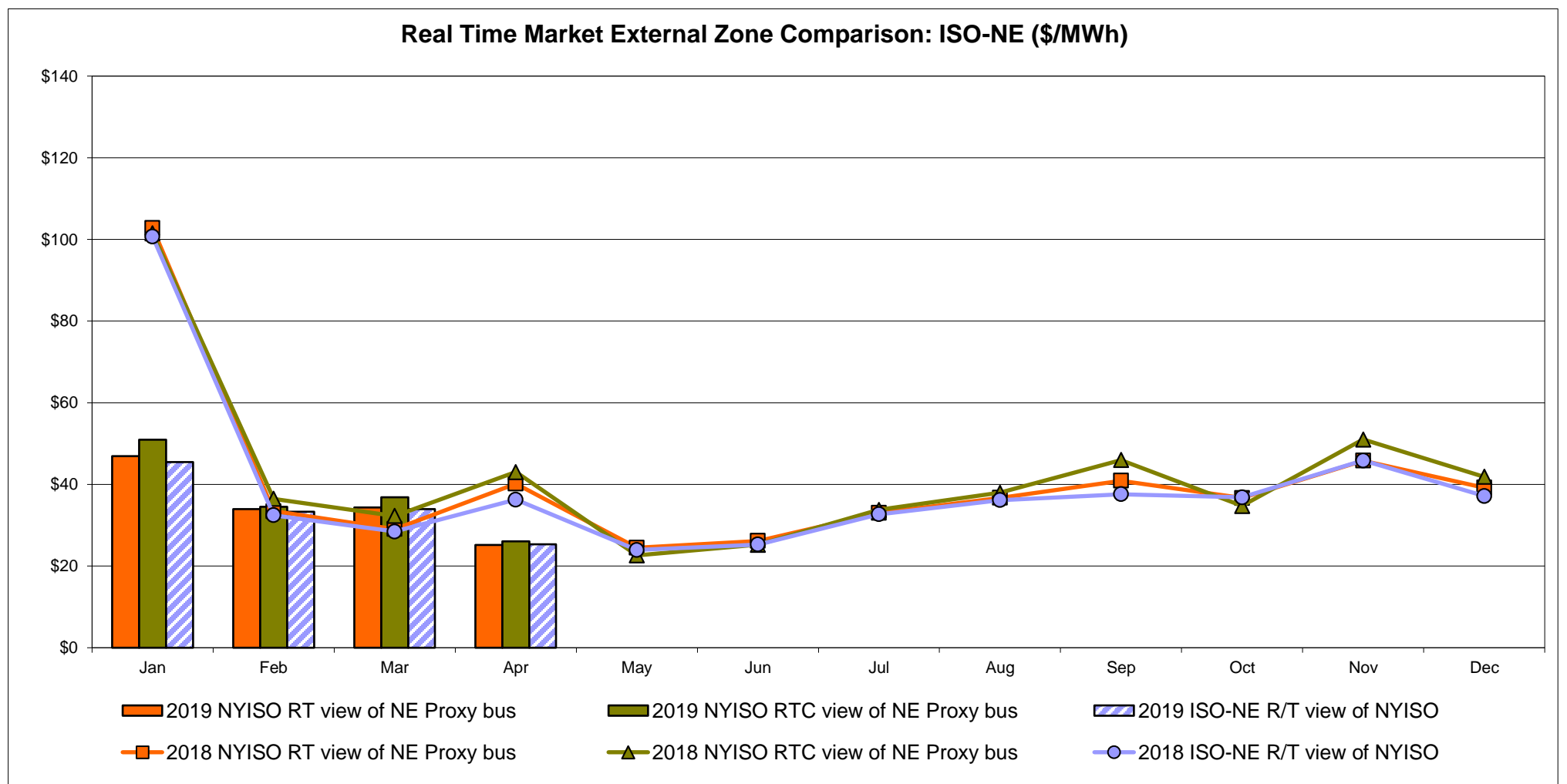
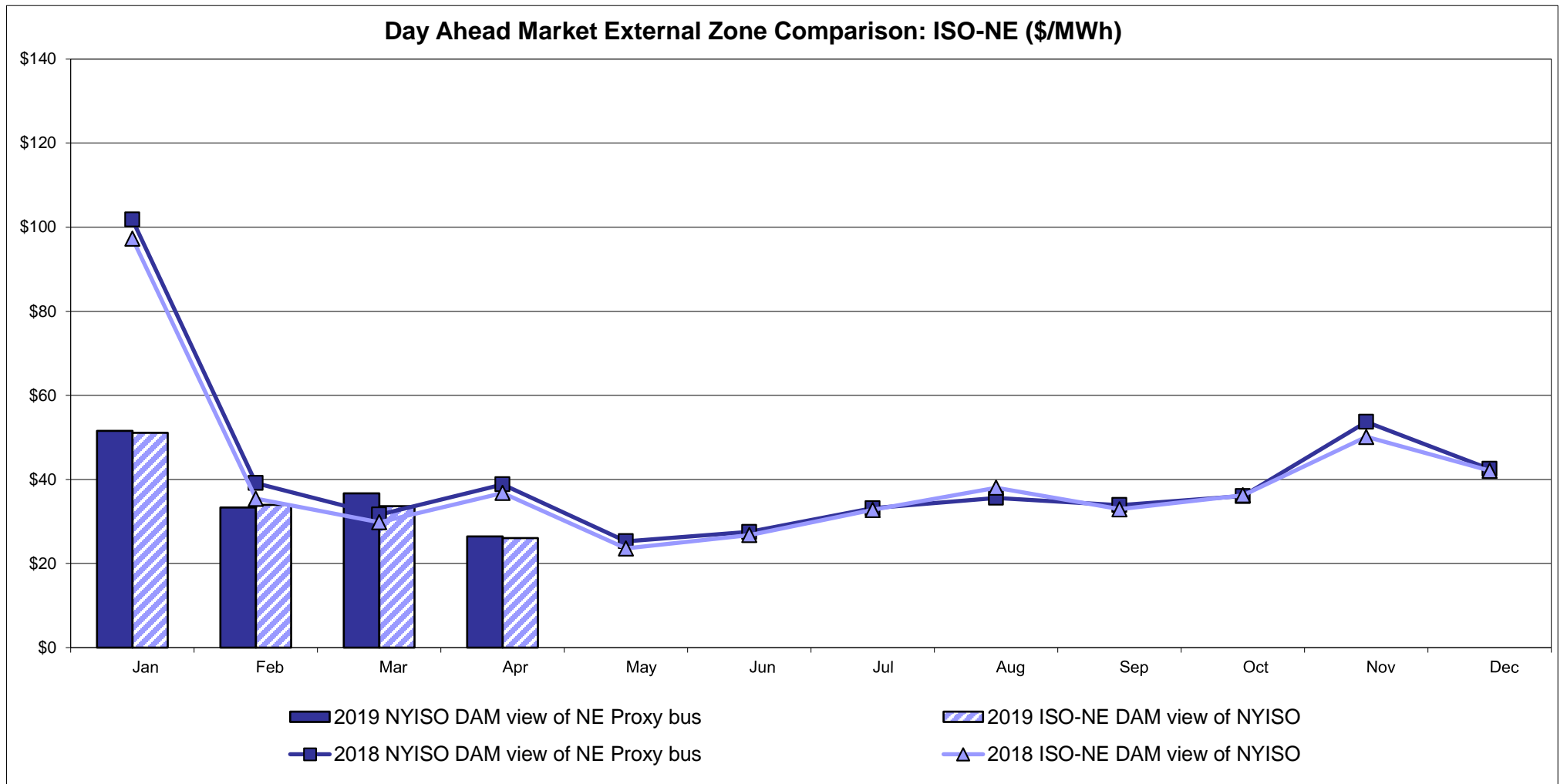
**DAM Zonal Unweighted Monthly Average LBMP Components
thru April 30, 2019**



**RT Zonal Unweighted Monthly Average LBMP Components
thru April 30, 2019**

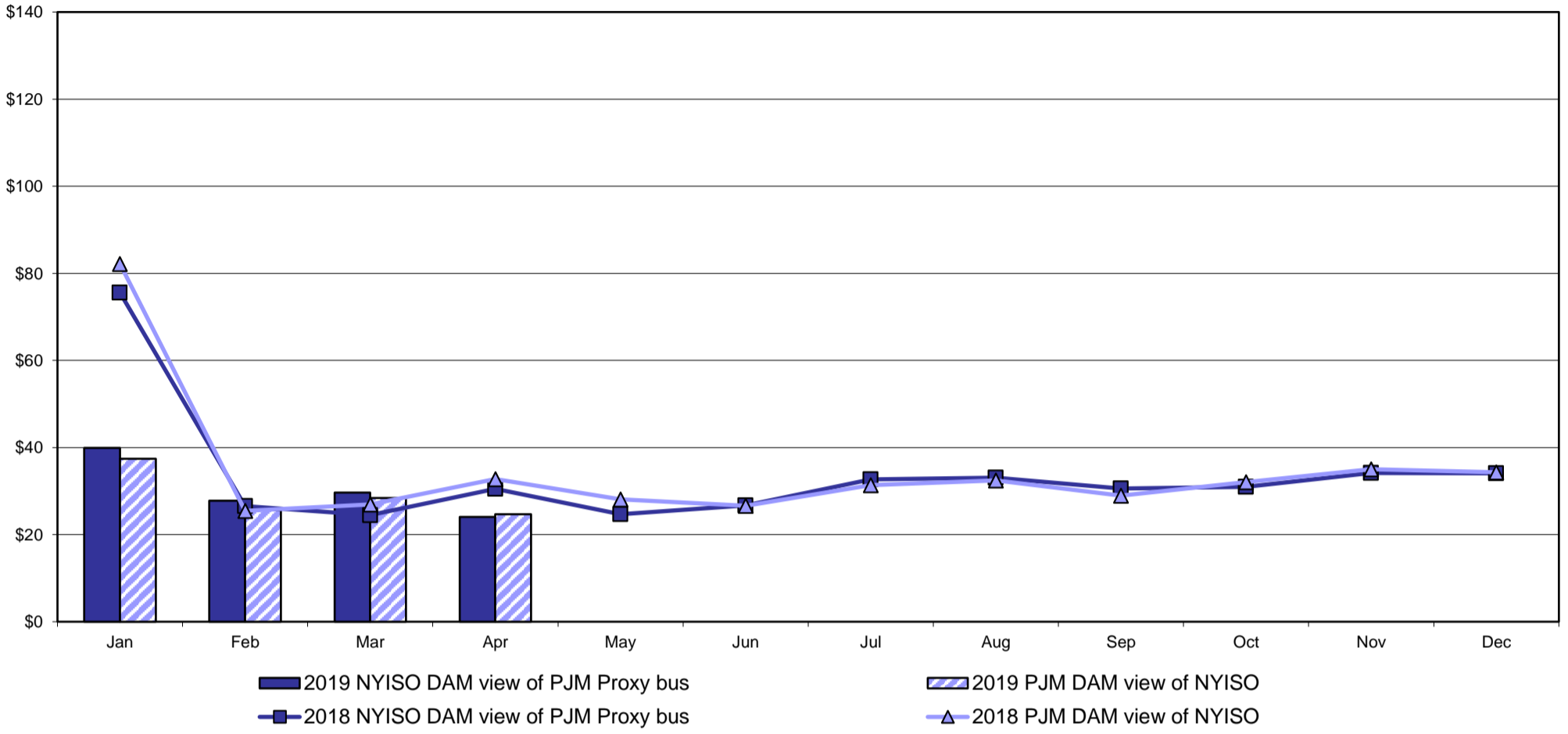


External Comparison ISO-New England

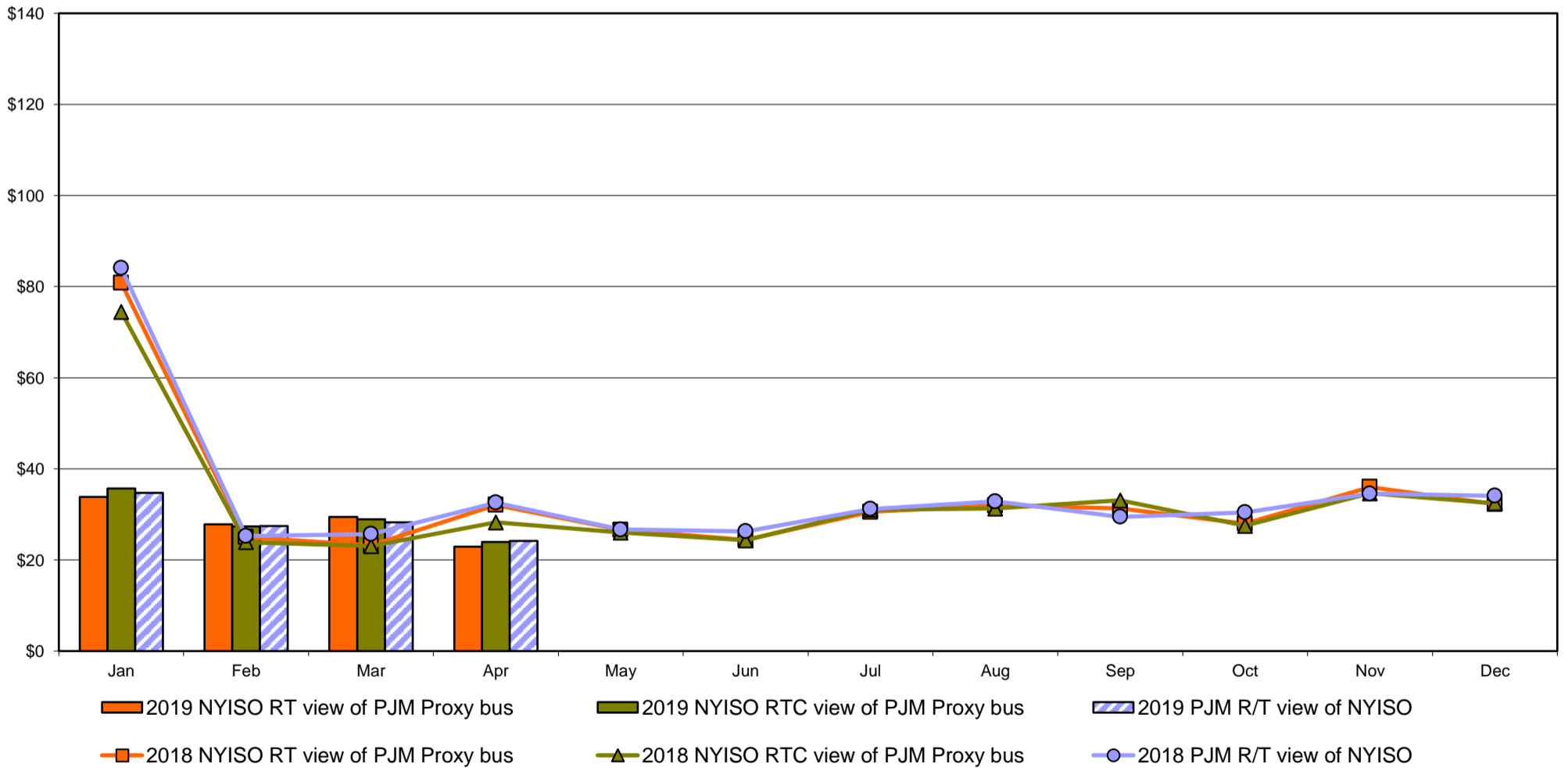


External Comparison PJM

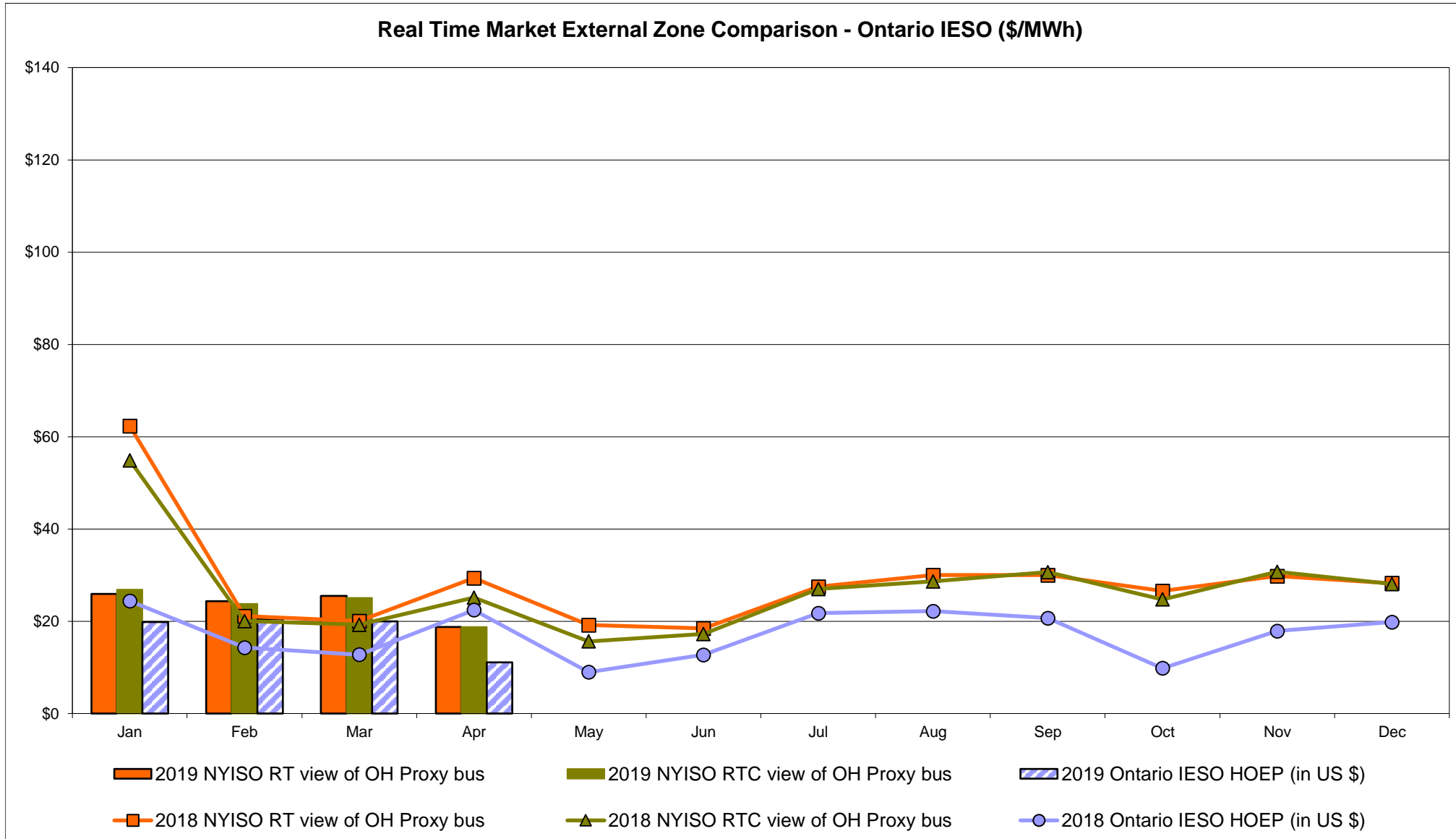
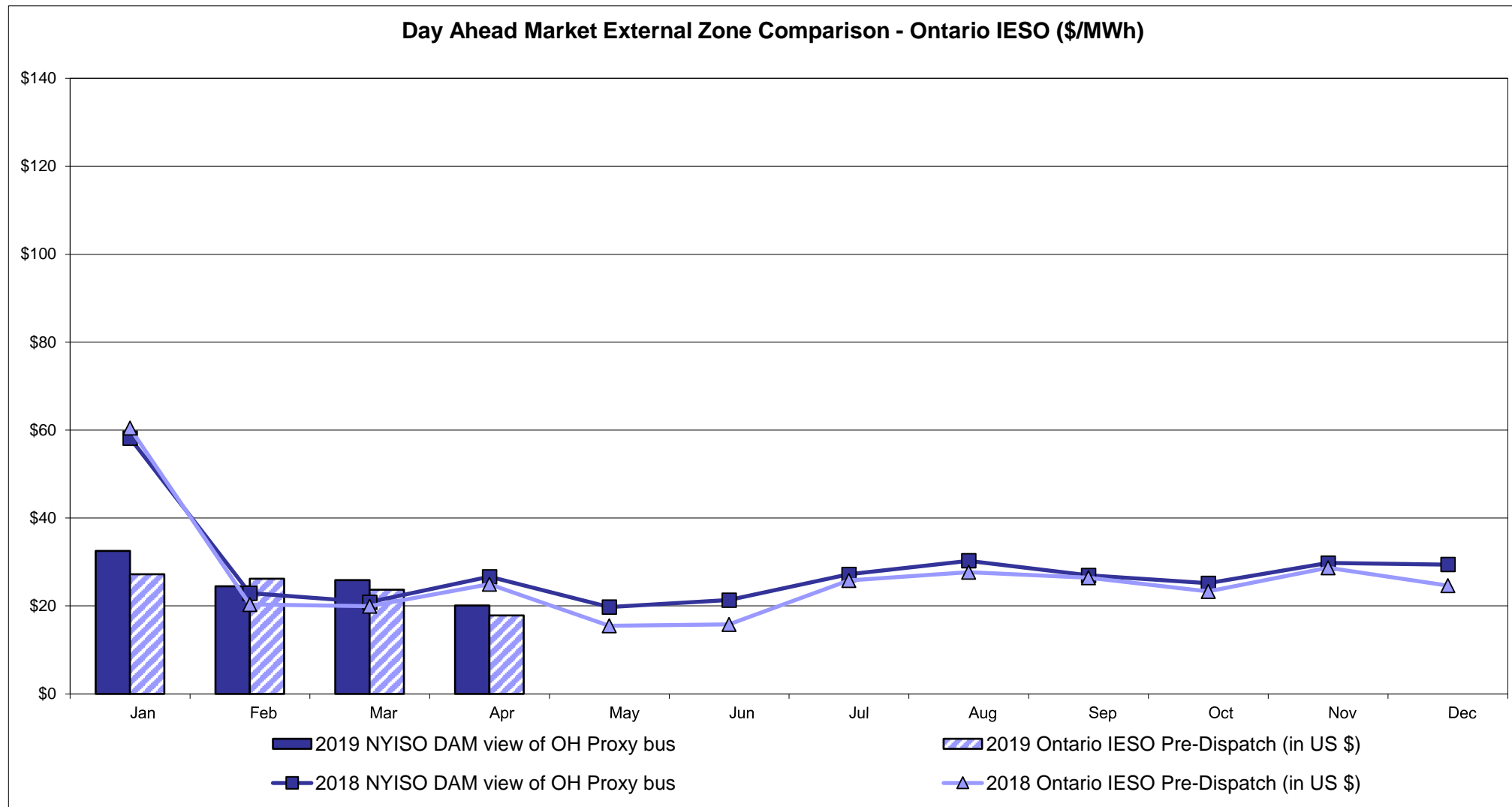
Day Ahead Market External Zone Comparison - PJM (\$/MWh)



Real Time Market External Zone Comparison - PJM (\$/MWh)

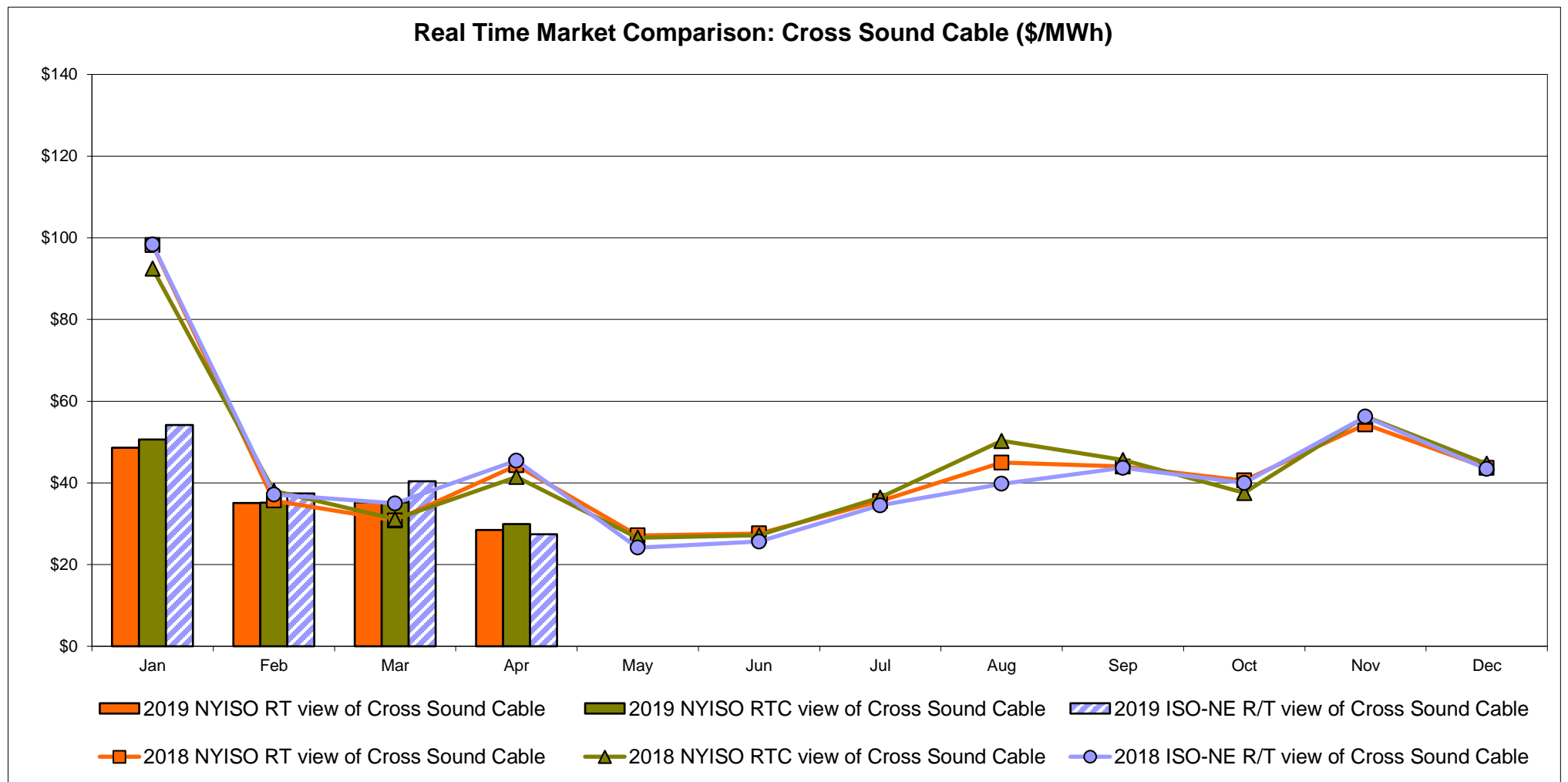
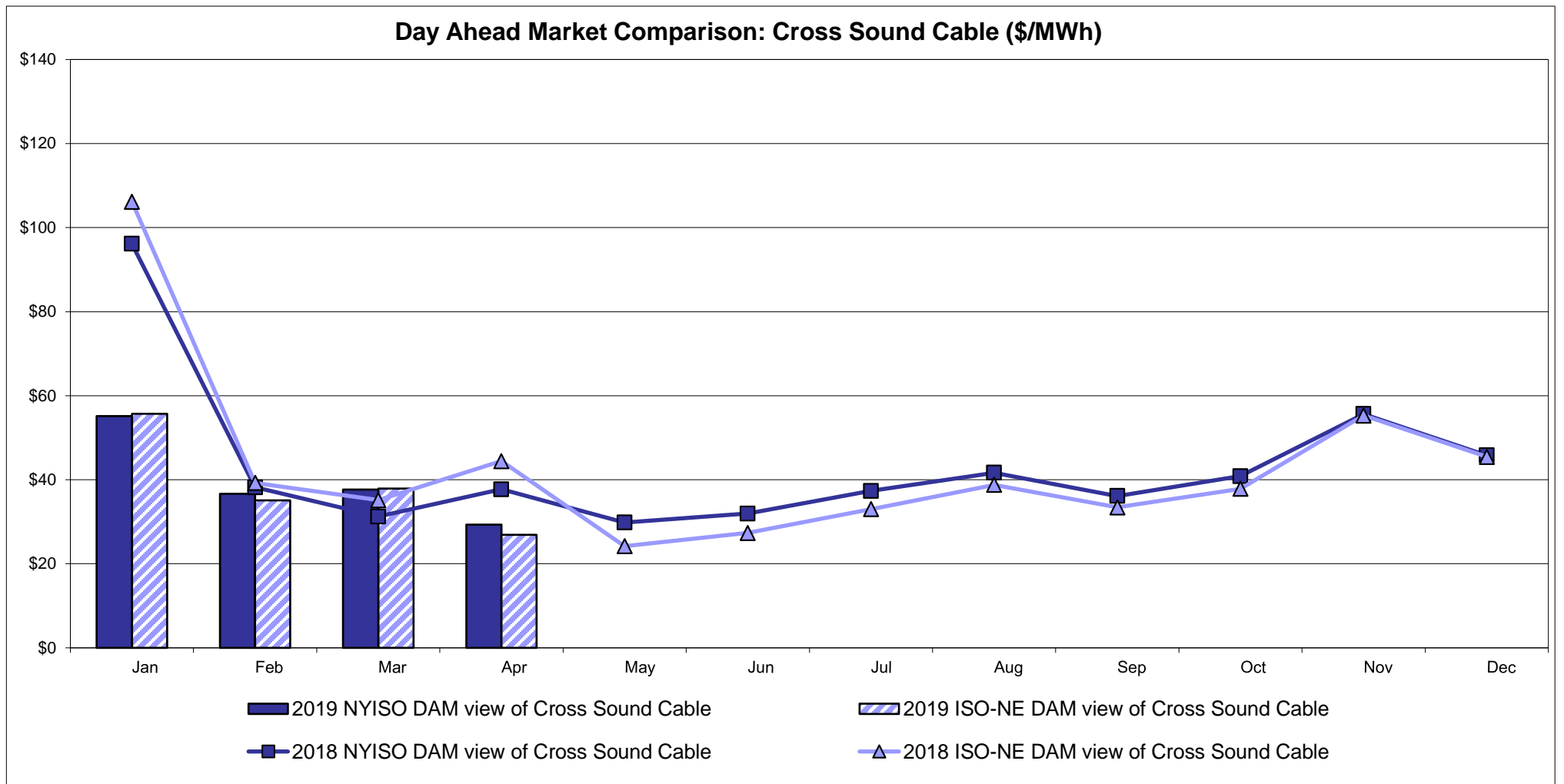


External Comparison Ontario IESO



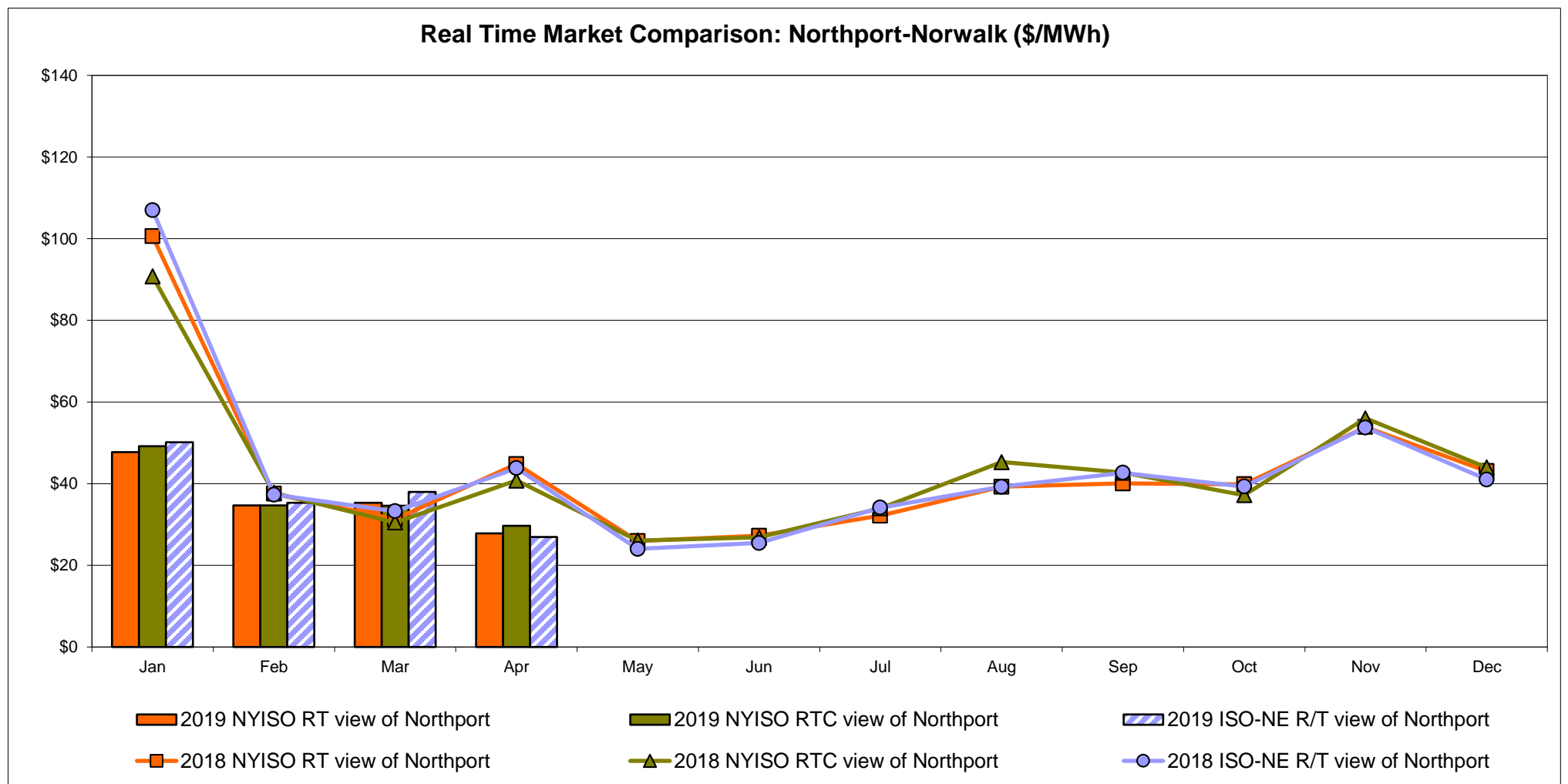
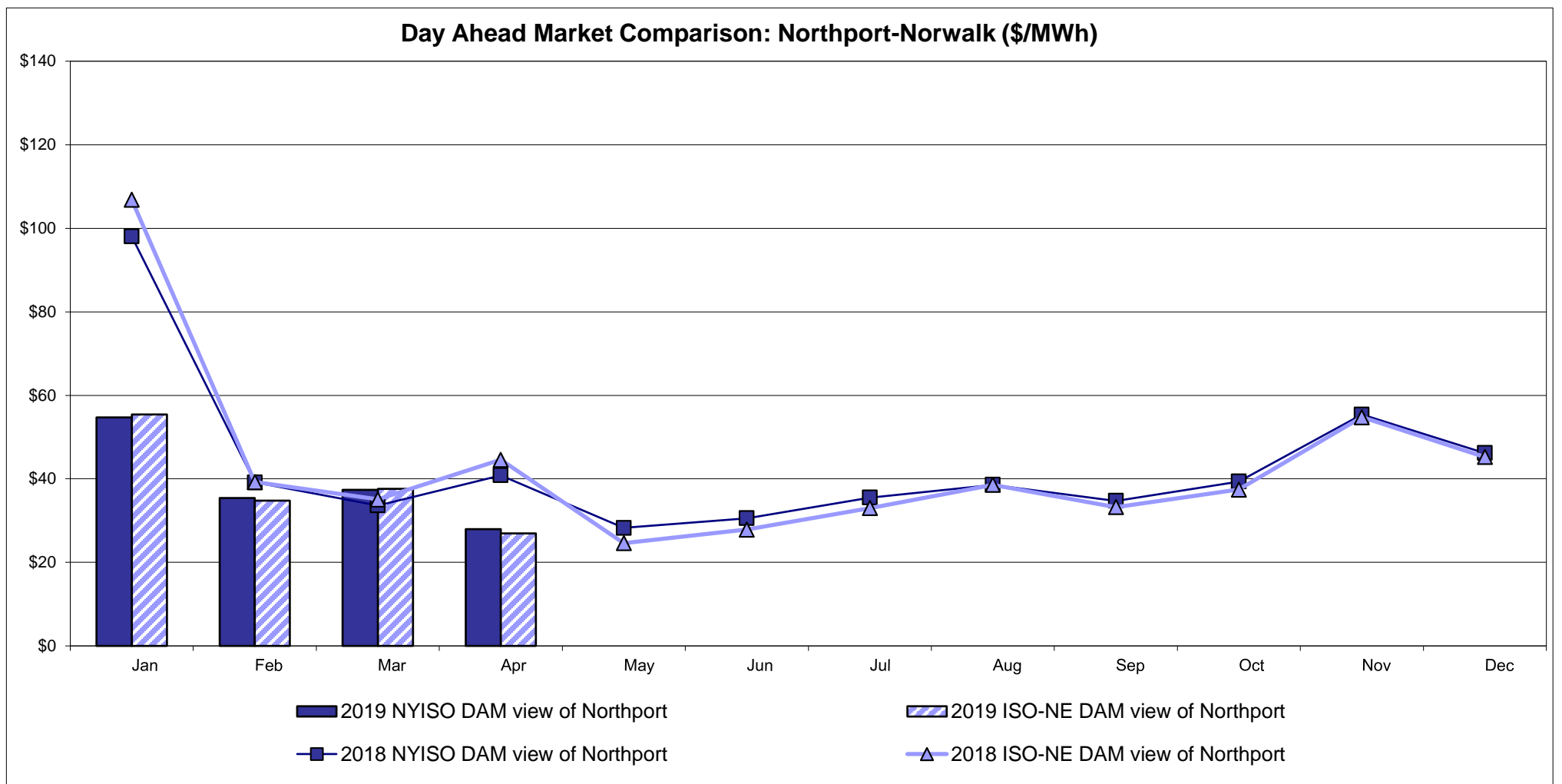
Notes: Exchange factor used for April 2019 was 0.747495888772612 to US
 HOEP: Hourly Ontario Energy Price
 Pre-Dispatch: Projected Energy Price

External Controllable Line: Cross Sound Cable (New England)



Note:
 ISO-NE Forecast is an advisory posting @ 18:00 day before.
 The DAM and R/T prices at the Shorham 13899 interface are used for ISO-NE.
 The DAM and R/T prices at the CSC interface are used for NYISO.

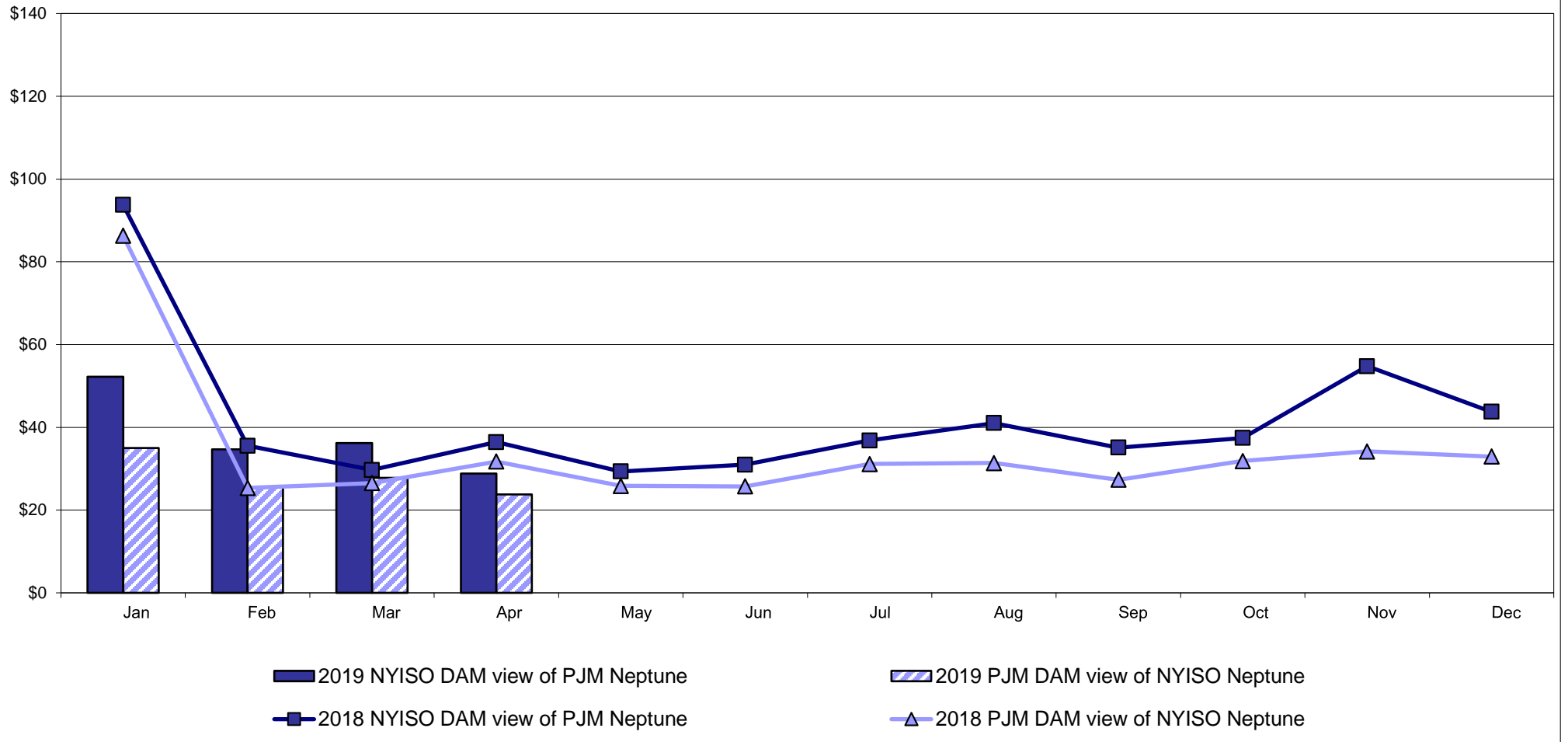
External Controllable Line: Northport - Norwalk (New England)



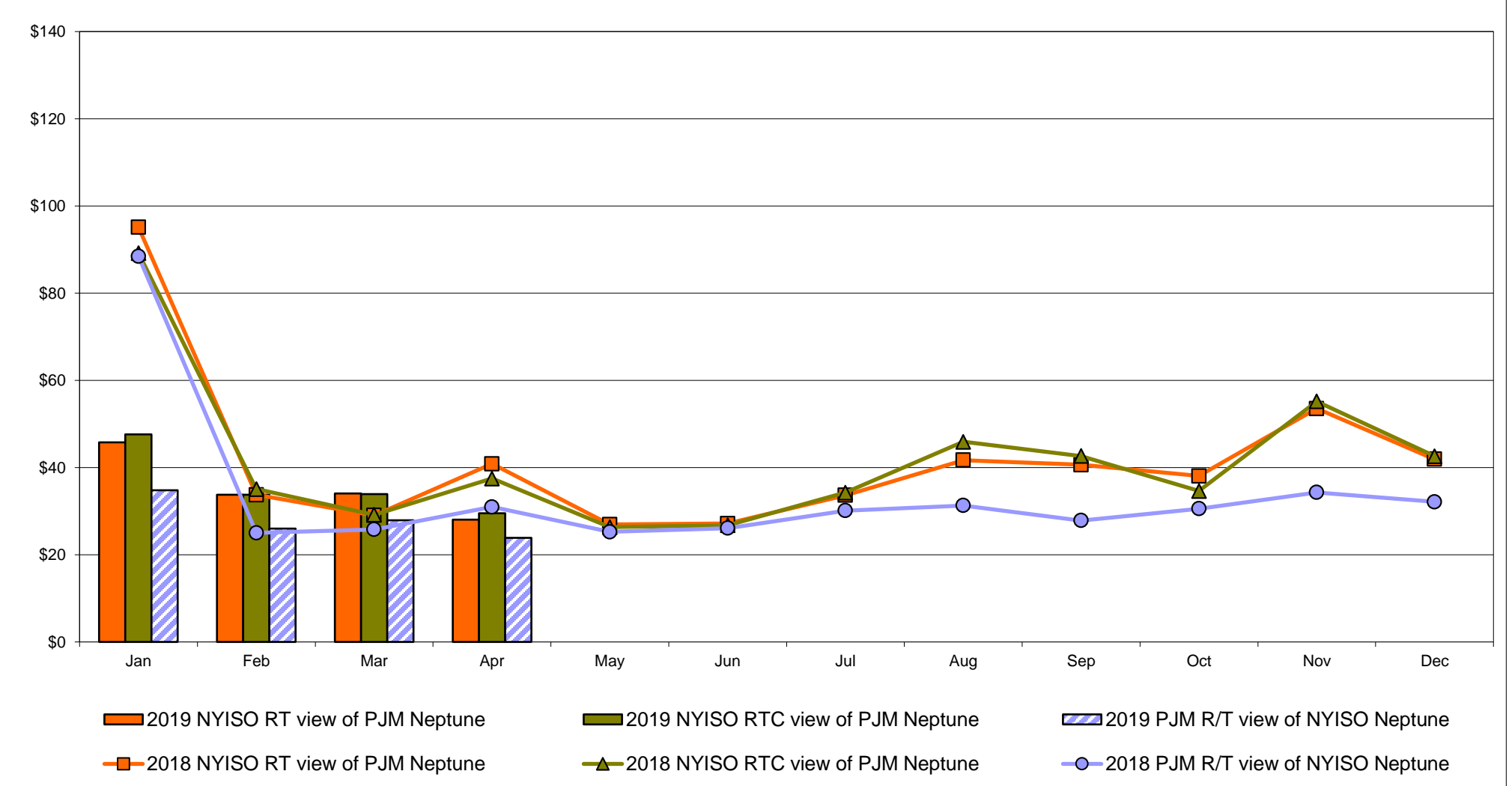
Note:
 ISO-NE Forecast is an advisory posting @ 18:00 day before.
 The DAM and R/T prices at the Northport 138 interface are used for ISO-NE.
 The DAM and R/T prices at the 1385 interface are used for NYISO.

External Controllable Line: Neptune (PJM)

Day Ahead Market Comparison: Neptune (\$/MWh)

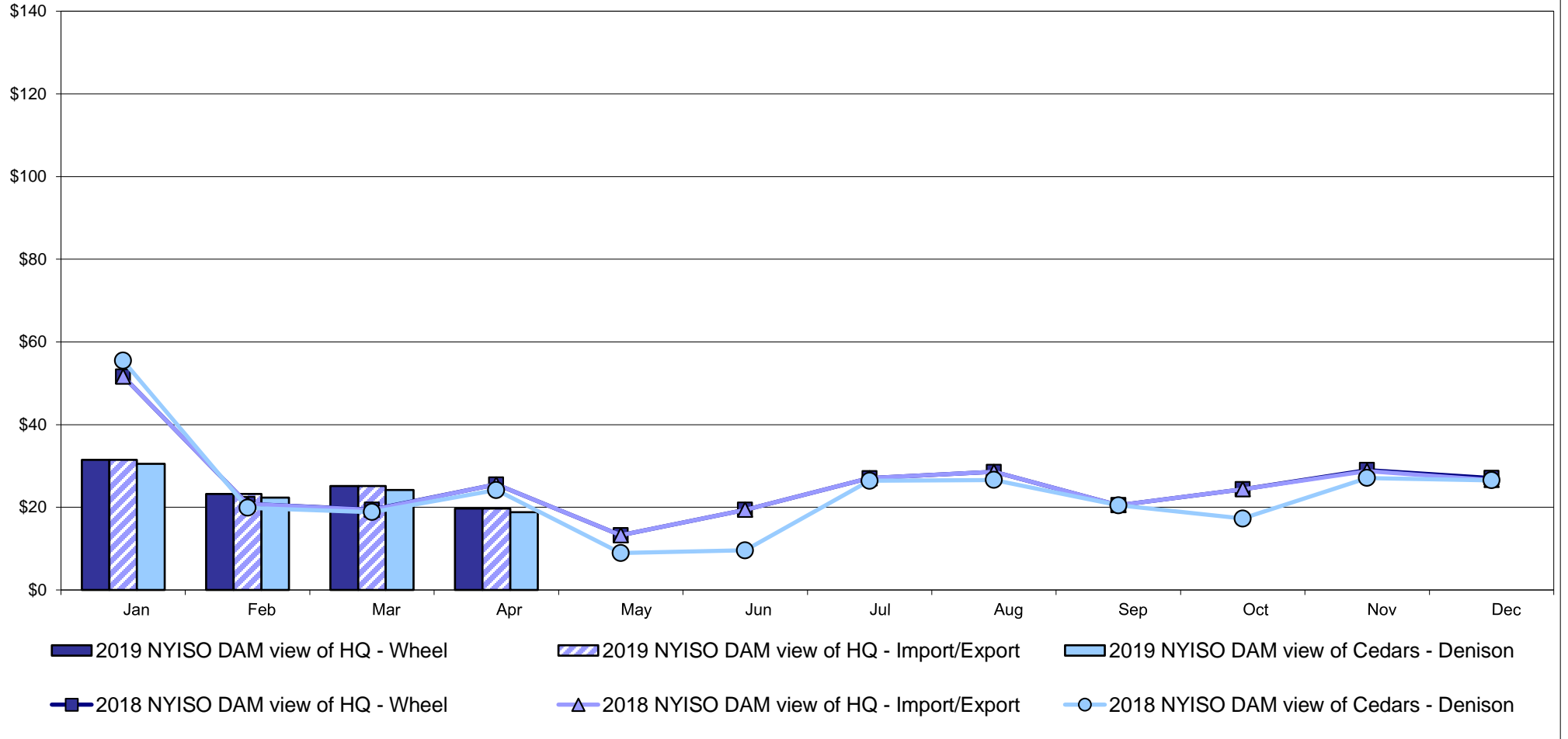


Real Time Market Comparison: Neptune (\$/MWh)

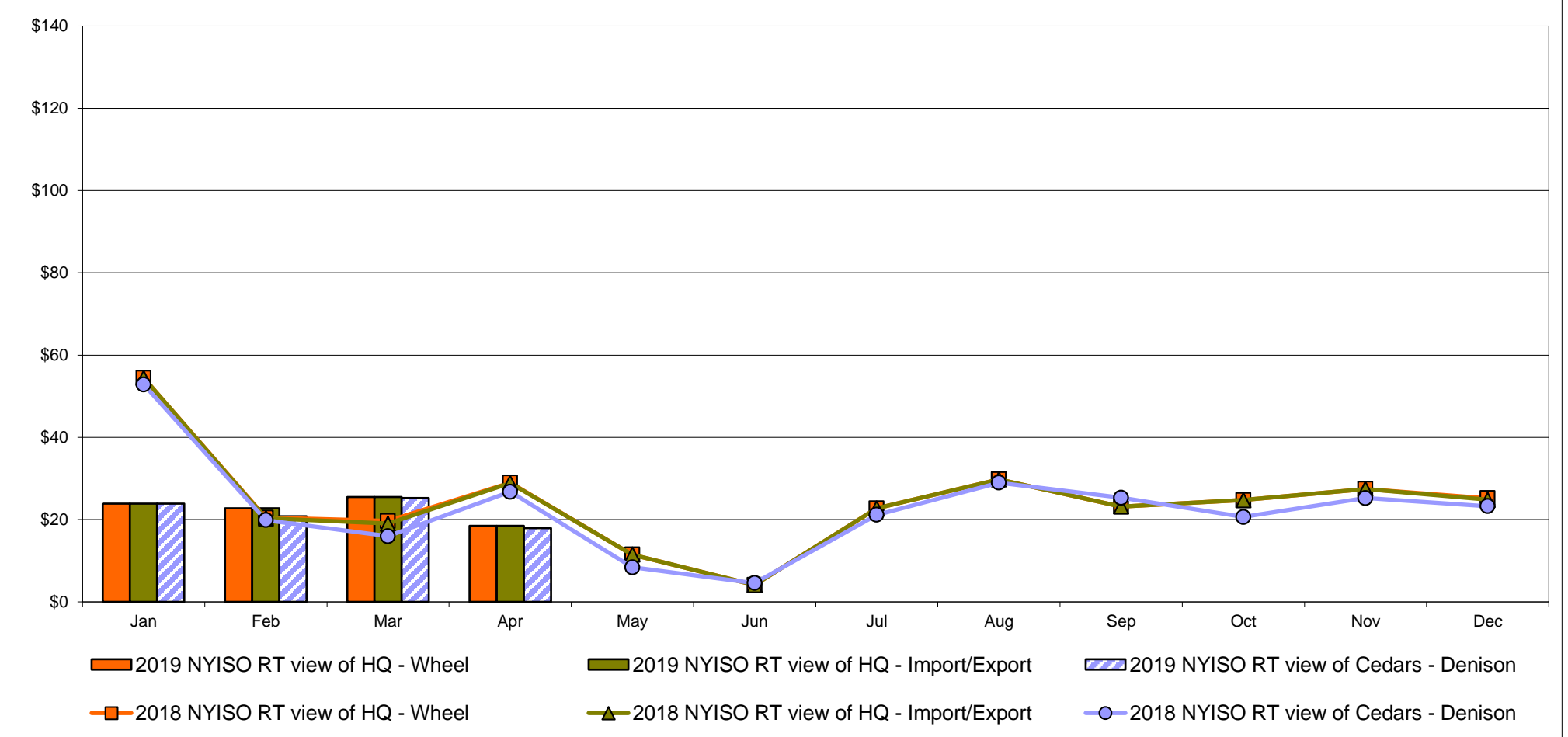


External Comparison Hydro-Quebec

Day Ahead Market External Zone Comparison - HQ (\$/MWh)

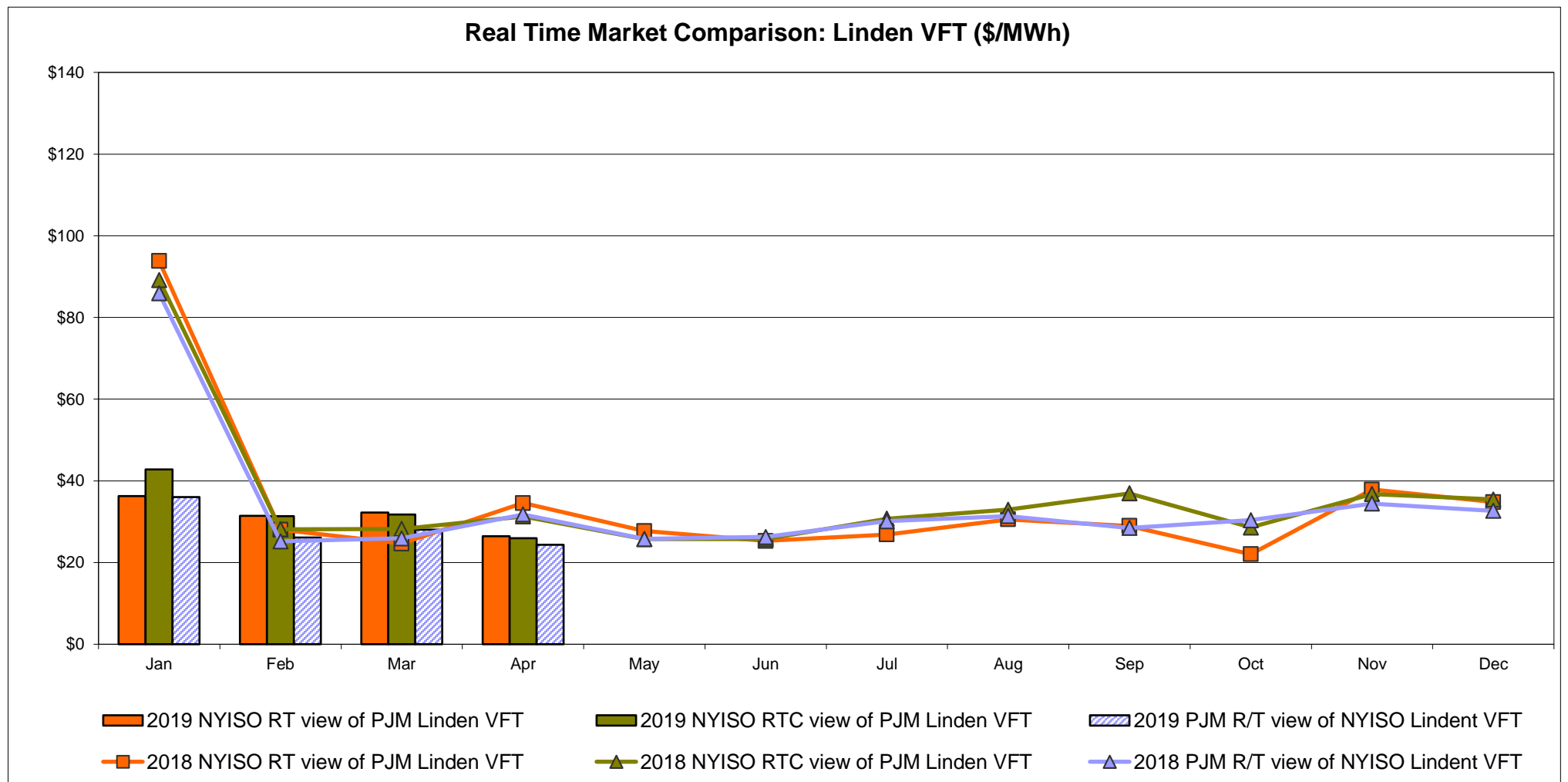
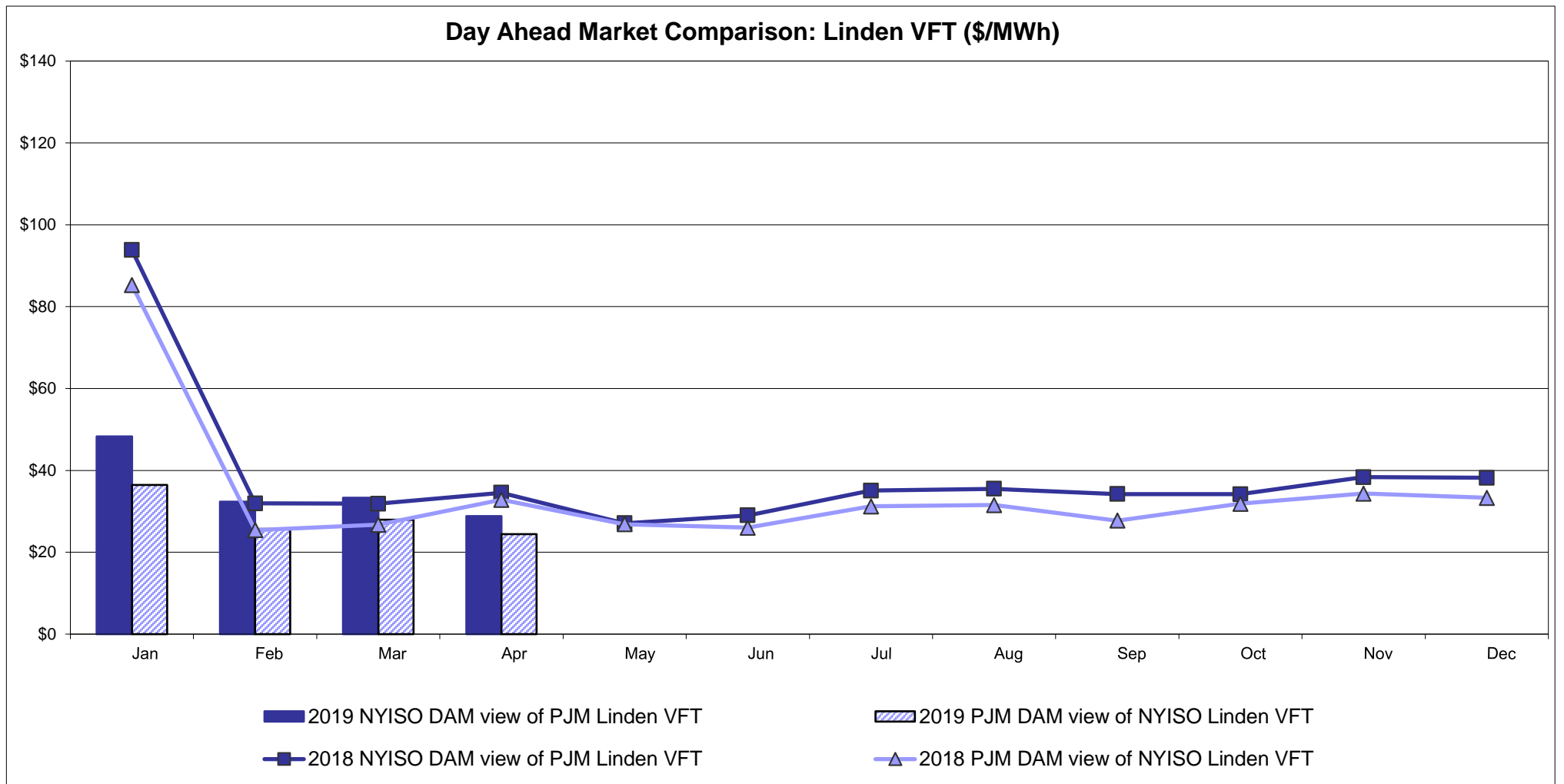


Real Time Market External Zone Comparison - HQ (\$/MWh)

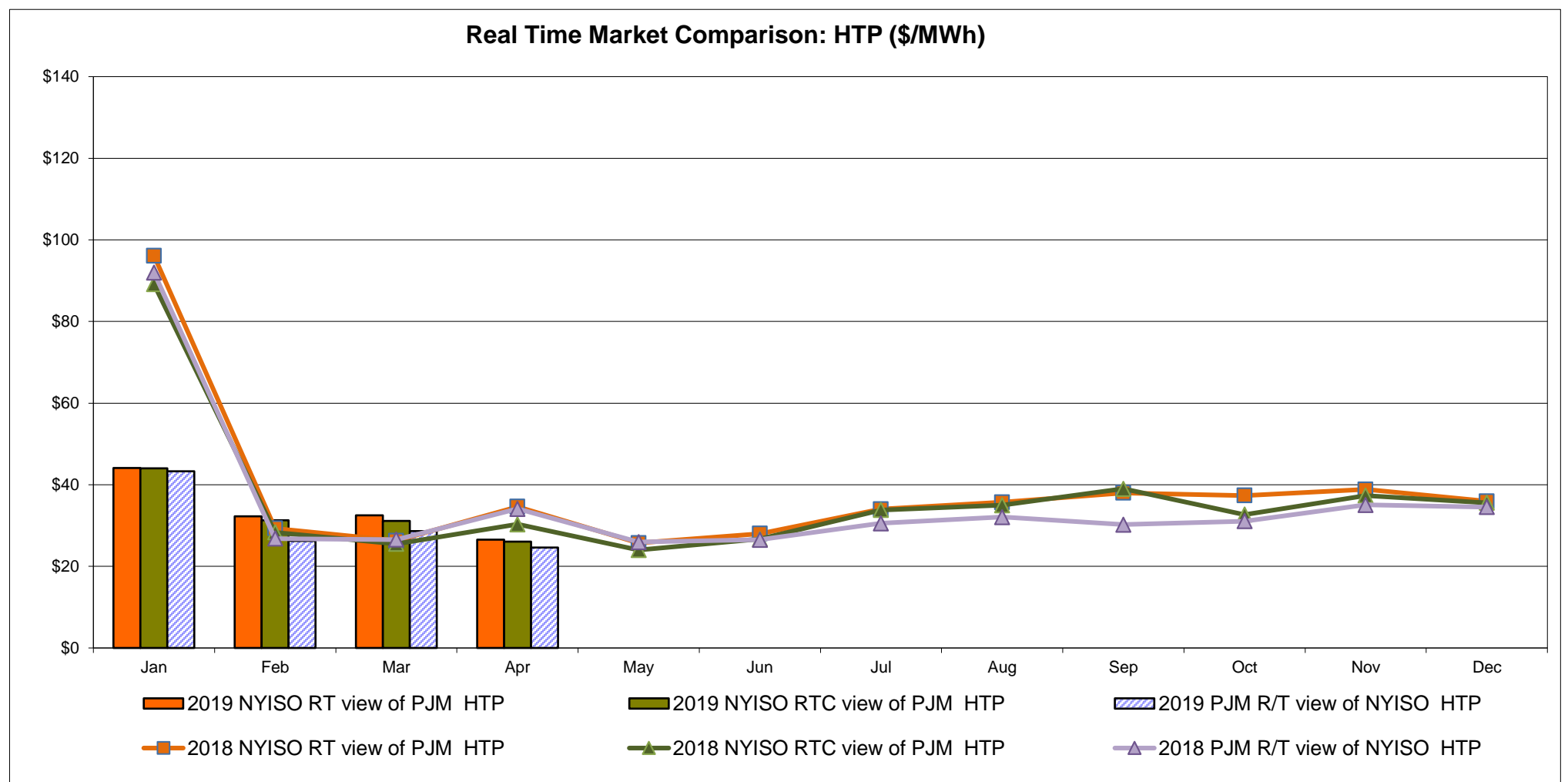
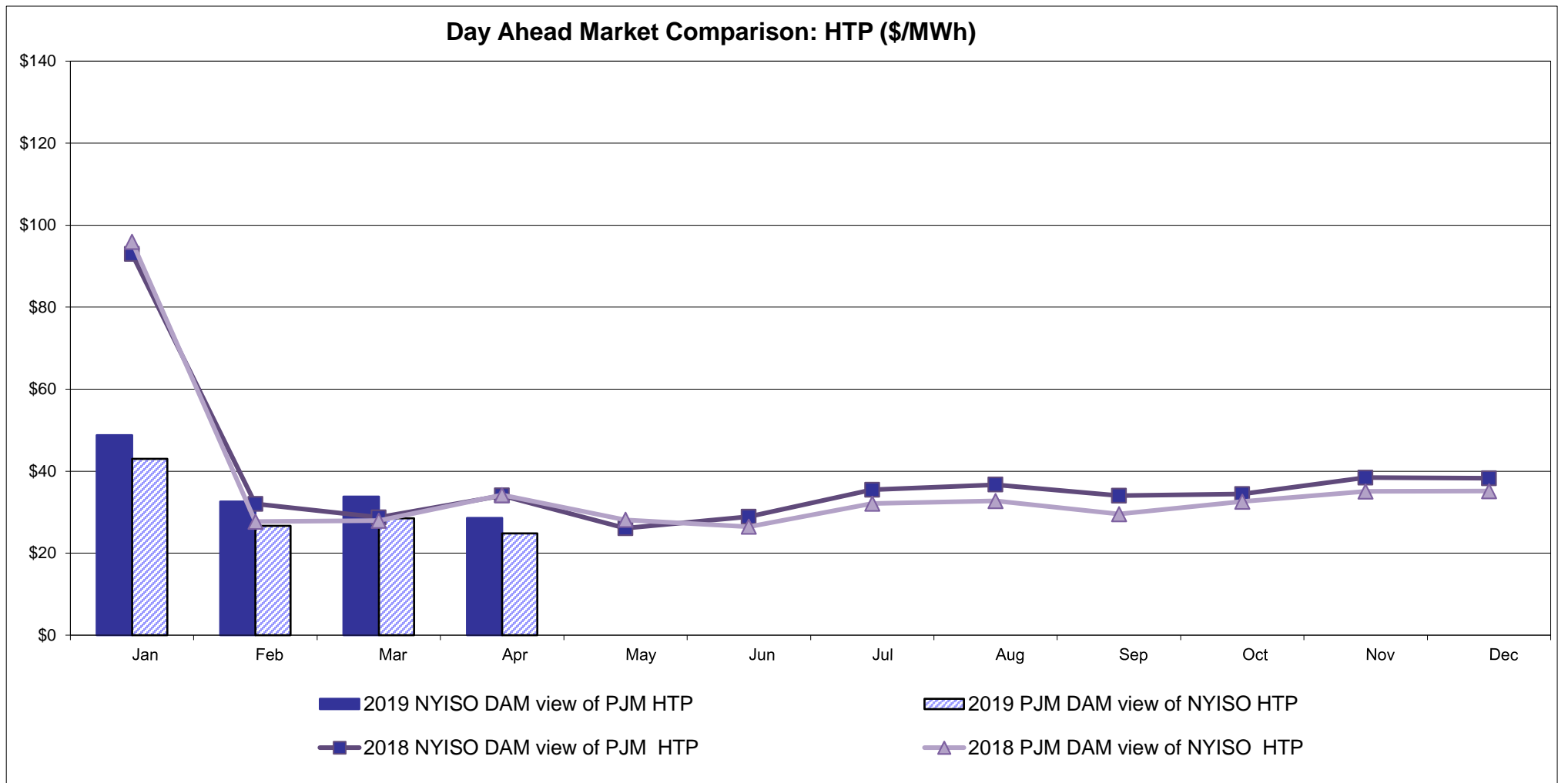


Note:
Hydro-Quebec Prices are unavailable.

External Controllable Line: Linden VFT (PJM)



External Controllable Line: Hudson (PJM)

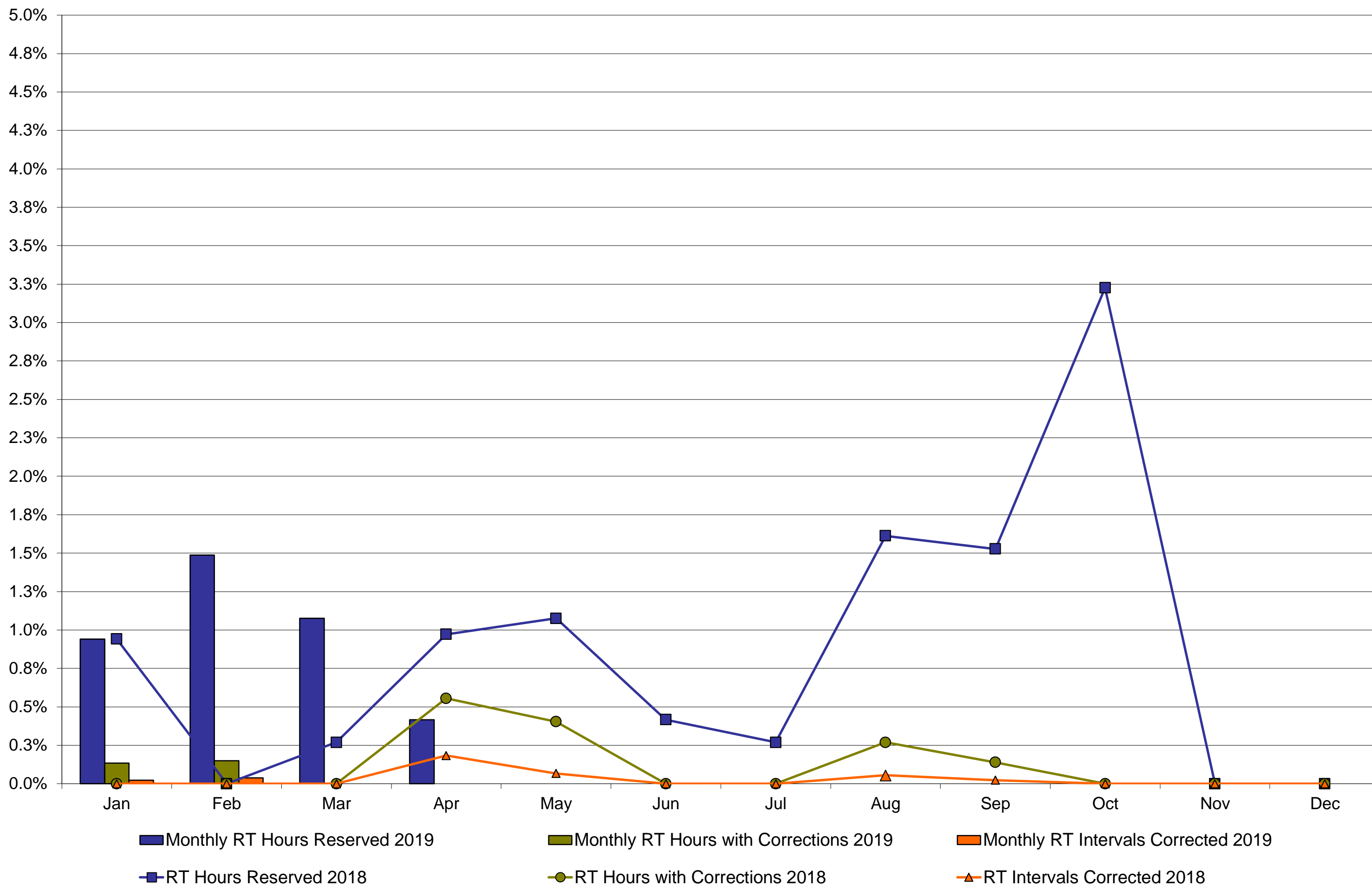


NYISO Real Time Price Correction Statistics

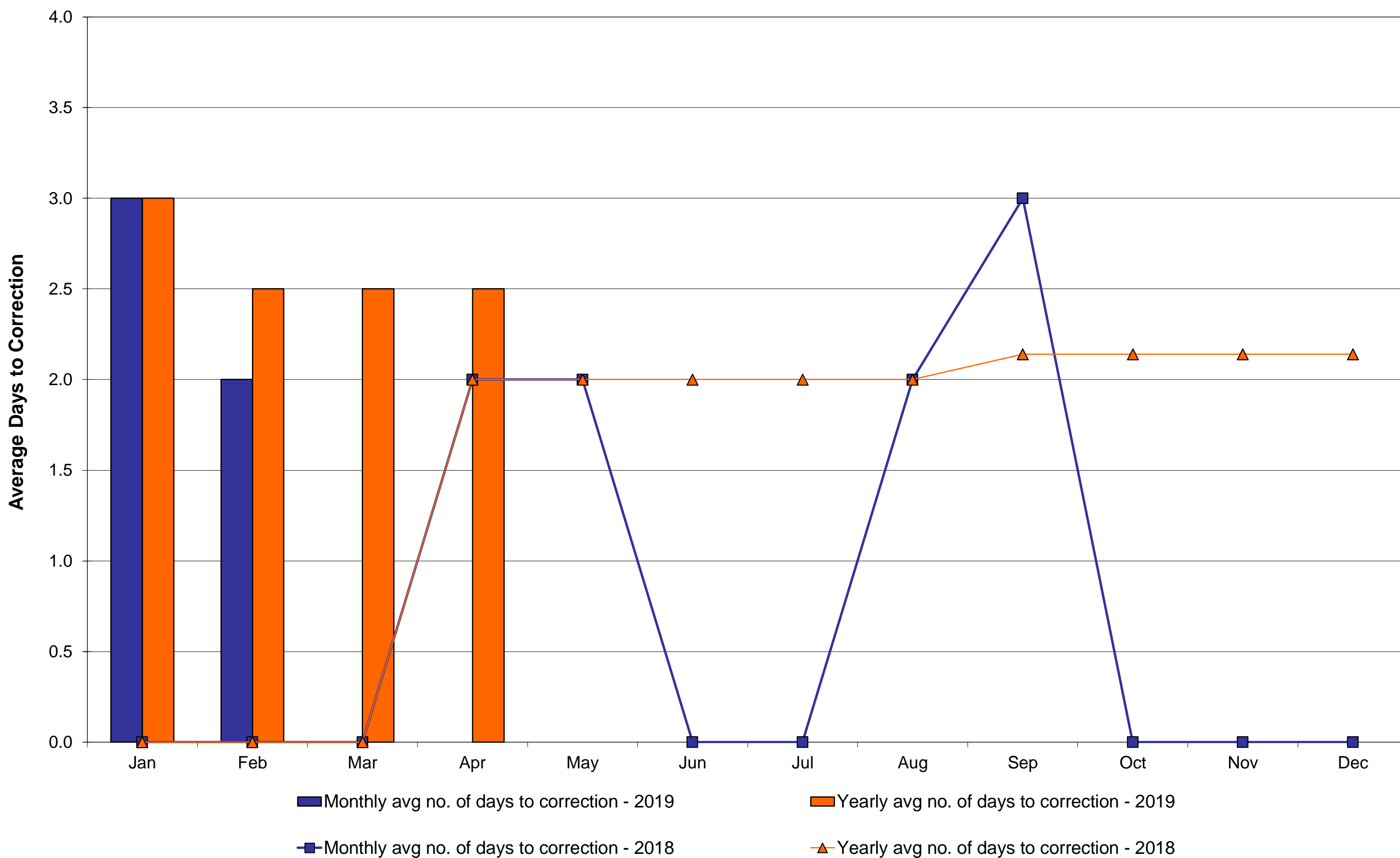
| 2019 | | January | February | March | April | May | June | July | August | September | October | November | December |
|-----------------------------------|--------------|---------|----------|-------|-------|-------|-------|-------|--------|-----------|---------|----------|----------|
| Hour Corrections | | | | | | | | | | | | | |
| Number of hours with corrections | in the month | 1 | 1 | 0 | 0 | | | | | | | | |
| Number of hours | in the month | 744 | 672 | 743 | 720 | | | | | | | | |
| % of hours with corrections | in the month | 0.13% | 0.15% | 0.00% | 0.00% | | | | | | | | |
| % of hours with corrections | year-to-date | 0.13% | 0.14% | 0.09% | 0.07% | | | | | | | | |
| Interval Corrections | | | | | | | | | | | | | |
| Number of intervals corrected | in the month | 2 | 3 | 0 | 0 | | | | | | | | |
| Number of intervals | in the month | 9,071 | 8,131 | 9,008 | 8,750 | | | | | | | | |
| % of intervals corrected | in the month | 0.02% | 0.04% | 0.00% | 0.00% | | | | | | | | |
| % of intervals corrected | year-to-date | 0.02% | 0.03% | 0.02% | 0.01% | | | | | | | | |
| Hours Reserved | | | | | | | | | | | | | |
| Number of hours reserved | in the month | 7 | 10 | 8 | 3 | | | | | | | | |
| Number of hours | in the month | 744 | 672 | 743 | 720 | | | | | | | | |
| % of hours reserved | in the month | 0.94% | 1.49% | 1.08% | 0.42% | | | | | | | | |
| % of hours reserved | year-to-date | 0.94% | 1.20% | 1.16% | 0.97% | | | | | | | | |
| Days to Correction * | | | | | | | | | | | | | |
| Avg. number of days to correction | in the month | 3.00 | 2.00 | 0.00 | 0.00 | | | | | | | | |
| Avg. number of days to correction | year-to-date | 3.00 | 2.50 | 2.50 | 2.50 | | | | | | | | |
| Days Without Corrections | | | | | | | | | | | | | |
| Days without corrections | in the month | 30 | 27 | 31 | 30 | | | | | | | | |
| Days without corrections | year-to-date | 30 | 57 | 88 | 118 | | | | | | | | |
| 2018 | | January | February | March | April | May | June | July | August | September | October | November | December |
| Hour Corrections | | | | | | | | | | | | | |
| Number of hours with corrections | in the month | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 2 | 1 | 0 | 0 | 0 |
| Number of hours | in the month | 744 | 672 | 743 | 720 | 744 | 720 | 744 | 744 | 720 | 744 | 721 | 744 |
| % of hours with corrections | in the month | 0.00% | 0.00% | 0.00% | 0.56% | 0.40% | 0.00% | 0.00% | 0.27% | 0.14% | 0.00% | 0.00% | 0.00% |
| % of hours with corrections | year-to-date | 0.00% | 0.00% | 0.00% | 0.14% | 0.19% | 0.16% | 0.14% | 0.15% | 0.15% | 0.14% | 0.12% | 0.11% |
| Interval Corrections | | | | | | | | | | | | | |
| Number of intervals corrected | in the month | 0 | 0 | 0 | 16 | 6 | 0 | 0 | 5 | 2 | 0 | 0 | 0 |
| Number of intervals | in the month | 9,021 | 8,112 | 9,002 | 8,717 | 9,033 | 8,723 | 9,021 | 9,071 | 8,723 | 8,990 | 8,763 | 8,993 |
| % of intervals corrected | in the month | 0.00% | 0.00% | 0.00% | 0.18% | 0.07% | 0.00% | 0.00% | 0.06% | 0.02% | 0.00% | 0.00% | 0.00% |
| % of intervals corrected | year-to-date | 0.00% | 0.00% | 0.00% | 0.05% | 0.05% | 0.04% | 0.04% | 0.04% | 0.04% | 0.03% | 0.03% | 0.03% |
| Hours Reserved | | | | | | | | | | | | | |
| Number of hours reserved | in the month | 7 | 0 | 2 | 7 | 8 | 3 | 2 | 12 | 11 | 24 | 0 | 0 |
| Number of hours | in the month | 744 | 672 | 743 | 720 | 744 | 720 | 744 | 744 | 720 | 744 | 721 | 744 |
| % of hours reserved | in the month | 0.94% | 0.00% | 0.27% | 0.97% | 1.08% | 0.42% | 0.27% | 1.61% | 1.53% | 3.23% | 0.00% | 0.00% |
| % of hours reserved | year-to-date | 0.94% | 0.49% | 0.42% | 0.56% | 0.66% | 0.62% | 0.57% | 0.70% | 0.79% | 1.04% | 0.95% | 0.87% |
| Days to Correction * | | | | | | | | | | | | | |
| Avg. number of days to correction | in the month | 0.00 | 0.00 | 0.00 | 2.00 | 2.00 | 0.00 | 0.00 | 2.00 | 3.00 | 0.00 | 0.00 | 0.00 |
| Avg. number of days to correction | year-to-date | 0.00 | 0.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.14 | 2.14 | 2.14 | 2.14 |
| Days Without Corrections | | | | | | | | | | | | | |
| Days without corrections | in the month | 31 | 28 | 31 | 28 | 28 | 30 | 31 | 30 | 29 | 31 | 30 | 31 |
| Days without corrections | year-to-date | 31 | 59 | 90 | 118 | 146 | 176 | 207 | 237 | 266 | 297 | 327 | 358 |

*Calendar days from reservation date; for June 2018 forward, business days from market date

Percentage of Real-Time Corrections

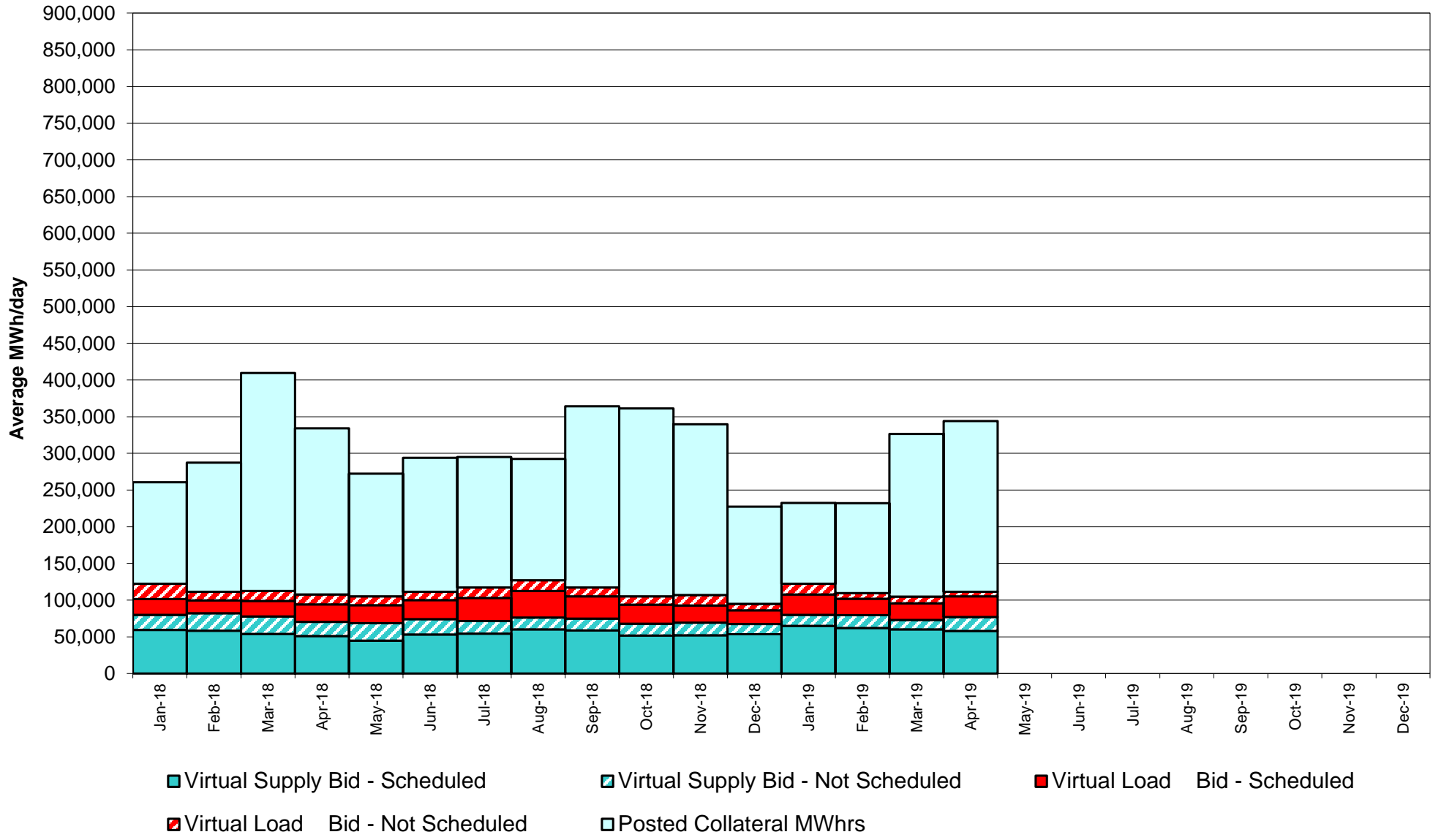


Annual average time period for making Price Corrections (from reservation date) *

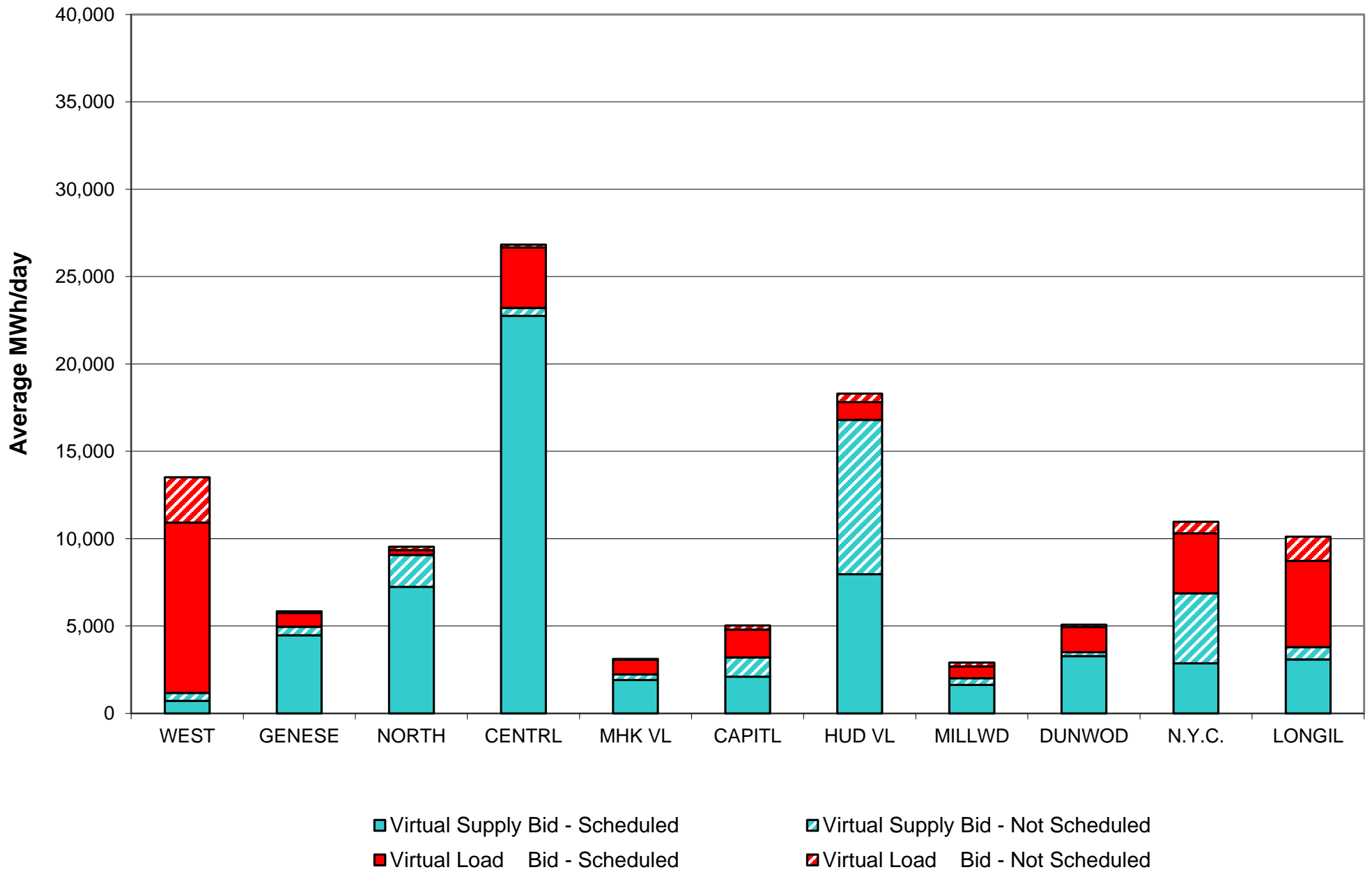


*Calendar days from reservation date; for June 2018 forward, business days from market date

NYISO Virtual Trading Average MWh per day



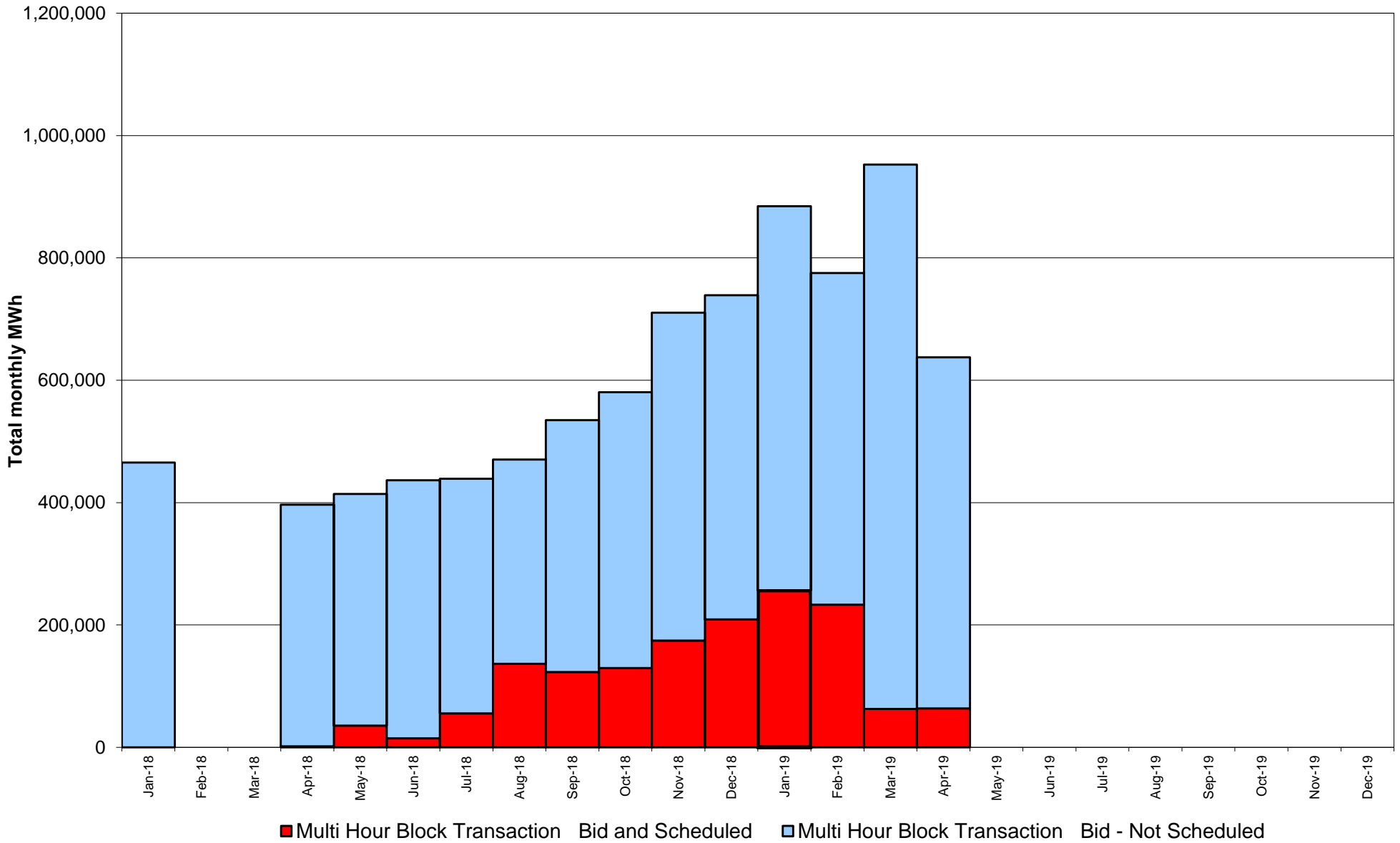
Virtual Load and Supply Zonal Statistics through April 30, 2019



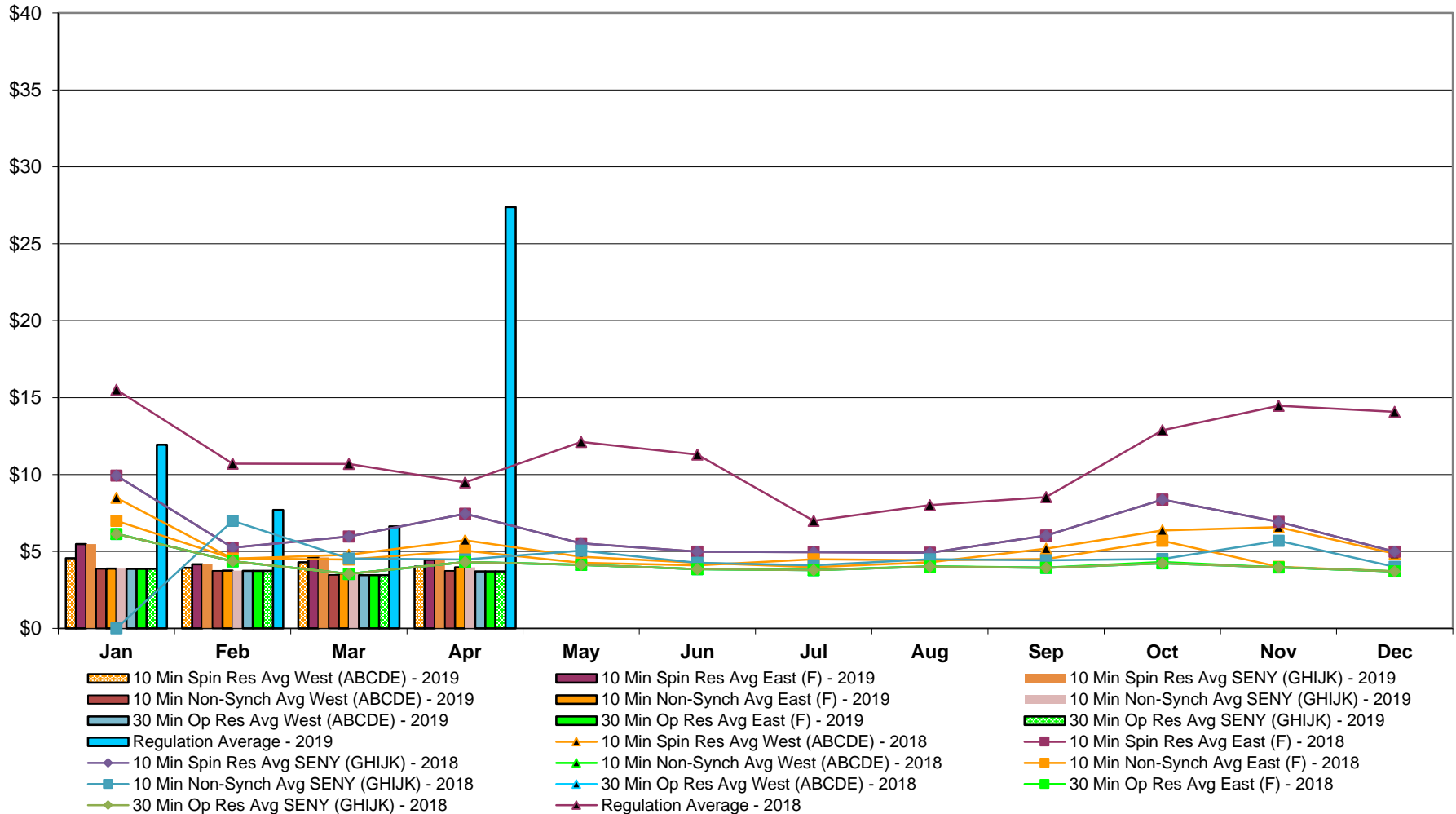
Virtual Load and Supply Zonal Statistics (Average MWh/day) - 2019

| | | Virtual Load Bid | | Virtual Supply Bid | | | | Virtual Load Bid | | Virtual Supply Bid | | | | Virtual Load Bid | | Virtual Supply Bid | |
|---------------|--------|------------------|---------------|--------------------|---------------|---------------|--------|------------------|---------------|--------------------|---------------|---------------|--------|------------------|---------------|--------------------|---------------|
| Zone | Date | Scheduled | Not Scheduled | Scheduled | Not Scheduled | Zone | Date | Scheduled | Not Scheduled | Scheduled | Not Scheduled | Zone | Date | Scheduled | Not Scheduled | Scheduled | Not Scheduled |
| WEST | Jan-19 | 9,007 | 5,211 | 1,609 | 797 | MHK VL | Jan-19 | 1,171 | 117 | 1,965 | 471 | DUNWOD | Jan-19 | 1,370 | 798 | 2,651 | 203 |
| | Feb-19 | 6,628 | 2,000 | 1,397 | 921 | | Feb-19 | 872 | 75 | 1,709 | 596 | | Feb-19 | 1,064 | 494 | 3,273 | 259 |
| | Mar-19 | 5,264 | 2,548 | 1,107 | 569 | | Mar-19 | 1,275 | 113 | 2,208 | 386 | | Mar-19 | 1,159 | 471 | 3,571 | 199 |
| | Apr-19 | 9,744 | 2,589 | 721 | 461 | | Apr-19 | 843 | 43 | 1,904 | 331 | | Apr-19 | 1,446 | 125 | 3,278 | 228 |
| | May-19 | | | | | | May-19 | | | | | | May-19 | | | | |
| | Jun-19 | | | | | | Jun-19 | | | | | | Jun-19 | | | | |
| | Jul-19 | | | | | | Jul-19 | | | | | | Jul-19 | | | | |
| | Aug-19 | | | | | | Aug-19 | | | | | | Aug-19 | | | | |
| | Sep-19 | | | | | | Sep-19 | | | | | | Sep-19 | | | | |
| | Oct-19 | | | | | | Oct-19 | | | | | | Oct-19 | | | | |
| | Nov-19 | | | | | | Nov-19 | | | | | | Nov-19 | | | | |
| | Dec-19 | | | | | | Dec-19 | | | | | | Dec-19 | | | | |
| GENESE | Jan-19 | 527 | 153 | 3,560 | 529 | CAPITL | Jan-19 | 3,042 | 962 | 1,550 | 1,424 | N.Y.C. | Jan-19 | 3,665 | 3,061 | 2,599 | 1,366 |
| | Feb-19 | 896 | 66 | 3,776 | 520 | | Feb-19 | 2,591 | 485 | 1,851 | 1,756 | | Feb-19 | 2,545 | 2,025 | 2,248 | 1,648 |
| | Mar-19 | 987 | 241 | 3,224 | 432 | | Mar-19 | 2,012 | 383 | 2,004 | 1,666 | | Mar-19 | 3,746 | 1,774 | 2,432 | 968 |
| | Apr-19 | 808 | 83 | 4,479 | 475 | | Apr-19 | 1,585 | 232 | 2,102 | 1,111 | | Apr-19 | 3,431 | 656 | 2,869 | 4,012 |
| | May-19 | | | | | | May-19 | | | | | | May-19 | | | | |
| | Jun-19 | | | | | | Jun-19 | | | | | | Jun-19 | | | | |
| | Jul-19 | | | | | | Jul-19 | | | | | | Jul-19 | | | | |
| | Aug-19 | | | | | | Aug-19 | | | | | | Aug-19 | | | | |
| | Sep-19 | | | | | | Sep-19 | | | | | | Sep-19 | | | | |
| | Oct-19 | | | | | | Oct-19 | | | | | | Oct-19 | | | | |
| | Nov-19 | | | | | | Nov-19 | | | | | | Nov-19 | | | | |
| | Dec-19 | | | | | | Dec-19 | | | | | | Dec-19 | | | | |
| NORTH | Jan-19 | 484 | 540 | 6,406 | 1,553 | HUD VL | Jan-19 | 856 | 980 | 9,176 | 7,130 | LONGIL | Jan-19 | 3,362 | 2,135 | 3,091 | 1,056 |
| | Feb-19 | 431 | 359 | 6,559 | 1,743 | | Feb-19 | 977 | 843 | 7,408 | 7,858 | | Feb-19 | 2,514 | 1,297 | 3,446 | 1,425 |
| | Mar-19 | 349 | 419 | 6,855 | 1,845 | | Mar-19 | 1,460 | 1,425 | 8,787 | 4,948 | | Mar-19 | 2,752 | 1,198 | 3,372 | 1,025 |
| | Apr-19 | 284 | 186 | 7,243 | 1,823 | | Apr-19 | 1,011 | 487 | 7,962 | 8,845 | | Apr-19 | 4,934 | 1,386 | 3,096 | 697 |
| | May-19 | | | | | | May-19 | | | | | | May-19 | | | | |
| | Jun-19 | | | | | | Jun-19 | | | | | | Jun-19 | | | | |
| | Jul-19 | | | | | | Jul-19 | | | | | | Jul-19 | | | | |
| | Aug-19 | | | | | | Aug-19 | | | | | | Aug-19 | | | | |
| | Sep-19 | | | | | | Sep-19 | | | | | | Sep-19 | | | | |
| | Oct-19 | | | | | | Oct-19 | | | | | | Oct-19 | | | | |
| | Nov-19 | | | | | | Nov-19 | | | | | | Nov-19 | | | | |
| | Dec-19 | | | | | | Dec-19 | | | | | | Dec-19 | | | | |
| CENTRL | Jan-19 | 3,795 | 374 | 30,145 | 507 | MILLWD | Jan-19 | 405 | 386 | 2,051 | 169 | NYISO | Jan-19 | 27,683 | 14,720 | 64,802 | 15,203 |
| | Feb-19 | 3,059 | 123 | 29,111 | 609 | | Feb-19 | 540 | 138 | 1,311 | 247 | | Feb-19 | 22,118 | 7,905 | 62,089 | 17,582 |
| | Mar-19 | 3,411 | 332 | 25,195 | 542 | | Mar-19 | 505 | 89 | 1,404 | 155 | | Mar-19 | 22,918 | 8,993 | 60,159 | 12,736 |
| | Apr-19 | 3,475 | 150 | 22,748 | 453 | | Apr-19 | 686 | 215 | 1,636 | 371 | | Apr-19 | 28,247 | 6,153 | 58,038 | 18,807 |
| | May-19 | | | | | | May-19 | | | | | | May-19 | | | | |
| | Jun-19 | | | | | | Jun-19 | | | | | | Jun-19 | | | | |
| | Jul-19 | | | | | | Jul-19 | | | | | | Jul-19 | | | | |
| | Aug-19 | | | | | | Aug-19 | | | | | | Aug-19 | | | | |
| | Sep-19 | | | | | | Sep-19 | | | | | | Sep-19 | | | | |
| | Oct-19 | | | | | | Oct-19 | | | | | | Oct-19 | | | | |
| | Nov-19 | | | | | | Nov-19 | | | | | | Nov-19 | | | | |
| | Dec-19 | | | | | | Dec-19 | | | | | | Dec-19 | | | | |

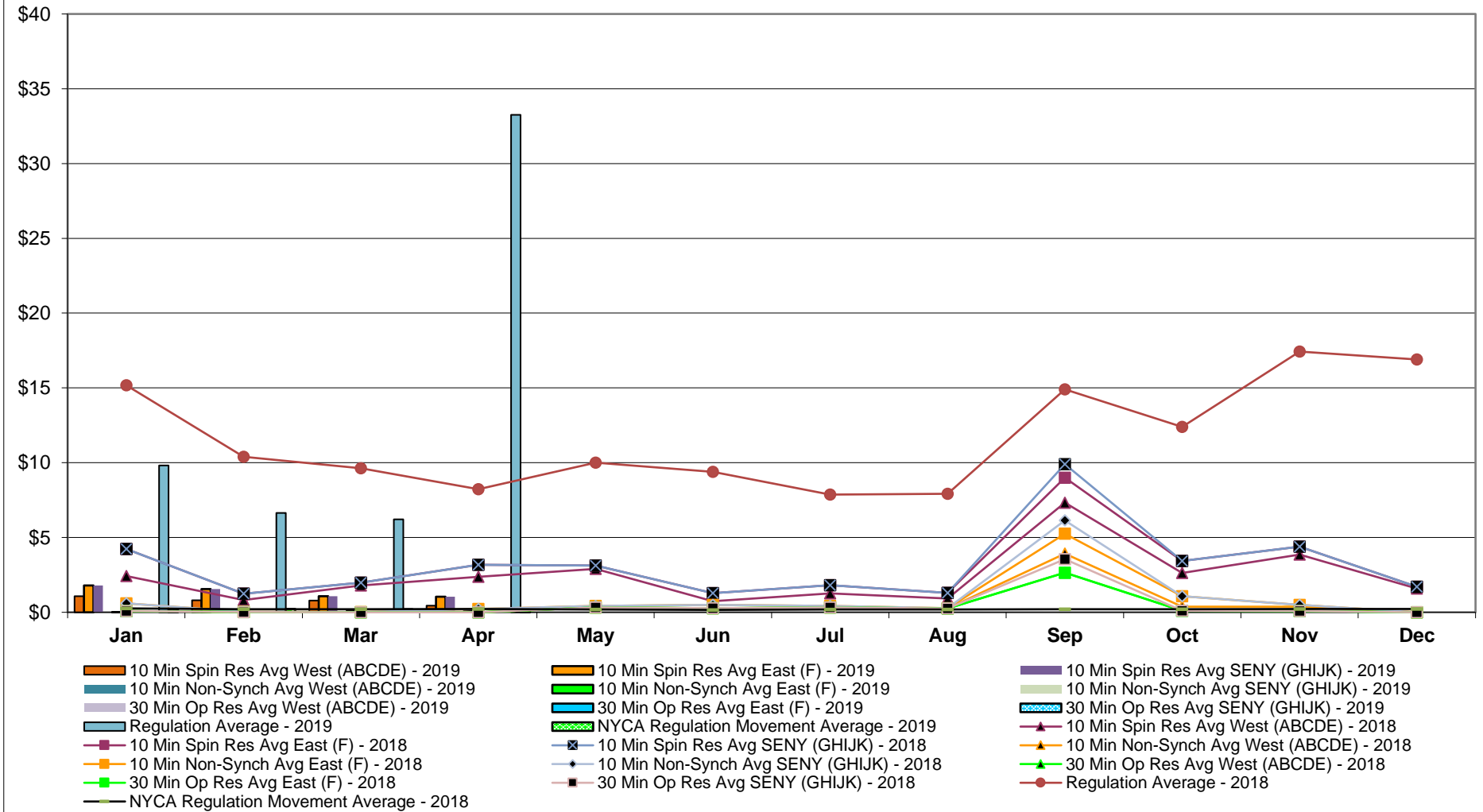
NYISO Multi Hour Block Transactions Monthly Total MWh



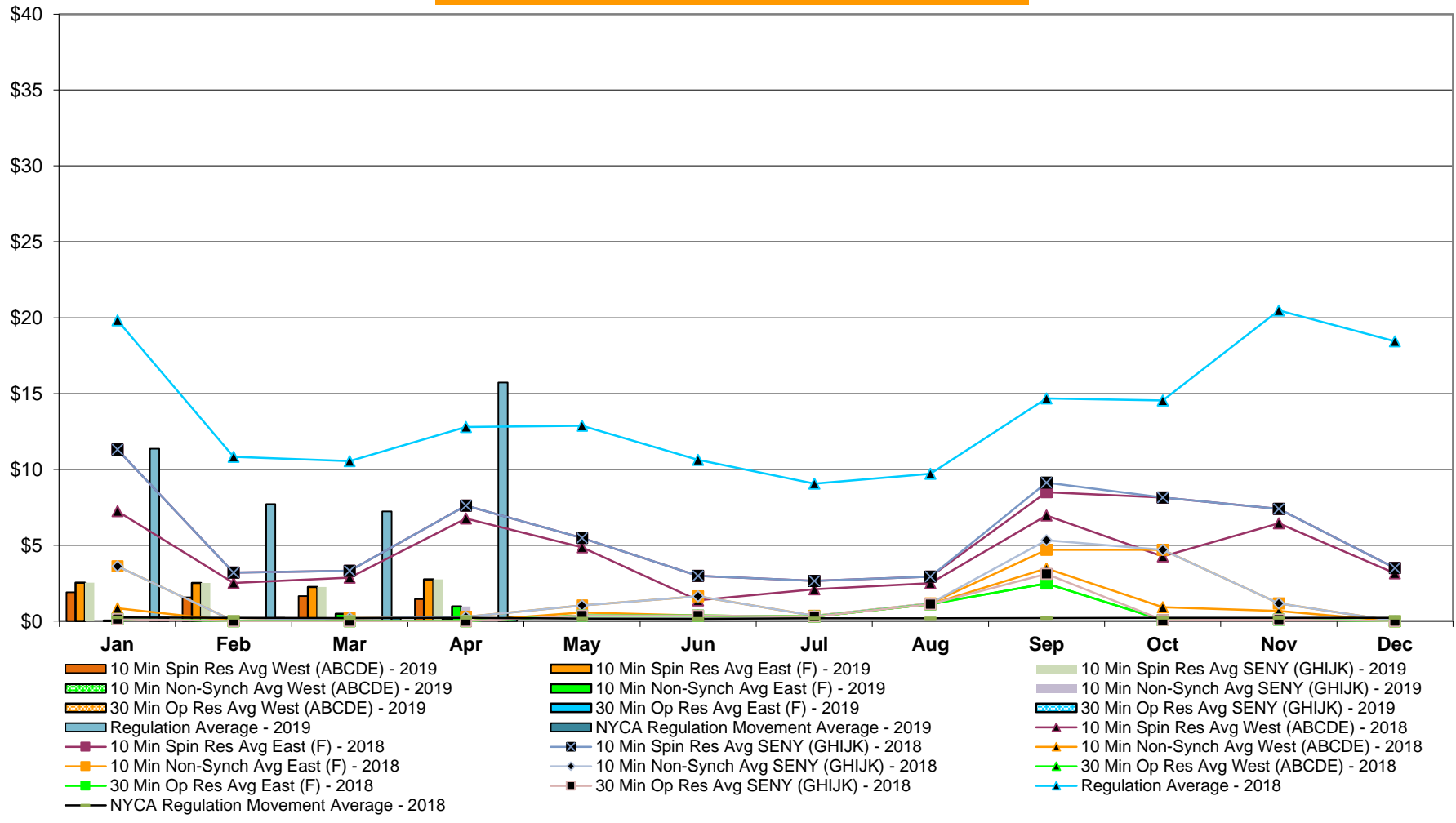
NYISO Monthly Average Ancillary Service Prices Day Ahead Market 2018 - 2019



NYISO Monthly Average Ancillary Service Prices RTC Market 2018 - 2019



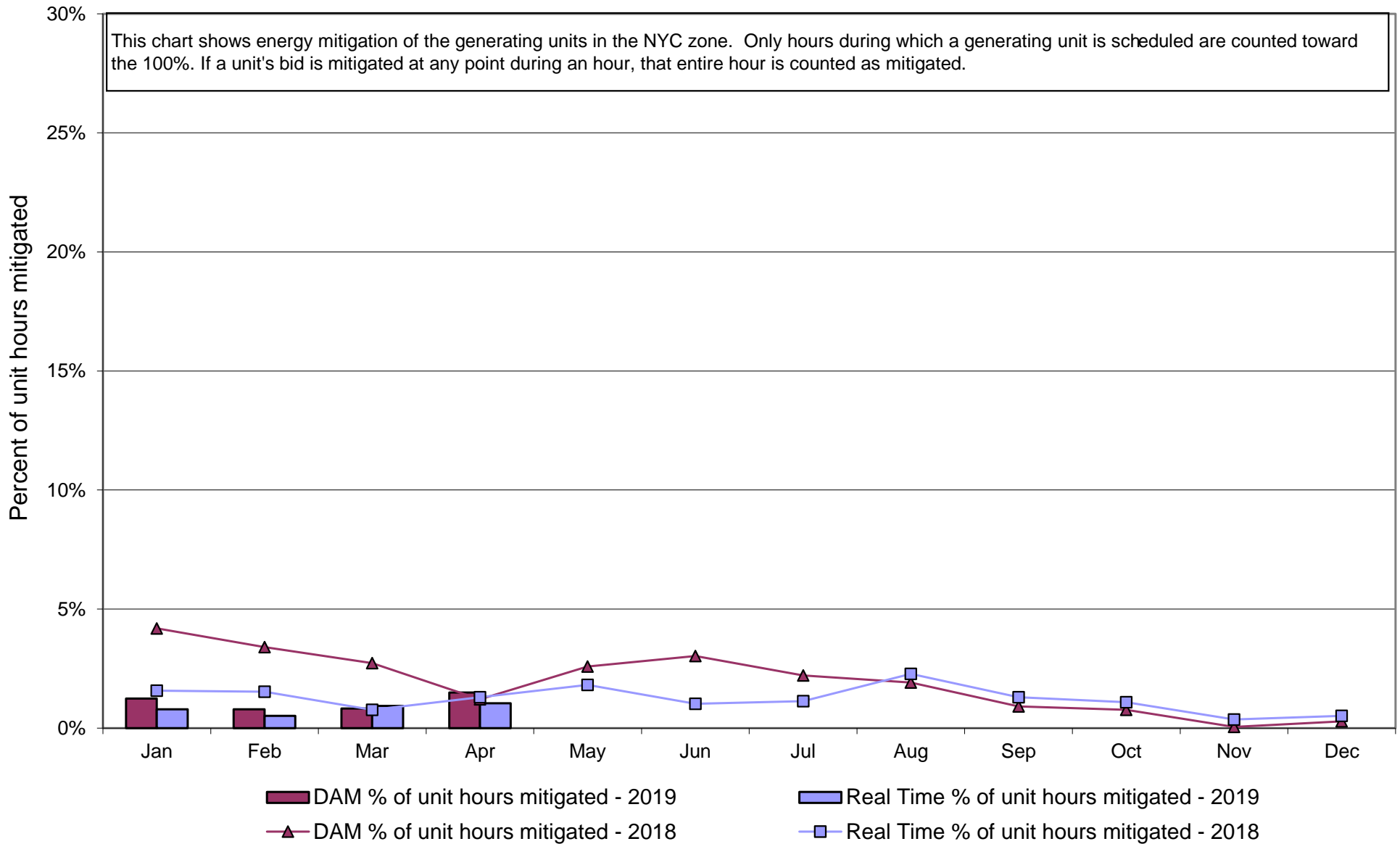
NYISO Monthly Average Ancillary Service Prices Real Time Market 2018 - 2019



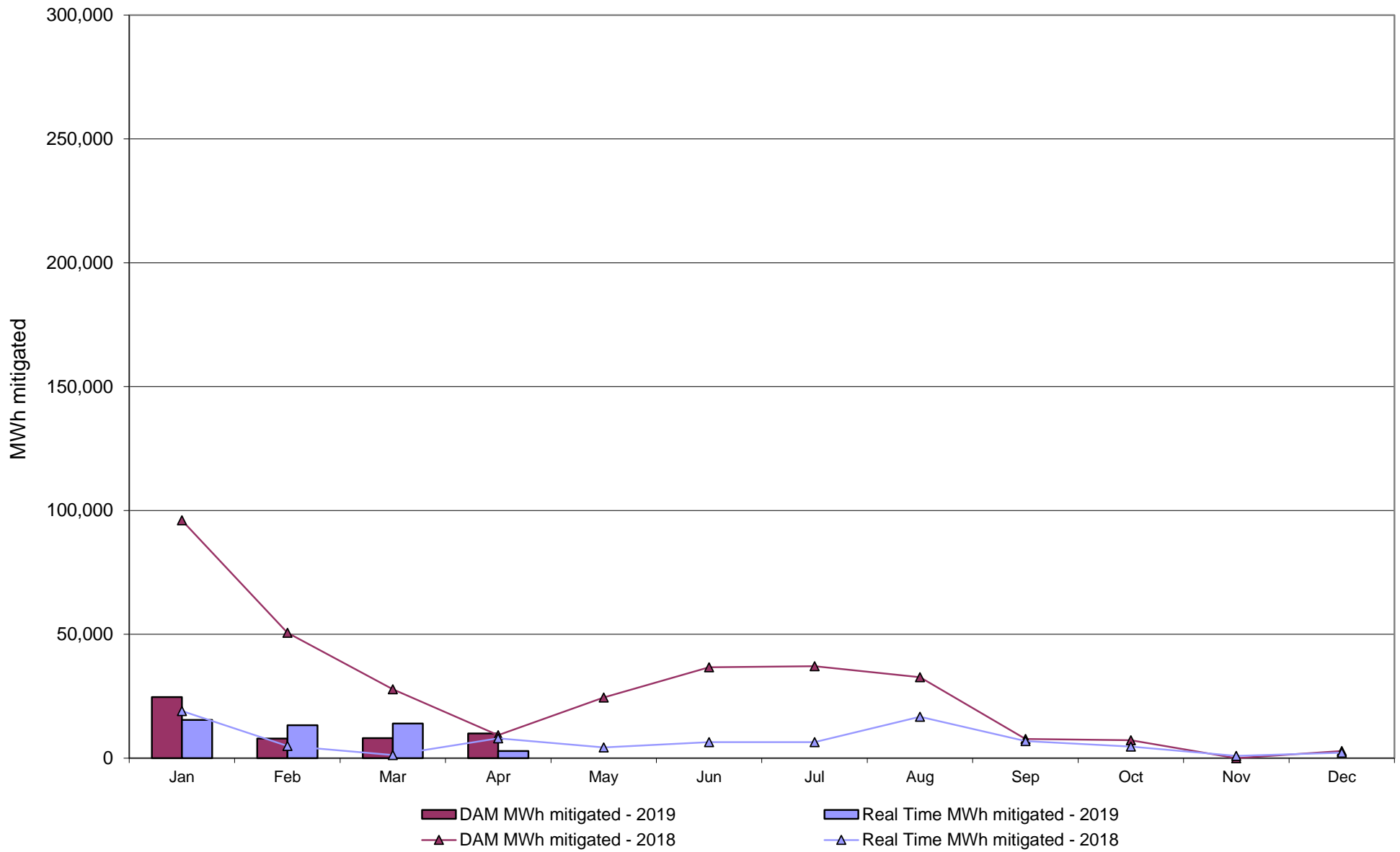
NYISO Markets Ancillary Services Statistics - Unweighted Price (\$/MWH)

| 2019 | January | February | March | April | May | June | July | August | September | October | November | December |
|--------------------------------|---------|----------|-------|-------|-------|-------|------|--------|-----------|---------|----------|----------|
| Day Ahead Market | | | | | | | | | | | | |
| 10 Min Spin SENEY (GHIJK) | 5.47 | 4.17 | 4.61 | 4.46 | | | | | | | | |
| 10 Min Spin East (F) | 5.47 | 4.17 | 4.61 | 4.46 | | | | | | | | |
| 10 Min Spin West (ABCDE) | 4.56 | 3.94 | 4.30 | 4.01 | | | | | | | | |
| 10 Min Non Synch SENEY (GHIJK) | 3.88 | 3.75 | 3.57 | 3.96 | | | | | | | | |
| 10 Min Non Synch East (F) | 3.88 | 3.75 | 3.57 | 3.96 | | | | | | | | |
| 10 Min Non Synch West (ABCDE) | 3.86 | 3.74 | 3.47 | 3.73 | | | | | | | | |
| 30 Min SENEY (GHIJK) | 3.86 | 3.74 | 3.46 | 3.71 | | | | | | | | |
| 30 Min East (F) | 3.86 | 3.74 | 3.46 | 3.71 | | | | | | | | |
| 30 Min West (ABCDE) | 3.86 | 3.74 | 3.46 | 3.71 | | | | | | | | |
| Regulation | 11.94 | 7.69 | 6.62 | 27.38 | | | | | | | | |
| RTC Market | | | | | | | | | | | | |
| 10 Min Spin SENEY (GHIJK) | 1.80 | 1.55 | 1.08 | 1.04 | | | | | | | | |
| 10 Min Spin East (F) | 1.80 | 1.55 | 1.08 | 1.04 | | | | | | | | |
| 10 Min Spin West (ABCDE) | 1.08 | 0.80 | 0.79 | 0.44 | | | | | | | | |
| 10 Min Non Synch SENEY (GHIJK) | 0.01 | 0.08 | 0.11 | 0.13 | | | | | | | | |
| 10 Min Non Synch East (F) | 0.01 | 0.08 | 0.11 | 0.13 | | | | | | | | |
| 10 Min Non Synch West (ABCDE) | 0.00 | 0.01 | 0.01 | 0.00 | | | | | | | | |
| 30 Min SENEY (GHIJK) | 0.00 | 0.01 | 0.01 | 0.00 | | | | | | | | |
| 30 Min East (F) | 0.00 | 0.01 | 0.01 | 0.00 | | | | | | | | |
| 30 Min West (ABCDE) | 0.00 | 0.01 | 0.01 | 0.00 | | | | | | | | |
| Regulation | 9.81 | 6.64 | 6.21 | 33.26 | | | | | | | | |
| NYCA Regulation Movement | 0.23 | 0.22 | 0.21 | 0.25 | | | | | | | | |
| Real Time Market | | | | | | | | | | | | |
| 10 Min Spin SENEY (GHIJK) | 2.53 | 2.51 | 2.24 | 2.75 | | | | | | | | |
| 10 Min Spin East (F) | 2.53 | 2.51 | 2.24 | 2.75 | | | | | | | | |
| 10 Min Spin West (ABCDE) | 1.89 | 1.57 | 1.64 | 1.45 | | | | | | | | |
| 10 Min Non Synch SENEY (GHIJK) | 0.03 | 0.18 | 0.48 | 0.96 | | | | | | | | |
| 10 Min Non Synch East (F) | 0.03 | 0.18 | 0.48 | 0.96 | | | | | | | | |
| 10 Min Non Synch West (ABCDE) | 0.00 | 0.01 | 0.09 | 0.17 | | | | | | | | |
| 30 Min SENEY (GHIJK) | 0.00 | 0.01 | 0.03 | 0.00 | | | | | | | | |
| 30 Min East (F) | 0.00 | 0.01 | 0.03 | 0.00 | | | | | | | | |
| 30 Min West (ABCDE) | 0.00 | 0.01 | 0.03 | 0.00 | | | | | | | | |
| Regulation | 11.36 | 7.72 | 7.23 | 15.73 | | | | | | | | |
| NYCA Regulation Movement | 0.22 | 0.22 | 0.20 | 0.25 | | | | | | | | |
| 2018 | | | | | | | | | | | | |
| Day Ahead Market | | | | | | | | | | | | |
| 10 Min Spin SENEY (GHIJK) | 9.93 | 5.24 | 5.97 | 7.45 | 5.52 | 4.98 | 4.95 | 4.91 | 6.04 | 8.37 | 6.93 | 4.99 |
| 10 Min Spin East (F) | 9.93 | 5.24 | 5.97 | 7.45 | 5.52 | 4.98 | 4.95 | 4.91 | 6.04 | 8.37 | 6.93 | 4.99 |
| 10 Min Spin West (ABCDE) | 8.49 | 4.53 | 4.78 | 5.73 | 4.65 | 4.26 | 3.98 | 4.30 | 5.18 | 6.36 | 6.57 | 4.86 |
| 10 Min Non Synch SENEY (GHIJK) | 6.99 | 4.54 | 4.48 | 5.05 | 4.26 | 4.09 | 4.49 | 4.43 | 4.51 | 5.69 | 4.00 | 3.71 |
| 10 Min Non Synch East (F) | 6.99 | 4.54 | 4.48 | 5.05 | 4.26 | 4.09 | 4.49 | 4.43 | 4.51 | 5.69 | 4.00 | 3.71 |
| 10 Min Non Synch West (ABCDE) | 6.15 | 4.36 | 3.54 | 4.31 | 4.13 | 3.85 | 3.80 | 4.03 | 3.95 | 4.31 | 3.97 | 3.70 |
| 30 Min SENEY (GHIJK) | 6.14 | 4.36 | 3.54 | 4.31 | 4.13 | 3.85 | 3.79 | 4.02 | 3.94 | 4.22 | 3.97 | 3.70 |
| 30 Min East (F) | 6.14 | 4.36 | 3.54 | 4.31 | 4.13 | 3.85 | 3.79 | 4.02 | 3.94 | 4.22 | 3.97 | 3.70 |
| 30 Min West (ABCDE) | 6.14 | 4.36 | 3.54 | 4.31 | 4.13 | 3.85 | 3.79 | 4.02 | 3.94 | 4.22 | 3.97 | 3.70 |
| Regulation | 15.51 | 10.70 | 10.68 | 9.49 | 12.11 | 11.30 | 6.99 | 8.00 | 8.54 | 12.88 | 14.47 | 14.07 |
| RTC Market | | | | | | | | | | | | |
| 10 Min Spin SENEY (GHIJK) | 4.23 | 1.24 | 1.98 | 3.17 | 3.13 | 1.28 | 1.81 | 1.29 | 9.90 | 3.43 | 4.39 | 1.71 |
| 10 Min Spin East (F) | 4.23 | 1.24 | 1.98 | 3.17 | 3.13 | 1.28 | 1.81 | 1.29 | 9.90 | 3.43 | 4.39 | 1.71 |
| 10 Min Spin West (ABCDE) | 2.43 | 0.82 | 1.79 | 2.38 | 2.91 | 0.74 | 1.27 | 0.93 | 7.33 | 2.63 | 3.85 | 1.58 |
| 10 Min Non Synch SENEY (GHIJK) | 0.59 | 0.03 | 0.01 | 0.22 | 0.42 | 0.49 | 0.42 | 0.27 | 6.14 | 1.07 | 0.50 | 0.00 |
| 10 Min Non Synch East (F) | 0.59 | 0.03 | 0.01 | 0.22 | 0.42 | 0.49 | 0.42 | 0.27 | 5.25 | 1.07 | 0.50 | 0.00 |
| 10 Min Non Synch West (ABCDE) | 0.08 | 0.02 | 0.00 | 0.00 | 0.33 | 0.27 | 0.33 | 0.25 | 3.92 | 0.38 | 0.38 | 0.00 |
| 30 Min SENEY (GHIJK) | 0.08 | 0.02 | 0.00 | 0.00 | 0.32 | 0.27 | 0.33 | 0.25 | 3.55 | 0.11 | 0.09 | 0.00 |
| 30 Min East (F) | 0.08 | 0.02 | 0.00 | 0.00 | 0.32 | 0.27 | 0.33 | 0.25 | 2.65 | 0.11 | 0.09 | 0.00 |
| 30 Min West (ABCDE) | 0.08 | 0.02 | 0.00 | 0.00 | 0.32 | 0.27 | 0.33 | 0.25 | 2.65 | 0.11 | 0.09 | 0.00 |
| Regulation | 15.17 | 10.40 | 9.63 | 8.22 | 10.01 | 9.39 | 7.87 | 7.92 | 14.90 | 12.40 | 17.43 | 16.90 |
| NYCA Regulation Movement | 0.26 | 0.21 | 0.20 | 0.22 | 0.19 | 0.16 | 0.19 | 0.19 | 0.20 | 0.21 | 0.22 | 0.22 |
| Real Time Market | | | | | | | | | | | | |
| 10 Min Spin SENEY (GHIJK) | 11.31 | 3.19 | 3.31 | 7.62 | 5.48 | 2.98 | 2.65 | 2.93 | 9.13 | 8.14 | 7.39 | 3.49 |
| 10 Min Spin East (F) | 11.31 | 3.19 | 3.31 | 7.62 | 5.48 | 2.98 | 2.65 | 2.93 | 8.50 | 8.14 | 7.39 | 3.49 |
| 10 Min Spin West (ABCDE) | 7.24 | 2.52 | 2.86 | 6.77 | 4.86 | 1.37 | 2.10 | 2.50 | 6.96 | 4.26 | 6.45 | 3.15 |
| 10 Min Non Synch SENEY (GHIJK) | 3.61 | 0.01 | 0.19 | 0.28 | 1.03 | 1.63 | 0.35 | 1.16 | 5.33 | 4.70 | 1.16 | 0.00 |
| 10 Min Non Synch East (F) | 3.61 | 0.01 | 0.19 | 0.28 | 1.03 | 1.63 | 0.35 | 1.16 | 4.70 | 4.70 | 1.16 | 0.00 |
| 10 Min Non Synch West (ABCDE) | 0.85 | 0.00 | 0.00 | 0.00 | 0.57 | 0.37 | 0.29 | 1.12 | 3.47 | 0.92 | 0.67 | 0.00 |
| 30 Min SENEY (GHIJK) | 0.13 | 0.00 | 0.00 | 0.00 | 0.37 | 0.37 | 0.29 | 1.12 | 3.11 | 0.06 | 0.10 | 0.00 |
| 30 Min East (F) | 0.13 | 0.00 | 0.00 | 0.00 | 0.37 | 0.37 | 0.29 | 1.12 | 2.48 | 0.06 | 0.10 | 0.00 |
| 30 Min West (ABCDE) | 0.13 | 0.00 | 0.00 | 0.00 | 0.37 | 0.37 | 0.29 | 1.12 | 2.48 | 0.06 | 0.10 | 0.00 |
| Regulation | 19.82 | 10.82 | 10.54 | 12.80 | 12.88 | 10.62 | 9.06 | 9.71 | 14.67 | 14.54 | 20.48 | 18.44 |
| NYCA Regulation Movement | 0.24 | 0.21 | 0.20 | 0.21 | 0.17 | 0.15 | 0.18 | 0.18 | 0.20 | 0.21 | 0.22 | 0.21 |

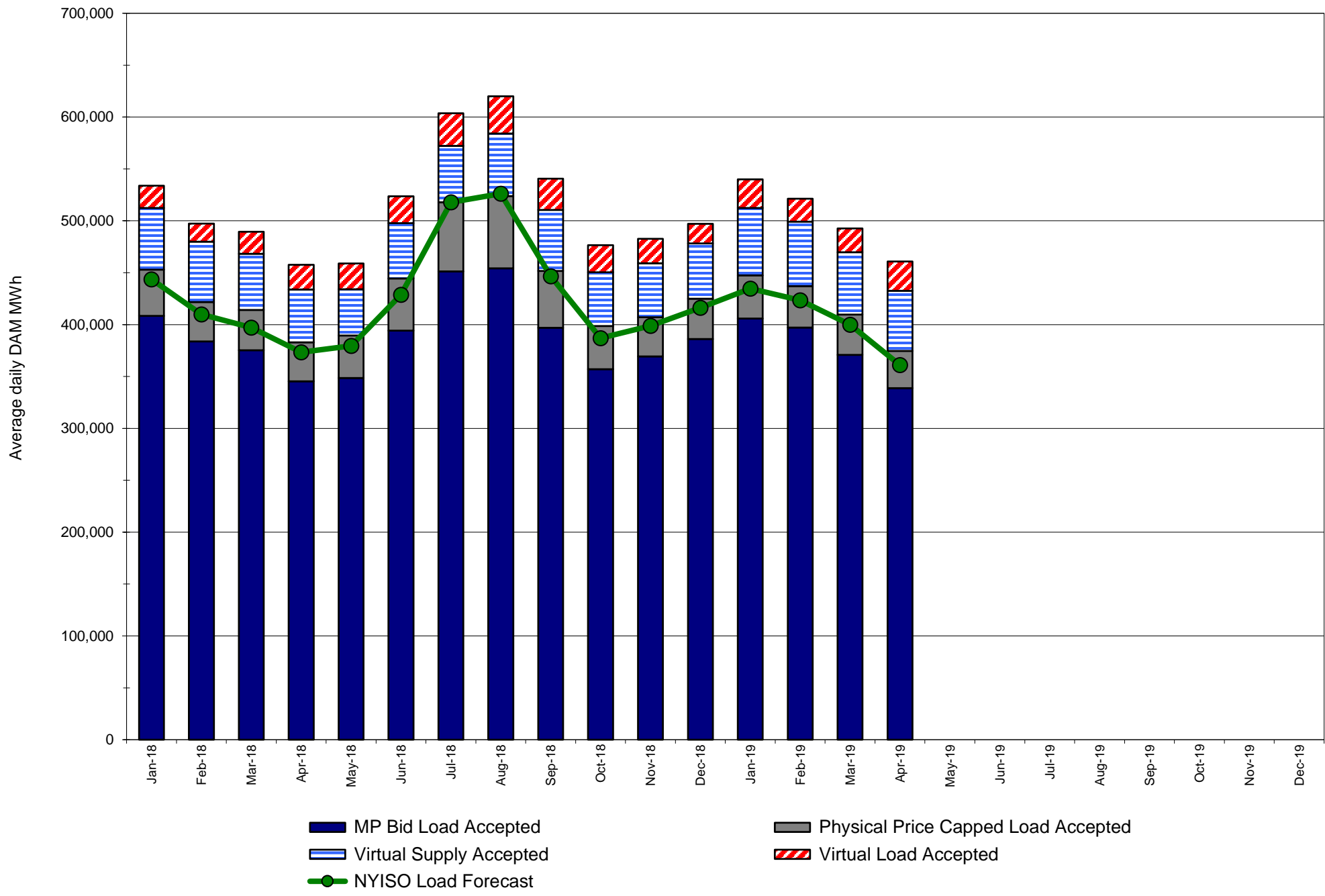
NYISO In City Energy Mitigation - AMP (NYC Zone) 2018 - 2019 Percentage of committed unit-hours mitigated



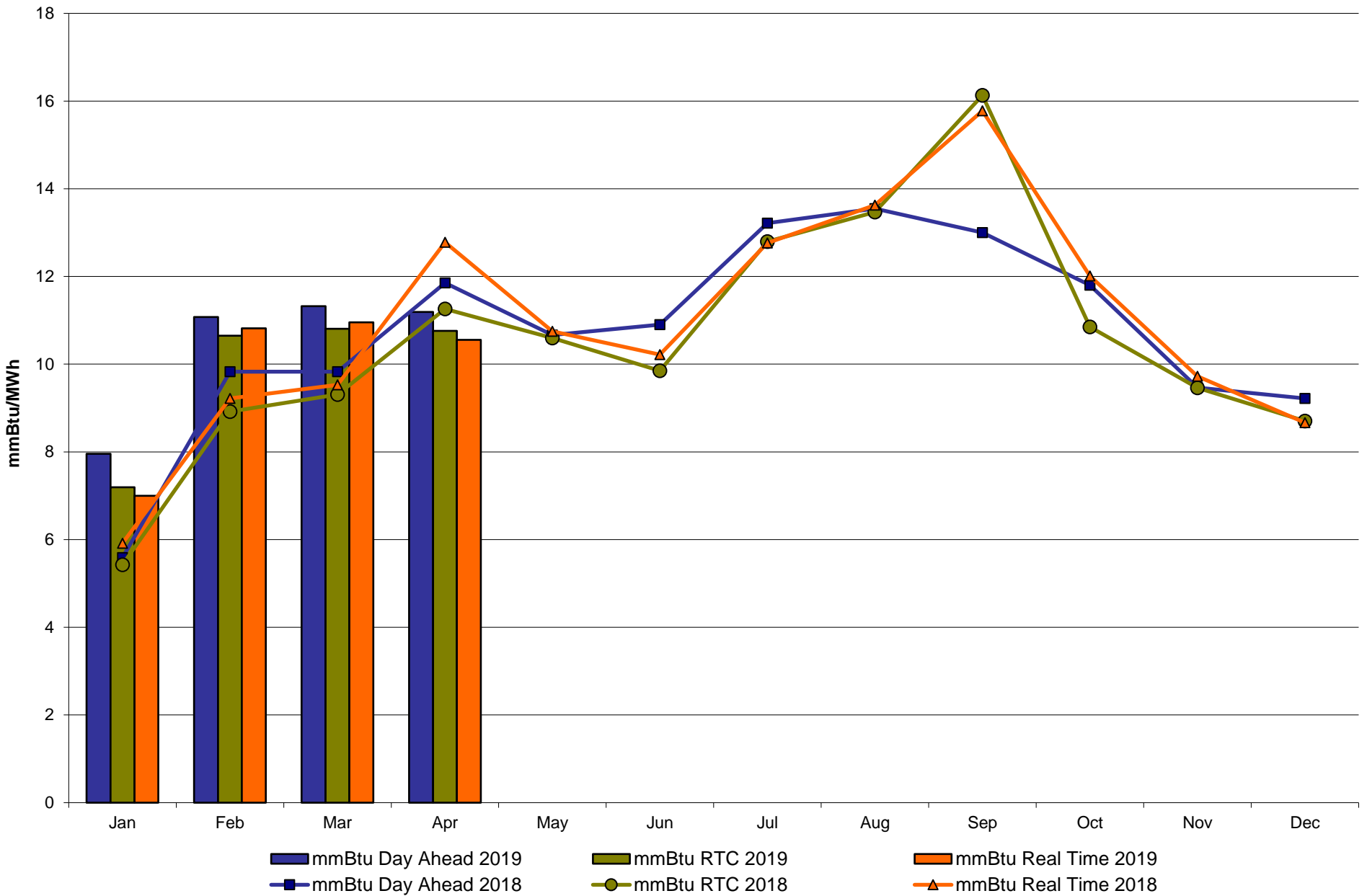
NYISO In City Energy Mitigation (NYC Zone) 2018 - 2019
Monthly megawatt hours mitigated



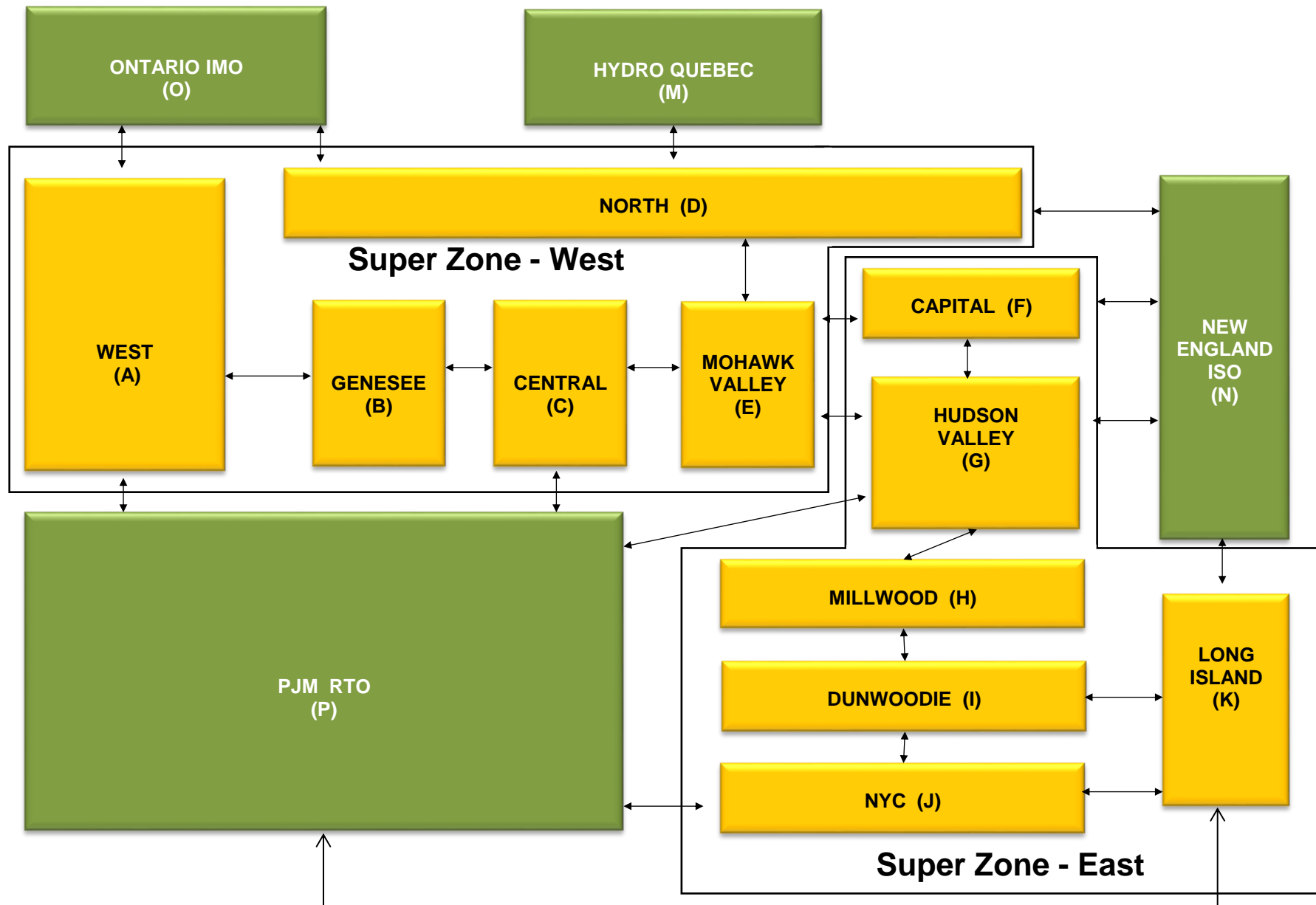
NYISO Average Daily DAM Load Bid Summary



Monthly Implied Heat Rate 2018-2019



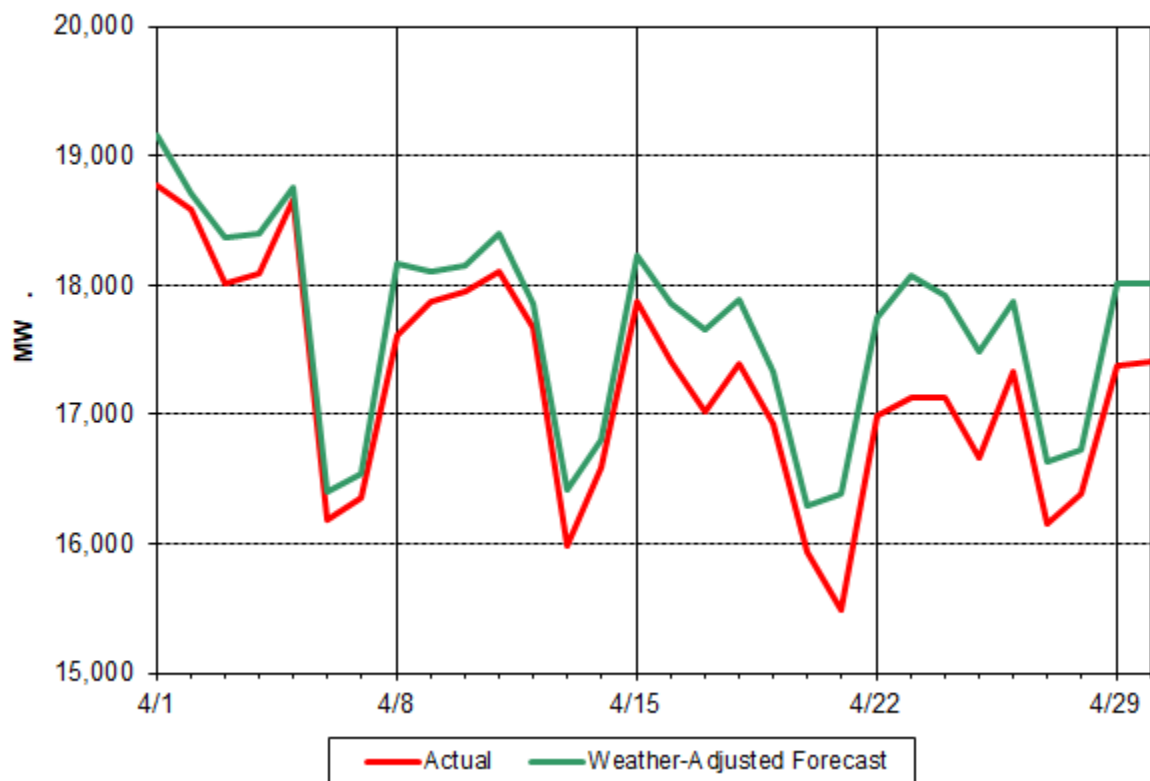
NYISO LBMP ZONES



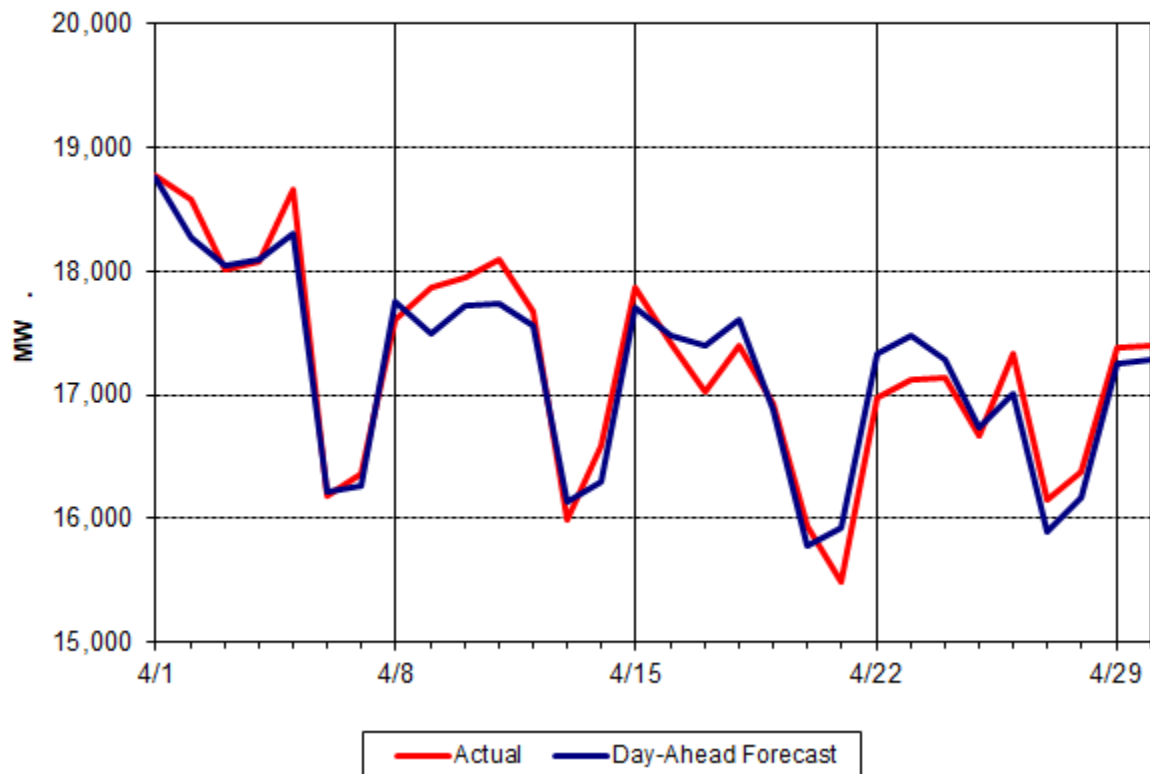
Billing Codes for Chart C

| Chart - C Category Name | Billing Code | Billing Category Name |
|---|---------------------|--|
| Bid Production Cost Guarantee Balancing | 81203 | Balancing NYISO Bid Production Cost Guarantee - Internal Units |
| Bid Production Cost Guarantee Balancing | 81204 | Balancing NYISO Bid Production Cost Guarantee - External Units |
| Bid Production Cost Guarantee Balancing | 81205 | Balancing NYISO Bid Production Cost Guarantee Expenditure due to Curtailed Imports |
| Bid Production Cost Guarantee Balancing | 81208 | Balancing NYISO Bid Production Cost Guarantee - Internal Units |
| Bid Production Cost Guarantee Balancing | 81209 | Balancing NYISO Bid Production Cost Guarantee - External Units |
| Bid Production Cost Guarantee Balancing | 81213 | Balancing NYISO Bid Production Cost Guarantee Expenditure due to Curtailed Imports |
| Bid Production Cost Guarantee DAM | 81201 | DAM NYISO Bid Production Cost Guarantee - Internal Units |
| Bid Production Cost Guarantee DAM | 84001 | EDRP/SCR Demand Response - Local |
| Bid Production Cost Guarantee DAM | 84101 | EDRP/SCR Demand Response - NYISO Wide |
| Bid Production Cost Guarantee DAM | 81401 | DAM Price Responsive Load Program |
| Bid Production Cost Guarantee DAM | 81202 | DAM NYISO Bid Production Cost Guarantee - External Units |
| Bid Production Cost Guarantee DAM | 81206 | DAM NYISO Bid Production Cost Guarantee - Internal Units |
| Bid Production Cost Guarantee DAM | 81207 | DAM NYISO Bid Production Cost Guarantee - External Units |
| Bid Production Cost Guarantee DAM Virtual | 81501 | DAM Virtual Bid Production Cost Guarantee |
| DAM Contract Balancing | 81315 | DAM Contract Balancing |
| DAM Contract Balancing | 81317 | DAM Contract Balancing |
| Local Reliability Balancing | 81002 | Balancing Local Reliability Bid Production Cost Guarantee |
| Local Reliability Balancing | 83901 | Margin Restoration (MOB) Revenue |
| Local Reliability DAM | 81001 | DAM Local Reliability Bid Production Cost Guarantee |
| NYISO Cost of Operations | 80901 | NYISO Cost Of Operations |
| NYISO Cost of Operations | 80902 | NYISO Cost Of Operations |
| NYISO Cost of Operations | 83501 | NYISO Cost Of Operations |
| NYISO Cost of Operations | 83502 | NYISO Cost Of Operations |
| Residuals Balancing | 81302 | Balancing Market Energy Residual |
| Residuals Balancing | 81304 | Balancing Market Loss Residual |
| Residuals Balancing | 81305 | Balancing Market Congestion Balancing |
| Residuals Balancing | 81306 | Emergency Energy Purchases |
| Residuals Balancing | 81307 | Emergency Energy Sales |
| Residuals Balancing | 81309 | Balancing Market Energy Residual |
| Residuals Balancing | 81311 | Balancing Market Loss Residual |
| Residuals Balancing | 81312 | Balancing Market Congestion Balancing |
| Residuals Balancing | 81313 | Emergency Energy Purchases |
| Residuals Balancing | 81314 | Emergency Energy Sales |
| Residuals DAM | 81301 | Day Ahead Market Energy Residual |
| Residuals DAM | 81303 | Day Ahead Market Loss Residual |
| Residuals DAM | 81308 | Day Ahead Market Energy Residual |
| Residuals DAM | 81310 | Day Ahead Market Loss Residual |

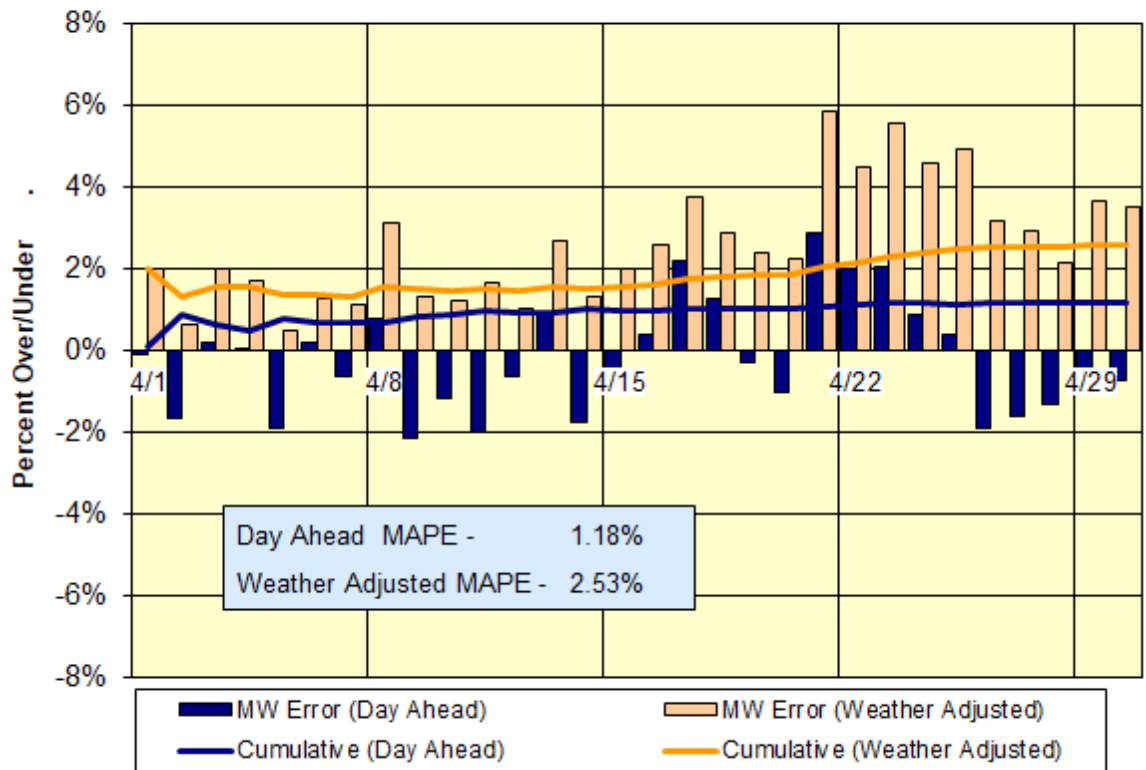
**NYISO Daily Peak Load - April 2019
Actual vs. Weather-Adjusted Forecast**



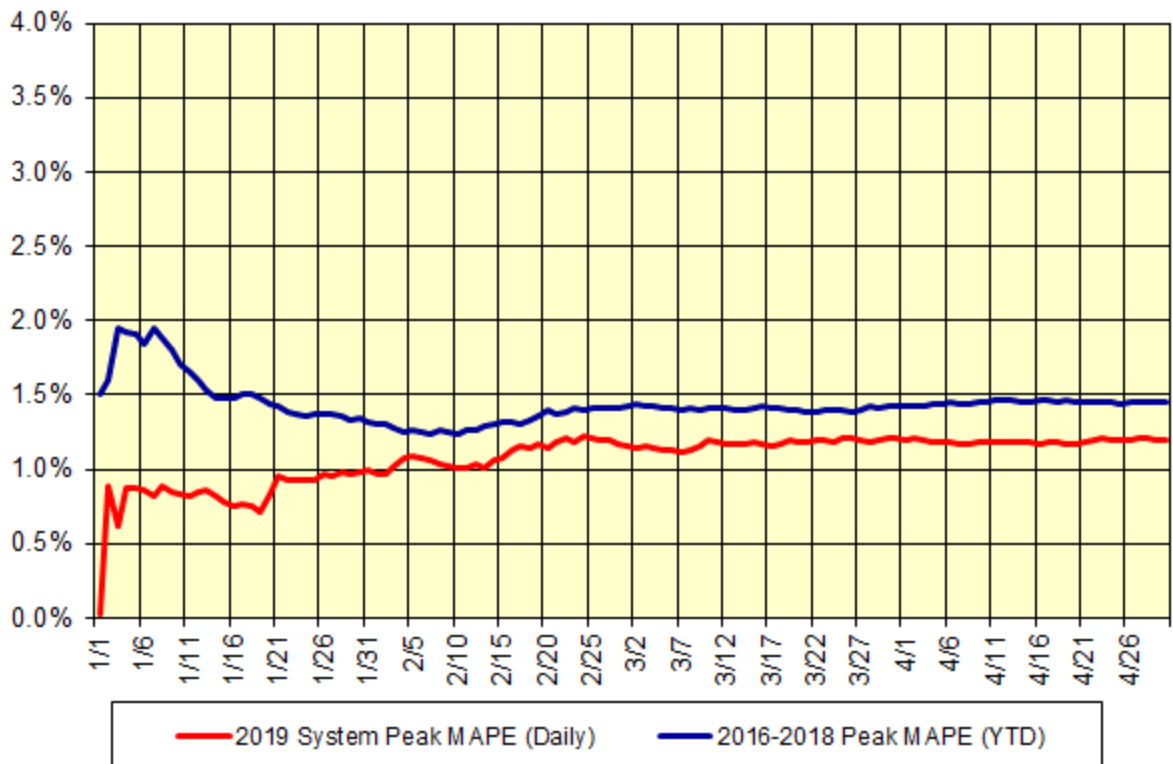
**NYISO Daily Peak Load - April 2019
Actual vs. Forecast**



Day Ahead Peak Forecast - April 2019 Percent Error - Actual & Weather-Adjusted



Day-Ahead Forecast Accuracy - Cumulative Performance 2019 Year-to-Date



**Summary Description of Regulatory Filings, Investigations,
Rulemakings and Related Orders in NYISO Matters – April 2019**

| Filing Date | Filing Summary | Docket No. | Order Date | Order Summary |
|--------------------|--|-------------------------|-------------------|------------------------|
| 04/01/2019 | NYISO compliance filing re: annual report on unreserved use and late study penalties | OA08-109-000 | | No order to be issued. |
| 04/10/2019 | NYISO RMR compliance filing re: modify the Generator notification and NYISO action deadlines specified in MST Sections 23.4.5.6.4.2.1 and 23.4.5.6.4.2.2.1 | ER16-120-008 | | |
| 04/12/2019 | NYISO filing re: Reporting Requirement No. 582 – total megawatt-hours of transmission service in interstate commerce for calendar year 2018 | No Docket No. | | No order to be issued. |
| 04/12/2019 | NYISO confidential filing re: Reliability Commitment Data Report for the 3-month period ending 03/31/2019 | PSC Matter No. 10-02007 | | No order to be issued. |
| 04/16/2019 | NYISO 205 filing re: modify the credit requirement for Fixed Price Transmission Congestion Contracts ("FPTCCs") to align with all other TCCs | ER19-1581-000 | | |
| 04/16/2019 | NYISO filing re: FERC Form 1 annual report of major electric utilities, licensees and others for the year ending 2018 | No Docket No. | | No order to be issued. |
| 04/24/2019 | NYISO filing re: Q1 2019 EQR report | ER02-2001-000 | | No order to be issued. |
| 04/26/2019 | NYISO 205 filing re: implement a new locational operating reserves region for New York City (Load Zone J) | ER19-1678-000 | | |