



# Monthly Report

**August 2019**

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



## ***August 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 September 10, 2019.

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## August 2019 Operations Performance Highlights

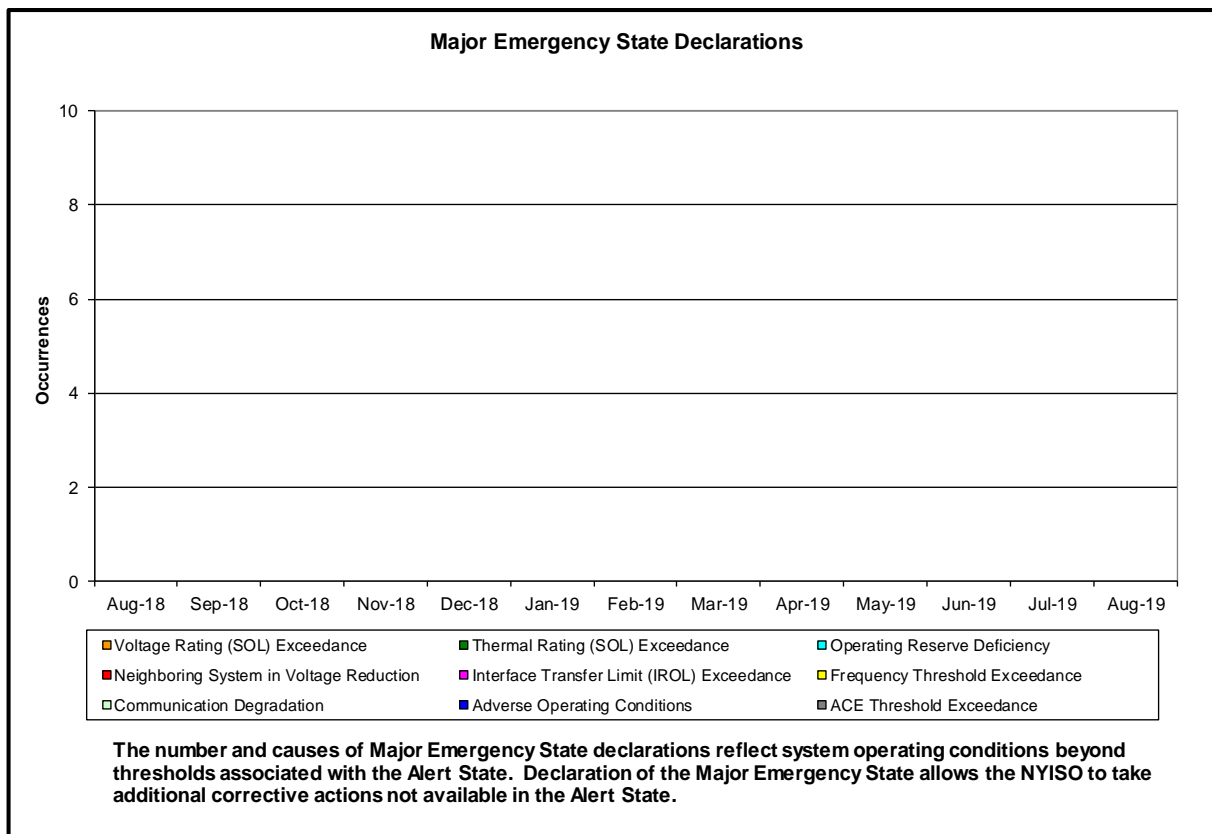
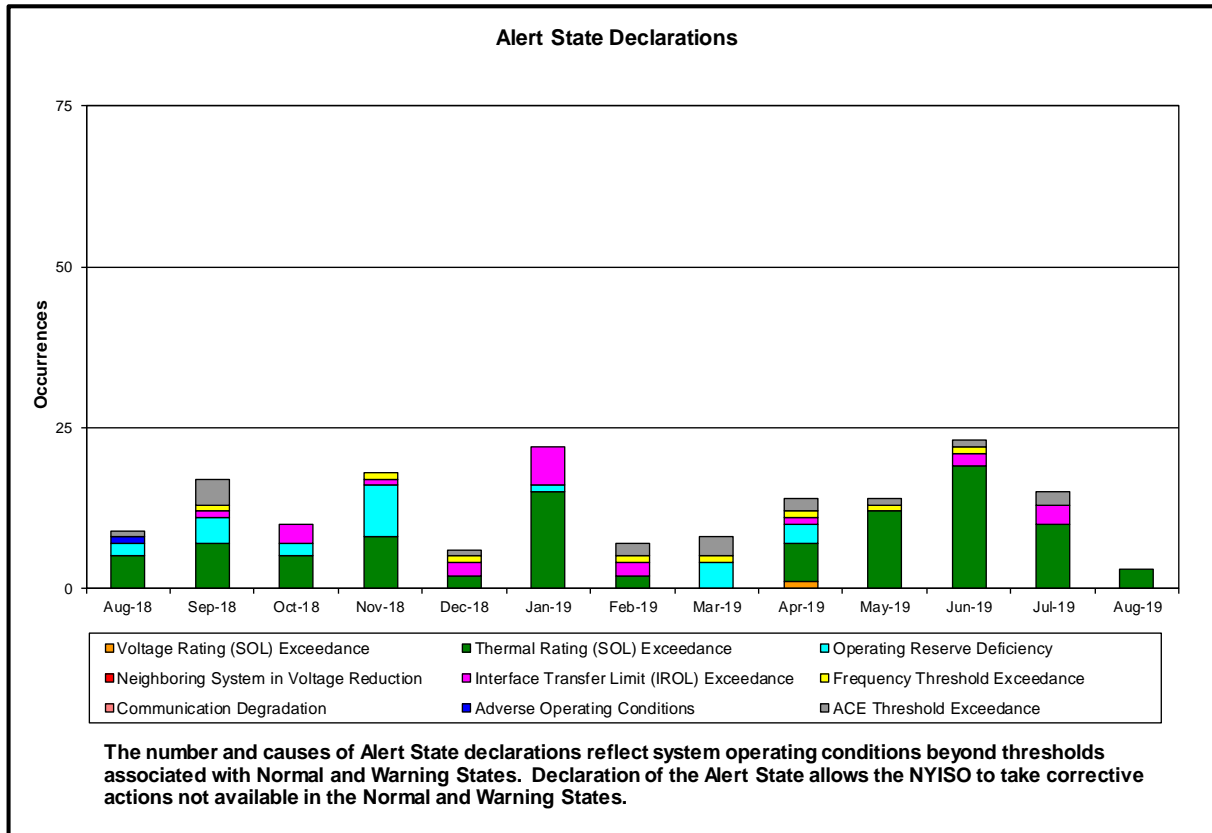
- Peak load of 28,488 MW occurred on 08/19/2019 HB 15
- All-time summer capability period peak load of 33,956 MW occurred on 7/19/2013 HB 16
- 29.30 hours of Thunder Storm Alerts were declared
- 0 hours of NERC TLR level 3 curtailment
- The following table identifies the estimated production cost savings associated with the Broader Regional Market initiatives.

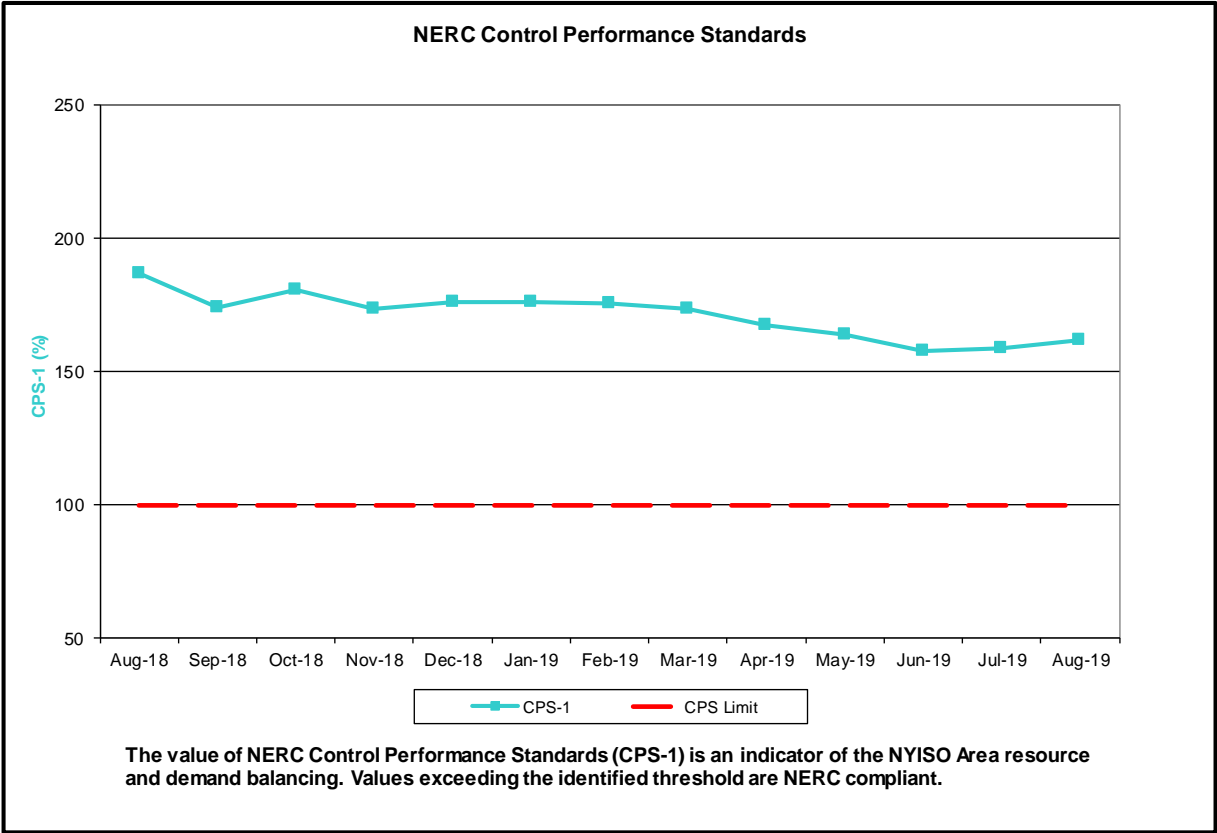
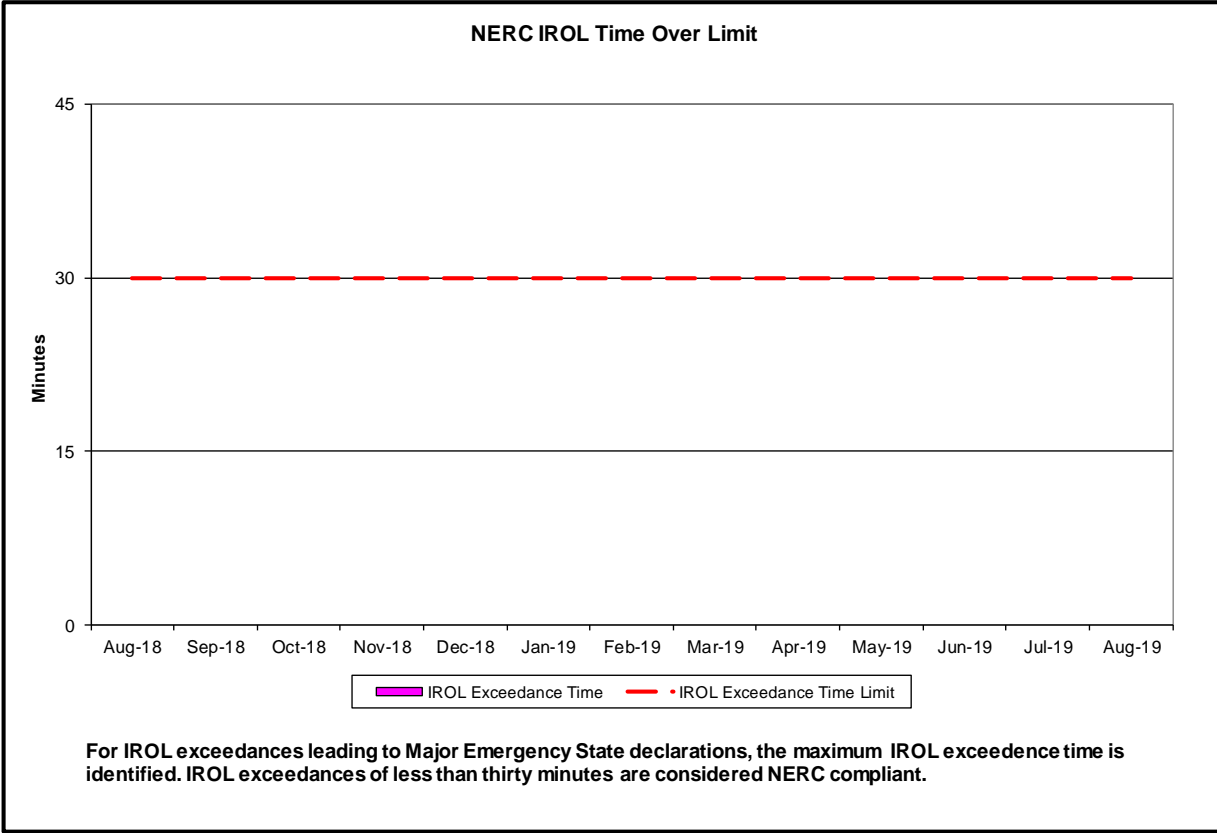
	Current Month Value (\$M)	Year-to-Date Value (\$M)
<b>NY Savings from PJM-NY Congestion Coordination</b>	\$0.10	\$6.63
<b>NY Savings from PJM-NY Coordinated Transaction Scheduling</b>	(\$0.13)	(\$1.27)
<b>NY Savings from NE-NY Coordinated Transaction Scheduling</b>	\$0.32	\$0.32
<b>Total NY Savings</b>	<b>\$0.29</b>	<b>\$5.68</b>
<b>Regional Savings from PJM-NY Coordinated Transaction Scheduling</b>	\$0.38	\$3.94
<b>Regional Savings from NE-NY Coordinated Transaction Scheduling</b>	\$0.07	\$0.43
<b>Total Regional Savings</b>	<b>\$0.45</b>	<b>\$4.37</b>

- Statewide uplift cost monthly average was (\$0.45)/MWh
- The following table identifies the Monthly ICAP spot market prices and the price delta.

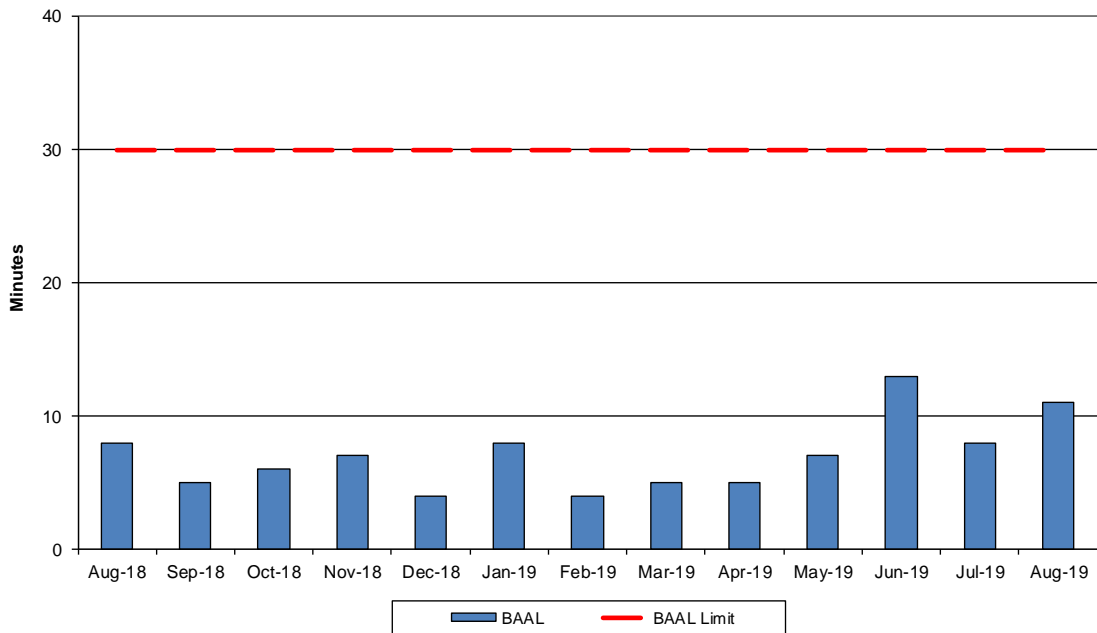
Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
September 2019 Spot Price	\$1.35	\$4.79	\$13.34	\$5.53
August 2019 Spot Price	\$1.36	\$4.78	\$13.39	\$5.51
Delta	(\$0.01)	\$0.01	(\$0.05)	\$0.02

## Reliability Performance Metrics



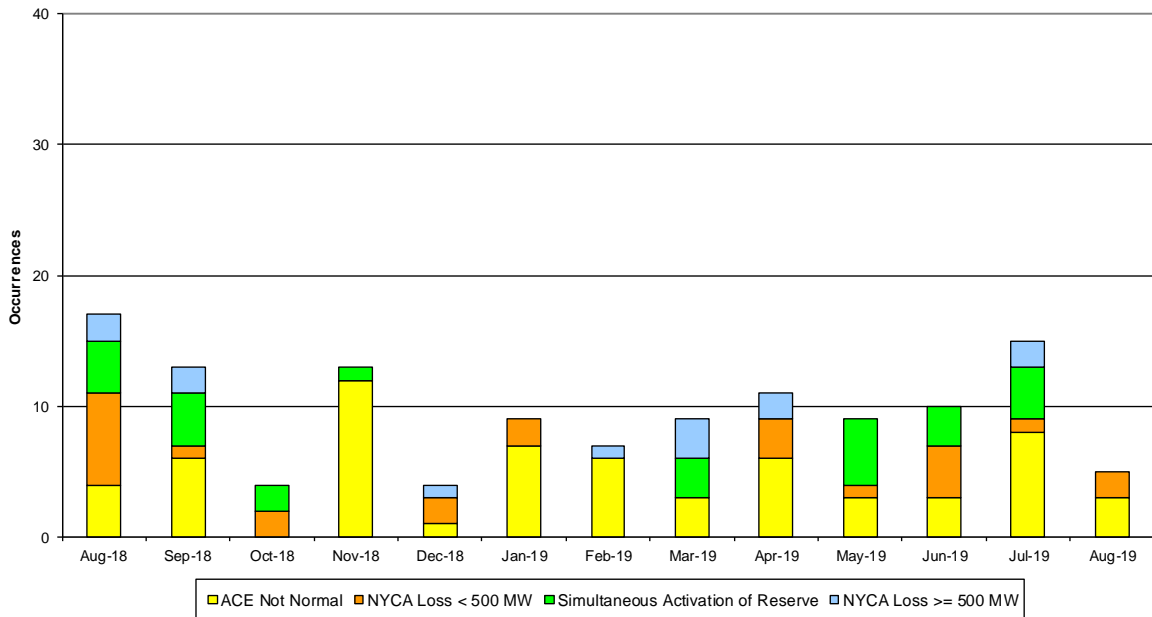


### NERC Balancing Authority ACE Limit Standard



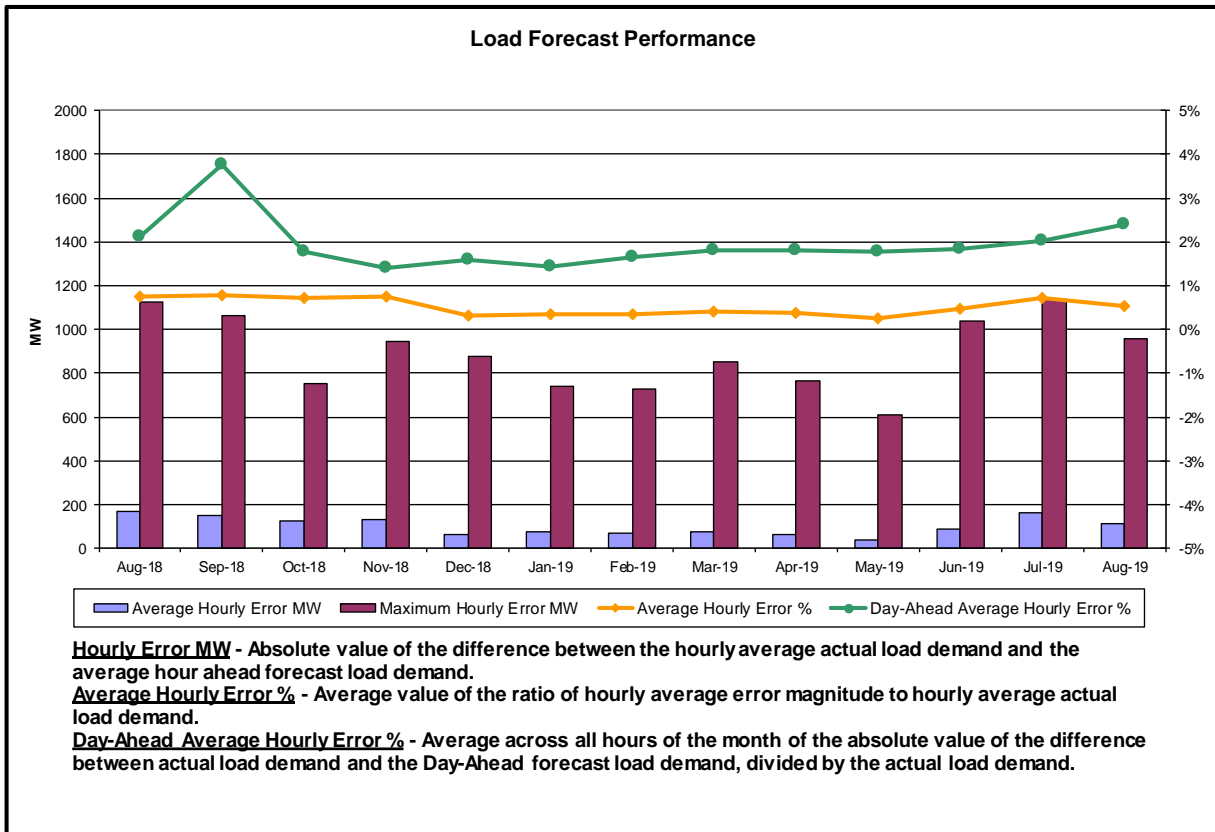
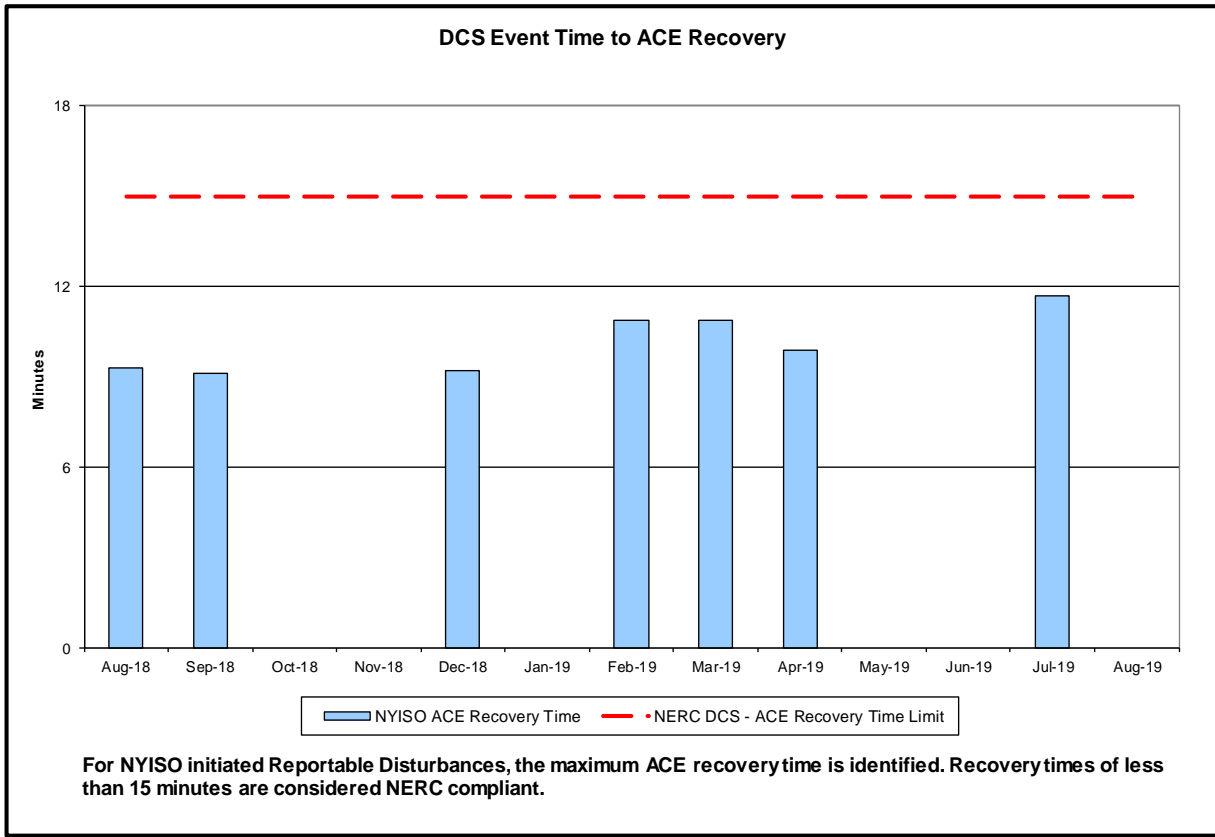
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

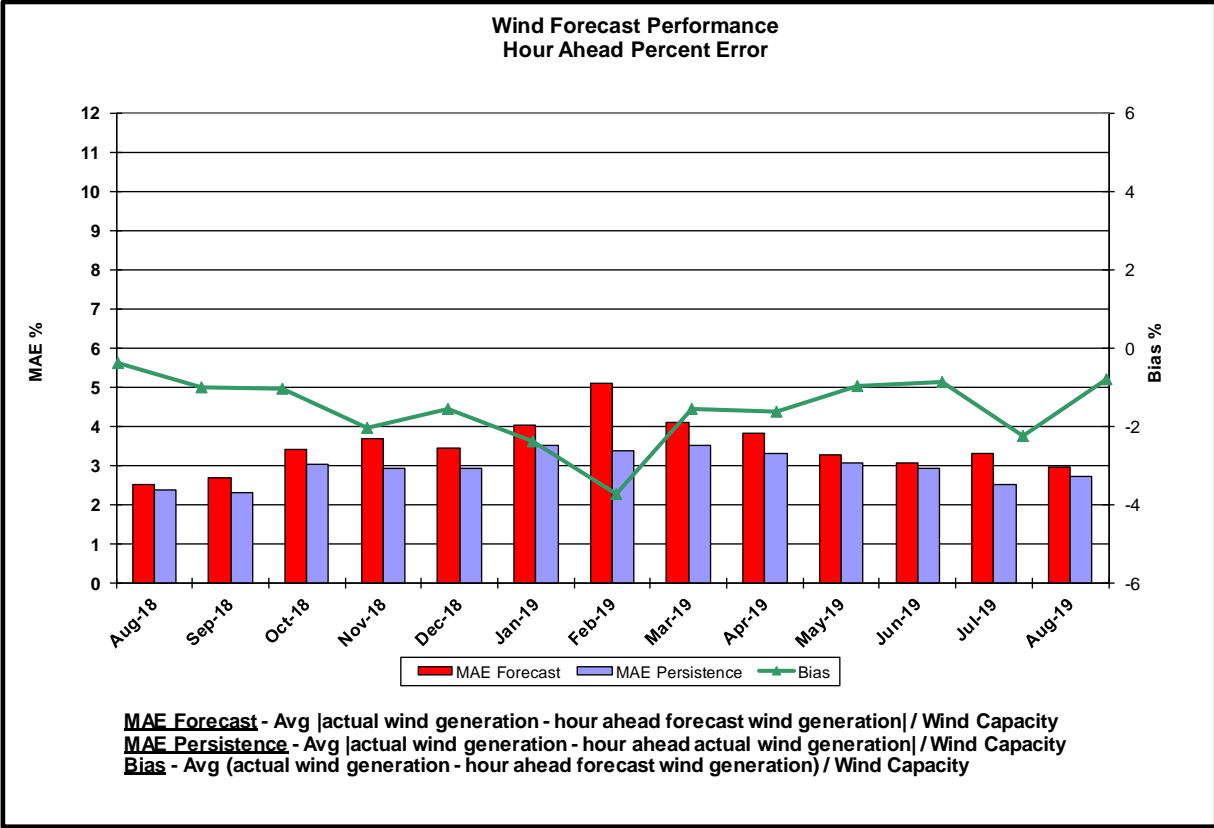
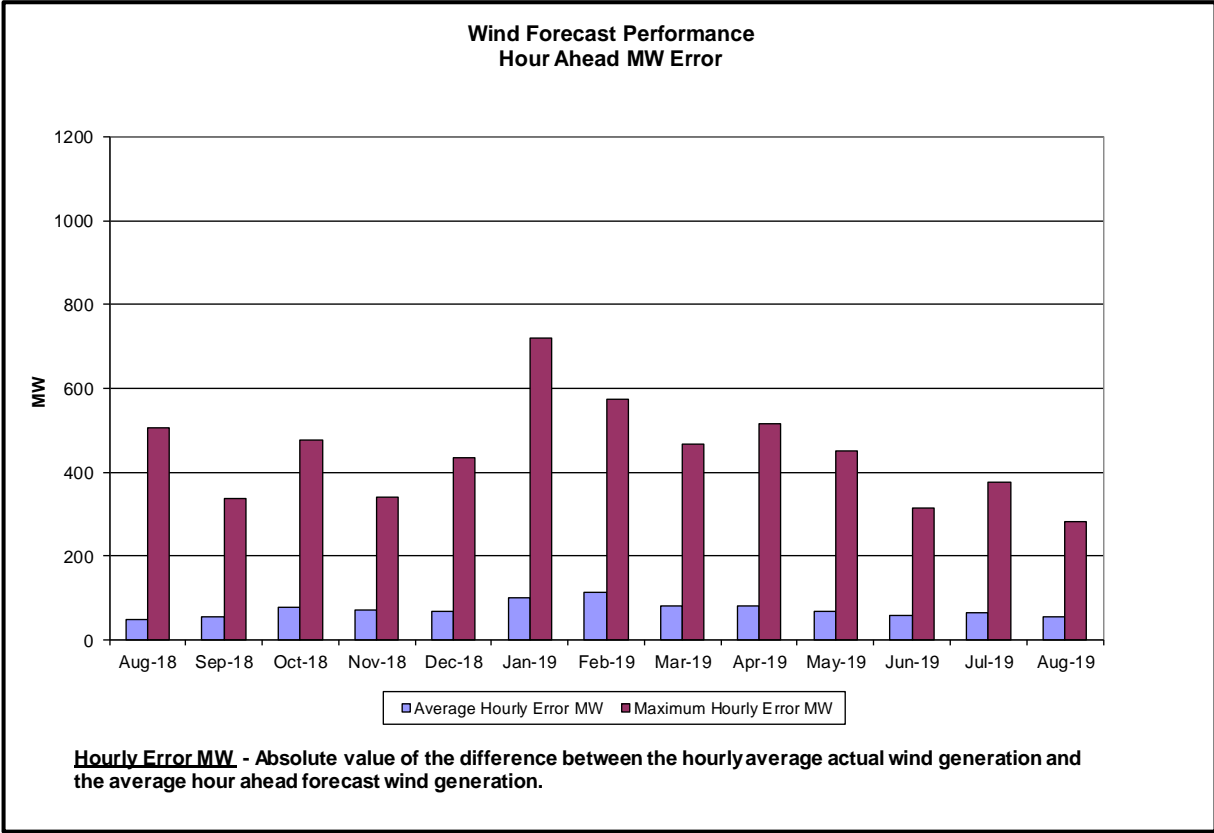
### Reserve Activations

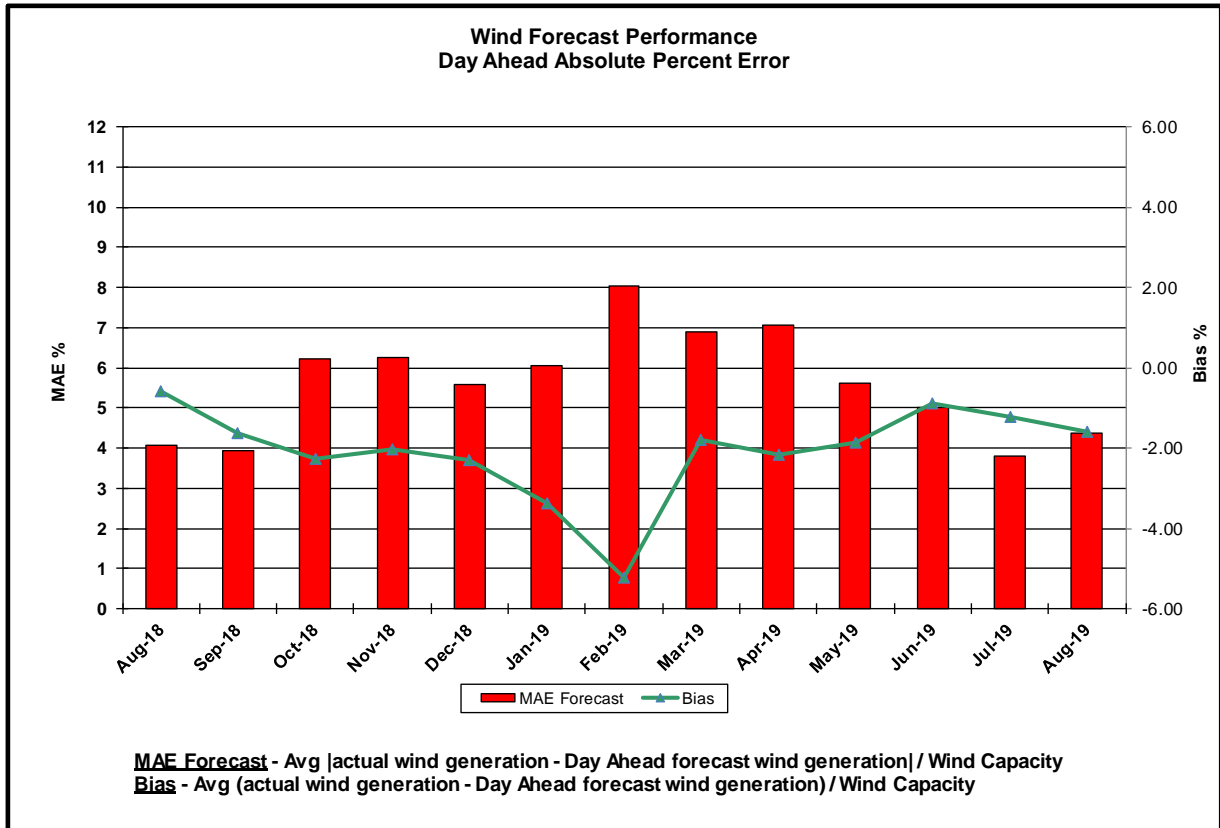
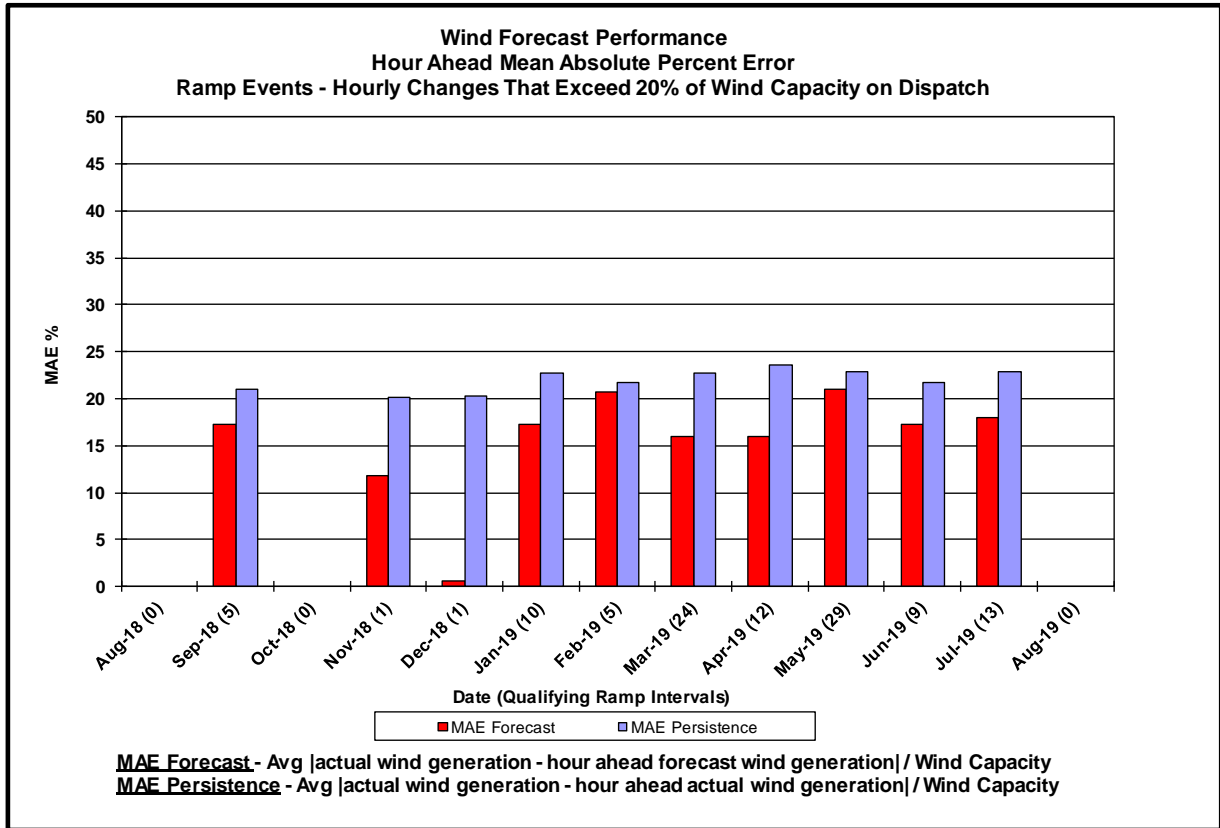


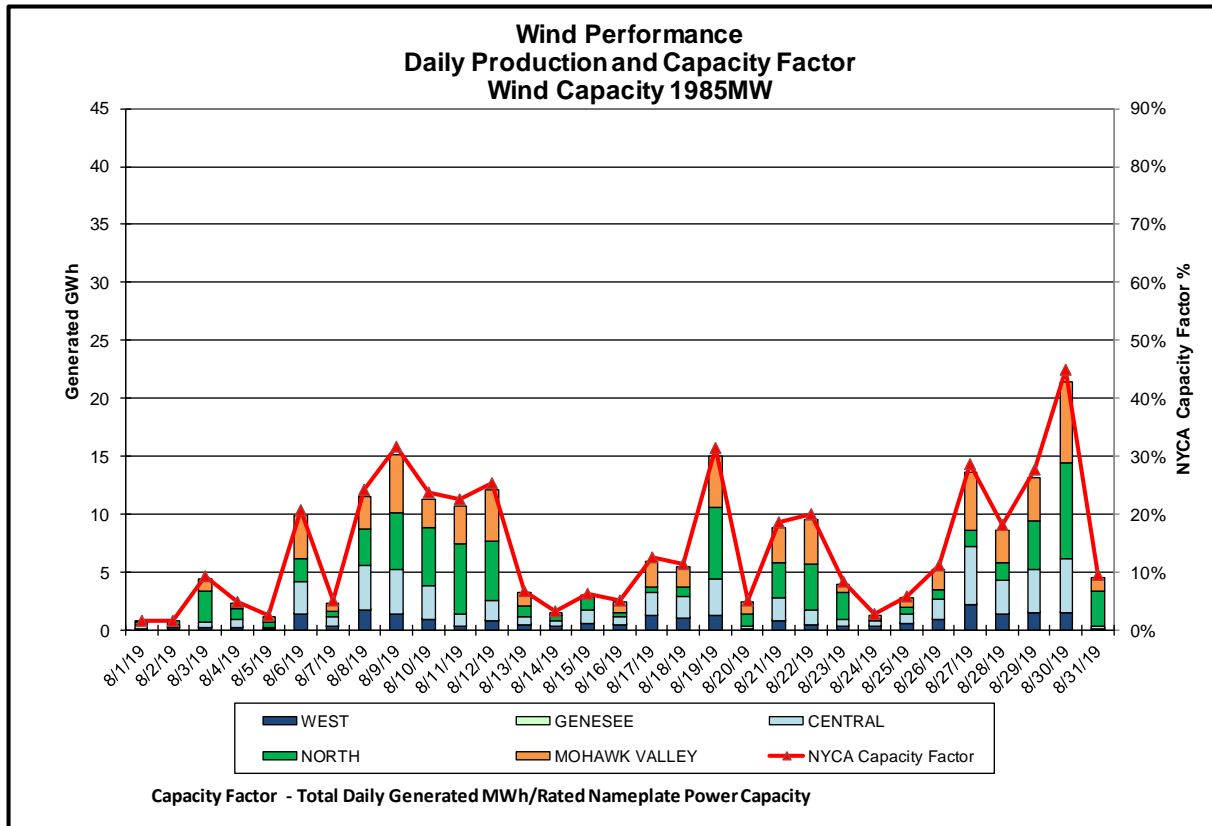
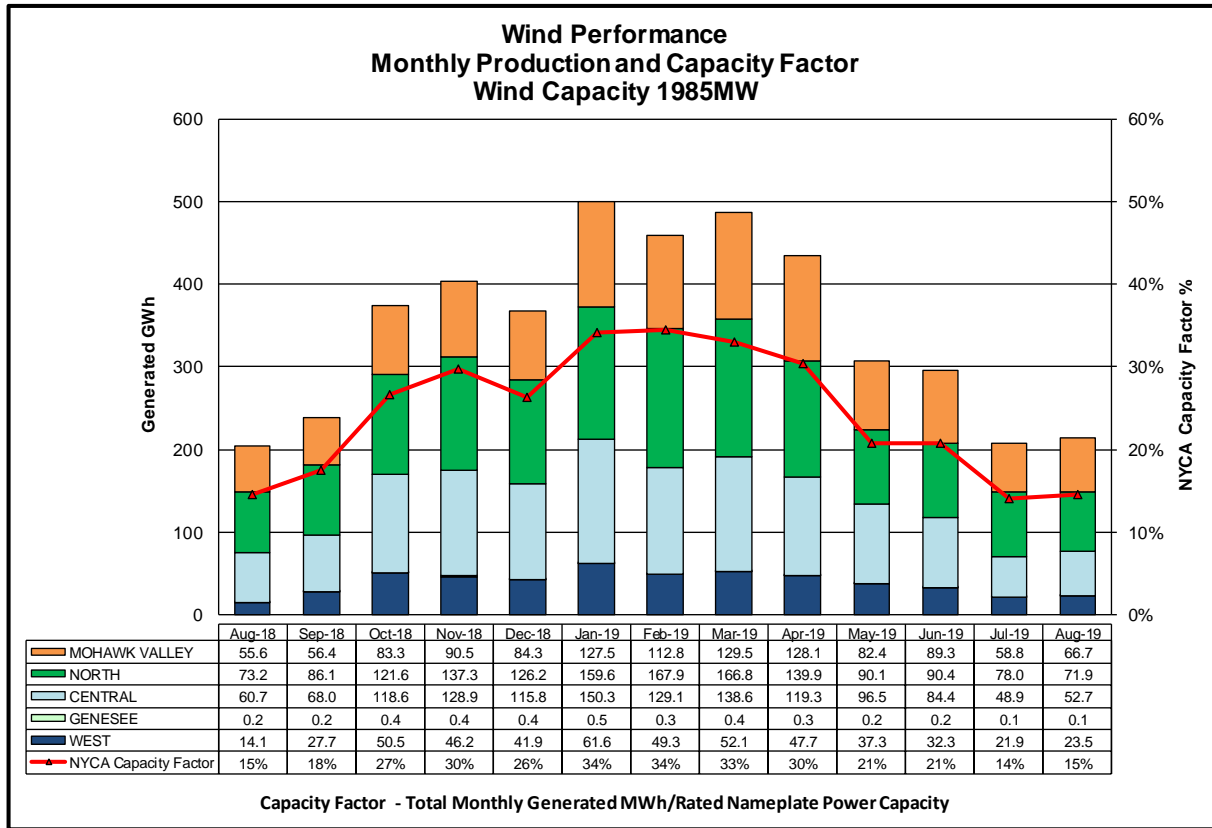
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

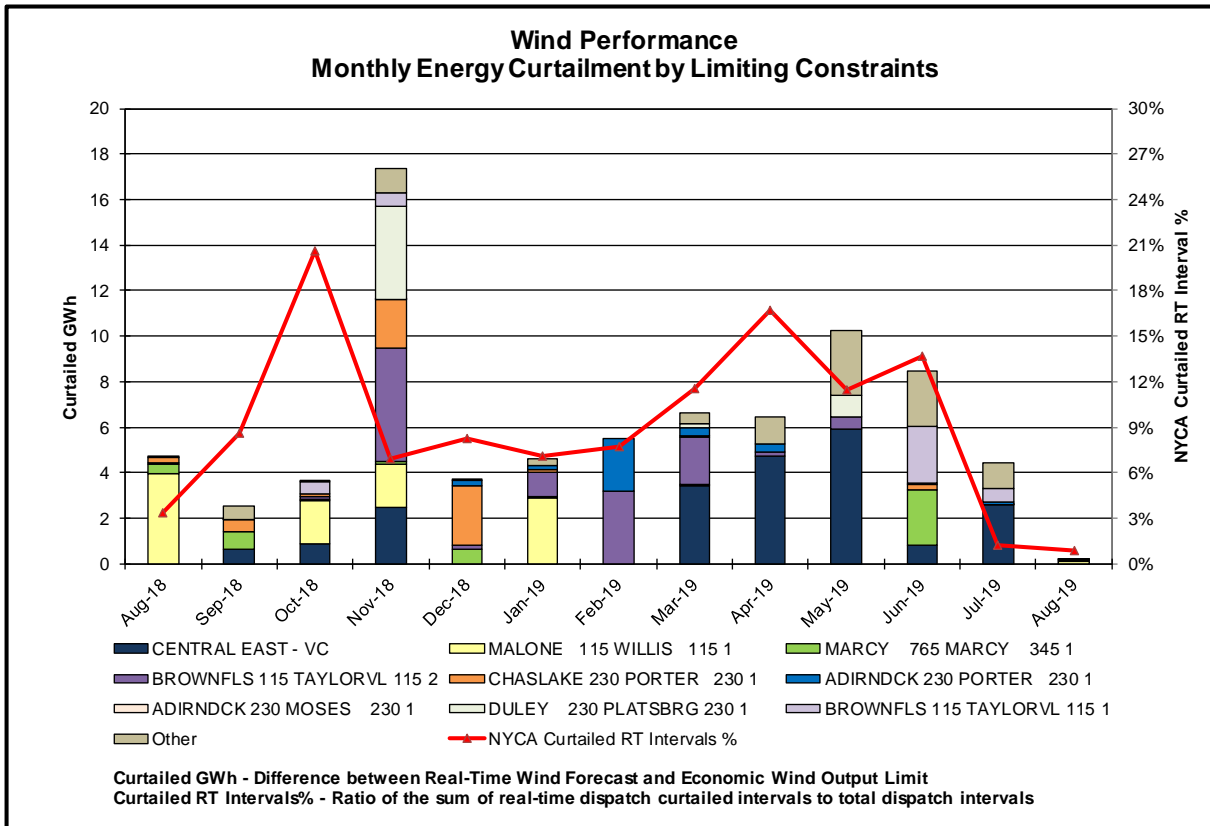
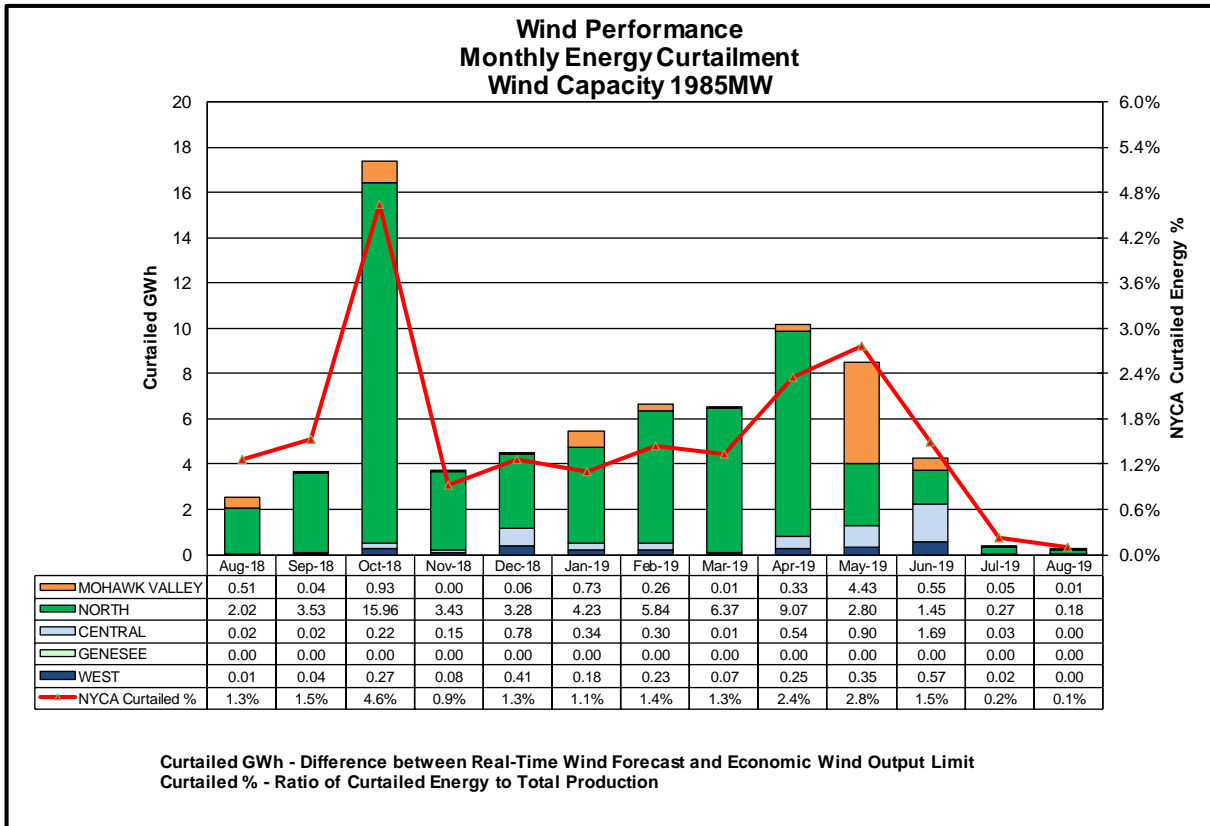


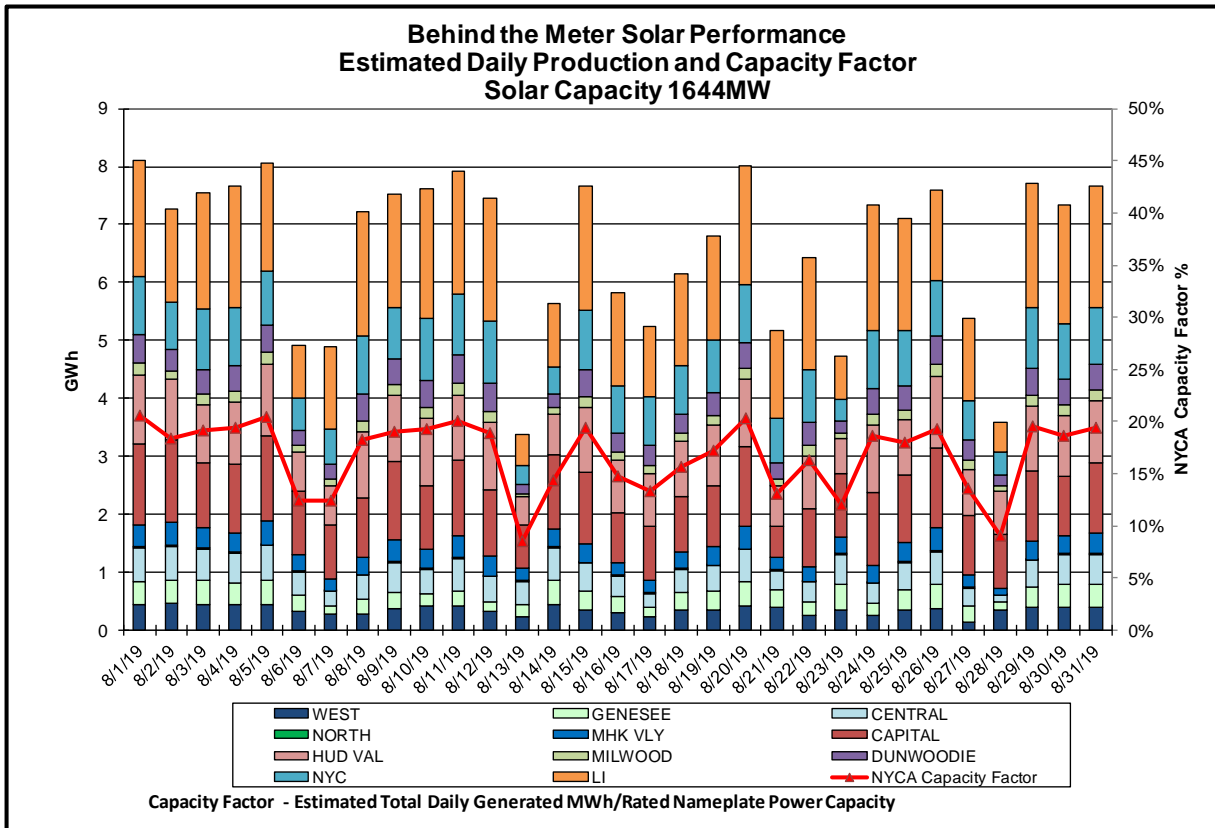
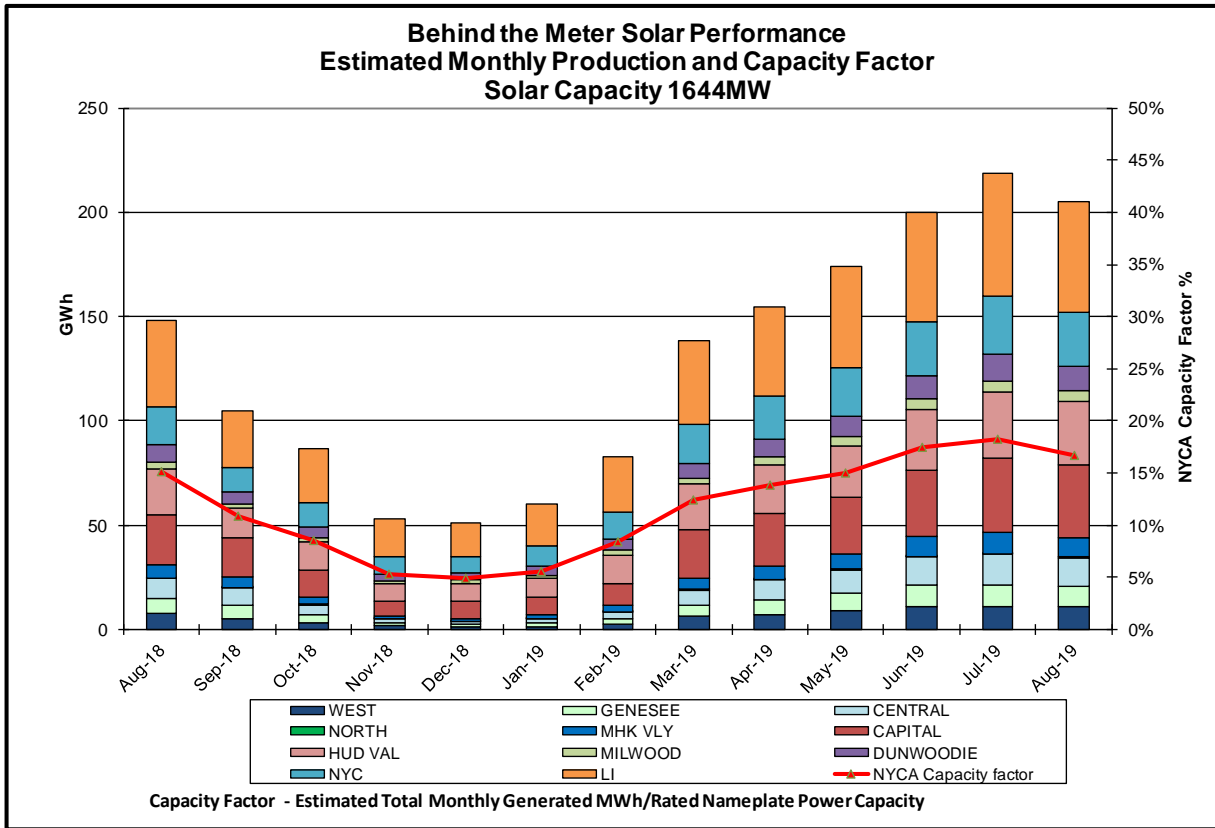


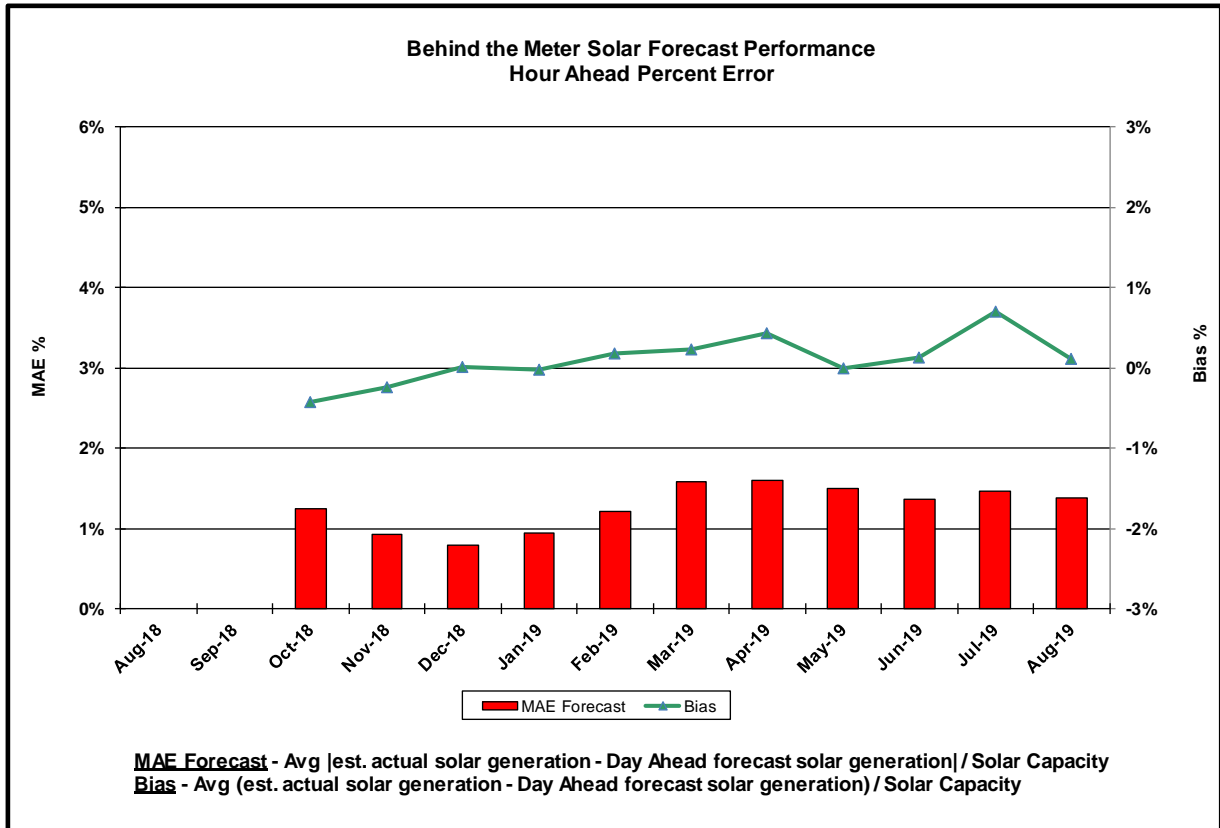
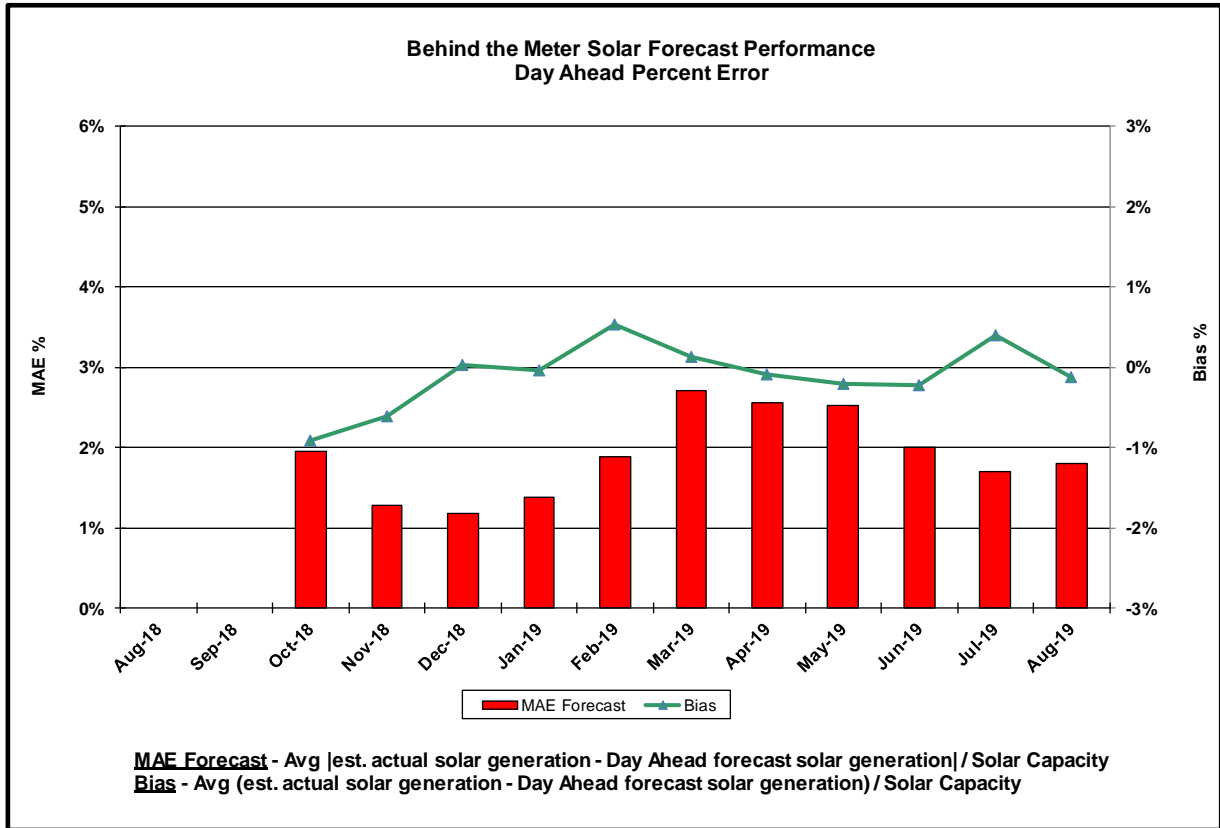


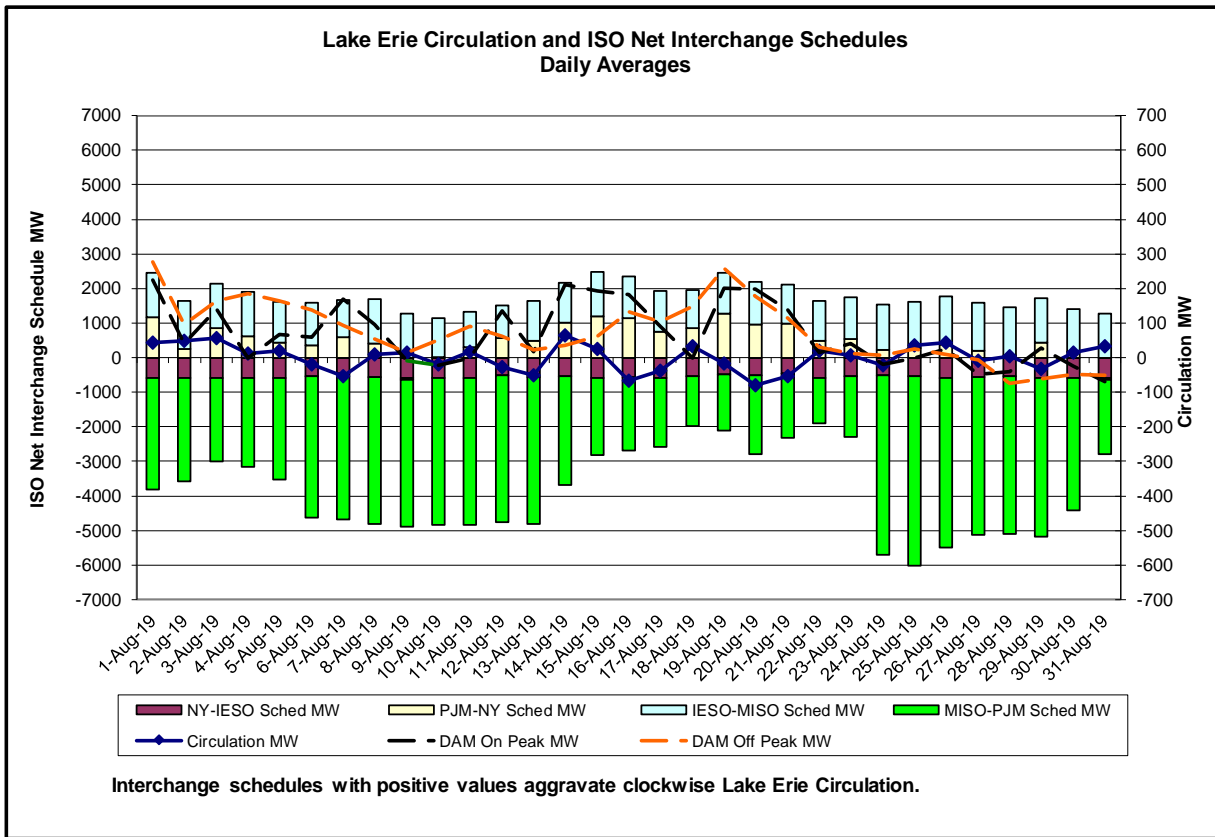
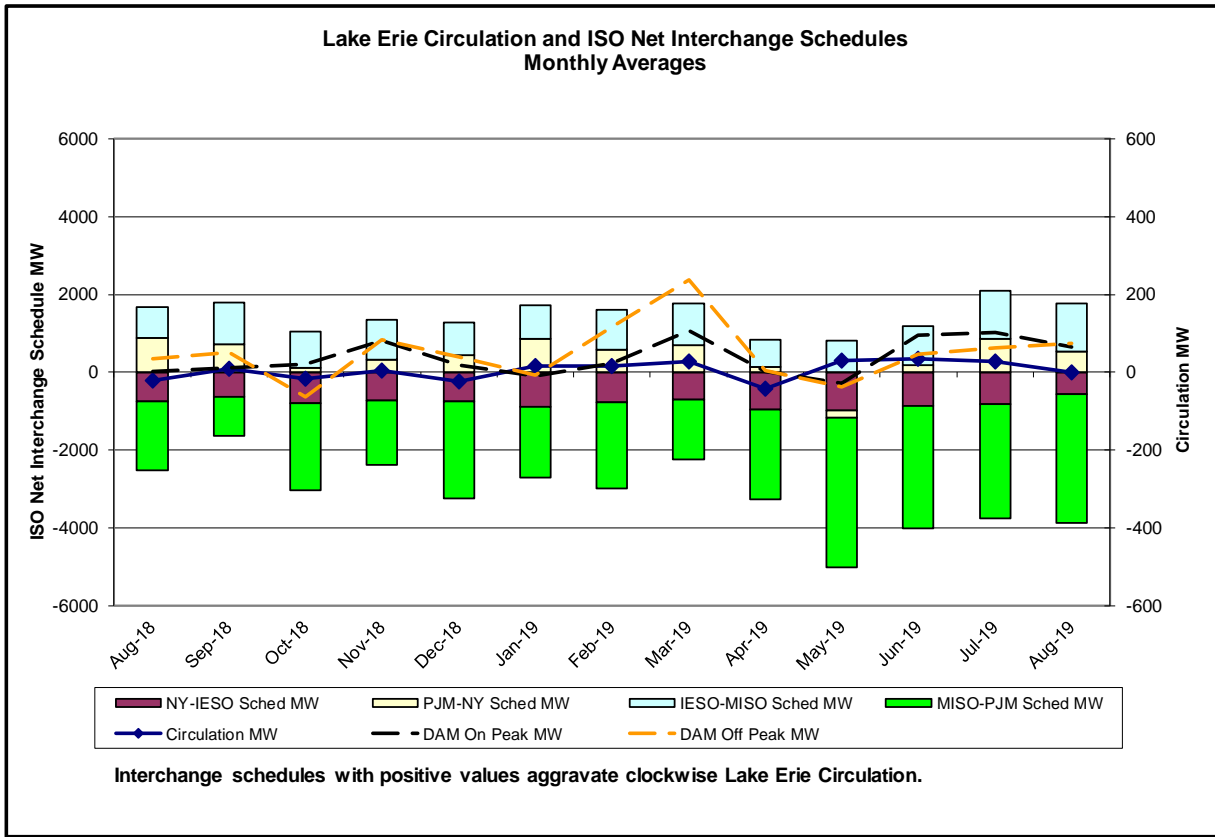






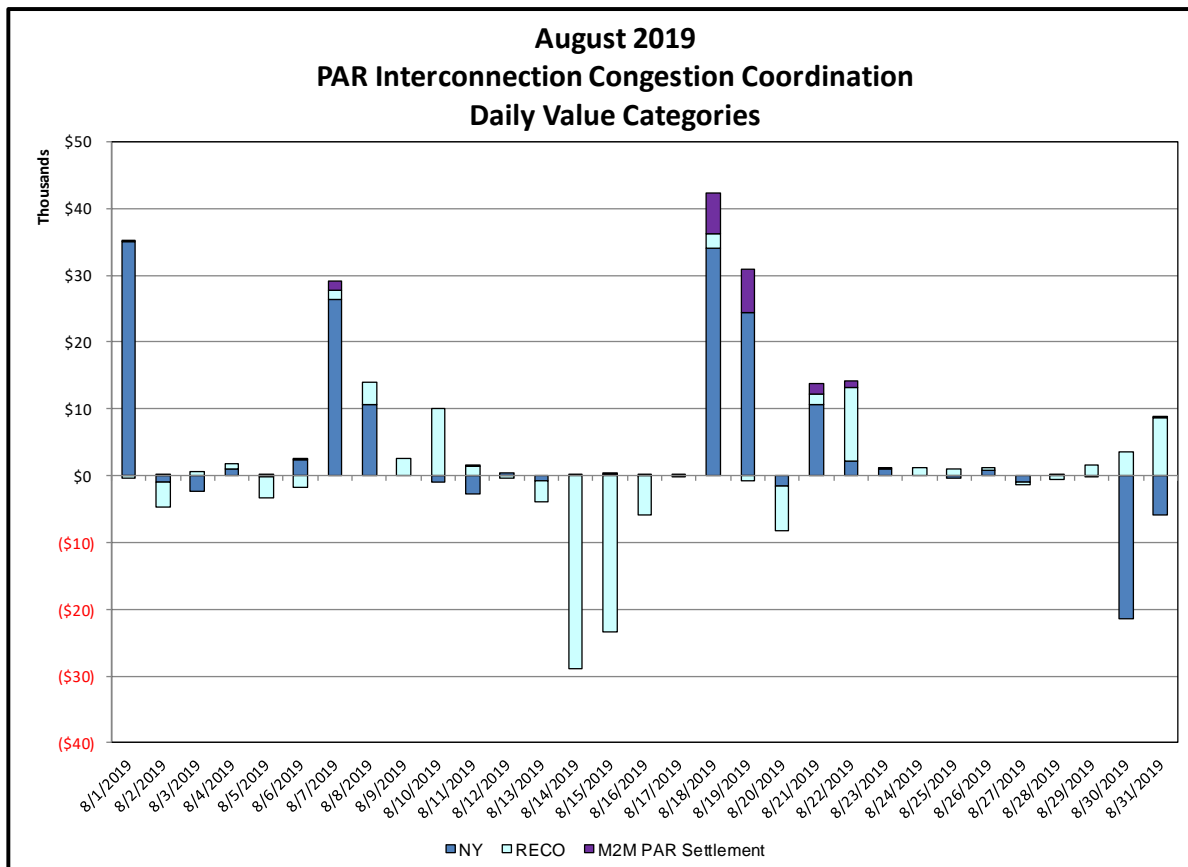
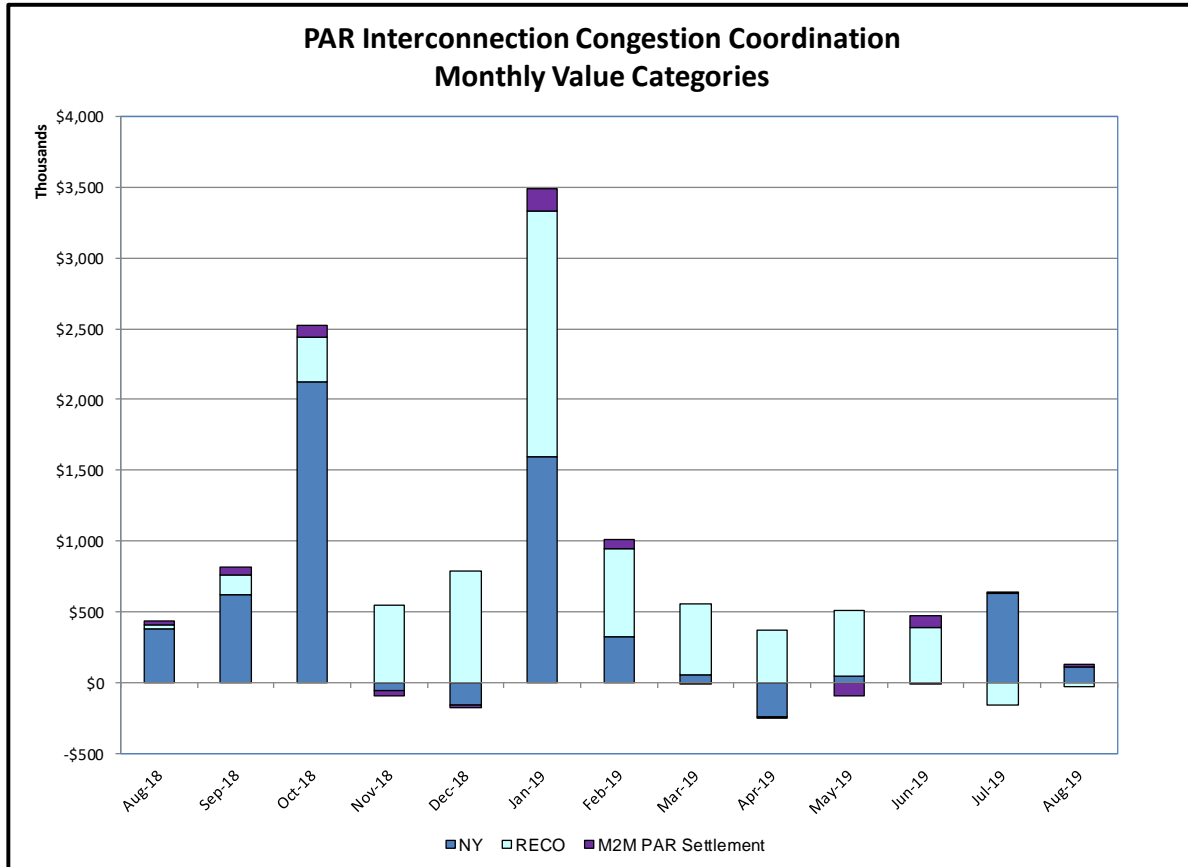






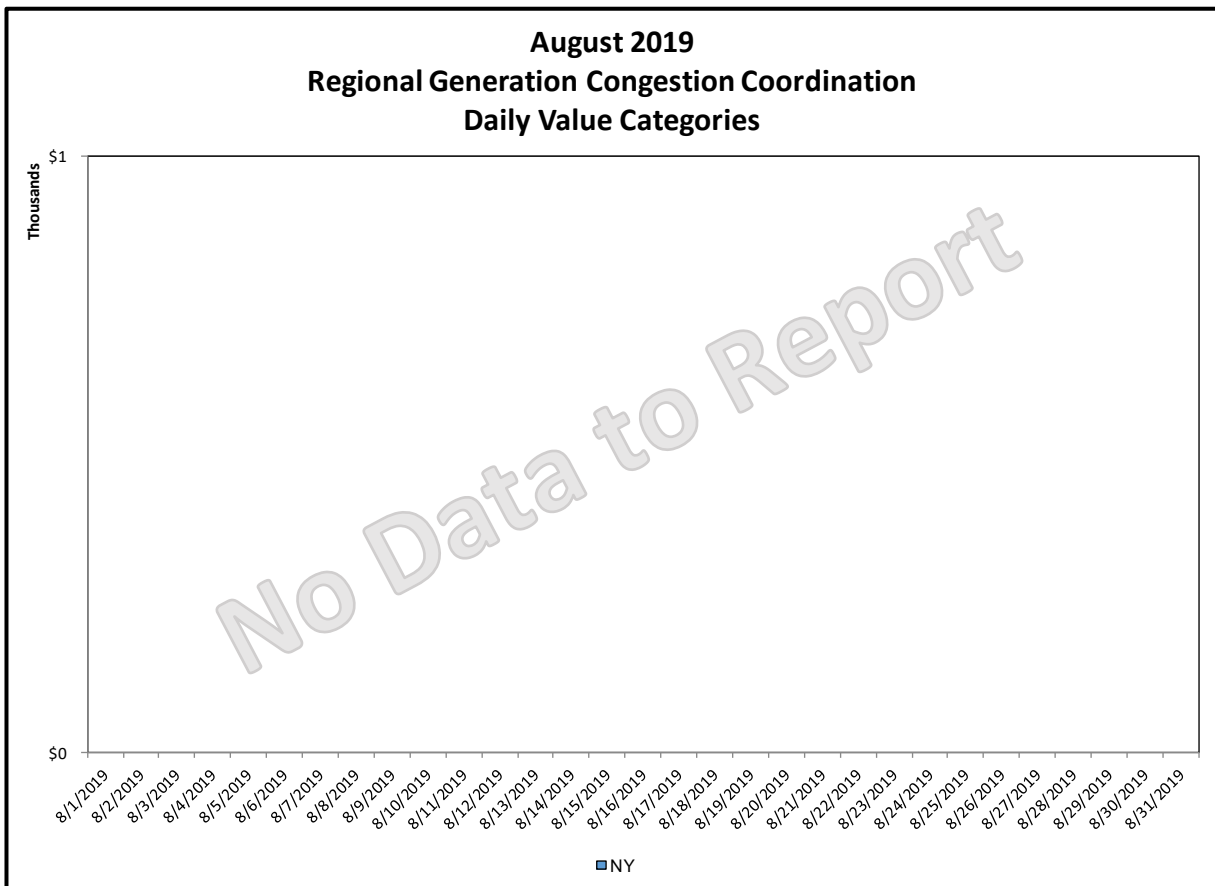
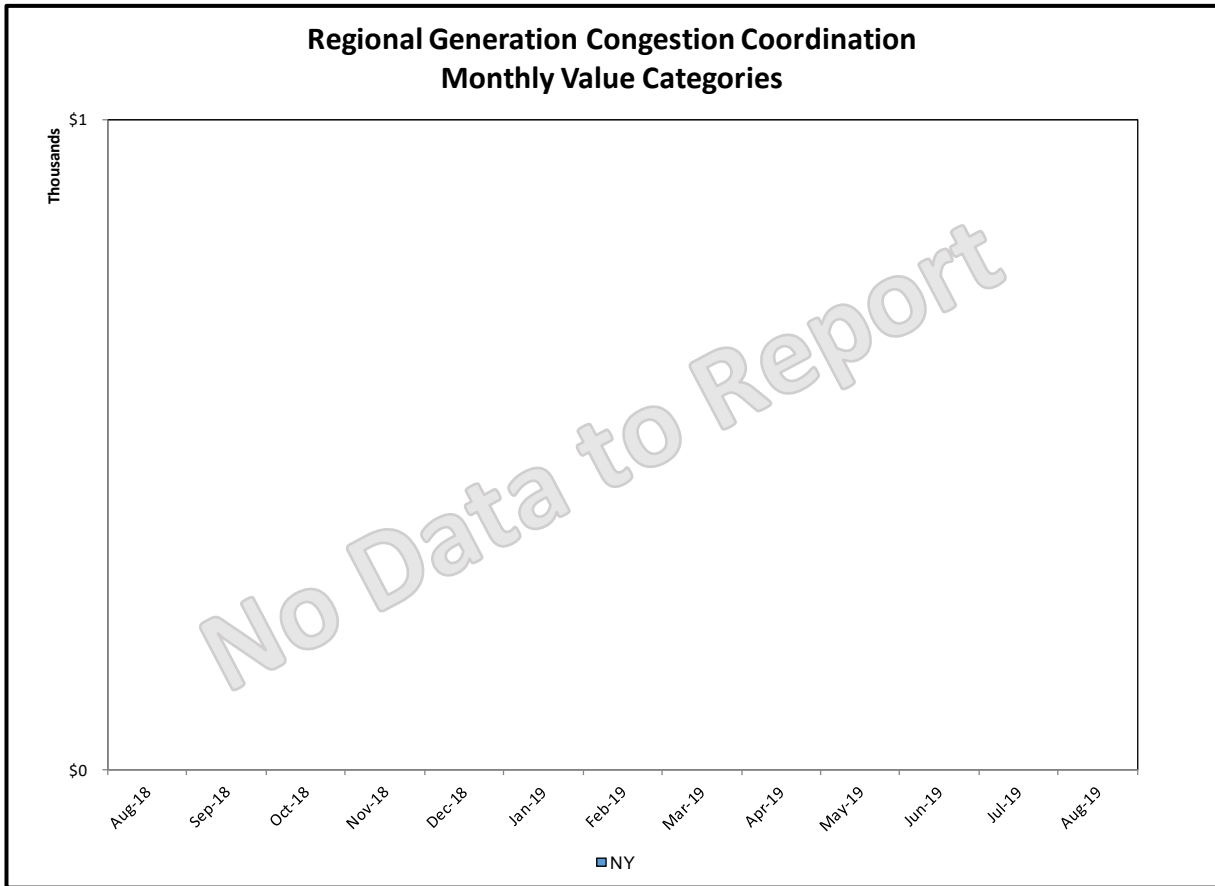


## Broader Regional Market Performance Metrics



**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.



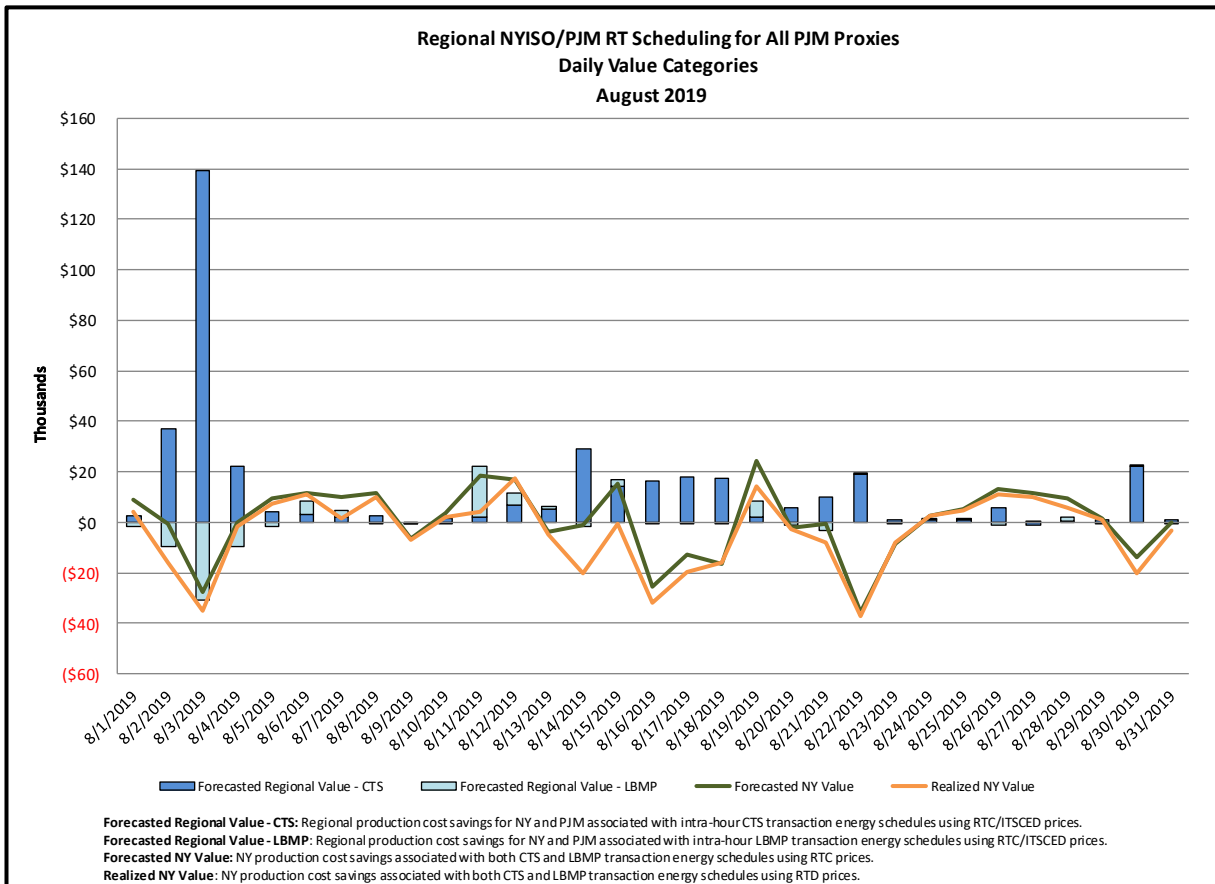
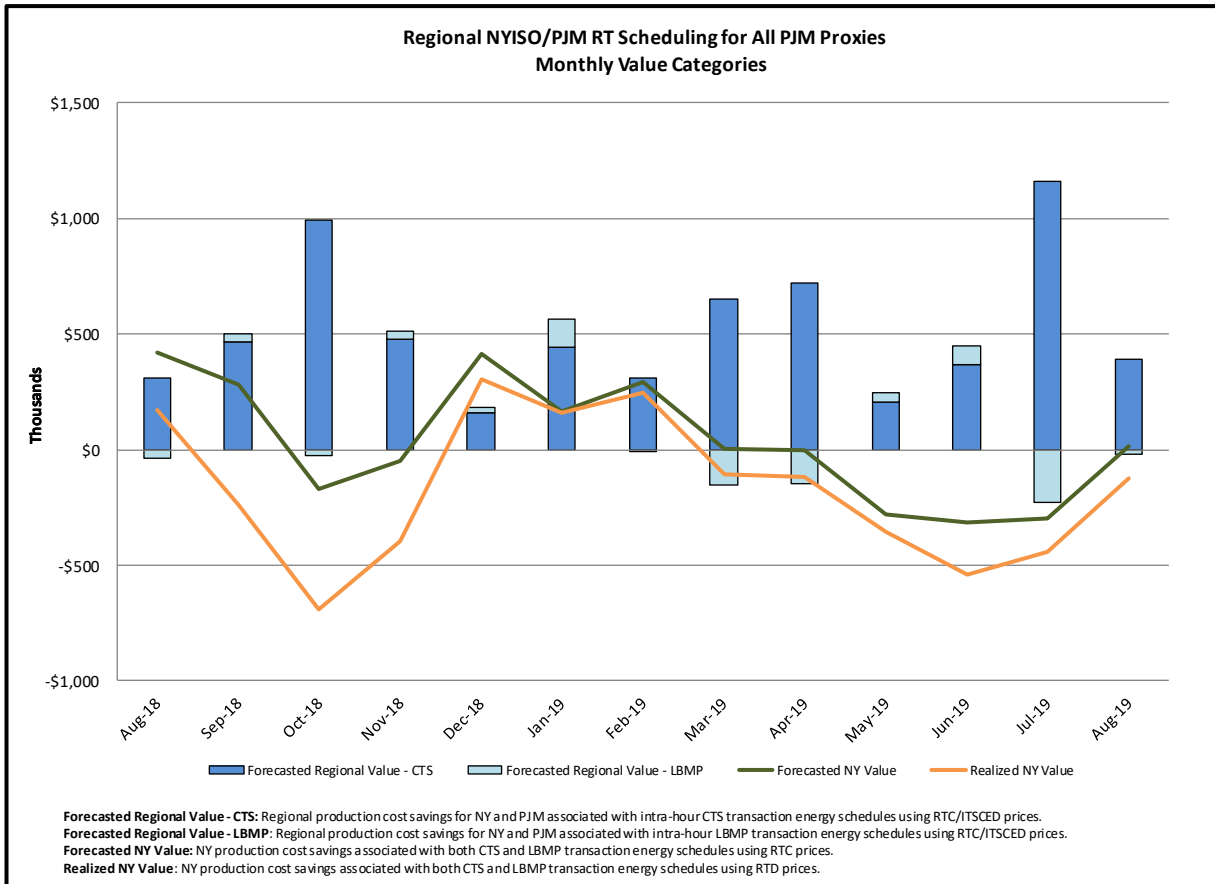
**Regional Generation Congestion Coordination**

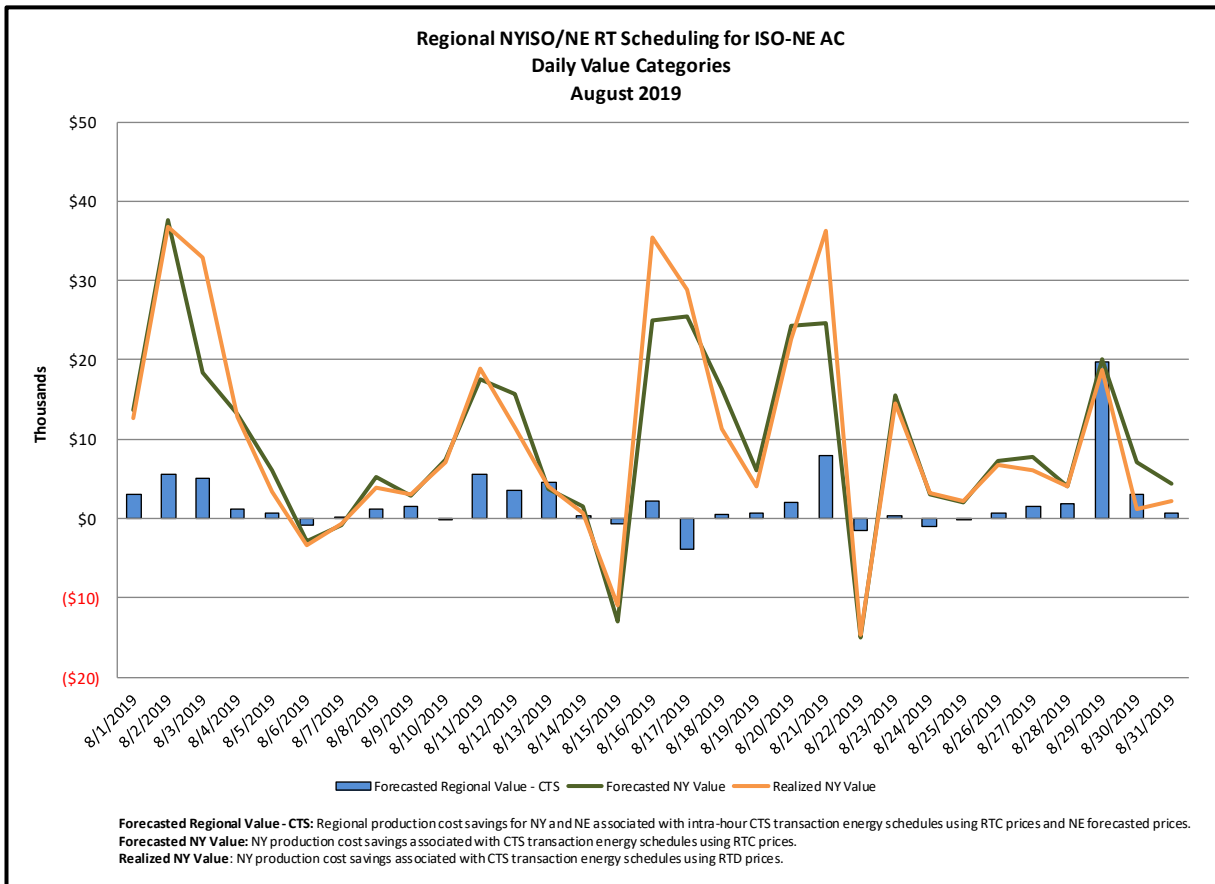
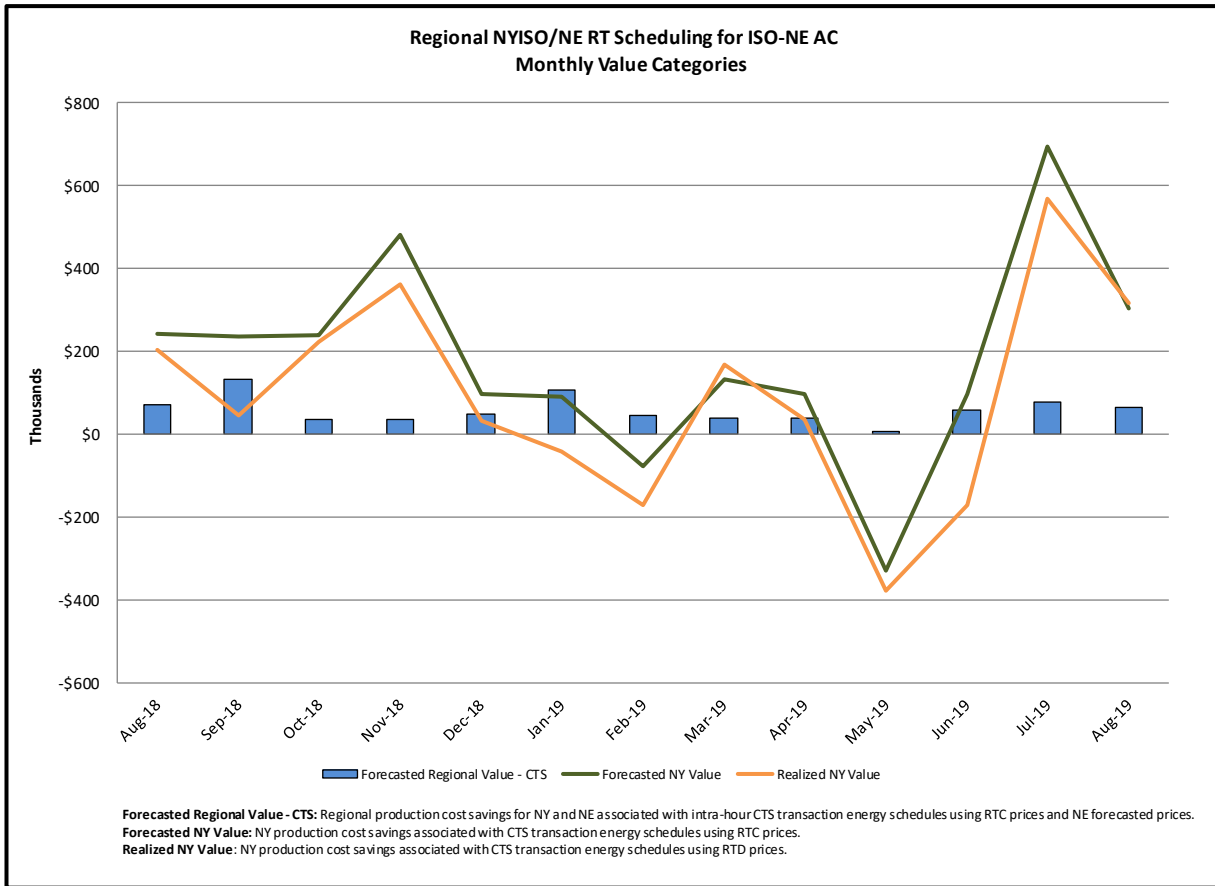
**Category**

NY

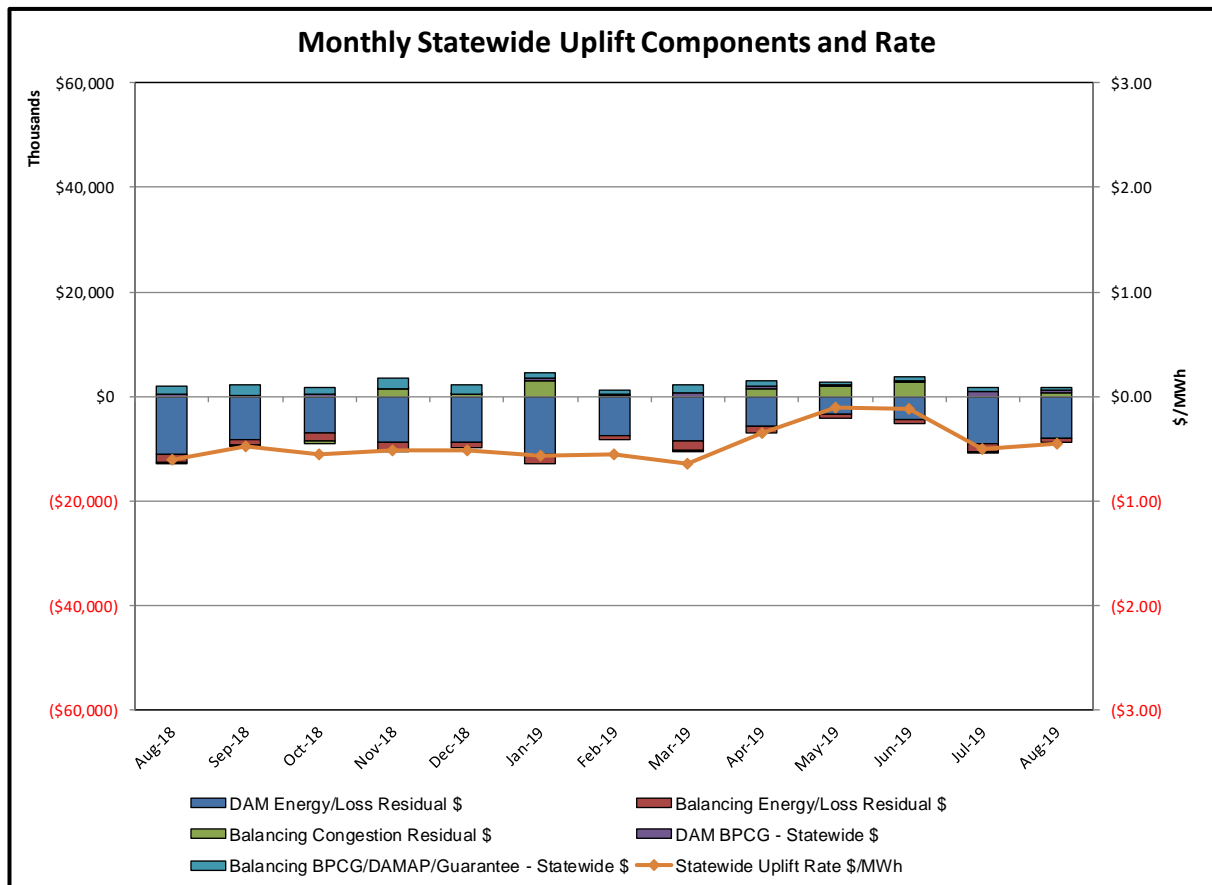
**Description**

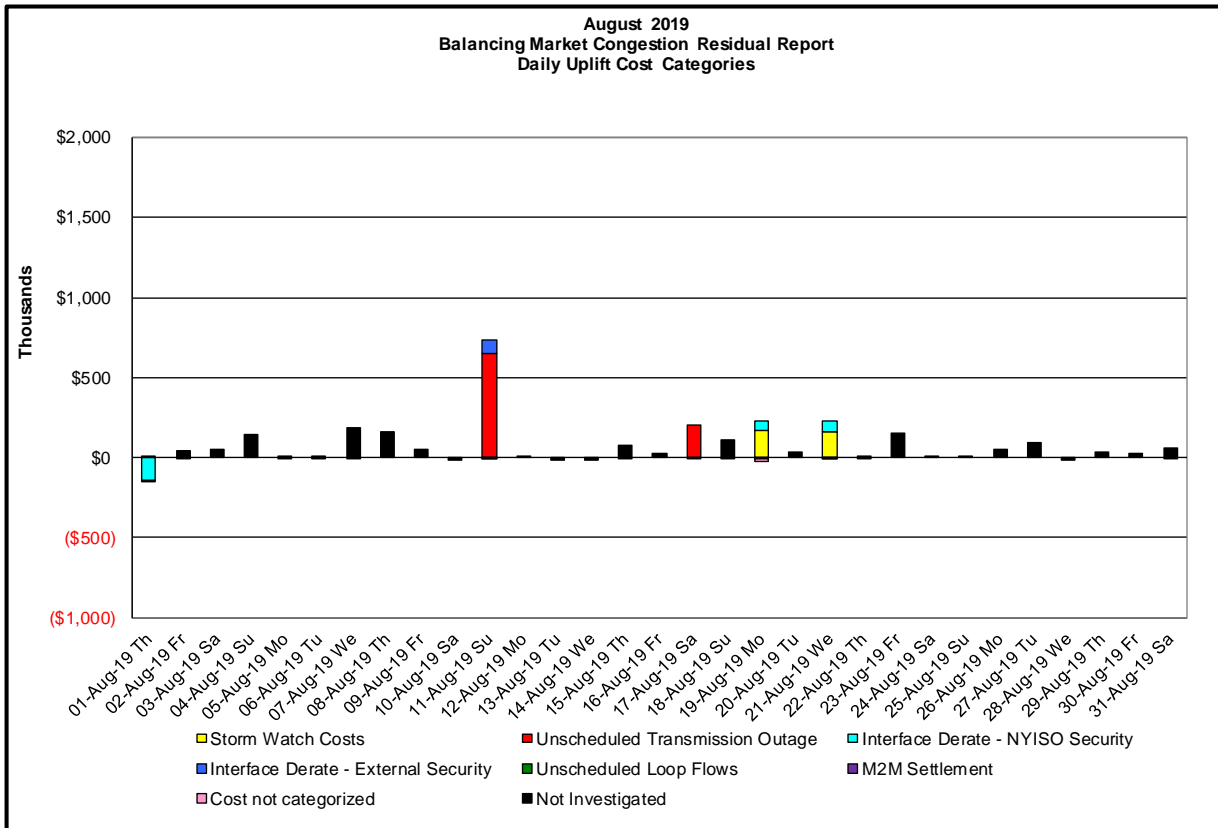
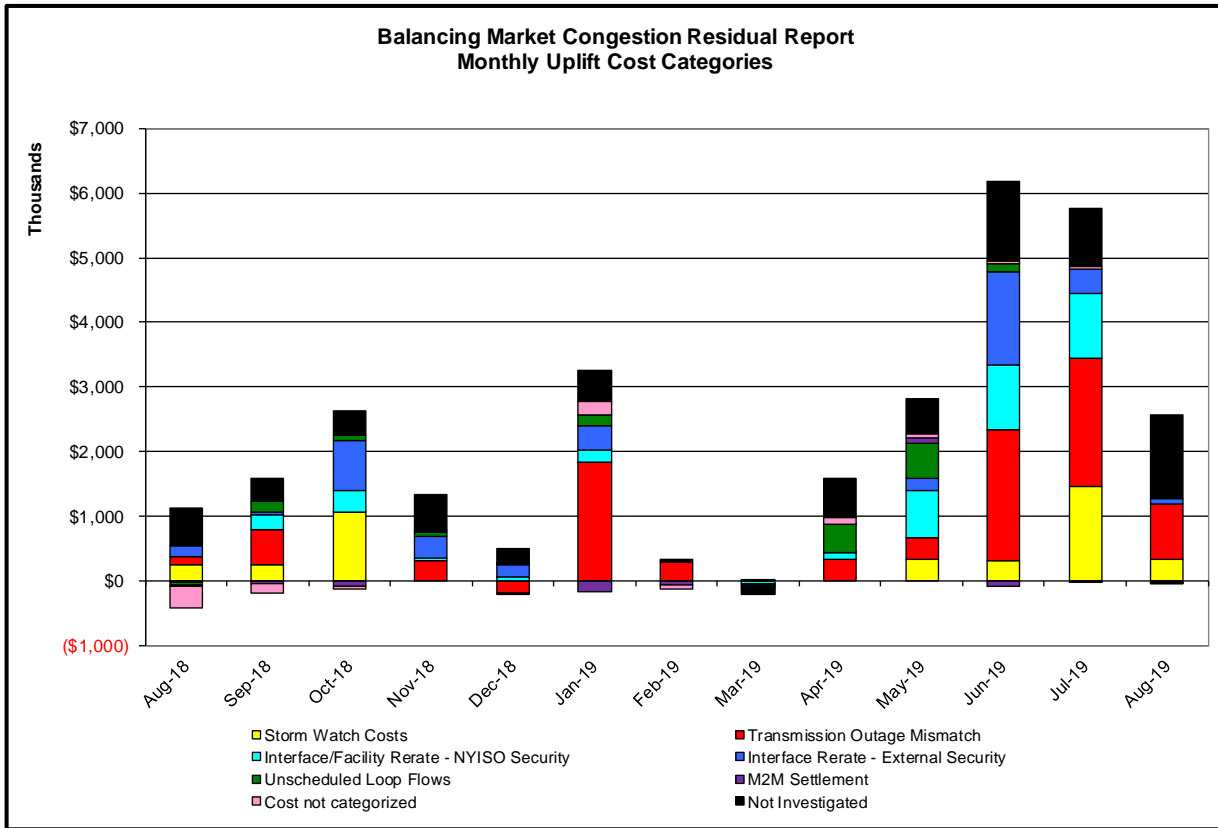
NYISO savings that result from PJM payments to NYISO when PJM's transmission use (PJM's market flow) is greater than PJM's entitlement of the NY transmission system and NYISO is incurring Western or Central NY congestion. Additionally, NYISO savings may result from the more efficient regional utilization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





### Market Performance Metrics







Day's investigated in August: 1, 11, 17, 19, 21

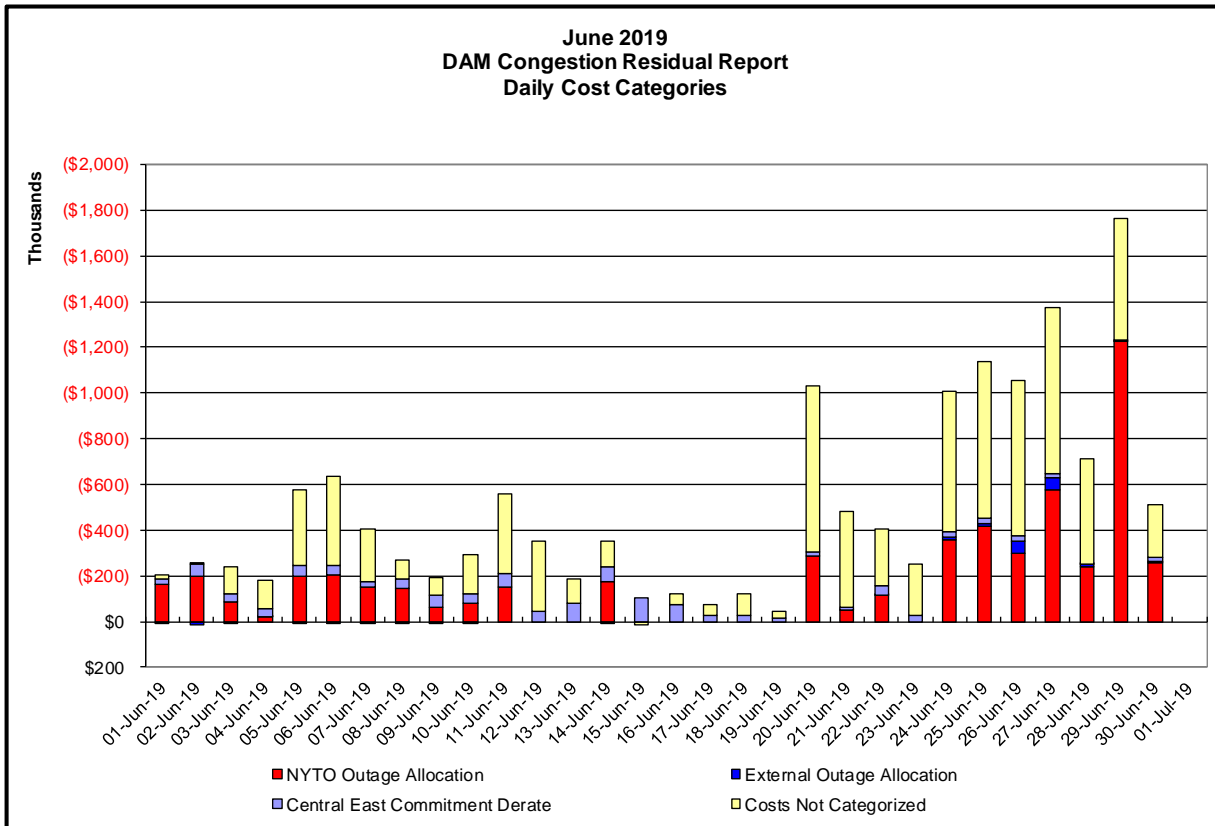
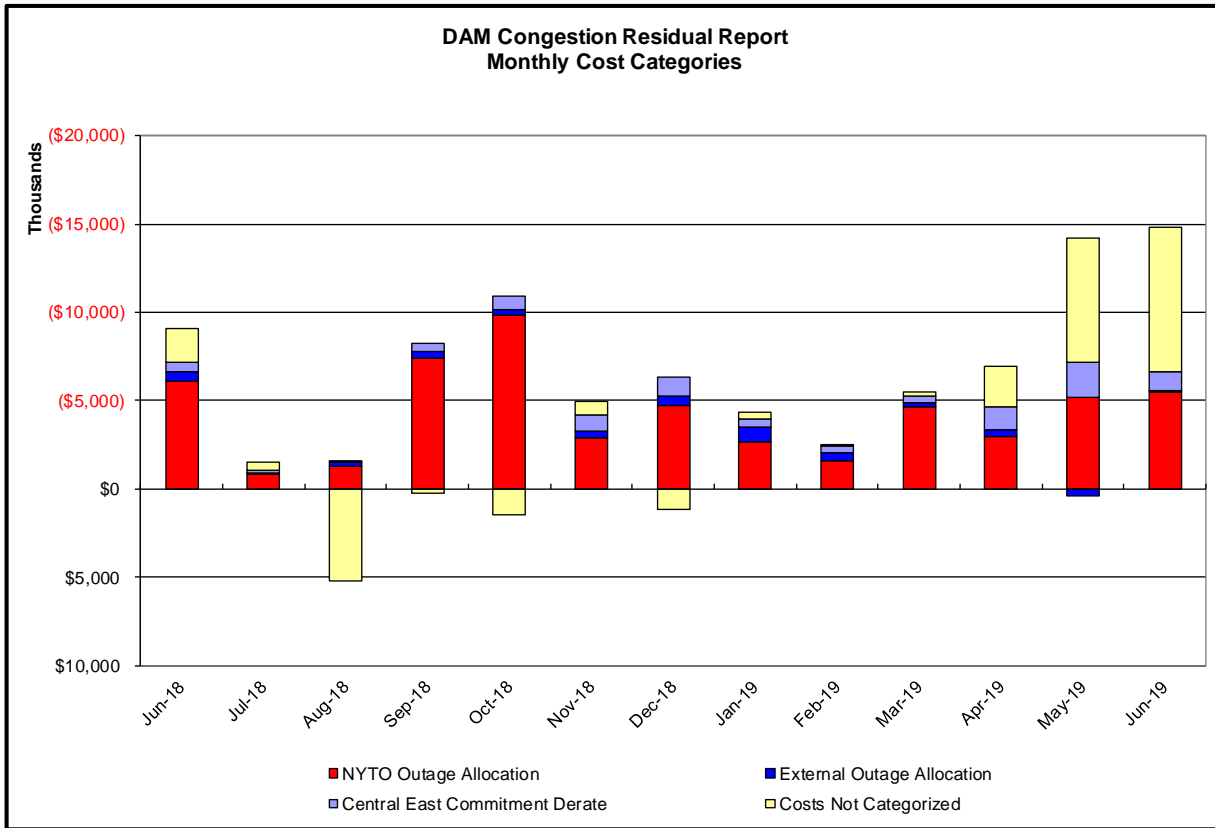
Event	Date (yyyymmdd)	Hours	Description
	8/1/2019	8, 10-12	Uprate Gowanus-Goethals 345kV (#25/26)
	8/11/2019	14-22	Forced Outage East Garden City-Sprainbrook 345kV (#Y49)
	8/11/2019	15, 18	NE_NNC1385-NY Scheduling Limit
	8/17/2019	16-21	Extended Outage Goethals-FreshKill 345kV (#22)
	8/19/2019	15-18	Thunder Storm Alert, Buchanon-Eastview 345kV (#W93)
	8/19/2019	15, 16	Thunder Storm Alert, Chester-Shoemaker 138kV (#27)
	8/19/2019	15-17	Thunder Storm Alert, Leeds-Pleasant Valley 345kV (#92)
	8/19/2019	15, 18	NYCA DNI Ramp Limit
	8/19/2019	15	Derate Dunwoodie-Shore Rd 345kV (#Y50) I/o SCB:SPBK(RNS2):Y49&M29&Y49_ST
	8/21/2019	16-19	Thunder Storm Alert, Buchanon-Eastview 345kV (#W93)
	8/21/2019	16, 17	Thunder Storm Alert, Chester-Shoemaker 138kV (#27)
	8/21/2019	16, 17	Thunder Storm Alert, Leeds-Pleasant Valley 345kV (#92)
	8/21/2019	16, 18	NYCA DNI Ramp Limit

**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	

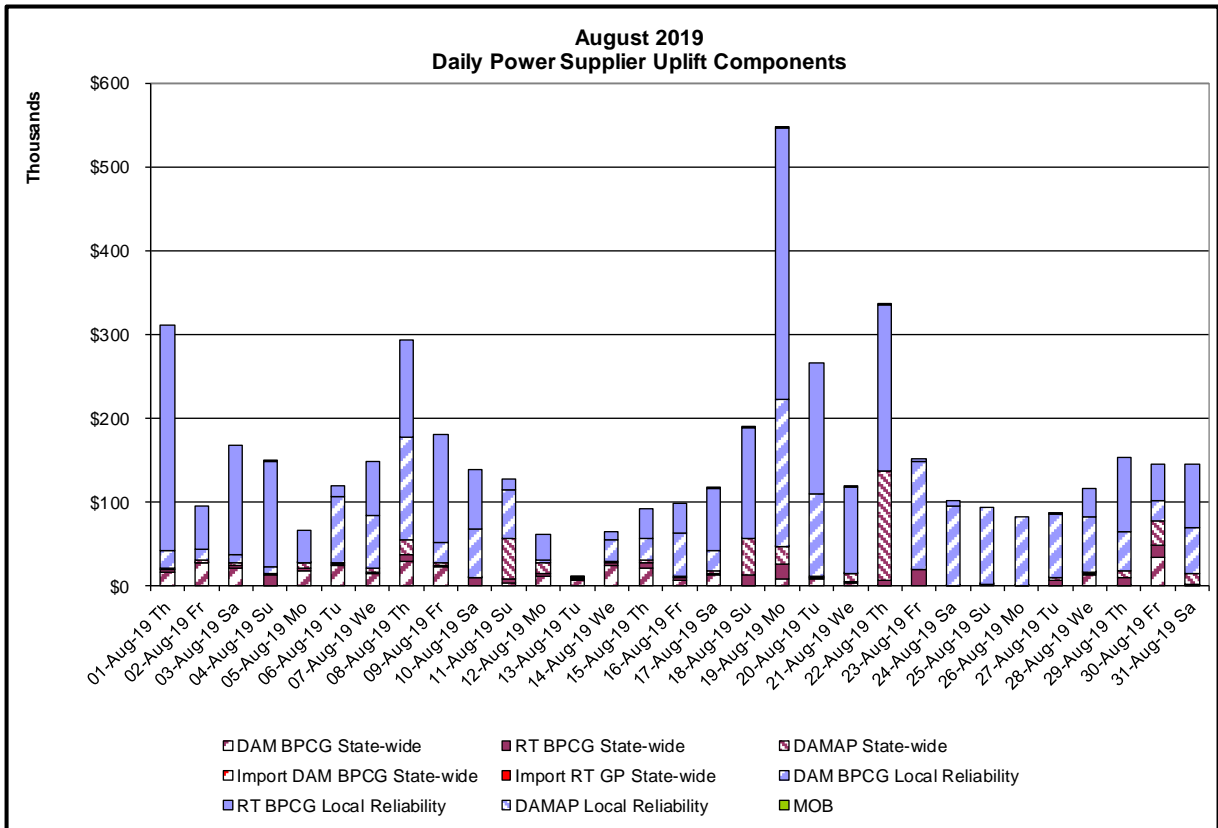
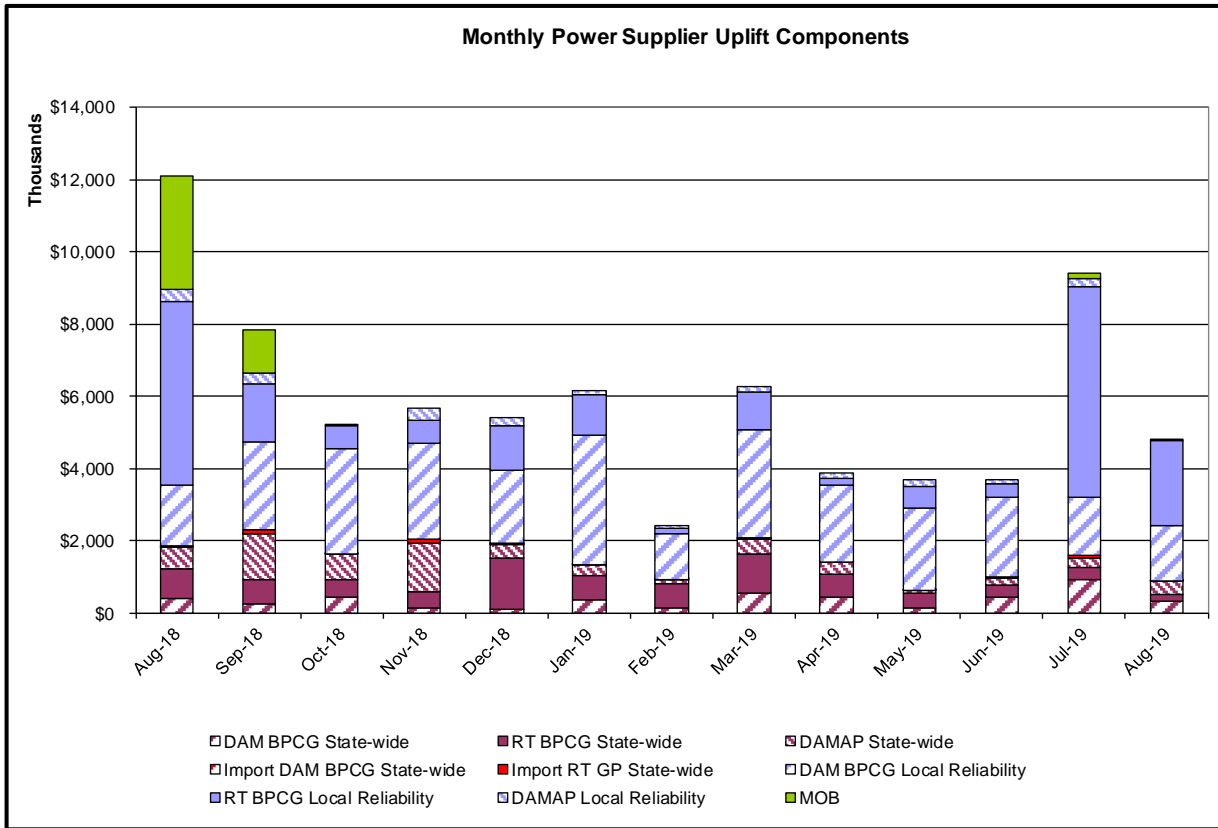
**Monthly Balancing Market Congestion Report Assumptions/Notes**

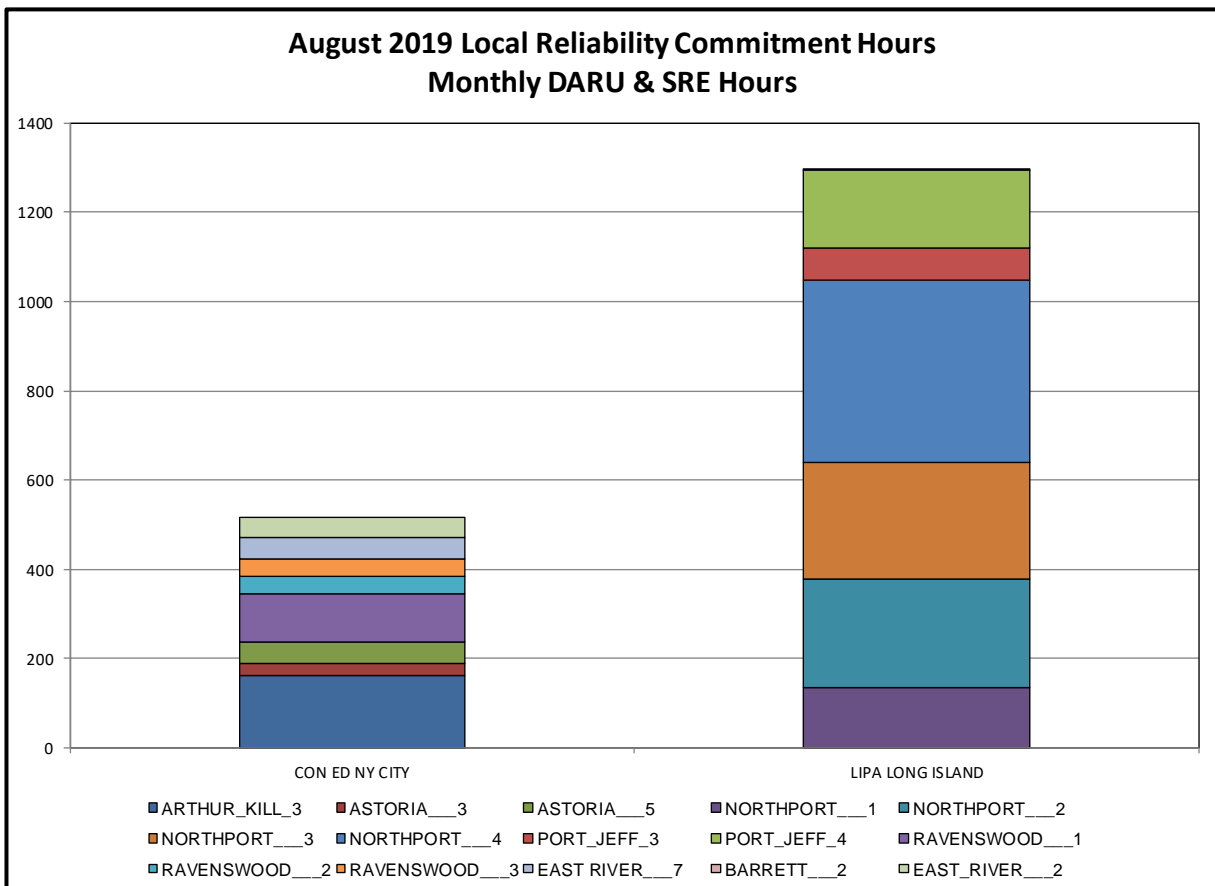
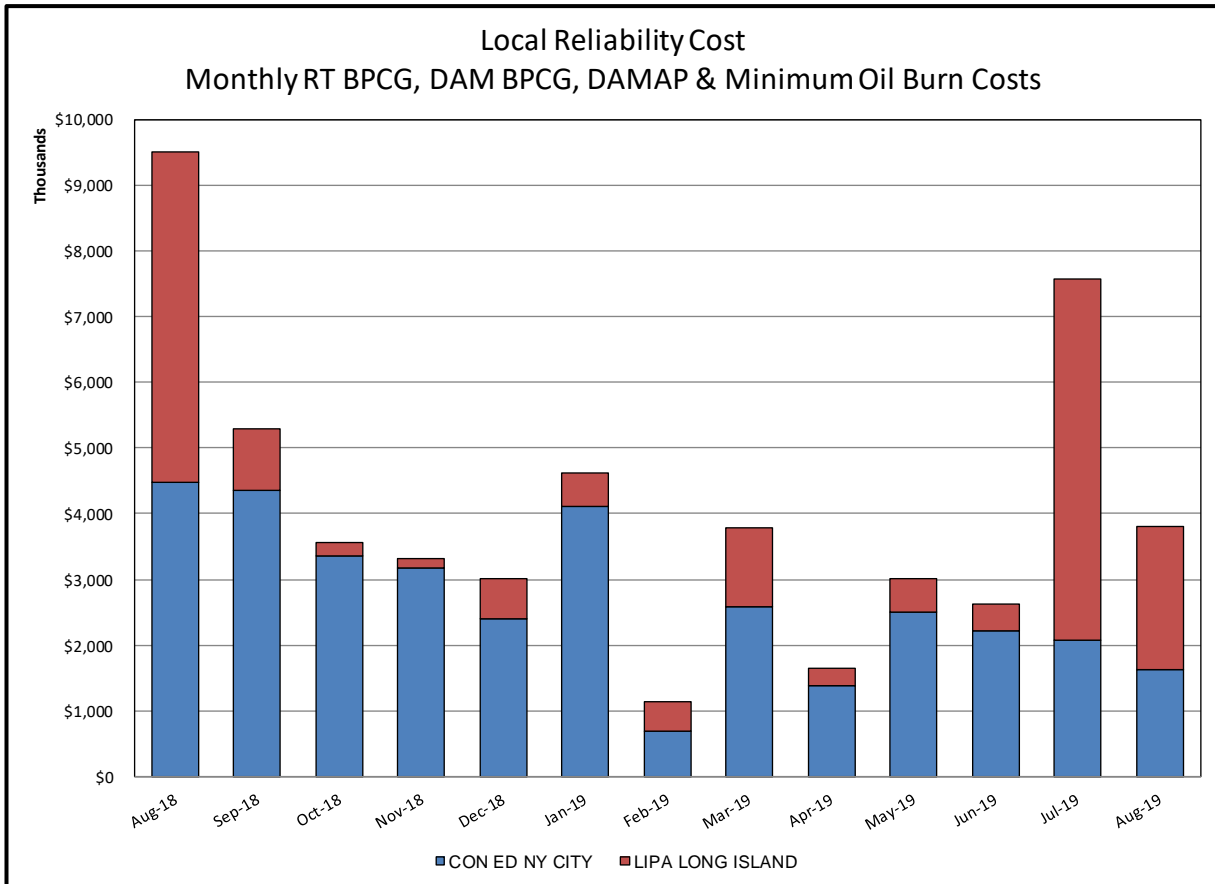
- 1) Storm Watch Costs are identified as daily total uplift costs
- 2) Days with a value of BMCR less M2M Settlement of \$100K/HR, shortfall of \$200K/Day or more, or surplus of \$100K/Day or more are investigated.
- 3) Uplift costs associated with multiple event types are apportioned equally by hour

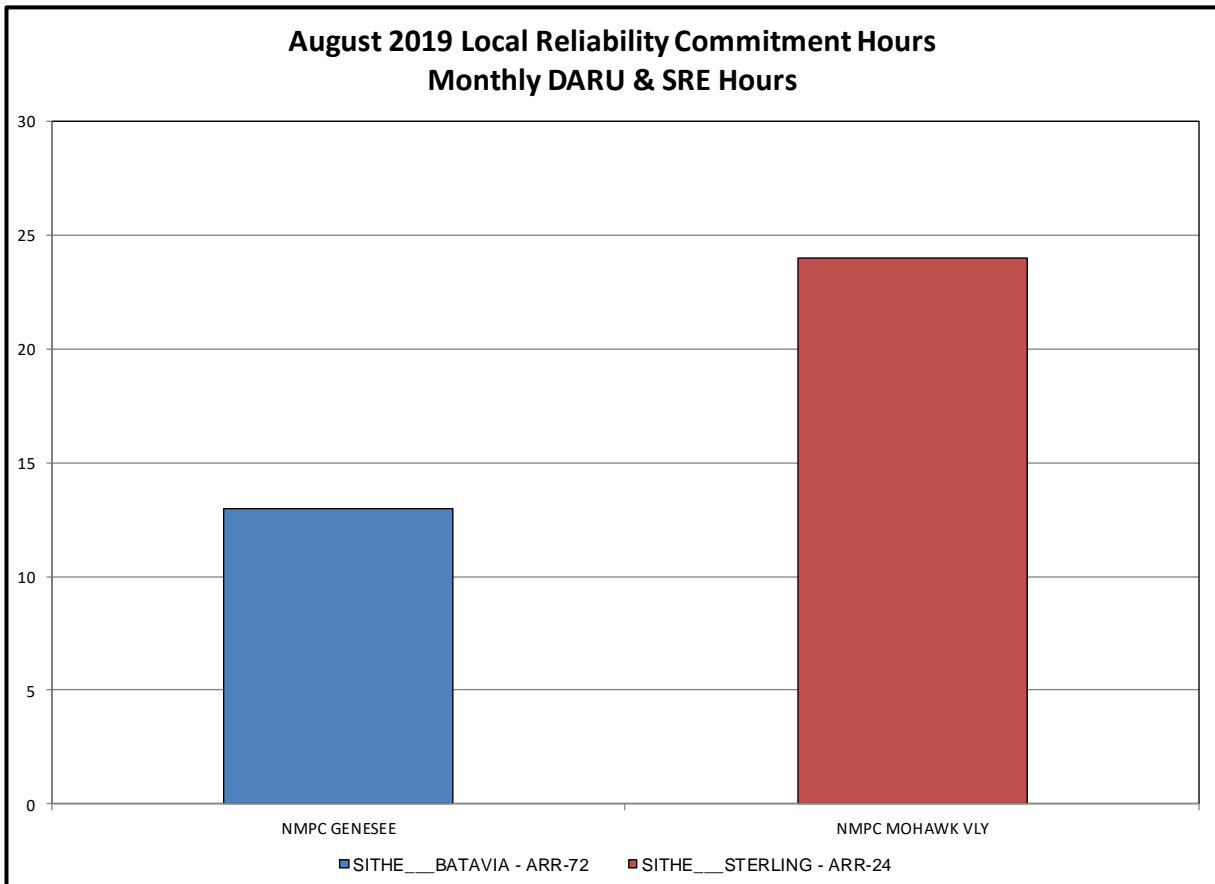
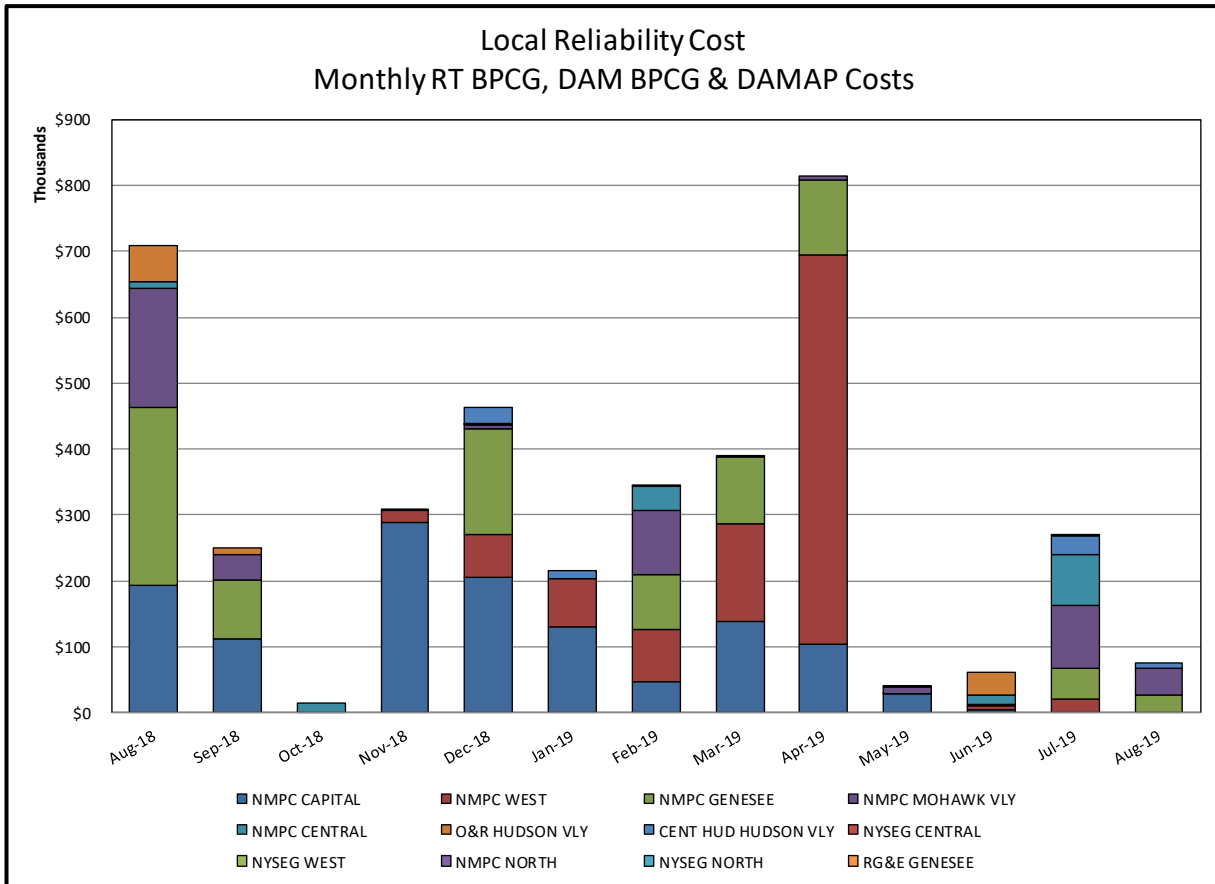


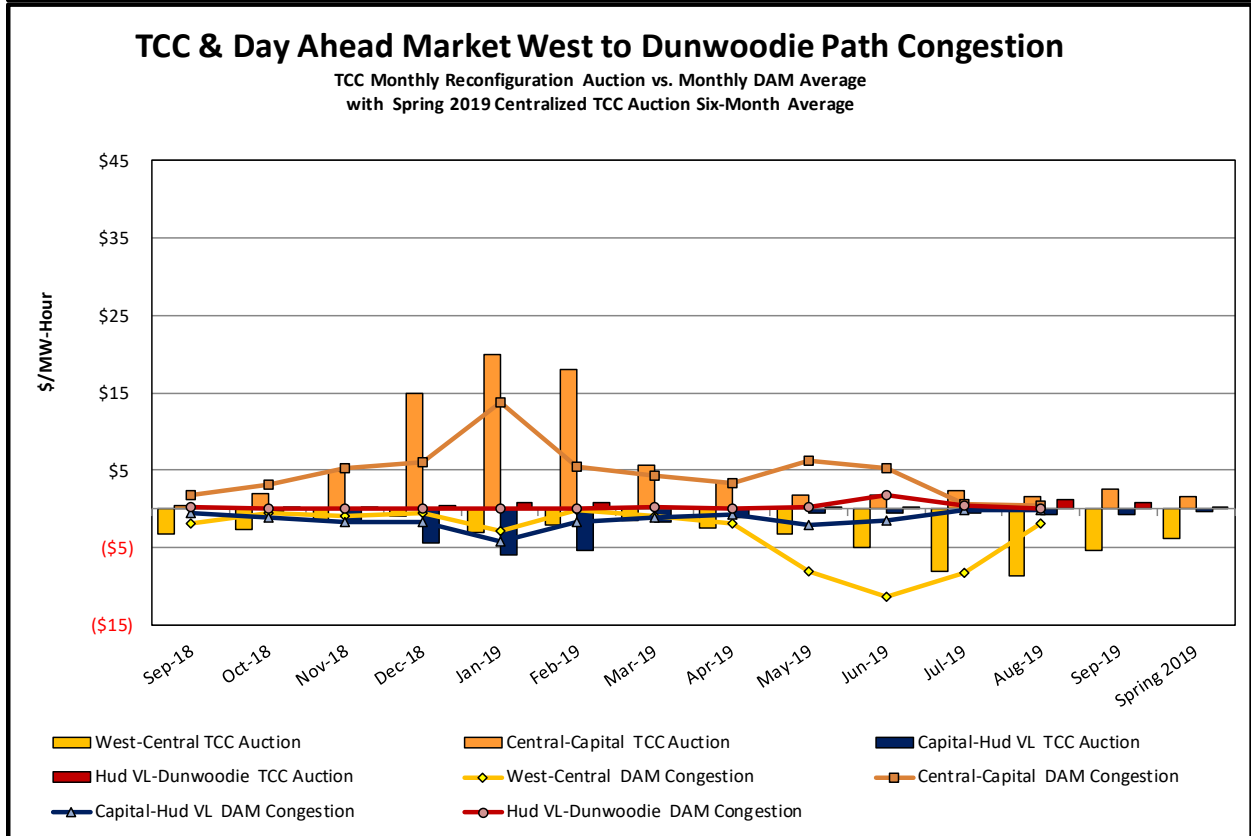
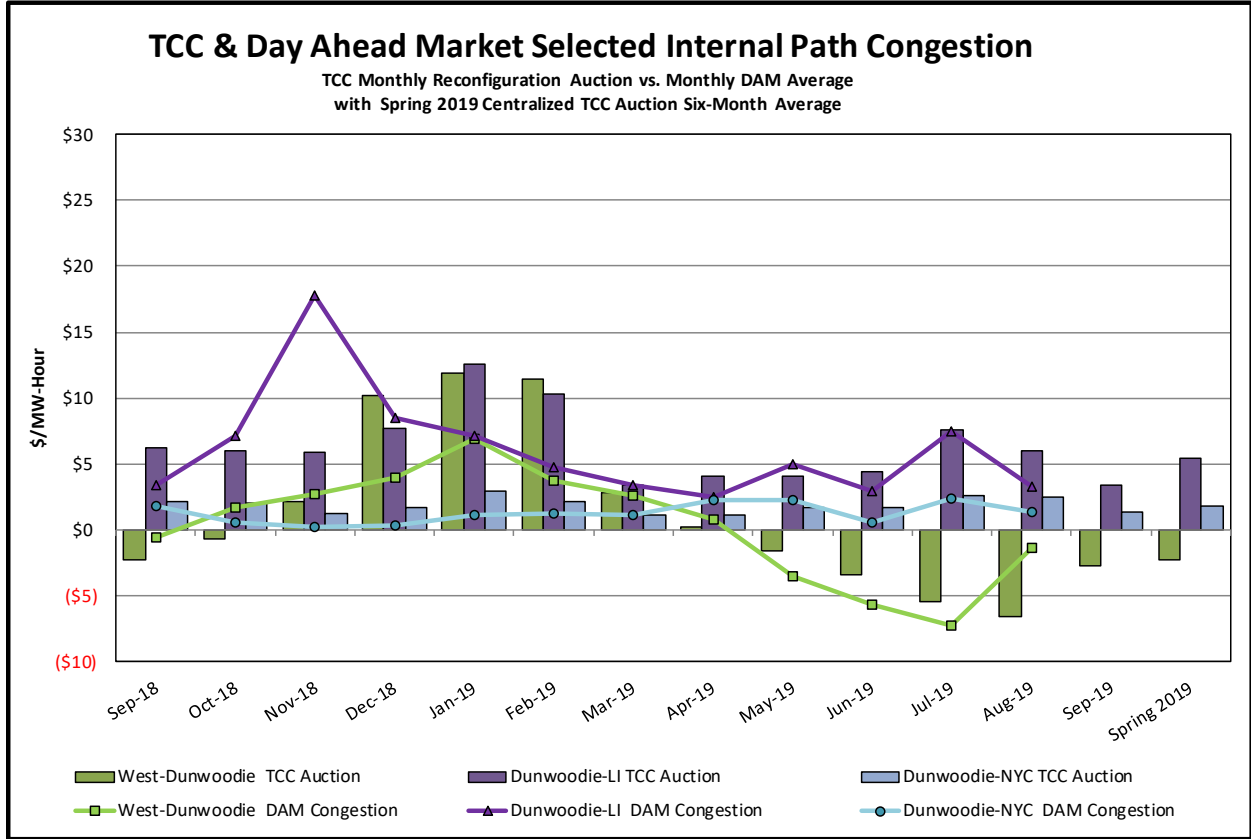
**Day-Ahead Market Congestion Residual Categories**

<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.	



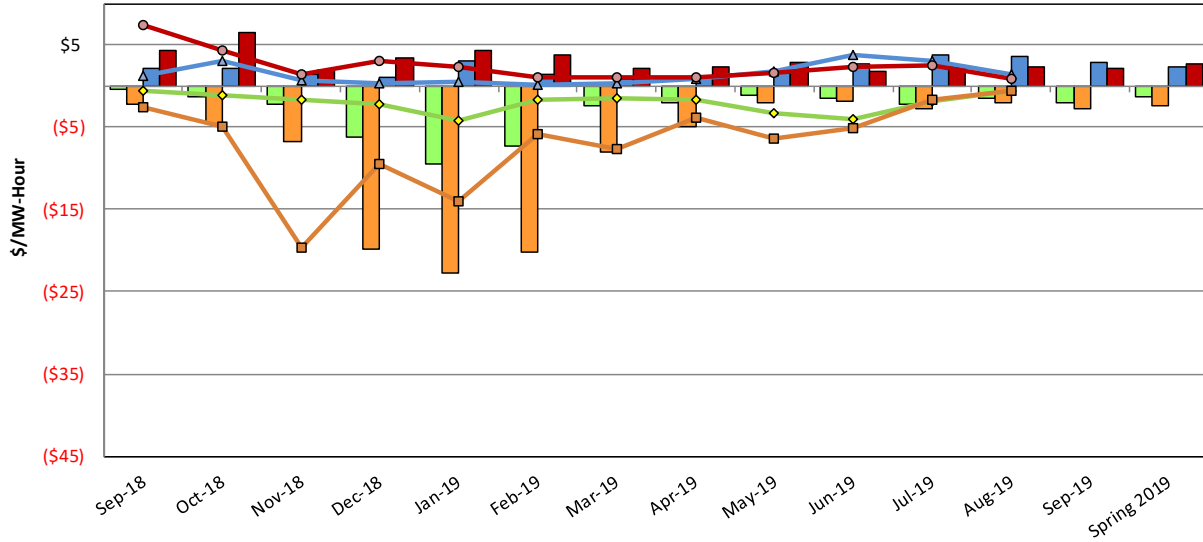






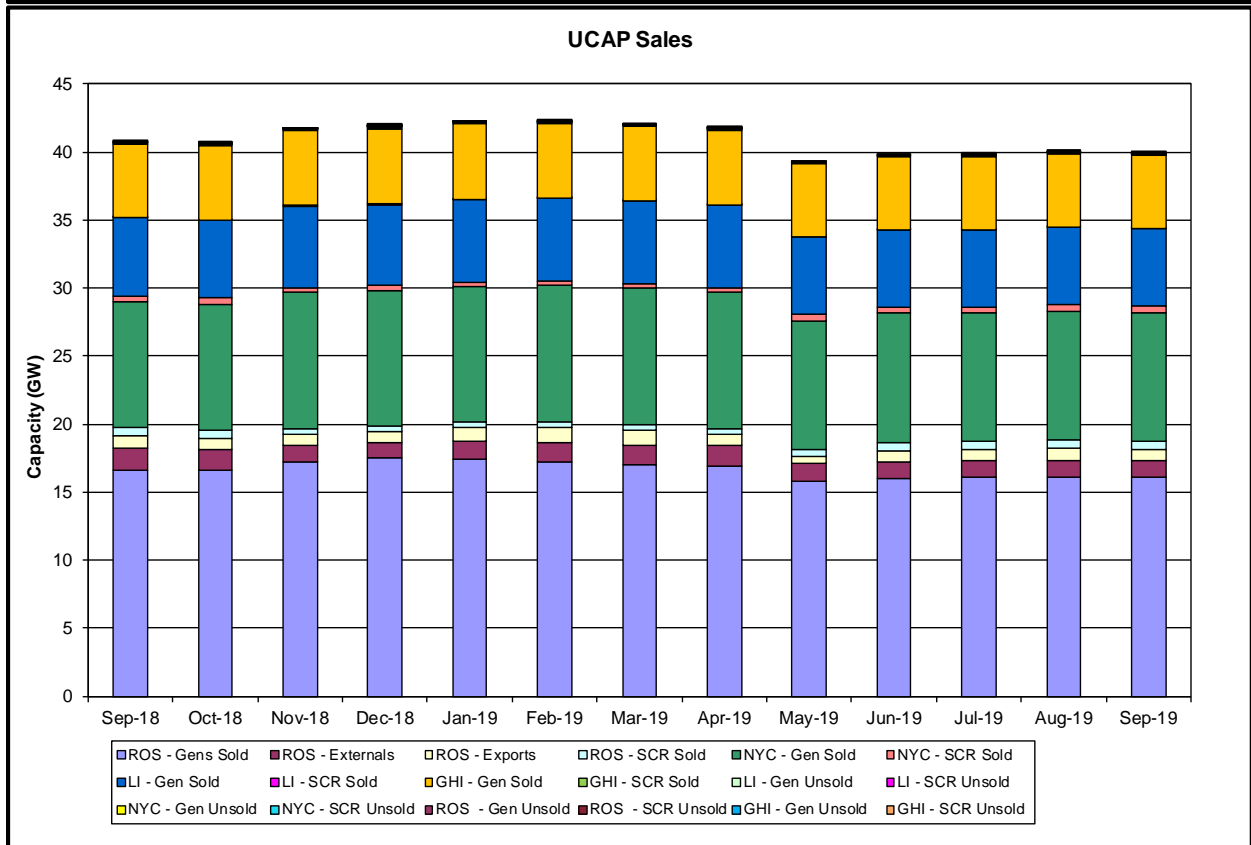
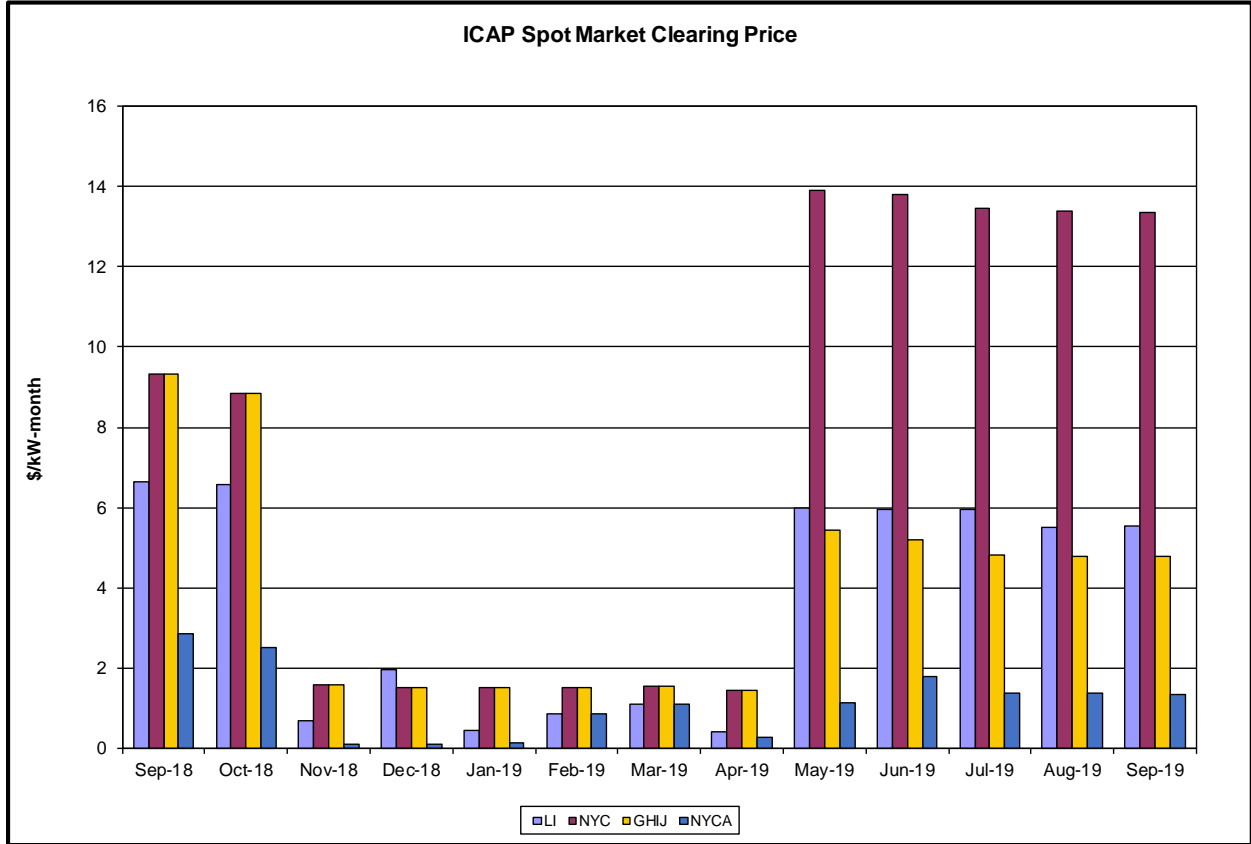
### TCC & Day Ahead Market Selected External Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average  
with 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



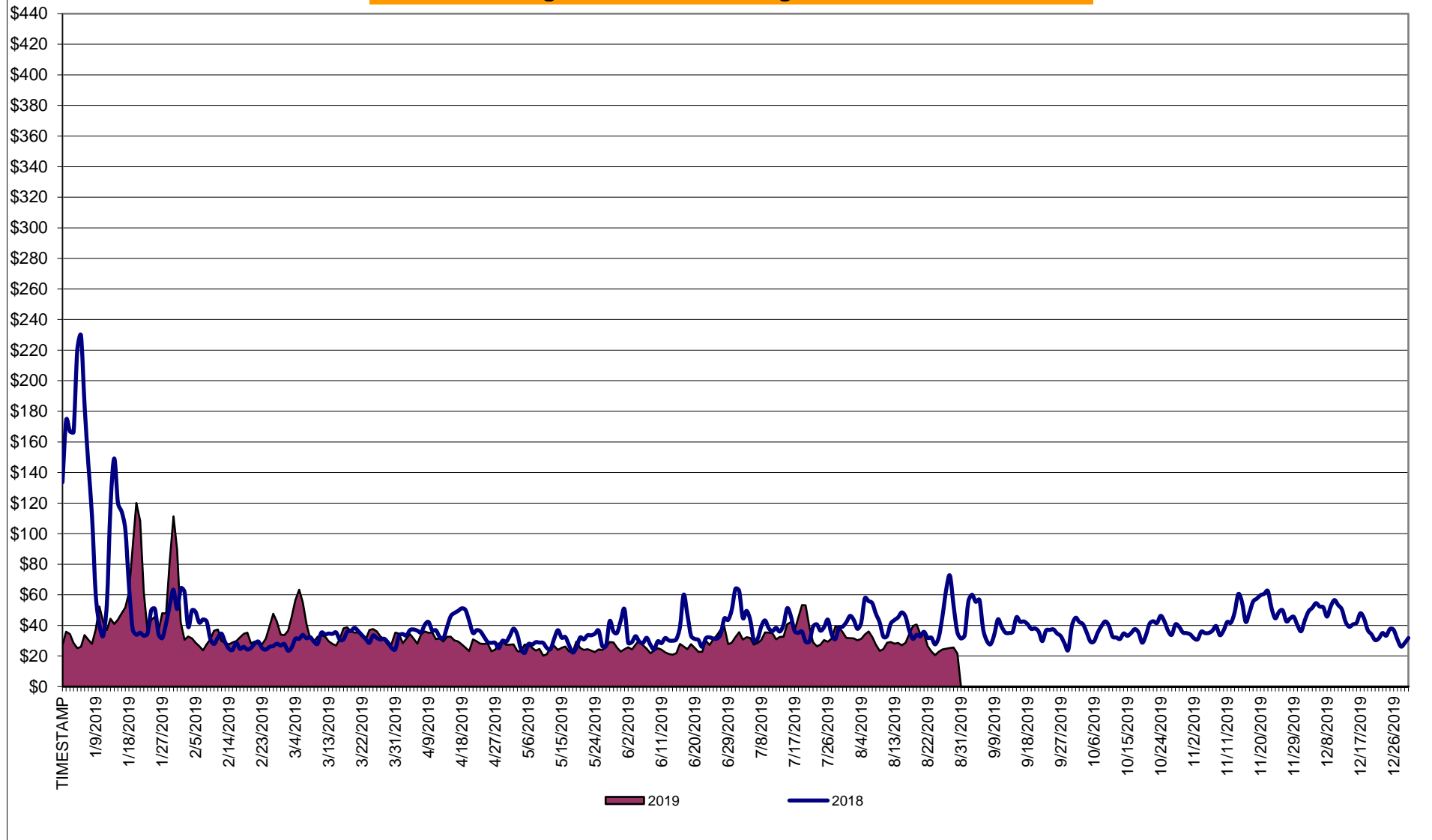


# Market Performance Highlights

## August 2019

- LBMP for August is \$27.83/MWh; lower than \$33.18/MWh in July 2019 and \$42.56/MWh in August 2018.
  - Day Ahead and Real Time Load Weighted LBMPs are lower compared to July.
- August 2019 average year-to-date monthly cost of \$34.96/MWh is a 25% decrease from \$46.37/MWh in August 2018.
- Average daily sendout is 487 GWh/day in August; lower than 539 GWh/day in July 2019 and 537 GWh/day in August 2018.
- Natural gas prices and distillate prices were lower compared to the previous month.
  - Natural Gas (Transco Z6 NY) was \$1.85/MMBtu, down from \$2.18/MMBtu in July.
  - Natural gas prices are down 38.3% year-over-year.
  - Jet Kerosene Gulf Coast was \$13.32/MMBtu, down from \$14.18/MMBtu in July.
  - Ultra Low Sulfur No.2 Diesel NY Harbor was \$13.02/MMBtu, down from \$13.71/MMBtu in July.
  - Distillate prices are down 15.1% year-over-year.
- Uplift per MWh is lower compared to the previous month.
  - Uplift (not including NYISO cost of operations) is (\$0.20)/MWh; lower than (\$0.06)/MWh in July.
    - Local Reliability Share is \$0.25/MWh, lower than \$0.44/MWh in July.
    - Statewide Share is (\$0.45)/MWh, higher than (\$0.50)/MWh in July.
  - TSA \$ per NYC MWh is \$0.33/MWh.
  - Total uplift costs (Schedule 1 components including NYISO Cost of Operations) are lower than July.

**Daily NYISO Average Cost/MWh (Energy & Ancillary Services)\***  
**2018 Annual Average \$44.92/MWh**  
**August 2018 YTD Average \$46.37/MWh**  
**August 2019 YTD Average \$34.96/MWh**



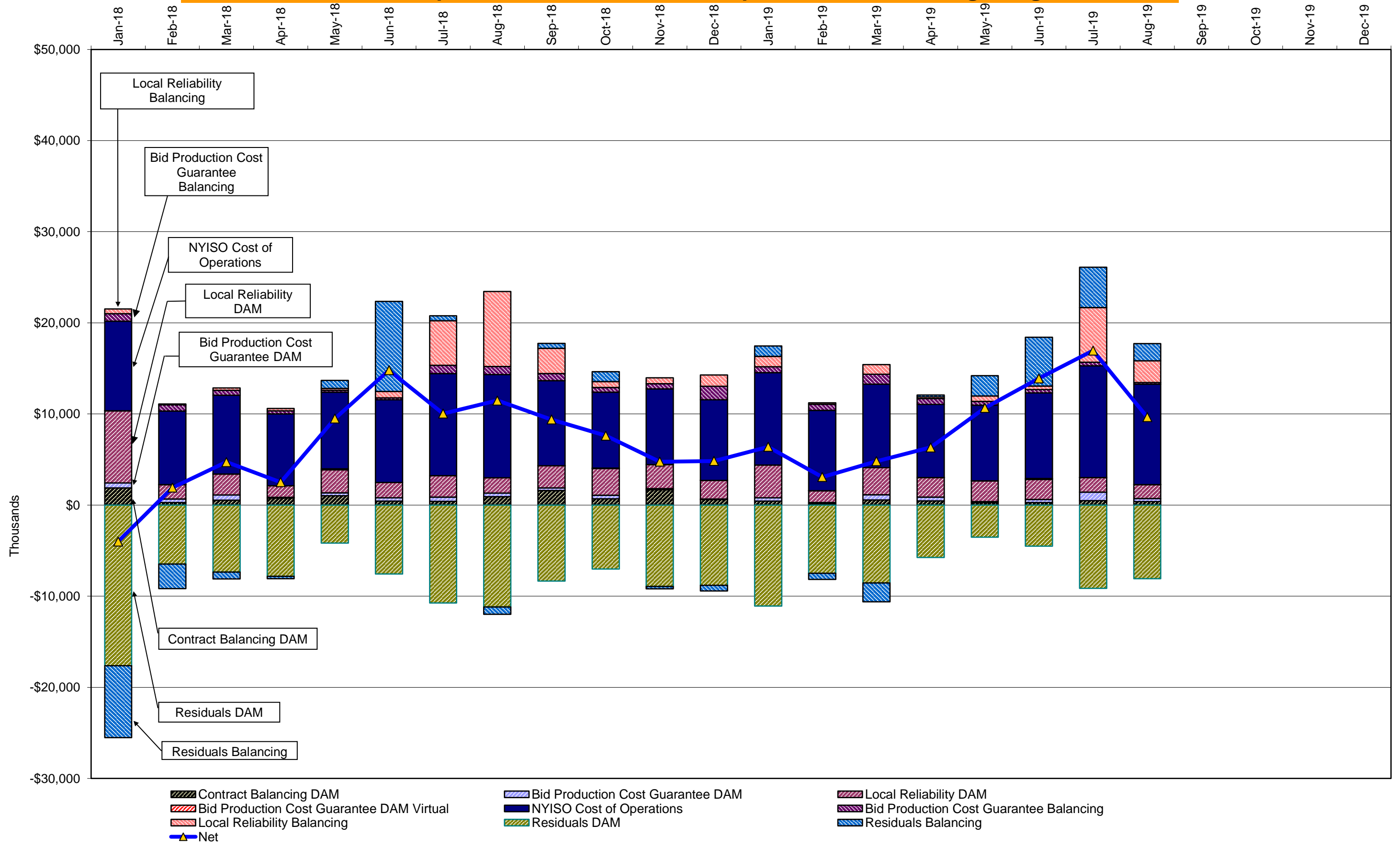
\* Excludes ICAP payments.

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

<b>2019</b>	<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	23.10	24.43	33.18	27.83				
NTAC	0.51	0.69	0.98	1.16	0.72	1.08	1.01	0.98				
Reserve	0.54	0.51	0.55	0.63	0.63	0.50	0.44	0.49				
Regulation	0.13	0.11	0.10	0.33	0.13	0.09	0.07	0.09				
NYISO Cost of Operations	0.68	0.68	0.69	0.69	0.68	0.69	0.70	0.70				
FERC Fee Recovery	0.08	0.09	0.09	0.10	0.10	0.08	0.06	0.07				
Uplift	(0.25)	(0.44)	(0.33)	(0.15)	0.13	0.07	(0.06)	(0.20)				
Uplift: Local Reliability Share	0.32	0.11	0.31	0.20	0.23	0.19	0.44	0.25				
Uplift: Statewide Share	(0.57)	(0.55)	(0.64)	(0.35)	(0.11)	(0.12)	(0.50)	(0.45)				
Voltage Support and Black Start	0.37	0.37	0.38	0.38	0.38	0.38	0.38	0.38				
<b>Avg Monthly Cost</b>	<b>52.99</b>	<b>35.51</b>	<b>37.38</b>	<b>31.16</b>	<b>25.88</b>	<b>27.32</b>	<b>35.78</b>	<b>30.33</b>				
Avg YTD Cost	52.99	44.93	42.54	40.12	37.57	35.76	35.75	34.96				
TSA \$ per NYC MWh	0.00	0.00	0.01	0.01	0.19	0.77	1.00	0.33				
<b>2018</b>	<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
<b>Avg Monthly Cost</b>	<b>101.54</b>	<b>35.87</b>	<b>32.45</b>	<b>37.74</b>	<b>31.70</b>	<b>35.73</b>	<b>42.12</b>	<b>45.01</b>	<b>40.76</b>	<b>38.00</b>	<b>46.01</b>	<b>42.78</b>
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: 9/10/2019 1:42 PM

## NYISO Dollar Flows - Uplift - OATT Schedule 1 components - Data through August 31, 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	January	February	March	April	May	June	July	August	September	October	November	December
<b>Day Ahead Market MWh</b>	15,299,458	13,391,383	13,527,834	11,811,029	12,521,583	13,723,372	17,416,589	16,379,968				
DAM LSE Internal LBMP Energy Sales	57%	57%	59%	59%	57%	58%	64%	63%				
DAM External TC LBMP Energy Sales	6%	5%	3%	1%	3%	3%	3%	3%				
DAM Bilateral - Internal Bilaterals	29%	30%	30%	31%	32%	29%	26%	26%				
DAM Bilateral - Import/Non-LBMP Market Bilaterals	5%	5%	5%	5%	6%	5%	4%	4%				
DAM Bilateral - Export/Non-LBMP Market Bilaterals	1%	1%	2%	2%	2%	2%	1%	1%				
DAM Bilateral - Wheel Through Bilaterals	2%	2%	2%	2%	1%	2%	2%	2%				
<b>Balancing Energy Market MWh</b>	-322,442	-323,188	-261,217	-218,482	-392,699	-102,044	103,628	-514,102				
Balancing Energy LSE Internal LBMP Energy Sales	-120%	-126%	-138%	-178%	-150%	-264%	-2%	-119%				
Balancing Energy External TC LBMP Energy Sales	65%	67%	82%	113%	68%	233%	199%	41%				
Balancing Energy Bilateral - Internal Bilaterals	-4%	-1%	-3%	2%	1%	0%	5%	0%				
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	0%	0%	0%	0%	0%	15%	0%				
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	3%	7%	6%	7%	2%	8%	8%	1%				
Balancing Energy Bilateral - Wheel Through Bilaterals	-45%	-47%	-47%	-44%	-21%	-77%	-125%	-23%				
<b>Transactions Summary</b>												
LBMP	63%	62%	61%	60%	59%	62%	68%	65%				
Internal Bilaterals	29%	30%	30%	31%	33%	30%	25%	27%				
Import Bilaterals	5%	5%	6%	6%	6%	5%	4%	5%				
Export Bilaterals	1%	2%	2%	2%	2%	2%	1%	1%				
Wheels Through	1%	1%	1%	1%	0%	1%	1%	1%				
<b>Market Share of Total Load</b>												
Day Ahead Market	102.2%	102.5%	102.0%	101.9%	103.2%	100.7%	99.4%	103.2%				
Balancing Energy +	-2.2%	-2.5%	-2.0%	-1.9%	-3.2%	-0.7%	0.6%	-3.2%				
Total MWh	14,977,016	13,068,195	13,266,617	11,592,547	12,128,884	13,621,328	17,520,217	15,865,866				
Average Daily Energy Sendout/Month GWh	449	436	411	371	373	429	539	487				

2018	January	February	March	April	May	June	July	August	September	October	November	December
<b>Day Ahead Market MWh</b>	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%
<b>Balancing Energy Market MWh</b>	-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%
<b>Transactions Summary</b>												
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%
<b>Market Share of Total Load</b>												
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>
<b><u>DAY AHEAD LBMP</u></b>												
Price *	\$45.01	\$30.66	\$32.34	\$25.97	\$21.16	\$21.79	\$30.16	\$25.35				
Standard Deviation	\$25.67	\$12.86	\$9.30	\$6.32	\$5.89	\$7.28	\$12.06	\$8.73				
Load Weighted Price **	\$46.88	\$31.53	\$33.14	\$26.57	\$21.89	\$23.04	\$31.98	\$26.83				
<b><u>RTC LBMP</u></b>												
Price *	\$40.86	\$29.74	\$31.04	\$25.07	\$21.88	\$25.67	\$32.23	\$24.92				
Standard Deviation	\$23.02	\$10.79	\$8.48	\$7.53	\$8.01	\$23.45	\$21.96	\$14.96				
Load Weighted Price **	\$42.39	\$30.32	\$31.62	\$25.54	\$22.44	\$27.64	\$33.92	\$26.14				
<b><u>REAL TIME LBMP</u></b>												
Price *	\$39.54	\$30.13	\$31.46	\$24.47	\$20.56	\$23.30	\$30.77	\$24.01				
Standard Deviation	\$26.03	\$13.77	\$12.54	\$17.27	\$10.35	\$17.49	\$20.63	\$12.36				
Load Weighted Price **	\$41.24	\$30.80	\$32.06	\$25.06	\$21.28	\$25.05	\$32.53	\$25.34				
Average Daily Energy Sendout/Month GWh	449	436	411	371	373	429	539	487				

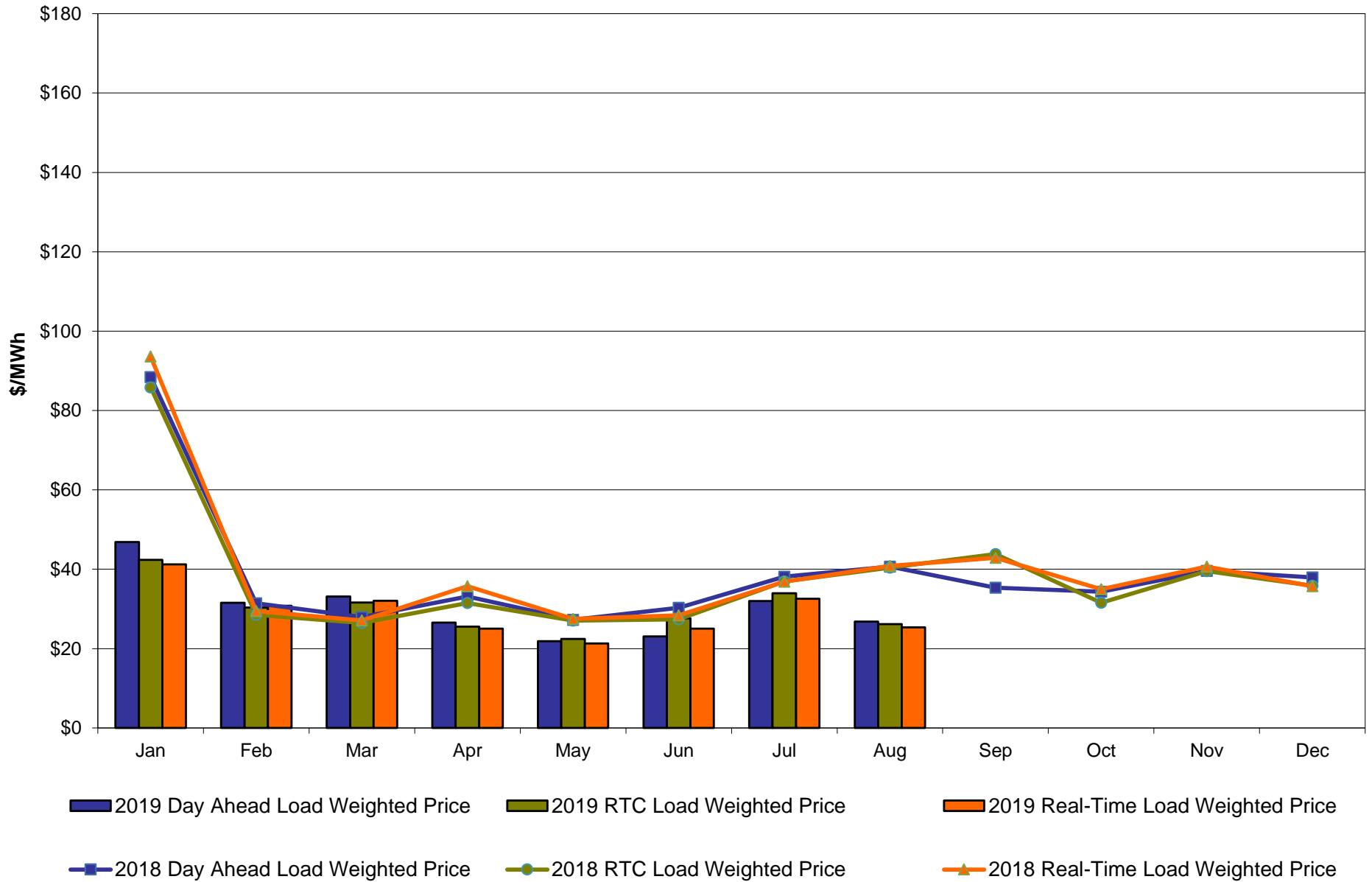
### NYISO Markets 2018 Energy Statistics

	<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>
<b><u>DAY AHEAD LBMP</u></b>												
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
<b><u>RTC LBMP</u></b>												
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
<b><u>REAL TIME LBMP</u></b>												
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



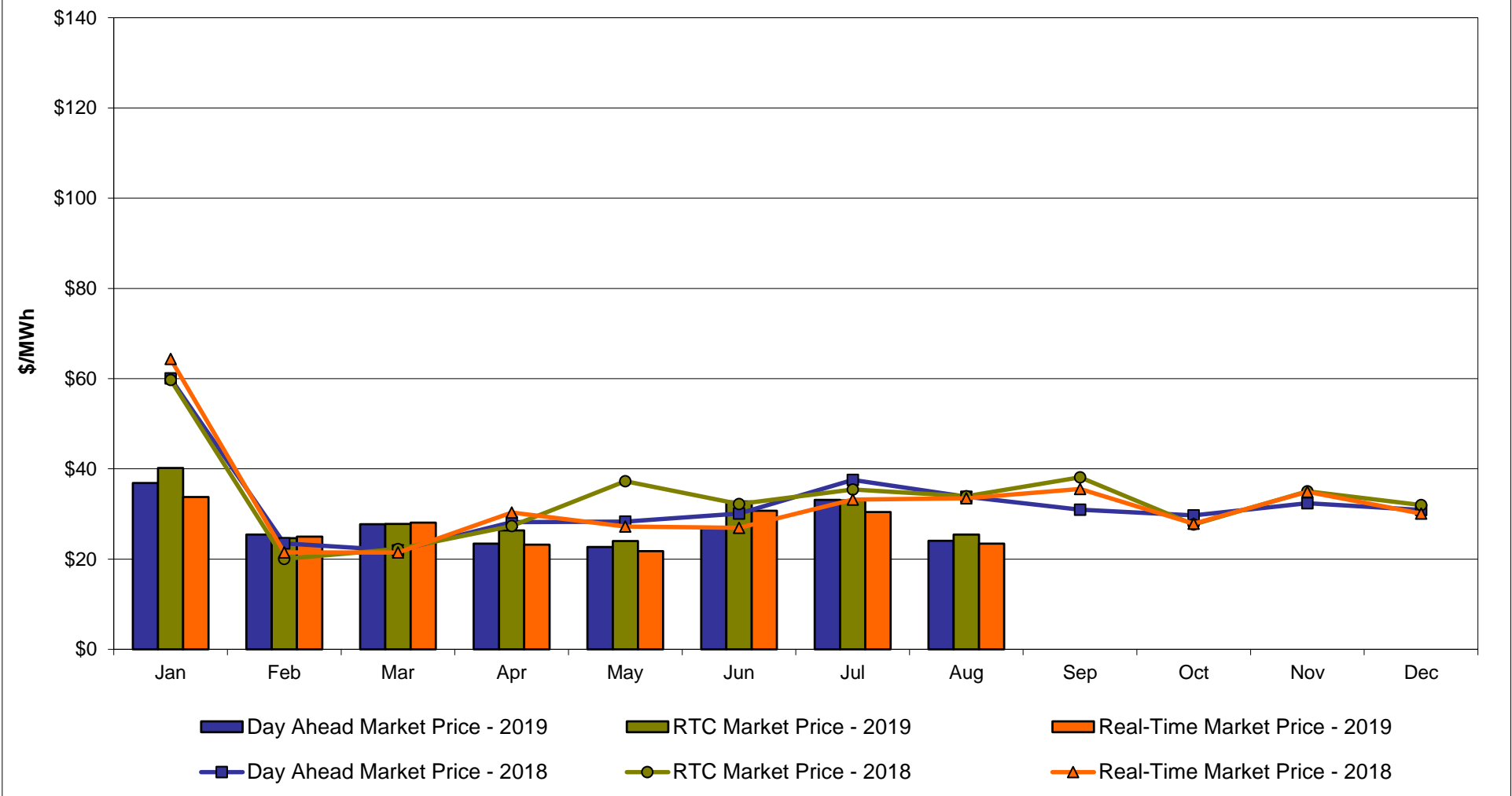


**August 2019 Zonal LBMP Statistics for NYISO (\$/MWh)**

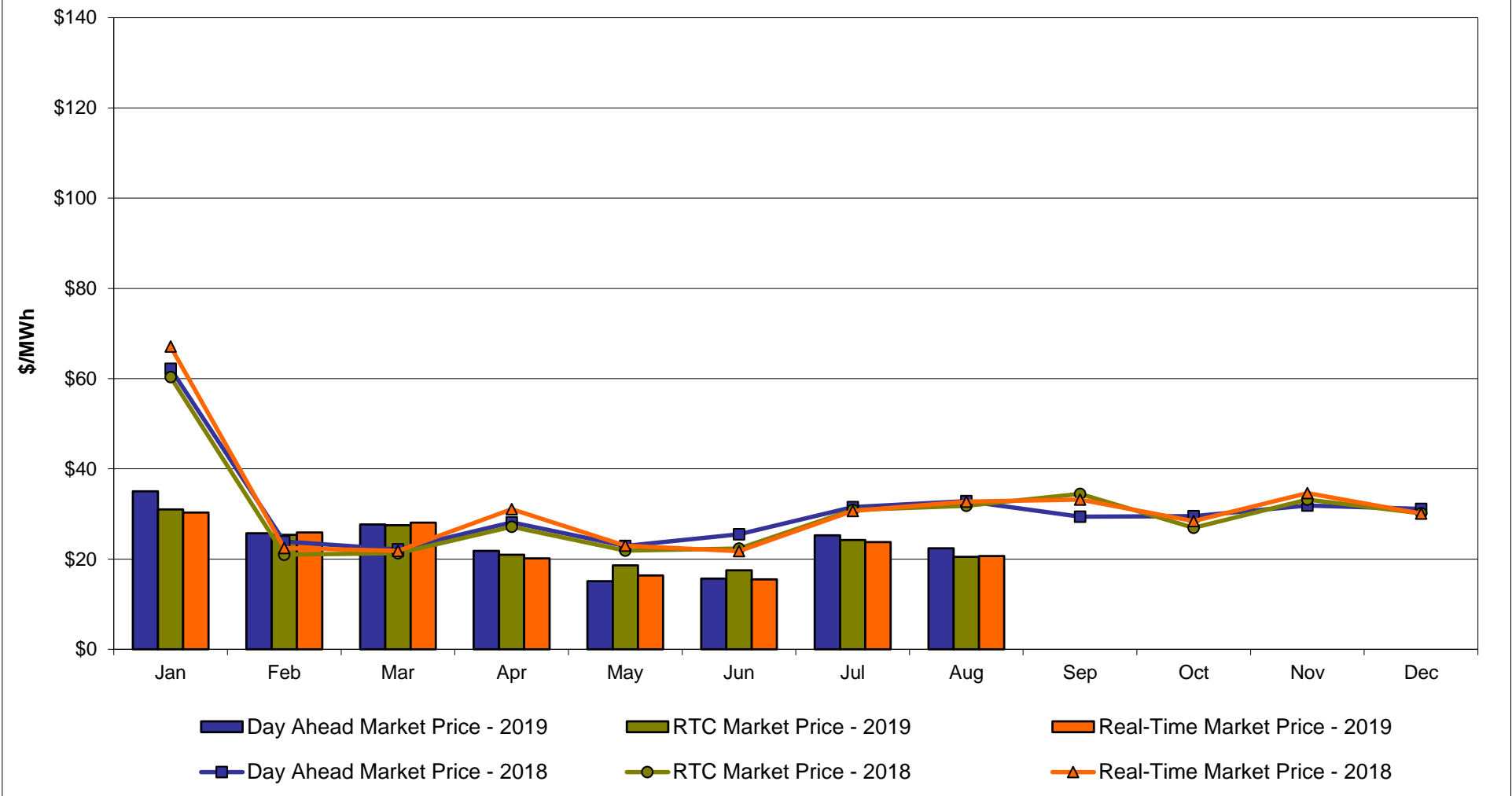
	<u>WEST Zone A</u>	<u>GENESEE Zone B</u>	<u>NORTH Zone D</u>	<u>CENTRAL Zone C</u>	<u>MOHAWK VALLEY Zone E</u>	<u>CAPITAL Zone F</u>	<u>HUDSON VALLEY Zone G</u>	<u>MILLWOOD Zone H</u>	<u>DUNWOODIE Zone I</u>	<u>NEW YORK CITY Zone J</u>	<u>LONG ISLAND Zone K</u>
<b><u>DAY AHEAD LBMP</u></b>											
Unweighted Price *	24.05	21.53	19.62	22.40	22.60	24.06	24.50	24.86	25.03	26.59	28.99
Standard Deviation	11.08	7.03	7.26	7.59	7.62	7.46	8.07	8.51	8.63	9.57	10.11
<b><u>RTC LBMP</u></b>											
Unweighted Price *	25.44	19.46	18.73	20.48	20.83	22.08	22.38	22.67	23.12	23.66	37.01
Standard Deviation	28.81	7.55	7.80	8.00	8.19	7.83	8.89	9.30	9.76	10.18	73.86
<b><u>REAL TIME LBMP</u></b>											
Unweighted Price *	23.41	19.88	18.96	20.67	21.04	22.20	22.44	22.72	23.29	23.97	31.50
Standard Deviation	17.34	10.46	9.97	10.77	11.02	10.89	11.47	11.67	12.14	12.89	28.42
	<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>
<b><u>DAY AHEAD LBMP</u></b>											
Unweighted Price *	20.23	20.33	20.33	23.69	24.47	27.55	26.59	26.89	24.95	25.42	19.17
Standard Deviation	6.13	6.89	6.89	7.98	7.89	8.98	8.22	9.03	7.72	8.64	7.09
<b><u>RTC LBMP</u></b>											
Unweighted Price *	19.04	18.38	18.38	22.18	23.70	40.24	32.32	30.39	21.83	23.21	18.61
Standard Deviation	7.08	8.06	8.06	10.35	9.64	80.04	72.69	52.33	10.25	9.54	8.92
<b><u>REAL TIME LBMP</u></b>											
Unweighted Price *	19.15	18.73	18.73	21.72	22.99	34.97	25.42	27.24	20.06	23.37	18.77
Standard Deviation	10.67	9.91	9.91	11.59	11.16	39.77	36.87	21.21	25.97	11.96	10.53

\* Straight LBMP averages

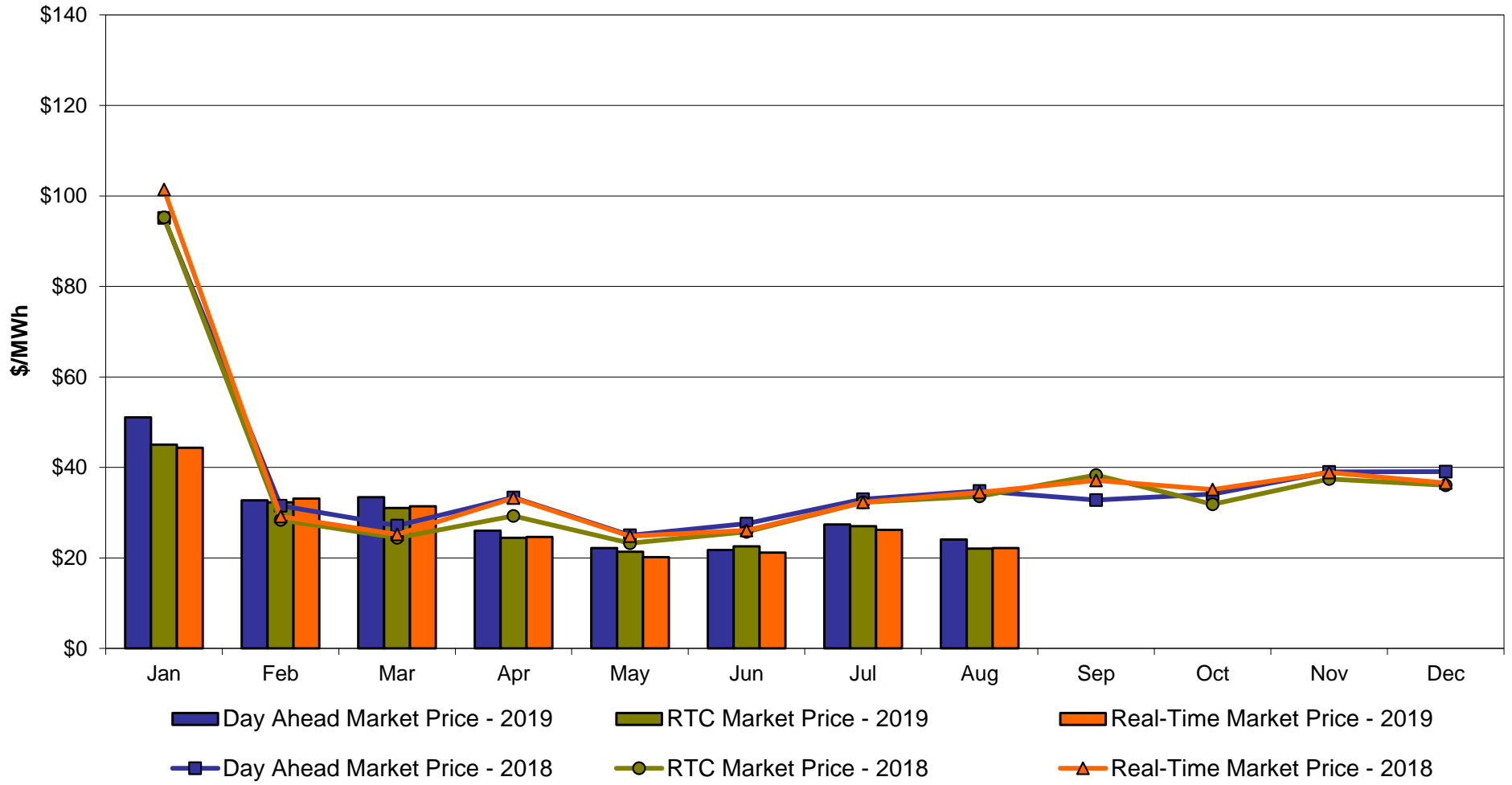
**West Zone A**  
**Monthly Average LBMP Prices 2018 - 2019**



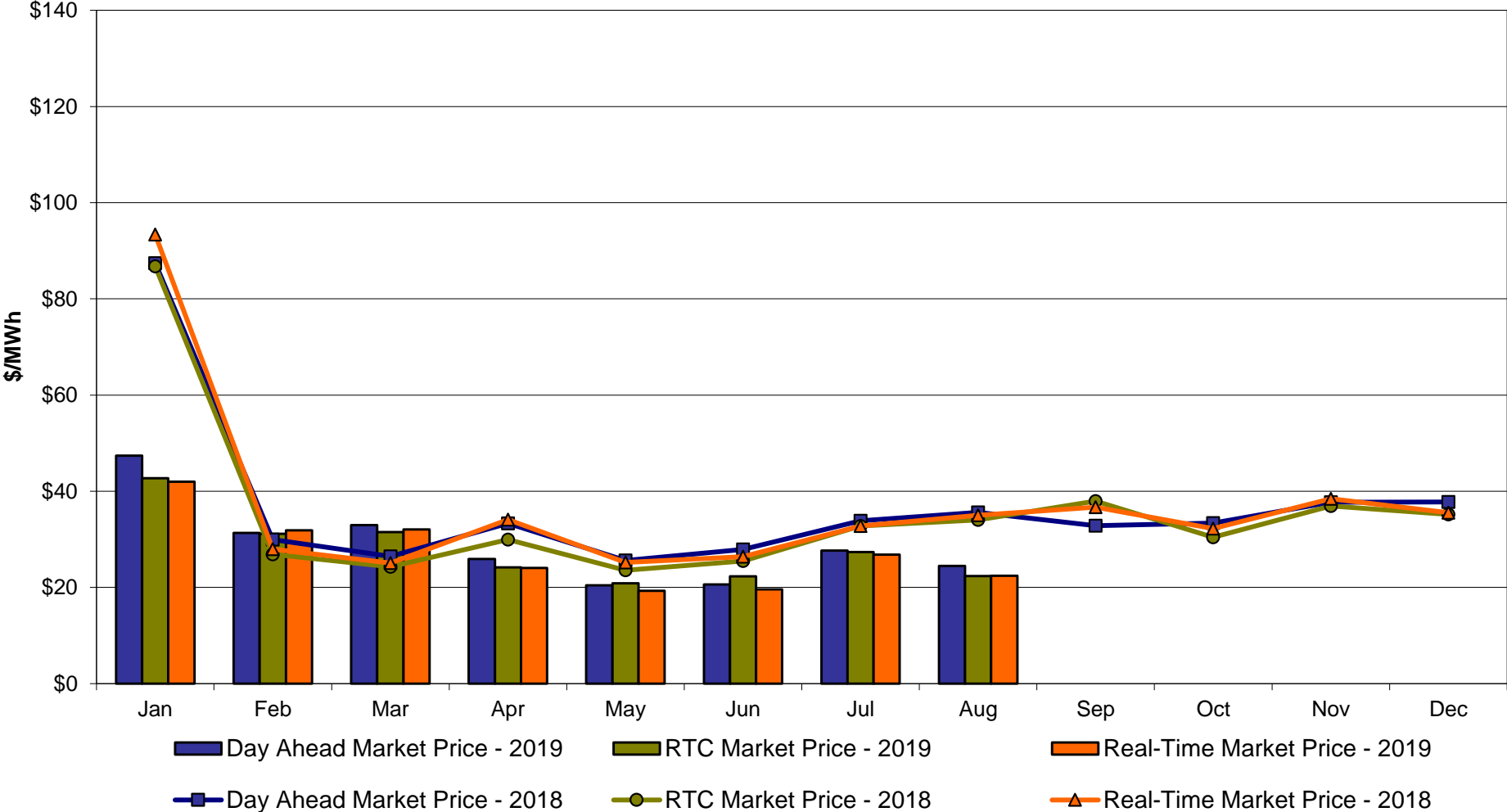
**Central Zone C  
Monthly Average LBMP Prices 2018 - 2019**



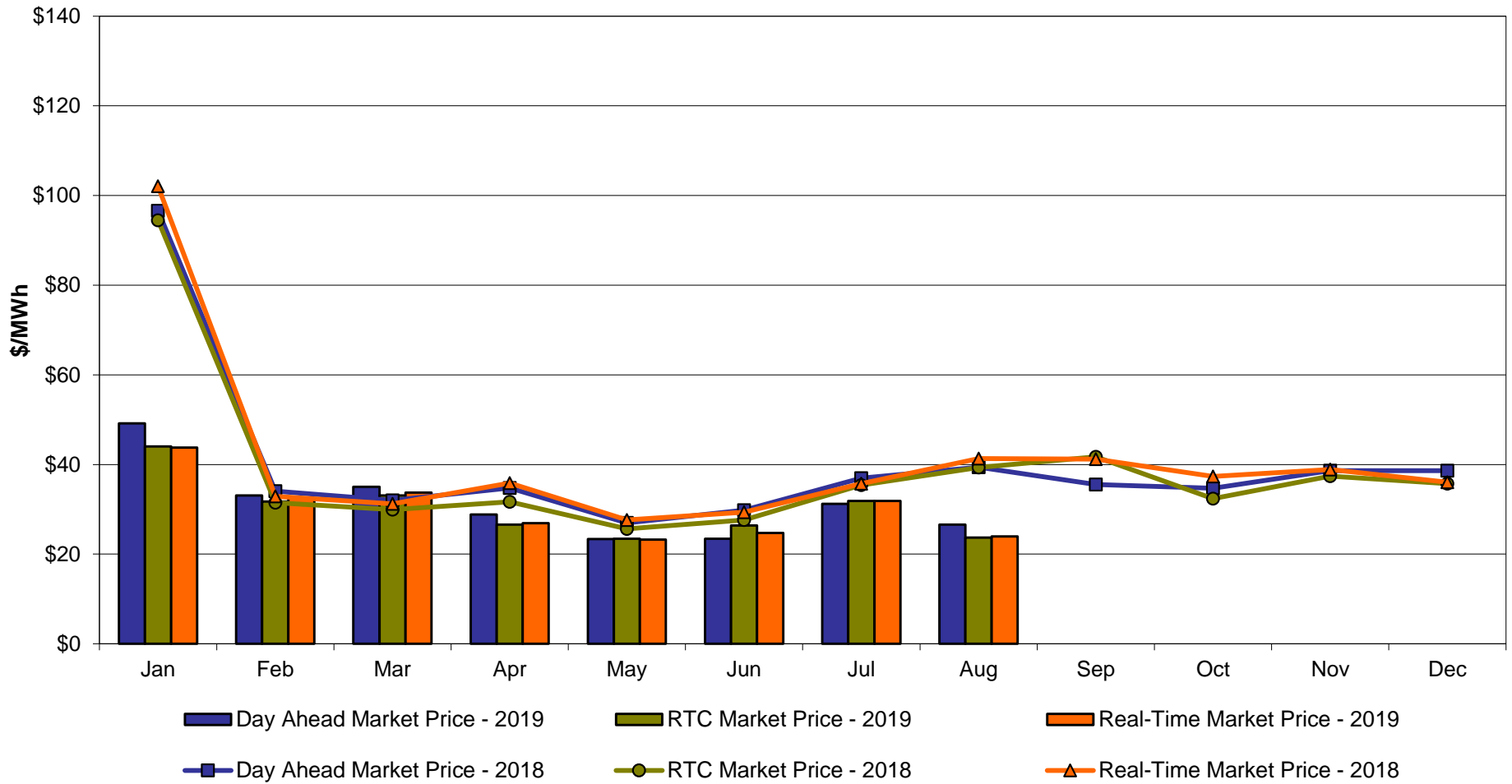
### Capital Zone F Monthly Average LBMP Prices 2018 - 2019



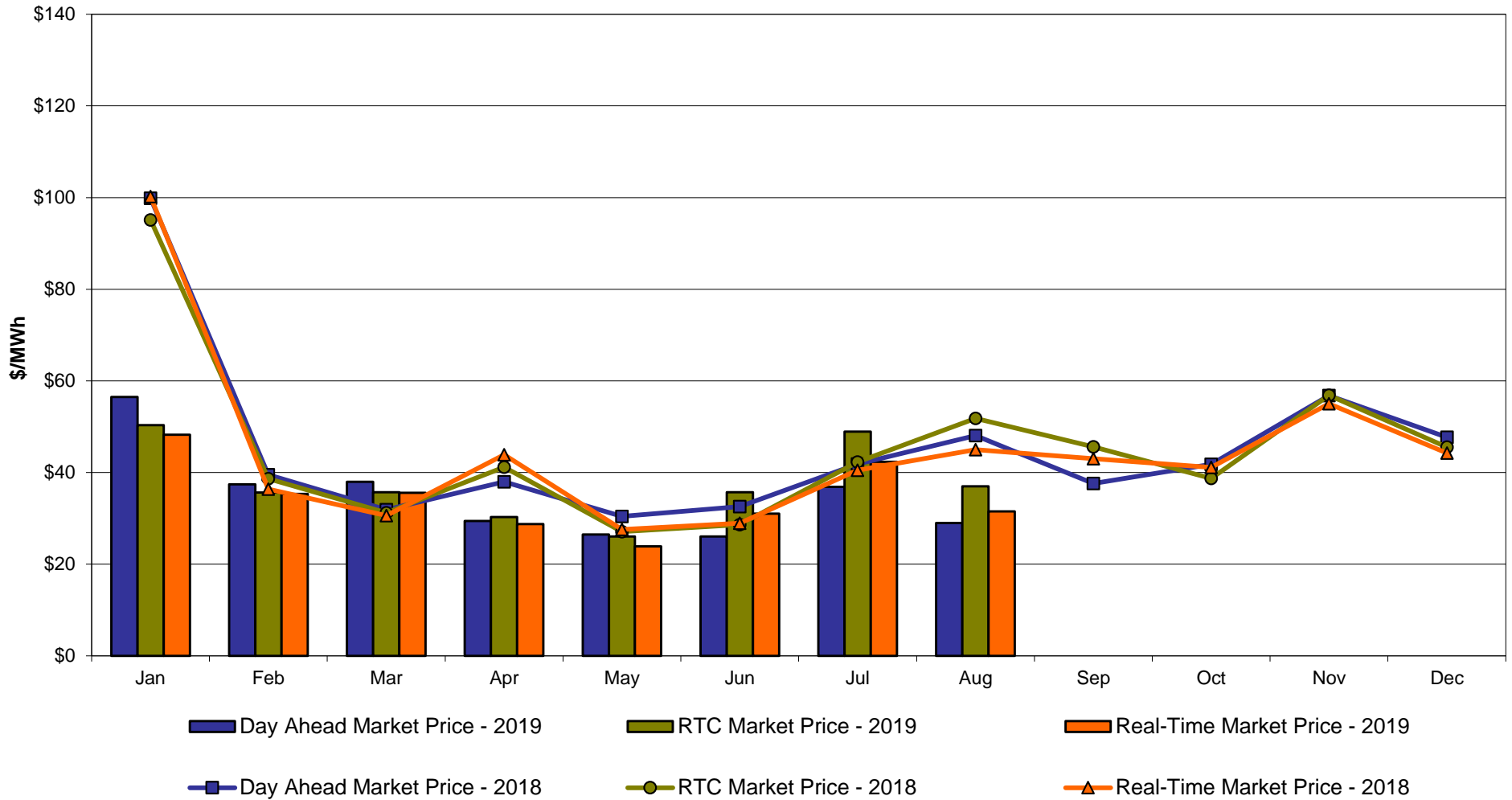
### Hudson Valley Zone G Monthly Average LBMP Prices 2018 - 2019



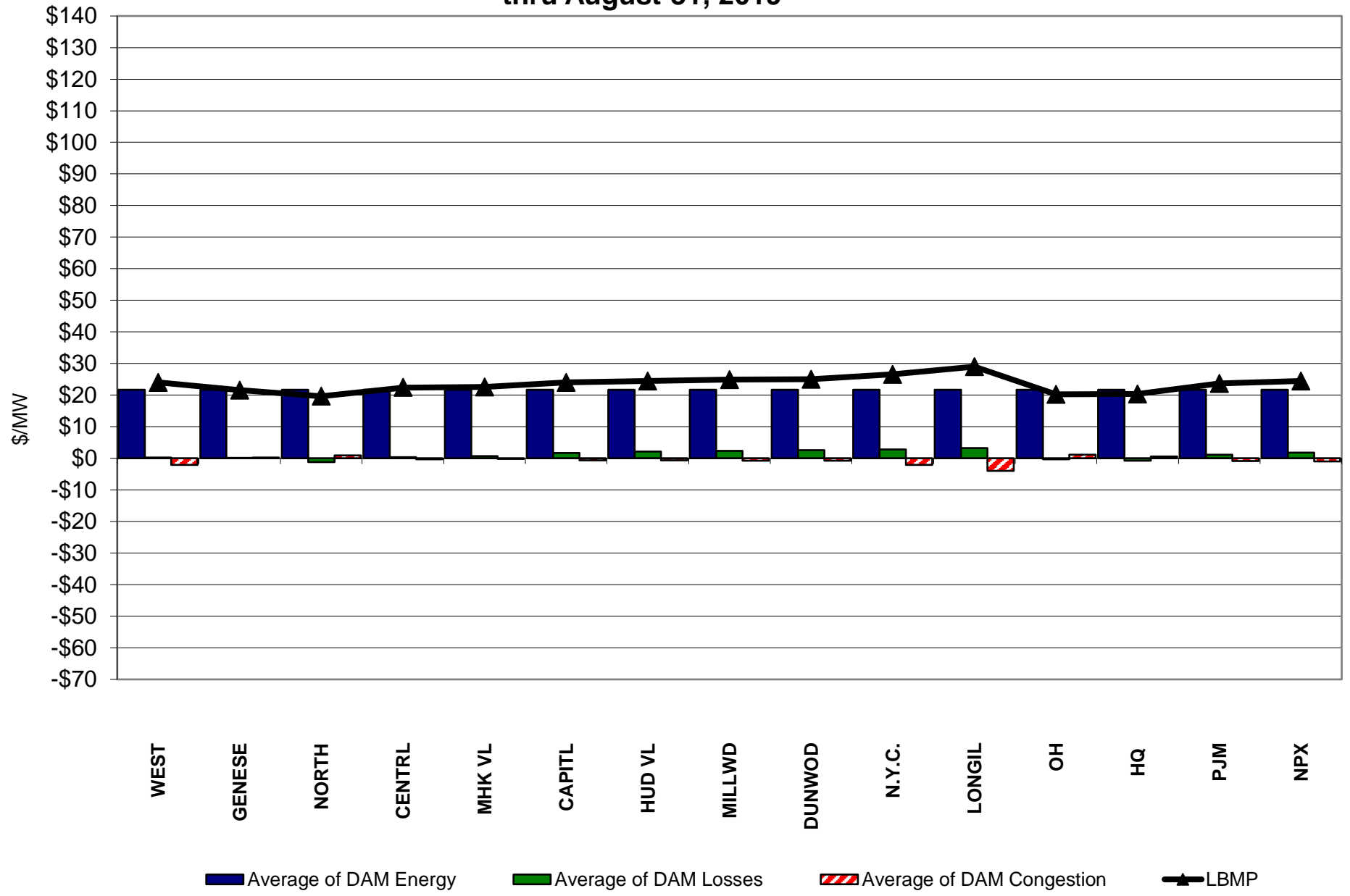
## NYC Zone J Monthly Average LBMP Prices 2018 - 2019



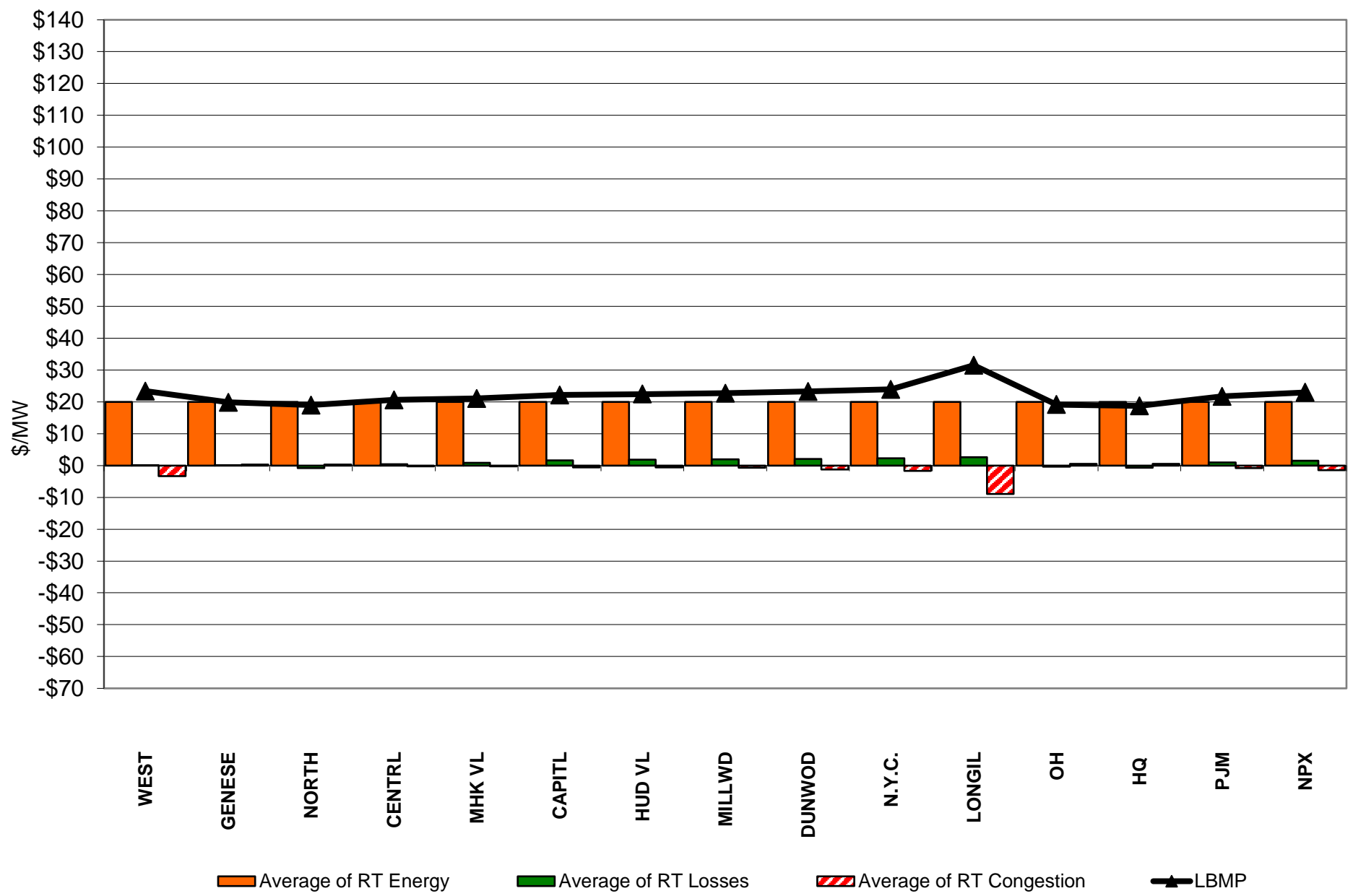
## Long Island Zone K Monthly Average LBMP Prices 2018 - 2019



**DAM Zonal Unweighted Monthly Average LBMP Components  
thru August 31, 2019**

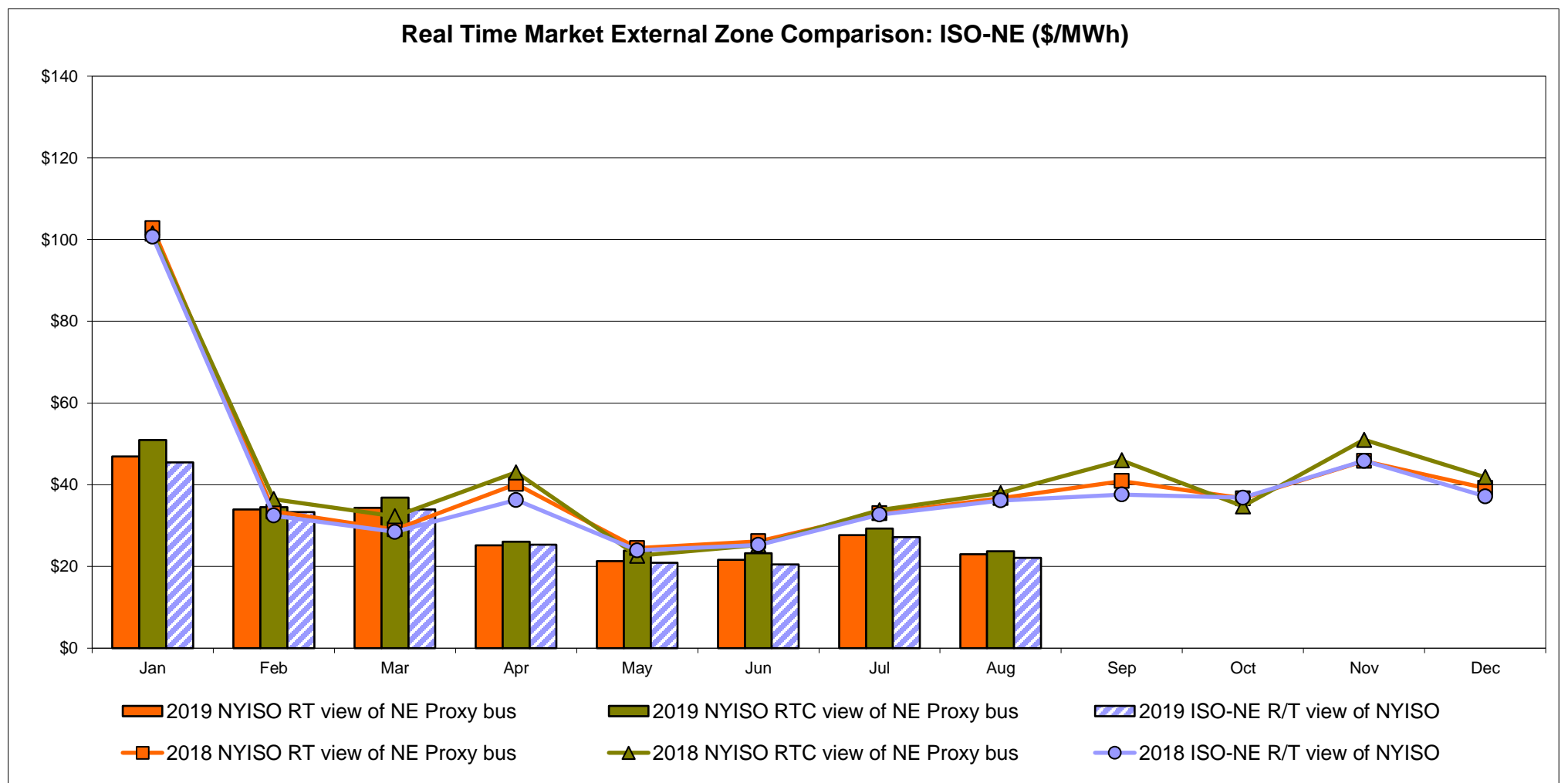
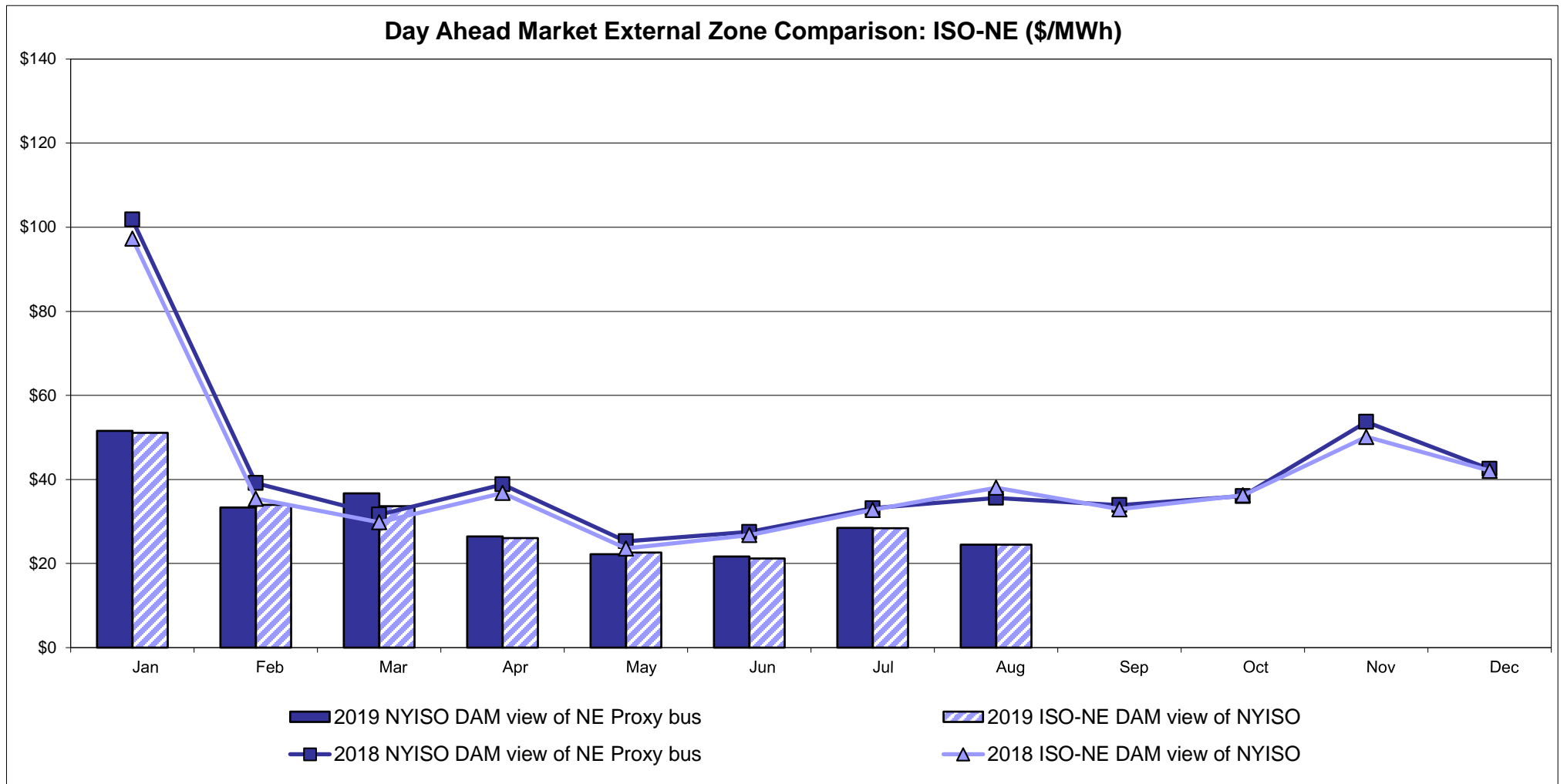


**RT Zonal Unweighted Monthly Average LBMP Components  
thru August 31, 2019**



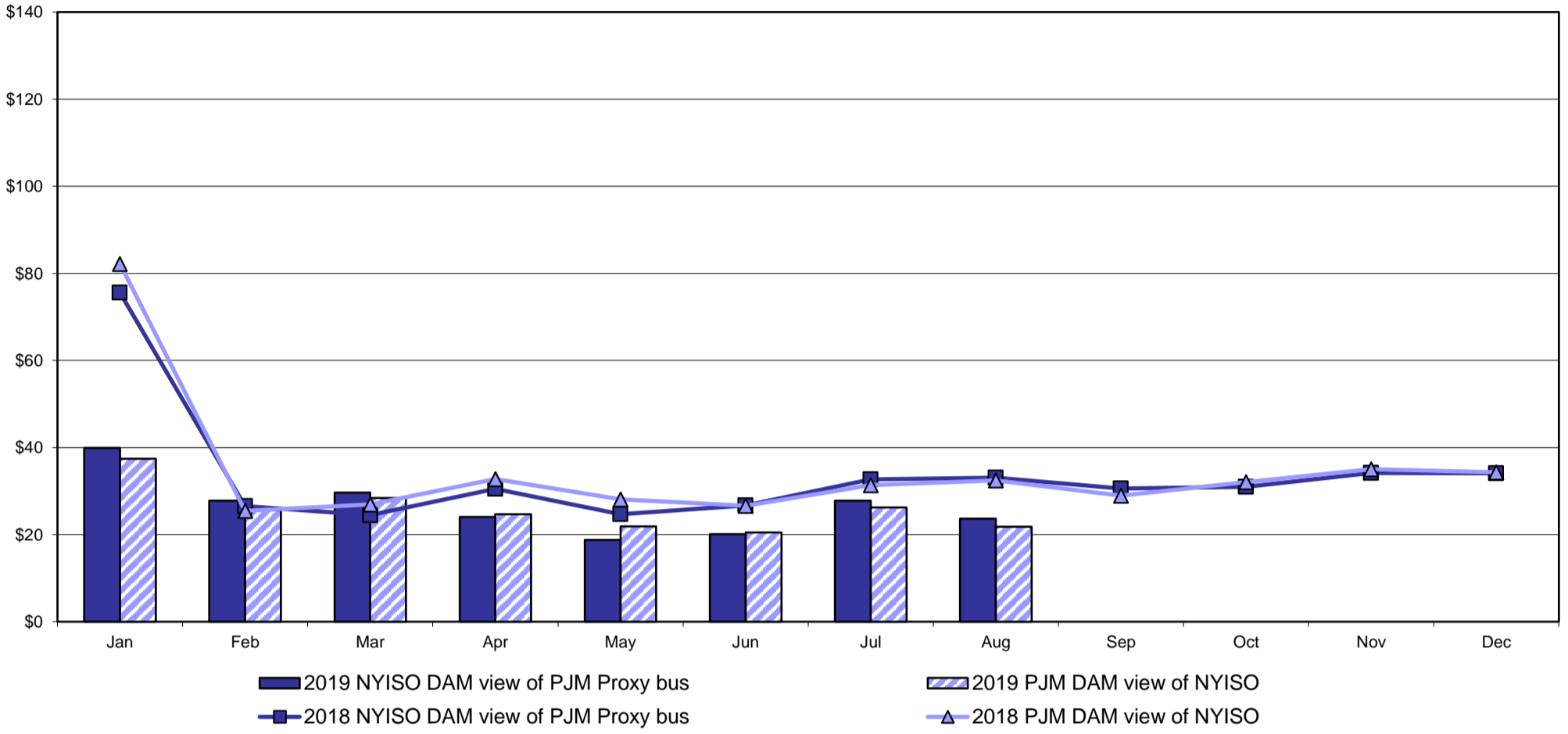


# External Comparison ISO-New England

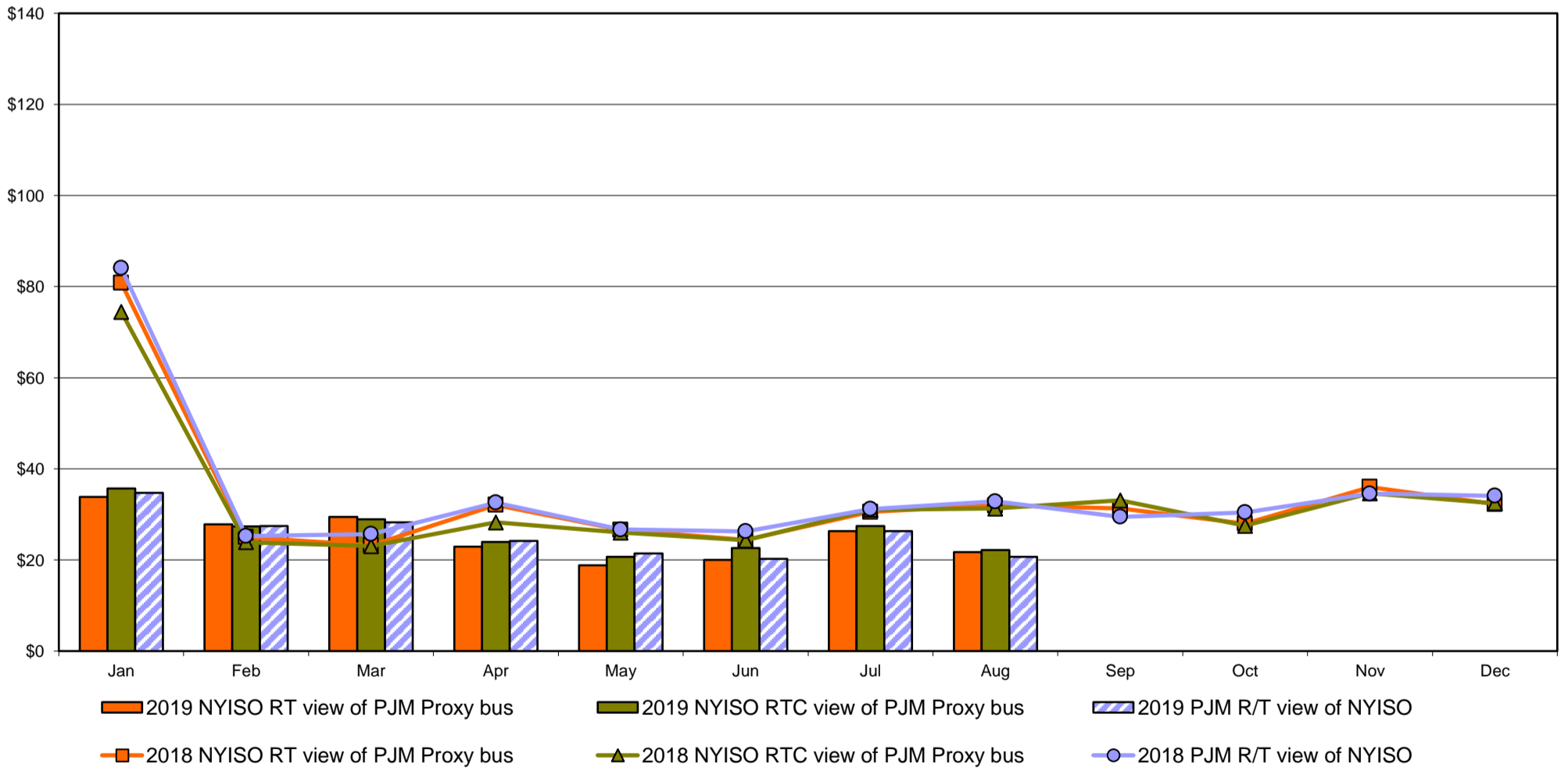


# External Comparison PJM

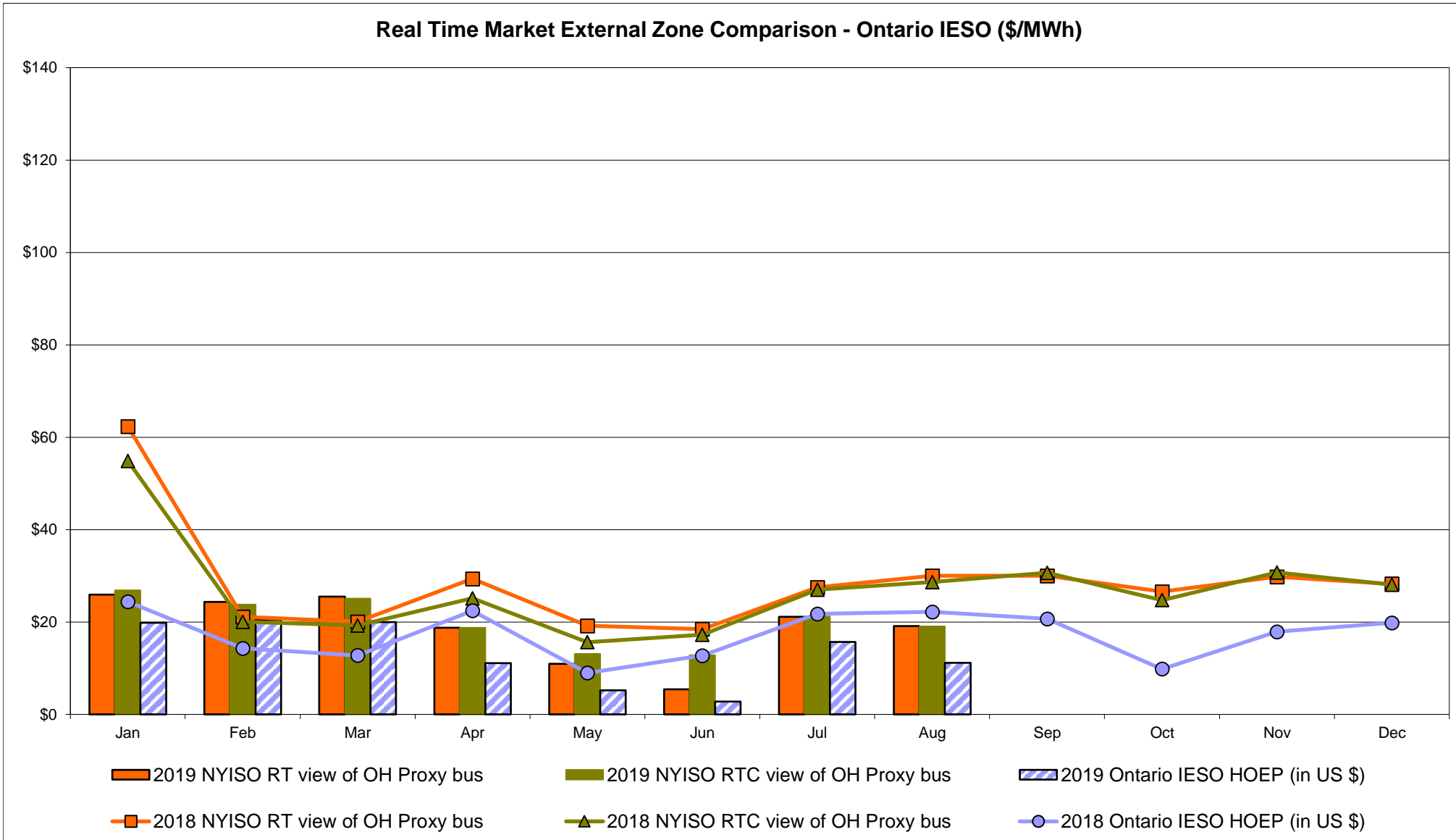
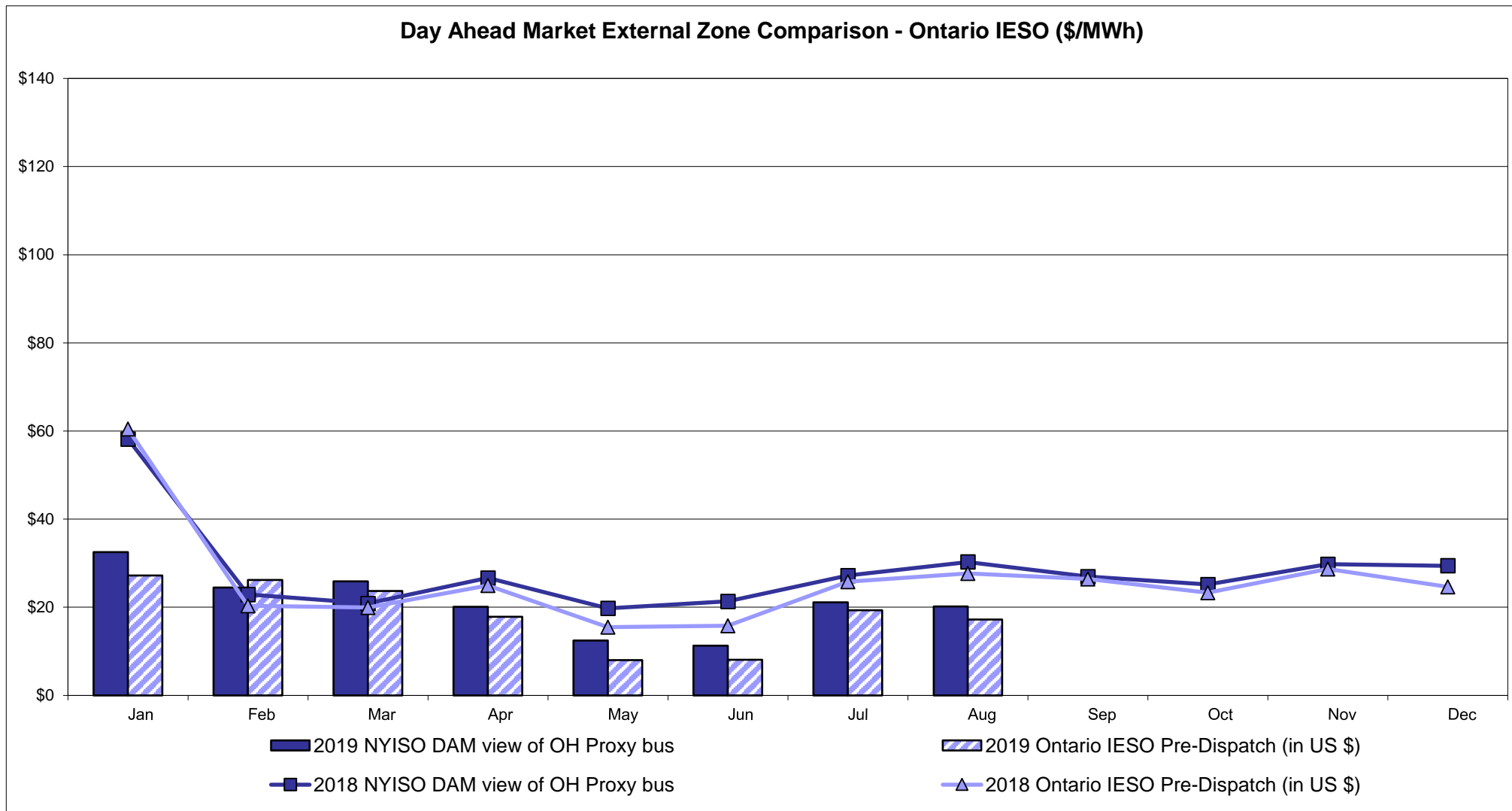
## Day Ahead Market External Zone Comparison - PJM (\$/MWh)



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

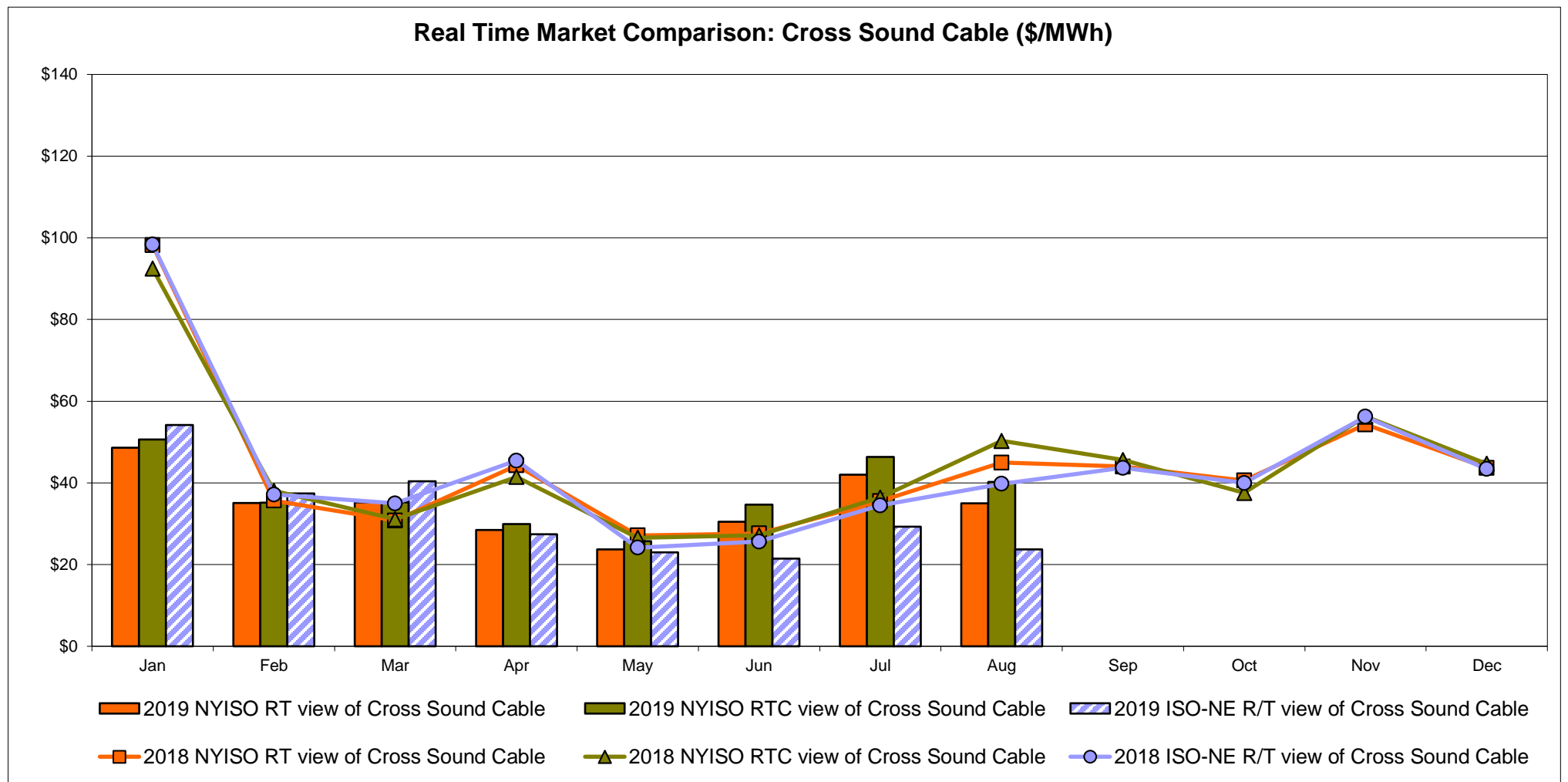
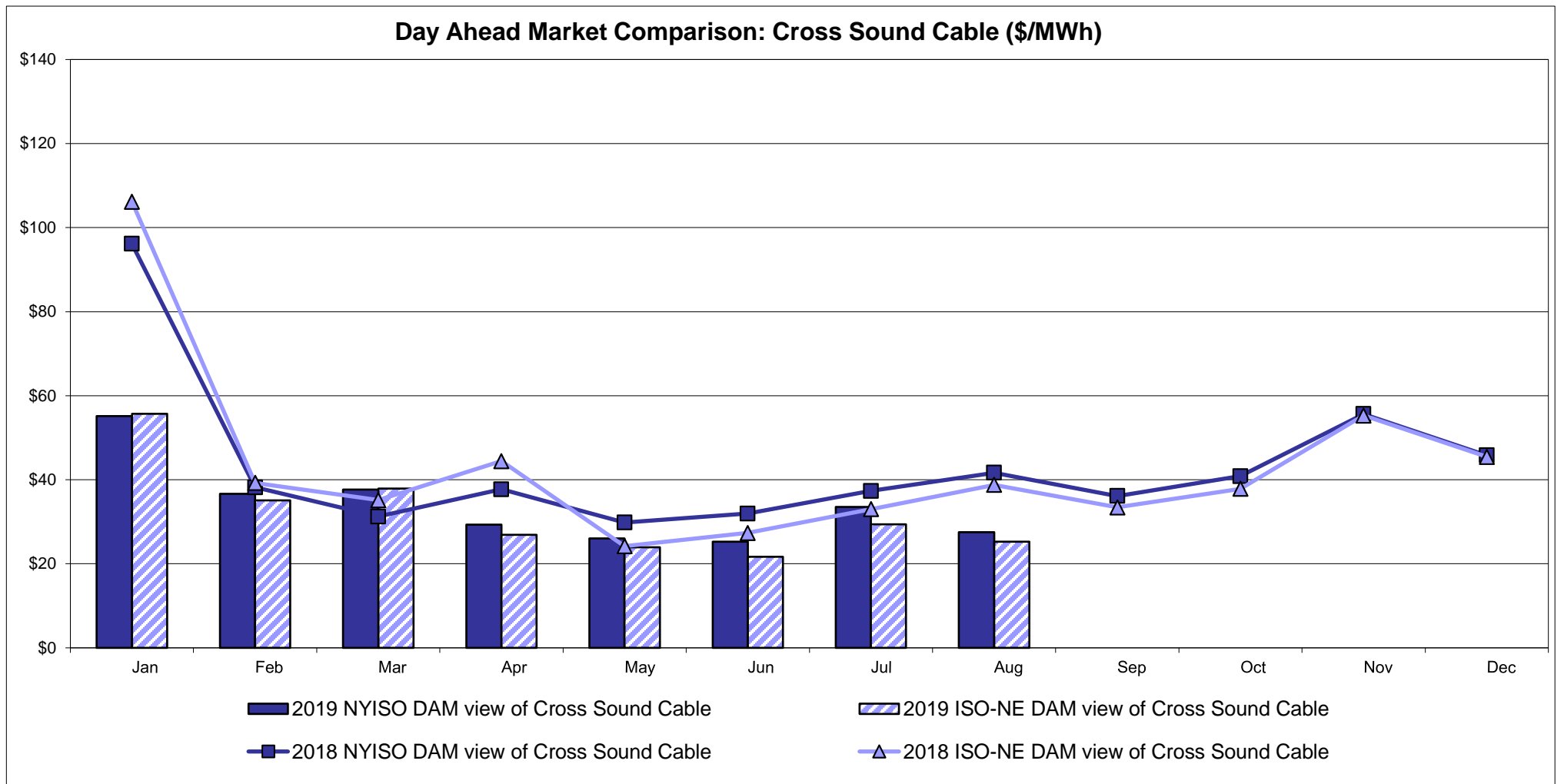


# External Comparison Ontario IESO



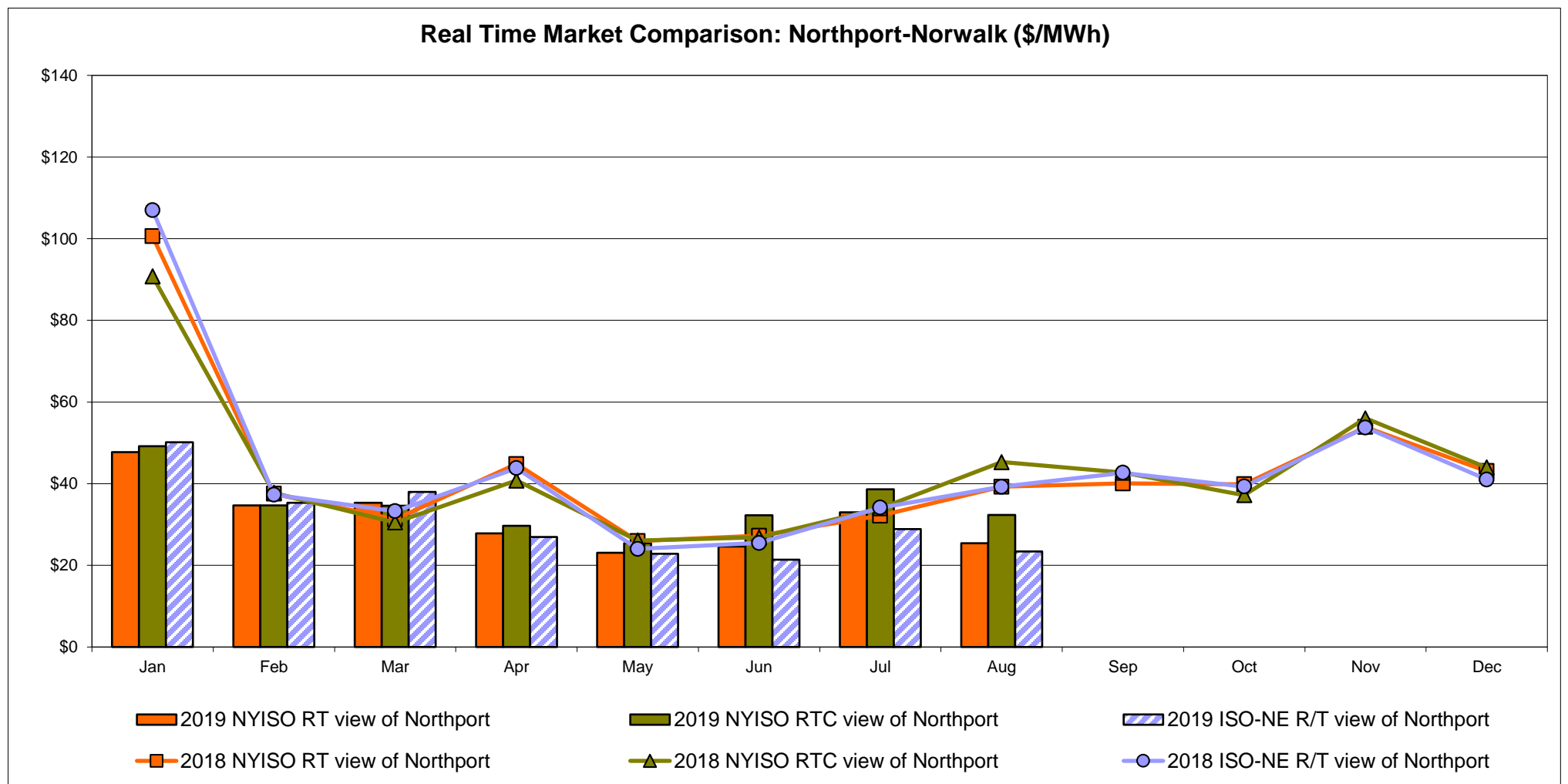
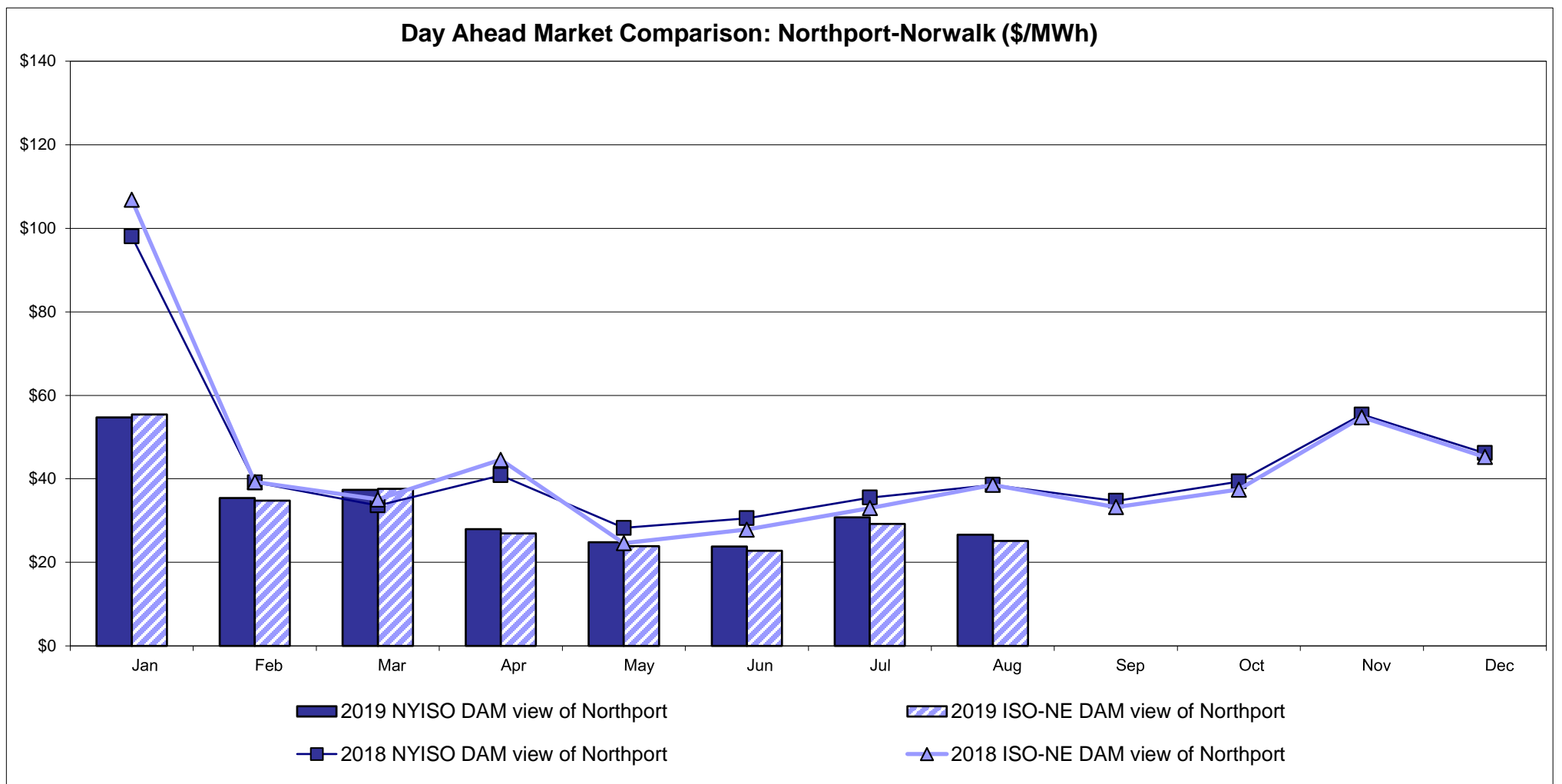
Notes: Exchange factor used for August 2019 was 0.75340917652377 to US  
 HOEP: Hourly Ontario Energy Price  
 Pre-Dispatch: Projected Energy Price

# 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.

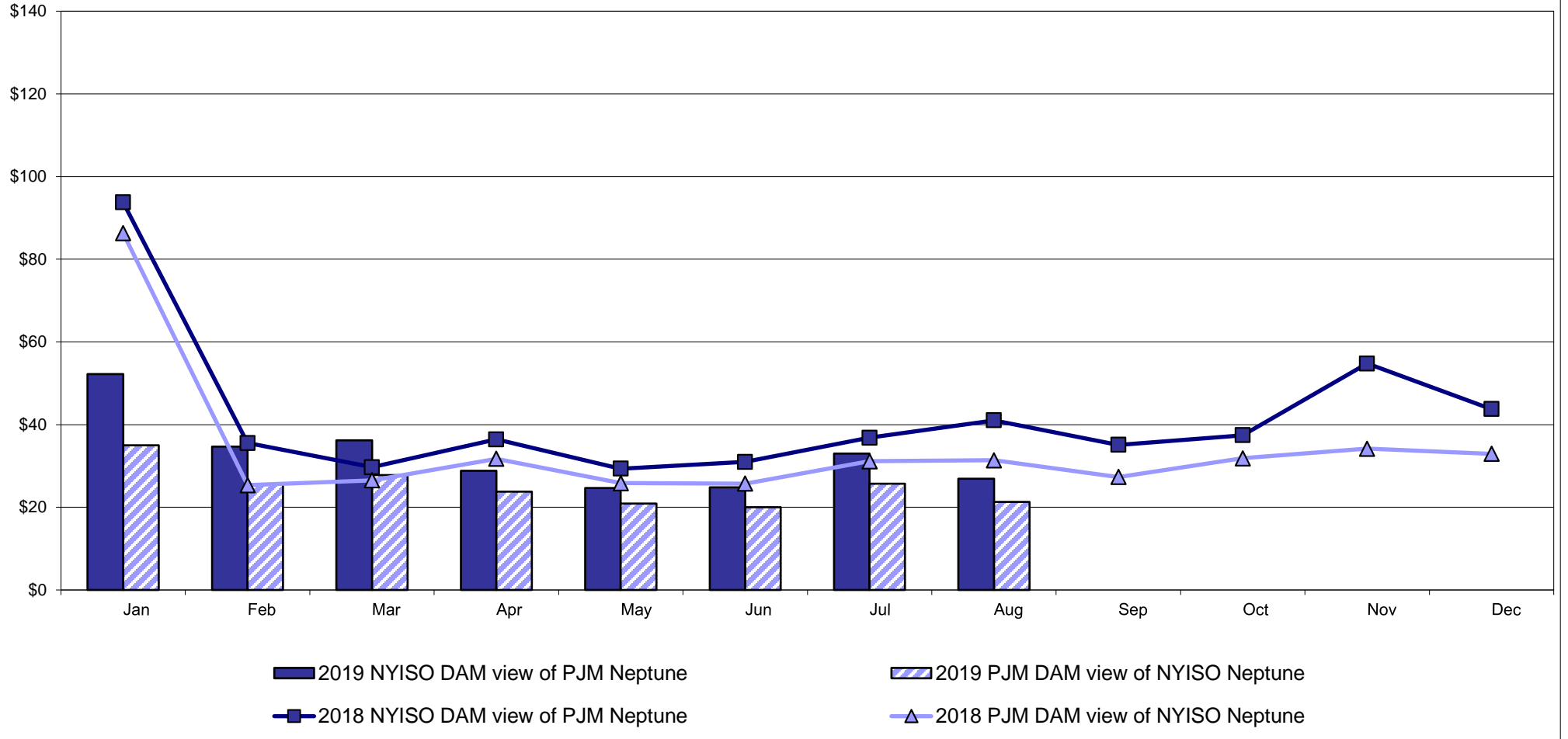
# External Controllable Line: Northport - Norwalk (New England)



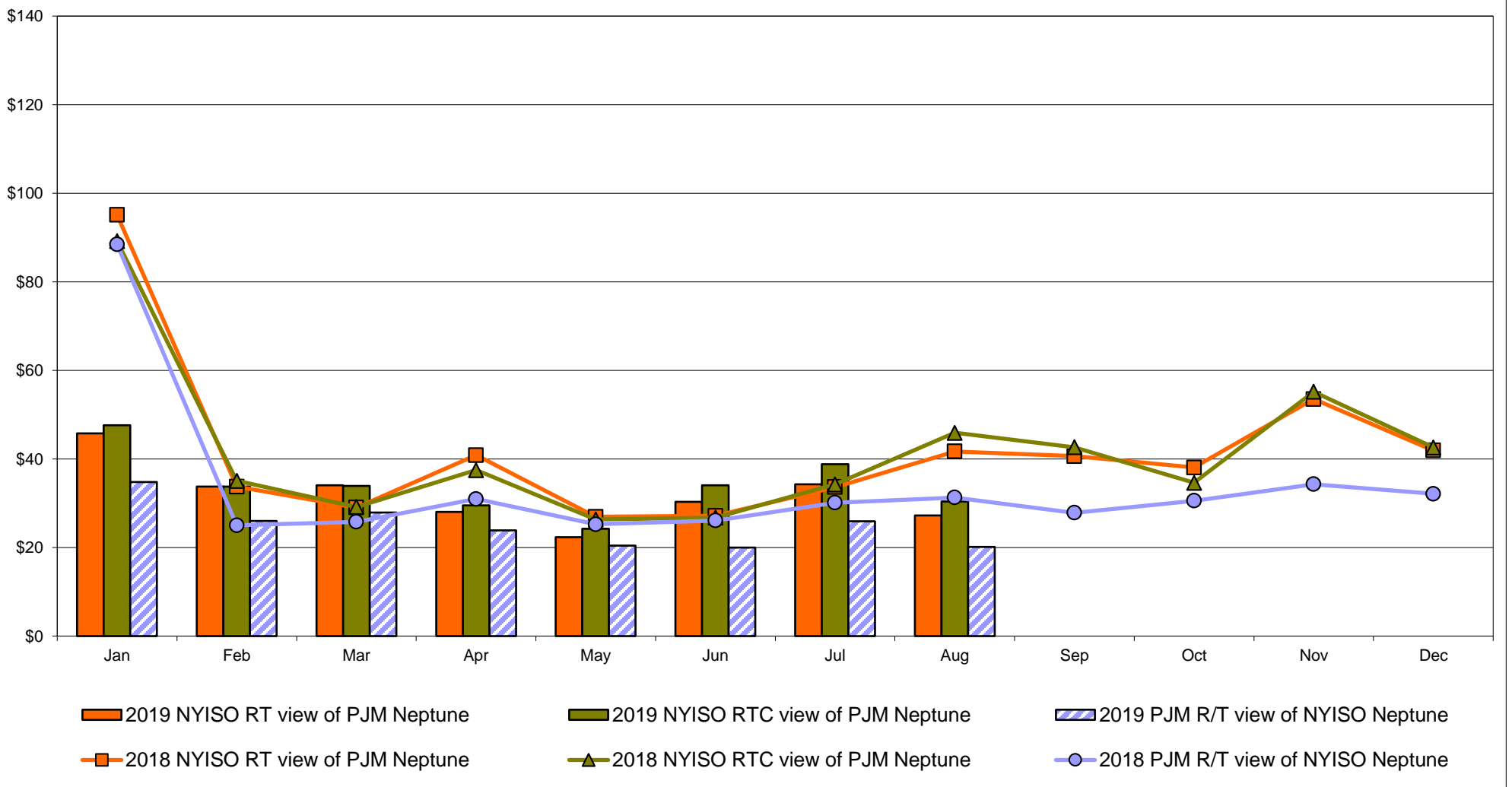
Note:  
 ISO-NE Forecast is an advisory posting @ 18:00 day before.  
 The DAM and R/T prices at the Northport 138 interface are used for ISO-NE.  
 The DAM and R/T prices at the 1385 interface are used for NYISO.

# External Controllable Line: Neptune (PJM)

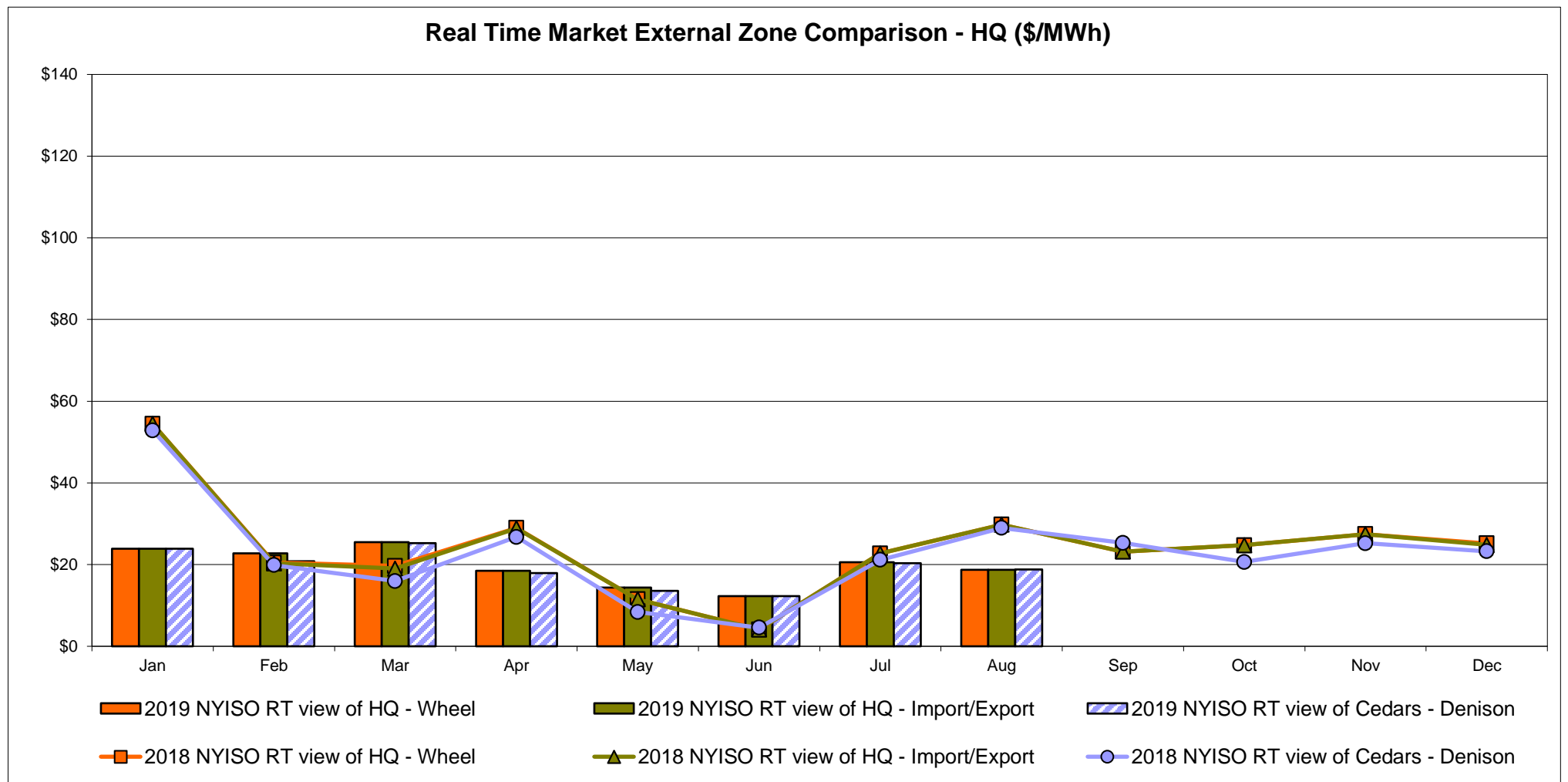
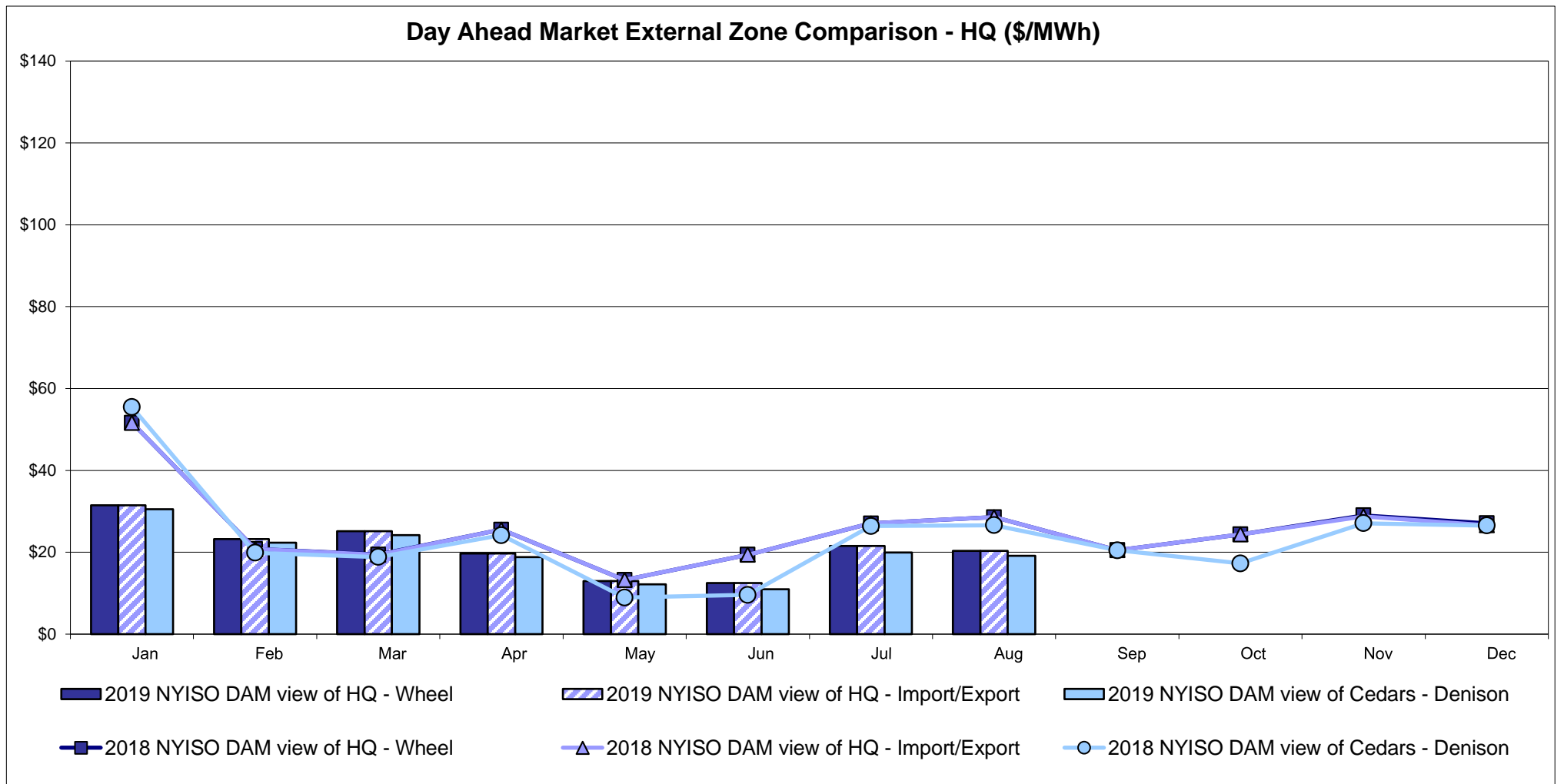
## Day Ahead Market Comparison: Neptune (\$/MWh)



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

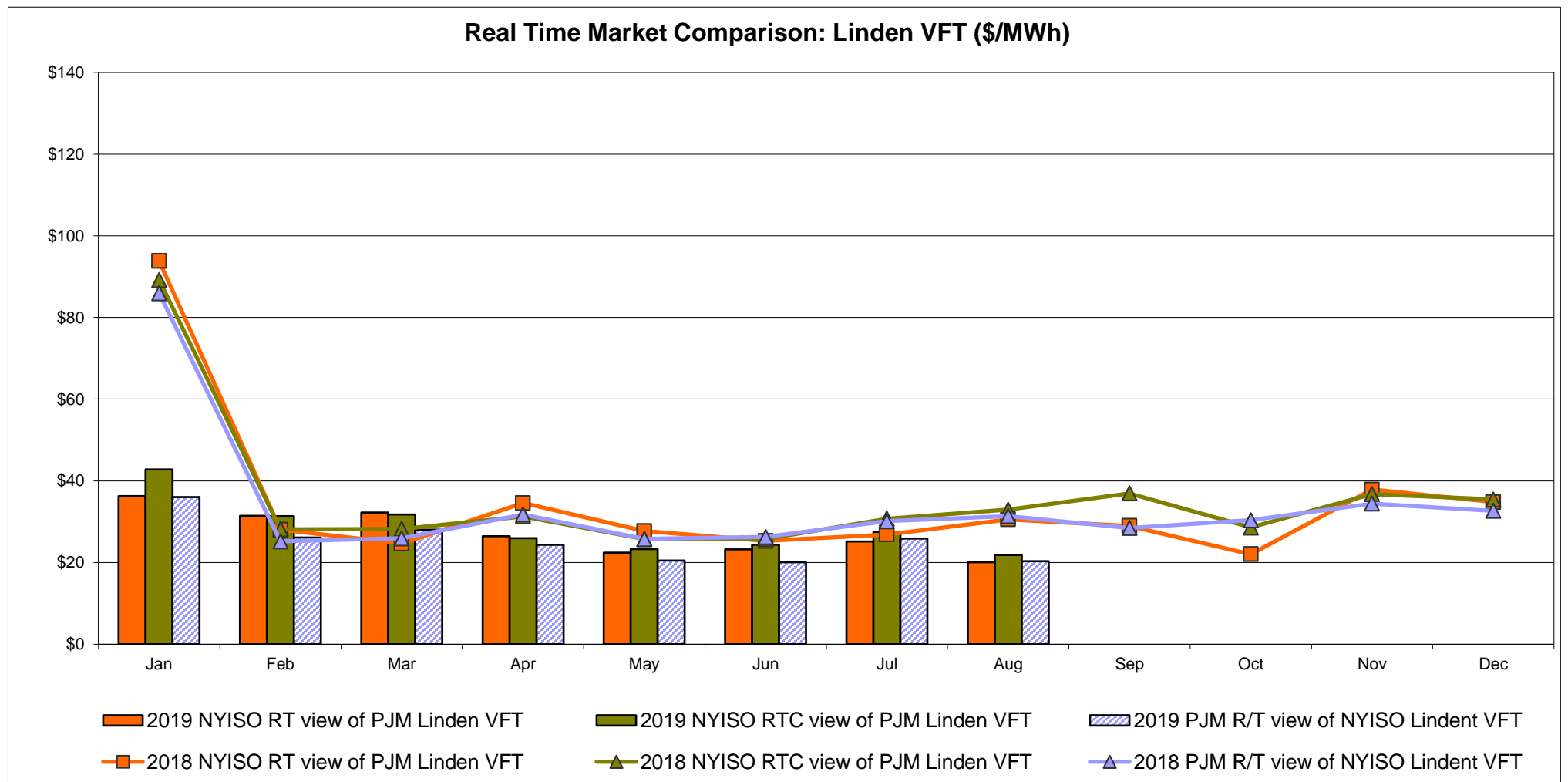
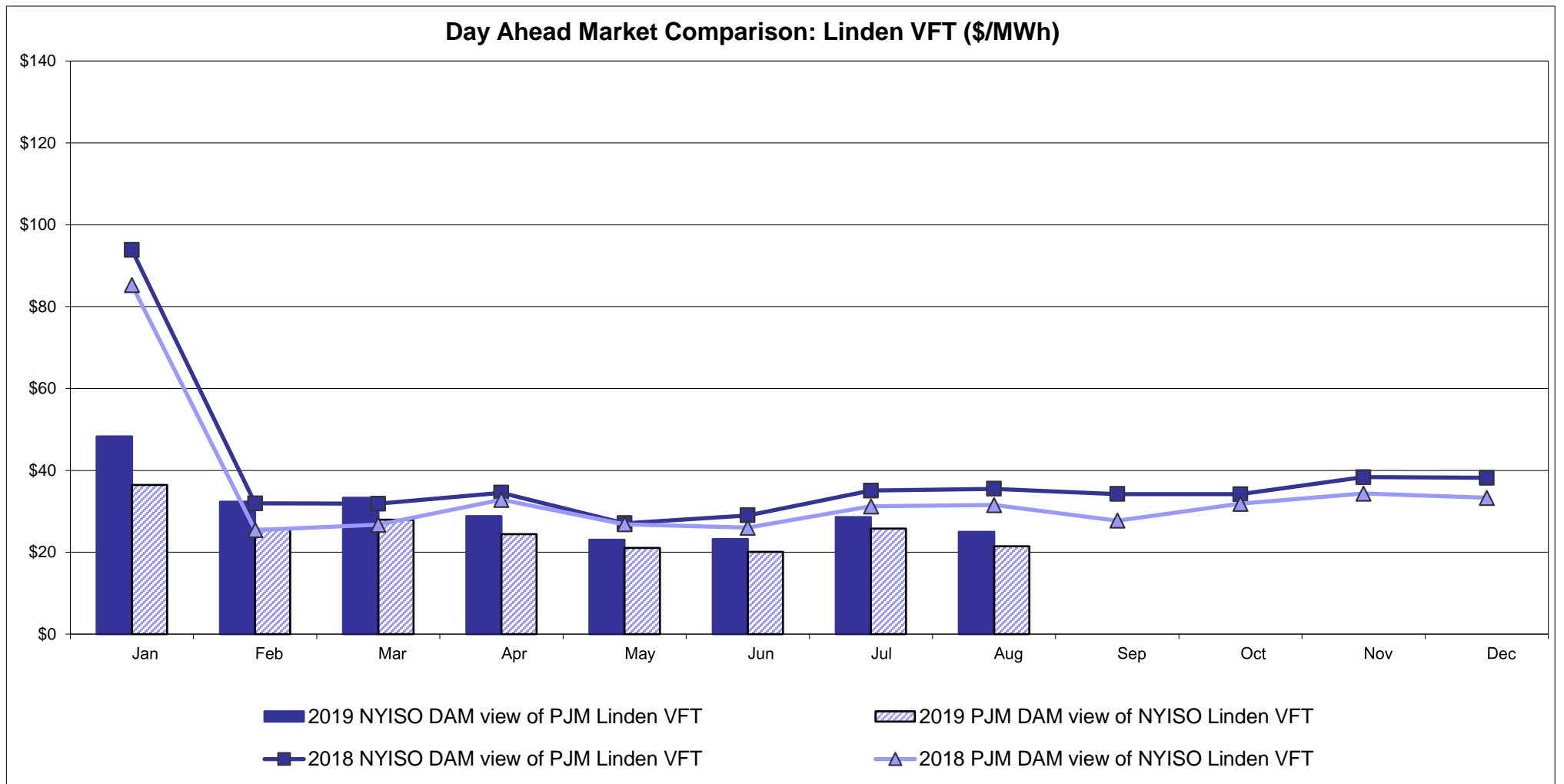


# External Comparison Hydro-Quebec



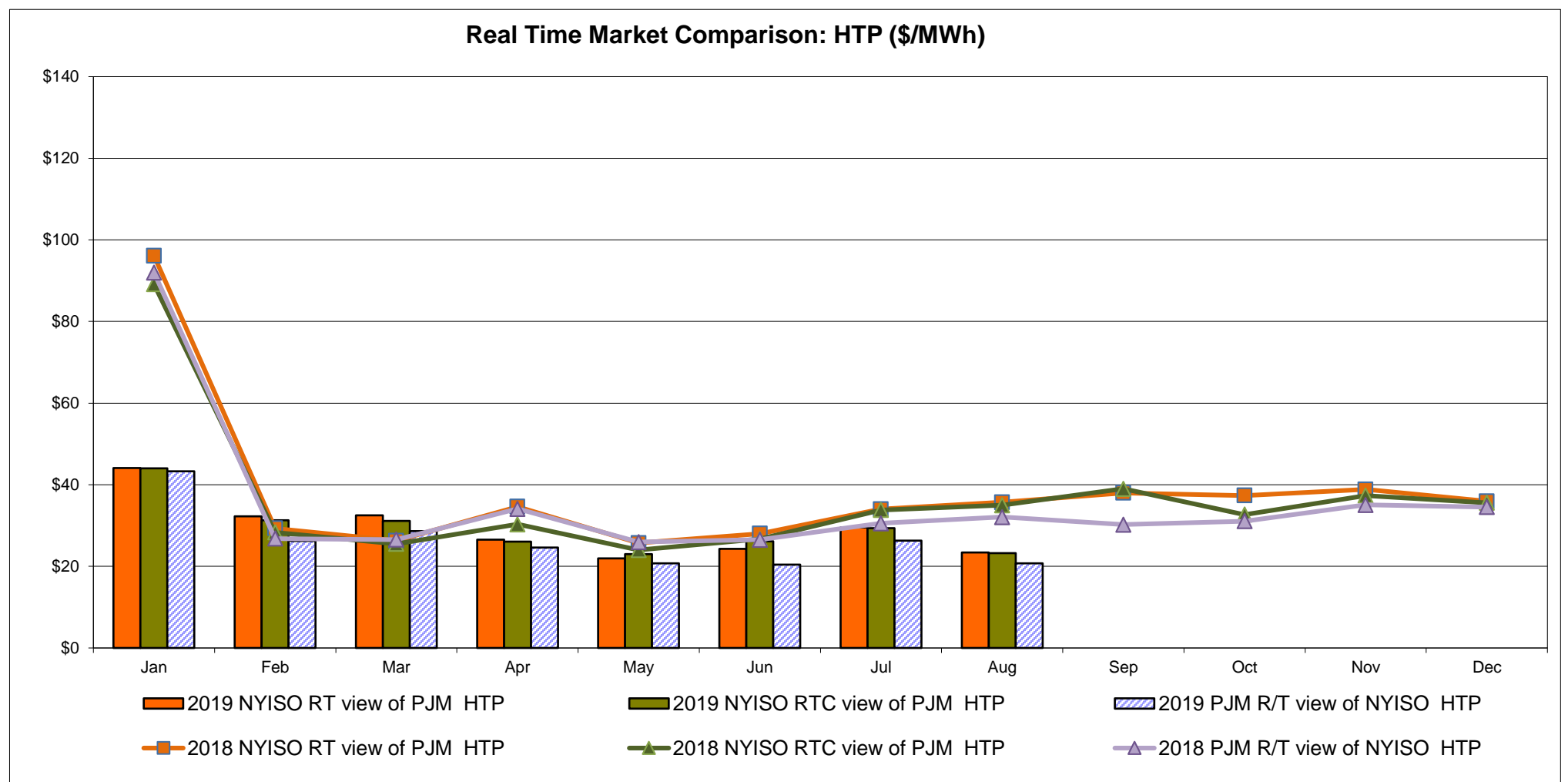
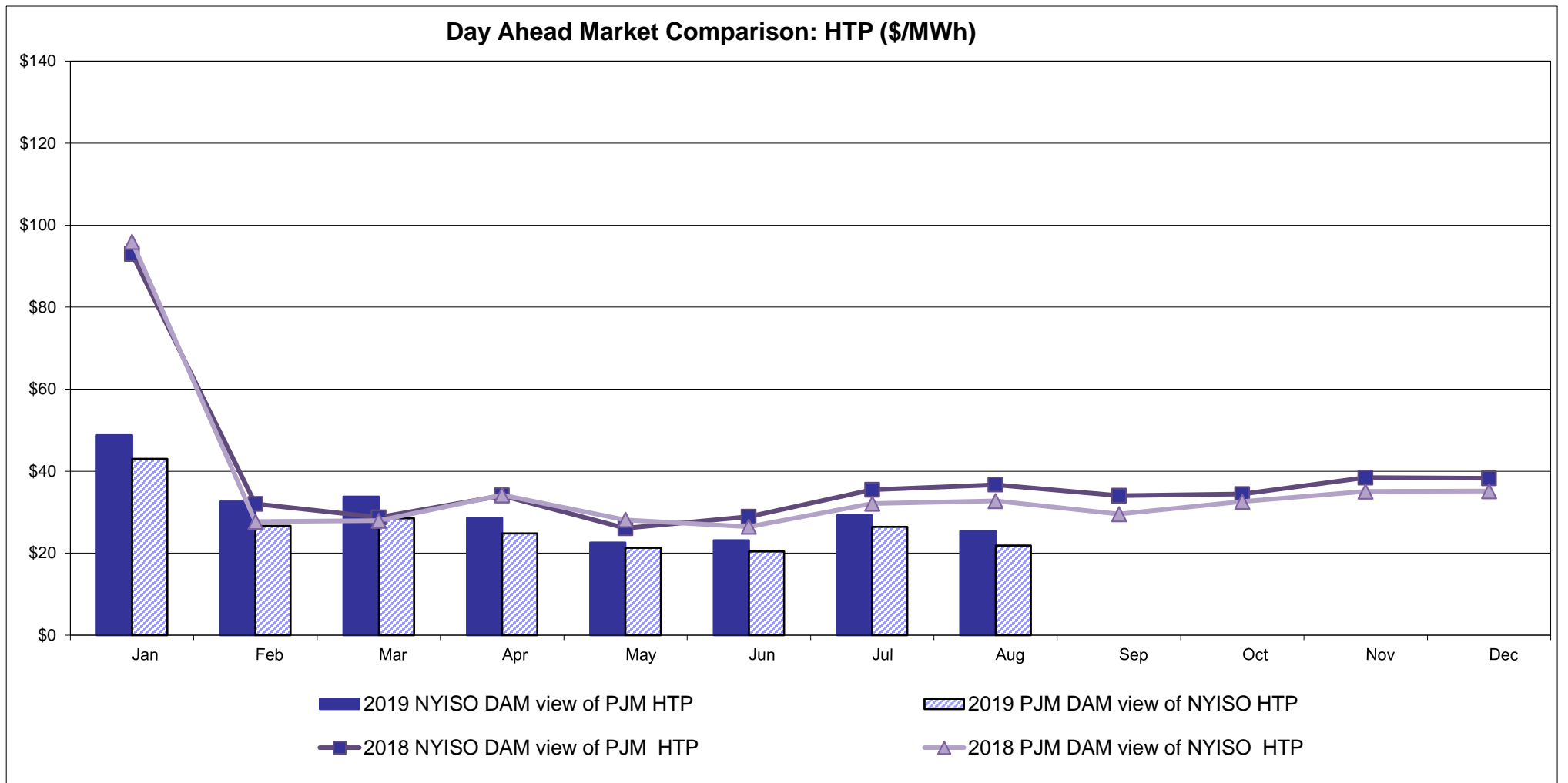
Note:  
Hydro-Quebec Prices are unavailable.

# External Controllable Line: Linden VFT (PJM)





## External Controllable Line: Hudson (PJM)

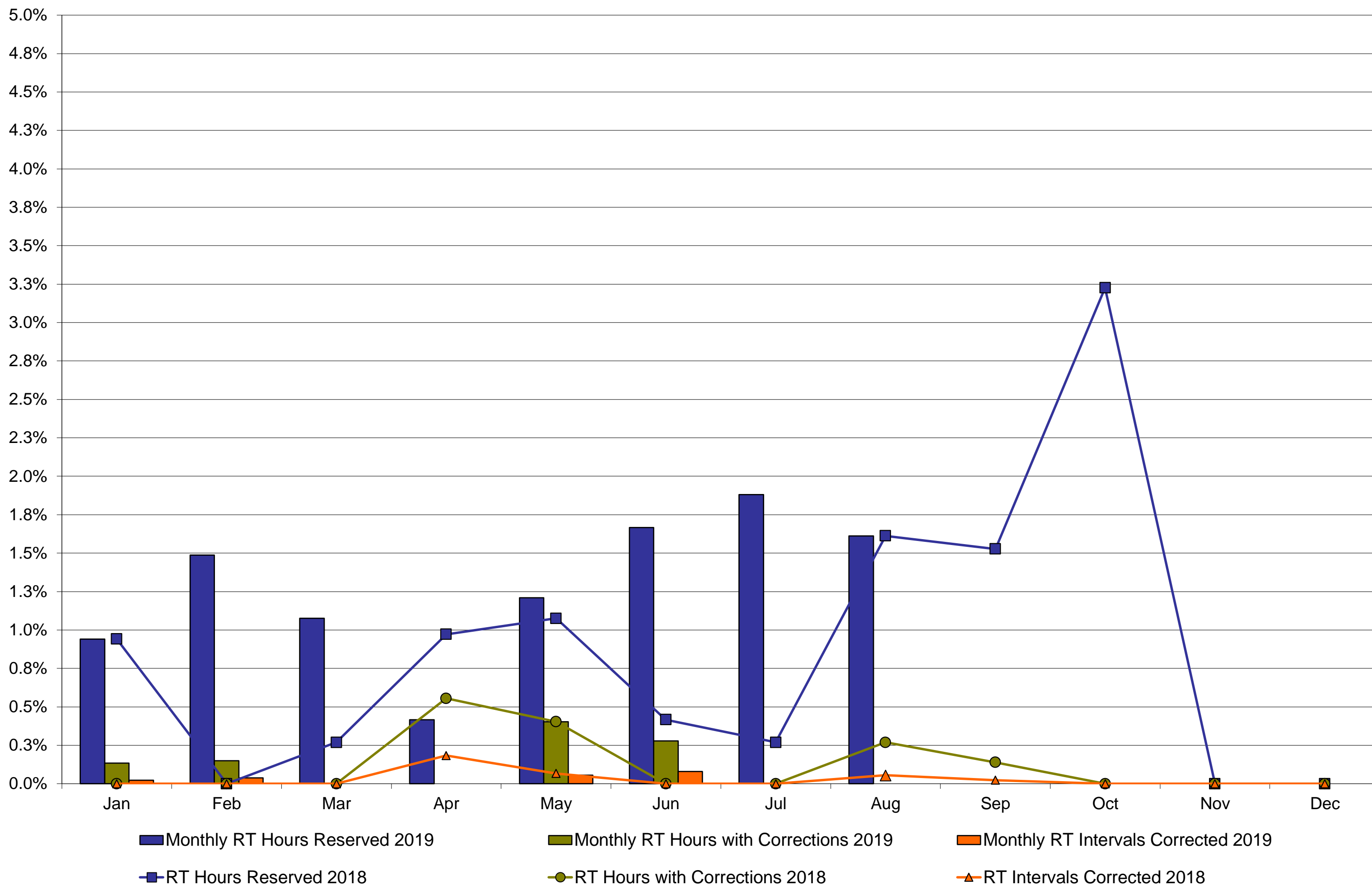


### NYISO Real Time Price Correction Statistics

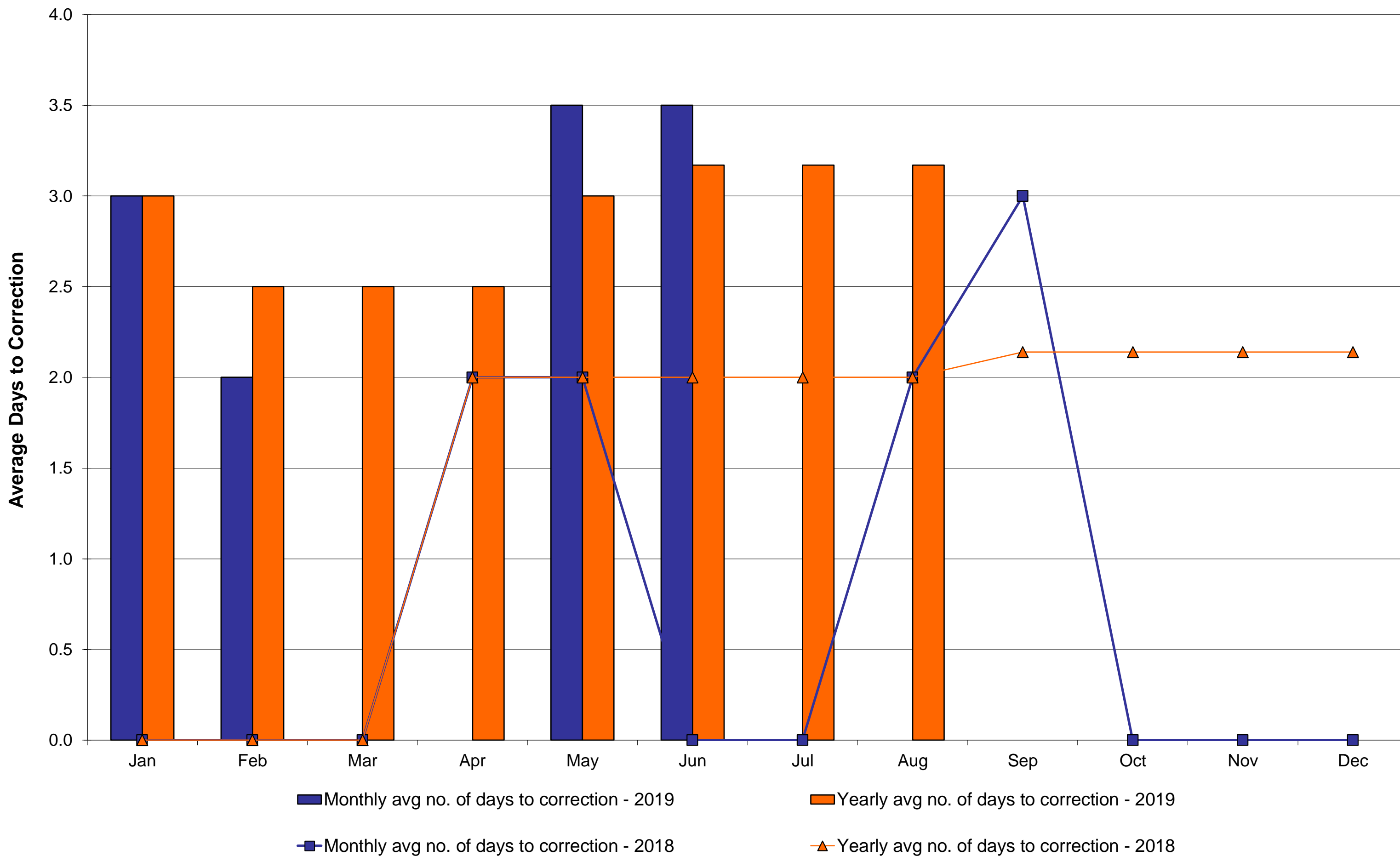
<b>2019</b>		<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<b>Hour Corrections</b>													
Number of hours with corrections	in the month	1	1	0	0	3	2	0	0				
Number of hours	in the month	744	672	743	720	744	720	744	744				
% of hours with corrections	in the month	0.13%	0.15%	0.00%	0.00%	0.40%	0.28%	0.00%	0.00%				
% of hours with corrections	year-to-date	0.13%	0.14%	0.09%	0.07%	0.14%	0.16%	0.14%	0.12%				
<b>Interval Corrections</b>													
Number of intervals corrected	in the month	2	3	0	0	5	7	0	0				
Number of intervals	in the month	9,071	8,131	9,008	8,750	9,033	8,863	9,243	9,048				
% of intervals corrected	in the month	0.02%	0.04%	0.00%	0.00%	0.06%	0.08%	0.00%	0.00%				
% of intervals corrected	year-to-date	0.02%	0.03%	0.02%	0.01%	0.02%	0.03%	0.03%	0.02%				
<b>Hours Reserved</b>													
Number of hours reserved	in the month	7	10	8	3	9	12	14	12				
Number of hours	in the month	744	672	743	720	744	720	744	744				
% of hours reserved	in the month	0.94%	1.49%	1.08%	0.42%	1.21%	1.67%	1.88%	1.61%				
% of hours reserved	year-to-date	0.94%	1.20%	1.16%	0.97%	1.02%	1.13%	1.24%	1.29%				
<b>Days to Correction *</b>													
Avg. number of days to correction	in the month	3.00	2.00	0.00	0.00	3.50	3.50	0.00	0.00				
Avg. number of days to correction	year-to-date	3.00	2.50	2.50	2.50	3.00	3.17	3.17	3.17				
<b>Days Without Corrections</b>													
Days without corrections	in the month	30	27	31	30	29	28	31	31				
Days without corrections	year-to-date	30	57	88	118	147	175	206	237				
<b>2018</b>		<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>
<b>Hour Corrections</b>													
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%
<b>Interval Corrections</b>													
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%
<b>Hours Reserved</b>													
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%
<b>Days to Correction *</b>													
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
<b>Days Without Corrections</b>													
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

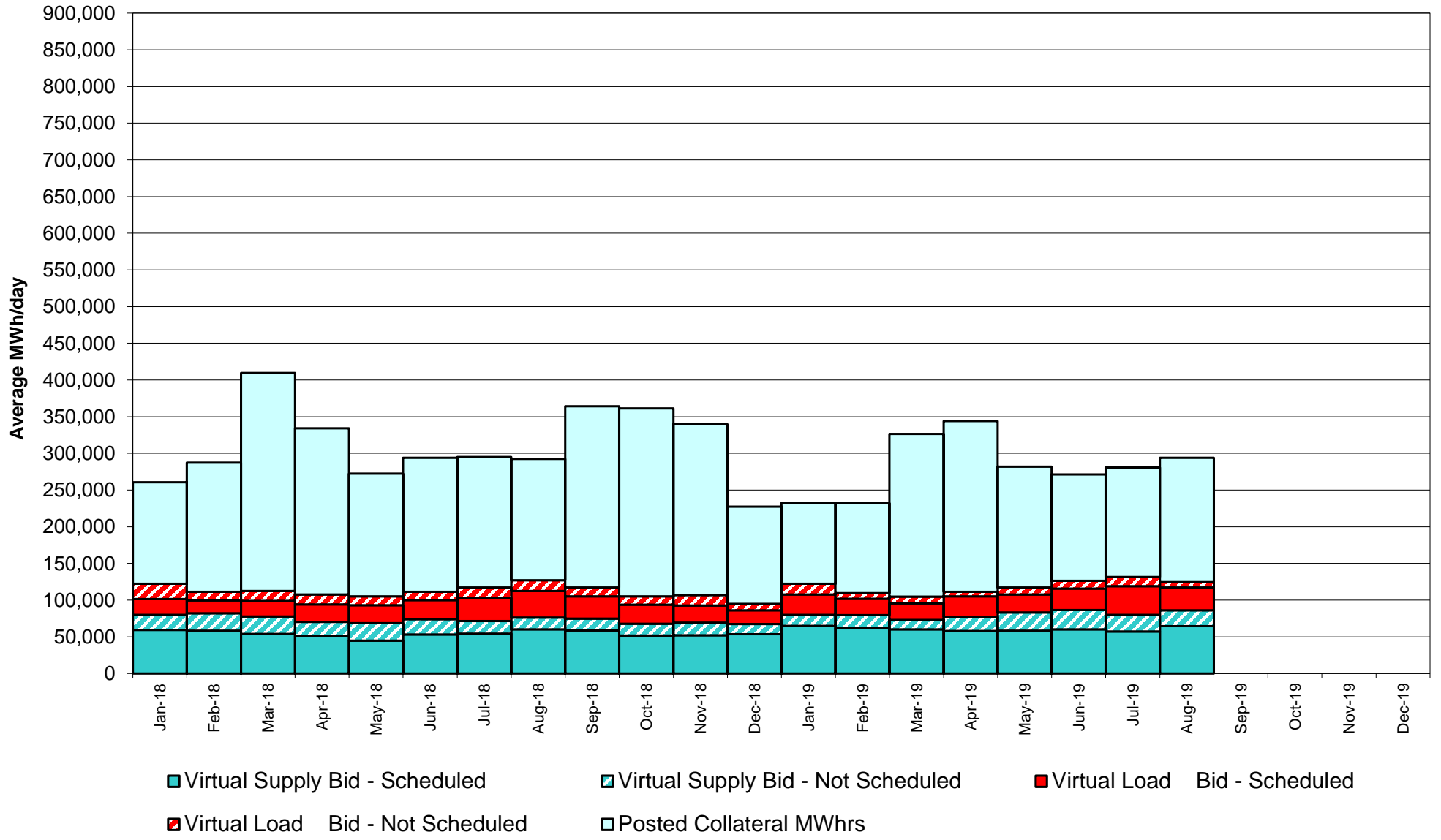


### Annual average time period for making Price Corrections (from reservation date) \*

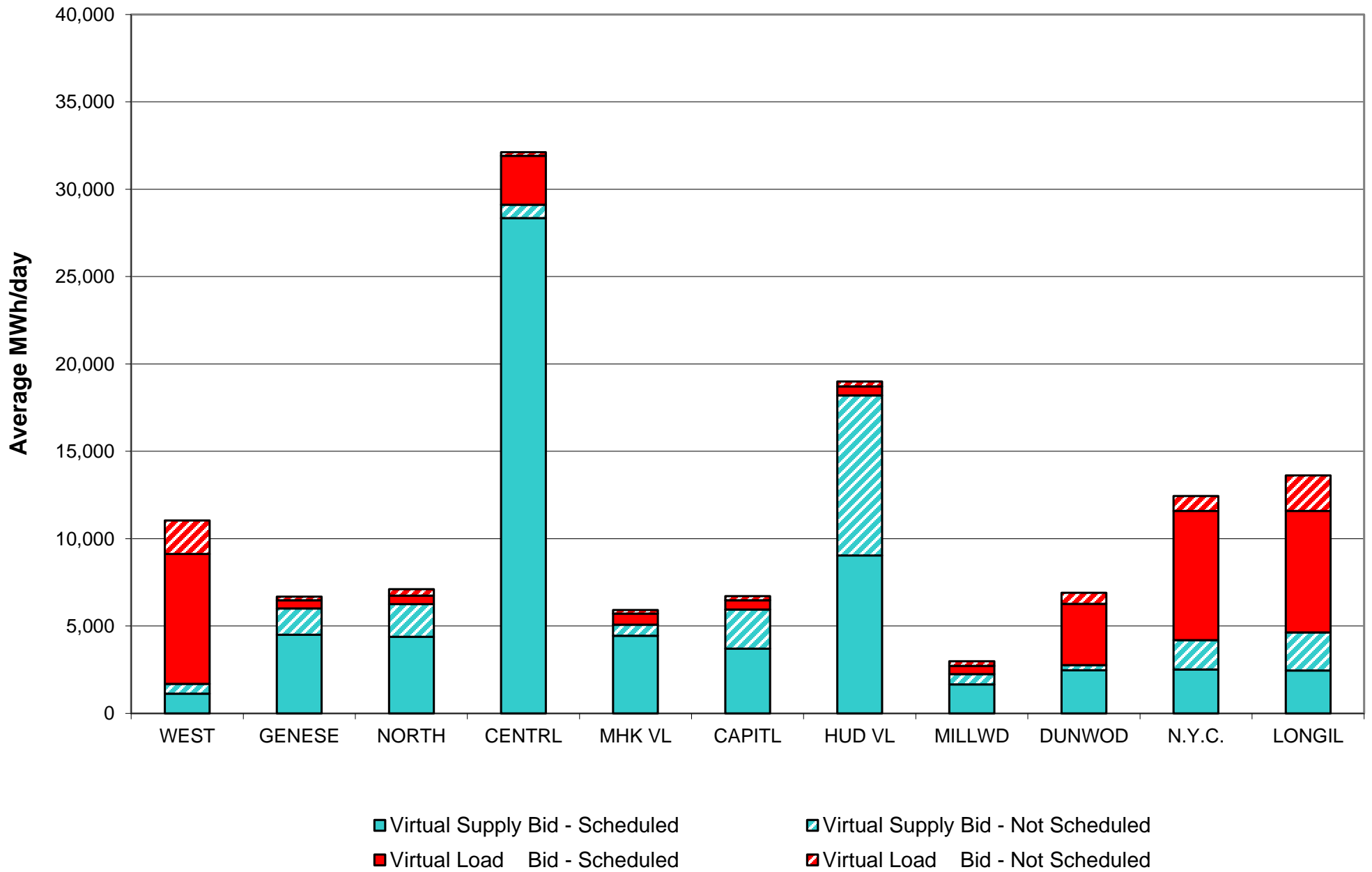


\*Calendar days from reservation date; for June 2018 forward, business days from market date

## NYISO Virtual Trading Average MWh per day



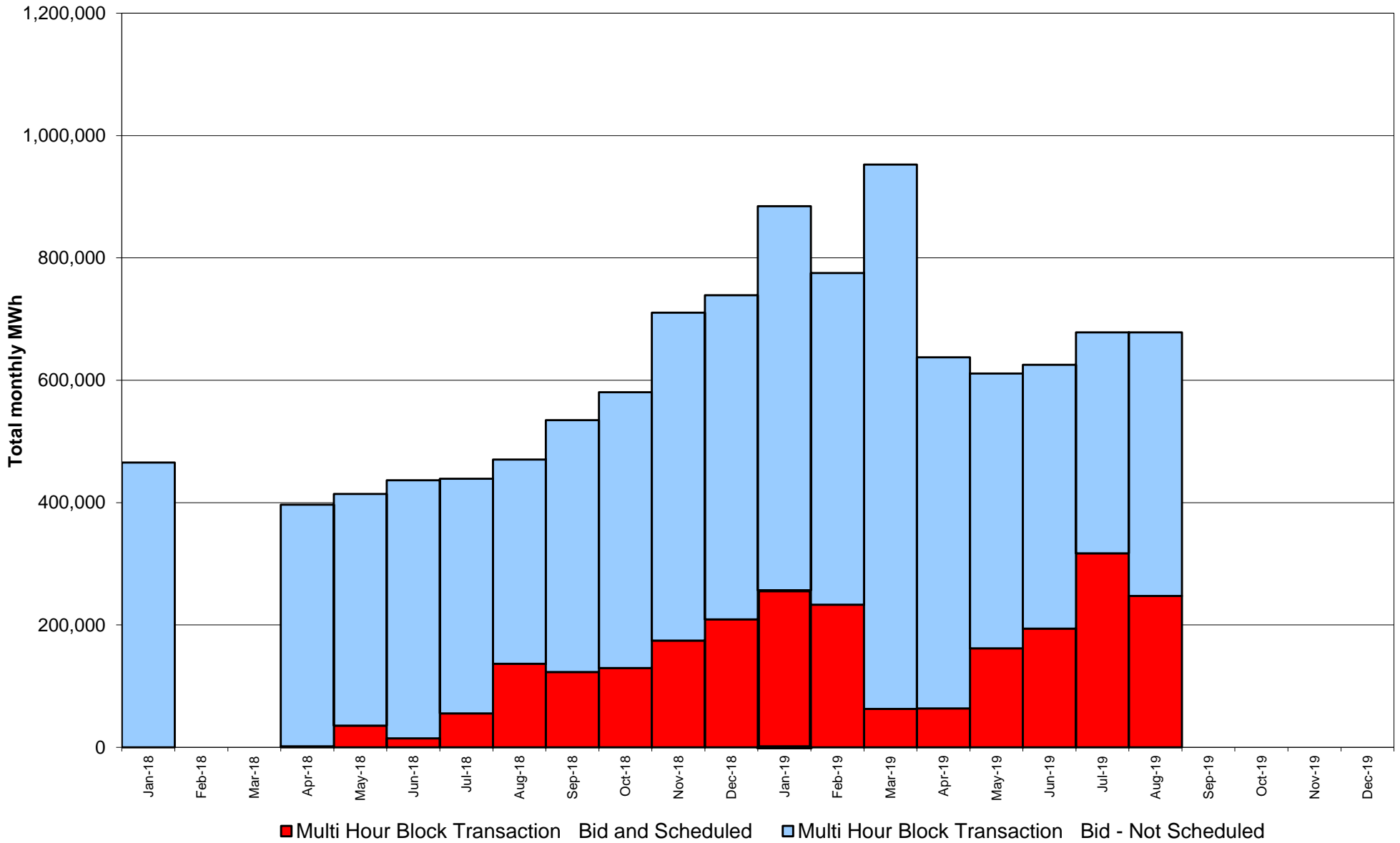
## Virtual Load and Supply Zonal Statistics through August 31, 2019



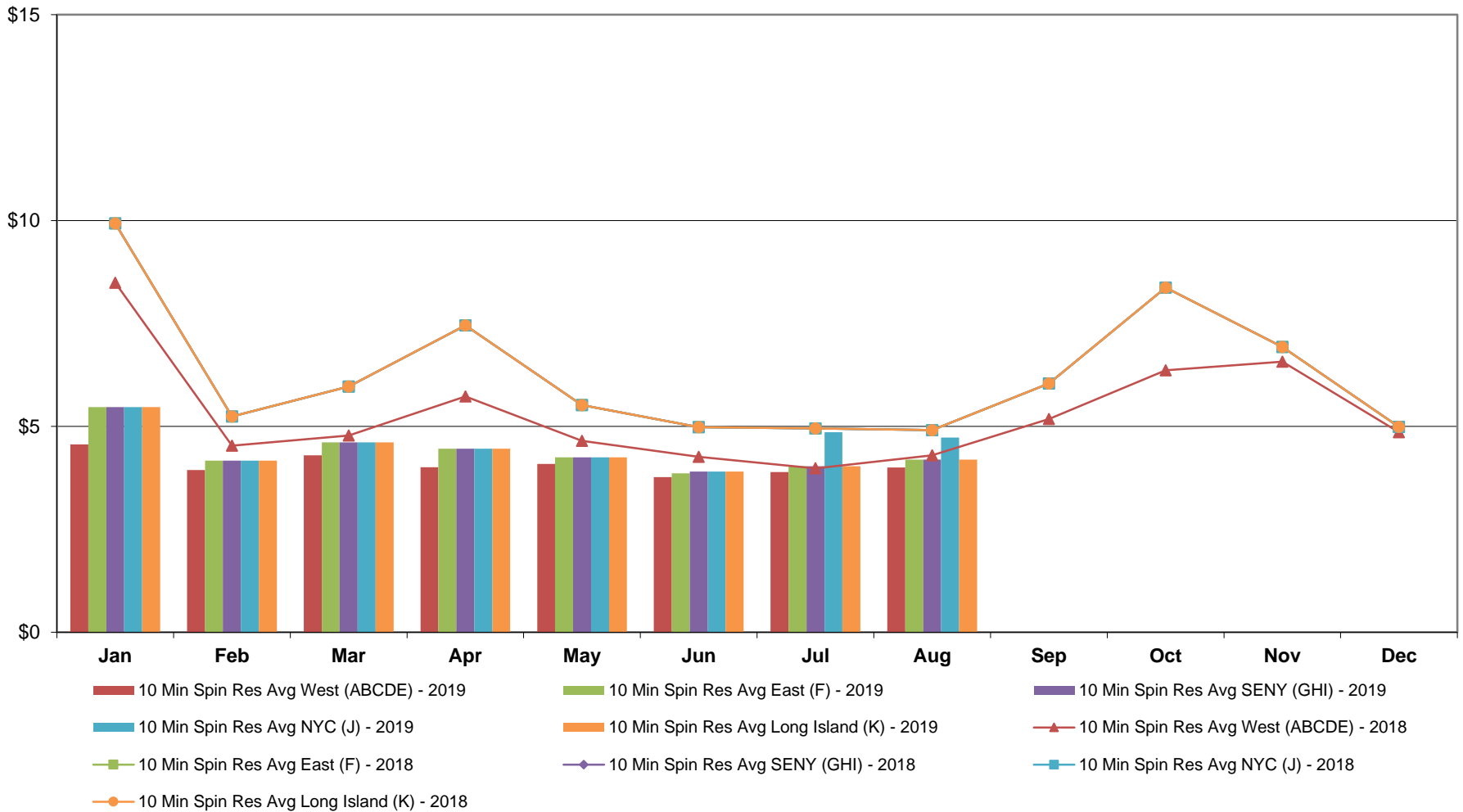
**Virtual Load and Supply Zonal Statistics (Average MWh/day) - 2019**

		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
<b>WEST</b>	Jan-19	9,007	5,211	1,609	797	<b>MHK VL</b>	Jan-19	1,171	117	1,965	471	<b>DUNWOD</b>	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	7,022	5,165	818	783		May-19	527	32	2,337	489		May-19	1,459	153	2,999	255
	Jun-19	8,695	6,210	1,183	1,106		Jun-19	577	98	1,731	582		Jun-19	3,157	426	2,365	290
	Jul-19	9,264	5,278	1,201	856		Jul-19	775	142	3,111	336		Jul-19	4,623	673	1,967	276
	Aug-19	7,441	1,910	1,129	562		Aug-19	629	209	4,439	643		Aug-19	3,509	624	2,470	295
	Sep-19						Sep-19						Sep-19				
	Oct-19						Oct-19						Oct-19				
	Nov-19						Nov-19						Nov-19				
	Dec-19						Dec-19						Dec-19				
<b>GENESE</b>	Jan-19	527	153	3,560	529	<b>CAPITL</b>	Jan-19	3,042	962	1,550	1,424	<b>N.Y.C.</b>	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	343	171	2,680	1,446		May-19	1,438	362	3,006	2,580		May-19	4,207	977	3,304	4,320
	Jun-19	407	146	4,498	2,552		Jun-19	741	206	3,393	4,222		Jun-19	5,271	930	2,404	1,778
	Jul-19	503	215	2,807	1,125		Jul-19	802	243	3,884	3,155		Jul-19	10,542	1,697	1,247	1,418
	Aug-19	469	204	4,508	1,496		Aug-19	531	232	3,710	2,237		Aug-19	7,395	852	2,521	1,675
	Sep-19						Sep-19						Sep-19				
	Oct-19						Oct-19						Oct-19				
	Nov-19						Nov-19						Nov-19				
	Dec-19						Dec-19						Dec-19				
<b>NORTH</b>	Jan-19	484	540	6,406	1,553	<b>HUD VL</b>	Jan-19	856	980	9,176	7,130	<b>LONGIL</b>	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	498	446	4,995	2,954		May-19	1,064	457	6,634	9,871		May-19	3,869	1,430	3,396	1,359
	Jun-19	481	256	4,364	2,986		Jun-19	658	249	8,949	9,323		Jun-19	5,177	1,639	2,391	2,303
	Jul-19	553	311	4,460	1,978		Jul-19	795	392	7,632	10,915		Jul-19	6,906	3,006	1,739	1,662
	Aug-19	489	374	4,387	1,866		Aug-19	503	281	9,041	9,166		Aug-19	6,950	2,028	2,454	2,183
	Sep-19						Sep-19						Sep-19				
	Oct-19						Oct-19						Oct-19				
	Nov-19						Nov-19						Nov-19				
	Dec-19						Dec-19						Dec-19				
<b>CENTRL</b>	Jan-19	3,795	374	30,145	507	<b>MILLWD</b>	Jan-19	405	386	2,051	169	<b>NYISO</b>	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	3,220	195	26,474	474		May-19	613	226	1,687	505		May-19	24,261	9,615	58,331	25,035
	Jun-19	3,635	241	26,799	832		Jun-19	495	182	1,940	506		Jun-19	29,295	10,583	60,017	26,481
	Jul-19	3,307	209	27,998	642		Jul-19	780	452	1,156	470		Jul-19	38,851	12,618	57,203	22,833
	Aug-19	2,794	208	28,343	772		Aug-19	464	269	1,657	595		Aug-19	31,173	7,192	64,660	21,491
	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

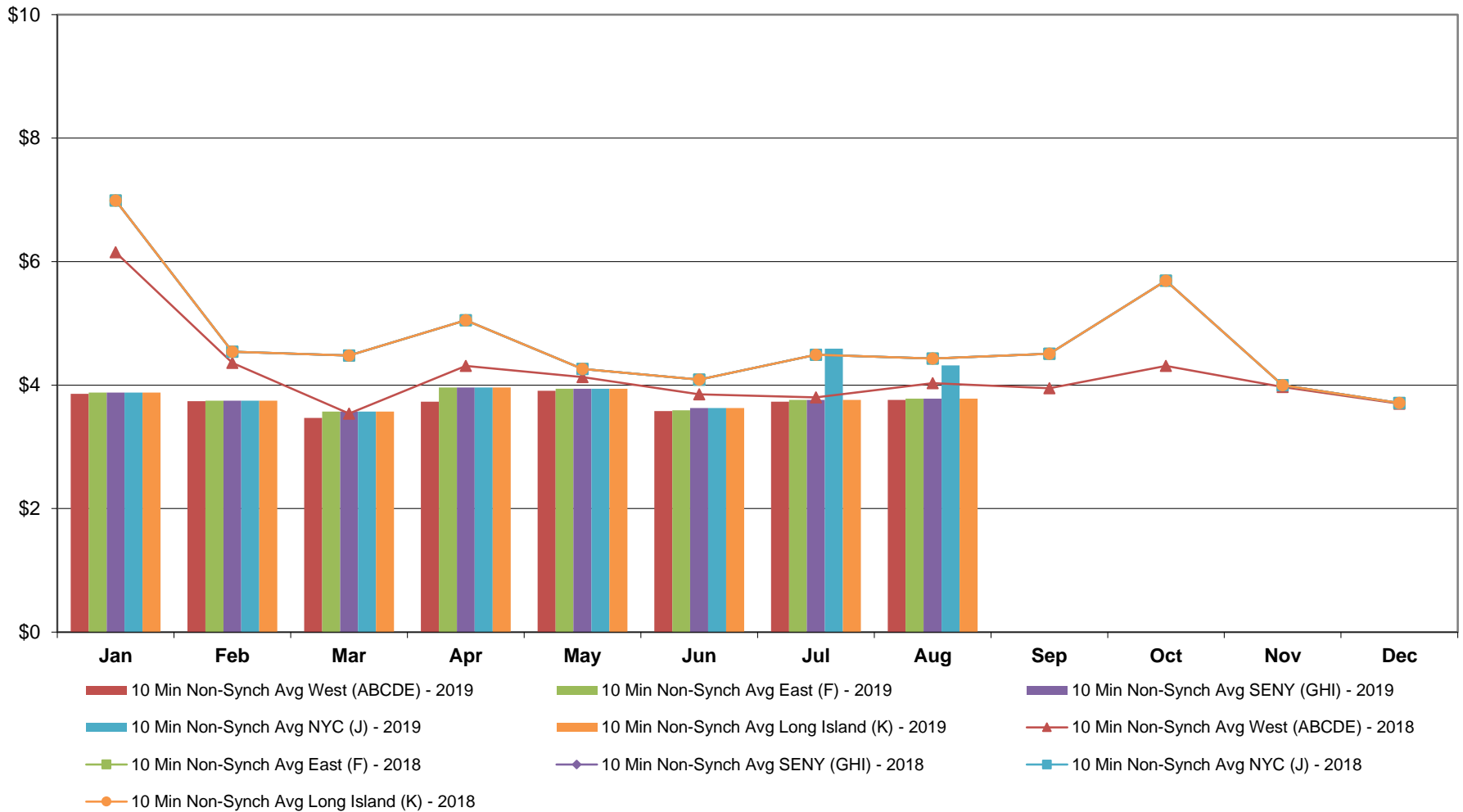


**NYISO Monthly Average Ancillary Service Prices  
Day Ahead Market - 10 Min Spin 2018 - 2019**

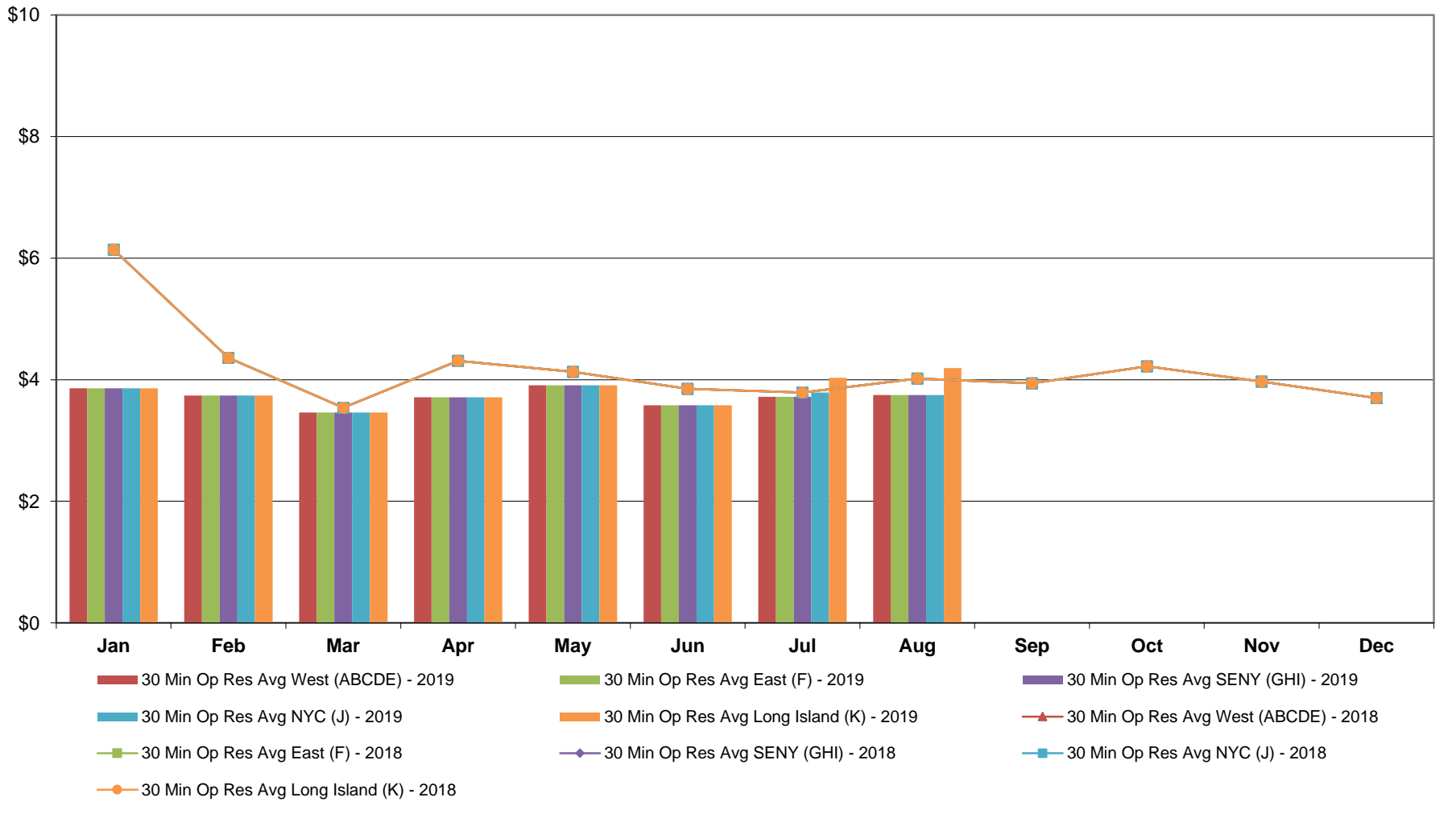




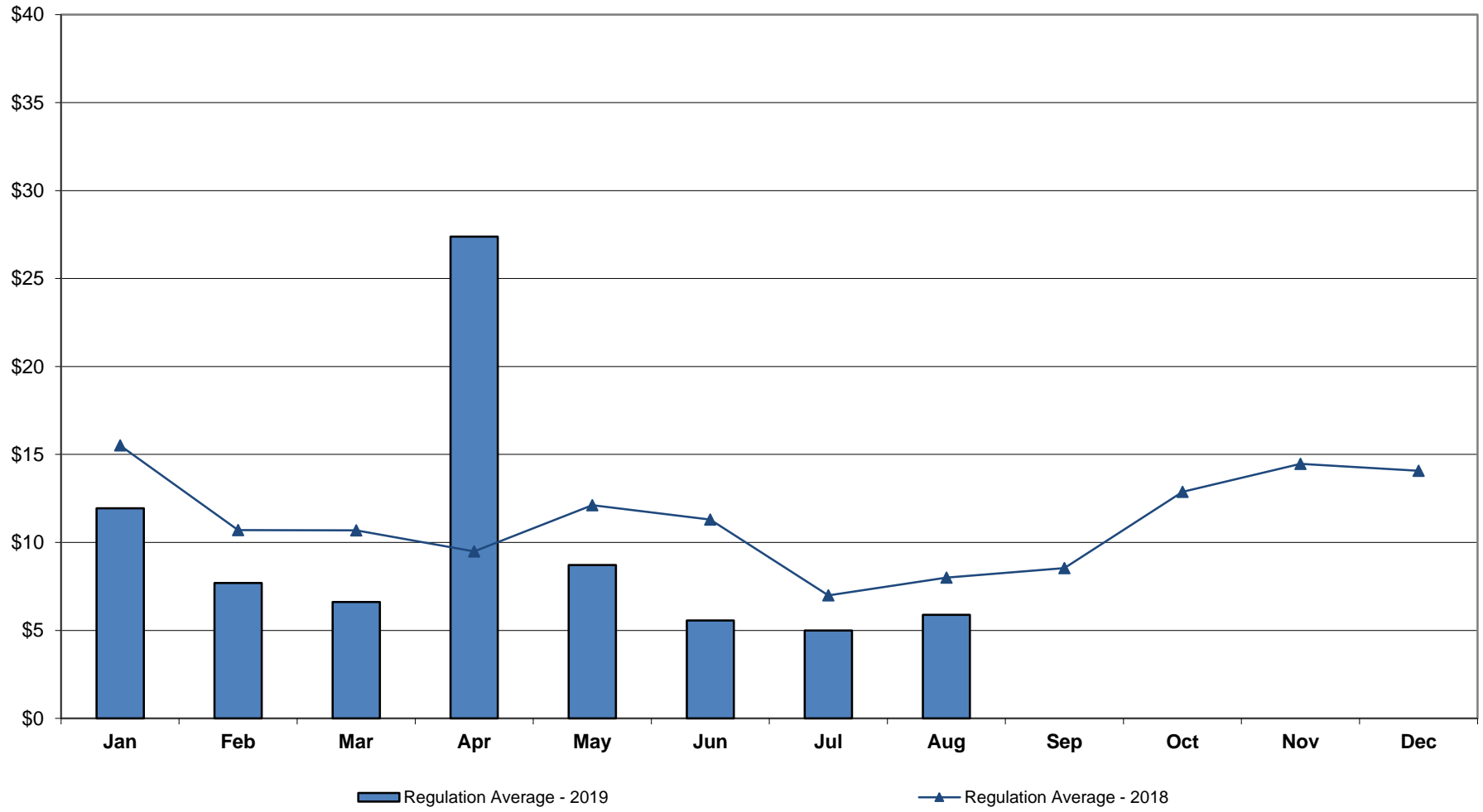
**NYISO Monthly Average Ancillary Service Prices  
Day Ahead Market - 10 Min Non-Synch 2018 - 2019**



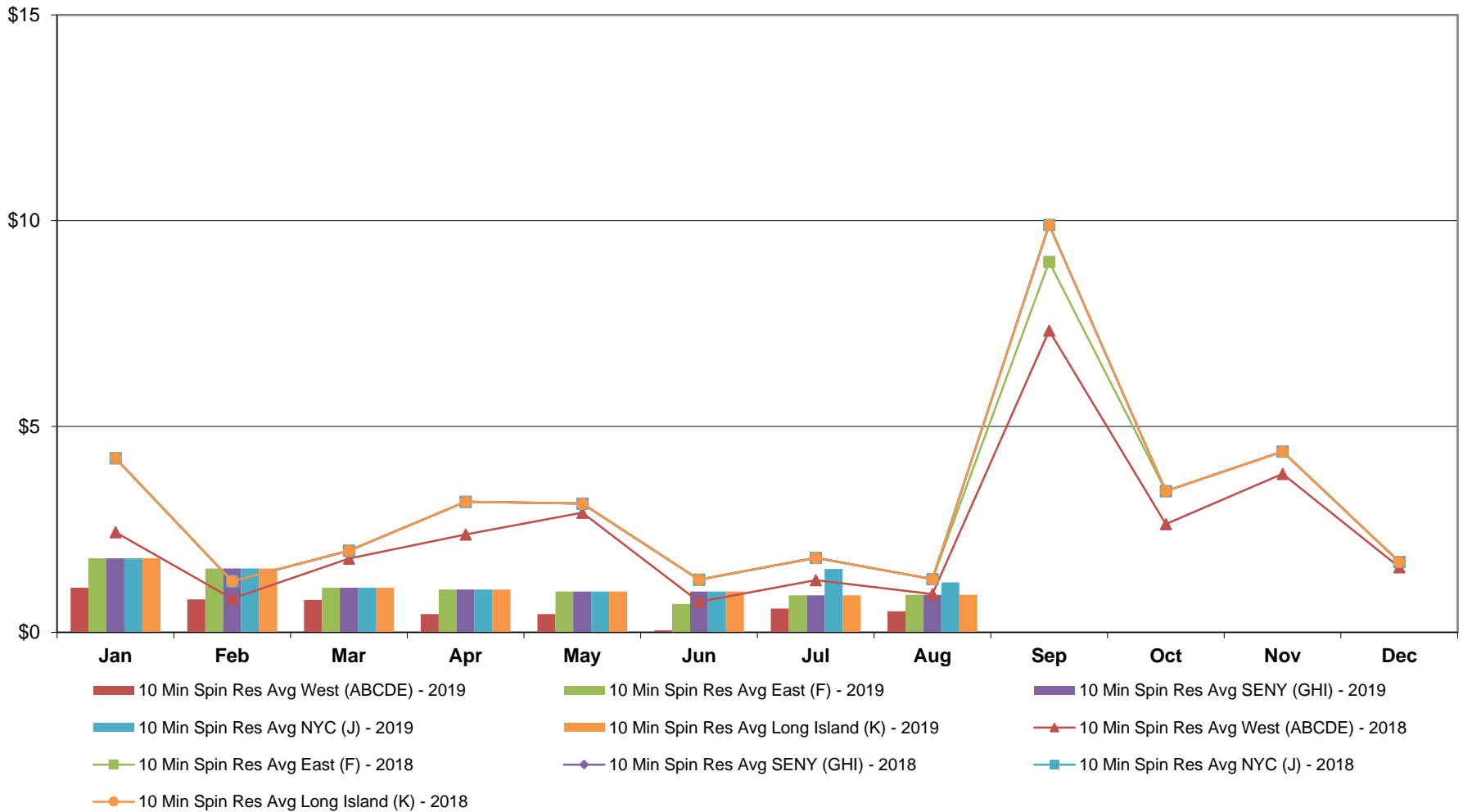
**NYISO Monthly Average Ancillary Service Prices  
Day Ahead Market - 30 Min Op Res 2018 - 2019**



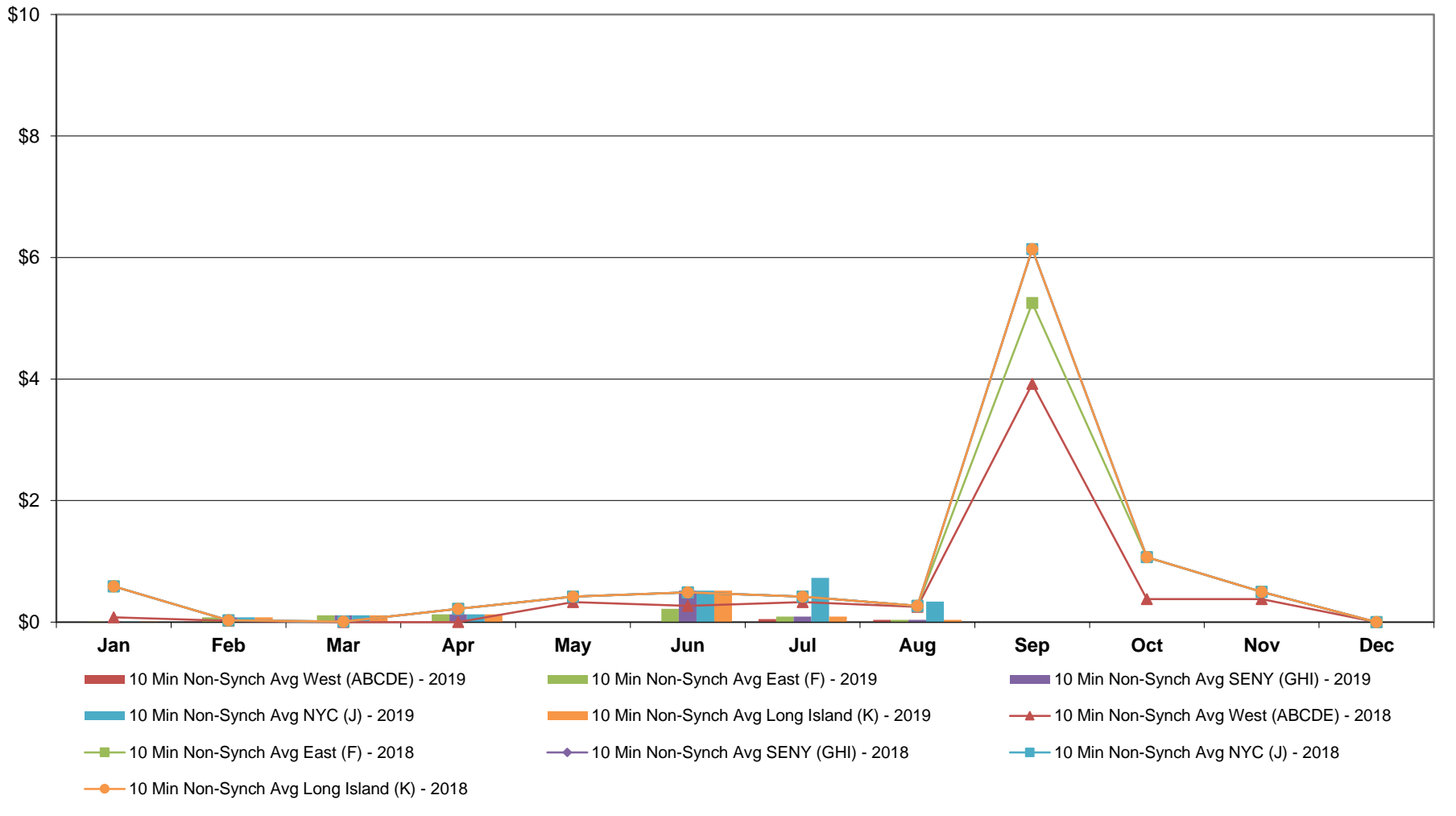
**NYISO Monthly Average Ancillary Service Prices  
Day Ahead Market - Regulation 2018 - 2019**



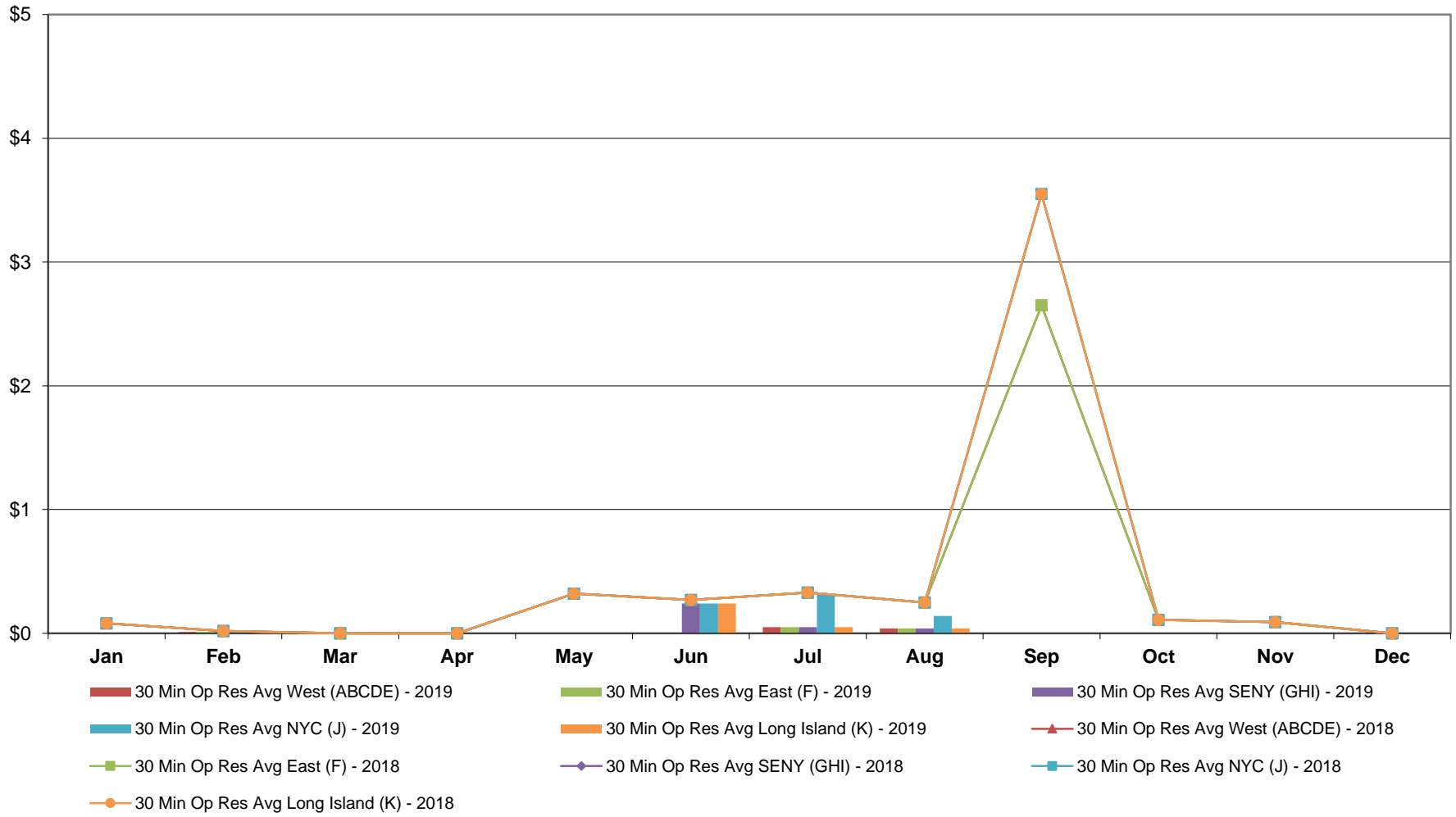
**NYISO Monthly Average Ancillary Service Prices  
RTC Market - 10 Min Spin 2018 - 2019**



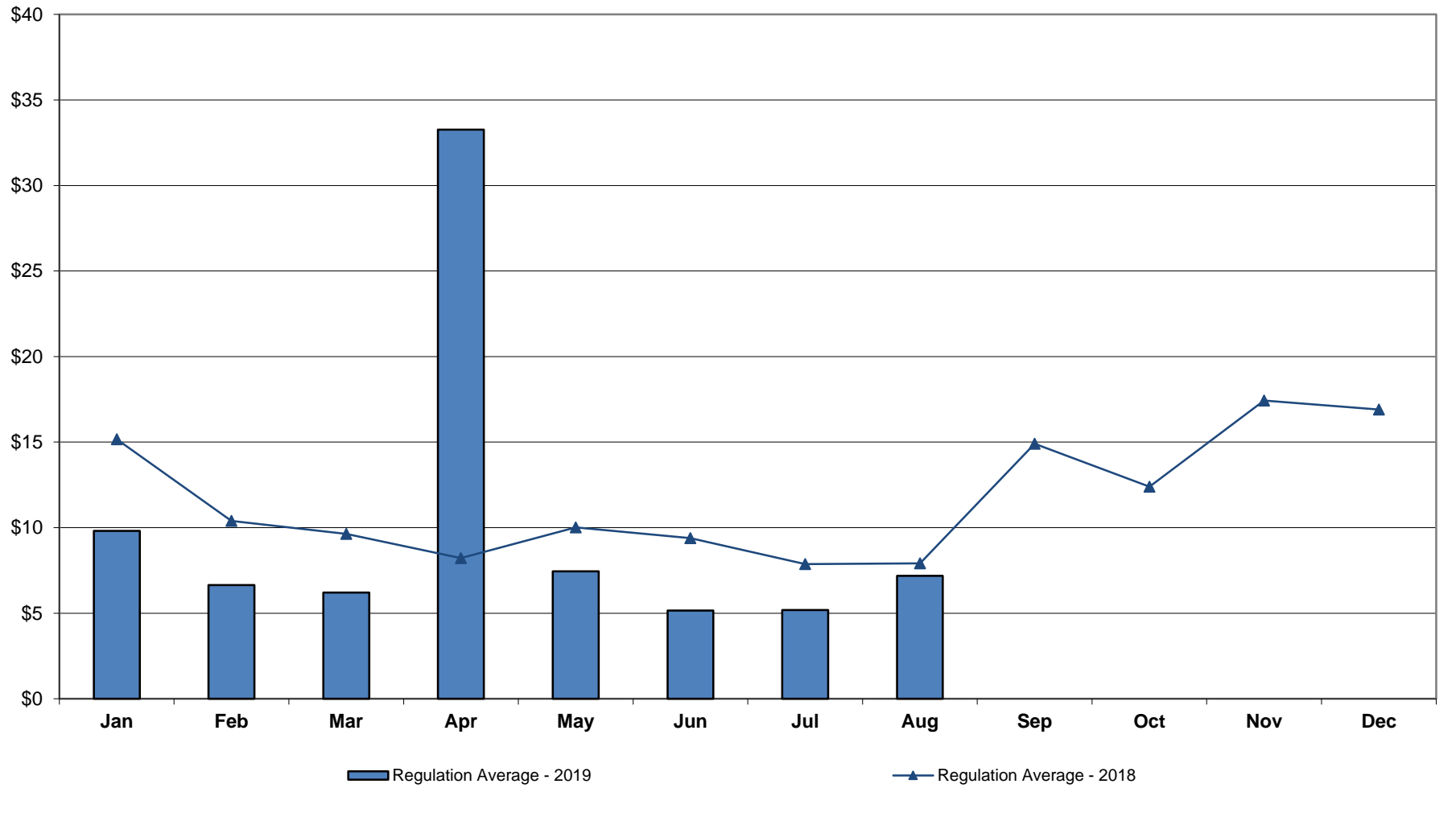
**NYISO Monthly Average Ancillary Service Prices  
RTC Market - 10 Min Non-Synch 2018 - 2019**



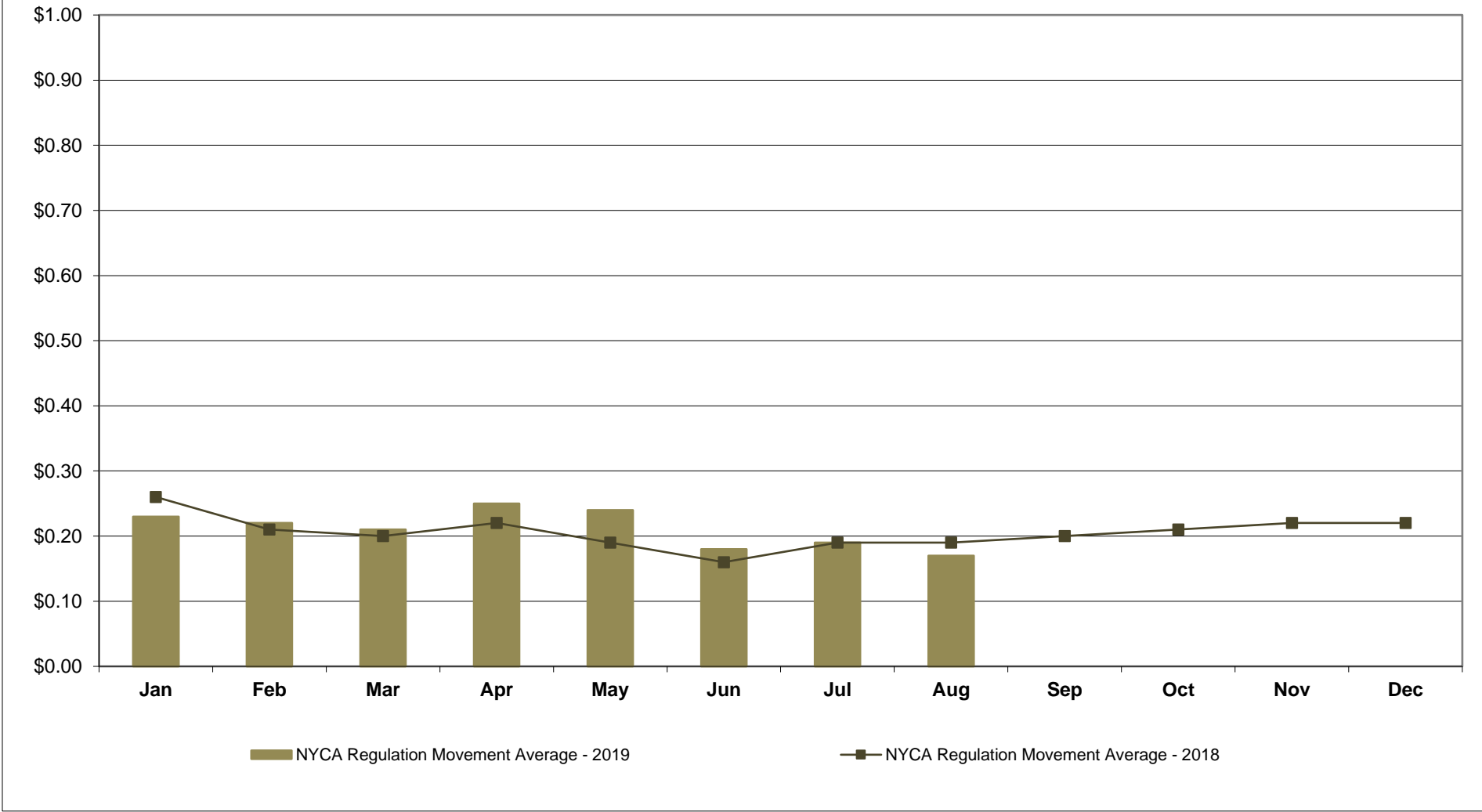
**NYISO Monthly Average Ancillary Service Prices  
RTC Market - 30 Min Op Res 2018 - 2019**



**NYISO Monthly Average Ancillary Service Prices  
RTC Market - Regulation 2018 - 2019**

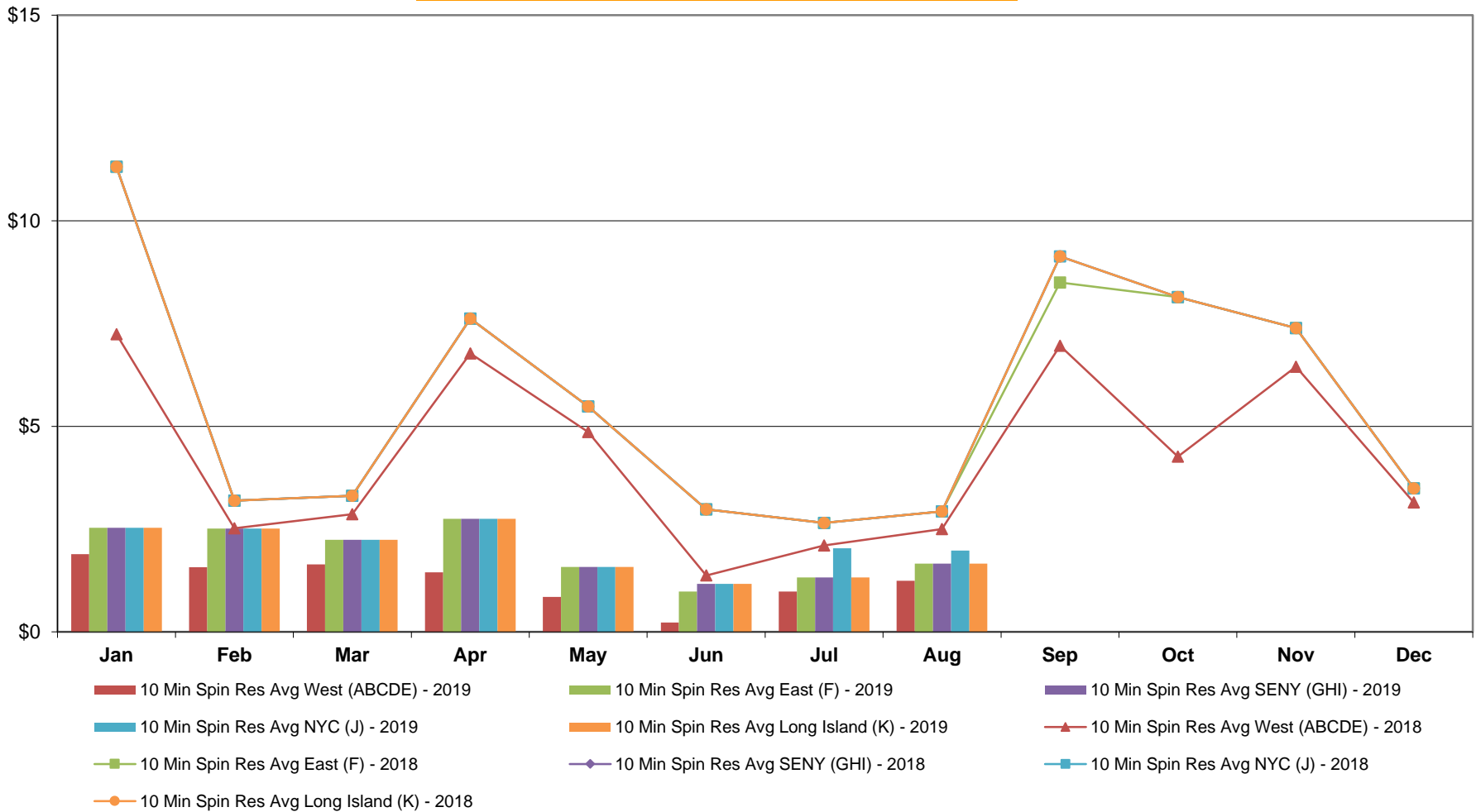


**NYISO Monthly Average Ancillary Service Prices  
RTC Market - Regulation Movement 2018 - 2019**

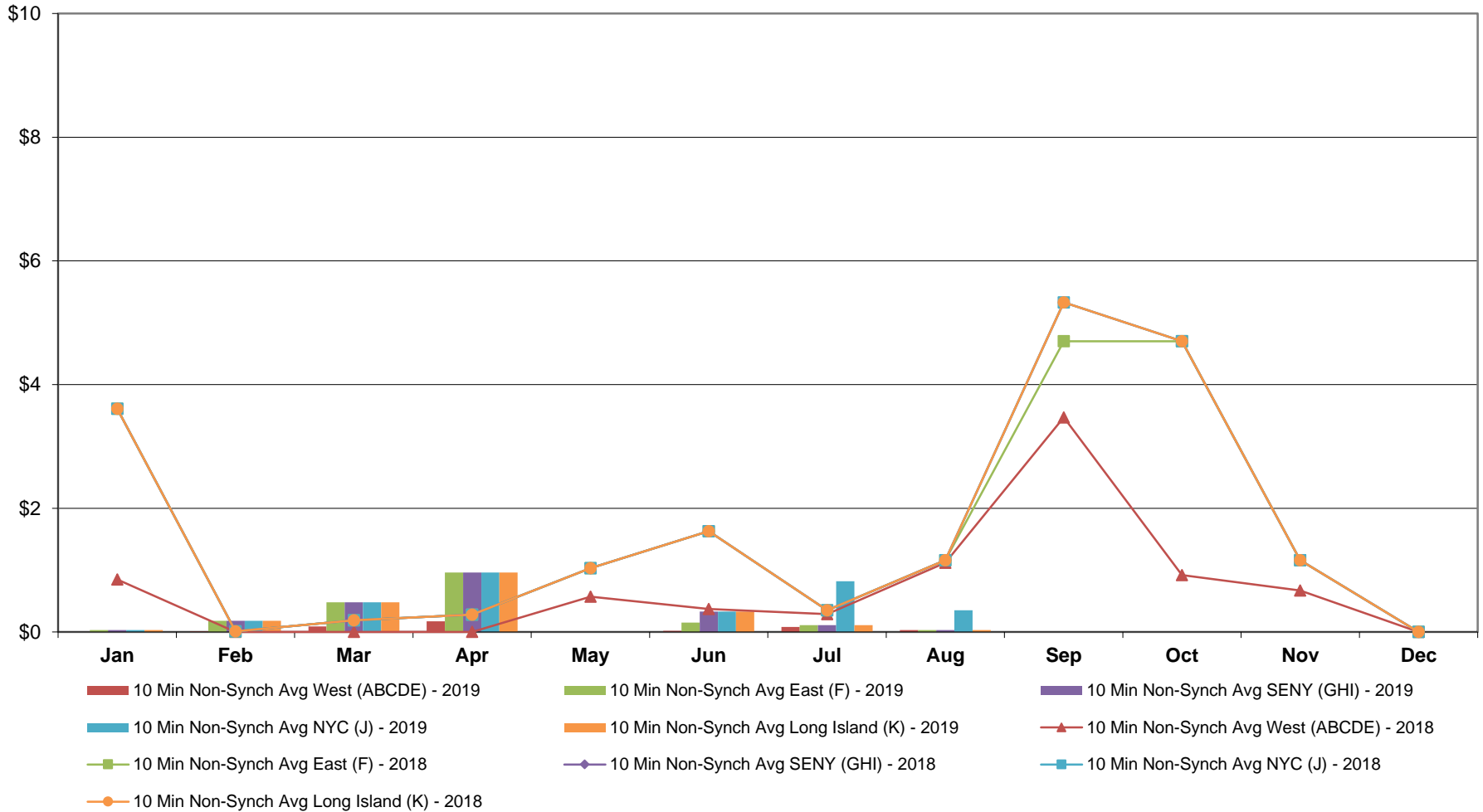




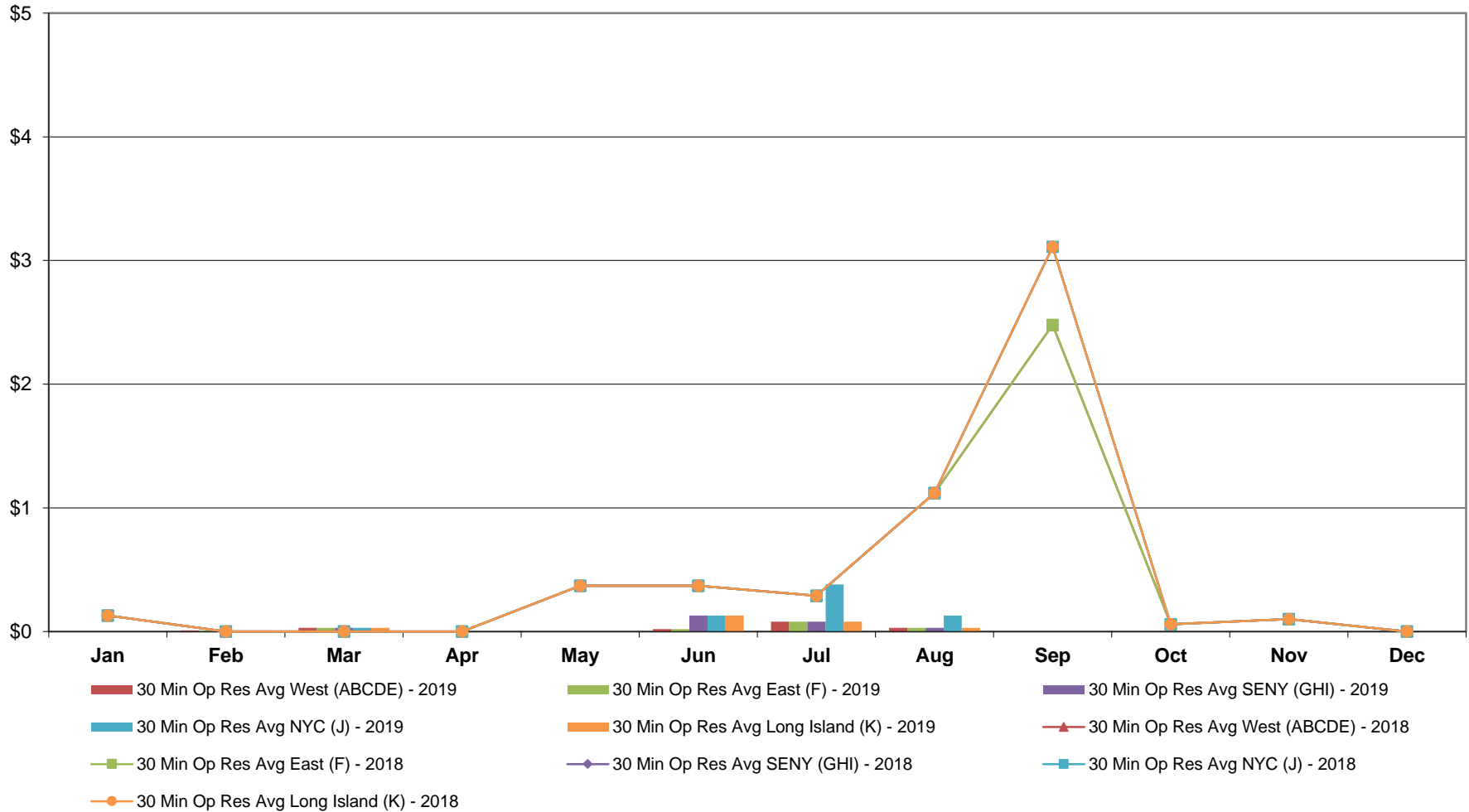
**NYISO Monthly Average Ancillary Service Prices  
Real Time Market - 10 Min Spin 2018 - 2019**



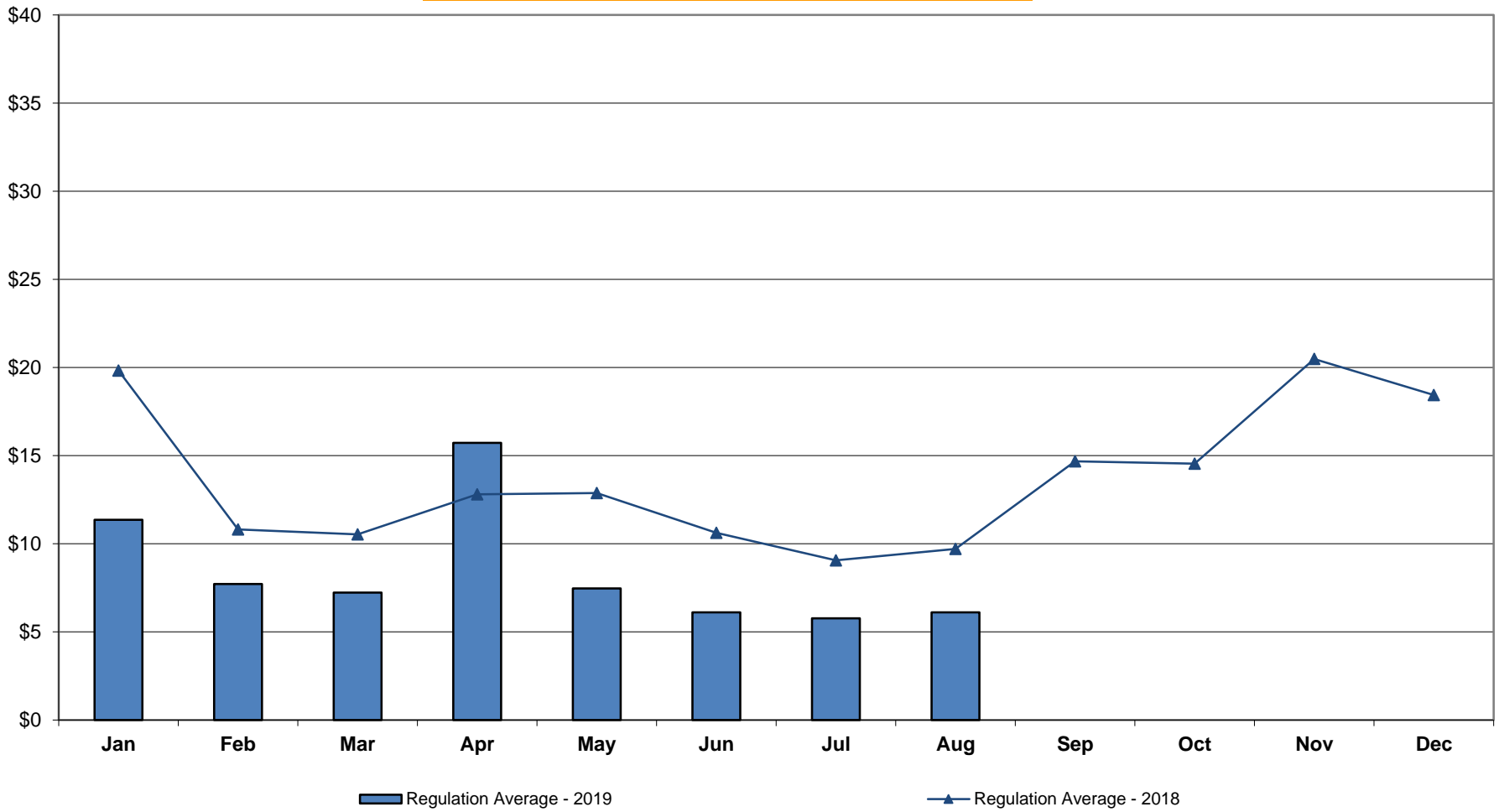
**NYISO Monthly Average Ancillary Service Prices  
Real Time Market - 10 Min Non-Synch 2018 - 2019**



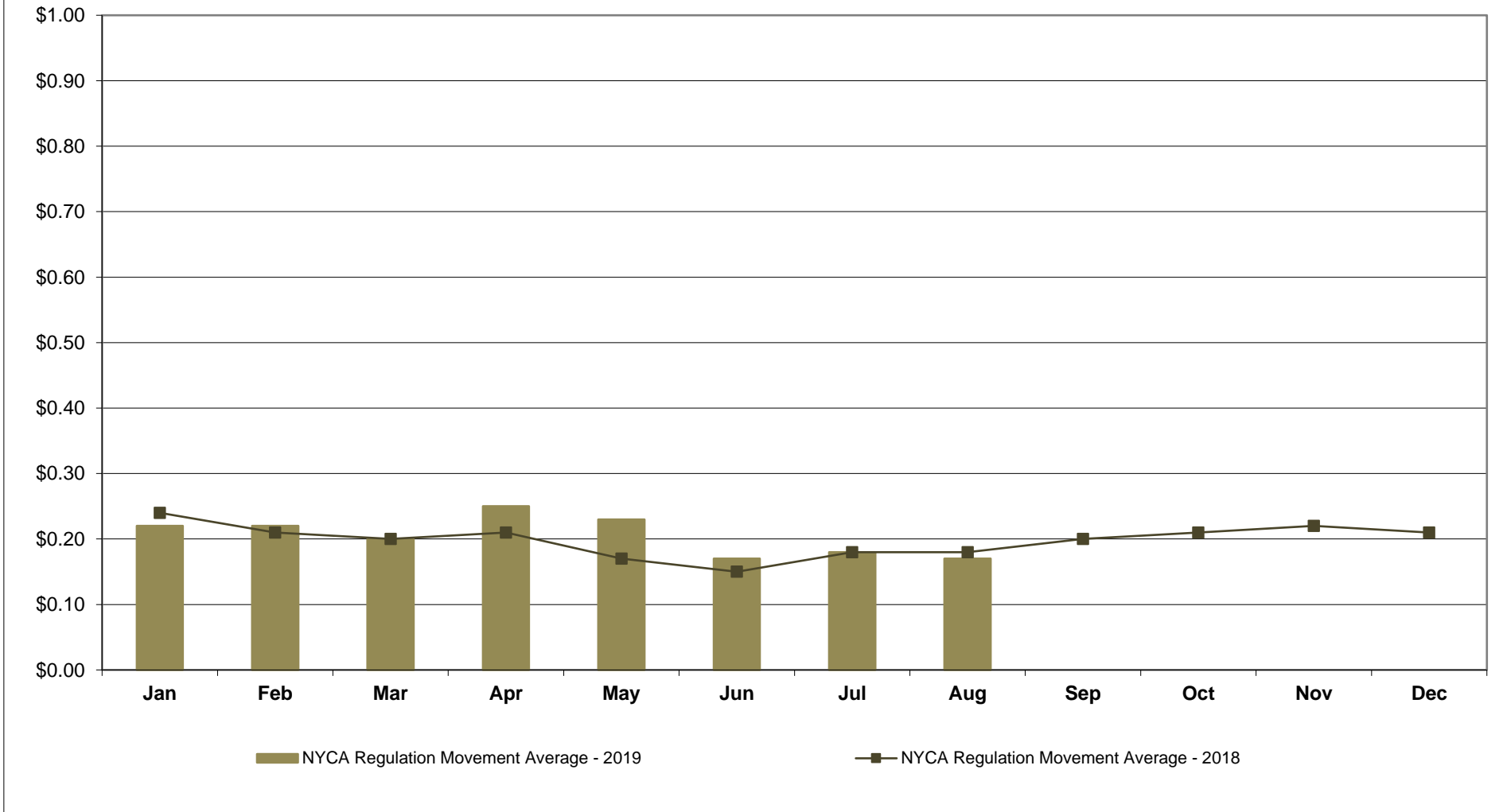
**NYISO Monthly Average Ancillary Service Prices  
Real Time Market - 30 Min Op Res 2018 - 2019**



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



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



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

<u>2019</u>	<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>
<b>Day Ahead Market</b>												
10 Min Spin Long Island (K)	5.47	4.17	4.61	4.46	4.25	3.90	4.03	4.19				
10 Min Spin NYC (J)	5.47	4.17	4.61	4.46	4.25	3.90	4.86	4.73				
10 Min Spin SENY (GHI)	5.47	4.17	4.61	4.46	4.25	3.90	4.03	4.19				
10 Min Spin East (F)	5.47	4.17	4.61	4.46	4.25	3.86	4.03	4.19				
10 Min Spin West (ABCDE)	4.56	3.94	4.30	4.01	4.09	3.77	3.89	4.00				
10 Min Non Synch Long Island (K)	3.88	3.75	3.57	3.96	3.94	3.63	3.76	3.78				
10 Min Non Synch NYC (J)	3.88	3.75	3.57	3.96	3.94	3.63	4.59	4.32				
10 Min Non Synch SENY (GHI)	3.88	3.75	3.57	3.96	3.94	3.63	3.76	3.78				
10 Min Non Synch East (F)	3.88	3.75	3.57	3.96	3.94	3.59	3.76	3.78				
10 Min Non Synch West (ABCDE)	3.86	3.74	3.47	3.73	3.91	3.58	3.73	3.76				
30 Min Long Island (K)	3.86	3.74	3.46	3.71	3.91	3.58	3.72	3.75				
30 Min NYC (J)	3.86	3.74	3.46	3.71	3.91	3.58	3.79	3.75				
30 Min SENY (GHI)	3.86	3.74	3.46	3.71	3.91	3.58	3.72	3.75				
30 Min East (F)	3.86	3.74	3.46	3.71	3.91	3.58	3.72	3.75				
30 Min West (ABCDE)	3.86	3.74	3.46	3.71	3.91	3.58	3.72	3.75				
Regulation	11.94	7.69	6.62	27.38	8.71	5.57	4.99	5.89				
<b>2018</b>	<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>
<b>Day Ahead Market</b>												
10 Min Spin SENY (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 SENY (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 SENY (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

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

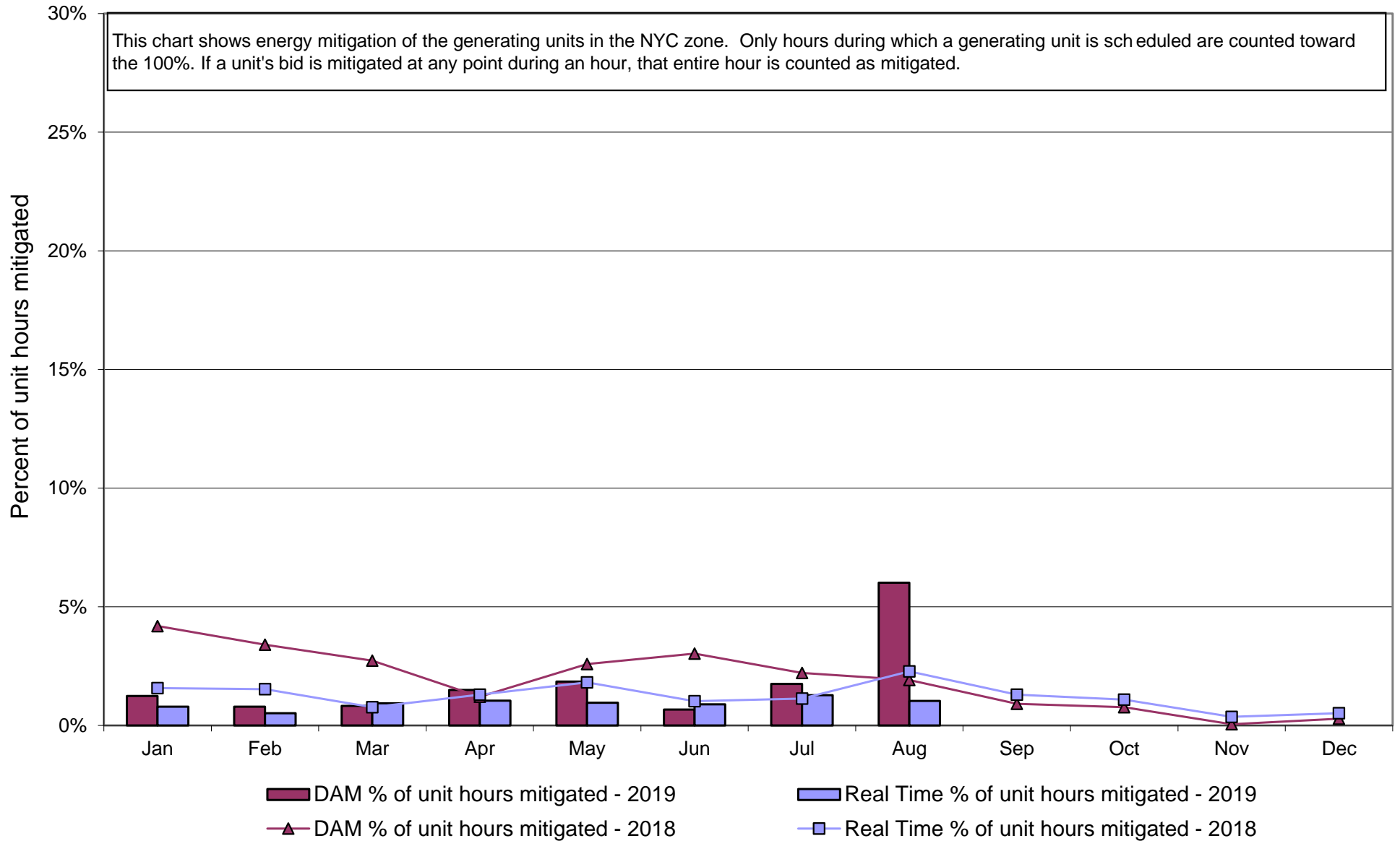
<u>2019</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<b>RTC Market</b>												
10 Min Spin Long Island (K)	1.80	1.55	1.08	1.04	0.99	0.99	0.90	0.91				
10 Min Spin NYC (J)	1.80	1.55	1.08	1.04	0.99	0.99	1.54	1.21				
10 Min Spin SENY (GHI)	1.80	1.55	1.08	1.04	0.99	0.99	0.90	0.91				
10 Min Spin East (F)	1.80	1.55	1.08	1.04	0.99	0.69	0.90	0.91				
10 Min Spin West (ABCDE)	1.08	0.80	0.79	0.44	0.44	0.05	0.58	0.51				
10 Min Non Synch Long Island (K)	0.01	0.08	0.11	0.13	0.00	0.52	0.09	0.04				
10 Min Non Synch NYC (J)	0.01	0.08	0.11	0.13	0.00	0.52	0.73	0.34				
10 Min Non Synch SENY (GHI)	0.01	0.08	0.11	0.13	0.00	0.52	0.09	0.04				
10 Min Non Synch East (F)	0.01	0.08	0.11	0.13	0.00	0.22	0.09	0.04				
10 Min Non Synch West (ABCDE)	0.00	0.01	0.01	0.00	0.00	0.00	0.05	0.04				
30 Min Long Island (K)	0.00	0.01	0.01	0.00	0.00	0.24	0.05	0.04				
30 Min NYC (J)	0.00	0.01	0.01	0.00	0.00	0.24	0.31	0.14				
30 Min SENY (GHI)	0.00	0.01	0.01	0.00	0.00	0.24	0.05	0.04				
30 Min East (F)	0.00	0.01	0.01	0.00	0.00	0.00	0.05	0.04				
30 Min West (ABCDE)	0.00	0.01	0.01	0.00	0.00	0.00	0.05	0.04				
Regulation	9.81	6.64	6.21	33.26	7.45	5.16	5.19	7.19				
NYCA Regulation Movement	0.23	0.22	0.21	0.25	0.24	0.18	0.19	0.17				
<u>2018</u>	<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>
<b>RTC Market</b>												
10 Min Spin SENY (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	9.00	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 SENY (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 SENY (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

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

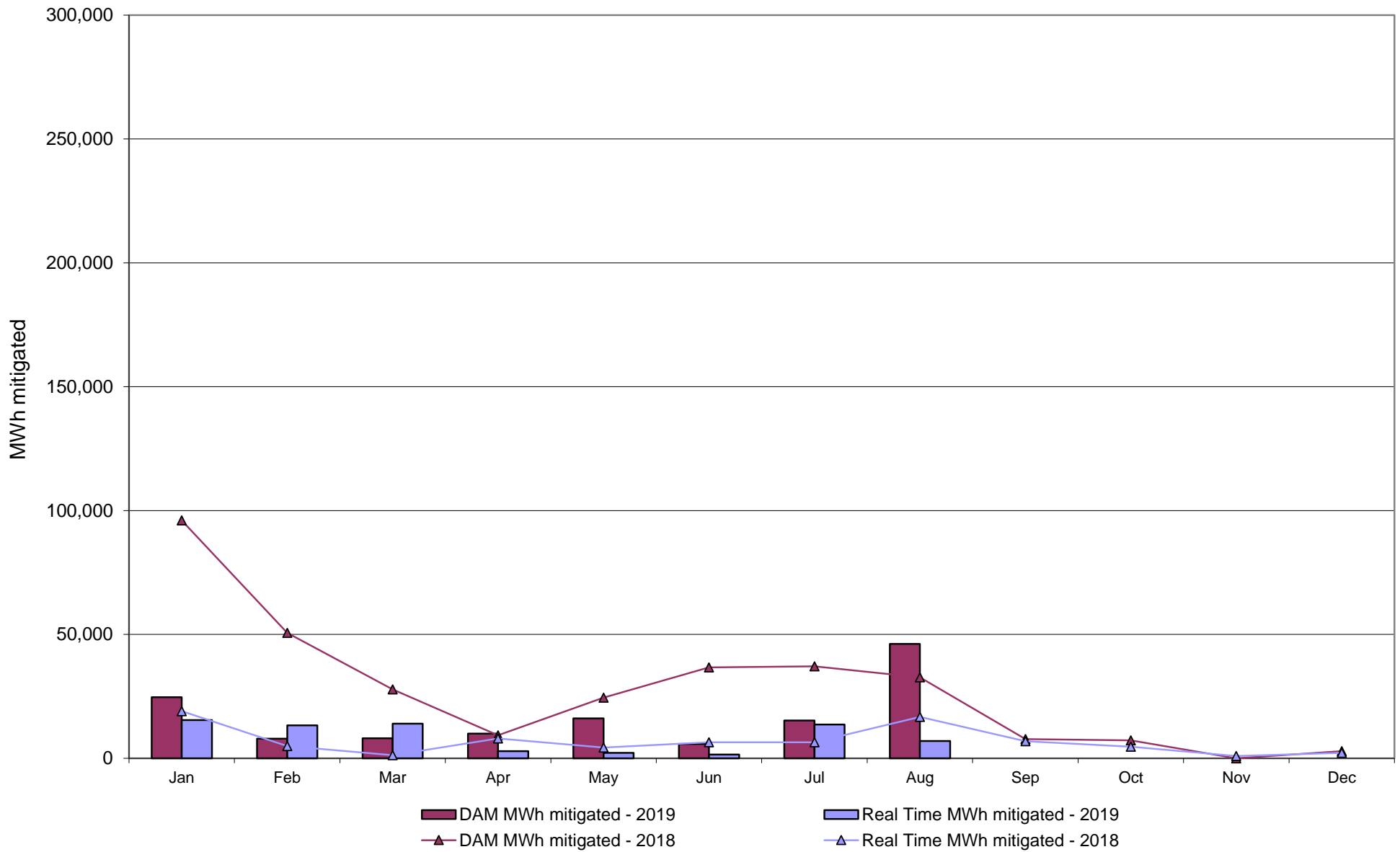
<u>2019</u>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<b>Real Time Market</b>												
10 Min Spin Long Island (K)	2.53	2.51	2.24	2.75	1.58	1.17	1.32	1.66				
10 Min Spin NYC (J)	2.53	2.51	2.24	2.75	1.58	1.17	2.03	1.98				
10 Min Spin SENEY (GHI)	2.53	2.51	2.24	2.75	1.58	1.17	1.32	1.66				
10 Min Spin East (F)	2.53	2.51	2.24	2.75	1.58	0.98	1.32	1.66				
10 Min Spin West (ABCDE)	1.89	1.57	1.64	1.45	0.85	0.23	0.98	1.24				
10 Min Non Synch Long Island (K)	0.03	0.18	0.48	0.96	0.00	0.33	0.11	0.03				
10 Min Non Synch NYC (J)	0.03	0.18	0.48	0.96	0.00	0.33	0.82	0.35				
10 Min Non Synch SENEY (GHI)	0.03	0.18	0.48	0.96	0.00	0.33	0.11	0.03				
10 Min Non Synch East (F)	0.03	0.18	0.48	0.96	0.00	0.15	0.11	0.03				
10 Min Non Synch West (ABCDE)	0.00	0.01	0.09	0.17	0.00	0.02	0.08	0.03				
30 Min Long Island (K)	0.00	0.01	0.03	0.00	0.00	0.13	0.08	0.03				
30 Min NYC (J)	0.00	0.01	0.03	0.00	0.00	0.13	0.38	0.13				
30 Min SENEY (GHI)	0.00	0.01	0.03	0.00	0.00	0.13	0.08	0.03				
30 Min East (F)	0.00	0.01	0.03	0.00	0.00	0.02	0.08	0.03				
30 Min West (ABCDE)	0.00	0.01	0.03	0.00	0.00	0.02	0.08	0.03				
Regulation	11.36	7.72	7.23	15.73	7.47	6.11	5.77	6.11				
NYCA Regulation Movement	0.22	0.22	0.20	0.25	0.23	0.17	0.18	0.17				
<b>2018</b>	<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>
<b>Real Time Market</b>												
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



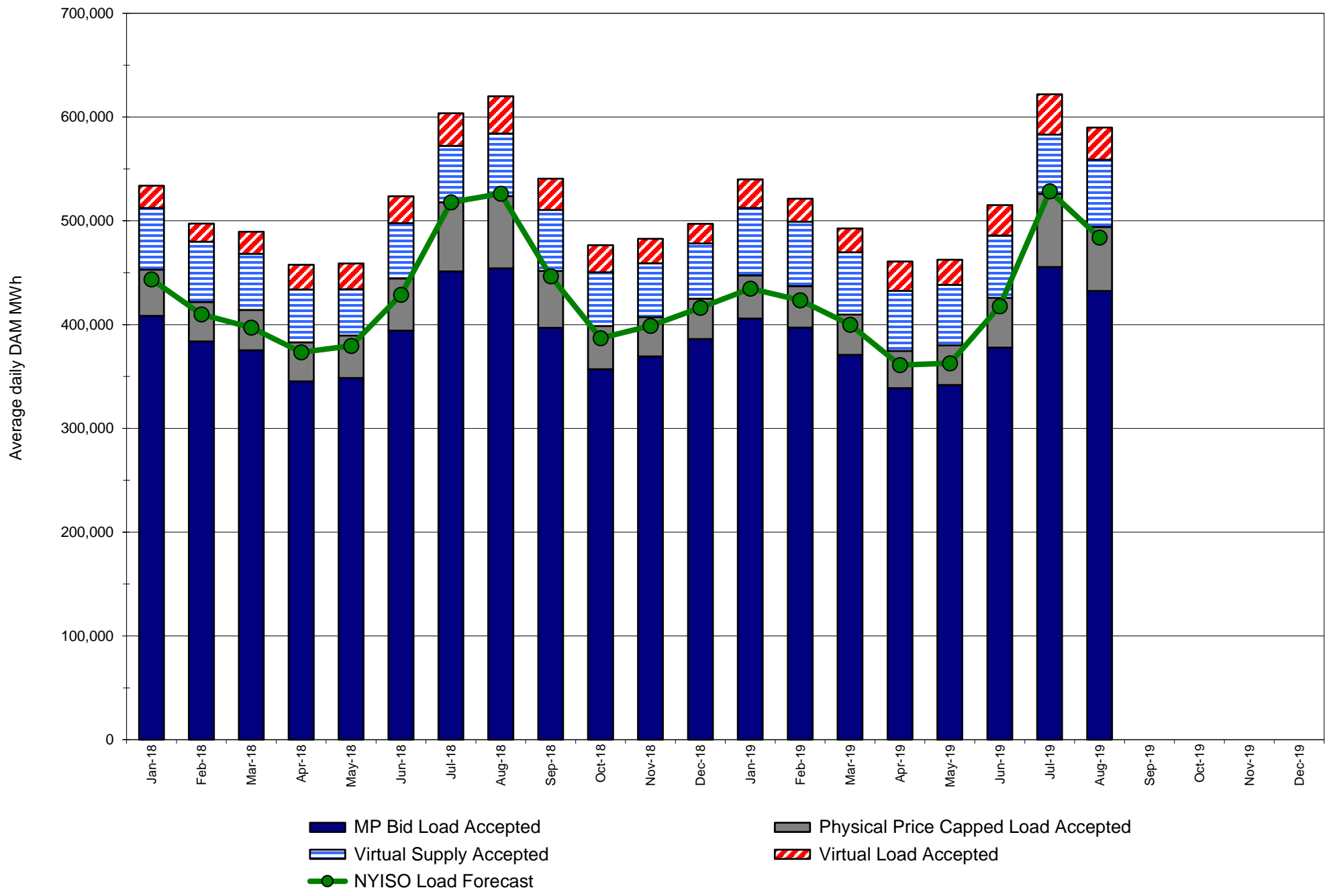
## NYISO In City Energy Mitigation - AMP (NYC Zone) 2018 - 2019 Percentage of committed unit-hours mitigated



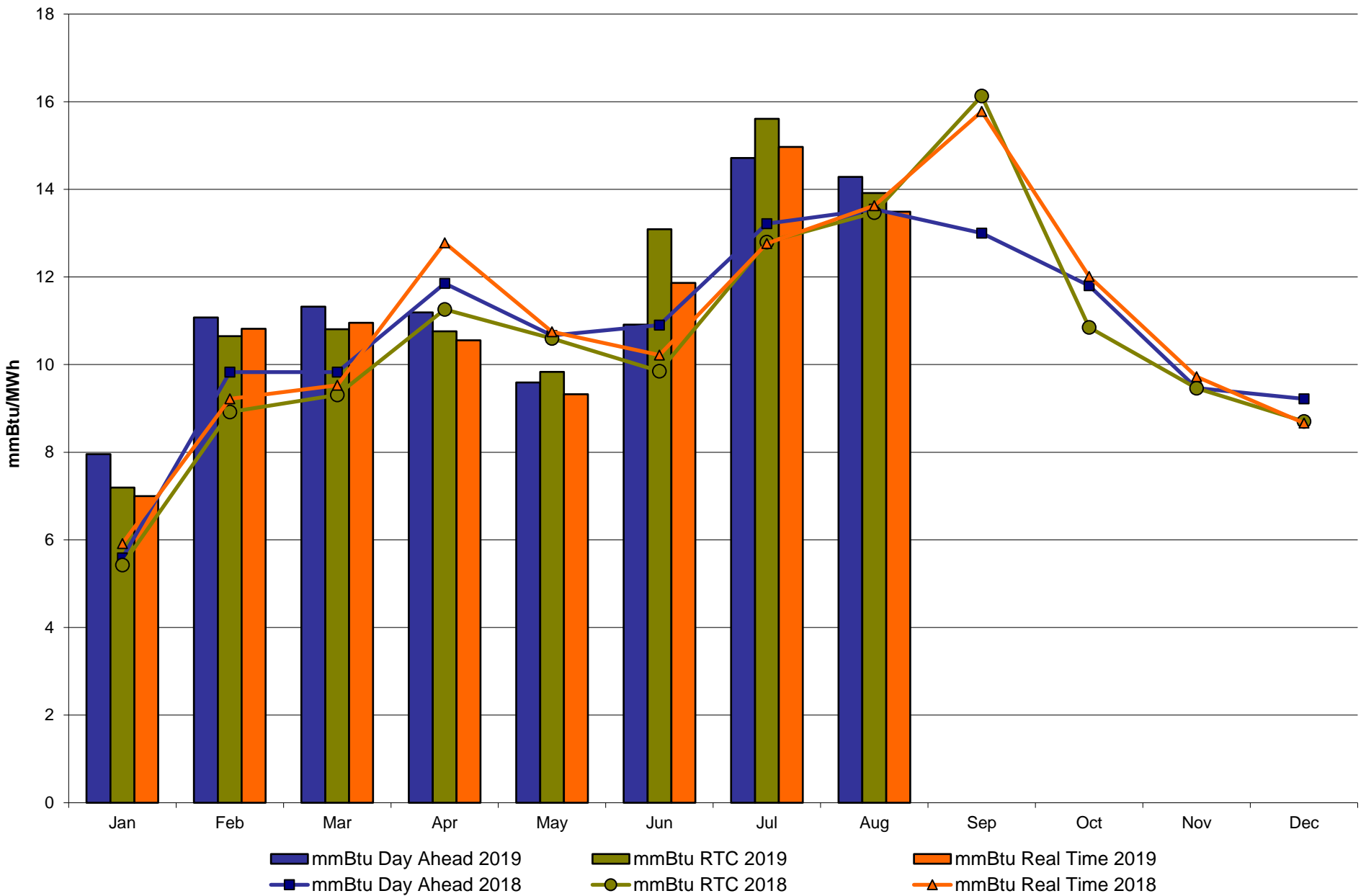
**NYISO In City Energy Mitigation (NYC Zone) 2018 - 2019**  
**Monthly megawatt hours mitigated**



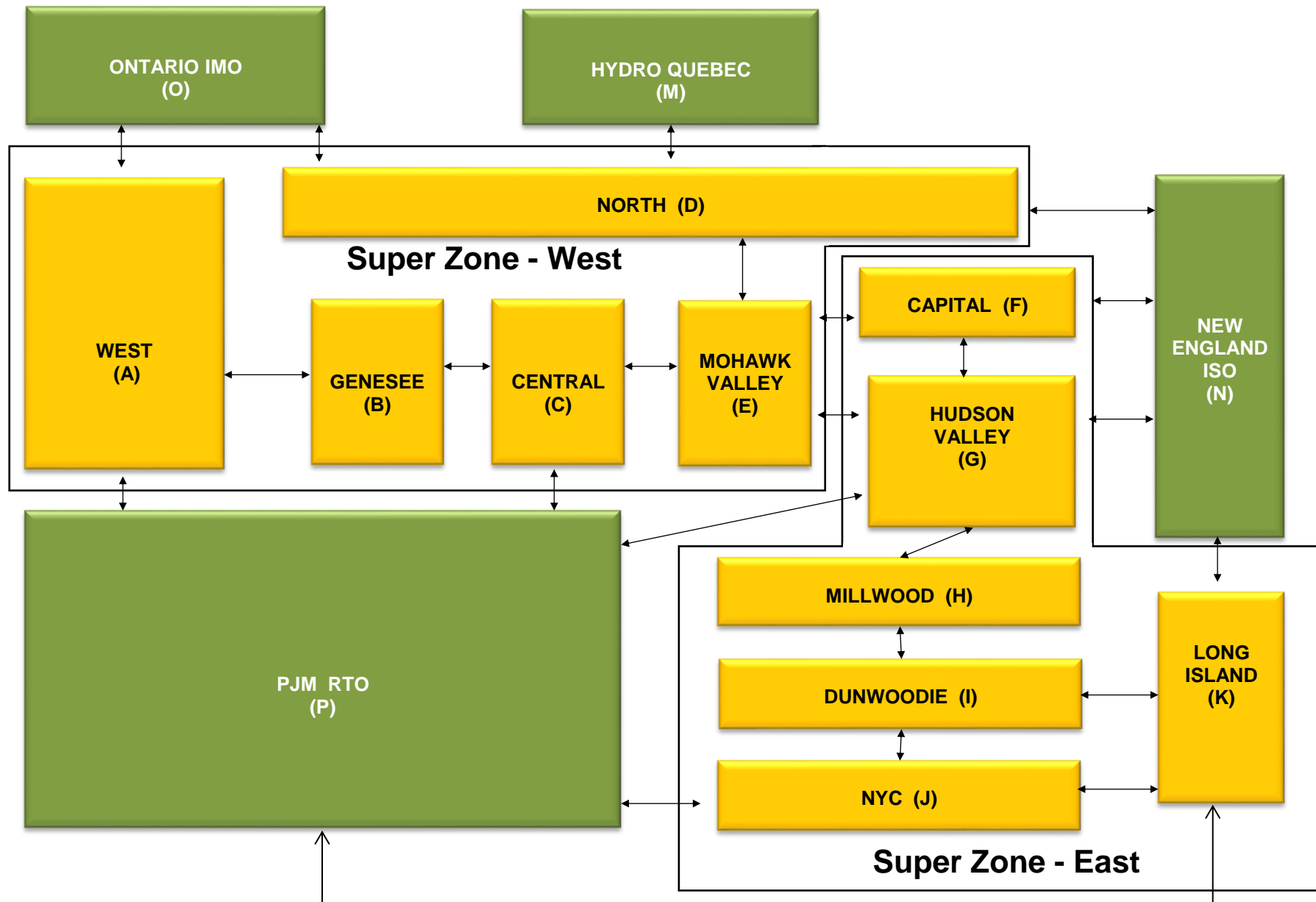
### NYISO Average Daily DAM Load Bid Summary



## Monthly Implied Heat Rate 2018-2019



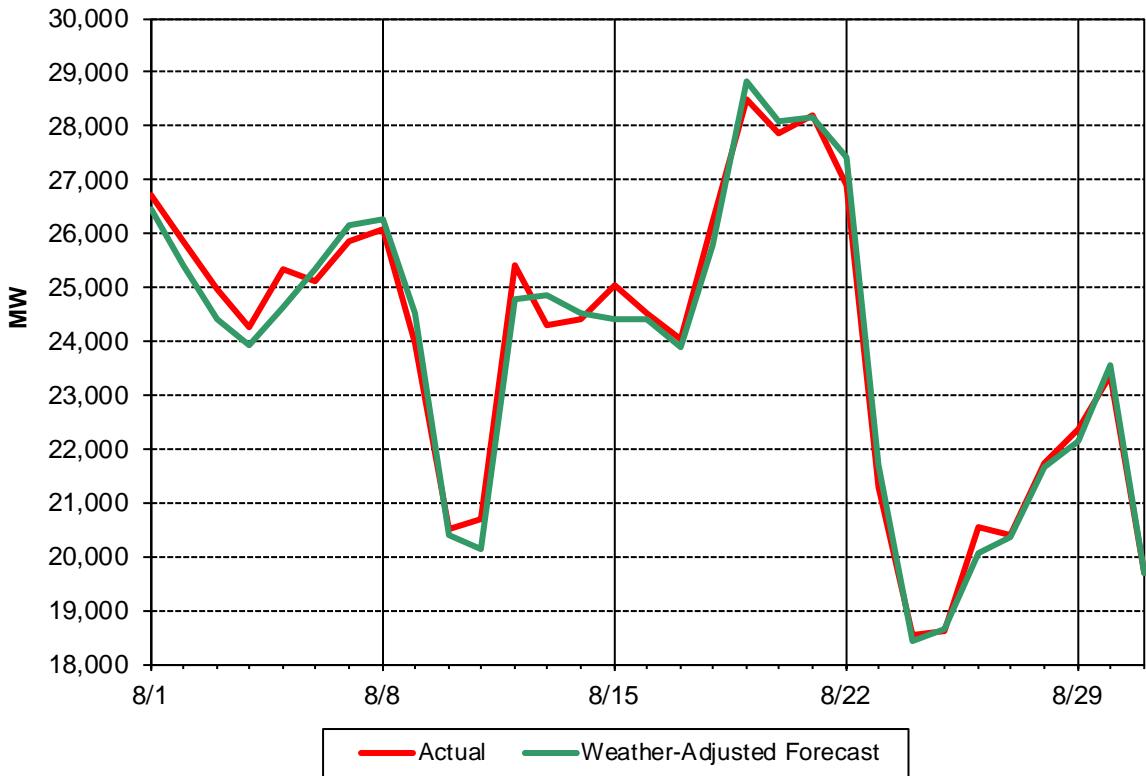
# NYISO LBMP ZONES



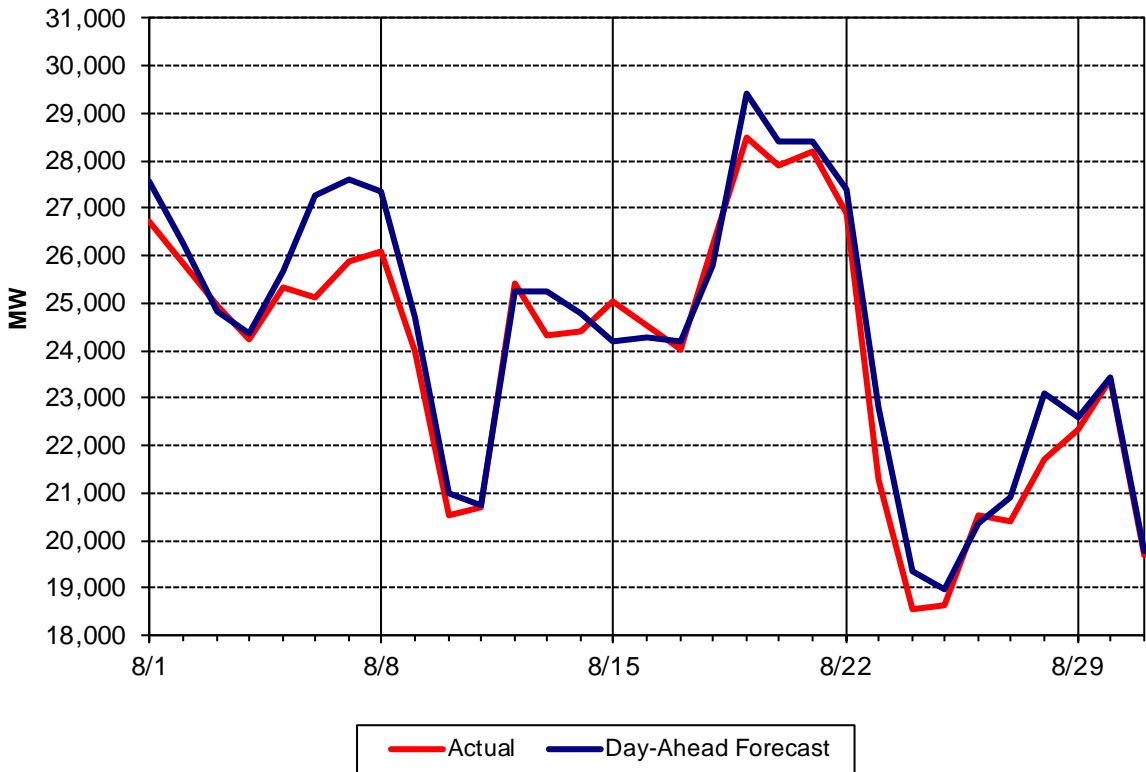
**Billing Codes for Chart C**

<b>Chart - C Category Name</b>	<b>Billing Code</b>	<b>Billing Category Name</b>
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

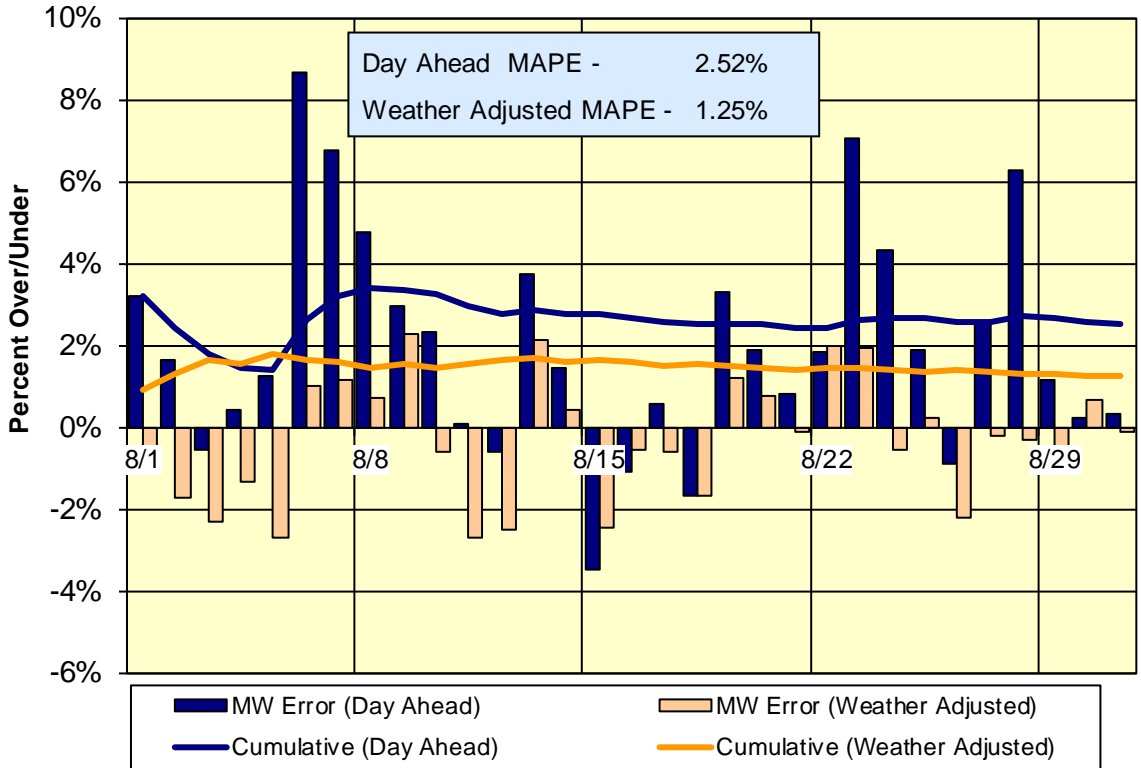
**NYISO Daily Peak Load - August 2019  
Actual vs. Weather-Adjusted Forecast**



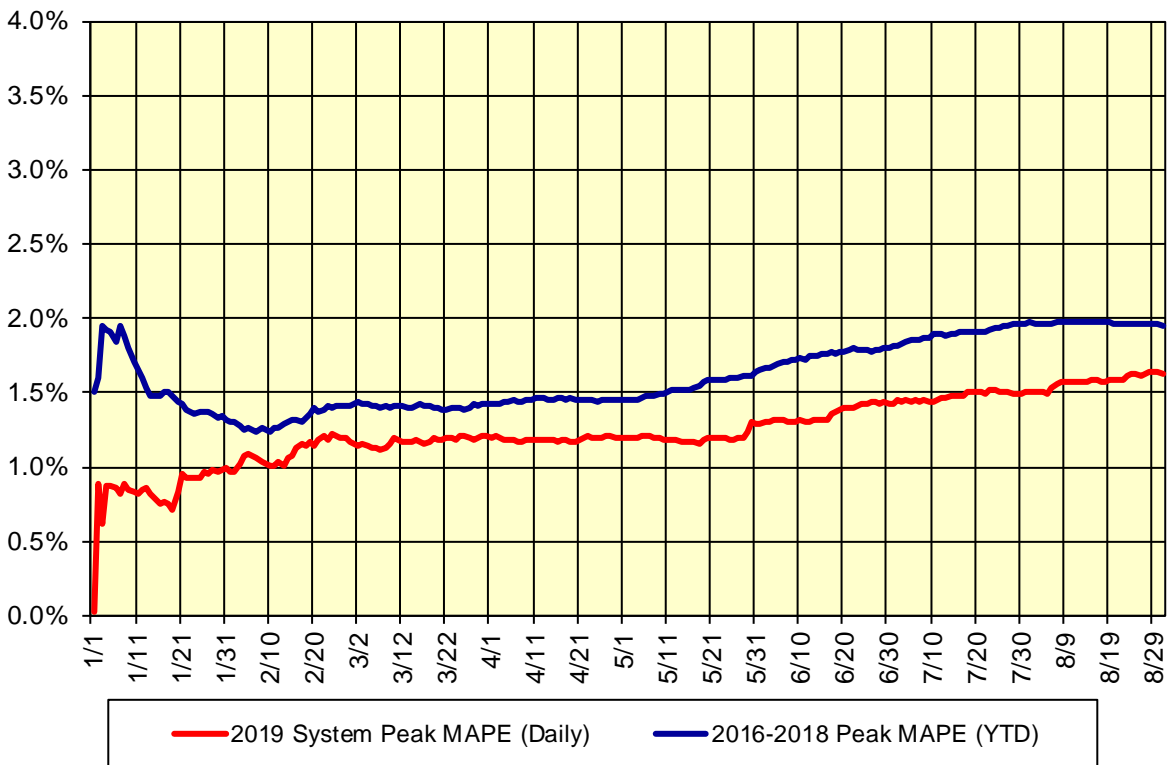
**NYISO Daily Peak Load - August 2019  
Actual vs. Forecast**



### Day Ahead Peak Forecast - August 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 – August 2019**

<b>Filing Date</b>	<b>Filing Summary</b>	<b>Docket No.</b>	<b>Order Date</b>	<b>Order Summary</b>
06/28/2019	NYISO and PJM joint filing re: revisions to the Joint Operating Agreement concerning Market-to-Market (M2M) flowgates for M2M coordination	ER19-2282-000	08/28/2019	Order accepted certain revisions subject to a two-week advance notice of the actual effective date and other revisions to be effective 09/16/19, as requested
08/02/2019	NYISO filing re: answer to third party comments and protests of its 06/27/2019 distributed energy resource filing	ER19-2276-000		
08/07/2019	Joint NYISO, Central Hudson and Niagara Mohawk 205 filing re: Engineering, Procurement, and Construction Agreement (SA 2449) among the NYISO, Central Hudson, Niagara Mohawk, Stony Creek Energy LLC, TBE Montgomery, LLC, and CPV Valley, LLC	ER19-2543-000		
08/08/2019	NYISO 205 filing re: implementation agreement (SA 2474) concerning fuel oil storage between NYISO and Astoria Generating Company	ER19-2555-000		
08/15/2019	NYISO confidential filing to the NYPSC re: three-month Reliability Commitment Data Report for the period ending 07/31/2019	PSC Matter No. 10-02007		
08/19/2019	Joint NYISO and PJM filing re: third report on efforts to develop joint operating agreement revisions to address generation redispatch on the East Towanda Hillside Tie Line	ER18-2442-000		
08/19/2019	NYISO answer to the NYPSC/NYSERDA complaint re: application of the buyer side mitigation rules to new energy storage resources	EL19-86-000		
08/20/2019	Joint NYISO, Niagara Mohawk Power Corporation 205 filing re: Transmission Interconnection Agreement (SA 2472) among NYISO, Niagara Mohawk Power Corporation and HQ Energy Services (U.S.)	ER19-2645-000		
08/21/2019	Joint NYISO, Niagara Mohawk Power Corporation 205 filing re: large generator interconnection agreement (SA 2473) among NYISO, National Grid and Ball Hill Wind Energy, LLC	ER19-2665-000		
08/21/2019	NYISO supplemental filing re: inclusion of omitted signature page from the large generator interconnection	ER19-2665-000		

	agreement (SA 2473) among NYISO, National Grid and Ball Hill Wind Energy, LLC			
08/28/2019	NYISO filing re: FERC Form3Q Quarterly financial report of electric utilities, licensees, and natural gas companies for 2019/Q2	No Docket No.		