

Market Operations Report

Rana Mukerji

SENIOR VICE PRESIDENT – MARKET STRUCTURES, NYISO

Business Issues Committee Meeting

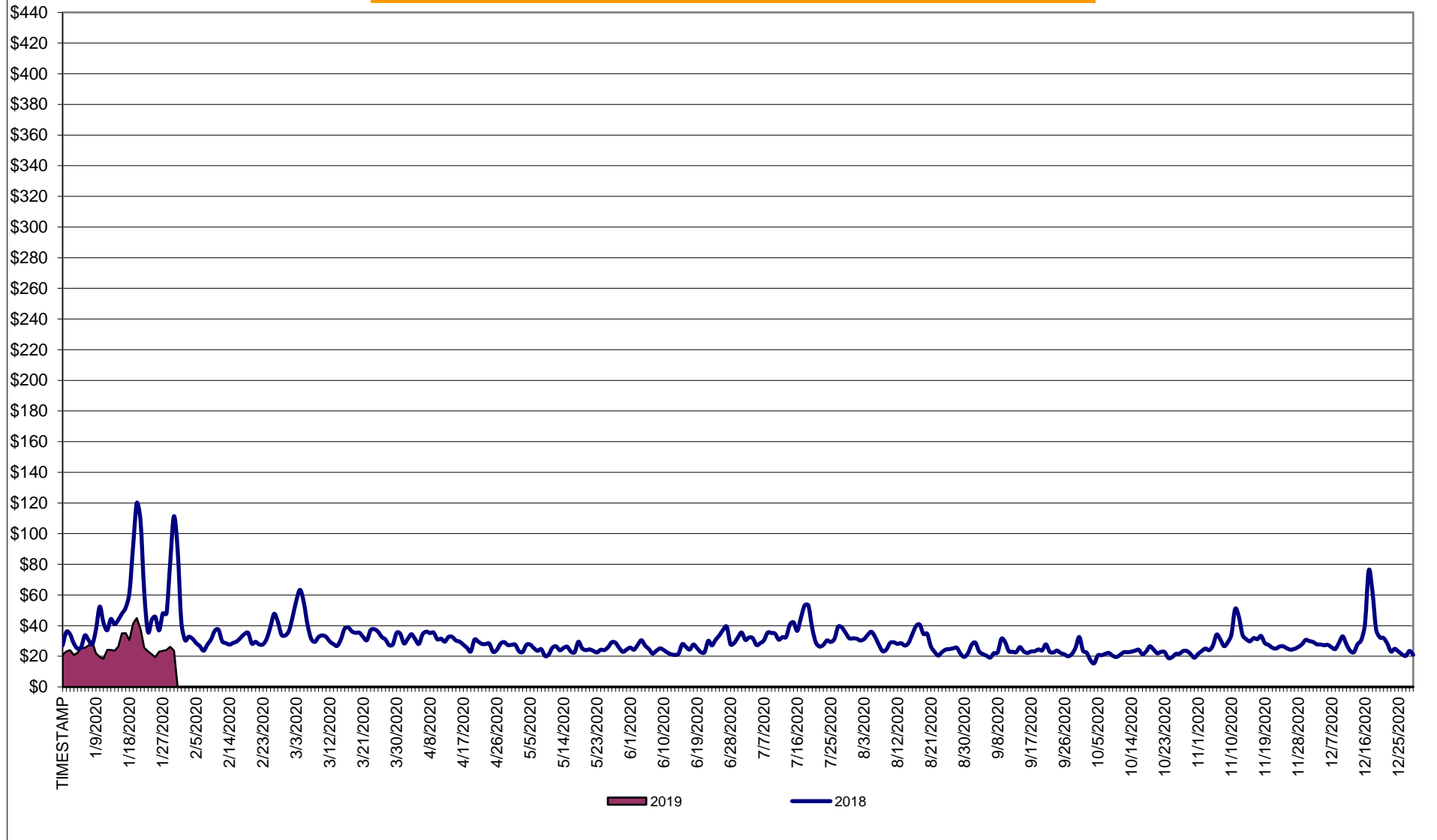
February 12, 2020 Rensselaer, NY

Market Performance Highlights

January 2020

- LBMP for January is \$24.77/MWh; lower than \$29.52/MWh in December 2019 and \$50.93/MWh in January 2019.
 - Day Ahead and Real Time Load Weighted LBMPs are lower compared to December.
- January 2020 average year-to-date monthly cost of \$27.29/MWh is a 49% decrease from \$52.99/MWh in January 2019.
- Average daily sendout is 423 GWh/day in January; lower than 427 GWh/day in December 2019 and 449 GWh/day in January 2019.
- Natural gas and distillate prices are lower compared to the previous month.
 - Natural Gas (Transco Z6 NY) was \$2.20/MMBtu, down from \$2.55/MMBtu in December.
 - Natural gas prices are down 64.1% year-over-year.
 - Jet Kerosene Gulf Coast was \$13.24/MMBtu, down from \$14.03/MMBtu in December.
 - Ultra Low Sulfur No.2 Diesel NY Harbor was \$13.33/MMBtu, down from \$14.21/MMBtu in December.
 - Distillate prices are up 0.4% 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 (\$0.19)/MWh in December.
 - Local Reliability Share is \$0.07/MWh, lower than \$0.17/MWh in December.
 - Statewide Share is (\$0.22)/MWh, higher than (\$0.35)/MWh in December.
 - TSA \$ per NYC MWh is \$0.00/MWh.
 - Total uplift costs (Schedule 1 components including NYISO Cost of Operations) are higher than December.

Daily NYISO Average Cost/MWh (Energy & Ancillary Services)*
2019 Annual Average \$32.59/MWh
January 2019 YTD Average \$52.99/MWh
January 2020 YTD Average \$27.29/MWh



* Excludes ICAP payments.

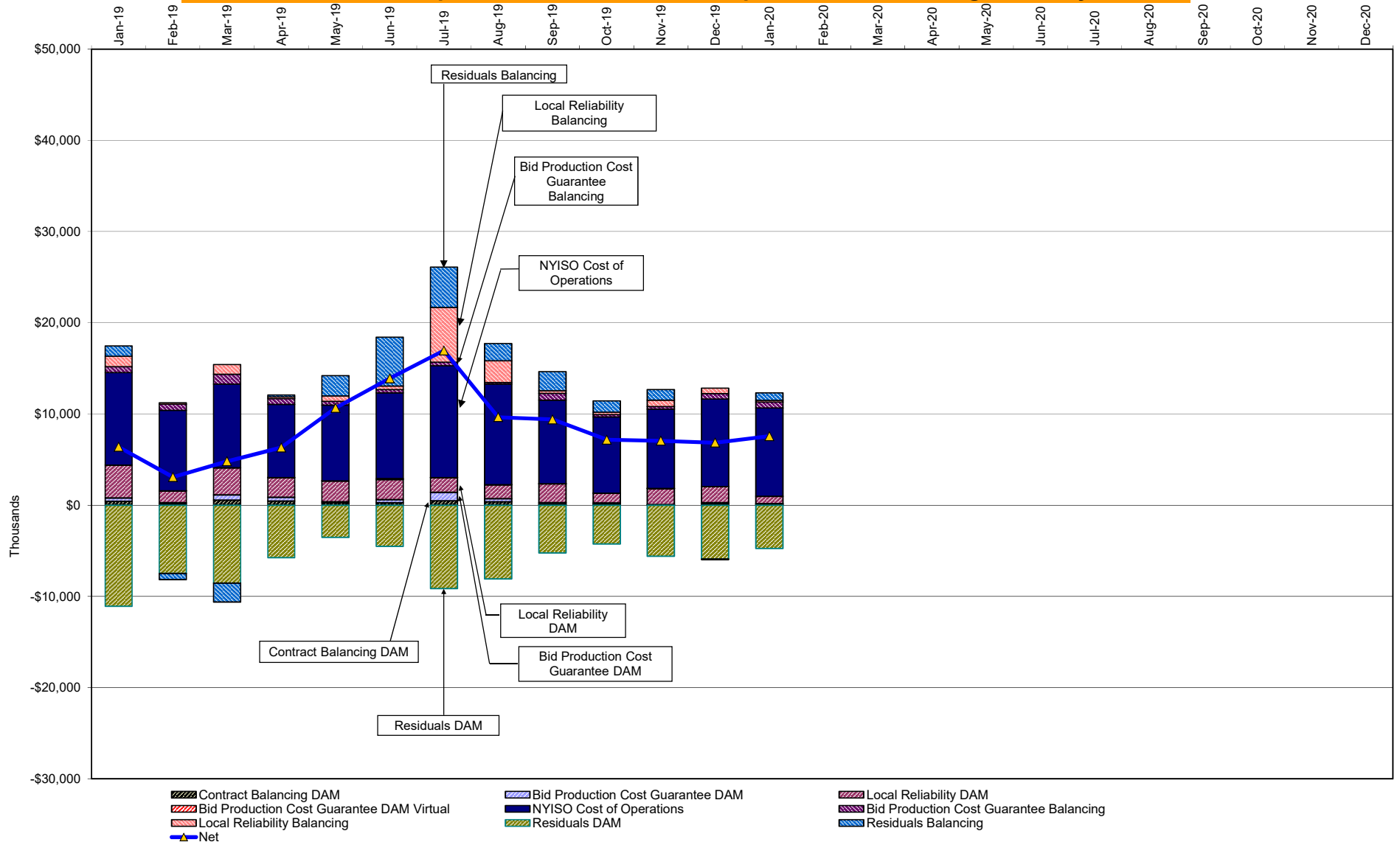
NYISO Average Cost/MWh (Energy and Ancillary Services) *
from the LBMP Customer point of view

2020	<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	24.77											
NTAC	0.91											
Reserve	0.46											
Regulation	0.09											
NYISO Cost of Operations	0.68											
FERC Fee Recovery	0.08											
Uplift	(0.15)											
Uplift: Local Reliability Share	0.07											
Uplift: Statewide Share	(0.22)											
Voltage Support and Black Start	0.44											
Avg Monthly Cost	27.29											
 Avg YTD Cost	27.29											
 TSA \$ per NYC MWh	0.00											
 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	23.10	24.43	33.18	27.83	22.22	20.84	27.39	29.52
NTAC	0.51	0.69	0.98	1.16	0.72	1.08	1.01	0.98	0.48	0.57	0.88	0.77
Reserve	0.54	0.51	0.55	0.63	0.63	0.50	0.44	0.49	0.50	0.62	0.50	0.44
Regulation	0.13	0.11	0.10	0.33	0.13	0.09	0.07	0.09	0.09	0.13	0.11	0.10
NYISO Cost of Operations	0.68	0.68	0.69	0.69	0.68	0.69	0.70	0.70	0.69	0.67	0.67	0.67
FERC Fee Recovery	0.08	0.09	0.09	0.10	0.10	0.08	0.06	0.07	0.09	0.09	0.09	0.08
Uplift	(0.25)	(0.44)	(0.33)	(0.15)	0.13	0.07	(0.06)	(0.20)	(0.13)	(0.09)	(0.13)	(0.19)
Uplift: Local Reliability Share	0.32	0.11	0.31	0.20	0.23	0.19	0.44	0.25	0.17	0.11	0.19	0.17
Uplift: Statewide Share	(0.57)	(0.55)	(0.64)	(0.35)	(0.11)	(0.12)	(0.50)	(0.45)	(0.30)	(0.20)	(0.31)	(0.35)
Voltage Support and Black Start	0.37	0.37	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.37	0.37	0.36
Avg Monthly Cost	52.99	35.51	37.38	31.16	25.88	27.32	35.78	30.33	24.32	23.21	29.89	31.76
 Avg YTD Cost	52.99	44.93	42.54	40.12	37.57	35.76	35.75	34.96	33.88	32.94	32.69	32.59
 TSA \$ per NYC MWh	0.00	0.00	0.01	0.01	0.19	0.77	1.00	0.33	0.43	0.00	0.00	0.00

* Excludes ICAP payments.
Market Mitigation and Analysis
Prepared: 2/7/2020 11:52 AM

As of Jan. 2016, the annual FERC fee is recovered separately from Cost of Ops.

NYISO Dollar Flows - Uplift - OATT Schedule 1 components - Data through January 31, 2020



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

<u>2020</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>
<u>Day Ahead Market MWh</u>	14,194,609											
DAM LSE Internal LBMP Energy Sales	56%											
DAM External TC LBMP Energy Sales	6%											
DAM Bilateral - Internal Bilaterals	30%											
DAM Bilateral - Import/Non-LBMP Market Bilaterals	5%											
DAM Bilateral - Export/Non-LBMP Market Bilaterals	2%											
DAM Bilateral - Wheel Through Bilaterals	1%											
<u>Balancing Energy Market MWh</u>	-26,753											
Balancing Energy LSE Internal LBMP Energy Sales	-1080%											
Balancing Energy External TC LBMP Energy Sales	1156%											
Balancing Energy Bilateral - Internal Bilaterals	62%											
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%											
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	127%											
Balancing Energy Bilateral - Wheel Through Bilaterals	-365%											
<u>Transactions Summary</u>												
LBMP	62%											
Internal Bilaterals	31%											
Import Bilaterals	5%											
Export Bilaterals	2%											
Wheels Through	0%											
<u>Market Share of Total Load</u>												
Day Ahead Market	100.2%											
Balancing Energy +	-0.2%											
Total MWH	14,167,856											
Average Daily Energy Sendout/Month GWh	423											

<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>
<u>Day Ahead Market MWh</u>	15,299,458	13,391,383	13,527,834	11,811,029	12,521,583	13,723,372	17,416,589	16,379,968	13,588,715	12,567,821	13,036,152	14,345,711
DAM LSE Internal LBMP Energy Sales	57%	57%	59%	59%	57%	58%	64%	63%	58%	57%	54%	56%
DAM External TC LBMP Energy Sales	6%	5%	3%	1%	3%	3%	3%	3%	3%	4%	6%	6%
DAM Bilateral - Internal Bilaterals	29%	30%	30%	31%	32%	29%	26%	26%	30%	32%	32%	30%
DAM Bilateral - Import/Non-LBMP Market Bilaterals	5%	5%	5%	5%	6%	5%	4%	4%	5%	5%	5%	5%
DAM Bilateral - Export/Non-LBMP Market Bilaterals	1%	1%	2%	2%	2%	2%	1%	1%	2%	2%	2%	2%
DAM Bilateral - Wheel Through Bilaterals	2%	2%	2%	2%	1%	2%	2%	2%	2%	1%	1%	1%
<u>Balancing Energy Market MWh</u>	-322,442	-323,188	-261,217	-218,482	-392,699	-102,044	103,628	-514,102	-247,267	-112,057	-17,421	46,828
Balancing Energy LSE Internal LBMP Energy Sales	-120%	-126%	-138%	-178%	-150%	-264%	-2%	-119%	-163%	-346%	-1332%	-480%
Balancing Energy External TC LBMP Energy Sales	65%	67%	82%	113%	68%	233%	199%	41%	93%	266%	1435%	699%
Balancing Energy Bilateral - Internal Bilaterals	-4%	-1%	-3%	2%	1%	0%	5%	0%	-4%	6%	103%	39%
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	3%	7%	6%	7%	2%	8%	8%	1%	6%	25%	170%	70%
Balancing Energy Bilateral - Wheel Through Bilaterals	-45%	-47%	-47%	-44%	-21%	-77%	-125%	-23%	-31%	-52%	-476%	-229%
<u>Transactions Summary</u>												
LBMP	63%	62%	61%	60%	59%	62%	68%	65%	61%	61%	60%	63%
Internal Bilaterals	29%	30%	30%	31%	33%	30%	25%	27%	30%	32%	32%	30%
Import Bilaterals	5%	5%	6%	6%	6%	5%	4%	5%	5%	5%	5%	5%
Export Bilaterals	1%	2%	2%	2%	2%	2%	1%	1%	2%	2%	2%	2%
Wheels Through	1%	1%	1%	1%	0%	1%	1%	1%	2%	0%	0%	0%
<u>Market Share of Total Load</u>												
Day Ahead Market	102.2%	102.5%	102.0%	101.9%	103.2%	100.7%	99.4%	103.2%	101.9%	100.9%	100.1%	99.7%
Balancing Energy +	-2.2%	-2.5%	-2.0%	-1.9%	-3.2%	-0.7%	0.6%	-3.2%	-1.9%	-0.9%	-0.1%	0.3%
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	13,341,448	12,455,764	13,018,731	14,392,539
Average Daily Energy Sendout/Month GWh	449	436	411	371	373	429	539	487	419	377	401	427

+ 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 2020 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 *	\$22.11											
Standard Deviation	\$7.43											
Load Weighted Price **	\$22.77											
<u>RTC LBMP</u>												
Price *	\$22.86											
Standard Deviation	\$9.33											
Load Weighted Price **	\$23.50											
<u>REAL TIME LBMP</u>												
Price *	\$22.53											
Standard Deviation	\$11.90											
Load Weighted Price **	\$23.20											
Average Daily Energy Sendout/Month GWh	423											

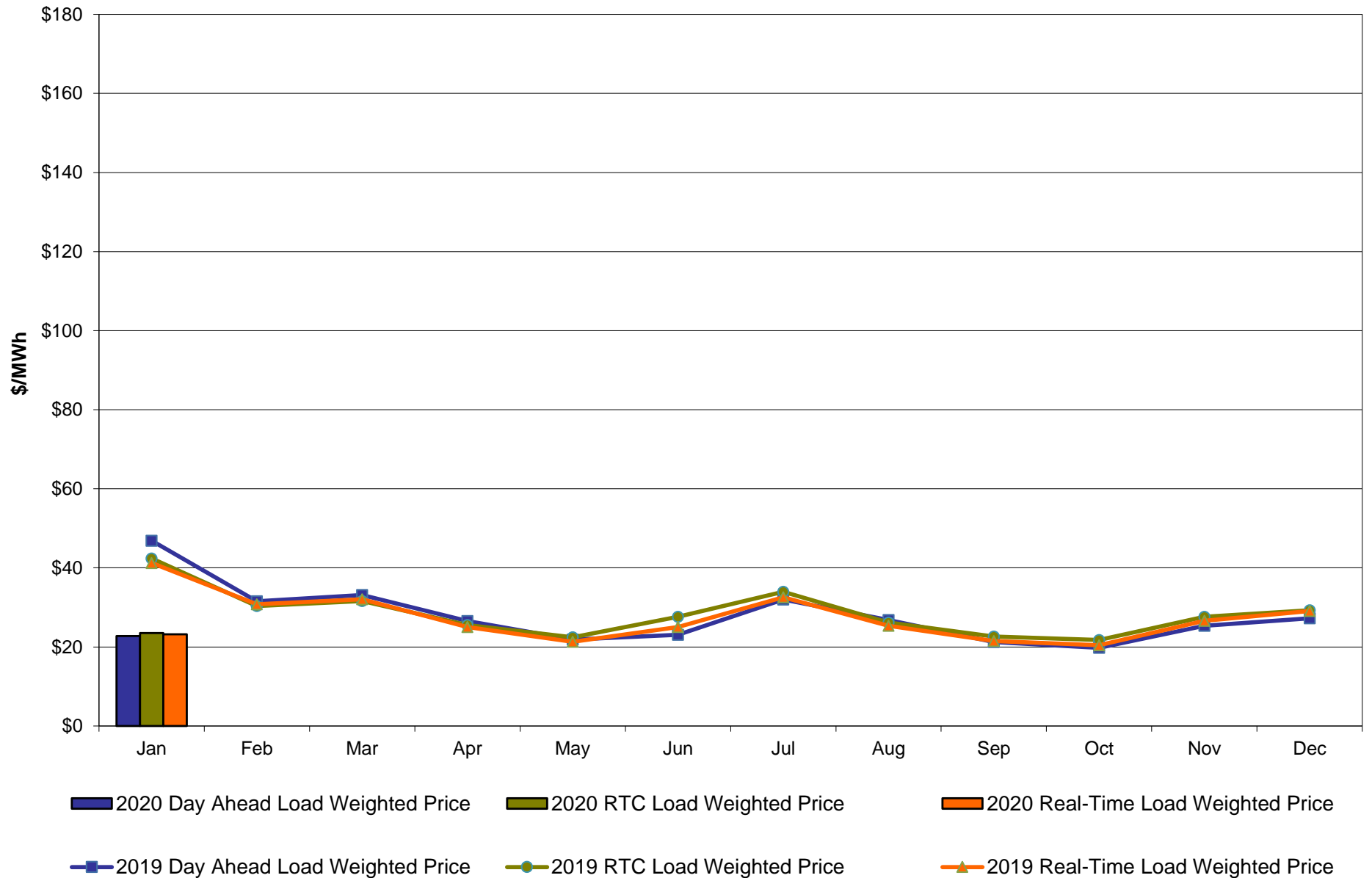
NYISO Markets 2019 Energy Statistics

	<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	\$21.16	\$21.79	\$30.16	\$25.35	\$20.45	\$19.18	\$24.65	\$26.29
Standard Deviation	\$25.67	\$12.86	\$9.30	\$6.32	\$5.89	\$7.28	\$12.06	\$8.73	\$5.57	\$5.09	\$7.73	\$11.81
Load Weighted Price **	\$46.88	\$31.53	\$33.14	\$26.57	\$21.89	\$23.04	\$31.98	\$26.83	\$21.23	\$19.77	\$25.36	\$27.22
<u>RTC LBMP</u>												
Price *	\$40.86	\$29.74	\$31.04	\$25.07	\$21.88	\$25.67	\$32.23	\$24.92	\$21.70	\$20.92	\$26.82	\$28.17
Standard Deviation	\$23.02	\$10.79	\$8.48	\$7.53	\$8.01	\$23.45	\$21.96	\$14.96	\$9.22	\$13.95	\$10.37	\$16.26
Load Weighted Price **	\$42.39	\$30.32	\$31.62	\$25.54	\$22.44	\$27.64	\$33.92	\$26.14	\$22.60	\$21.76	\$27.64	\$29.24
<u>REAL TIME LBMP</u>												
Price *	\$39.54	\$30.13	\$31.46	\$24.47	\$20.56	\$23.30	\$30.77	\$24.01	\$20.49	\$19.53	\$25.82	\$27.81
Standard Deviation	\$26.03	\$13.77	\$12.54	\$17.27	\$10.35	\$17.49	\$20.63	\$12.36	\$9.62	\$12.02	\$11.60	\$19.64
Load Weighted Price **	\$41.24	\$30.80	\$32.06	\$25.06	\$21.28	\$25.05	\$32.53	\$25.34	\$21.50	\$20.43	\$26.64	\$29.05
Average Daily Energy Sendout/Month GWh	449	436	411	371	373	429	539	487	419	377	401	427

* Average zonal load weighted prices.

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

NYISO Monthly Average Internal LBMPs 2019- 2020

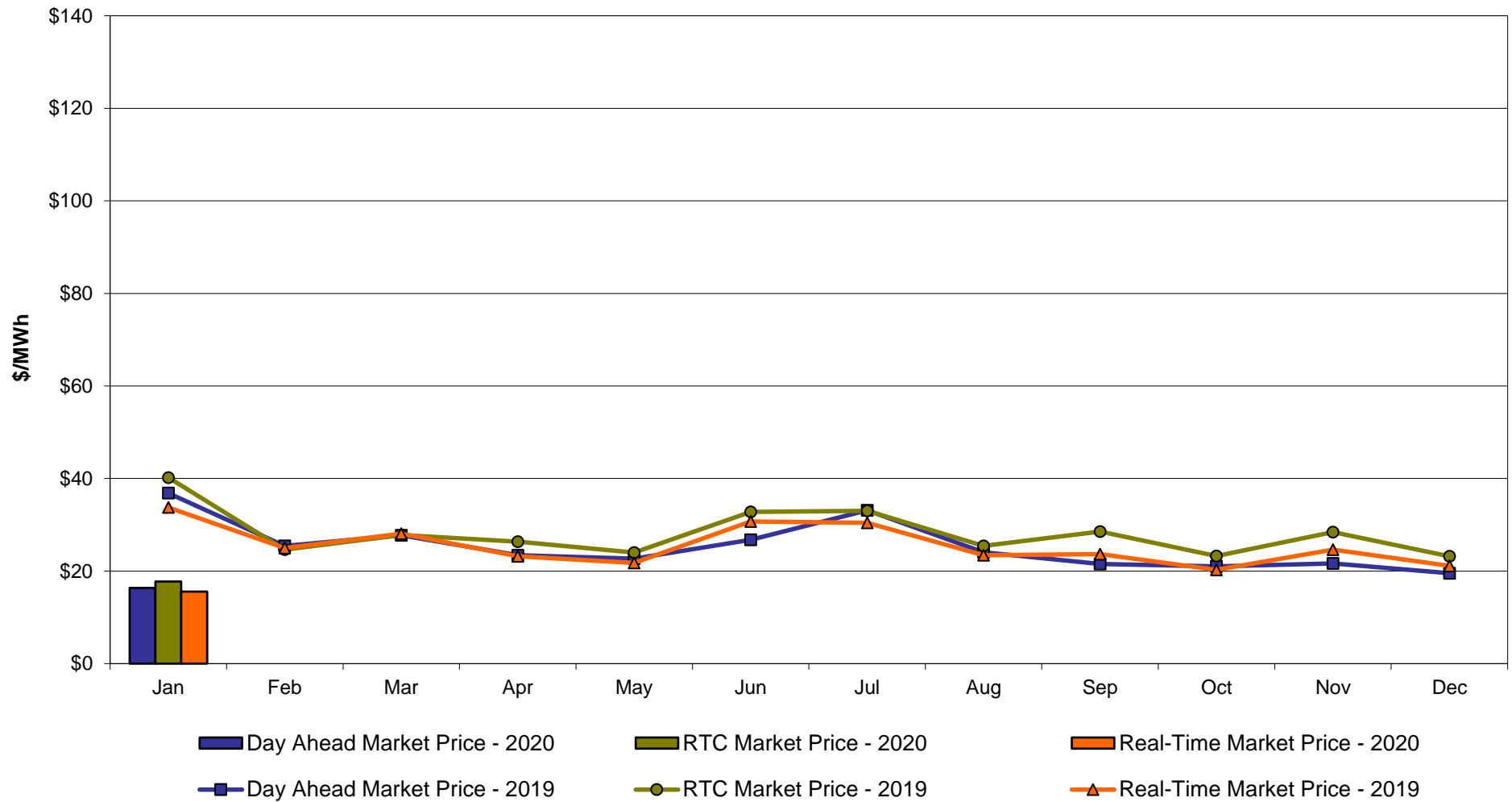


January 2020 Zonal LBMP Statistics for NYISO (\$/MWh)

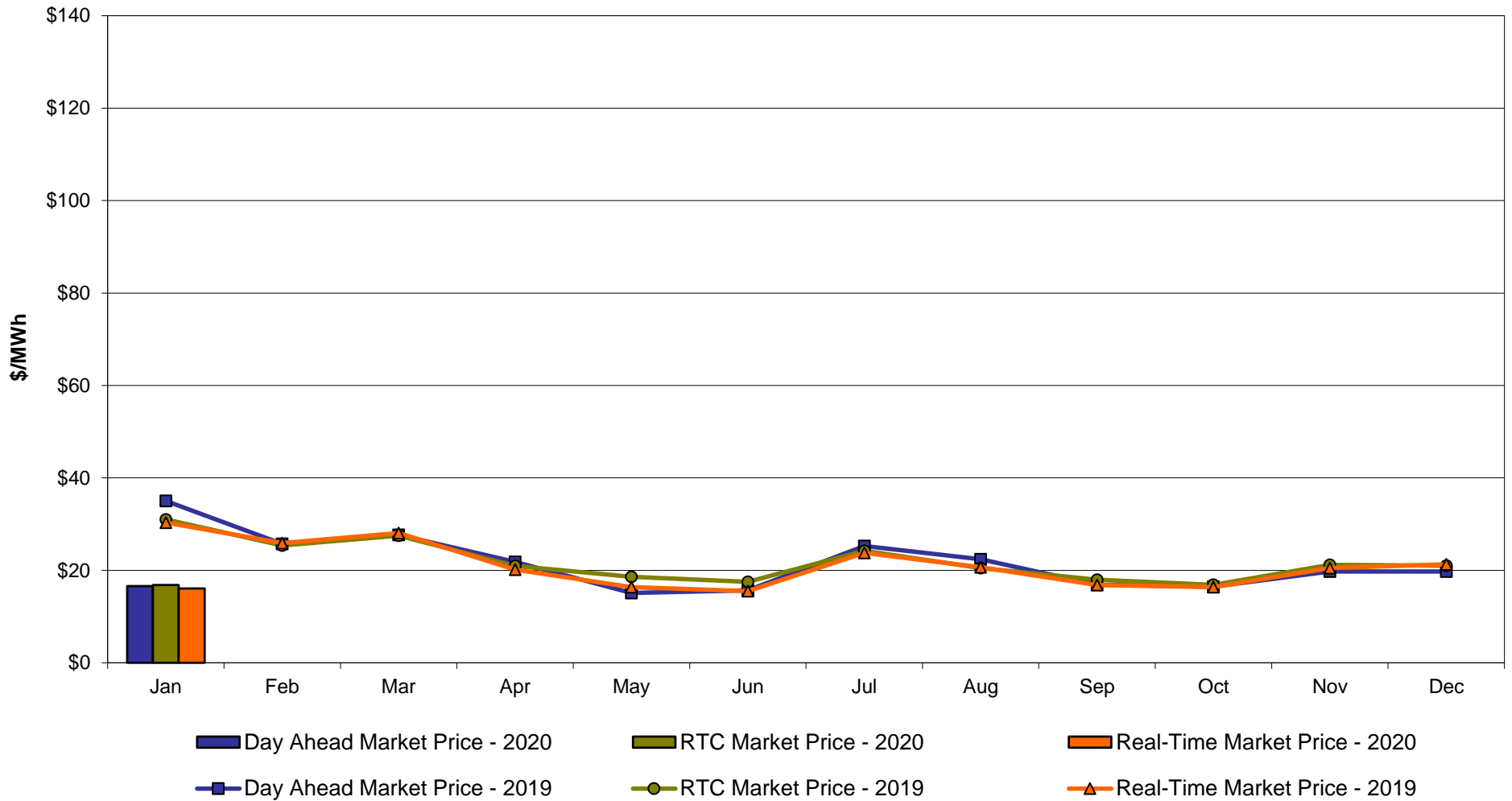
	<u>WEST</u> <u>Zone A</u>	<u>GENESEE</u> <u>Zone B</u>	<u>NORTH</u> <u>Zone D</u>	<u>CENTRAL</u> <u>Zone C</u>	<u>MOHAWK</u> <u>VALLEY</u> <u>Zone E</u>	<u>CAPITAL</u> <u>Zone F</u>	<u>HUDSON</u> <u>VALLEY</u> <u>Zone G</u>	<u>MILLWOOD</u> <u>Zone H</u>	<u>DUNWOODIE</u> <u>Zone I</u>	<u>NEW YORK</u> <u>CITY</u> <u>Zone J</u>	<u>LONG</u> <u>ISLAND</u> <u>Zone K</u>
<u>DAY AHEAD LBMP</u>											
Unweighted Price *	16.37	15.82	14.59	16.57	16.82	25.53	23.36	23.59	23.60	25.12	27.57
Standard Deviation	6.82	6.69	7.08	6.82	7.06	7.56	6.96	7.03	7.04	8.48	10.50
<u>RTC LBMP</u>											
Unweighted Price *	17.74	15.46	15.11	16.81	17.06	25.06	23.00	23.18	23.15	27.13	27.81
Standard Deviation	12.88	8.00	8.99	8.26	8.37	8.95	7.39	7.46	7.41	15.95	22.34
<u>REAL TIME LBMP</u>											
Unweighted Price *	15.54	15.26	14.41	16.07	16.44	25.26	22.94	23.13	23.08	28.19	25.97
Standard Deviation	10.36	9.91	10.75	9.93	10.23	14.13	11.31	11.45	11.36	21.59	13.65
	<u>ONTARIO</u> <u>IESO</u>	<u>HYDRO</u> <u>QUEBEC</u> <u>(Wheel)</u>	<u>HYDRO</u> <u>QUEBEC</u> <u>(Import/Export)</u>	<u>PJM</u>	<u>NEW</u> <u>ENGLAND</u>	<u>CROSS</u> <u>SOUND</u> <u>CABLE</u> <u>Controllable</u> <u>Line</u>	<u>NORTHPORT-</u> <u>NORWALK</u> <u>Controllable</u> <u>Line</u>	<u>NEPTUNE</u> <u>Controllable</u> <u>Line</u>	<u>LINDEN VFT</u> <u>Controllable</u> <u>Line</u>	<u>HUDSON</u> <u>Controllable</u> <u>Line</u>	<u>Dennison</u> <u>Controllable</u> <u>Line</u>
	<u>Zone O</u>	<u>Zone M</u>	<u>Zone M</u>	<u>Zone P</u>	<u>Zone N</u>						
<u>DAY AHEAD LBMP</u>											
Unweighted Price *	15.24	14.49	14.41	19.95	25.60	26.68	26.35	25.66	23.99	23.91	14.28
Standard Deviation	5.53	7.00	6.97	6.20	8.55	9.91	9.67	9.32	7.23	7.18	6.96
<u>RTC LBMP</u>											
Unweighted Price *	13.65	14.84	14.84	19.92	26.47	28.57	26.77	26.30	23.15	23.25	14.74
Standard Deviation	6.78	8.84	8.84	6.76	12.40	29.47	20.78	20.69	7.39	7.44	8.79
<u>REAL TIME LBMP</u>											
Unweighted Price *	12.86	14.19	14.19	19.35	25.28	26.46	25.37	24.92	22.93	23.21	14.06
Standard Deviation	18.43	10.64	10.64	9.09	13.54	17.68	13.26	12.81	12.77	11.38	10.50

* Straight LBMP averages

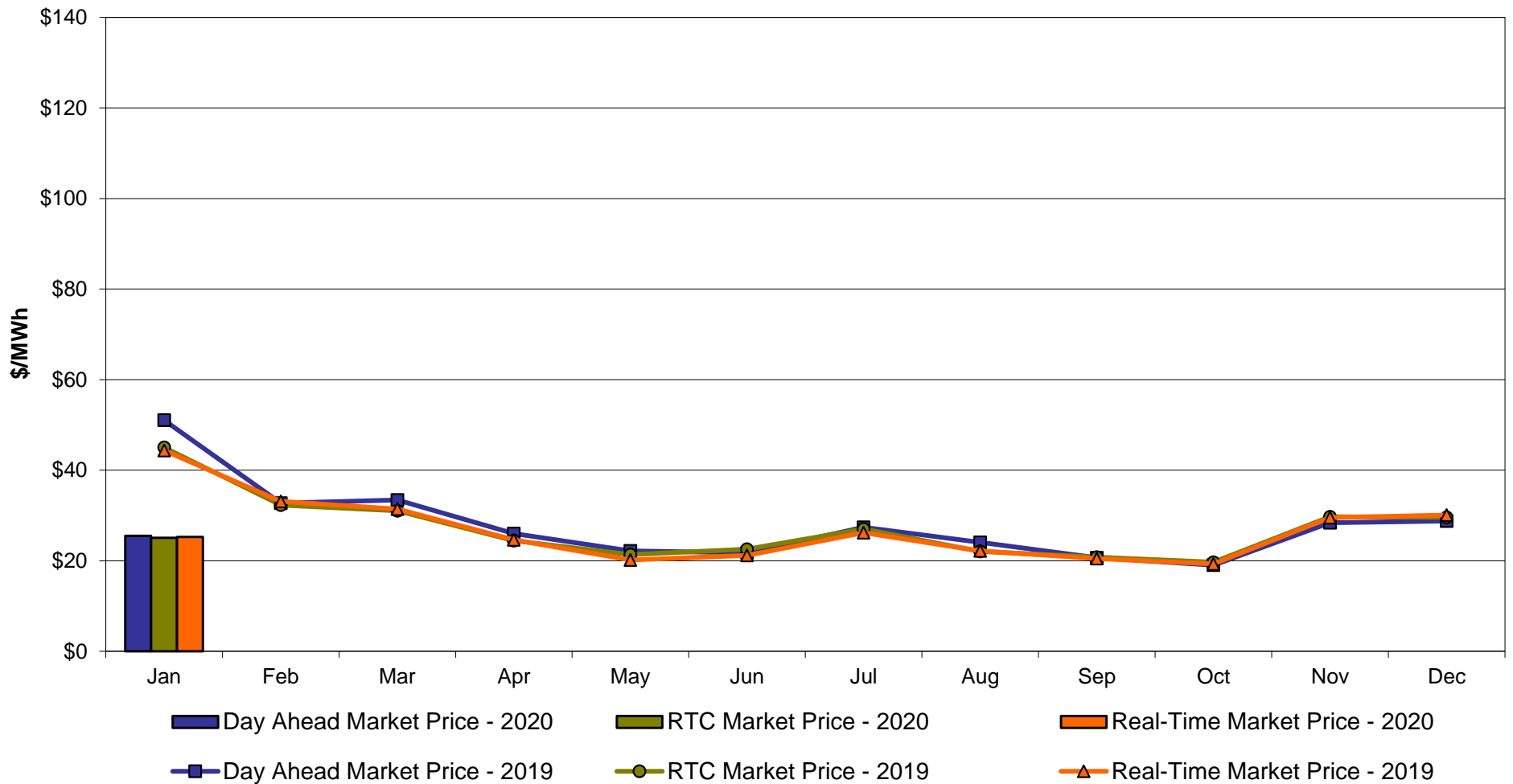
West Zone A **Monthly Average LBMP Prices 2019 - 2020**



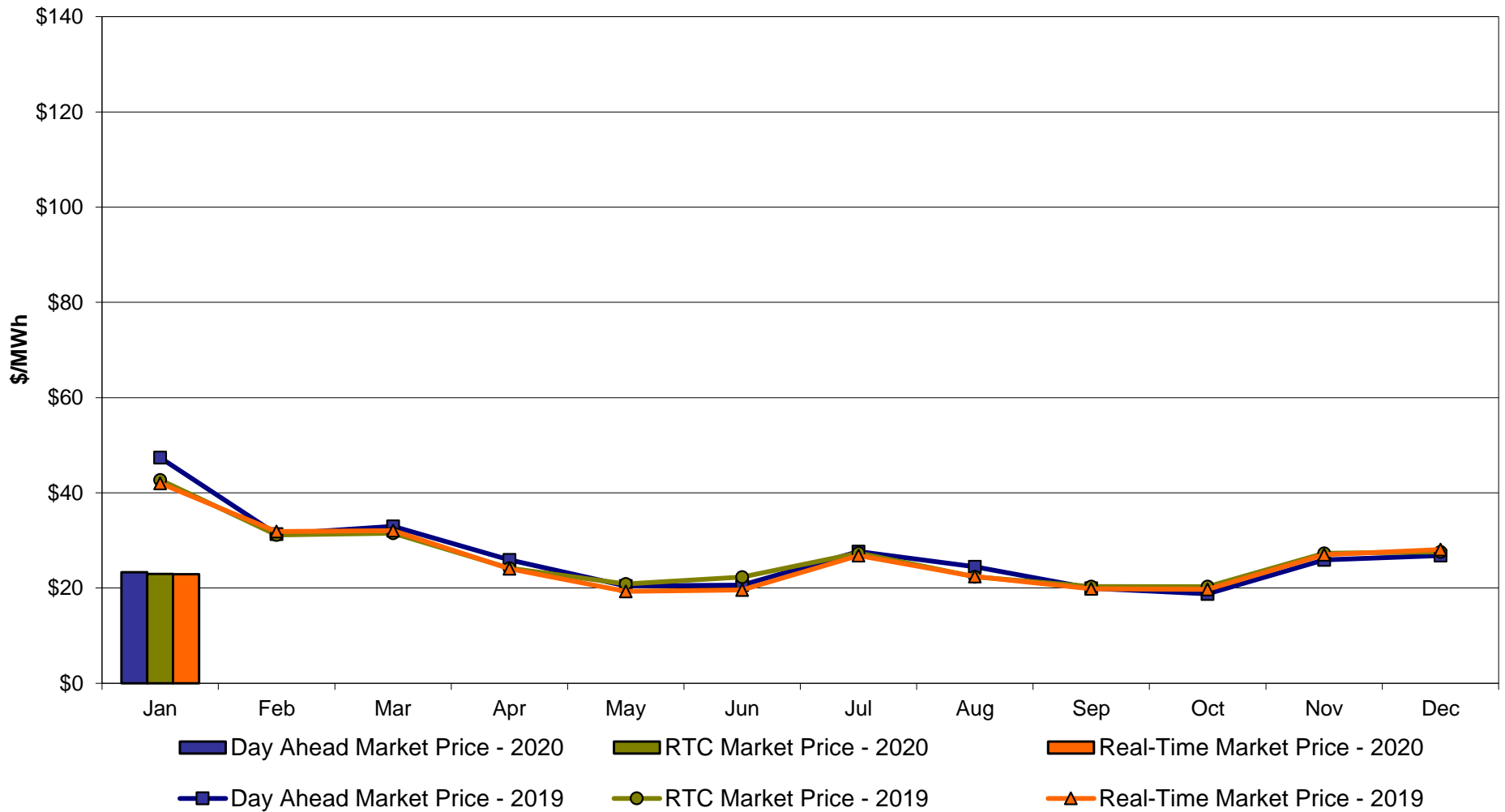
Central Zone C
Monthly Average LBMP Prices 2019 - 2020



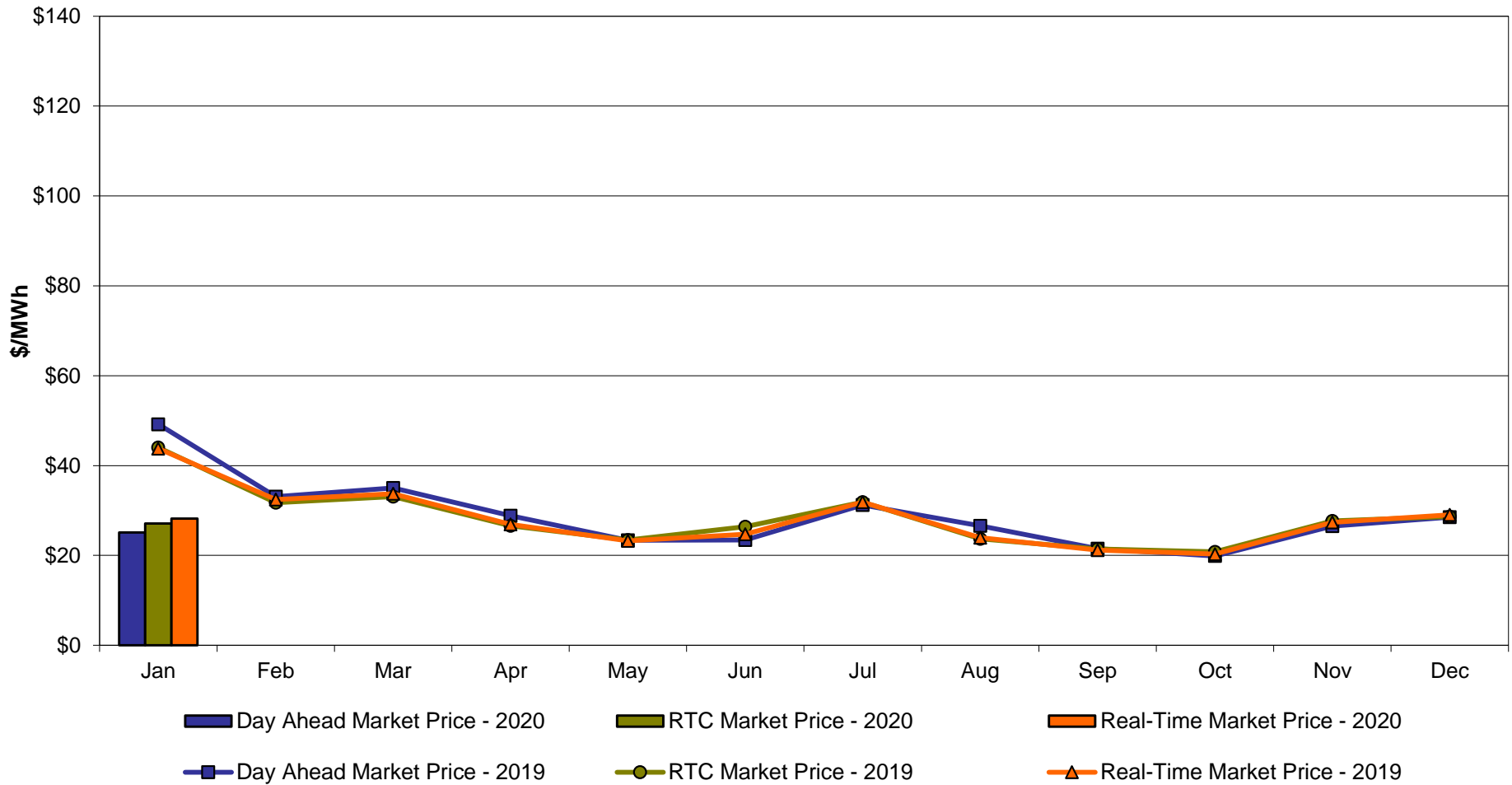
Capital Zone F **Monthly Average LBMP Prices 2019 - 2020**



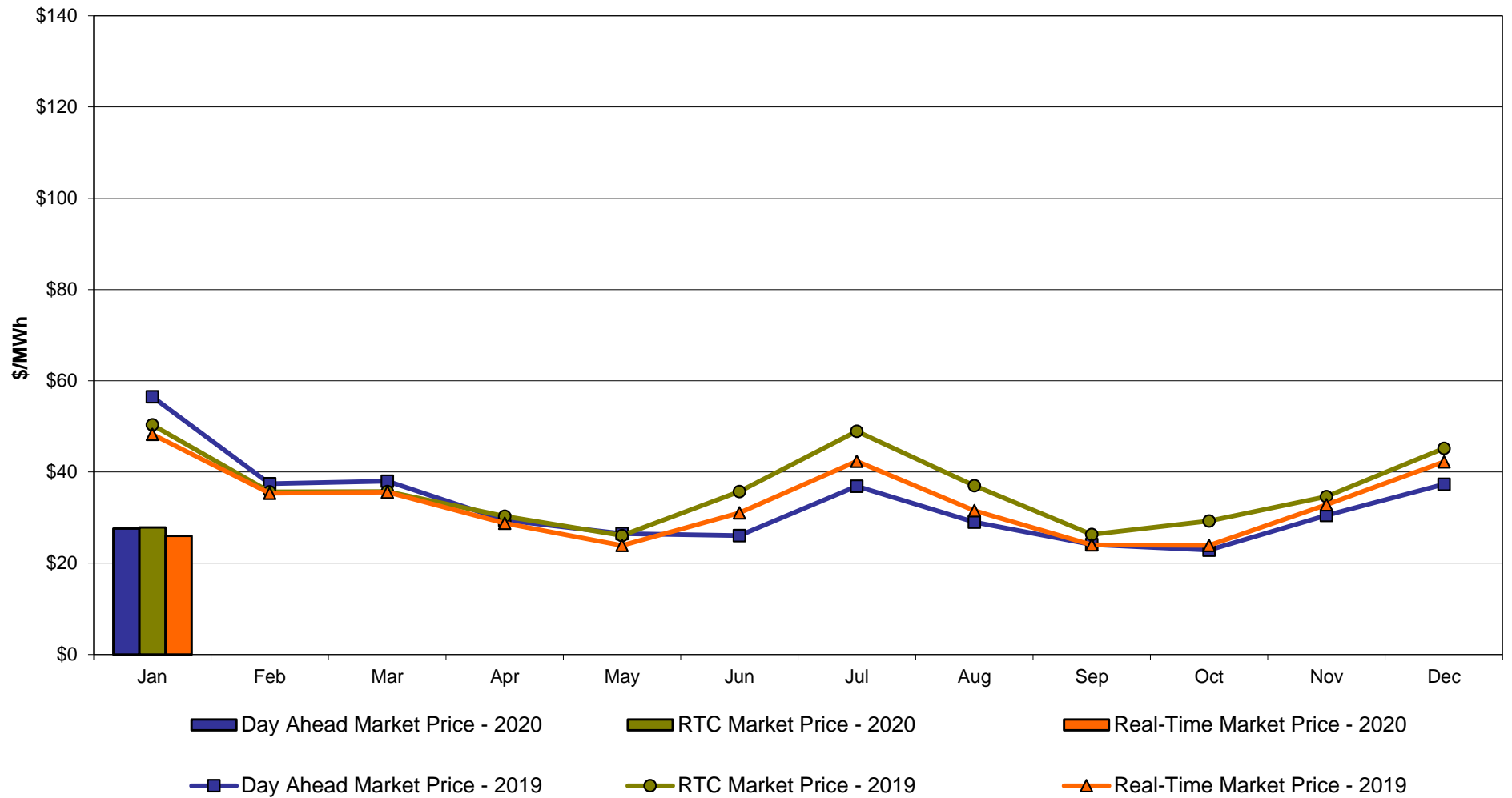
Hudson Valley Zone G Monthly Average LBMP Prices 2019 - 2020



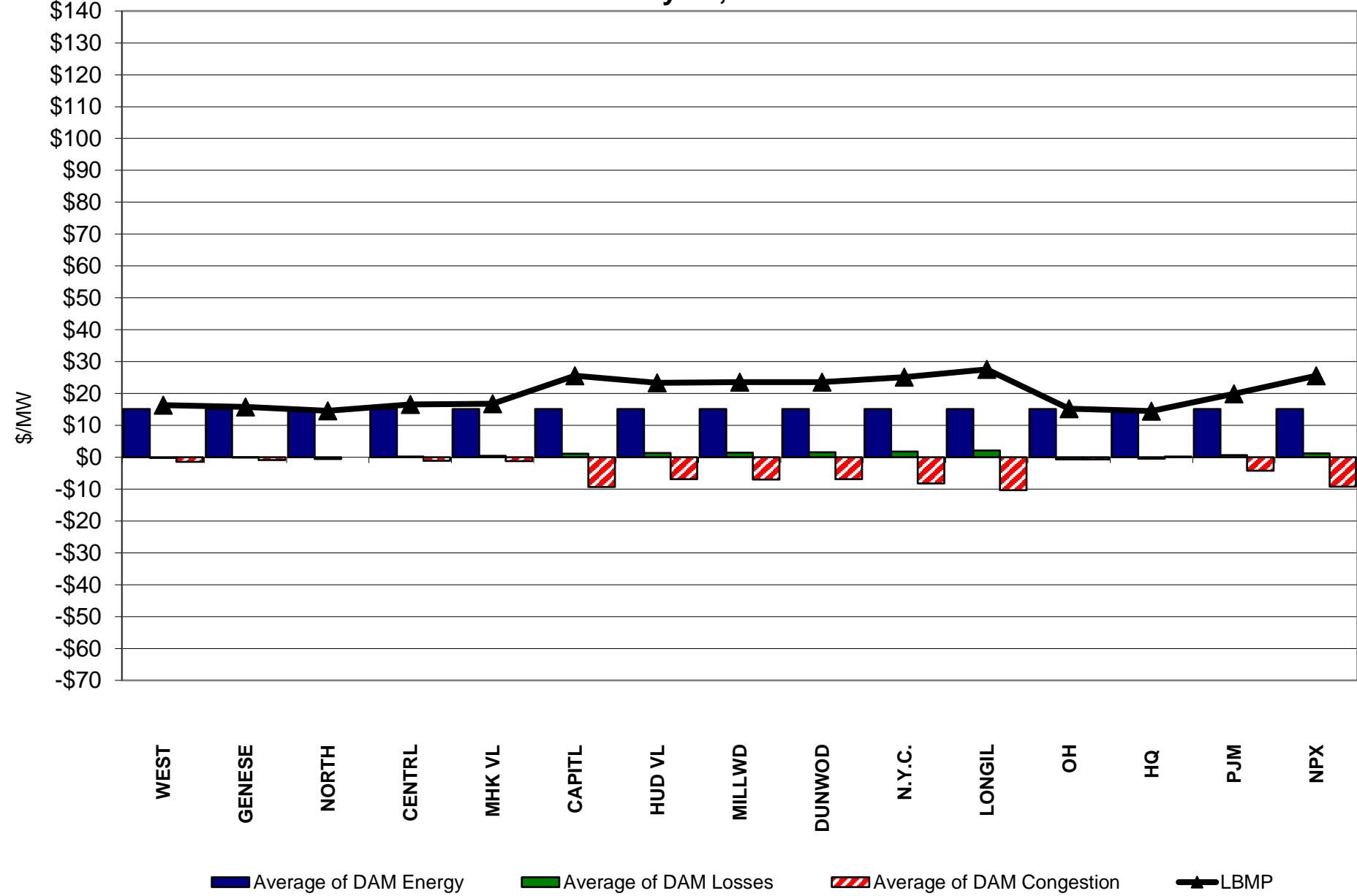
NYC Zone J **Monthly Average LBMP Prices 2019 - 2020**



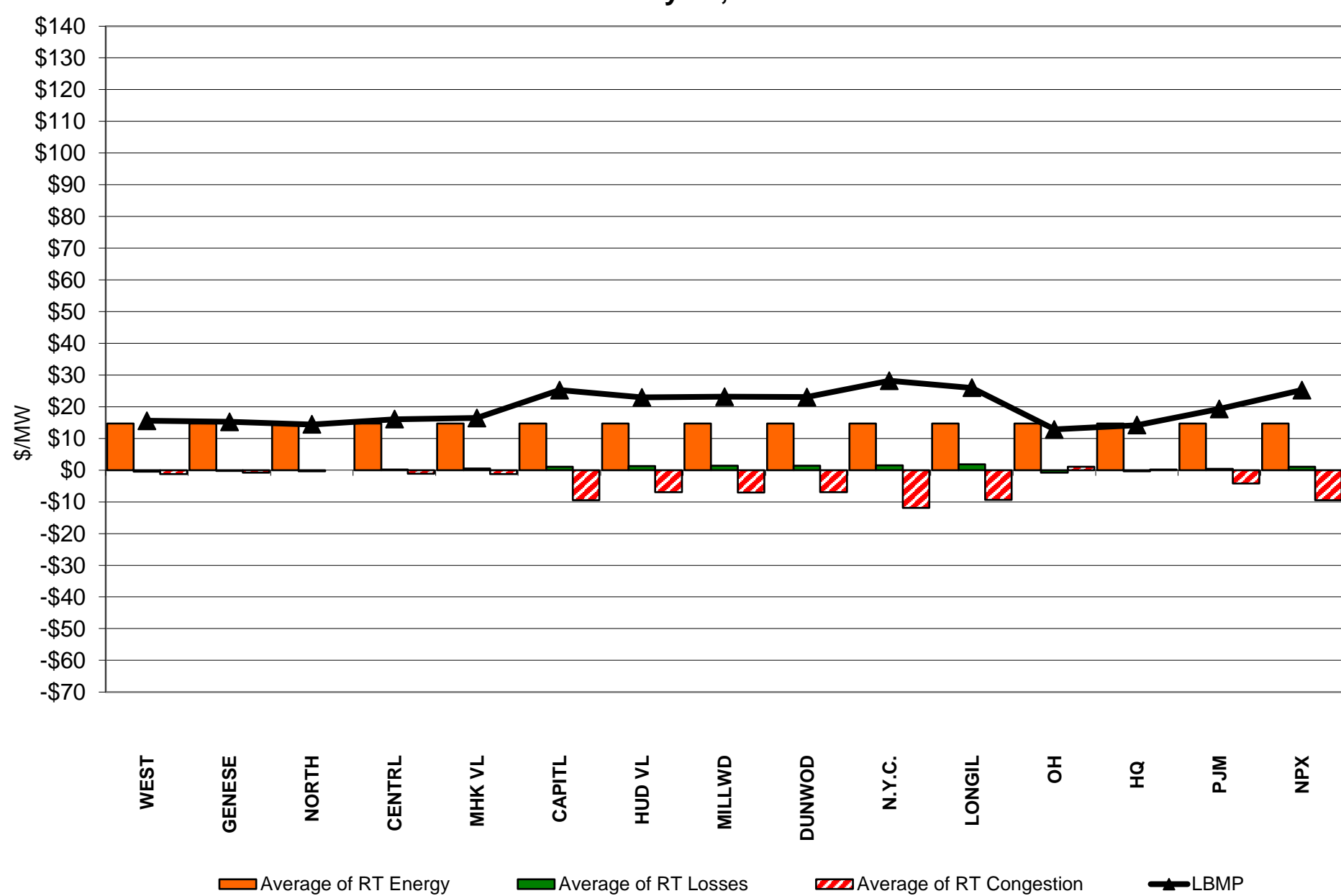
Long Island Zone K Monthly Average LBMP Prices 2019 - 2020



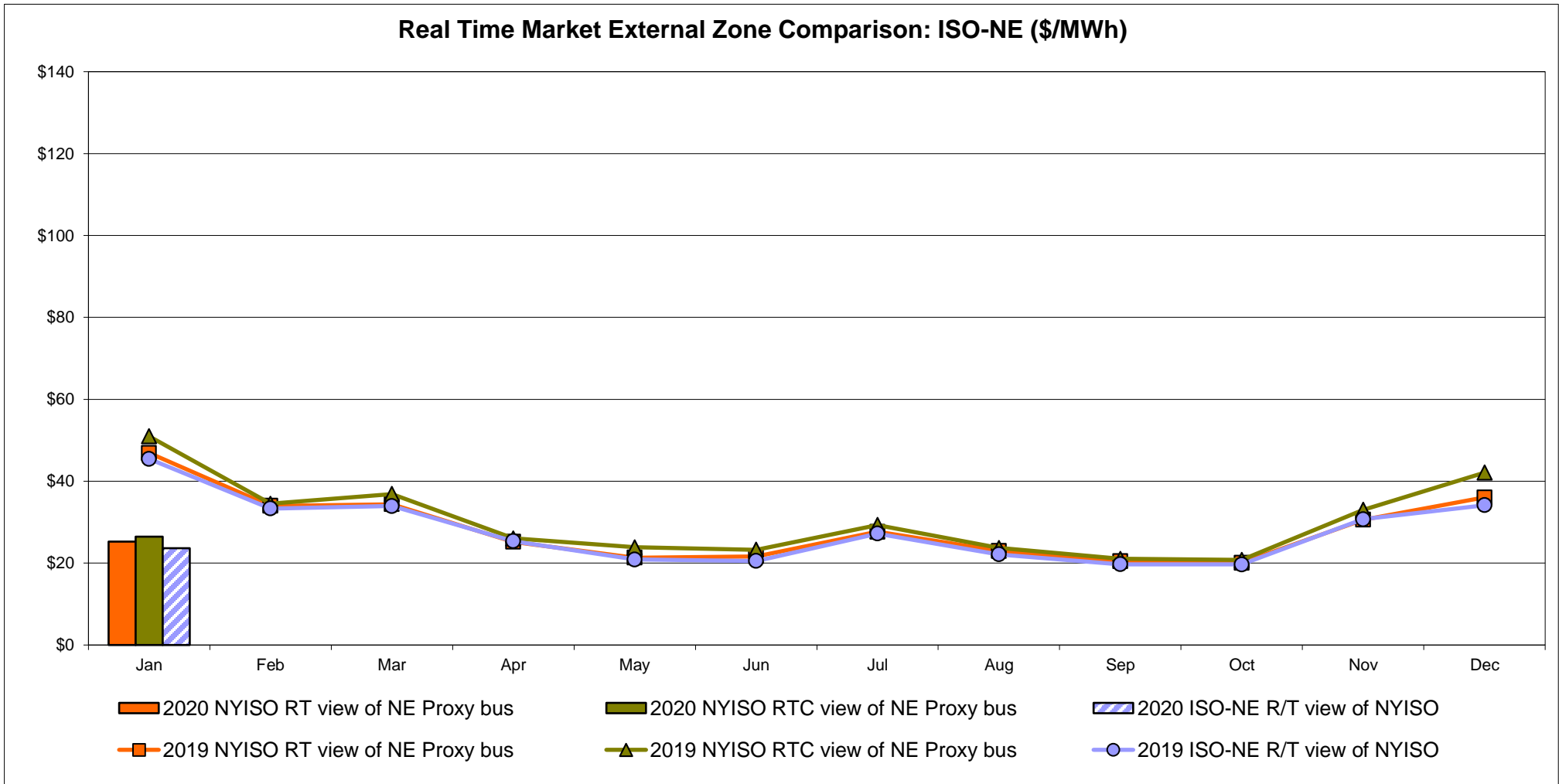
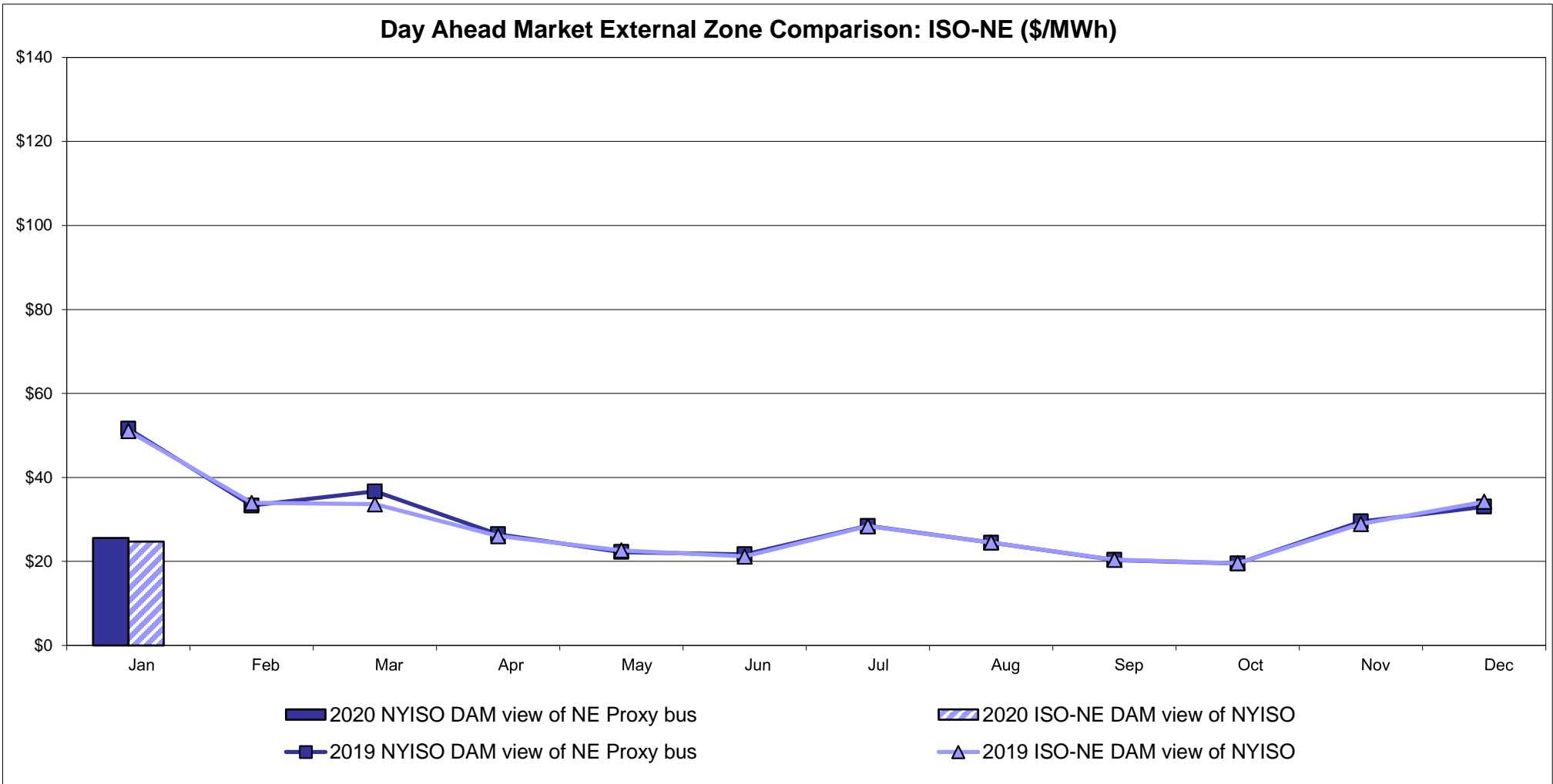
DAM Zonal Unweighted Monthly Average LBMP Components
thru January 31, 2020



RT Zonal Unweighted Monthly Average LBMP Components
thru January 31, 2020

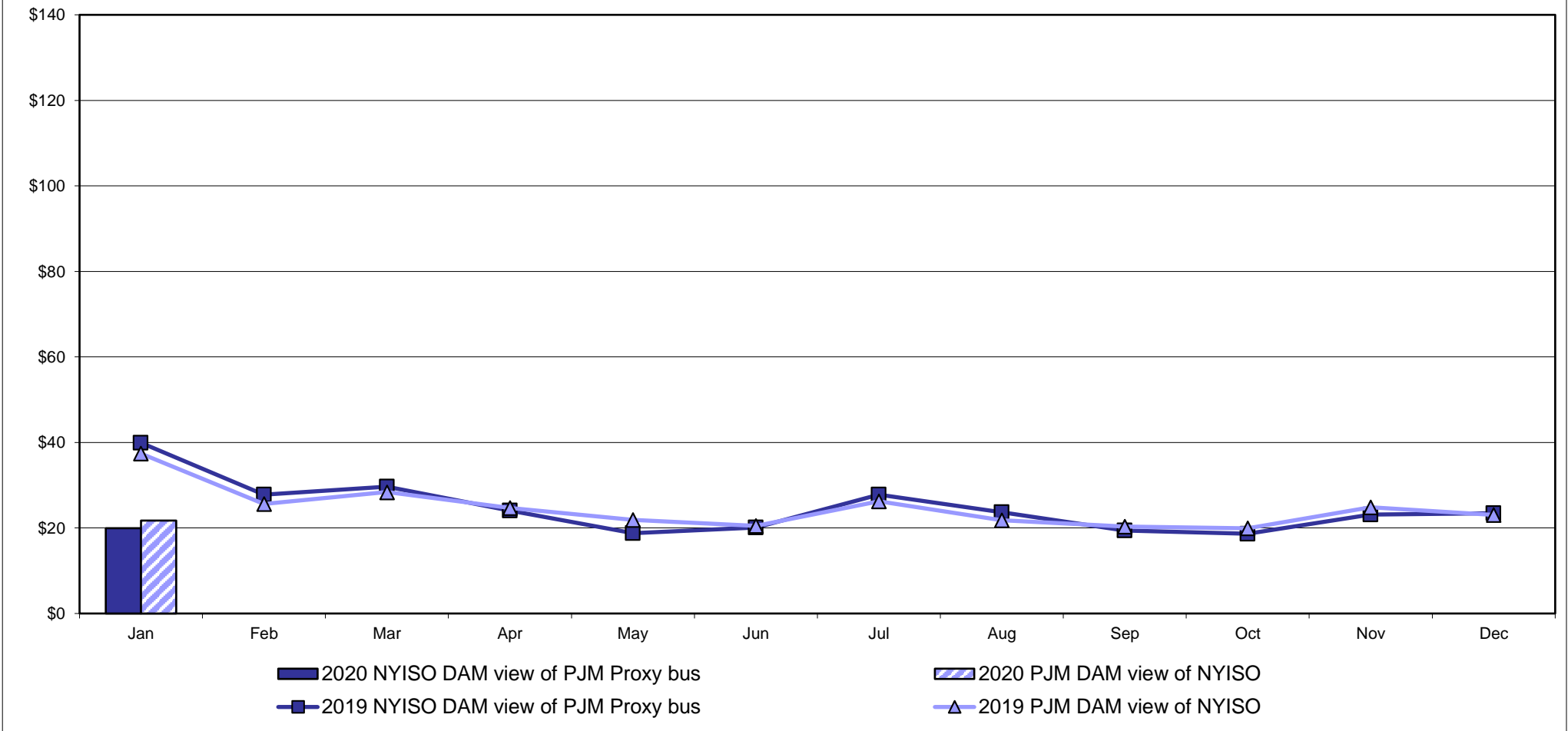


External Comparison ISO-New England

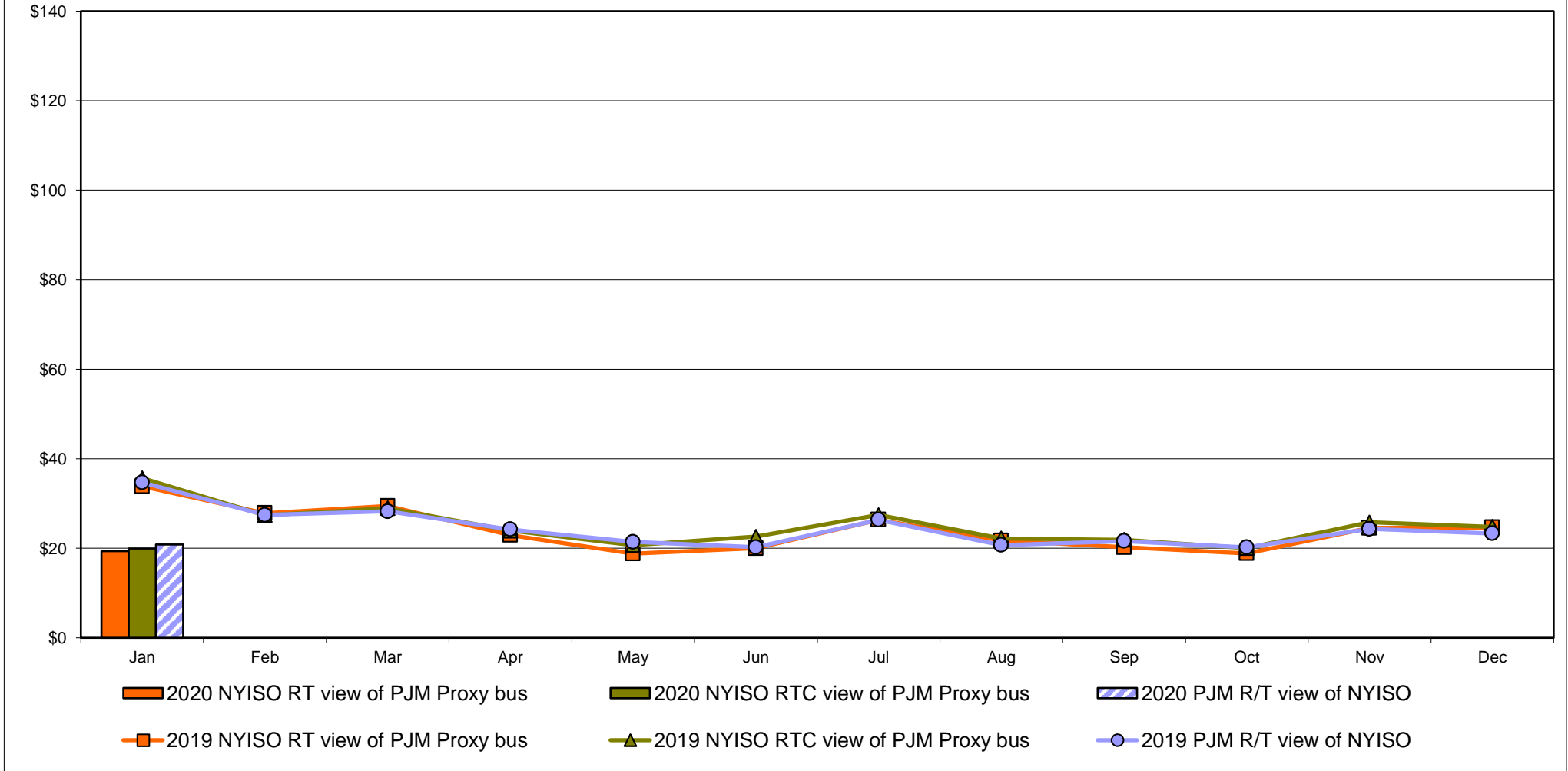


External Comparison PJM

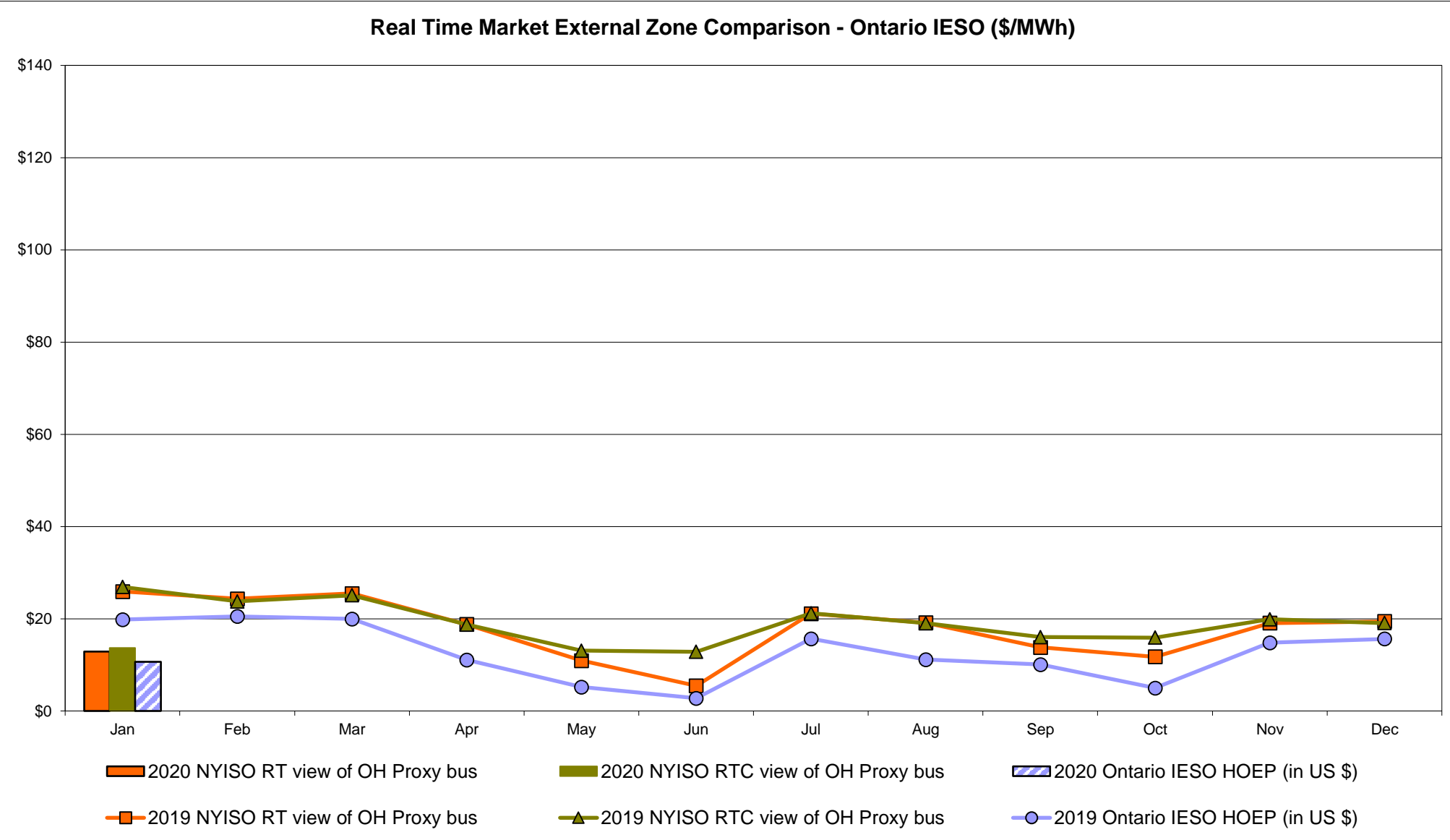
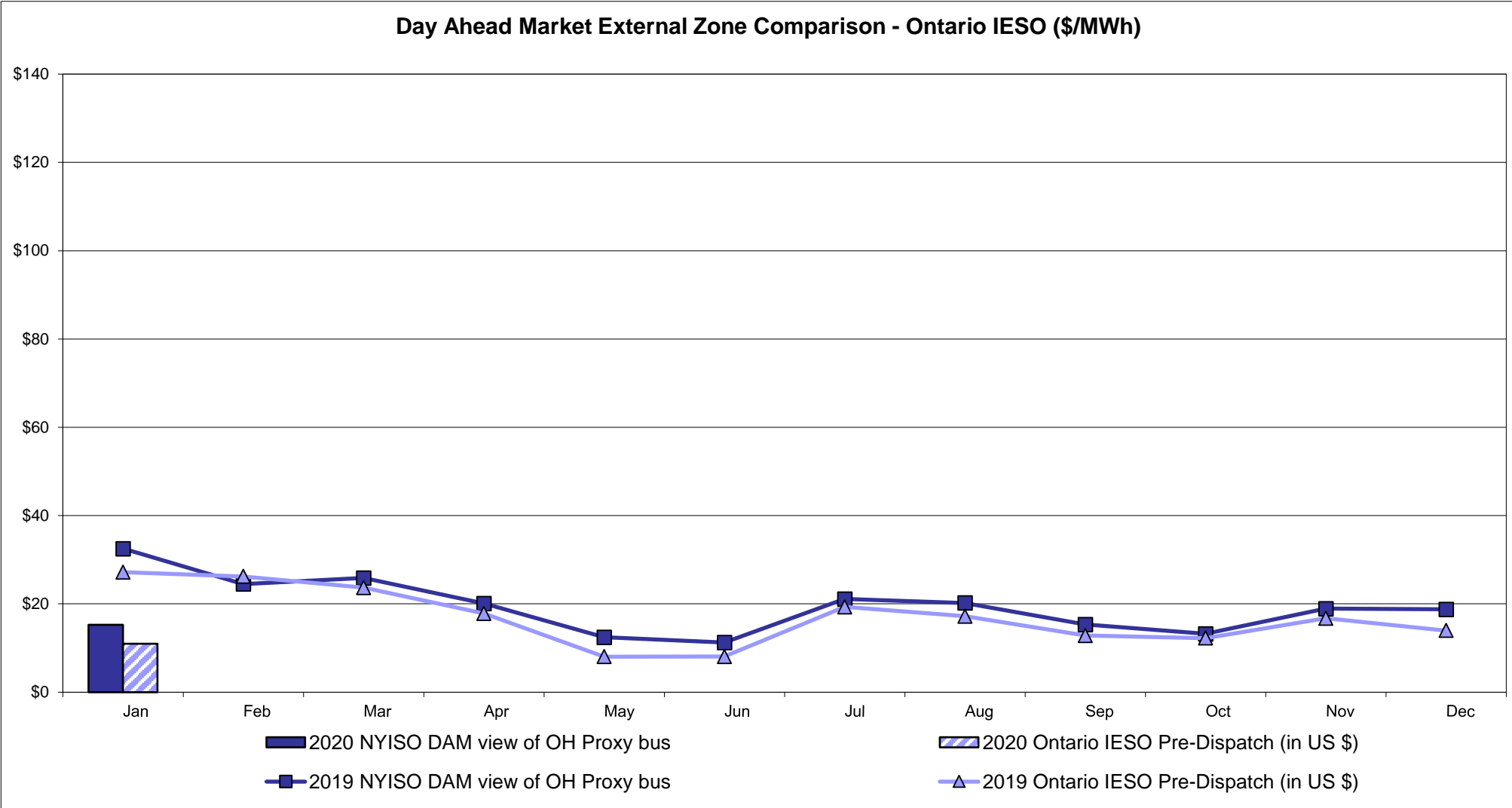
Day Ahead Market External Zone Comparison - PJM (\$/MWh)



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

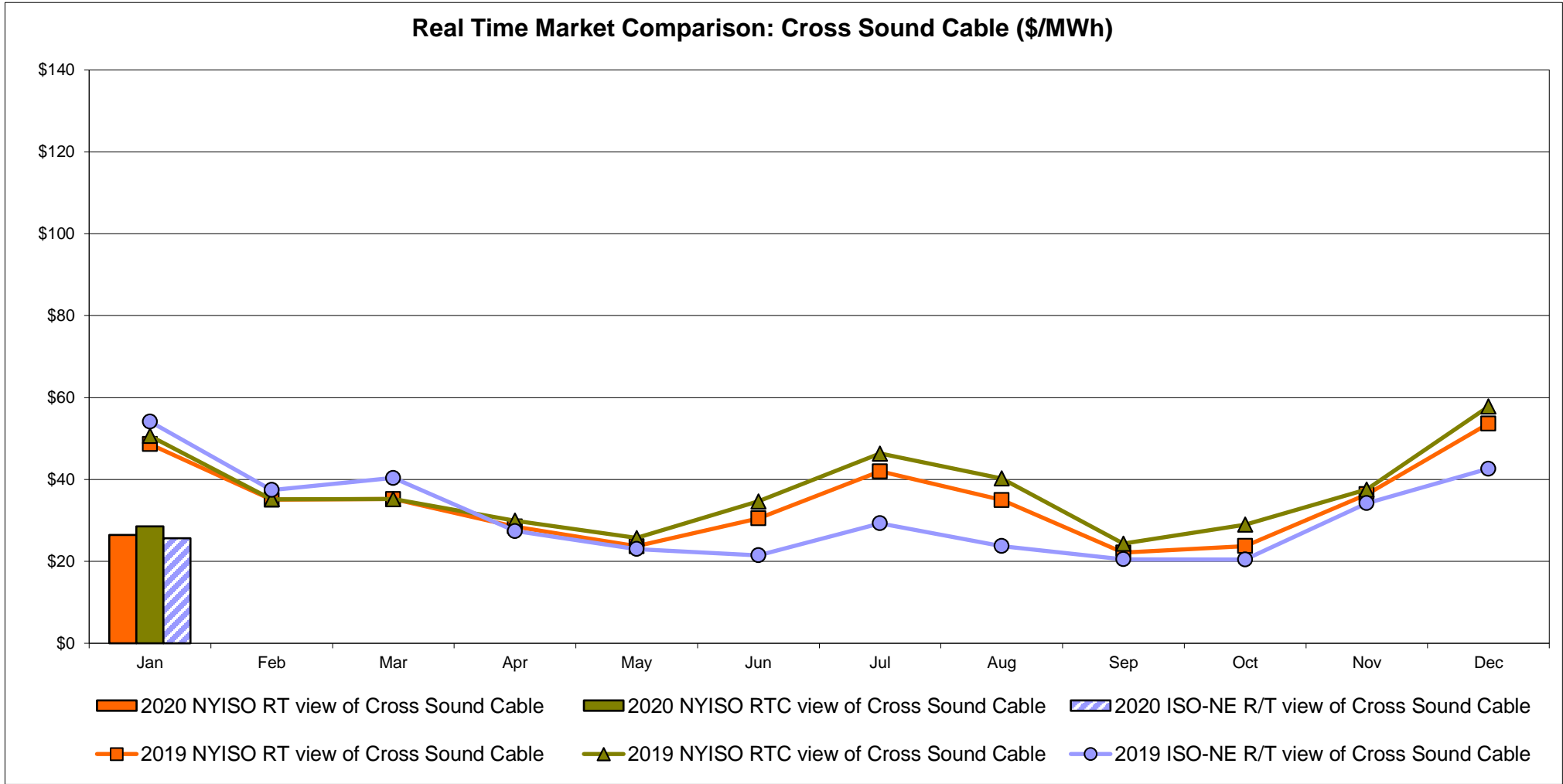
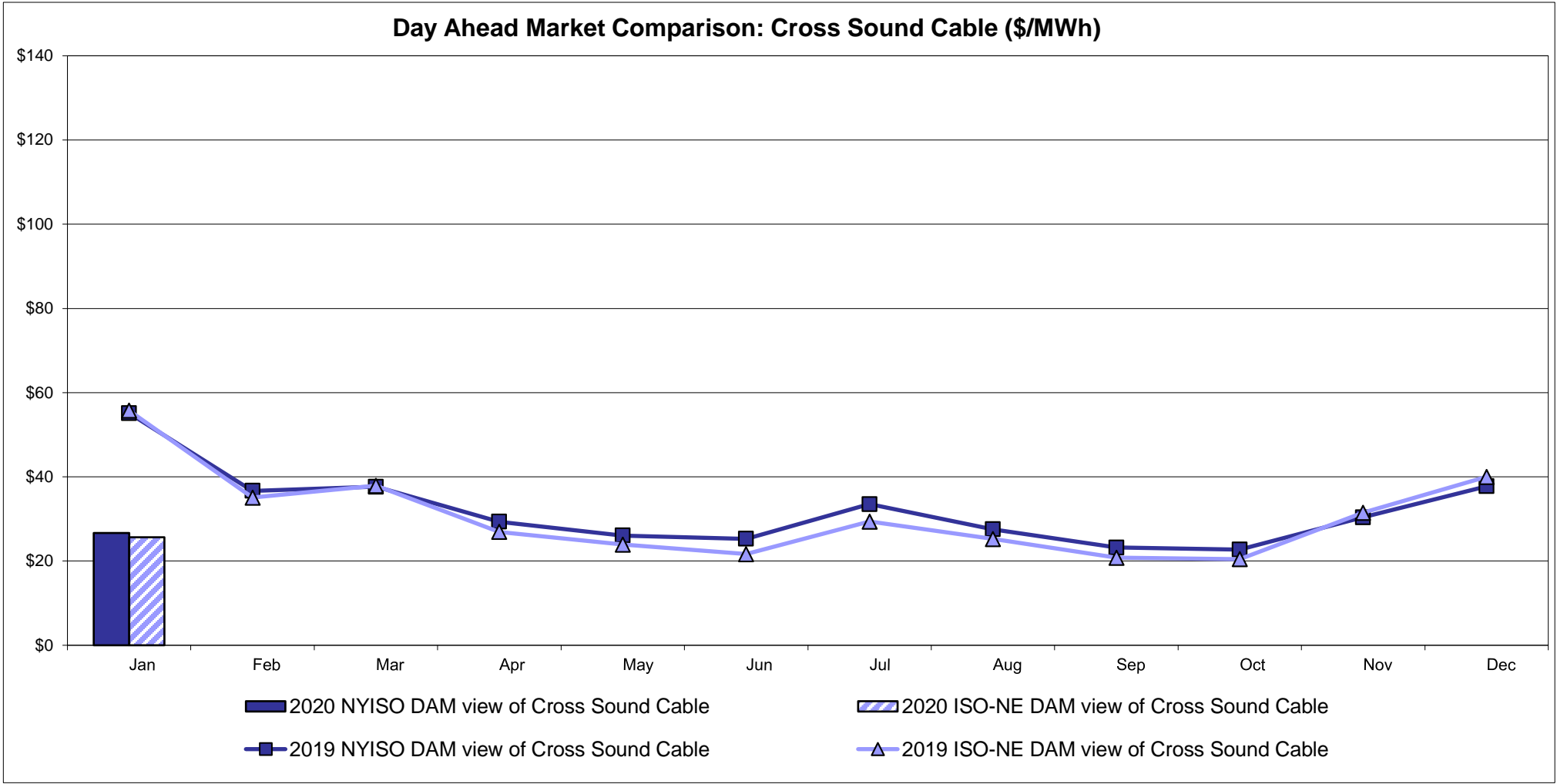


External Comparison Ontario IESO



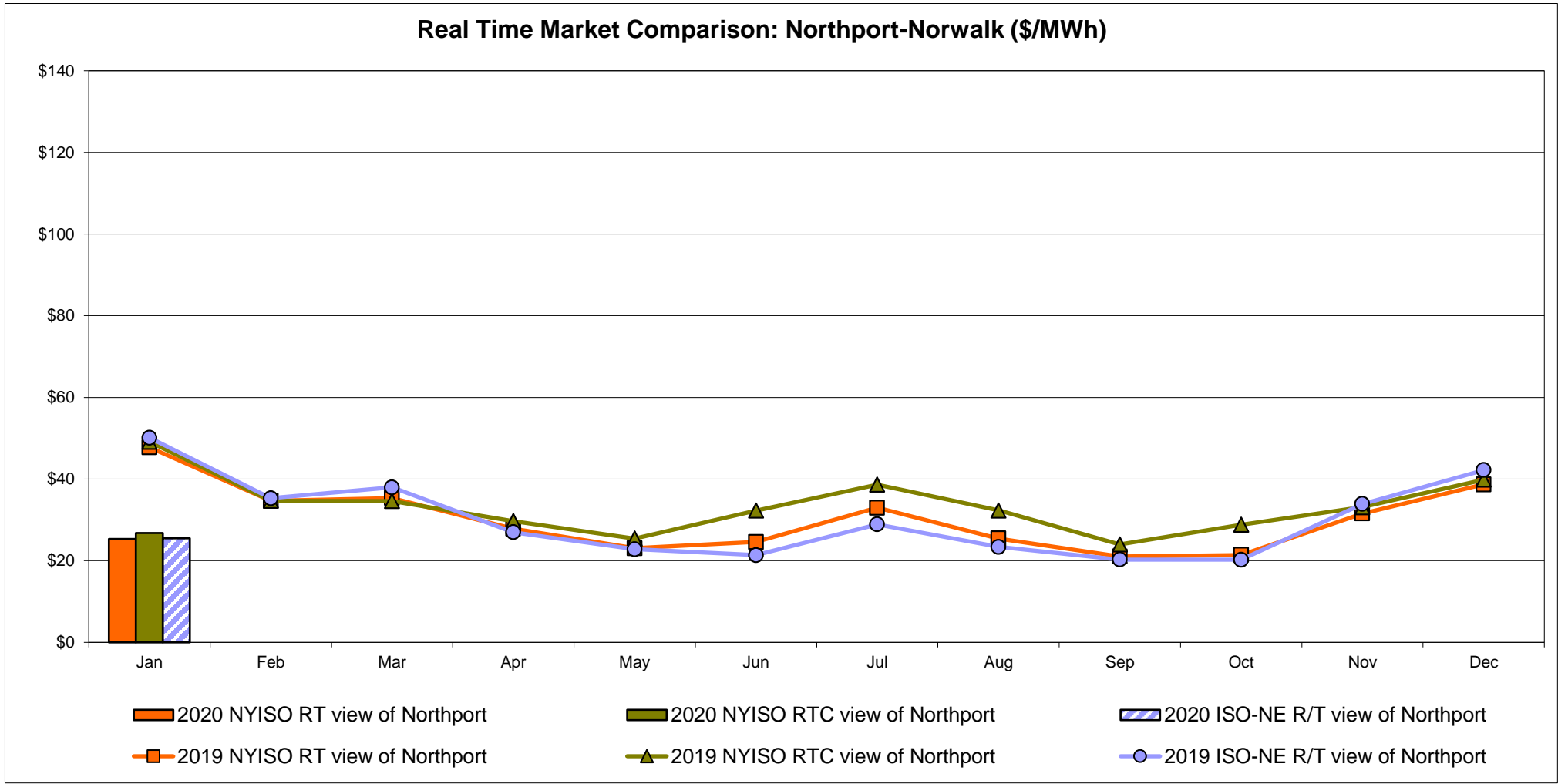
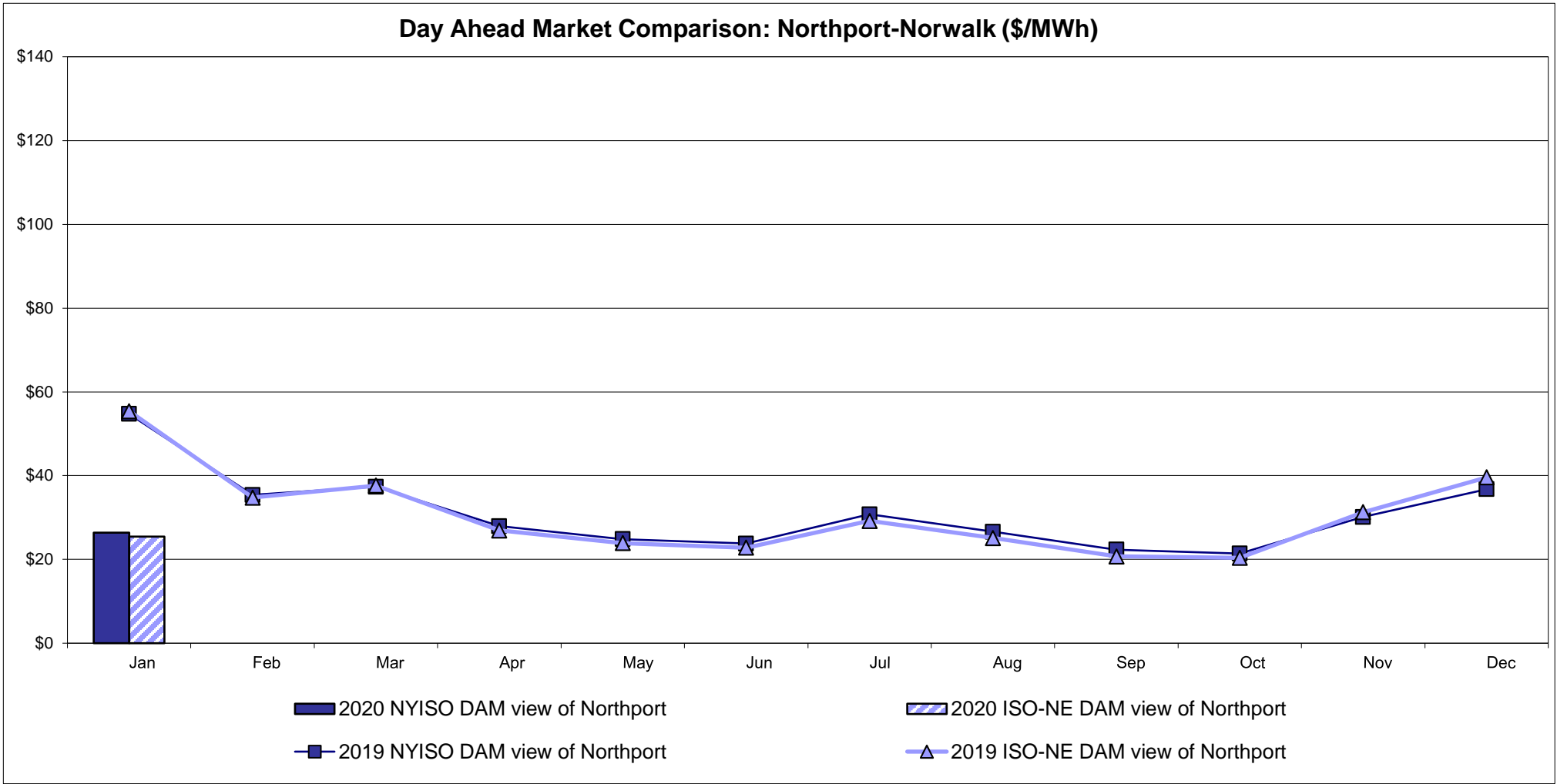
Notes: Exchange factor used for January 2020 was 0.764000305600122 to US
HOEP: Hourly Ontario Energy Price
Pre-Dispatch: Projected Energy Price

External Controllable Line: Cross Sound Cable (New England)



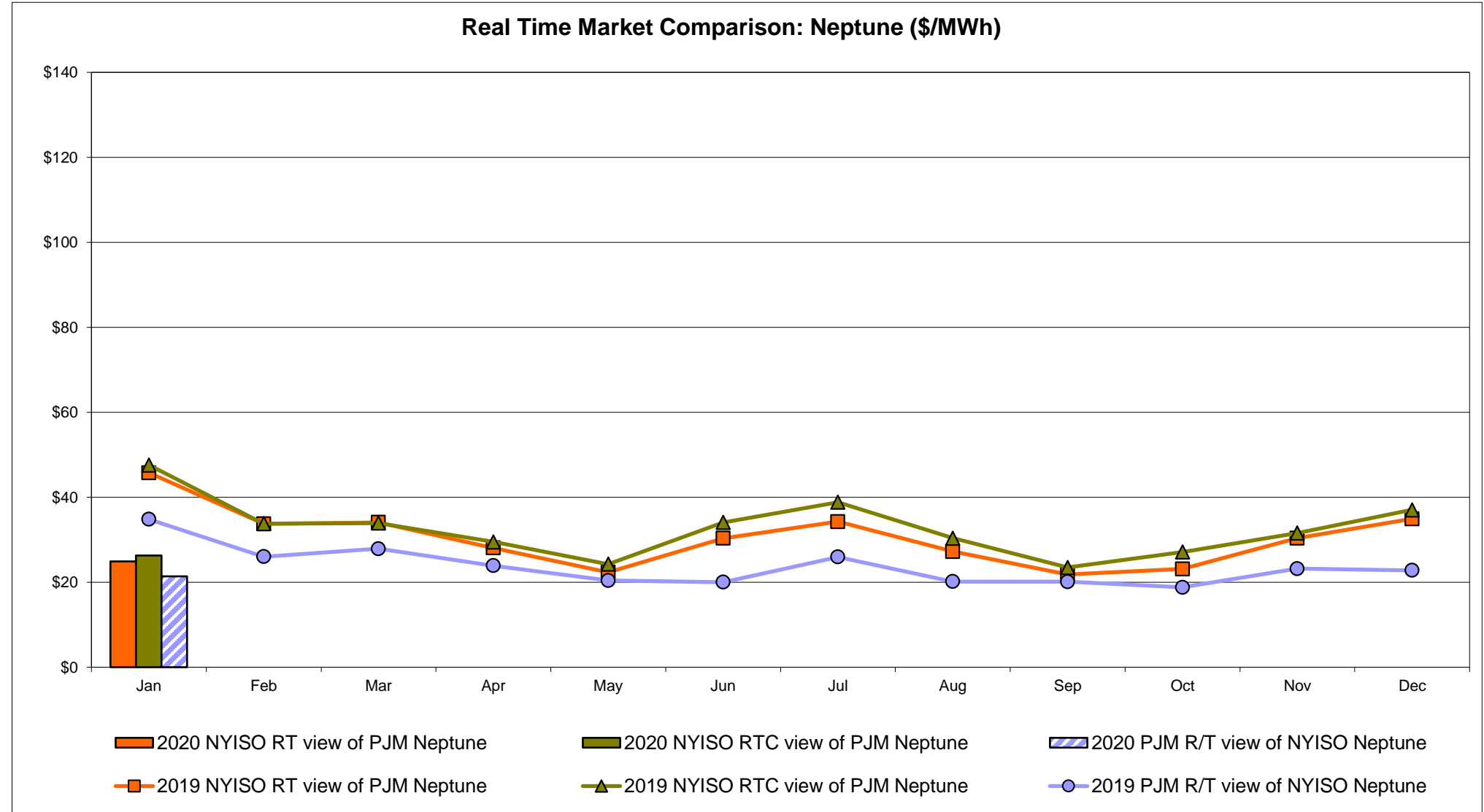
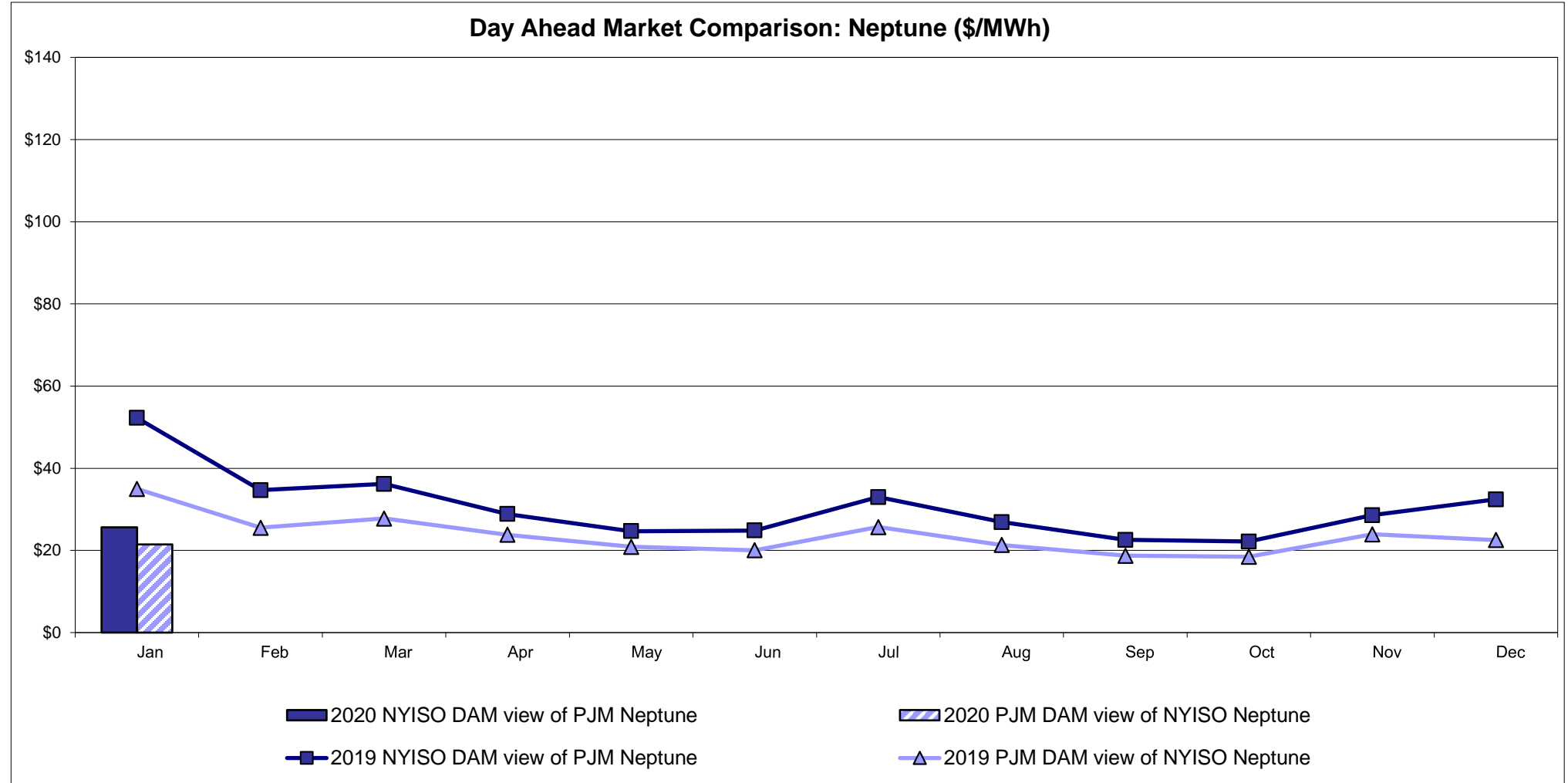
Note:
ISO-NE Forecast is an advisory posting @ 18:00 day before.
The DAM and R/T prices at the Shorham 13899 interface are used for ISO-NE.
The DAM and R/T prices at the CSC interface are used for NYISO.

External Controllable Line: Northport - Norwalk (New England)

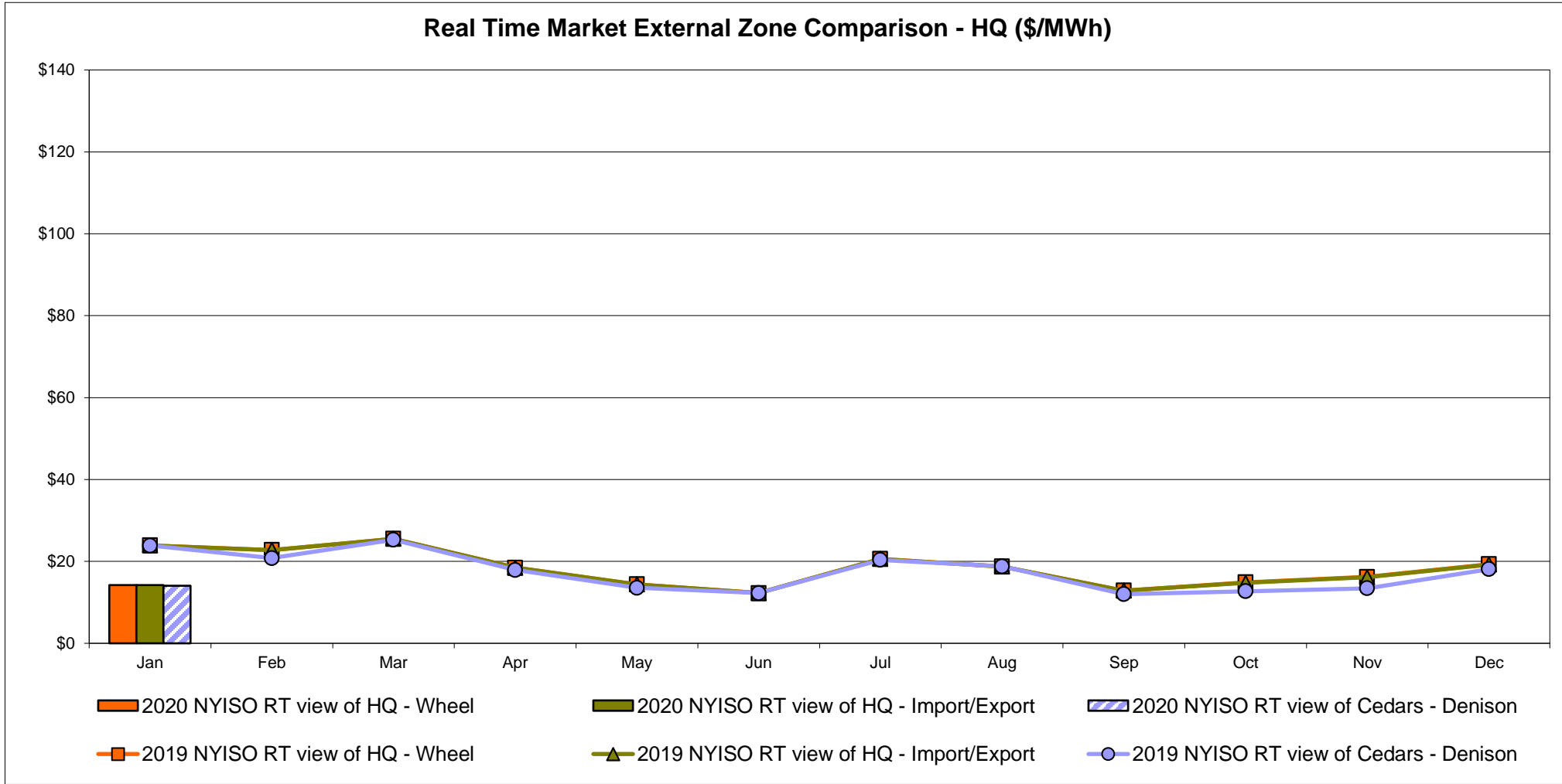
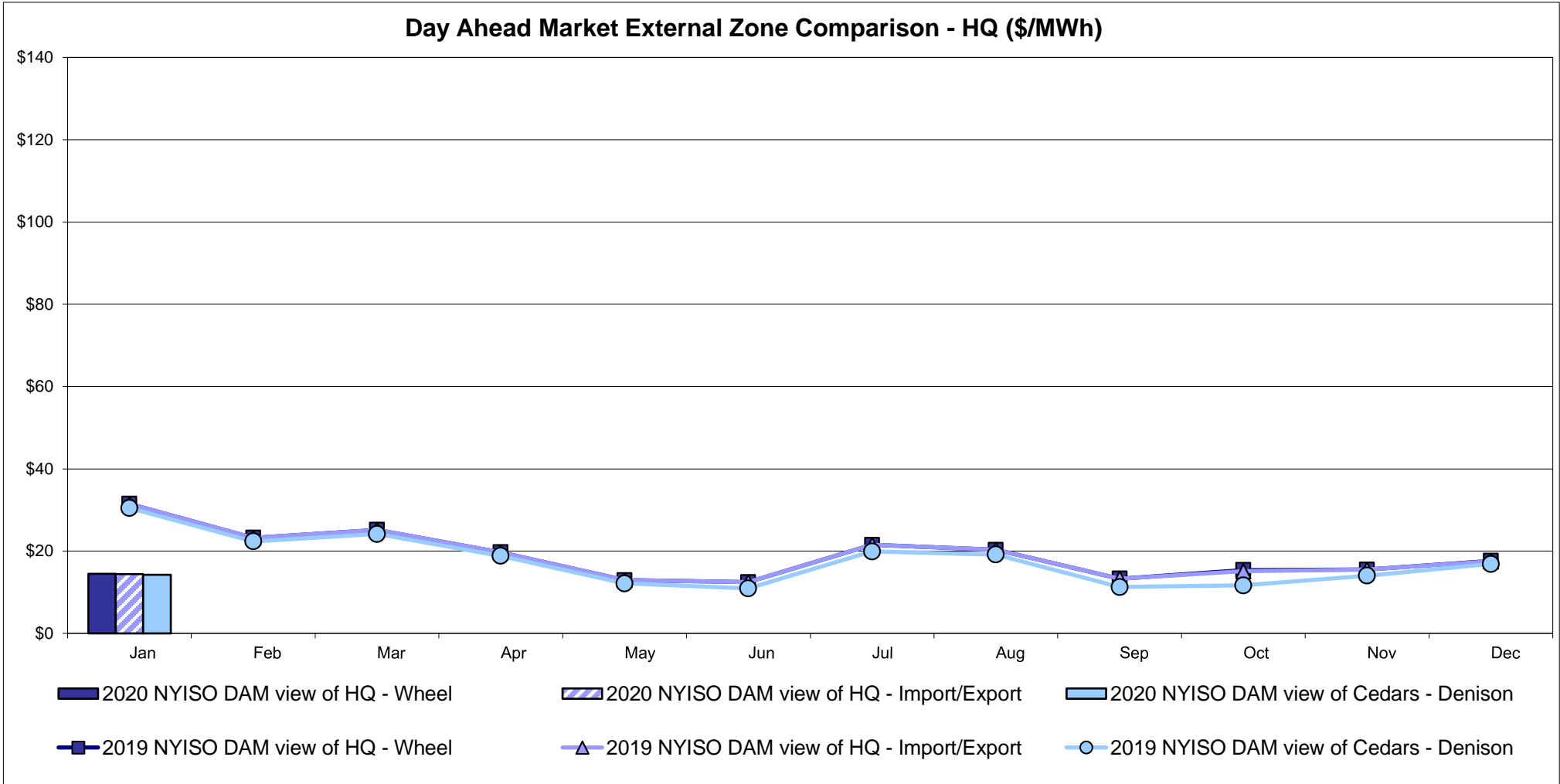


Note:
ISO-NE Forecast is an advisory posting @ 18:00 day before.
The DAM and R/T prices at the Northport 138 interface are used for ISO-NE.
The DAM and R/T prices at the 1385 interface are used for NYISO.

External Controllable Line: Neptune (PJM)

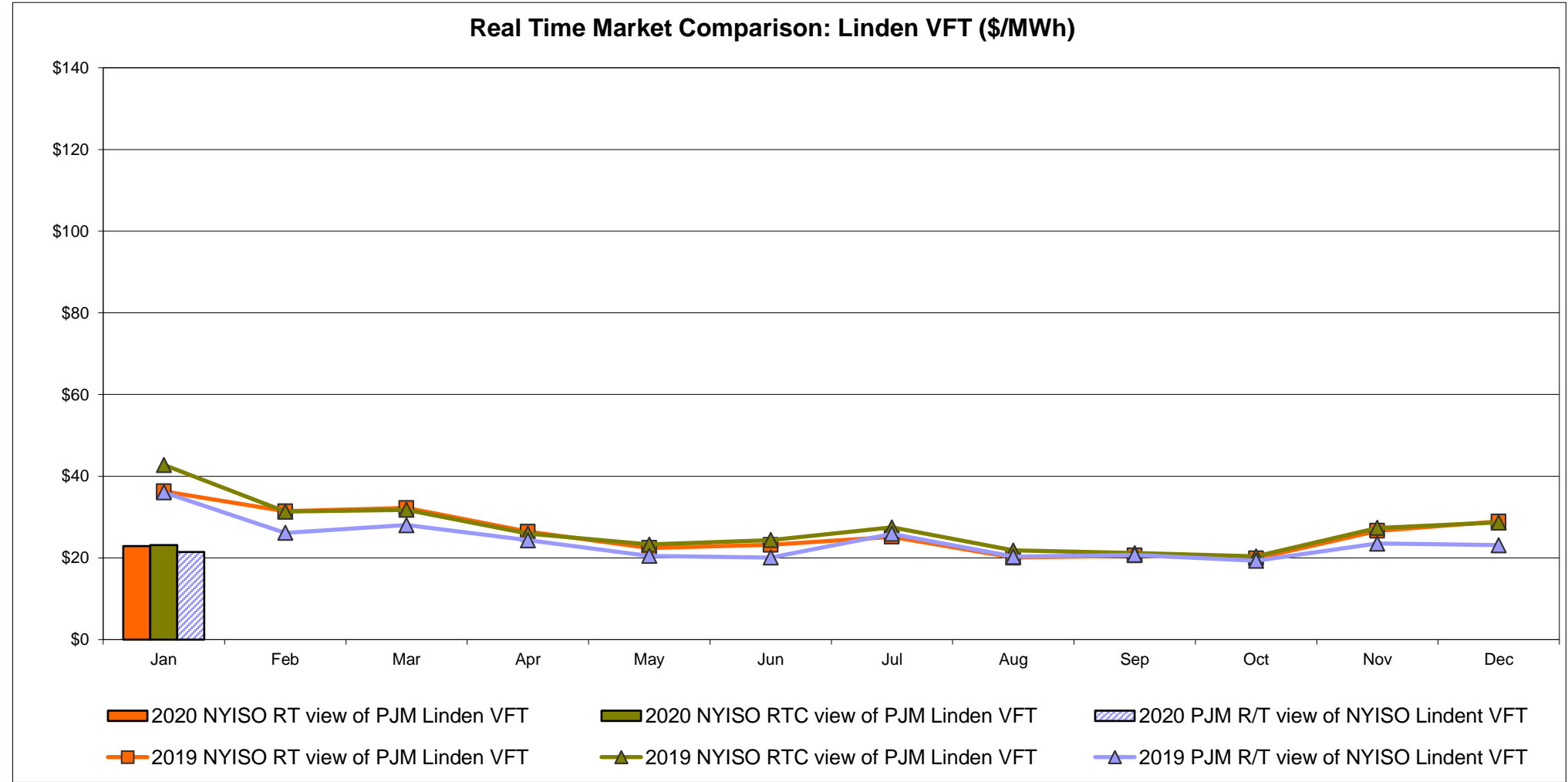
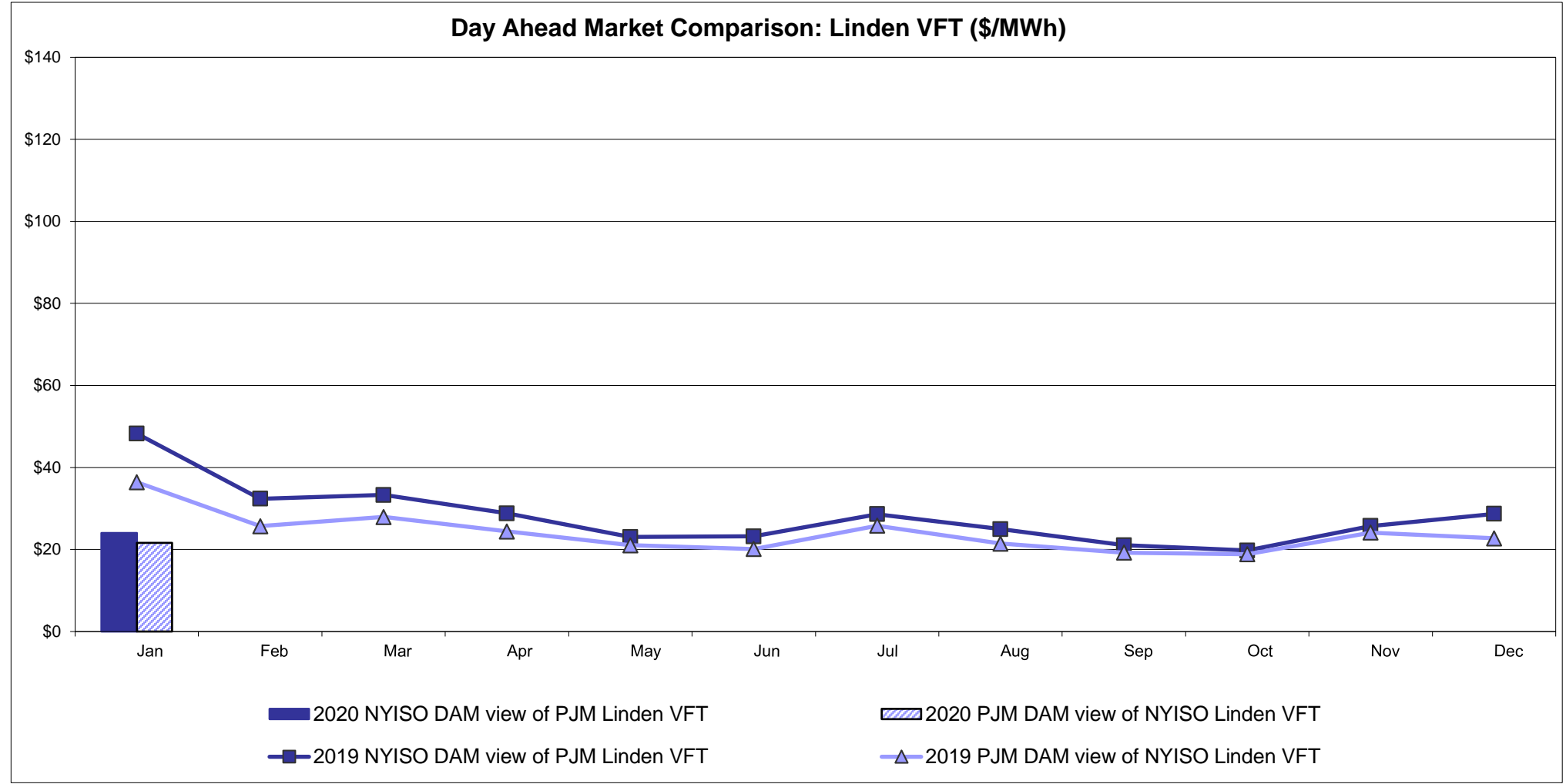


External Comparison Hydro-Quebec

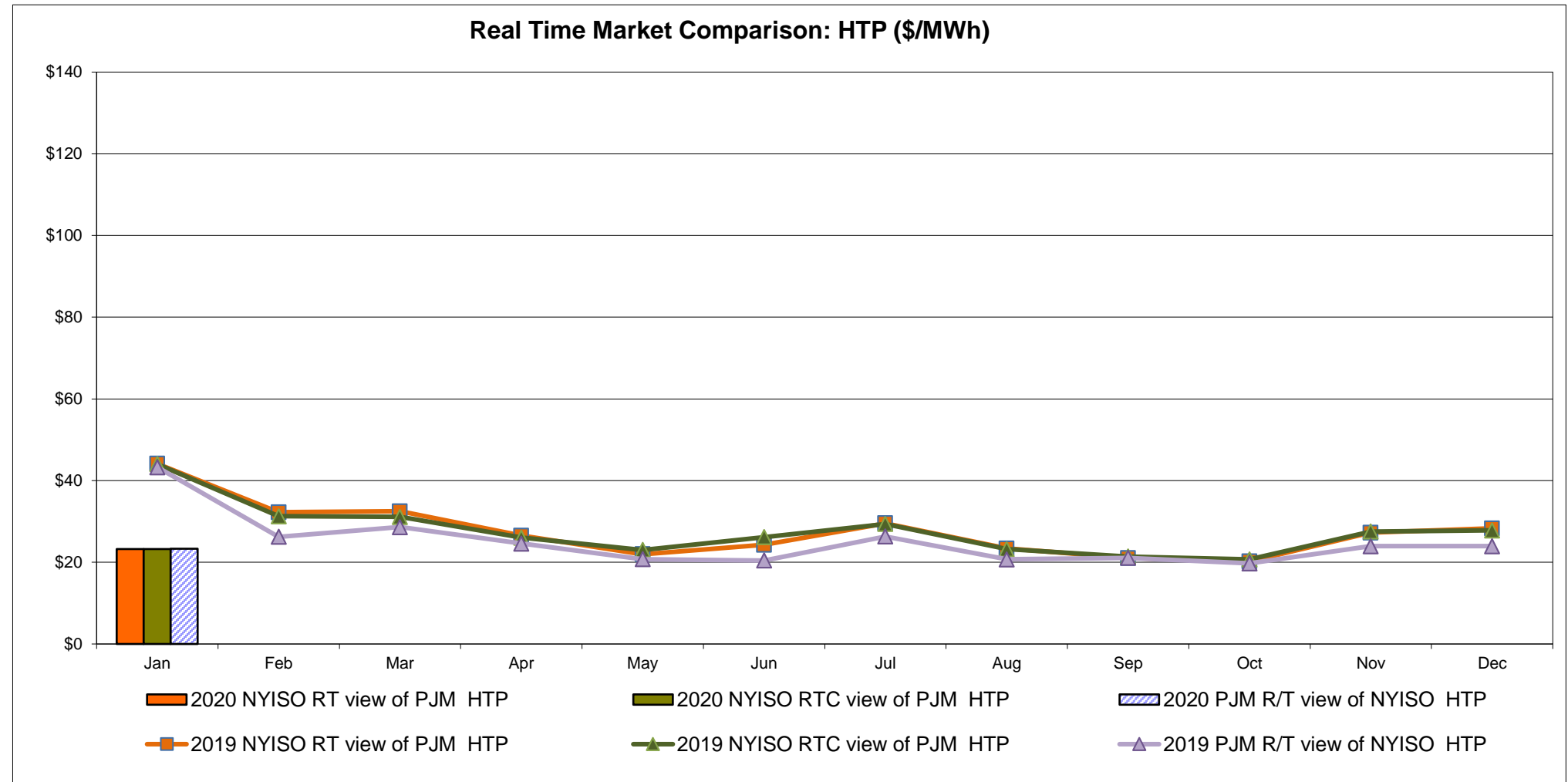
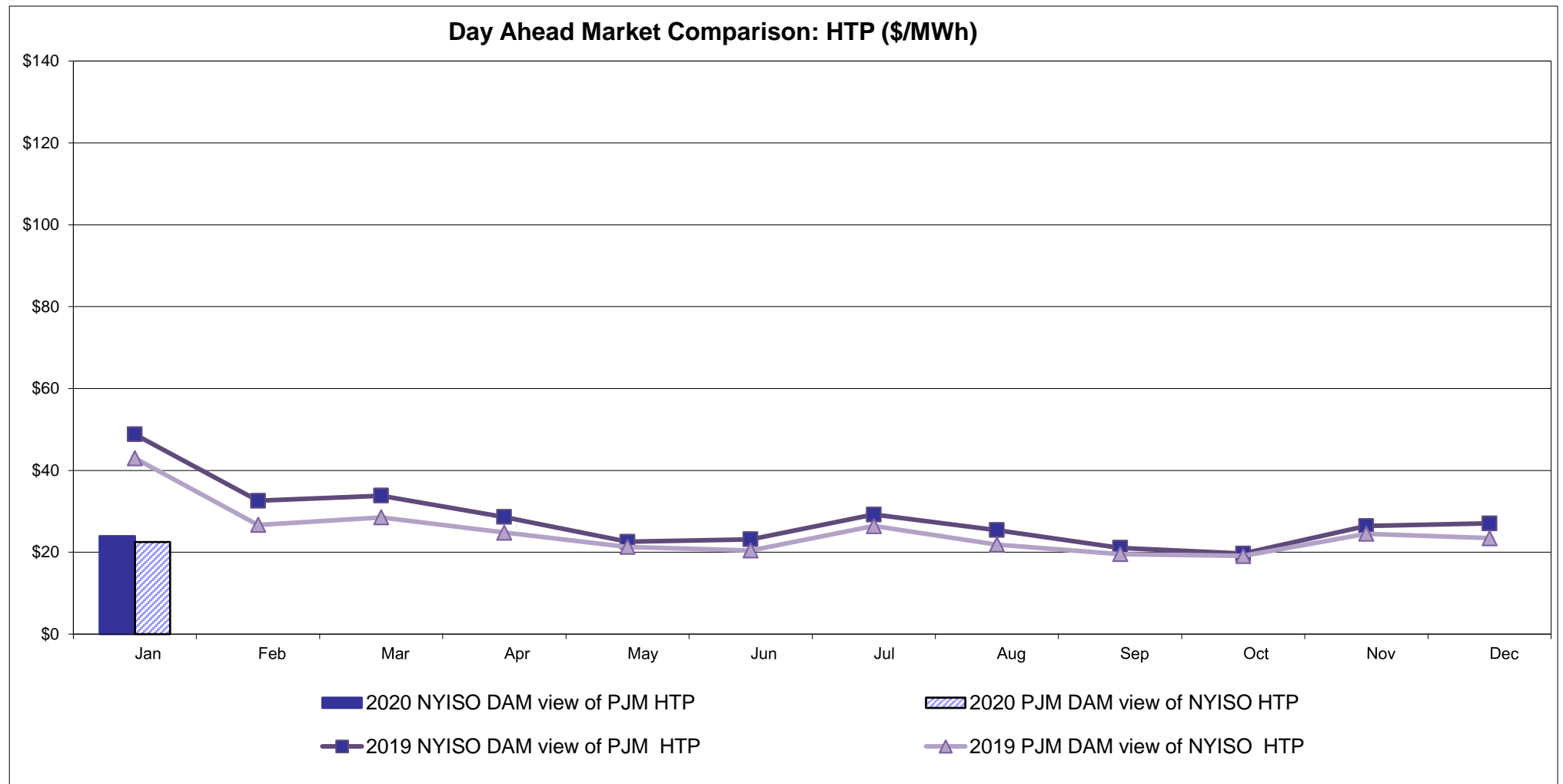


Note:
Hydro-Quebec Prices are unavailable.

External Controllable Line: Linden VFT (PJM)



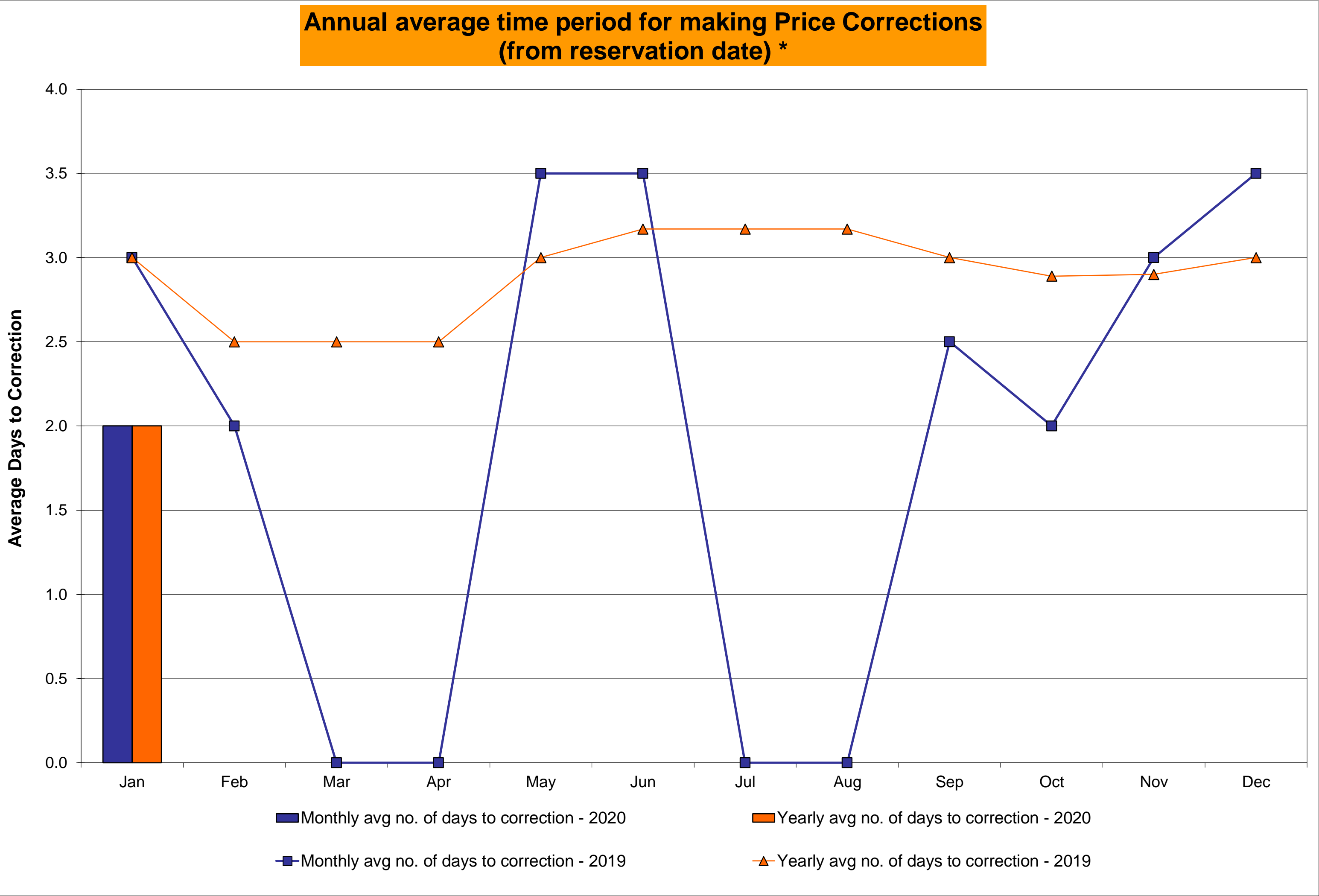
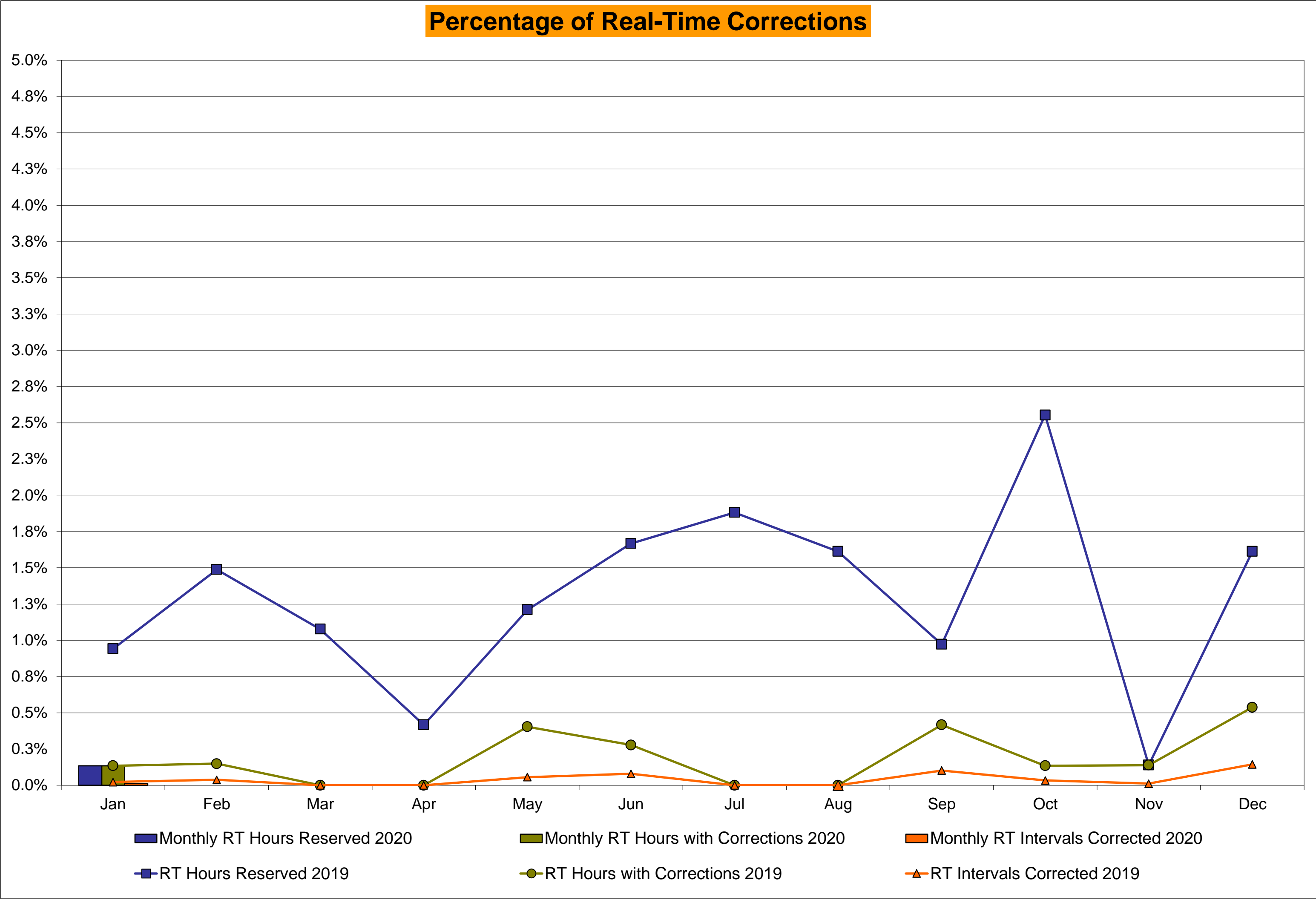
External Controllable Line: Hudson (PJM)



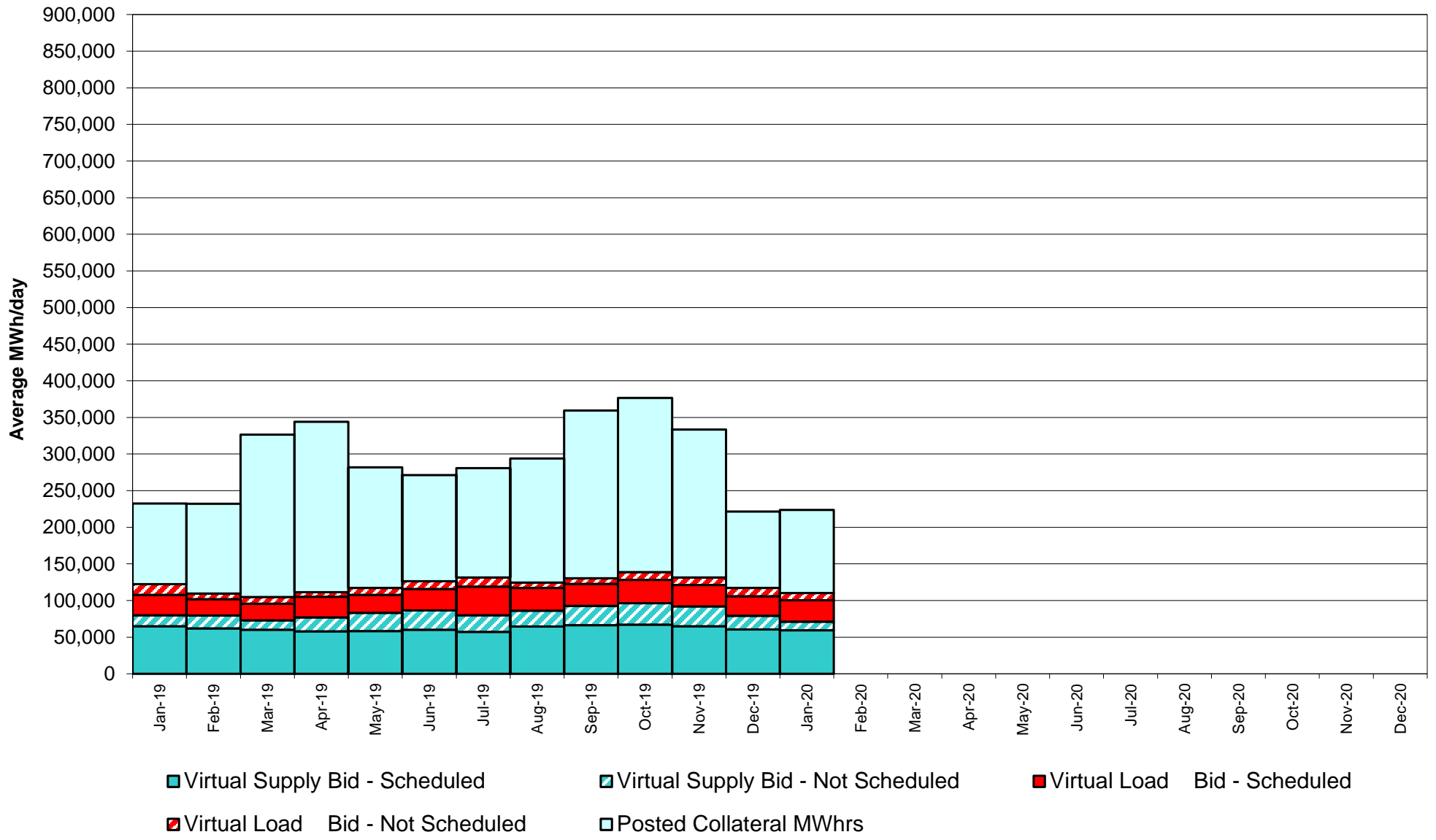
NYISO Real Time Price Correction Statistics

2020		<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>Hour Corrections</u>													
Number of hours with corrections	in the month	1											
Number of hours	in the month	744											
% of hours with corrections	in the month	0.13%											
% of hours with corrections	year-to-date	0.13%											
<u>Interval Corrections</u>													
Number of intervals corrected	in the month	1											
Number of intervals	in the month	9,088											
% of intervals corrected	in the month	0.01%											
% of intervals corrected	year-to-date	0.01%											
<u>Hours Reserved</u>													
Number of hours reserved	in the month	1											
Number of hours	in the month	744											
% of hours reserved	in the month	0.13%											
% of hours reserved	year-to-date	0.13%											
<u>Days to Correction</u> *													
Avg. number of days to correction	in the month	2.00											
Avg. number of days to correction	year-to-date	2.00											
<u>Days Without Corrections</u>													
Days without corrections	in the month	30											
Days without corrections	year-to-date	30											
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>
<u>Hour Corrections</u>													
Number of hours with corrections	in the month	1	1	0	0	3	2	0	0	3	1	1	4
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	0.13%	0.15%	0.00%	0.00%	0.40%	0.28%	0.00%	0.00%	0.42%	0.13%	0.14%	0.54%
% of hours with corrections	year-to-date	0.13%	0.14%	0.09%	0.07%	0.14%	0.16%	0.14%	0.12%	0.15%	0.15%	0.15%	0.18%
<u>Interval Corrections</u>													
Number of intervals corrected	in the month	2	3	0	0	5	7	0	0	9	3	1	13
Number of intervals	in the month	9,071	8,131	9,008	8,750	9,033	8,863	9,243	9,048	8,820	9,087	8,788	9,021
% of intervals corrected	in the month	0.02%	0.04%	0.00%	0.00%	0.06%	0.08%	0.00%	0.00%	0.10%	0.03%	0.01%	0.14%
% of intervals corrected	year-to-date	0.02%	0.03%	0.02%	0.01%	0.02%	0.03%	0.03%	0.02%	0.03%	0.03%	0.03%	0.04%
<u>Hours Reserved</u>													
Number of hours reserved	in the month	7	10	8	3	9	12	14	12	7	19	1	12
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%	1.49%	1.08%	0.42%	1.21%	1.67%	1.88%	1.61%	0.97%	2.55%	0.14%	1.61%
% of hours reserved	year-to-date	0.94%	1.20%	1.16%	0.97%	1.02%	1.13%	1.24%	1.29%	1.25%	1.38%	1.27%	1.30%
<u>Days to Correction</u> *													
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	2.50	2.00	3.00	3.50
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	3.00	2.89	2.90	3.00
<u>Days Without Corrections</u>													
Days without corrections	in the month	30	27	31	30	29	28	31	31	28	30	29	29
Days without corrections	year-to-date	30	57	88	118	147	175	206	237	265	295	324	353

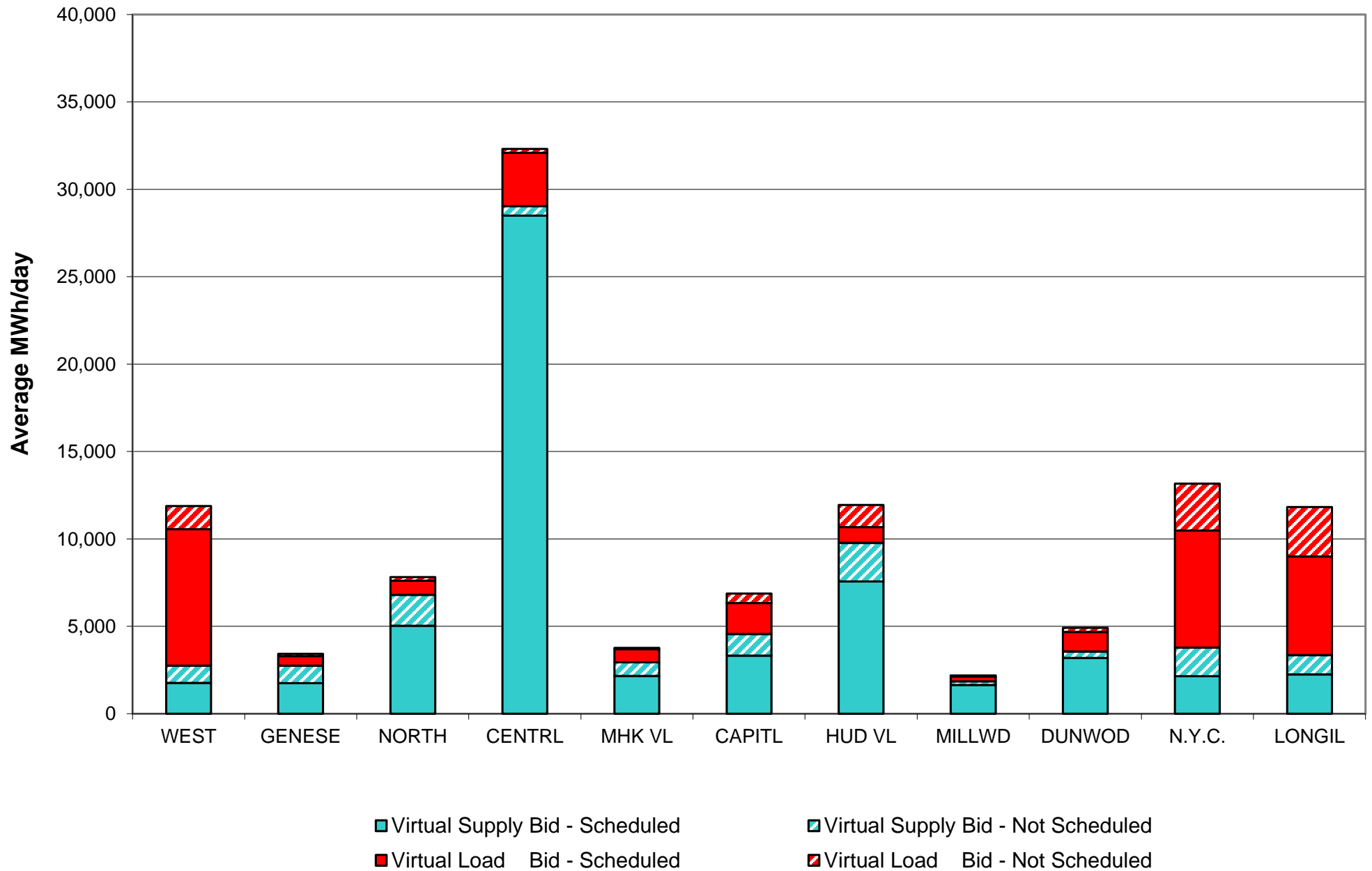
*Calendar days from reservation date; for June 2018 forward, business days from market date



NYISO Virtual Trading Average MWh per day



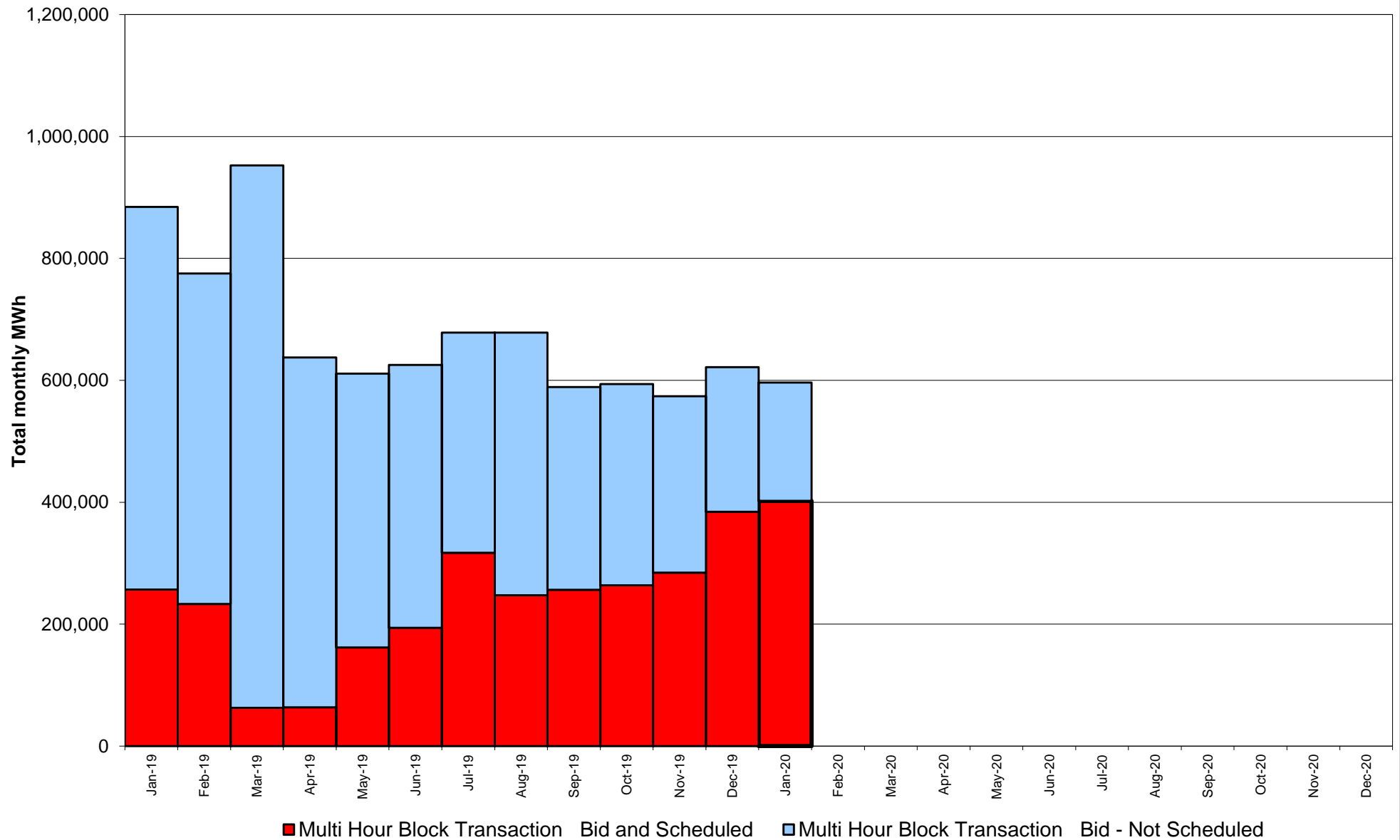
Virtual Load and Supply Zonal Statistics through January 31, 2020



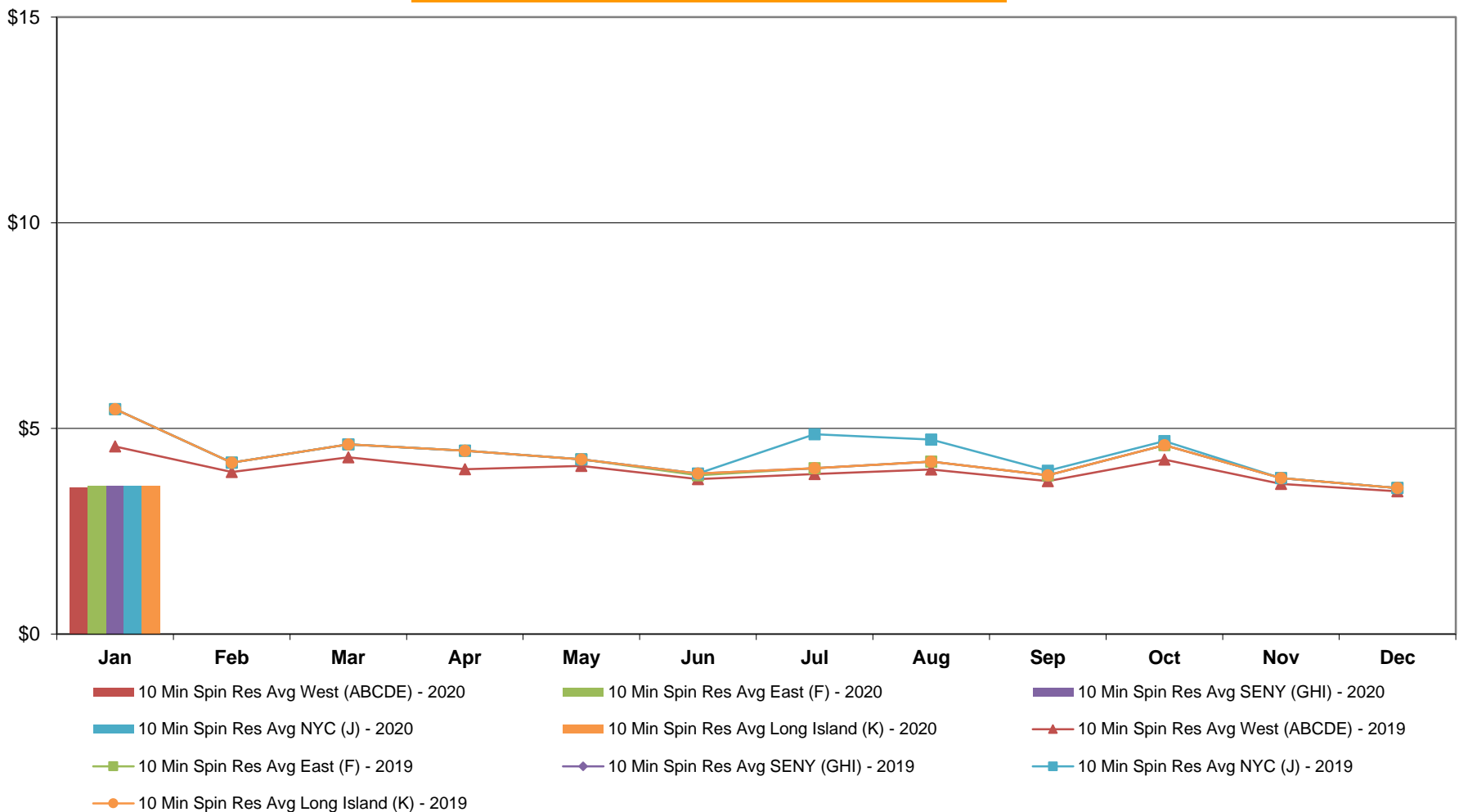
Virtual Load and Supply Zonal Statistics (Average MWh/day) - 2020

		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
WEST	Jan-20	7,809	1,328	1,765	984		MHK VL	Jan-20	747	77	2,155	793		DUNWOD	Jan-20	1,120	241
	Feb-20							Feb-20							Feb-20		
	Mar-20							Mar-20							Mar-20		
	Apr-20							Apr-20							Apr-20		
	May-20							May-20							May-20		
	Jun-20							Jun-20							Jun-20		
	Jul-20							Jul-20							Jul-20		
	Aug-20							Aug-20							Aug-20		
	Sep-20							Sep-20							Sep-20		
	Oct-20							Oct-20							Oct-20		
	Nov-20							Nov-20							Nov-20		
	Dec-20							Dec-20							Dec-20		
GENESE	Jan-20	553	131	1,749	995		CAPITL	Jan-20	1,772	539	3,324	1,235		N.Y.C.	Jan-20	6,699	2,678
	Feb-20							Feb-20							Feb-20		
	Mar-20							Mar-20							Mar-20		
	Apr-20							Apr-20							Apr-20		
	May-20							May-20							May-20		
	Jun-20							Jun-20							Jun-20		
	Jul-20							Jul-20							Jul-20		
	Aug-20							Aug-20							Aug-20		
	Sep-20							Sep-20							Sep-20		
	Oct-20							Oct-20							Oct-20		
	Nov-20							Nov-20							Nov-20		
	Dec-20							Dec-20							Dec-20		
NORTH	Jan-20	811	206	5,038	1,765		HUD VL	Jan-20	891	1,274	7,573	2,206		LONGIL	Jan-20	5,640	2,824
	Feb-20							Feb-20							Feb-20		
	Mar-20							Mar-20							Mar-20		
	Apr-20							Apr-20							Apr-20		
	May-20							May-20							May-20		
	Jun-20							Jun-20							Jun-20		
	Jul-20							Jul-20							Jul-20		
	Aug-20							Aug-20							Aug-20		
	Sep-20							Sep-20							Sep-20		
	Oct-20							Oct-20							Oct-20		
	Nov-20							Nov-20							Nov-20		
	Dec-20							Dec-20							Dec-20		
CENTRL	Jan-20	3,050	214	28,503	541		MILLWD	Jan-20	270	68	1,646	213		NYISO	Jan-20	29,361	9,580
	Feb-20							Feb-20							Feb-20		
	Mar-20							Mar-20							Mar-20		
	Apr-20							Apr-20							Apr-20		
	May-20							May-20							May-20		
	Jun-20							Jun-20							Jun-20		
	Jul-20							Jul-20							Jul-20		
	Aug-20							Aug-20							Aug-20		
	Sep-20							Sep-20							Sep-20		
	Oct-20							Oct-20							Oct-20		
	Nov-20							Nov-20							Nov-20		
	Dec-20							Dec-20							Dec-20		

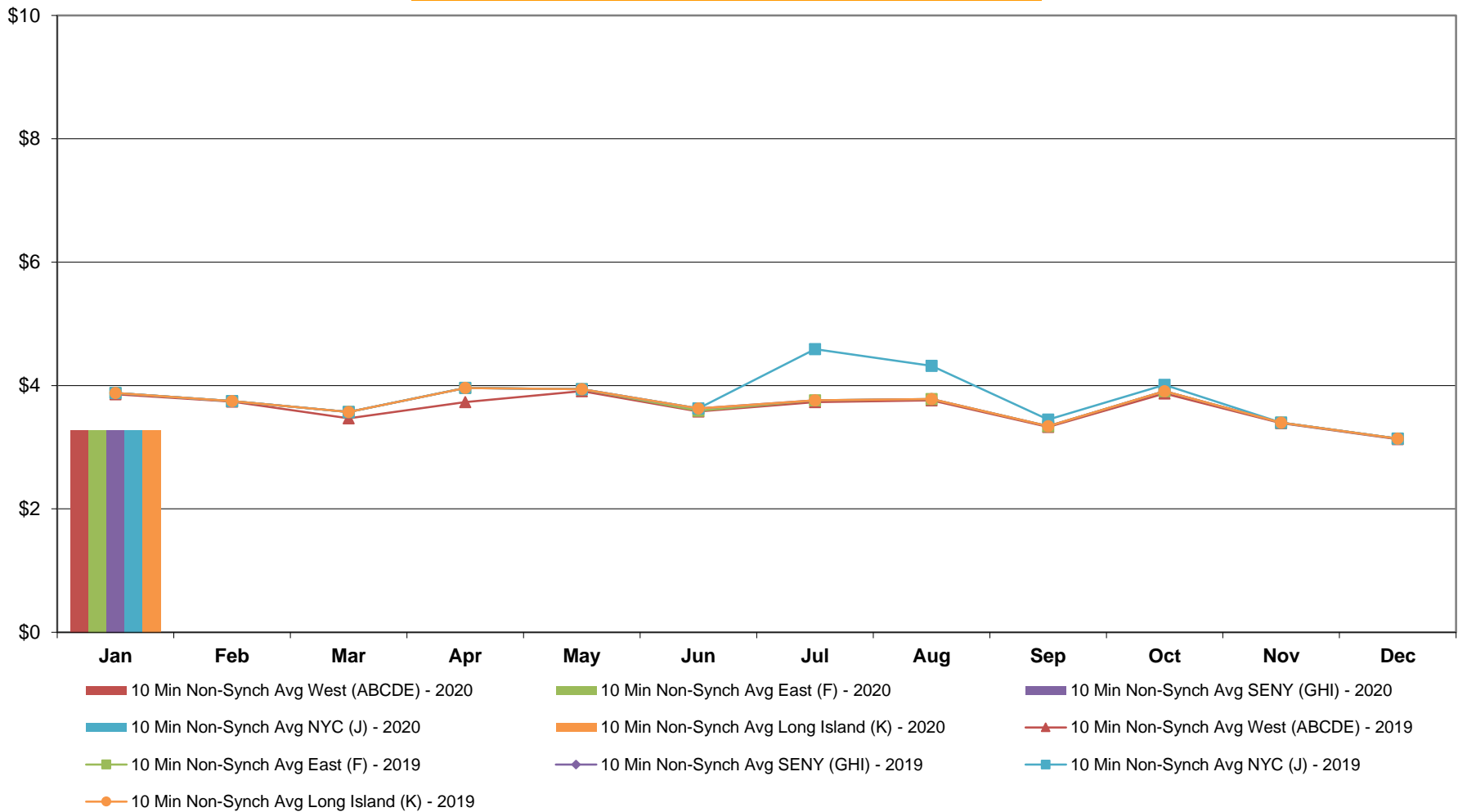
NYISO Multi Hour Block Transactions Monthly Total MWh



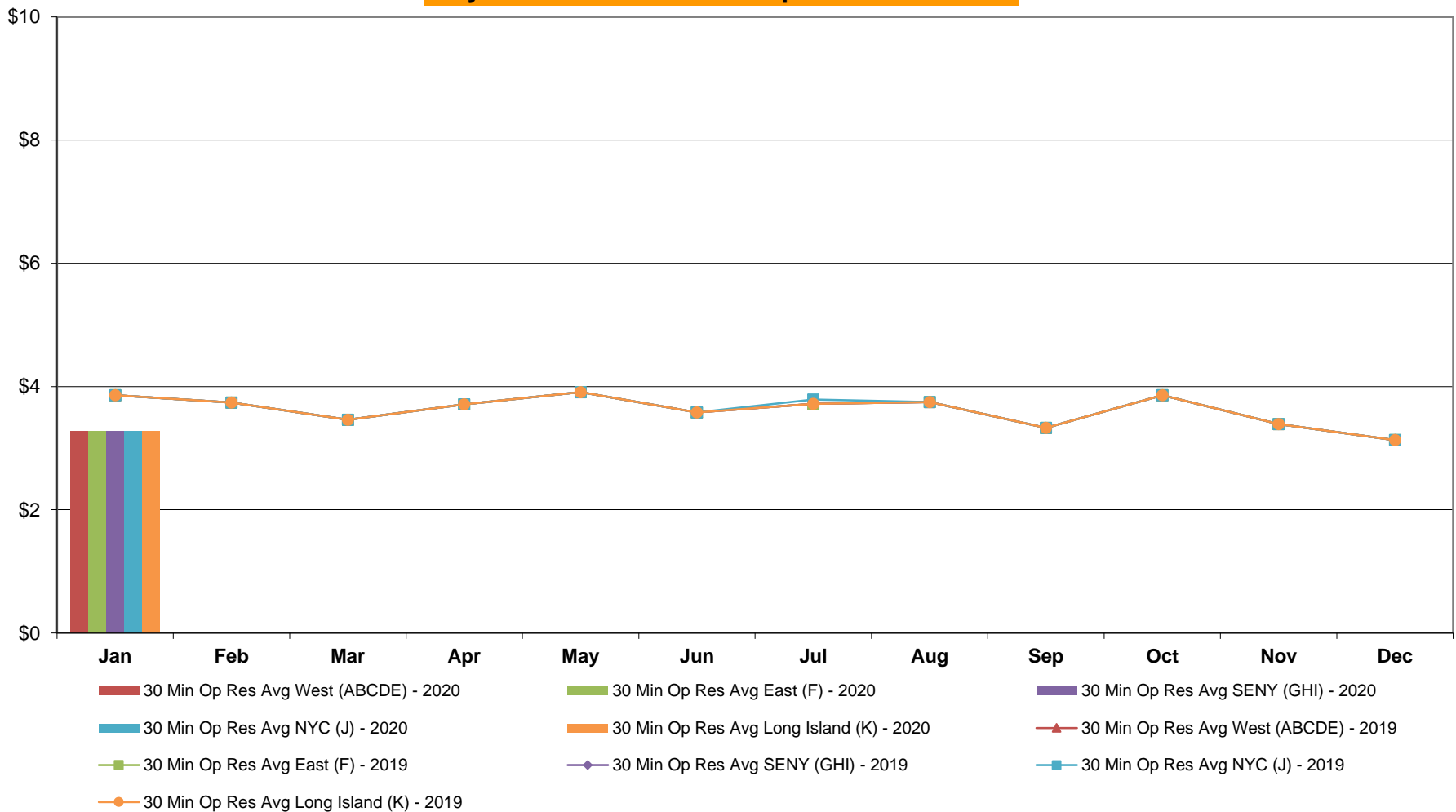
**NYISO Monthly Average Ancillary Service Prices
Day Ahead Market - 10 Min Spin 2019 - 2020**

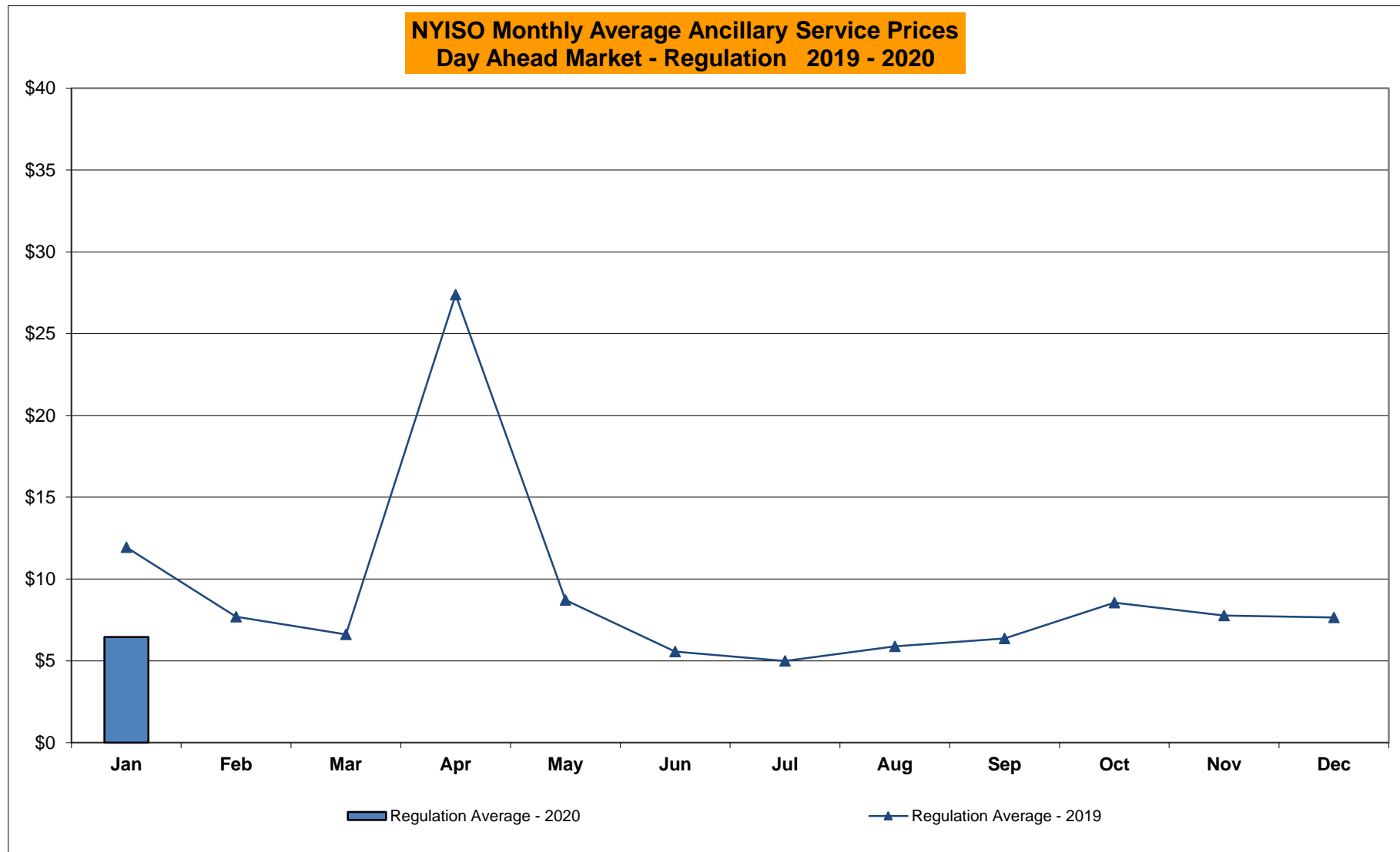


**NYISO Monthly Average Ancillary Service Prices
Day Ahead Market - 10 Min Non-Synch 2019 - 2020**

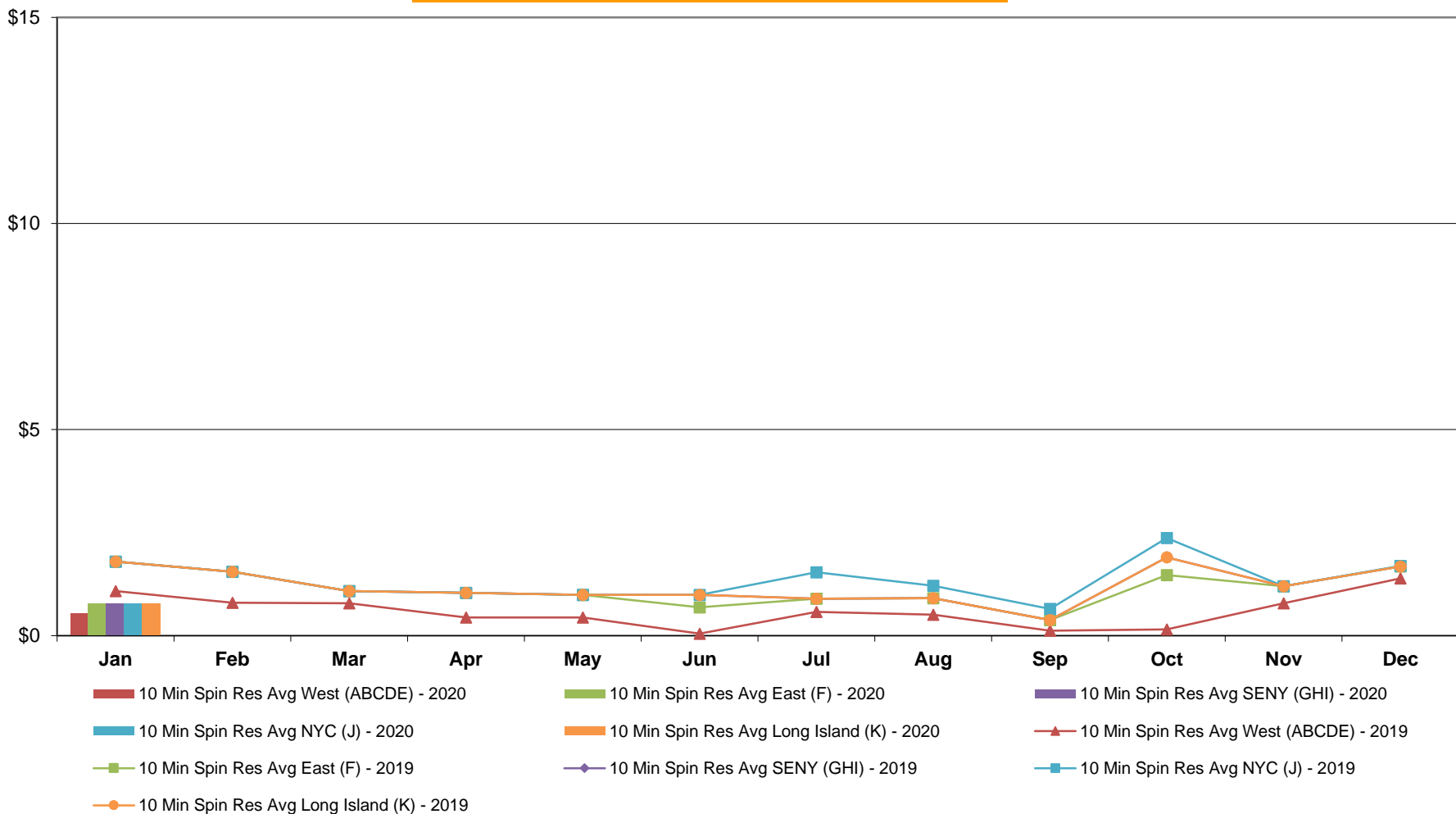


**NYISO Monthly Average Ancillary Service Prices
Day Ahead Market - 30 Min Op Res 2019 - 2020**

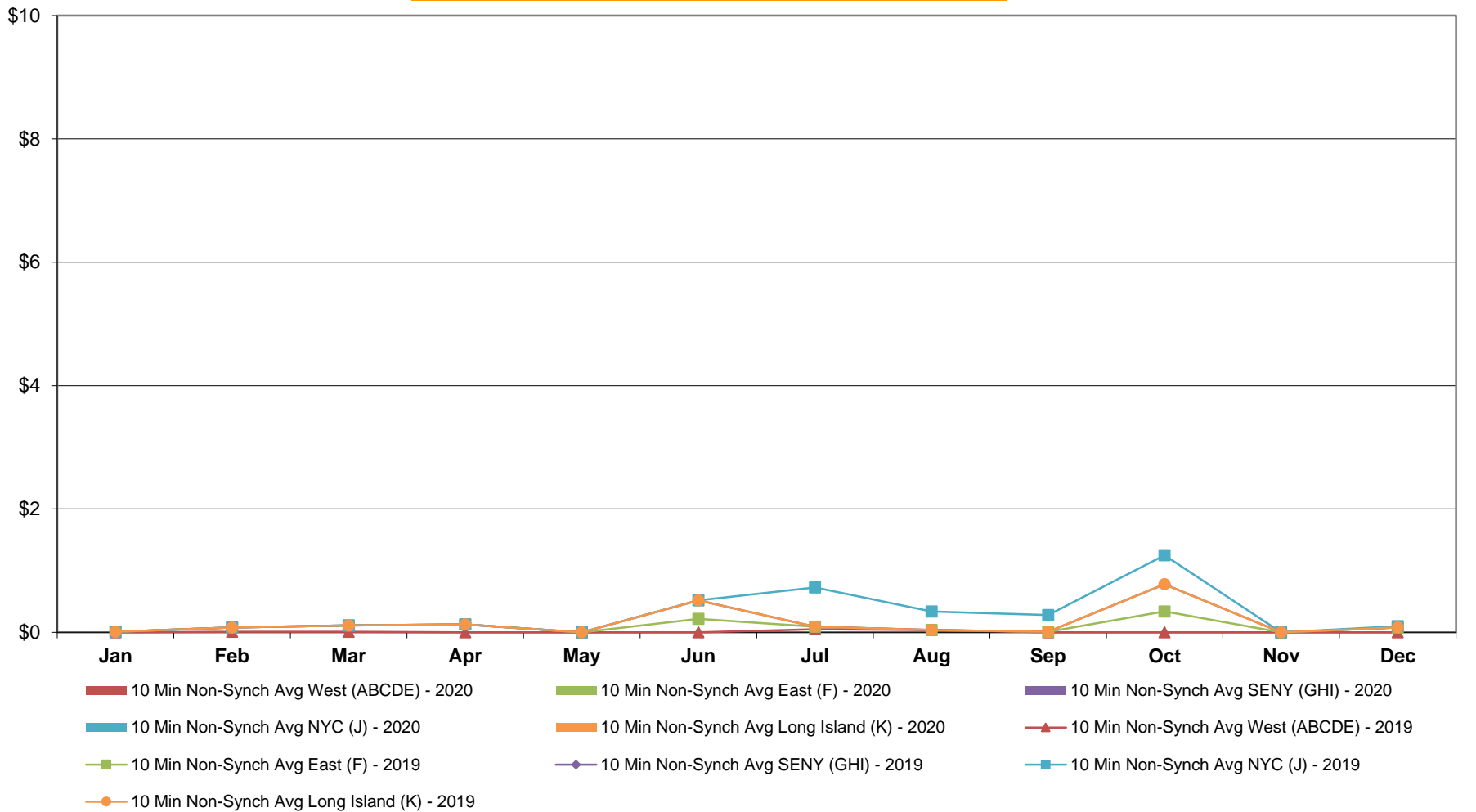




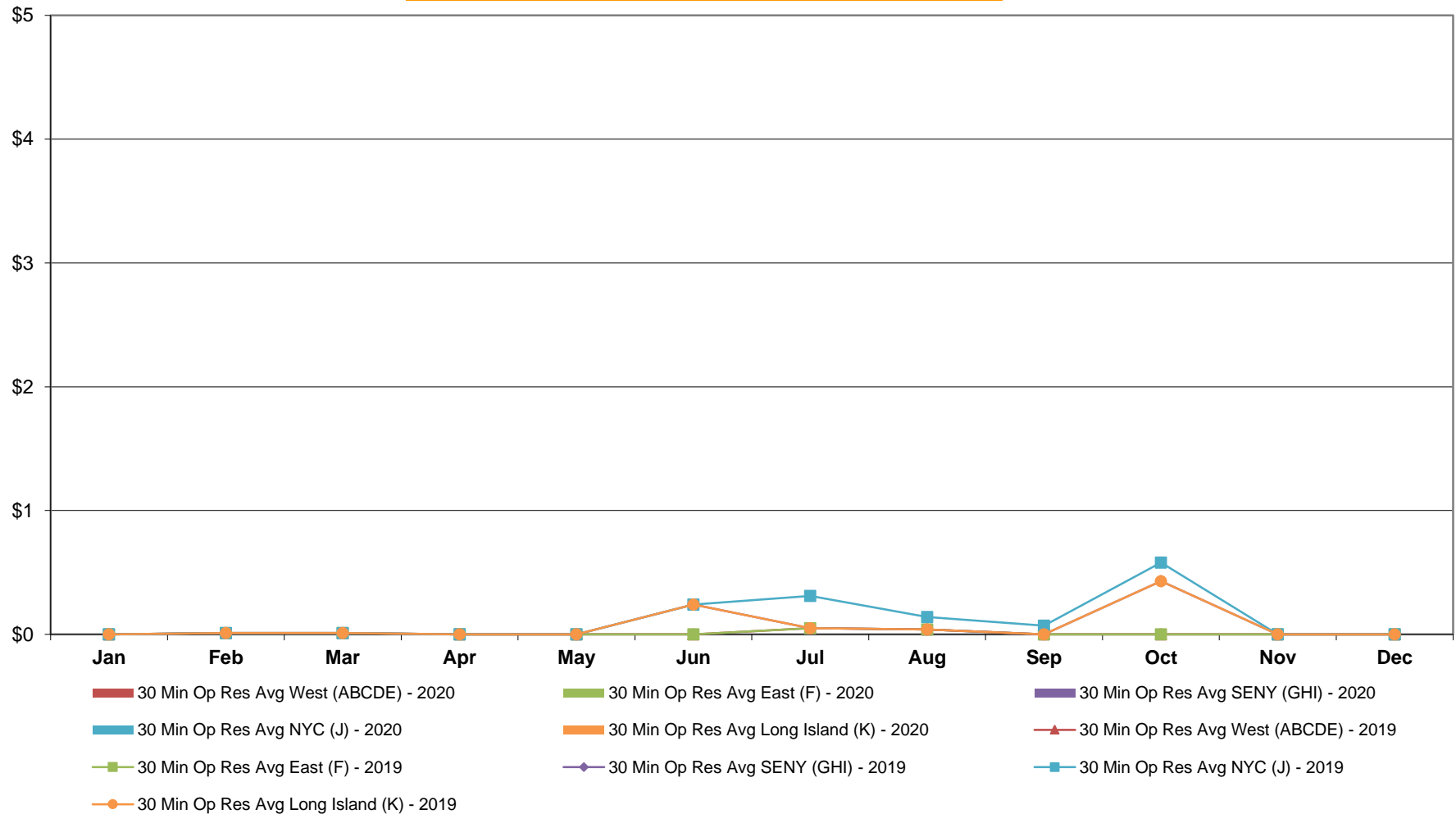
NYISO Monthly Average Ancillary Service Prices RTC Market - 10 Min Spin 2019 - 2020

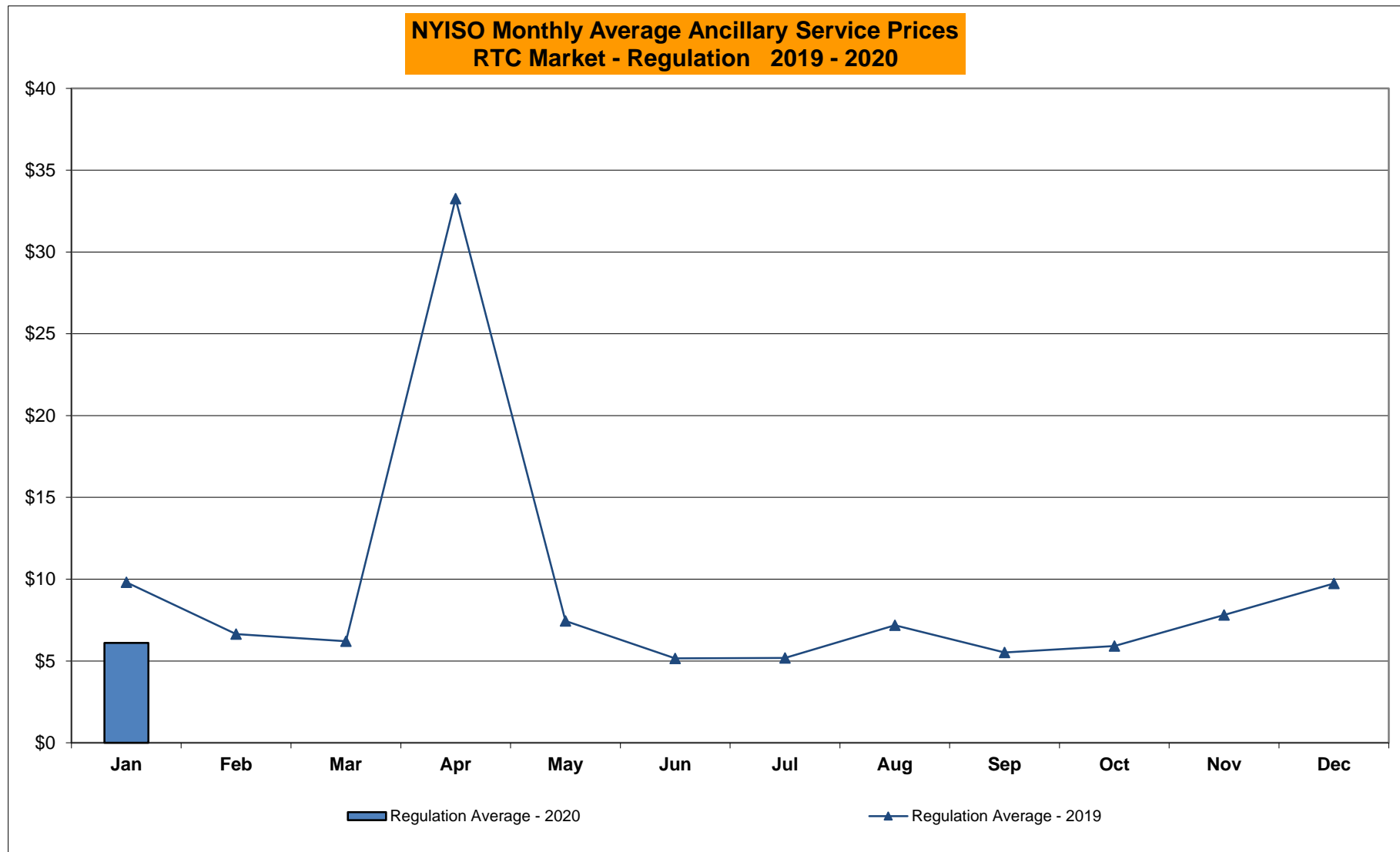


**NYISO Monthly Average Ancillary Service Prices
RTC Market - 10 Min Non-Synch 2019 - 2020**

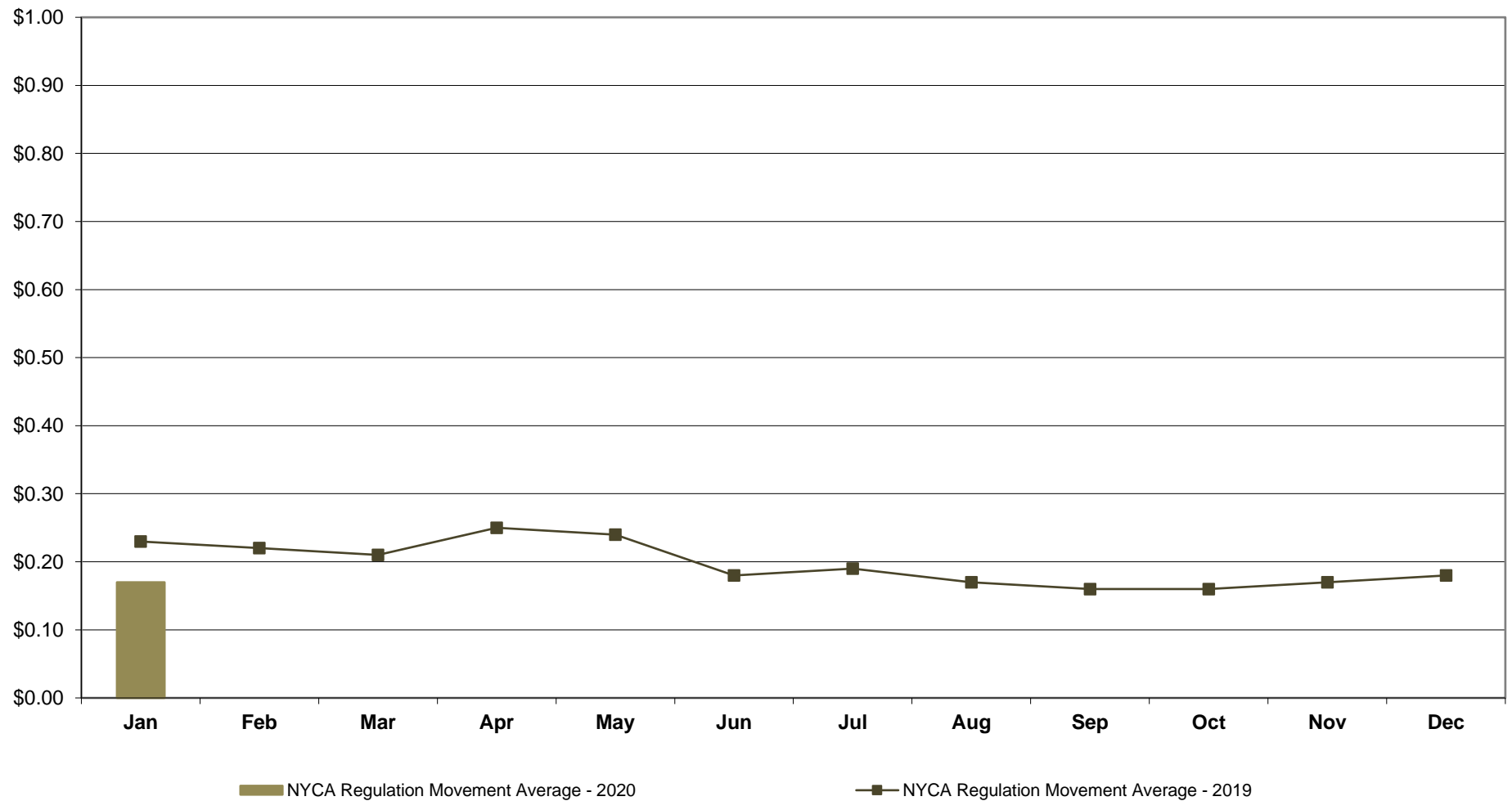


NYISO Monthly Average Ancillary Service Prices RTC Market - 30 Min Op Res 2019 - 2020

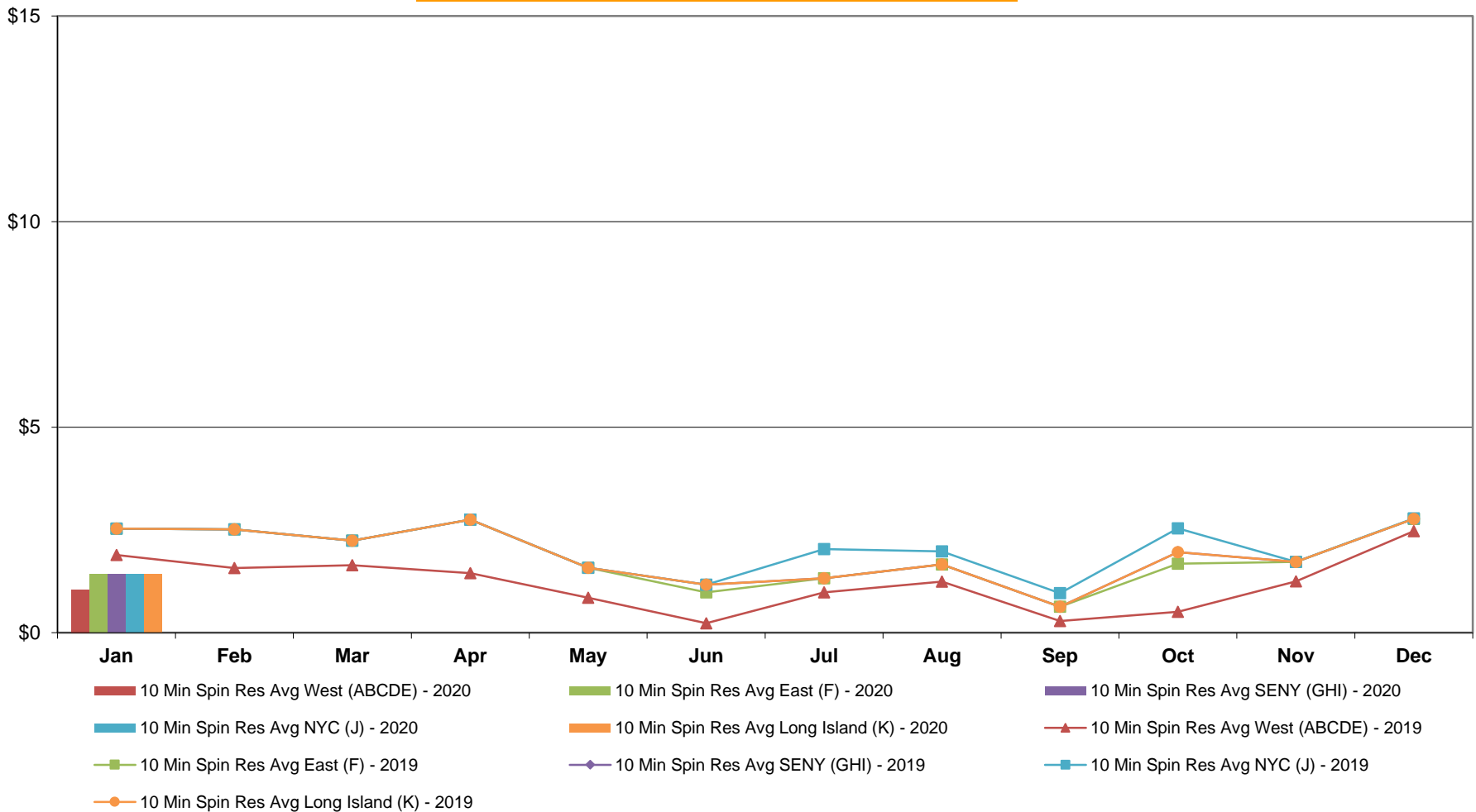




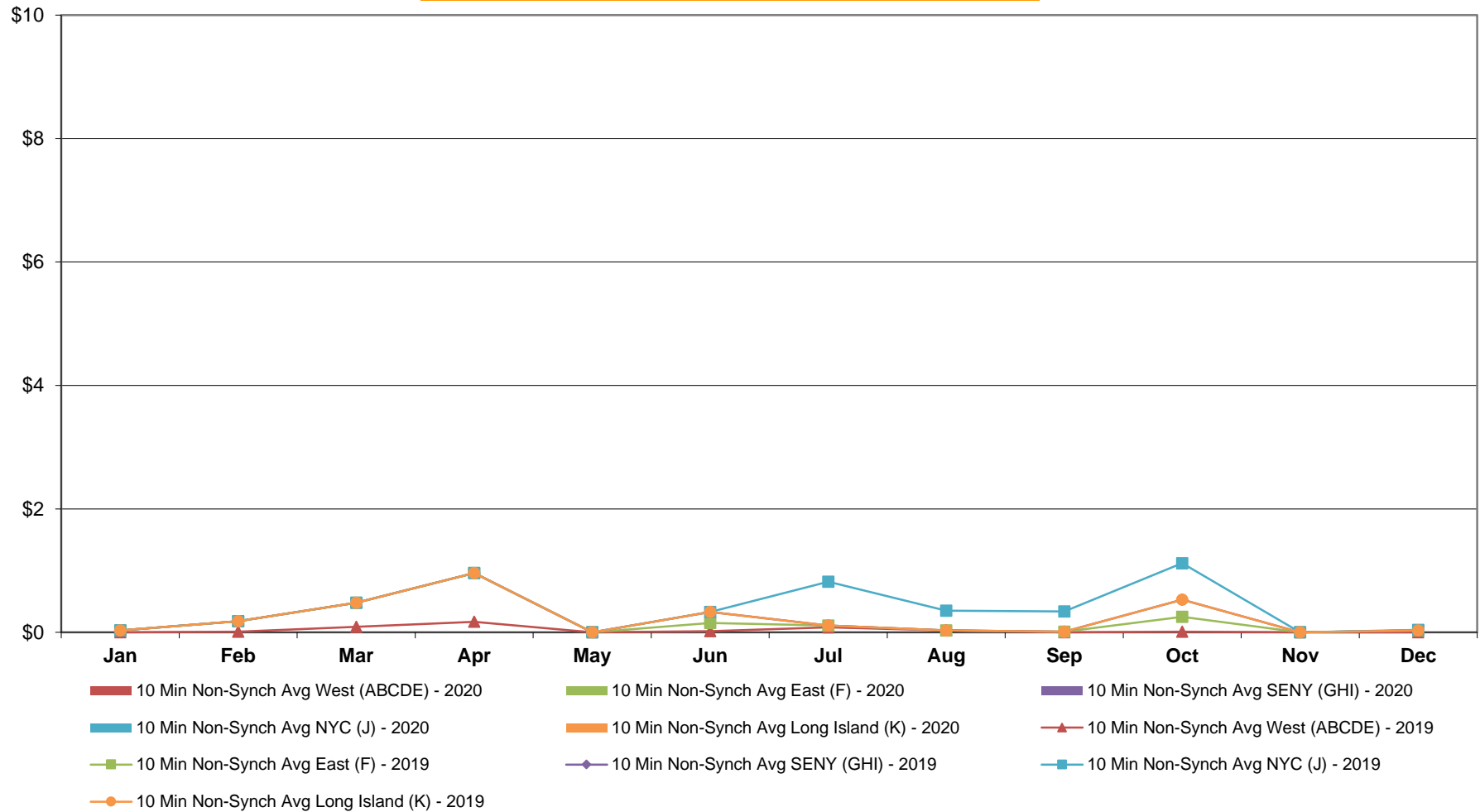
**NYISO Monthly Average Ancillary Service Prices
RTC Market - Regulation Movement 2019 - 2020**



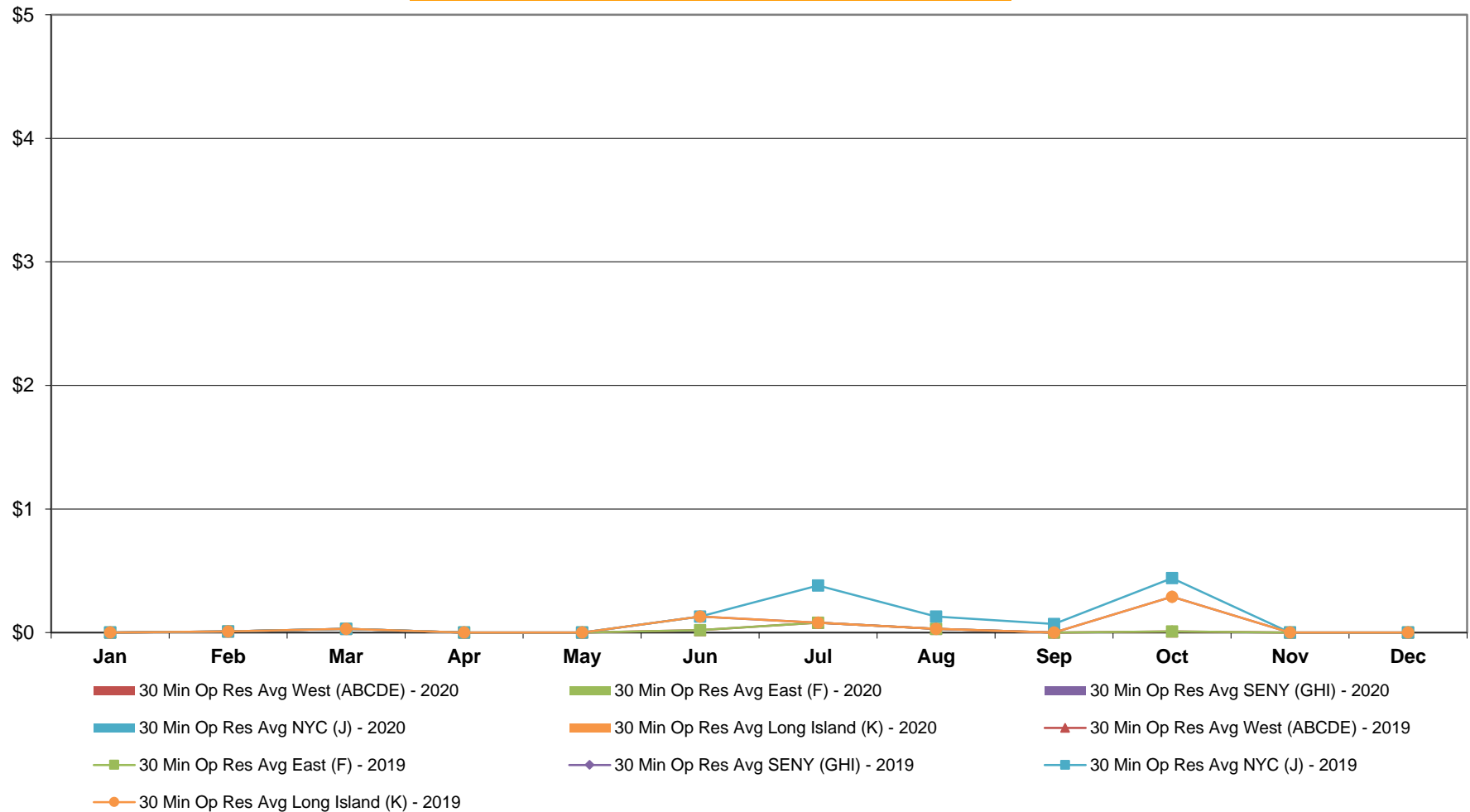
**NYISO Monthly Average Ancillary Service Prices
Real Time Market - 10 Min Spin 2019 - 2020**

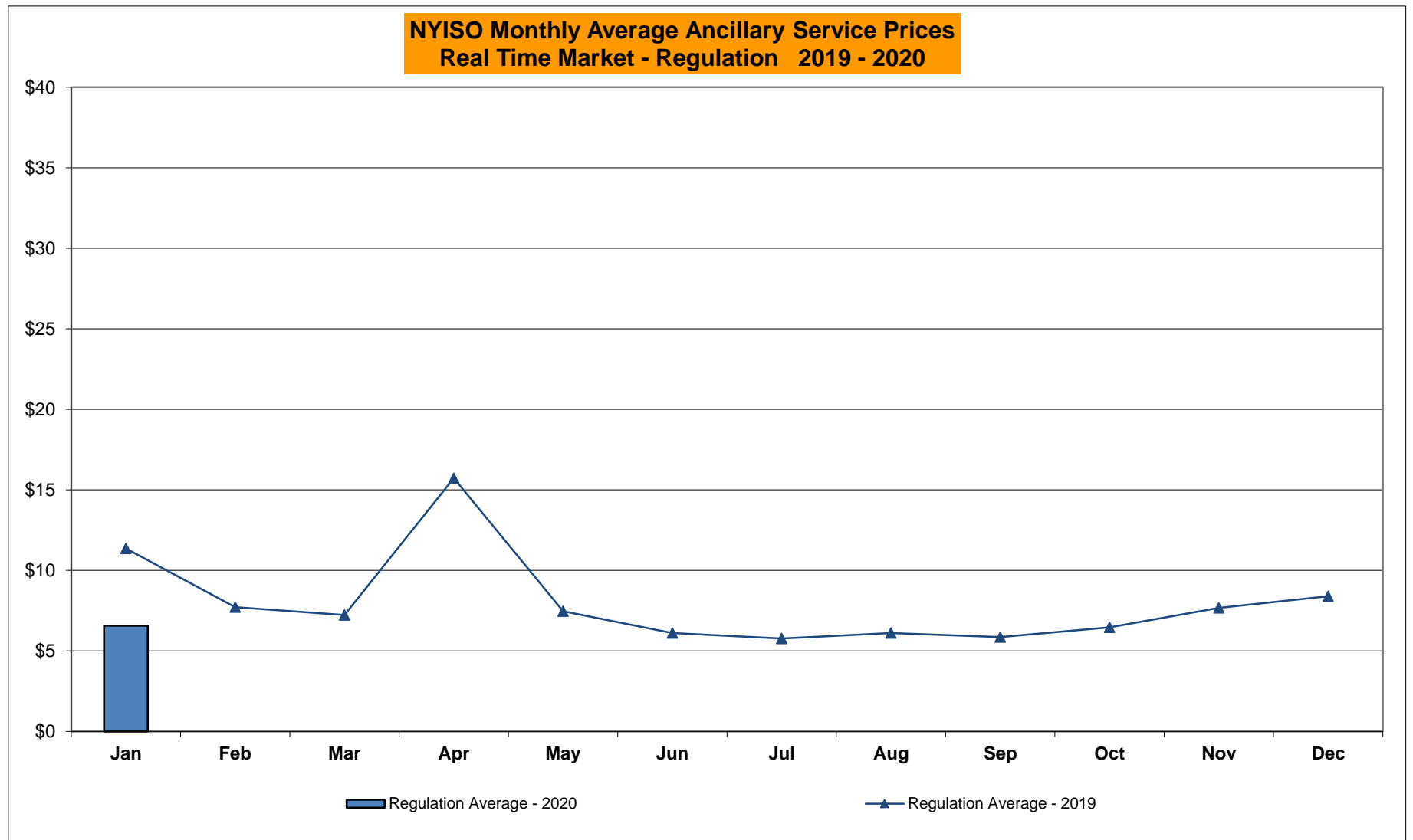


NYISO Monthly Average Ancillary Service Prices Real Time Market - 10 Min Non-Synch 2019 - 2020

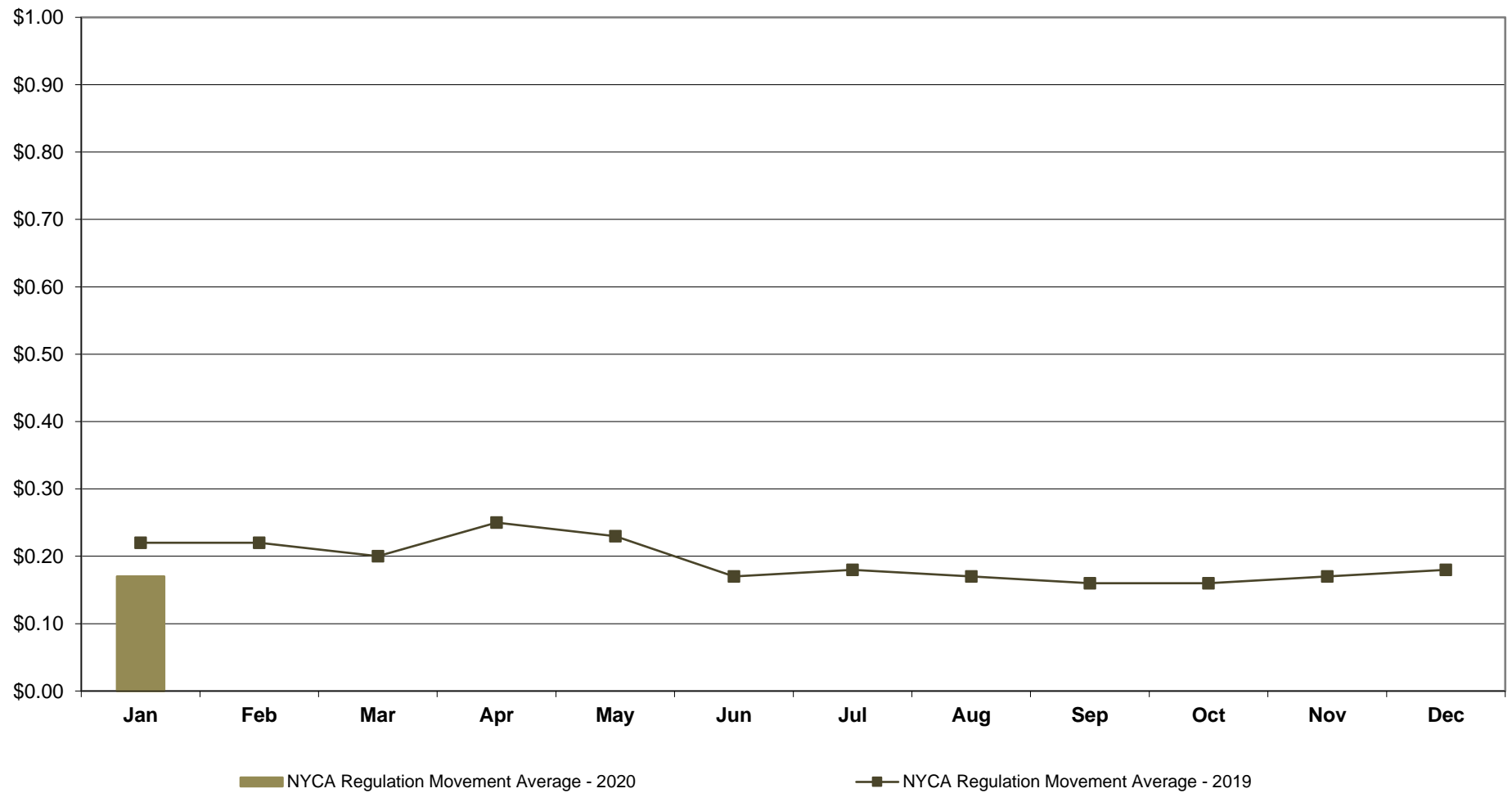


NYISO Monthly Average Ancillary Service Prices Real Time Market - 30 Min Op Res 2019 - 2020





NYISO Monthly Average Ancillary Service Prices Real Time Market - Regulation Movement 2019 - 2020



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

<u>2020</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>
<u>Day Ahead Market</u>												
10 Min Spin Long Island (K)	3.60											
10 Min Spin NYC (J)	3.60											
10 Min Spin SENY (GHI)	3.60											
10 Min Spin East (F)	3.60											
10 Min Spin West (ABCDE)	3.57											
10 Min Non Synch Long Island (K)	3.28											
10 Min Non Synch NYC (J)	3.28											
10 Min Non Synch SENY (GHI)	3.28											
10 Min Non Synch East (F)	3.28											
10 Min Non Synch West (ABCDE)	3.28											
30 Min Long Island (K)	3.28											
30 Min NYC (J)	3.28											
30 Min SENY (GHI)	3.28											
30 Min East (F)	3.28											
30 Min West (ABCDE)	3.28											
Regulation	6.46											
<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>
<u>Day Ahead Market</u>												
10 Min Spin Long Island (K)	5.47	4.17	4.61	4.46	4.25	3.90	4.03	4.19	3.86	4.59	3.79	3.55
10 Min Spin NYC (J)	5.47	4.17	4.61	4.46	4.25	3.90	4.86	4.73	3.97	4.69	3.79	3.55
10 Min Spin SENY (GHI)	5.47	4.17	4.61	4.46	4.25	3.90	4.03	4.19	3.86	4.59	3.79	3.55
10 Min Spin East (F)	5.47	4.17	4.61	4.46	4.25	3.86	4.03	4.19	3.86	4.59	3.79	3.55
10 Min Spin West (ABCDE)	4.56	3.94	4.30	4.01	4.09	3.77	3.89	4.00	3.72	4.24	3.65	3.47
10 Min Non Synch Long Island (K)	3.88	3.75	3.57	3.96	3.94	3.63	3.76	3.78	3.34	3.91	3.40	3.14
10 Min Non Synch NYC (J)	3.88	3.75	3.57	3.96	3.94	3.63	4.59	4.32	3.45	4.01	3.40	3.14
10 Min Non Synch SENY (GHI)	3.88	3.75	3.57	3.96	3.94	3.63	3.76	3.78	3.34	3.91	3.40	3.14
10 Min Non Synch East (F)	3.88	3.75	3.57	3.96	3.94	3.59	3.76	3.78	3.34	3.91	3.40	3.14
10 Min Non Synch West (ABCDE)	3.86	3.74	3.47	3.73	3.91	3.58	3.73	3.76	3.33	3.87	3.39	3.13
30 Min Long Island (K)	3.86	3.74	3.46	3.71	3.91	3.58	3.72	3.75	3.33	3.86	3.39	3.13
30 Min NYC (J)	3.86	3.74	3.46	3.71	3.91	3.58	3.79	3.75	3.33	3.86	3.39	3.13
30 Min SENY (GHI)	3.86	3.74	3.46	3.71	3.91	3.58	3.72	3.75	3.33	3.86	3.39	3.13
30 Min East (F)	3.86	3.74	3.46	3.71	3.91	3.58	3.72	3.75	3.33	3.86	3.39	3.13
30 Min West (ABCDE)	3.86	3.74	3.46	3.71	3.91	3.58	3.72	3.75	3.33	3.86	3.39	3.13
Regulation	11.94	7.69	6.62	27.38	8.71	5.57	4.99	5.89	6.36	8.55	7.77	7.65

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

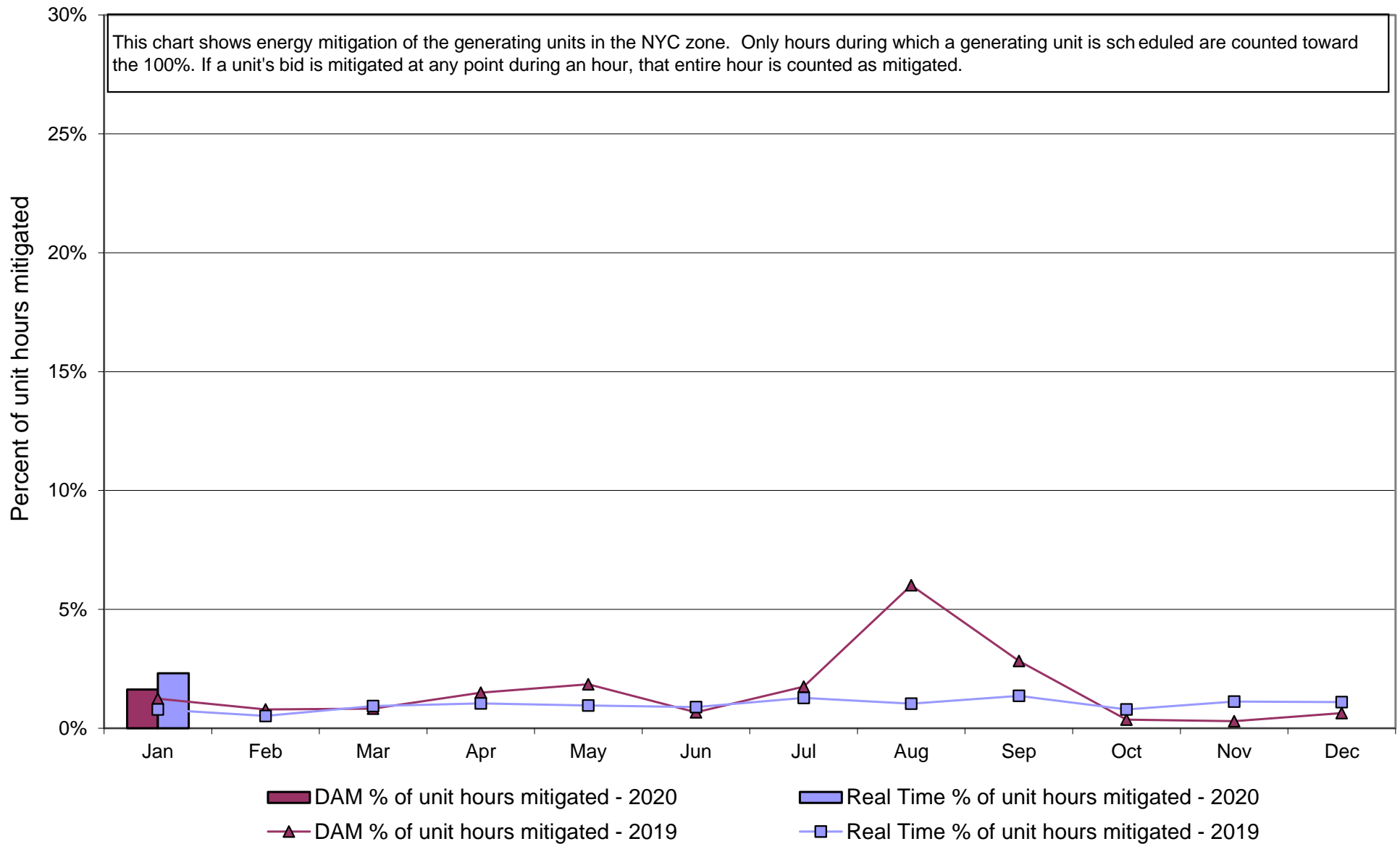
2020	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
RTC Market												
10 Min Spin Long Island (K)	0.78											
10 Min Spin NYC (J)	0.78											
10 Min Spin SENY (GHI)	0.78											
10 Min Spin East (F)	0.78											
10 Min Spin West (ABCDE)	0.54											
10 Min Non Synch Long Island (K)	0.00											
10 Min Non Synch NYC (J)	0.00											
10 Min Non Synch SENY (GHI)	0.00											
10 Min Non Synch East (F)	0.00											
10 Min Non Synch West (ABCDE)	0.00											
30 Min Long Island (K)	0.00											
30 Min NYC (J)	0.00											
30 Min SENY (GHI)	0.00											
30 Min East (F)	0.00											
30 Min West (ABCDE)	0.00											
Regulation	6.11											
NYCA Regulation Movement	0.17											
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>
RTC Market												
10 Min Spin Long Island (K)	1.80	1.55	1.08	1.04	0.99	0.99	0.90	0.91	0.38	1.90	1.20	1.68
10 Min Spin NYC (J)	1.80	1.55	1.08	1.04	0.99	0.99	1.54	1.21	0.65	2.37	1.20	1.69
10 Min Spin SENY (GHI)	1.80	1.55	1.08	1.04	0.99	0.99	0.90	0.91	0.38	1.90	1.20	1.68
10 Min Spin East (F)	1.80	1.55	1.08	1.04	0.99	0.69	0.90	0.91	0.38	1.47	1.20	1.68
10 Min Spin West (ABCDE)	1.08	0.80	0.79	0.44	0.44	0.05	0.58	0.51	0.12	0.15	0.79	1.39
10 Min Non Synch Long Island (K)	0.01	0.08	0.11	0.13	0.00	0.52	0.09	0.04	0.01	0.78	0.00	0.08
10 Min Non Synch NYC (J)	0.01	0.08	0.11	0.13	0.00	0.52	0.73	0.34	0.28	1.25	0.00	0.10
10 Min Non Synch SENY (GHI)	0.01	0.08	0.11	0.13	0.00	0.52	0.09	0.04	0.01	0.78	0.00	0.08
10 Min Non Synch East (F)	0.01	0.08	0.11	0.13	0.00	0.22	0.09	0.04	0.01	0.34	0.00	0.08
10 Min Non Synch West (ABCDE)	0.00	0.01	0.01	0.00	0.00	0.00	0.05	0.04	0.00	0.00	0.00	0.00
30 Min Long Island (K)	0.00	0.01	0.01	0.00	0.00	0.24	0.05	0.04	0.00	0.43	0.00	0.00
30 Min NYC (J)	0.00	0.01	0.01	0.00	0.00	0.24	0.31	0.14	0.07	0.58	0.00	0.00
30 Min SENY (GHI)	0.00	0.01	0.01	0.00	0.00	0.24	0.05	0.04	0.00	0.43	0.00	0.00
30 Min East (F)	0.00	0.01	0.01	0.00	0.00	0.00	0.05	0.04	0.00	0.00	0.00	0.00
30 Min West (ABCDE)	0.00	0.01	0.01	0.00	0.00	0.00	0.05	0.04	0.00	0.00	0.00	0.00
Regulation	9.81	6.64	6.21	33.26	7.45	5.16	5.19	7.19	5.52	5.91	7.81	9.74
NYCA Regulation Movement	0.23	0.22	0.21	0.25	0.24	0.18	0.19	0.17	0.16	0.16	0.17	0.18

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

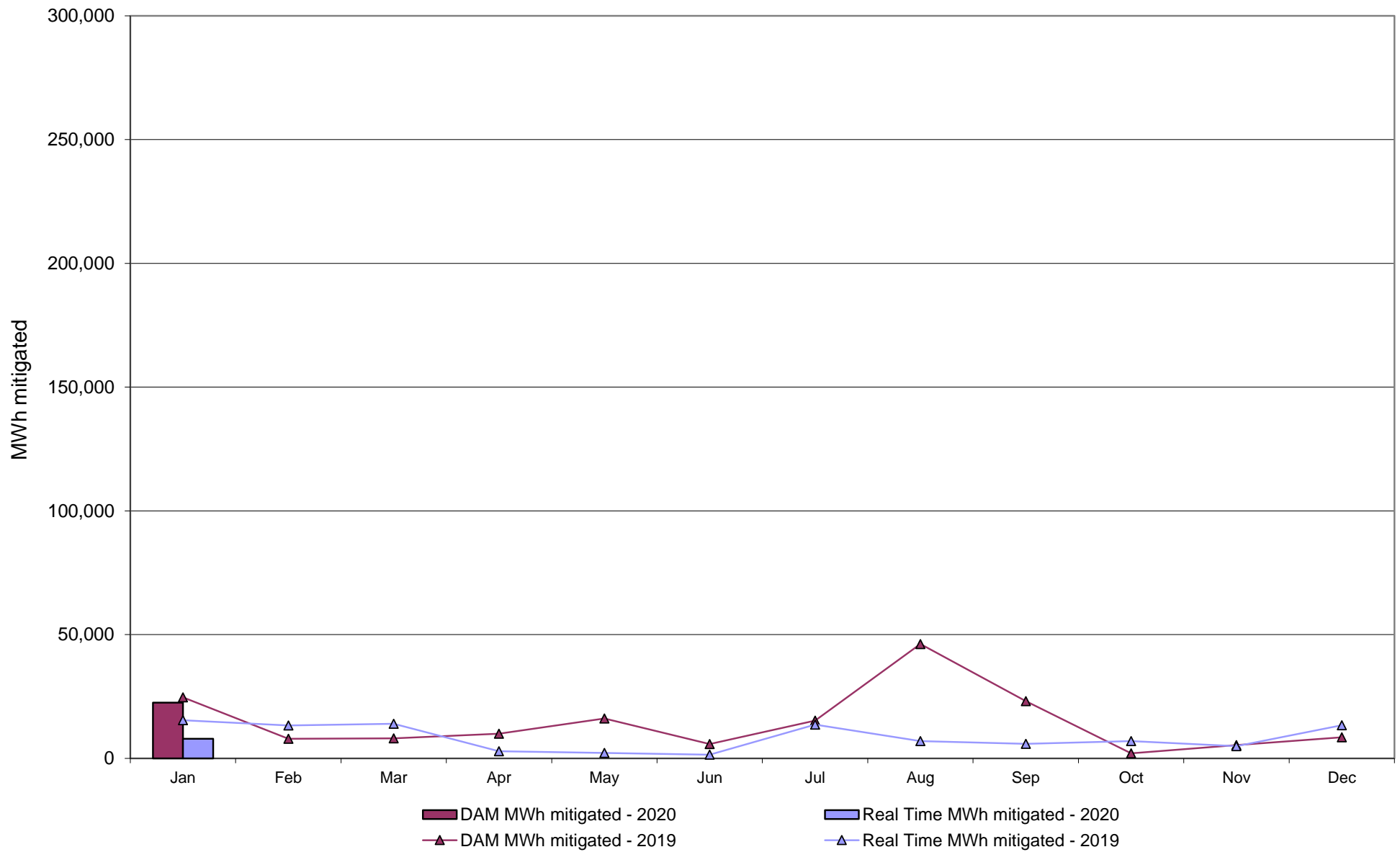
2020	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Real Time Market												
10 Min Spin Long Island (K)	1.42											
10 Min Spin NYC (J)	1.42											
10 Min Spin SENY (GHI)	1.42											
10 Min Spin East (F)	1.42											
10 Min Spin West (ABCDE)	1.05											
10 Min Non Synch Long Island (K)	0.00											
10 Min Non Synch NYC (J)	0.00											
10 Min Non Synch SENY (GHI)	0.00											
10 Min Non Synch East (F)	0.00											
10 Min Non Synch West (ABCDE)	0.00											
30 Min Long Island (K)	0.00											
30 Min NYC (J)	0.00											
30 Min SENY (GHI)	0.00											
30 Min East (F)	0.00											
30 Min West (ABCDE)	0.00											
Regulation	6.57											
NYCA Regulation Movement	0.17											
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>
Real Time Market												
10 Min Spin Long Island (K)	2.53	2.51	2.24	2.75	1.58	1.17	1.32	1.66	0.63	1.96	1.72	2.77
10 Min Spin NYC (J)	2.53	2.51	2.24	2.75	1.58	1.17	2.03	1.98	0.96	2.54	1.72	2.78
10 Min Spin SENY (GHI)	2.53	2.51	2.24	2.75	1.58	1.17	1.32	1.66	0.63	1.96	1.72	2.77
10 Min Spin East (F)	2.53	2.51	2.24	2.75	1.58	0.98	1.32	1.66	0.63	1.68	1.72	2.77
10 Min Spin West (ABCDE)	1.89	1.57	1.64	1.45	0.85	0.23	0.98	1.24	0.28	0.51	1.25	2.47
10 Min Non Synch Long Island (K)	0.03	0.18	0.48	0.96	0.00	0.33	0.11	0.03	0.01	0.53	0.00	0.03
10 Min Non Synch NYC (J)	0.03	0.18	0.48	0.96	0.00	0.33	0.82	0.35	0.34	1.12	0.00	0.04
10 Min Non Synch SENY (GHI)	0.03	0.18	0.48	0.96	0.00	0.33	0.11	0.03	0.01	0.53	0.00	0.03
10 Min Non Synch East (F)	0.03	0.18	0.48	0.96	0.00	0.15	0.11	0.03	0.01	0.25	0.00	0.03
10 Min Non Synch West (ABCDE)	0.00	0.01	0.09	0.17	0.00	0.02	0.08	0.03	0.00	0.01	0.00	0.00
30 Min Long Island (K)	0.00	0.01	0.03	0.00	0.00	0.13	0.08	0.03	0.00	0.29	0.00	0.00
30 Min NYC (J)	0.00	0.01	0.03	0.00	0.00	0.13	0.38	0.13	0.07	0.44	0.00	0.00
30 Min SENY (GHI)	0.00	0.01	0.03	0.00	0.00	0.13	0.08	0.03	0.00	0.29	0.00	0.00
30 Min East (F)	0.00	0.01	0.03	0.00	0.00	0.02	0.08	0.03	0.00	0.01	0.00	0.00
30 Min West (ABCDE)	0.00	0.01	0.03	0.00	0.00	0.02	0.08	0.03	0.00	0.01	0.00	0.00
Regulation	11.36	7.72	7.23	15.73	7.47	6.11	5.77	6.11	5.86	6.47	7.67	8.40
NYCA Regulation Movement	0.22	0.22	0.20	0.25	0.23	0.17	0.18	0.17	0.16	0.16	0.17	0.18

NYISO In City Energy Mitigation - AMP (NYC Zone) 2019 - 2020

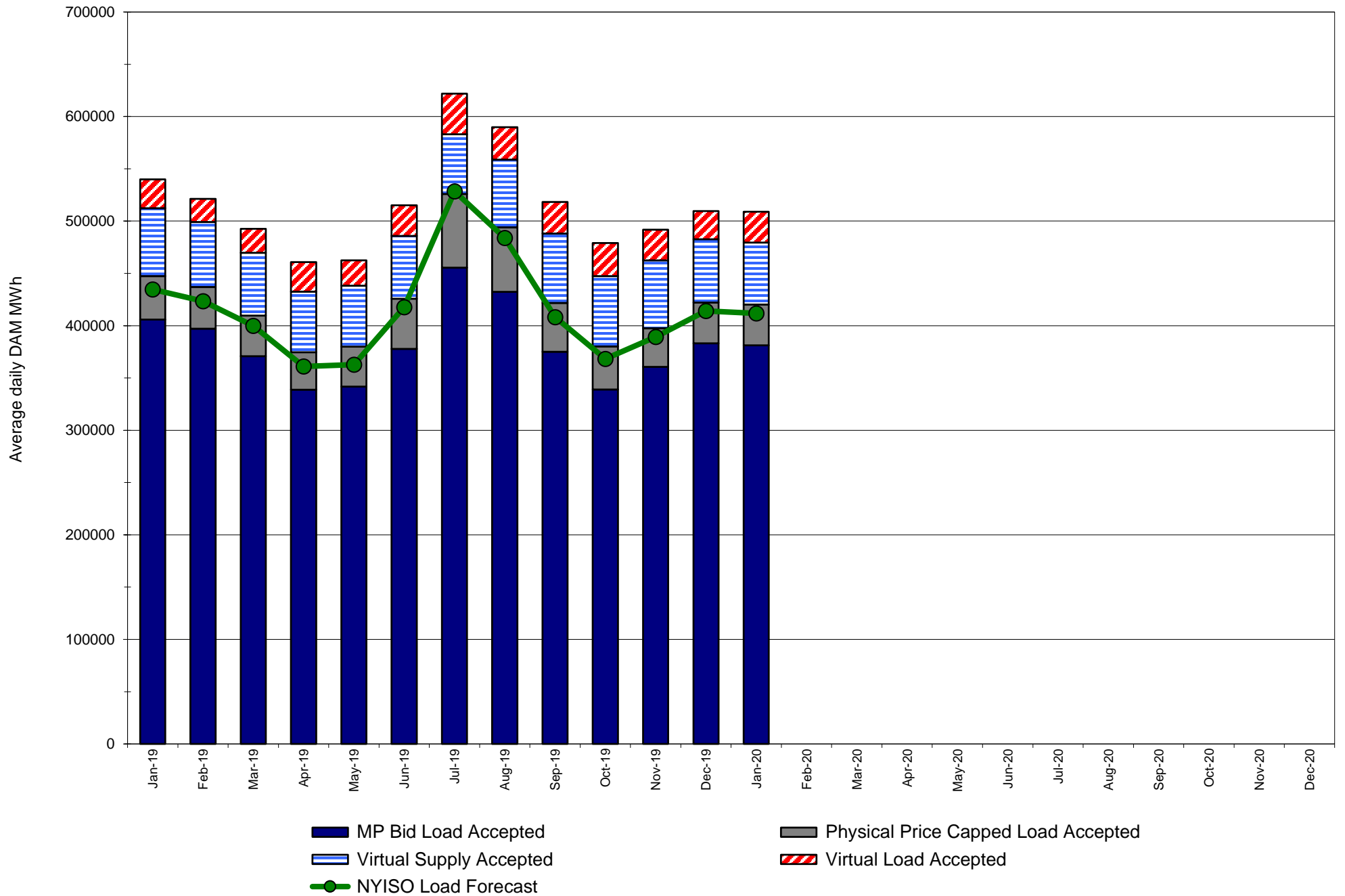
Percentage of committed unit-hours mitigated



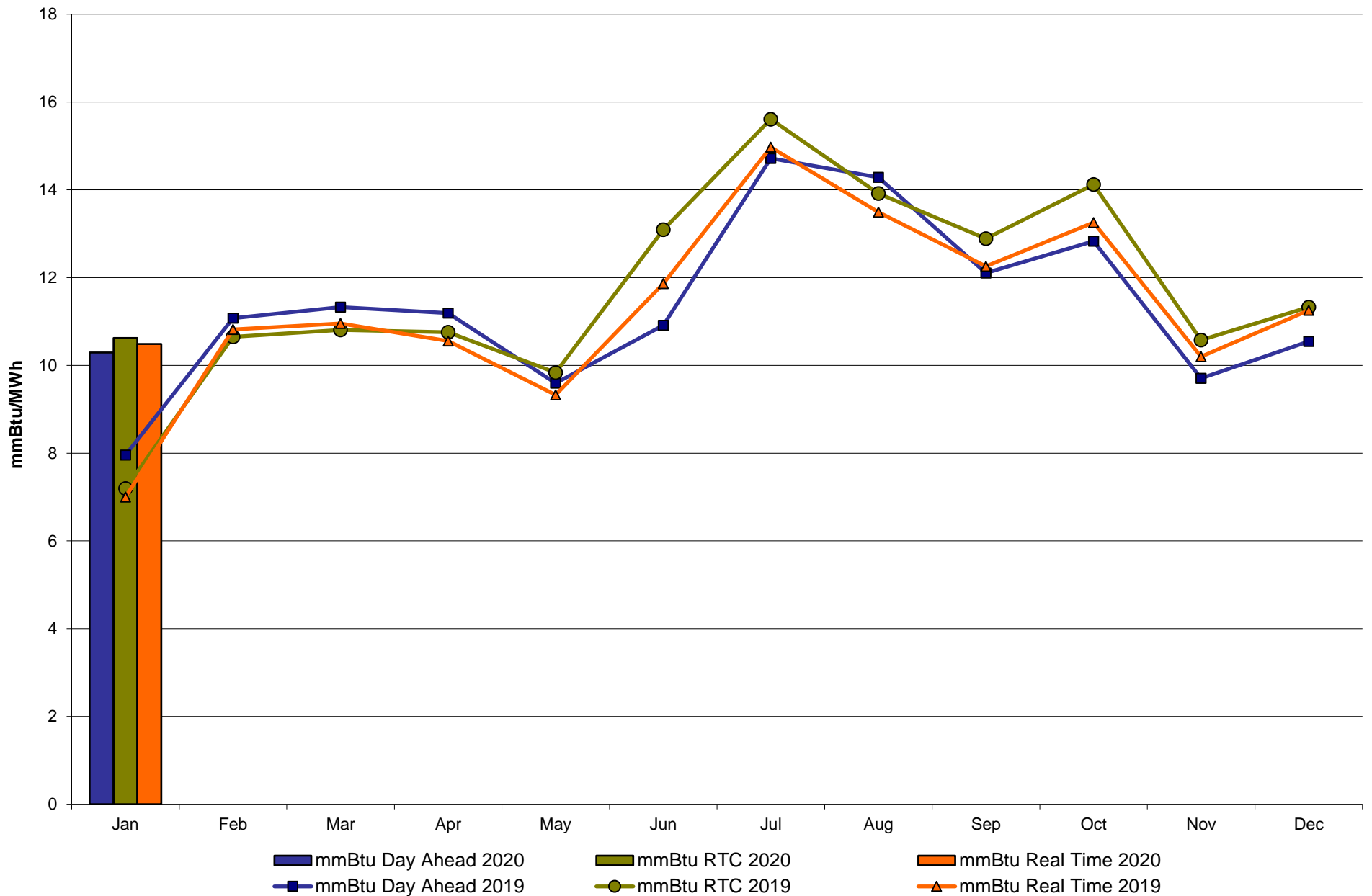
NYISO In City Energy Mitigation (NYC Zone) 2019 - 2020
Monthly megawatt hours mitigated



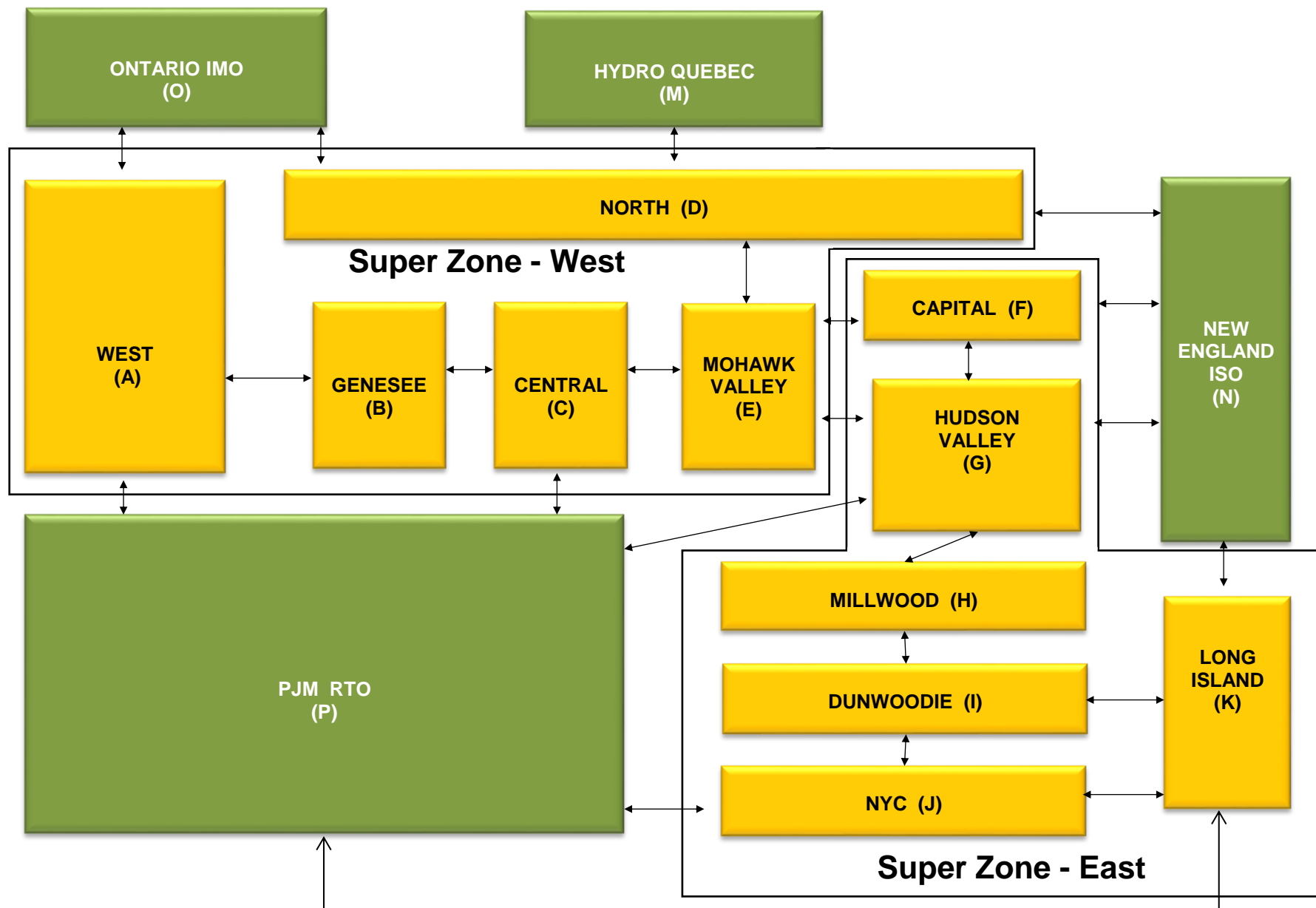
NYISO Average Daily DAM Load Bid Summary



Monthly Implied Heat Rate 2019-2020



NYISO LBMP ZONES



Billing Codes for Chart C

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

Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system

