

Market Operations Report

Rana Mukerji

SENIOR VICE PRESIDENT – MARKET STRUCTURES, NYISO

Business Issues Committee Meeting

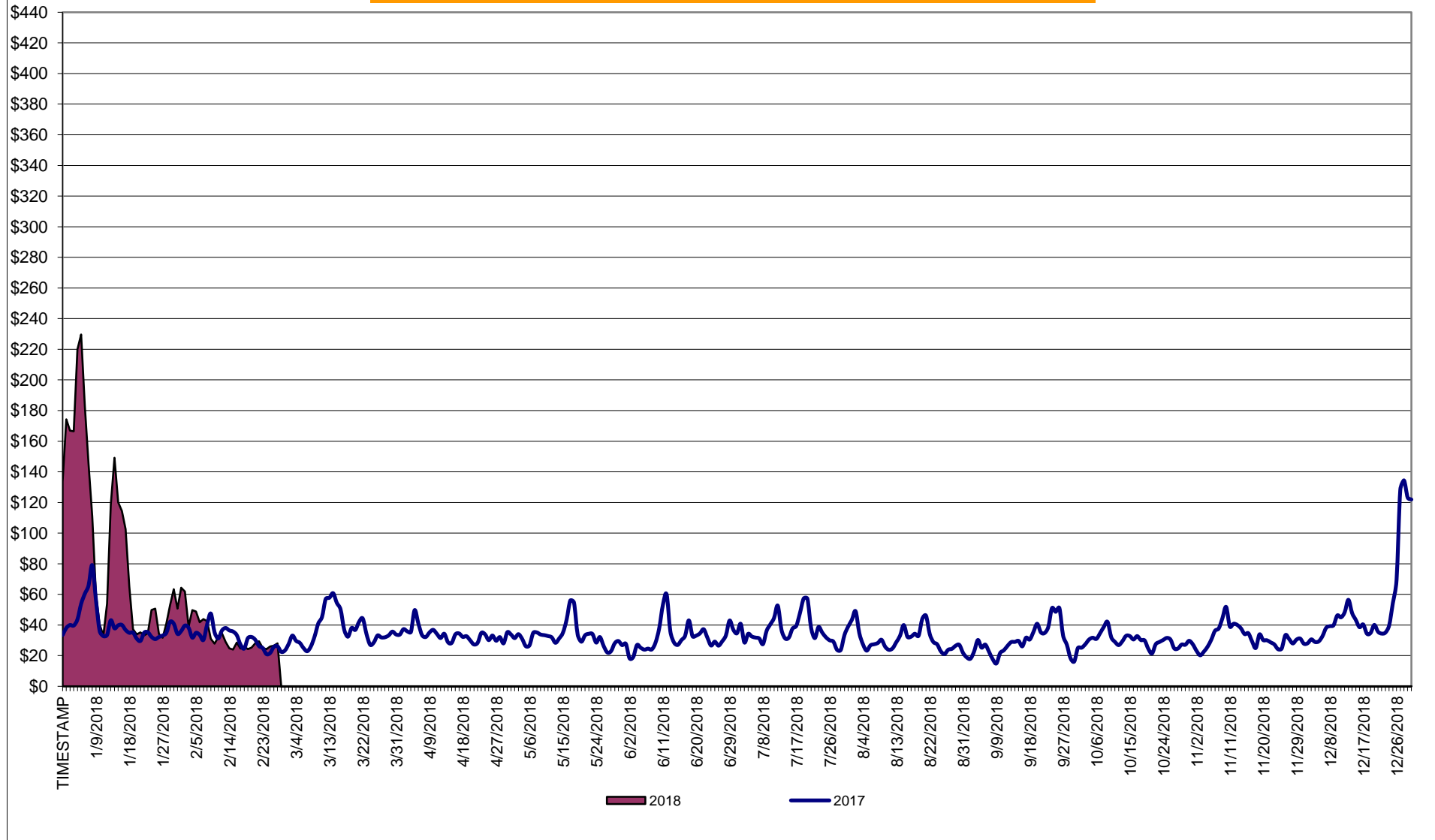
March 15, 2018, Rensselaer, NY

Market Performance Highlights

February 2018

- LBMP for February is \$33.83/MWh; lower than \$99.55/MWh in January 2018 and higher than \$30.95/MWh in February 2017.
 - Day Ahead and Real Time Load Weighted LBMPs are lower compared to January.
- February 2018 average year-to-date monthly cost of \$72.85/MWh is a 92% increase from \$38.02/MWh in February 2017.
- Average daily sendout is 426 GWh/day in February; lower than 463 GWh/day in January 2018 and higher 418 GWh/day in February 2017.
- Natural gas and distillate prices were lower compared to the previous month.
 - Natural Gas (Transco Z6 NY) was \$3.14/MMBtu, down from \$17.94/MMBtu in January.
 - Natural gas prices are up 11.1% year-over-year.
 - Jet Kerosene Gulf Coast was \$13.72/MMBtu, down from \$14.47/MMBtu in January.
 - Ultra Low Sulfur No.2 Diesel NY Harbor was \$13.86/MMBtu, down from \$14.83/MMBtu in January.
 - Distillate prices are up 19.3% year-over-year.
- Uplift per MWh is higher compared to the previous month.
 - Uplift (not including NYISO cost of operations) is (\$0.50)/MWh; higher than (\$0.92)/MWh in January.
 - Local Reliability Share is \$0.14/MWh, lower than \$0.59/MWh in January.
 - Statewide Share is (\$0.64)/MWh, higher than (\$1.52)/MWh in January.
 - TSA \$ per NYC MWh is \$0.00/MWh.
 - Total uplift costs (Schedule 1 components including NYISO Cost of Operations) are higher than January.

Daily NYISO Average Cost/MWh (Energy & Ancillary Services)*
2017 Annual Average \$36.56/MWh
February 2017 YTD Average \$38.36/MWh
February 2018 YTD Average \$72.85/MWh



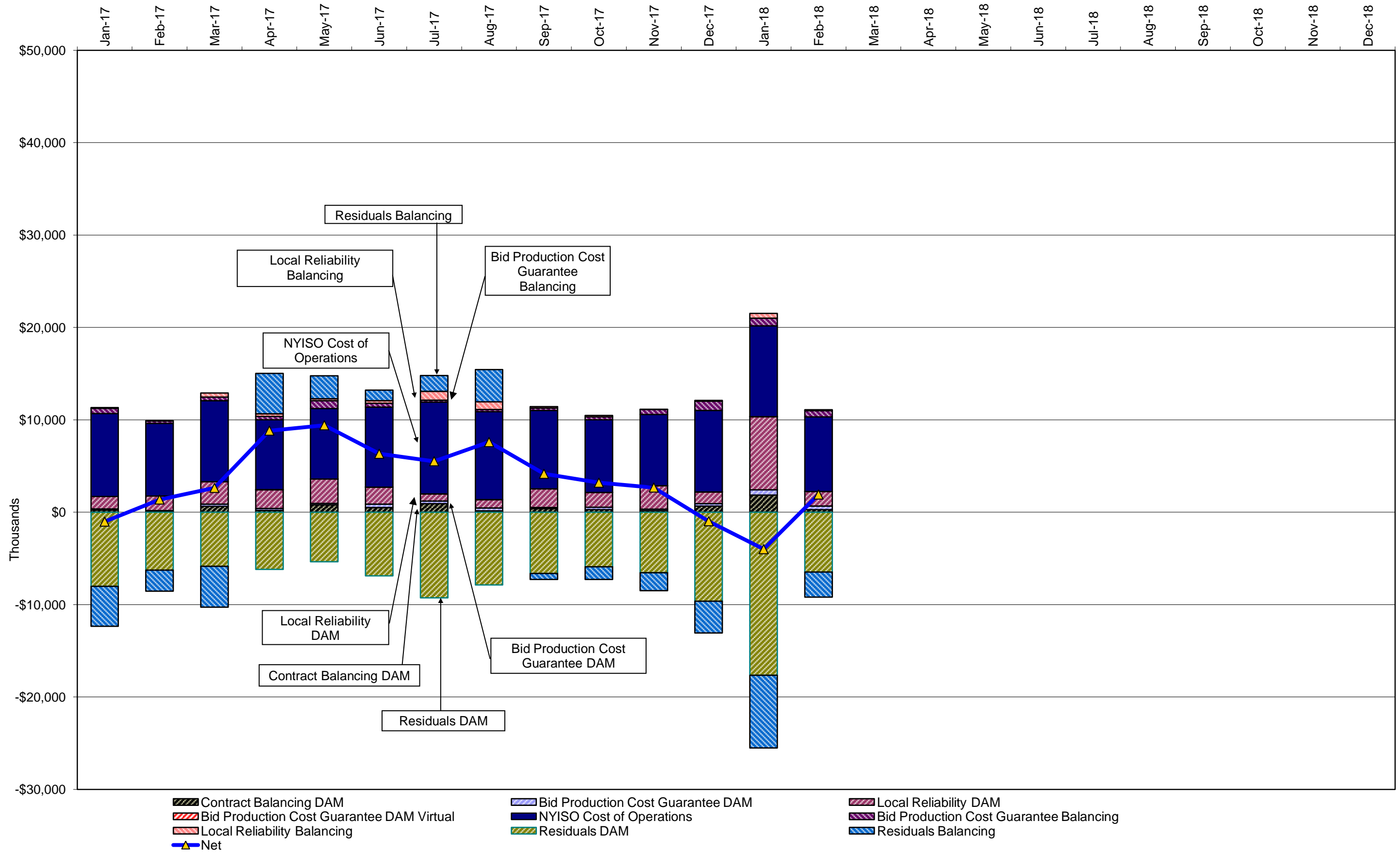
* Excludes ICAP payments.

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

2018	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
LBMP	99.55	33.83										
NTAC	0.71	0.58										
Reserve	0.92	0.65										
Regulation	0.15	0.15										
NYISO Cost of Operations	0.65	0.65										
FERC Fee Recovery	0.08	0.10										
Uplift	(0.92)	(0.50)										
Uplift: Local Reliability Share	0.59	0.14										
Uplift: Statewide Share	(1.52)	(0.64)										
Voltage Support and Black Start	0.40	0.41										
Avg Monthly Cost	101.54	35.87										
Avg YTD Cost	101.54	72.85										
TSA \$ per NYC MWh	0.00	0.00										
2017	<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	40.07	30.95	34.97	31.06	31.74	31.76	35.84	30.57	29.57	28.35	30.60	52.63
NTAC	0.66	1.11	0.86	1.05	0.79	0.62	0.87	0.59	0.62	0.50	0.75	0.81
Reserve	0.70	0.67	0.74	0.70	0.61	0.55	0.48	0.44	0.47	0.59	0.55	0.71
Regulation	0.14	0.12	0.13	0.17	0.16	0.13	0.10	0.10	0.11	0.13	0.20	0.15
NYISO Cost of Operations	0.65	0.65	0.65	0.65	0.62	0.63	0.63	0.63	0.63	0.62	0.61	0.60
FERC Fee Recovery	0.09	0.10	0.10	0.12	0.10	0.09	0.07	0.08	0.09	0.10	0.10	0.08
Uplift	(0.73)	(0.54)	(0.46)	0.12	0.10	(0.37)	(0.43)	(0.19)	(0.34)	(0.36)	(0.40)	(0.68)
Uplift: Local Reliability Share	0.10	0.13	0.21	0.20	0.24	0.15	0.11	0.12	0.16	0.14	0.20	0.09
Uplift: Statewide Share	(0.83)	(0.67)	(0.67)	(0.08)	(0.13)	(0.52)	(0.54)	(0.31)	(0.50)	(0.50)	(0.60)	(0.78)
Voltage Support and Black Start	0.37	0.37	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.37	0.37
Avg Monthly Cost	41.96	33.44	37.38	34.26	34.52	33.80	37.94	32.60	31.54	30.31	32.79	54.67
Avg YTD Cost	41.96	38.02	37.81	37.05	36.54	36.01	36.35	35.80	35.34	34.89	34.72	36.56
TSA \$ per NYC MWh	0.00	0.00	0.00	0.08	0.12	0.56	0.42	0.23	0.00	0.00	0.00	0.00

* Excludes ICAP payments.
Market Mitigation and Analysis
Prepared: 3/8/2018 11:31 AM

NYISO Dollar Flows - Uplift - OATT Schedule 1 components - Data through February 28, 2018



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

2018	January	February	March	April	May	June	July	August	September	October	November	December
Day Ahead Market MWh	15,153,751	12,643,854										
DAM LSE Internal LBMP Energy Sales	59%	57%										
DAM External TC LBMP Energy Sales	4%	3%										
DAM Bilateral - Internal Bilaterals	29%	31%										
DAM Bilateral - Import/Non-LBMP Market Bilaterals	5%	5%										
DAM Bilateral - Export/Non-LBMP Market Bilaterals	2%	2%										
DAM Bilateral - Wheel Through Bilaterals	1%	2%										
Balancing Energy Market MWh	-149,619	-299,377										
Balancing Energy LSE Internal LBMP Energy Sales	-147%	-101%										
Balancing Energy External TC LBMP Energy Sales	74%	24%										
Balancing Energy Bilateral - Internal Bilaterals	9%	5%										
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	0%										
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	22%	9%										
Balancing Energy Bilateral - Wheel Through Bilaterals	-58%	-36%										
Transactions Summary												
LBMP	63%	59%										
Internal Bilaterals	30%	32%										
Import Bilaterals	5%	5%										
Export Bilaterals	2%	2%										
Wheels Through	1%	1%										
Market Share of Total Load												
Day Ahead Market	101.0%	102.4%										
Balancing Energy +	-1.0%	-2.4%										
Total MWh	15,004,132	12,344,477										
Average Daily Energy Sendout/Month GWh	463	426										

2017	January	February	March	April	May	June	July	August	September	October	November	December
Day Ahead Market MWh	14,135,019	12,565,206	13,983,865	12,061,475	12,966,981	14,406,180	16,505,801	15,948,927	14,100,695	13,252,368	13,042,826	14,829,403
DAM LSE Internal LBMP Energy Sales	57%	57%	55%	54%	58%	60%	62%	61%	57%	55%	53%	55%
DAM External TC LBMP Energy Sales	2%	2%	1%	1%	1%	1%	1%	1%	1%	2%	3%	5%
DAM Bilateral - Internal Bilaterals	32%	32%	34%	35%	33%	31%	29%	29%	32%	34%	34%	32%
DAM Bilateral - Import/Non-LBMP Market Bilaterals	5%	5%	5%	6%	4%	5%	4%	5%	5%	5%	5%	5%
DAM Bilateral - Export/Non-LBMP Market Bilaterals	2%	2%	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%
DAM Bilateral - Wheel Through Bilaterals	2%	2%	2%	2%	2%	2%	3%	3%	4%	2%	3%	2%
Balancing Energy Market MWh	-256,448	-407,284	-509,053	-466,426	-666,048	-564,312	-747,473	-853,898	-633,990	-510,721	-410,072	-254,003
Balancing Energy LSE Internal LBMP Energy Sales	-157%	-132%	-148%	-115%	-120%	-114%	-100%	-87%	-76%	-102%	-108%	-99%
Balancing Energy External TC LBMP Energy Sales	64%	39%	44%	22%	28%	23%	18%	13%	12%	26%	45%	25%
Balancing Energy Bilateral - Internal Bilaterals	15%	8%	12%	5%	1%	4%	3%	2%	3%	5%	5%	-1%
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	10%	7%	5%	4%	3%	3%	1%	1%	1%	4%	7%	9%
Balancing Energy Bilateral - Wheel Through Bilaterals	-32%	-26%	-13%	-15%	-12%	-16%	-22%	-29%	-40%	-33%	-49%	-34%
Transactions Summary												
LBMP	58%	57%	55%	54%	58%	60%	62%	61%	58%	56%	56%	60%
Internal Bilaterals	33%	34%	36%	37%	34%	32%	30%	31%	33%	36%	36%	32%
Import Bilaterals	5%	5%	5%	6%	4%	5%	5%	5%	5%	5%	5%	5%
Export Bilaterals	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Wheels Through	2%	2%	2%	2%	2%	1%	2%	2%	2%	1%	1%	1%
Market Share of Total Load												
Day Ahead Market	101.8%	103.3%	103.8%	104.0%	105.4%	104.1%	104.7%	105.7%	104.7%	104.0%	103.2%	101.7%
Balancing Energy +	-1.8%	-3.3%	-3.8%	-4.0%	-5.4%	-4.1%	-4.7%	-5.7%	-4.7%	-4.0%	-3.2%	-1.7%
Total MWh	13,878,571	12,157,922	13,474,812	11,595,049	12,300,933	13,841,868	15,758,328	15,095,029	13,466,705	12,741,647	12,632,754	14,575,400
Average Daily Energy Sendout/Month GWh	431	418	419	377	383	454	498	477	437	398	403	444

+ 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 2018 Energy Statistics

	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<u>DAY AHEAD LBMP</u>												
Price *	\$83.53	\$30.37										
Standard Deviation	\$58.94	\$12.38										
Load Weighted Price **	\$88.42	\$31.44										
<u>RTC LBMP</u>												
Price *	\$81.65	\$27.73										
Standard Deviation	\$60.83	\$11.96										
Load Weighted Price **	\$85.85	\$28.54										
<u>REAL TIME LBMP</u>												
Price *	\$87.94	\$28.50										
Standard Deviation	\$87.41	\$17.36										
Load Weighted Price **	\$93.59	\$29.49										
Average Daily Energy Sendout/Month GWh	463	426										

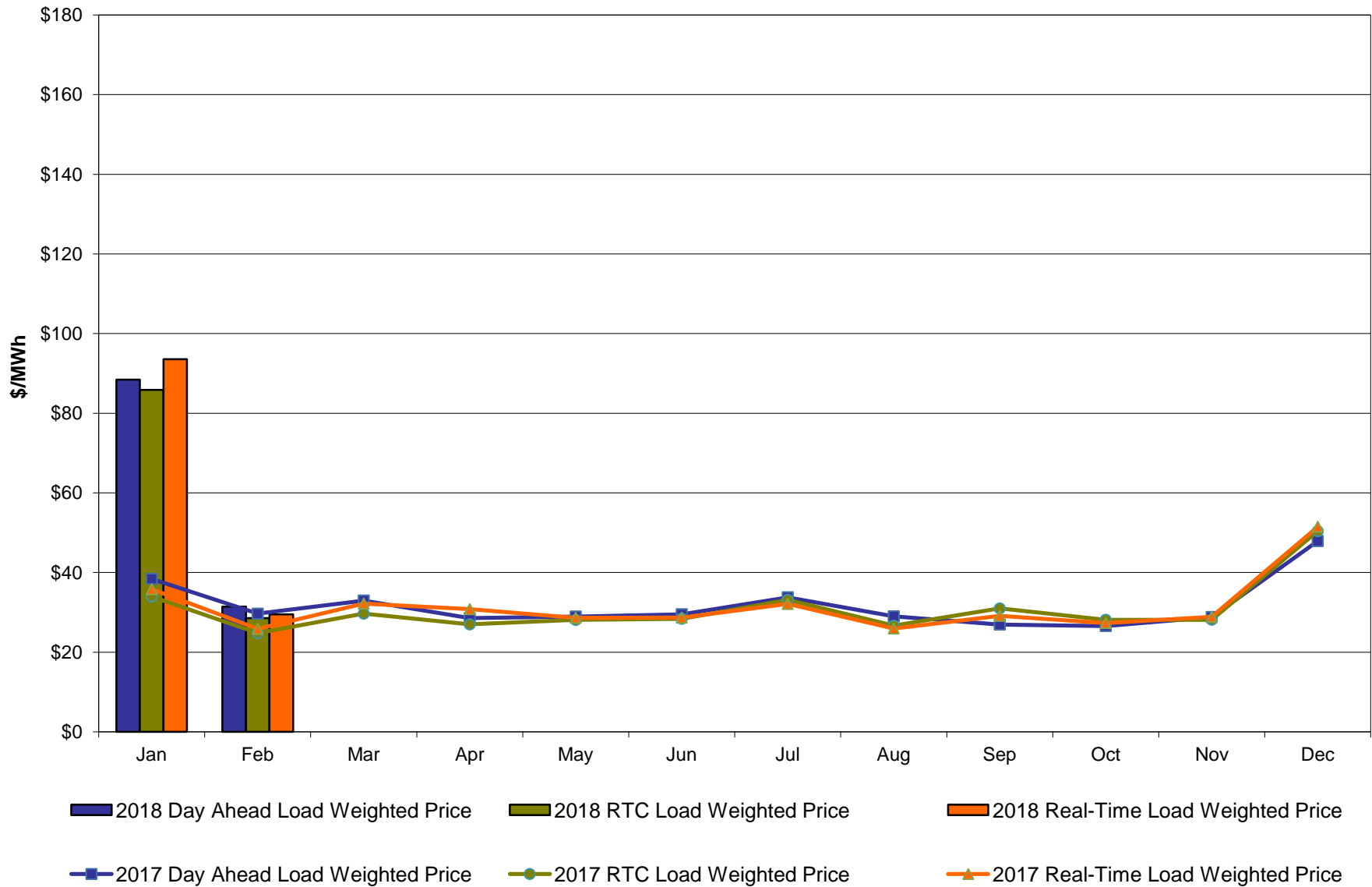
NYISO Markets 2017 Energy Statistics

	<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 *	\$37.22	\$28.84	\$32.04	\$27.70	\$27.66	\$27.37	\$31.64	\$27.28	\$25.05	\$25.49	\$27.88	\$45.46
Standard Deviation	\$13.20	\$7.97	\$11.95	\$7.66	\$9.47	\$12.37	\$13.51	\$10.60	\$12.09	\$8.53	\$9.87	\$31.56
Load Weighted Price **	\$38.42	\$29.66	\$32.96	\$28.56	\$28.95	\$29.52	\$33.78	\$29.00	\$26.95	\$26.57	\$28.83	\$47.90
<u>RTC LBMP</u>												
Price *	\$32.87	\$24.09	\$28.86	\$26.19	\$26.19	\$26.40	\$30.84	\$25.26	\$27.97	\$26.91	\$27.35	\$47.75
Standard Deviation	\$14.57	\$9.52	\$13.70	\$10.36	\$21.29	\$14.76	\$18.14	\$13.08	\$27.14	\$13.40	\$10.54	\$37.33
Load Weighted Price **	\$33.96	\$24.81	\$29.67	\$26.98	\$28.10	\$28.39	\$33.13	\$26.65	\$30.98	\$28.13	\$28.15	\$50.39
<u>REAL TIME LBMP</u>												
Price *	\$34.61	\$25.14	\$31.21	\$29.61	\$26.56	\$26.16	\$29.47	\$24.36	\$26.08	\$25.95	\$27.91	\$48.42
Standard Deviation	\$18.20	\$14.21	\$25.02	\$39.82	\$26.11	\$19.00	\$20.25	\$14.03	\$25.72	\$14.49	\$15.86	\$42.66
Load Weighted Price **	\$35.80	\$25.84	\$32.21	\$30.81	\$28.64	\$28.67	\$32.11	\$25.95	\$29.13	\$27.33	\$28.90	\$51.49
Average Daily Energy Sendout/Month GWh	431	418	419	377	383	454	498	477	437	398	403	444

* Average zonal load weighted prices.

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

NYISO Monthly Average Internal LBMPs 2017- 2018

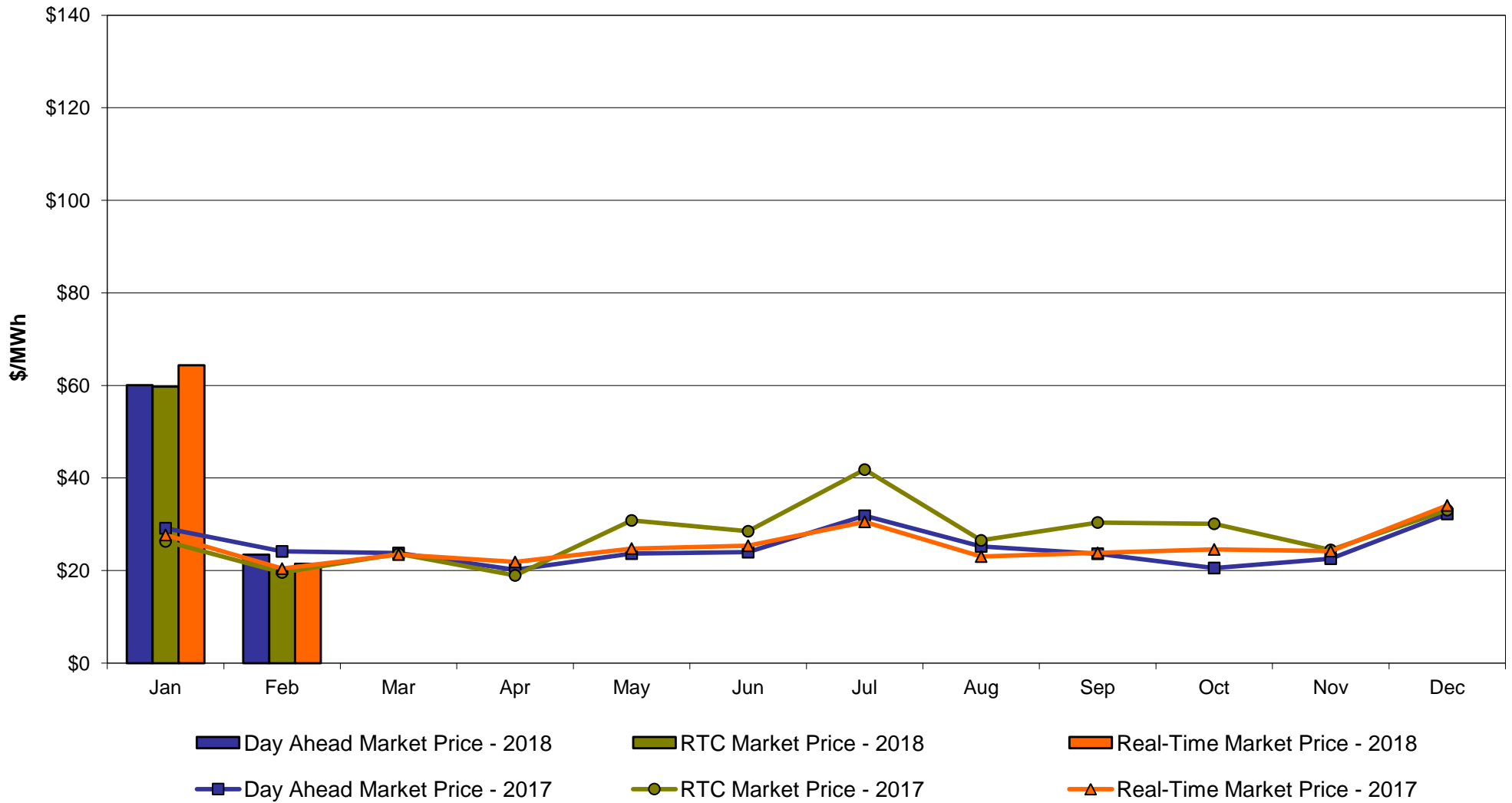


February 2018 Zonal LBMP Statistics for NYISO (\$/MWh)

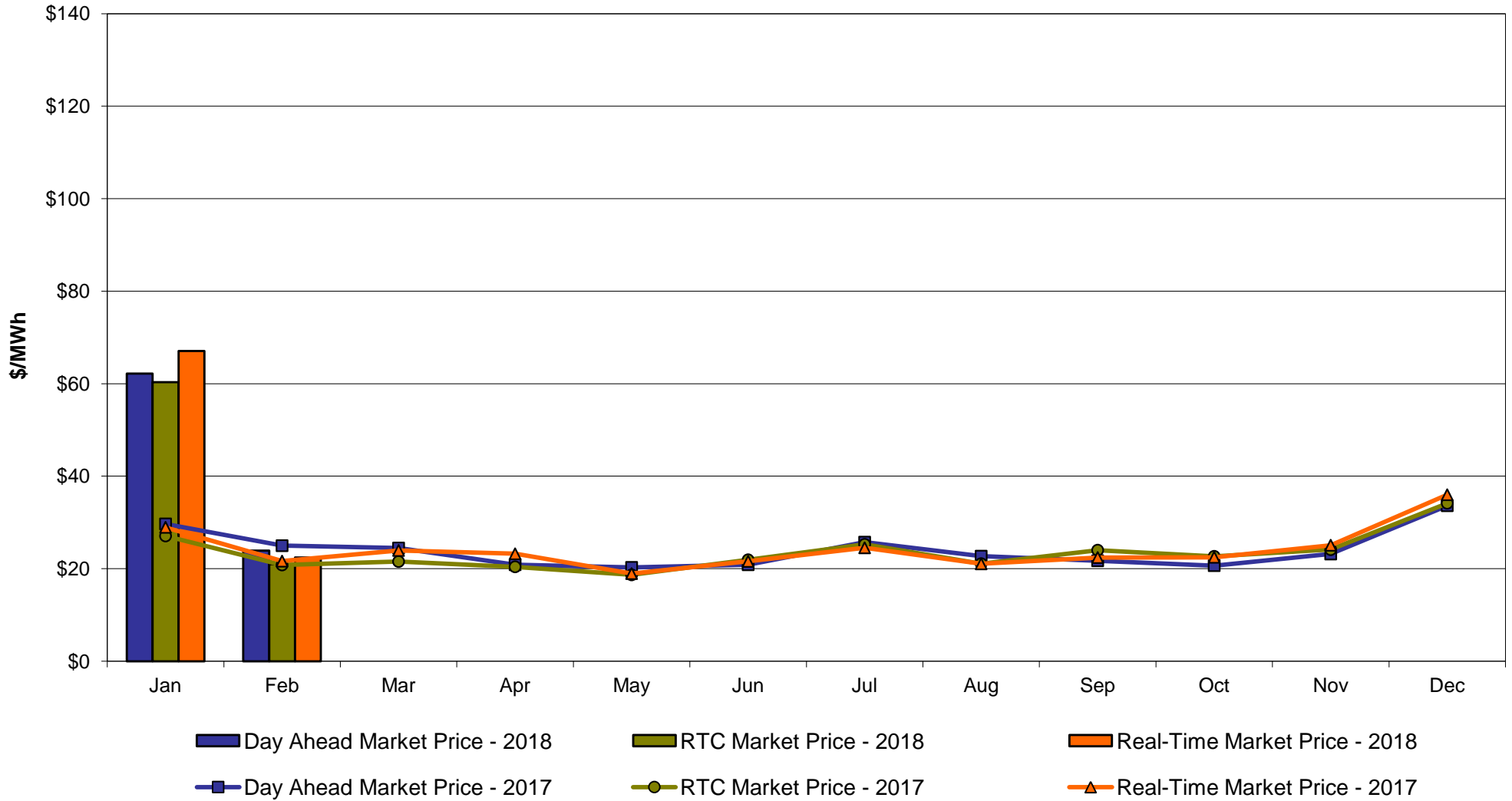
	<u>WEST Zone A</u>	<u>GENESEE Zone B</u>	<u>NORTH Zone D</u>	<u>CENTRAL Zone C</u>	<u>MOHAWK VALLEY Zone E</u>	<u>CAPITAL Zone F</u>	<u>HUDSON VALLEY Zone G</u>	<u>MILLWOOD Zone H</u>	<u>DUNWOODIE Zone I</u>	<u>NEW YORK CITY Zone J</u>	<u>LONG ISLAND Zone K</u>
<u>DAY AHEAD LBMP</u>											
Unweighted Price *	23.46	23.14	20.33	23.91	24.12	31.52	29.98	30.33	31.68	34.05	39.50
Standard Deviation	8.29	8.24	8.40	8.42	8.61	13.90	11.39	11.64	13.99	16.38	17.89
<u>RTC LBMP</u>											
Unweighted Price *	20.05	20.12	19.05	20.98	21.41	28.39	26.90	27.07	27.19	31.45	38.66
Standard Deviation	8.50	8.78	9.33	8.93	9.17	14.02	11.29	11.43	11.85	16.17	33.34
<u>REAL TIME LBMP</u>											
Unweighted Price *	21.48	21.58	20.56	22.43	22.88	29.14	27.94	28.11	28.22	32.89	36.40
Standard Deviation	14.11	14.41	14.49	14.80	15.16	19.17	17.44	17.58	17.93	22.37	23.77
	<u>ONTARIO IESO Zone O</u>	<u>HYDRO QUEBEC (Wheel) Zone M</u>	<u>HYDRO QUEBEC (Import/Export) Zone M</u>	<u>PJM Zone P</u>	<u>NEW ENGLAND Zone N</u>	<u>CROSS SOUND CABLE Controllable Line</u>	<u>NORTHPORT- NORWALK Controllable Line</u>	<u>NEPTUNE Controllable Line</u>	<u>LINDEN VFT Controllable Line</u>	<u>HUDSON Controllable Line</u>	<u>Dennison Controllable Line</u>
<u>DAY AHEAD LBMP</u>											
Unweighted Price *	22.90	20.79	20.79	26.57	39.15	38.19	39.14	35.52	31.95	32.00	19.88
Standard Deviation	7.99	7.95	7.95	9.16	19.33	17.99	18.99	17.15	13.65	13.69	8.11
<u>RTC LBMP</u>											
Unweighted Price *	20.05	18.84	18.78	23.89	36.46	38.03	37.75	35.06	28.15	28.32	18.93
Standard Deviation	13.49	14.92	14.96	13.97	22.83	35.15	35.12	30.74	16.47	16.62	14.02
<u>REAL TIME LBMP</u>											
Unweighted Price *	21.13	20.46	20.33	25.01	33.44	35.67	37.53	33.75	28.02	29.28	19.86
Standard Deviation	13.85	17.61	17.62	18.26	21.75	24.17	25.83	25.26	29.21	20.95	14.13

* Straight LBMP averages

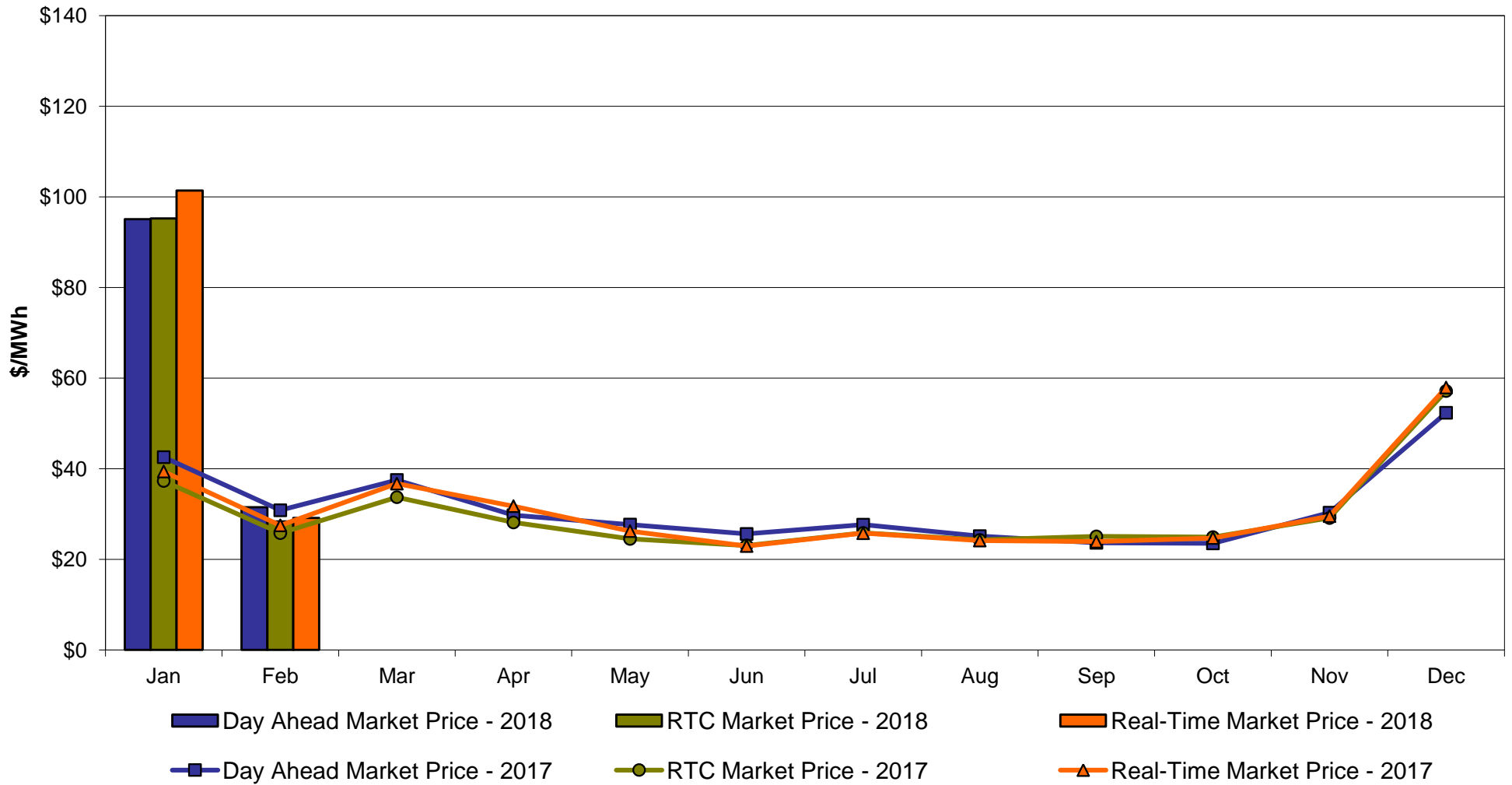
**West Zone A
Monthly Average LBMP Prices 2017 - 2018**



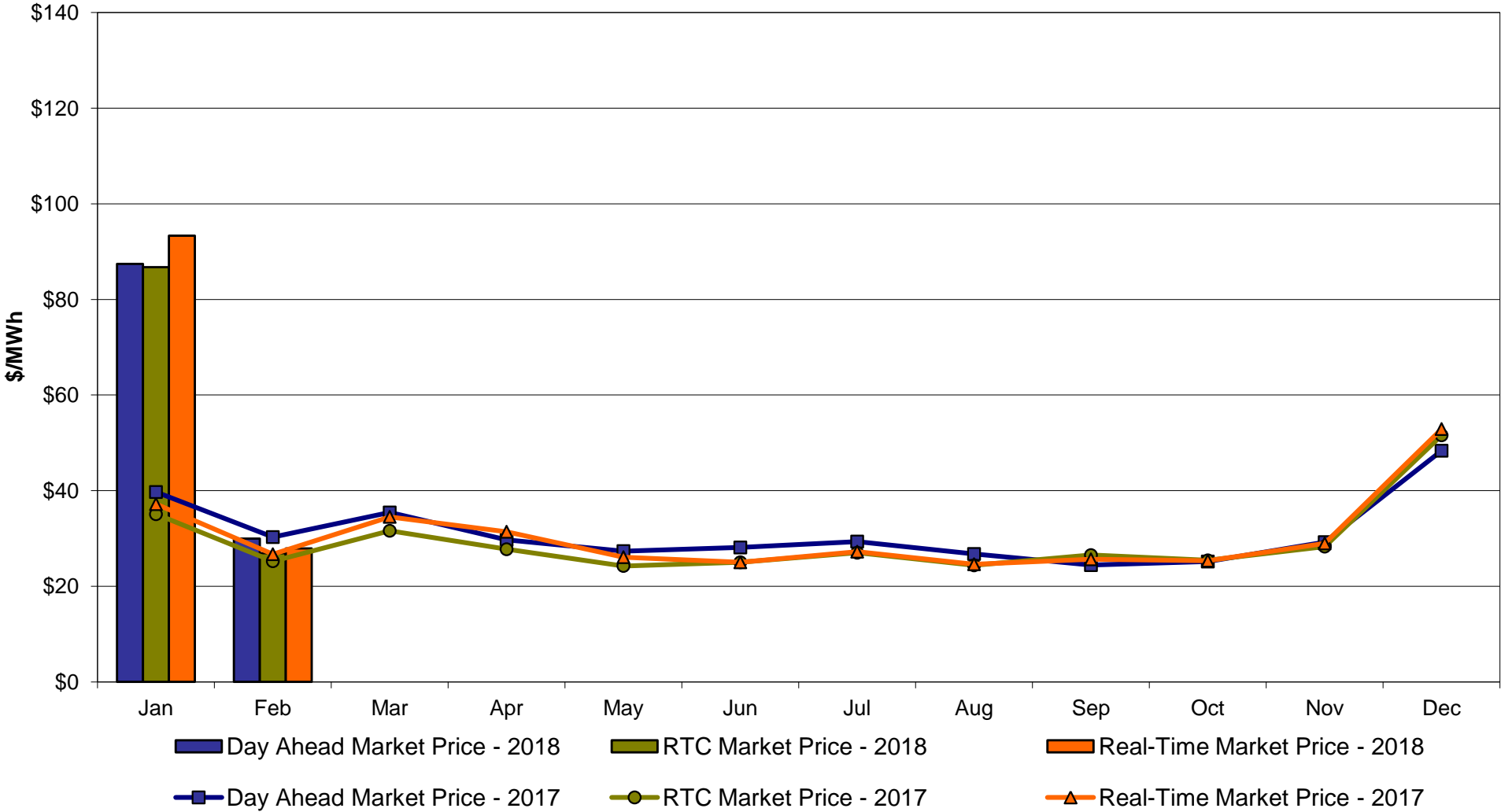
**Central Zone C
Monthly Average LBMP Prices 2017 - 2018**



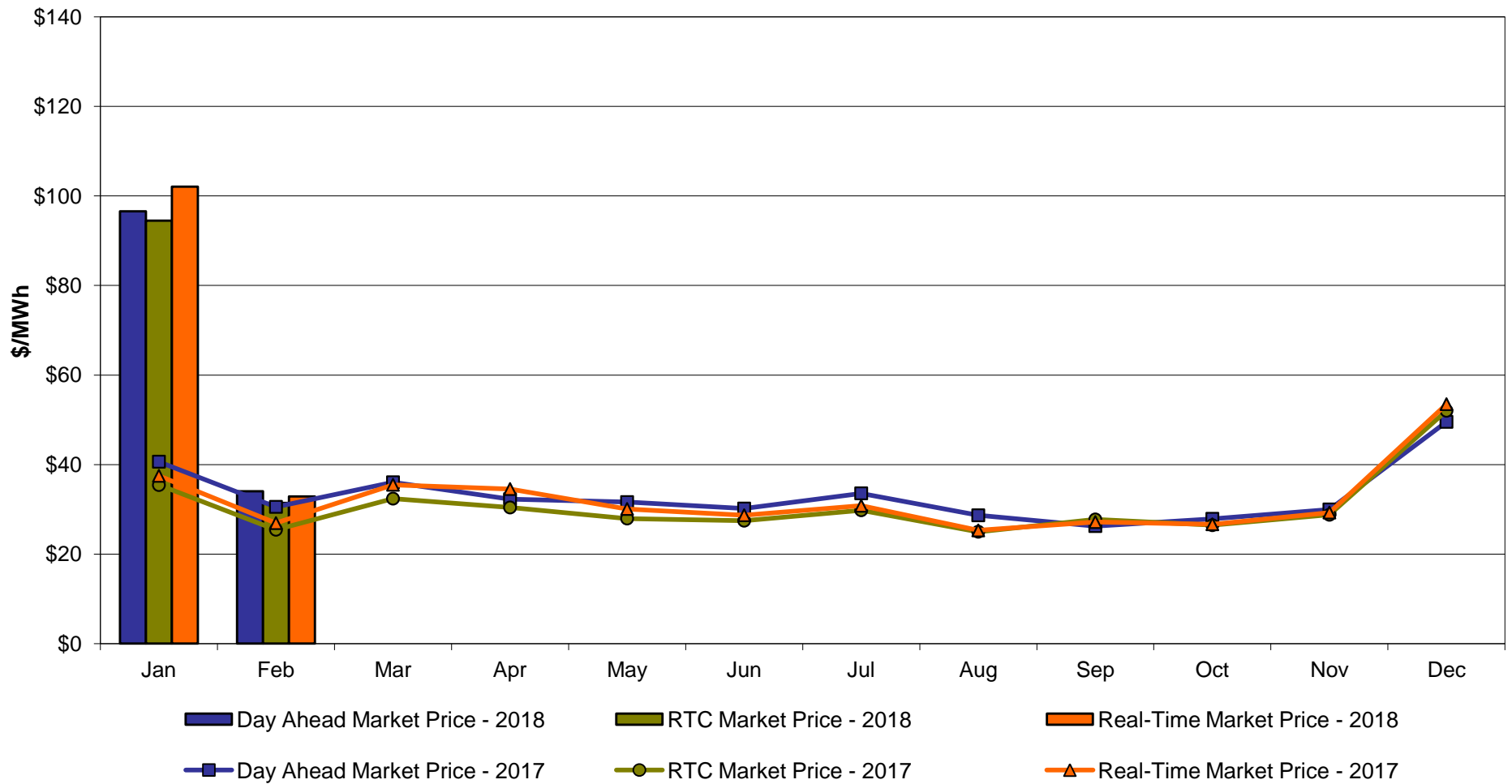
Capital Zone F Monthly Average LBMP Prices 2017 - 2018



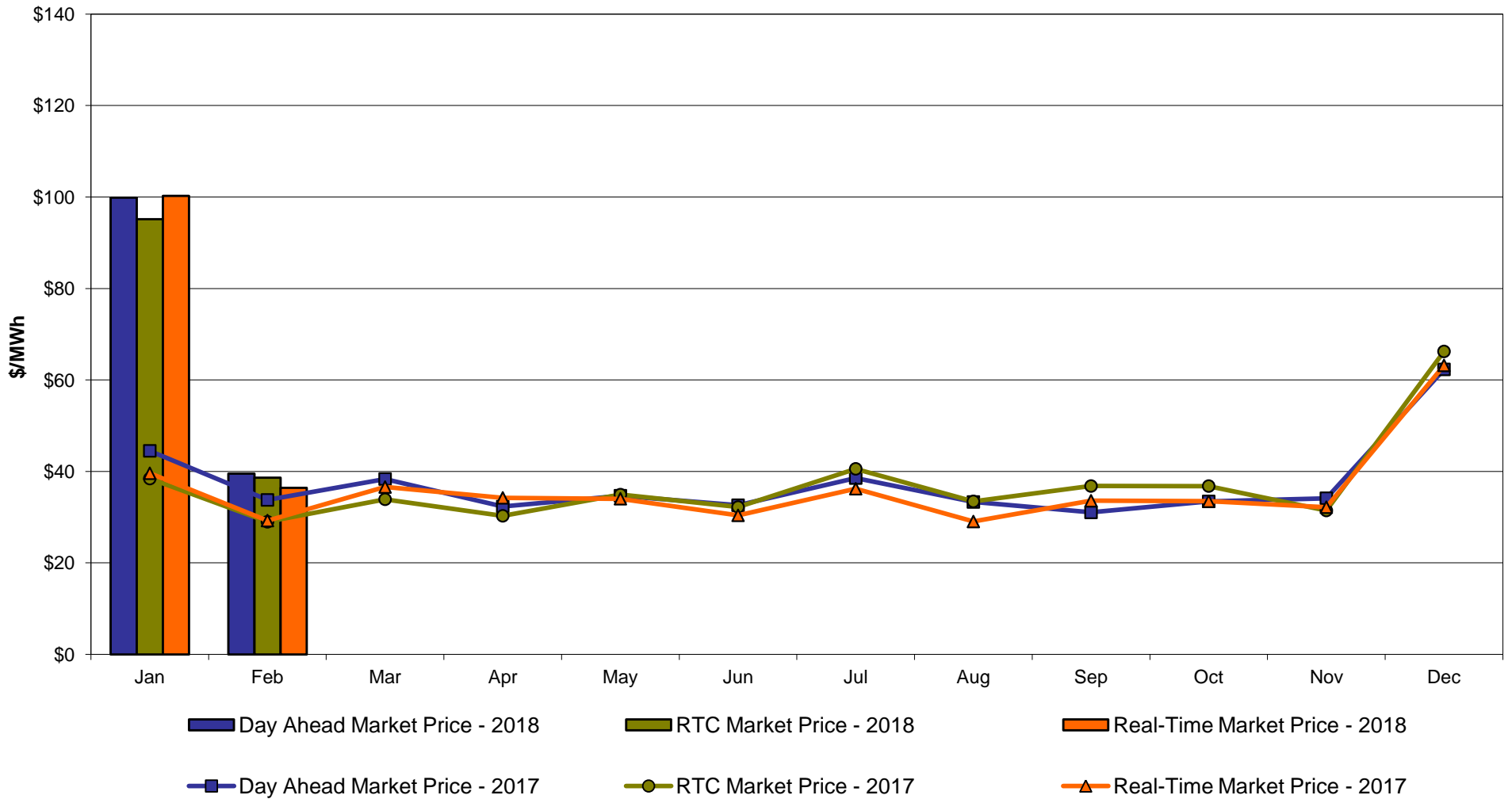
Hudson Valley Zone G Monthly Average LBMP Prices 2017 - 2018



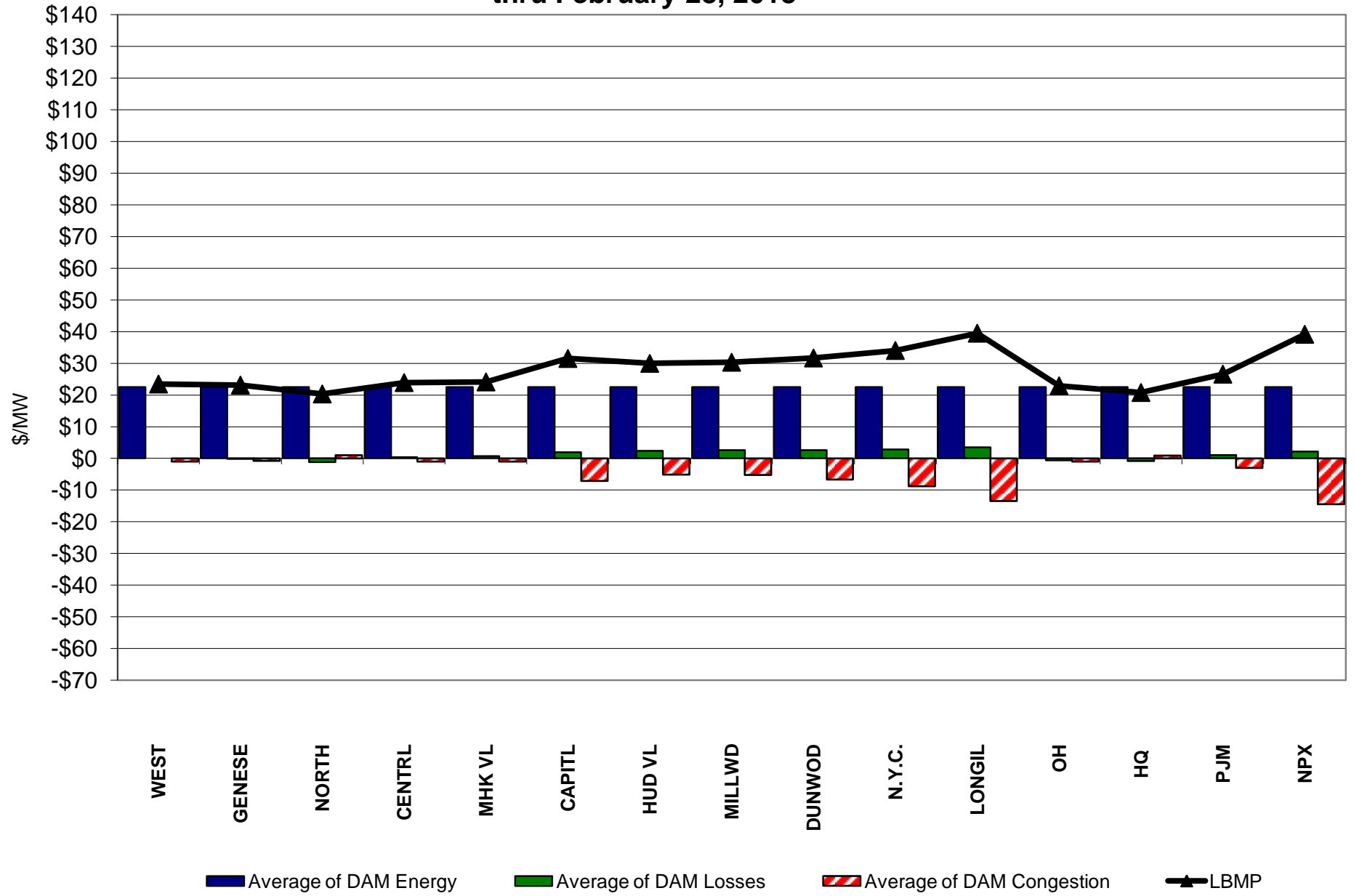
NYC Zone J Monthly Average LBMP Prices 2017 - 2018



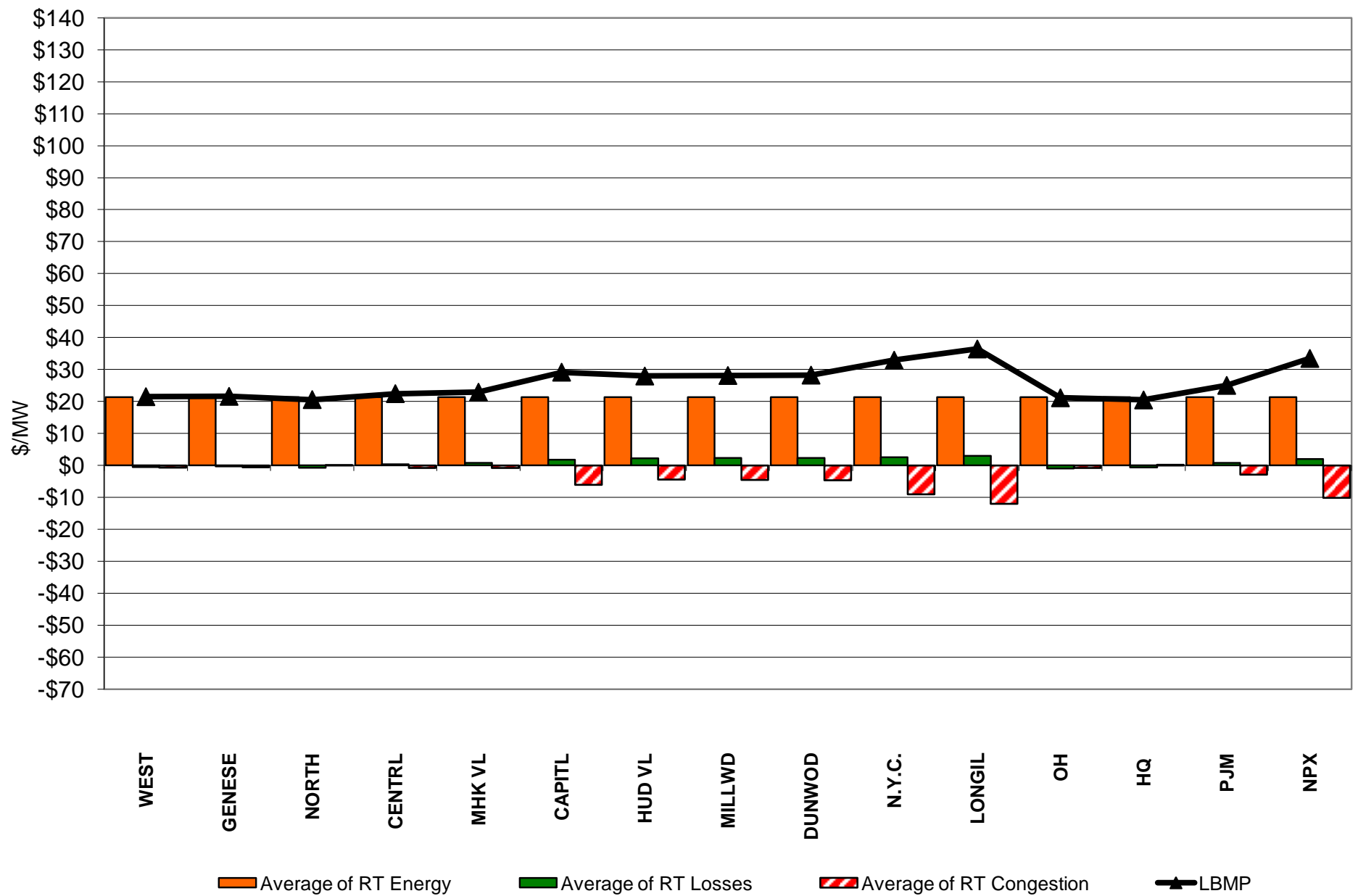
Long Island Zone K Monthly Average LBMP Prices 2017 - 2018



**DAM Zonal Unweighted Monthly Average LBMP Components
thru February 28, 2018**

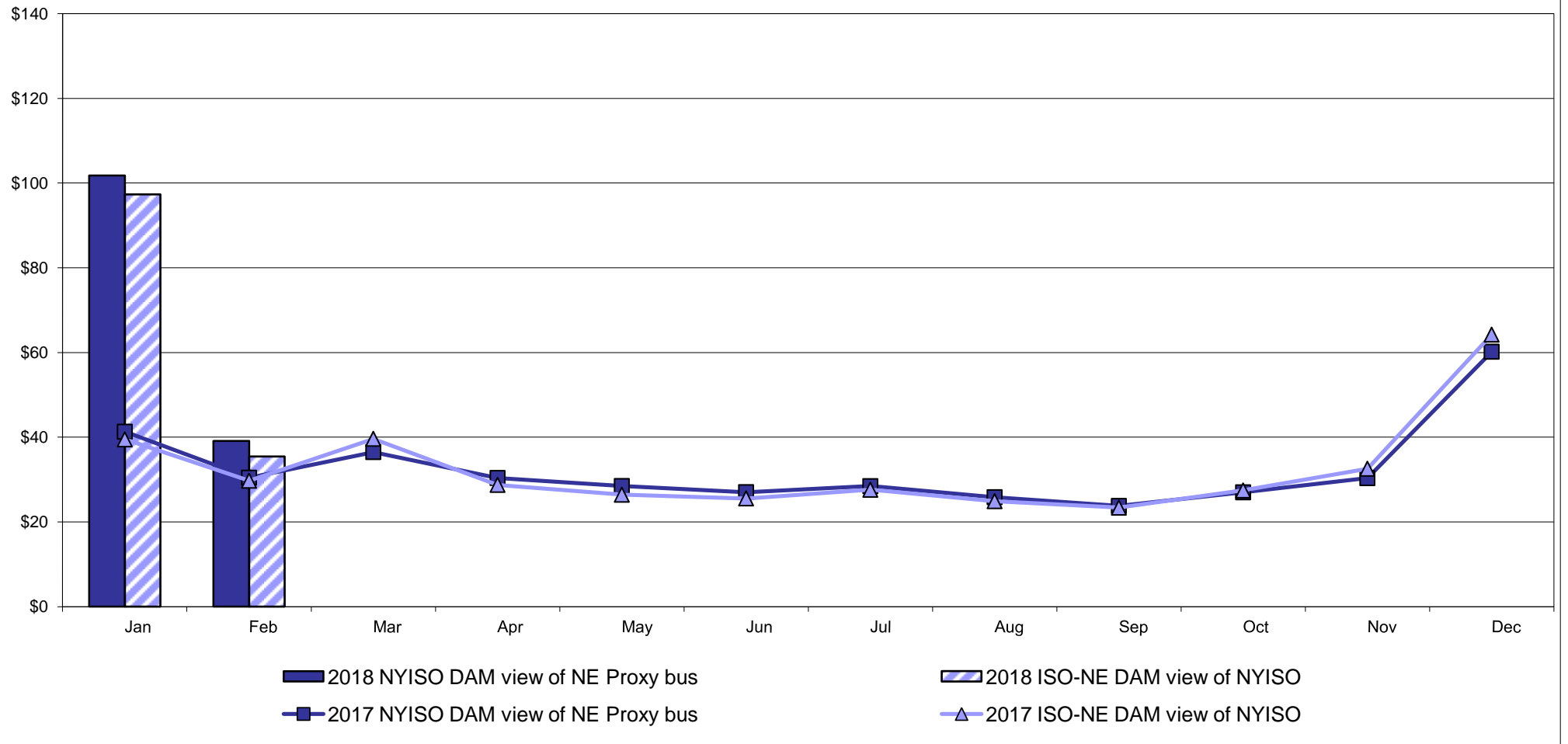


**RT Zonal Unweighted Monthly Average LBMP Components
thru February 28, 2018**

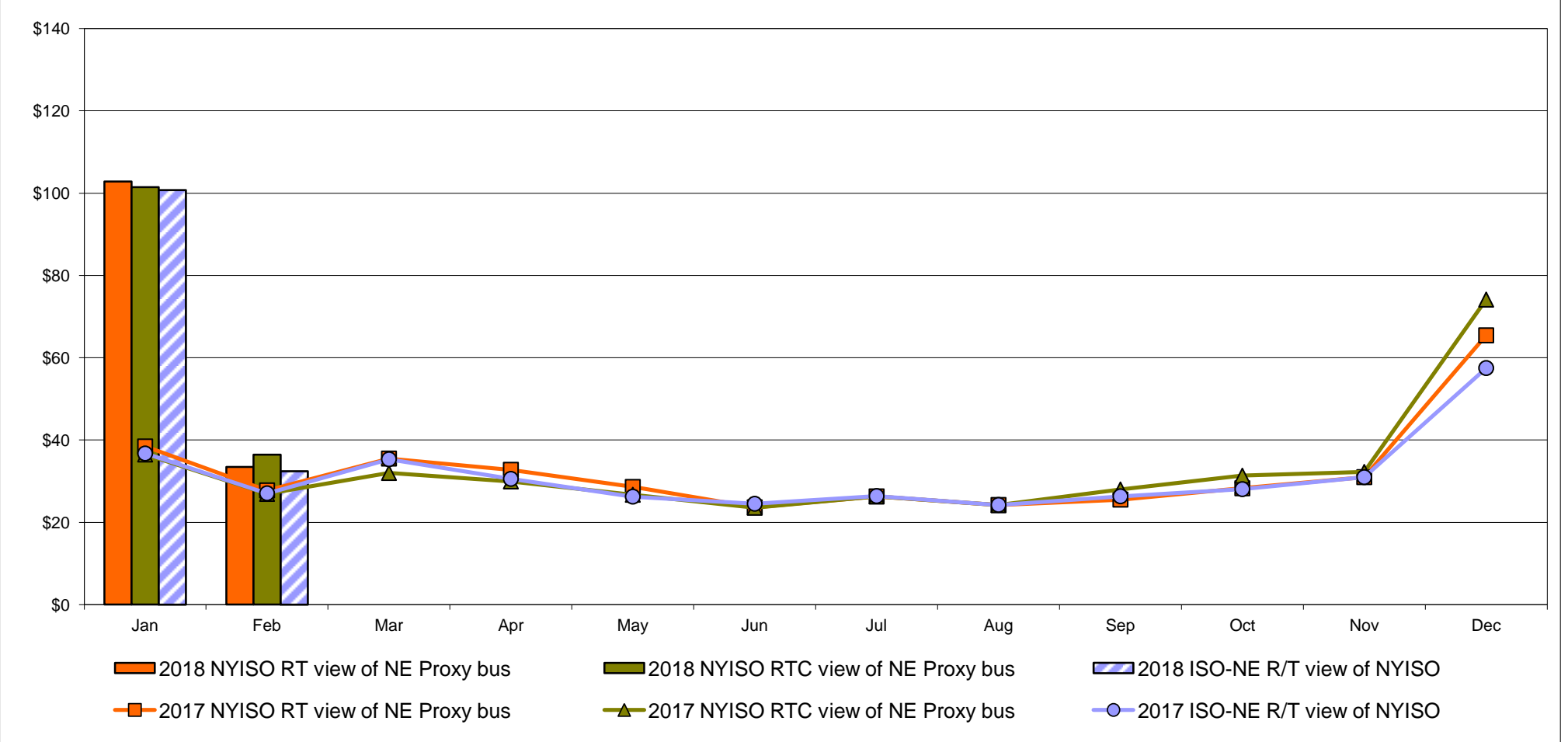


External Comparison ISO-New England

Day Ahead Market External Zone Comparison: ISO-NE (\$/MWh)

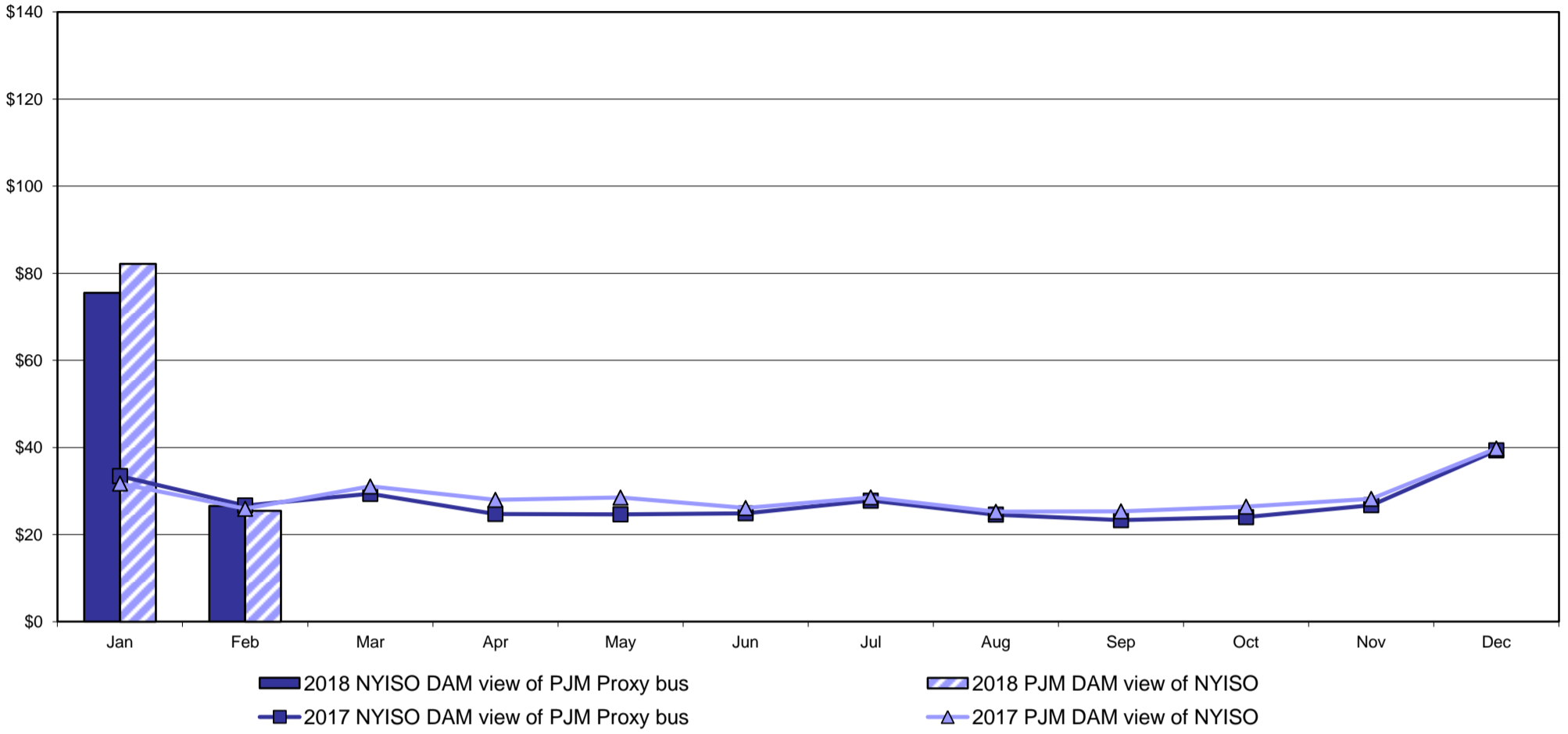


Real Time Market External Zone Comparison: ISO-NE (\$/MWh)

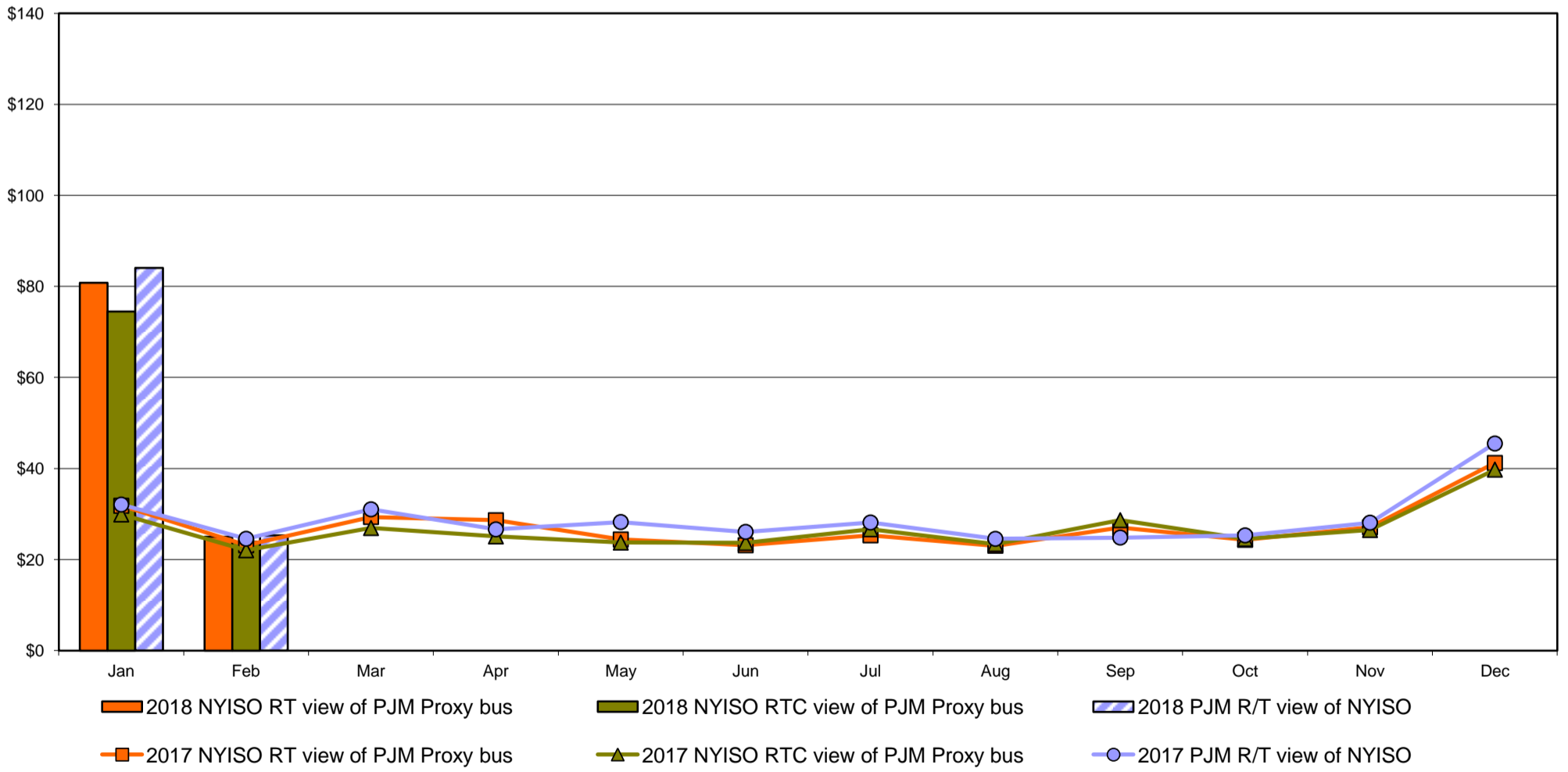


External Comparison PJM

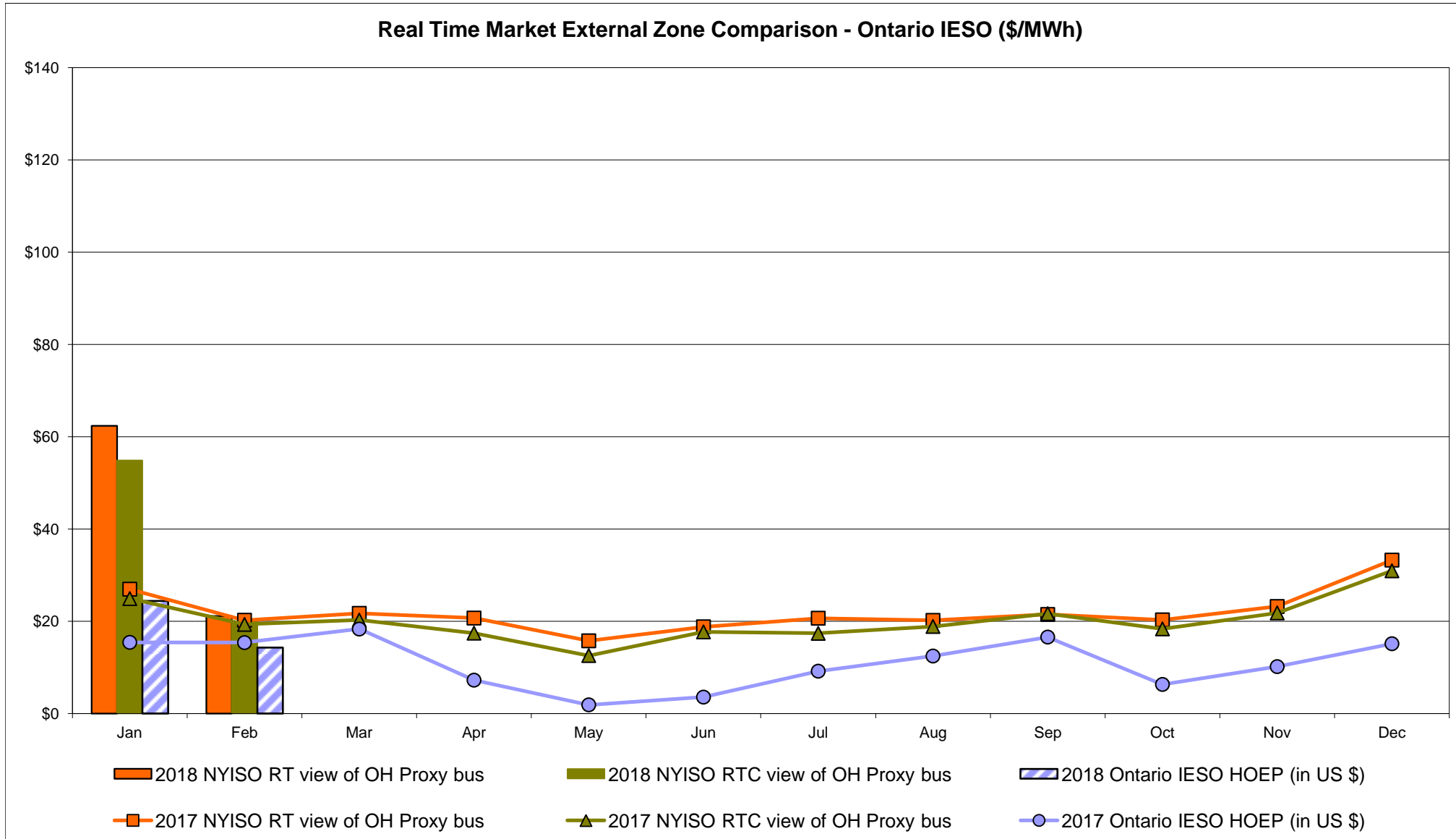
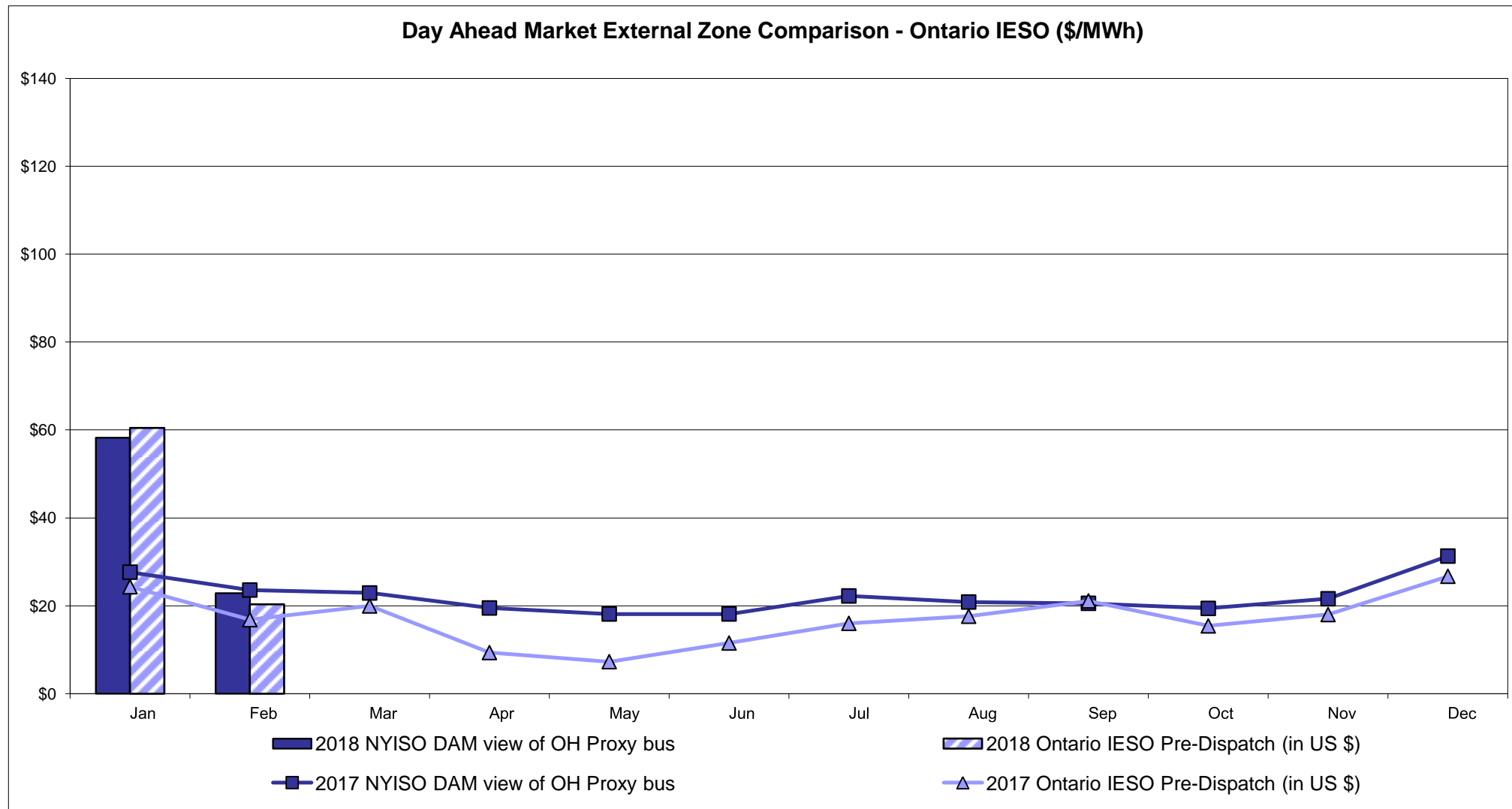
Day Ahead Market External Zone Comparison - PJM (\$/MWh)



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

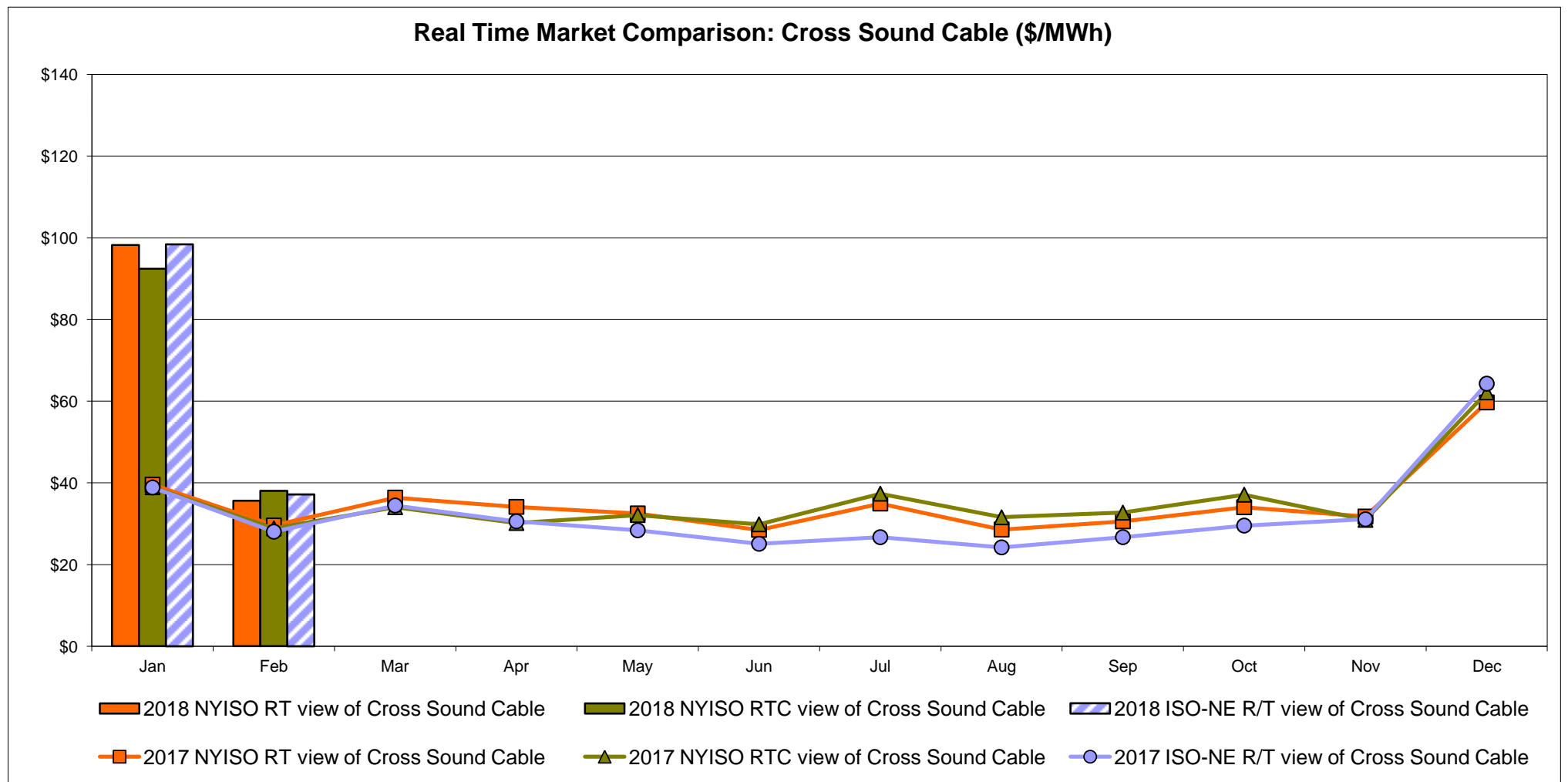
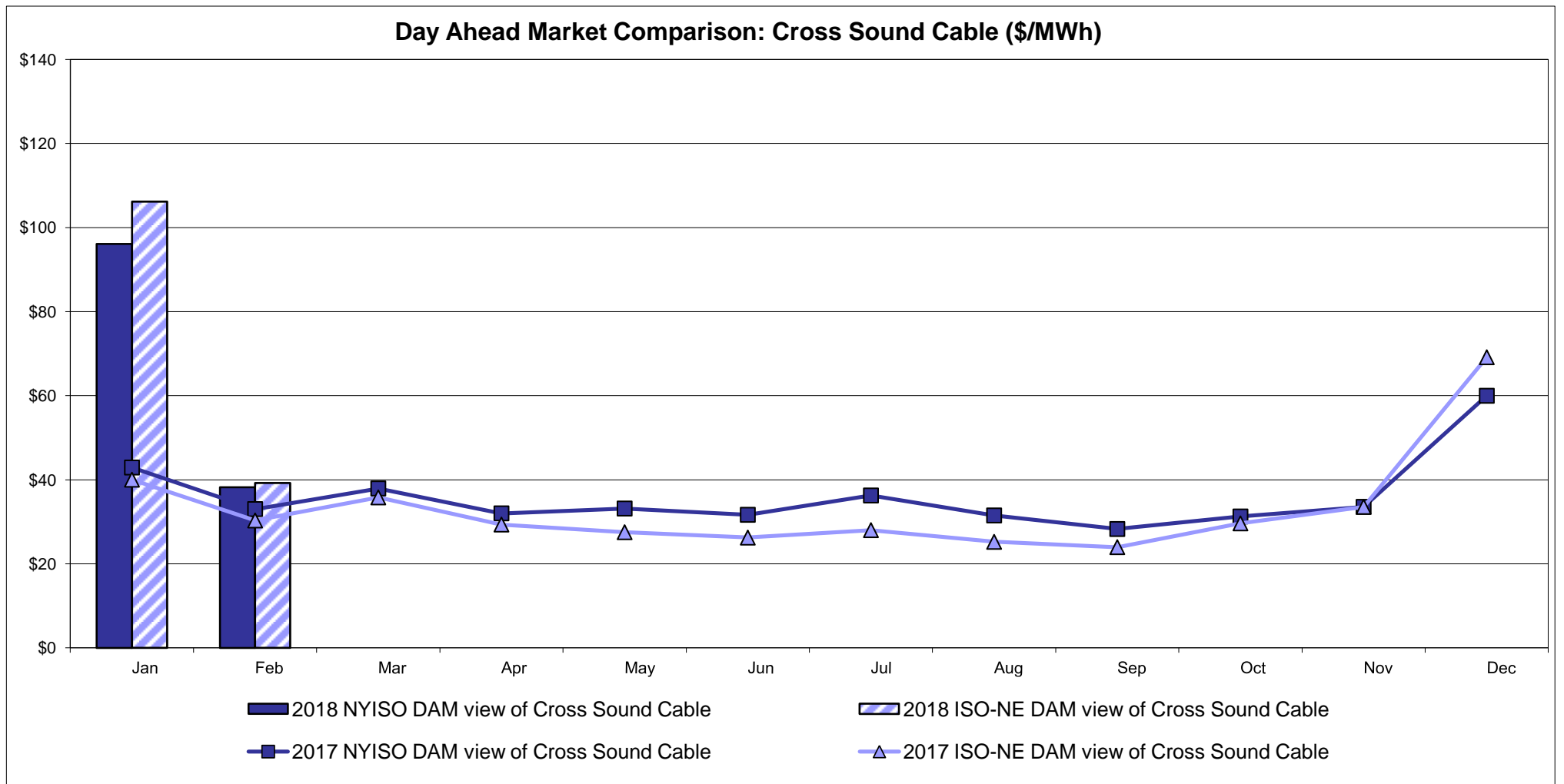


External Comparison Ontario IESO



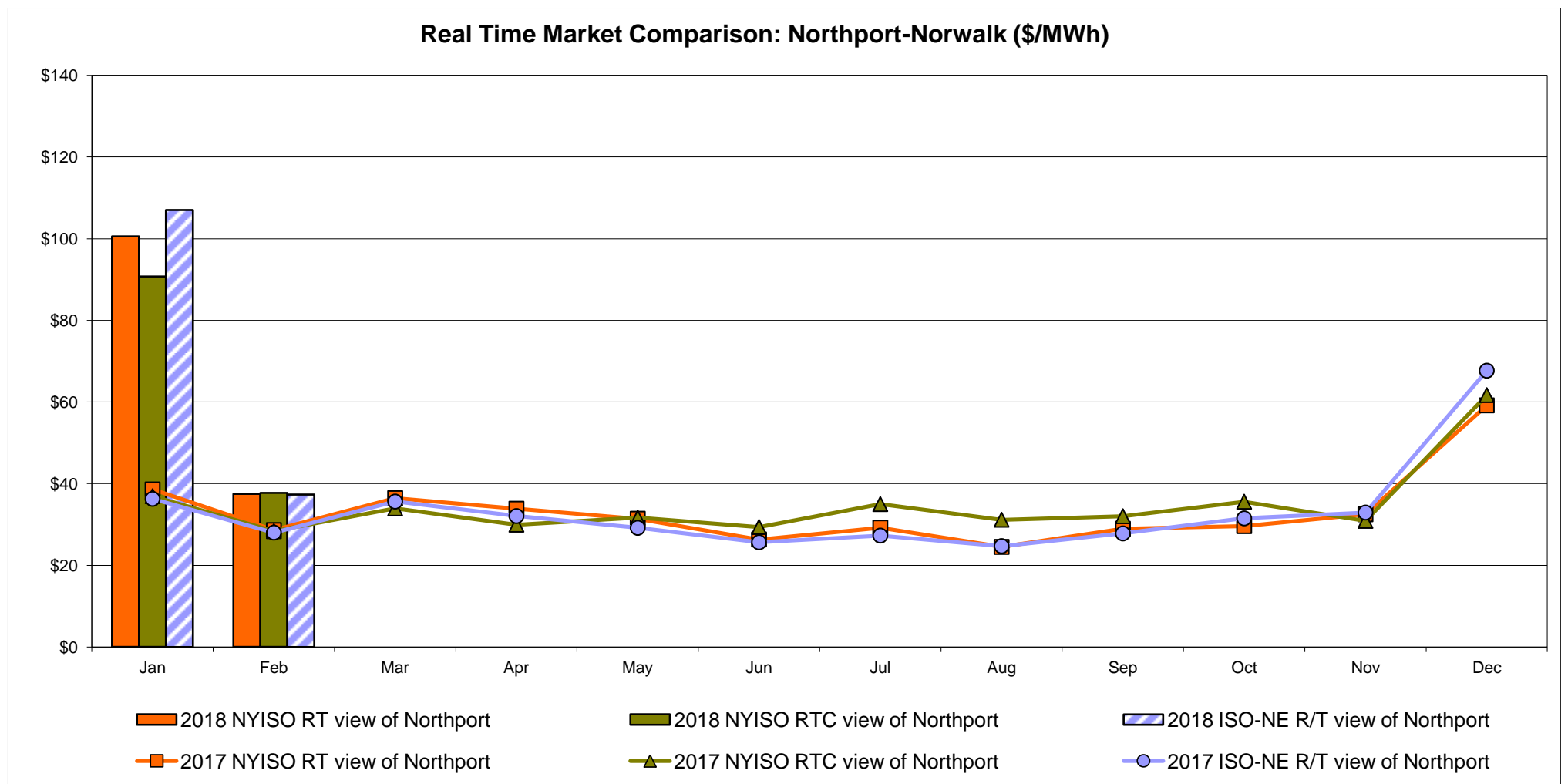
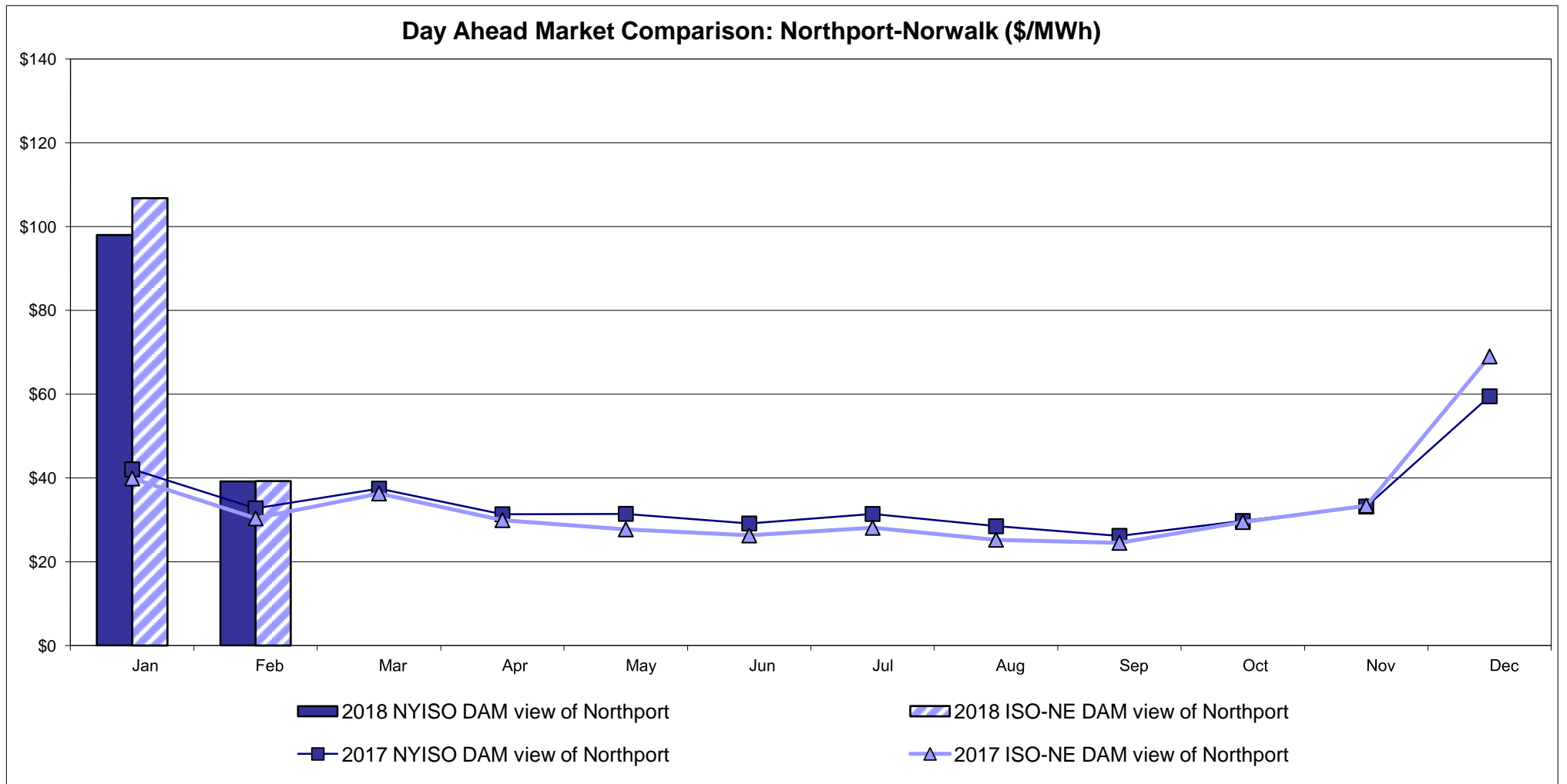
Notes: Exchange factor used for February 2018 was 0.794407372100413 to US
 HOEP: Hourly Ontario Energy Price
 Pre-Dispatch: Projected Energy Price

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.

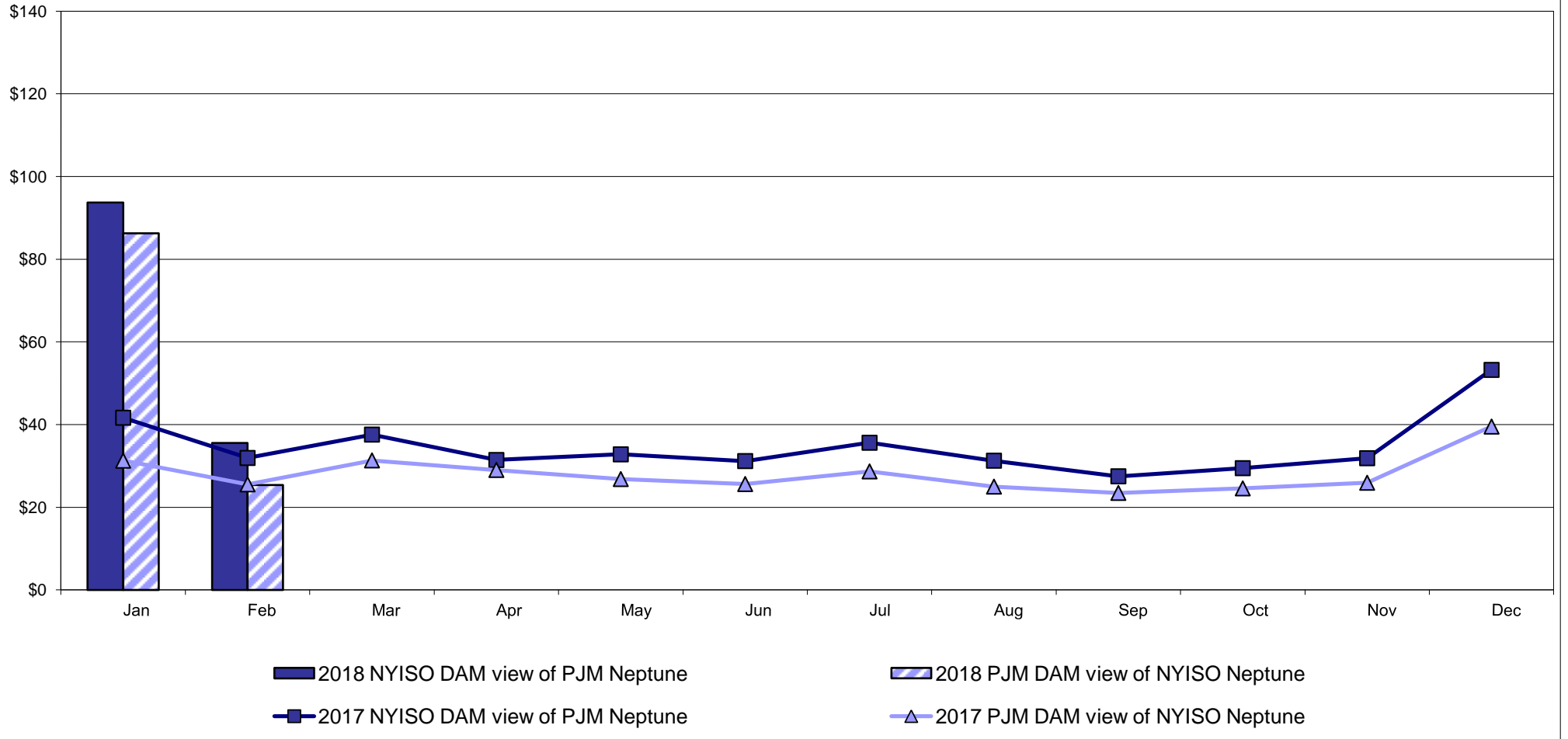
External Controllable Line: Northport - Norwalk (New England)



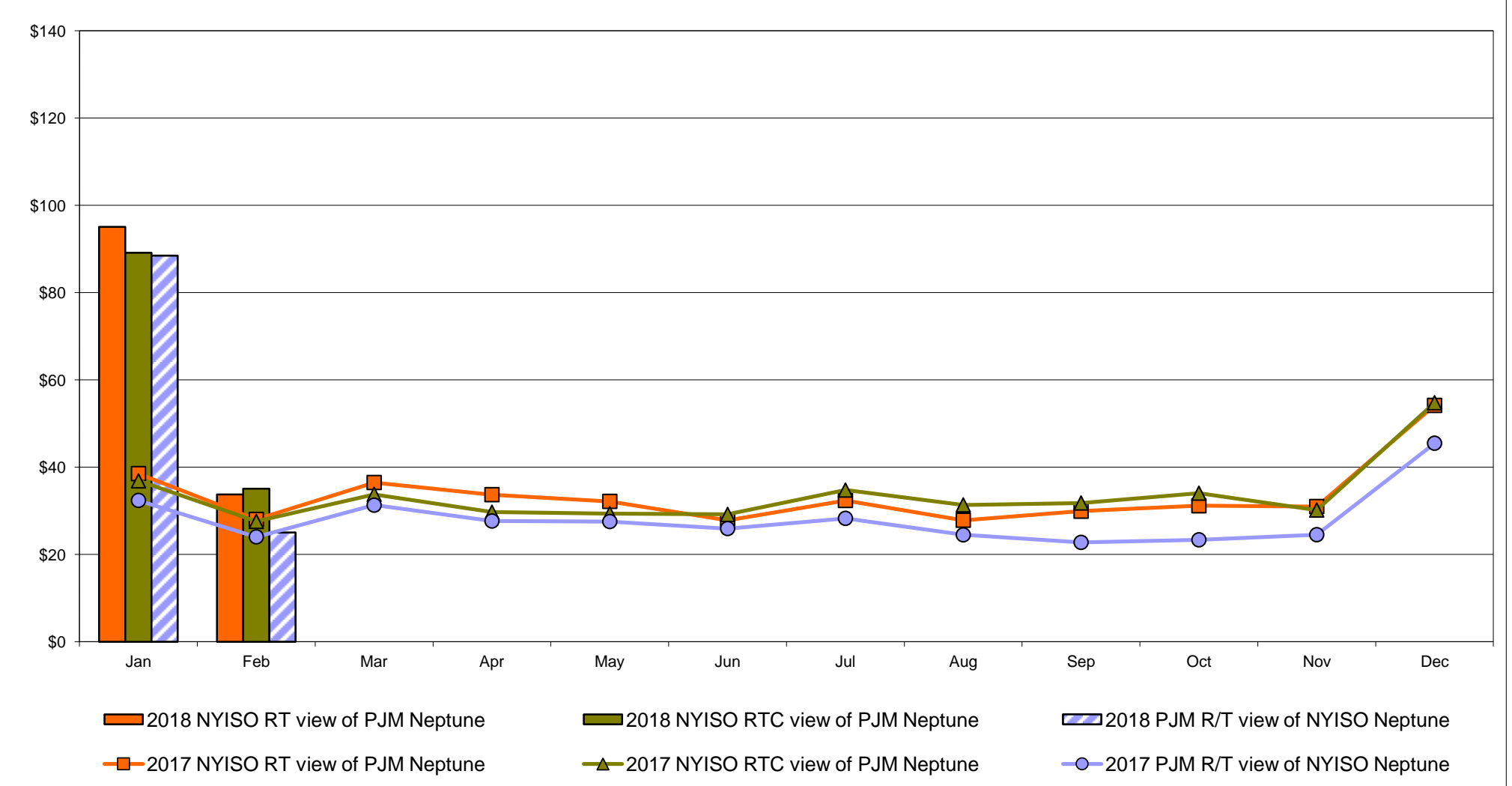
Note:
 ISO-NE Forecast is an advisory posting @ 18:00 day before.
 The DAM and R/T prices at the Northport 138 interface are used for ISO-NE.
 The DAM and R/T prices at the 1385 interface are used for NYISO.

External Controllable Line: Neptune (PJM)

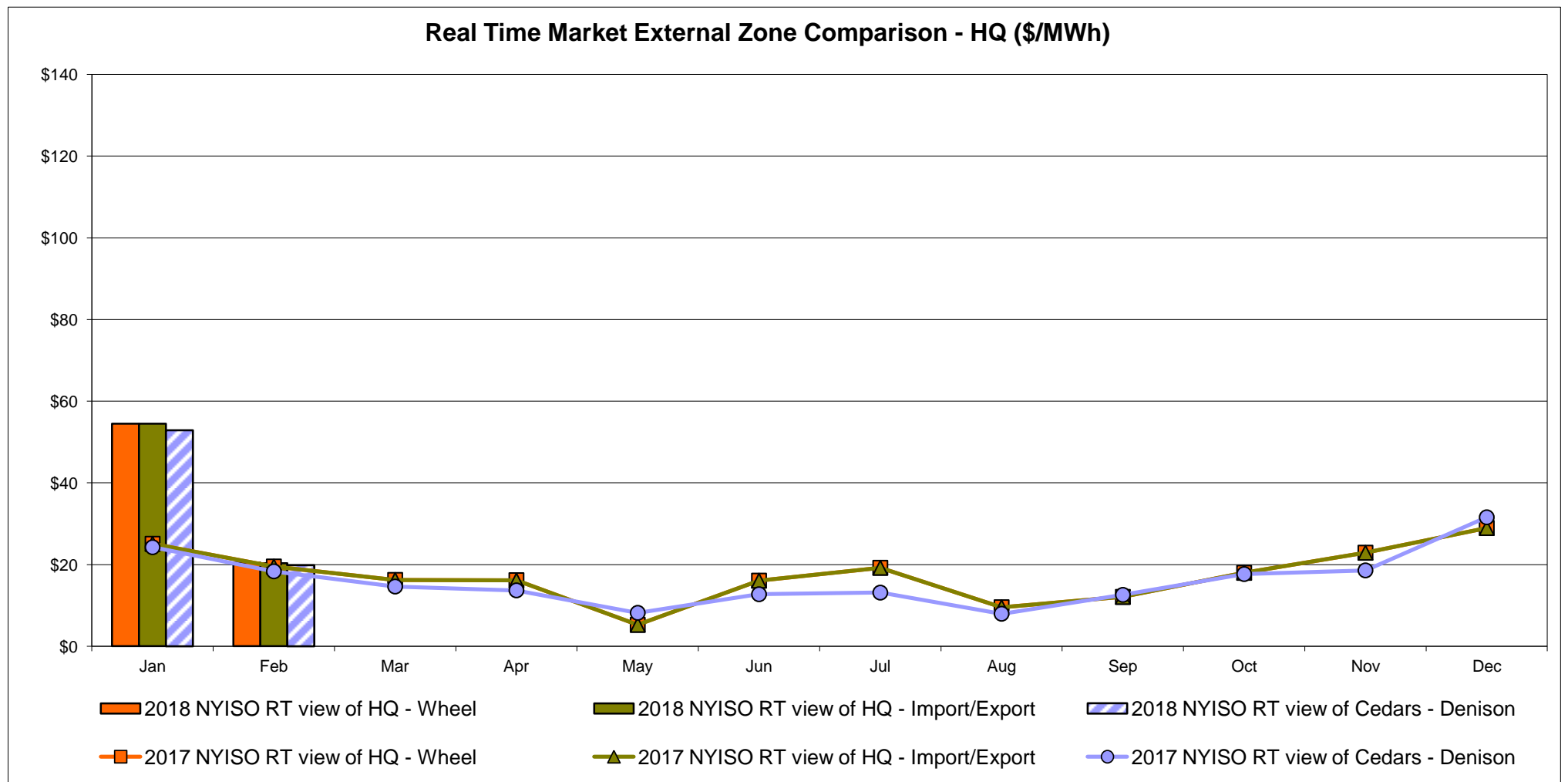
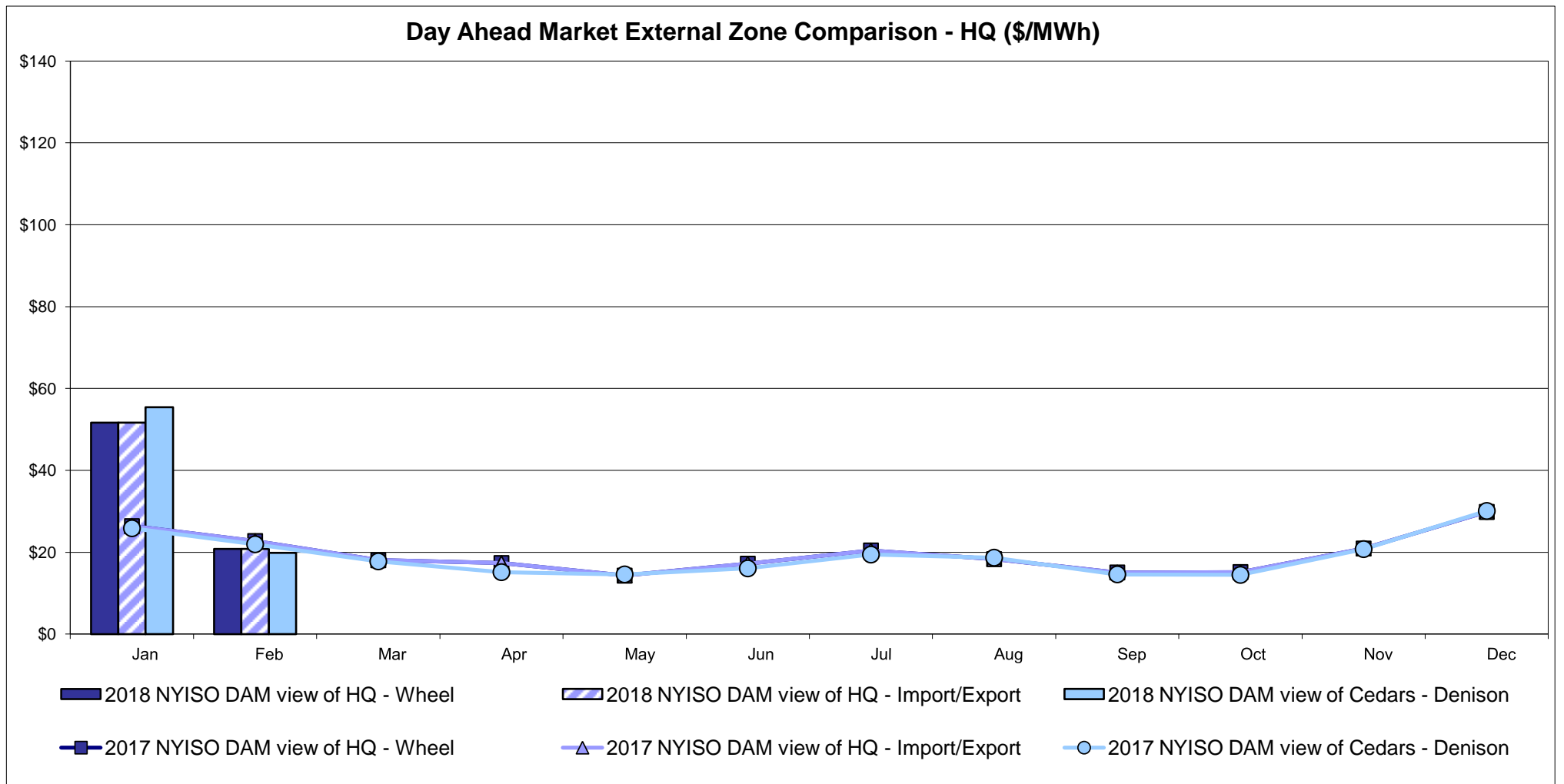
Day Ahead Market Comparison: Neptune (\$/MWh)



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

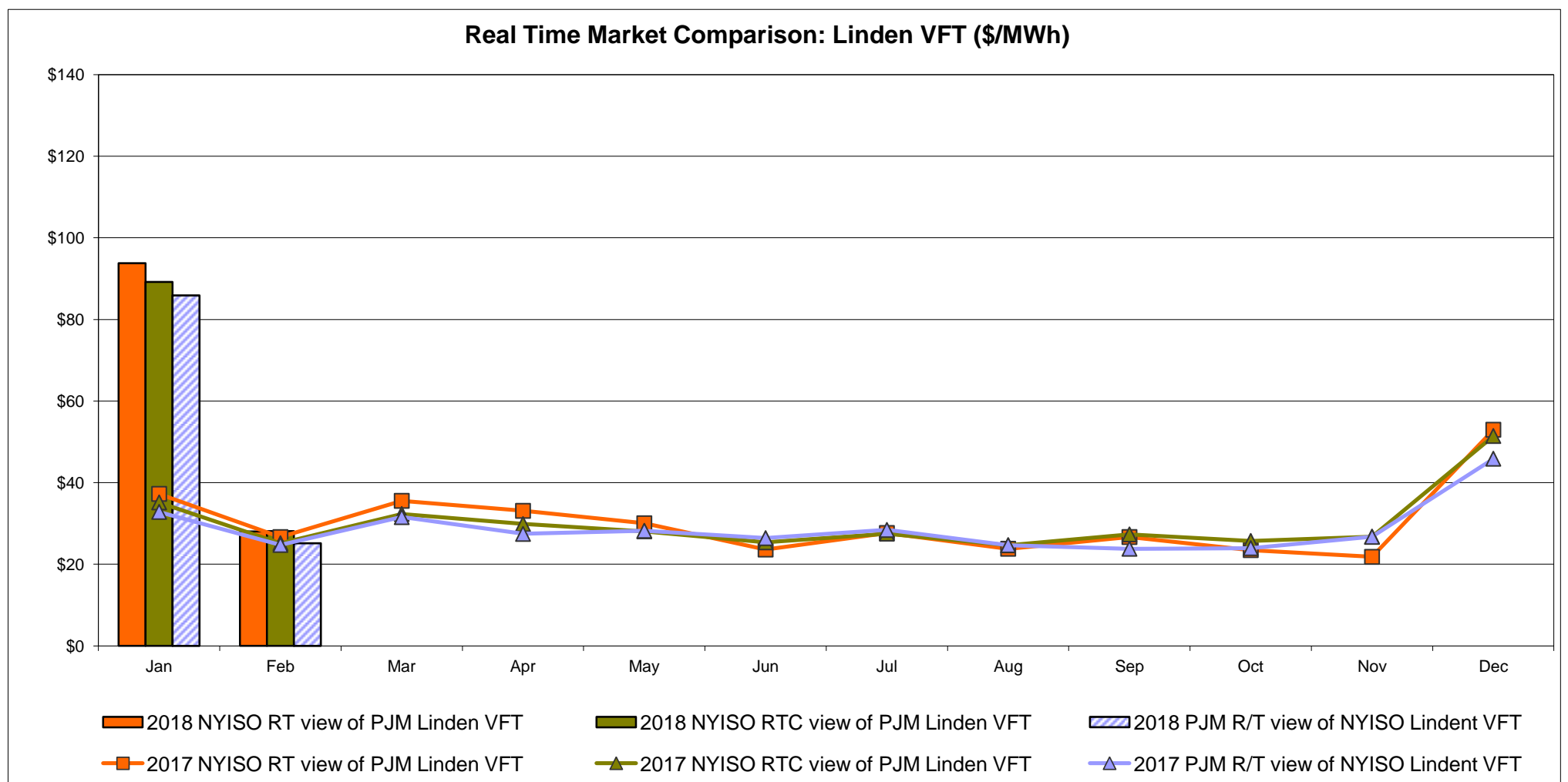
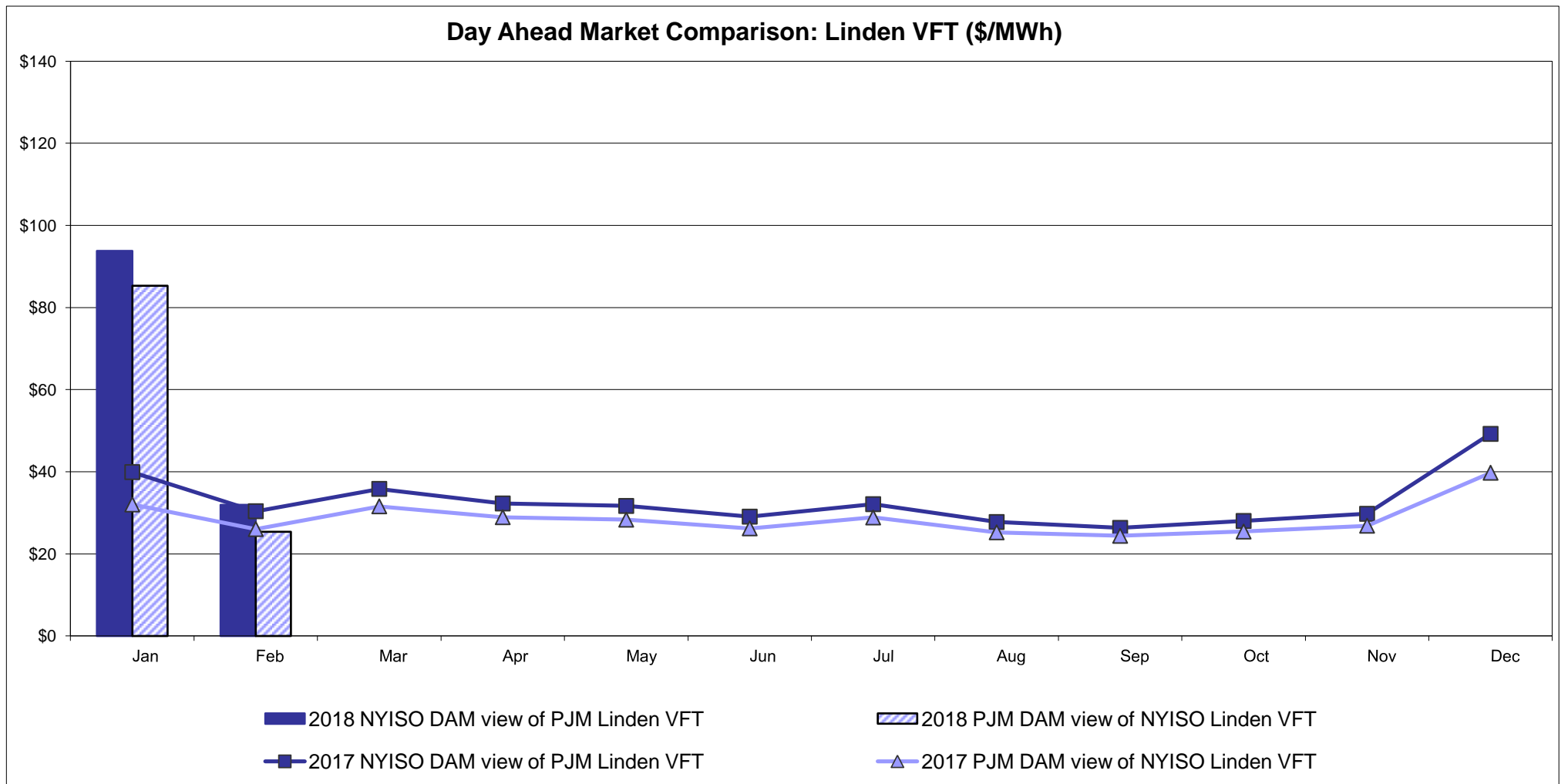


External Comparison Hydro-Quebec

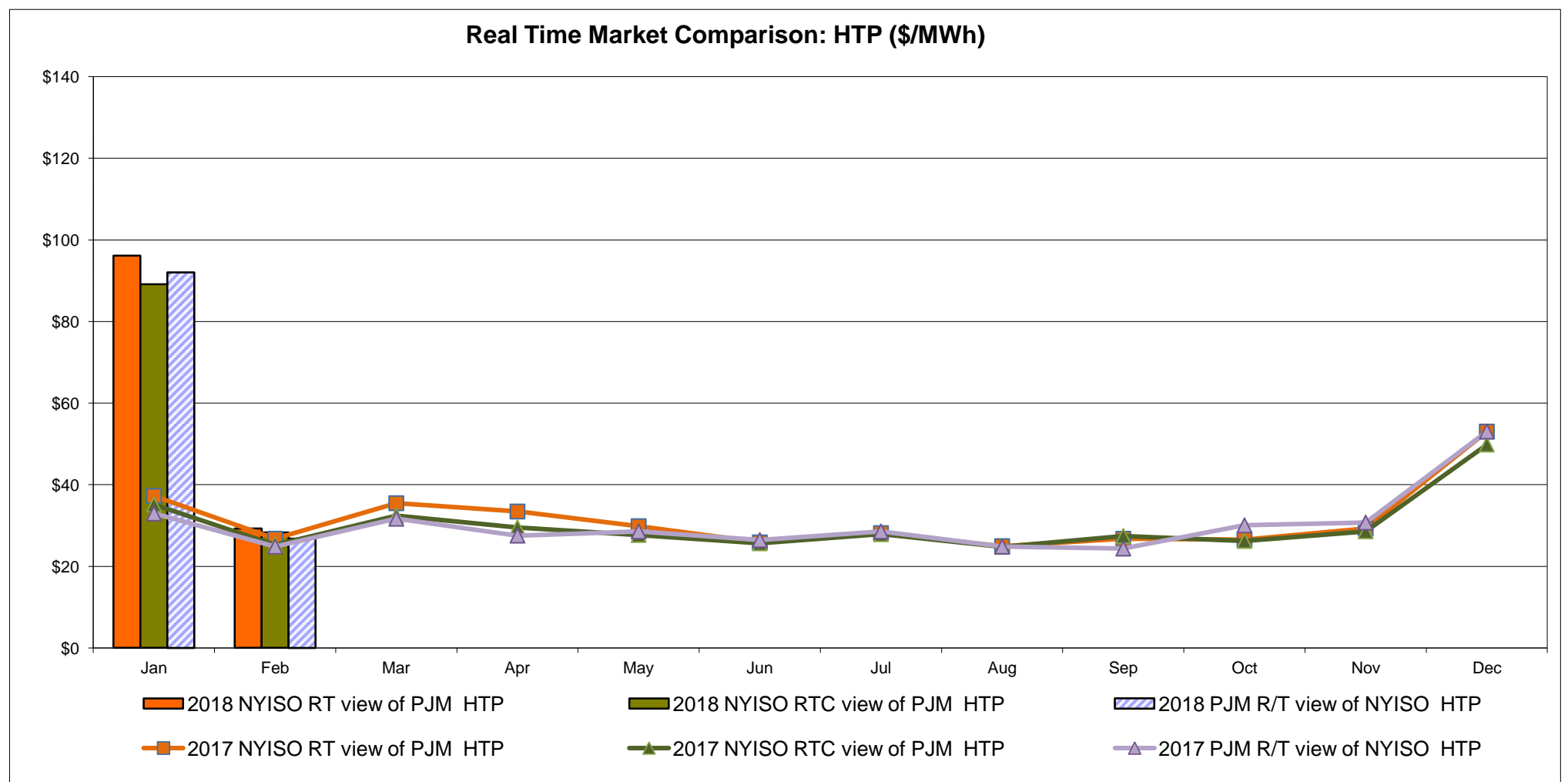
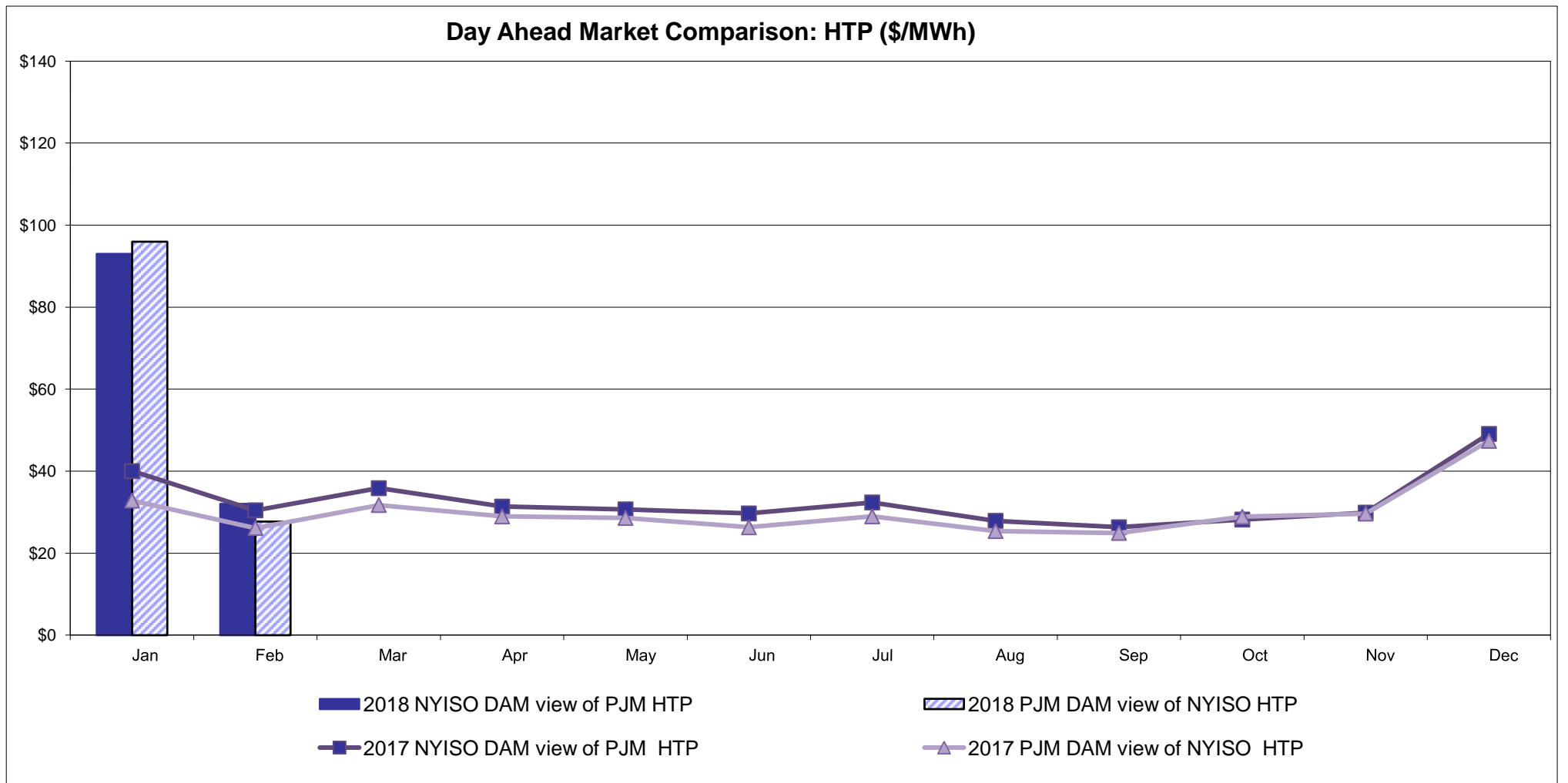


Note:
Hydro-Quebec Prices are unavailable.

External Controllable Line: Linden VFT (PJM)



External Controllable Line: Hudson (PJM)

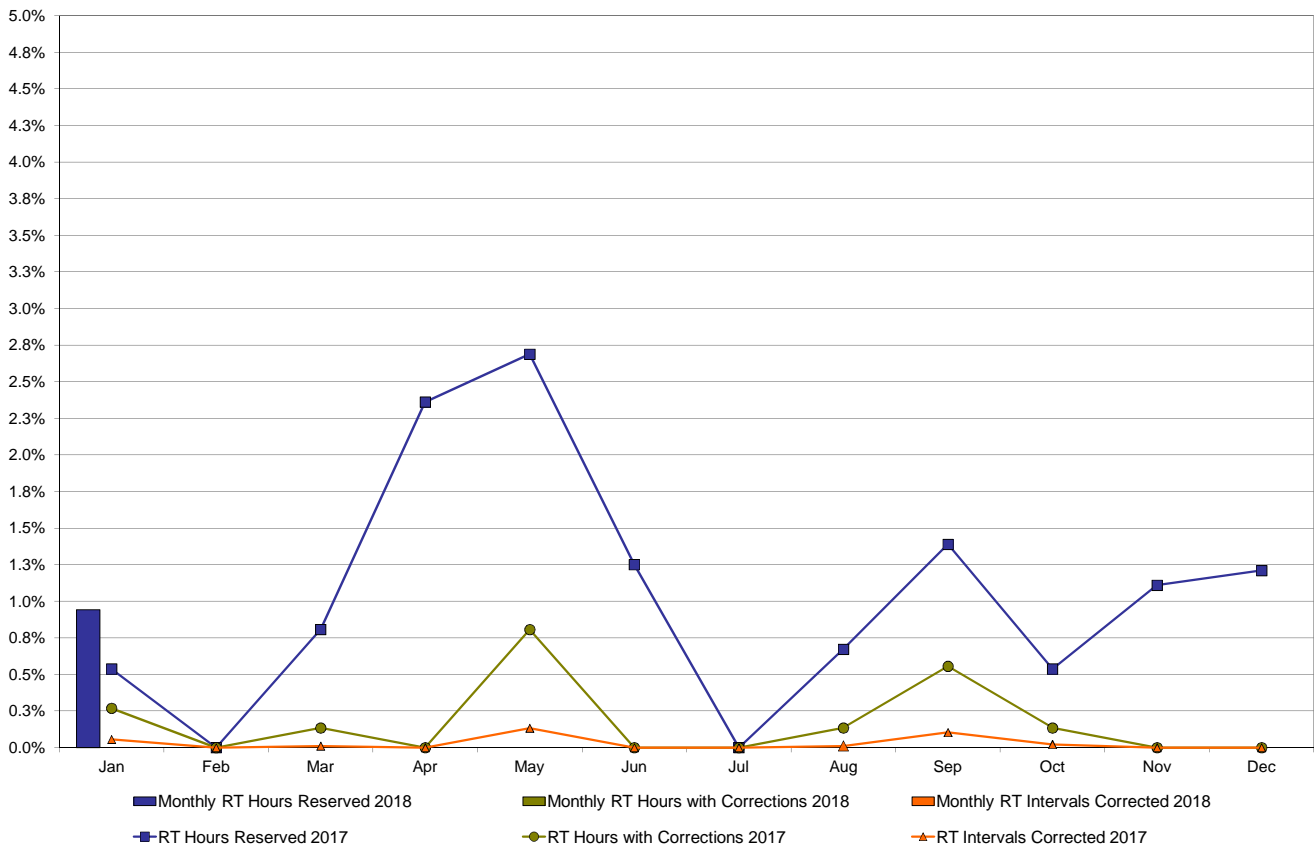


NYISO Real Time Price Correction Statistics

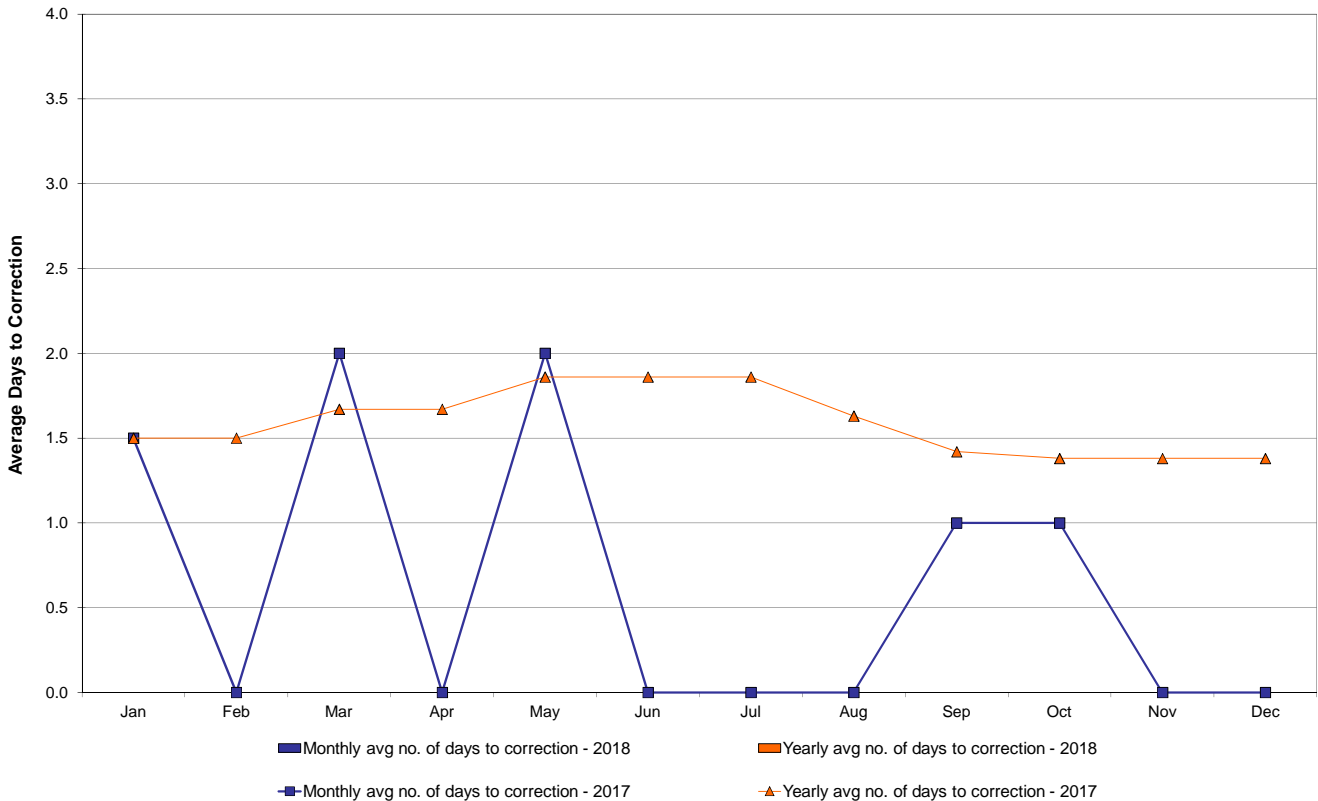
2018		<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Hour Corrections													
Number of hours with corrections	in the month	0	0										
Number of hours	in the month	744	672										
% of hours with corrections	in the month	0.00%	0.00%										
% of hours with corrections	year-to-date	0.00%	0.00%										
Interval Corrections													
Number of intervals corrected	in the month	0	0										
Number of intervals	in the month	9,021	8,112										
% of intervals corrected	in the month	0.00%	0.00%										
% of intervals corrected	year-to-date	0.00%	0.00%										
Hours Reserved													
Number of hours reserved	in the month	7	0										
Number of hours	in the month	744	672										
% of hours reserved	in the month	0.94%	0.00%										
% of hours reserved	year-to-date	0.94%	0.49%										
Days to Correction *													
Avg. number of days to correction	in the month	0.00	0.00										
Avg. number of days to correction	year-to-date	0.00	0.00										
Days Without Corrections													
Days without corrections	in the month	31	28										
Days without corrections	year-to-date	31	59										
2017		<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>
Hour Corrections													
Number of hours with corrections	in the month	2	0	1	0	6	0	0	1	4	1	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	0.27%	0.00%	0.13%	0.00%	0.81%	0.00%	0.00%	0.13%	0.56%	0.13%	0.00%	0.00%
% of hours with corrections	year-to-date	0.27%	0.14%	0.14%	0.10%	0.25%	0.21%	0.18%	0.17%	0.21%	0.21%	0.19%	0.17%
Interval Corrections													
Number of intervals corrected	in the month	5	0	1	0	12	0	0	1	9	2	0	0
Number of intervals	in the month	8,983	8,101	9,026	8,745	9,004	8,712	8,968	8,980	8,701	9,006	8,712	9,063
% of intervals corrected	in the month	0.06%	0.00%	0.01%	0.00%	0.13%	0.00%	0.00%	0.01%	0.10%	0.02%	0.00%	0.00%
% of intervals corrected	year-to-date	0.06%	0.03%	0.02%	0.02%	0.04%	0.03%	0.03%	0.03%	0.04%	0.03%	0.03%	0.03%
Hours Reserved													
Number of hours reserved	in the month	4	0	6	17	20	9	0	5	10	4	8	9
Number of hours	in the month	744	672	743	720	744	720	744	744	720	744	721	744
% of hours reserved	in the month	0.54%	0.00%	0.81%	2.36%	2.69%	1.25%	0.00%	0.67%	1.39%	0.54%	1.11%	1.21%
% of hours reserved	year-to-date	0.54%	0.28%	0.46%	0.94%	1.30%	1.29%	1.10%	1.05%	1.08%	1.03%	1.04%	1.05%
Days to Correction *													
Avg. number of days to correction	in the month	1.50	0.00	2.00	0.00	2.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00
Avg. number of days to correction	year-to-date	1.50	1.50	1.67	1.67	1.86	1.86	1.86	1.63	1.42	1.38	1.38	1.38
Days Without Corrections													
Days without corrections	in the month	29	28	30	30	27	30	31	30	26	30	30	31
Days without corrections	year-to-date	29	57	87	117	144	174	205	235	261	291	321	352

* Calendar days from reservation date.

Percentage of Real-Time Corrections

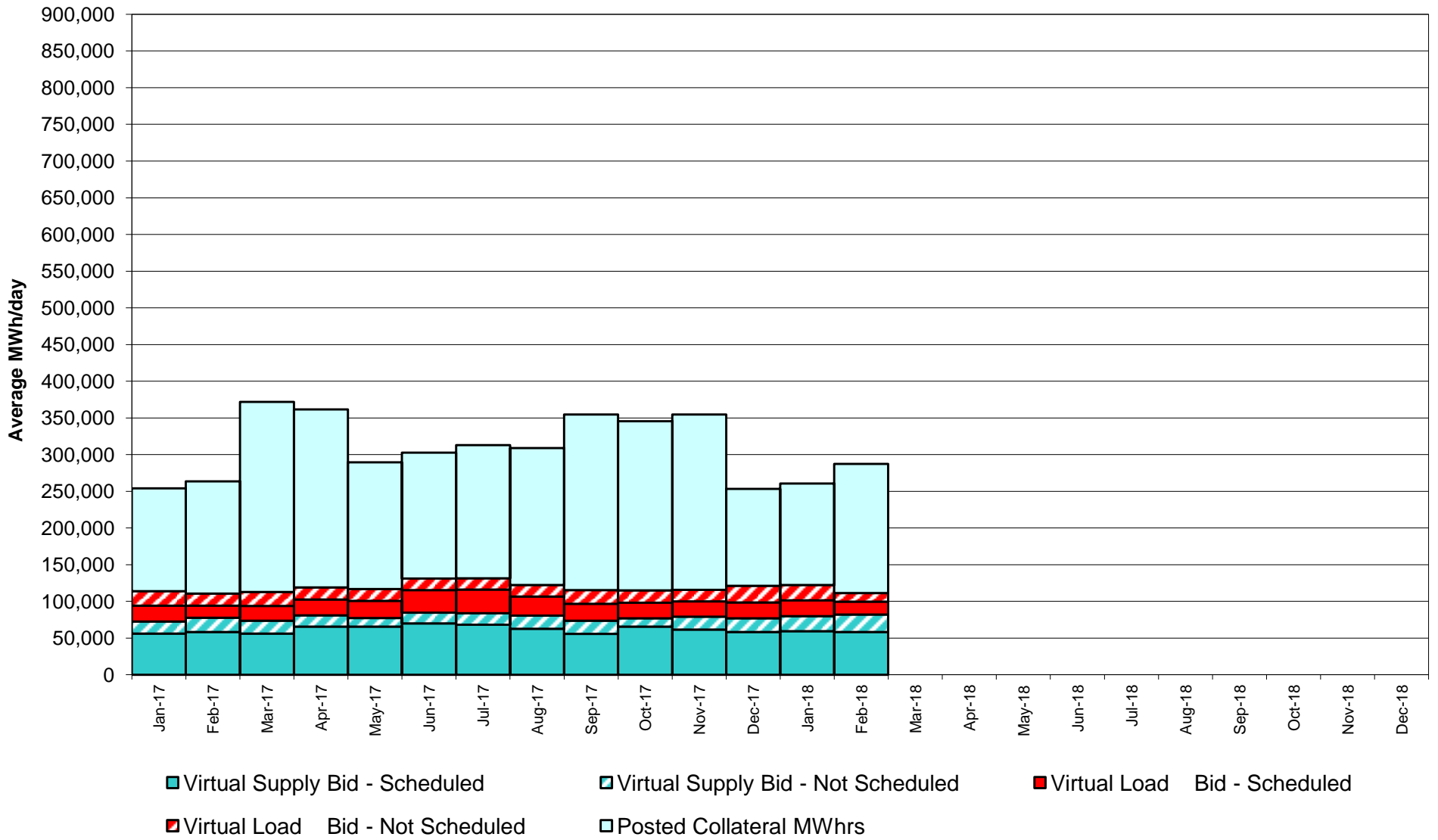


Annual average time period for making Price Corrections (from reservation date) *

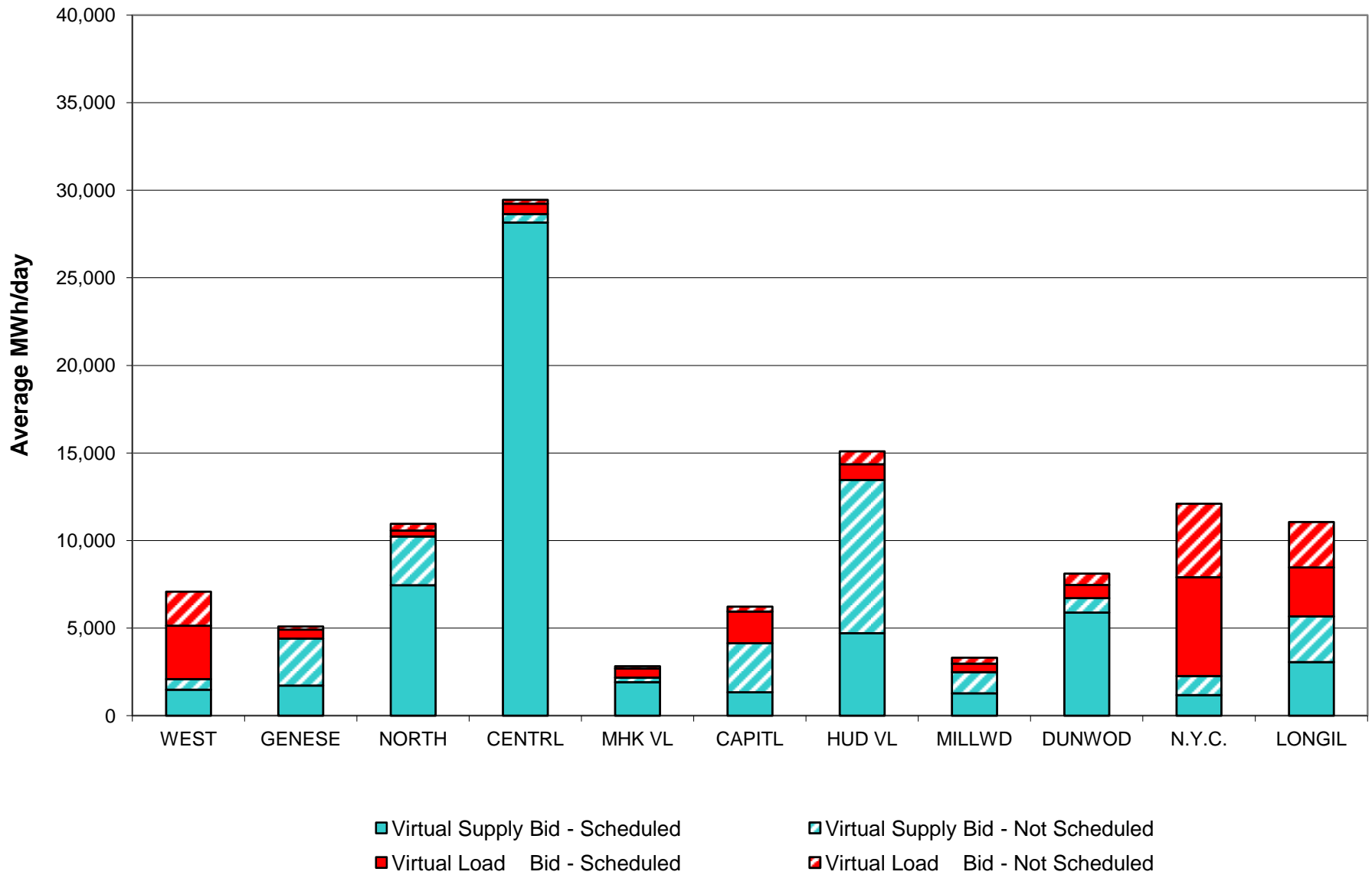


* Calendar days from reservation date.

NYISO Virtual Trading Average MWh per day



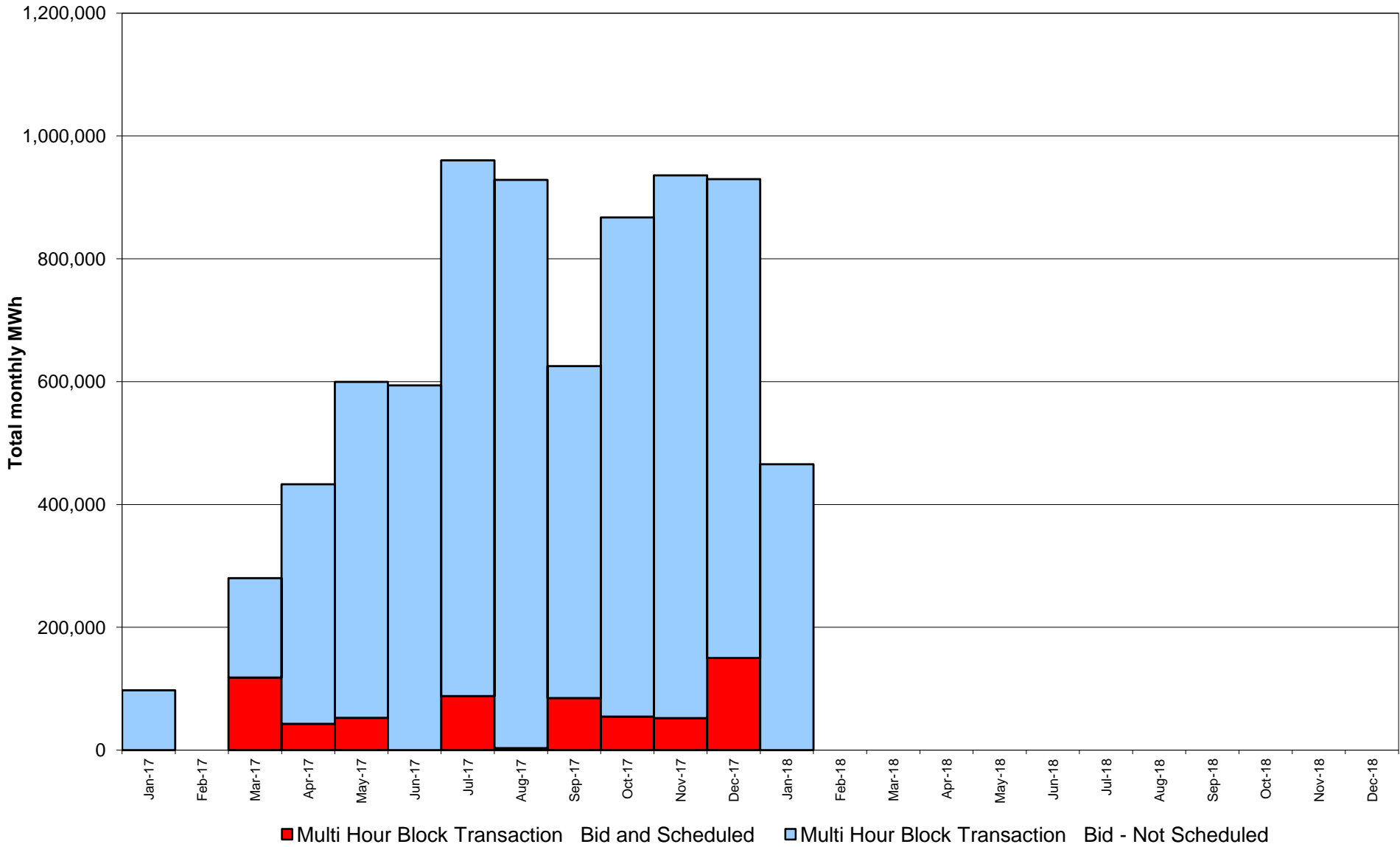
Virtual Load and Supply Zonal Statistics through February 28, 2018



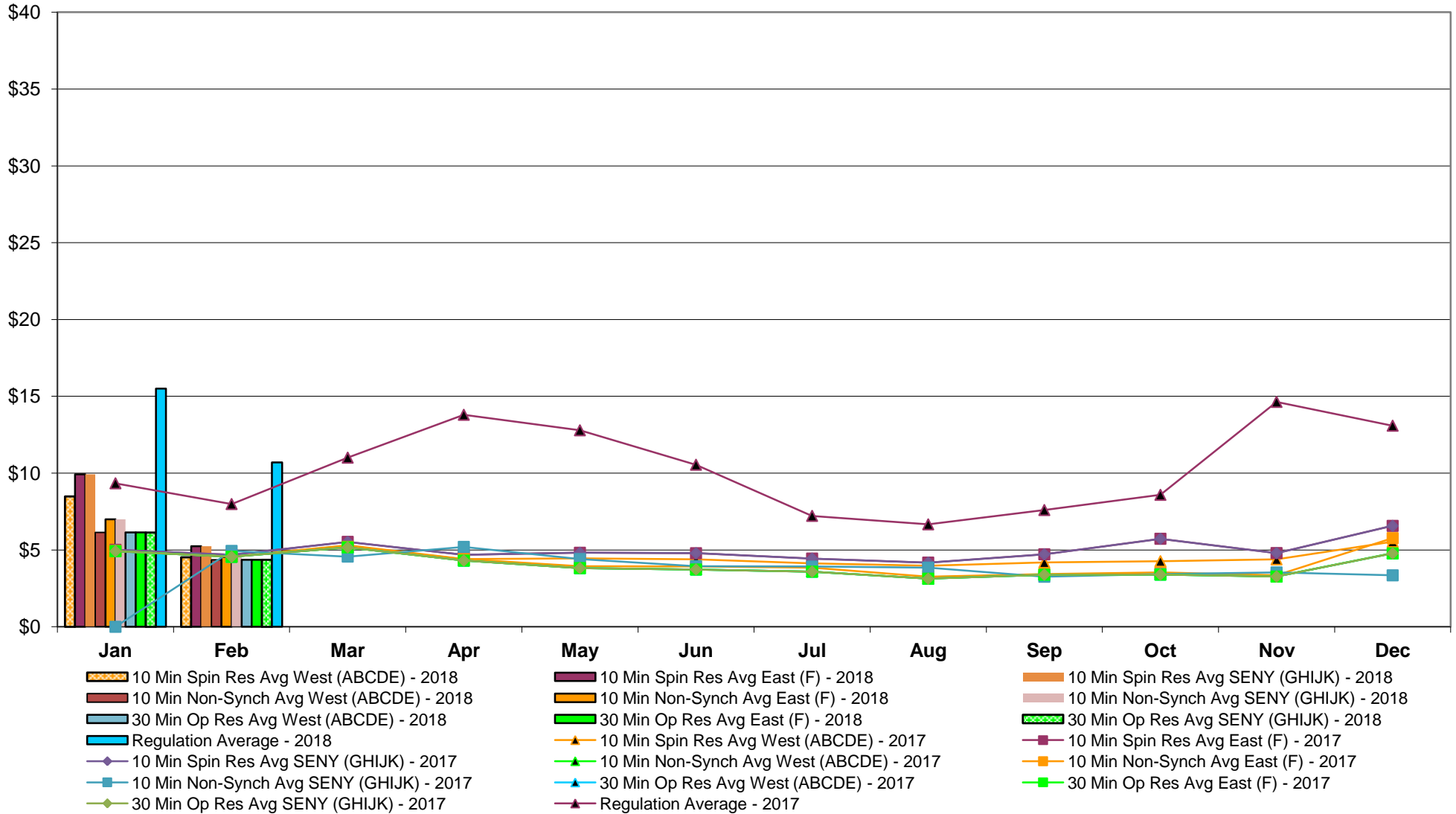
Virtual Load and Supply Zonal Statistics (Average MWh/day) - 2018

		Virtual Load Bid		Virtual Supply Bid				Virtual Load Bid		Virtual Supply Bid				Virtual Load Bid		Virtual Supply Bid	
Zone	Date	Scheduled	Not Scheduled	Scheduled	Not Scheduled	Zone	Date	Scheduled	Not Scheduled	Scheduled	Not Scheduled	Zone	Date	Scheduled	Not Scheduled	Scheduled	Not Scheduled
WEST	Jan-18	4,761	4,241	1,938	427	MHK VL	Jan-18	763	456	2,040	266	DUNWOD	Jan-18	1,795	1,509	2,215	620
	Feb-18	3,058	1,941	1,478	603		Feb-18	512	130	1,910	269		Feb-18	742	658	5,891	824
	Mar-18						Mar-18						Mar-18				
	Apr-18						Apr-18						Apr-18				
	May-18						May-18						May-18				
	Jun-18						Jun-18						Jun-18				
	Jul-18						Jul-18						Jul-18				
	Aug-18						Aug-18						Aug-18				
	Sep-18						Sep-18						Sep-18				
	Oct-18						Oct-18						Oct-18				
	Nov-18						Nov-18						Nov-18				
	Dec-18						Dec-18						Dec-18				
GENESE	Jan-18	554	310	3,772	2,739	CAPITL	Jan-18	2,291	1,751	1,887	2,212	N.Y.C.	Jan-18	4,302	5,885	1,359	704
	Feb-18	525	172	1,723	2,671		Feb-18	1,822	269	1,331	2,799		Feb-18	5,644	4,187	1,181	1,086
	Mar-18						Mar-18						Mar-18				
	Apr-18						Apr-18						Apr-18				
	May-18						May-18						May-18				
	Jun-18						Jun-18						Jun-18				
	Jul-18						Jul-18						Jul-18				
	Aug-18						Aug-18						Aug-18				
	Sep-18						Sep-18						Sep-18				
	Oct-18						Oct-18						Oct-18				
	Nov-18						Nov-18						Nov-18				
	Dec-18						Dec-18						Dec-18				
NORTH	Jan-18	274	282	8,259	3,265	HUD VL	Jan-18	1,562	1,285	5,029	7,218	LONGIL	Jan-18	3,335	3,714	1,932	1,622
	Feb-18	352	369	7,449	2,777		Feb-18	888	740	4,703	8,761		Feb-18	2,800	2,591	3,061	2,605
	Mar-18						Mar-18						Mar-18				
	Apr-18						Apr-18						Apr-18				
	May-18						May-18						May-18				
	Jun-18						Jun-18						Jun-18				
	Jul-18						Jul-18						Jul-18				
	Aug-18						Aug-18						Aug-18				
	Sep-18						Sep-18						Sep-18				
	Oct-18						Oct-18						Oct-18				
	Nov-18						Nov-18						Nov-18				
	Dec-18						Dec-18						Dec-18				
CENTRL	Jan-18	983	434	28,975	647	MILLWD	Jan-18	923	988	2,033	757	NYISO	Jan-18	21,542	20,854	59,437	20,478
	Feb-18	595	215	28,161	483		Feb-18	486	337	1,284	1,197		Feb-18	17,423	11,608	58,172	24,075
	Mar-18						Mar-18						Mar-18				
	Apr-18						Apr-18						Apr-18				
	May-18						May-18						May-18				
	Jun-18						Jun-18						Jun-18				
	Jul-18						Jul-18						Jul-18				
	Aug-18						Aug-18						Aug-18				
	Sep-18						Sep-18						Sep-18				
	Oct-18						Oct-18						Oct-18				
	Nov-18						Nov-18						Nov-18				
	Dec-18						Dec-18						Dec-18				

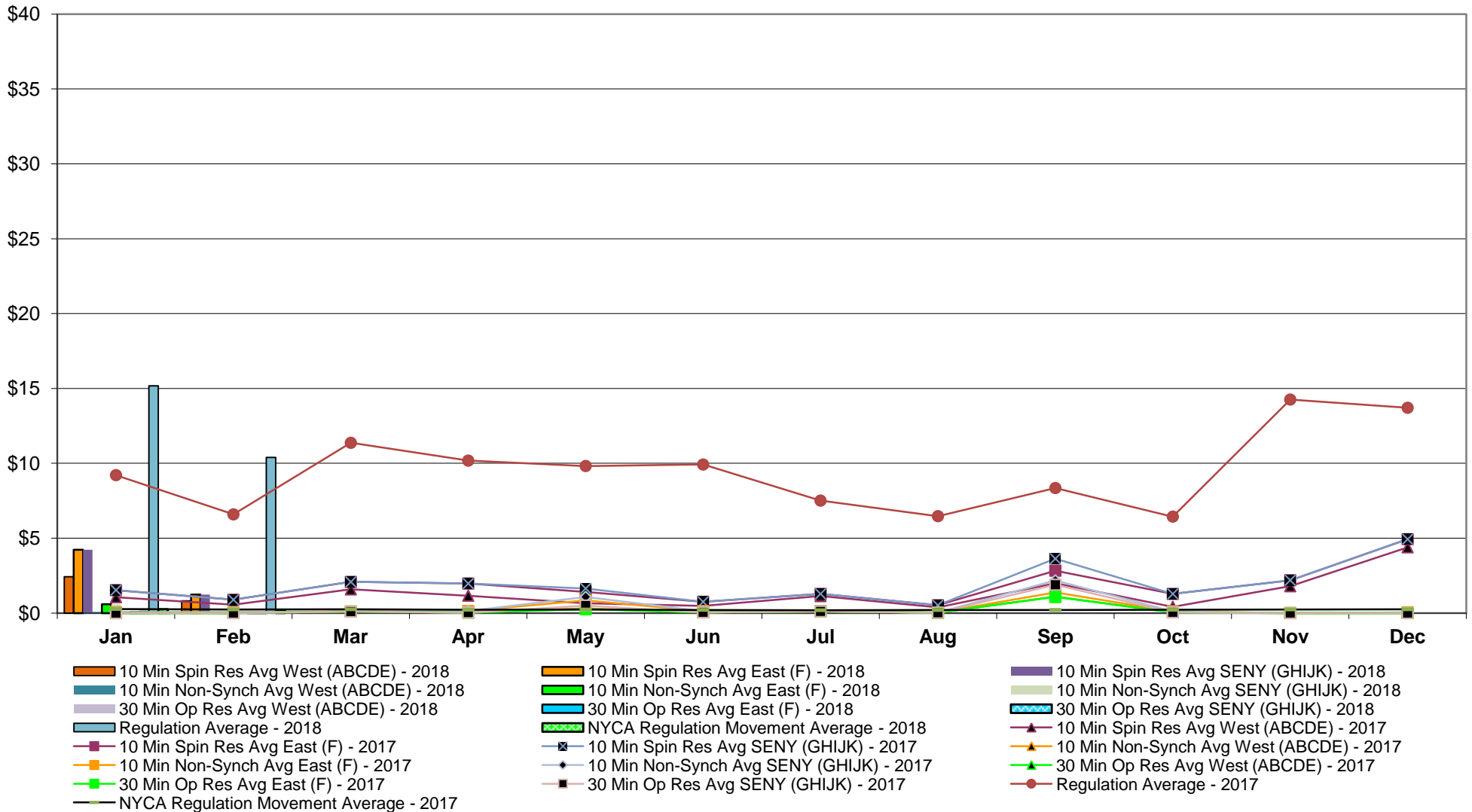
NYISO Multi Hour Block Transactions Monthly Total MWh



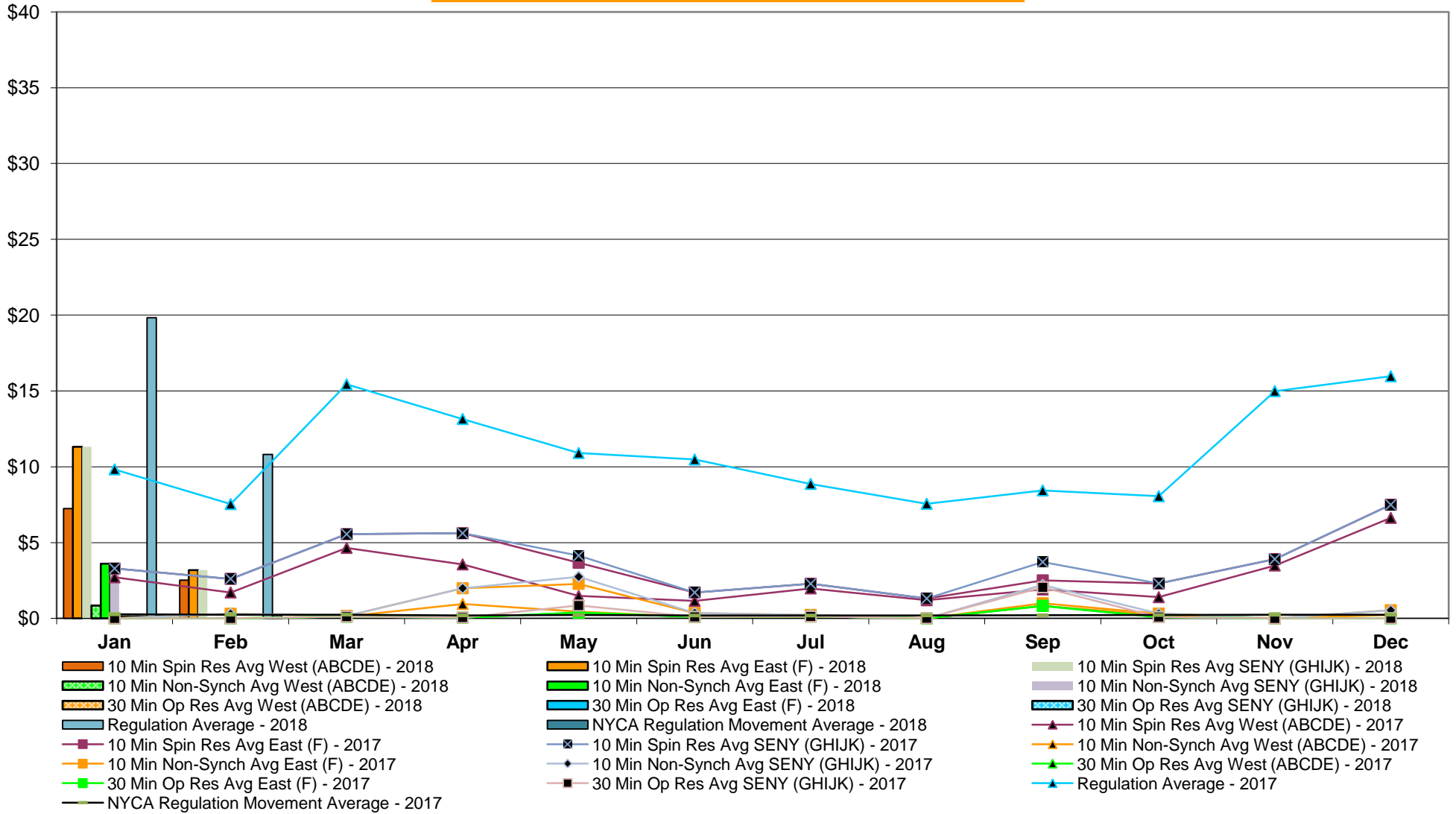
NYISO Monthly Average Ancillary Service Prices Day Ahead Market 2017 - 2018



NYISO Monthly Average Ancillary Service Prices RTC Market 2017 - 2018



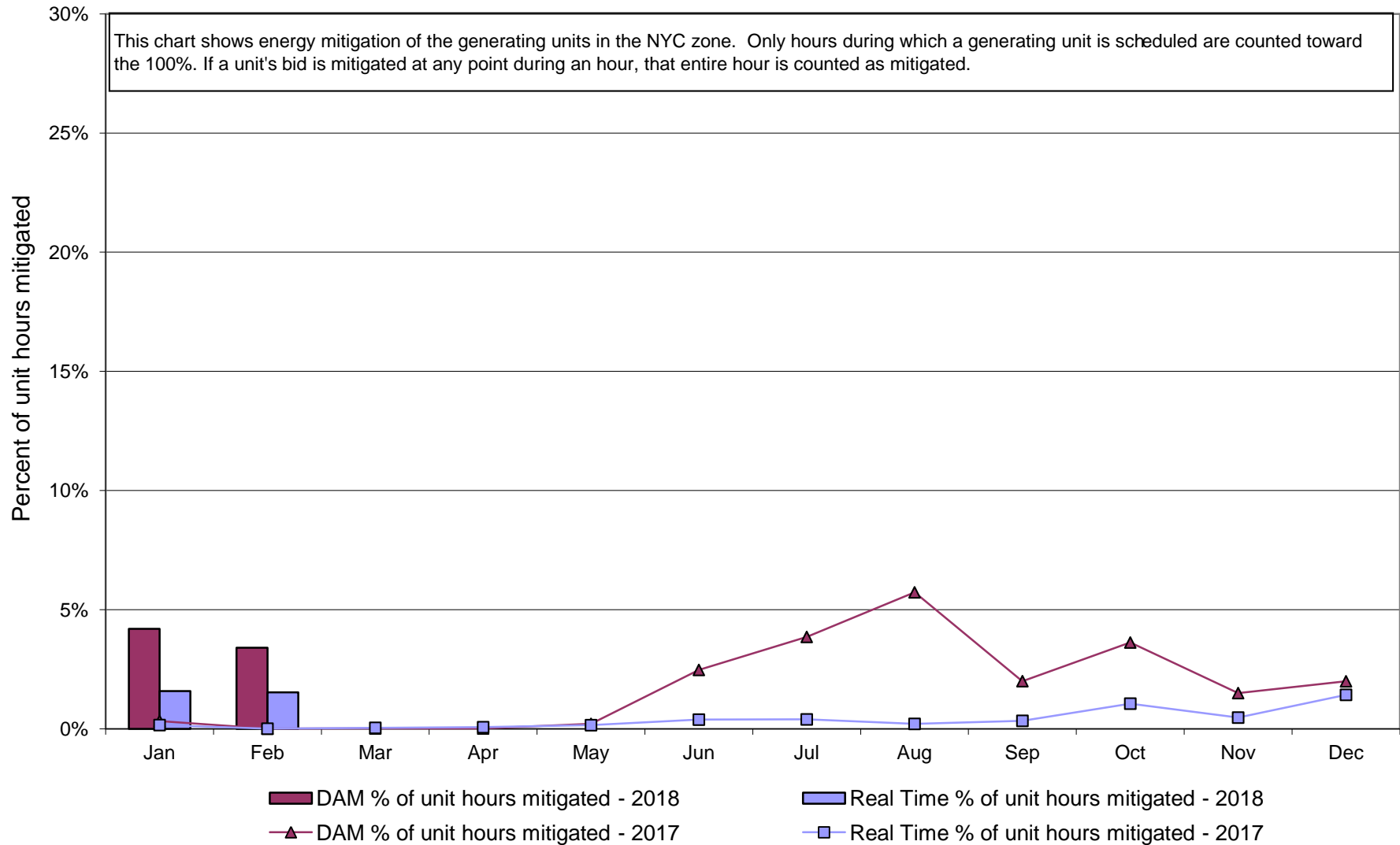
NYISO Monthly Average Ancillary Service Prices Real Time Market 2017 - 2018



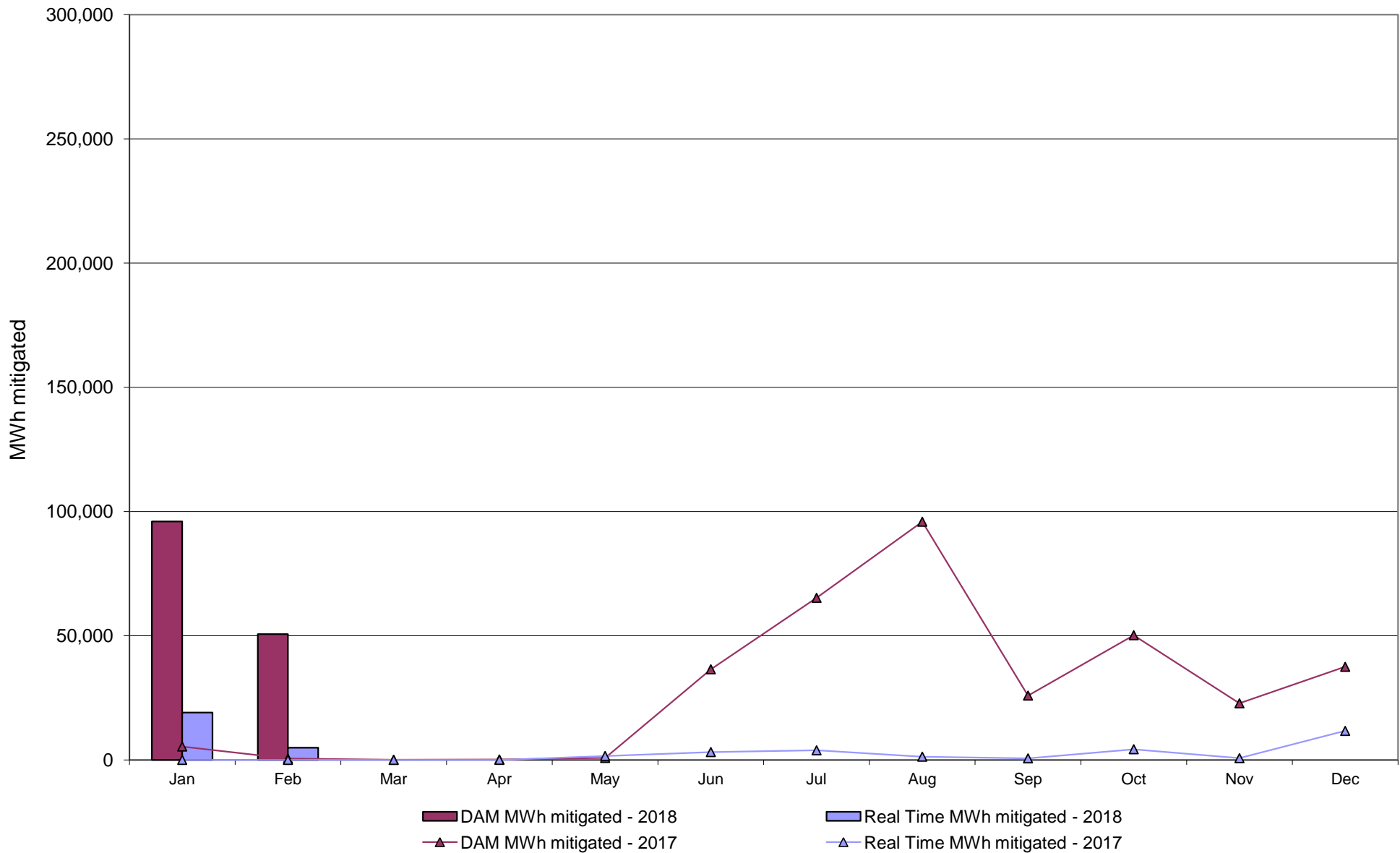
NYISO Markets Ancillary Services Statistics - Unweighted Price (\$/MWH)

2018	January	February	March	April	May	June	July	August	September	October	November	December
Day Ahead Market												
10 Min Spin SENY (GHIJK)	9.93	5.24										
10 Min Spin East (F)	9.93	5.24										
10 Min Spin West (ABCDE)	8.49	4.53										
10 Min Non Synch SENY (GHIJK)	6.99	4.54										
10 Min Non Synch East (F)	6.99	4.54										
10 Min Non Synch West (ABCDE)	6.15	4.36										
30 Min SENY (GHIJK)	6.14	4.36										
30 Min East (F)	6.14	4.36										
30 Min West (ABCDE)	6.14	4.36										
Regulation	15.51	10.70										
RTC Market												
10 Min Spin SENY (GHIJK)	4.23	1.24										
10 Min Spin East (F)	4.23	1.24										
10 Min Spin West (ABCDE)	2.43	0.82										
10 Min Non Synch SENY (GHIJK)	0.59	0.03										
10 Min Non Synch East (F)	0.59	0.03										
10 Min Non Synch West (ABCDE)	0.08	0.02										
30 Min SENY (GHIJK)	0.08	0.02										
30 Min East (F)	0.08	0.02										
30 Min West (ABCDE)	0.08	0.02										
Regulation	15.17	10.40										
NYCA Regulation Movement	0.26	0.21										
Real Time Market												
10 Min Spin SENY (GHIJK)	11.31	3.19										
10 Min Spin East (F)	11.31	3.19										
10 Min Spin West (ABCDE)	7.24	2.52										
10 Min Non Synch SENY (GHIJK)	3.61	0.01										
10 Min Non Synch East (F)	3.61	0.01										
10 Min Non Synch West (ABCDE)	0.85	0.00										
30 Min SENY (GHIJK)	0.13	0.00										
30 Min East (F)	0.13	0.00										
30 Min West (ABCDE)	0.13	0.00										
Regulation	19.82	10.82										
NYCA Regulation Movement	0.24	0.21										
2017												
Day Ahead Market												
10 Min Spin SENY (GHIJK)	5.01	5.38	5.04	6.31	4.93	4.62	6.41	7.12	5.57	5.37	4.83	4.89
10 Min Spin East (F)	5.01	5.38	5.04	6.31	4.93	4.62	6.41	7.12	5.57	5.37	4.83	4.89
10 Min Spin West (ABCDE)	4.94	5.25	4.84	5.60	4.77	4.52	5.78	6.20	5.14	4.89	4.50	4.73
10 Min Non Synch SENY (GHIJK)	4.94	5.25	4.88	5.80	4.83	4.36	6.34	7.07	5.52	5.09	4.43	4.49
10 Min Non Synch East (F)	4.94	5.25	4.88	5.80	4.83	4.36	6.34	7.07	5.52	5.09	4.43	4.49
10 Min Non Synch West (ABCDE)	4.92	5.20	4.84	5.58	4.68	4.32	5.72	6.15	5.10	4.82	4.39	4.43
30 Min SENY (GHIJK)	4.92	5.20	4.84	5.58	4.67	4.32	5.70	6.15	5.10	4.82	4.39	4.43
30 Min East (F)	4.92	5.20	4.84	5.58	4.67	4.32	5.70	6.15	5.10	4.82	4.39	4.43
30 Min West (ABCDE)	4.92	5.20	4.84	5.58	4.67	4.32	5.70	6.15	5.10	4.82	4.39	4.43
Regulation	9.34	8.19	8.05	7.93	6.11	7.00	8.19	8.61	7.00	8.57	7.77	13.80
RTC Market												
10 Min Spin SENY (GHIJK)	1.53	0.59	0.71	1.81	0.43	0.49	2.79	7.26	0.61	0.99	1.05	1.92
10 Min Spin East (F)	1.53	0.59	0.71	1.81	0.43	0.46	2.77	6.88	0.61	0.99	1.05	1.92
10 Min Spin West (ABCDE)	1.06	0.26	0.08	0.95	0.23	0.24	1.72	4.80	0.30	0.29	0.82	1.14
10 Min Non Synch SENY (GHIJK)	0.06	0.00	0.17	0.14	0.05	0.05	1.89	6.06	0.21	0.09	0.00	0.00
10 Min Non Synch East (F)	0.06	0.00	0.17	0.14	0.05	0.02	1.87	5.67	0.21	0.09	0.00	0.00
10 Min Non Synch West (ABCDE)	0.00	0.00	0.00	0.14	0.04	0.02	1.18	3.80	0.16	0.08	0.00	0.00
30 Min SENY (GHIJK)	0.00	0.00	0.00	0.14	0.04	0.04	0.94	3.65	0.15	0.08	0.00	0.00
30 Min East (F)	0.00	0.00	0.00	0.14	0.04	0.02	0.93	3.27	0.15	0.08	0.00	0.00
30 Min West (ABCDE)	0.00	0.00	0.00	0.14	0.04	0.02	0.93	3.27	0.15	0.08	0.00	0.00
Regulation	9.21	6.86	7.15	7.07	5.43	6.09	7.51	10.25	5.52	6.86	7.00	16.70
NYCA Regulation Movement	0.27	0.21	0.20	0.25	0.25	0.23	0.23	0.24	0.24	0.26	0.24	0.26
Real Time Market												
10 Min Spin SENY (GHIJK)	3.29	1.12	1.73	4.34	1.19	1.43	4.73	8.04	1.59	1.96	2.69	3.18
10 Min Spin East (F)	3.29	1.12	1.73	4.34	1.19	1.40	4.72	7.68	1.59	1.96	2.69	3.18
10 Min Spin West (ABCDE)	2.71	0.58	0.48	2.23	0.79	1.00	2.51	4.72	0.90	1.16	2.29	2.33
10 Min Non Synch SENY (GHIJK)	0.00	0.00	0.22	1.20	0.06	0.15	3.49	6.70	0.59	0.18	0.00	0.00
10 Min Non Synch East (F)	0.00	0.00	0.22	1.20	0.06	0.11	3.48	6.34	0.59	0.18	0.00	0.00
10 Min Non Synch West (ABCDE)	0.00	0.00	0.00	0.26	0.03	0.04	1.65	3.56	0.21	0.11	0.00	0.00
30 Min SENY (GHIJK)	0.00	0.00	0.00	0.25	0.03	0.07	0.98	3.48	0.21	0.11	0.00	0.00
30 Min East (F)	0.00	0.00	0.00	0.25	0.03	0.04	0.97	3.12	0.21	0.11	0.00	0.00
30 Min West (ABCDE)	0.00	0.00	0.00	0.25	0.03	0.04	0.97	3.12	0.21	0.11	0.00	0.00
Regulation	9.83	7.21	7.73	8.30	6.06	6.92	8.37	10.31	6.42	7.70	8.21	14.88
NYCA Regulation Movement	0.27	0.22	0.20	0.25	0.25	0.23	0.23	0.24	0.24	0.26	0.23	0.24

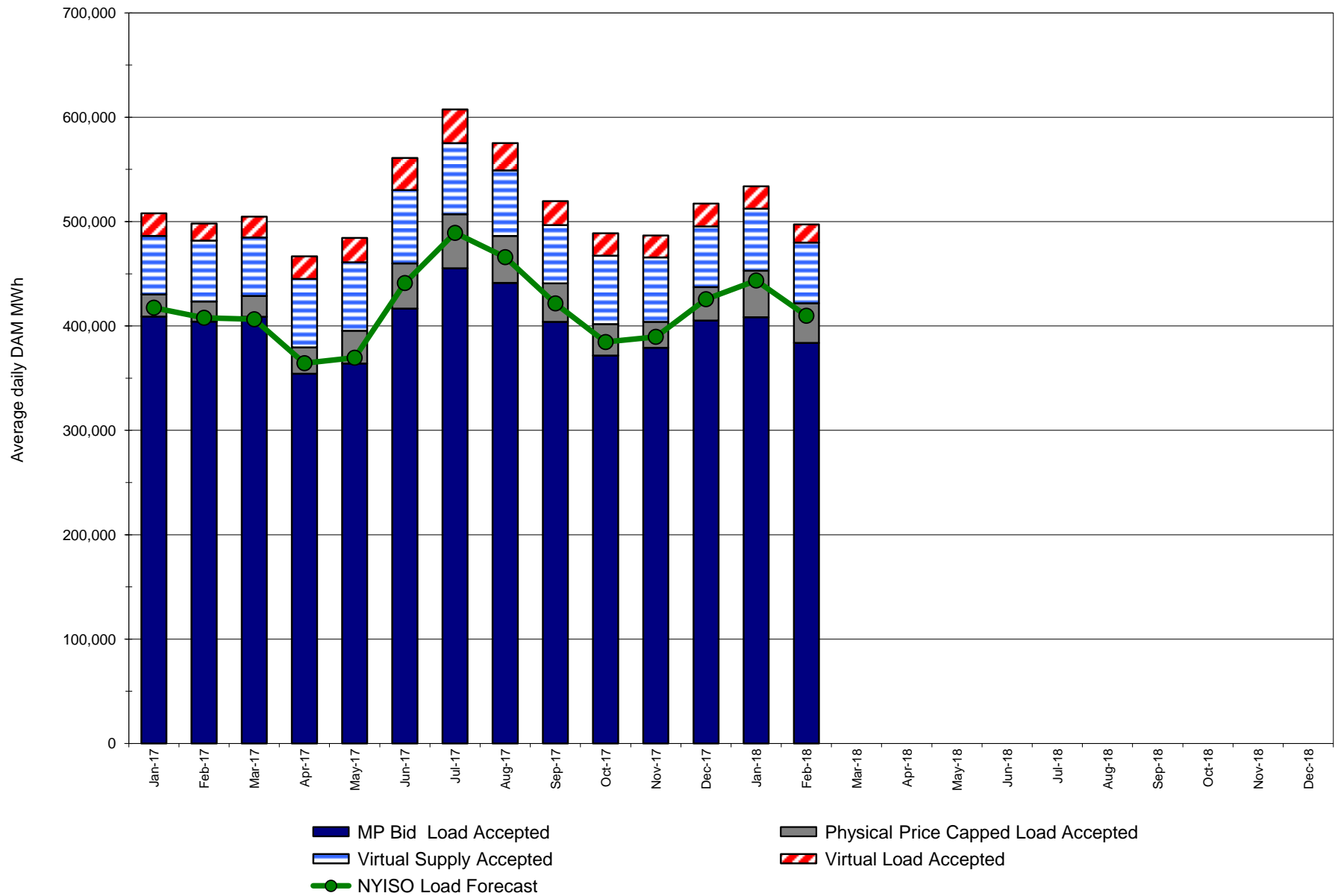
NYISO In City Energy Mitigation - AMP (NYC Zone) 2017 - 2018 Percentage of committed unit-hours mitigated



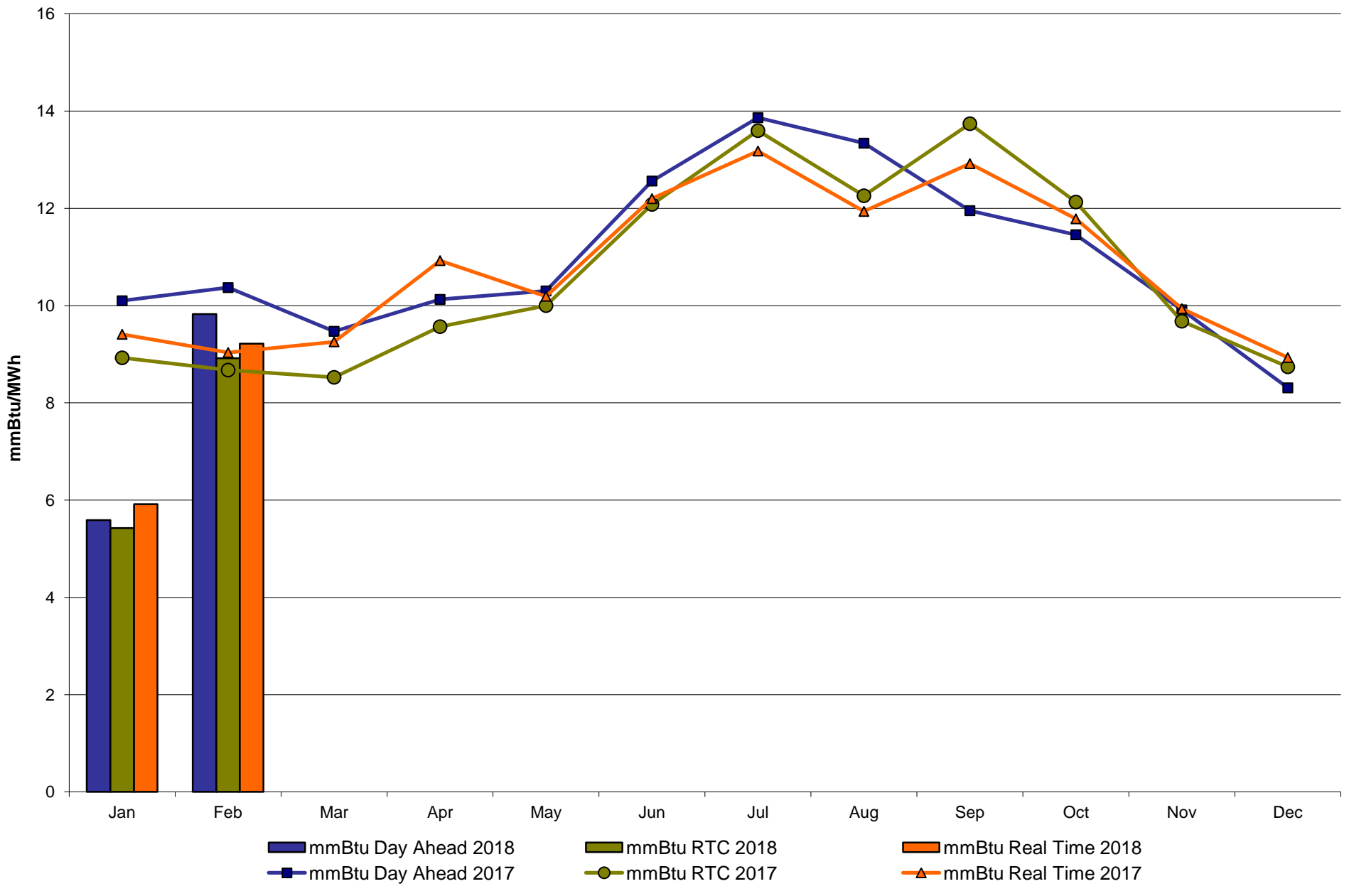
NYISO In City Energy Mitigation (NYC Zone) 2017 - 2018
Monthly megawatt hours mitigated



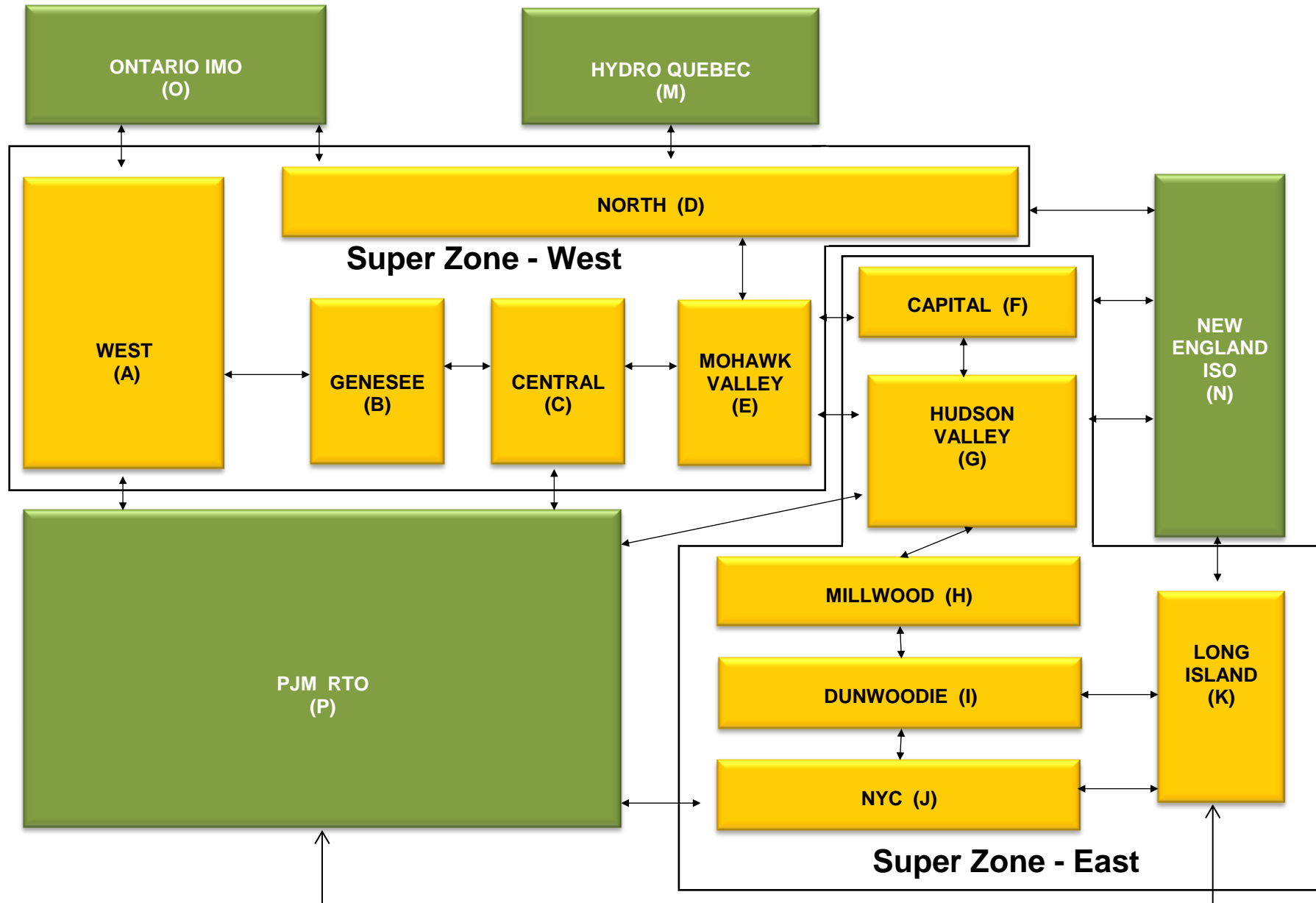
NYISO Average Daily DAM Load Bid Summary



Monthly Implied Heat Rate 2017-2018



NYISO LBMP ZONES



Billing Codes for Chart C

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

The Mission of the New York Independent System Operator is to:

- Serve the public interest and
- Provide benefit to stakeholders 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 policy makers, stakeholders and investors in the power system



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