

Market Operations Report

Rana Mukerji

SENIOR VICE PRESIDENT – MARKET STRUCTURES, NYISO

Business Issues Committee Meeting

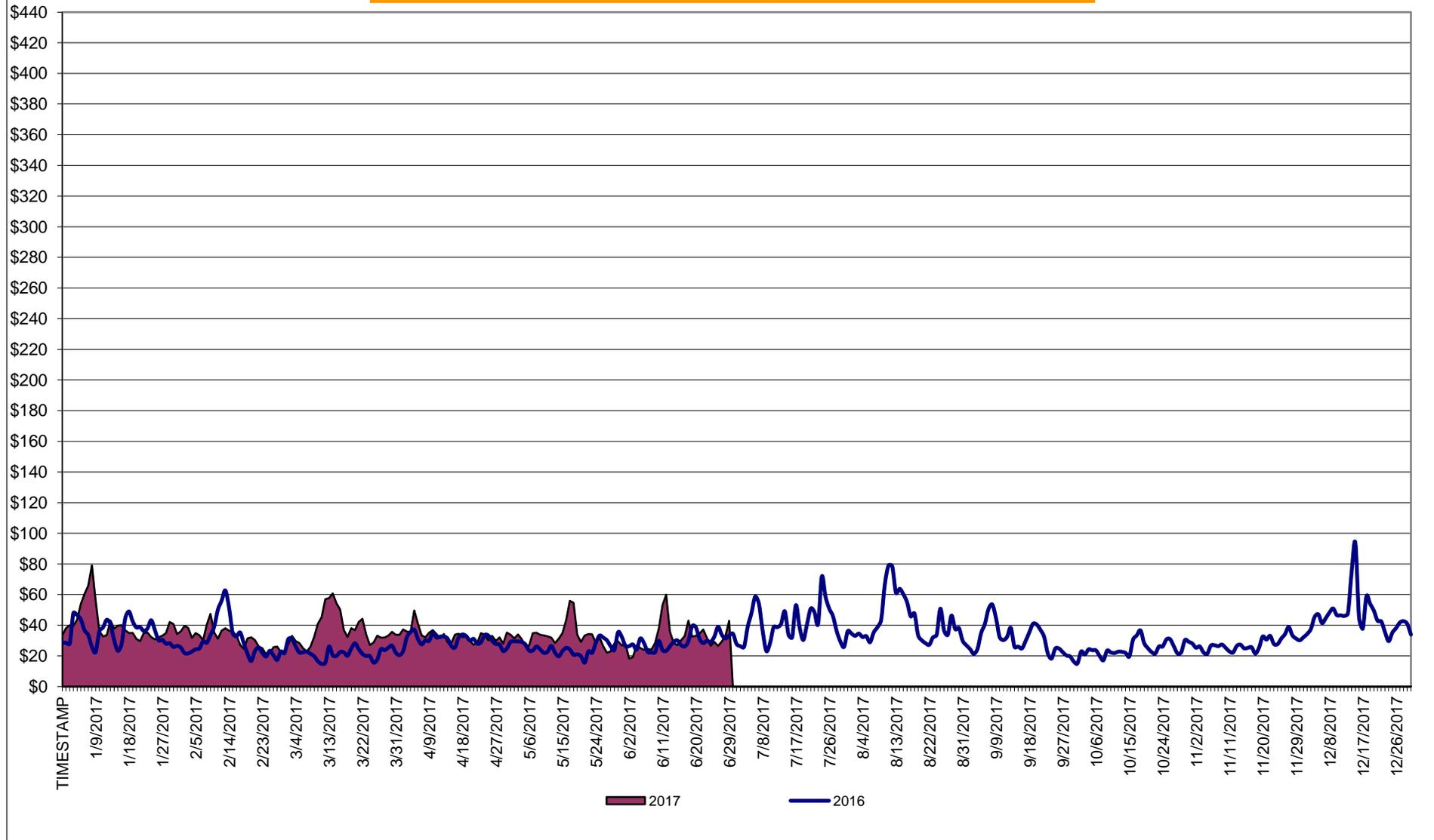
July 24, 2017, Rensselaer, NY

Market Performance Highlights

June 2017

- LBMP for June is \$31.76/MWh; higher than \$31.74/MWh in May 2017 and \$27.35/MWh in June 2016.
 - Day Ahead Load Weighted LBMPs are higher and Real Time Load Weighted LBMPs are higher compared to May.
- June 2017 average year-to-date monthly cost of \$36.01/MWh is a 20% increase from \$29.93/MWh in June 2016.
- Average daily sendout is 454 GWh/day in June; higher than 383 GWh/day in May 2017 and lower than 456 GWh/day in June 2016.
- Natural gas prices and distillate prices were lower compared to the previous month.
 - Natural Gas (Transco Z6 NY) was \$2.35/MMBtu, down from \$2.80/MMBtu in May.
 - Natural gas prices are up 27.5% year-over-year.
 - Jet Kerosene Gulf Coast was \$9.59/MMBtu, down from \$10.47/MMBtu in May.
 - Ultra Low Sulfur No.2 Diesel NY Harbor was \$10.14/MMBtu, down from \$10.82/MMBtu in May.
 - Distillate prices are down 5.4% year-over-year.
- Uplift per MWh is lower compared to the previous month.
 - Uplift (not including NYISO cost of operations) is (\$0.37)/MWh; lower than \$0.10/MWh in May.
 - Local Reliability Share is \$0.15/MWh, lower than \$0.24/MWh in May.
 - Statewide Share is (\$0.52)/MWh, lower than (\$0.13)/MWh in May.
 - TSA \$ per NYC MWh is \$0.56/MWh.
- Total uplift costs (Schedule 1 components including NYISO Cost of Operations) are lower than May.

Daily NYISO Average Cost/MWh (Energy & Ancillary Services)*
2016 Annual Average \$34.28/MWh
June 2016 YTD Average \$29.93/MWh
June 2017 YTD Average \$36.01/MWh



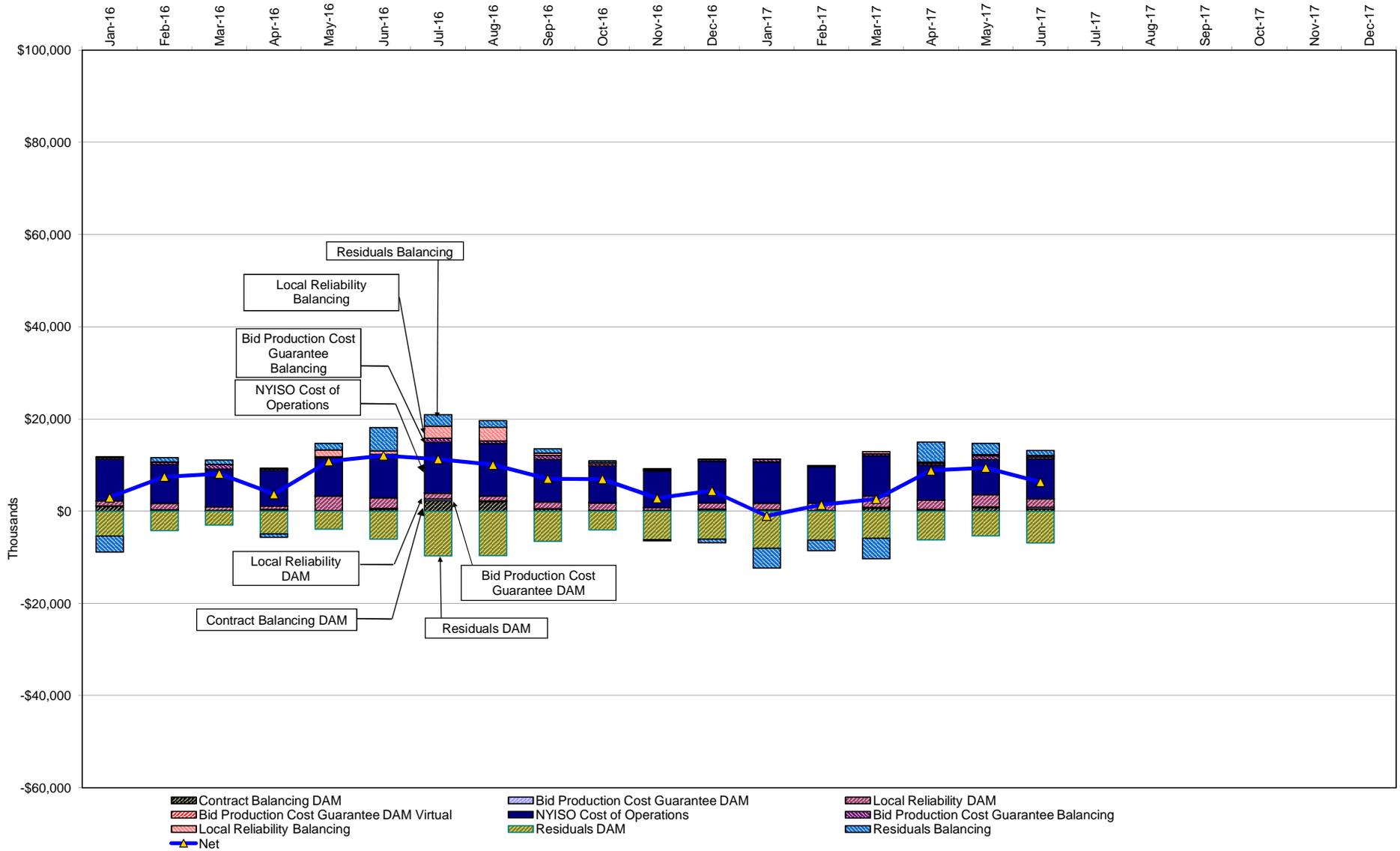
* Excludes ICAP payments.

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

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						
NTAC	0.66	1.11	0.86	1.05	0.79	0.62						
Reserve	0.70	0.67	0.74	0.70	0.61	0.55						
Regulation	0.14	0.12	0.13	0.17	0.16	0.13						
NYISO Cost of Operations	0.65	0.65	0.65	0.65	0.62	0.63						
FERC Fee Recovery	0.09	0.10	0.10	0.12	0.10	0.09						
Uplift	(0.73)	(0.54)	(0.46)	0.12	0.10	(0.37)						
Uplift: Local Reliability Share	0.10	0.13	0.21	0.20	0.24	0.15						
Uplift: Statewide Share	(0.83)	(0.67)	(0.67)	(0.08)	(0.13)	(0.52)						
Voltage Support and Black Start	0.37	0.37	0.38	0.38	0.38	0.38						
Avg Monthly Cost	41.96	33.44	37.38	34.26	34.52	33.80						
Avg YTD Cost	41.96	38.02	37.81	37.05	36.54	36.01						
TSA \$ per NYC MWh	0.00	0.00	0.00	0.08	0.12	0.56						
2016	<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	34.29	28.71	20.66	27.96	23.31	27.35	40.01	42.99	30.89	22.33	26.31	43.90
NTAC	0.59	0.78	0.62	1.14	1.10	0.93	0.78	0.54	0.55	0.86	0.79	0.97
Reserve	0.77	0.73	0.73	0.87	0.71	0.59	0.67	0.68	0.69	0.77	0.68	0.63
Regulation	0.12	0.12	0.12	0.12	0.11	0.12	0.10	0.10	0.10	0.15	0.13	0.17
NYISO Cost of Operations	0.64	0.65	0.65	0.64	0.65	0.66	0.65	0.65	0.64	0.64	0.64	0.64
FERC Fee Recovery	0.09	0.10	0.11	0.10	0.09	0.09	0.07	0.06	0.08	0.10	0.10	0.08
Uplift	(0.43)	(0.07)	(0.03)	(0.34)	0.19	0.20	(0.26)	(0.63)	(0.15)	(0.09)	(0.42)	(0.33)
Uplift: Local Reliability Share	0.09	0.11	0.06	0.07	0.35	0.21	0.23	0.22	0.14	0.15	0.07	0.10
Uplift: Statewide Share	(0.52)	(0.18)	(0.09)	(0.41)	(0.16)	(0.01)	(0.49)	(0.86)	(0.29)	(0.24)	(0.49)	(0.43)
Voltage Support and Black Start	0.35	0.36	0.36	0.35	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.35
Avg Monthly Cost	36.42	31.37	23.23	30.84	26.52	30.29	42.40	44.75	33.16	25.12	28.61	46.42
Avg YTD Cost	36.42	34.02	30.68	30.71	29.85	29.93	32.32	34.43	34.31	33.54	33.16	34.28
TSA \$ per NYC MWh	0.00	0.00	0.05	0.00	0.00	0.02	0.84	1.64	0.00	0.00	0.00	0.00
2015	<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	59.61	114.37	52.09	28.36	32.98	28.20	34.77	33.09	34.40	30.05	24.83	20.91
NTAC	0.32	0.35	0.41	0.64	0.56	0.80	0.54	0.60	0.63	0.53	0.68	1.05
Reserve	0.27	0.37	0.56	0.36	0.38	0.24	0.27	0.20	0.28	0.28	0.47	0.60
Regulation	0.10	0.18	0.11	0.12	0.10	0.13	0.12	0.12	0.10	0.12	0.13	0.13
NYISO Cost of Operations	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.69	0.70	0.69
Uplift	(0.48)	(1.08)	(0.68)	(0.15)	0.26	0.33	0.04	0.03	(0.15)	0.10	0.44	(0.07)
Uplift: Local Reliability Share	0.25	0.33	0.13	0.27	0.30	0.37	0.35	0.36	0.22	0.33	0.20	0.12
Uplift: Statewide Share	(0.73)	(1.41)	(0.81)	(0.42)	(0.05)	(0.04)	(0.30)	(0.33)	(0.37)	(0.23)	0.25	(0.18)
Voltage Support and Black Start	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.38
Avg Monthly Cost	60.91	115.27	53.58	30.41	35.37	30.79	36.84	35.14	36.35	32.18	27.64	23.71
Avg YTD Cost	60.91	87.74	76.64	66.82	60.96	56.02	52.77	50.20	48.59	47.17	45.66	44.10
TSA \$ per NYC MWh	0.00	0.00	0.00	0.00	0.17	0.50	0.07	0.06	0.01	0.00	0.00	0.00

* Excludes ICAP payments.
Market Mitigation and Analysis
Prepared: 7/10/2017 11:21 AM

NYISO Dollar Flows - Uplift - OATT Schedule 1 components - Data through June 30, 2017



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

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						
DAM LSE Internal LBMP Energy Sales	57%	57%	55%	54%	58%	60%						
DAM External TC LBMP Energy Sales	2%	2%	1%	1%	1%	1%						
DAM Bilateral - Internal Bilaterals	32%	32%	34%	35%	33%	31%						
DAM Bilateral - Import/Non-LBMP Market Bilaterals	5%	5%	5%	6%	4%	5%						
DAM Bilateral - Export/Non-LBMP Market Bilaterals	2%	2%	2%	2%	2%	2%						
DAM Bilateral - Wheel Through Bilaterals	2%	2%	2%	2%	2%	2%						
Balancing Energy Market MWh	-256,448	-407,284	-509,053	-466,426	-666,048	-564,312						
Balancing Energy LSE Internal LBMP Energy Sales	-157%	-132%	-148%	-115%	-120%	-114%						
Balancing Energy External TC LBMP Energy Sales	64%	39%	44%	22%	28%	23%						
Balancing Energy Bilateral - Internal Bilaterals	15%	8%	12%	5%	1%	4%						
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	4%	0%	0%	0%	0%						
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	10%	7%	5%	4%	3%	3%						
Balancing Energy Bilateral - Wheel Through Bilaterals	-32%	-26%	-13%	-15%	-12%	-16%						
Transactions Summary												
LBMP	58%	57%	55%	54%	58%	60%						
Internal Bilaterals	33%	34%	36%	37%	34%	32%						
Import Bilaterals	5%	5%	5%	6%	4%	5%						
Export Bilaterals	2%	2%	2%	2%	2%	2%						
Wheels Through	2%	2%	2%	2%	2%	1%						
Market Share of Total Load												
Day Ahead Market	101.8%	103.3%	103.8%	104.0%	105.4%	104.1%						
Balancing Energy +	-1.8%	-3.3%	-3.8%	-4.0%	-5.4%	-4.1%						
Total MWh	13,878,571	12,157,922	13,474,812	11,595,049	12,300,933	13,841,868						
Average Daily Energy Sendout/Month GWh	431	418	419	377	383	454						

2016	January	February	March	April	May	June	July	August	September	October	November	December
Day Ahead Market MWh	14,760,915	13,614,754	13,413,781	12,496,141	12,959,886	14,095,904	16,950,819	17,413,898	14,563,318	13,014,354	12,770,775	14,245,185
DAM LSE Internal LBMP Energy Sales	54%	55%	55%	57%	58%	60%	64%	63%	60%	56%	56%	58%
DAM External TC LBMP Energy Sales	4%	2%	1%	5%	2%	1%	1%	3%	3%	2%	2%	3%
DAM Bilateral - Internal Bilaterals	34%	34%	35%	28%	31%	30%	28%	27%	30%	33%	32%	31%
DAM Bilateral - Import/Non-LBMP Market Bilaterals	5%	5%	5%	6%	5%	5%	4%	4%	5%	5%	5%	5%
DAM Bilateral - Export/Non-LBMP Market Bilaterals	2%	1%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
DAM Bilateral - Wheel Through Bilaterals	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Balancing Energy Market MWh	-522,919	-580,900	-741,701	-303,313	-180,848	-143,015	-86,025	224,316	-250,802	-477,109	-394,575	-127,836
Balancing Energy LSE Internal LBMP Energy Sales	-125%	-114%	-118%	-76%	-147%	-203%	-347%	42%	-139%	-111%	-102%	-269%
Balancing Energy External TC LBMP Energy Sales	12%	13%	19%	-13%	55%	77%	204%	56%	49%	21%	28%	138%
Balancing Energy Bilateral - Internal Bilaterals	19%	9%	4%	8%	27%	47%	62%	28%	18%	6%	9%	65%
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	6%	5%	3%	5%	7%	10%	15%	5%	5%	4%	6%	27%
Balancing Energy Bilateral - Wheel Through Bilaterals	-12%	-12%	-8%	-24%	-42%	-32%	-34%	-31%	-32%	-21%	-40%	-66%
Transactions Summary												
LBMP	56%	56%	54%	62%	59%	61%	65%	66%	62%	57%	57%	60%
Internal Bilaterals	36%	36%	37%	29%	32%	31%	28%	27%	30%	35%	34%	32%
Import Bilaterals	5%	5%	6%	6%	5%	5%	4%	4%	5%	5%	6%	5%
Export Bilaterals	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Wheels Through	1%	1%	1%	1%	2%	2%	1%	1%	2%	1%	2%	2%
Market Share of Total Load												
Day Ahead Market	103.7%	104.5%	105.9%	102.5%	101.4%	101.0%	100.5%	98.7%	101.8%	103.8%	103.2%	100.9%
Balancing Energy +	-3.7%	-4.5%	-5.9%	-2.5%	-1.4%	-1.0%	-0.5%	1.3%	-1.8%	-3.8%	-3.2%	-0.9%
Total MWh	14,237,996	13,033,853	12,672,080	12,192,828	12,779,038	13,952,889	16,864,794	17,638,213	14,312,516	12,537,245	12,376,200	14,117,349
Average Daily Energy Sendout/Month GWh	439	436	397	385	397	456	532	548	458	391	398	433

+ 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 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						
Standard Deviation	\$13.20	\$7.97	\$11.95	\$7.66	\$9.47	\$12.37						
Load Weighted Price **	\$38.42	\$29.66	\$32.96	\$28.56	\$28.95	\$29.52						
<u>RTC LBMP</u>												
Price *	\$32.87	\$24.09	\$28.86	\$26.19	\$26.19	\$26.40						
Standard Deviation	\$14.57	\$9.52	\$13.70	\$10.36	\$21.29	\$14.76						
Load Weighted Price **	\$33.96	\$24.81	\$29.67	\$26.98	\$28.10	\$28.39						
<u>REAL TIME LBMP</u>												
Price *	\$34.61	\$25.14	\$31.21	\$29.61	\$26.56	\$26.16						
Standard Deviation	\$18.20	\$14.21	\$25.02	\$39.82	\$26.11	\$19.00						
Load Weighted Price **	\$35.80	\$25.84	\$32.21	\$30.81	\$28.64	\$28.67						
Average Daily Energy Sendout/Month GWh	431	418	419	377	383	454						

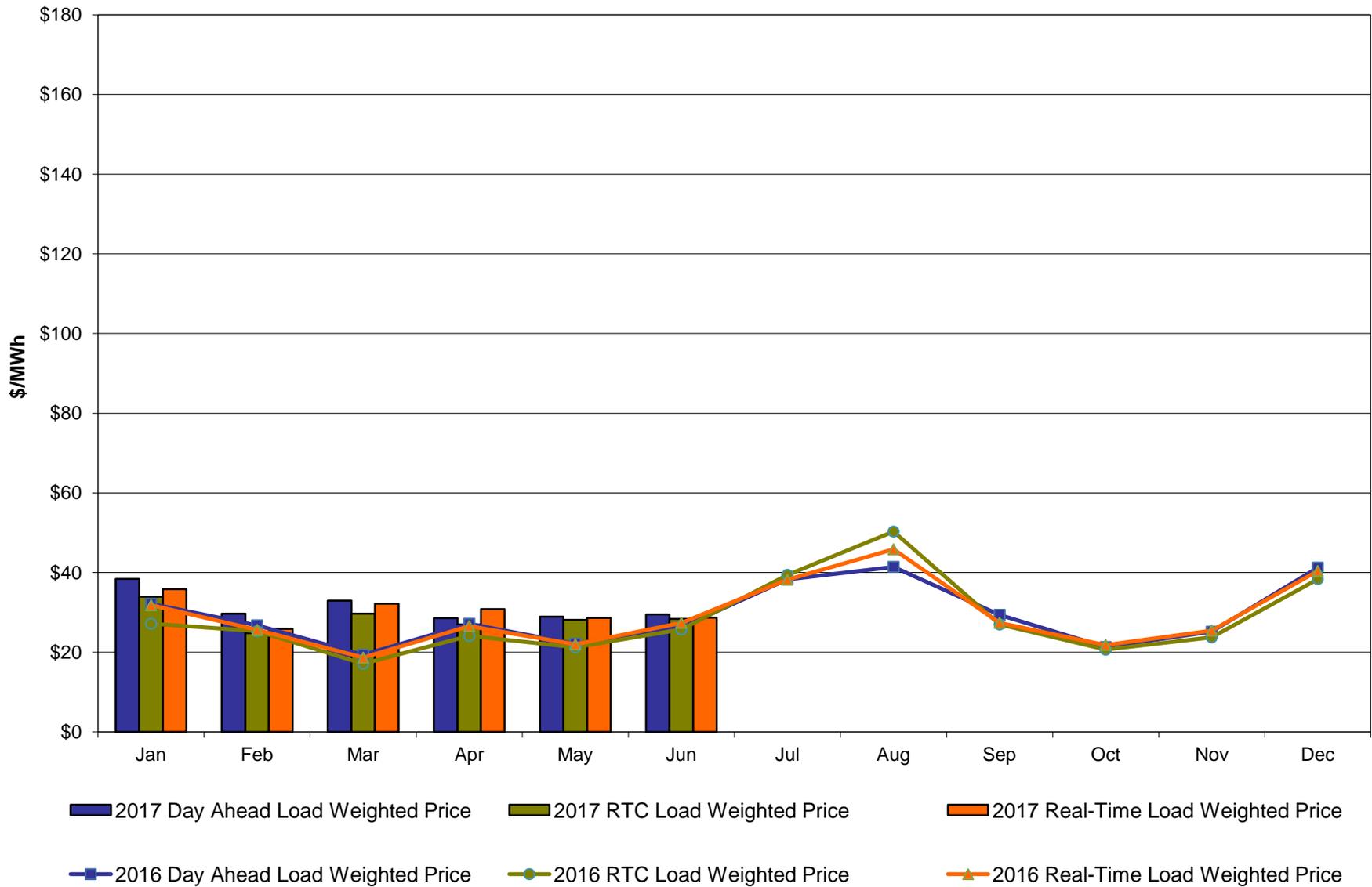
NYISO Markets 2016 Energy Statistics

	<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 *	\$31.01	\$25.76	\$18.63	\$26.39	\$21.07	\$24.83	\$35.24	\$38.25	\$27.15	\$20.37	\$24.35	\$39.83
Standard Deviation	\$10.86	\$12.46	\$6.99	\$6.95	\$7.04	\$9.21	\$18.37	\$20.59	\$13.55	\$7.48	\$7.32	\$15.08
Load Weighted Price **	\$32.13	\$26.75	\$19.37	\$27.14	\$22.12	\$26.30	\$38.29	\$41.41	\$29.38	\$21.29	\$25.15	\$41.22
<u>RTC LBMP</u>												
Price *	\$26.12	\$24.10	\$16.41	\$23.41	\$19.96	\$24.29	\$36.22	\$45.03	\$24.70	\$19.76	\$23.02	\$37.08
Standard Deviation	\$16.06	\$17.89	\$11.32	\$9.09	\$11.44	\$16.58	\$38.04	\$70.57	\$17.46	\$8.96	\$9.49	\$16.72
Load Weighted Price **	\$27.16	\$25.29	\$17.11	\$24.10	\$21.23	\$25.73	\$39.42	\$50.28	\$26.97	\$20.64	\$23.73	\$38.35
<u>REAL TIME LBMP</u>												
Price *	\$30.15	\$24.28	\$17.84	\$25.71	\$20.67	\$25.87	\$34.40	\$40.87	\$24.90	\$20.91	\$24.72	\$39.00
Standard Deviation	\$60.09	\$18.19	\$15.06	\$16.59	\$12.84	\$19.27	\$38.56	\$52.85	\$20.70	\$12.15	\$12.71	\$20.92
Load Weighted Price **	\$31.80	\$25.61	\$18.64	\$26.57	\$21.99	\$27.39	\$38.20	\$45.82	\$27.38	\$21.81	\$25.45	\$40.42
Average Daily Energy Sendout/Month GWh	439	436	397	385	397	456	532	548	458	391	398	433

* Average zonal load weighted prices.

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

NYISO Monthly Average Internal LBMPs 2016- 2017

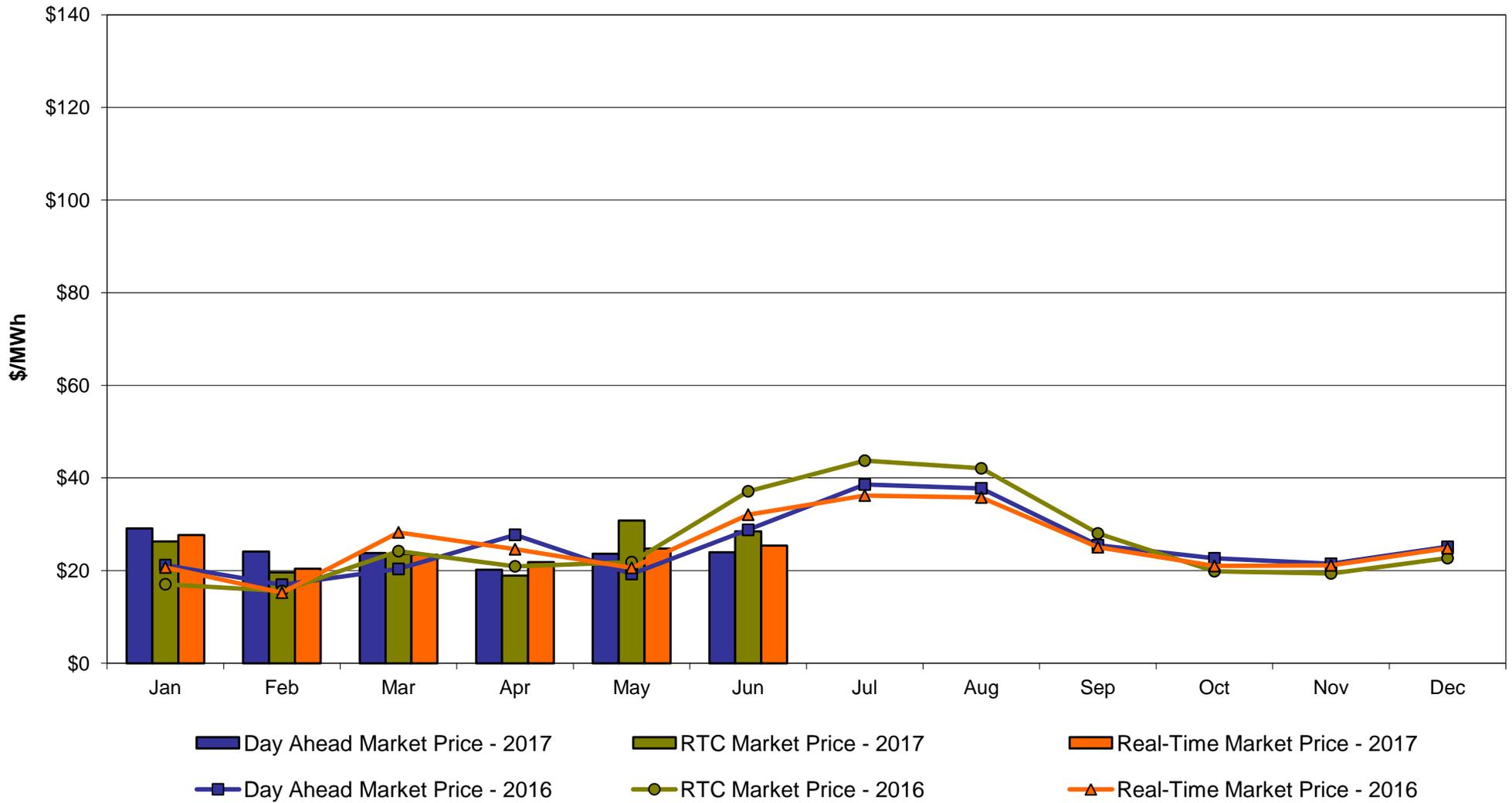


June 2017 Zonal LBMP Statistics for NYISO (\$/MWh)

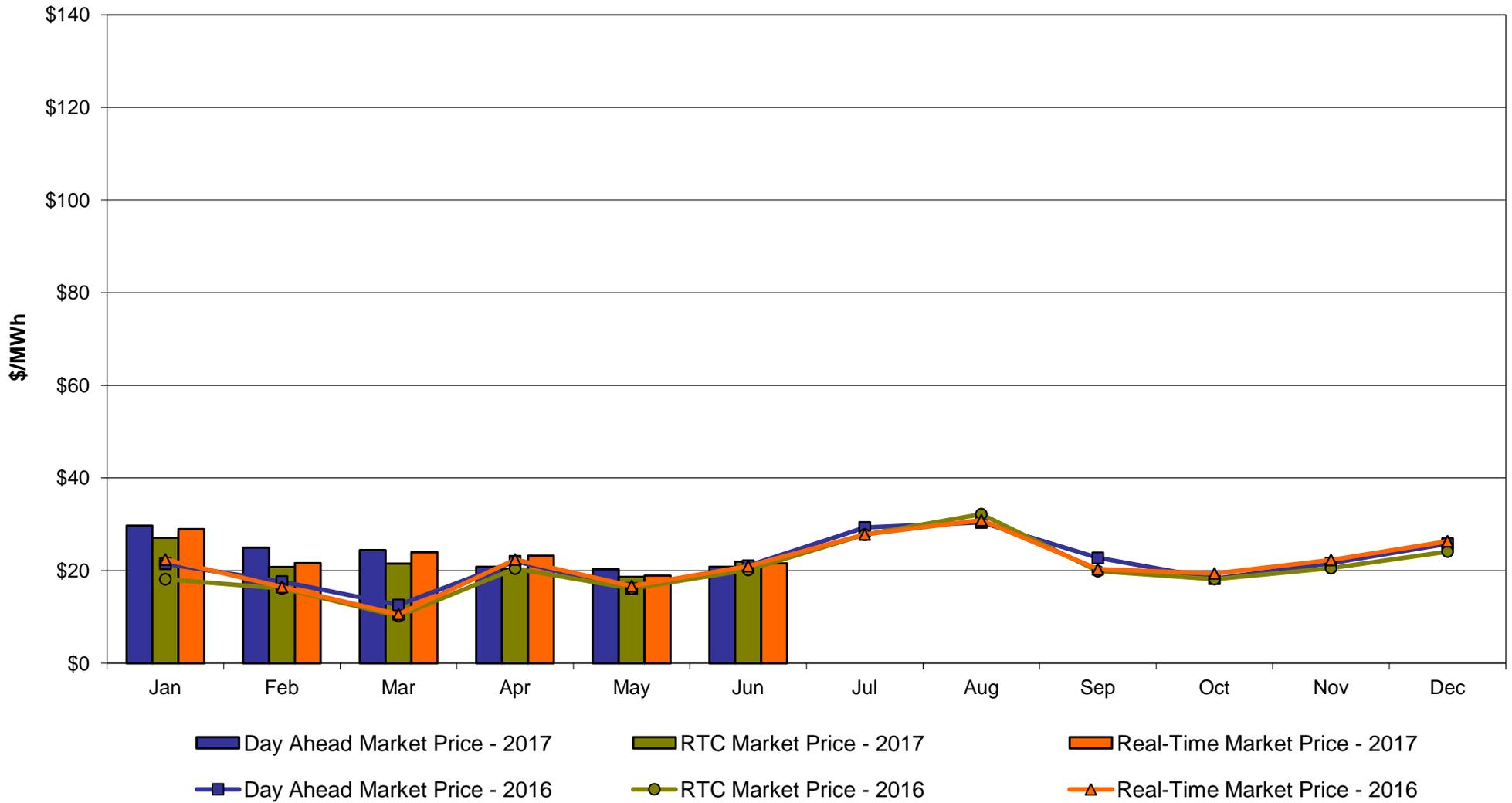
	<u>WEST Zone A</u>	<u>GENESEE Zone B</u>	<u>NORTH Zone D</u>	<u>CENTRAL Zone C</u>	<u>MOHAWK VALLEY Zone E</u>	<u>CAPITAL Zone F</u>	<u>HUDSON VALLEY Zone G</u>	<u>MILLWOOD Zone H</u>	<u>DUNWOODIE Zone I</u>	<u>NEW YORK CITY Zone J</u>	<u>LONG ISLAND Zone K</u>
<u>DAY AHEAD LBMP</u>											
Unweighted Price *	23.98	19.95	17.72	20.86	20.84	25.61	28.11	29.11	29.14	30.17	32.61
Standard Deviation	14.89	8.82	8.28	9.30	9.10	8.06	12.49	14.12	14.15	14.27	14.41
<u>RTC LBMP</u>											
Unweighted Price *	28.49	20.61	17.91	21.93	21.42	23.06	25.02	25.47	25.50	27.46	32.21
Standard Deviation	39.27	9.10	11.29	10.38	9.94	9.14	12.73	14.01	14.14	18.17	31.19
<u>REAL TIME LBMP</u>											
Unweighted Price *	25.38	20.55	17.55	21.60	21.35	22.94	25.01	25.63	25.75	28.68	30.40
Standard Deviation	41.62	12.56	14.06	14.00	13.29	13.12	16.29	17.97	18.71	25.42	29.35
	<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 *	18.15	17.22	17.22	24.91	27.03	31.66	29.12	31.18	29.07	29.69	16.06
Standard Deviation	7.19	8.16	8.16	11.19	10.44	14.70	11.57	14.54	12.66	14.14	7.82
<u>RTC LBMP</u>											
Unweighted Price *	17.69	15.91	15.91	23.63	23.56	29.86	29.39	29.19	25.38	25.65	15.33
Standard Deviation	11.88	11.69	11.69	10.98	10.55	29.45	29.24	29.30	13.37	13.98	36.44
<u>REAL TIME LBMP</u>											
Unweighted Price *	18.80	16.07	16.07	23.13	23.65	28.50	26.33	27.82	23.62	25.87	12.74
Standard Deviation	14.01	13.49	13.49	15.38	14.17	25.08	23.87	24.57	35.44	18.49	30.63

* Straight LBMP averages

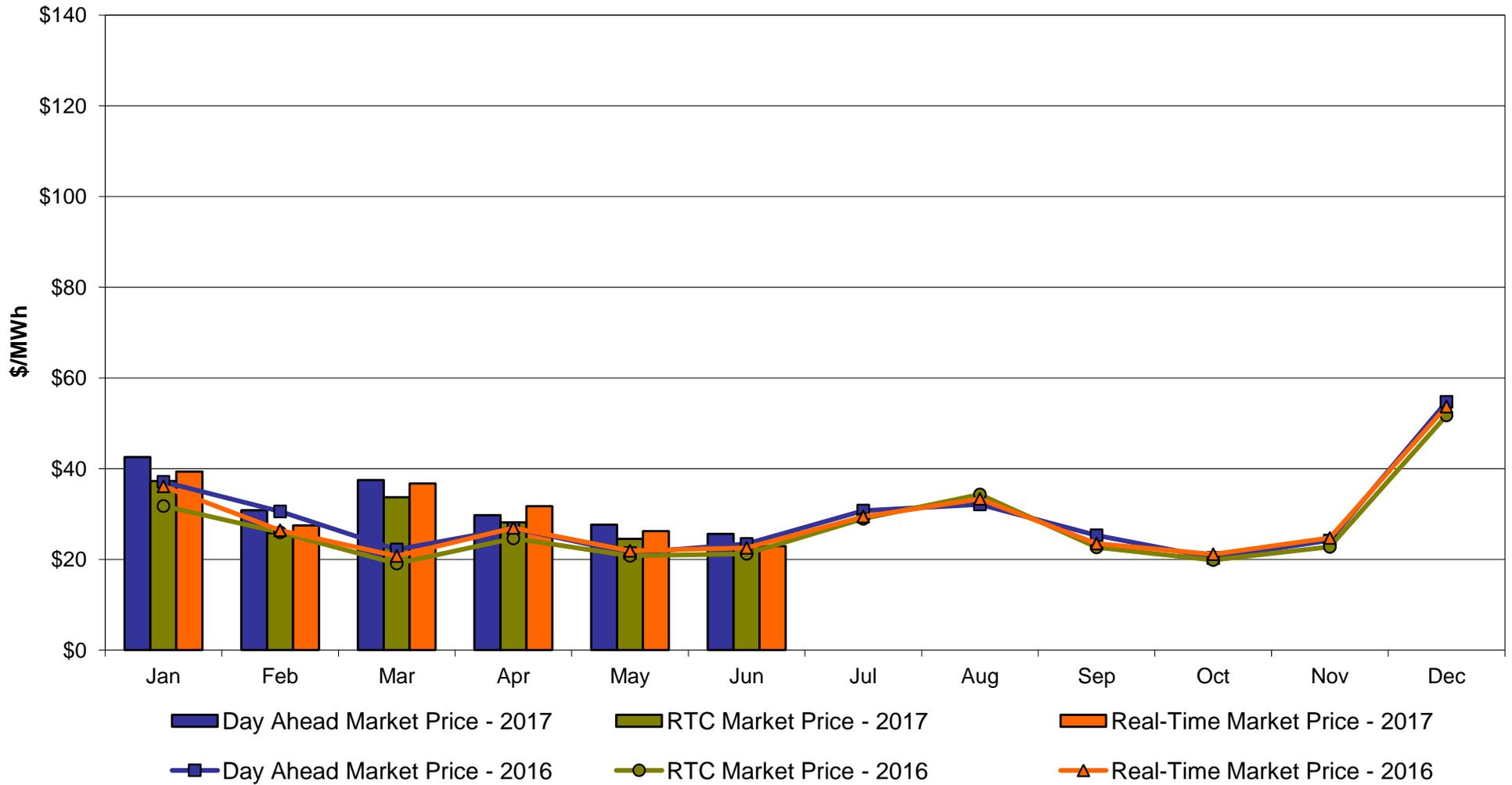
West Zone A Monthly Average LBMP Prices 2016 - 2017



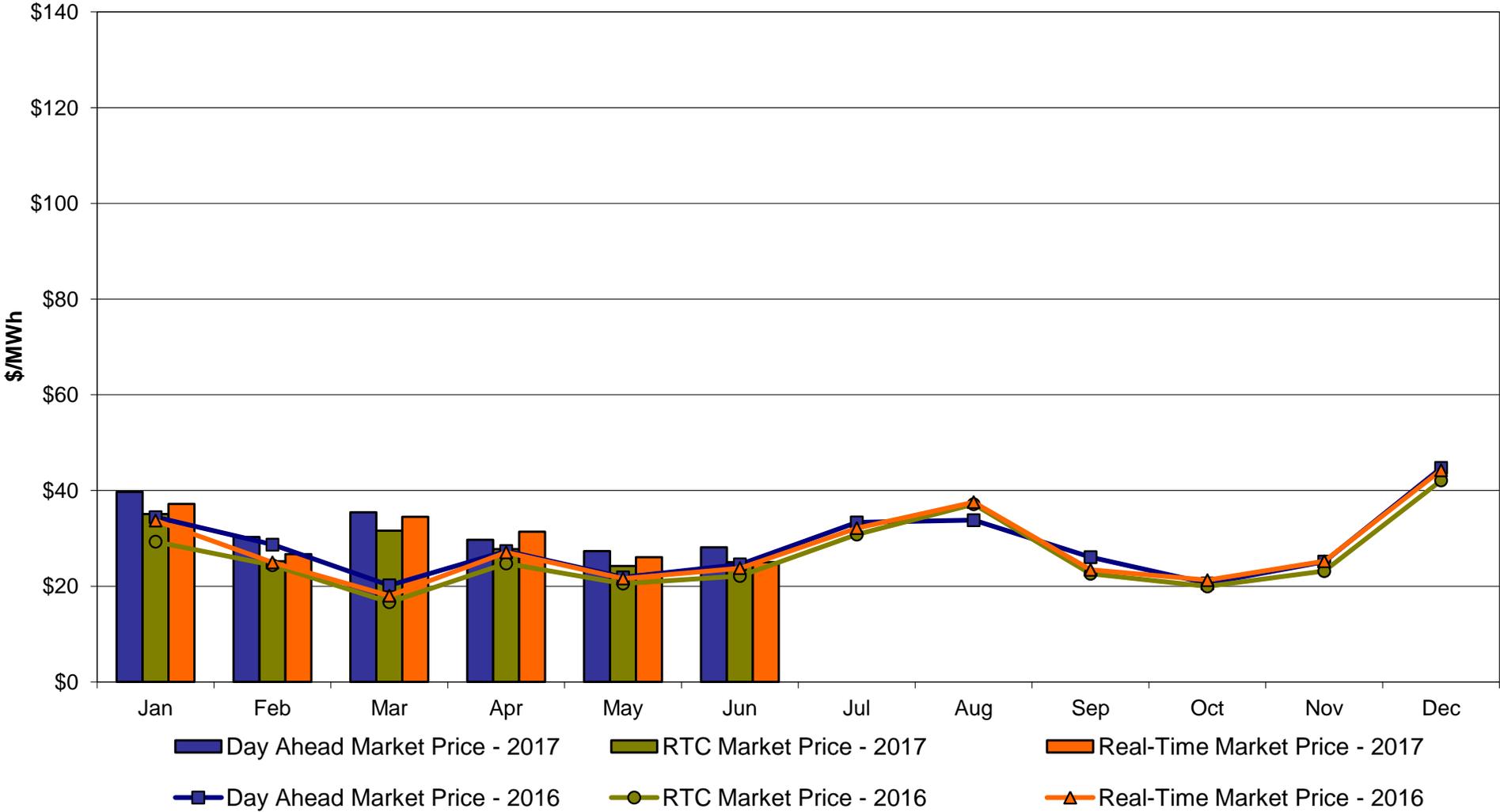
**Central Zone C
Monthly Average LBMP Prices 2016 - 2017**



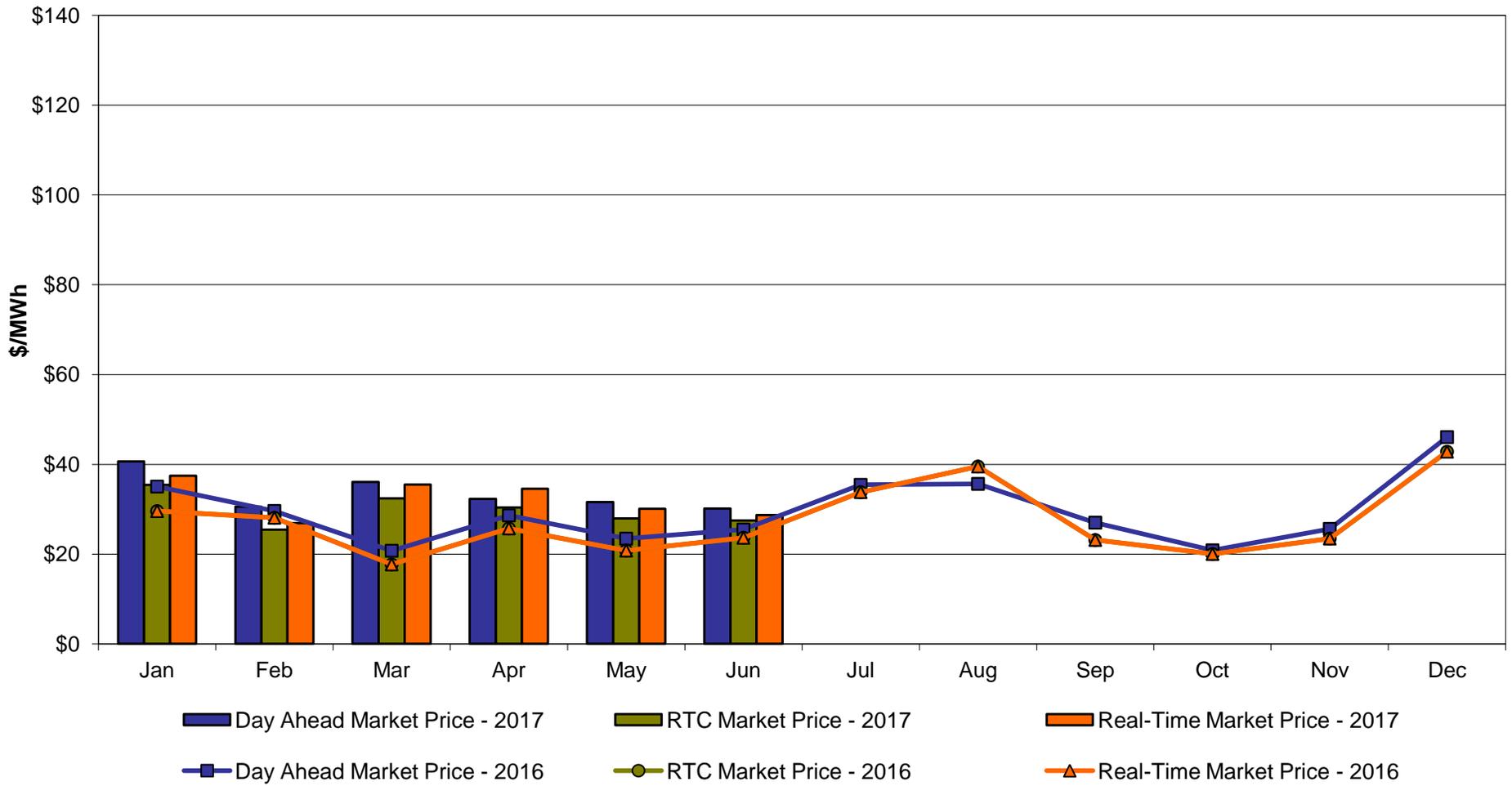
Capital Zone F Monthly Average LBMP Prices 2016 - 2017



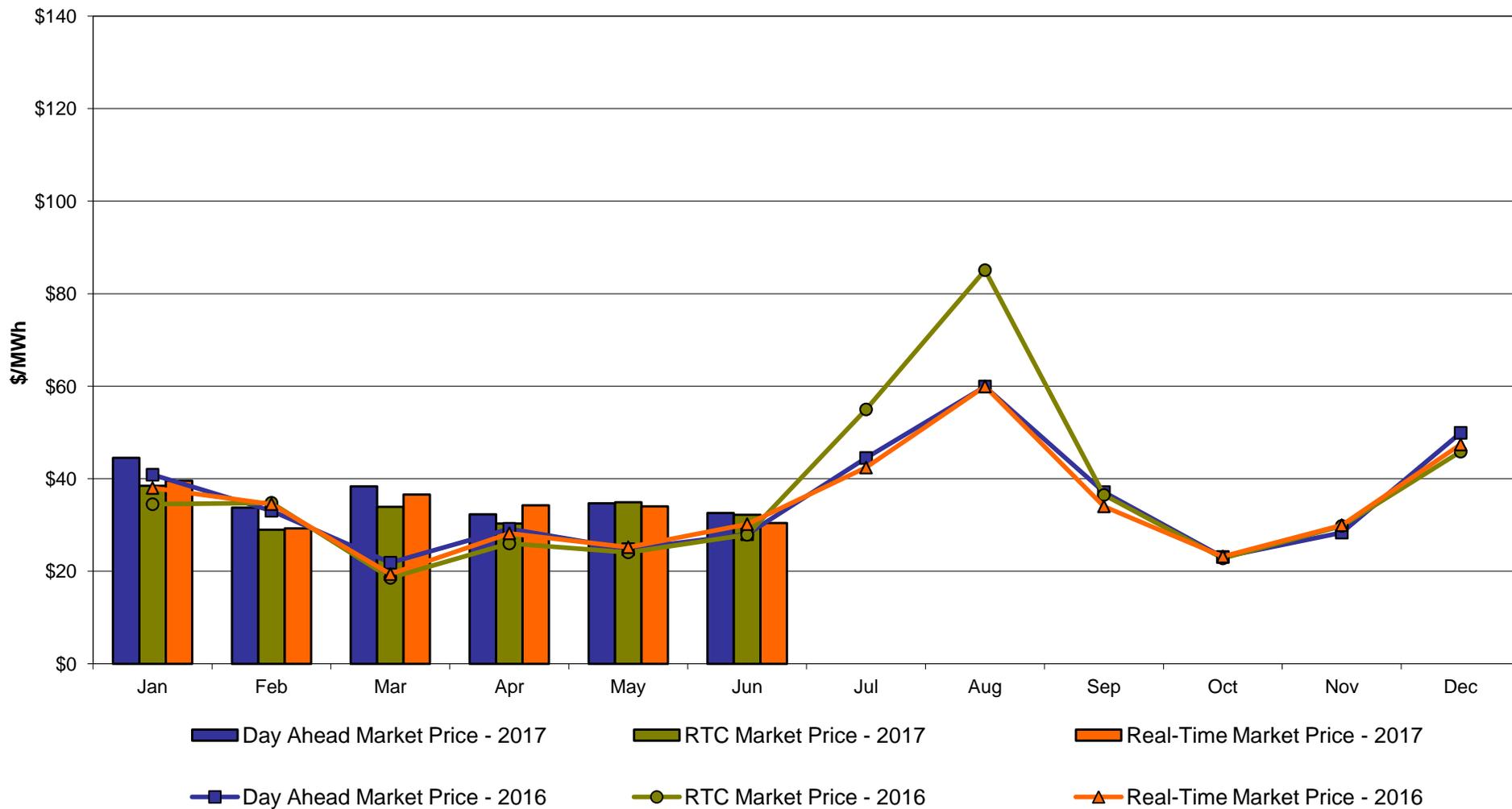
Hudson Valley Zone G Monthly Average LBMP Prices 2016 - 2017



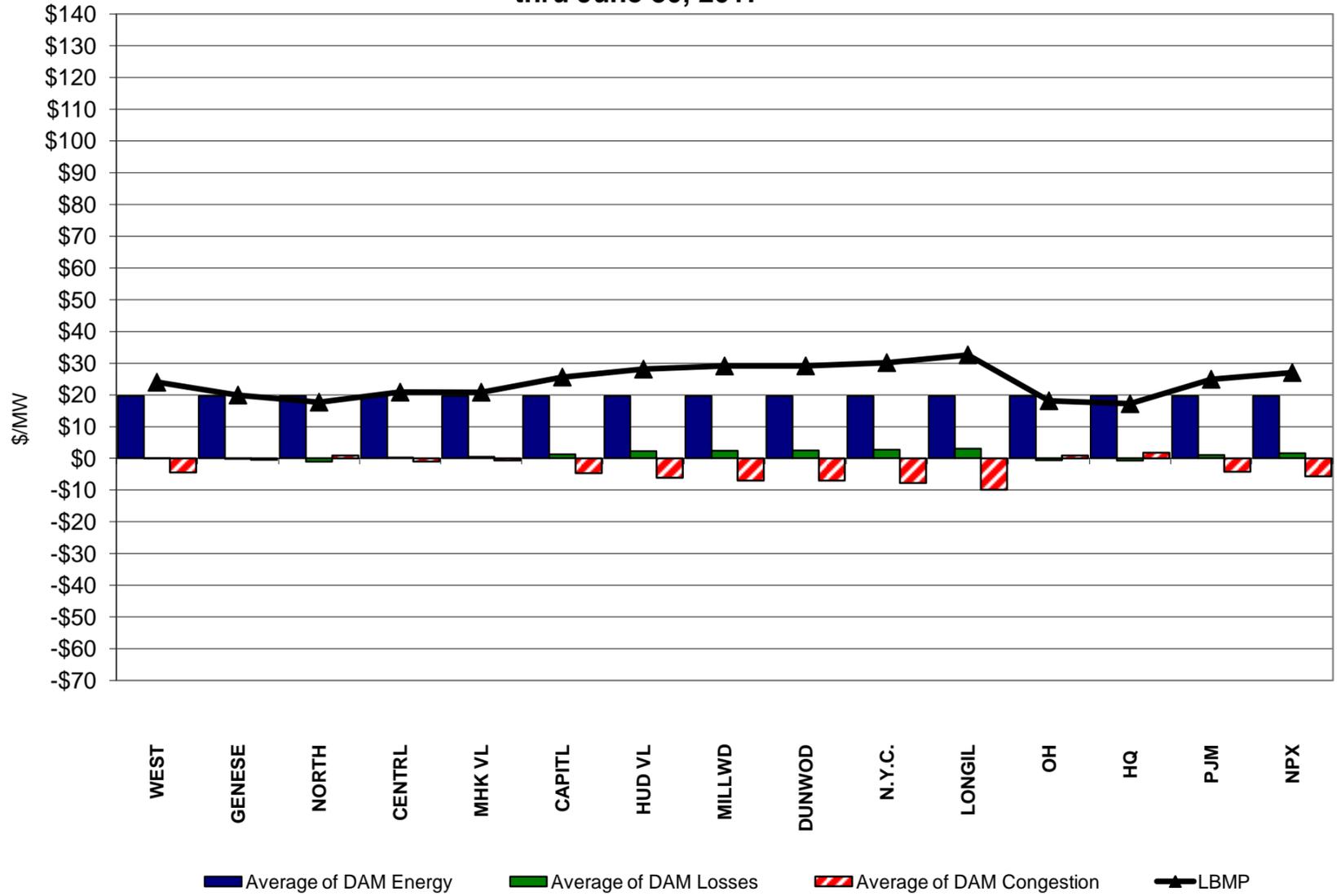
NYC Zone J Monthly Average LBMP Prices 2016 - 2017



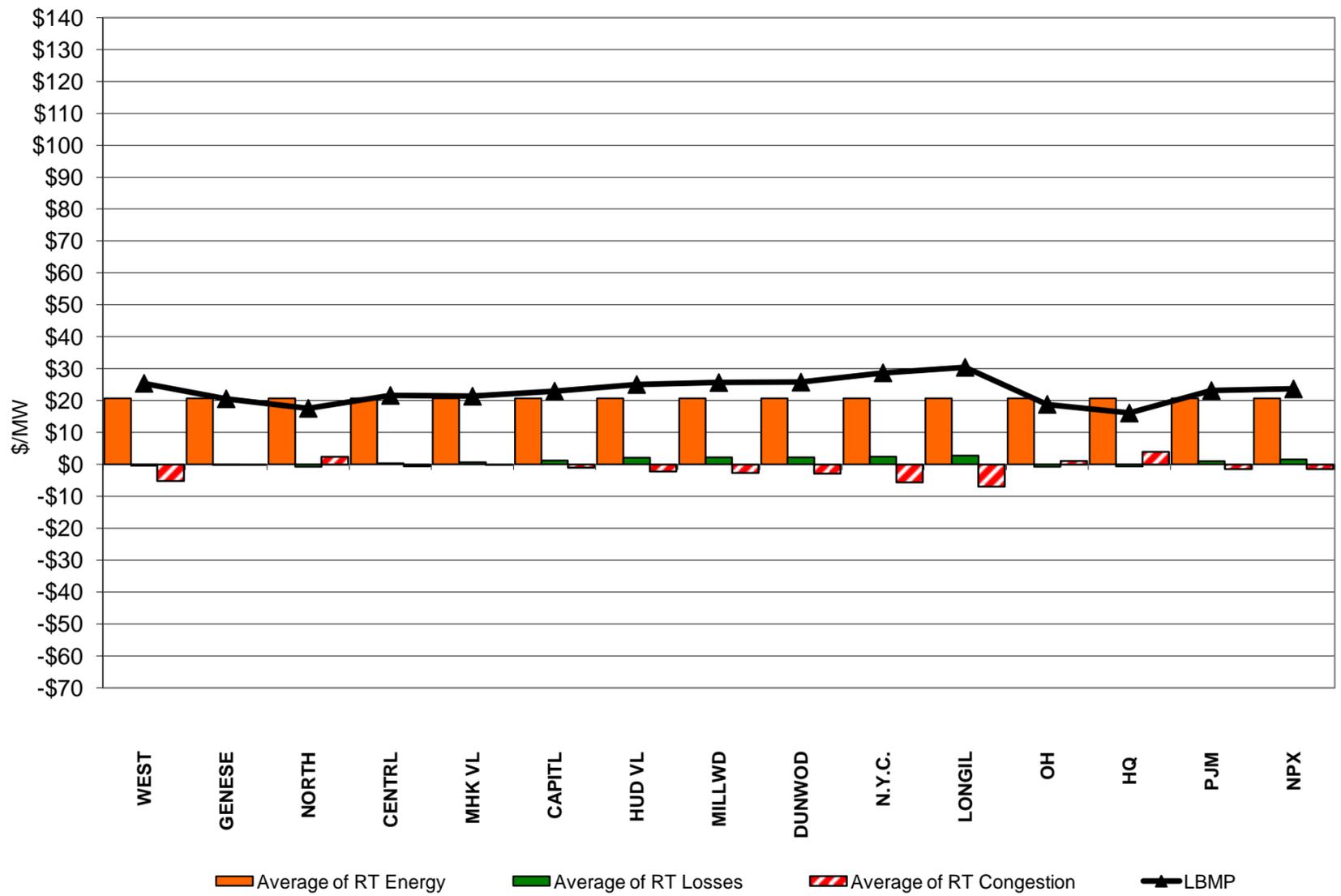
Long Island Zone K Monthly Average LBMP Prices 2016 - 2017



**DAM Zonal Unweighted Monthly Average LBMP Components
thru June 30, 2017**

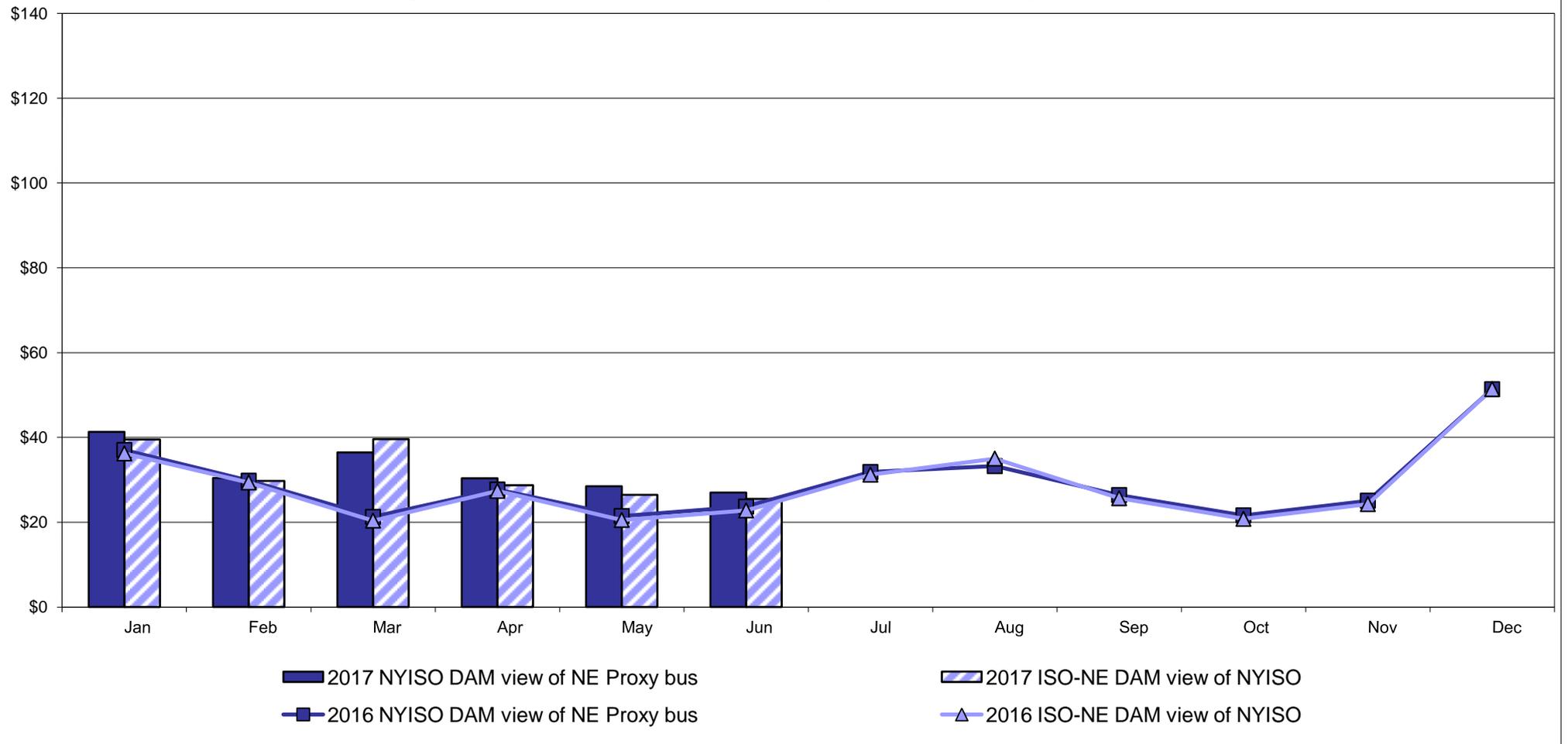


**RT Zonal Unweighted Monthly Average LBMP Components
thru June 30, 2017**

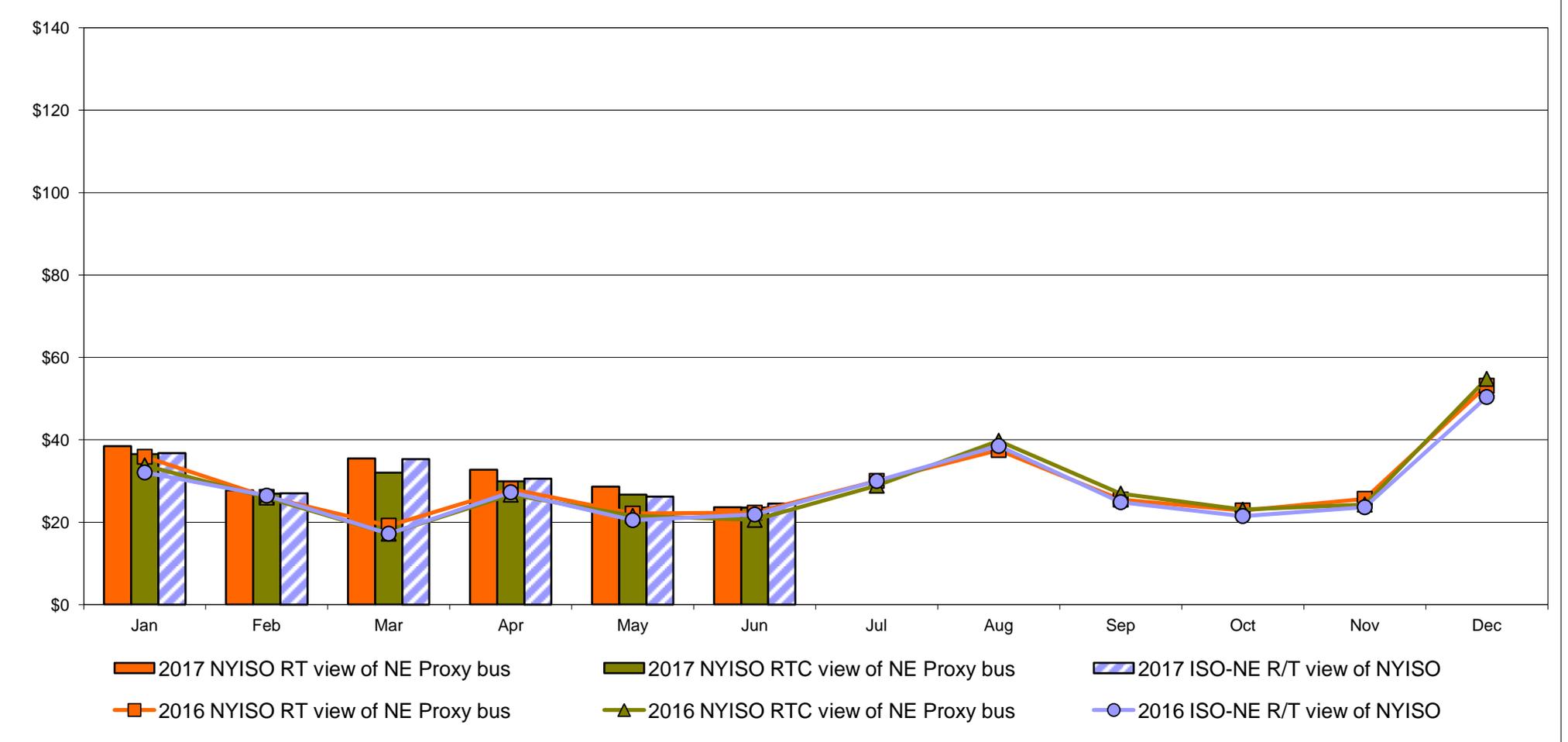


External Comparison ISO-New England

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

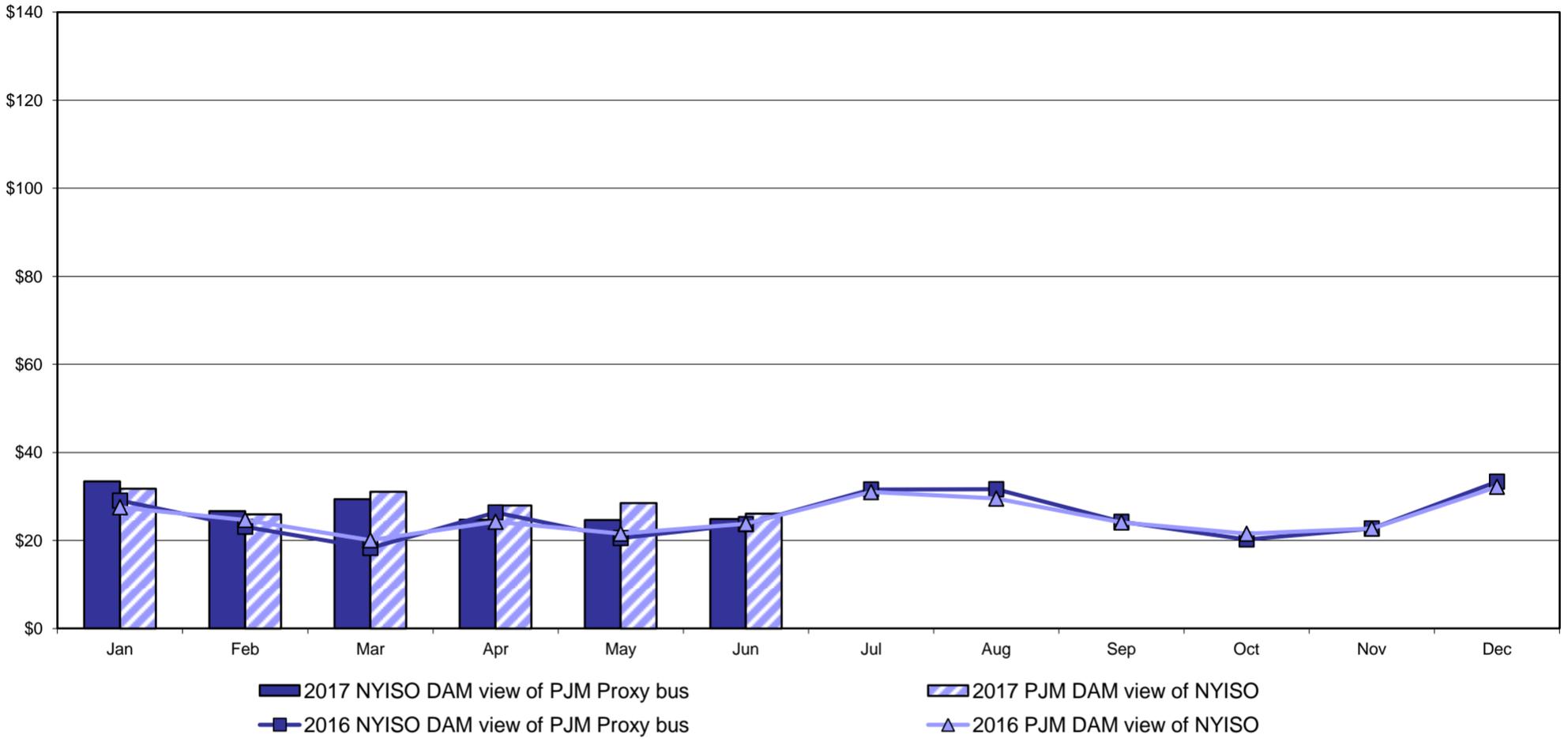


Real Time Market External Zone Comparison: ISO-NE (\$/MWh)

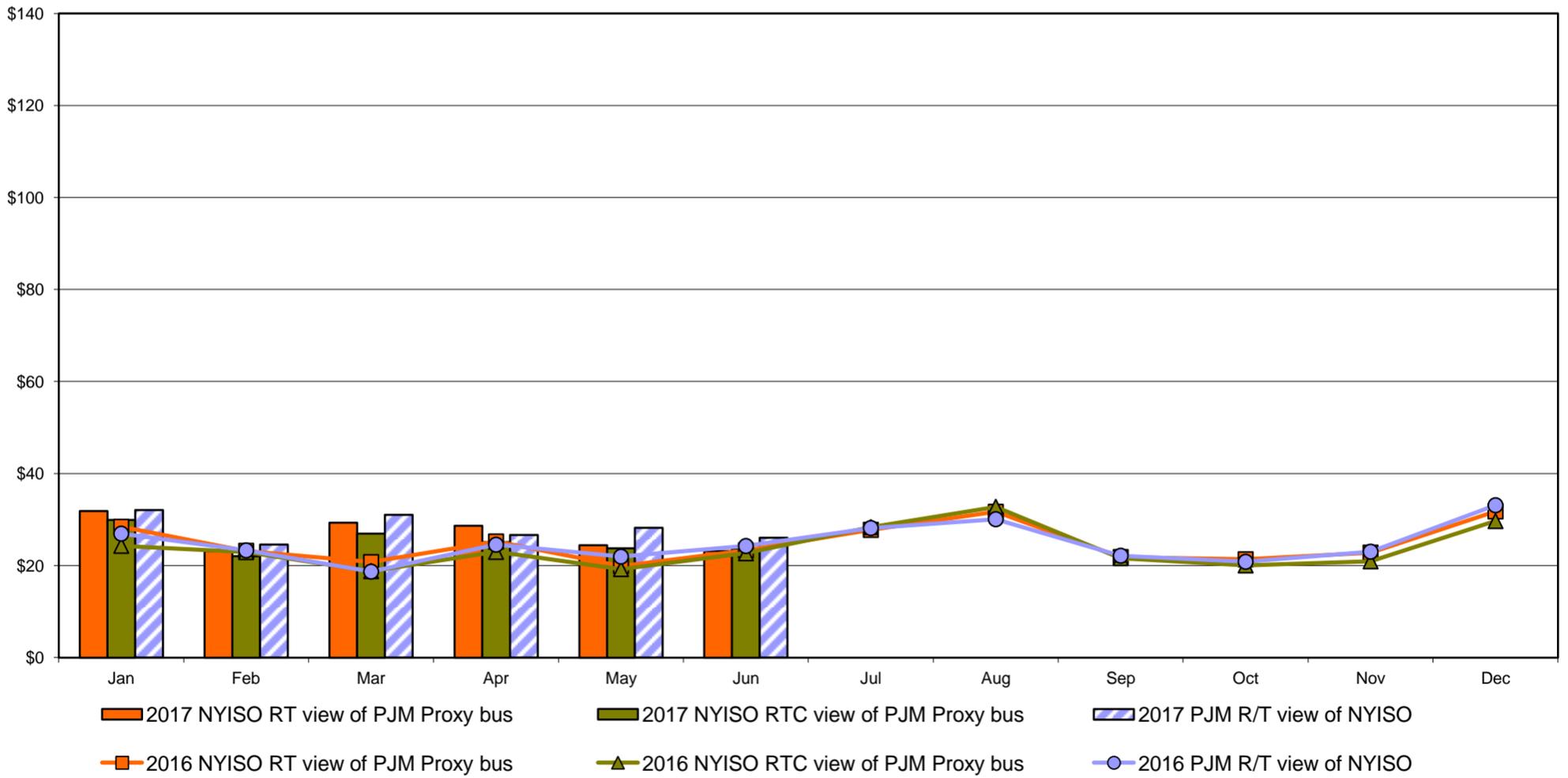


External Comparison PJM

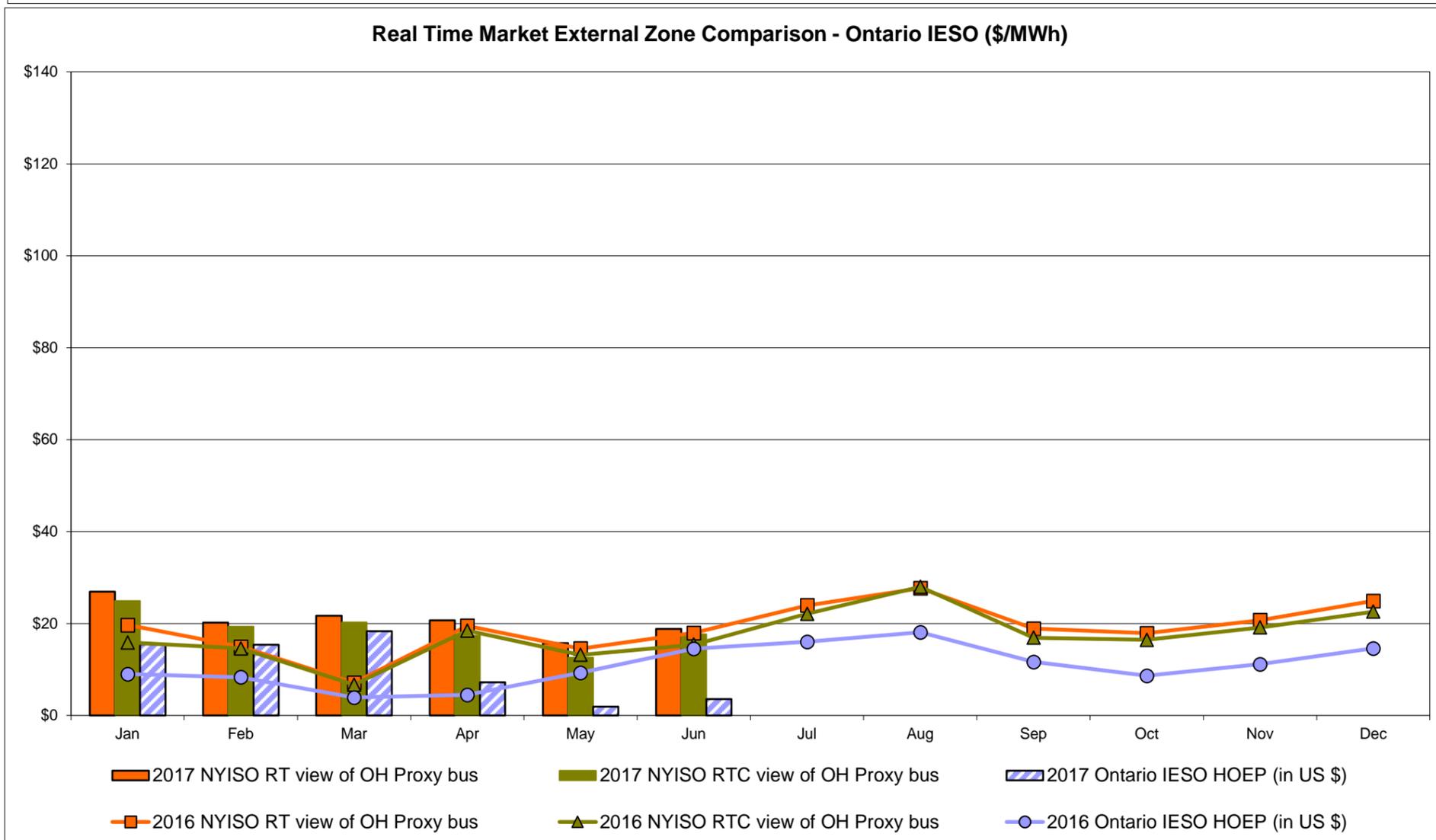
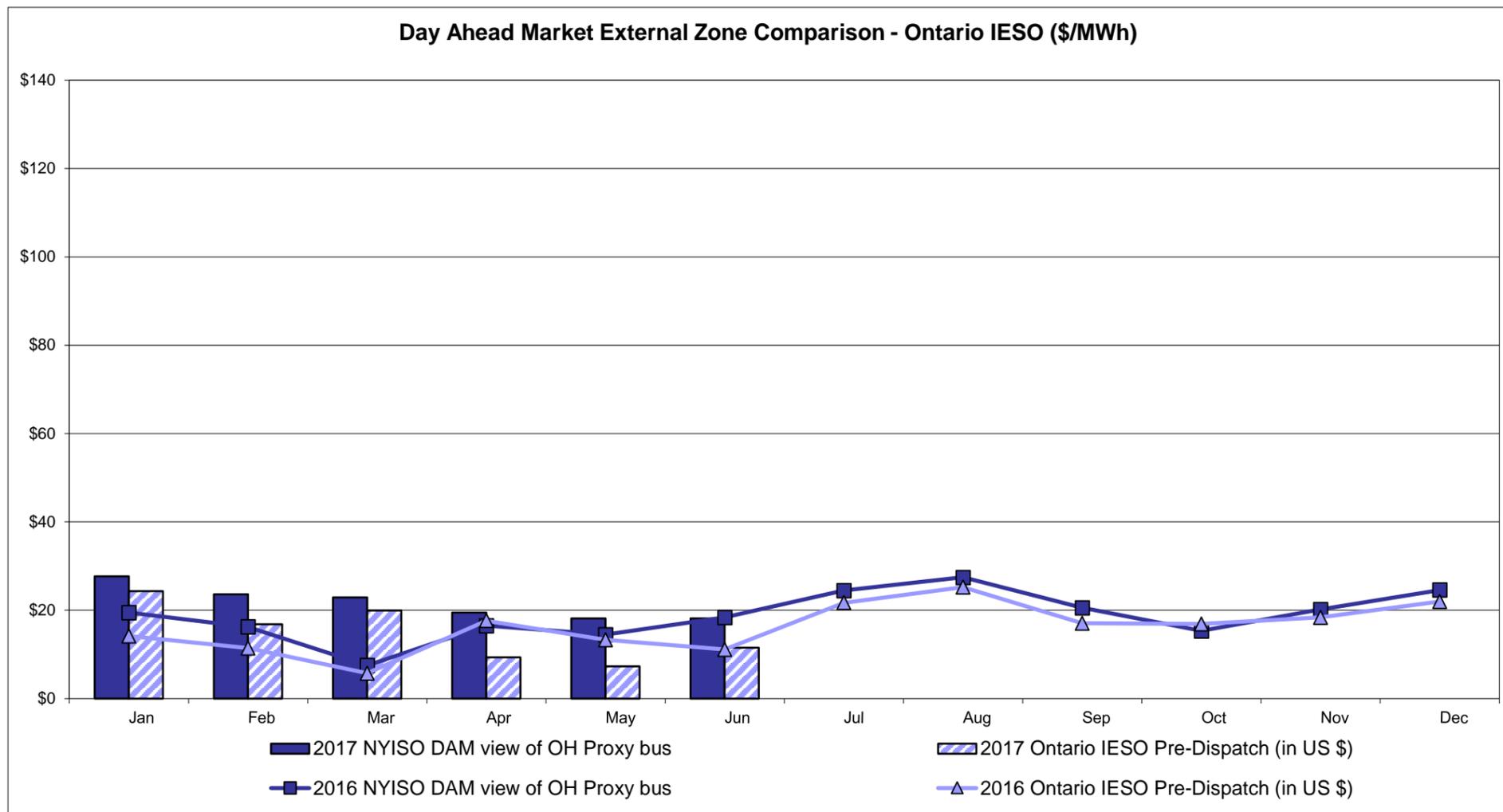
Day Ahead Market External Zone Comparison - PJM (\$/MWh)



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

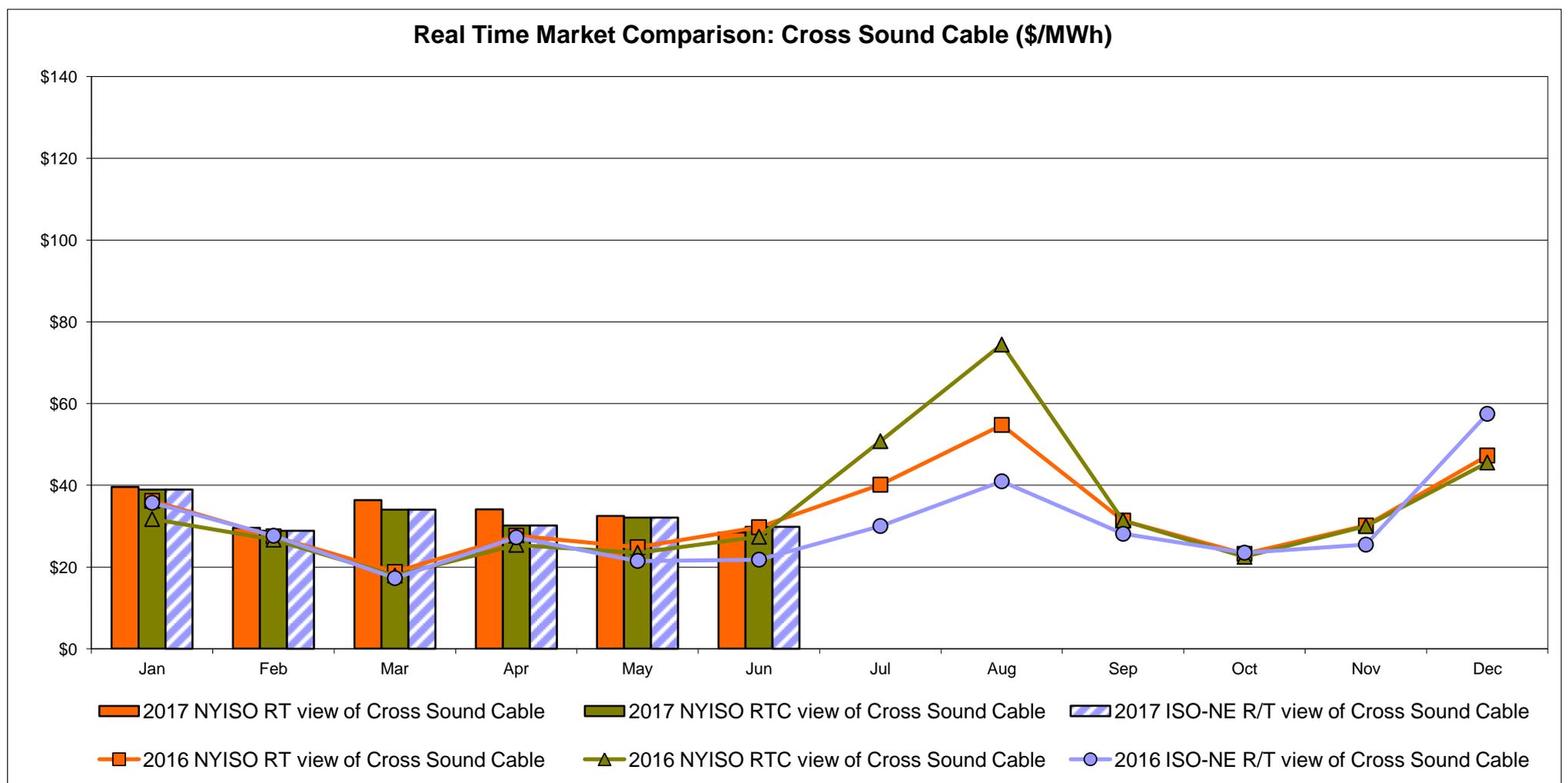
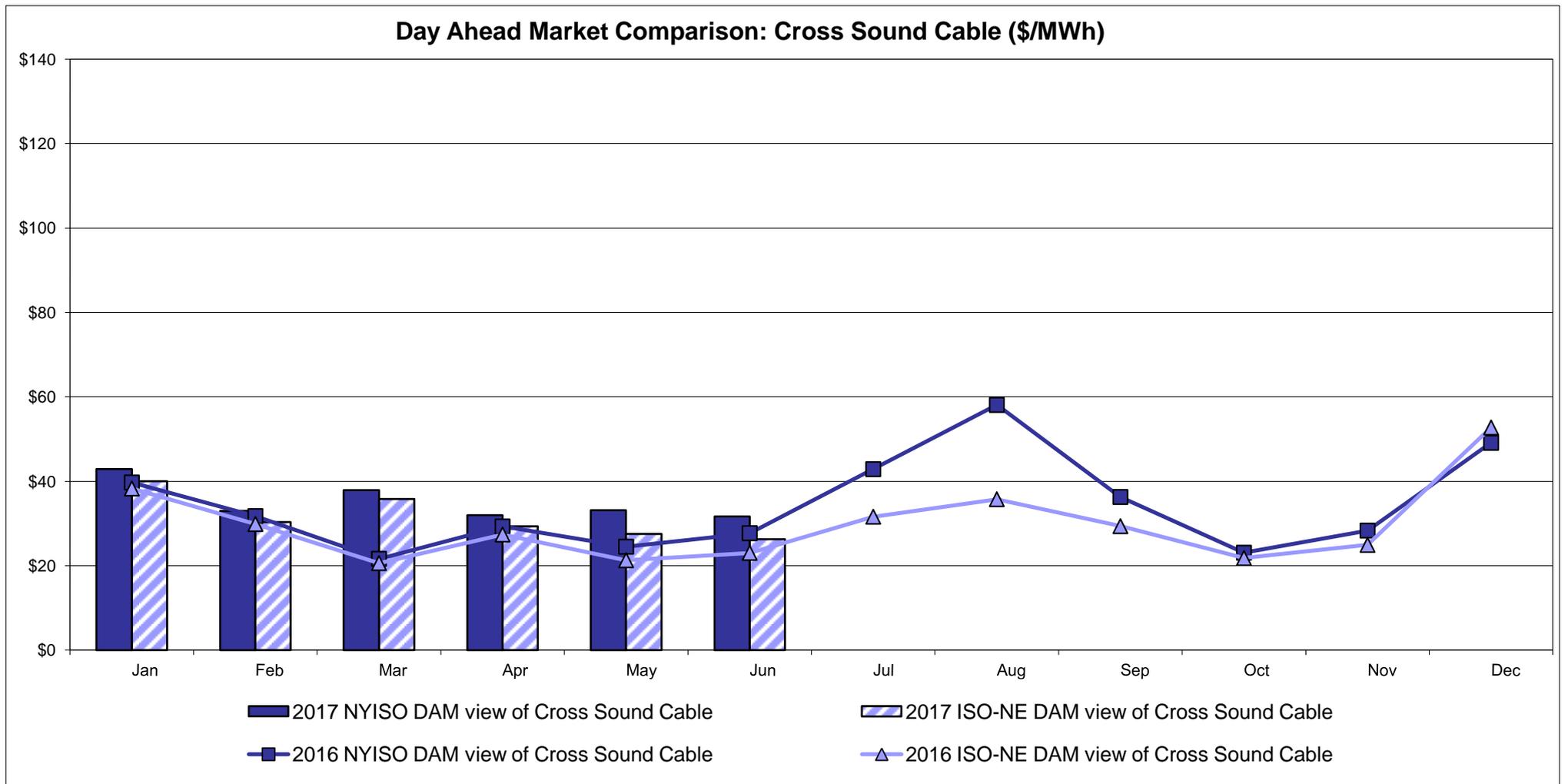


External Comparison Ontario IESO



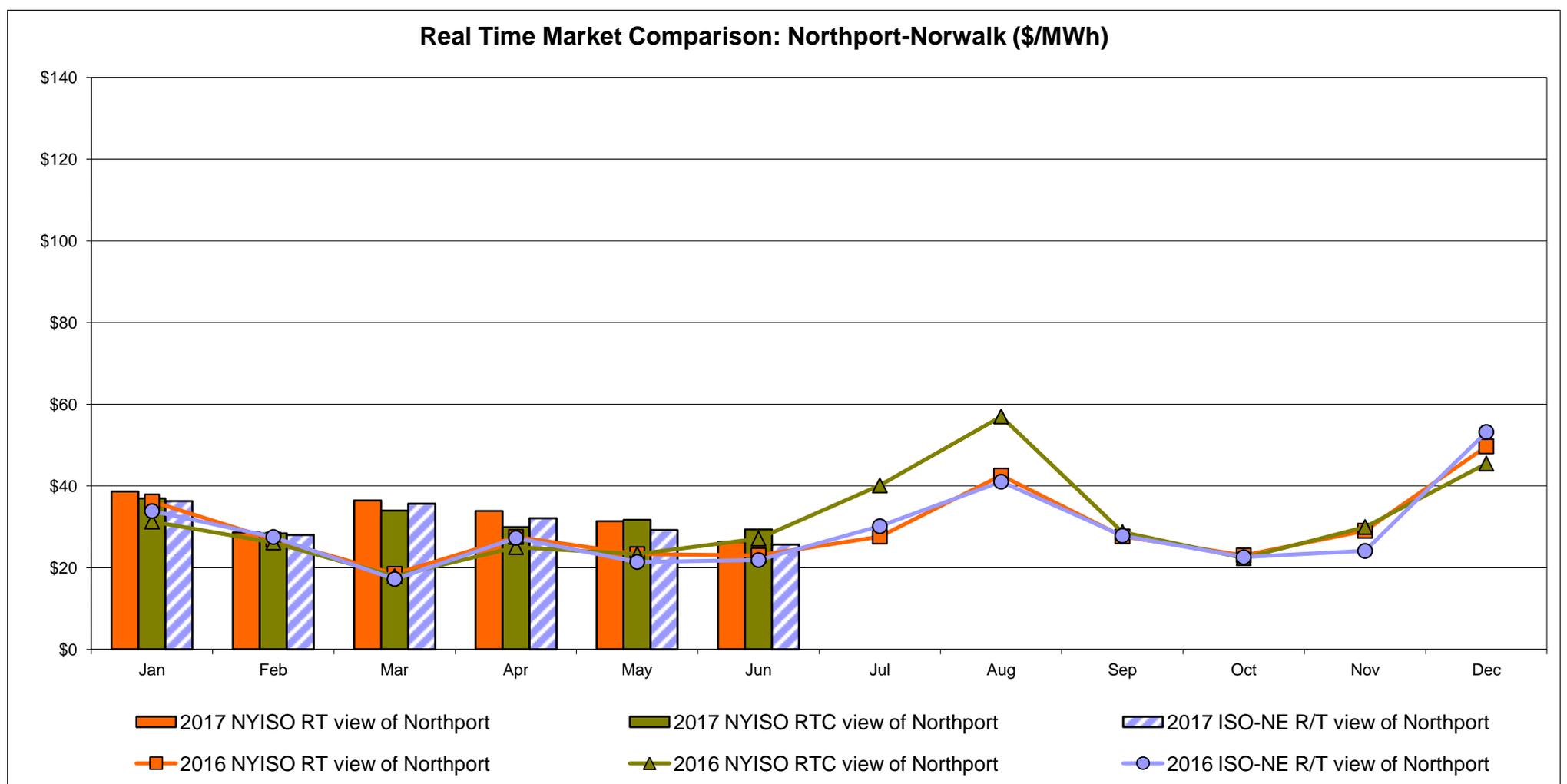
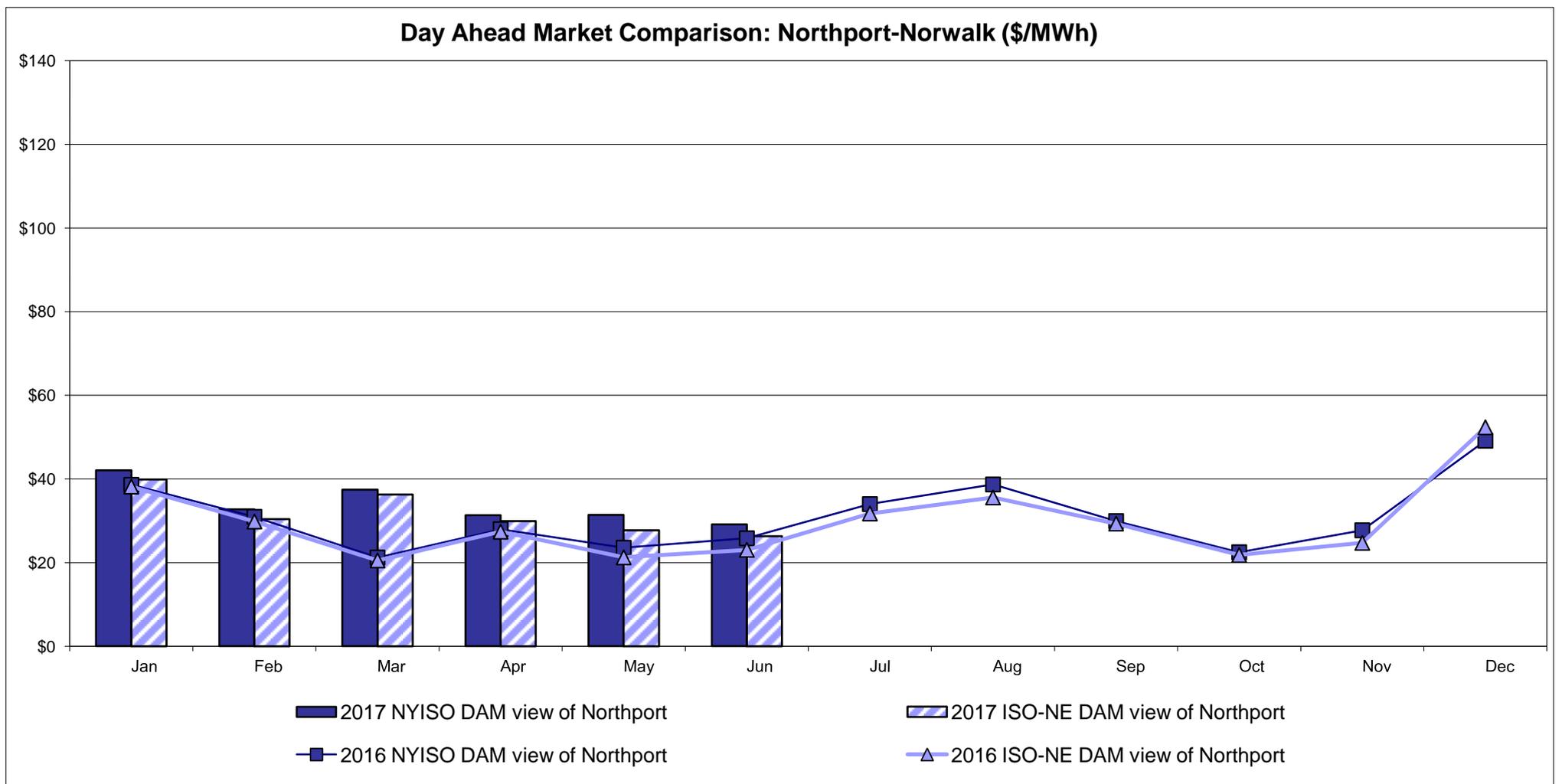
Notes: Exchange factor used for June 2017 was 0.752162467 to US
 HOEP: Hourly Ontario Energy Price
 Pre-Dispatch: Projected Energy Price

External Controllable Line: Cross Sound Cable (New England)



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

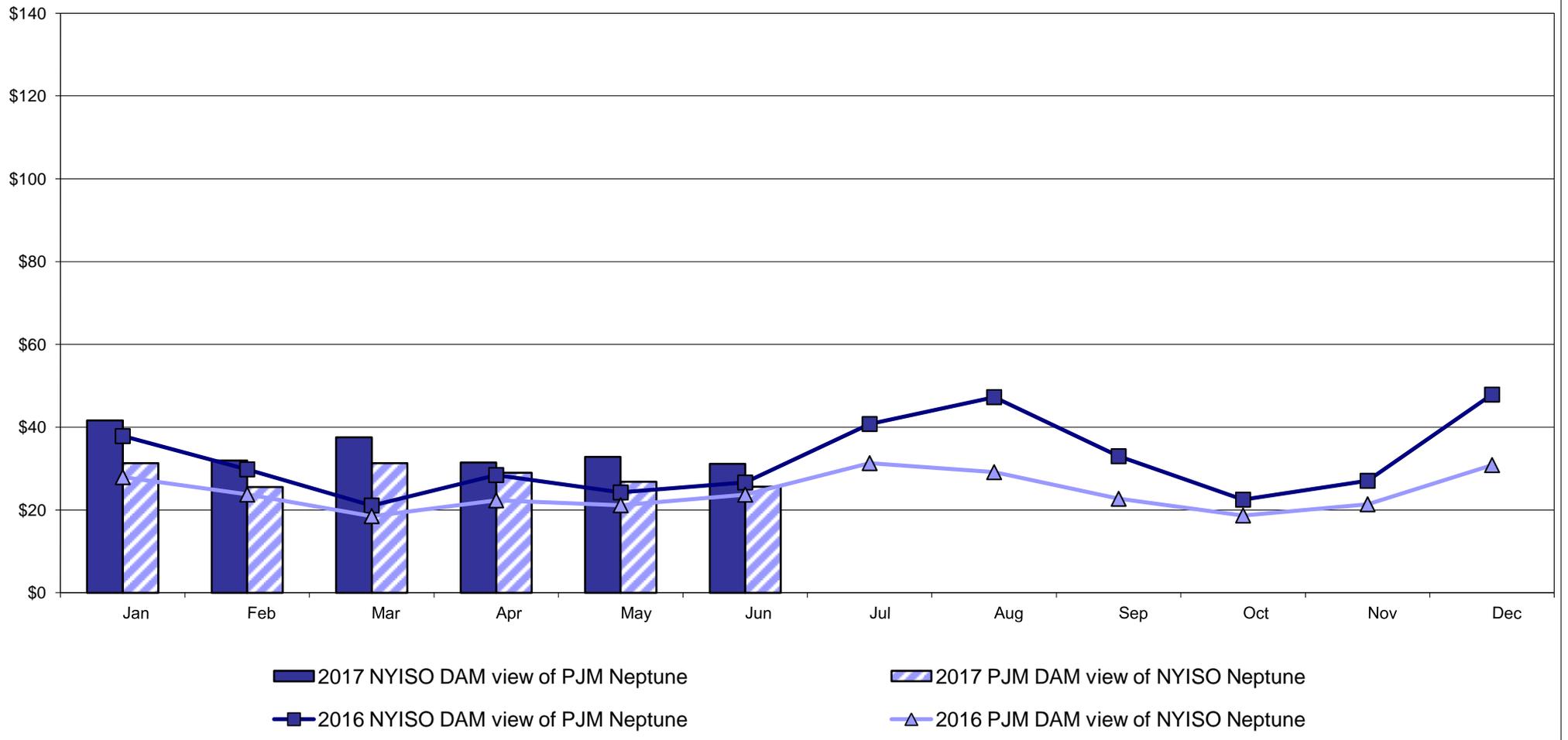
External Controllable Line: Northport - Norwalk (New England)



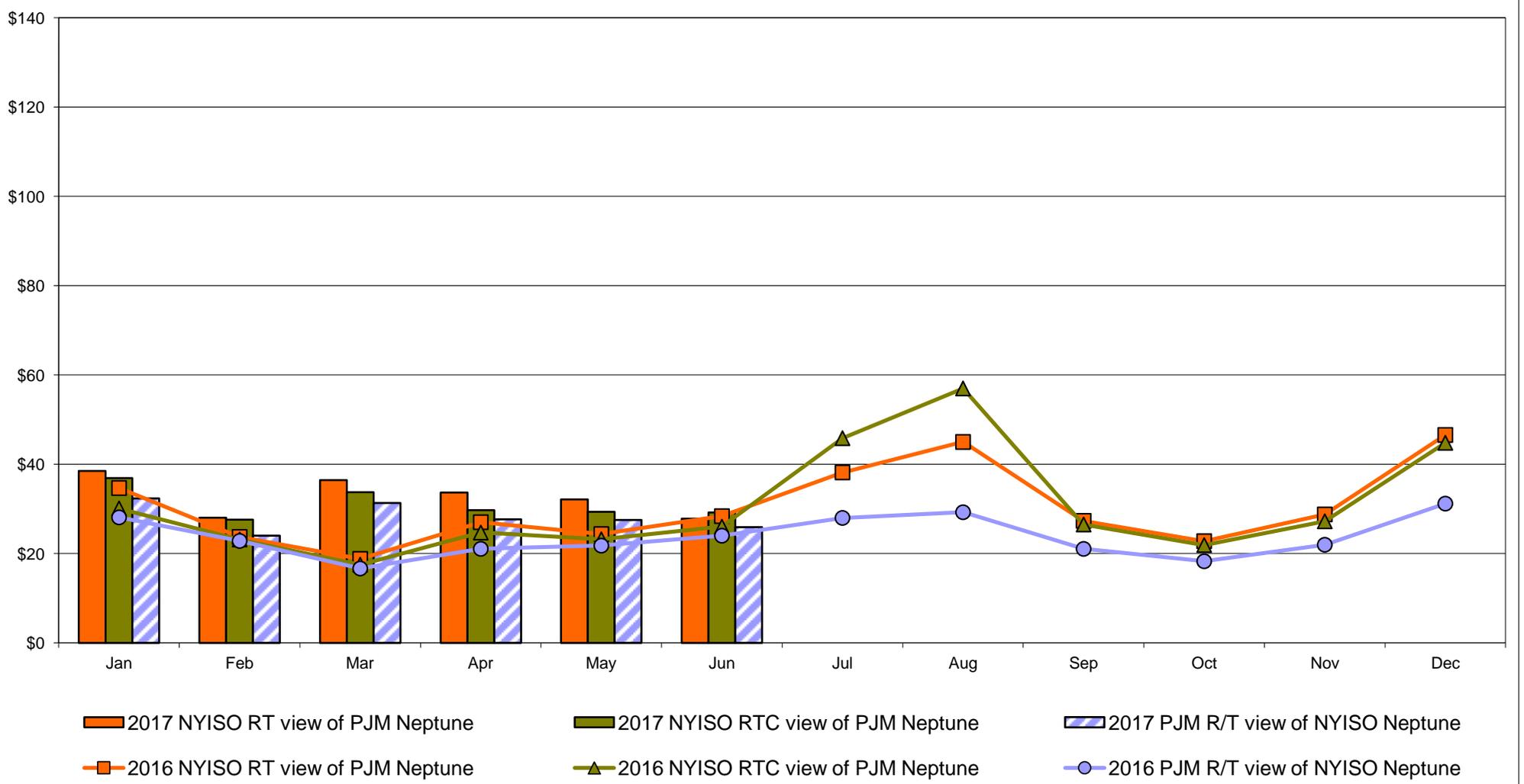
Note:
 ISO-NE Forecast is an advisory posting @ 18:00 day before.
 The DAM and R/T prices at the Northport 138 interface are used for ISO-NE.
 The DAM and R/T prices at the 1385 interface are used for NYISO.

External Controllable Line: Neptune (PJM)

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

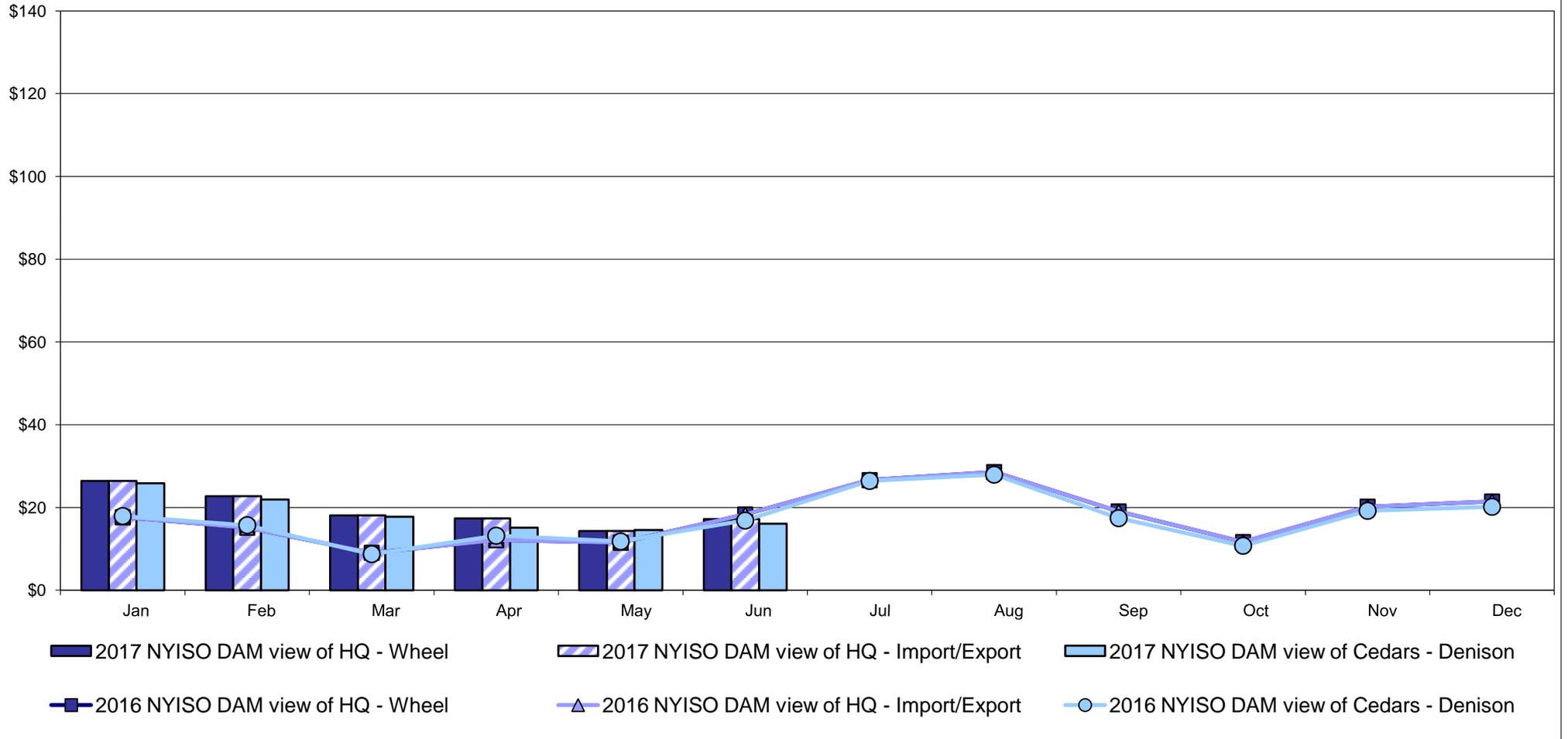


Real Time Market Comparison: Neptune (\$/MWh)

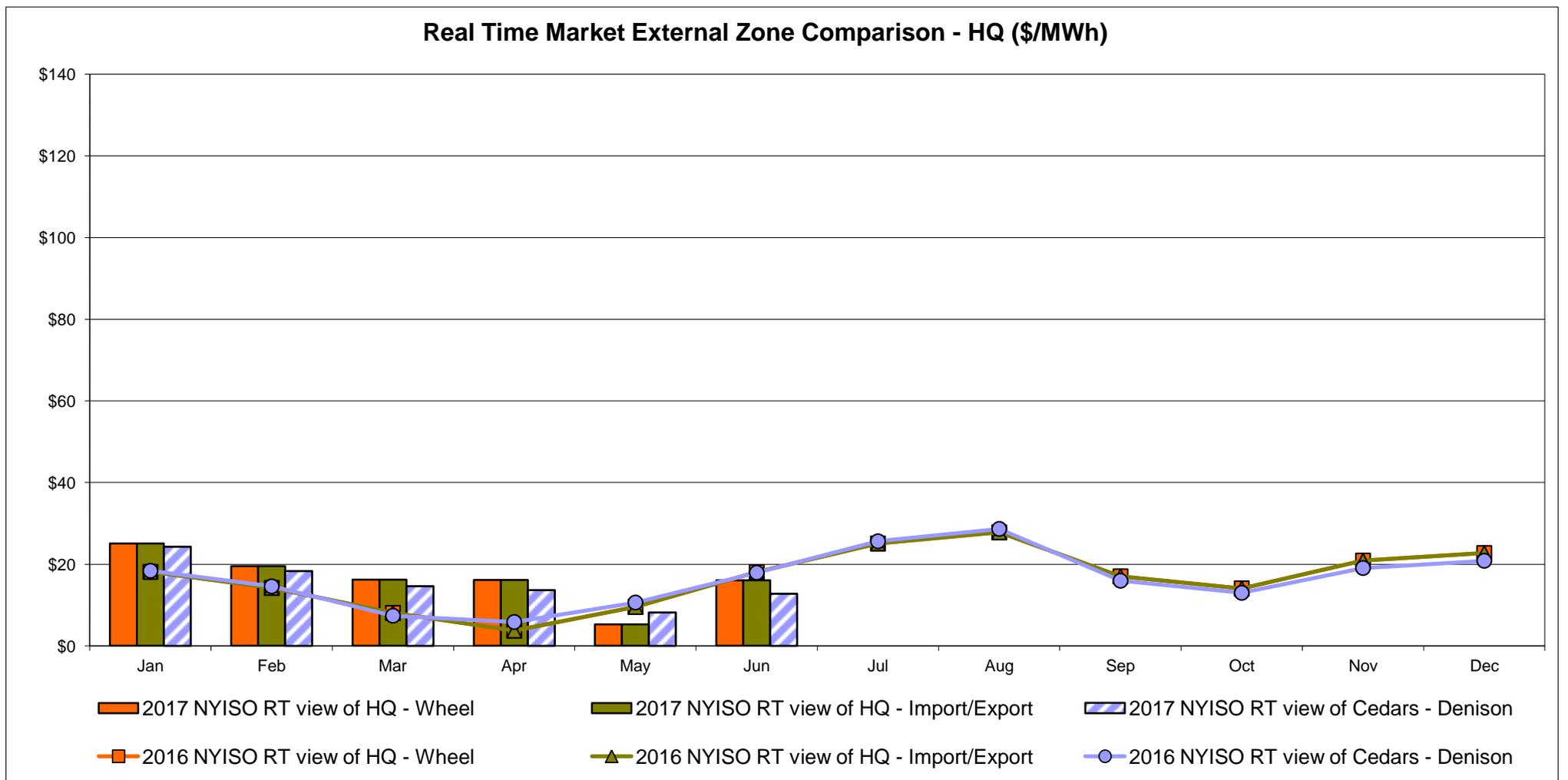


External Comparison Hydro-Quebec

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

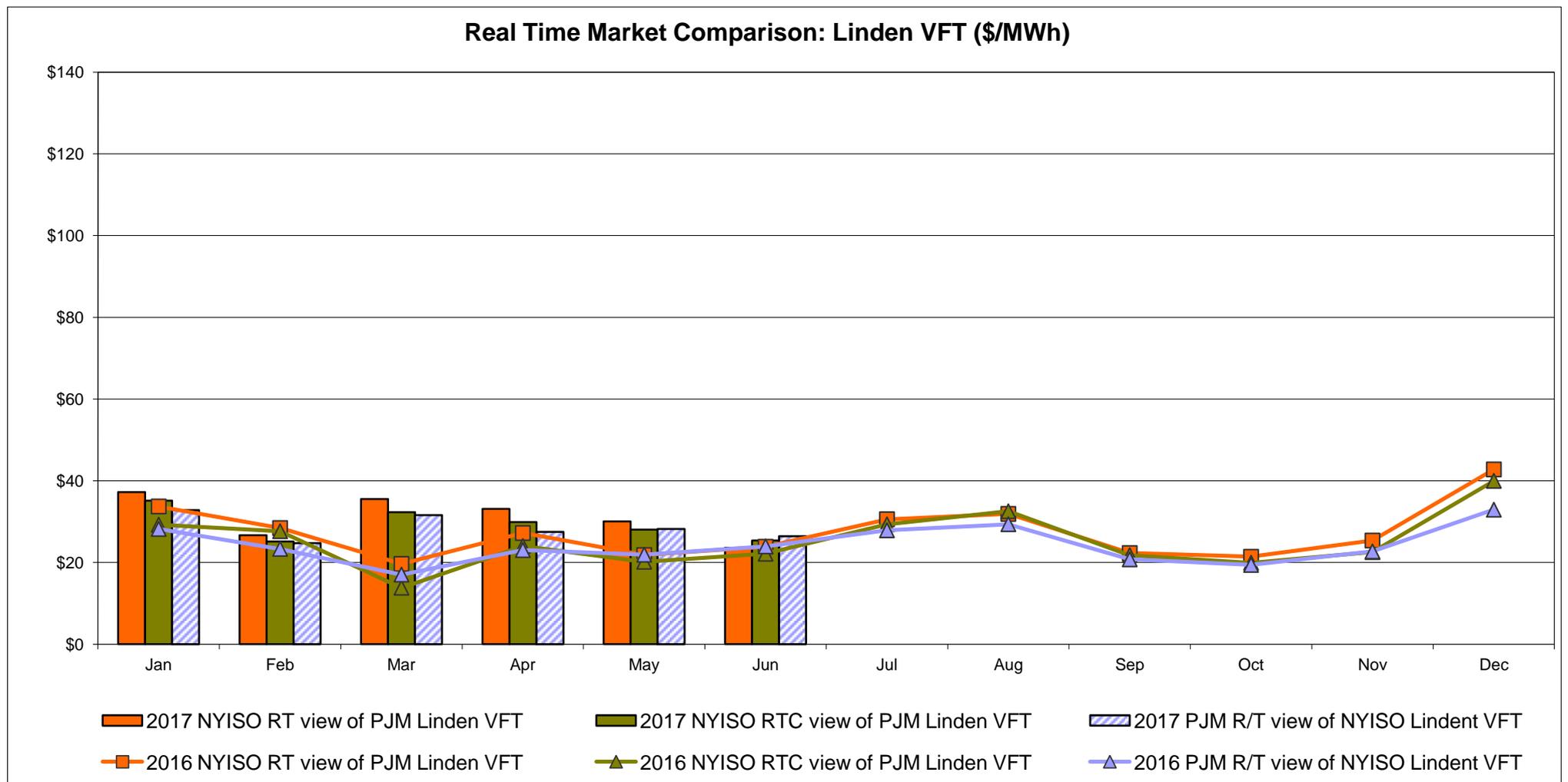
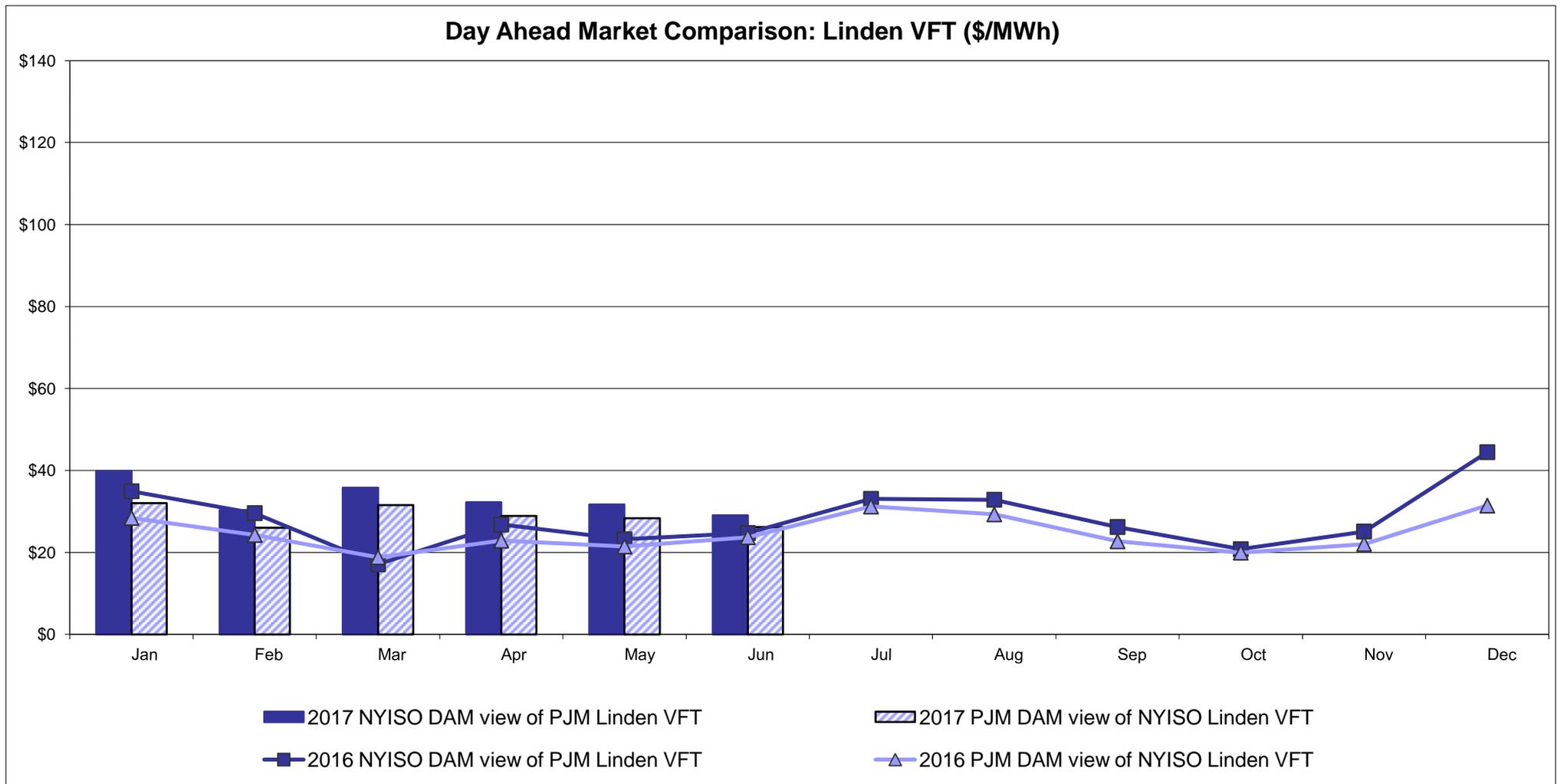


Real Time Market External Zone Comparison - HQ (\$/MWh)

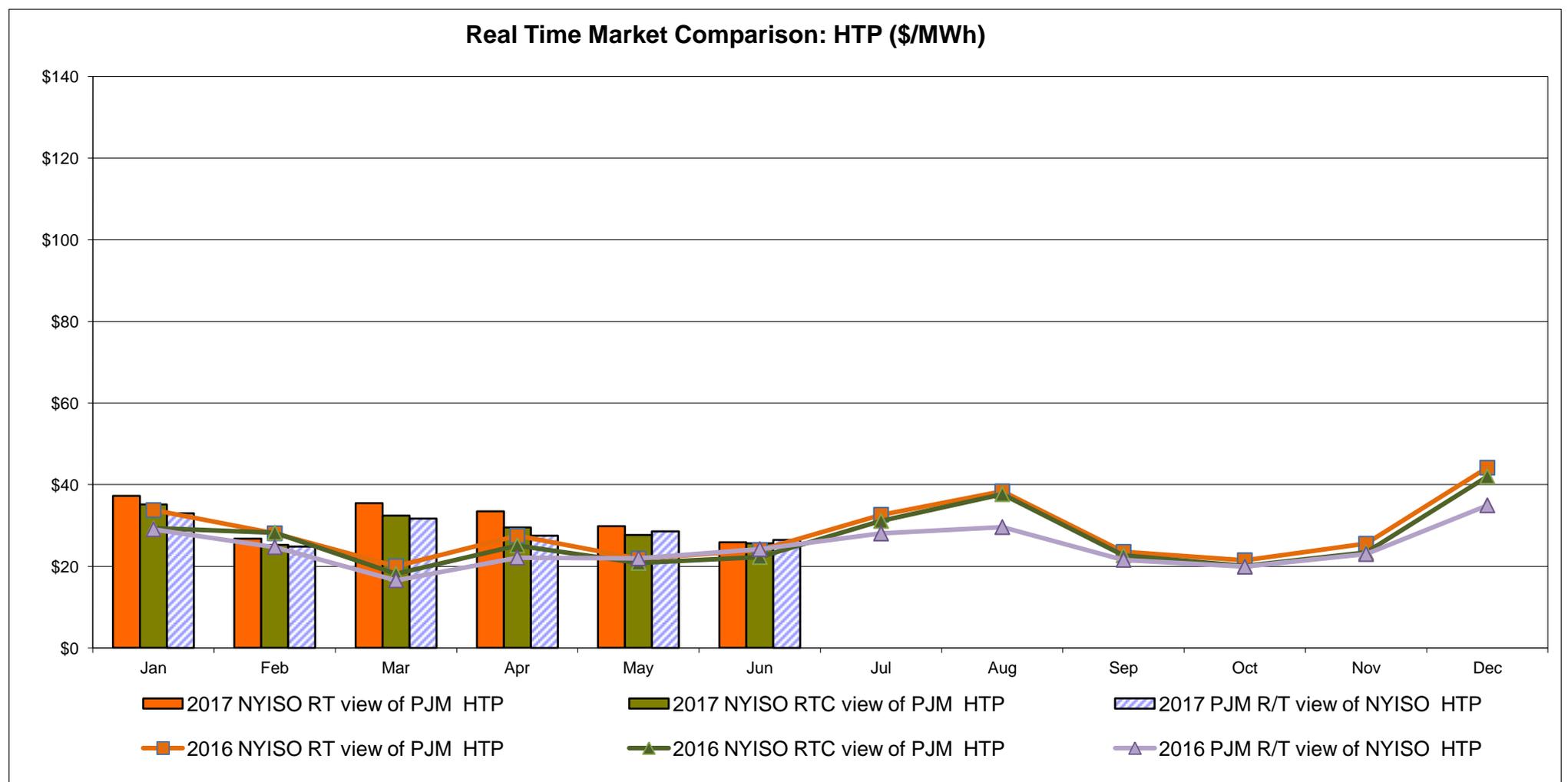
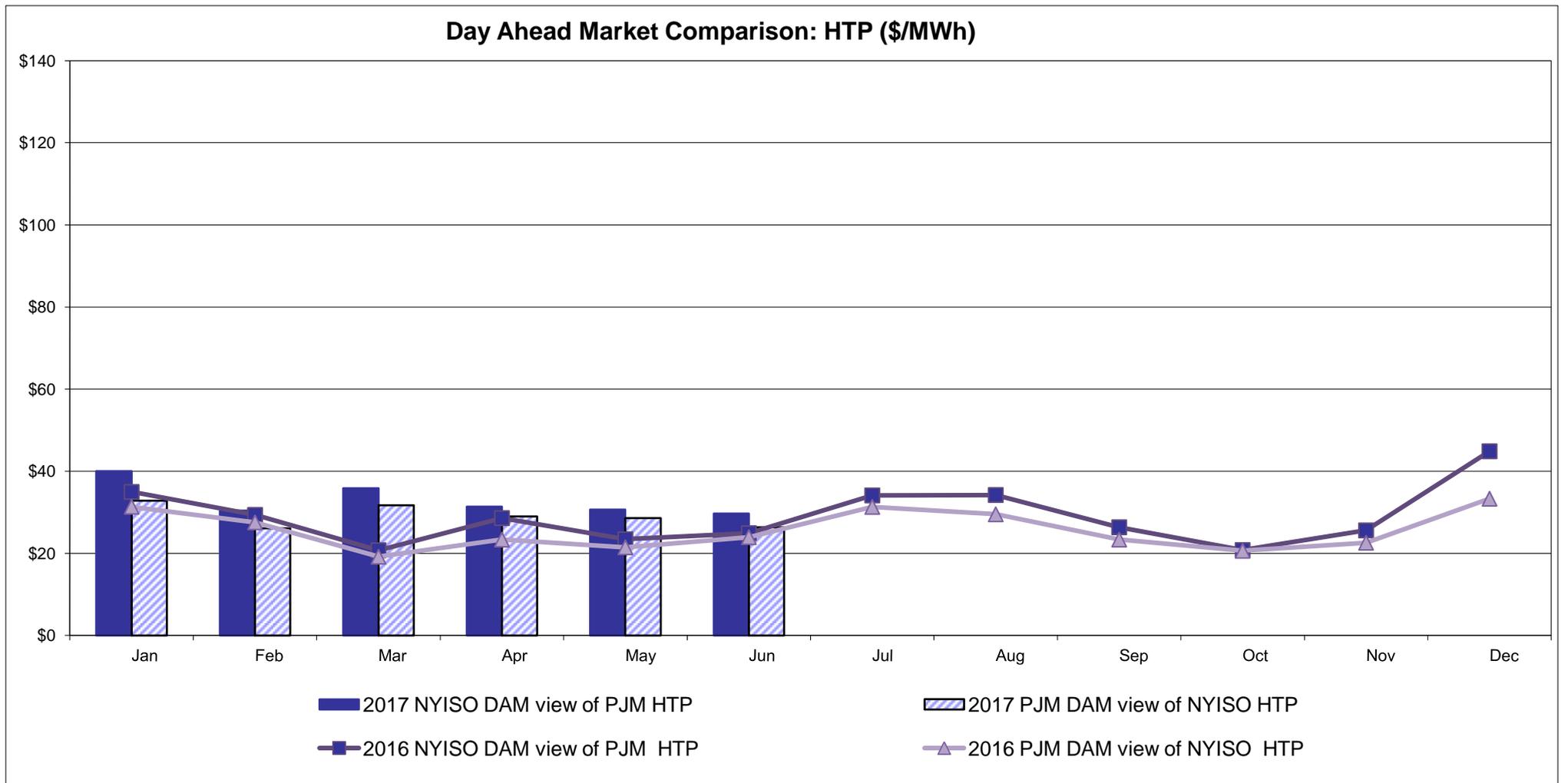


Note:
Hydro-Quebec Prices are unavailable.

External Controllable Line: Linden VFT (PJM)



External Controllable Line: Hudson (PJM)

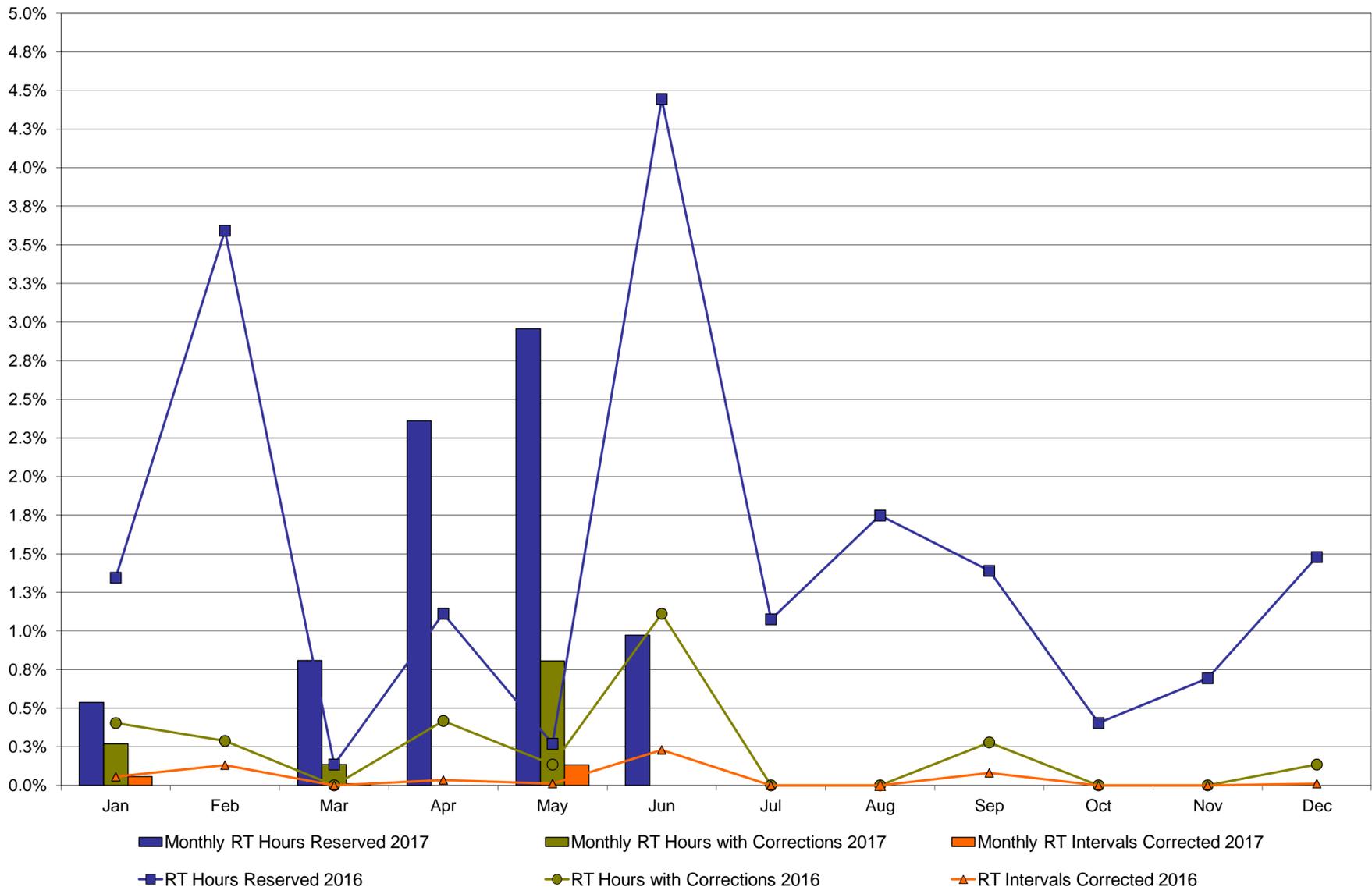


NYISO Real Time Price Correction Statistics

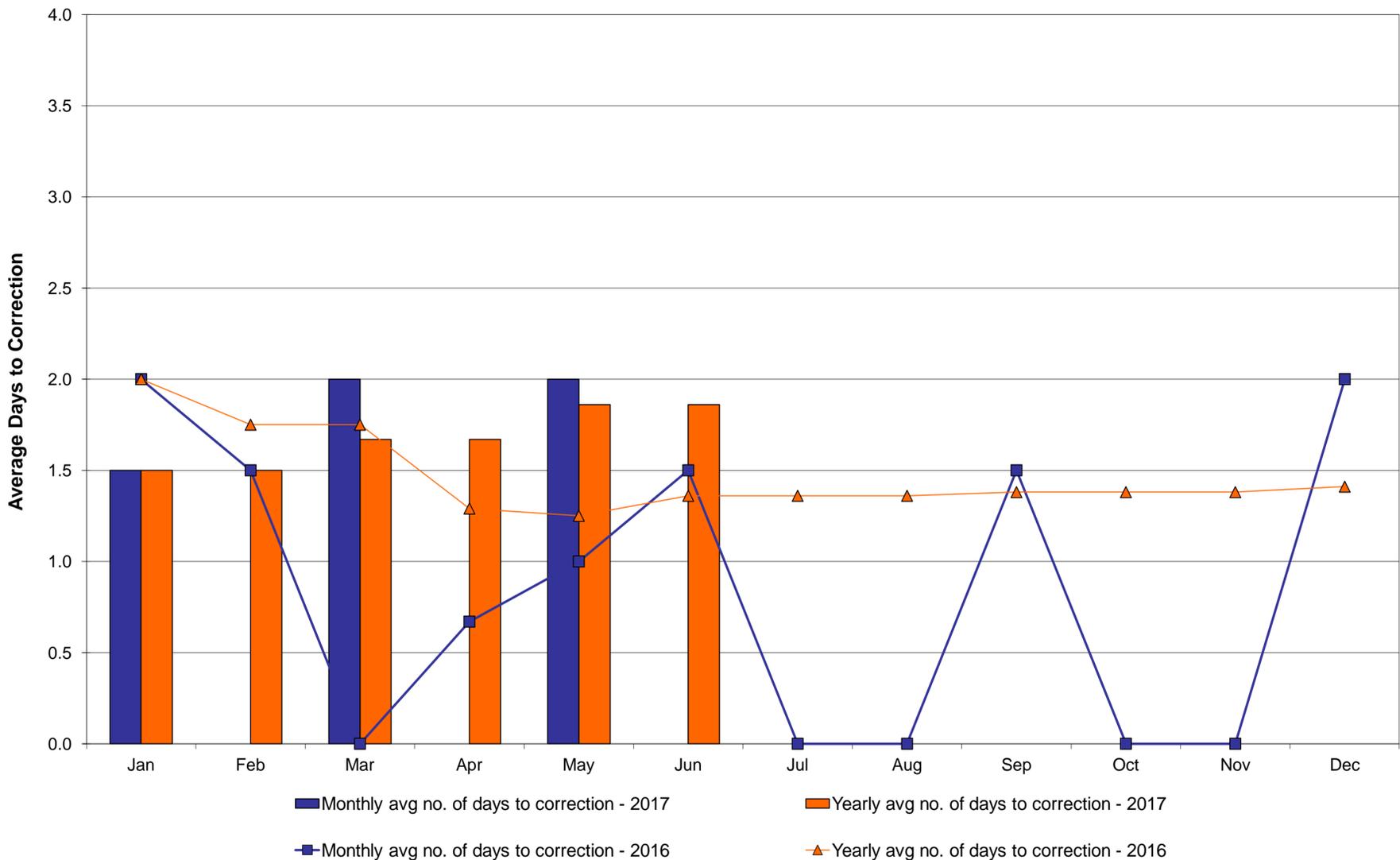
2017		January	February	March	April	May	June	July	August	September	October	November	December
Hour Corrections													
Number of hours with corrections	in the month	2	0	1	0	6	0						
Number of hours	in the month	744	672	743	720	744	720						
% of hours with corrections	in the month	0.27%	0.00%	0.13%	0.00%	0.81%	0.00%						
% of hours with corrections	year-to-date	0.27%	0.14%	0.14%	0.10%	0.25%	0.21%						
Interval Corrections													
Number of intervals corrected	in the month	5	0	1	0	12	0						
Number of intervals	in the month	8,983	8,101	9,026	8,745	9,004	8,712						
% of intervals corrected	in the month	0.06%	0.00%	0.01%	0.00%	0.13%	0.00%						
% of intervals corrected	year-to-date	0.06%	0.03%	0.02%	0.02%	0.04%	0.03%						
Hours Reserved													
Number of hours reserved	in the month	4	0	6	17	22	7						
Number of hours	in the month	744	672	743	720	744	720						
% of hours reserved	in the month	0.54%	0.00%	0.81%	2.36%	2.96%	0.97%						
% of hours reserved	year-to-date	0.54%	0.28%	0.46%	0.94%	1.35%	1.29%						
Days to Correction *													
Avg. number of days to correction	in the month	1.50	0.00	2.00	0.00	2.00	0.00						
Avg. number of days to correction	year-to-date	1.50	1.50	1.67	1.67	1.86	1.86						
Days Without Corrections													
Days without corrections	in the month	29	28	30	30	27	30						
Days without corrections	year-to-date	29	57	87	117	144	174						
2016		January	February	March	April	May	June	July	August	September	October	November	December
Hour Corrections													
Number of hours with corrections	in the month	3	2	0	3	1	8	0	0	2	0	0	1
Number of hours	in the month	744	696	743	720	744	720	744	744	720	744	721	744
% of hours with corrections	in the month	0.40%	0.29%	0.00%	0.42%	0.13%	1.11%	0.00%	0.00%	0.28%	0.00%	0.00%	0.13%
% of hours with corrections	year-to-date	0.40%	0.35%	0.23%	0.28%	0.25%	0.39%	0.33%	0.29%	0.29%	0.26%	0.24%	0.23%
Interval Corrections													
Number of intervals corrected	in the month	5	11	0	3	1	20	0	0	7	0	0	1
Number of intervals	in the month	9,000	8,440	8,995	8,724	8,987	8,725	9,038	9,048	8,713	8,960	8,724	9,034
% of intervals corrected	in the month	0.06%	0.13%	0.00%	0.03%	0.01%	0.23%	0.00%	0.00%	0.08%	0.00%	0.00%	0.01%
% of intervals corrected	year-to-date	0.06%	0.09%	0.06%	0.05%	0.05%	0.08%	0.06%	0.06%	0.06%	0.05%	0.05%	0.05%
Hours Reserved													
Number of hours reserved	in the month	10	25	1	8	2	32	8	13	10	3	5	11
Number of hours	in the month	744	696	743	720	744	720	744	744	720	744	721	744
% of hours reserved	in the month	1.34%	3.59%	0.13%	1.11%	0.27%	4.44%	1.08%	1.75%	1.39%	0.40%	0.69%	1.48%
% of hours reserved	year-to-date	1.34%	2.43%	1.65%	1.52%	1.26%	1.79%	1.68%	1.69%	1.66%	1.53%	1.46%	1.46%
Days to Correction *													
Avg. number of days to correction	in the month	2.00	1.50	0.00	0.67	1.00	1.50	0.00	0.00	1.50	0.00	0.00	2.00
Avg. number of days to correction	year-to-date	2.00	1.75	1.75	1.29	1.25	1.36	1.36	1.36	1.38	1.38	1.38	1.41
Days Without Corrections													
Days without corrections	in the month	29	27	31	27	30	24	31	31	28	31	30	30
Days without corrections	year-to-date	29	56	87	114	144	168	199	230	258	289	319	349

* Calendar days from reservation date.

Percentage of Real-Time Corrections

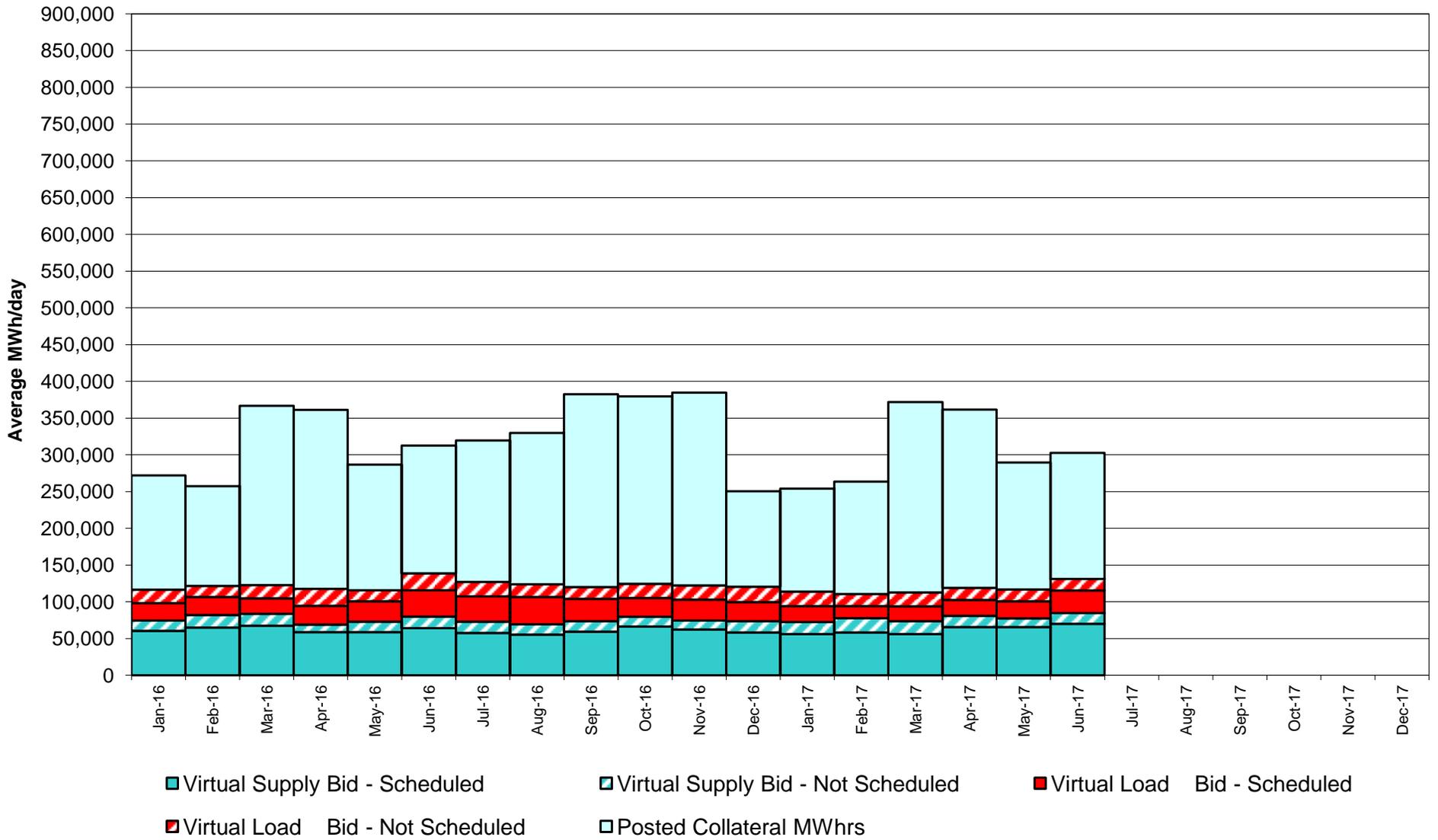


Annual average time period for making Price Corrections (from reservation date) *

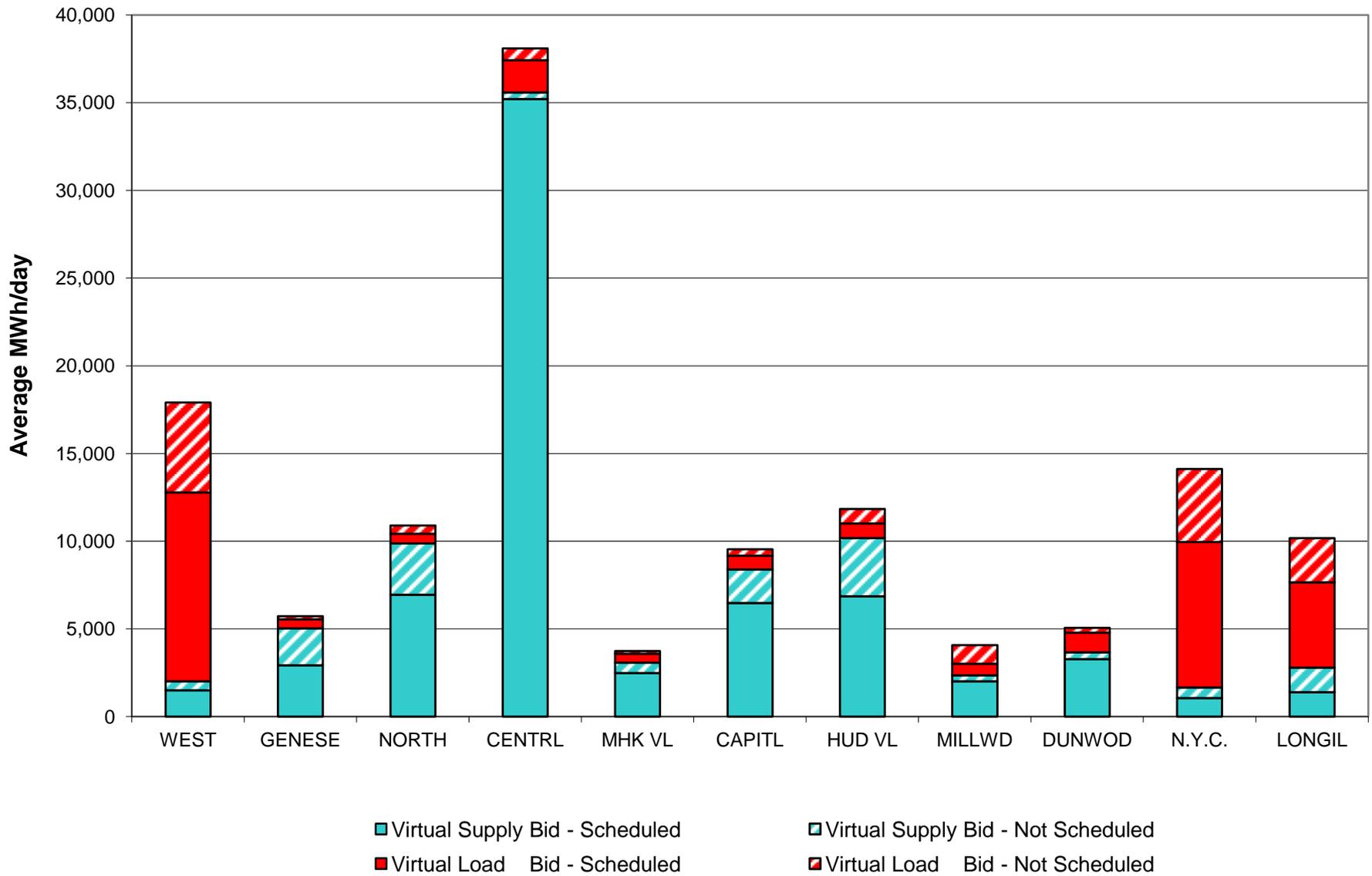


* Calendar days from reservation date.

NYISO Virtual Trading Average MWh per day



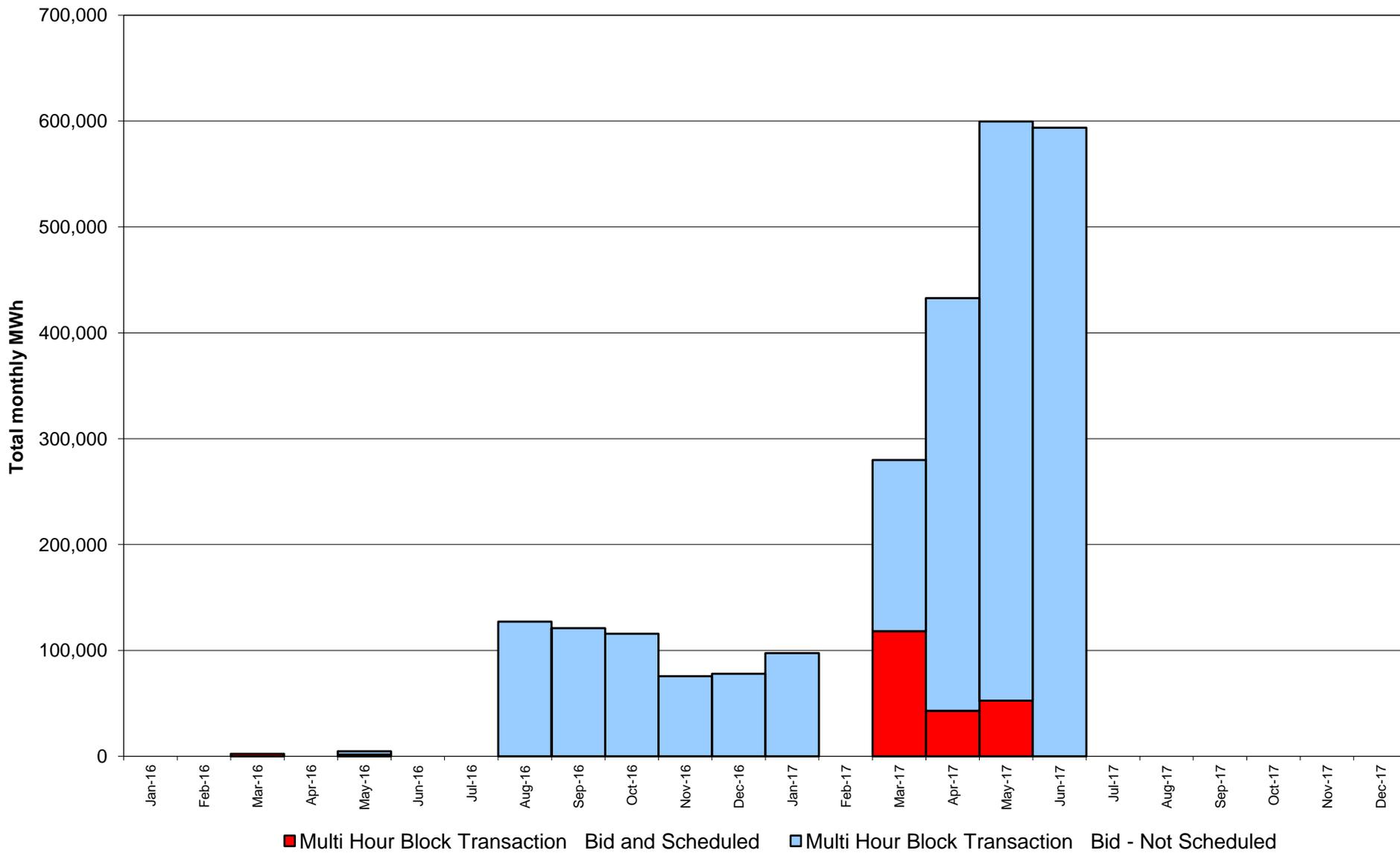
Virtual Load and Supply Zonal Statistics through June 30, 2017



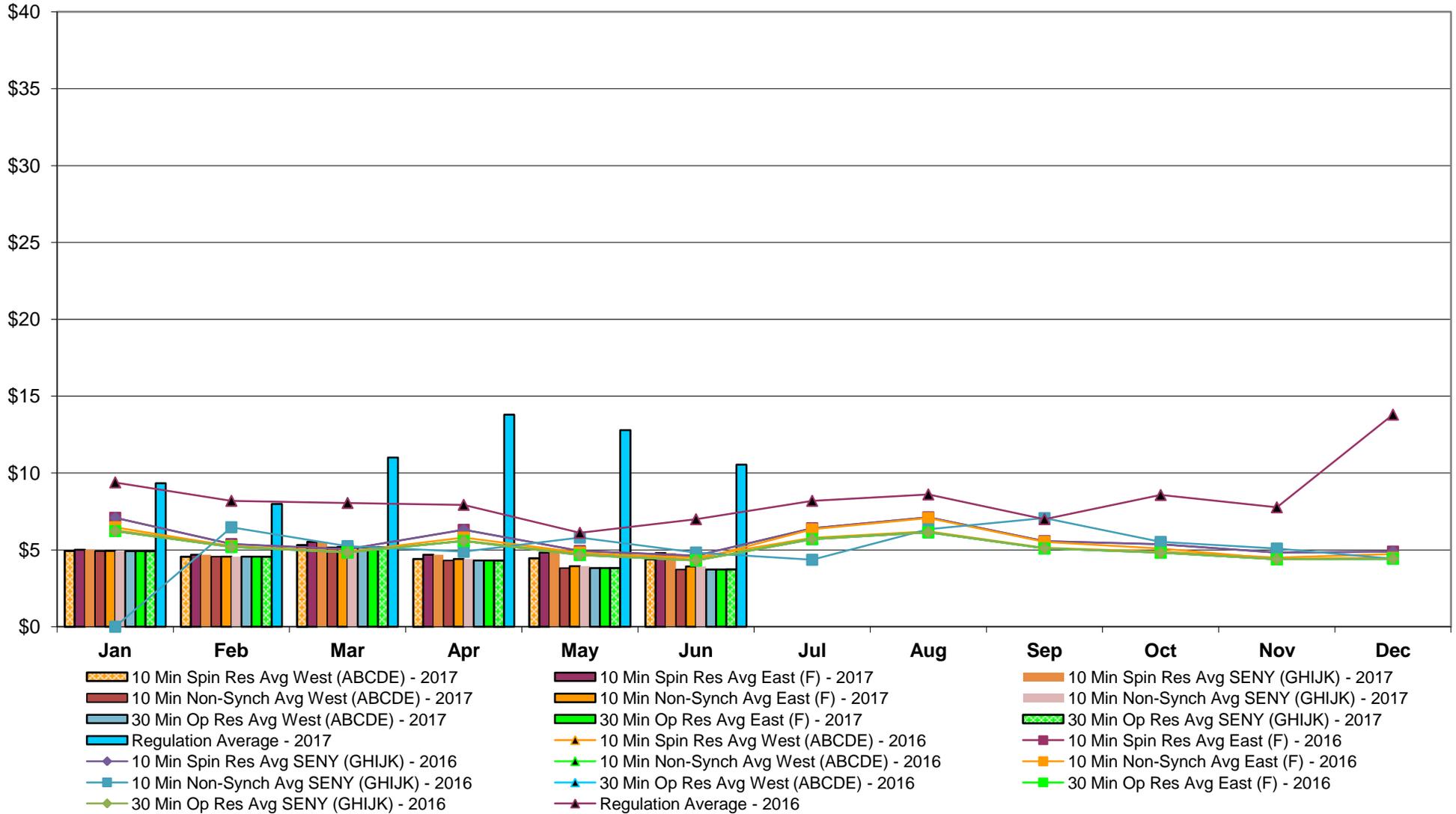
Virtual Load and Supply Zonal Statistics (Average MWh/day) - 2017

		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-17	6,094	5,795	2,019	337	MHK VL	Jan-17	566	202	2,022	131	DUNWOD	Jan-17	304	832	5,708	389
	Feb-17	3,771	4,772	3,346	567		Feb-17	422	100	2,459	293		Feb-17	193	585	5,966	424
	Mar-17	6,522	4,960	2,386	616		Mar-17	407	186	3,594	378		Mar-17	436	763	4,871	439
	Apr-17	6,956	5,390	1,934	699		Apr-17	457	102	2,856	430		Apr-17	1,097	406	3,517	232
	May-17	8,468	5,775	1,261	546		May-17	532	105	2,786	401		May-17	1,215	155	1,863	276
	Jun-17	10,776	5,128	1,497	512		Jun-17	516	149	2,492	586		Jun-17	1,117	287	3,281	383
	Jul-17						Jul-17						Jul-17				
	Aug-17						Aug-17						Aug-17				
	Sep-17						Sep-17						Sep-17				
	Oct-17						Oct-17						Oct-17				
	Nov-17						Nov-17						Nov-17				
	Dec-17						Dec-17						Dec-17				
GENESE	Jan-17	654	1,282	3,652	2,482	CAPITL	Jan-17	1,291	666	3,990	3,861	N.Y.C.	Jan-17	5,761	5,474	1,543	1,008
	Feb-17	276	600	3,782	3,206		Feb-17	1,115	409	3,432	3,798		Feb-17	4,622	5,309	1,712	1,219
	Mar-17	480	838	3,806	3,419		Mar-17	1,409	528	5,186	2,484		Mar-17	4,052	5,826	1,561	1,058
	Apr-17	353	656	4,074	2,880		Apr-17	1,160	549	5,589	1,973		Apr-17	4,374	4,331	1,161	529
	May-17	393	128	4,096	2,027		May-17	1,232	454	5,697	1,635		May-17	3,357	4,679	1,434	569
	Jun-17	516	169	2,920	2,119		Jun-17	779	372	6,479	1,916		Jun-17	8,293	4,163	1,050	608
	Jul-17						Jul-17						Jul-17				
	Aug-17						Aug-17						Aug-17				
	Sep-17						Sep-17						Sep-17				
	Oct-17						Oct-17						Oct-17				
	Nov-17						Nov-17						Nov-17				
	Dec-17						Dec-17						Dec-17				
NORTH	Jan-17	655	316	6,415	3,473	HUD VL	Jan-17	911	817	5,317	3,064	LONGIL	Jan-17	3,559	3,788	1,354	1,367
	Feb-17	465	338	7,504	4,006		Feb-17	1,292	915	6,266	3,873		Feb-17	3,341	3,127	1,653	1,667
	Mar-17	426	311	7,227	4,576		Mar-17	659	1,048	5,427	2,652		Mar-17	4,133	3,779	1,958	1,463
	Apr-17	414	138	7,520	4,435		Apr-17	1,575	871	5,708	2,333		Apr-17	3,706	3,309	1,748	1,232
	May-17	555	280	7,848	2,436		May-17	1,202	1,006	6,608	2,378		May-17	4,232	2,893	1,740	998
	Jun-17	552	468	6,955	2,920		Jun-17	836	823	6,861	3,317		Jun-17	4,848	2,532	1,402	1,398
	Jul-17						Jul-17						Jul-17				
	Aug-17						Aug-17						Aug-17				
	Sep-17						Sep-17						Sep-17				
	Oct-17						Oct-17						Oct-17				
	Nov-17						Nov-17						Nov-17				
	Dec-17						Dec-17						Dec-17				
CENTRL	Jan-17	1,482	455	22,561	196	MILLWD	Jan-17	435	91	1,422	128	NYISO	Jan-17	21,713	19,719	56,001	16,436
	Feb-17	707	177	20,639	320		Feb-17	202	74	1,555	164		Feb-17	16,405	16,406	58,312	19,537
	Mar-17	979	605	18,610	518		Mar-17	454	157	1,452	158		Mar-17	19,956	19,002	56,078	17,759
	Apr-17	1,079	505	30,148	519		Apr-17	595	328	1,228	149		Apr-17	21,767	16,586	65,484	15,411
	May-17	1,472	492	30,724	312		May-17	662	255	1,474	195		May-17	23,320	16,222	65,531	11,774
	Jun-17	1,839	672	35,205	380		Jun-17	663	1,057	2,019	340		Jun-17	30,736	15,820	70,160	14,480
	Jul-17						Jul-17						Jul-17				
	Aug-17						Aug-17						Aug-17				
	Sep-17						Sep-17						Sep-17				
	Oct-17						Oct-17						Oct-17				
	Nov-17						Nov-17						Nov-17				
	Dec-17						Dec-17						Dec-17				

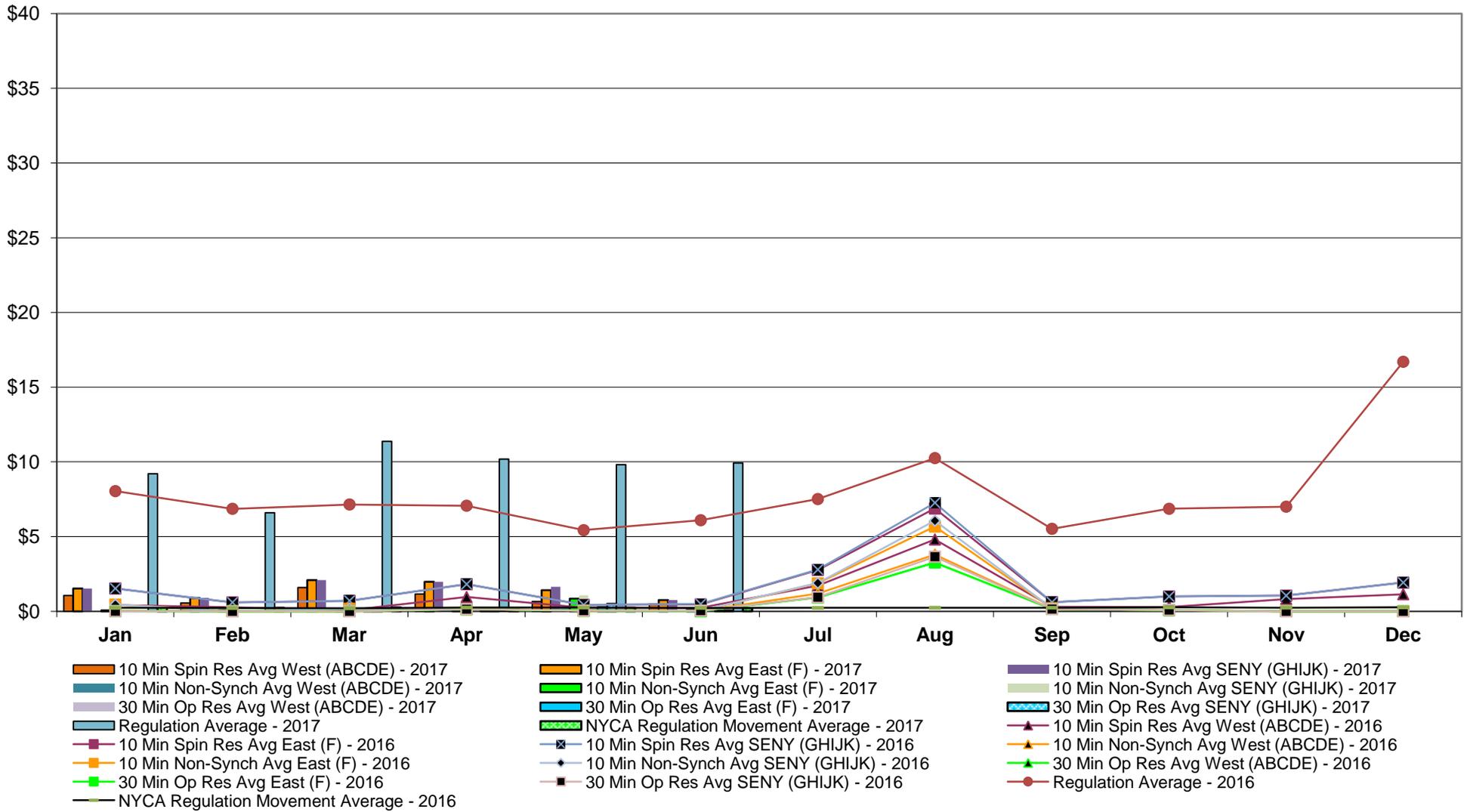
NYISO Multi Hour Block Transactions Monthly Total MWh



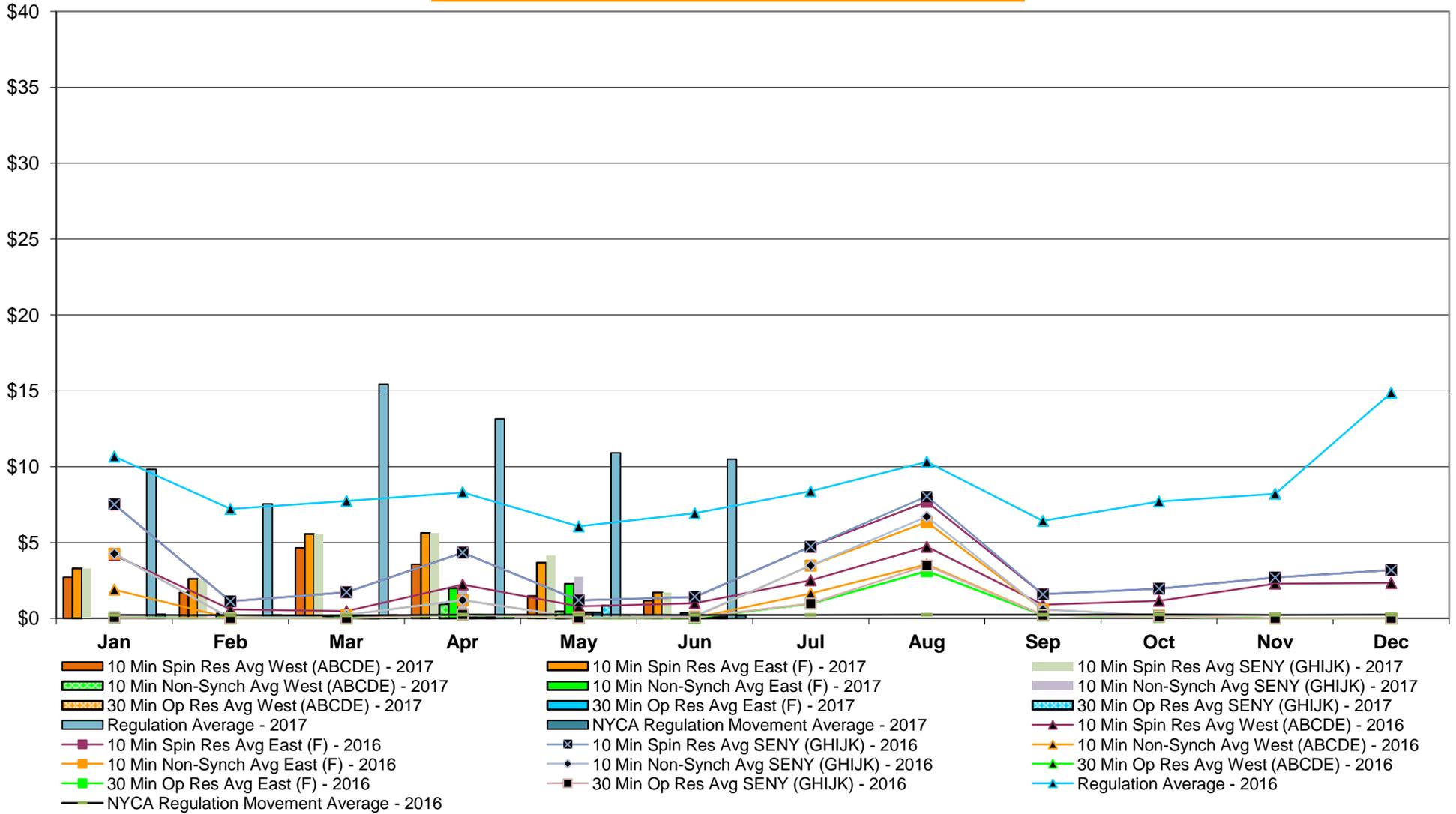
NYISO Monthly Average Ancillary Service Prices Day Ahead Market 2016 - 2017



NYISO Monthly Average Ancillary Service Prices RTC Market 2016 - 2017



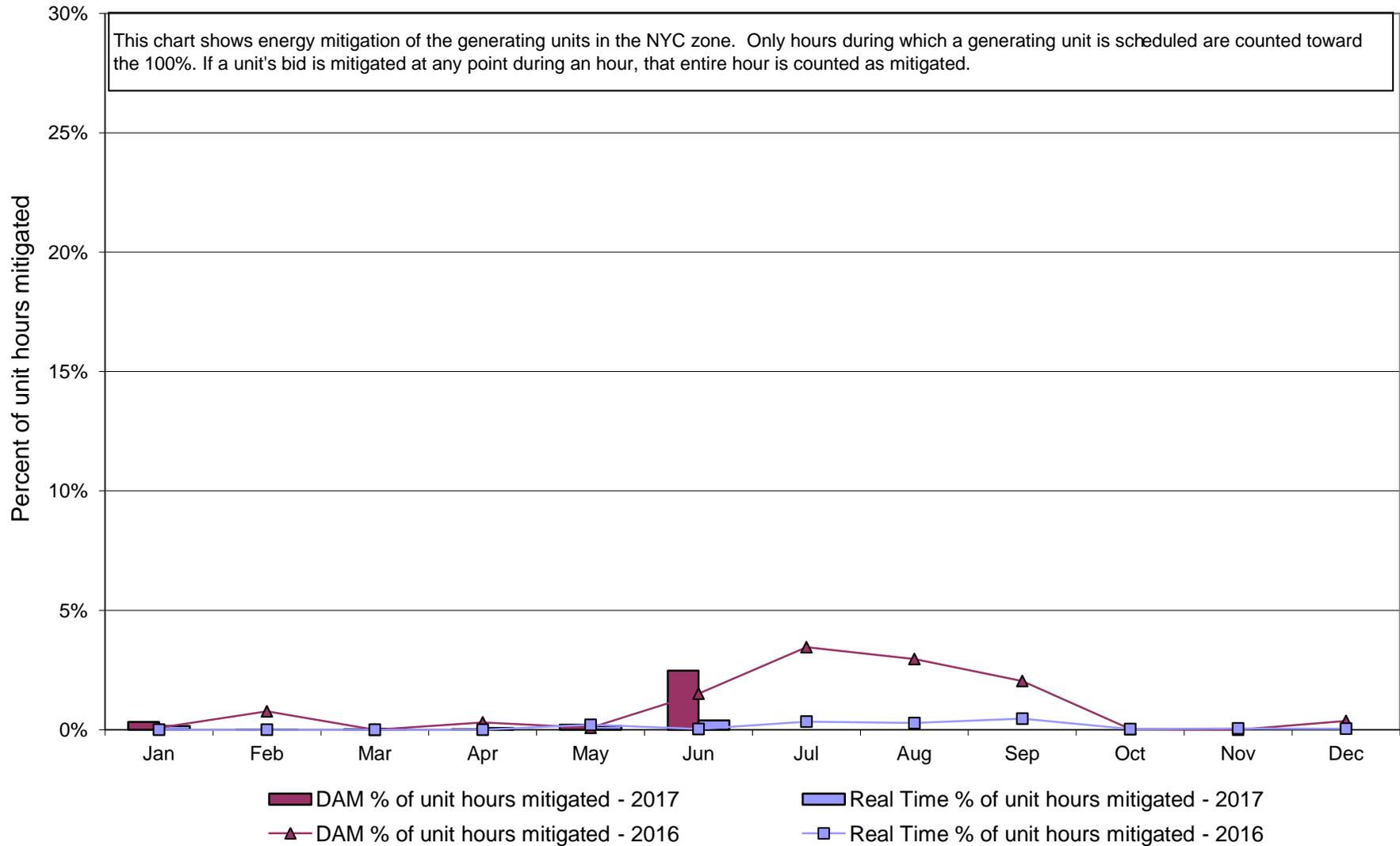
NYISO Monthly Average Ancillary Service Prices Real Time Market 2016 - 2017



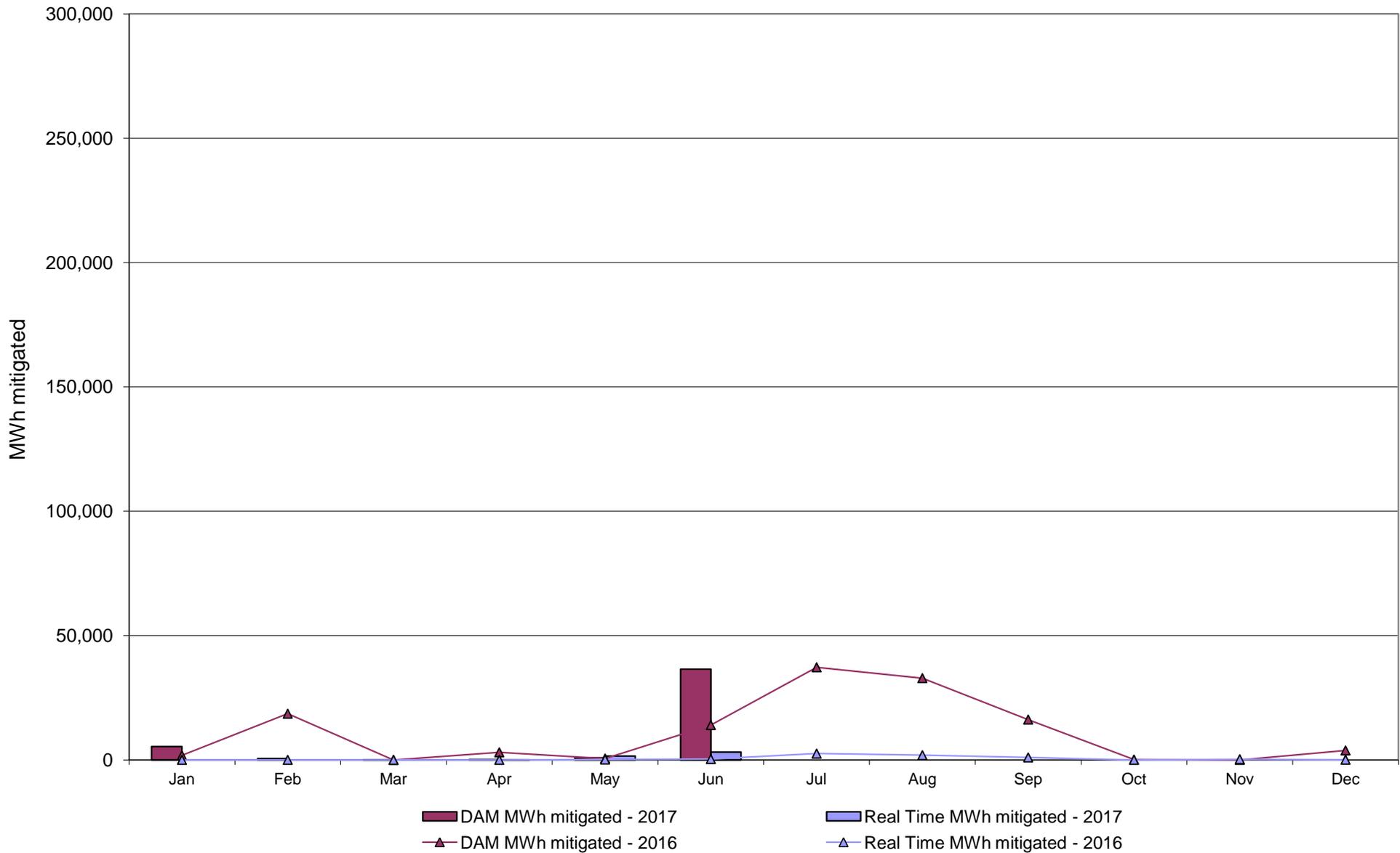
NYISO Markets Ancillary Services Statistics - Unweighted Price (\$/MWH)

2017	January	February	March	April	May	June	July	August	September	October	November	December
Day Ahead Market												
10 Min Spin SENY (GHIJK)	5.01	4.68	5.53	4.68	4.82	4.79						
10 Min Spin East (F)	5.01	4.68	5.53	4.68	4.82	4.79						
10 Min Spin West (ABCDE)	4.94	4.56	5.31	4.41	4.45	4.39						
10 Min Non Synch SENY (GHIJK)	4.94	4.57	5.20	4.41	3.95	3.92						
10 Min Non Synch East (F)	4.94	4.57	5.20	4.41	3.95	3.92						
10 Min Non Synch West (ABCDE)	4.92	4.56	5.17	4.31	3.82	3.73						
30 Min SENY (GHIJK)	4.92	4.56	5.17	4.31	3.82	3.73						
30 Min East (F)	4.92	4.56	5.17	4.31	3.82	3.73						
30 Min West (ABCDE)	4.92	4.56	5.17	4.31	3.82	3.73						
Regulation	9.34	7.99	11.01	13.80	12.79	10.55						
RTC Market												
10 Min Spin SENY (GHIJK)	1.53	0.89	2.08	1.97	1.64	0.75						
10 Min Spin East (F)	1.53	0.89	2.08	1.97	1.41	0.75						
10 Min Spin West (ABCDE)	1.06	0.55	1.58	1.16	0.65	0.47						
10 Min Non Synch SENY (GHIJK)	0.06	0.06	0.10	0.14	1.08	0.13						
10 Min Non Synch East (F)	0.06	0.06	0.10	0.14	0.85	0.13						
10 Min Non Synch West (ABCDE)	0.00	0.00	0.10	0.07	0.31	0.05						
30 Min SENY (GHIJK)	0.00	0.00	0.10	0.03	0.50	0.05						
30 Min East (F)	0.00	0.00	0.10	0.03	0.27	0.05						
30 Min West (ABCDE)	0.00	0.00	0.10	0.03	0.27	0.05						
Regulation	9.21	6.59	11.37	10.18	9.82	9.92						
NYCA Regulation Movement	0.27	0.24	0.25	0.22	0.24	0.21						
Real Time Market												
10 Min Spin SENY (GHIJK)	3.29	2.61	5.56	5.62	4.14	1.71						
10 Min Spin East (F)	3.29	2.61	5.56	5.62	3.67	1.71						
10 Min Spin West (ABCDE)	2.71	1.71	4.65	3.56	1.48	1.15						
10 Min Non Synch SENY (GHIJK)	0.00	0.31	0.17	1.99	2.75	0.36						
10 Min Non Synch East (F)	0.00	0.31	0.17	1.99	2.28	0.36						
10 Min Non Synch West (ABCDE)	0.00	0.00	0.13	0.95	0.44	0.10						
30 Min SENY (GHIJK)	0.00	0.00	0.12	0.06	0.85	0.10						
30 Min East (F)	0.00	0.00	0.12	0.06	0.38	0.10						
30 Min West (ABCDE)	0.00	0.00	0.12	0.06	0.38	0.10						
Regulation	9.83	7.54	15.44	13.15	10.91	10.48						
NYCA Regulation Movement	0.27	0.24	0.25	0.20	0.22	0.19						
2016												
Day Ahead Market												
10 Min Spin SENY (GHIJK)	7.09	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)	7.09	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)	6.28	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)	6.47	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)	6.47	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)	6.23	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)	6.23	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)	6.23	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)	6.23	5.20	4.84	5.58	4.67	4.32	5.70	6.15	5.10	4.82	4.39	4.43
Regulation	9.39	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)	0.42	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)	0.45	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)	0.45	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)	0.04	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)	0.01	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)	0.01	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)	0.01	0.00	0.00	0.14	0.04	0.02	0.93	3.27	0.15	0.08	0.00	0.00
Regulation	8.04	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	0.23	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)	7.51	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)	7.51	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)	4.17	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)	4.26	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)	4.26	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)	1.89	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)	0.06	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)	0.06	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)	0.06	0.00	0.00	0.25	0.03	0.04	0.97	3.12	0.21	0.11	0.00	0.00
Regulation	10.66	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	0.23	0.22	0.20	0.25	0.25	0.23	0.23	0.24	0.24	0.26	0.23	0.24

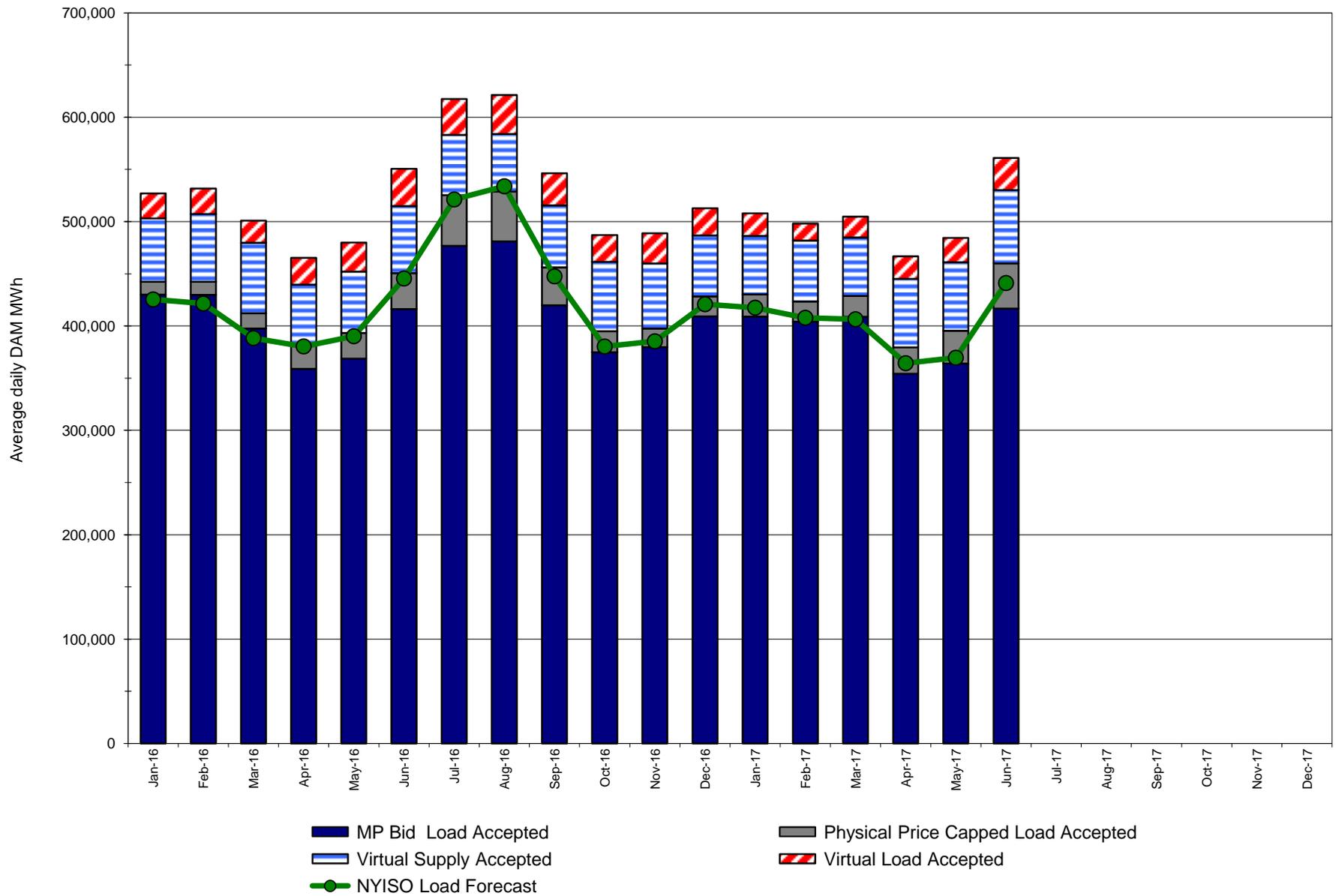
NYISO In City Energy Mitigation - AMP (NYC Zone) 2016 - 2017 Percentage of committed unit-hours mitigated



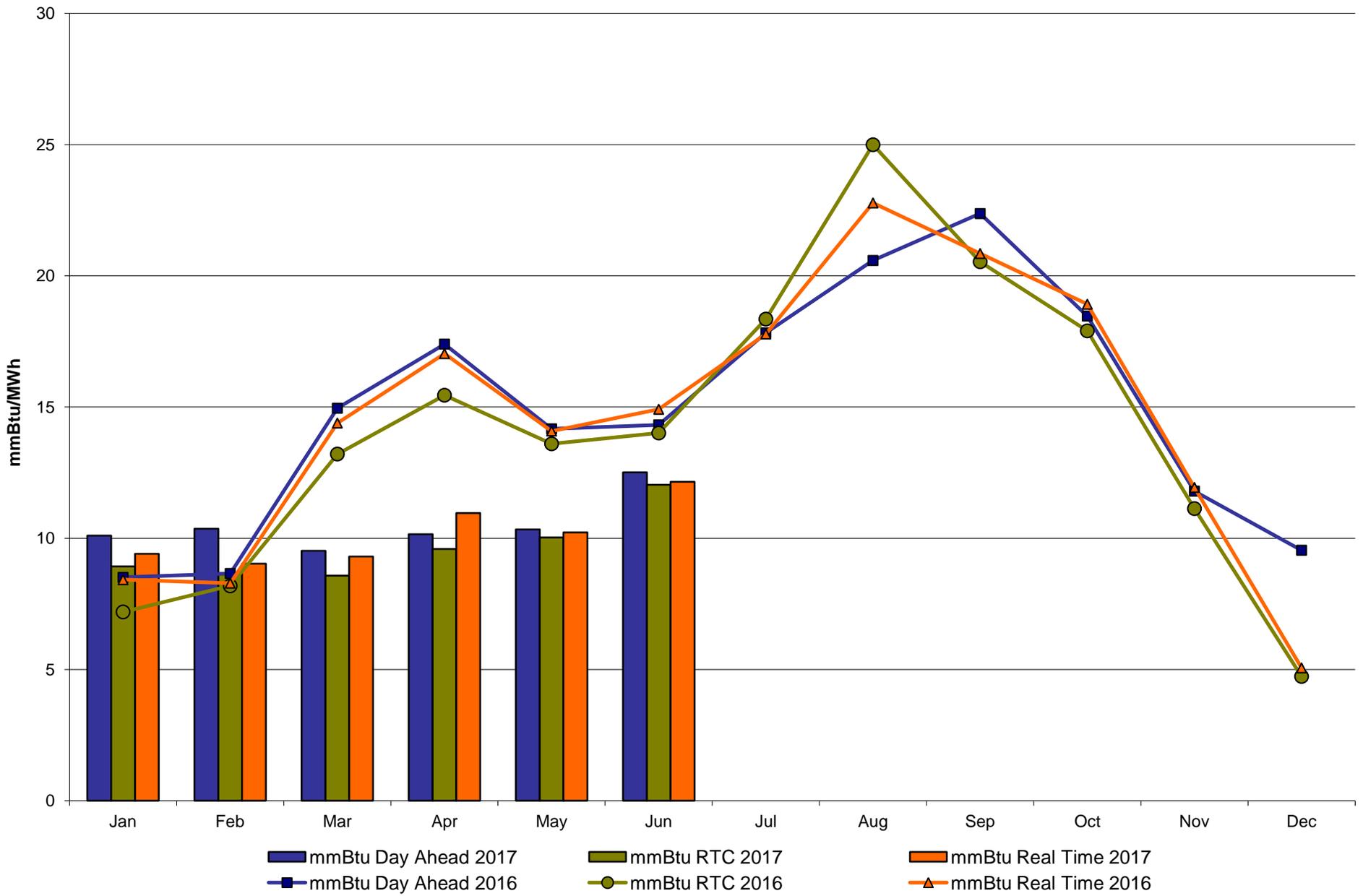
NYISO In City Energy Mitigation (NYC Zone) 2016 - 2017
Monthly megawatt hours mitigated



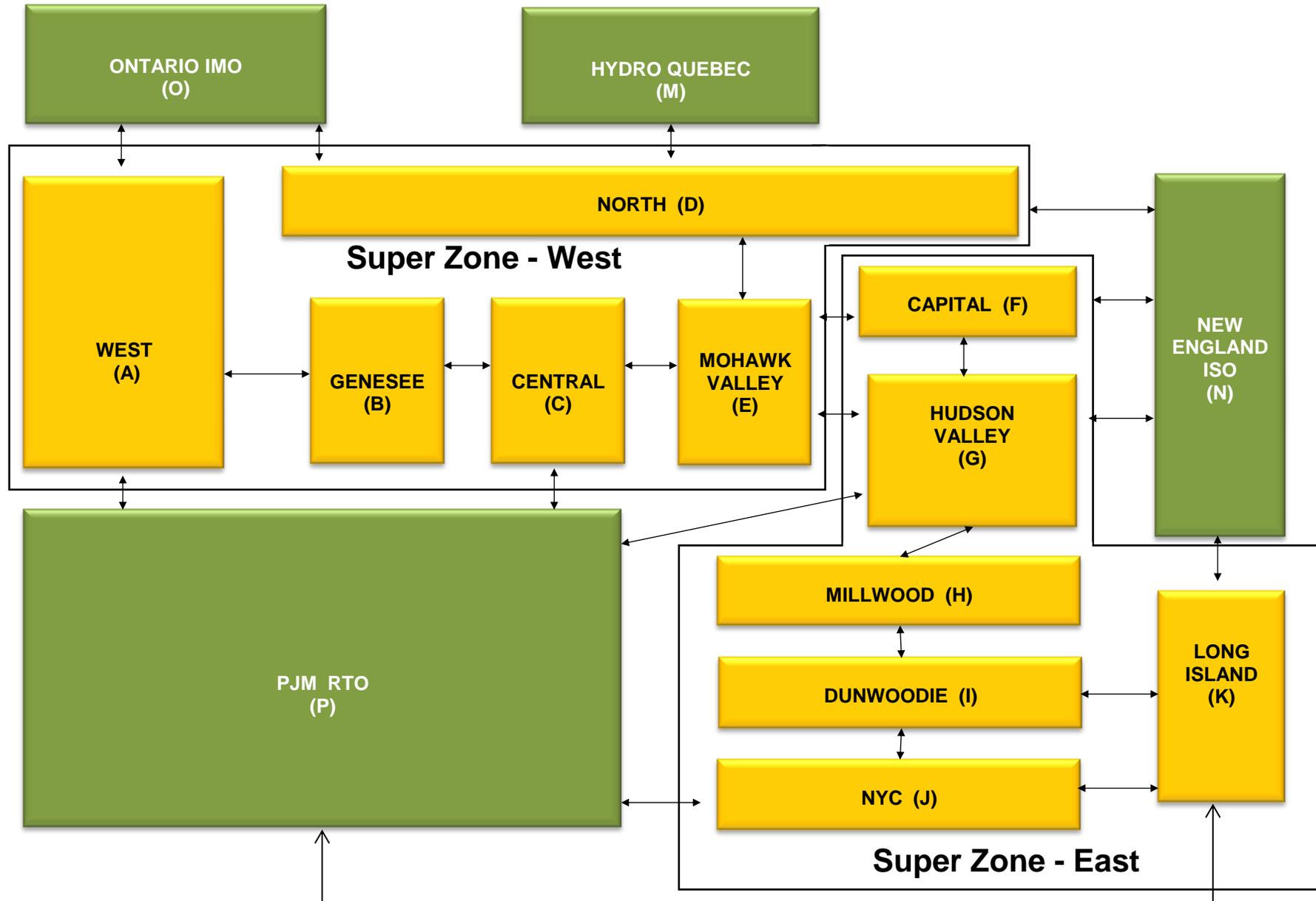
NYISO Average Daily DAM Load Bid Summary



Monthly Implied Heat Rate 2016-2017



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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