


# Market Operations Report

A faint background map of the state of New York is overlaid with a network of colored lines representing a power grid. The lines are primarily red and blue, with some green lines. The nodes of the grid are represented by small colored circles. The map is centered behind the main title and author information.

**Rana Mukerji**

*Senior Vice President, Market Structures  
New York Independent System Operator*

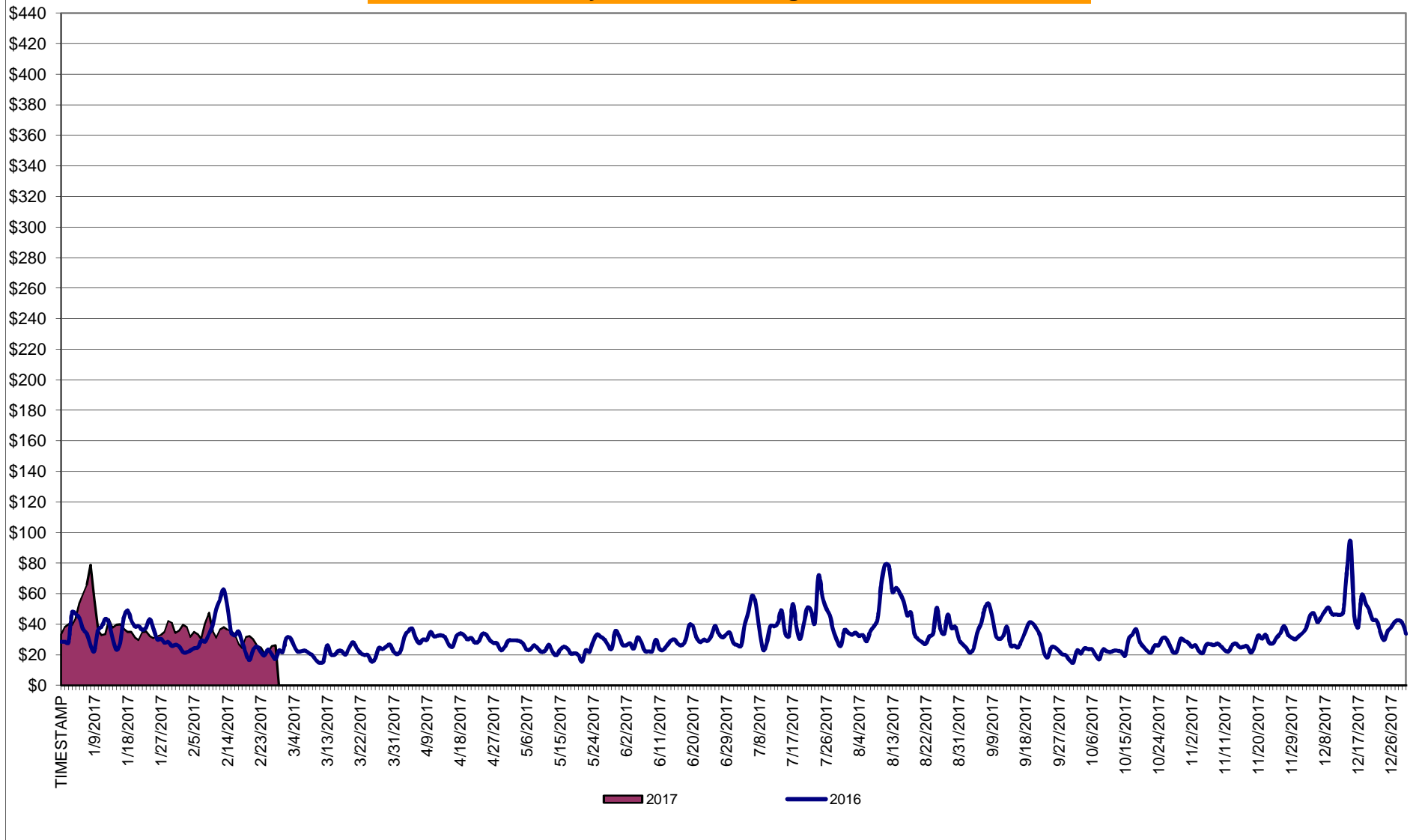
**Business Issues Committee Meeting**

*March 14, 2017*

# Market Performance Highlights for February 2017

- LBMP for February is \$30.95/MWh; lower than \$40.07/MWh in January 2017 and higher than \$28.71/MWh in February 2016.
  - Day Ahead and Real Time Load Weighted LBMPs are lower compared to January.
- February 2017 average year-to-date monthly cost of \$38.02/MWh is a 12% increase from \$34.02/MWh in February 2016.
- Average daily sendout is 418 GWh/day in February; lower than 431 GWh/day in January 2017 and 436 GWh/day in February 2016.
- Natural gas prices were lower and distillate prices were higher compared to the previous month.
  - Natural Gas (Transco Z6 NY) was \$2.83/MMBtu, down from \$3.82/MMBtu in January.
  - Natural gas prices are down 6.1% year-over-year.
  - Jet Kerosene Gulf Coast was \$11.48/MMBtu, up from \$11.24/MMBtu in January.
  - Ultra Low Sulfur No.2 Diesel NY Harbor was \$11.63/MMBtu, up from \$11.61/MMBtu in January.
  - Distillate prices are up 57.9% year-over-year.
- Uplift per MWh is higher compared to the previous month.
  - Uplift (not including NYISO cost of operations) is (\$0.54)/MWh; higher than (\$0.73)/MWh in January.
    - Local Reliability Share is \$0.13/MWh, higher than \$0.10/MWh in January.
    - Statewide Share is (\$0.67)/MWh, higher than (\$0.83)/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)\***  
**2016 Annual Average \$34.28/MWh**  
**February 2016 YTD Average \$34.02/MWh**  
**February 2017 YTD Average \$38.02/MWh**



\* Excludes ICAP payments.

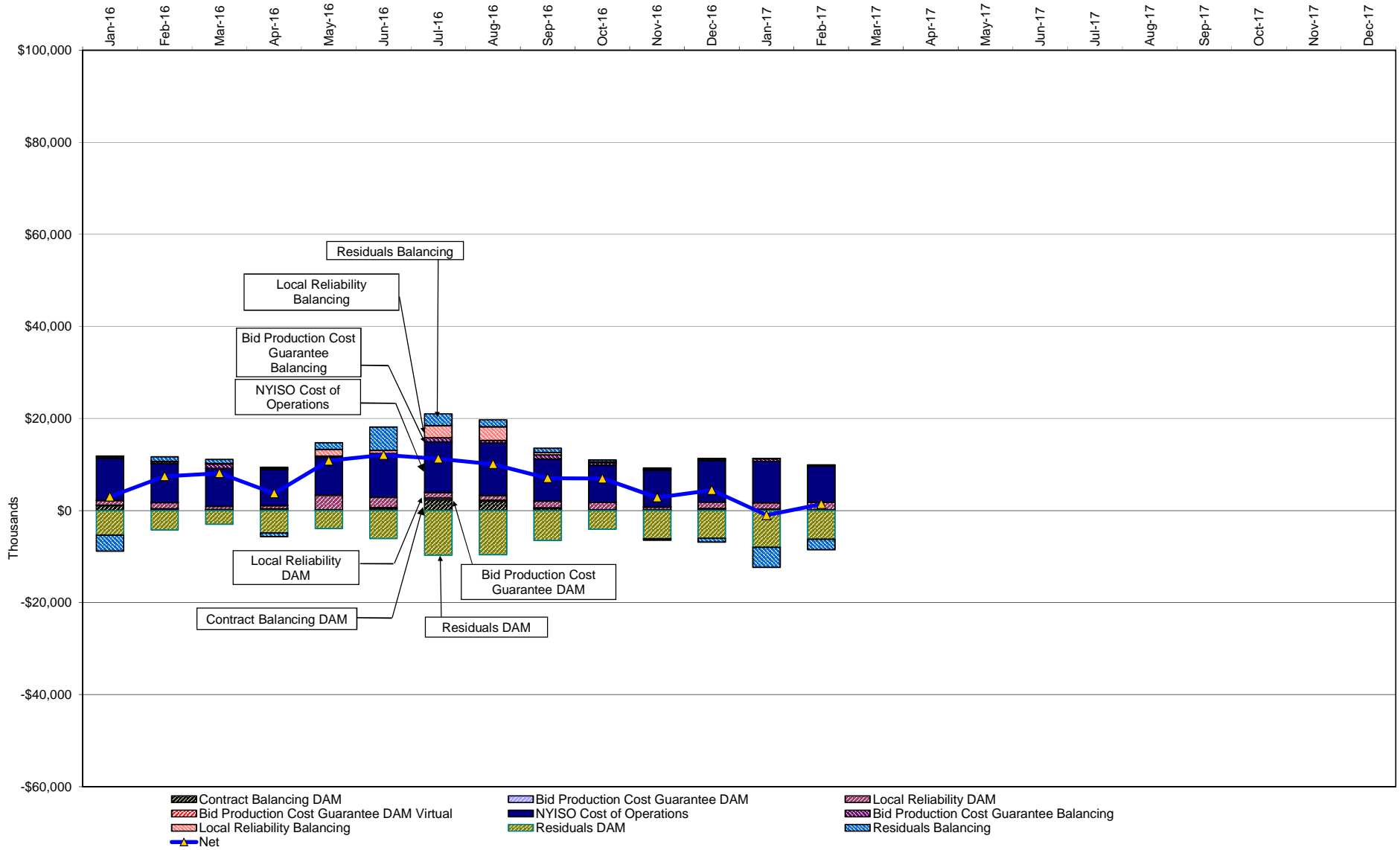
**NYISO Average Cost/MWh (Energy and Ancillary Services)\*  
from the LBMP Customer point of view**

<b>2017</b>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
LBMP	40.07	30.95										
NTAC	0.66	1.11										
Reserve	0.70	0.67										
Regulation	0.14	0.12										
NYISO Cost of Operations	0.65	0.65										
FERC Fee Recovery	0.09	0.10										
Uplift	(0.73)	(0.54)										
Uplift: Local Reliability Share	0.10	0.13										
Uplift: Statewide Share	(0.83)	(0.67)										
Voltage Support and Black Start	0.37	0.37										
<b>Avg Monthly Cost</b>	<b>41.96</b>	<b>33.44</b>										
Avg YTD Cost	41.96	38.02										
TSA \$ per NYC MWh	0.00	0.00										
<b>2016</b>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
LBMP	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
<b>Avg Monthly Cost</b>	<b>36.42</b>	<b>31.37</b>	<b>23.23</b>	<b>30.84</b>	<b>26.52</b>	<b>30.29</b>	<b>42.40</b>	<b>44.75</b>	<b>33.16</b>	<b>25.12</b>	<b>28.61</b>	<b>46.42</b>
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
<b>2015</b>	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
LBMP	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
<b>Avg Monthly Cost</b>	<b>60.91</b>	<b>115.27</b>	<b>53.58</b>	<b>30.41</b>	<b>35.37</b>	<b>30.79</b>	<b>36.84</b>	<b>35.14</b>	<b>36.35</b>	<b>32.18</b>	<b>27.64</b>	<b>23.71</b>
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: 3/9/2017 11:14 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 February 28, 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
<b>Day Ahead Market MWh</b>												
DAM LSE Internal LBMP Energy Sales	14,135,019	12,565,206										
DAM External TC LBMP Energy Sales	57%	57%										
DAM Bilateral - Internal Bilaterals	2%	2%										
DAM Bilateral - Import/Non-LBMP Market Bilaterals	32%	32%										
DAM Bilateral - Export/Non-LBMP Market Bilaterals	5%	5%										
DAM Bilateral - Wheel Through Bilaterals	2%	2%										
<b>Balancing Energy Market MWh</b>												
Balancing Energy LSE Internal LBMP Energy Sales	-256,448	-407,284										
Balancing Energy External TC LBMP Energy Sales	-157%	-132%										
Balancing Energy Bilateral - Internal Bilaterals	64%	39%										
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	15%	8%										
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	0%	4%										
Balancing Energy Bilateral - Wheel Through Bilaterals	10%	7%										
	-32%	-26%										
<b>Transactions Summary</b>												
LBMP	58%	57%										
Internal Bilaterals	33%	34%										
Import Bilaterals	5%	5%										
Export Bilaterals	2%	2%										
Wheels Through	2%	2%										
<b>Market Share of Total Load</b>												
Day Ahead Market	101.8%	103.3%										
Balancing Energy +	-1.8%	-3.3%										
Total MWH	13,878,571	12,157,922										
Average Daily Energy Sendout/Month GWh	431	418										

2016	January	February	March	April	May	June	July	August	September	October	November	December
<b>Day Ahead Market MWh</b>												
DAM LSE Internal LBMP Energy Sales	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 External TC LBMP Energy Sales	54%	55%	55%	57%	58%	60%	64%	63%	60%	56%	56%	58%
DAM Bilateral - Internal Bilaterals	4%	2%	1%	5%	2%	1%	1%	3%	3%	2%	2%	3%
DAM Bilateral - Import/Non-LBMP Market Bilaterals	34%	34%	35%	28%	31%	30%	28%	27%	30%	33%	32%	31%
DAM Bilateral - Export/Non-LBMP Market Bilaterals	5%	5%	5%	6%	5%	5%	4%	4%	5%	5%	5%	5%
DAM Bilateral - Wheel Through Bilaterals	2%	1%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
<b>Balancing Energy Market MWh</b>												
Balancing Energy LSE Internal LBMP Energy Sales	-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 External TC LBMP Energy Sales	-125%	-114%	-118%	-76%	-147%	-203%	-347%	42%	-139%	-111%	-102%	-269%
Balancing Energy Bilateral - Internal Bilaterals	12%	13%	19%	-13%	55%	77%	204%	56%	49%	21%	28%	138%
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	19%	9%	4%	8%	27%	47%	62%	28%	18%	6%	9%	65%
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
Balancing Energy Bilateral - Wheel Through Bilaterals	6%	5%	3%	5%	7%	10%	15%	5%	5%	4%	6%	27%
	-12%	-12%	-8%	-24%	-42%	-32%	-34%	-31%	-32%	-21%	-40%	-66%
<b>Transactions Summary</b>												
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%
<b>Market Share of Total Load</b>												
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>
<b><u>DAY AHEAD LBMP</u></b>												
Price *	\$37.22	\$28.84										
Standard Deviation	\$13.20	\$7.97										
Load Weighted Price **	\$38.42	\$29.66										
<b><u>RTC LBMP</u></b>												
Price *	\$32.87	\$24.09										
Standard Deviation	\$14.57	\$9.52										
Load Weighted Price **	\$33.96	\$24.81										
<b><u>REAL TIME LBMP</u></b>												
Price *	\$34.61	\$25.14										
Standard Deviation	\$18.20	\$14.21										
Load Weighted Price **	\$35.80	\$25.84										
Average Daily Energy Sendout/Month GWh	431	418										

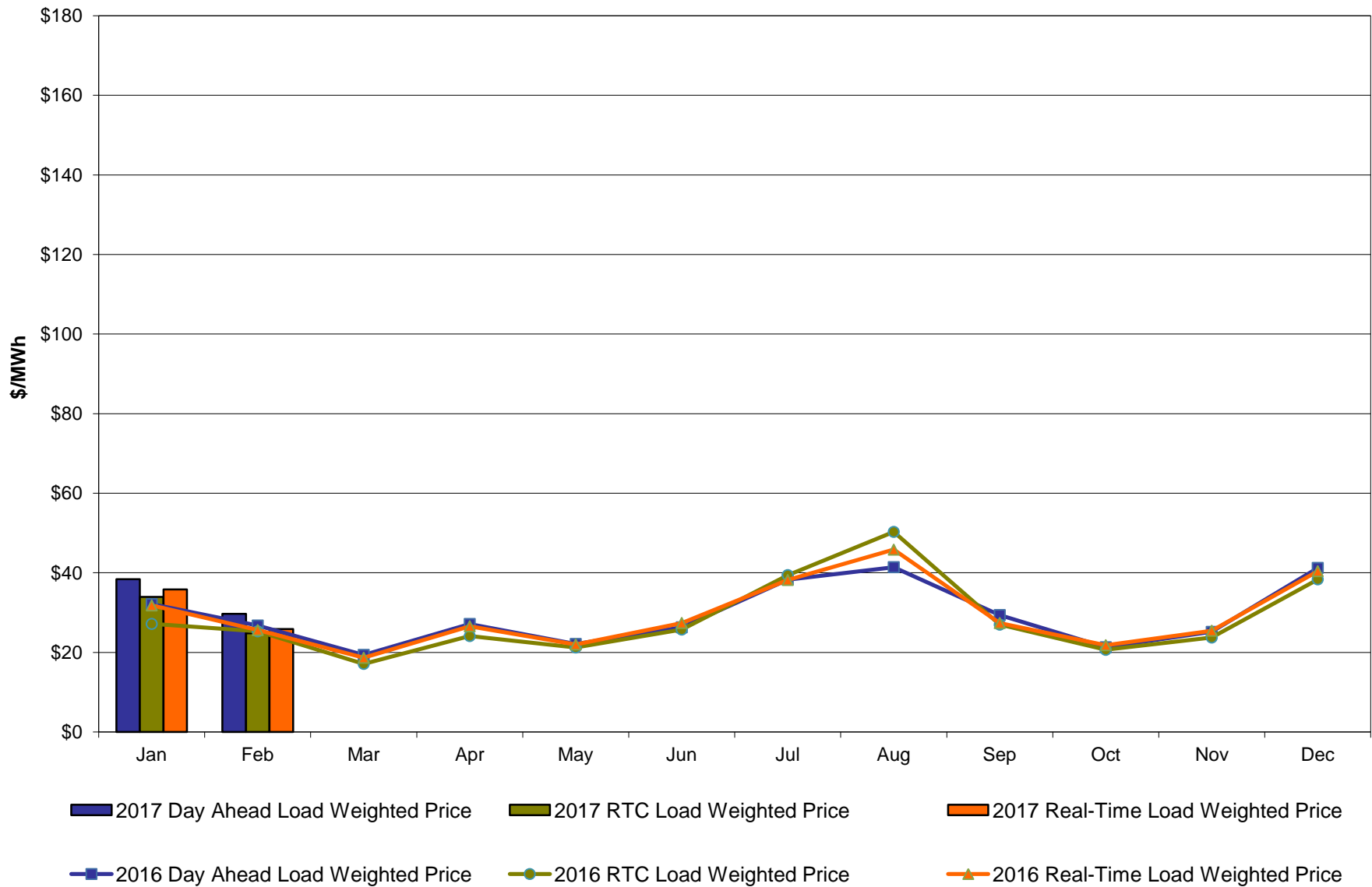
### NYISO Markets 2016 Energy Statistics

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



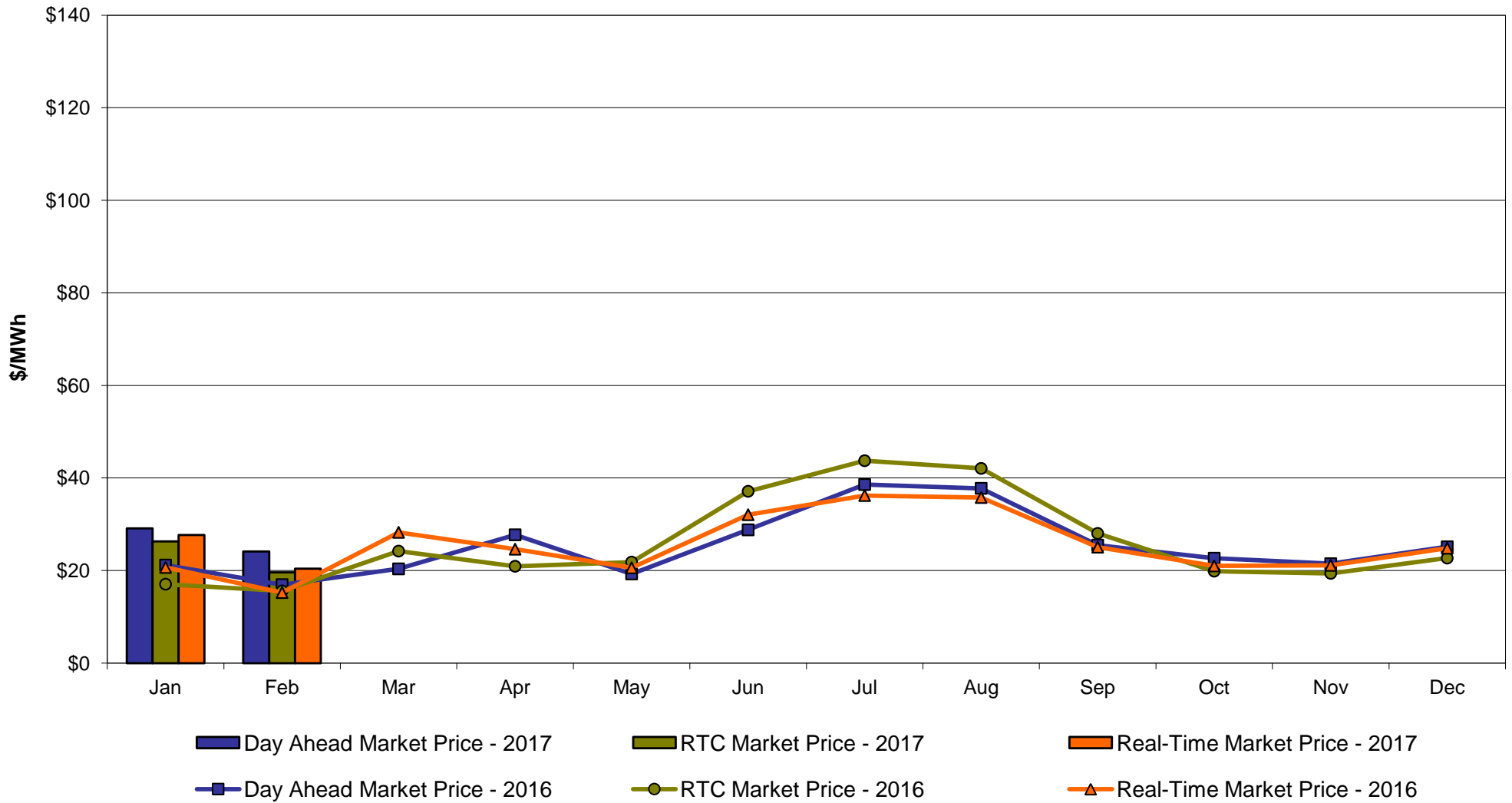


**February 2017 Zonal LBMP Statistics for NYISO (\$/MWh)**

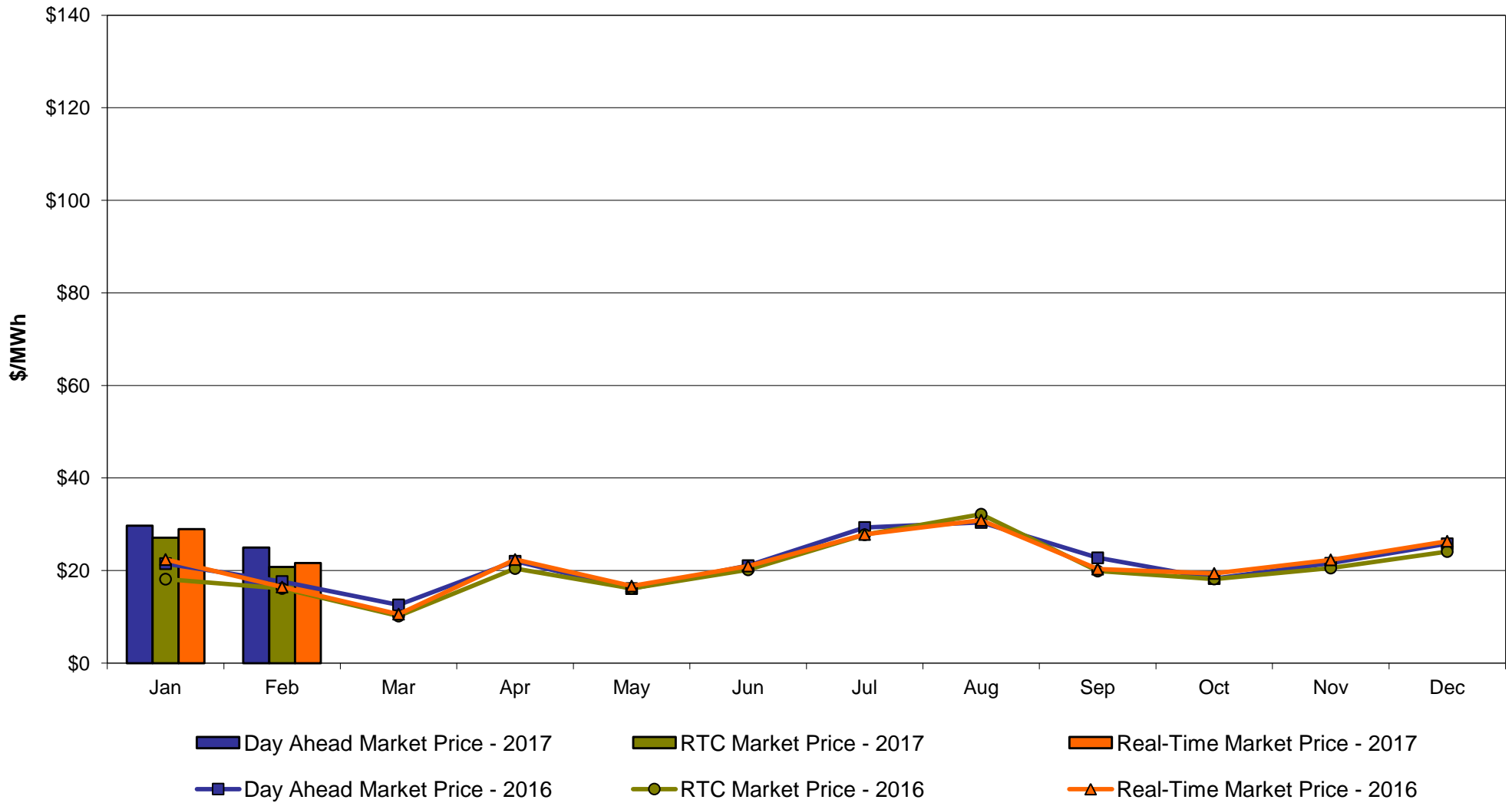
	<u>WEST Zone A</u>	<u>GENESEE Zone B</u>	<u>NORTH Zone D</u>	<u>CENTRAL Zone C</u>	<u>MOHAWK VALLEY Zone E</u>	<u>CAPITAL Zone F</u>	<u>HUDSON VALLEY Zone G</u>	<u>MILLWOOD Zone H</u>	<u>DUNWOODIE Zone I</u>	<u>NEW YORK CITY Zone J</u>	<u>LONG ISLAND Zone K</u>
<b><u>DAY AHEAD LBMP</u></b>											
Unweighted Price *	24.14	24.22	22.45	24.98	25.46	30.83	30.29	30.38	30.31	30.55	33.77
Standard Deviation	6.93	7.21	7.45	7.40	7.66	8.32	8.17	8.18	8.13	8.20	10.66
<b><u>RTC LBMP</u></b>											
Unweighted Price *	19.59	20.10	18.76	20.81	21.29	25.79	25.24	25.27	25.20	25.44	28.99
Standard Deviation	8.61	9.12	10.34	9.29	9.56	10.42	9.64	9.65	9.59	9.66	20.57
<b><u>REAL TIME LBMP</u></b>											
Unweighted Price *	20.42	20.91	19.29	21.64	22.13	27.50	26.71	26.75	26.69	26.92	29.26
Standard Deviation	12.33	12.93	14.16	13.20	13.52	18.27	15.87	15.92	15.82	15.88	19.10
	<u>ONTARIO IESO Zone O</u>	<u>HYDRO QUEBEC (Wheel) Zone M</u>	<u>HYDRO QUEBEC (Import/Export) Zone M</u>	<u>PJM Zone P</u>	<u>NEW ENGLAND Zone N</u>	<u>CROSS SOUND CABLE Controllable Line</u>	<u>NORTHPORT- NORWALK Controllable Line</u>	<u>NEPTUNE Controllable Line</u>	<u>LINDEN VFT Controllable Line</u>	<u>HUDSON Controllable Line</u>	<u>Dennison Controllable Line</u>
<b><u>DAY AHEAD LBMP</u></b>											
Unweighted Price *	23.59	22.75	22.75	26.70	30.45	33.02	32.75	31.93	30.39	30.45	21.95
Standard Deviation	6.71	7.47	7.47	7.15	8.14	10.43	10.17	9.79	8.12	8.17	7.21
<b><u>RTC LBMP</u></b>											
Unweighted Price *	19.32	19.04	19.04	22.03	26.91	28.87	28.36	27.59	25.17	25.28	18.33
Standard Deviation	8.45	9.63	9.63	8.32	13.80	21.51	20.24	18.72	9.55	9.61	10.05
<b><u>REAL TIME LBMP</u></b>											
Unweighted Price *	20.22	19.53	19.53	23.13	27.77	29.58	28.63	28.04	26.67	26.77	18.35
Standard Deviation	12.20	13.42	13.42	12.77	17.81	22.81	18.03	17.57	15.80	15.86	13.63

\* Straight LBMP averages

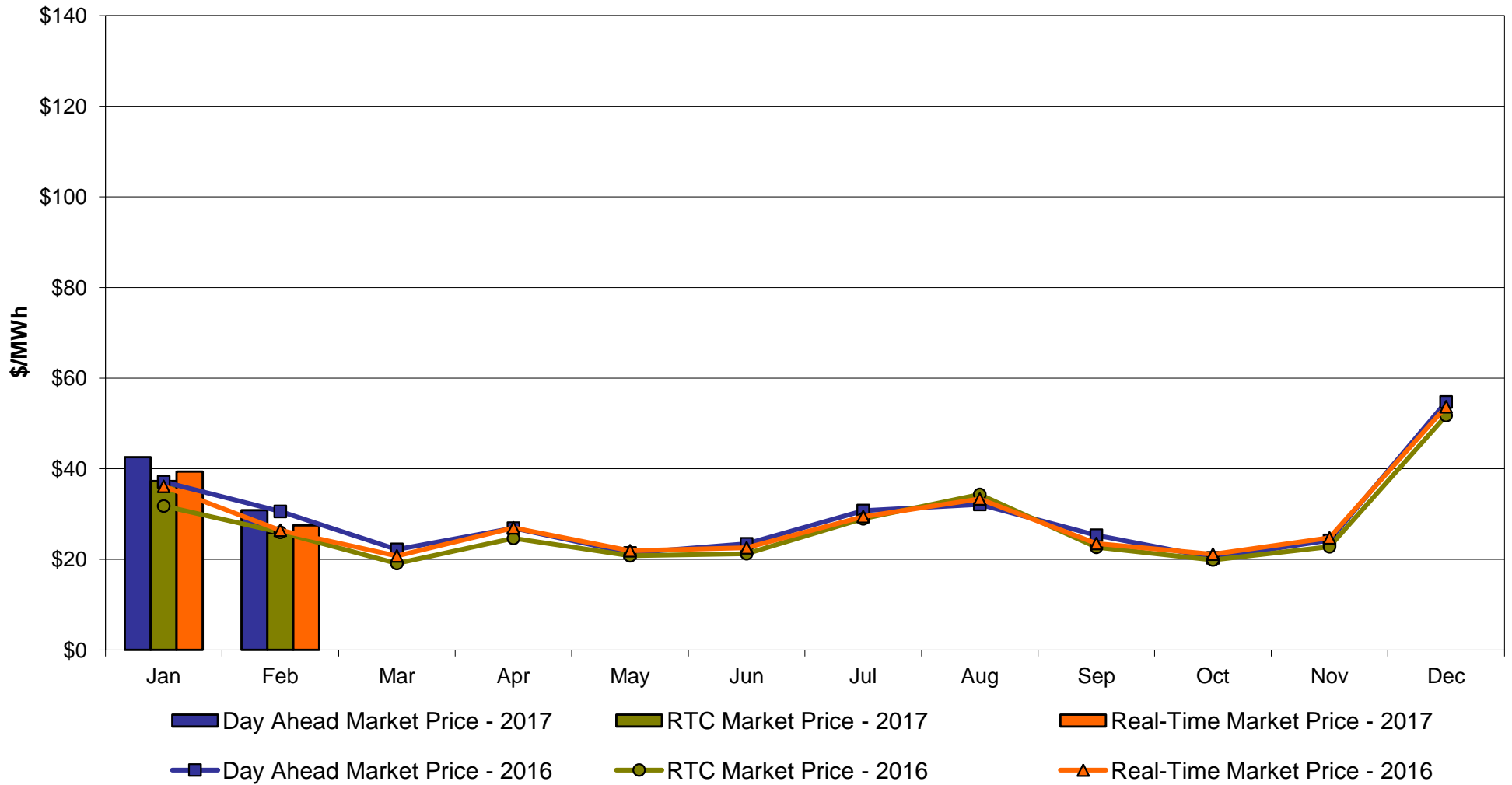
**West Zone A  
Monthly Average LBMP Prices 2016 - 2017**



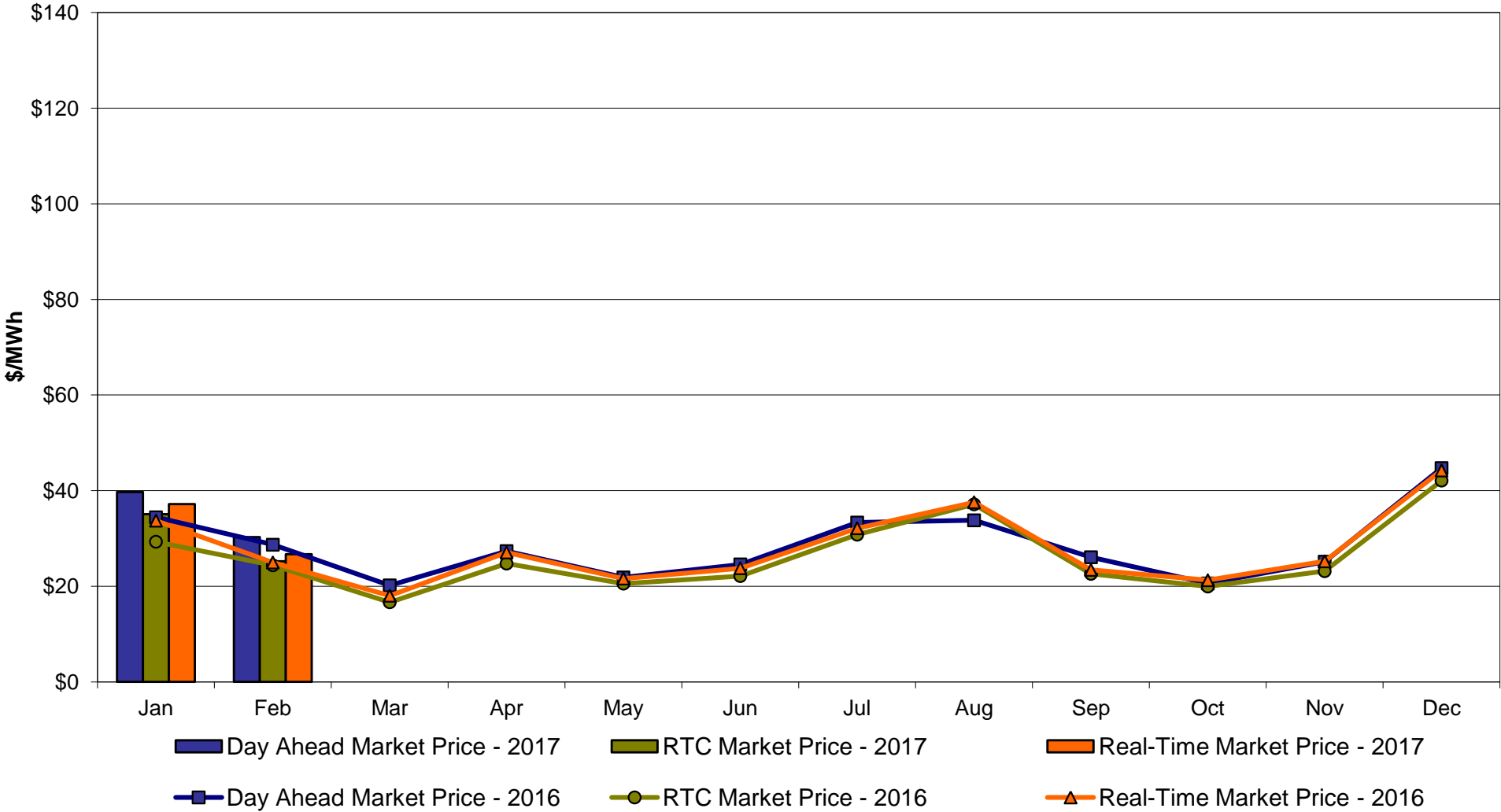
**Central Zone C  
Monthly Average LBMP Prices 2016 - 2017**



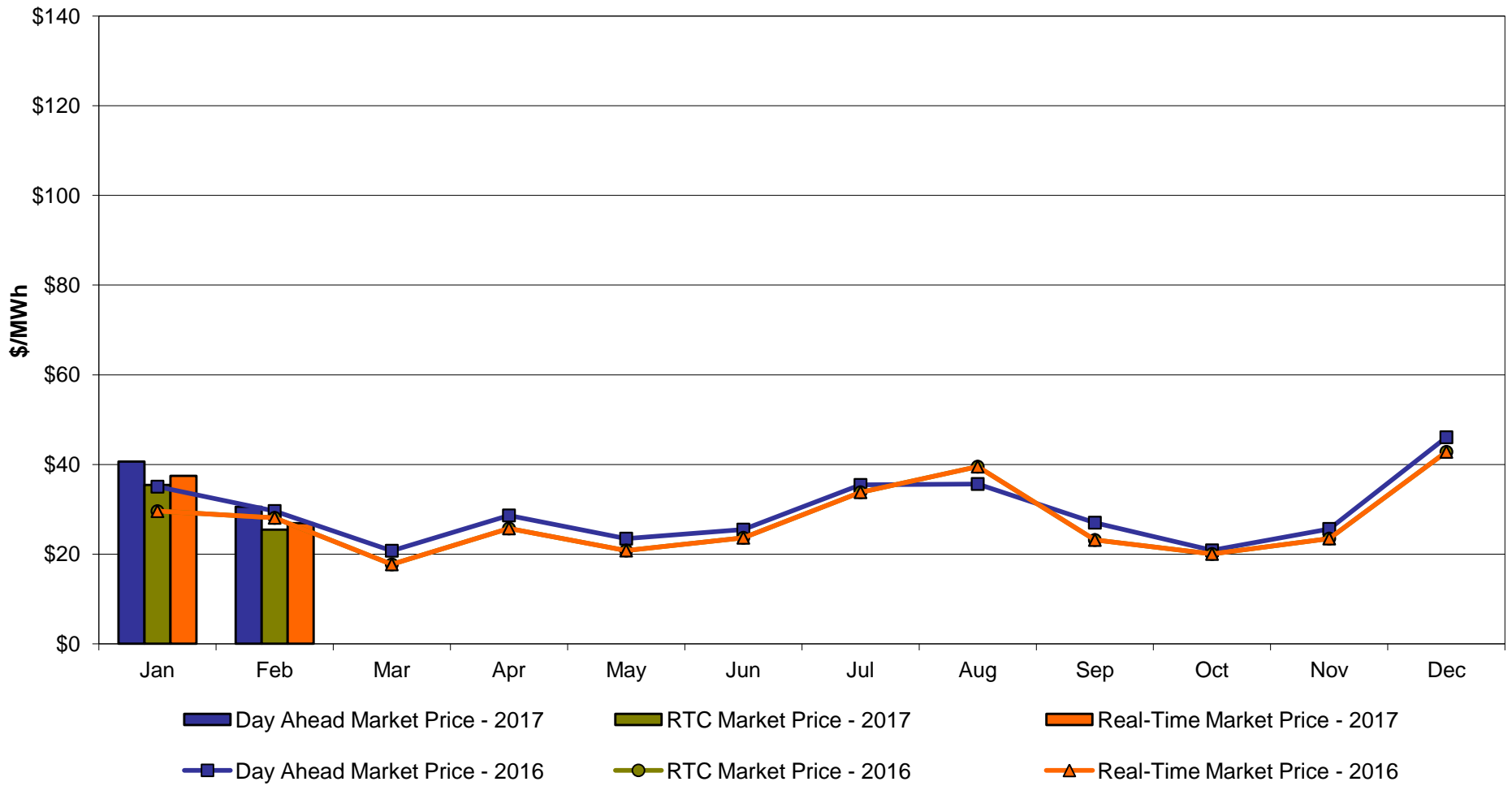
## Capital Zone F Monthly Average LBMP Prices 2016 - 2017



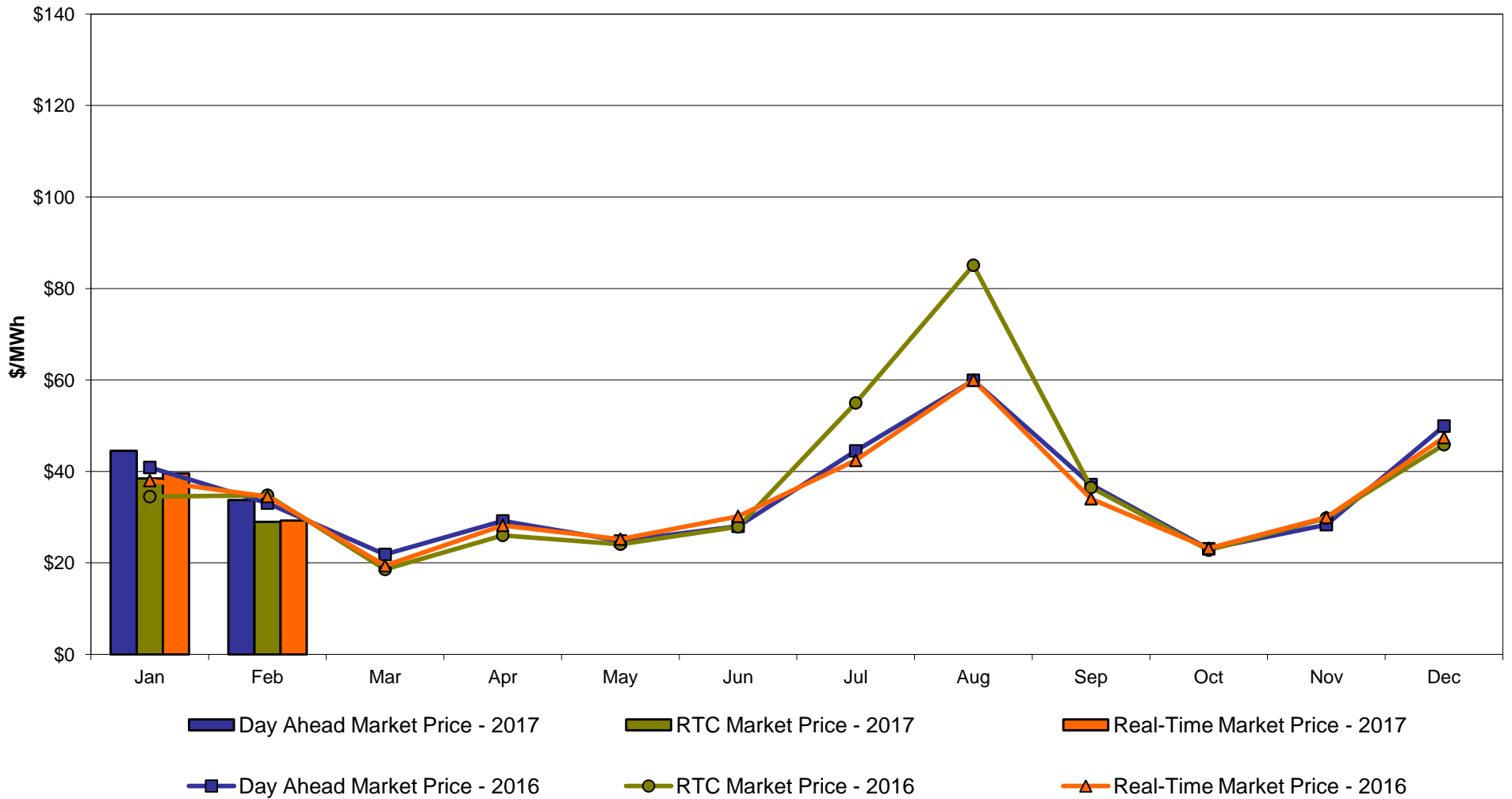
### Hudson Valley Zone G Monthly Average LBMP Prices 2016 - 2017



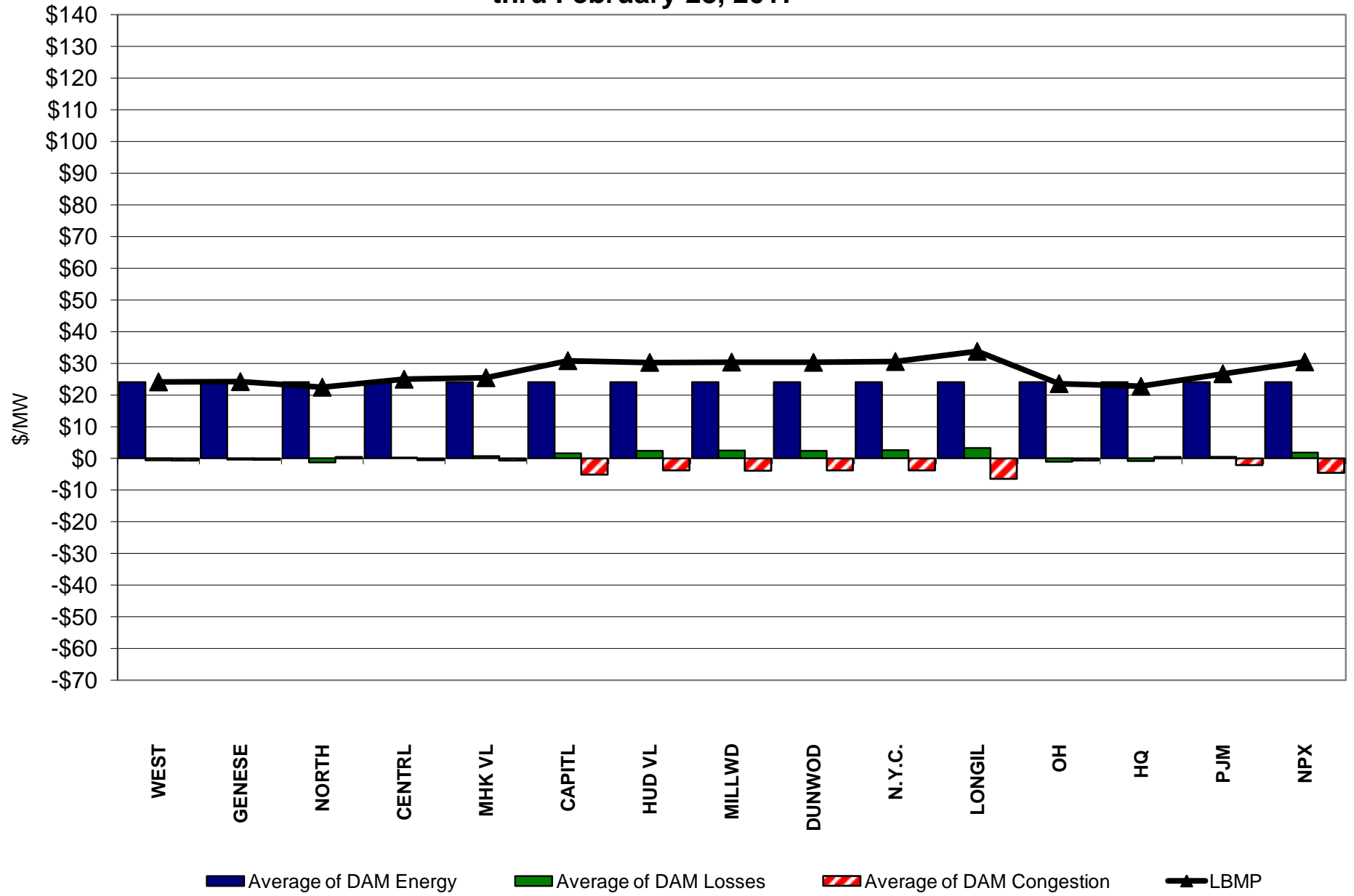
## NYC Zone J Monthly Average LBMP Prices 2016 - 2017



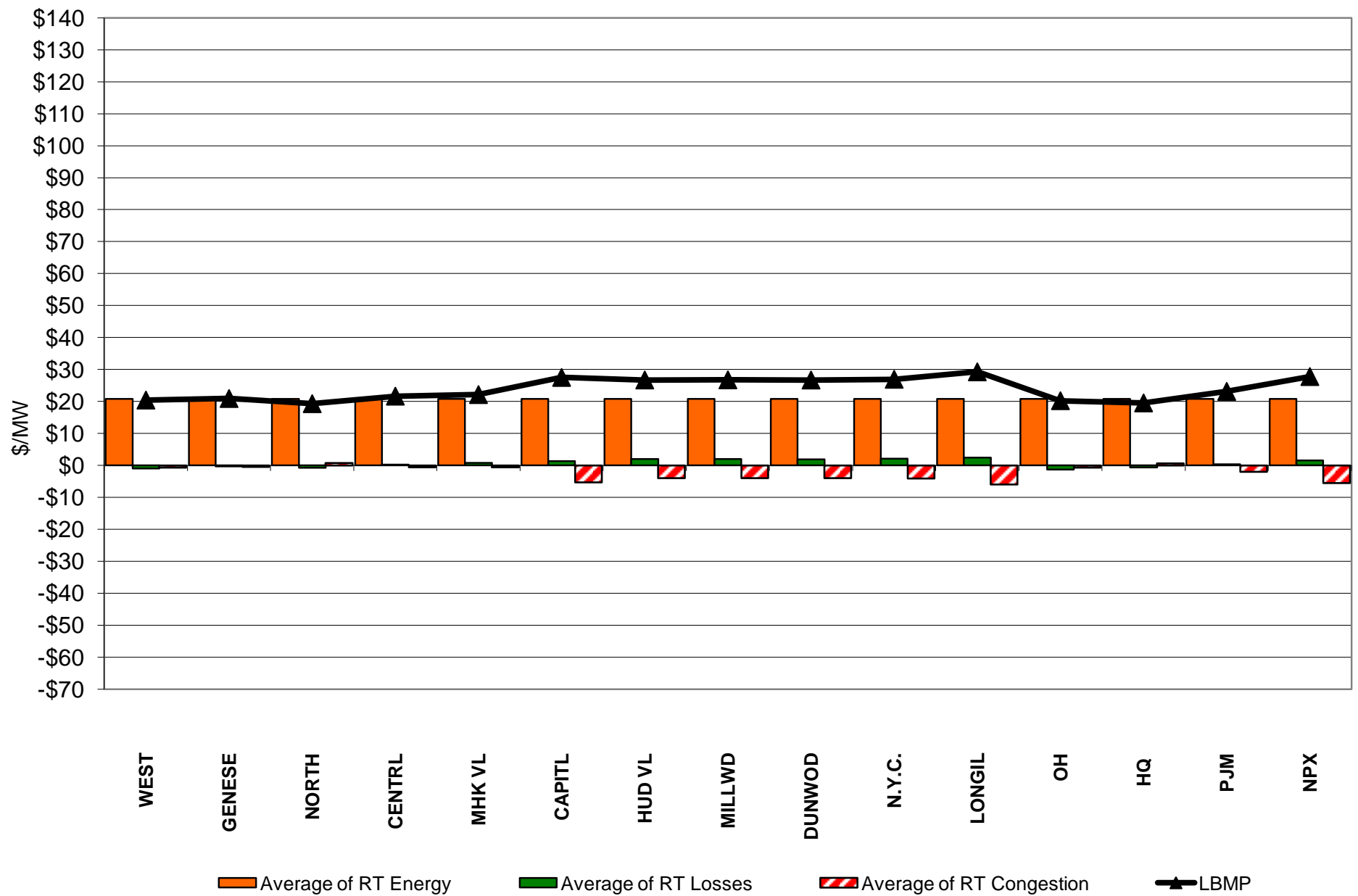
## Long Island Zone K Monthly Average LBMP Prices 2016 - 2017



**DAM Zonal Unweighted Monthly Average LBMP Components  
thru February 28, 2017**



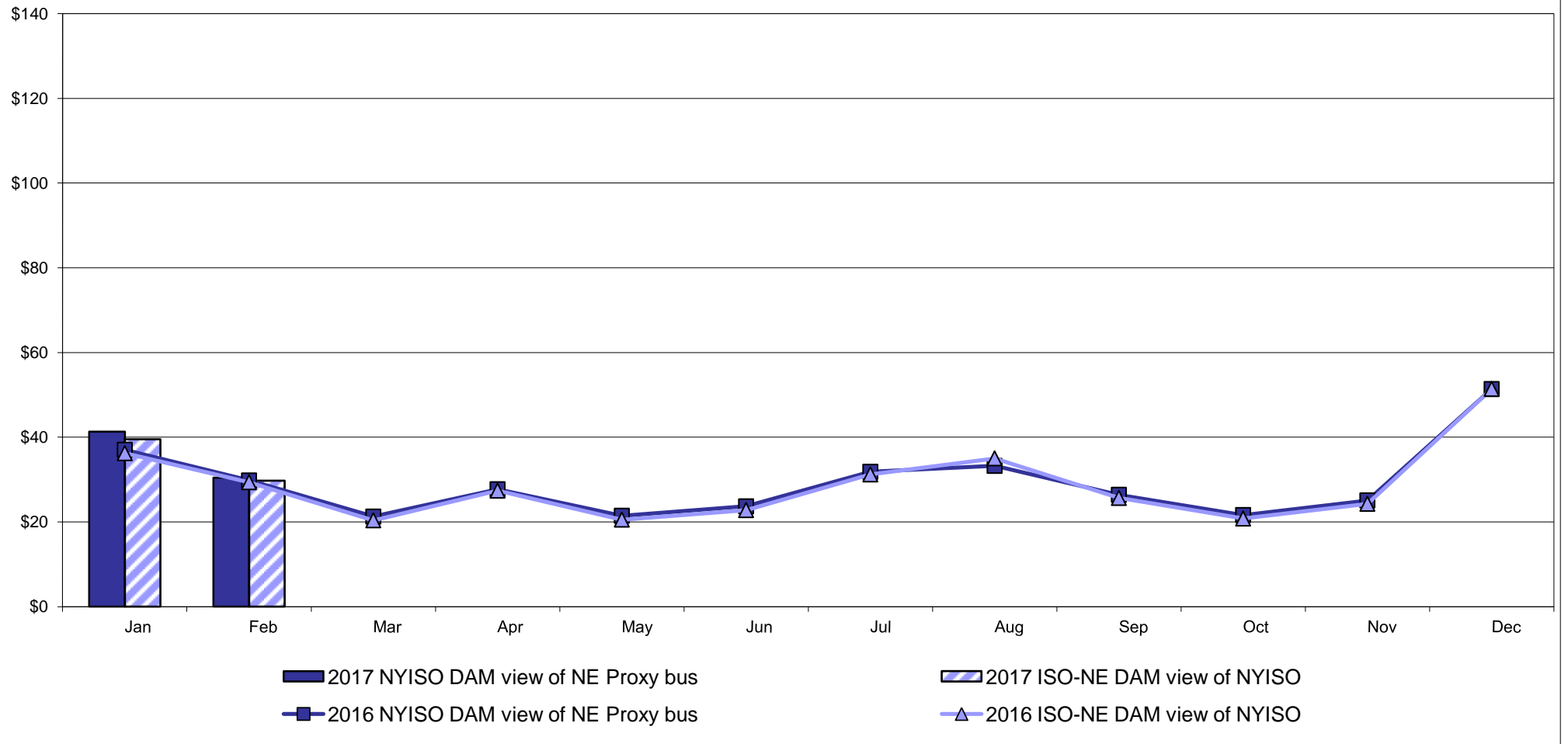
**RT Zonal Unweighted Monthly Average LBMP Components  
thru February 28, 2017**



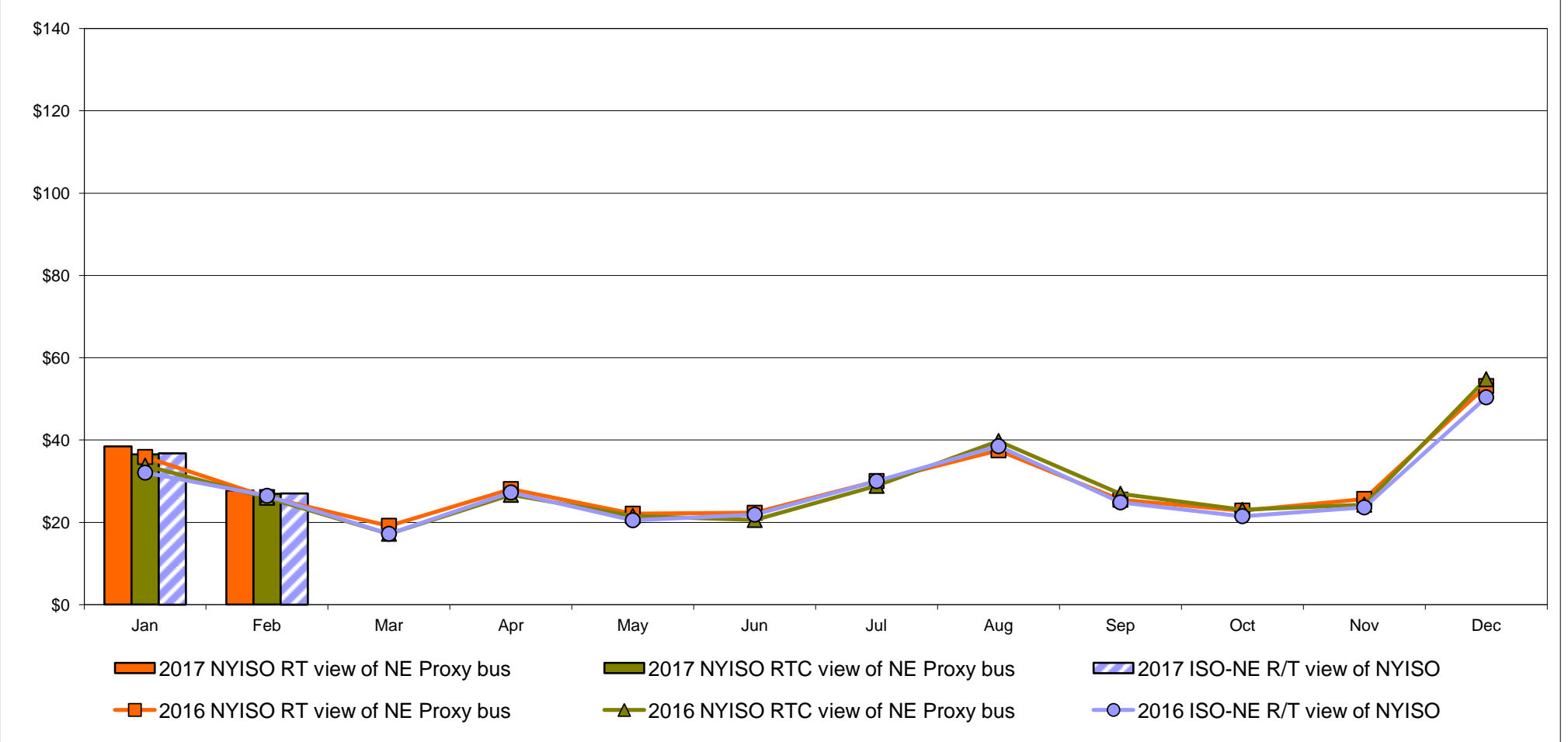


# External Comparison ISO-New England

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

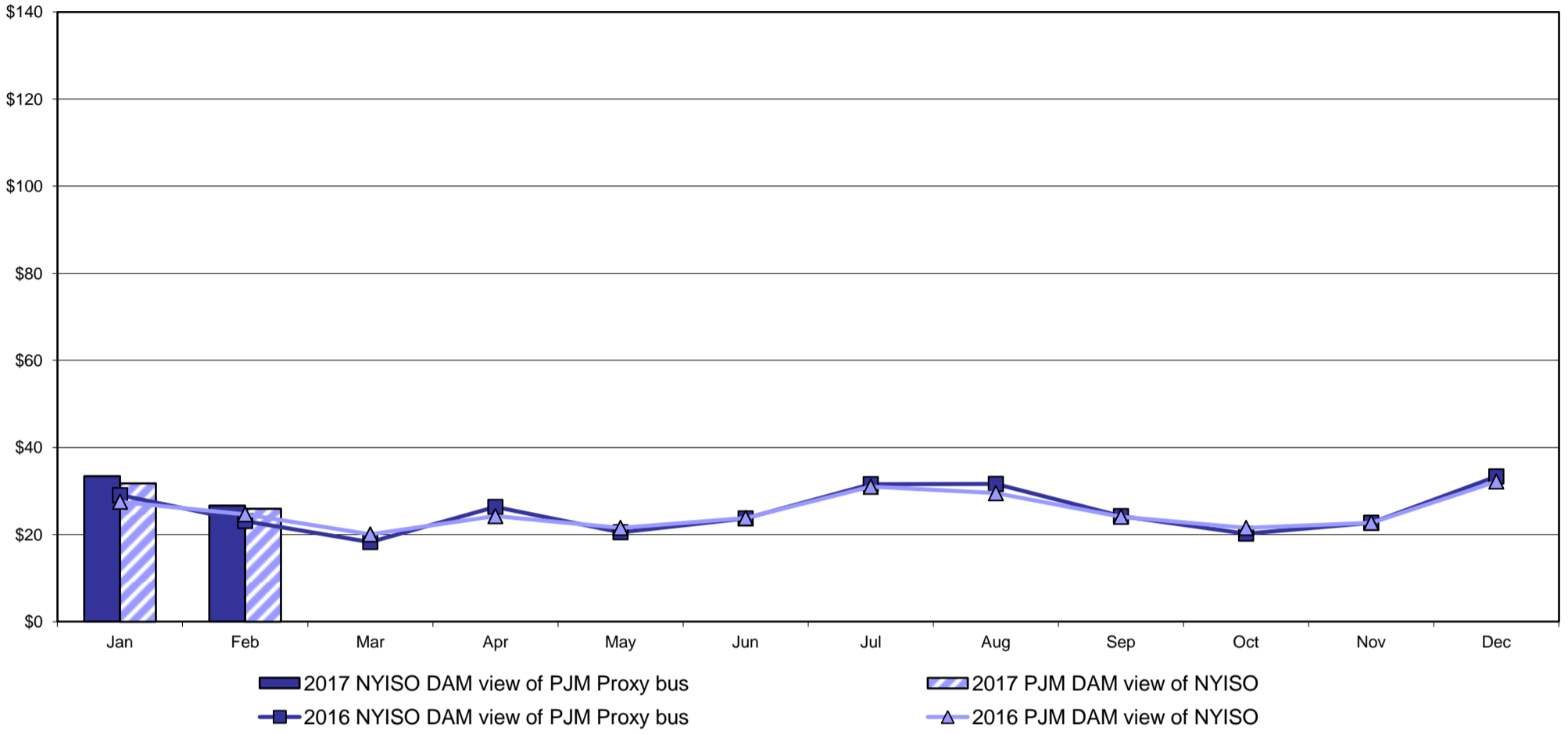


### Real Time Market External Zone Comparison: ISO-NE (\$/MWh)

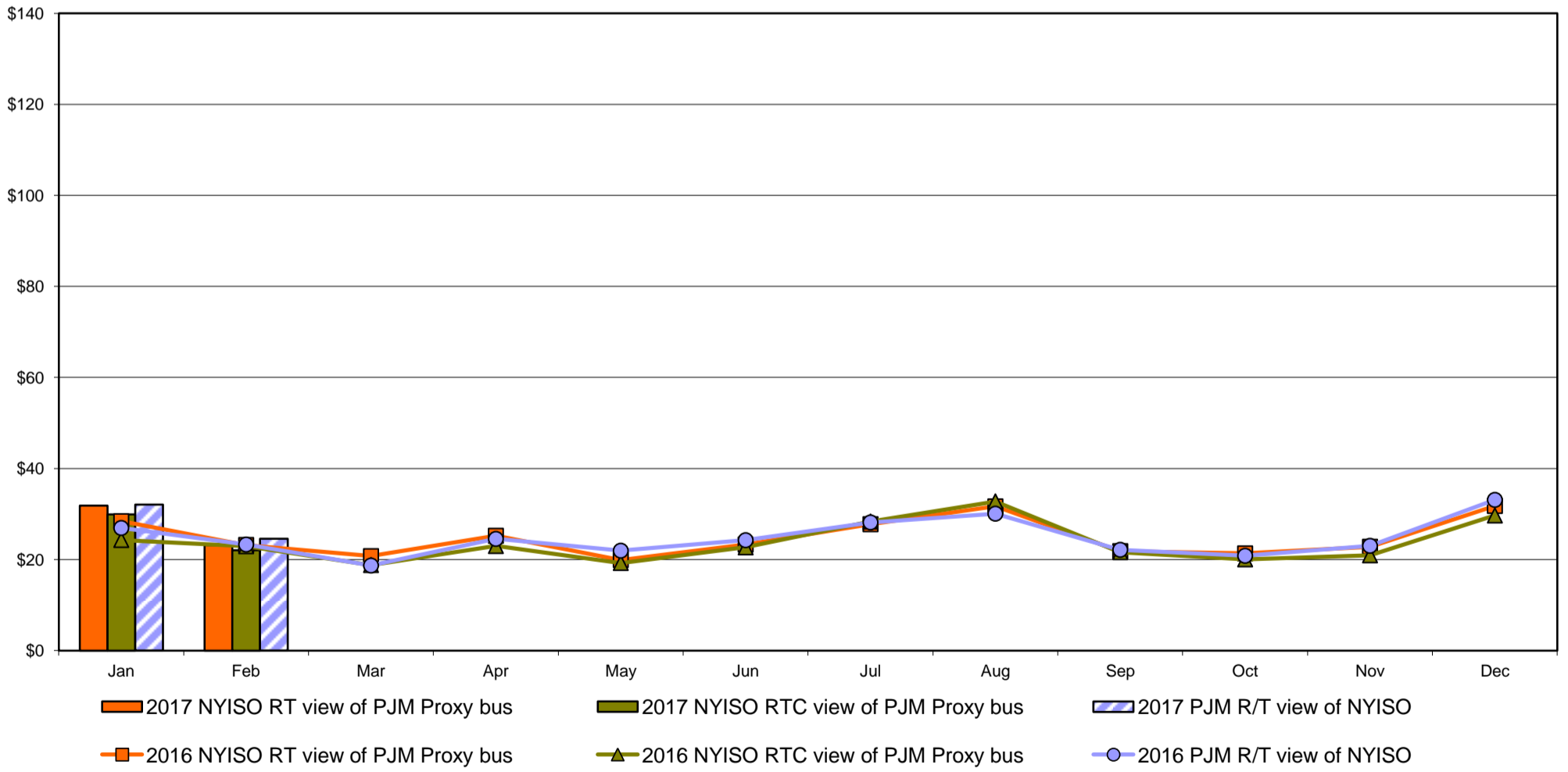


# External Comparison PJM

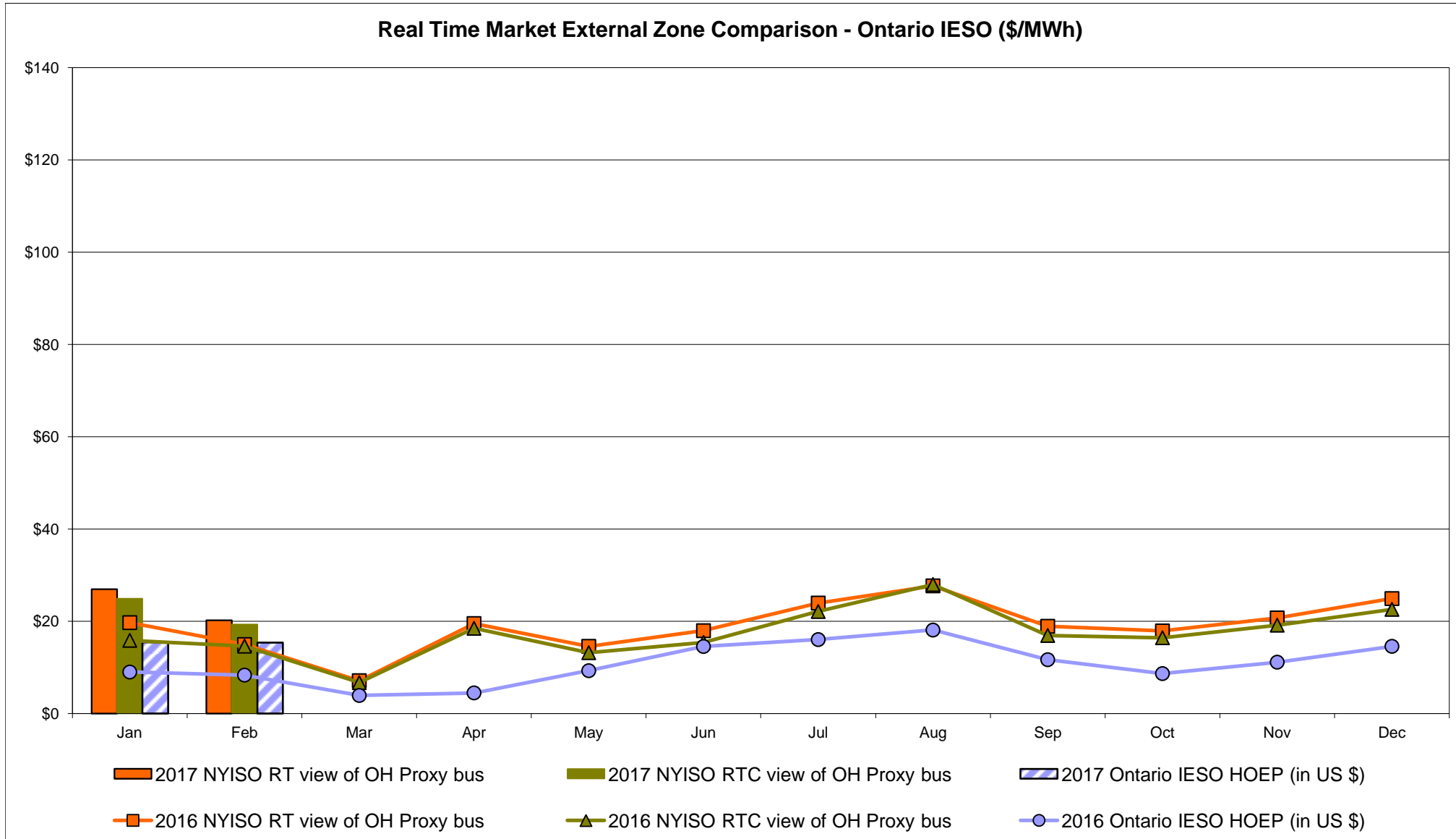
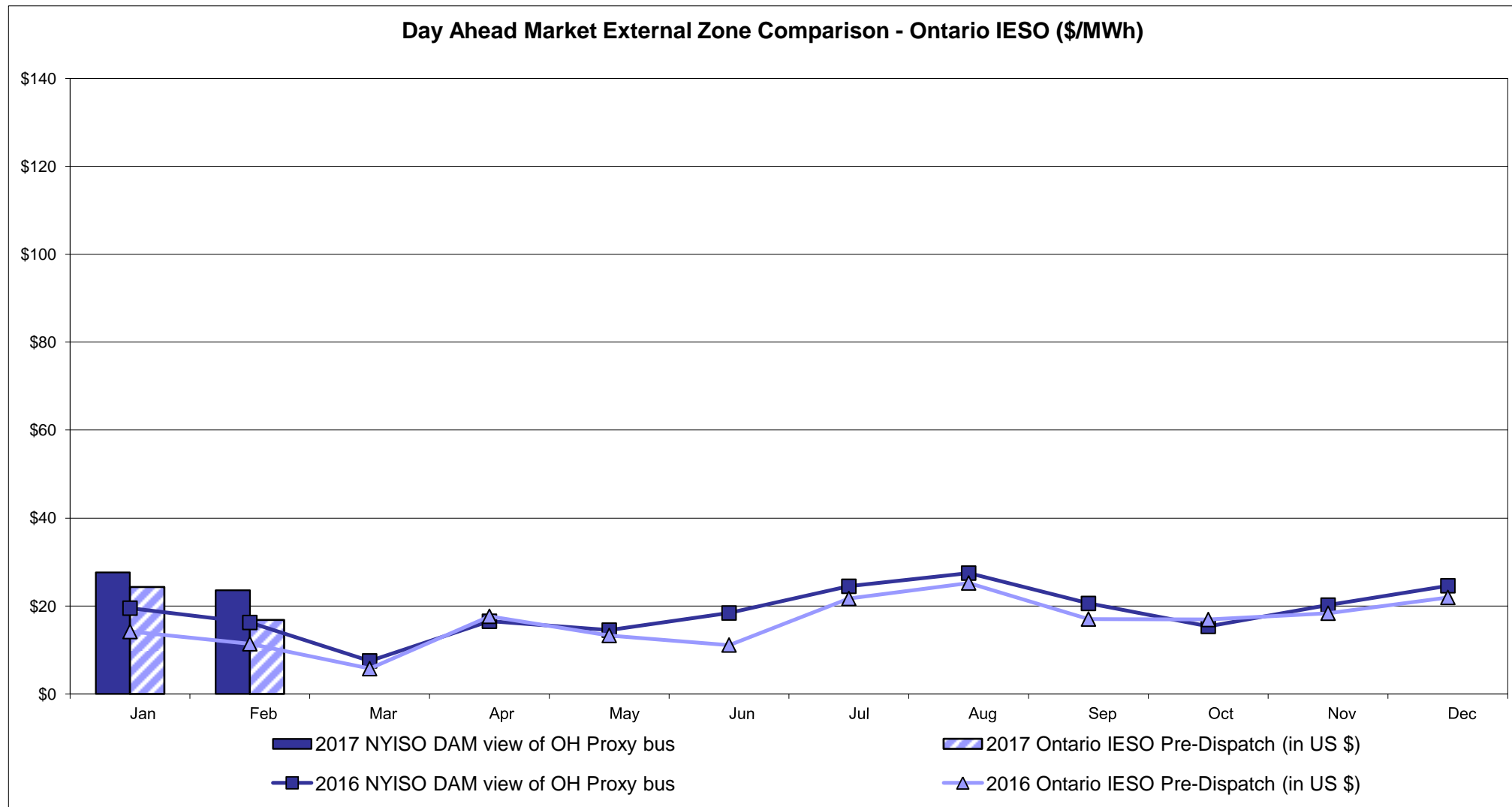
## Day Ahead Market External Zone Comparison - PJM (\$/MWh)



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

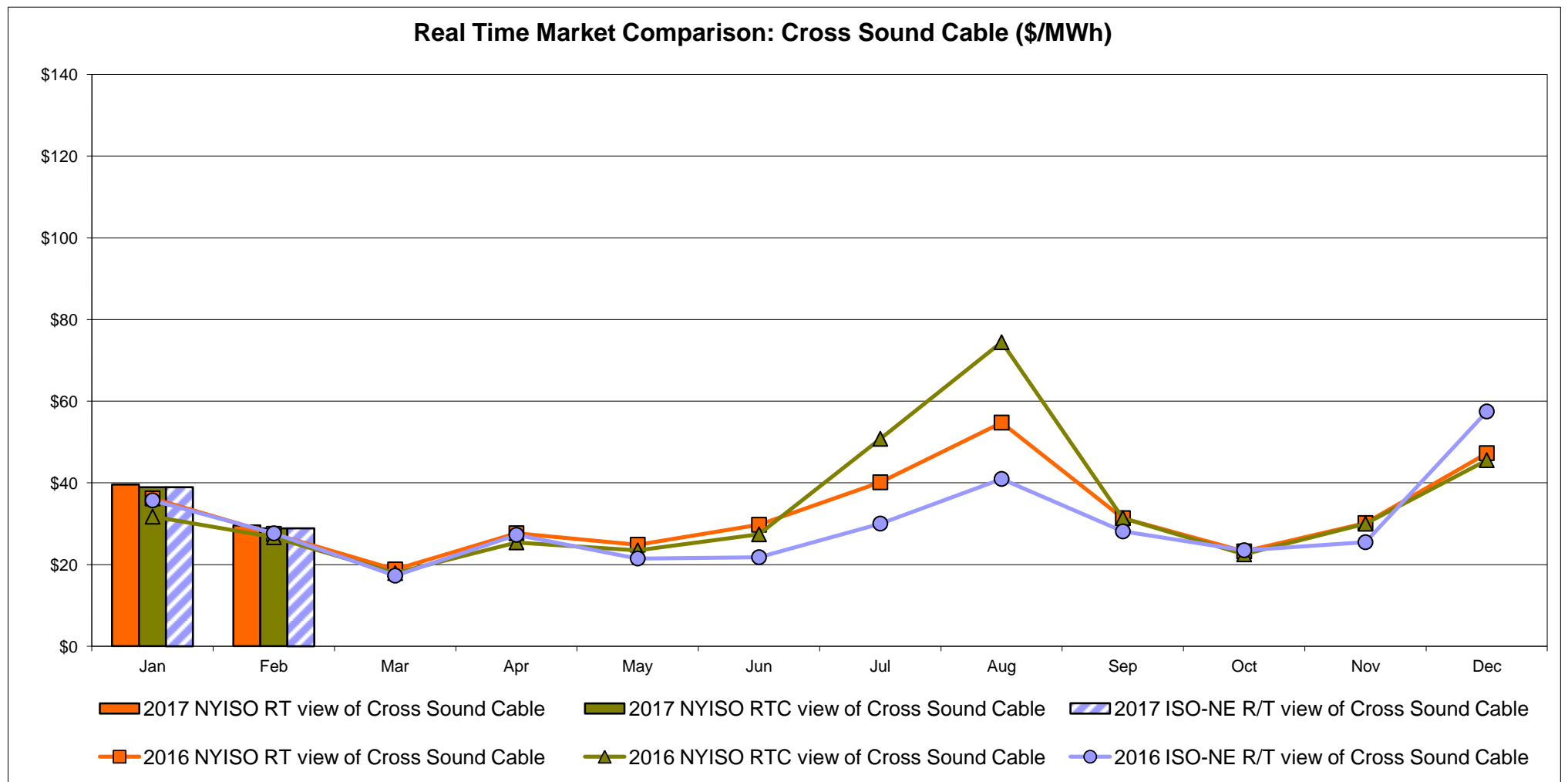
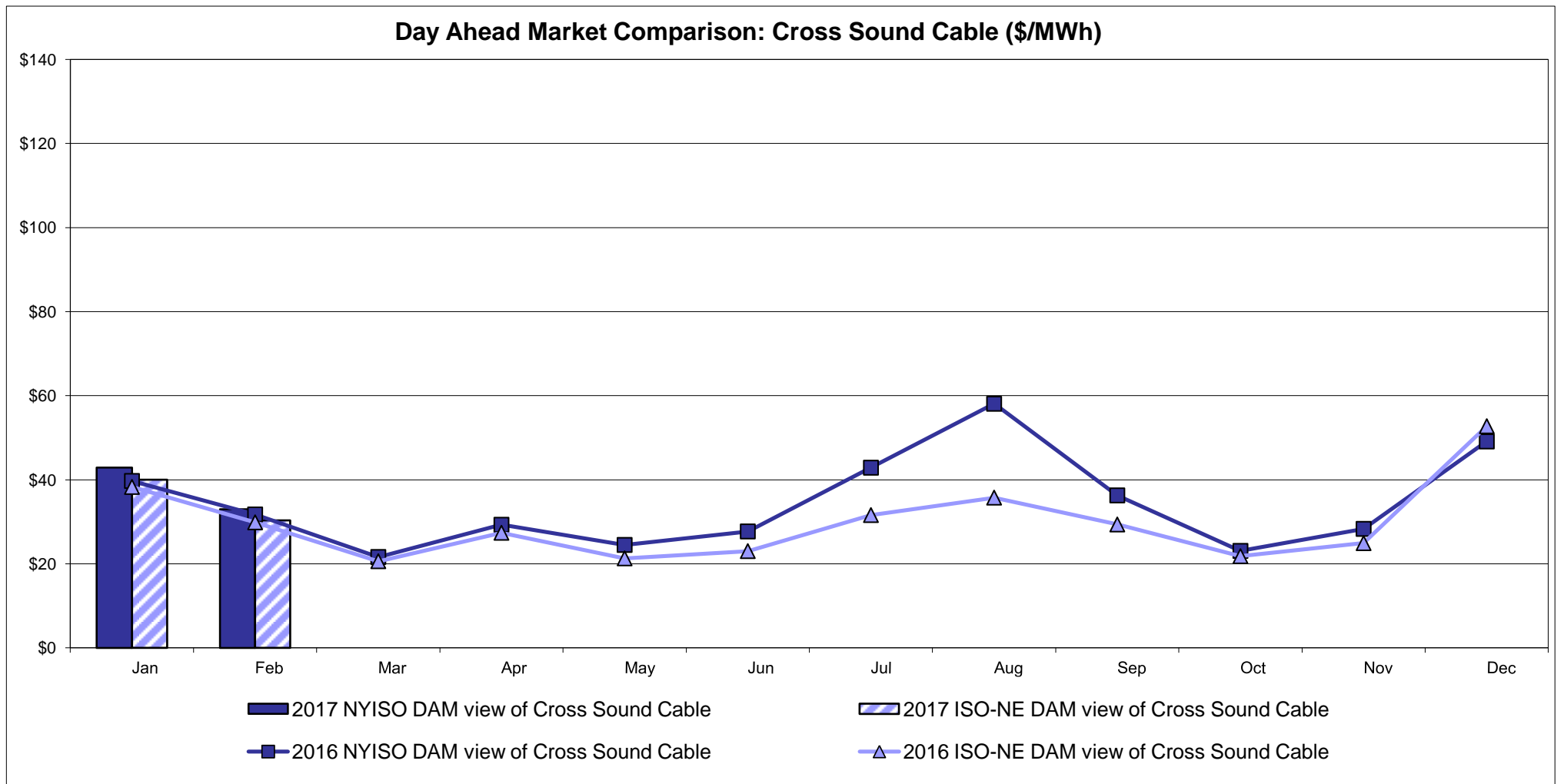


# External Comparison Ontario IESO



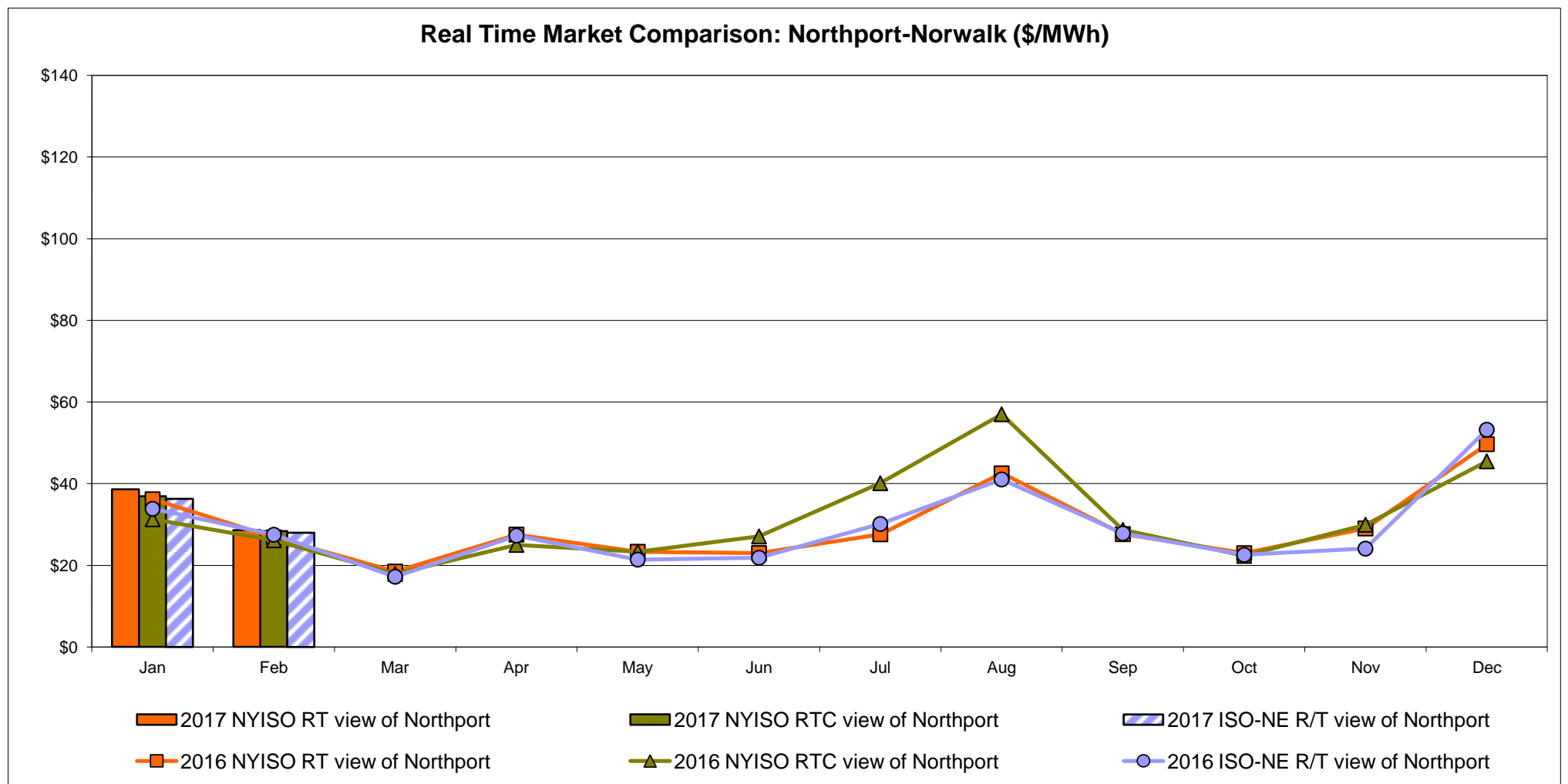
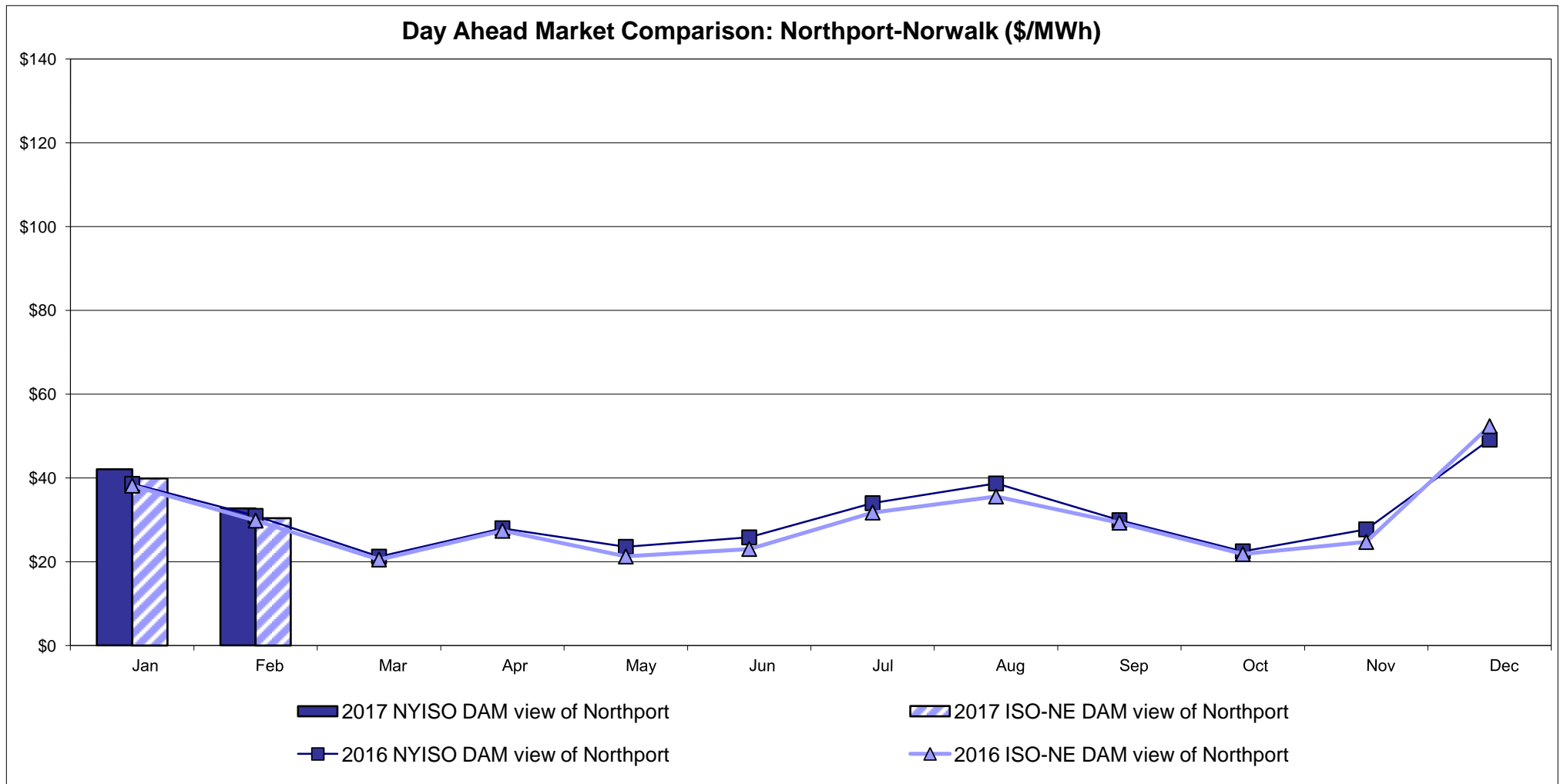
Notes: Exchange factor used for February 2017 was 0.763242253 to US  
 HOEP: Hourly Ontario Energy Price  
 Pre-Dispatch: Projected Energy Price

# External Controllable Line: Cross Sound Cable (New England)



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

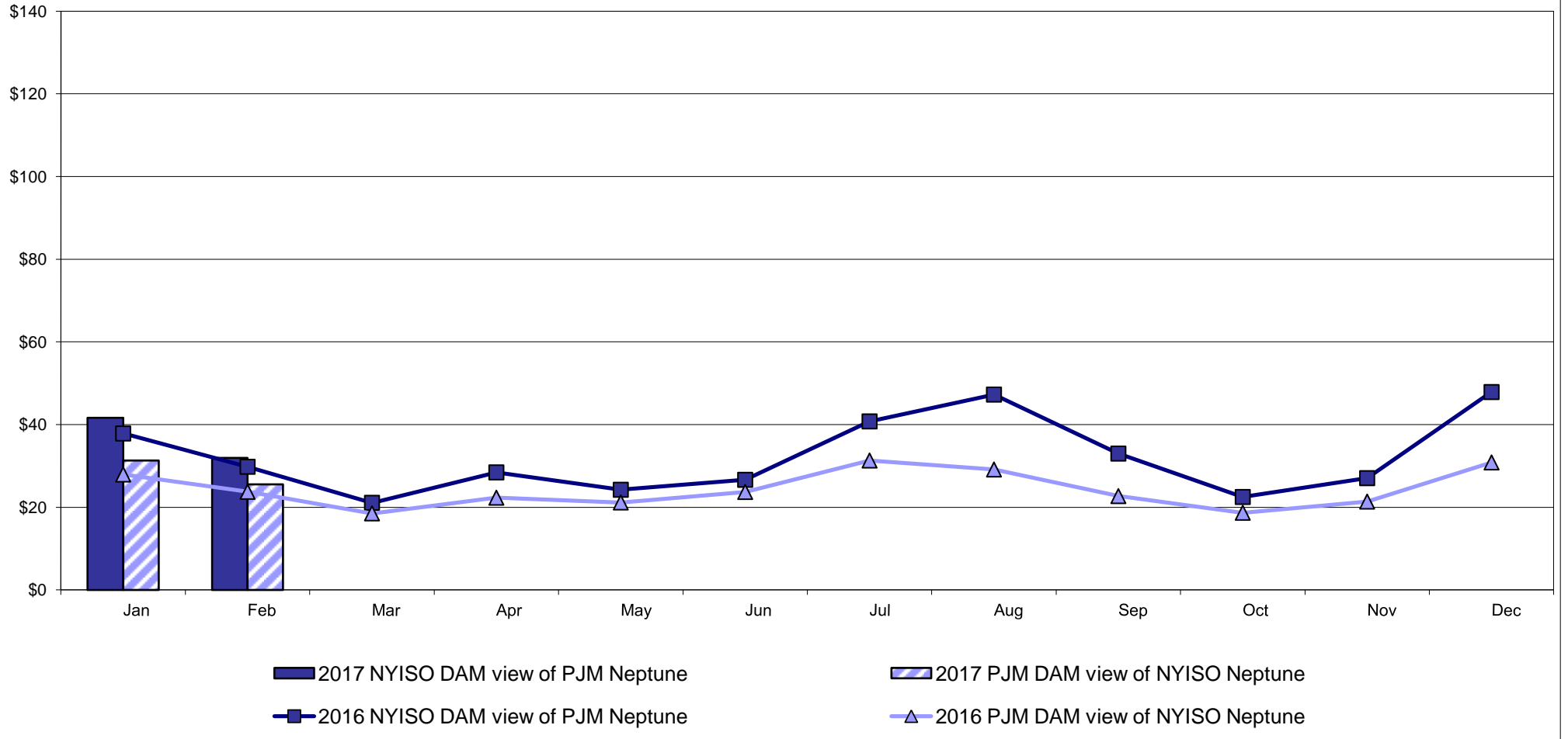
# External Controllable Line: Northport - Norwalk (New England)



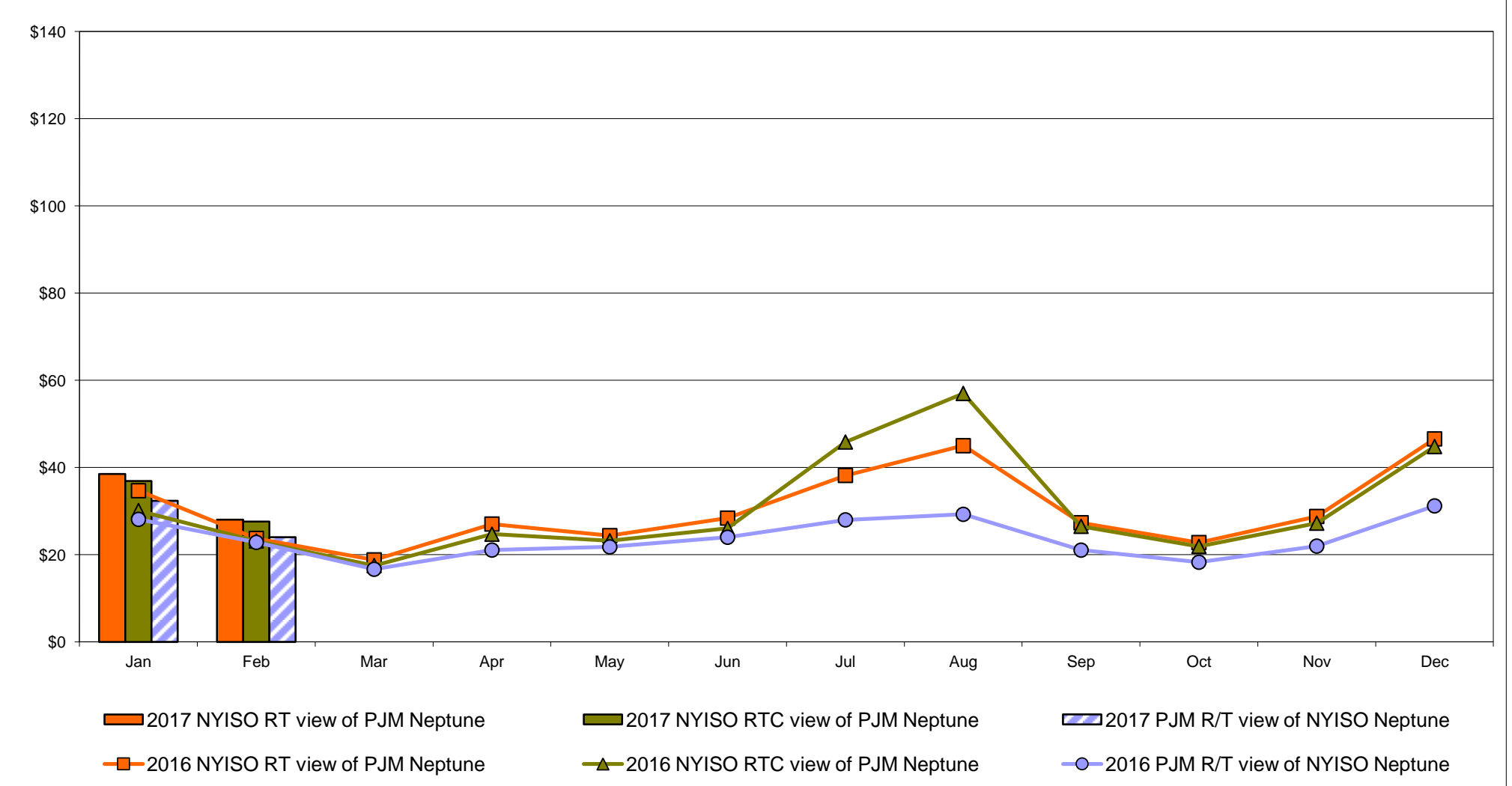
Note:  
 ISO-NE Forecast is an advisory posting @ 18:00 day before.  
 The DAM and R/T prices at the Northport 138 interface are used for ISO-NE.  
 The DAM and R/T prices at the 1385 interface are used for NYISO.

# External Controllable Line: Neptune (PJM)

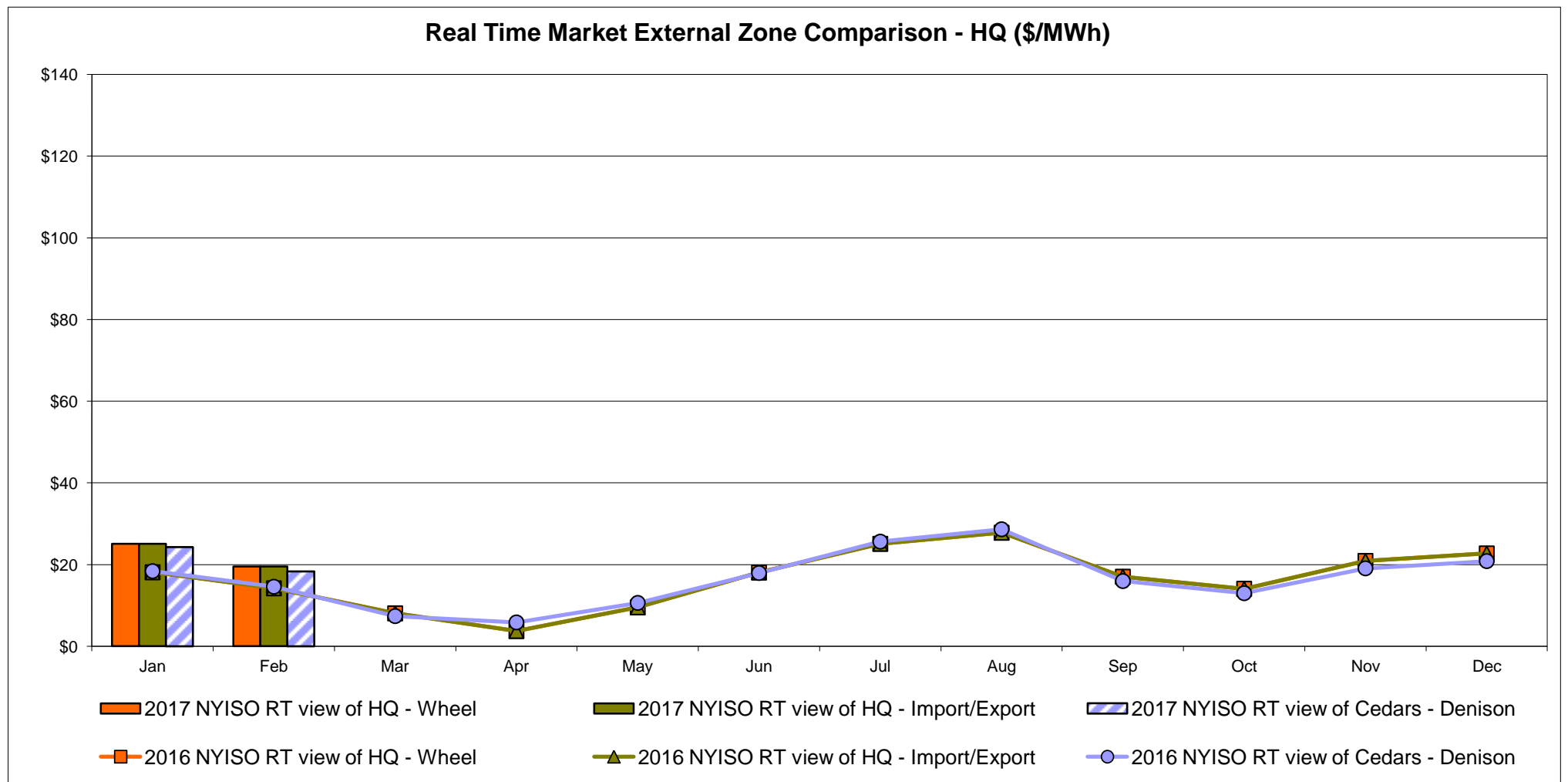
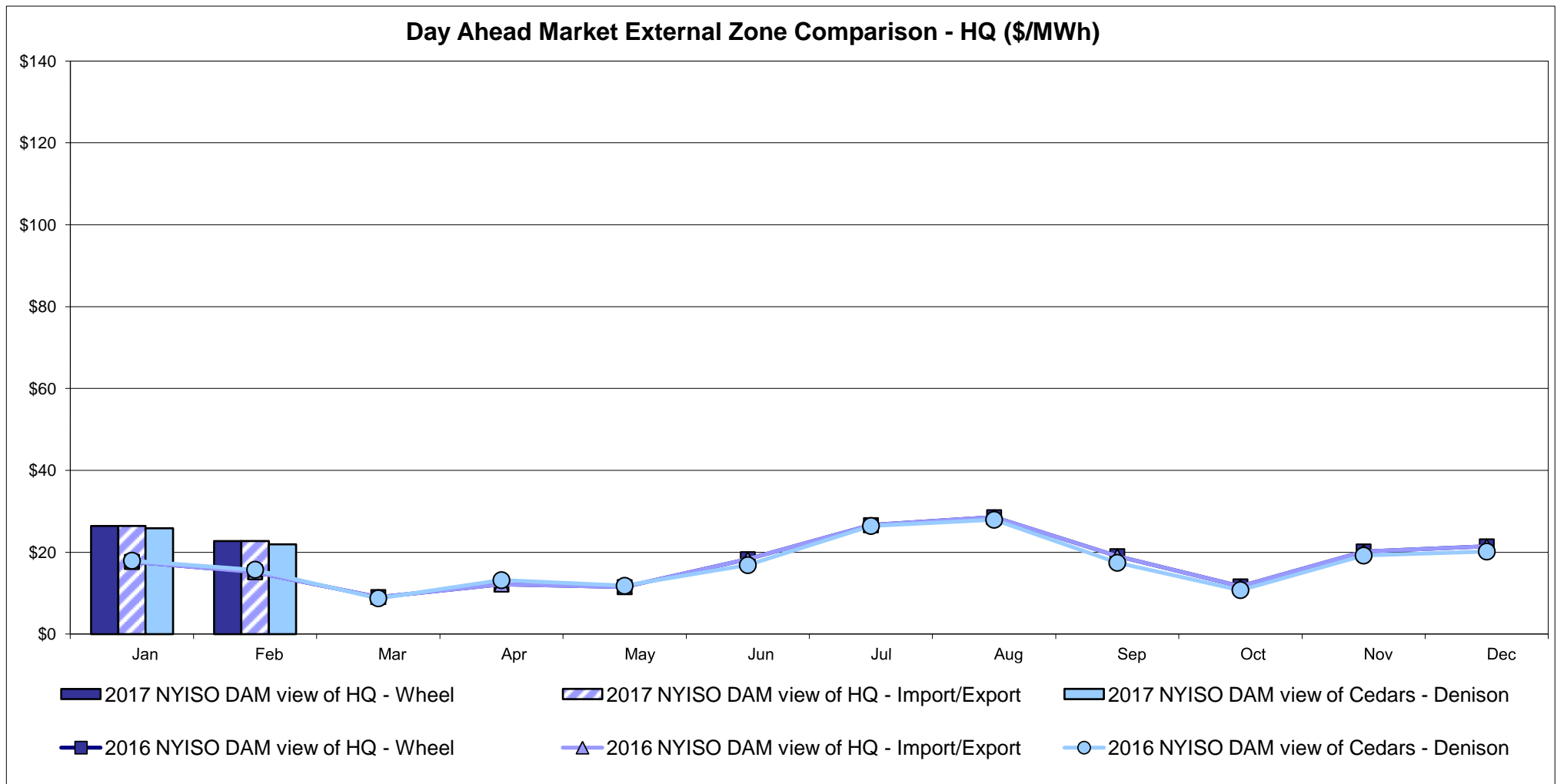
### Day Ahead Market Comparison: Neptune (\$/MWh)



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

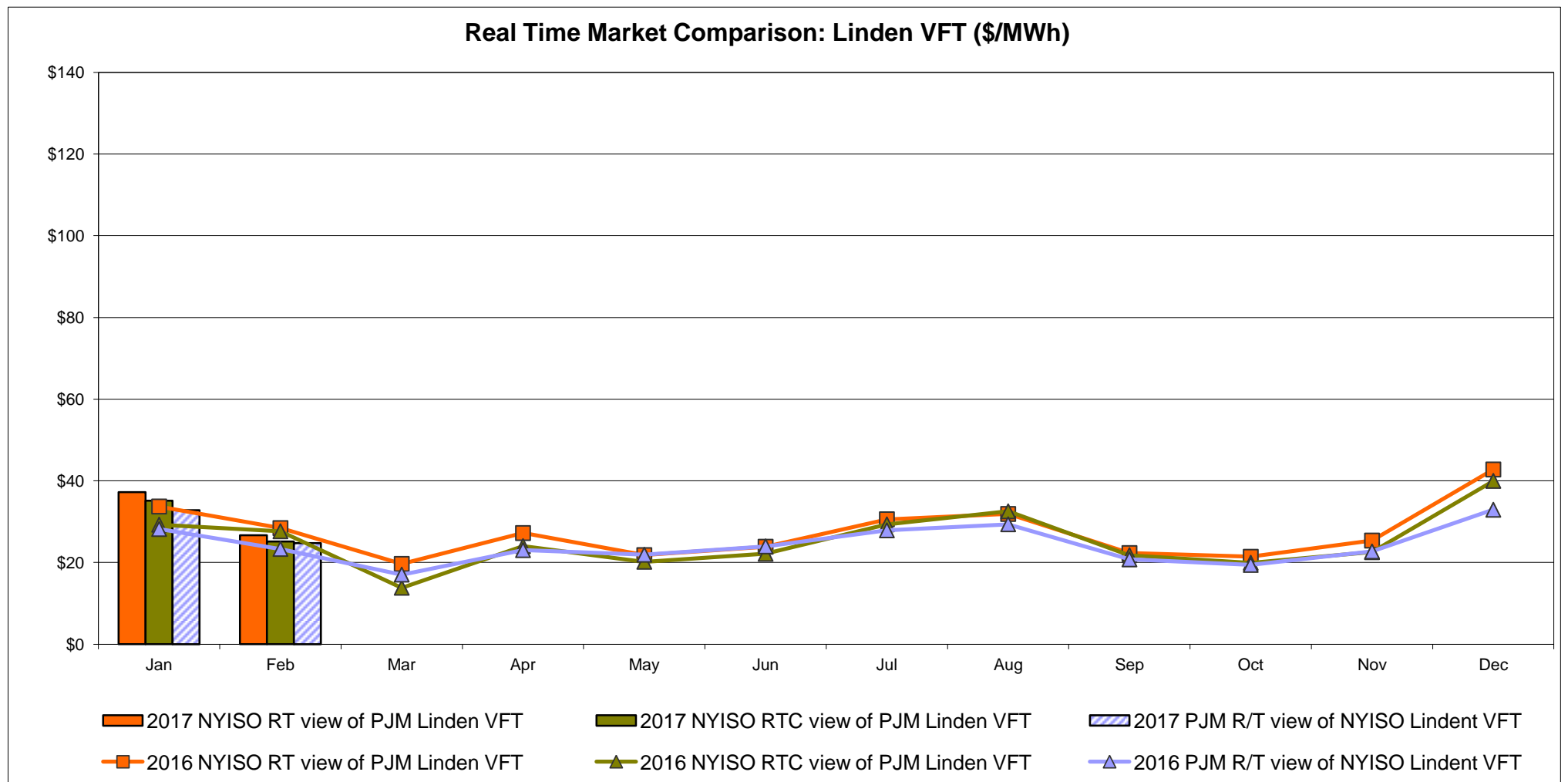
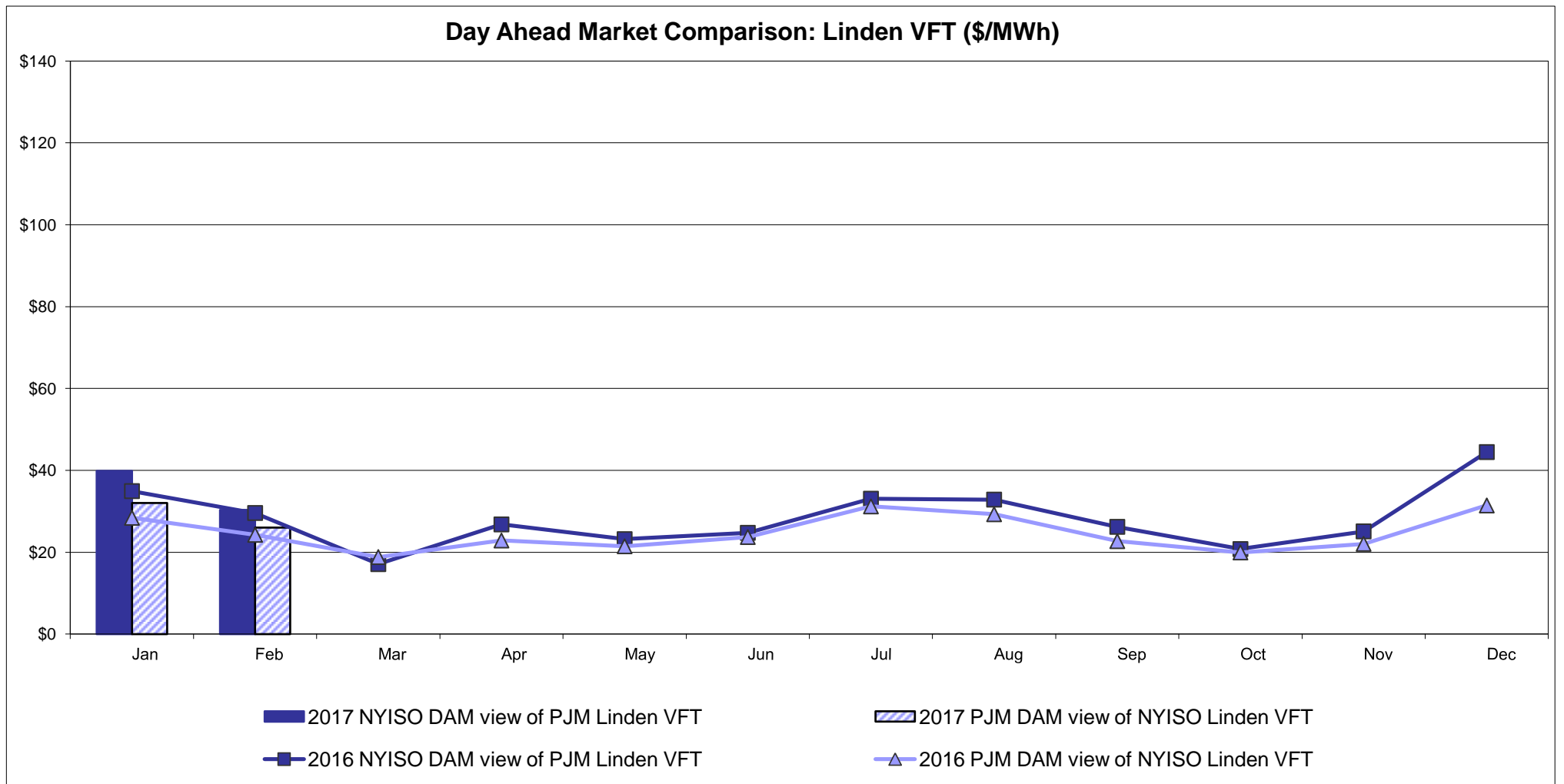


# External Comparison Hydro-Quebec



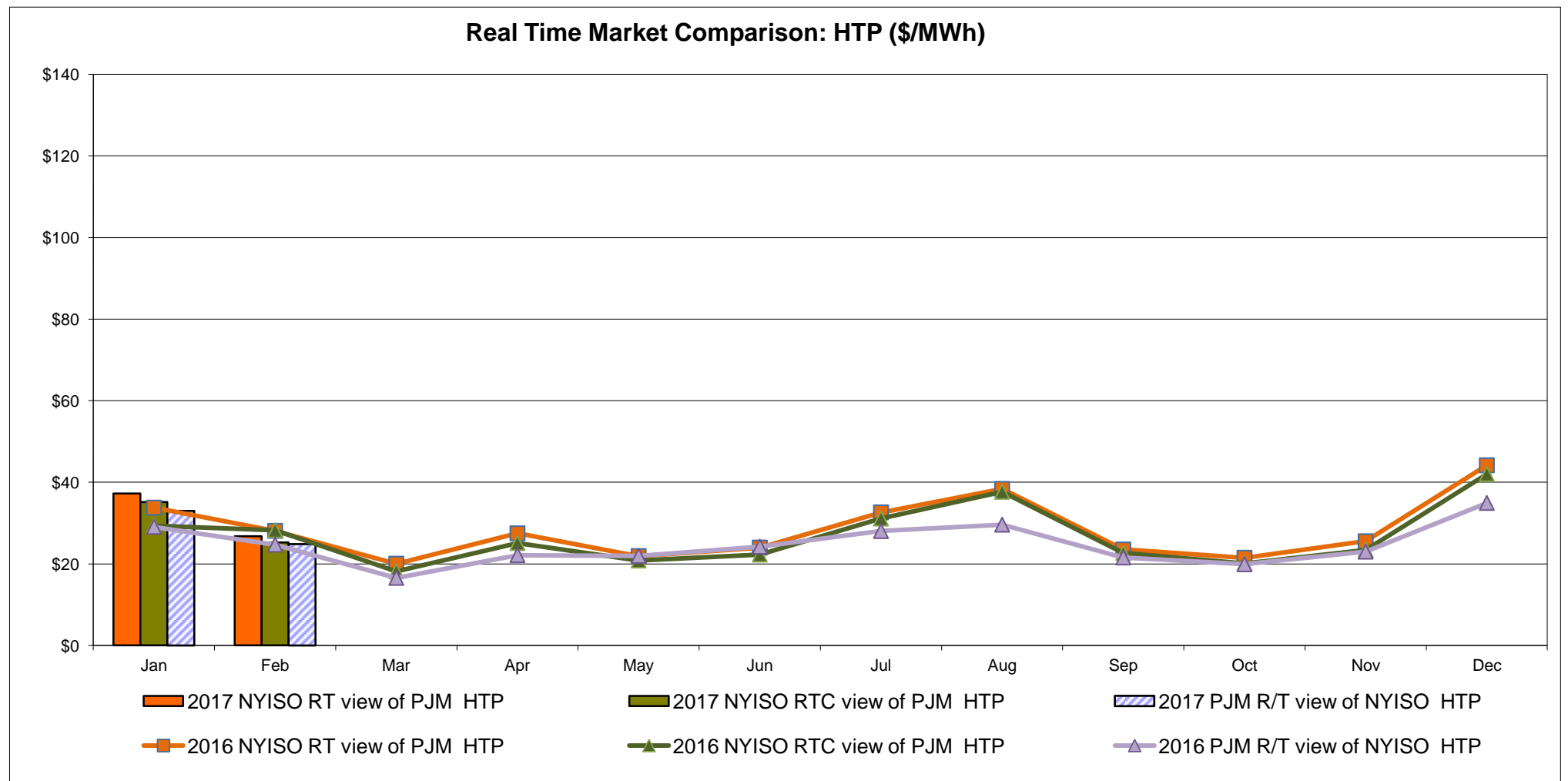
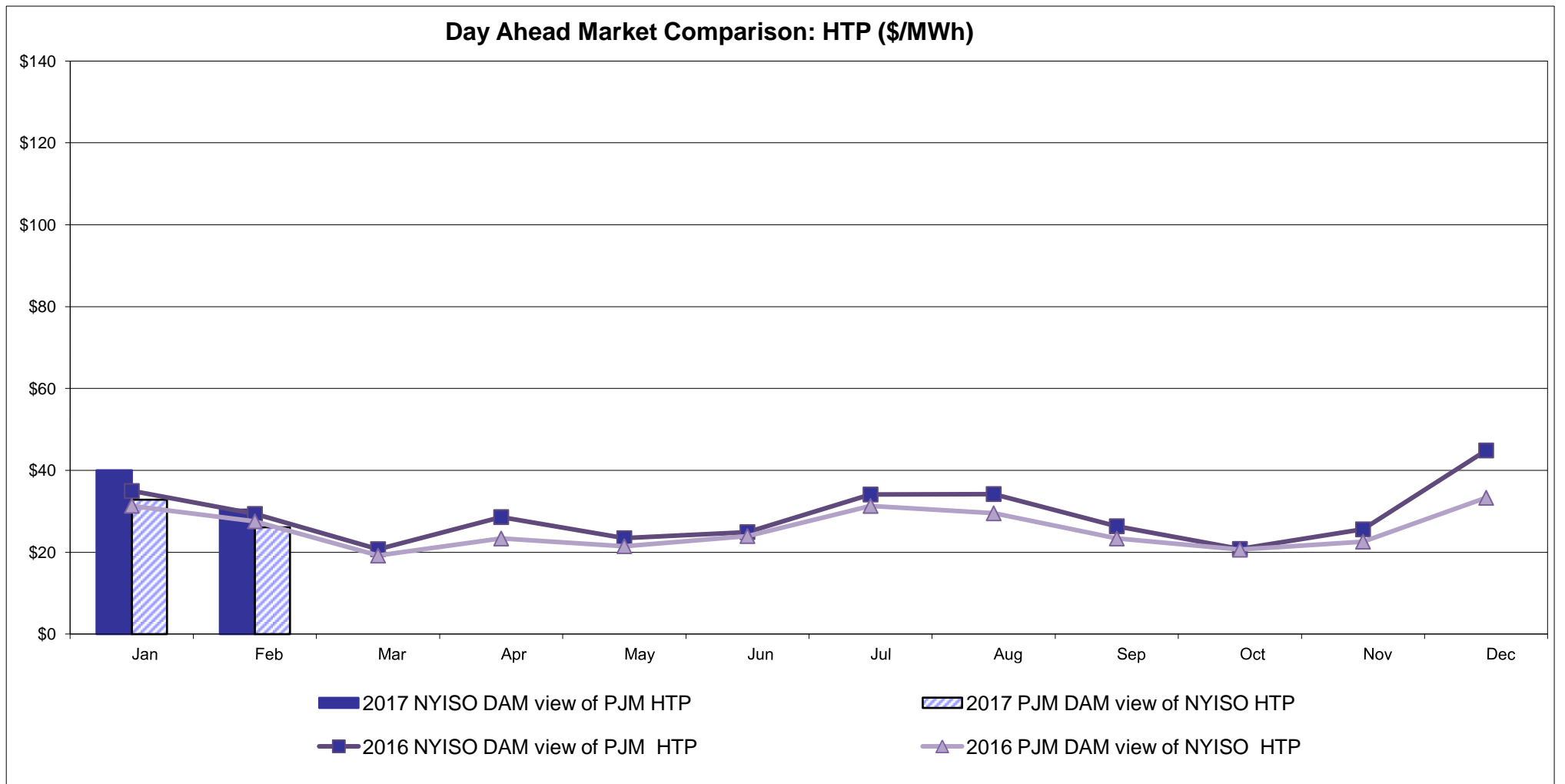
Note:  
Hydro-Quebec Prices are unavailable.

# External Controllable Line: Linden VFT (PJM)





## External Controllable Line: Hudson (PJM)

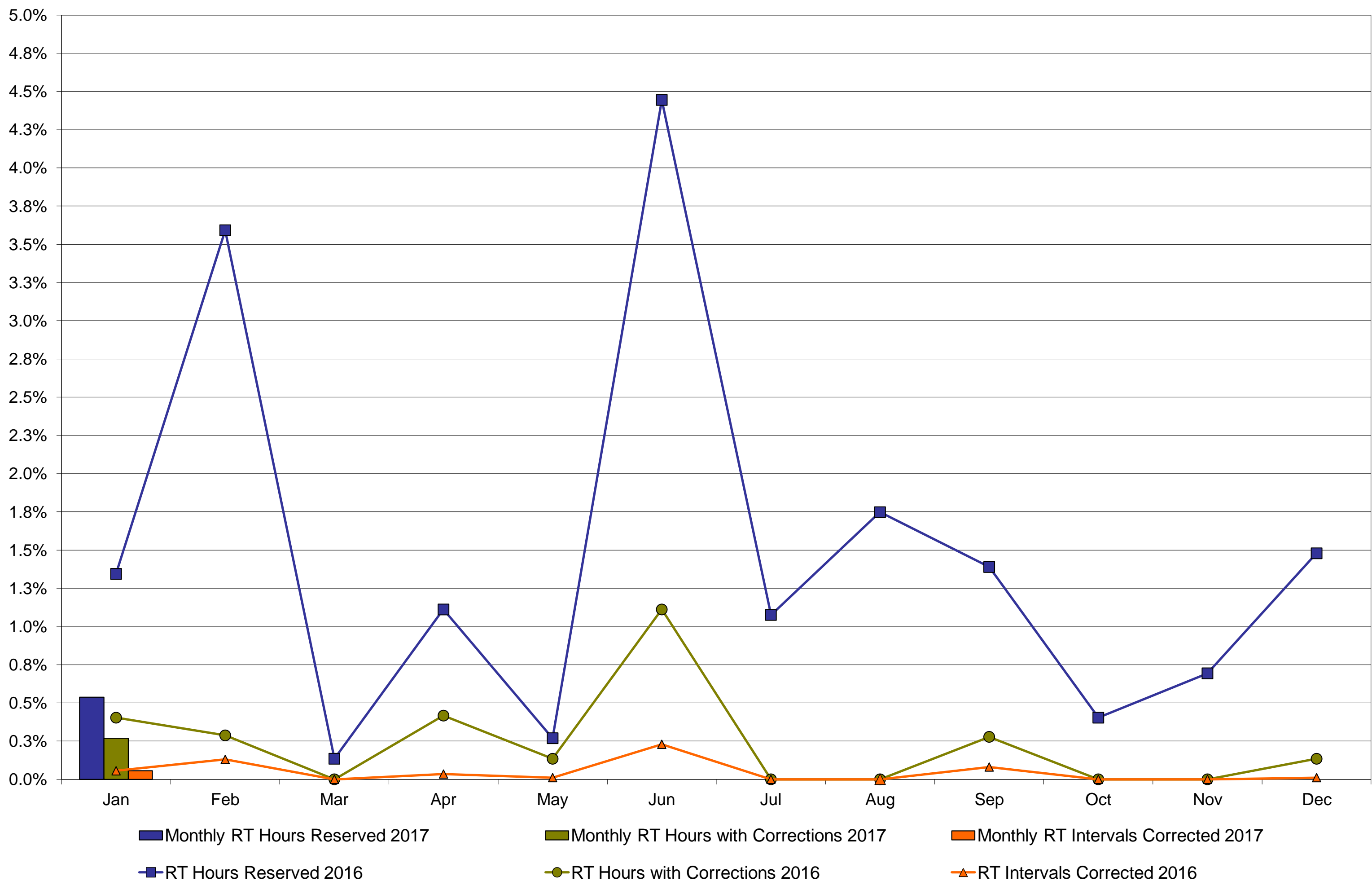


### NYISO Real Time Price Correction Statistics

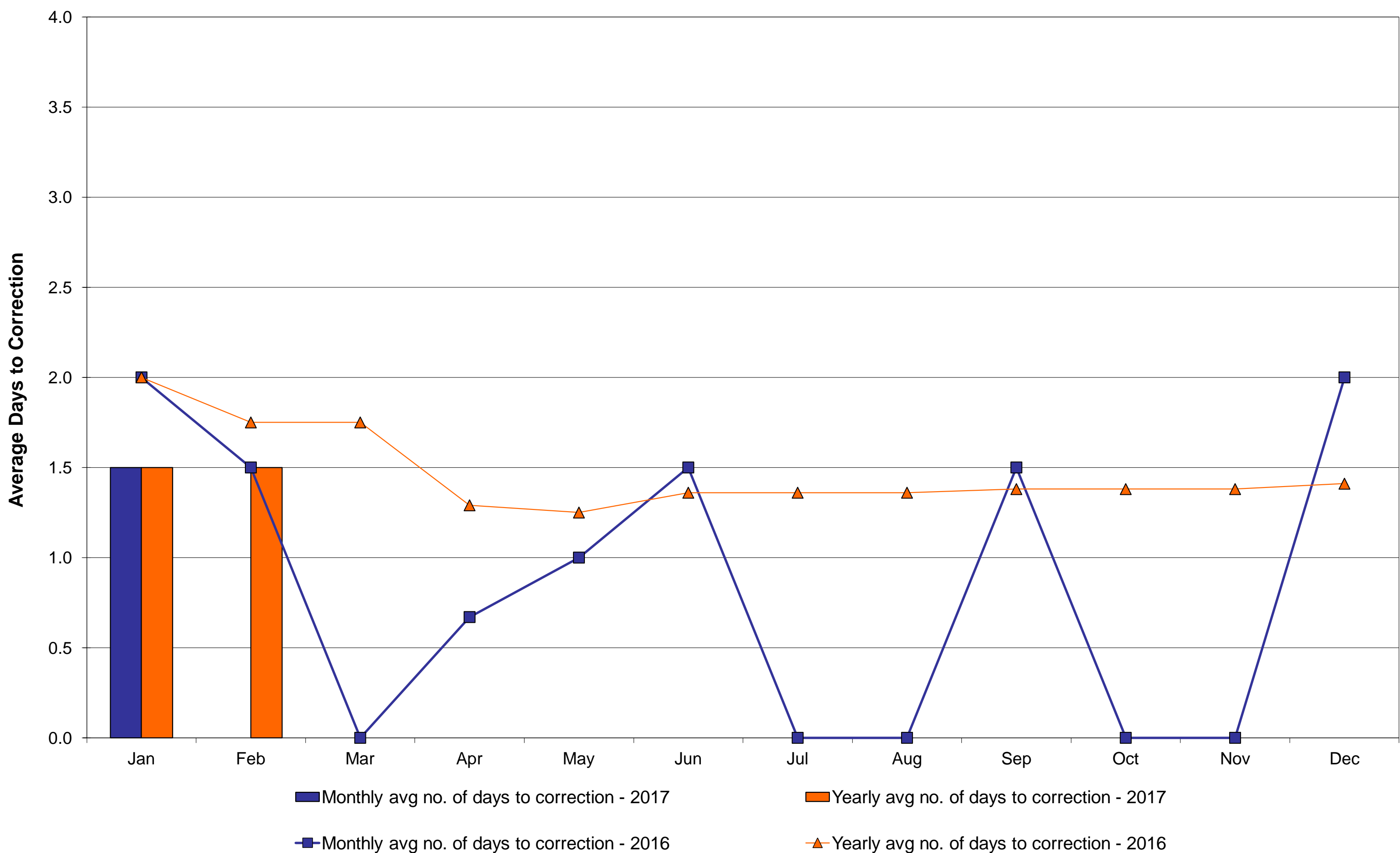
<b>2017</b>		<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<b>Hour Corrections</b>													
Number of hours with corrections	in the month	2	0										
Number of hours	in the month	744	672										
% of hours with corrections	in the month	0.27%	0.00%										
% of hours with corrections	year-to-date	0.27%	0.14%										
<b>Interval Corrections</b>													
Number of intervals corrected	in the month	5	0										
Number of intervals	in the month	8,983	8,101										
% of intervals corrected	in the month	0.06%	0.00%										
% of intervals corrected	year-to-date	0.06%	0.03%										
<b>Hours Reserved</b>													
Number of hours reserved	in the month	4	0										
Number of hours	in the month	744	672										
% of hours reserved	in the month	0.54%	0.00%										
% of hours reserved	year-to-date	0.54%	0.28%										
<b>Days to Correction *</b>													
Avg. number of days to correction	in the month	1.50	0.00										
Avg. number of days to correction	year-to-date	1.50	1.50										
<b>Days Without Corrections</b>													
Days without corrections	in the month	29	28										
Days without corrections	year-to-date	29	57										
<b>2016</b>		<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<b>Hour Corrections</b>													
Number of hours with corrections	in the month	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%
<b>Interval Corrections</b>													
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%
<b>Hours Reserved</b>													
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%
<b>Days to Correction *</b>													
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
<b>Days Without Corrections</b>													
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

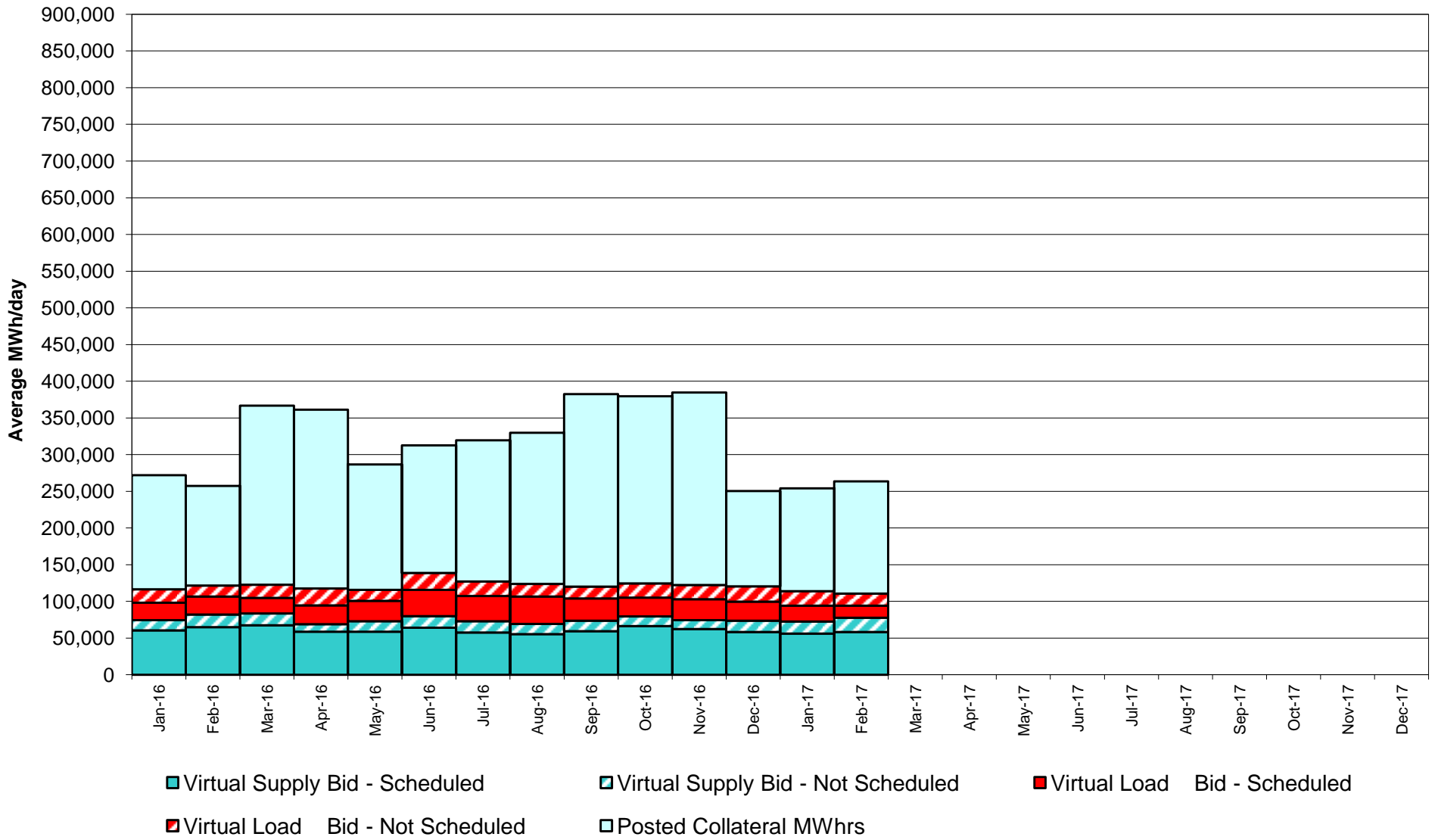


### Annual average time period for making Price Corrections (from reservation date) \*

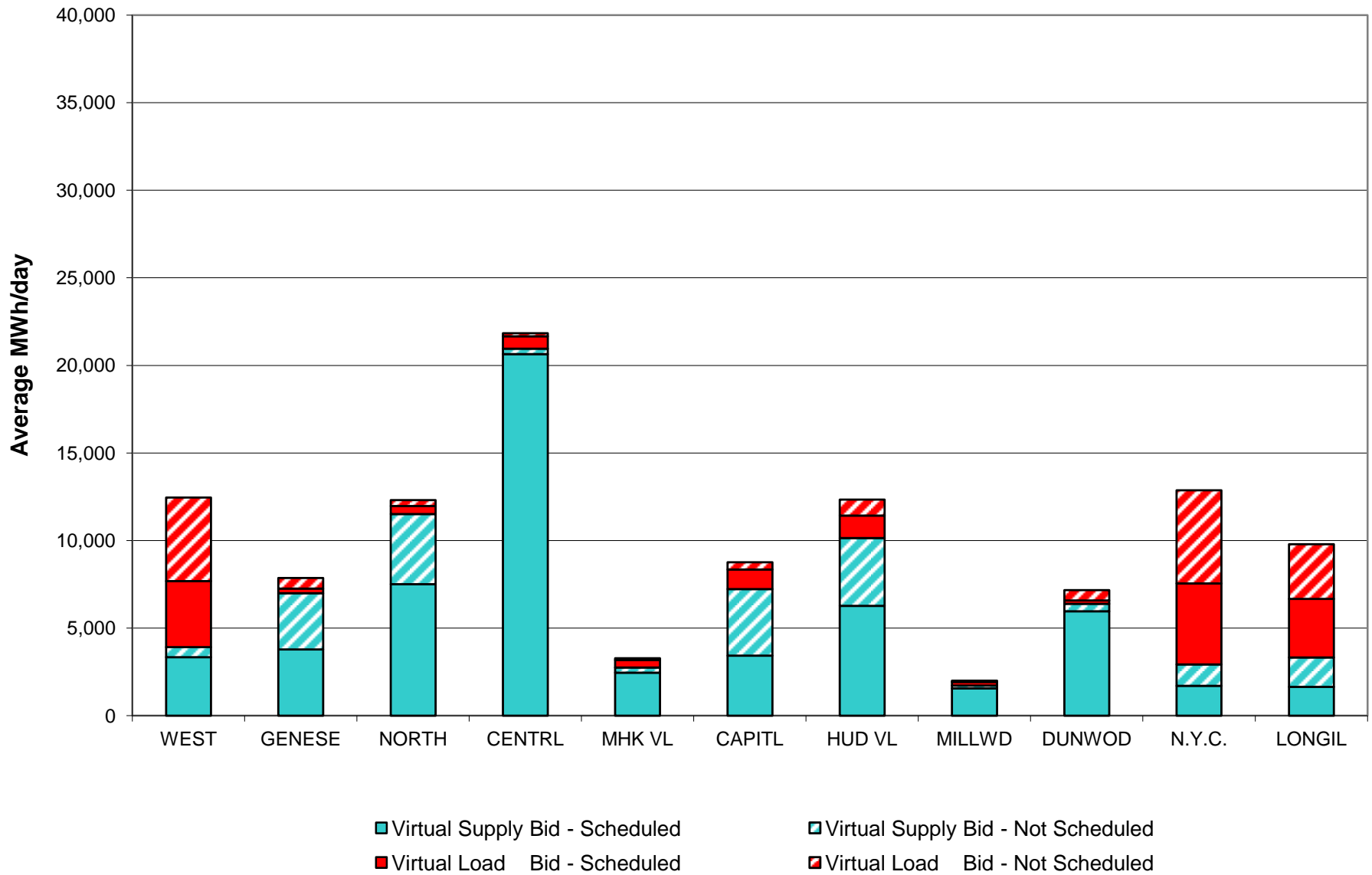


\* Calendar days from reservation date.

## NYISO Virtual Trading Average MWh per day



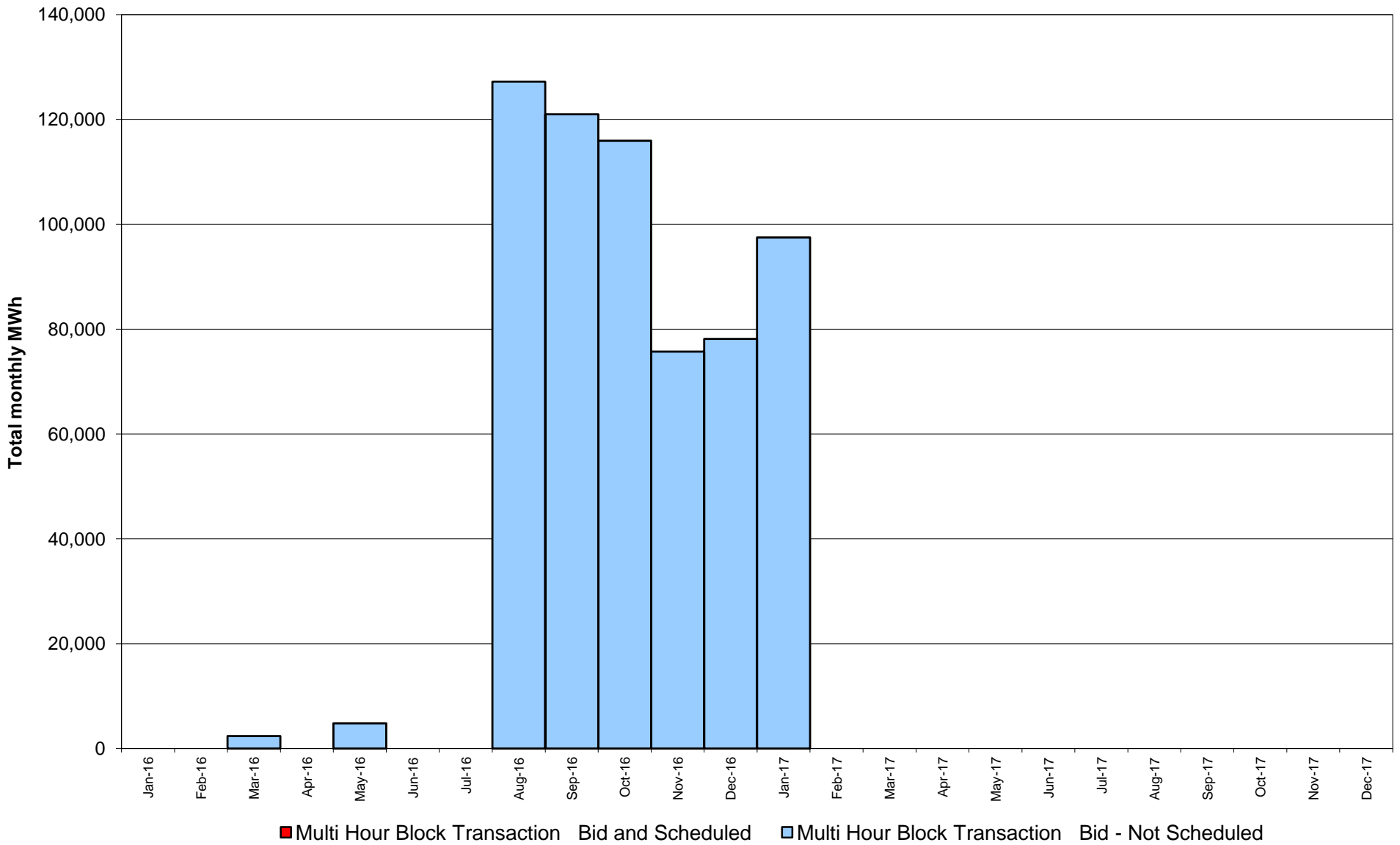
**Virtual Load and Supply Zonal Statistics  
through February 28, 2017**



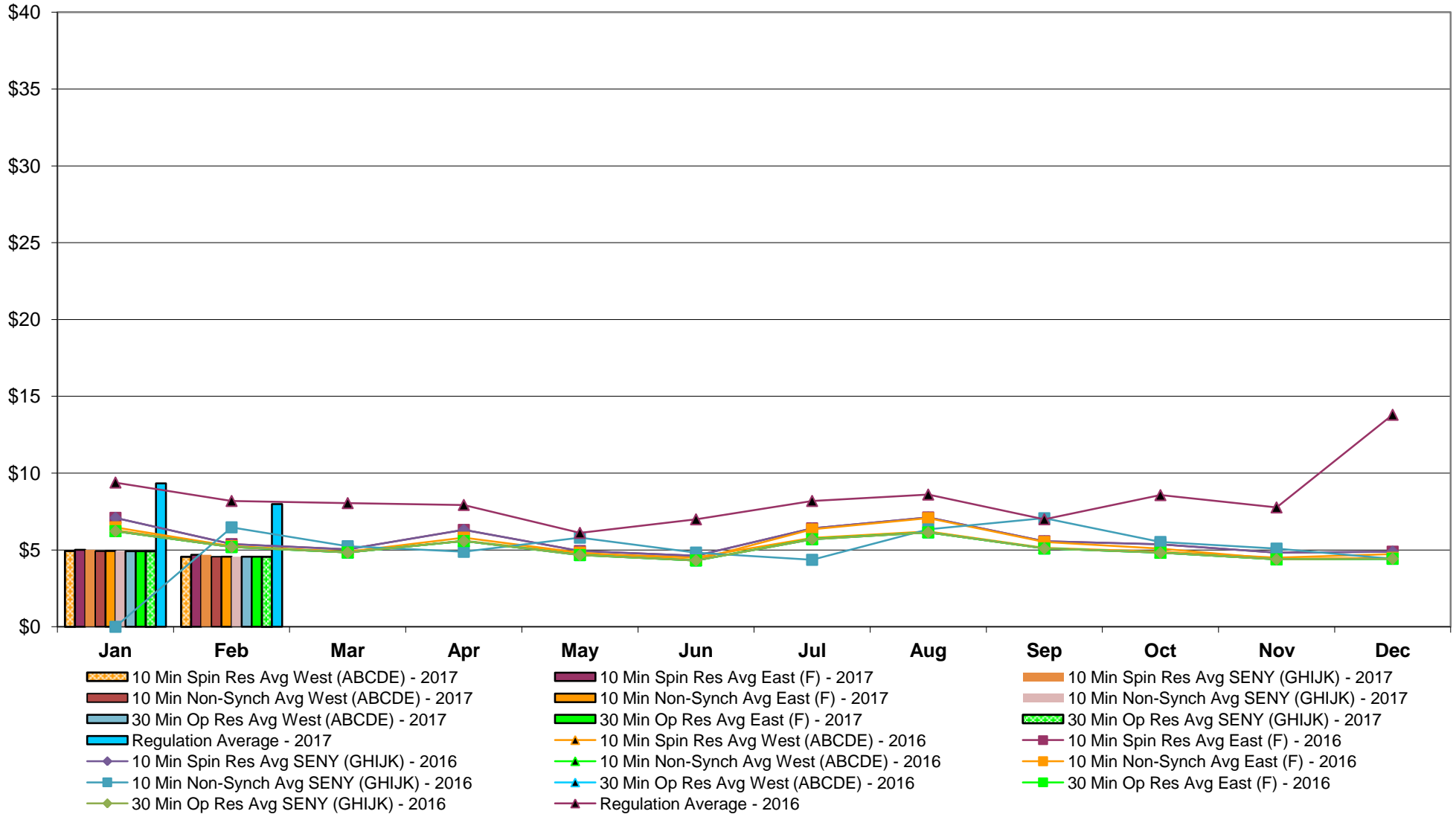
**Virtual Load and Supply Zonal Statistics (Average MWh/day) - 2017**

		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		
<b>WEST</b>	Jan-17	6,094	5,795	2,019	337	<b>MHK VL</b>	Jan-17	566	202	2,022	131	<b>DUNWOD</b>	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						Mar-17						Mar-17						
	Apr-17						Apr-17						Apr-17						
	May-17						May-17						May-17						
	Jun-17						Jun-17						Jun-17						
	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						
<b>GENESE</b>	Jan-17	654	1,282	3,652	2,482	<b>CAPITL</b>	Jan-17	1,291	666	3,990	3,861	<b>N.Y.C.</b>	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						Mar-17						Mar-17						
	Apr-17						Apr-17						Apr-17						
	May-17						May-17						May-17						
	Jun-17						Jun-17						Jun-17						
	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						
<b>NORTH</b>	Jan-17	655	316	6,415	3,473	<b>HUD VL</b>	Jan-17	911	817	5,317	3,064	<b>LONGIL</b>	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						Mar-17						Mar-17						
	Apr-17						Apr-17						Apr-17						
	May-17						May-17						May-17						
	Jun-17						Jun-17						Jun-17						
	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						
<b>CENTRL</b>	Jan-17	1,482	455	22,561	196	<b>MILLWD</b>	Jan-17	435	91	1,422	128	<b>NYISO</b>	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						Mar-17						Mar-17						
	Apr-17						Apr-17						Apr-17						
	May-17						May-17						May-17						
	Jun-17						Jun-17						Jun-17						
	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

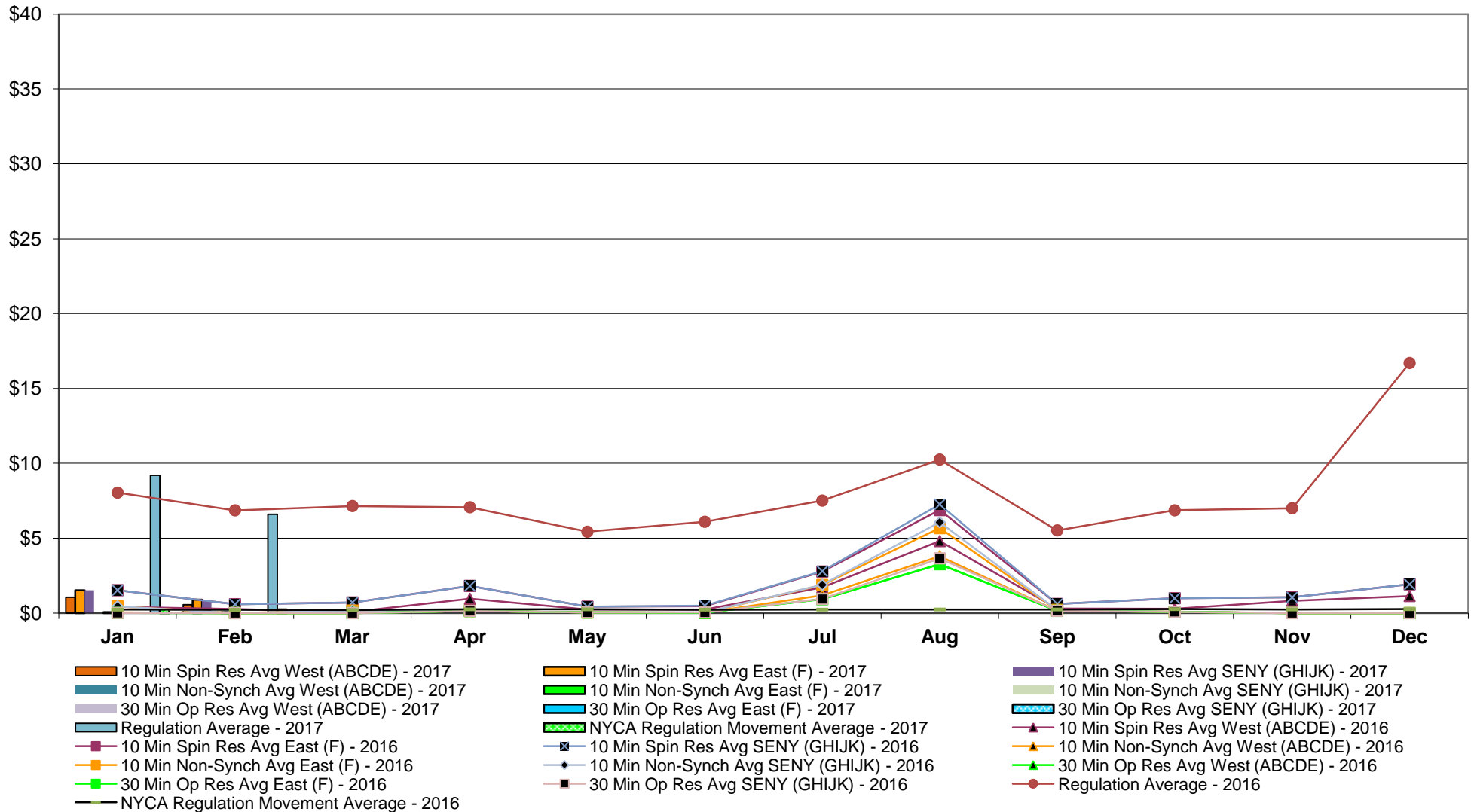


## NYISO Monthly Average Ancillary Service Prices Day Ahead Market 2016 - 2017

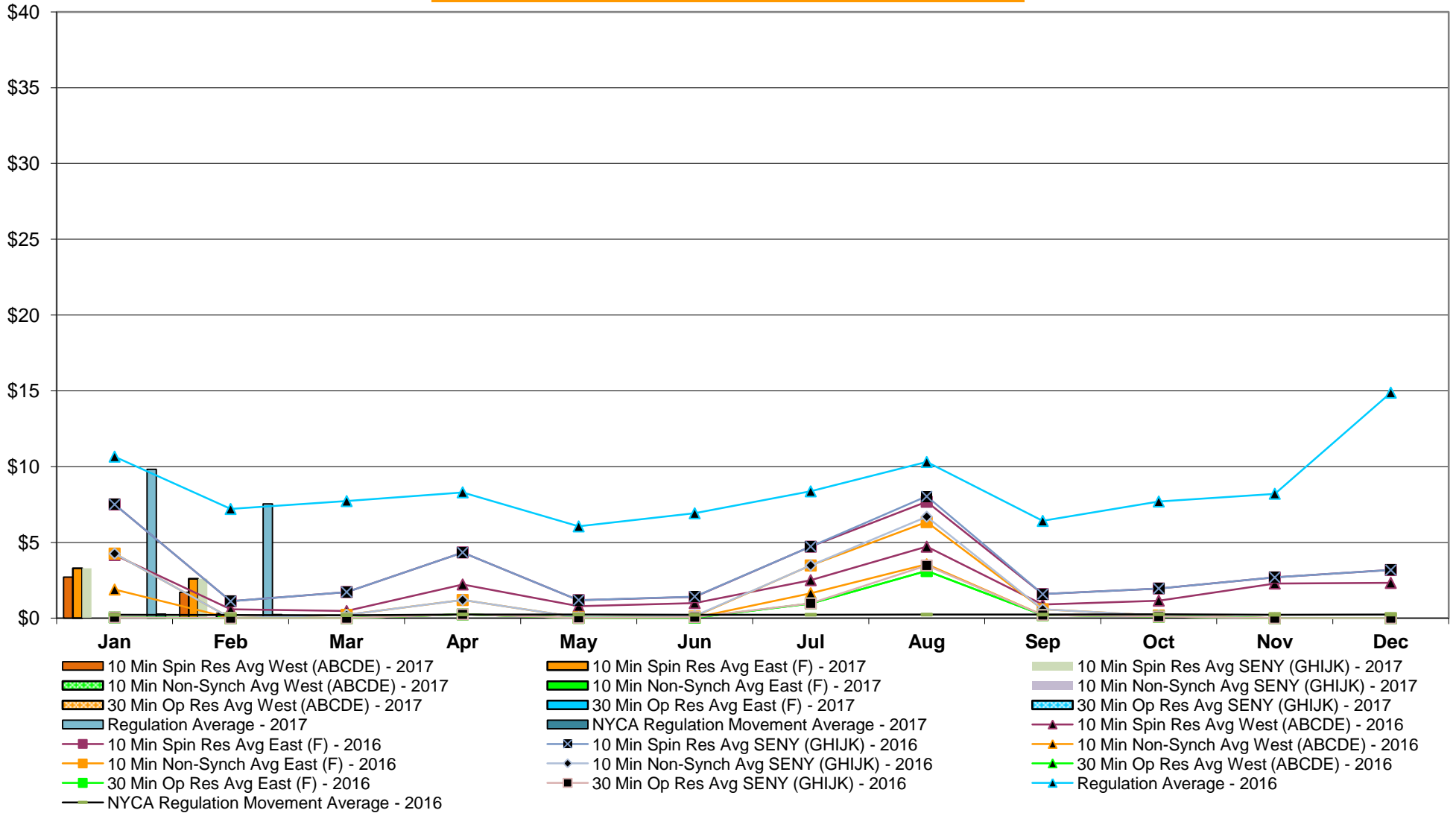




## NYISO Monthly Average Ancillary Service Prices RTC Market 2016 - 2017



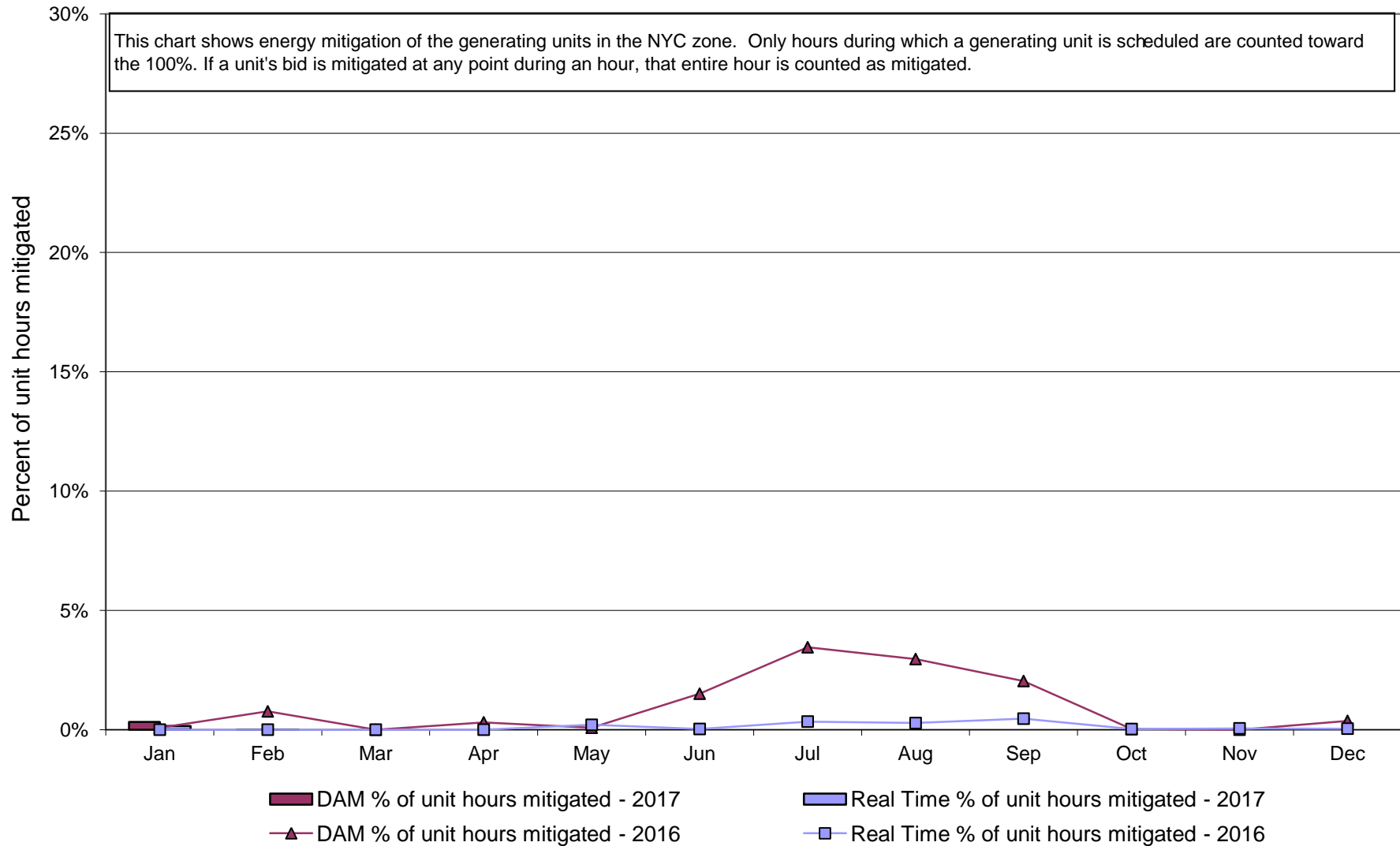
## NYISO Monthly Average Ancillary Service Prices Real Time Market 2016 - 2017



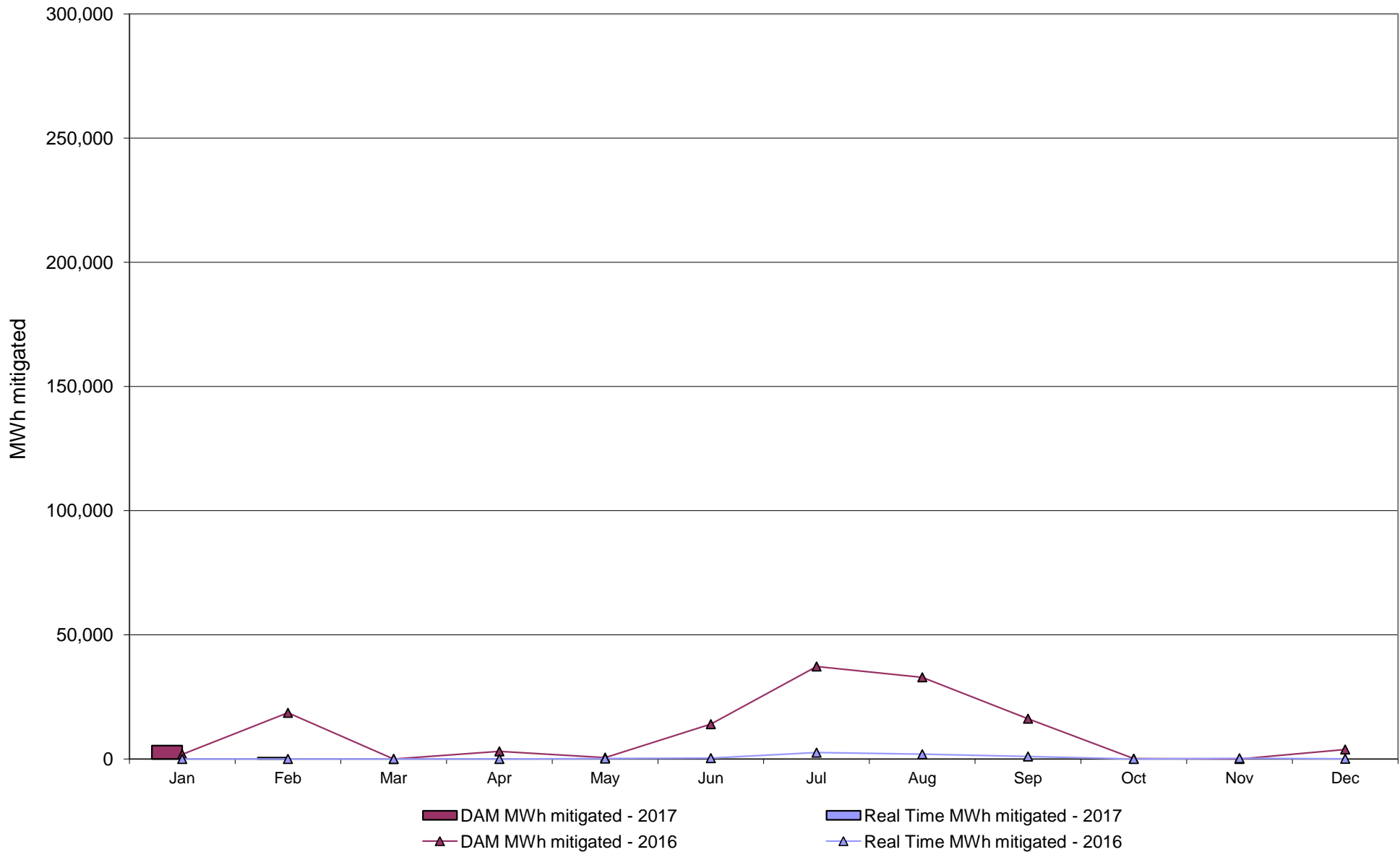
## NYISO Markets Ancillary Services Statistics - Unweighted Price (\$/MWH)

2017	January	February	March	April	May	June	July	August	September	October	November	December
<b>Day Ahead Market</b>												
10 Min Spin SENY (GHIJK)	5.01	4.68										
10 Min Spin East (F)	5.01	4.68										
10 Min Spin West (ABCDE)	4.94	4.56										
10 Min Non Synch SENY (GHIJK)	4.94	4.57										
10 Min Non Synch East (F)	4.94	4.57										
10 Min Non Synch West (ABCDE)	4.92	4.56										
30 Min SENY (GHIJK)	4.92	4.56										
30 Min East (F)	4.92	4.56										
30 Min West (ABCDE)	4.92	4.56										
Regulation	9.34	7.99										
<b>RTC Market</b>												
10 Min Spin SENY (GHIJK)	1.53	0.89										
10 Min Spin East (F)	1.53	0.89										
10 Min Spin West (ABCDE)	1.06	0.55										
10 Min Non Synch SENY (GHIJK)	0.06	0.06										
10 Min Non Synch East (F)	0.06	0.06										
10 Min Non Synch West (ABCDE)	0.00	0.00										
30 Min SENY (GHIJK)	0.00	0.00										
30 Min East (F)	0.00	0.00										
30 Min West (ABCDE)	0.00	0.00										
Regulation	9.21	6.59										
NYCA Regulation Movement	0.27	0.24										
<b>Real Time Market</b>												
10 Min Spin SENY (GHIJK)	3.29	2.61										
10 Min Spin East (F)	3.29	2.61										
10 Min Spin West (ABCDE)	2.71	1.71										
10 Min Non Synch SENY (GHIJK)	0.00	0.31										
10 Min Non Synch East (F)	0.00	0.31										
10 Min Non Synch West (ABCDE)	0.00	0.00										
30 Min SENY (GHIJK)	0.00	0.00										
30 Min East (F)	0.00	0.00										
30 Min West (ABCDE)	0.00	0.00										
Regulation	9.83	7.54										
NYCA Regulation Movement	0.27	0.24										
<b>2016</b>												
<b>Day Ahead Market</b>												
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
<b>RTC Market</b>												
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
<b>Real Time Market</b>												
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

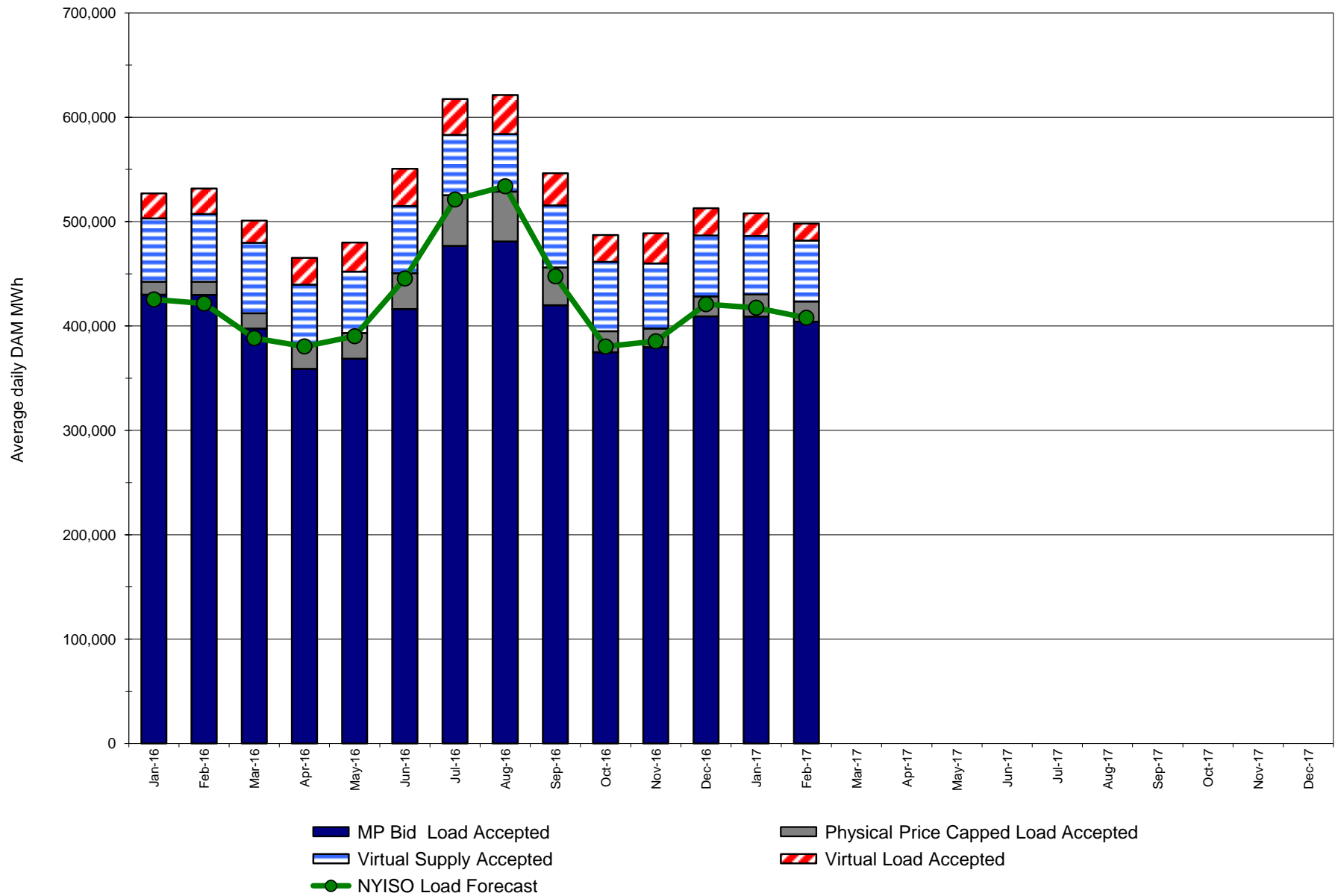
## NYISO In City Energy Mitigation - AMP (NYC Zone) 2016 - 2017 Percentage of committed unit-hours mitigated



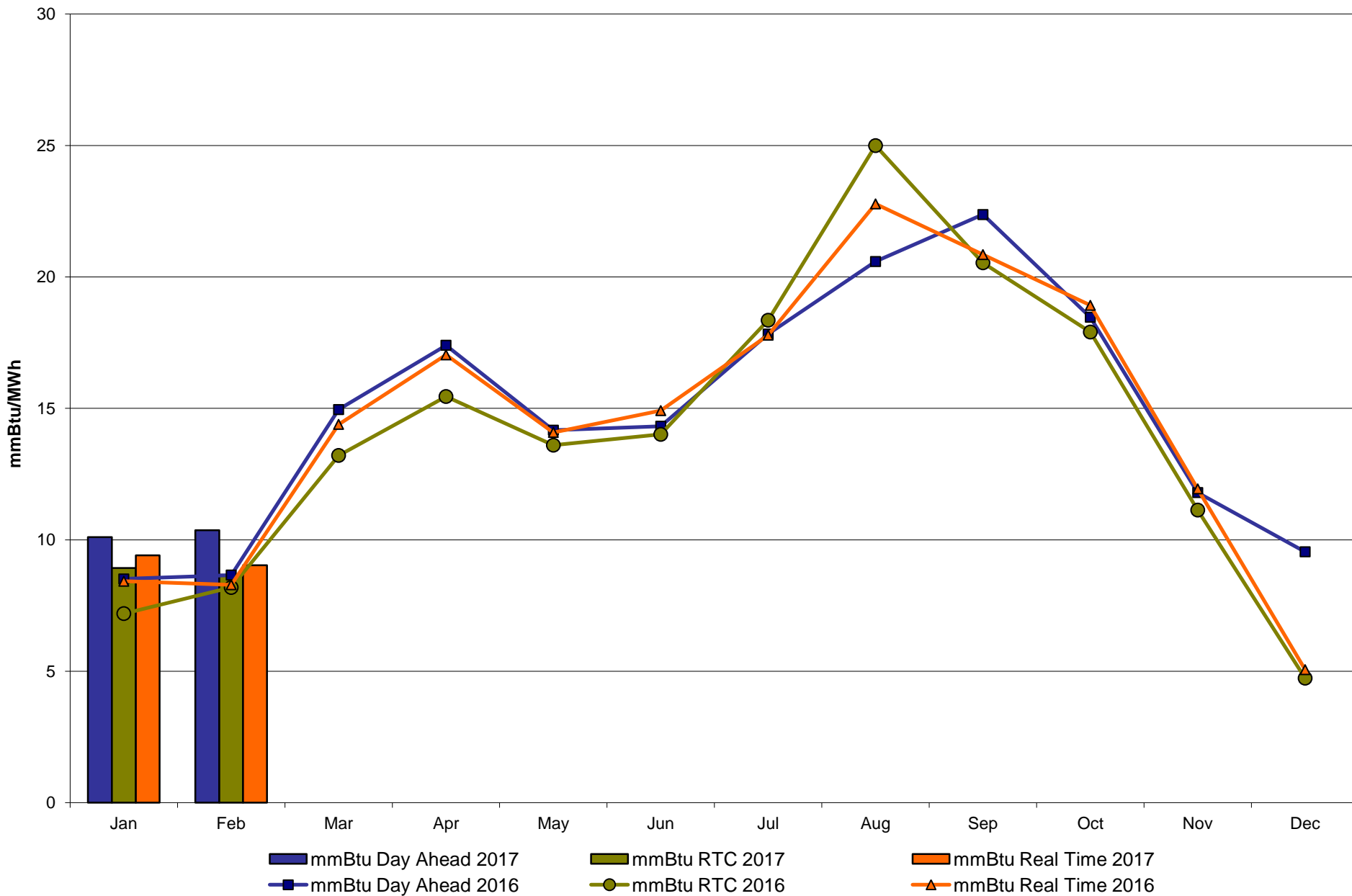
**NYISO In City Energy Mitigation (NYC Zone) 2016 - 2017**  
**Monthly megawatt hours mitigated**



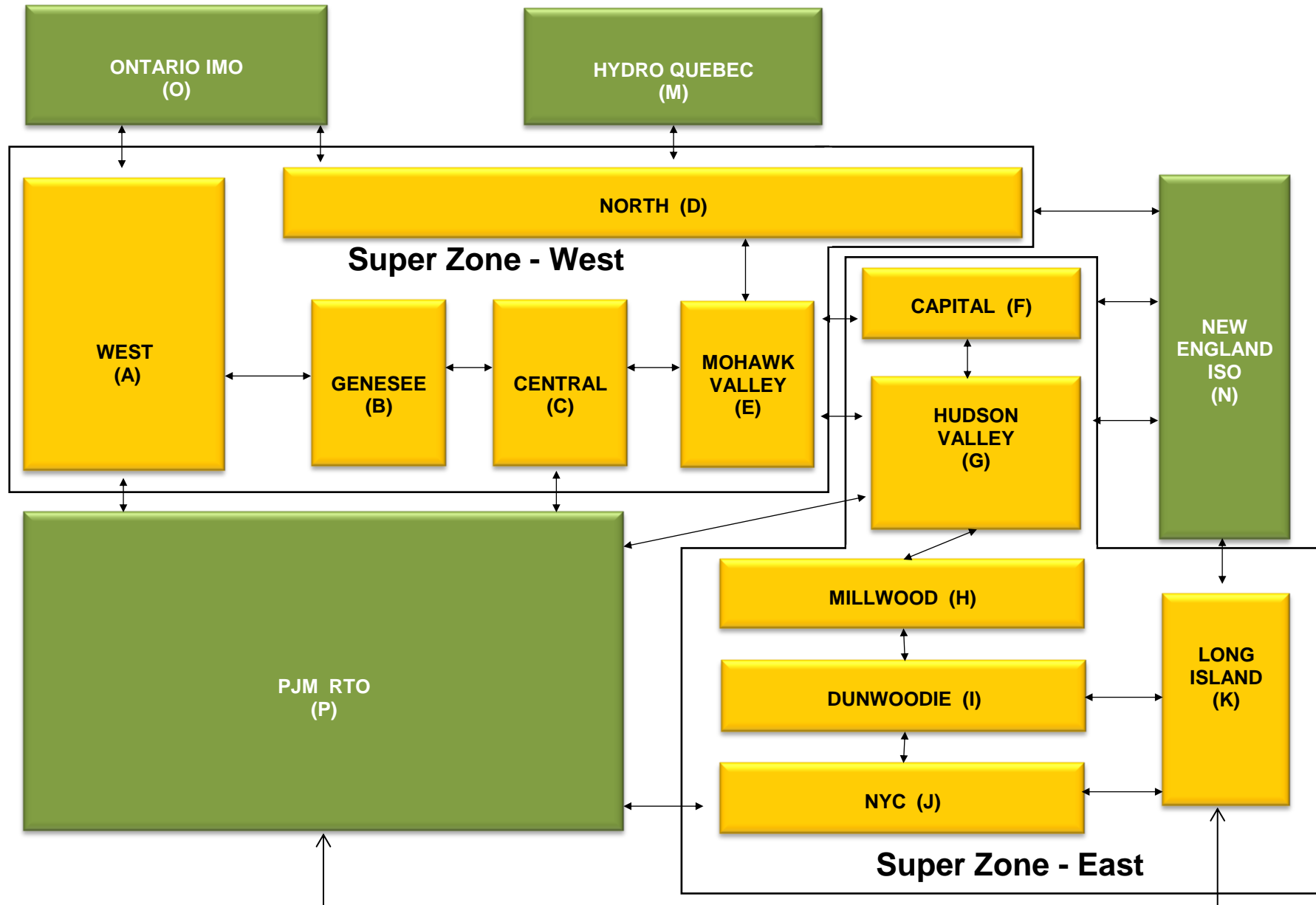
### NYISO Average Daily DAM Load Bid Summary



## Monthly Implied Heat Rate 2016-2017



# NYISO LBMP ZONES

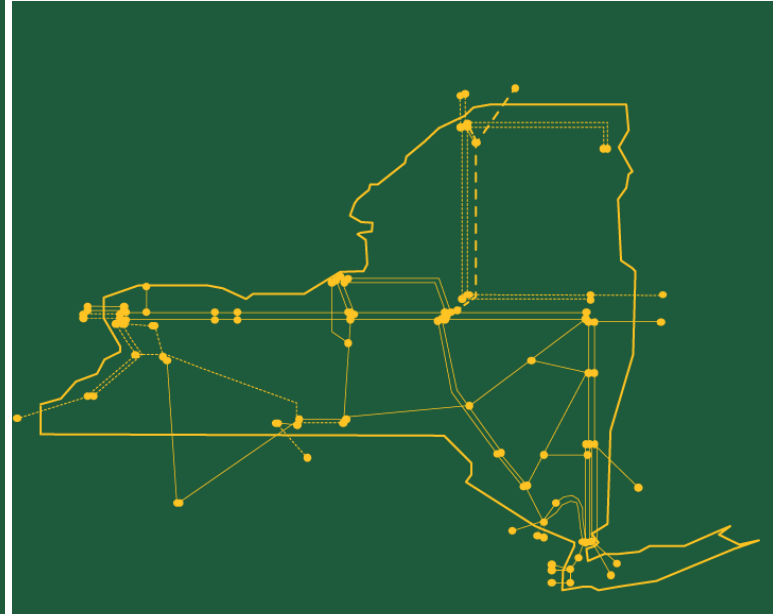




**Billing Codes for Chart C**

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

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



[www.nyiso.com](http://www.nyiso.com)