

# Market Operations Report

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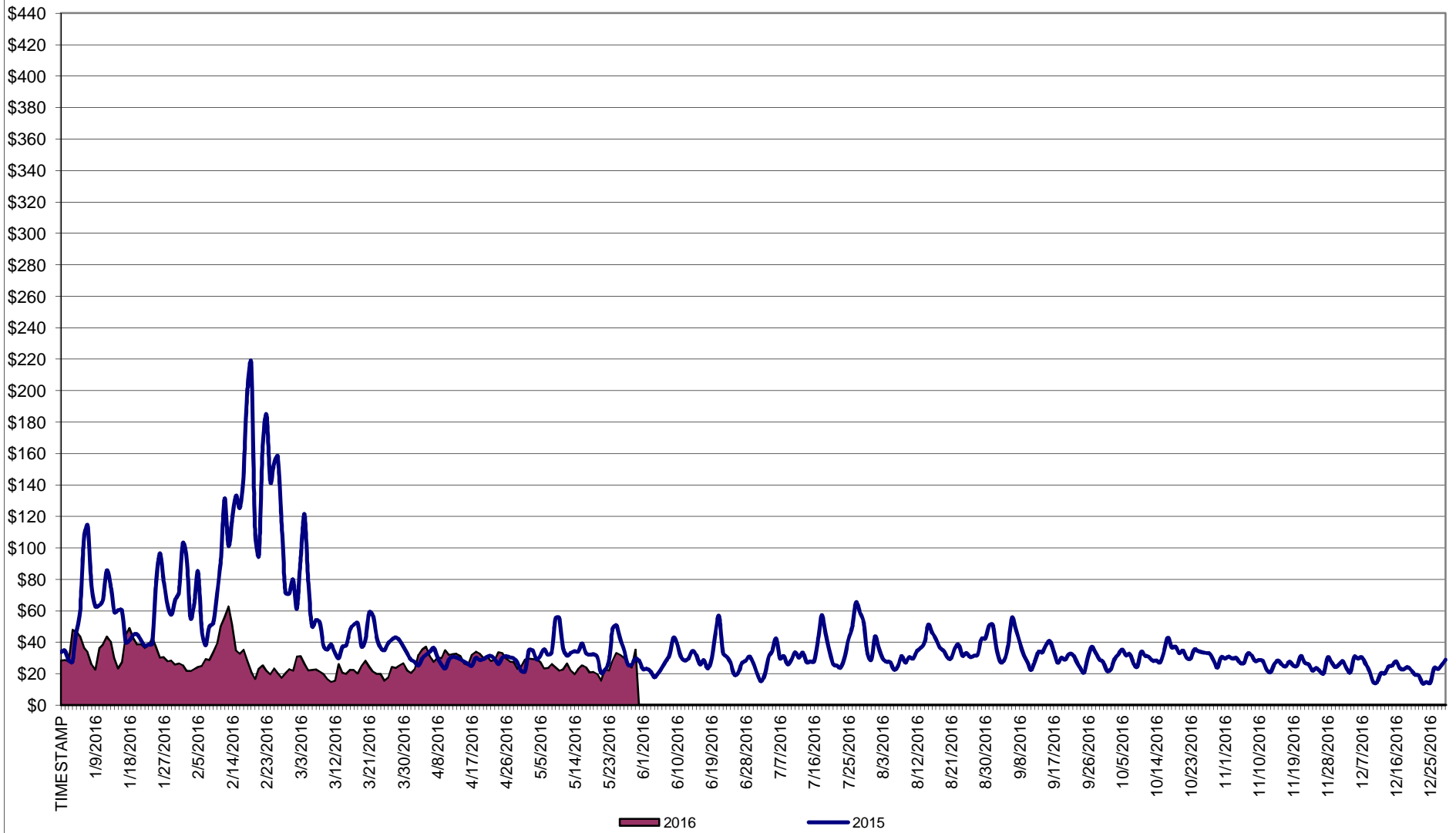
**Business Issues Committee Meeting**

*June 15, 2016*

# Market Performance Highlights for May 2016

- **LBMP for May is \$23.31/MWh; lower than \$27.96/MWh in April 2016 and lower than \$32.98/MWh in May 2015.**
  - Day Ahead and Real Time Load Weighted LBMPs are lower compared to April.
- **May 2016 average year-to-date monthly cost of \$29.85/MWh is a 51% decrease from \$60.96/MWh in May 2015.**
- **Average daily sendout is 397 GWh/day in May; higher than 385 GWh/day in April 2016 and lower than 409 GWh/day in May 2015.**
- **Natural gas prices were lower and distillate prices were higher compared to the previous month.**
  - Natural Gas (Transco Z6 NY) was \$1.58/MMBtu, down from \$1.62/MMBtu in April.
    - Natural gas prices are down 40% year-over-year
  - Jet Kerosene Gulf Coast was \$9.66/MMBtu, up from \$8.46/MMBtu in April.
  - Ultra Low Sulfur No.2 Diesel NY Harbor was \$10.17/MMBtu, up from \$8.89/MMBtu in April.
    - Distillate prices are down 28% year-over-year
- **Uplift per MWh is higher compared to the previous month.**
  - Uplift (not including NYISO cost of operations) is \$0.19/MWh; higher than (\$0.34)/MWh in April.
    - The Local Reliability Share is \$0.35/MWh, higher than \$0.07 in April.
    - The Statewide Share is (\$0.16)/MWh, higher than (\$0.41)/MWh in April.
  - TSA \$ per NYC MWh is \$0.00/MWh.
- Total uplift costs (Schedule 1 components including NYISO Cost of Operations) are higher than April.

**Daily NYISO Average Cost/MWh (Energy & Ancillary Services)\***  
 2015 Annual Average \$44.10/MWh  
 May 2015 YTD Average \$60.96/MWh  
 May 2016 YTD Average \$29.85/MWh



\* Excludes ICAP payments.

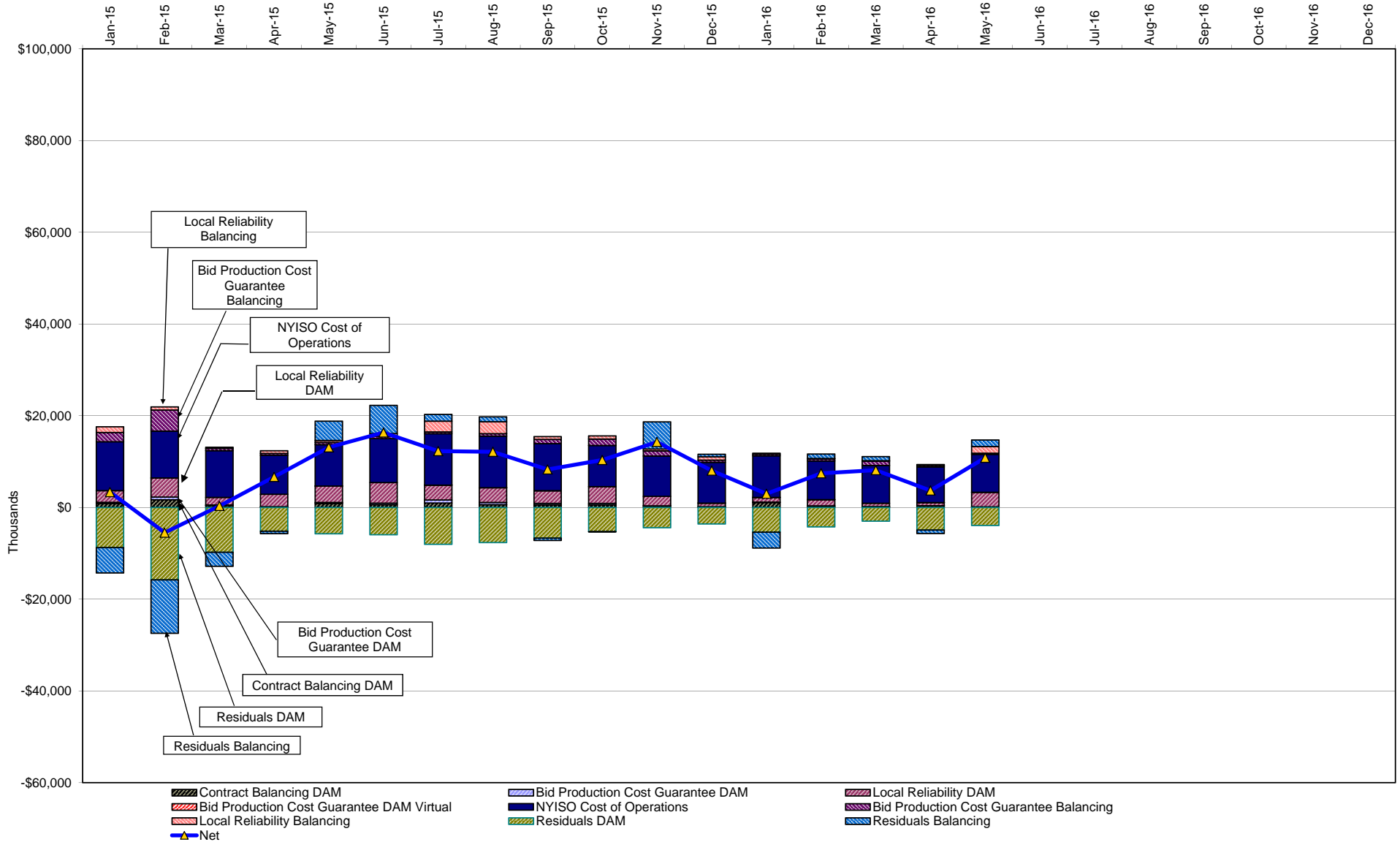
**NYISO Average Cost/MWh (Energy and Ancillary Services) \***  
**from the LBMP Customer point of view**

<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							
NTAC	0.59	0.78	0.62	1.14	1.10							
Reserve	0.77	0.73	0.73	0.87	0.71							
Regulation	0.12	0.12	0.12	0.12	0.11							
NYISO Cost of Operations	0.64	0.65	0.65	0.64	0.65							
FERC Fee Recovery	0.09	0.10	0.11	0.10	0.09							
Uplift	(0.43)	(0.07)	(0.03)	(0.34)	0.19							
Uplift: Local Reliability Share	0.09	0.11	0.06	0.07	0.35							
Uplift: Statewide Share	(0.52)	(0.18)	(0.09)	(0.41)	(0.16)							
Voltage Support and Black Start	0.35	0.36	0.36	0.35	0.36							
<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>							
Avg YTD Cost	36.42	34.02	30.68	30.71	29.85							
TSA \$ per NYC MWh	0.00	0.00	0.05	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
<b>2014</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	183.36	123.19	109.58	46.09	40.30	43.39	43.97	34.48	37.63	35.61	42.89	38.08
NTAC	0.56	0.64	0.39	1.18	0.69	0.78	0.43	0.41	0.50	0.57	0.68	0.86
Reserve	0.78	0.49	0.56	0.46	0.28	0.27	0.26	0.26	0.29	0.48	0.37	0.23
Regulation	0.27	0.21	0.22	0.13	0.12	0.12	0.12	0.13	0.11	0.12	0.11	0.08
NYISO Cost of Operations	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Uplift	0.22	0.56	0.35	(0.09)	0.07	(0.21)	(0.26)	(0.19)	(0.20)	(0.24)	(0.40)	(0.20)
Uplift: Local Reliability Share	1.43	0.75	0.62	0.15	0.51	0.32	0.29	0.27	0.26	0.26	0.24	0.13
Uplift: Statewide Share	(1.21)	(0.19)	(0.27)	(0.24)	(0.44)	(0.53)	(0.55)	(0.45)	(0.46)	(0.50)	(0.64)	(0.33)
Voltage Support and Black Start	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
<b>Avg Monthly Cost</b>	<b>186.24</b>	<b>126.14</b>	<b>112.15</b>	<b>48.82</b>	<b>42.51</b>	<b>45.39</b>	<b>45.57</b>	<b>36.14</b>	<b>39.38</b>	<b>37.59</b>	<b>44.71</b>	<b>40.09</b>
Avg YTD Cost	186.24	157.93	142.77	121.97	108.36	97.84	89.46	82.60	78.07	74.63	72.06	69.31
TSA \$ per NYC MWh	0.00	0.00	0.00	0.00	0.00	0.03	0.35	0.00	0.42	0.00	0.00	0.00

\* Excludes ICAP payments.  
Market Mitigation and Analysis  
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As of Jan. 2016, the annual FERC fee is recovered separately from Cost of Ops.  
Data reflects true-ups thru December 2015.

## NYISO Dollar Flows - Uplift- OATT Schedule 1 components - Data through May 31, 2016



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

2016	January	February	March	April	May	June	July	August	September	October	November	December
<b>Day Ahead Market MWh</b>	14,760,915	13,614,754	13,413,781	12,496,141	12,959,886							
DAM LSE Internal LBMP Energy Sales	54%	55%	55%	57%	58%							
DAM External TC LBMP Energy Sales	4%	2%	1%	5%	2%							
DAM Bilateral - Internal Bilaterals	34%	34%	35%	28%	31%							
DAM Bilateral - Import/Non-LBMP Market Bilaterals	5%	5%	5%	6%	5%							
DAM Bilateral - Export/Non-LBMP Market Bilaterals	2%	1%	2%	2%	2%							
DAM Bilateral - Wheel Through Bilaterals	2%	2%	2%	2%	2%							
<b>Balancing Energy Market MWh</b>	-522,919	-580,900	-741,701	-303,313	-180,848							
Balancing Energy LSE Internal LBMP Energy Sales	-125%	-114%	-118%	-76%	-147%							
Balancing Energy External TC LBMP Energy Sales	12%	13%	19%	-13%	55%							
Balancing Energy Bilateral - Internal Bilaterals	19%	9%	4%	8%	27%							
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	0%	0%	0%	0%							
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	6%	5%	3%	5%	7%							
Balancing Energy Bilateral - Wheel Through Bilaterals	-12%	-12%	-8%	-24%	-42%							
<b>Transactions Summary</b>												
LBMP	56%	56%	54%	62%	59%							
Internal Bilaterals	36%	36%	37%	29%	32%							
Import Bilaterals	5%	5%	6%	6%	5%							
Export Bilaterals	2%	2%	2%	2%	2%							
Wheels Through	1%	1%	1%	1%	2%							
<b>Market Share of Total Load</b>												
Day Ahead Market	103.7%	104.5%	105.9%	102.5%	101.4%							
Balancing Energy +	-3.7%	-4.5%	-5.9%	-2.5%	-1.4%							
Total MWh	14,237,996	13,033,853	12,672,080	12,192,828	12,779,038							
Average Daily Energy Sendout/Month GWh	439	436	397	385	397							

2015	January	February	March	April	May	June	July	August	September	October	November	December
<b>Day Ahead Market MWh</b>	15,961,306	14,967,371	15,059,207	12,589,321	13,291,917	14,277,299	16,573,027	16,333,932	14,740,907	13,546,033	13,338,332	13,620,002
DAM LSE Internal LBMP Energy Sales	55%	54%	53%	55%	57%	57%	62%	61%	58%	53%	53%	55%
DAM External TC LBMP Energy Sales	5%	6%	6%	4%	2%	1%	1%	1%	3%	6%	5%	1%
DAM Bilateral - Internal Bilaterals	35%	33%	33%	33%	35%	33%	30%	31%	31%	34%	33%	35%
DAM Bilateral - Import/Non-LBMP Market Bilaterals	3%	5%	5%	6%	4%	5%	4%	4%	5%	5%	5%	5%
DAM Bilateral - Export/Non-LBMP Market Bilaterals	2%	2%	1%	2%	1%	1%	1%	1%	1%	2%	2%	2%
DAM Bilateral - Wheel Through Bilaterals	0%	1%	1%	1%	0%	2%	2%	2%	2%	1%	2%	2%
<b>Balancing Energy Market MWh</b>	-650,944	-296,616	-396,739	-409,205	-331,091	-549,794	-505,637	-228,461	-33,268	-604,600	-718,787	-642,268
Balancing Energy LSE Internal LBMP Energy Sales	-149%	-247%	-192%	-147%	-142%	-106%	-120%	-139%	-345%	-115%	-110%	-115%
Balancing Energy External TC LBMP Energy Sales	30%	113%	64%	36%	35%	16%	25%	50%	110%	12%	12%	17%
Balancing Energy Bilateral - Internal Bilaterals	13%	14%	19%	5%	6%	6%	13%	25%	239%	7%	4%	5%
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	6%	8%	12%	12%	10%	4%	3%	8%	46%	5%	5%	6%
Balancing Energy Bilateral - Wheel Through Bilaterals	0%	12%	-4%	-5%	-9%	-22%	-21%	-44%	-149%	-9%	-11%	-13%
<b>Transactions Summary</b>												
LBMP	58%	59%	57%	57%	58%	57%	61%	61%	61%	56%	56%	54%
Internal Bilaterals	37%	34%	35%	35%	36%	35%	32%	32%	32%	36%	35%	37%
Import Bilaterals	3%	5%	5%	6%	4%	5%	5%	5%	5%	5%	6%	6%
Export Bilaterals	2%	2%	2%	2%	2%	1%	1%	1%	1%	2%	2%	2%
Wheels Through	0%	1%	1%	0%	0%	1%	1%	1%	1%	0%	1%	1%
<b>Market Share of Total Load</b>												
Day Ahead Market	104.3%	102.0%	102.7%	103.4%	102.6%	104.0%	103.1%	101.4%	100.2%	104.7%	105.7%	104.9%
Balancing Energy +	-4.3%	-2.0%	-2.7%	-3.4%	-2.6%	-4.0%	-3.1%	-1.4%	-0.2%	-4.7%	-5.7%	-4.9%
Total MWh	15,310,362	14,670,755	14,662,468	12,180,116	12,960,826	13,727,505	16,067,390	16,105,471	14,707,639	12,941,433	12,619,545	12,977,734
Average Daily Energy Sendout/Month GWh	462	481	436	387	409	450	512	511	473	389	396	408

+ 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 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							
Standard Deviation	\$10.86	\$12.46	\$6.99	\$6.95	\$7.04							
Load Weighted Price **	\$32.13	\$26.75	\$19.37	\$27.14	\$22.12							
<b><u>RTC LBMP</u></b>												
Price *	\$26.12	\$24.10	\$16.41	\$23.41	\$19.96							
Standard Deviation	\$16.06	\$17.89	\$11.32	\$9.09	\$11.44							
Load Weighted Price **	\$27.16	\$25.29	\$17.11	\$24.10	\$21.23							
<b><u>REAL TIME LBMP</u></b>												
Price *	\$30.15	\$24.28	\$17.84	\$25.71	\$20.67							
Standard Deviation	\$60.09	\$18.19	\$15.06	\$16.59	\$12.84							
Load Weighted Price **	\$31.80	\$25.61	\$18.64	\$26.57	\$21.99							
Average Daily Energy Sendout/Month GWh	439	436	397	385	397							

### NYISO Markets 2015 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 *	\$53.35	\$101.48	\$46.59	\$26.07	\$29.21	\$24.30	\$30.27	\$30.01	\$30.18	\$27.11	\$22.18	\$18.94
Standard Deviation	\$24.61	\$48.85	\$21.51	\$6.73	\$13.44	\$11.96	\$17.67	\$12.05	\$13.37	\$7.64	\$7.94	\$8.41
Load Weighted Price **	\$55.40	\$104.52	\$48.01	\$26.84	\$31.08	\$26.12	\$32.94	\$31.81	\$32.46	\$27.95	\$23.12	\$19.97
<b><u>RTC LBMP</u></b>												
Price *	\$46.98	\$95.06	\$43.43	\$25.11	\$32.85	\$24.73	\$27.51	\$31.83	\$32.39	\$23.97	\$20.07	\$19.34
Standard Deviation	\$22.84	\$47.55	\$29.42	\$12.31	\$35.40	\$24.71	\$21.84	\$23.25	\$22.99	\$10.56	\$15.66	\$14.23
Load Weighted Price **	\$48.59	\$97.62	\$45.10	\$26.00	\$35.08	\$26.73	\$29.76	\$34.04	\$34.99	\$24.79	\$21.17	\$20.46
<b><u>REAL TIME LBMP</u></b>												
Price *	\$48.51	\$98.83	\$44.38	\$25.46	\$30.39	\$23.96	\$27.71	\$31.54	\$34.82	\$25.50	\$21.33	\$20.75
Standard Deviation	\$25.99	\$52.53	\$29.07	\$12.66	\$31.69	\$31.14	\$23.42	\$26.51	\$34.85	\$12.56	\$18.76	\$19.00
Load Weighted Price **	\$50.18	\$101.34	\$46.10	\$26.28	\$32.52	\$26.86	\$30.50	\$34.05	\$38.48	\$26.29	\$22.47	\$21.86
Average Daily Energy Sendout/Month GWh	462	481	436	387	409	450	512	511	473	389	396	408

\* Average zonal load weighted prices.

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

### NYISO Monthly Average Internal LBMPs 2015- 2016



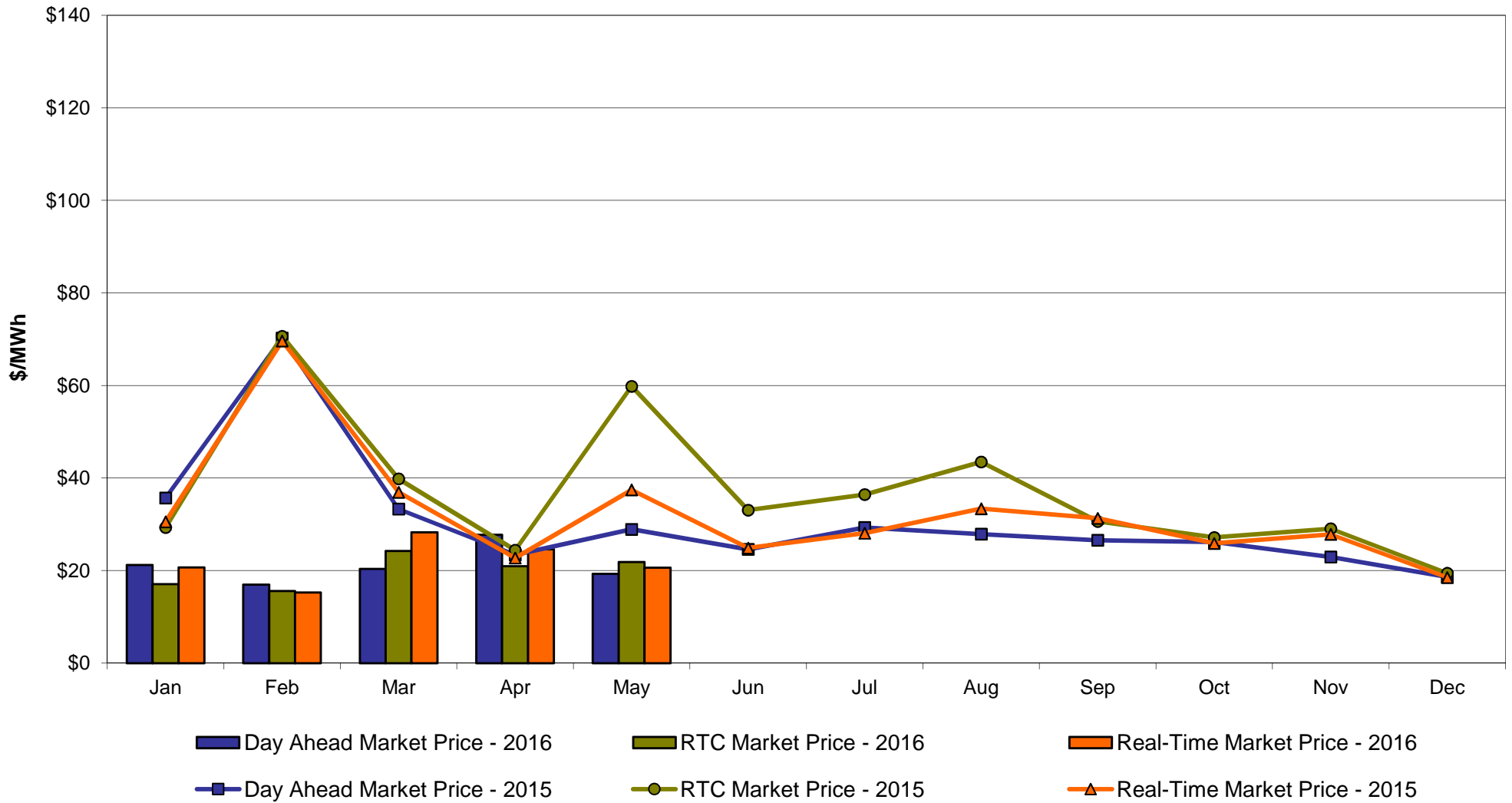


**May 2016 Zonal LBMP Statistics for NYISO (\$/MWh)**

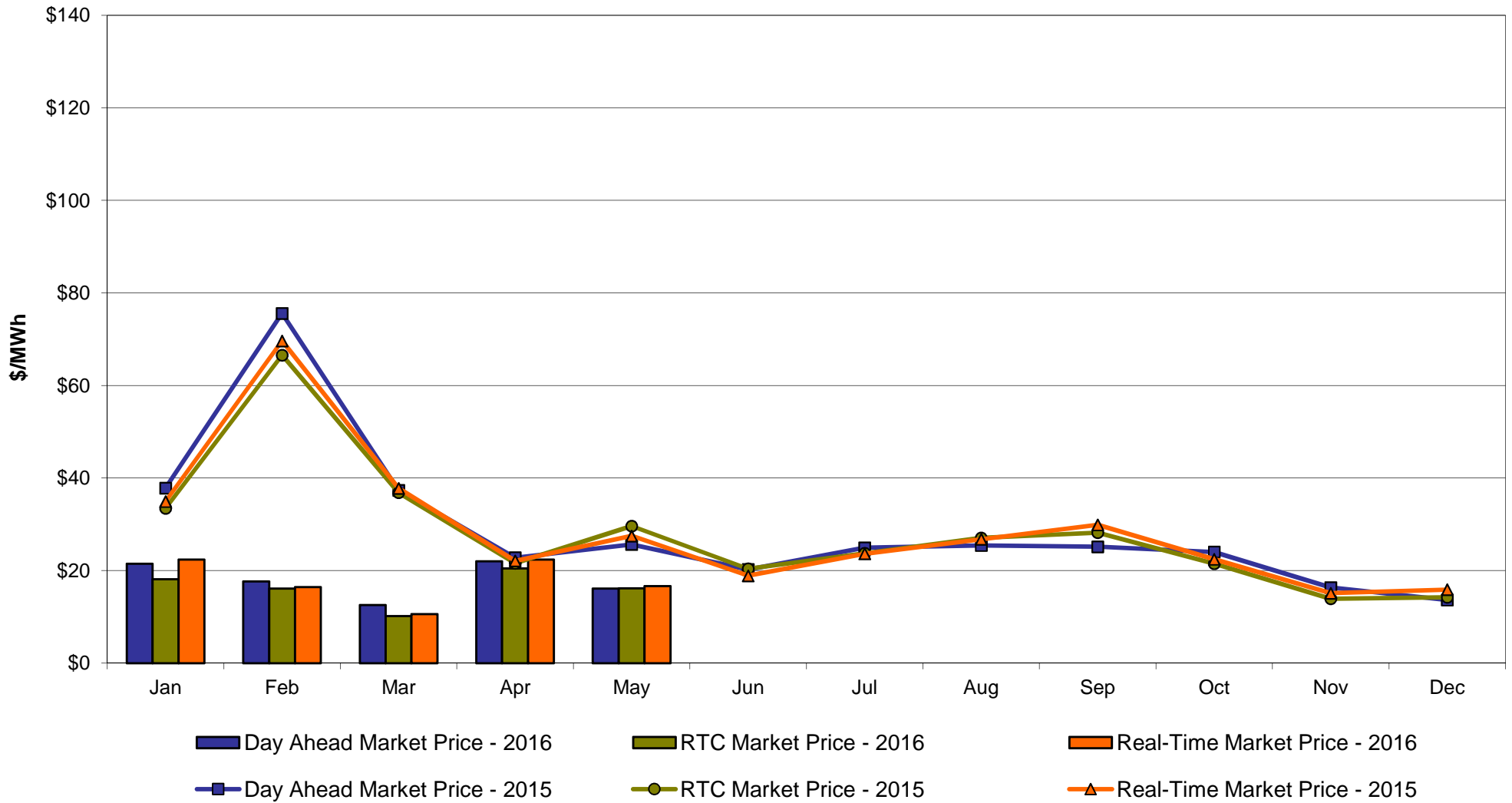
	<u>WEST</u> <u>Zone A</u>	<u>GENESEE</u> <u>Zone B</u>	<u>NORTH</u> <u>Zone D</u>	<u>CENTRAL</u> <u>Zone C</u>	<u>MOHAWK</u> <u>VALLEY</u> <u>Zone E</u>	<u>CAPITAL</u> <u>Zone F</u>	<u>HUDSON</u> <u>VALLEY</u> <u>Zone G</u>	<u>MILLWOOD</u> <u>Zone H</u>	<u>DUNWOODIE</u> <u>Zone I</u>	<u>NEW YORK</u> <u>CITY</u> <u>Zone J</u>	<u>LONG</u> <u>ISLAND</u> <u>Zone K</u>
<b>DAY AHEAD LBMP</b>											
Unweighted Price *	19.28	15.41	11.94	16.11	16.02	21.40	21.85	22.16	23.23	23.45	24.78
Standard Deviation	12.14	6.97	5.56	7.28	6.78	6.26	6.51	6.57	6.73	6.78	8.26
<b>RTC LBMP</b>											
Unweighted Price *	21.84	15.13	9.47	16.14	15.52	20.78	20.55	20.74	20.76	20.79	24.10
Standard Deviation	52.65	9.79	80.51	10.53	13.96	8.71	8.65	8.68	8.63	8.55	29.10
<b>REAL TIME LBMP</b>											
Unweighted Price *	20.60	15.60	10.75	16.65	16.25	21.89	21.61	21.81	21.84	21.88	25.21
Standard Deviation	46.99	14.01	55.49	14.57	15.01	11.08	10.99	11.04	10.96	10.88	23.84
	<u>ONTARIO</u> <u>IESO</u> <u>Zone O</u>	<u>HYDRO</u> <u>QUEBEC</u> <u>(Wheel)</u> <u>Zone M</u>	<u>HYDRO</u> <u>QUEBEC</u> <u>(Import/Export)</u> <u>Zone M</u>	<u>PJM</u> <u>Zone P</u>	<u>NEW</u> <u>ENGLAND</u> <u>Zone N</u>	<u>CROSS</u> <u>SOUND</u> <u>CABLE</u> <u>Controllable</u> <u>Line</u>	<u>NORTHPORT-</u> <u>NORWALK</u> <u>Controllable</u> <u>Line</u>	<u>NEPTUNE</u> <u>Controllable</u> <u>Line</u>	<u>LINDEN VFT</u> <u>Controllable</u> <u>Line</u>	<u>HUDSON</u> <u>Controllable</u> <u>Line</u>	<u>Dennison</u> <u>Controllable</u> <u>Line</u>
<b>DAY AHEAD LBMP</b>											
Unweighted Price *	14.51	11.49	11.49	20.56	21.46	24.49	23.55	24.24	23.20	23.44	11.81
Standard Deviation	5.83	5.25	5.25	6.66	6.43	8.08	6.38	7.54	6.38	6.79	5.43
<b>RTC LBMP</b>											
Unweighted Price *	13.19	7.94	7.94	19.23	21.56	23.50	23.33	23.21	20.19	20.82	9.40
Standard Deviation	12.60	91.28	91.28	9.08	13.11	27.74	27.63	27.08	7.65	8.63	78.17
<b>REAL TIME LBMP</b>											
Unweighted Price *	14.56	9.53	9.53	19.90	22.10	24.87	23.32	24.38	21.82	21.90	10.62
Standard Deviation	19.21	62.22	62.22	11.72	11.99	23.76	26.85	21.33	10.94	10.97	53.97

\* Straight LBMP averages

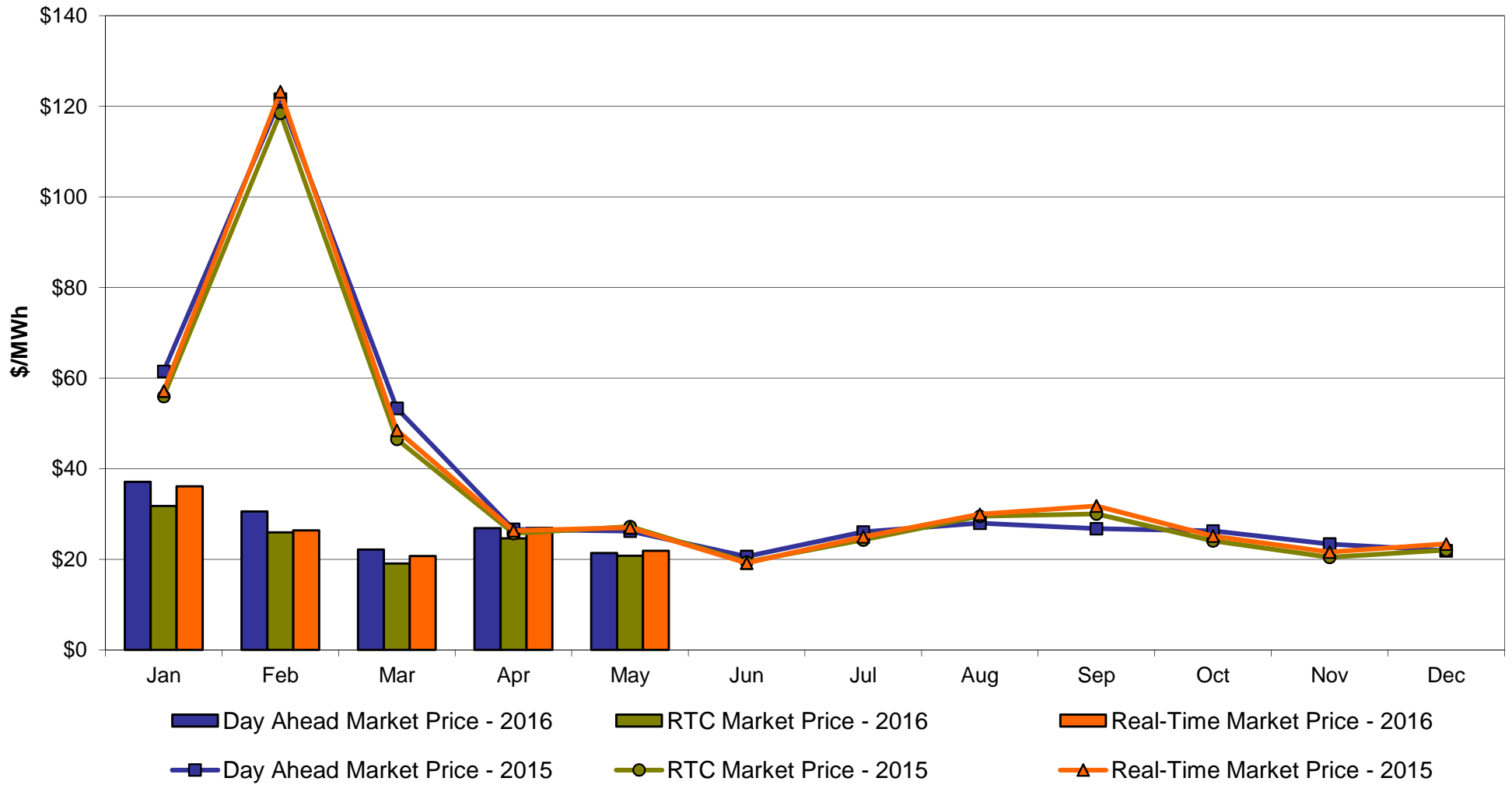
## West Zone A Monthly Average LBMP Prices 2015 - 2016



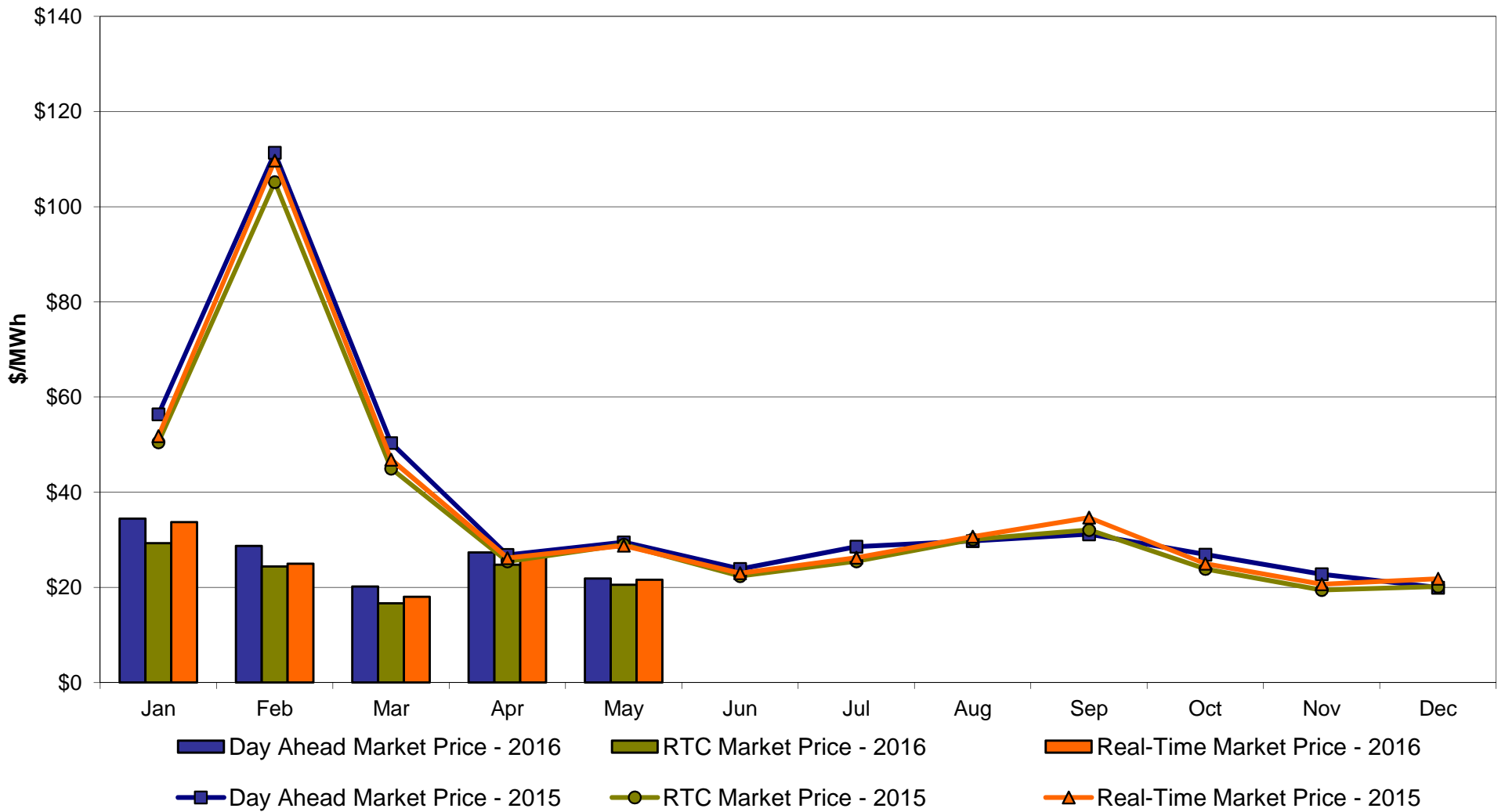
**Central Zone C  
Monthly Average LBMP Prices 2015 - 2016**



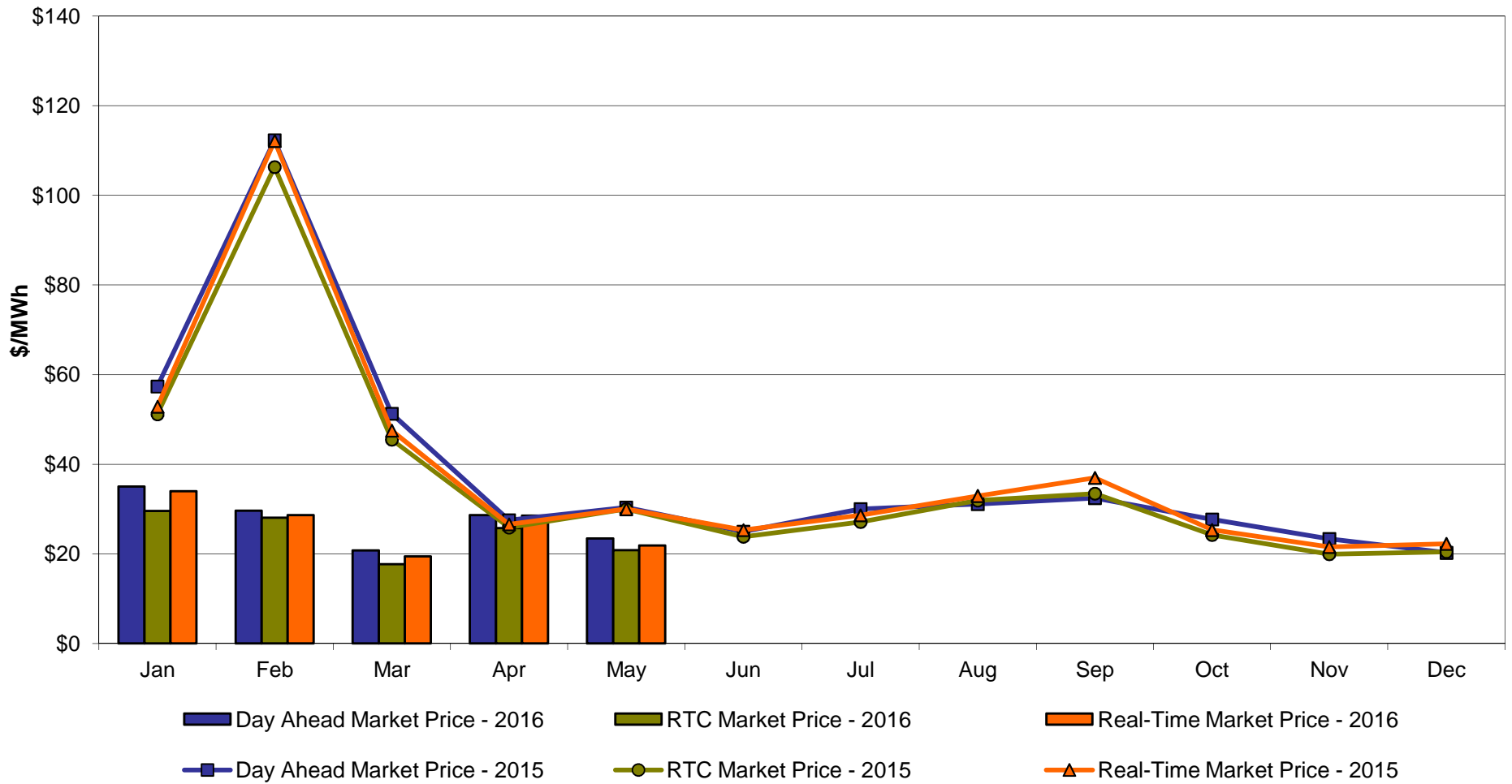
**Capital Zone F  
Monthly Average LBMP Prices 2015 - 2016**



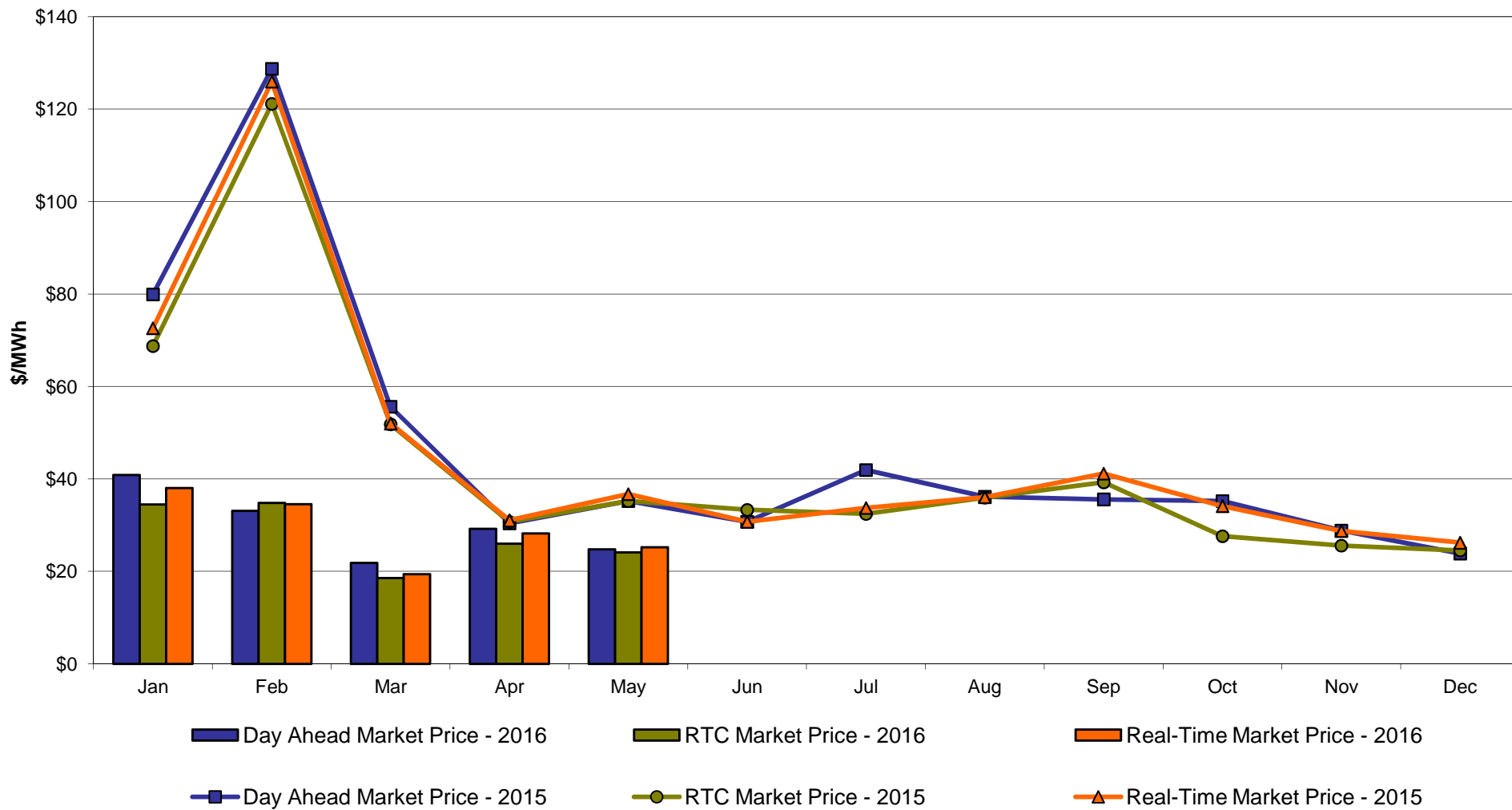
## Hudson Valley Zone G Monthly Average LBMP Prices 2015 - 2016



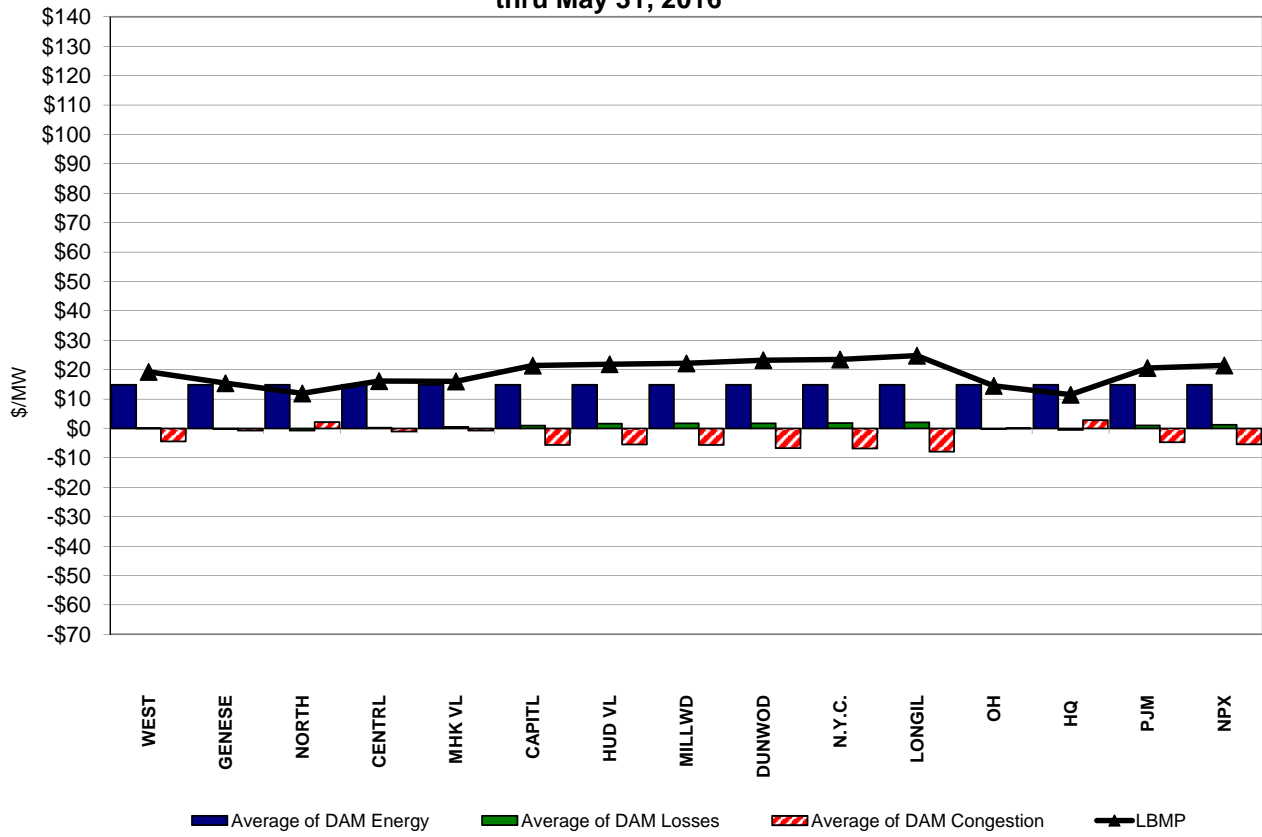
## NYC Zone J Monthly Average LBMP Prices 2015 - 2016



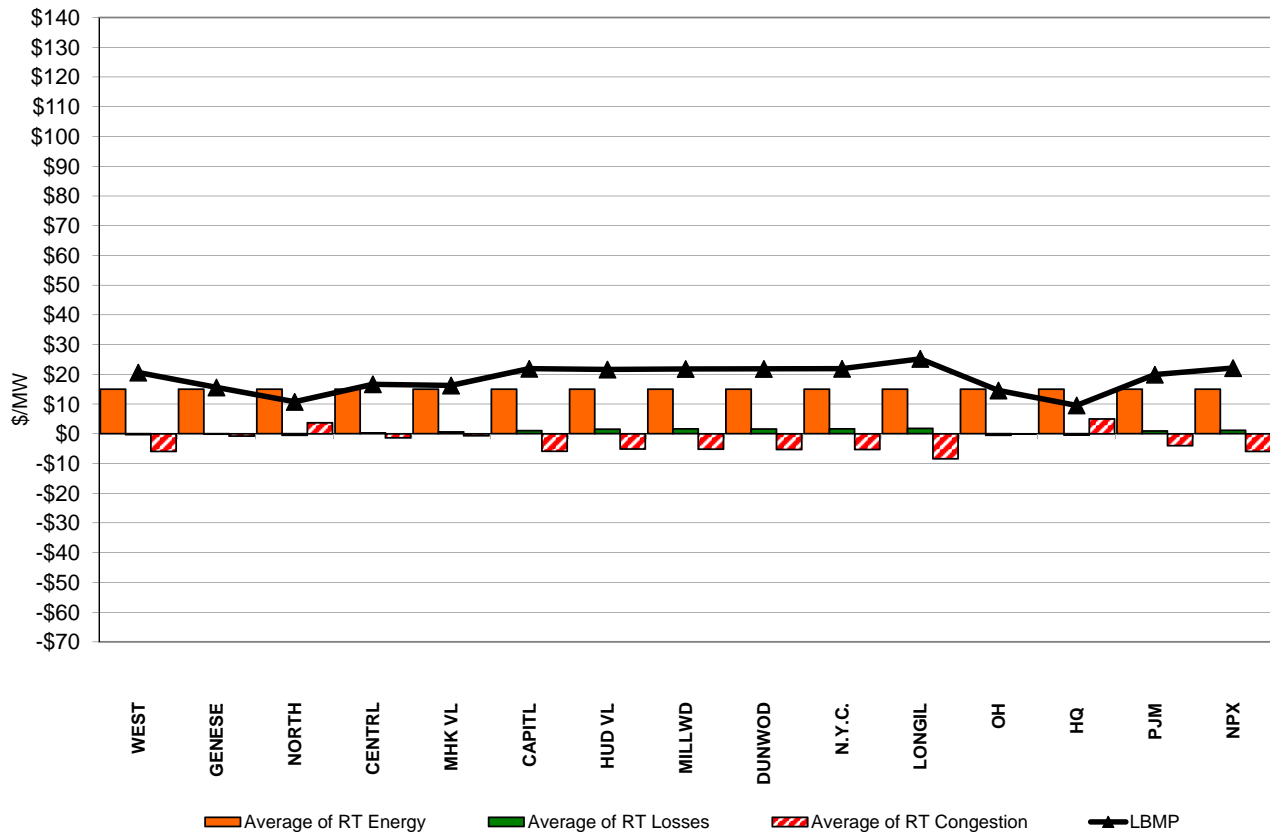
## Long Island Zone K Monthly Average LBMP Prices 2015 - 2016



### DAM Zonal Unweighted Monthly Average LBMP Components thru May 31, 2016



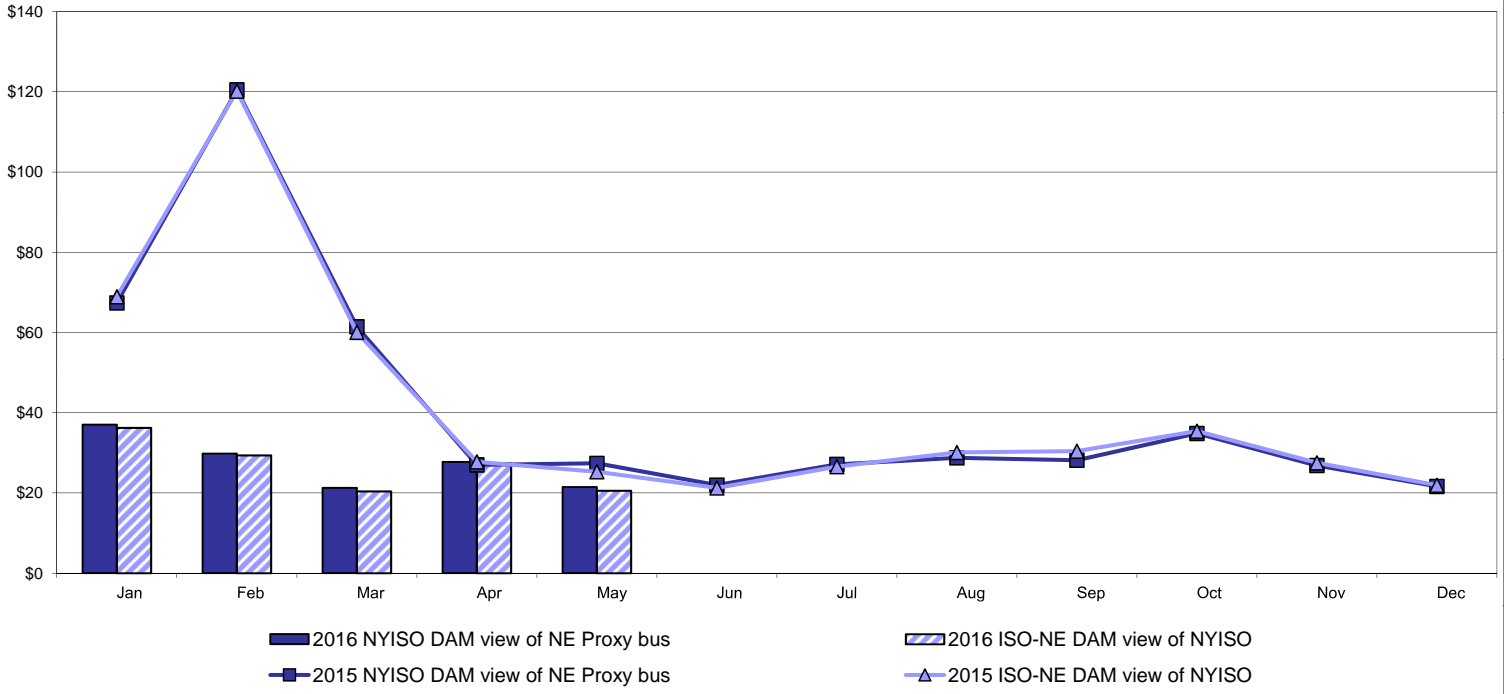
### RT Zonal Unweighted Monthly Average LBMP Components thru May 31, 2016



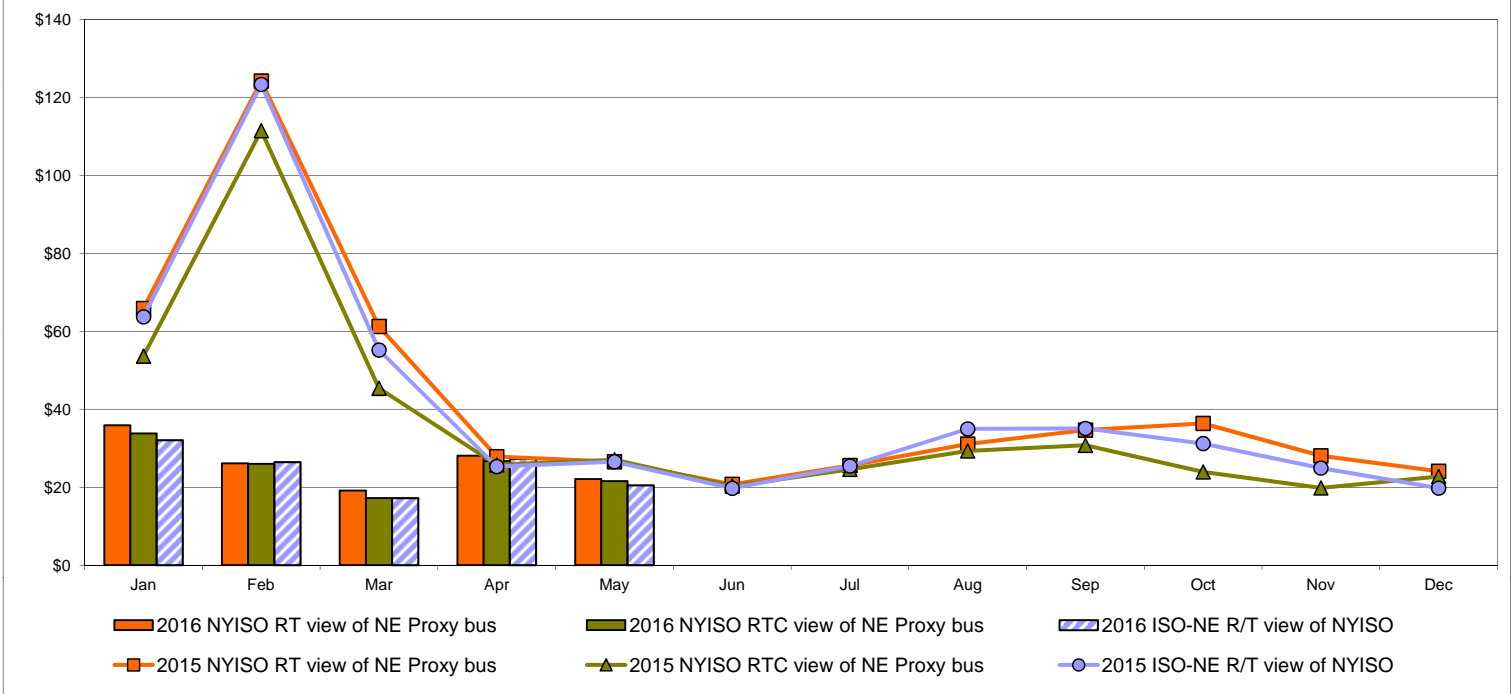


# External Comparison ISO-New England

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

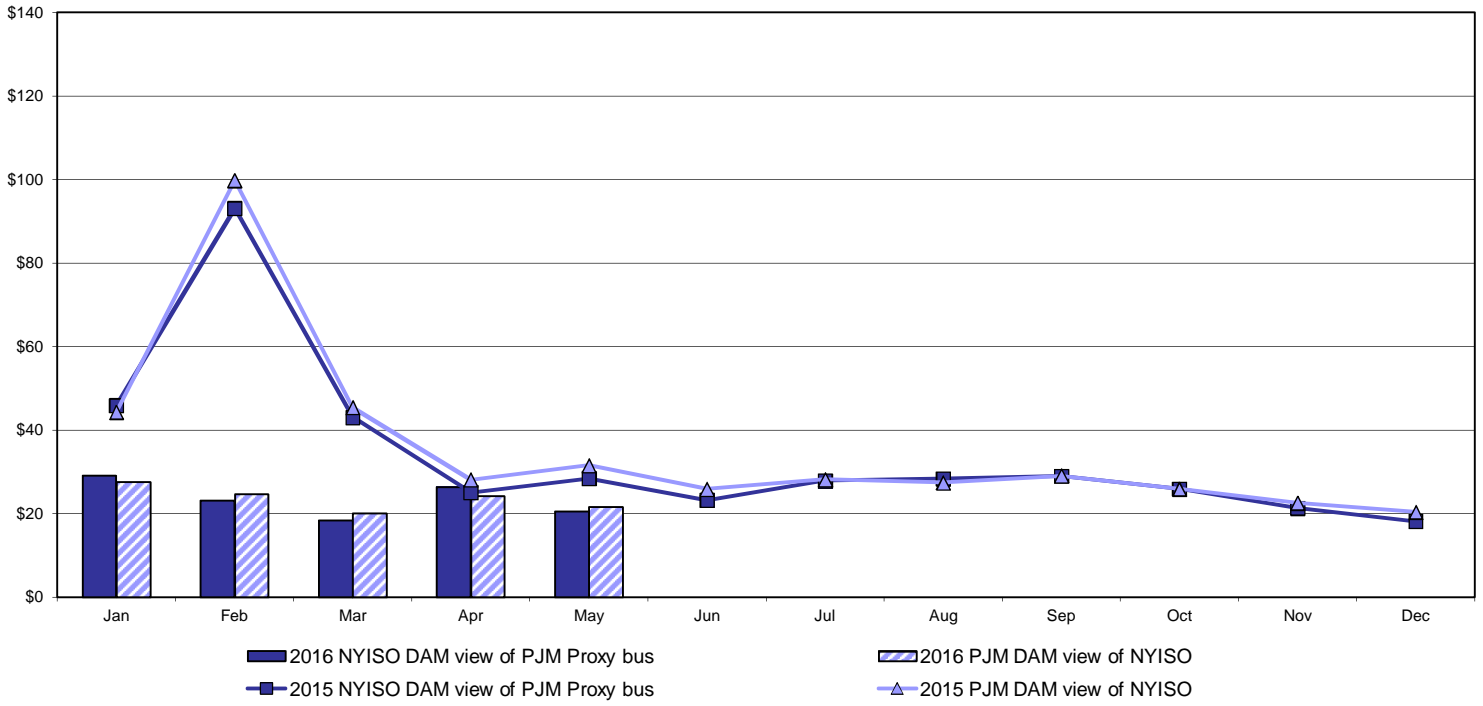


### Real Time Market External Zone Comparison: ISO-NE (\$/MWh)

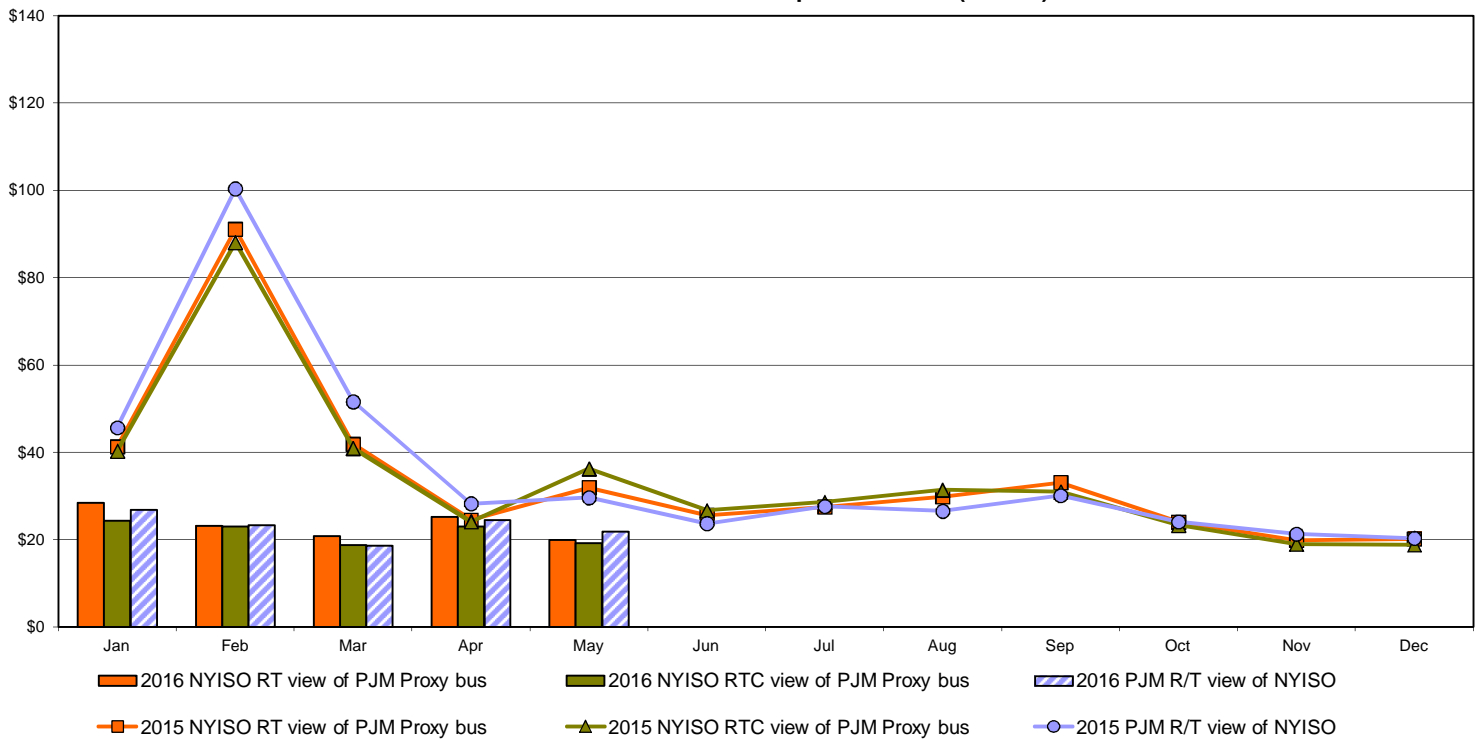


# External Comparison PJM

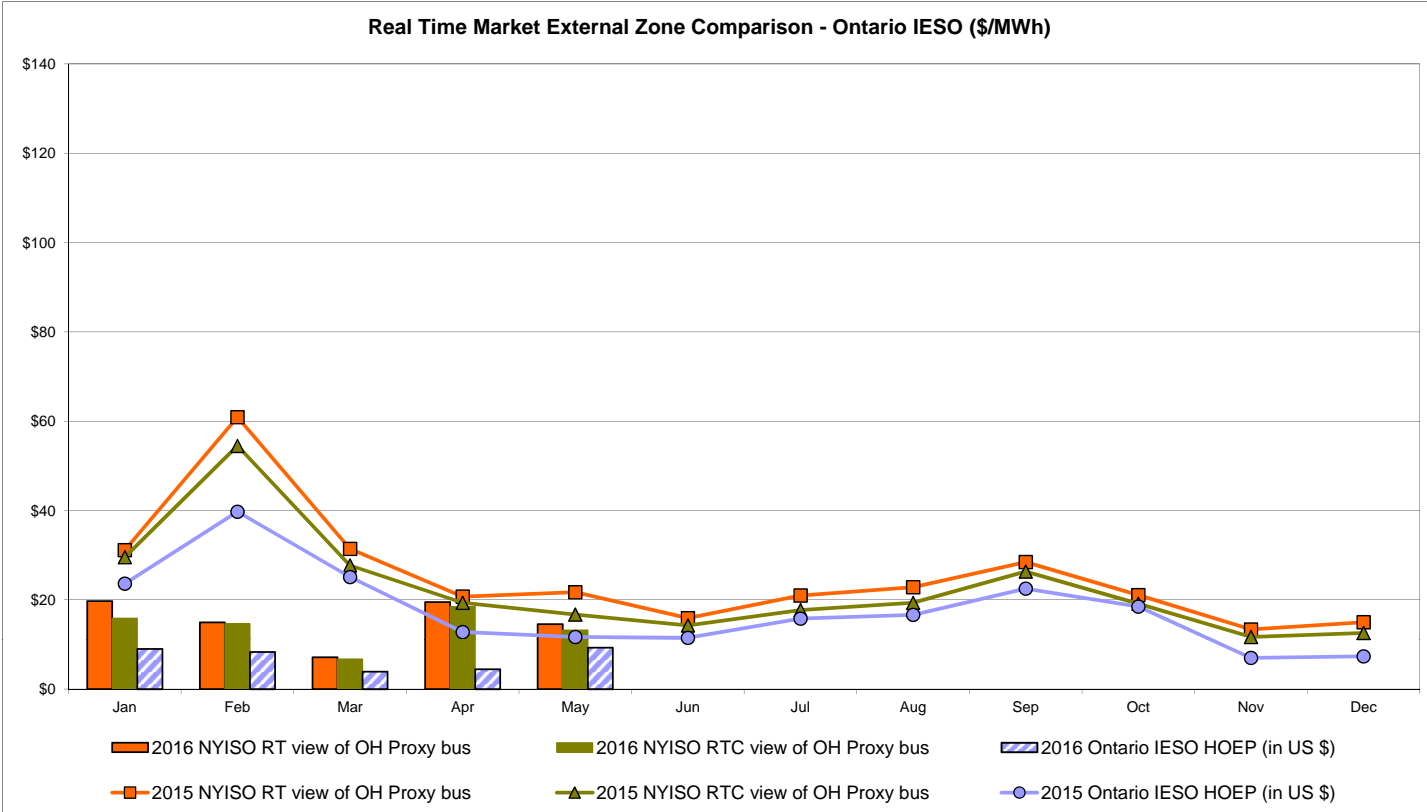
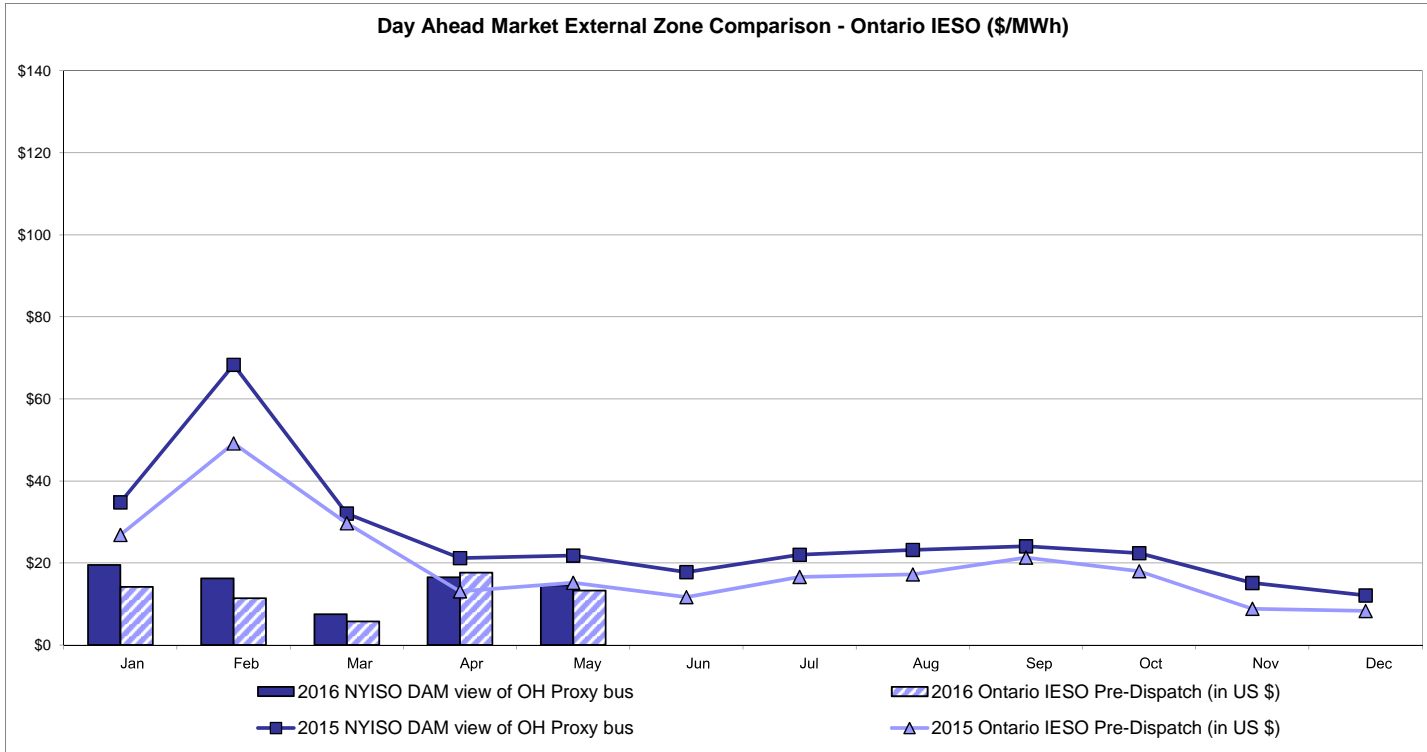
## Day Ahead Market External Zone Comparison - PJM (\$/MWh)



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

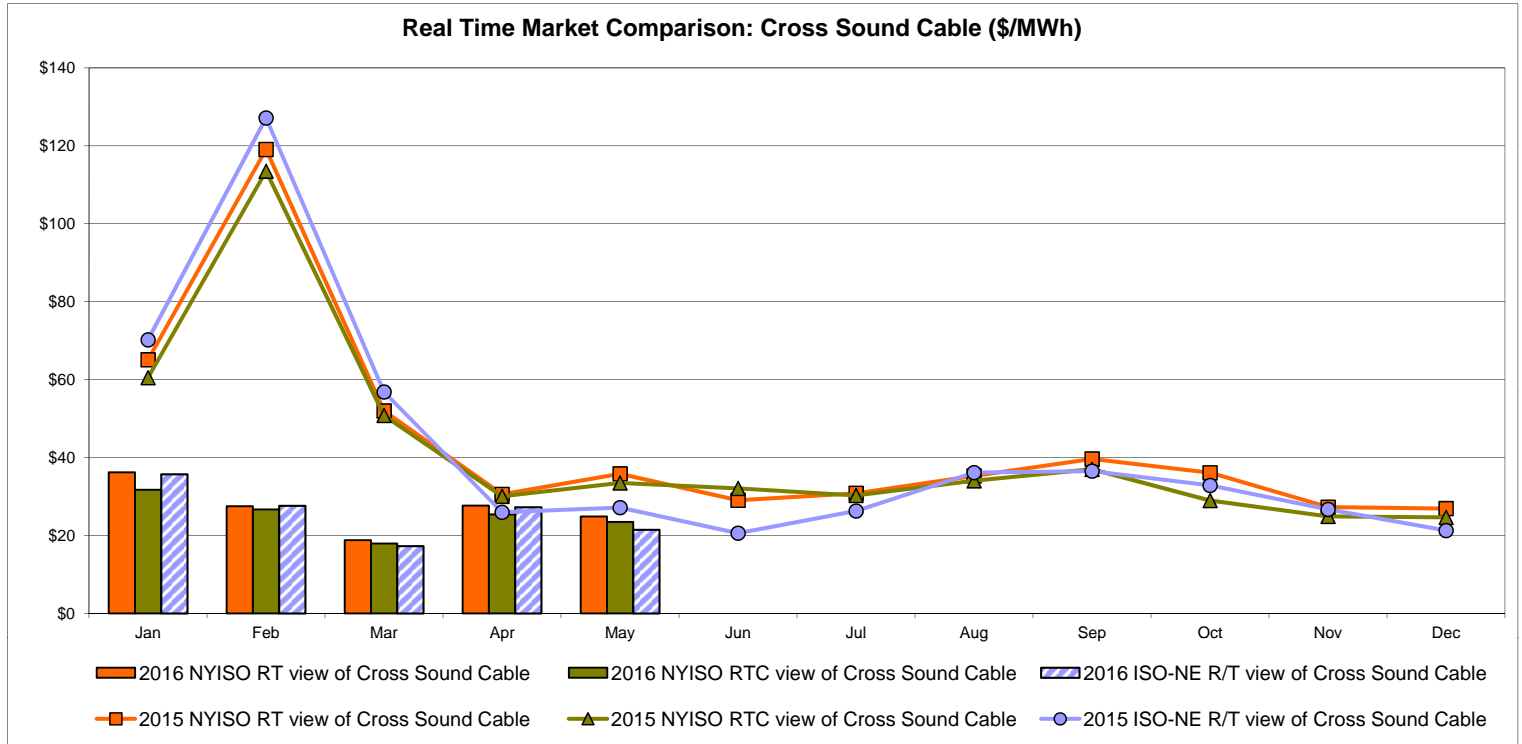
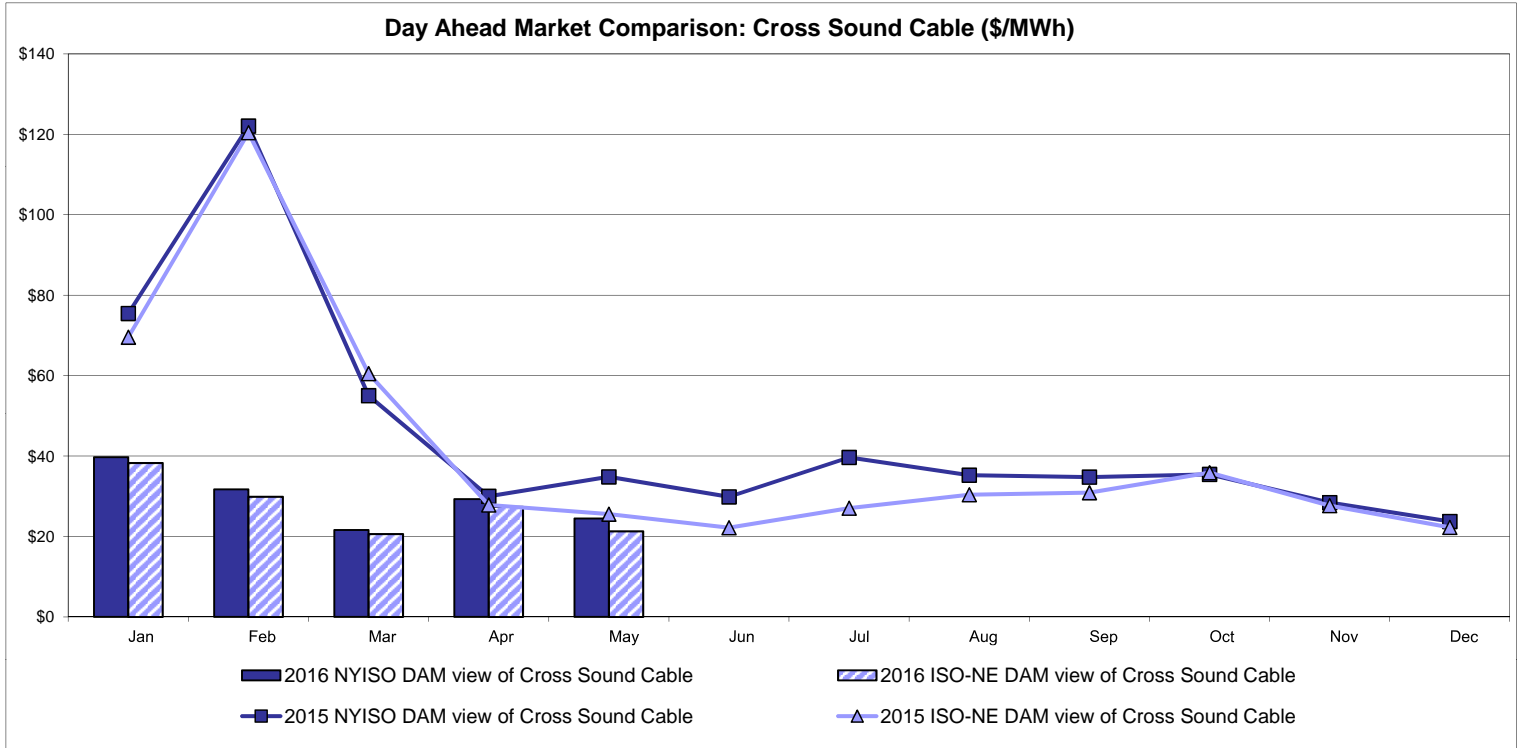


# External Comparison Ontario IESO



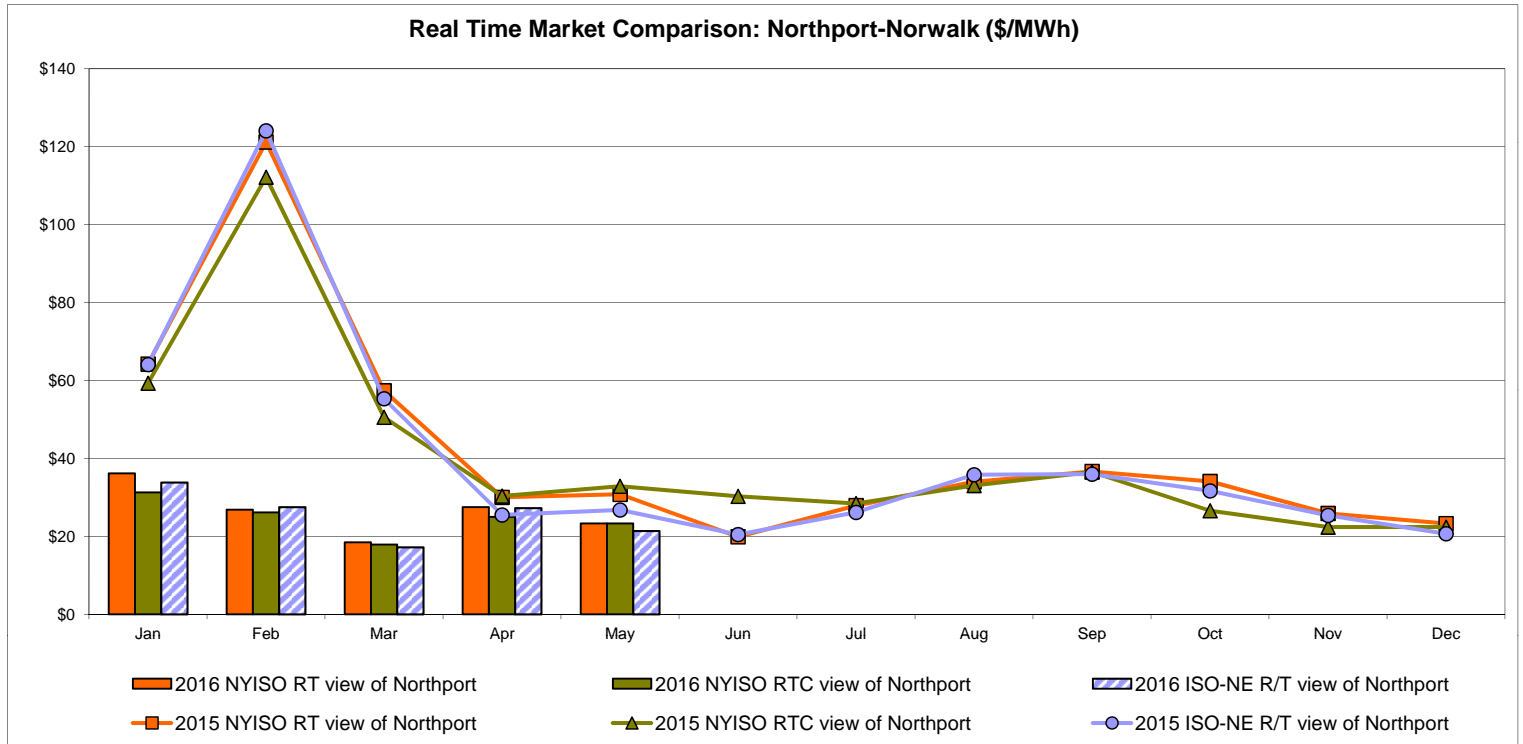
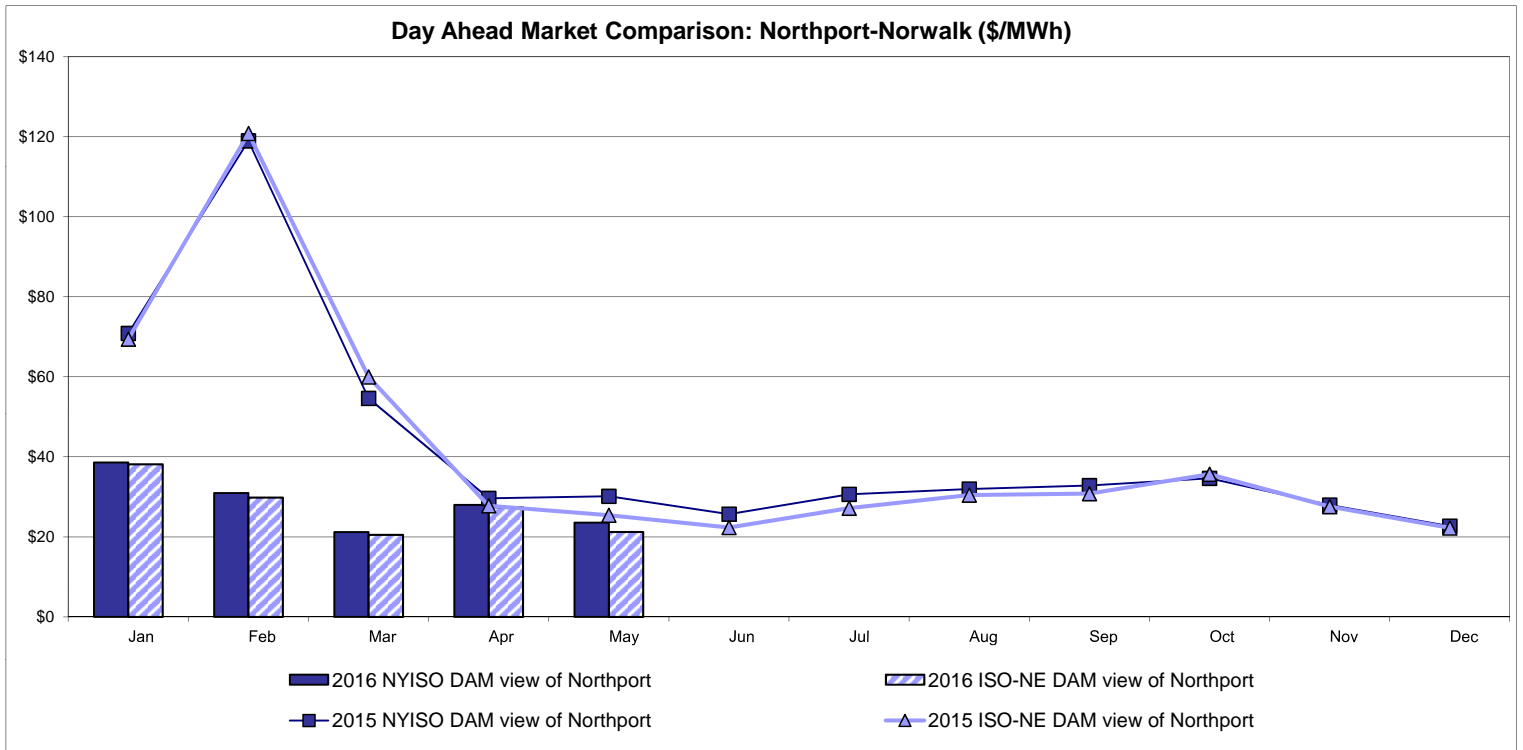
Notes: Exchange factor used for May 2016 was 0.7731 to US  
 HOEP: Hourly Ontario Energy Price  
 Pre-Dispatch: Projected Energy Price

# 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.

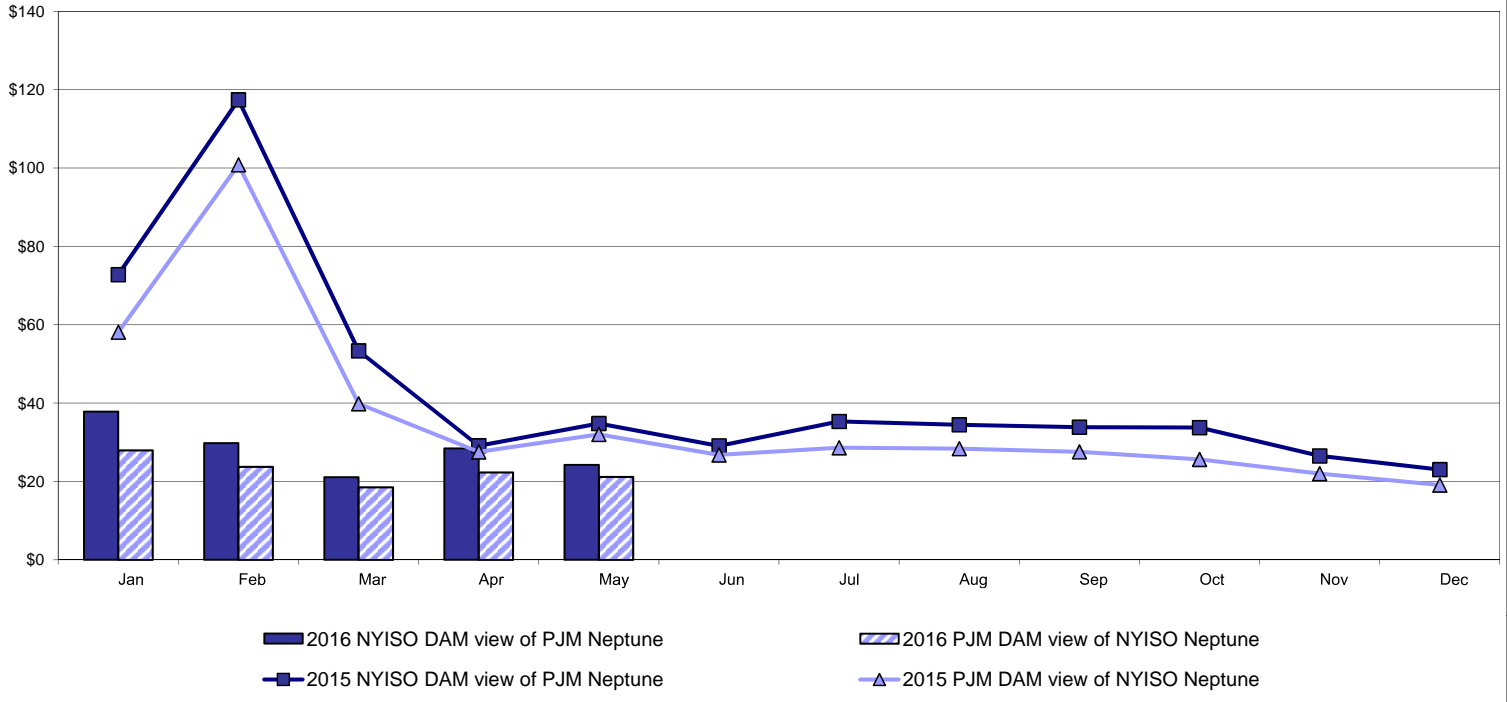
# External Controllable Line: Northport - Norwalk (New England)



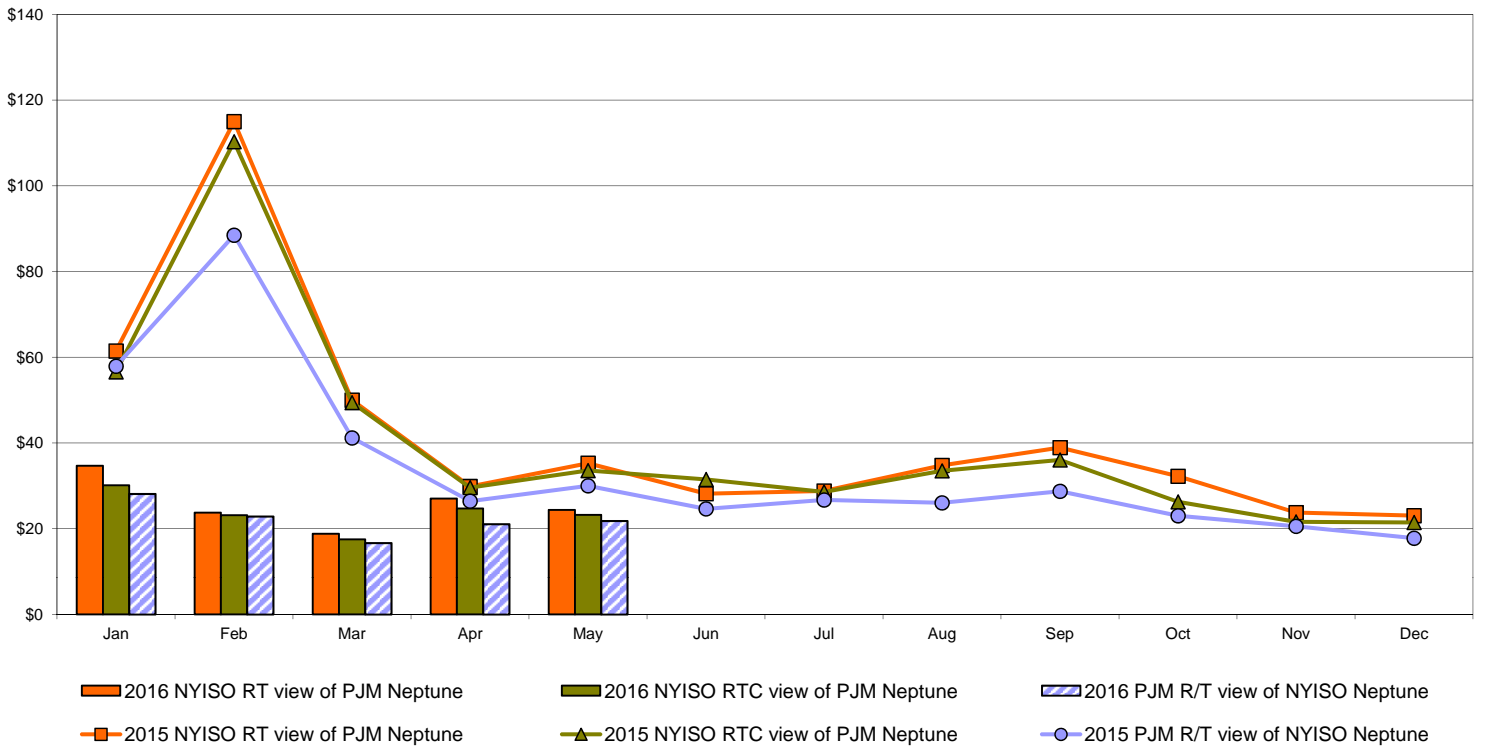
Note:  
 ISO-NE Forecast is an advisory posting @ 18:00 day before.  
 The DAM and R/T prices at the Northport 138 interface are used for ISO-NE.  
 The DAM and R/T prices at the 1385 interface are used for NYISO.

## External Controllable Line: Neptune (PJM)

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

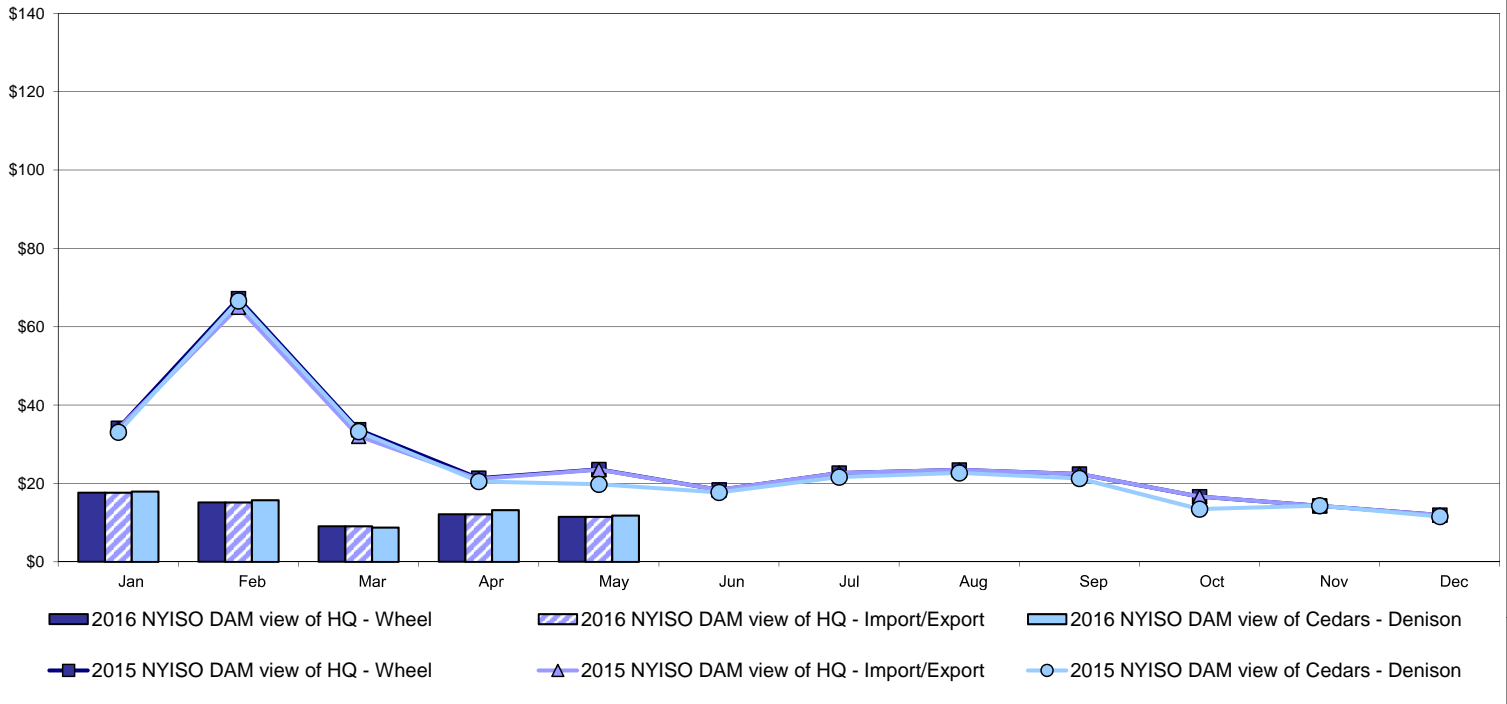


**Real Time Market Comparison: Neptune (\$/MWh)**

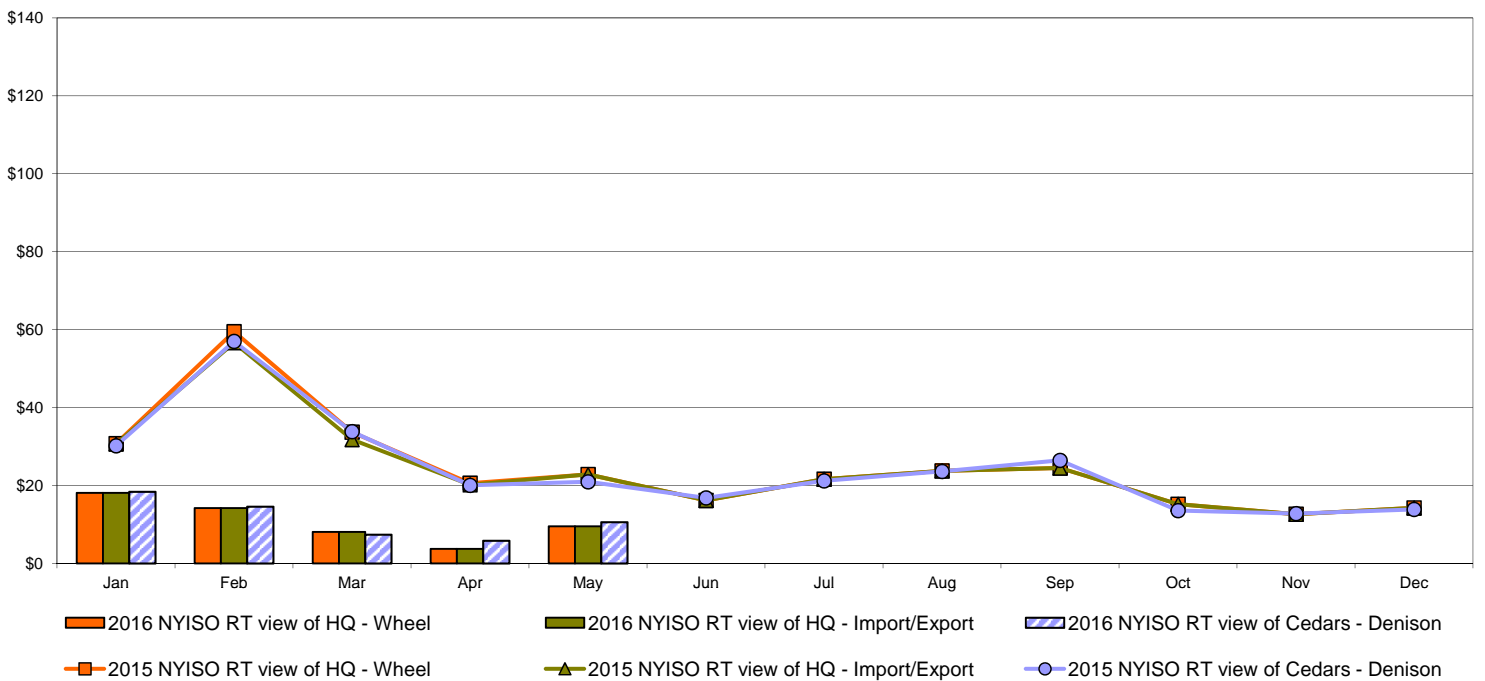


# External Comparison Hydro-Quebec

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

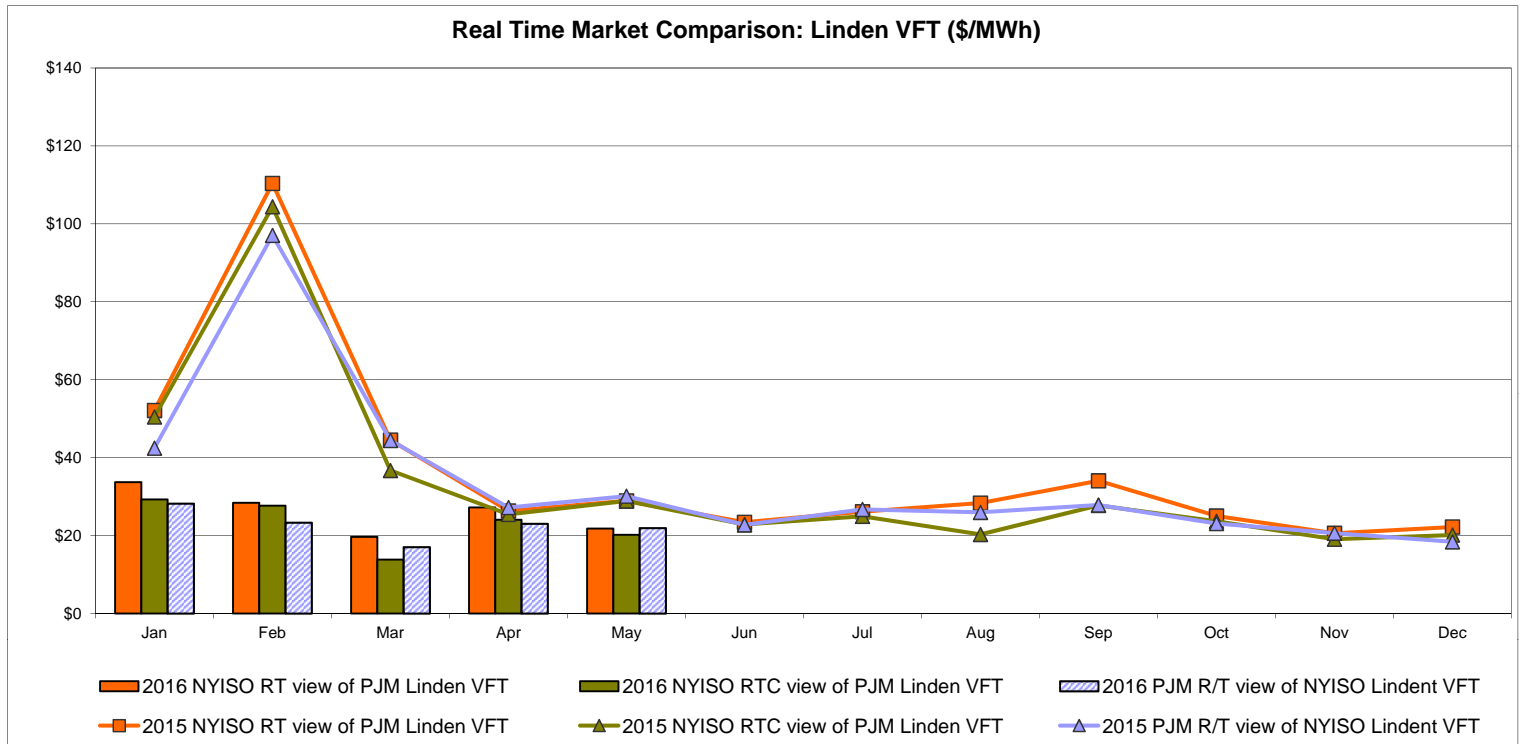
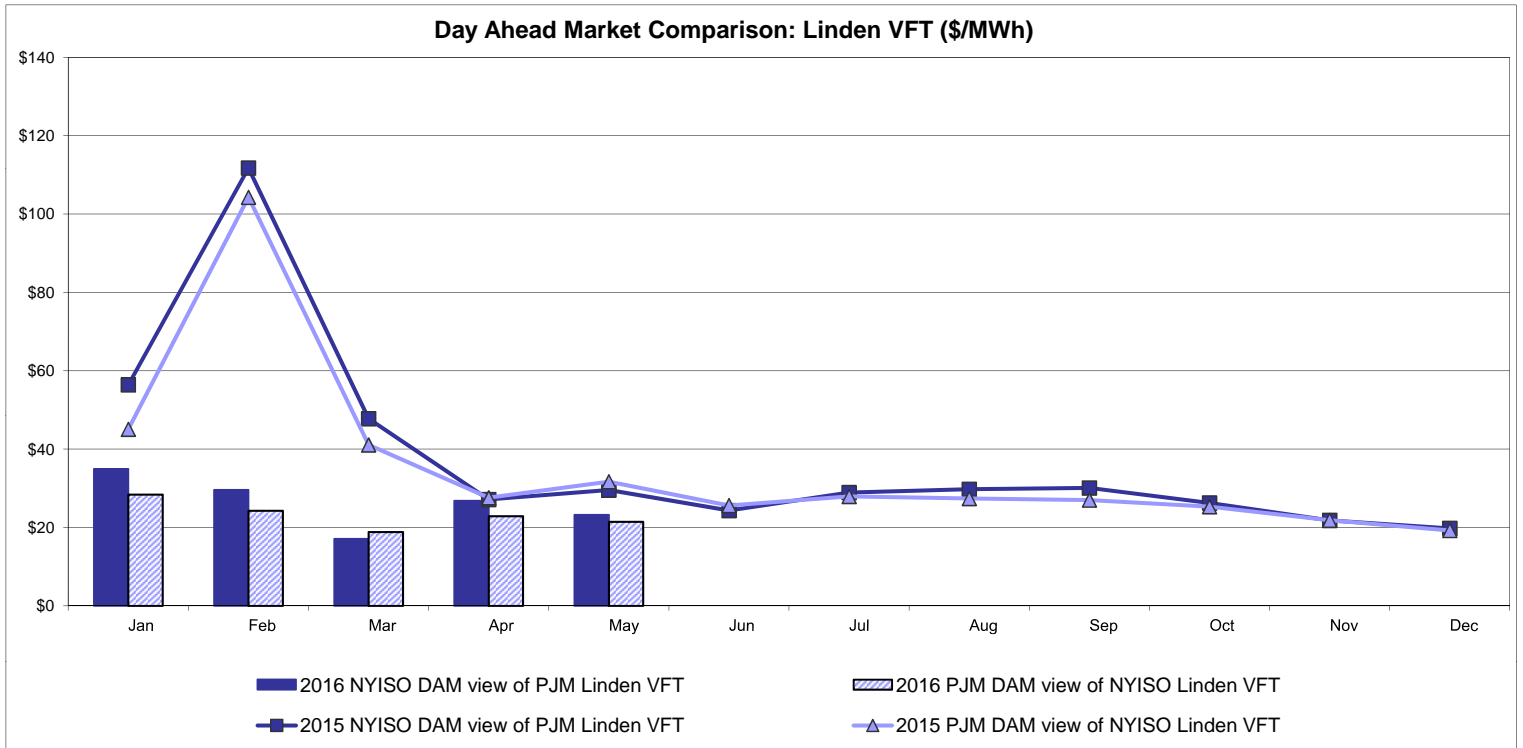


### Real Time Market External Zone Comparison - HQ (\$/MWh)



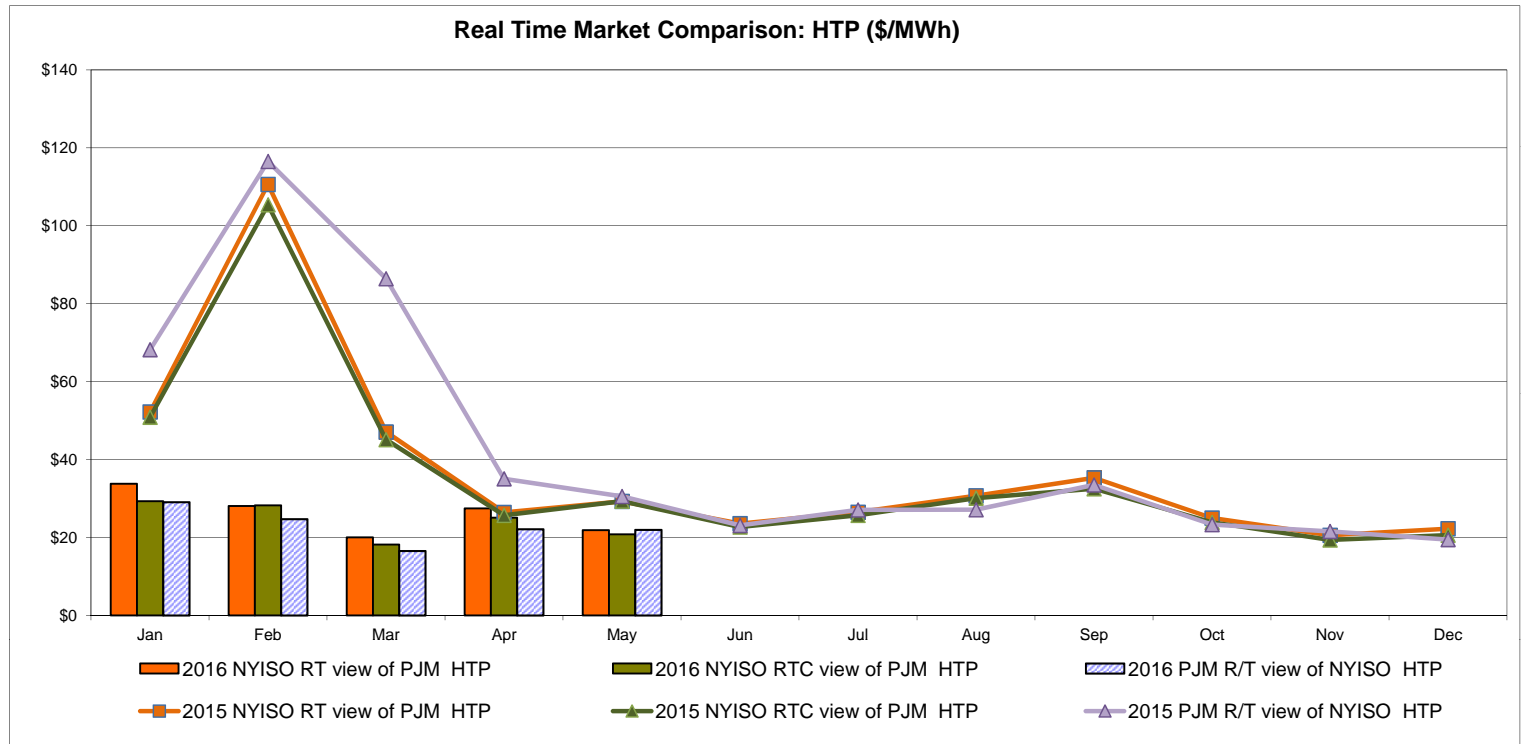
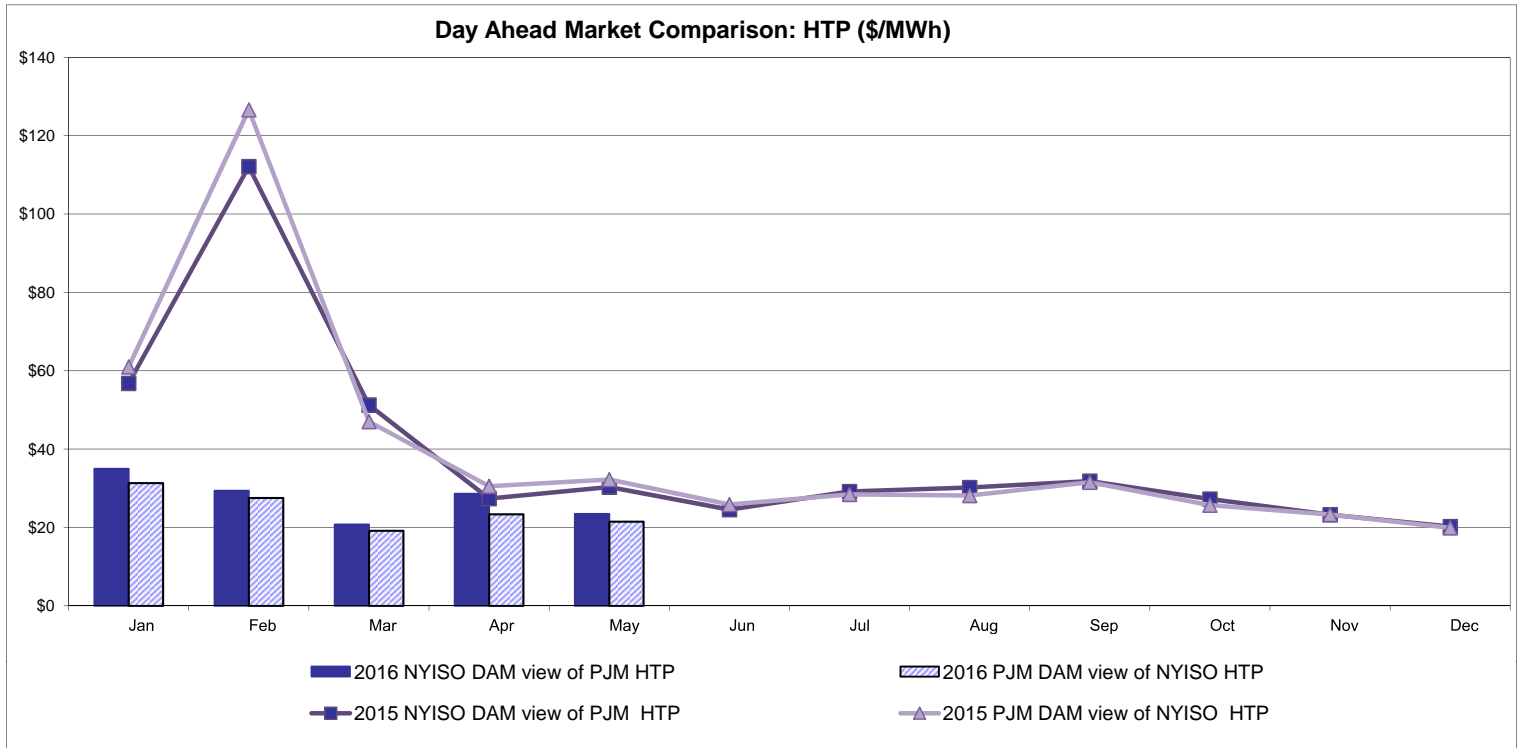
Note:  
Hydro-Quebec Prices are unavailable.

## External Controllable Line: Linden VFT (PJM)





## External Controllable Line: Hudson (PJM)

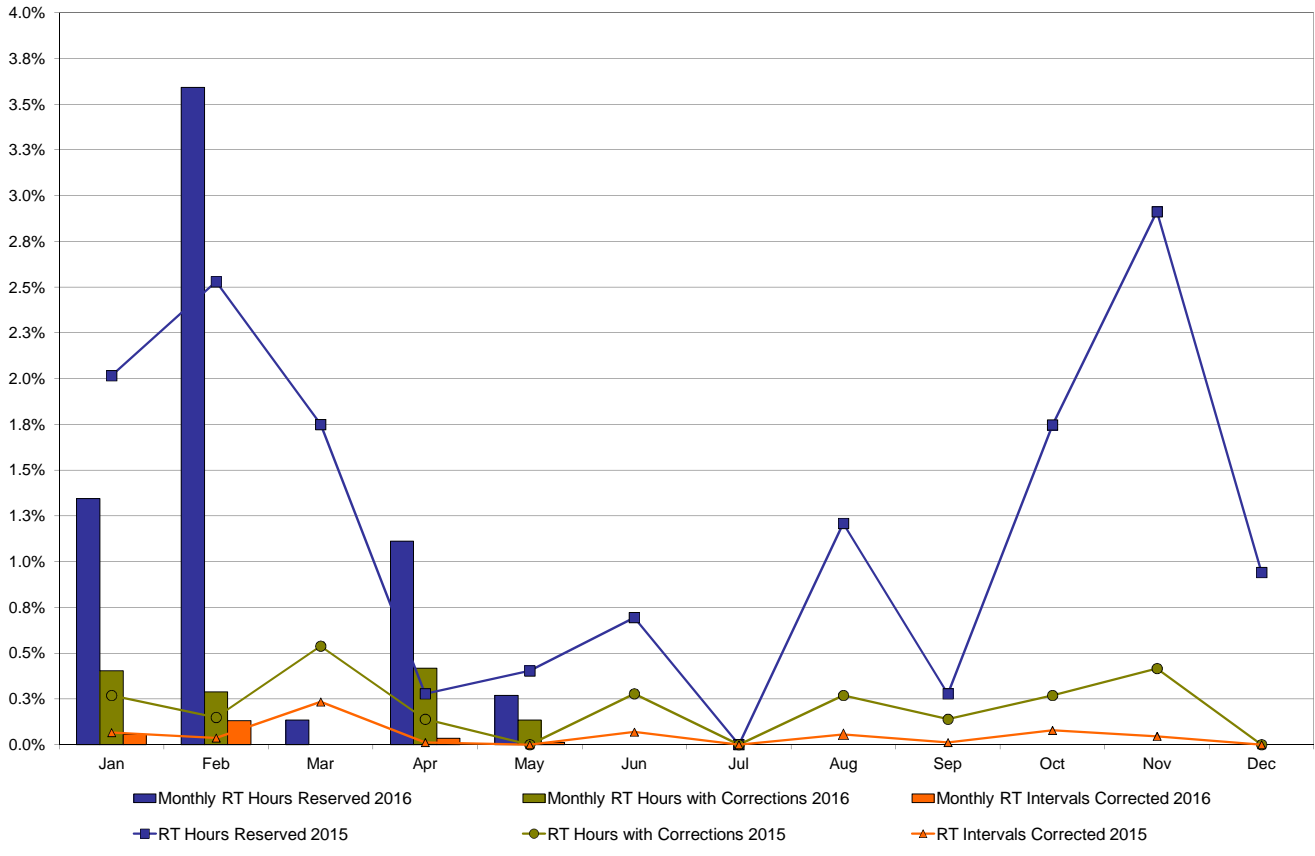


**NYISO Real Time Price Correction Statistics**

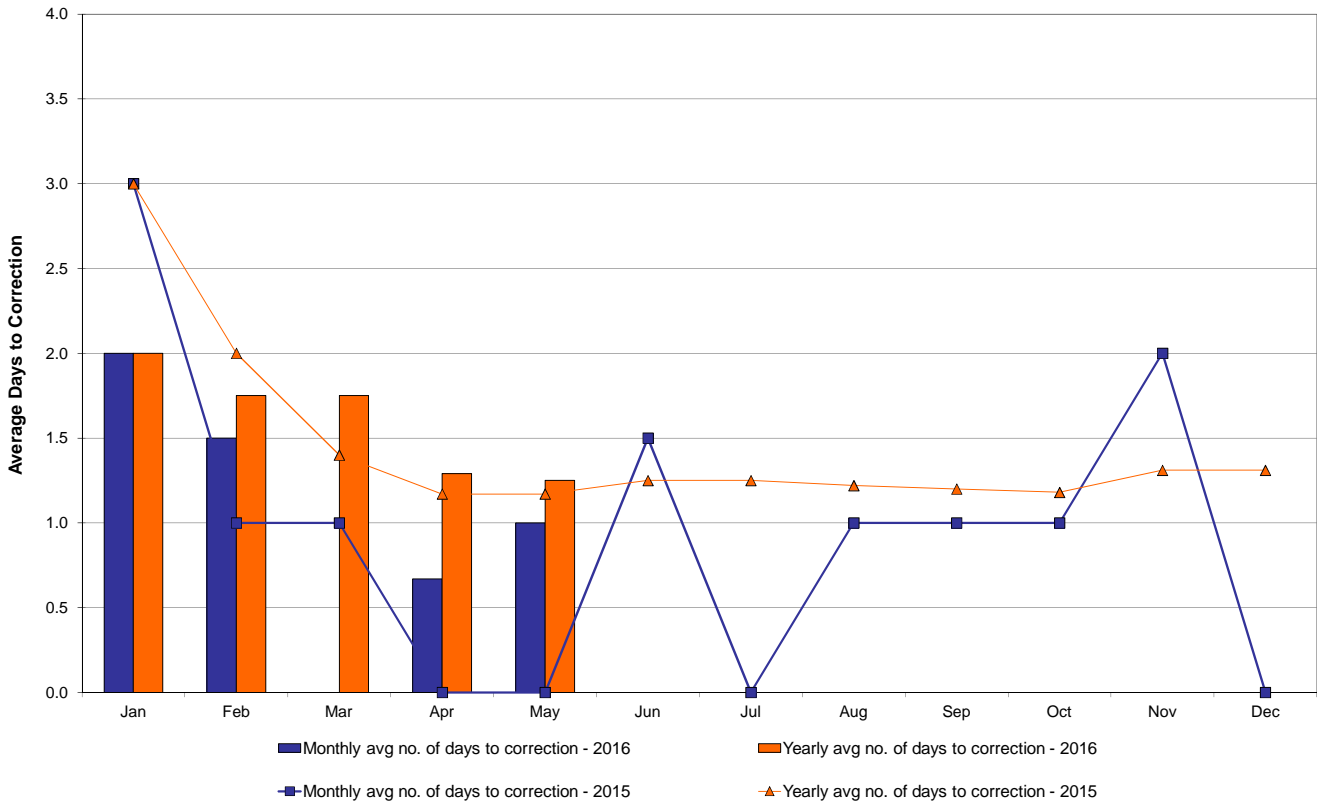
<b>2016</b>		<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<b>Hour Corrections</b>													
Number of hours with corrections	in the month	3	2	0	3	1							
Number of hours	in the month	744	696	743	720	744							
% of hours with corrections	in the month	0.40%	0.29%	0.00%	0.42%	0.13%							
% of hours with corrections	year-to-date	0.40%	0.35%	0.23%	0.28%	0.25%							
<b>Interval Corrections</b>													
Number of intervals corrected	in the month	5	11	0	3	1							
Number of intervals	in the month	9,000	8,440	8,995	8,724	8,987							
% of intervals corrected	in the month	0.06%	0.13%	0.00%	0.03%	0.01%							
% of intervals corrected	year-to-date	0.06%	0.09%	0.06%	0.05%	0.05%							
<b>Hours Reserved</b>													
Number of hours reserved	in the month	10	25	1	8	2							
Number of hours	in the month	744	696	743	720	744							
% of hours reserved	in the month	1.34%	3.59%	0.13%	1.11%	0.27%							
% of hours reserved	year-to-date	1.34%	2.43%	1.65%	1.52%	1.26%							
<b>Days to Correction *</b>													
Avg. number of days to correction	in the month	2.00	1.50	0.00	0.67	1.00							
Avg. number of days to correction	year-to-date	2.00	1.75	1.75	1.29	1.25							
<b>Days Without Corrections</b>													
Days without corrections	in the month	29	27	31	27	30							
Days without corrections	year-to-date	29	56	87	114	144							
<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>
<b>Hour Corrections</b>													
Number of hours with corrections	in the month	2	1	4	1	0	2	0	2	1	2	3	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%	0.15%	0.54%	0.14%	0.00%	0.28%	0.00%	0.27%	0.14%	0.27%	0.42%	0.00%
% of hours with corrections	year-to-date	0.27%	0.21%	0.32%	0.28%	0.22%	0.23%	0.20%	0.21%	0.20%	0.21%	0.22%	0.21%
<b>Interval Corrections</b>													
Number of intervals corrected	in the month	6	3	21	1	0	6	0	5	1	7	4	0
Number of intervals	in the month	9,066	8,231	9,005	8,696	9,032	8,731	9,025	8,987	8,728	9,008	8,743	8,975
% of intervals corrected	in the month	0.07%	0.04%	0.23%	0.01%	0.00%	0.07%	0.00%	0.06%	0.01%	0.08%	0.05%	0.00%
% of intervals corrected	year-to-date	0.07%	0.05%	0.11%	0.09%	0.07%	0.07%	0.06%	0.06%	0.05%	0.06%	0.06%	0.05%
<b>Hours Reserved</b>													
Number of hours reserved	in the month	15	17	13	2	3	5	0	9	2	13	21	7
Number of hours	in the month	744	672	743	720	744	720	744	744	720	744	721	744
% of hours reserved	in the month	2.02%	2.53%	1.75%	0.28%	0.40%	0.69%	0.00%	1.21%	0.28%	1.75%	2.91%	0.94%
% of hours reserved	year-to-date	2.02%	2.26%	2.08%	1.63%	1.38%	1.27%	1.08%	1.10%	1.01%	1.08%	1.25%	1.22%
<b>Days to Correction *</b>													
Avg. number of days to correction	in the month	3.00	1.00	1.00	0.00	0.00	1.50	0.00	1.00	1.00	1.00	2.00	0.00
Avg. number of days to correction	year-to-date	3.00	2.00	1.40	1.17	1.17	1.25	1.25	1.22	1.20	1.18	1.31	1.31
<b>Days Without Corrections</b>													
Days without corrections	in the month	30	27	28	29	31	28	31	30	29	30	28	31
Days without corrections	year-to-date	30	57	85	114	145	173	204	234	263	293	321	352

\* Calendar days from reservation date.

### Percentage of Real-Time Corrections

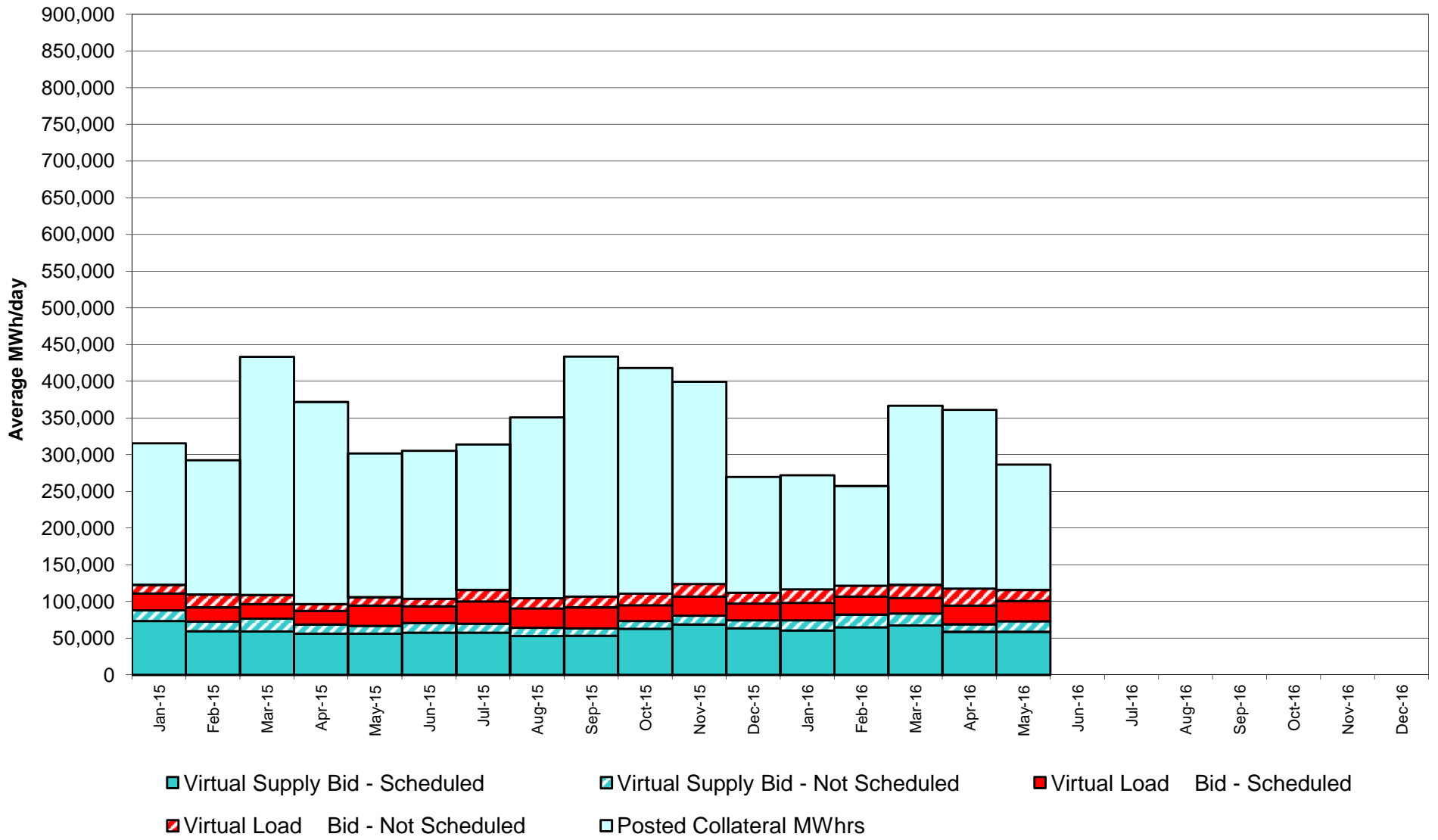


### Annual average time period for making Price Corrections (from reservation date) \*

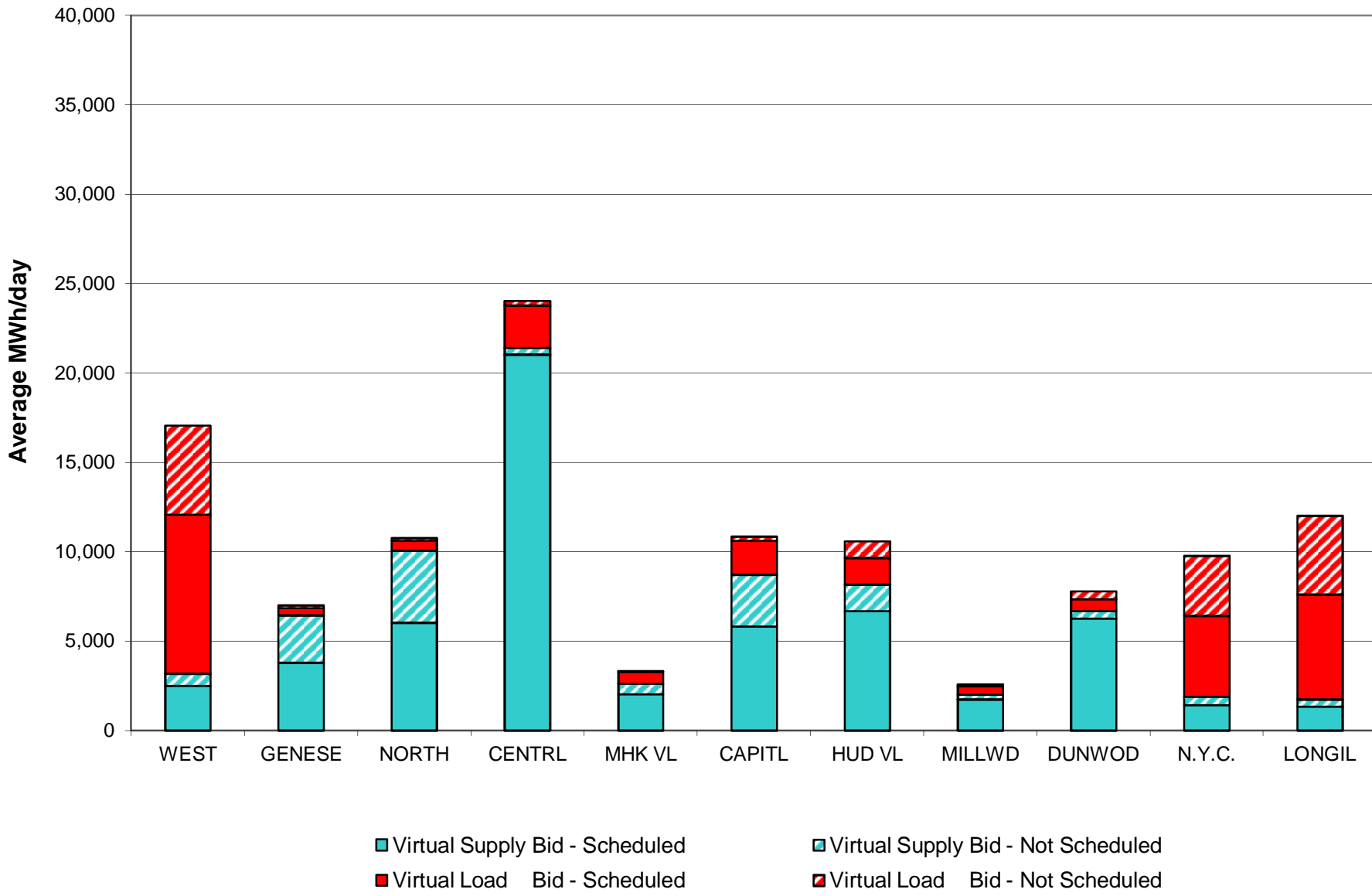


\* Calendar days from reservation date.

## NYISO Virtual Trading Average MWh per day



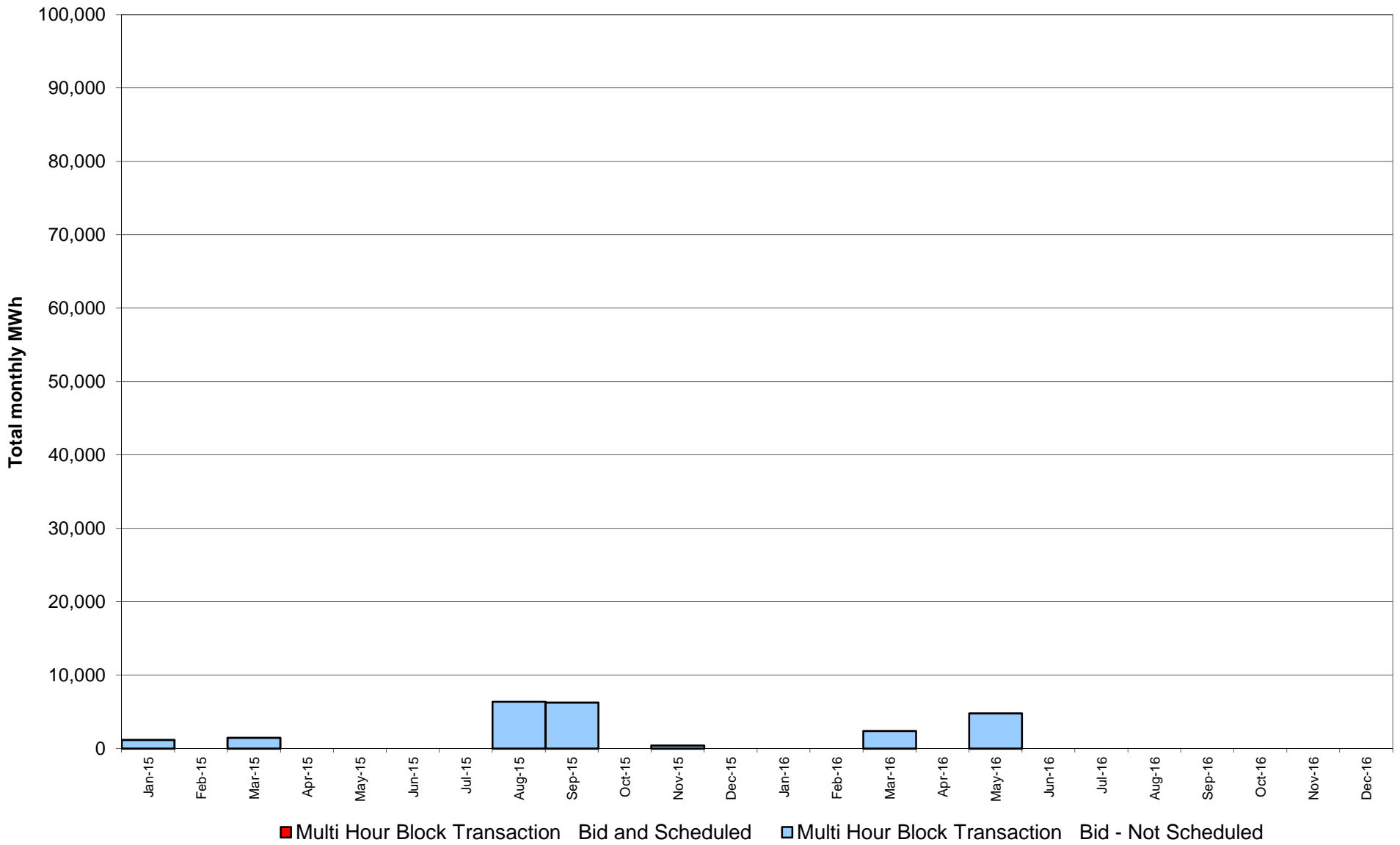
### Virtual Load and Supply Zonal Statistics through May 31, 2016



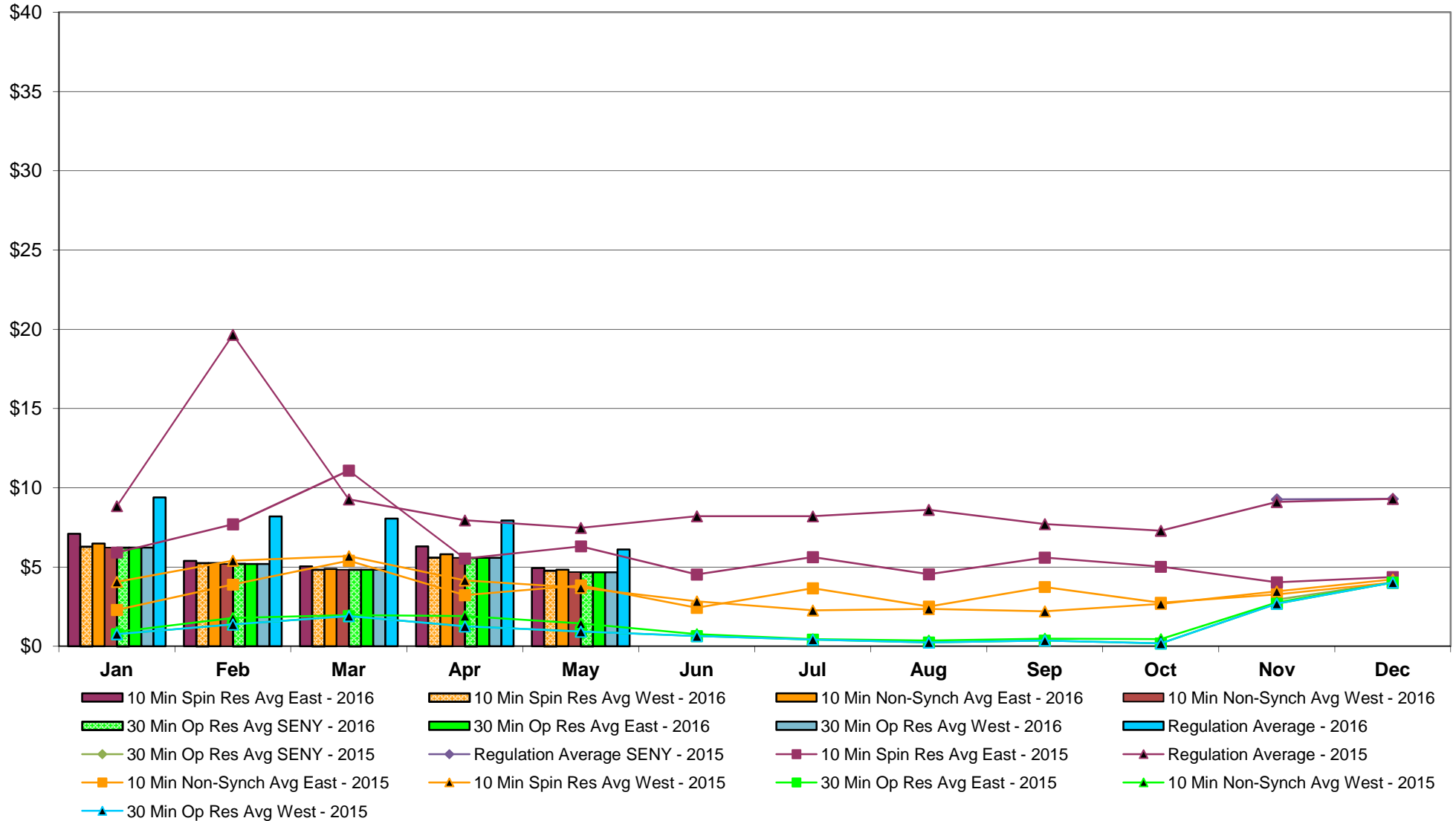
**Virtual Load and Supply Zonal Statistics (Average MWh/day) - 2016**

		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-16	8,416	4,440	2,862	419	<b>MHK VL</b>	Jan-16	463	92	2,024	146	<b>DUNWOD</b>	Jan-16	402	216	3,262	61		
	Feb-16	7,967	3,554	2,706	521		Feb-16	544	80	2,329	611		Feb-16	803	185	3,555	269		
	Mar-16	7,947	7,233	2,564	720		Mar-16	440	49	2,695	931		Mar-16	460	100	4,207	304		
	Apr-16	11,544	10,793	1,645	263		Apr-16	735	55	2,236	317		Apr-16	277	48	4,840	190		
	May-16	8,896	4,966	2,511	678		May-16	673	33	2,036	588		May-16	660	435	6,261	431		
	Jun-16						Jun-16						Jun-16						
	Jul-16						Jul-16						Jul-16						
	Aug-16						Aug-16						Aug-16						
	Sep-16						Sep-16						Sep-16						
	Oct-16						Oct-16						Oct-16						
	Nov-16						Nov-16						Nov-16						
	Dec-16						Dec-16						Dec-16						
	<b>GENESE</b>	Jan-16	1,030	638	3,868		2,421	<b>CAPITL</b>	Jan-16	2,195	1,472		4,568	3,470	<b>N.Y.C.</b>	Jan-16	2,862	4,976	2,531
Feb-16		795	923	3,461	3,707	Feb-16	1,593		684	5,140	3,581	Feb-16	3,281	4,752		2,390	403		
Mar-16		824	1,113	5,340	3,764	Mar-16	960		238	5,023	2,071	Mar-16	1,838	4,229		1,239	748		
Apr-16		448	1,398	6,028	1,718	Apr-16	1,410		198	6,433	1,645	Apr-16	3,263	4,302		1,221	336		
May-16		411	125	3,793	2,664	May-16	1,885		251	5,843	2,876	May-16	4,517	3,352		1,425	472		
Jun-16						Jun-16						Jun-16							
Jul-16						Jul-16						Jul-16							
Aug-16						Aug-16						Aug-16							
Sep-16						Sep-16						Sep-16							
Oct-16						Oct-16						Oct-16							
Nov-16						Nov-16						Nov-16							
Dec-16						Dec-16						Dec-16							
<b>NORTH</b>		Jan-16	274	312	7,038	3,010	<b>HUD VL</b>		Jan-16	1,036	1,609	6,763	2,202	<b>LONGIL</b>		Jan-16	6,153	3,761	700
	Feb-16	499	215	7,169	3,894	Feb-16		1,008	1,135	9,550	3,078	Feb-16	6,539		3,211	814	869		
	Mar-16	338	107	6,127	4,874	Mar-16		964	510	10,835	1,568	Mar-16	6,305		3,906	1,090	411		
	Apr-16	666	332	8,237	3,363	Apr-16		821	1,176	9,231	1,566	Apr-16	5,087		4,696	1,511	215		
	May-16	556	157	6,029	4,034	May-16		1,488	911	6,686	1,490	May-16	5,837		4,419	1,331	431		
	Jun-16					Jun-16						Jun-16							
	Jul-16					Jul-16						Jul-16							
	Aug-16					Aug-16						Aug-16							
	Sep-16					Sep-16						Sep-16							
	Oct-16					Oct-16						Oct-16							
	Nov-16					Nov-16						Nov-16							
	Dec-16					Dec-16						Dec-16							
	<b>CENTRL</b>	Jan-16	954	502	25,792	259		<b>MILLWD</b>	Jan-16	304	114	1,211	60		<b>NYISO</b>	Jan-16	24,086	18,132	60,619
Feb-16		975	212	26,176	301	Feb-16	403		145	1,477	100	Feb-16	24,407	15,096		64,766	17,335		
Mar-16		1,076	70	26,818	564	Mar-16	182		60	1,462	239	Mar-16	21,332	17,615		67,399	16,195		
Apr-16		1,124	159	15,555	284	Apr-16	186		26	1,913	101	Apr-16	25,563	23,182		58,849	9,998		
May-16		2,369	250	21,046	367	May-16	471		121	1,743	264	May-16	27,763	15,021		58,704	14,296		
Jun-16						Jun-16						Jun-16							
Jul-16						Jul-16						Jul-16							
Aug-16						Aug-16						Aug-16							
Sep-16						Sep-16						Sep-16							
Oct-16						Oct-16						Oct-16							
Nov-16						Nov-16						Nov-16							
Dec-16						Dec-16						Dec-16							

### NYISO Multi Hour Block Transactions Monthly Total MWh

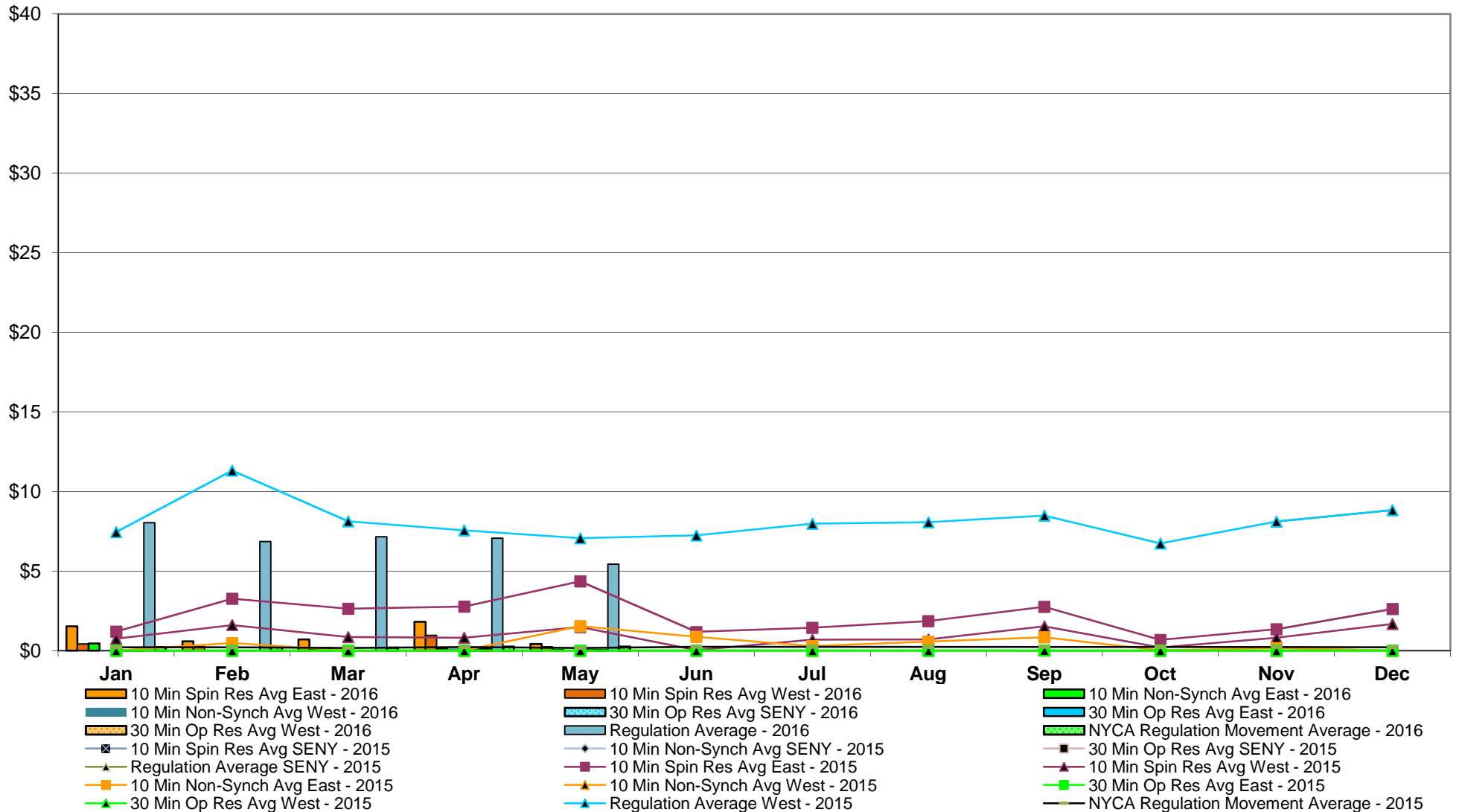


## NYISO Monthly Average Ancillary Service Prices Day Ahead Market 2015 - 2016

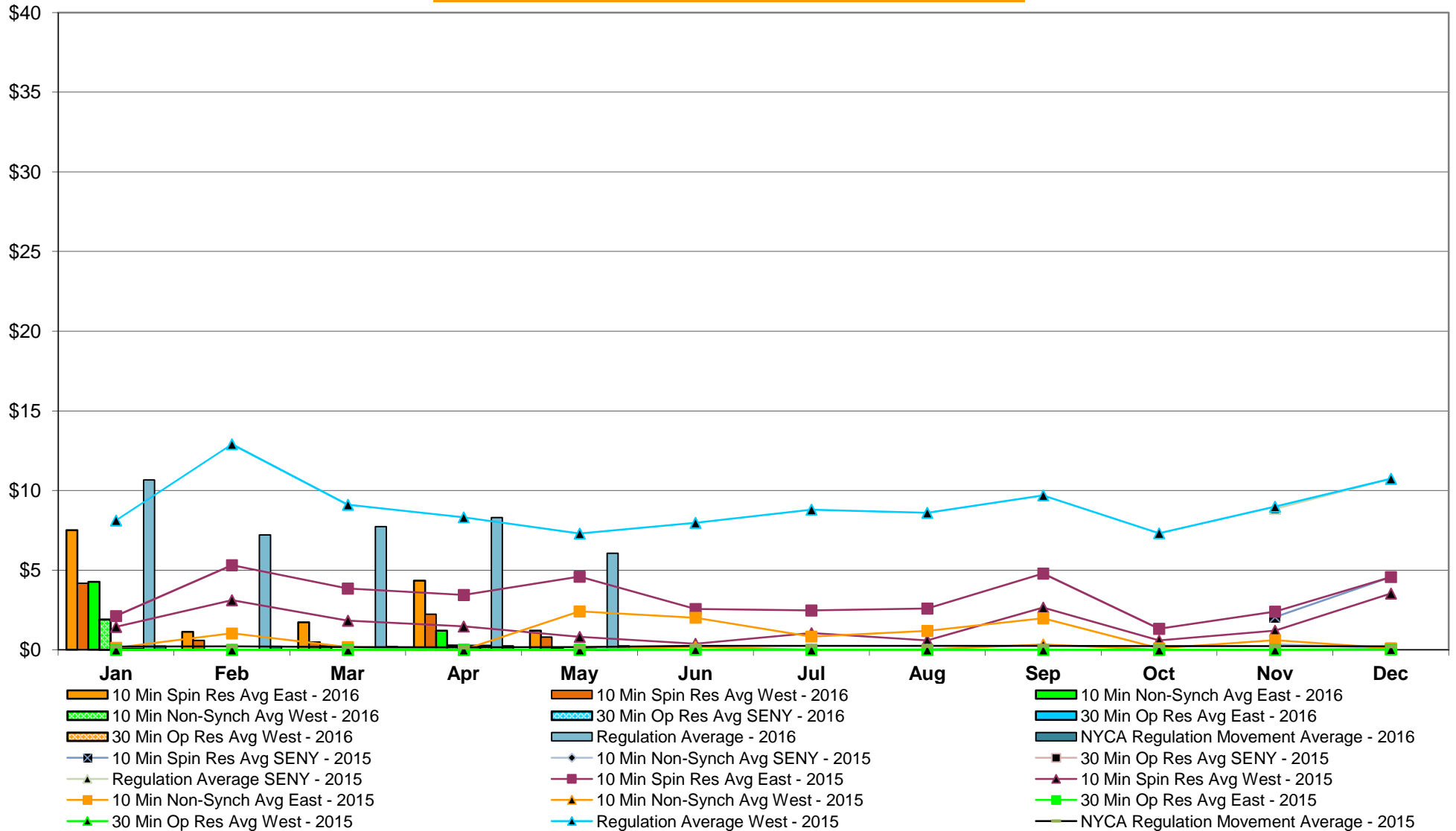




## NYISO Monthly Average Ancillary Service Prices RTC Market 2015 - 2016



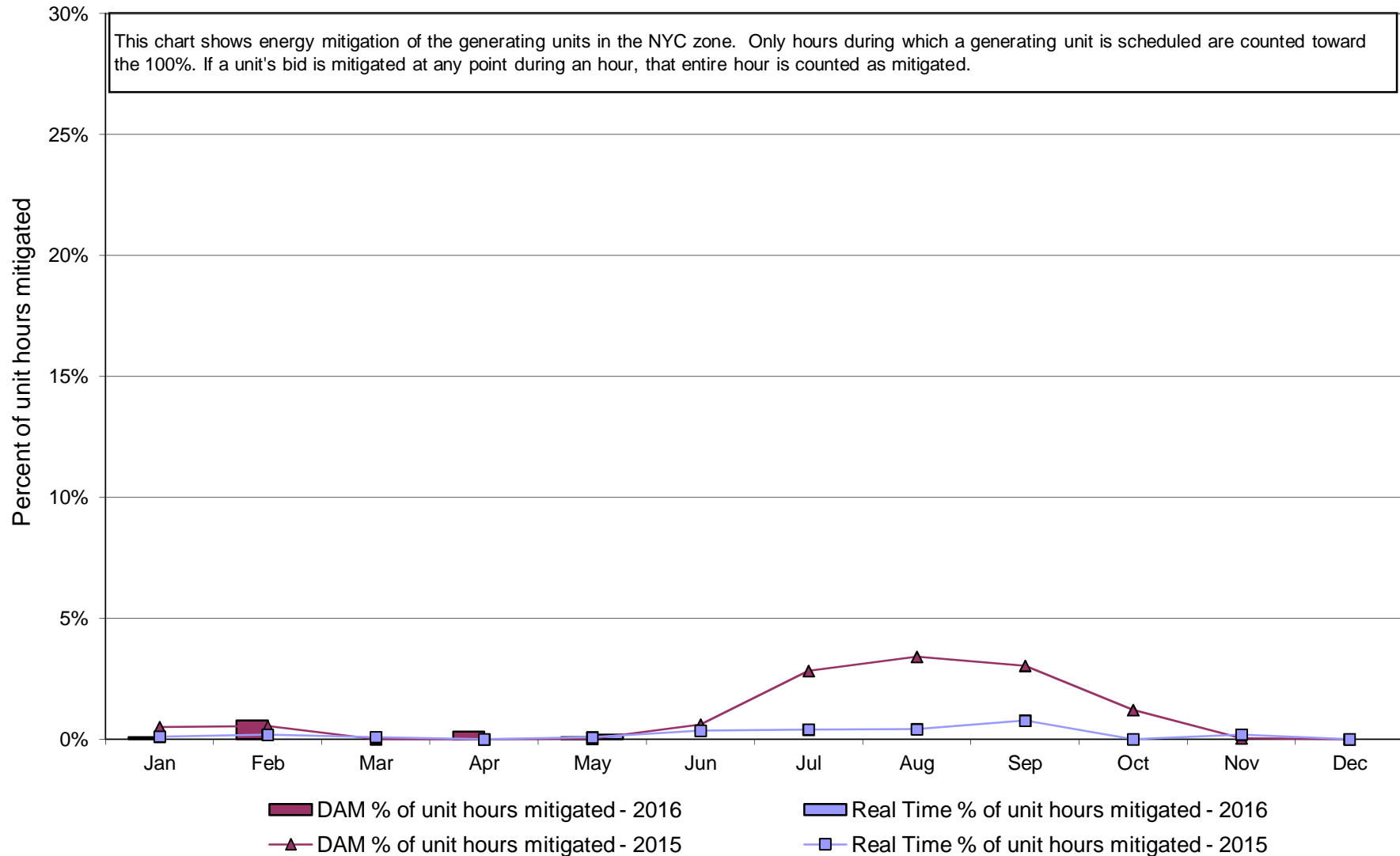
## NYISO Monthly Average Ancillary Service Prices Real Time Market 2015 - 2016



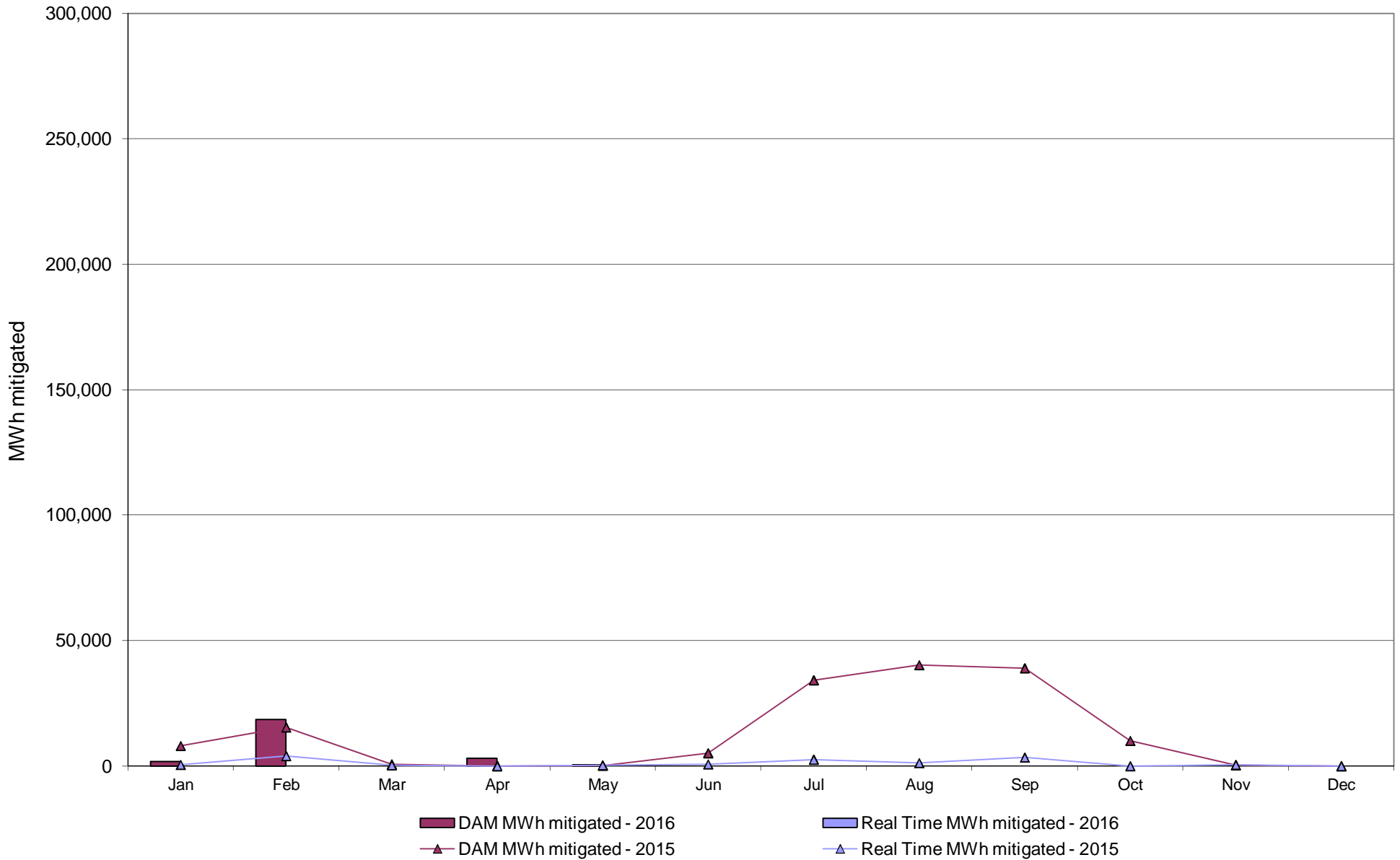
**NYISO Markets Ancillary Services Statistics - Unweighted Price (\$/MWH)**

<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>Day Ahead Market</b>												
10 Min Spin East	7.09	5.38	5.04	6.31	4.93							
10 Min Spin West	6.28	5.25	4.84	5.60	4.77							
10 Min Non Synch East	6.47	5.25	4.88	5.80	4.83							
10 Min Non Synch West	6.23	5.20	4.84	5.58	4.68							
30 Min SENY	6.23	5.20	4.84	5.58	4.67							
30 Min East	6.23	5.20	4.84	5.58	4.67							
30 Min West	6.23	5.20	4.84	5.58	4.67							
Regulation	9.39	8.19	8.05	7.93	6.11							
<b>RTC Market</b>												
10 Min Spin East	1.53	0.59	0.71	1.81	0.43							
10 Min Spin West	0.42	0.26	0.08	0.95	0.23							
10 Min Non Synch East	0.45	0.00	0.17	0.14	0.05							
10 Min Non Synch West	0.04	0.00	0.00	0.14	0.04							
30 Min SENY	0.01	0.00	0.00	0.14	0.04							
30 Min East	0.01	0.00	0.00	0.14	0.04							
30 Min West	0.01	0.00	0.00	0.14	0.04							
Regulation	8.04	6.86	7.15	7.07	5.43							
NYCA Regulation Movement	0.23	0.21	0.20	0.25	0.25							
<b>Real Time Market</b>												
10 Min Spin East	7.51	1.12	1.73	4.34	1.19							
10 Min Spin West	4.17	0.58	0.48	2.23	0.79							
10 Min Non Synch East	4.26	0.00	0.22	1.20	0.06							
10 Min Non Synch West	1.89	0.00	0.00	0.26	0.03							
30 Min SENY	0.06	0.00	0.00	0.25	0.03							
30 Min East	0.06	0.00	0.00	0.25	0.03							
30 Min West	0.06	0.00	0.00	0.25	0.03							
Regulation	10.66	7.21	7.73	8.30	6.06							
NYCA Regulation Movement	0.23	0.22	0.20	0.25	0.25							
<b>2015</b>												
<b>Day Ahead Market</b>												
10 Min Spin East	5.92	7.69	11.09	5.53	6.31	4.53	5.62	4.54	5.60	5.02	4.03	4.36
10 Min Spin West	4.07	5.40	5.68	4.16	3.69	2.84	2.26	2.36	2.20	2.68	3.47	4.22
10 Min Non Synch East	2.30	3.89	5.40	3.22	3.84	2.42	3.66	2.51	3.74	2.75	3.27	4.03
10 Min Non Synch West	0.90	1.79	1.97	1.91	1.45	0.77	0.45	0.36	0.49	0.45	2.77	4.02
30 Min SENY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.95	4.02
30 Min East	0.77	1.38	1.91	1.26	0.93	0.64	0.43	0.24	0.37	0.18	2.69	4.02
30 Min West	0.77	1.38	1.91	1.26	0.93	0.64	0.43	0.24	0.37	0.18	2.69	4.02
Regulation	8.84	19.65	9.27	7.94	7.48	8.20	8.20	8.61	7.71	7.29	9.10	9.30
<b>RTC Market</b>												
10 Min Spin East	1.20	3.27	2.64	2.77	4.36	1.18	1.44	1.86	2.76	0.67	1.35	2.62
10 Min Spin West	0.74	1.61	0.86	0.81	1.48	0.04	0.69	0.70	1.53	0.20	0.81	1.68
10 Min Non Synch East	0.01	0.48	0.01	0.00	1.54	0.87	0.28	0.57	0.84	0.01	0.16	0.01
10 Min Non Synch West	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
30 Min SENY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	0.00
30 Min East	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
30 Min West	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Regulation	7.45	11.32	8.13	7.56	7.06	7.24	7.97	8.07	8.49	6.73	8.12	8.83
NYCA Regulation Movement	0.21	0.21	0.16	0.22	0.16	0.24	0.25	0.23	0.24	0.23	0.22	0.22
<b>Real Time Market</b>												
10 Min Spin East	2.12	5.31	3.84	3.44	4.59	2.56	2.47	2.59	4.79	1.32	2.40	4.57
10 Min Spin West	1.44	3.11	1.83	1.46	0.81	0.38	1.04	0.59	2.65	0.59	1.20	3.53
10 Min Non Synch East	0.12	1.03	0.17	0.01	2.41	2.01	0.83	1.19	1.97	0.09	0.61	0.09
10 Min Non Synch West	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.02	0.33	0.00	0.00	0.05
30 Min SENY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.00	0.03
30 Min East	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.03
30 Min West	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.03
Regulation	8.12	12.91	9.11	8.32	7.30	7.97	8.80	8.60	9.69	7.32	8.98	10.73
NYCA Regulation Movement	0.20	0.21	0.17	0.15	0.16	0.24	0.24	0.24	0.24	0.23	0.22	0.21

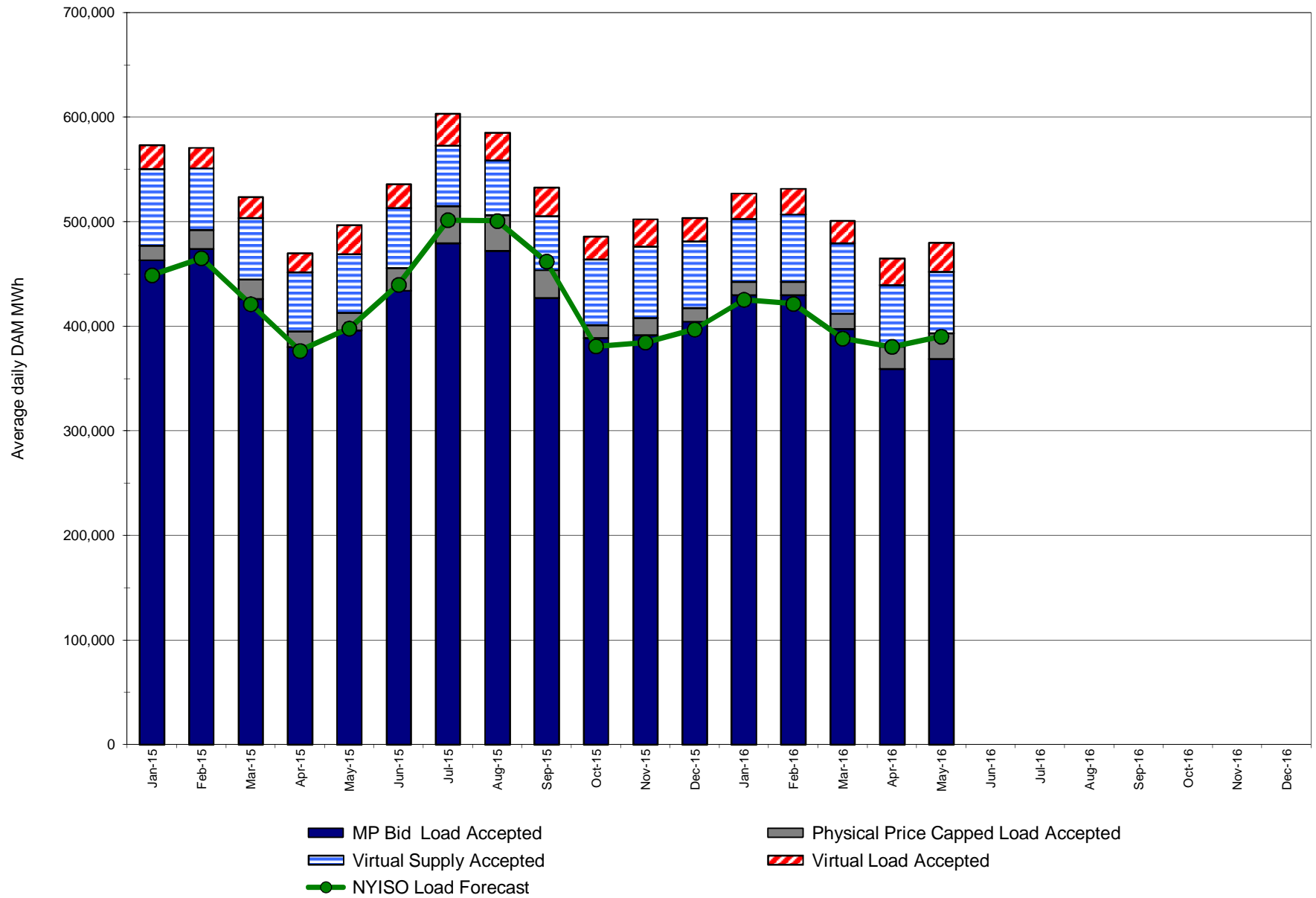
## NYISO In City Energy Mitigation - AMP (NYC Zone) 2015 - 2016 Percentage of committed unit-hours mitigated



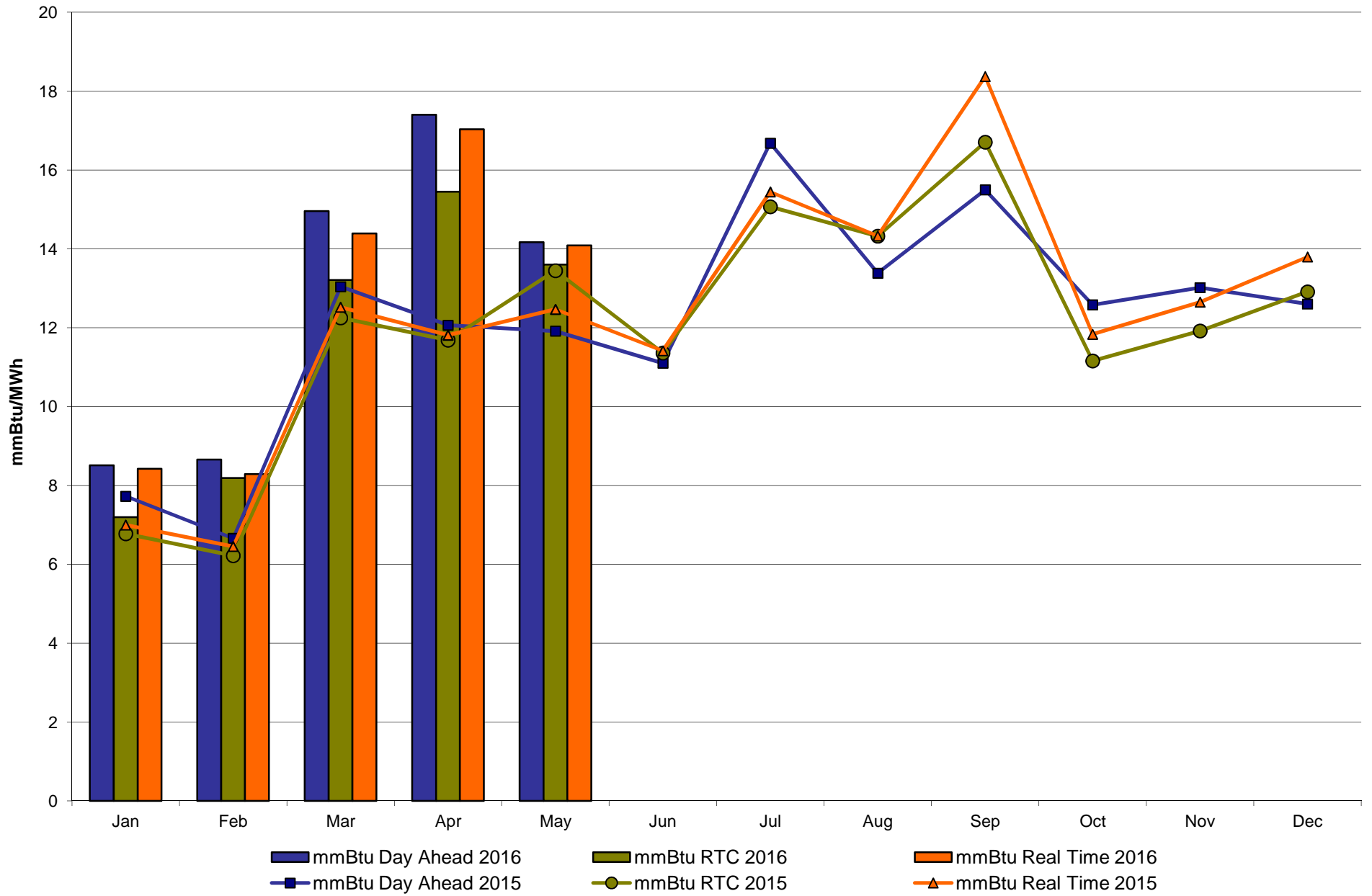
**NYISO In City Energy Mitigation (NYC Zone) 2015 - 2016**  
**Monthly megawatt hours mitigated**



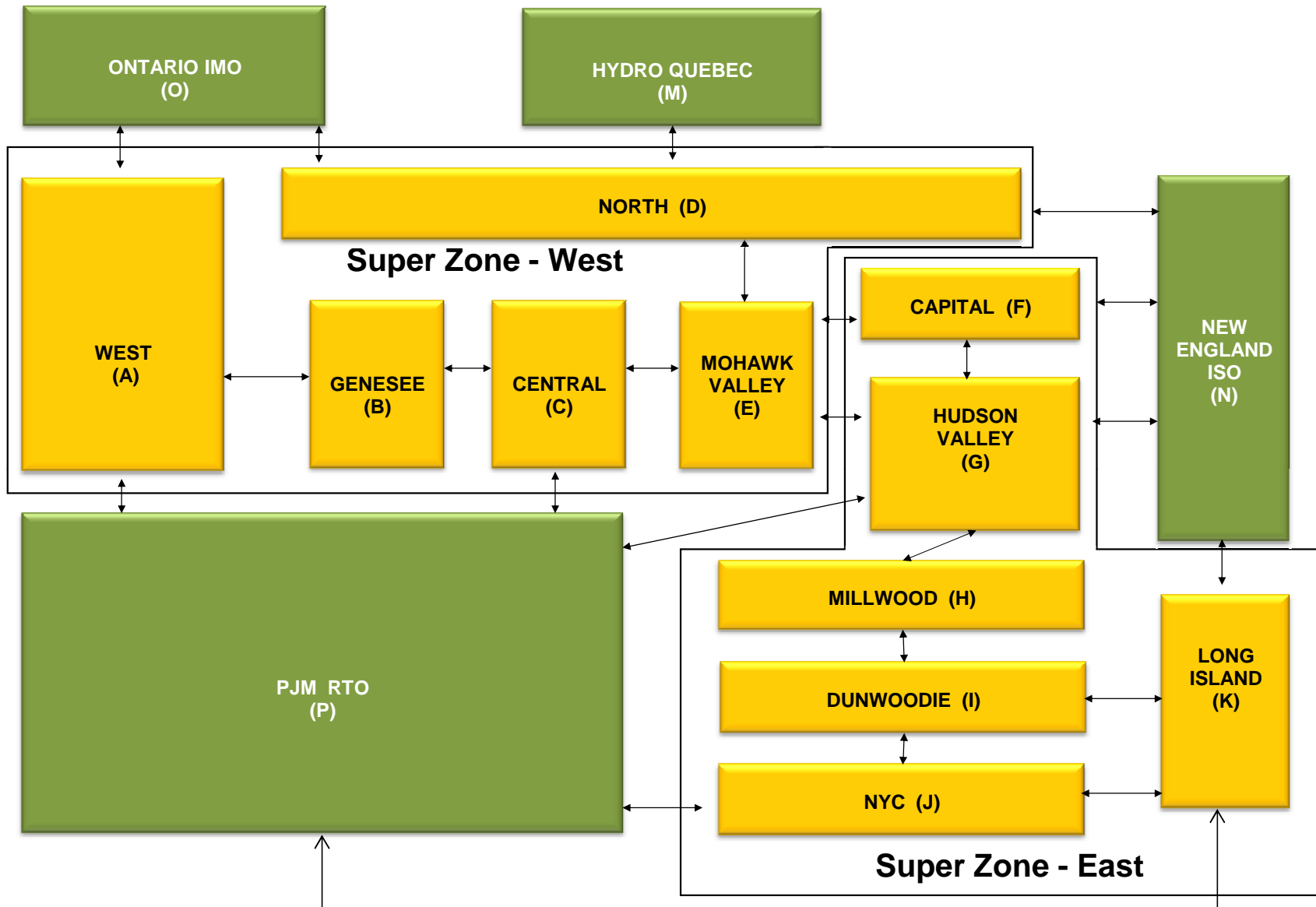
### NYISO Average Daily DAM Load Bid Summary



## Monthly Implied Heat Rate 2015-2016



# NYISO LBMP ZONES

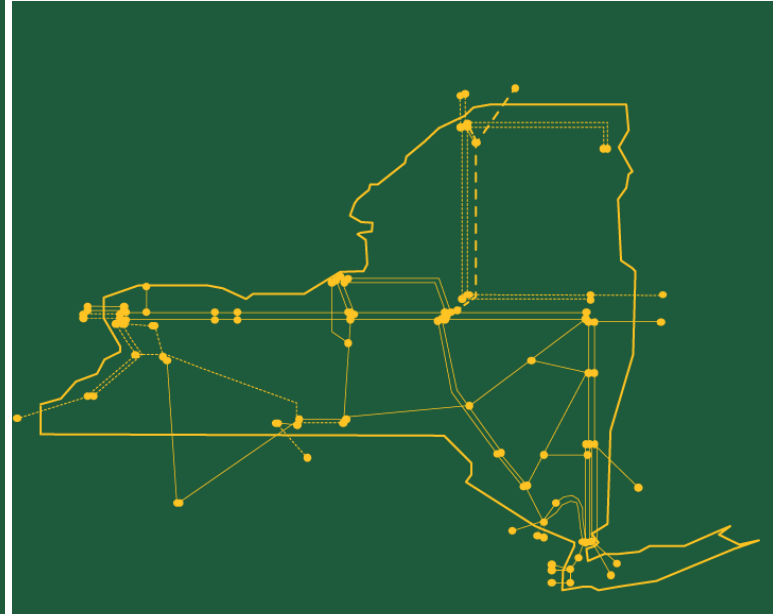




**Billing Codes for Chart C**

<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.



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