

# Market Operations Report

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New York Independent System Operator*

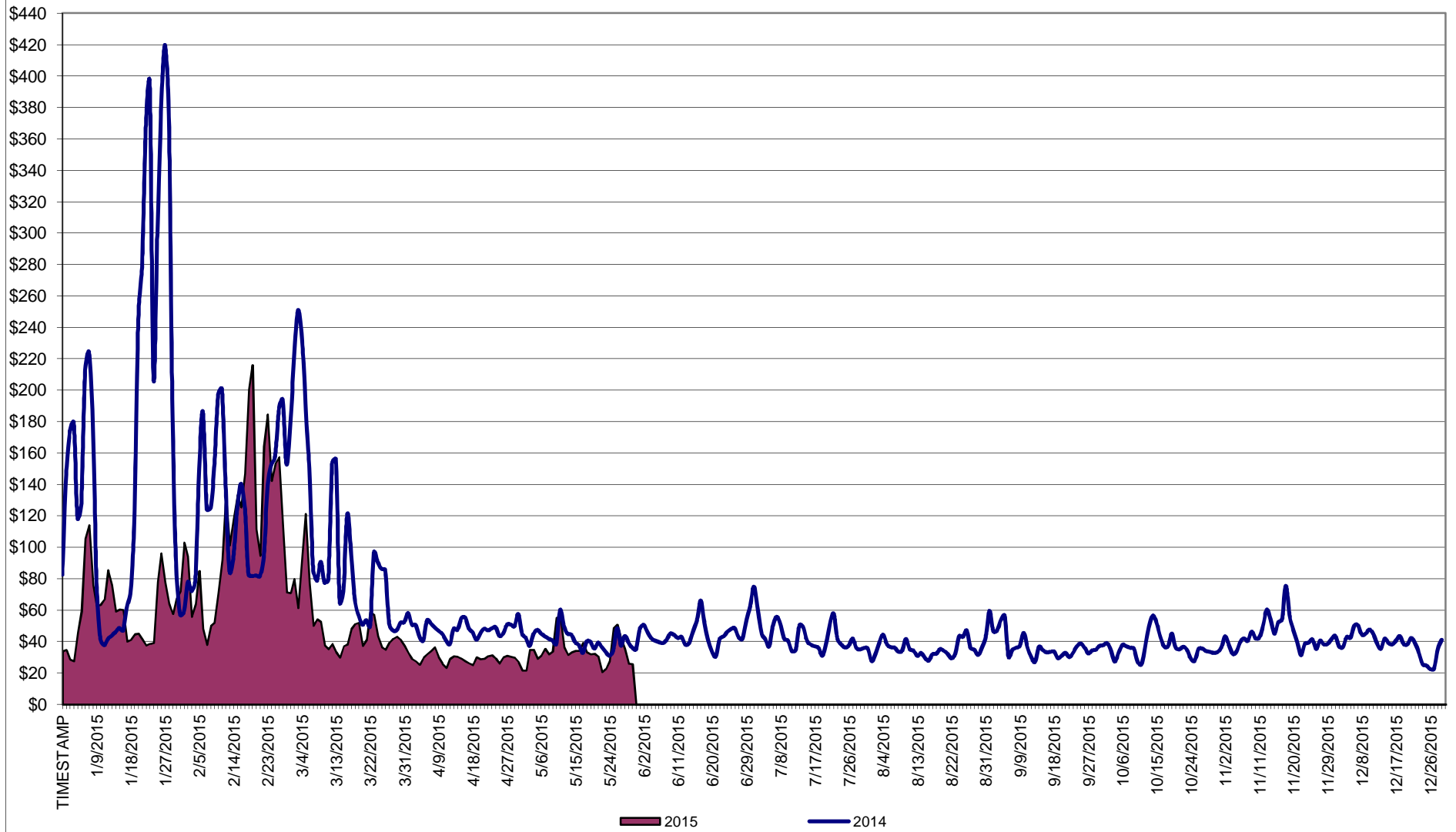
**Business Issues Committee Meeting**

*June 10, 2015*

# Market Performance Highlights for May 2015

- **LBMP for May is \$32.98/MWh; higher than \$28.35/MWh in April 2015 and lower than \$40.30/MWh in May 2014.**
  - Day Ahead and Real Time Load Weighted LBMPs are higher compared to April.
- **May 2015 average year-to-date monthly cost of \$60.96/MWh is a 44% decrease from \$108.36/MWh in May 2014.**
- **Average daily sendout is 409 GWh/day in May; higher than 387 GWh/day in April 2015 and 391 GWh/day in May 2014.**
- **Natural gas and distillate prices were higher compared to the previous month.**
  - Natural Gas (Transco Z6 NY) was \$2.65/MMBtu, up 20% from \$2.21/MMBtu in April.
    - Transco Z6 NY is down 24% year-over-year
  - Jet Kerosene Gulf Coast was \$13.72/MMBtu, up from \$12.44/MMBtu in April.
  - Ultra Low Sulfur No.2 Diesel NY Harbor was \$14.05/MMBtu, up from \$12.99/MMBtu in April.
    - Distillate prices are down 33% year-over-year
- **Uplift per MWh is higher compared to the previous month.**
  - Uplift (not including NYISO cost of operations) is \$0.28/MWh; higher than (\$0.14)/MWh in April.
    - The Local Reliability Share is \$0.32/MWh, higher than \$0.27 in April.
    - The Statewide Share is (\$0.04)/MWh, higher than (\$0.41)/MWh in April.
      - The biggest reason for the increase was congestion out West aggravated on a few days by Lake Erie Loop flow
  - TSA \$ per NYC MWh is \$0.17/MWh.
  - Total uplift costs (Schedule 1 components including NYISO Cost of Operations) are higher than April.

**Daily NYISO Average Cost/MWh (Energy & Ancillary Services)\***  
 2014 Annual Average \$69.31/MWh  
 May 2014 YTD Average \$108.36/MWh  
 May 2015 YTD Average \$60.95/MWh



\* Excludes ICAP payments.

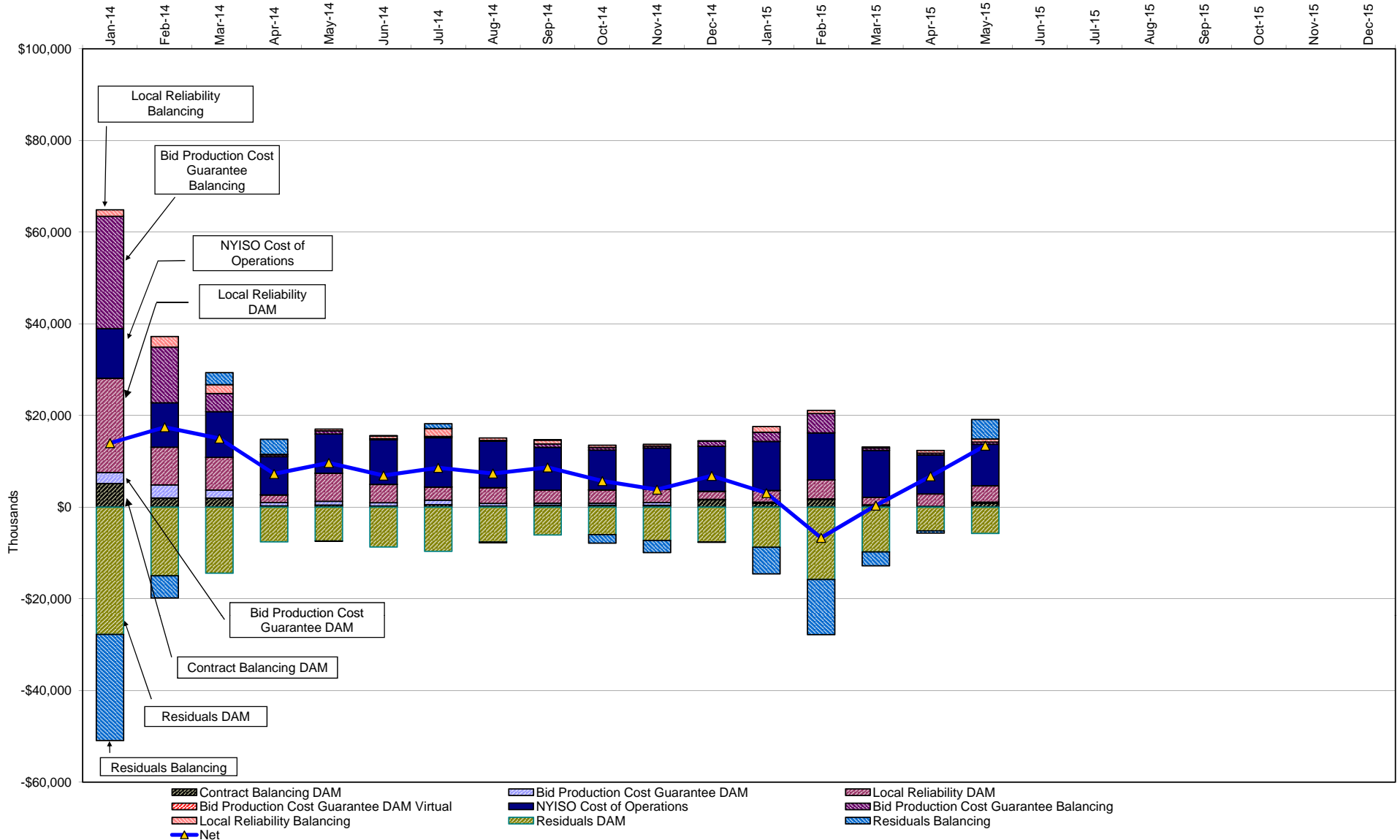
**NYISO Average Cost/MWh (Energy and Ancillary Services) \***  
**from the LBMP Customer point of view**

<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	59.60	114.35	52.09	28.35	32.98							
NTAC	0.32	0.35	0.42	0.64	0.56							
Reserve	0.27	0.37	0.56	0.36	0.38							
Regulation	0.10	0.18	0.11	0.12	0.10							
NYISO Cost of Operations	0.70	0.70	0.70	0.70	0.70							
Uplift	(0.50)	(1.17)	(0.68)	(0.14)	0.28							
Uplift: Local Reliability Share	0.25	0.33	0.13	0.27	0.32							
Uplift: Statewide Share	(0.75)	(1.49)	(0.81)	(0.41)	(0.04)							
Voltage Support and Black Start	0.39	0.39	0.39	0.39	0.39							
<b>Avg Monthly Cost</b>	<b>60.88</b>	<b>115.17</b>	<b>53.59</b>	<b>30.42</b>	<b>35.39</b>							
Avg YTD Cost	60.88	87.68	76.61	66.80	60.95							
TSA \$ per NYC MWh	0.00	0.00	0.00	0.00	0.17							
<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
<b>2013</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	79.77	85.76	48.94	44.47	52.21	50.17	68.49	40.81	44.24	39.85	43.30	66.41
NTAC	0.79	0.83	0.76	0.90	0.85	0.86	0.66	0.28	0.57	0.87	1.08	0.59
Reserve	0.38	0.44	0.43	0.36	0.49	0.34	0.50	0.32	0.38	0.42	0.38	0.44
Regulation	0.13	0.13	0.10	0.11	0.09	0.13	0.11	0.13	0.13	0.16	0.13	0.12
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	0.21	(0.15)	(0.33)	0.02	0.41	0.49	2.06	0.03	(0.05)	0.18	(0.07)	(0.25)
Uplift: Local Reliability Share	0.44	0.40	0.19	0.37	0.58	0.81	1.27	0.49	0.31	0.38	0.19	0.12
Uplift: Statewide Share	(0.23)	(0.55)	(0.52)	(0.35)	(0.17)	(0.31)	0.79	(0.46)	(0.36)	(0.19)	(0.25)	(0.37)
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>82.34</b>	<b>88.06</b>	<b>50.96</b>	<b>46.91</b>	<b>55.10</b>	<b>53.05</b>	<b>72.87</b>	<b>42.62</b>	<b>46.31</b>	<b>42.54</b>	<b>45.88</b>	<b>68.36</b>
Avg YTD Cost	82.34	85.08	74.02	67.80	65.46	63.36	65.10	62.27	60.74	59.30	58.24	59.13
TSA \$ per NYC MWh	0.00	0.00	0.00	0.04	0.58	0.61	1.52	0.43	0.22	0.01	0.00	0.00

\* Excludes ICAP payments.  
Market Mitigation and Analysis  
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Data reflects true-ups thru Dec 2014.

## NYISO Dollar Flows - Uplift- OATT Schedule 1 components - Data through May 31, 2015



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

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							
DAM LSE Internal LBMP Energy Sales	55%	54%	53%	55%	57%							
DAM External TC LBMP Energy Sales	5%	6%	6%	4%	2%							
DAM Bilateral - Internal Bilaterals	35%	33%	33%	33%	35%							
DAM Bilateral - Import/Non-LBMP Market Bilaterals	3%	5%	5%	6%	4%							
DAM Bilateral - Export/Non-LBMP Market Bilaterals	2%	2%	1%	2%	1%							
DAM Bilateral - Wheel Through Bilaterals	0%	1%	1%	1%	0%							
<b>Balancing Energy Market MWh</b>	-648,574	-287,795	-397,342	-410,311	-327,906							
Balancing Energy LSE Internal LBMP Energy Sales	-149%	-252%	-192%	-147%	-143%							
Balancing Energy External TC LBMP Energy Sales	30%	117%	64%	36%	36%							
Balancing Energy Bilateral - Internal Bilaterals	13%	14%	19%	5%	6%							
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	0%	0%	0%	0%							
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	6%	8%	12%	11%	10%							
Balancing Energy Bilateral - Wheel Through Bilaterals	0%	12%	-4%	-5%	-9%							
<b>Transactions Summary</b>												
LBMP	58%	59%	57%	57%	58%							
Internal Bilaterals	37%	34%	35%	35%	36%							
Import Bilaterals	3%	5%	5%	6%	4%							
Export Bilaterals	2%	2%	2%	2%	2%							
Wheels Through	0%	1%	1%	0%	0%							
<b>Market Share of Total Load</b>												
Day Ahead Market	104.2%	102.0%	102.7%	103.4%	102.5%							
Balancing Energy +	-4.2%	-2.0%	-2.7%	-3.4%	-2.5%							
Total MWh	15,312,732	14,679,576	14,661,865	12,179,010	12,964,011							
Average Daily Energy Sendout/Month GWh	462	481	436	387	409							

2014	January	February	March	April	May	June	July	August	September	October	November	December
<b>Day Ahead Market MWh</b>	16,034,264	14,409,515	14,633,570	12,101,747	12,984,458	14,719,929	16,528,338	15,536,610	14,312,509	13,684,158	13,945,509	14,992,656
DAM LSE Internal LBMP Energy Sales	52%	50%	53%	56%	53%	54%	58%	57%	56%	54%	54%	54%
DAM External TC LBMP Energy Sales	5%	7%	6%	3%	2%	3%	1%	0%	1%	2%	5%	5%
DAM Bilateral - Internal Bilaterals	36%	36%	35%	33%	38%	36%	34%	35%	36%	38%	36%	36%
DAM Bilateral - Import/Non-LBMP Market Bilaterals	5%	5%	5%	6%	5%	5%	4%	5%	4%	4%	3%	3%
DAM Bilateral - Export/Non-LBMP Market Bilaterals	2%	1%	1%	2%	2%	1%	1%	1%	1%	2%	2%	2%
DAM Bilateral - Wheel Through Bilaterals	1%	1%	1%	0%	1%	1%	1%	1%	1%	0%	0%	0%
<b>Balancing Energy Market MWh</b>	-249,484	-298,340	-116,173	54,298	-510,467	-558,413	-854,501	-764,108	-674,285	-999,342	-750,627	-705,848
Balancing Energy LSE Internal LBMP Energy Sales	-232%	-203%	-294%	-190%	-133%	-114%	-116%	-117%	-129%	-124%	-134%	-137%
Balancing Energy External TC LBMP Energy Sales	105%	76%	97%	207%	21%	22%	18%	15%	24%	14%	20%	28%
Balancing Energy Bilateral - Internal Bilaterals	20%	26%	69%	27%	3%	7%	4%	7%	7%	7%	9%	4%
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	0%	12%	0%	3%	0%	0%	0%	2%	1%	0%	0%
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	11%	6%	25%	67%	4%	3%	2%	2%	3%	3%	5%	3%
Balancing Energy Bilateral - Wheel Through Bilaterals	-4%	-6%	-10%	-12%	1%	-18%	-8%	-7%	-7%	-1%	0%	1%
<b>Transactions Summary</b>												
LBMP	56%	56%	57%	59%	53%	55%	57%	55%	55%	52%	55%	56%
Internal Bilaterals	37%	37%	36%	33%	39%	38%	36%	37%	38%	42%	39%	38%
Import Bilaterals	5%	5%	5%	6%	5%	5%	5%	5%	5%	4%	4%	3%
Export Bilaterals	2%	1%	2%	2%	2%	1%	1%	2%	2%	2%	2%	2%
Wheels Through	1%	1%	1%	0%	1%	1%	1%	1%	1%	0%	1%	0%
<b>Market Share of Total Load</b>												
Day Ahead Market	101.6%	102.1%	100.8%	99.6%	104.1%	103.9%	105.5%	105.2%	104.9%	107.9%	105.7%	104.9%
Balancing Energy +	-1.6%	-2.1%	-0.8%	0.4%	-4.1%	-3.9%	-5.5%	-5.2%	-4.9%	-7.9%	-5.7%	-4.9%
Total MWh	15,784,780	14,111,175	14,517,397	12,156,045	12,473,991	14,161,516	15,673,837	14,772,502	13,638,224	12,684,816	13,194,882	14,286,808
Average Daily Energy Sendout/Month GWh	475	460	440	390	391	456	496	470	442	394	413	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 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							
Standard Deviation	\$24.61	\$48.85	\$21.51	\$6.73	\$13.44							
Load Weighted Price **	\$55.40	\$104.52	\$48.01	\$26.84	\$31.08							
<b><u>RTC LBMP</u></b>												
Price *	\$46.98	\$95.06	\$43.43	\$25.11	\$32.85							
Standard Deviation	\$22.84	\$47.55	\$29.42	\$12.31	\$35.40							
Load Weighted Price **	\$48.59	\$97.62	\$45.10	\$26.00	\$35.08							
<b><u>REAL TIME LBMP</u></b>												
Price *	\$48.51	\$98.83	\$44.38	\$25.46	\$30.39							
Standard Deviation	\$25.99	\$52.53	\$29.07	\$12.66	\$31.69							
Load Weighted Price **	\$50.18	\$101.34	\$46.10	\$26.28	\$32.52							
Average Daily Energy Sendout/Month GWh	462	481	436	387	409							

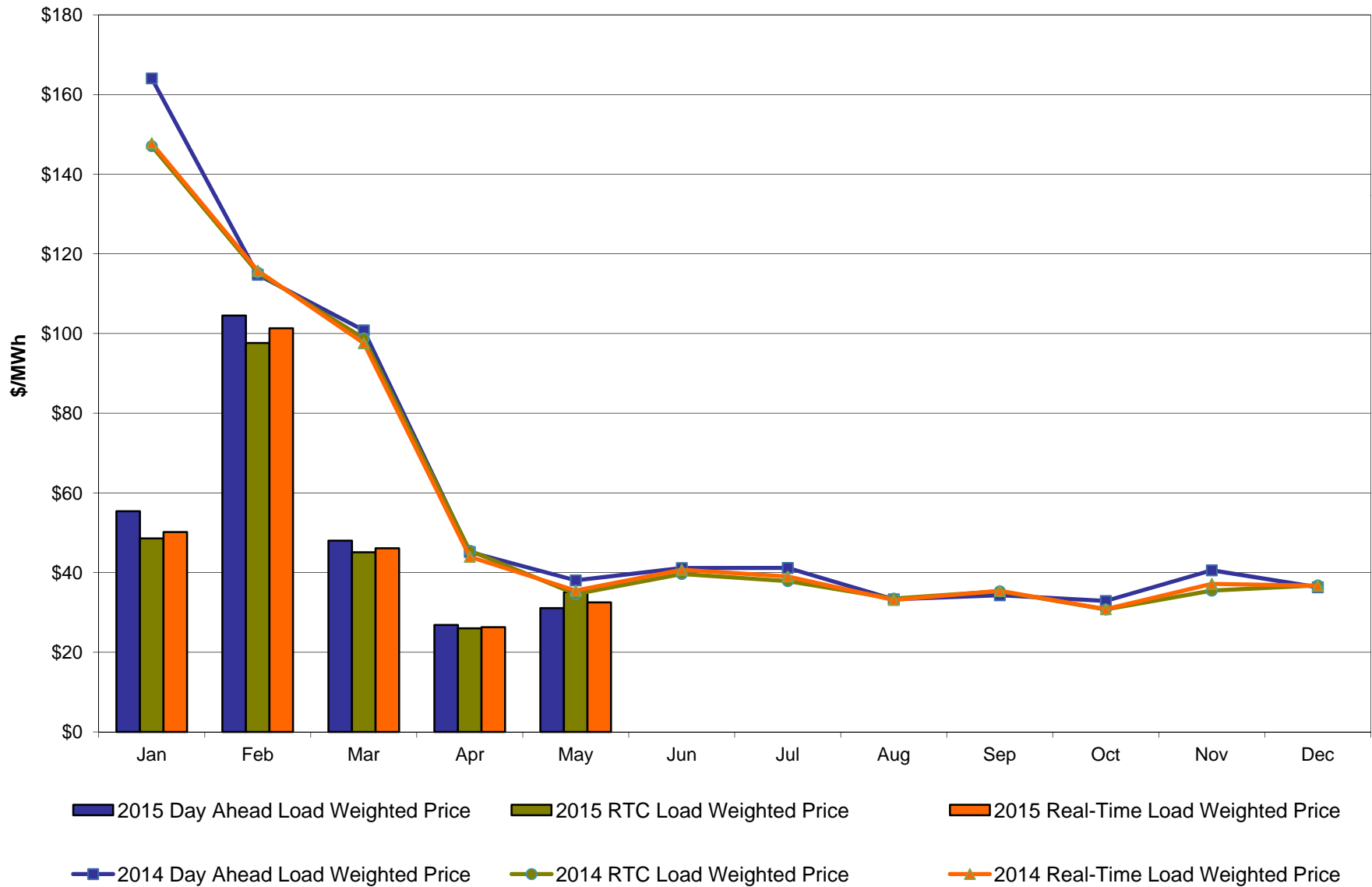
### NYISO Markets 2014 Energy Statistics

	<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 *	\$155.11	\$110.69	\$97.07	\$44.16	\$36.61	\$39.17	\$38.82	\$31.78	\$32.49	\$31.65	\$39.19	\$35.12
Standard Deviation	\$121.52	\$50.86	\$59.89	\$8.90	\$10.99	\$12.29	\$15.56	\$9.90	\$11.59	\$9.77	\$13.38	\$11.21
Load Weighted Price **	\$164.06	\$114.77	\$100.81	\$45.19	\$38.05	\$41.14	\$41.18	\$33.28	\$34.31	\$32.89	\$40.57	\$36.33
<b><u>RTC LBMP</u></b>												
Price *	\$138.41	\$110.71	\$94.71	\$44.00	\$33.16	\$37.34	\$35.32	\$31.74	\$32.89	\$29.23	\$34.27	\$34.99
Standard Deviation	\$125.42	\$72.22	\$97.72	\$27.44	\$17.51	\$25.39	\$24.90	\$23.34	\$33.68	\$20.45	\$14.23	\$35.81
Load Weighted Price **	\$147.06	\$115.31	\$98.80	\$45.48	\$34.63	\$39.64	\$37.85	\$33.48	\$35.31	\$30.74	\$35.46	\$36.79
<b><u>REAL TIME LBMP</u></b>												
Price *	\$137.90	\$111.51	\$93.37	\$42.79	\$34.06	\$38.23	\$35.97	\$31.21	\$32.50	\$29.36	\$36.01	\$34.80
Standard Deviation	\$122.32	\$70.35	\$89.05	\$19.38	\$17.15	\$23.33	\$27.27	\$18.18	\$33.51	\$21.14	\$17.99	\$42.67
Load Weighted Price **	\$147.77	\$115.80	\$97.58	\$43.97	\$35.46	\$40.71	\$39.00	\$33.13	\$35.42	\$30.81	\$37.17	\$36.69
Average Daily Energy Sendout/Month GWh	475	460	440	390	391	456	496	470	442	394	413	433

\* Average zonal load weighted prices.

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

### NYISO Monthly Average Internal LBMPs 2014- 2015



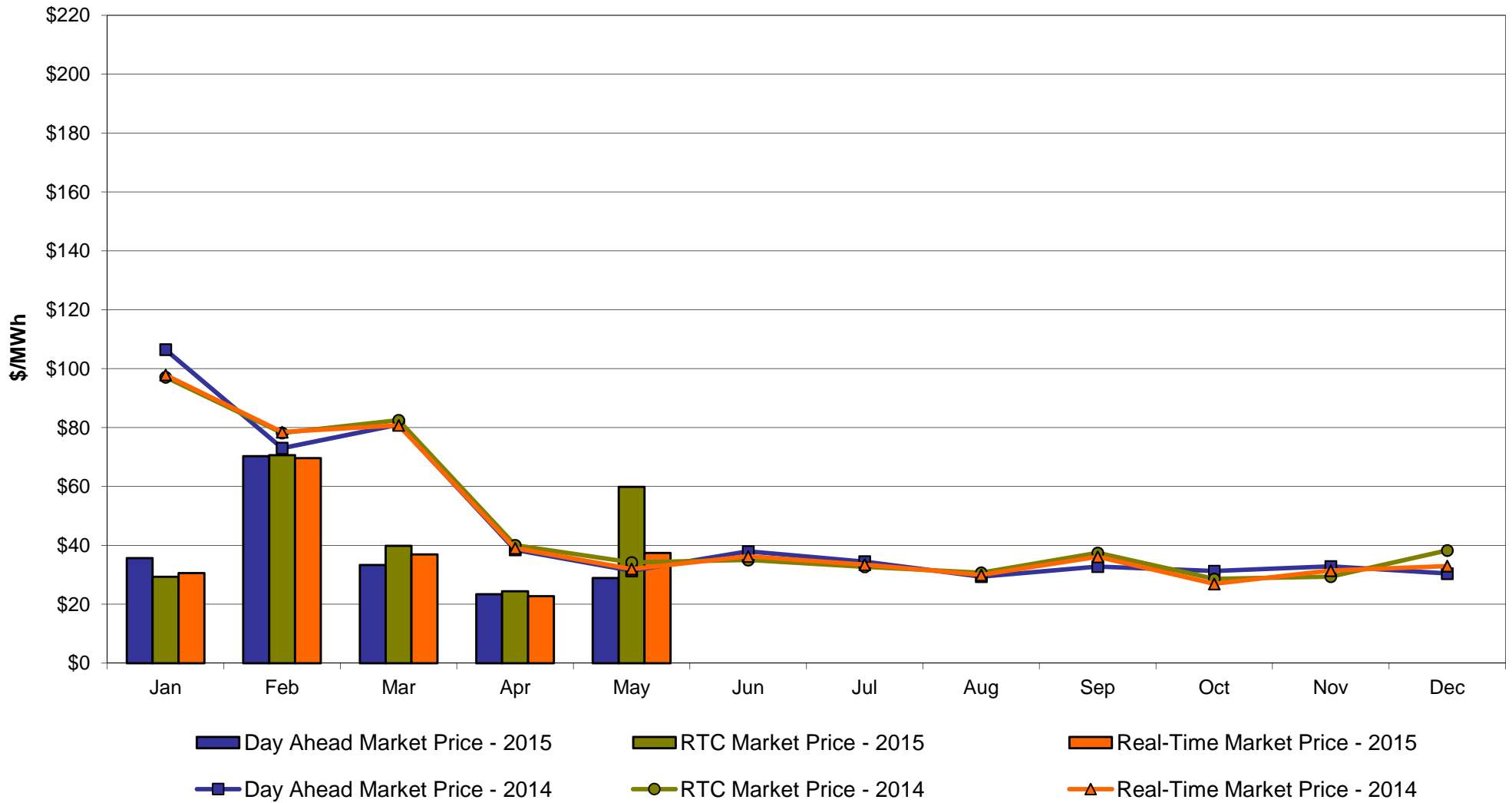


**May 2015 Zonal LBMP Statistics for NYISO (\$/MWh)**

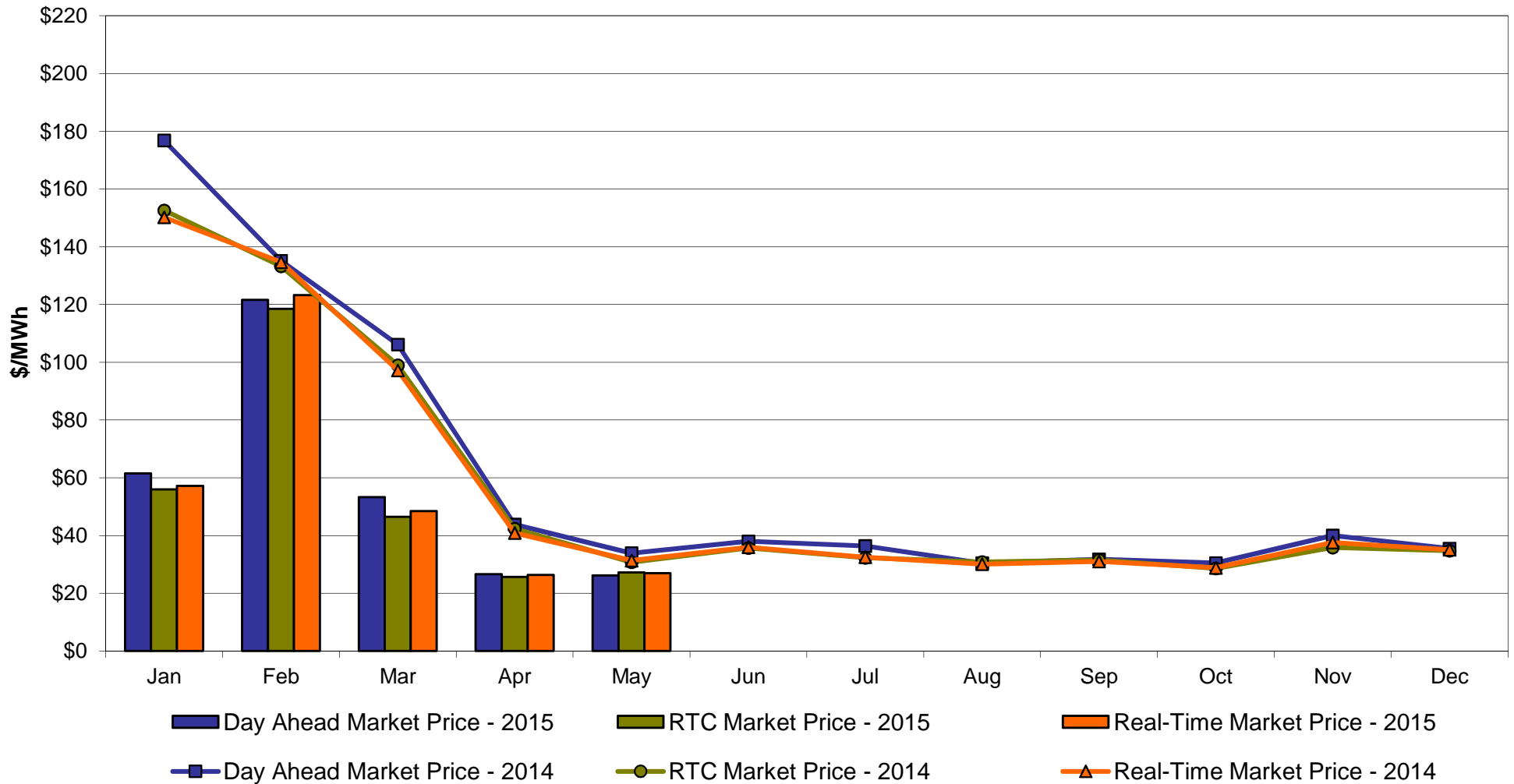
	<u>WEST</u> <u>Zone A</u>	<u>GENESEE</u> <u>Zone B</u>	<u>NORTH</u> <u>Zone D</u>	<u>CENTRAL</u> <u>Zone C</u>	<u>MOHAWK</u> <u>VALLEY</u> <u>Zone E</u>	<u>CAPITAL</u> <u>Zone F</u>	<u>HUDSON</u> <u>VALLEY</u> <u>Zone G</u>	<u>MILLWOOD</u> <u>Zone H</u>	<u>DUNWOODIE</u> <u>Zone I</u>	<u>NEW YORK</u> <u>CITY</u> <u>Zone J</u>	<u>LONG</u> <u>ISLAND</u> <u>Zone K</u>
<b>DAY AHEAD LBMP</b>											
Unweighted Price *	28.91	24.19	20.42	25.66	25.35	26.23	29.47	29.94	29.99	30.35	35.24
Standard Deviation	15.98	10.45	7.56	11.39	10.64	10.89	13.94	14.62	14.68	14.63	17.93
<b>RTC LBMP</b>											
Unweighted Price *	59.82	25.43	21.33	29.61	26.48	27.24	28.99	29.18	29.27	30.00	35.22
Standard Deviation	116.60	26.39	24.78	32.67	26.88	26.77	29.14	29.46	29.53	29.66	46.17
<b>REAL TIME LBMP</b>											
Unweighted Price *	37.45	24.83	21.10	27.48	26.11	26.99	28.76	28.96	29.06	29.98	36.70
Standard Deviation	69.15	24.92	20.62	30.41	25.57	25.95	28.54	28.99	29.10	29.43	47.38
	<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 *	21.82	23.58	23.53	28.41	27.38	34.83	30.15	34.80	29.56	30.33	19.80
Standard Deviation	8.29	9.24	9.14	13.48	11.57	17.89	9.85	17.81	12.61	14.71	7.81
<b>RTC LBMP</b>											
Unweighted Price *	16.71	23.25	23.25	36.21	27.06	33.49	32.87	33.57	28.88	29.34	20.52
Standard Deviation	26.01	25.11	25.11	59.03	27.10	44.56	44.16	44.68	28.41	28.97	27.04
<b>REAL TIME LBMP</b>											
Unweighted Price *	21.70	22.84	22.84	31.90	26.54	35.84	30.80	35.28	28.91	29.28	20.96
Standard Deviation	19.69	21.57	21.57	53.57	24.73	47.05	51.42	45.82	25.75	26.42	20.12

\* Straight LBMP averages

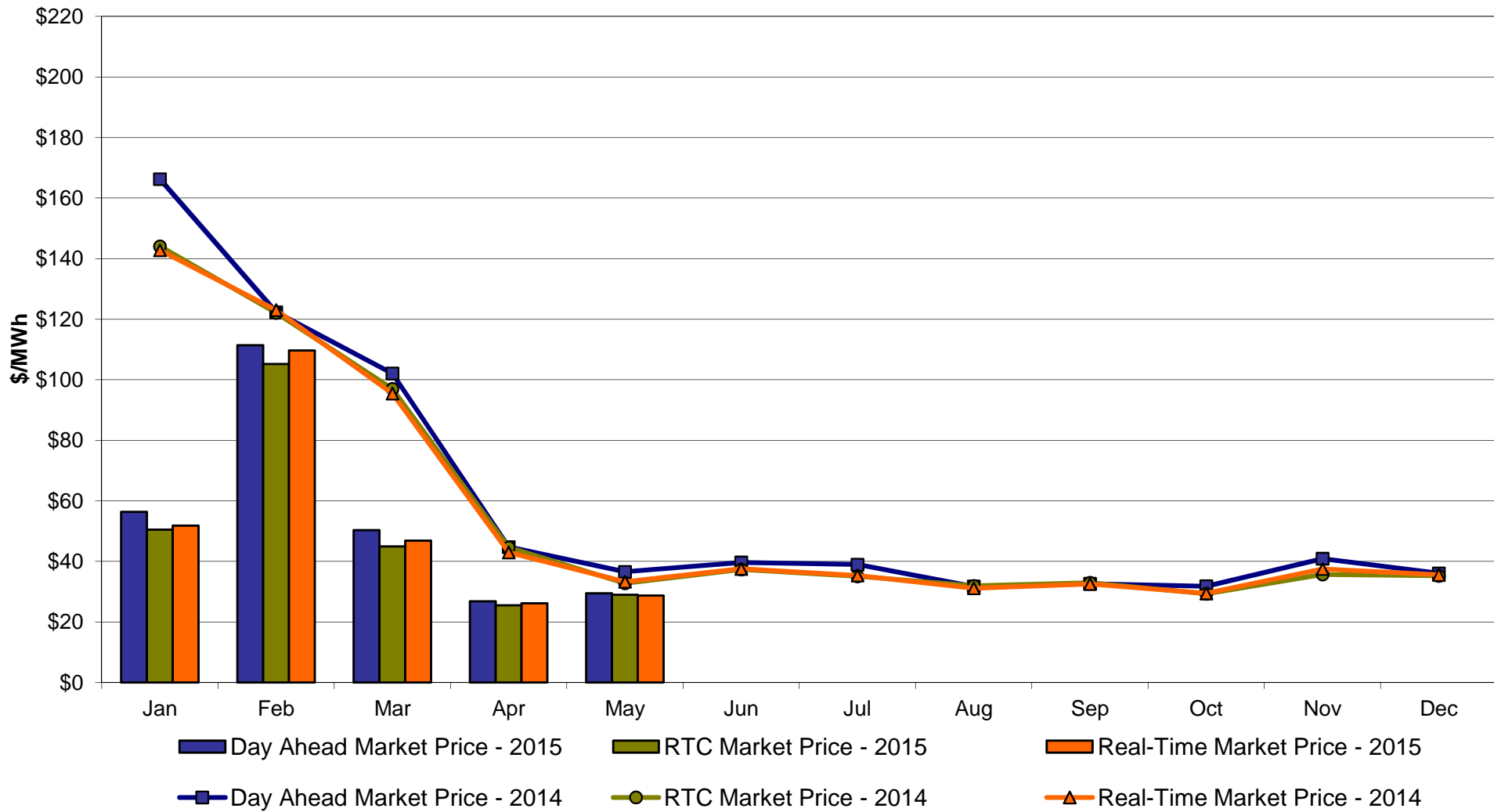
## West Zone A Monthly Average LBMP Prices 2014 - 2015



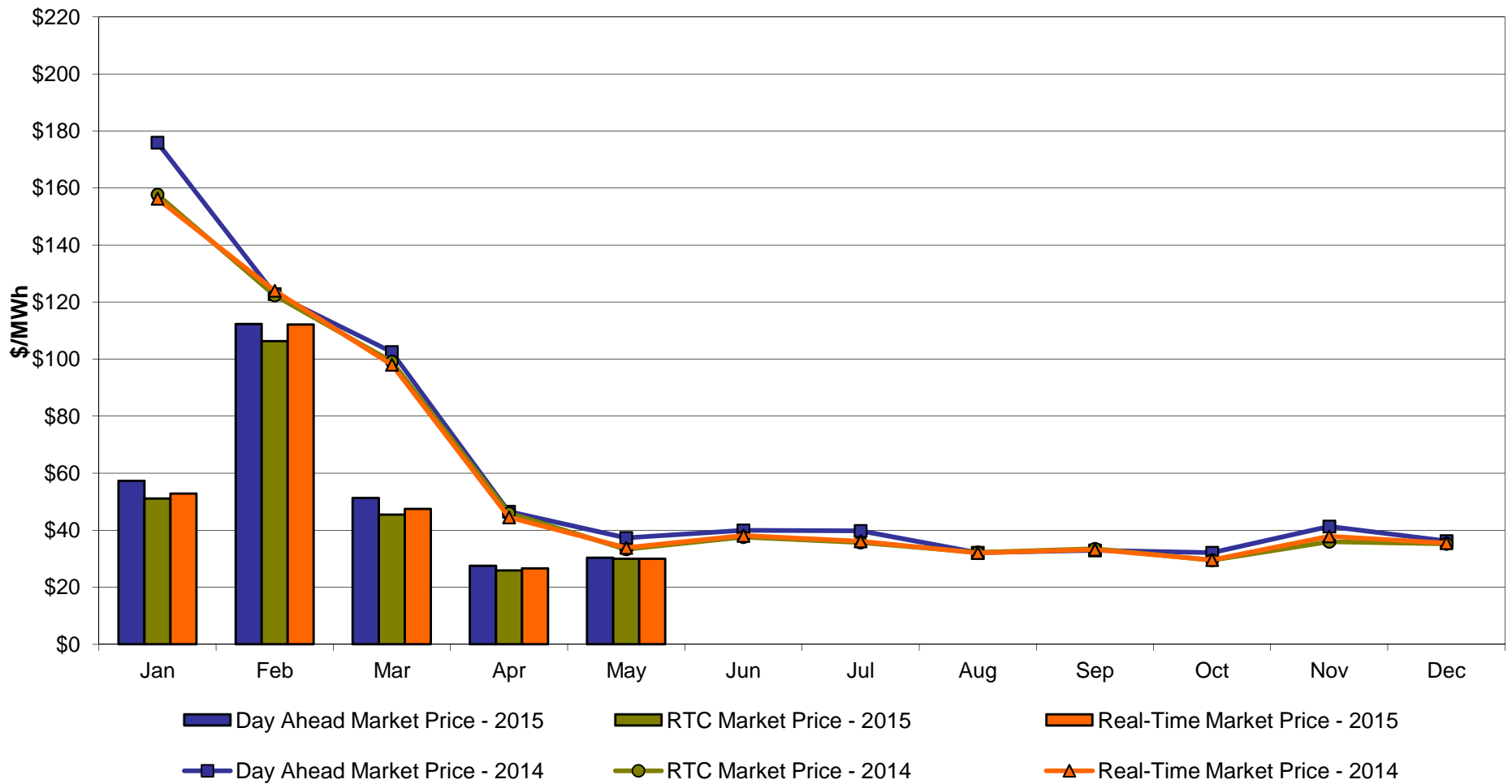
## Capital Zone F Monthly Average LBMP Prices 2014 - 2015



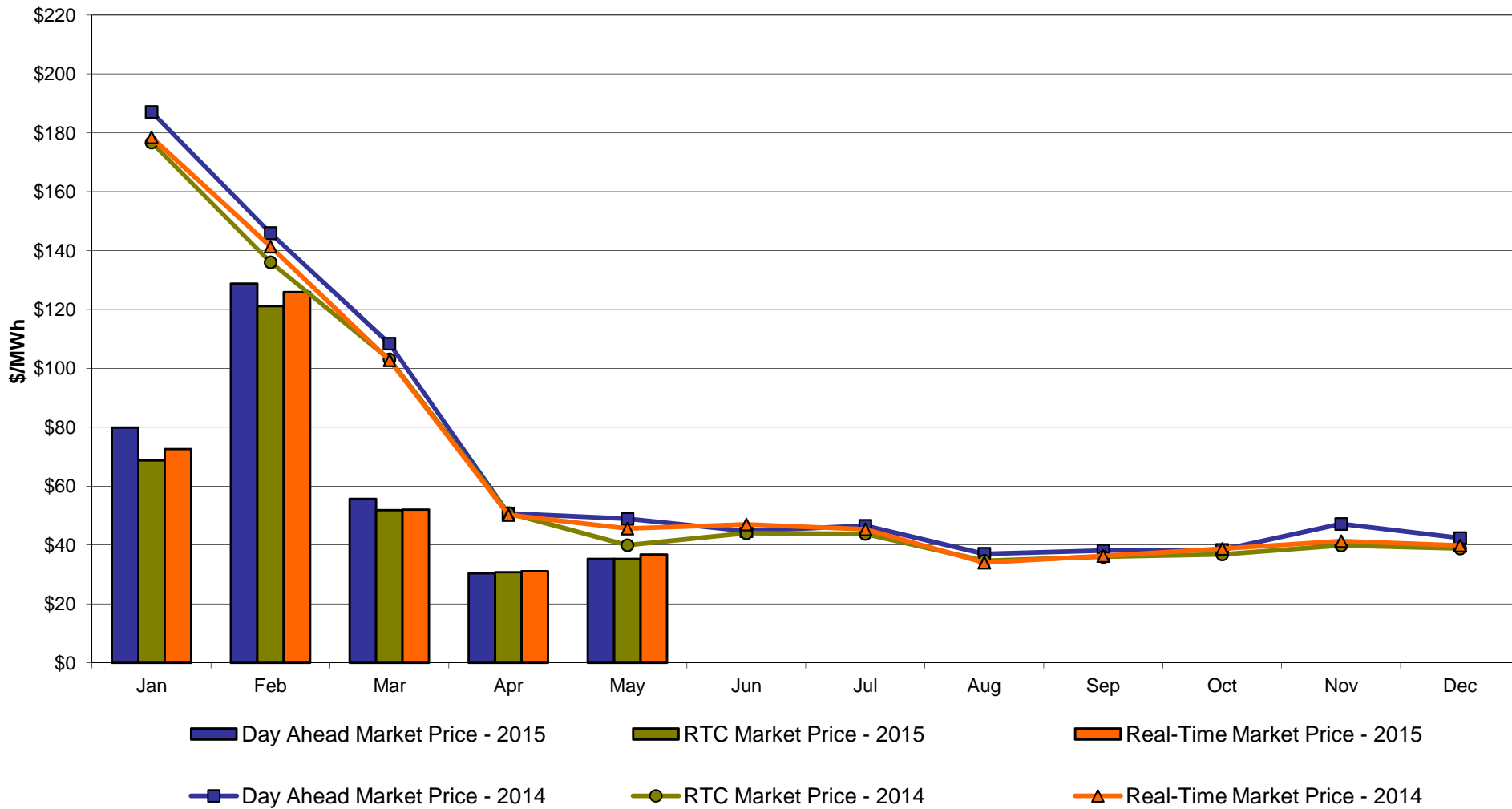
## Hudson Valley Zone G Monthly Average LBMP Prices 2014 - 2015



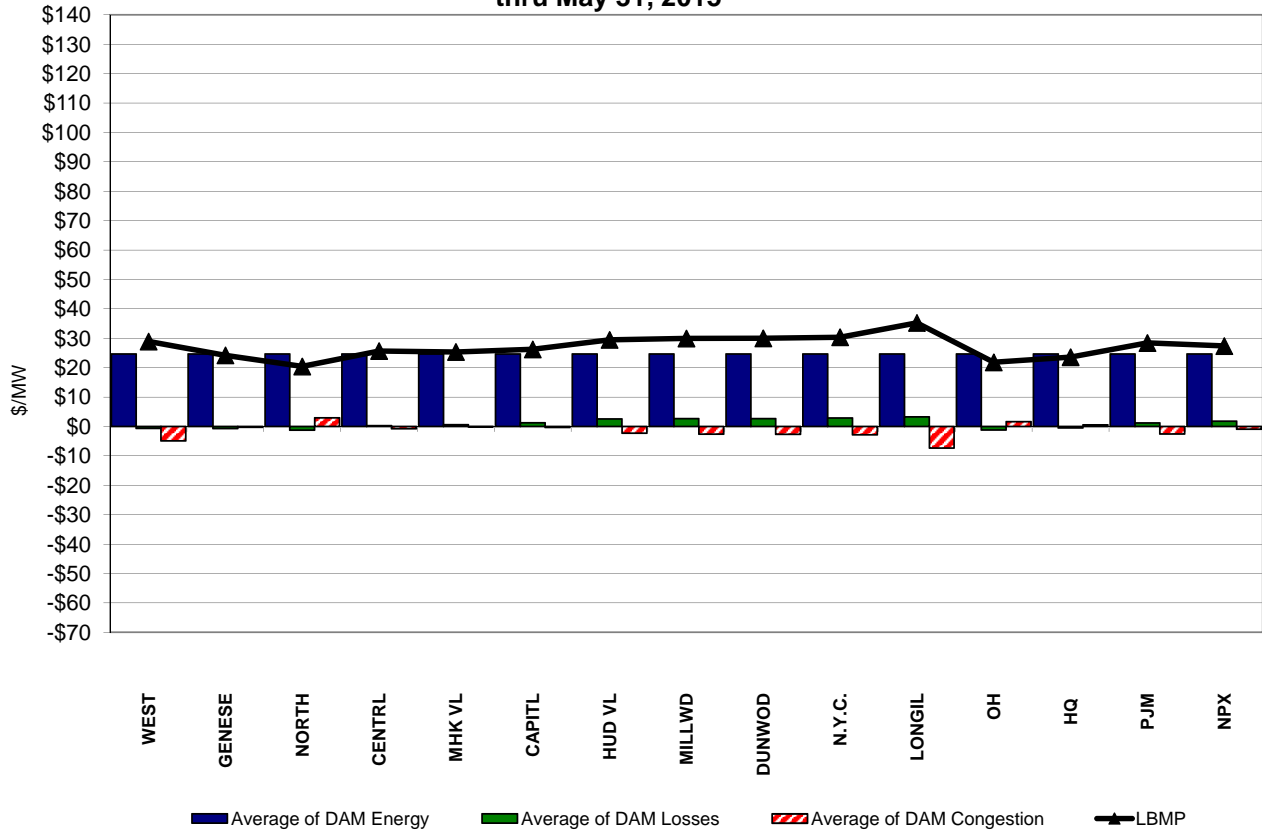
## NYC Zone J Monthly Average LBMP Prices 2014 - 2015



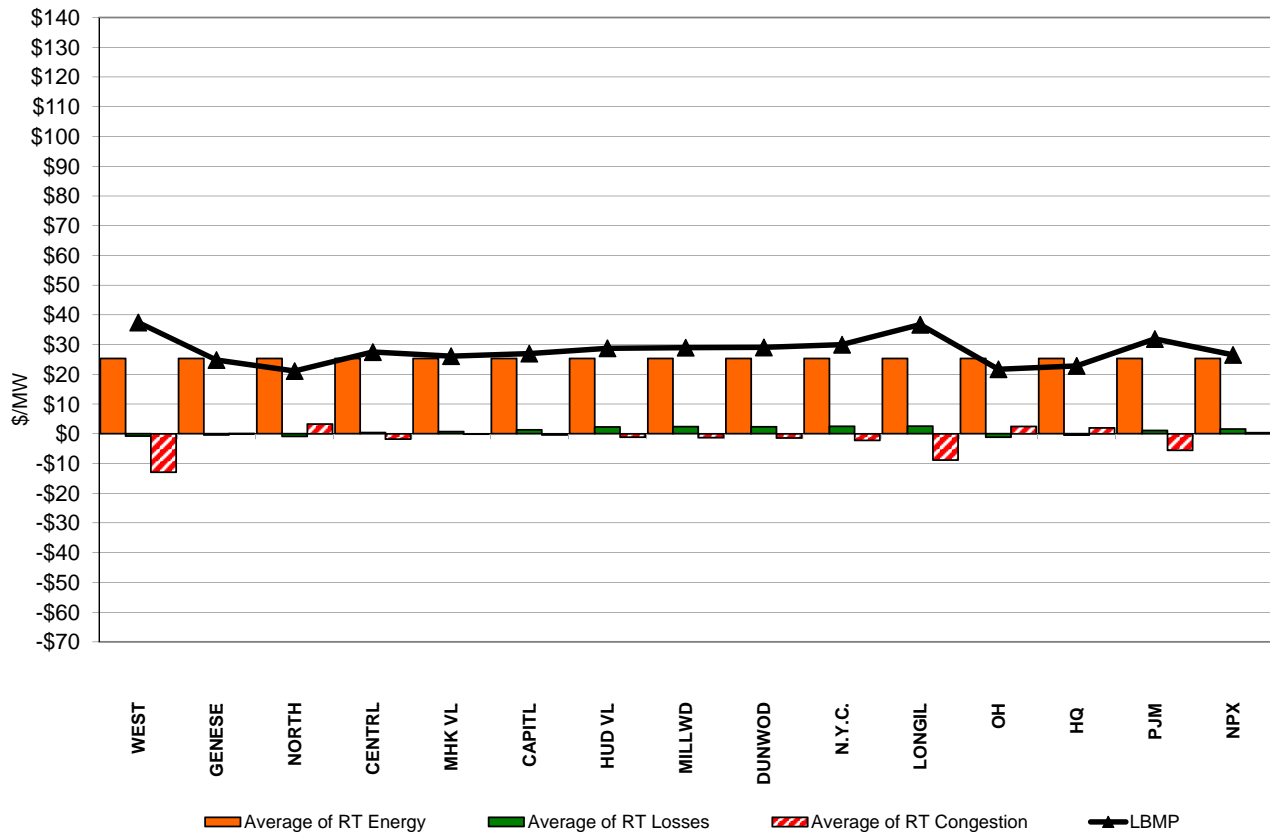
## Long Island Zone K Monthly Average LBMP Prices 2014 - 2015



### DAM Zonal Unweighted Monthly Average LBMP Components thru May 31, 2015

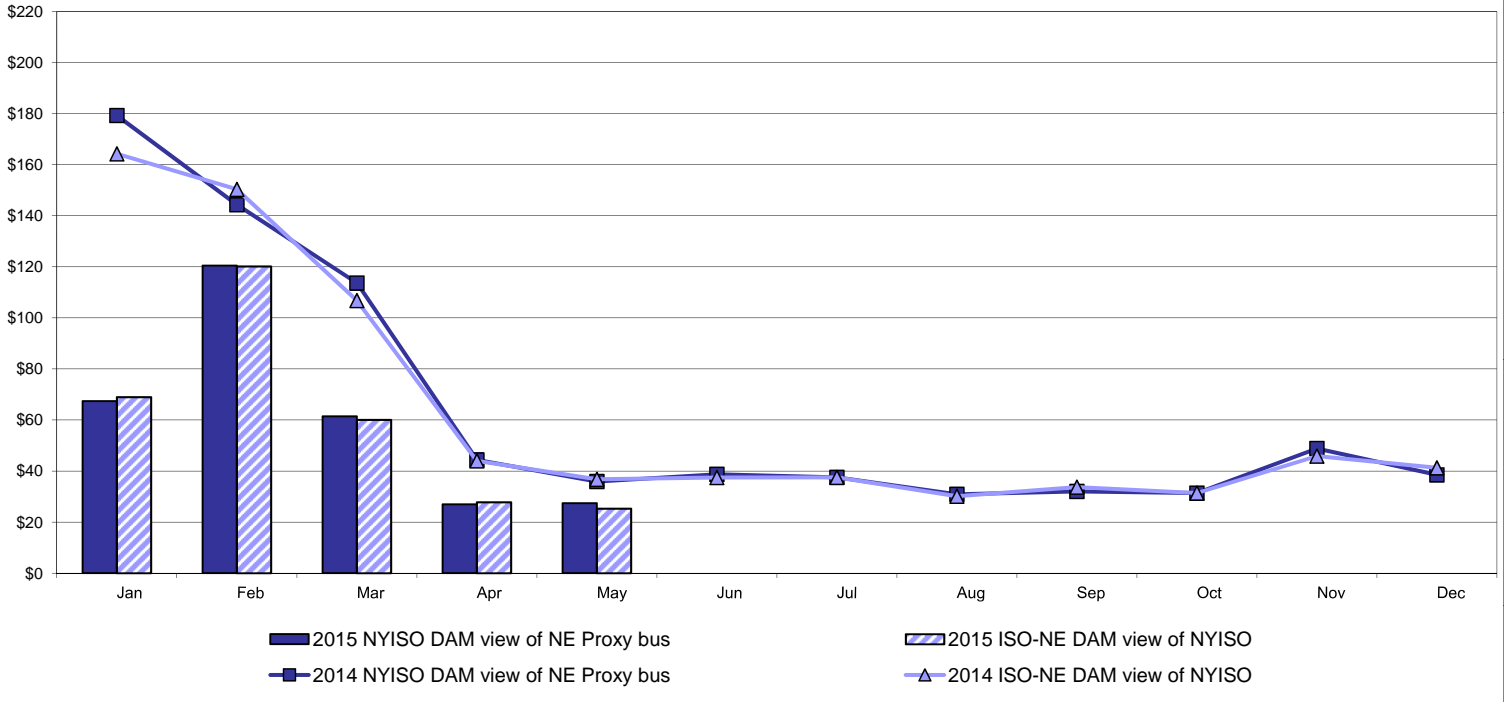


### RT Zonal Unweighted Monthly Average LBMP Components thru May 31, 2015

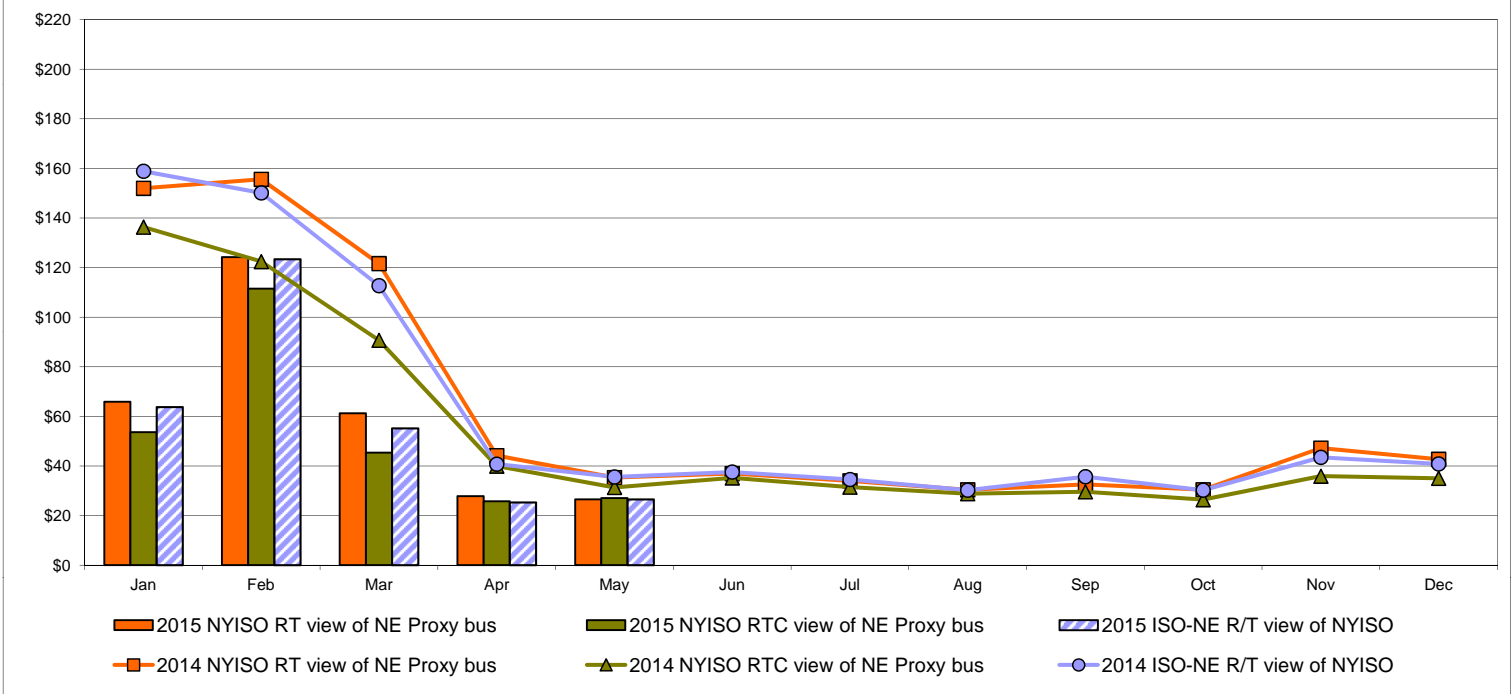


# External Comparison ISO-New England

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



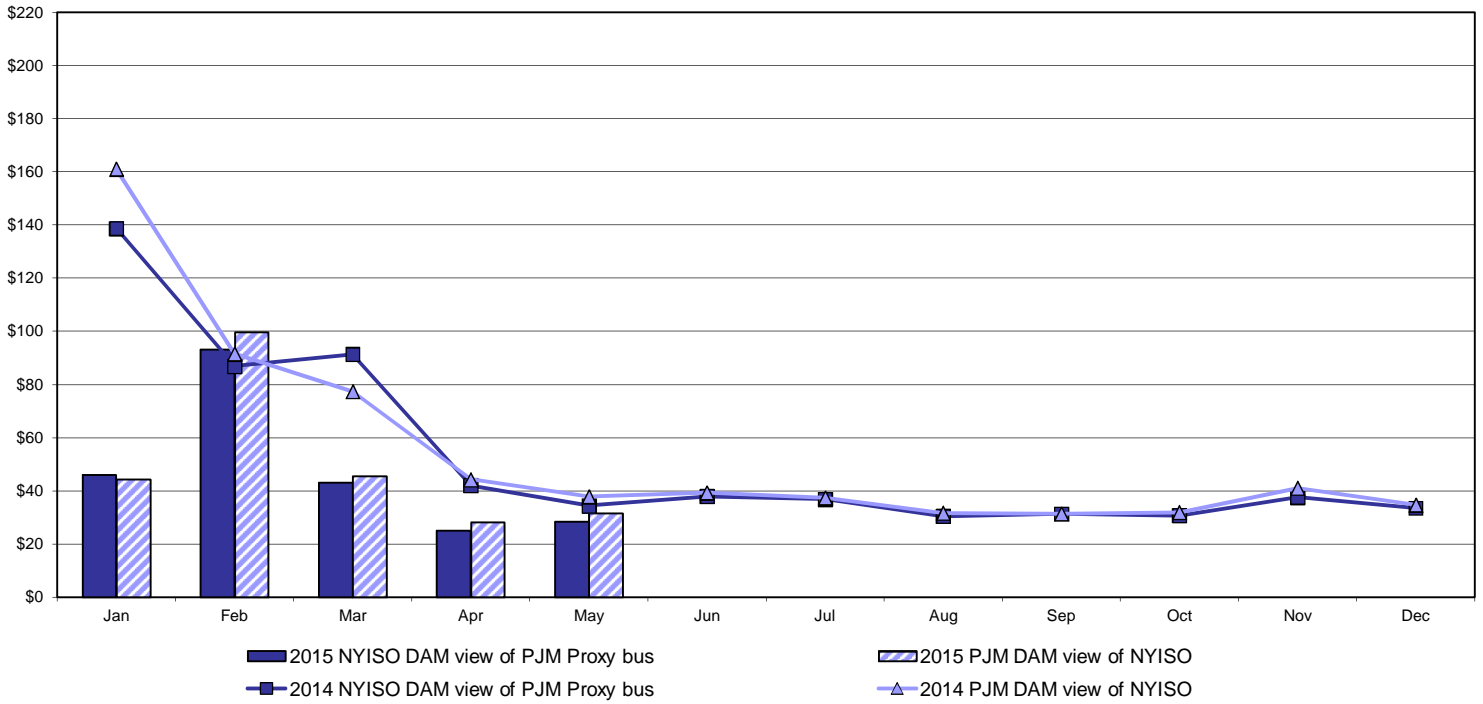
## Real Time Market External Zone Comparison: ISO-NE (\$/MWh)



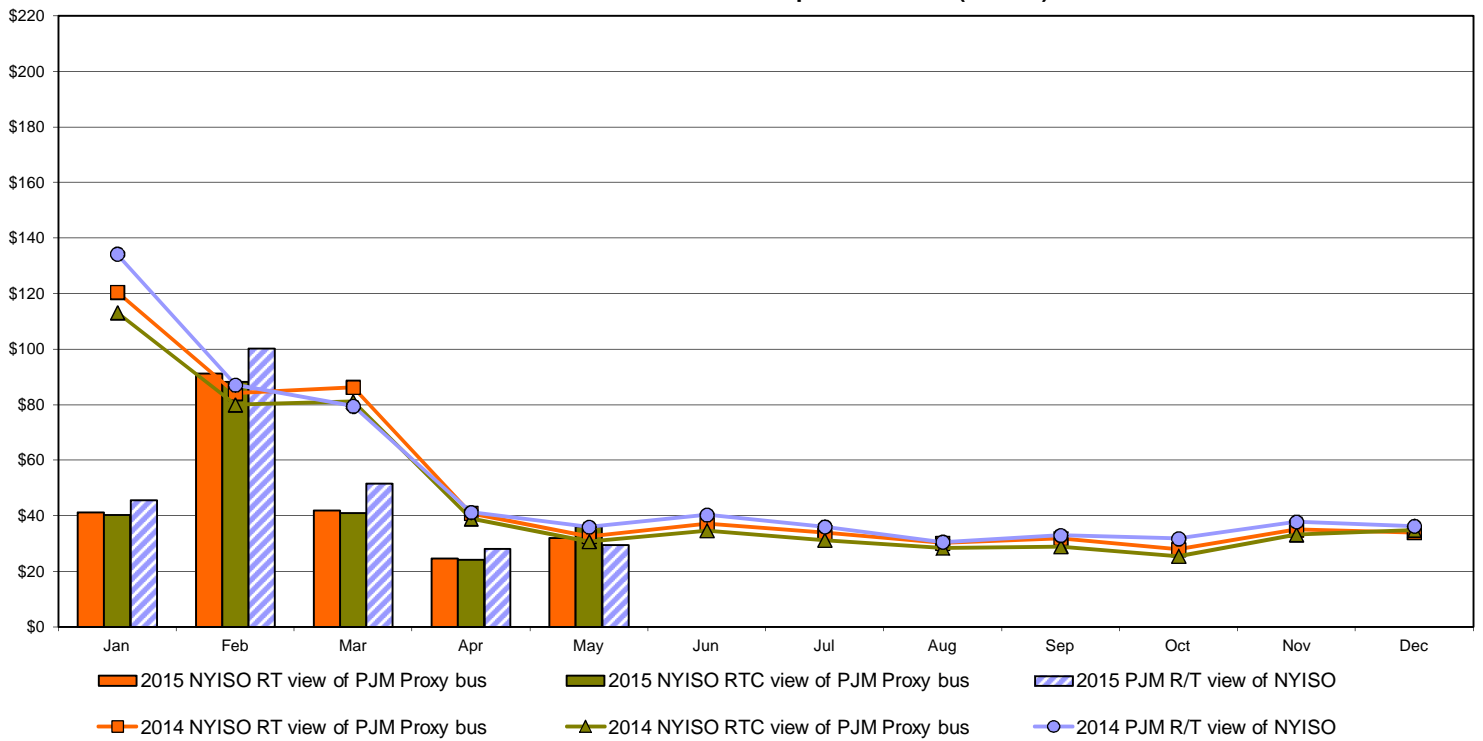


# External Comparison PJM

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

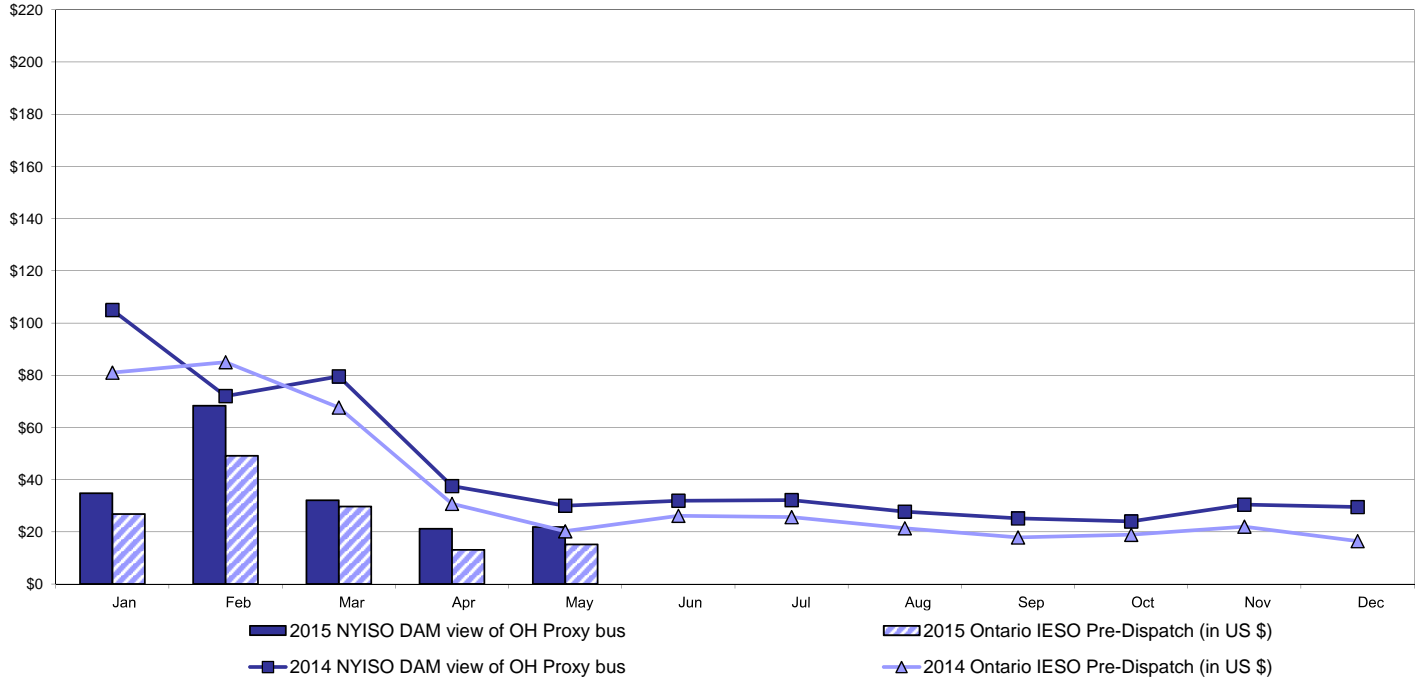


## Real Time Market External Zone Comparison - PJM (\$/MWh)

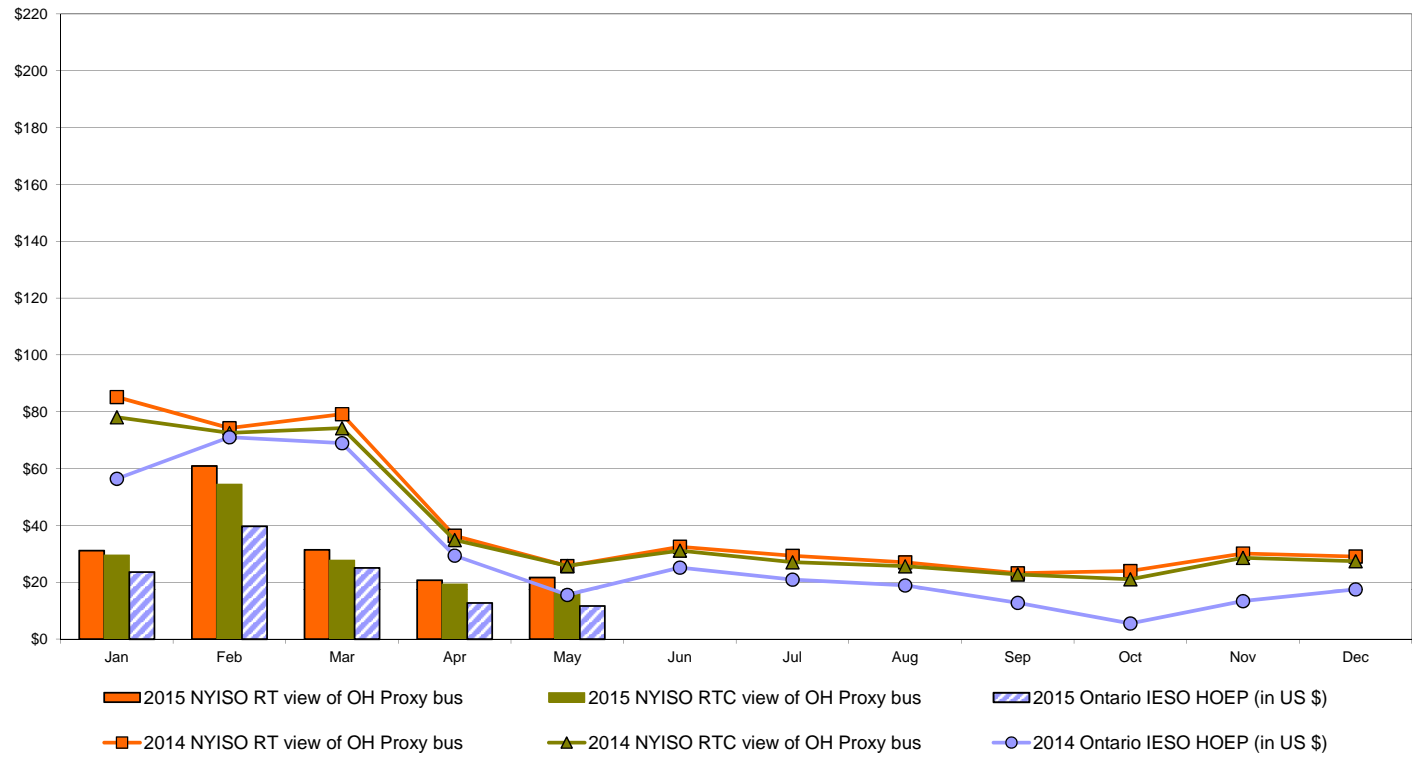


# External Comparison Ontario IESO

**Day Ahead Market External Zone Comparison - Ontario IESO (\$/MWh)**

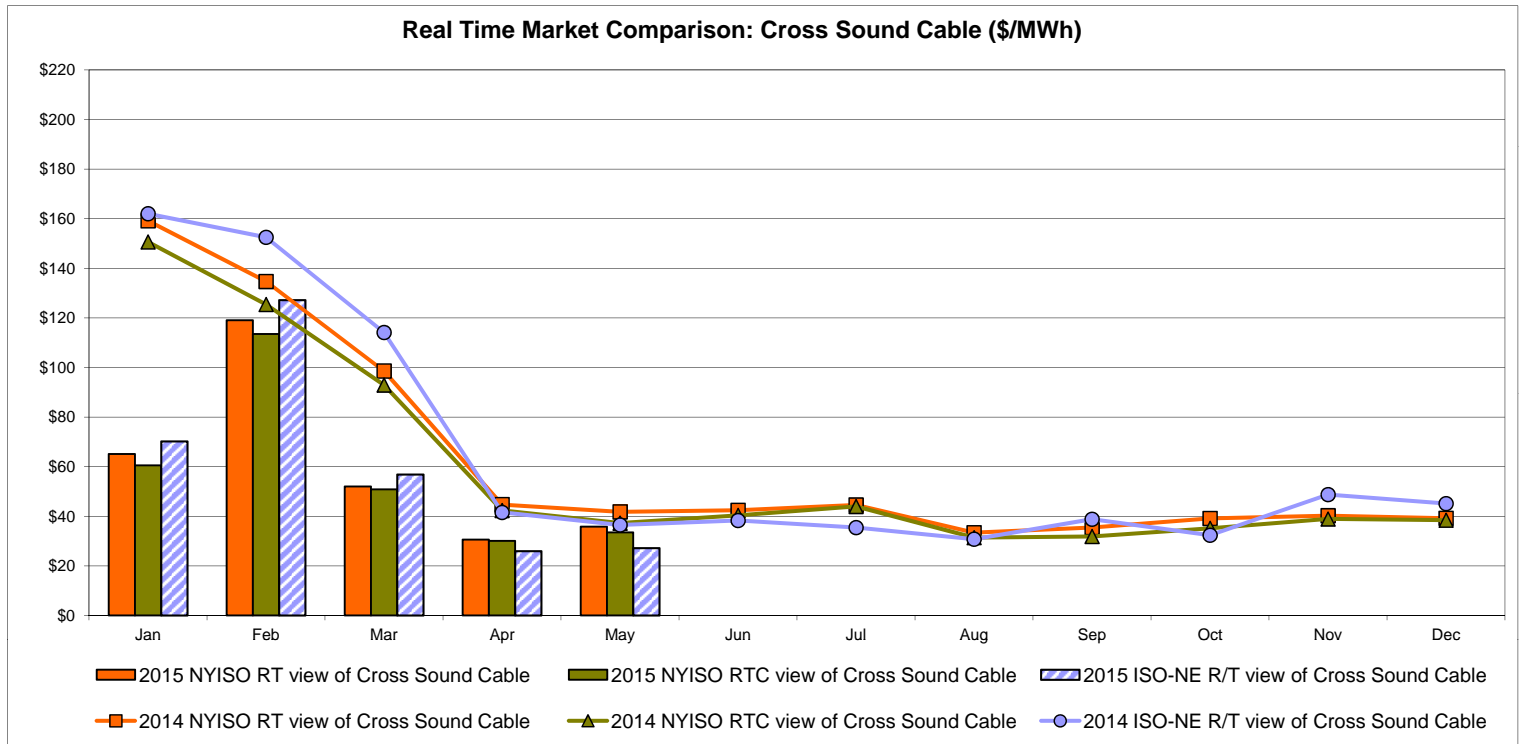
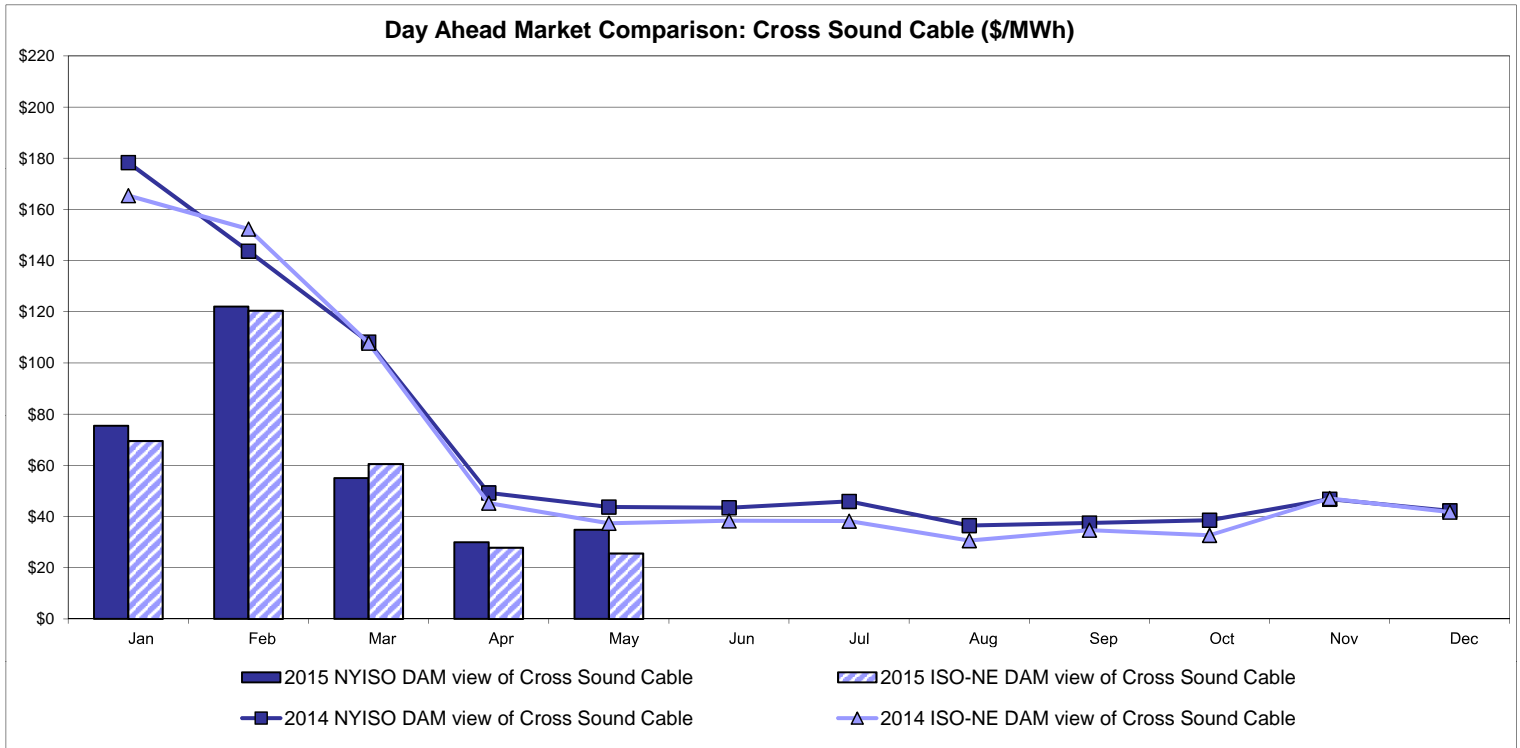


**Real Time Market External Zone Comparison - Ontario IESO (\$/MWh)**



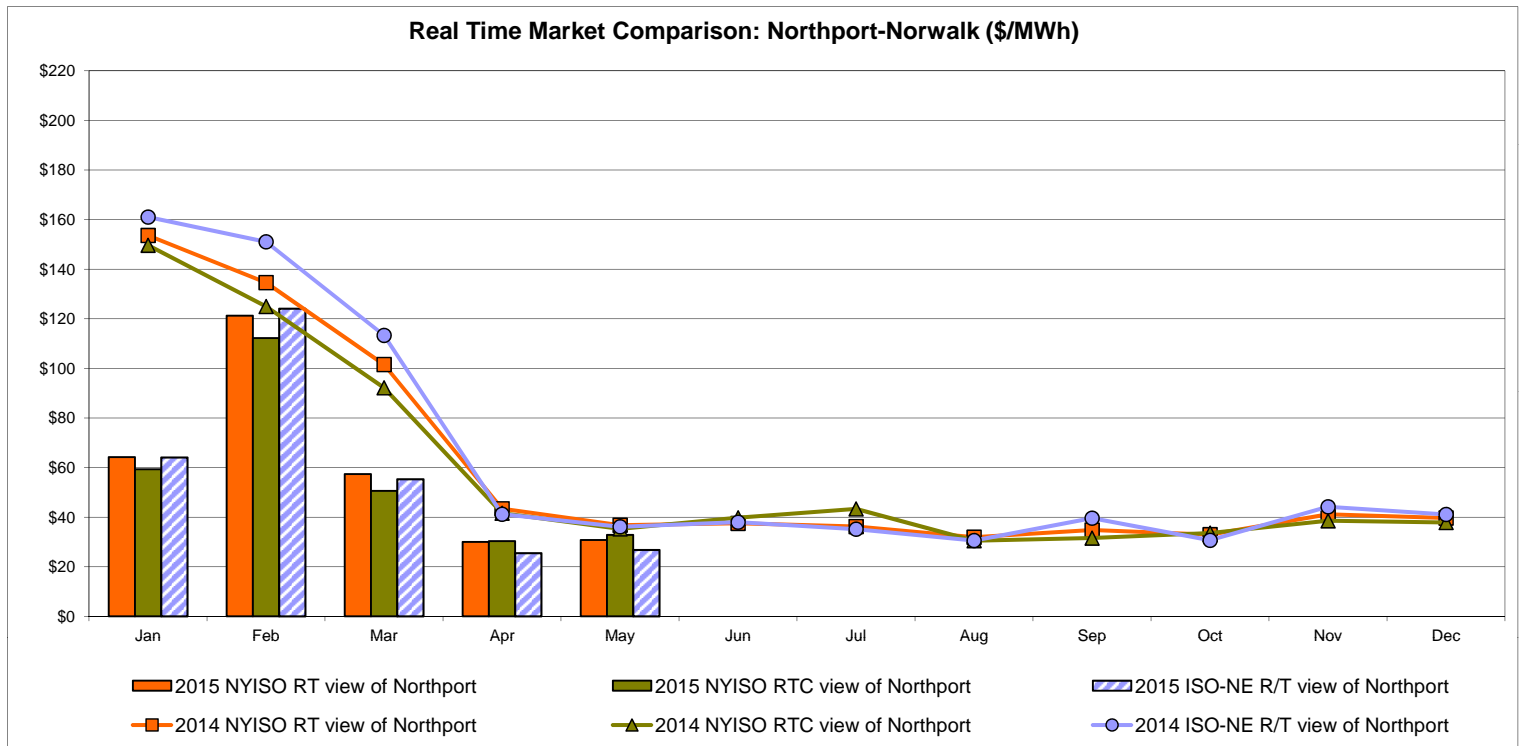
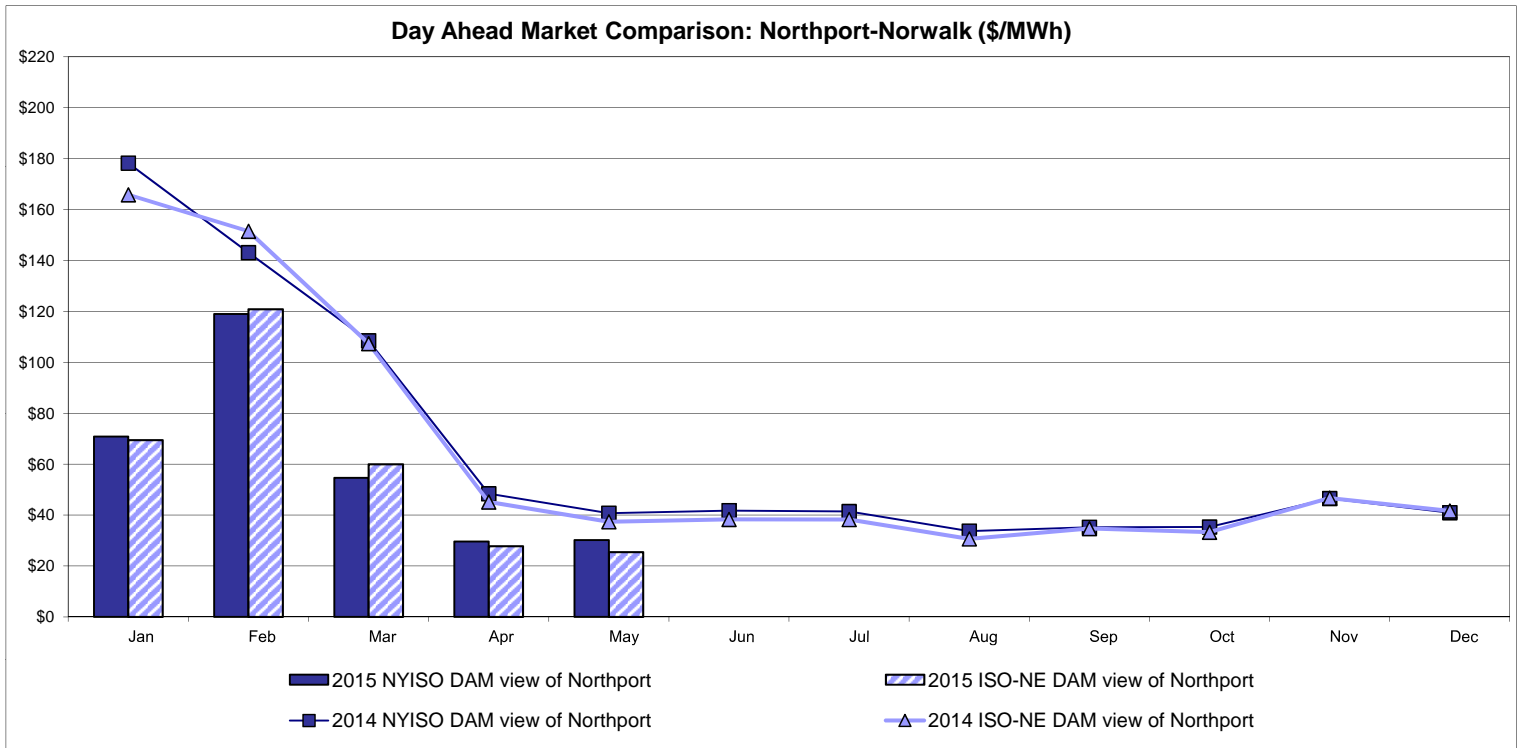
Notes: Exchange factor used for May 2015 was 0.821288 to US  
 HOEP: Hourly Ontario Energy Price  
 Pre-Dispatch: Projected Energy Price

# 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.

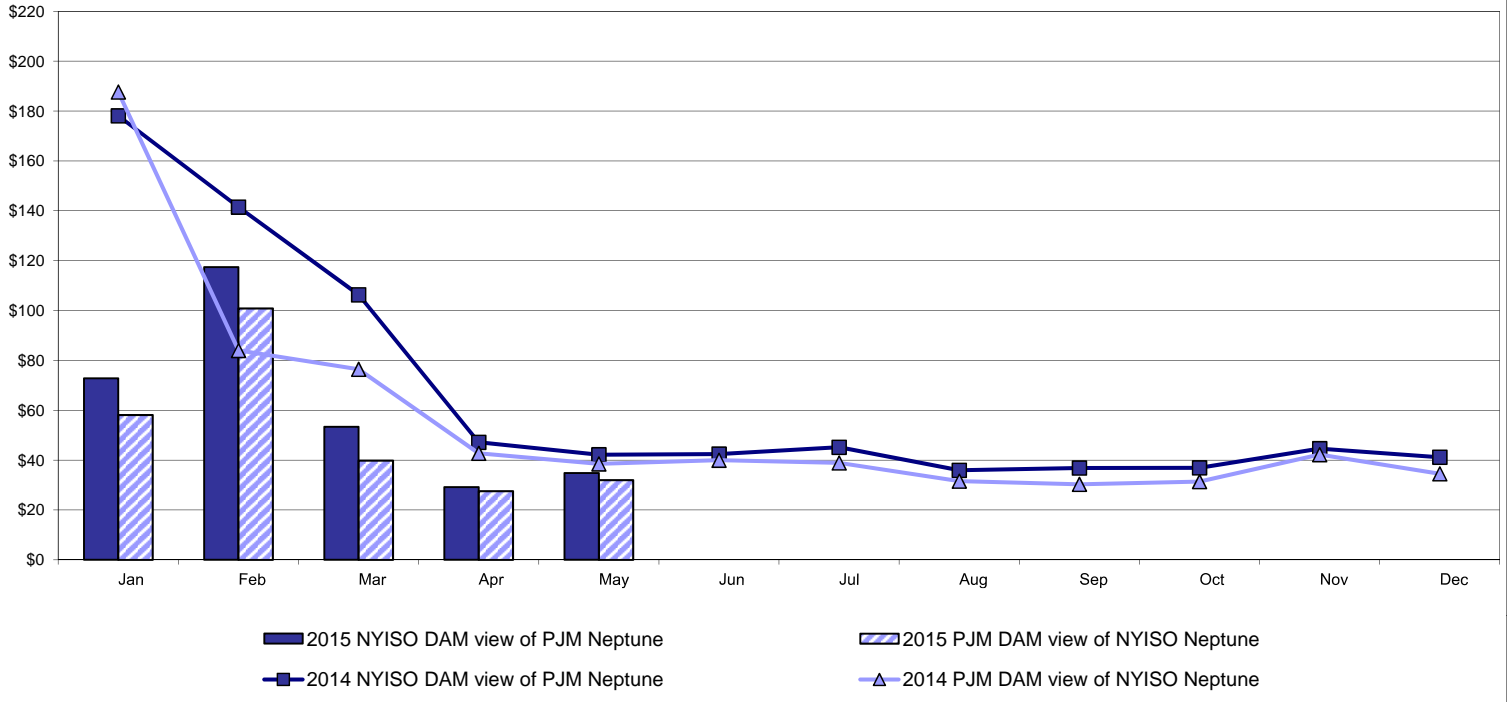
# External Controllable Line: Northport - Norwalk (New England)



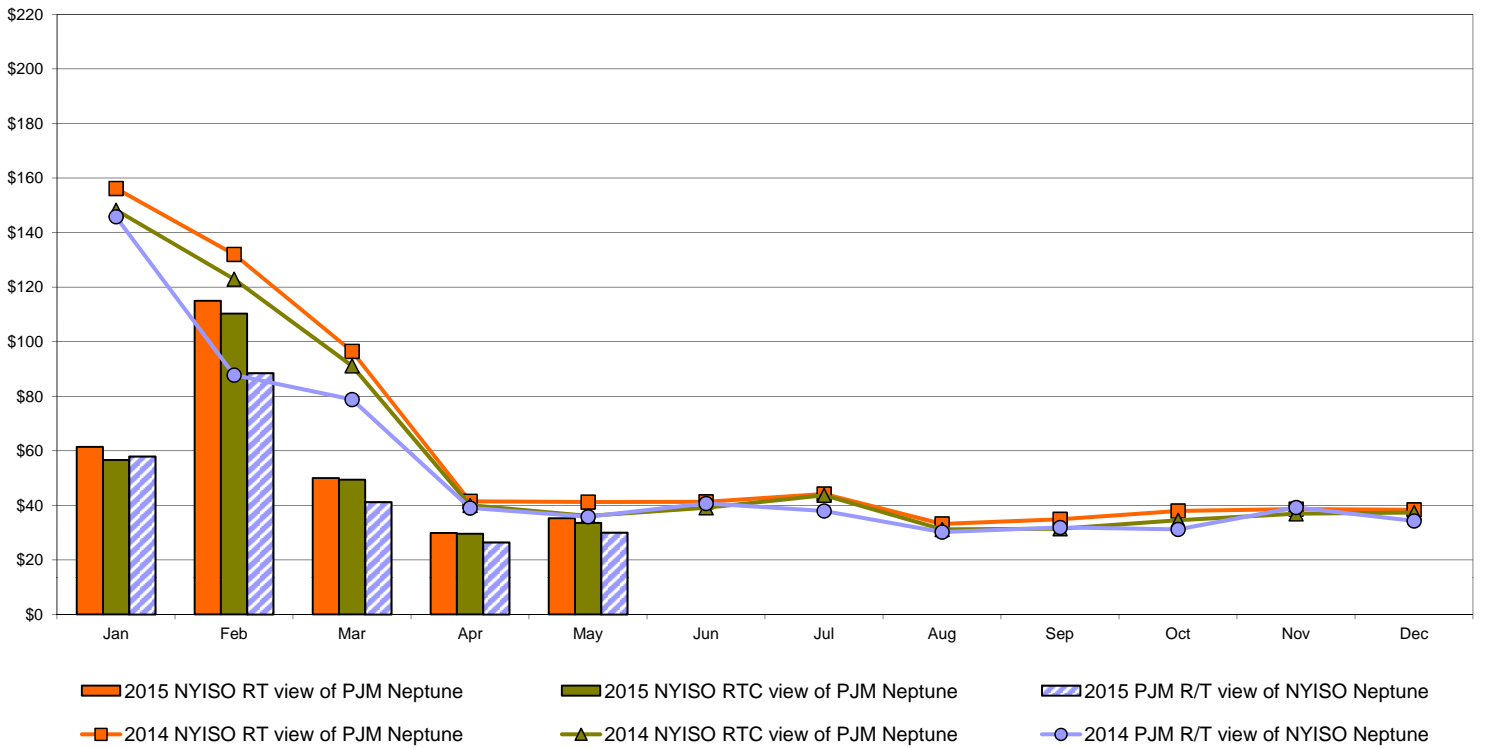
Note:  
 ISO-NE Forecast is an advisory posting @ 18:00 day before.  
 The DAM and R/T prices at the Northport 138 interface are used for ISO-NE.  
 The DAM and R/T prices at the 1385 interface are used for NYISO.

## External Controllable Line: Neptune (PJM)

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

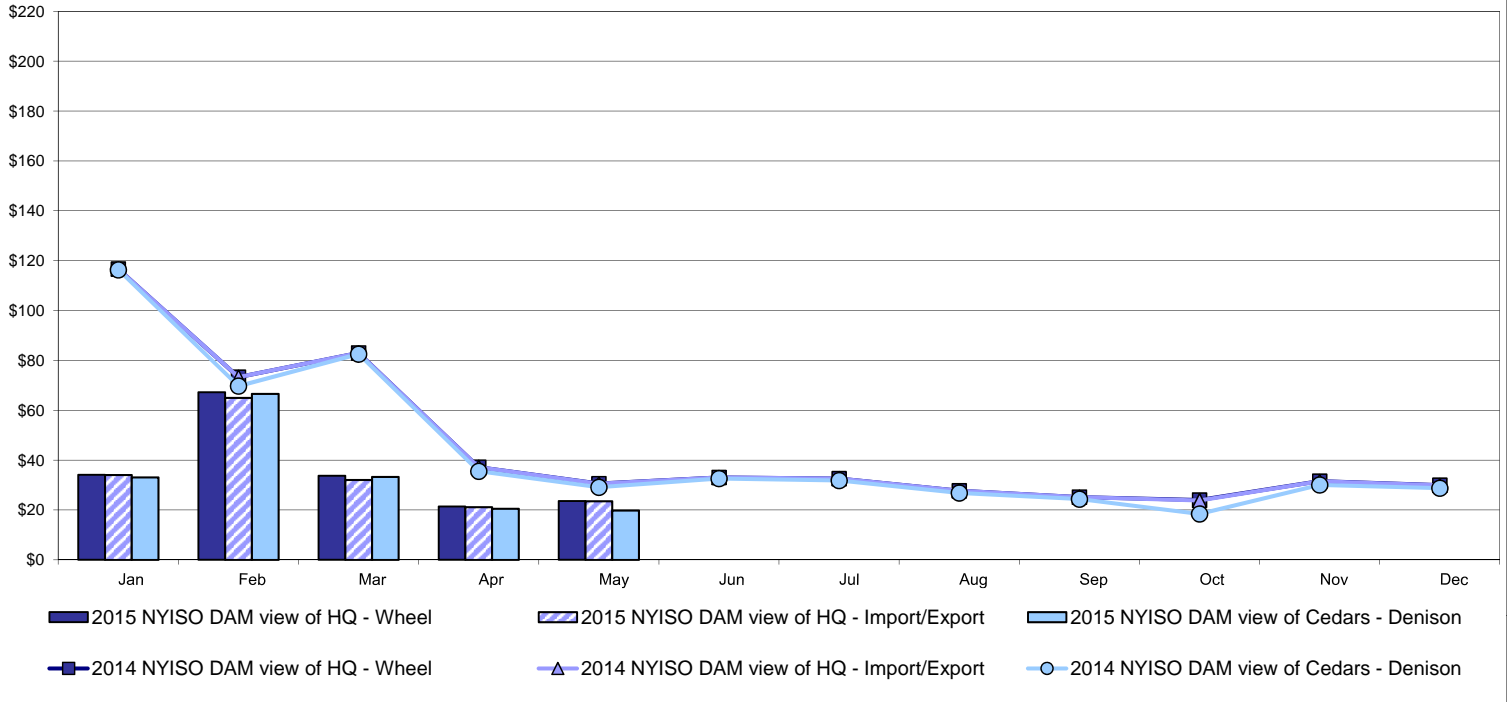


**Real Time Market Comparison: Neptune (\$/MWh)**

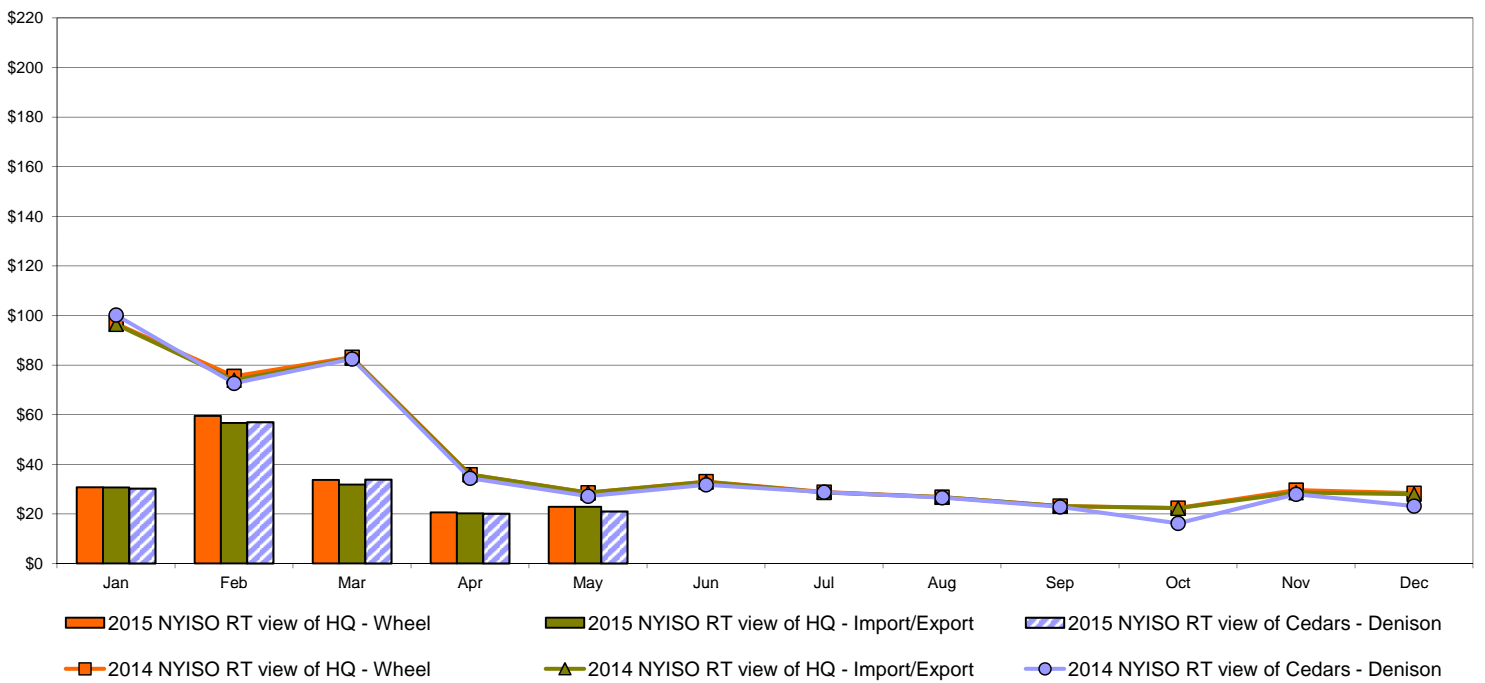


# External Comparison Hydro-Quebec

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

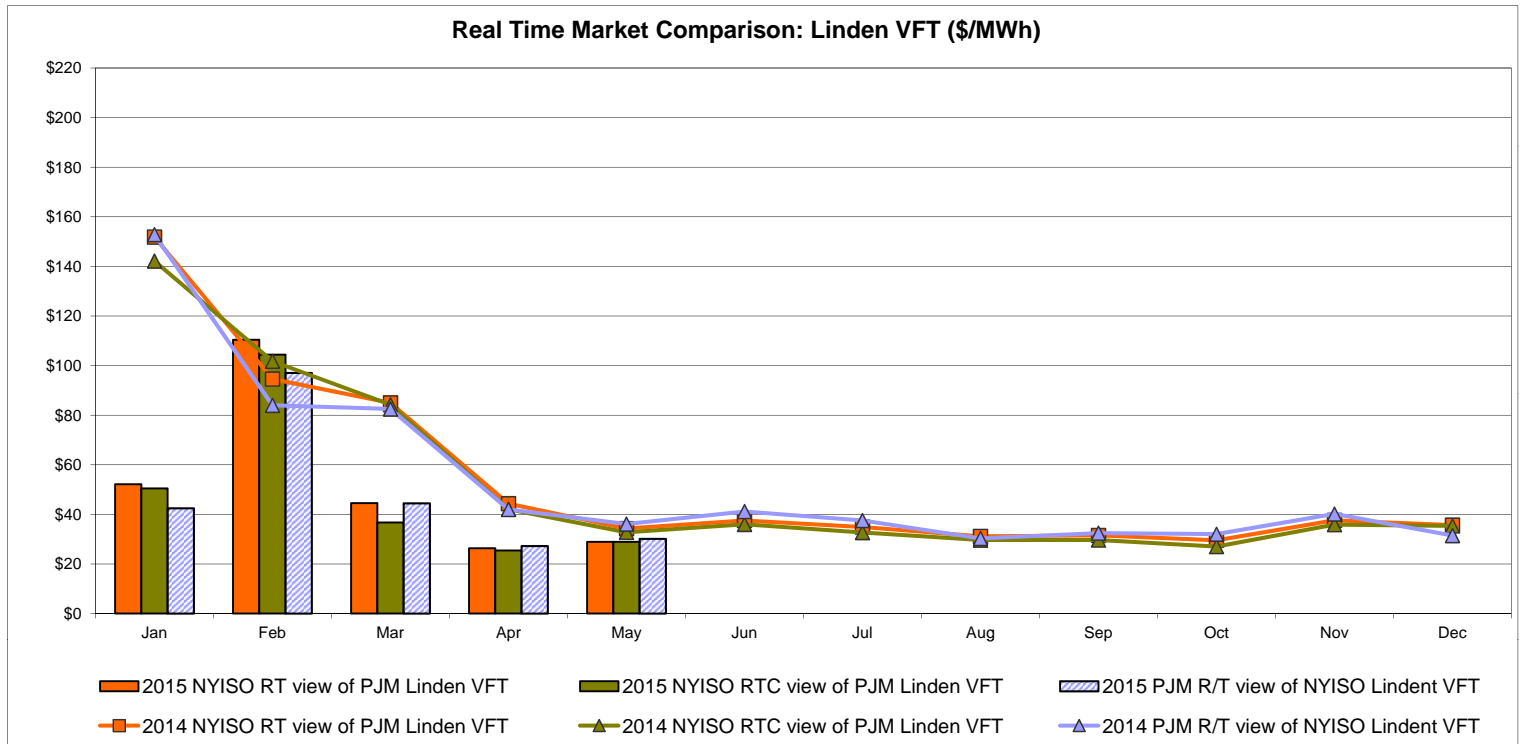
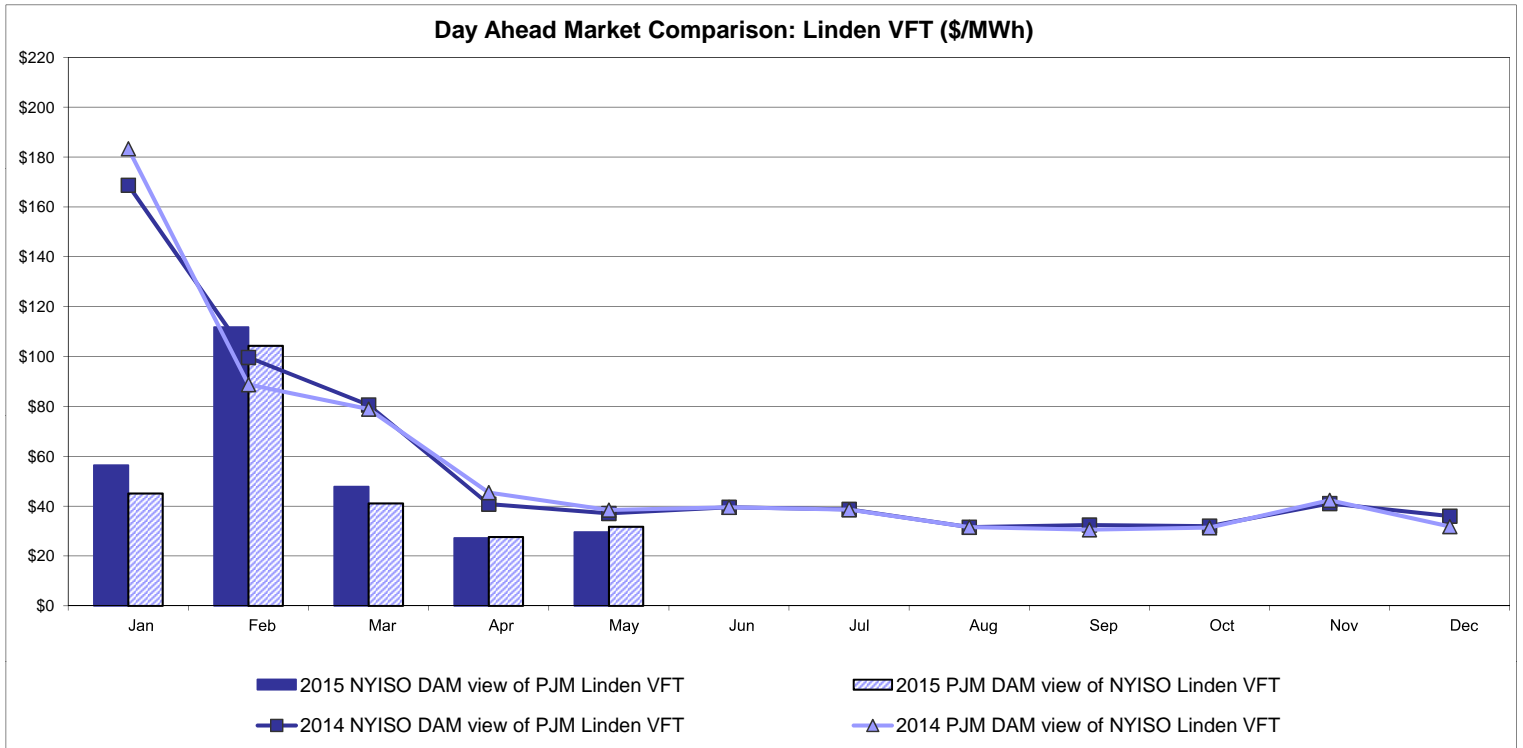


## Real Time Market External Zone Comparison - HQ (\$/MWh)

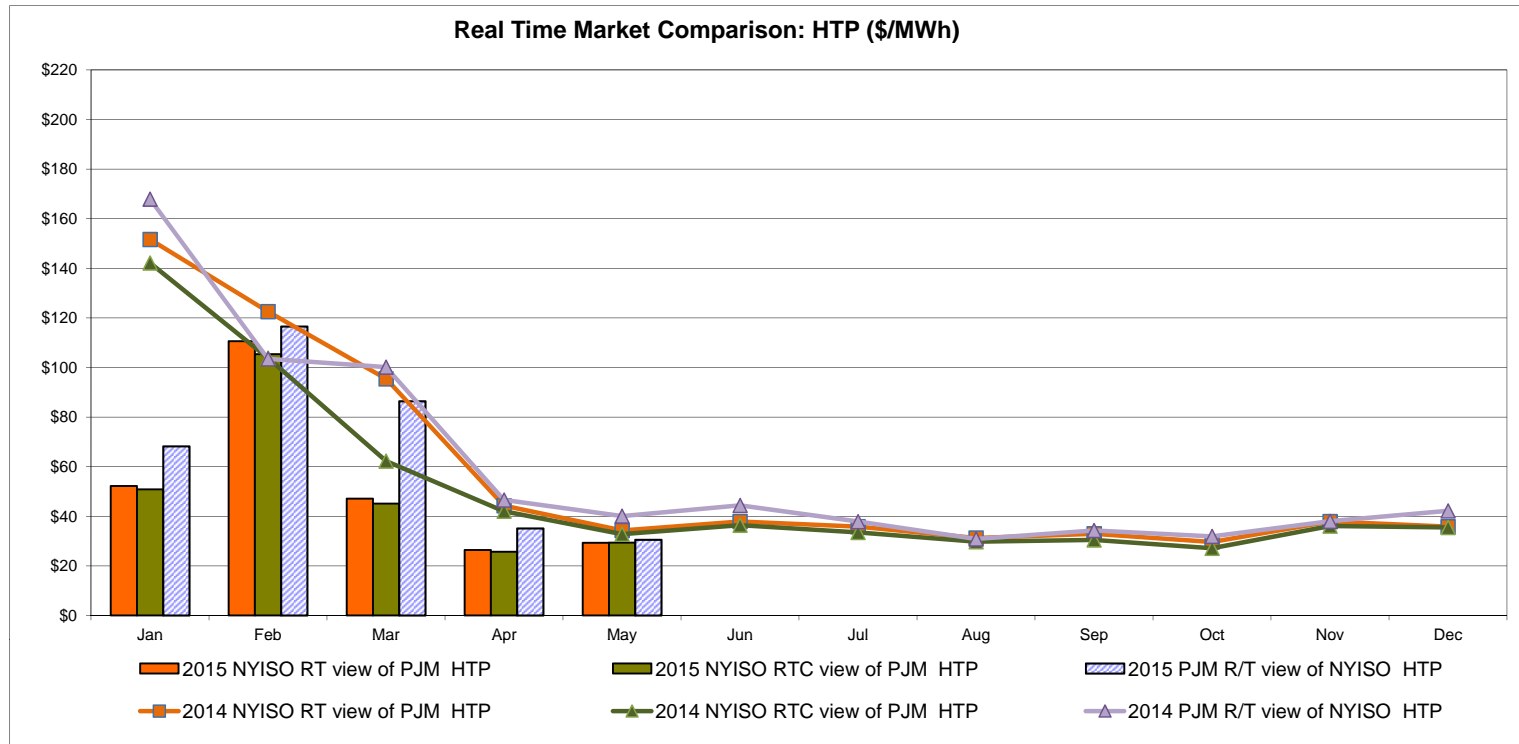
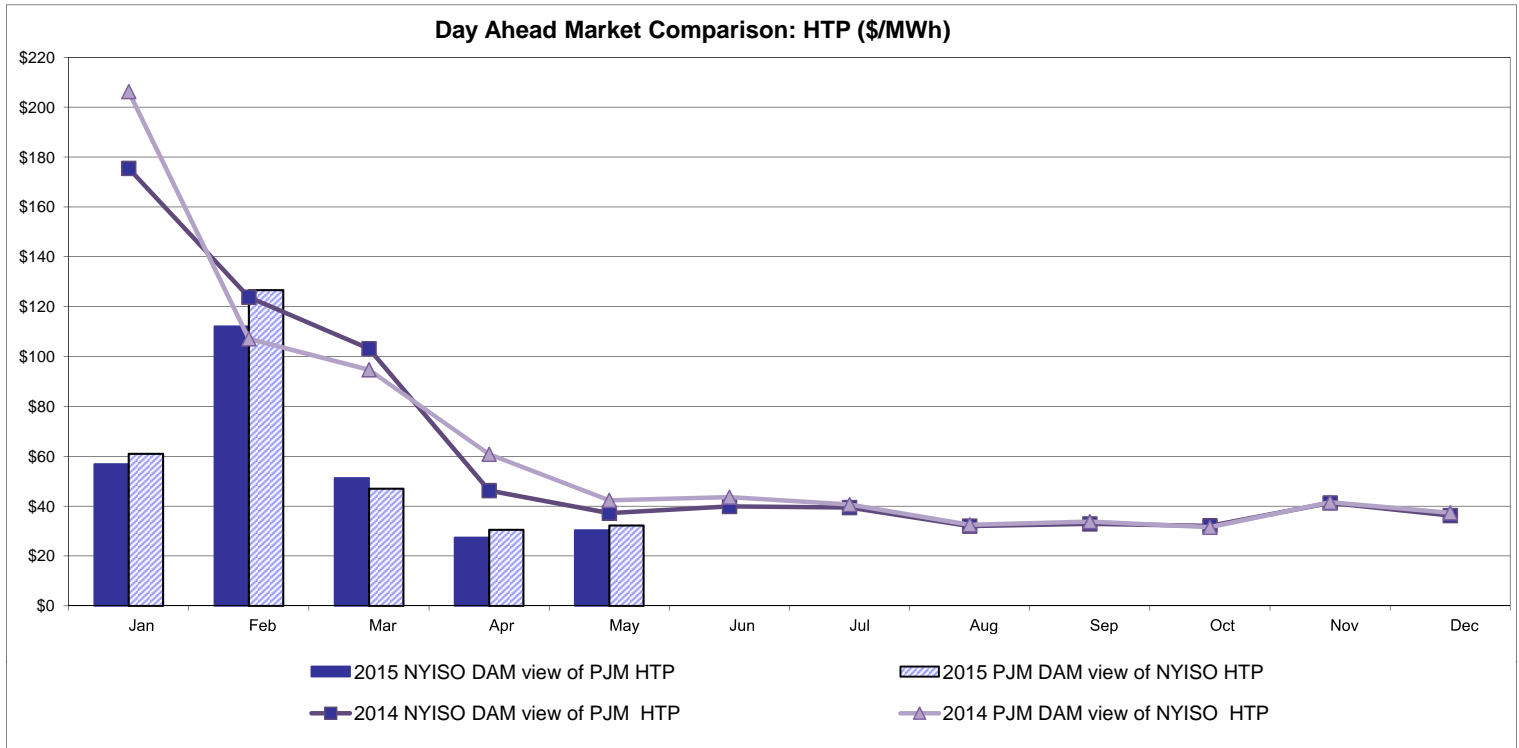


Note:  
Hydro-Quebec Prices are unavailable.

## External Controllable Line: Linden VFT (PJM)



## External Controllable Line: Hudson (PJM)



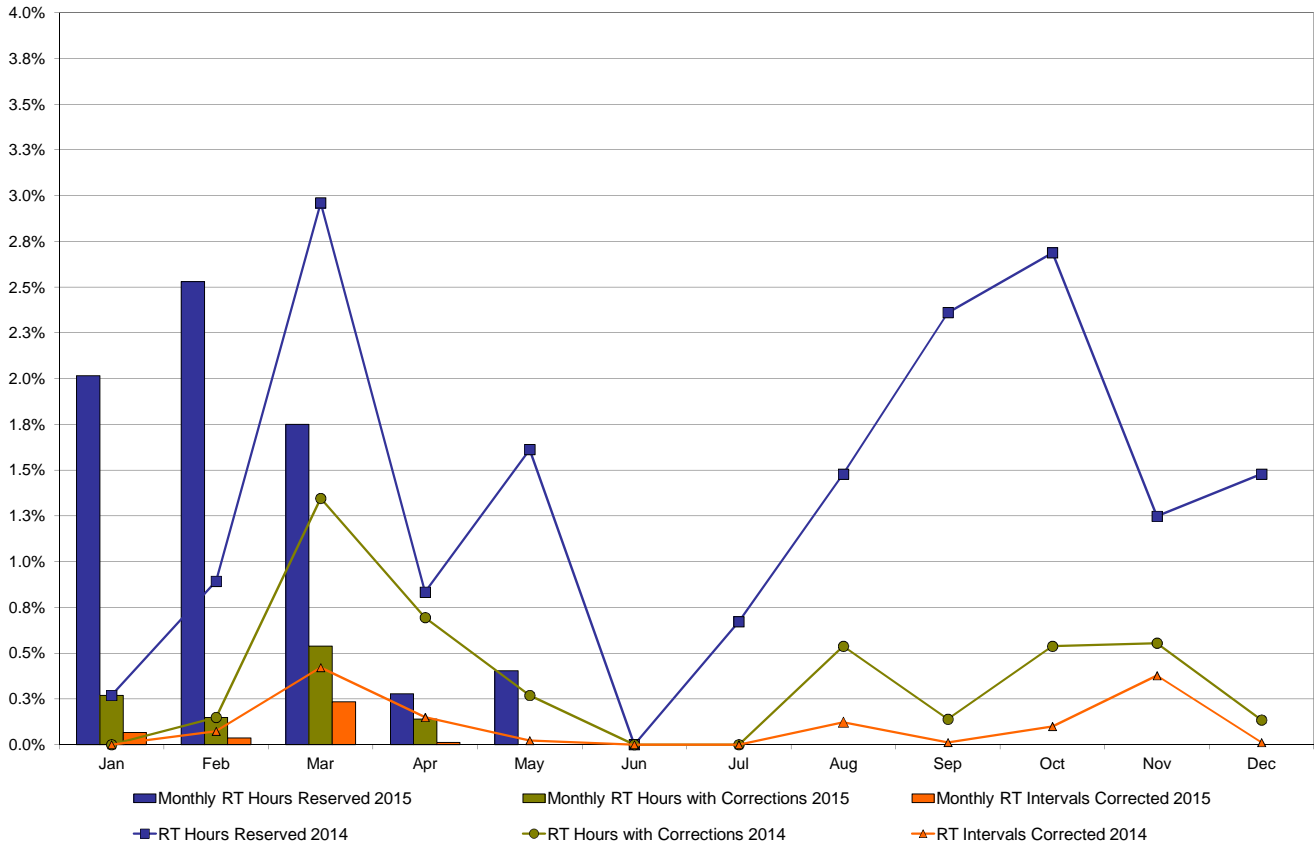


**NYISO Real Time Price Correction Statistics**

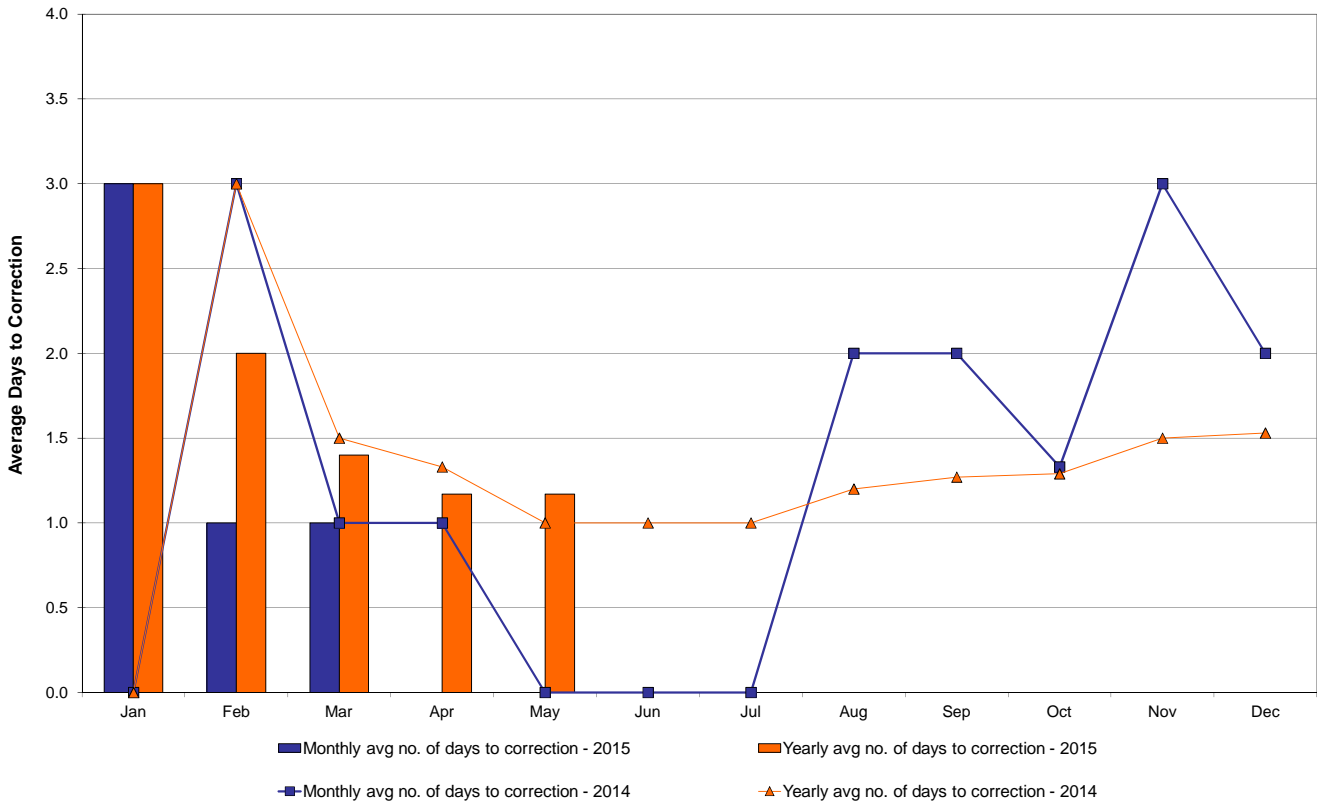
<b>2015</b>		<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<b>Hour Corrections</b>													
Number of hours with corrections	in the month	2	1	4	1	0							
Number of hours	in the month	744	672	743	720	744							
% of hours with corrections	in the month	0.27%	0.15%	0.54%	0.14%	0.00%							
% of hours with corrections	year-to-date	0.27%	0.21%	0.32%	0.28%	0.22%							
<b>Interval Corrections</b>													
Number of intervals corrected	in the month	6	3	21	1	0							
Number of intervals	in the month	9,066	8,231	9,005	8,696	9,032							
% of intervals corrected	in the month	0.07%	0.04%	0.23%	0.01%	0.00%							
% of intervals corrected	year-to-date	0.07%	0.05%	0.11%	0.09%	0.07%							
<b>Hours Reserved</b>													
Number of hours reserved	in the month	15	17	13	2	3							
Number of hours	in the month	744	672	743	720	744							
% of hours reserved	in the month	2.02%	2.53%	1.75%	0.28%	0.40%							
% of hours reserved	year-to-date	2.02%	2.26%	2.08%	1.63%	1.38%							
<b>Days to Correction *</b>													
Avg. number of days to correction	in the month	3.00	1.00	1.00	0.00	0.00							
Avg. number of days to correction	year-to-date	3.00	2.00	1.40	1.17	1.17							
<b>Days Without Corrections</b>													
Days without corrections	in the month	30	27	28	29	31							
Days without corrections	year-to-date	30	57	85	114	145							
<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>
<b>Hour Corrections</b>													
Number of hours with corrections	in the month	0	1	10	5	2	0	0	4	1	4	4	1
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	0.00%	0.15%	1.35%	0.69%	0.27%	0.00%	0.00%	0.54%	0.14%	0.54%	0.55%	0.13%
% of hours with corrections	year-to-date	0.00%	0.07%	0.51%	0.56%	0.50%	0.41%	0.35%	0.38%	0.35%	0.37%	0.39%	0.37%
<b>Interval Corrections</b>													
Number of intervals corrected	in the month	0	6	38	13	2	0	0	11	1	9	33	1
Number of intervals	in the month	9,232	8,205	9,023	8,720	9,030	8,729	8,999	8,975	8,779	9,026	8,763	9,030
% of intervals corrected	in the month	0.00%	0.07%	0.42%	0.15%	0.02%	0.00%	0.00%	0.12%	0.01%	0.10%	0.38%	0.01%
% of intervals corrected	year-to-date	0.00%	0.03%	0.17%	0.16%	0.13%	0.11%	0.10%	0.10%	0.09%	0.09%	0.12%	0.11%
<b>Hours Reserved</b>													
Number of hours reserved	in the month	2	6	22	6	12	0	5	11	17	20	9	11
Number of hours	in the month	744	672	743	720	744	720	744	744	720	744	721	744
% of hours reserved	in the month	0.27%	0.89%	2.96%	0.83%	1.61%	0.00%	0.67%	1.48%	2.36%	2.69%	1.25%	1.48%
% of hours reserved	year-to-date	0.27%	0.56%	1.39%	1.25%	1.32%	1.11%	1.04%	1.10%	1.24%	1.38%	1.37%	1.38%
<b>Days to Correction *</b>													
Avg. number of days to correction	in the month	0.00	3.00	1.00	1.00	0.00	0.00	0.00	2.00	2.00	1.33	3.00	2.00
Avg. number of days to correction	year-to-date	0.00	3.00	1.50	1.33	1.00	1.00	1.00	1.20	1.27	1.29	1.50	1.53
<b>Days Without Corrections</b>													
Days without corrections	in the month	31	27	28	28	29	30	31	29	29	28	28	30
Days without corrections	year-to-date	31	58	86	114	143	173	204	233	262	290	318	348

\* Calendar days from reservation date.

### Percentage of Real-Time Corrections

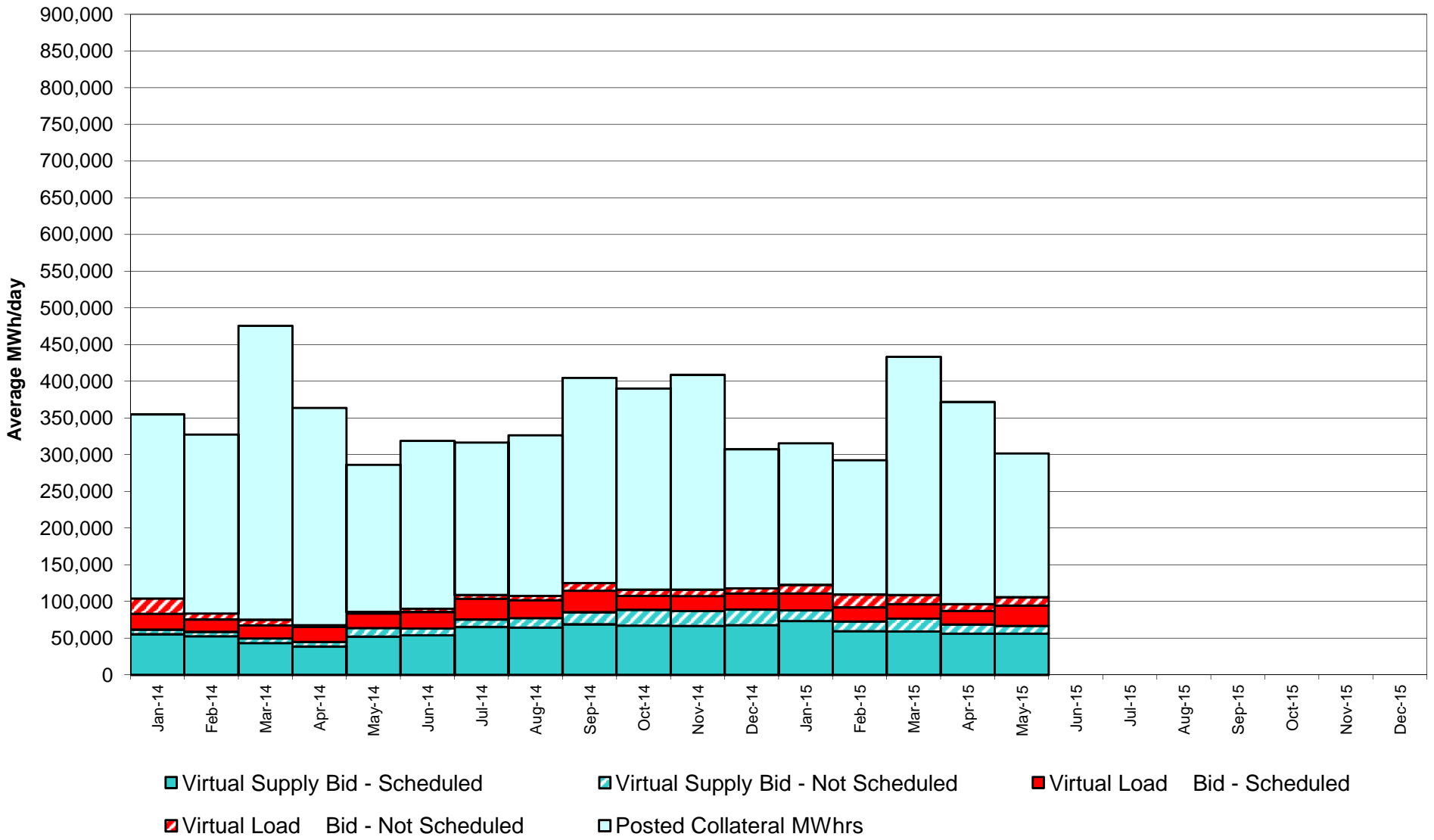


### Annual average time period for making Price Corrections (from reservation date) \*

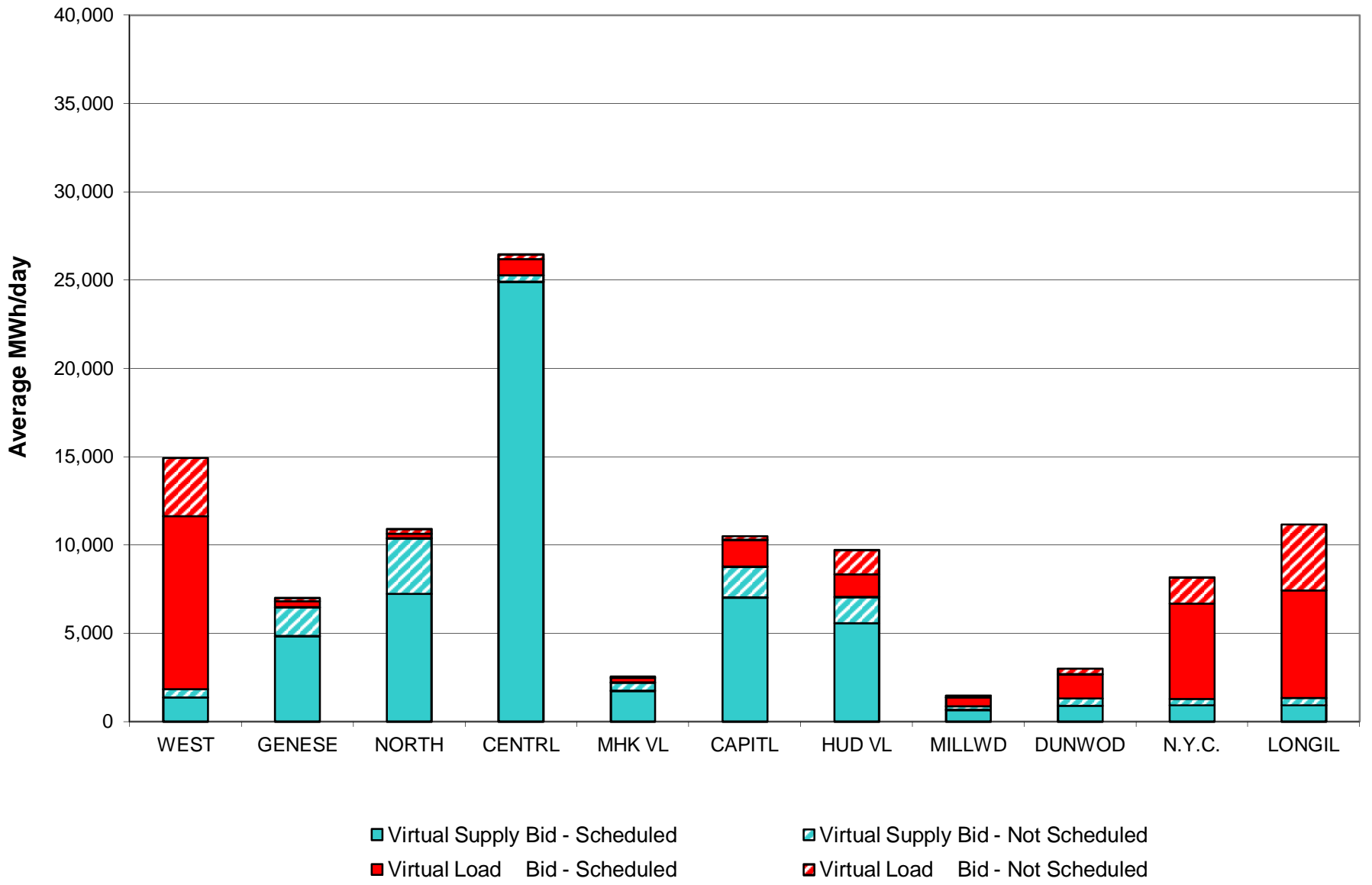


\* Calendar days from reservation date.

## NYISO Virtual Trading Average MWh per day



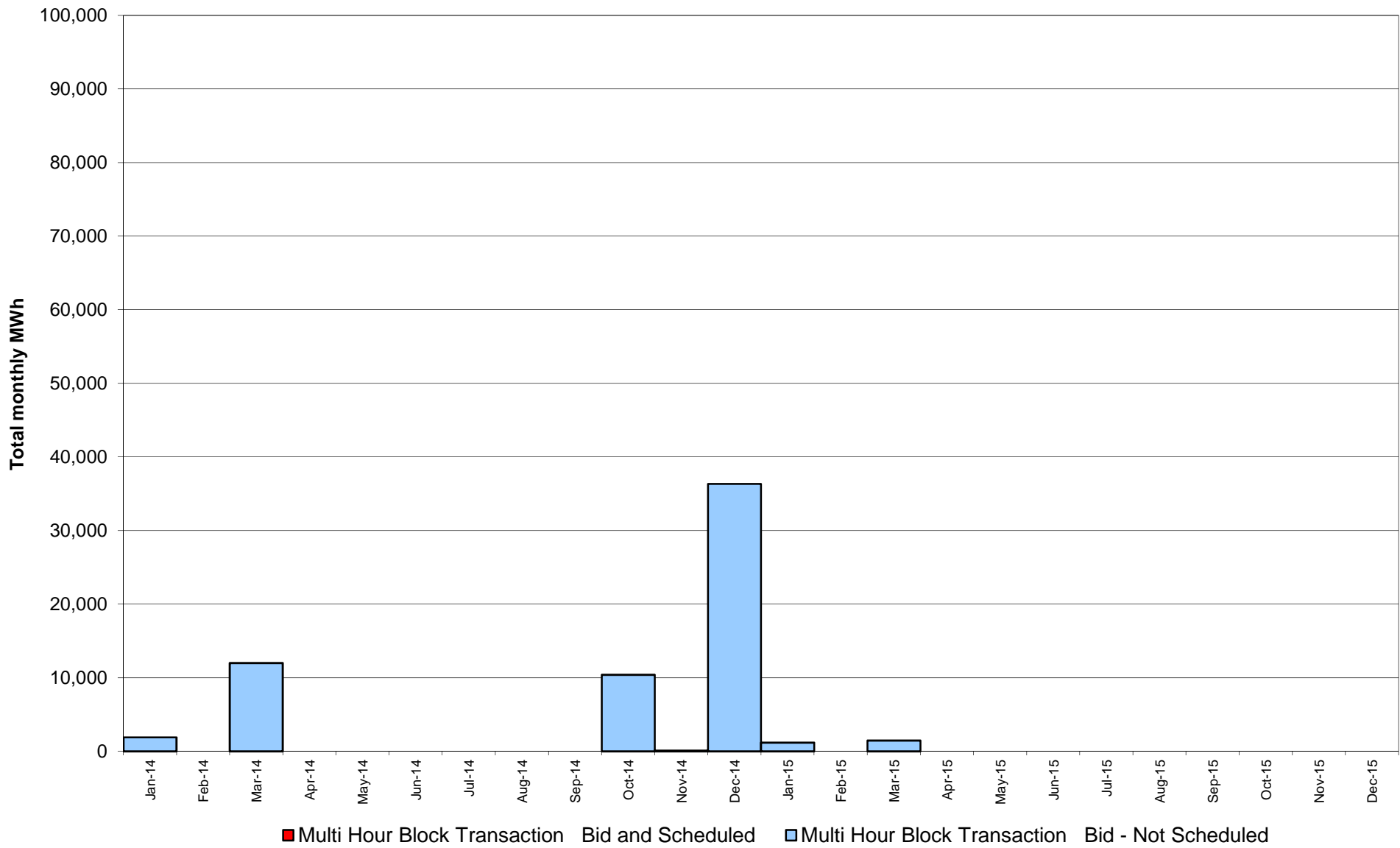
### Virtual Load and Supply Zonal Statistics through May 31, 2015



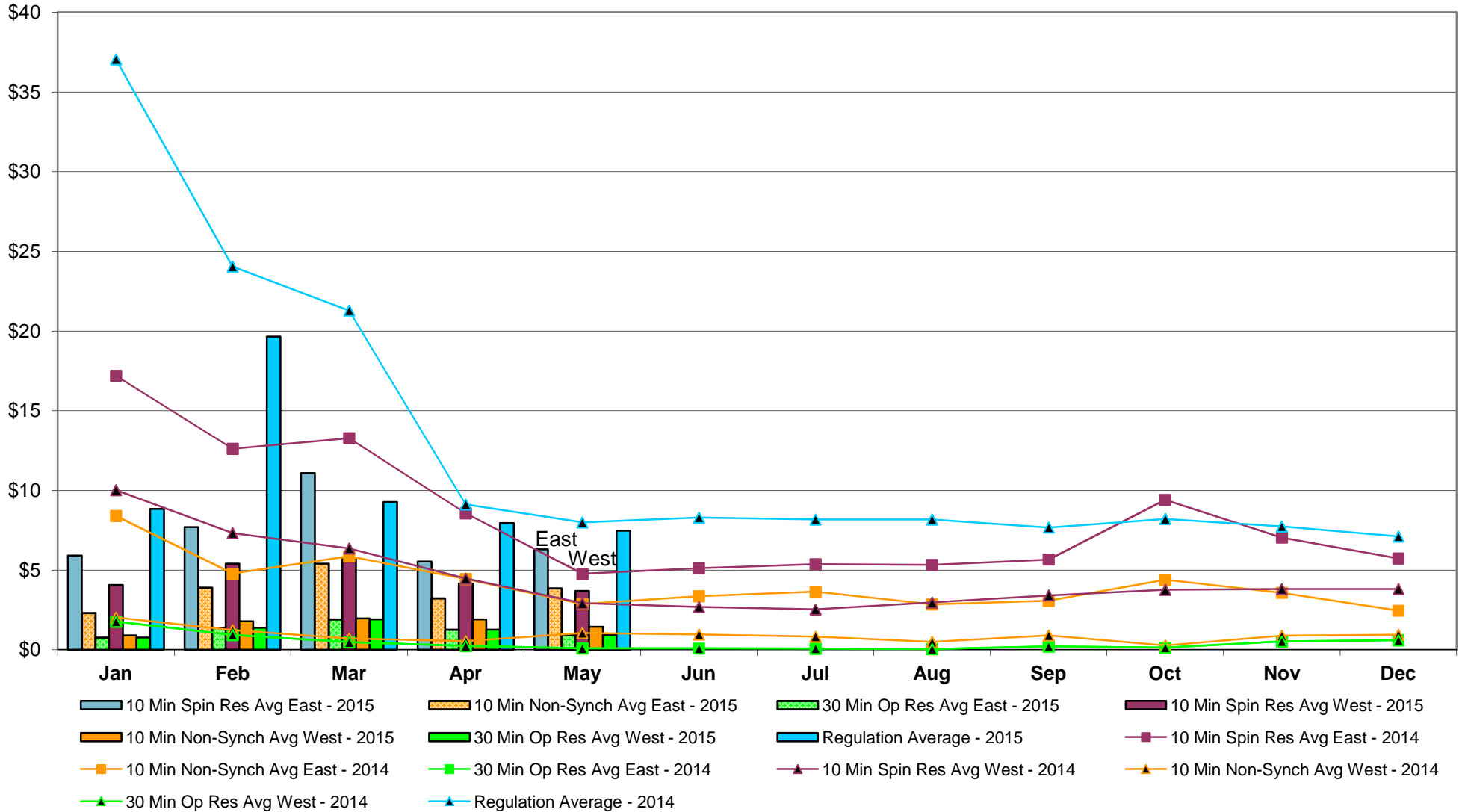
**Virtual Load and Supply Zonal Statistics (Average MWh/day) - 2015**

		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-15	6,244	977	3,837	688	<b>MHK VL</b>	Jan-15	534	185	1,757	1,021	<b>DUNWOD</b>	Jan-15	669	444	831	166
	Feb-15	3,180	1,570	3,288	936		Feb-15	901	790	1,446	812		Feb-15	647	663	725	156
	Mar-15	5,796	1,992	3,185	1,223		Mar-15	626	458	2,120	718		Mar-15	621	566	1,224	536
	Apr-15	6,734	1,797	1,790	419		Apr-15	293	226	3,094	867		Apr-15	433	299	1,517	366
	May-15	9,778	3,320	1,381	465		May-15	248	102	1,746	482		May-15	1,385	308	904	400
	Jun-15						Jun-15						Jun-15				
	Jul-15						Jul-15						Jul-15				
	Aug-15						Aug-15						Aug-15				
	Sep-15						Sep-15						Sep-15				
	Oct-15						Oct-15						Oct-15				
	Nov-15						Nov-15						Nov-15				
	Dec-15						Dec-15						Dec-15				
	<b>GENESE</b>	Jan-15	444	147	9,467		1,422	<b>CAPITL</b>	Jan-15	1,816	1,292		9,400	1,563	<b>N.Y.C.</b>	Jan-15	3,367
Feb-15		229	347	7,477	1,425	Feb-15	3,192		3,267	6,354	2,035	Feb-15	2,944	2,375		658	690
Mar-15		452	350	7,559	2,735	Mar-15	2,234		2,029	6,772	2,411	Mar-15	2,687	1,133		894	1,593
Apr-15		161	254	4,771	1,991	Apr-15	1,558		991	7,368	2,215	Apr-15	2,470	377		808	500
May-15		349	167	4,831	1,643	May-15	1,518		201	7,032	1,751	May-15	5,397	1,487		918	367
Jun-15						Jun-15						Jun-15					
Jul-15						Jul-15						Jul-15					
Aug-15						Aug-15						Aug-15					
Sep-15						Sep-15						Sep-15					
Oct-15						Oct-15						Oct-15					
Nov-15						Nov-15						Nov-15					
Dec-15						Dec-15						Dec-15					
<b>NORTH</b>		Jan-15	537	300	7,590	2,868	<b>HUD VL</b>		Jan-15	1,006	1,747	4,703	2,133	<b>LONGIL</b>		Jan-15	5,510
	Feb-15	274	423	7,361	1,898	Feb-15		769	2,147	2,841	2,800	Feb-15	4,383		3,985	613	1,722
	Mar-15	422	572	6,213	2,540	Mar-15		747	1,578	5,045	3,272	Mar-15	4,639		2,844	464	1,719
	Apr-15	223	366	8,249	3,243	Apr-15		1,180	1,056	6,875	1,292	Apr-15	4,399		3,064	760	678
	May-15	263	255	7,237	3,146	May-15		1,267	1,372	5,580	1,488	May-15	6,102		3,728	936	394
	Jun-15					Jun-15						Jun-15					
	Jul-15					Jul-15						Jul-15					
	Aug-15					Aug-15						Aug-15					
	Sep-15					Sep-15						Sep-15					
	Oct-15					Oct-15						Oct-15					
	Nov-15					Nov-15						Nov-15					
	Dec-15					Dec-15						Dec-15					
	<b>CENTRL</b>	Jan-15	2,414	939	33,426	776		<b>MILLWD</b>	Jan-15	418	244	716	192		<b>NYISO</b>	Jan-15	22,958
Feb-15		2,306	1,265	28,050	579	Feb-15	562		674	627	186	Feb-15	19,386	17,506		59,440	13,238
Mar-15		1,168	538	24,644	587	Mar-15	377		389	947	287	Mar-15	19,769	12,449		59,066	17,619
Apr-15		927	311	20,024	588	Apr-15	174		239	979	298	Apr-15	18,550	8,979		56,234	12,458
May-15		908	249	24,901	400	May-15	497		126	668	200	May-15	27,711	11,315		56,132	10,736
Jun-15						Jun-15						Jun-15					
Jul-15						Jul-15						Jul-15					
Aug-15						Aug-15						Aug-15					
Sep-15						Sep-15						Sep-15					
Oct-15						Oct-15						Oct-15					
Nov-15						Nov-15						Nov-15					
Dec-15						Dec-15						Dec-15					

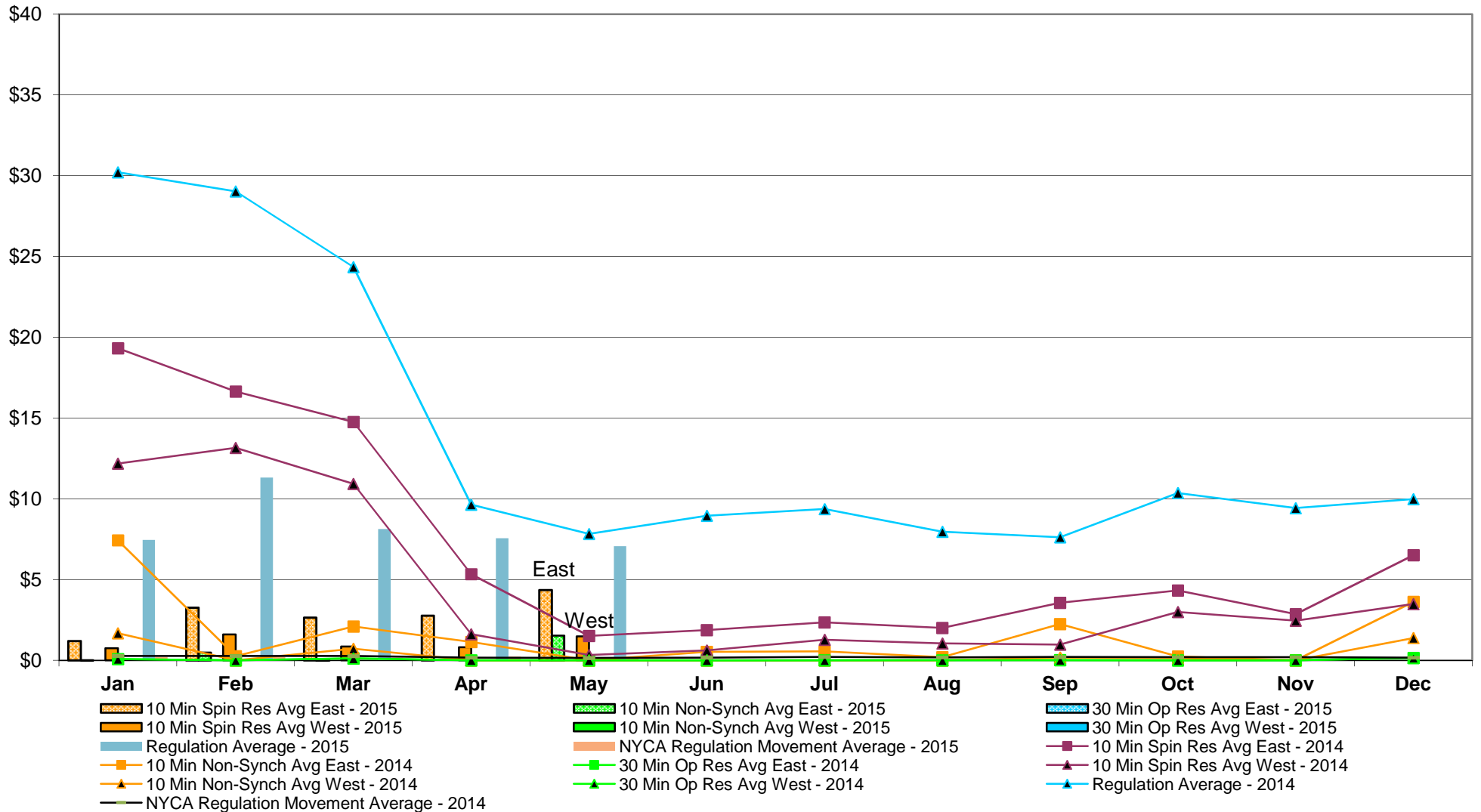
### NYISO Multi Hour Block Transactions Monthly Total MWh



## NYISO Monthly Average Ancillary Service Prices Day Ahead Market 2014 - 2015

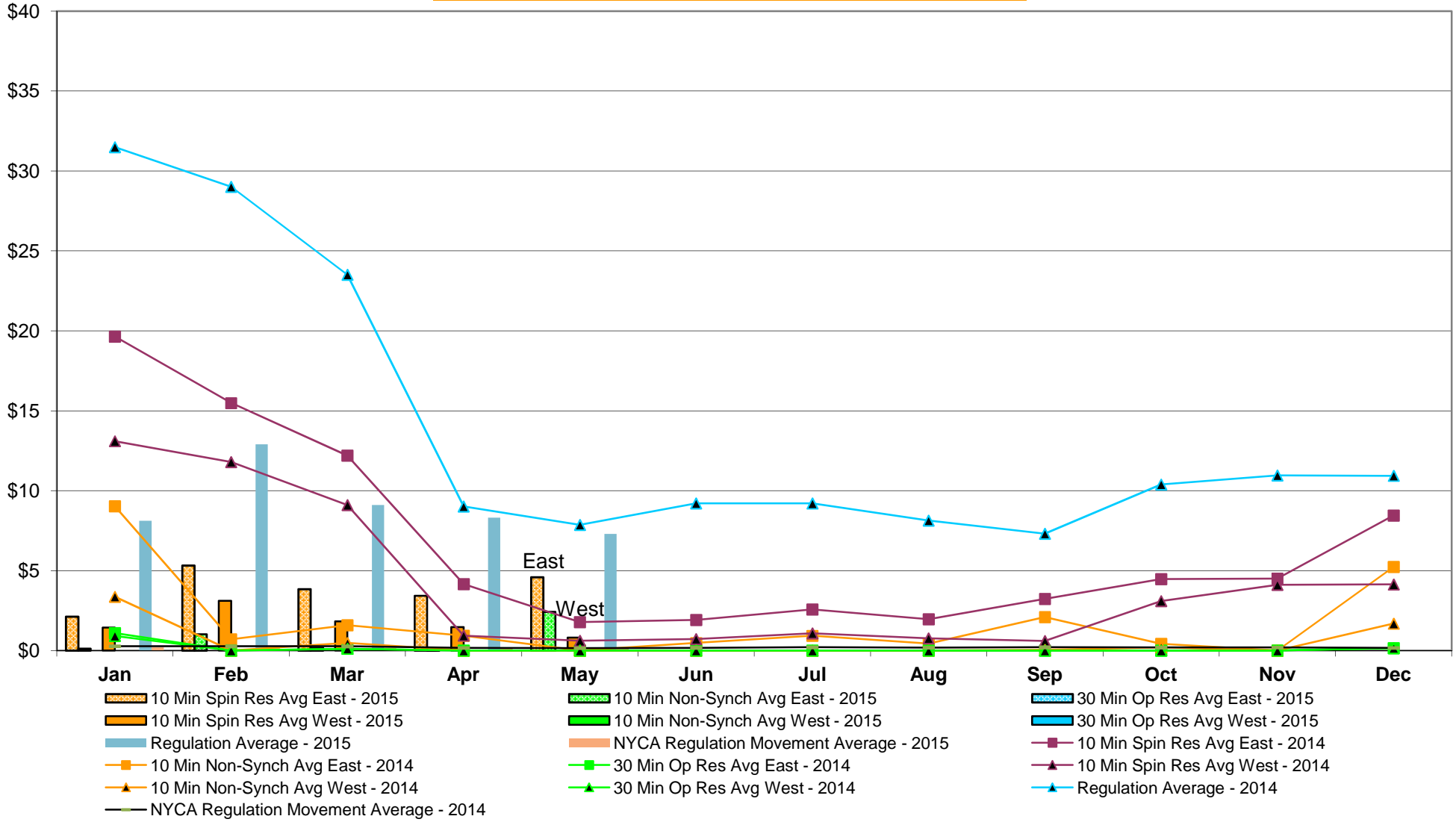


## NYISO Monthly Average Ancillary Service Prices RTC Market 2014 - 2015





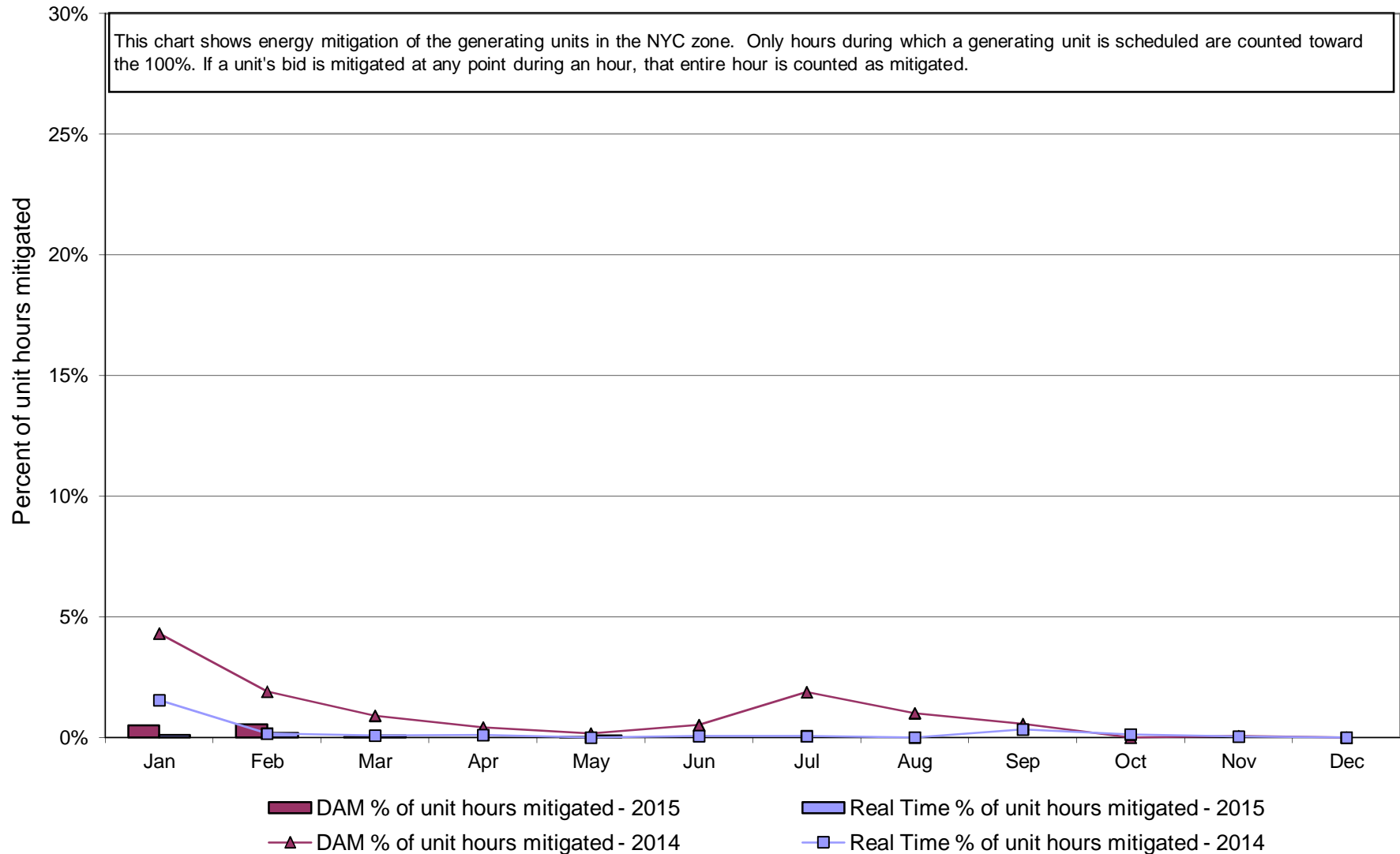
## NYISO Monthly Average Ancillary Service Prices Real Time Market 2014 - 2015



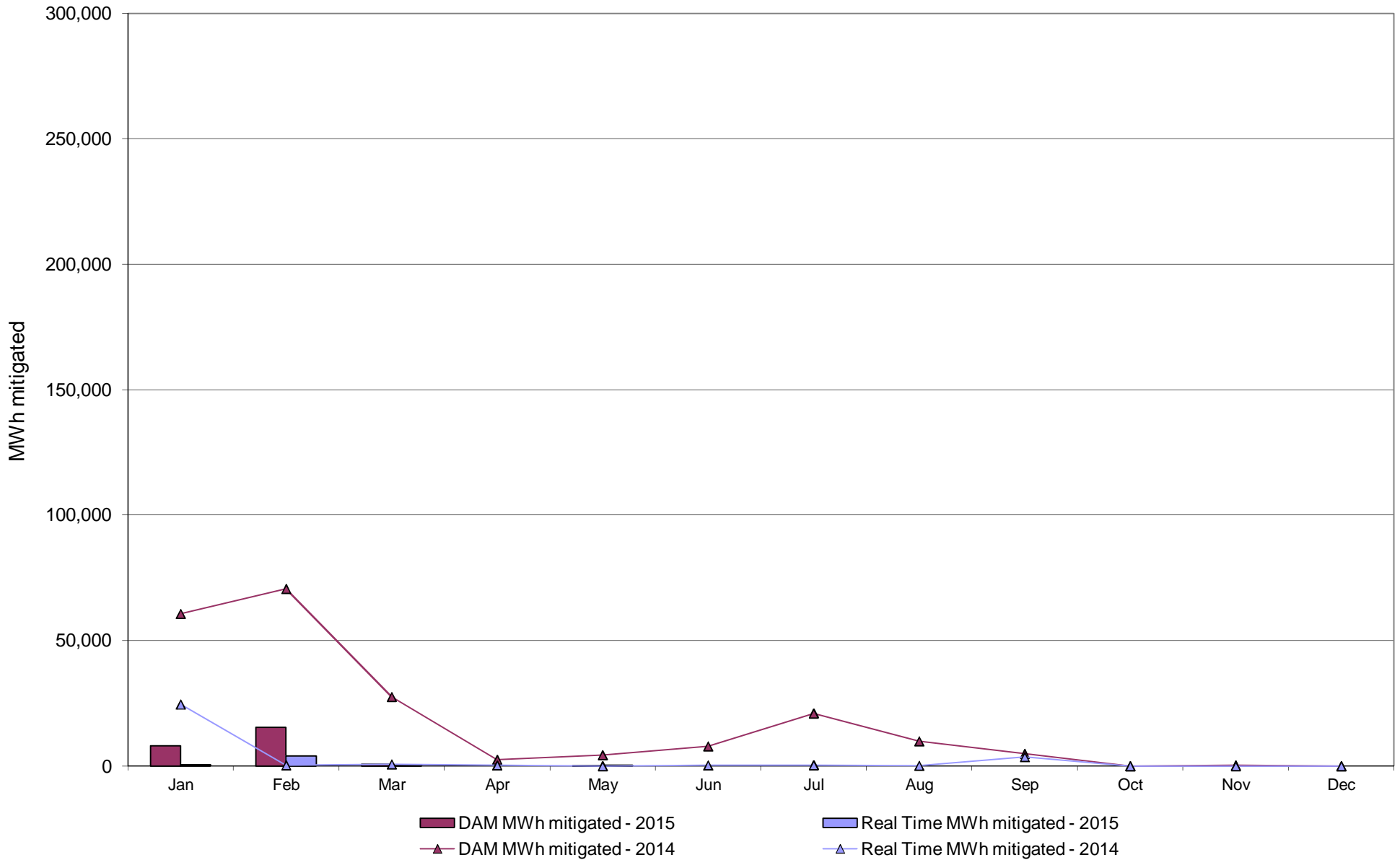
**NYISO Markets Ancillary Services Statistics - Unweighted Price (\$/MWH)**

<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>Day Ahead Market</b>												
10 Min Spin East	5.92	7.69	11.09	5.53	6.31							
10 Min Spin West	4.07	5.40	5.68	4.16	3.69							
10 Min Non Synch East	2.30	3.89	5.40	3.22	3.84							
10 Min Non Synch West	0.90	1.79	1.97	1.91	1.45							
30 Min East	0.77	1.38	1.91	1.26	0.93							
30 Min West	0.77	1.38	1.91	1.26	0.93							
Regulation	8.84	19.65	9.27	7.94	7.48							
<b>RTC Market</b>												
10 Min Spin East	1.20	3.27	2.64	2.77	4.36							
10 Min Spin West	0.74	1.61	0.86	0.81	1.48							
10 Min Non Synch East	0.01	0.48	0.01	0.00	1.54							
10 Min Non Synch West	0.00	0.00	0.00	0.00	0.00							
30 Min East	0.00	0.00	0.00	0.00	0.00							
30 Min West	0.00	0.00	0.00	0.00	0.00							
Regulation	7.45	11.32	8.13	7.56	7.06							
NYCA Regulation Movement	0.21	0.21	0.16	0.22	0.16							
<b>Real Time Market</b>												
10 Min Spin East	2.12	5.31	3.84	3.44	4.59							
10 Min Spin West	1.44	3.11	1.83	1.46	0.81							
10 Min Non Synch East	0.12	1.03	0.17	0.01	2.41							
10 Min Non Synch West	0.00	0.00	0.00	0.00	0.00							
30 Min East	0.00	0.00	0.00	0.00	0.00							
30 Min West	0.00	0.00	0.00	0.00	0.00							
Regulation	8.12	12.91	9.11	8.32	7.30							
NYCA Regulation Movement	0.20	0.21	0.17	0.15	0.16							
<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>
<b>Day Ahead Market</b>												
10 Min Spin East	17.19	12.62	13.27	8.57	4.77	5.11	5.37	5.33	5.66	9.41	7.04	5.73
10 Min Spin West	10.02	7.32	6.36	4.47	2.92	2.69	2.54	2.96	3.41	3.76	3.82	3.82
10 Min Non Synch East	8.40	4.78	5.86	4.44	2.86	3.37	3.65	2.85	3.08	4.40	3.58	2.45
10 Min Non Synch West	2.02	1.23	0.70	0.55	1.06	0.96	0.83	0.49	0.91	0.27	0.89	0.95
30 Min East	1.77	0.93	0.47	0.24	0.09	0.08	0.08	0.04	0.21	0.14	0.53	0.60
30 Min West	1.77	0.93	0.47	0.24	0.09	0.08	0.08	0.04	0.21	0.14	0.53	0.60
Regulation	37.05	24.05	21.29	9.12	7.99	8.30	8.18	8.18	7.67	8.21	7.74	7.12
<b>RTC Market</b>												
10 Min Spin East	19.32	16.64	14.76	5.34	1.52	1.87	2.35	2.00	3.57	4.32	2.86	6.51
10 Min Spin West	12.18	13.16	10.93	1.61	0.33	0.61	1.27	1.04	0.98	2.99	2.46	3.48
10 Min Non Synch East	7.43	0.26	2.10	1.14	0.00	0.52	0.55	0.20	2.25	0.25	0.00	3.62
10 Min Non Synch West	1.68	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.17	0.13	0.00	1.39
30 Min East	0.08	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.15
30 Min West	0.08	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.15
Regulation	30.21	29.03	24.35	9.64	7.83	8.95	9.36	7.97	7.62	10.36	9.42	9.99
NYCA Regulation Movement	0.28	0.27	0.26	0.17	0.15	0.17	0.21	0.18	0.21	0.20	0.20	0.17
<b>Real Time Market</b>												
10 Min Spin East	19.64	15.48	12.19	4.15	1.78	1.92	2.57	1.96	3.23	4.47	4.51	8.45
10 Min Spin West	13.10	11.80	9.11	0.94	0.61	0.72	1.08	0.76	0.60	3.10	4.12	4.14
10 Min Non Synch East	9.03	0.70	1.59	0.93	0.00	0.48	0.92	0.44	2.09	0.42	0.00	5.23
10 Min Non Synch West	3.37	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.05	0.20	0.00	1.69
30 Min East	1.10	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
30 Min West	0.92	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
Regulation	31.50	29.02	23.52	9.02	7.87	9.21	9.21	8.13	7.31	10.39	10.96	10.94
NYCA Regulation Movement	0.27	0.27	0.27	0.17	0.15	0.18	0.21	0.19	0.21	0.19	0.20	0.17

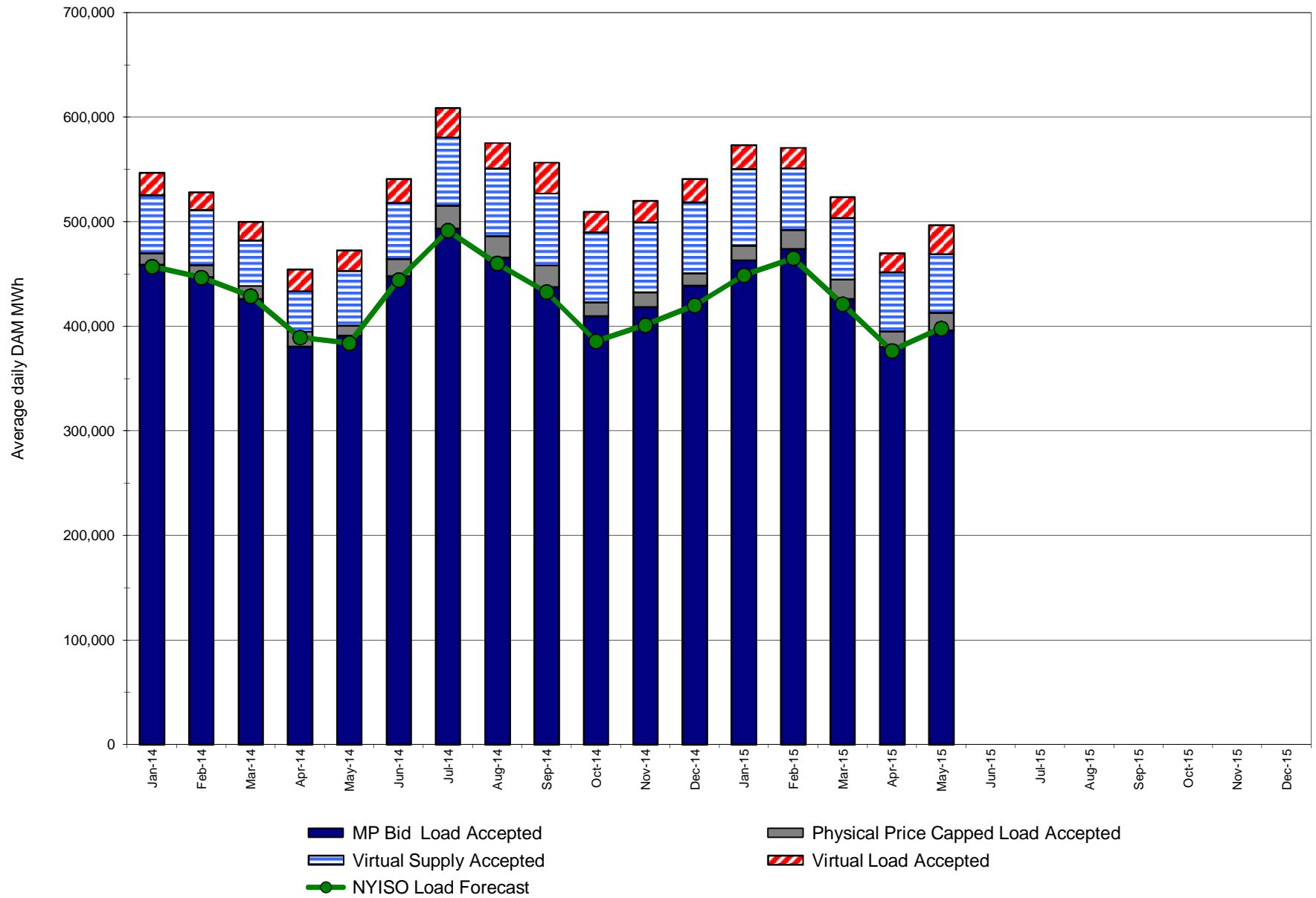
## NYISO In City Energy Mitigation - AMP (NYC Zone) 2014 - 2015 Percentage of committed unit-hours mitigated



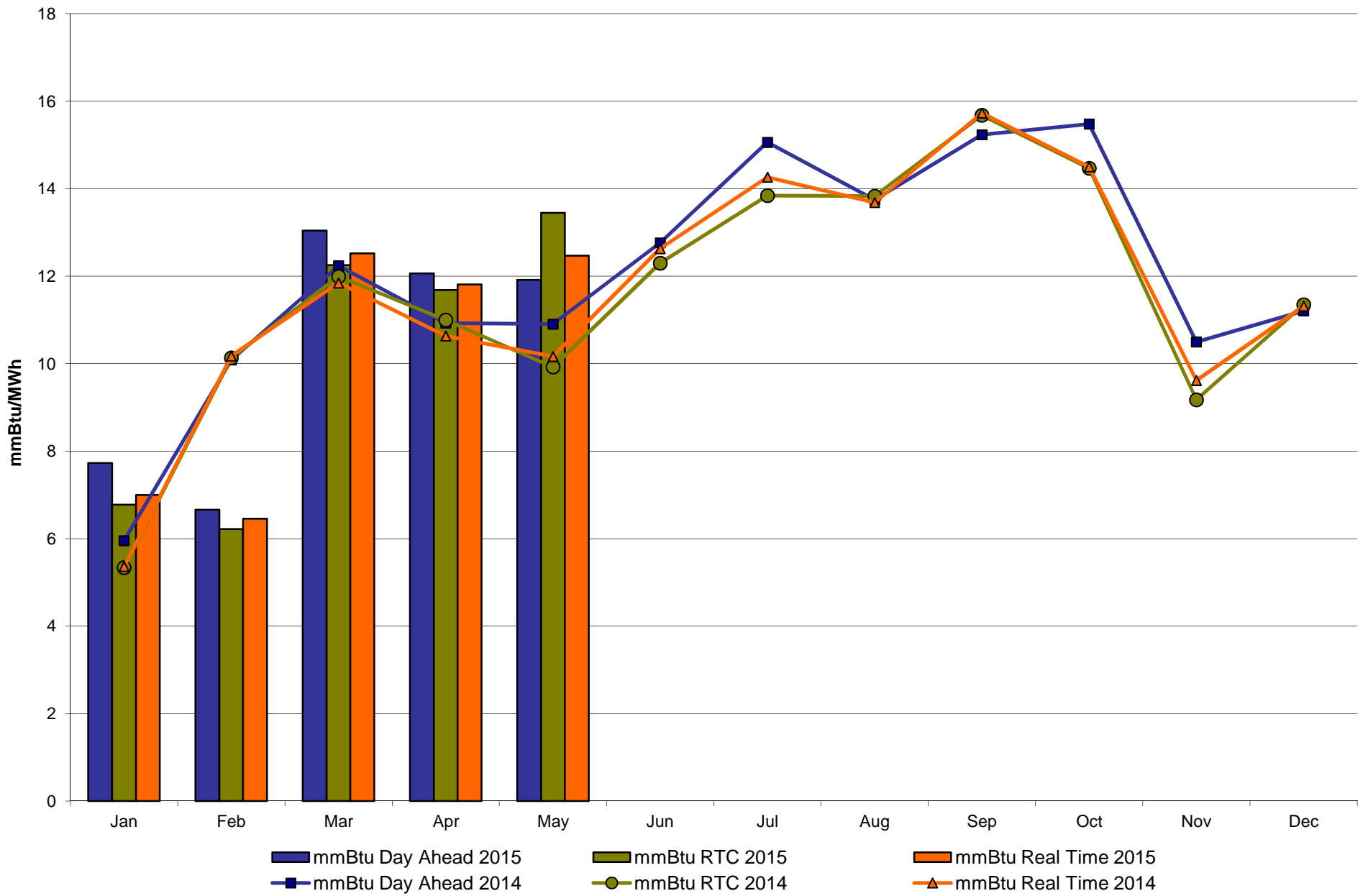
**NYISO In City Energy Mitigation (NYC Zone) 2014 - 2015**  
**Monthly megawatt hours mitigated**



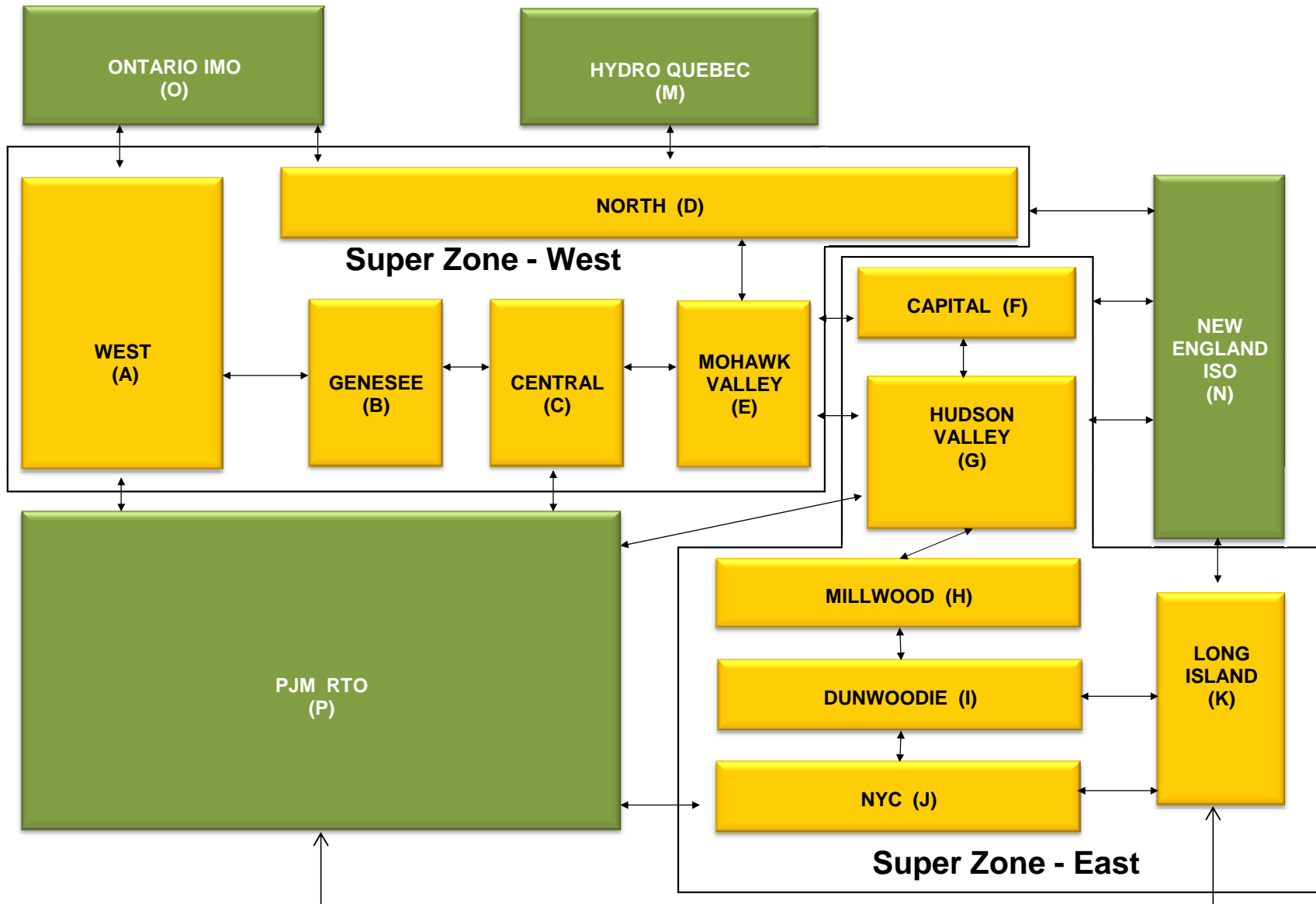
### NYISO Average Daily DAM Load Bid Summary



## Monthly Implied Heat Rate 2014-2015



# NYISO LBMP ZONES

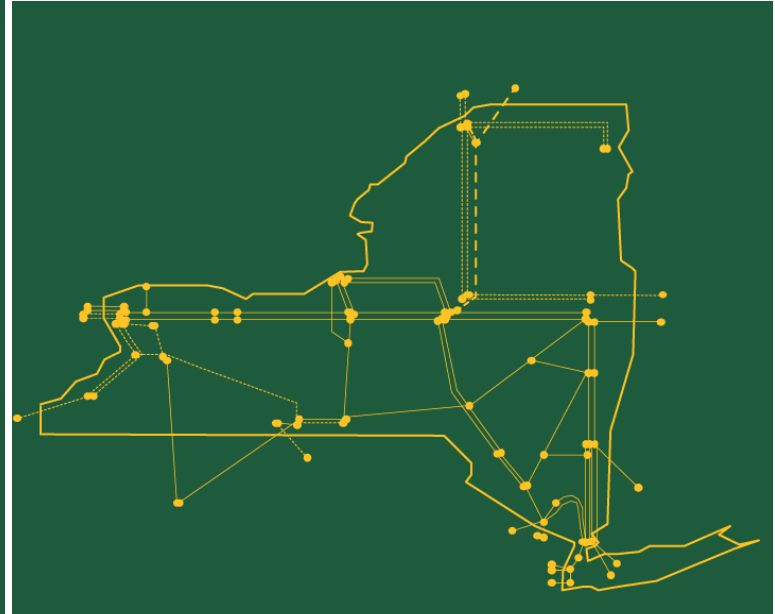


**Billing Codes for Chart 4-C**

<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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