

# NYISO CEO/COO Report

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**Rob Fernandez**

Interim President & Chief Executive Officer

**Rick Gonzales**

Senior Vice President & Chief Operating Officer

## Management Committee Meeting:

November 28, 2018 Rensselaer, NY



# NYISO CEO/COO Report

## CEO Report

## COO Report

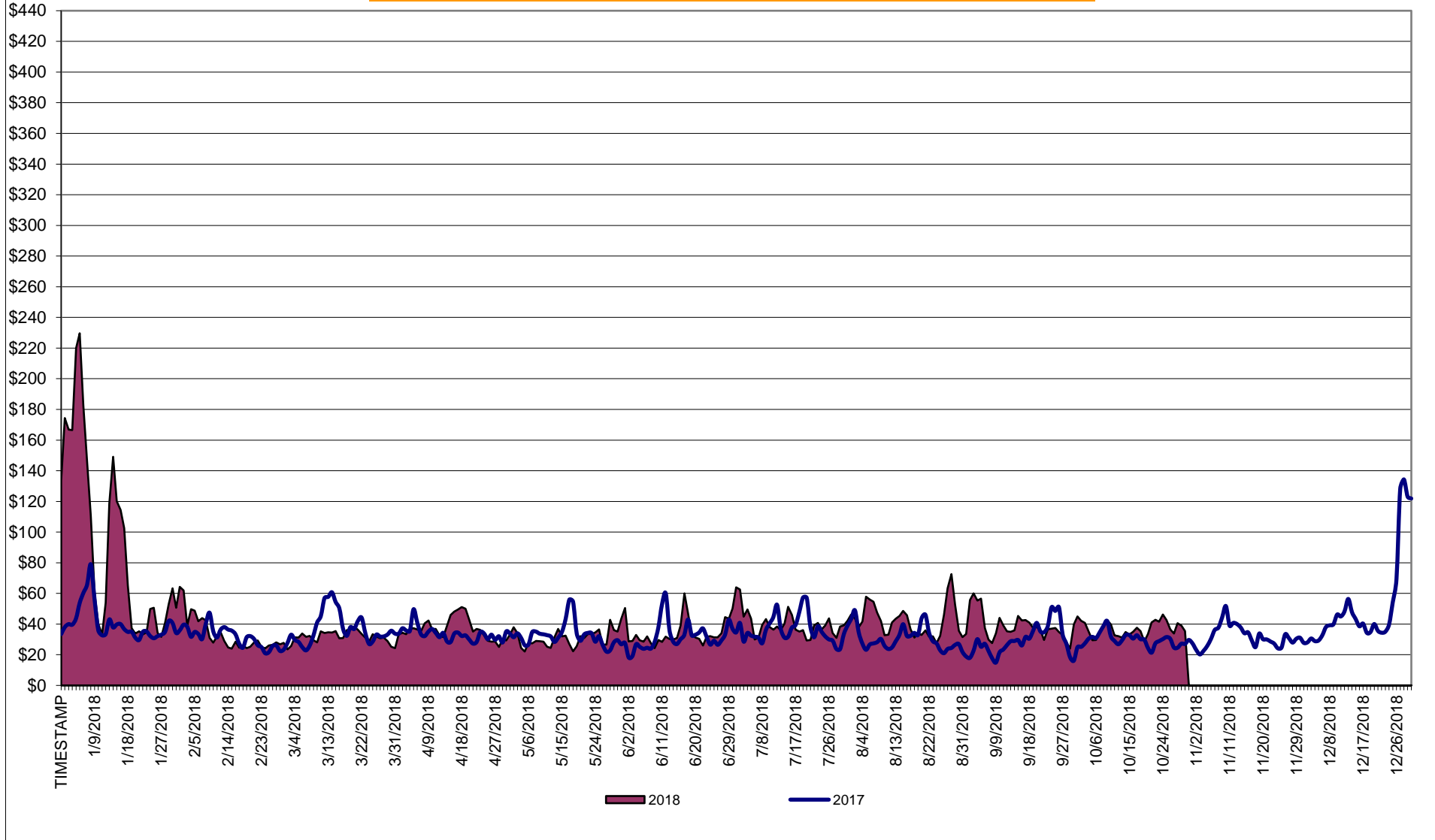
- Market Performance Highlights – For Information Only
- Operations Performance Metrics Monthly Report

# Market Performance Highlights

## October 2018

- LBMP for October is \$35.85/MWh; lower than \$38.70/MWh in September 2018 and higher than \$28.35/MWh in October 2017.
  - Day Ahead and Real Time Load Weighted LBMPs are lower compared to September.
- October 2018 average year-to-date monthly cost of \$45.03/MWh is a 29% increase from \$34.89/MWh in October 2017.
- Average daily sendout is 399 GWh/day in October; lower than 458 GWh/day in September 2018 and higher than 398 GWh/day in October 2017.
- Natural gas prices and distillate prices were higher compared to the previous month.
  - Natural Gas (Transco Z6 NY) was \$2.91/MMBtu, up from \$2.75/MMBtu in September.
  - Natural gas prices are up 23.2% year-over-year.
  - Jet Kerosene Gulf Coast was \$16.65/MMBtu, up from \$16.21/MMBtu in September.
  - Ultra Low Sulfur No.2 Diesel NY Harbor was \$16.66/MMBtu, up from \$16.08/MMBtu in September.
  - Distillate prices are up 32.4% year-over-year.
- Uplift per MWh is lower compared to the previous month.
  - Uplift (not including NYISO cost of operations) is (\$0.30)/MWh; lower than (\$0.11)/MWh in September.
    - Local Reliability Share is \$0.27/MWh, lower than \$0.37/MWh in September.
    - Statewide Share is (\$0.56)/MWh, lower than (\$0.48)/MWh in September.
  - TSA \$ per NYC MWh is \$0.75/MWh.
  - Total uplift costs (Schedule 1 components including NYISO Cost of Operations) are lower than September.

**Daily NYISO Average Cost/MWh (Energy & Ancillary Services)\***  
**2017 Annual Average \$36.56/MWh**  
**October 2017 YTD Average \$34.98/MWh**  
**October 2018 YTD Average \$45.03/MWh**



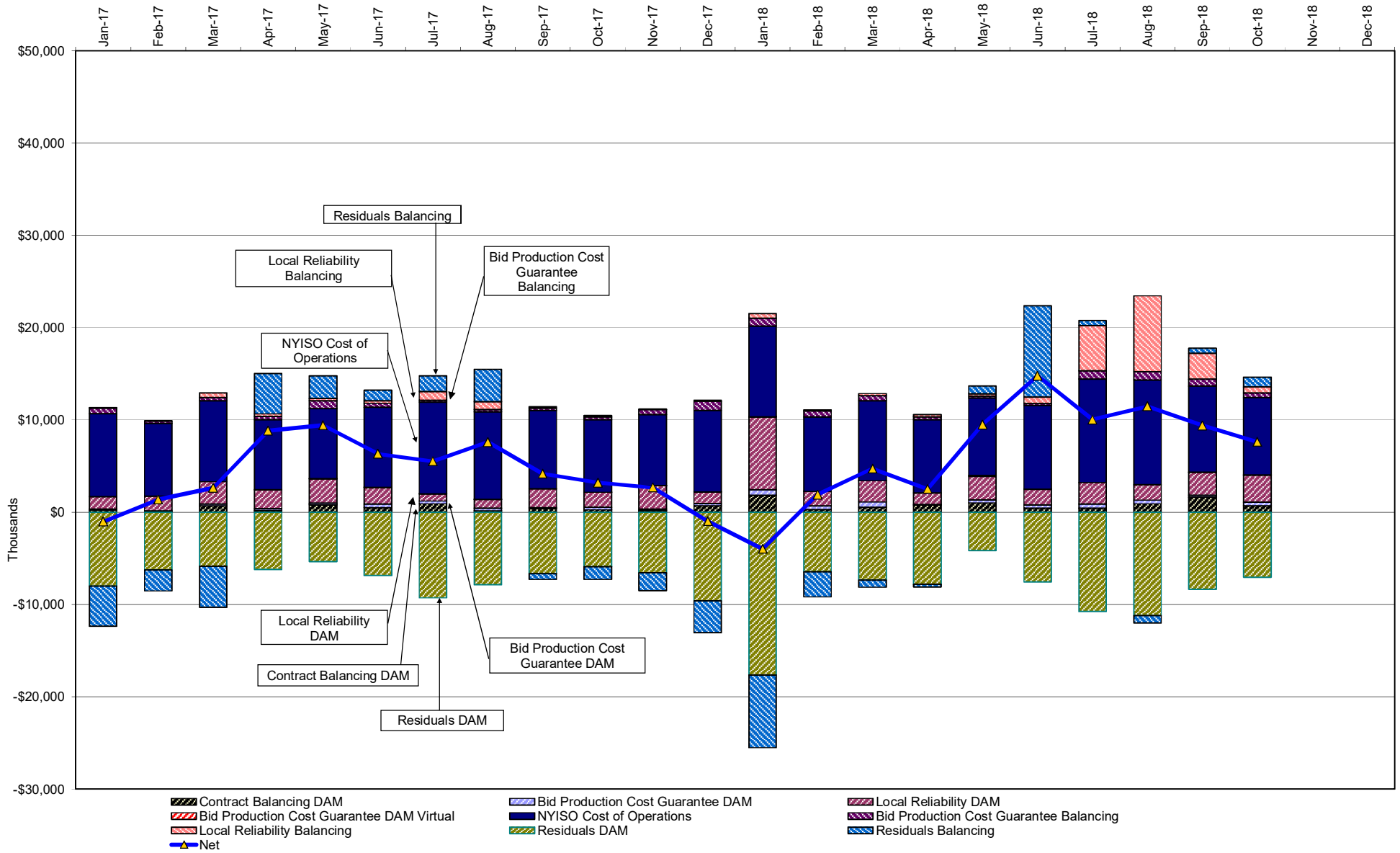
\* Excludes ICAP payments.

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

| <b>2018</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                            | 99.55          | 33.83           | 29.91        | 35.00        | 28.78      | 32.53       | 39.58       | 42.56         | 38.70            | 35.85          |                 |                 |
| NTAC                            | 0.71           | 0.58            | 0.88         | 1.09         | 0.88       | 1.00        | 0.93        | 0.72          | 0.40             | 0.36           |                 |                 |
| Reserve                         | 0.92           | 0.65            | 0.64         | 0.81         | 0.68       | 0.57        | 0.49        | 0.51          | 0.52             | 0.80           |                 |                 |
| Regulation                      | 0.15           | 0.15            | 0.16         | 0.12         | 0.14       | 0.16        | 0.09        | 0.09          | 0.09             | 0.16           |                 |                 |
| NYISO Cost of Operations        | 0.65           | 0.65            | 0.66         | 0.65         | 0.66       | 0.67        | 0.67        | 0.66          | 0.66             | 0.63           |                 |                 |
| FERC Fee Recovery               | 0.08           | 0.10            | 0.09         | 0.10         | 0.09       | 0.09        | 0.06        | 0.06          | 0.08             | 0.09           |                 |                 |
| Uplift                          | (0.92)         | (0.50)          | (0.31)       | (0.45)       | 0.05       | 0.30        | (0.13)      | (0.02)        | (0.11)           | (0.30)         |                 |                 |
| Uplift: Local Reliability Share | 0.59           | 0.14            | 0.19         | 0.12         | 0.22       | 0.18        | 0.44        | 0.59          | 0.37             | 0.27           |                 |                 |
| Uplift: Statewide Share         | (1.52)         | (0.64)          | (0.51)       | (0.57)       | (0.17)     | 0.12        | (0.57)      | (0.61)        | (0.48)           | (0.56)         |                 |                 |
| Voltage Support and Black Start | 0.40           | 0.41            | 0.42         | 0.41         | 0.42       | 0.42        | 0.42        | 0.42          | 0.42             | 0.40           |                 |                 |
| <b>Avg Monthly Cost</b>         | 101.54         | 35.87           | 32.45        | 37.74        | 31.70      | 35.73       | 42.12       | 45.01         | 40.76            | 38.00          |                 |                 |
| Avg YTD Cost                    | 101.54         | 72.85           | 60.06        | 54.82        | 50.20      | 47.70       | 46.64       | 46.37         | 45.75            | 45.03          |                 |                 |
| TSA \$ per NYC MWh              | 0.00           | 0.00            | 0.04         | 0.00         | 0.08       | 0.39        | 0.21        | 0.14          | 0.33             | 0.75           |                 |                 |
| <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           | 34.97        | 31.06        | 31.74      | 31.76       | 35.84       | 30.57         | 29.57            | 28.35          | 30.60           | 52.63           |
| NTAC                            | 0.66           | 1.11            | 0.86         | 1.05         | 0.79       | 0.62        | 0.87        | 0.59          | 0.62             | 0.50           | 0.75            | 0.81            |
| Reserve                         | 0.70           | 0.67            | 0.74         | 0.70         | 0.61       | 0.55        | 0.48        | 0.44          | 0.47             | 0.59           | 0.55            | 0.71            |
| Regulation                      | 0.14           | 0.12            | 0.13         | 0.17         | 0.16       | 0.13        | 0.10        | 0.10          | 0.11             | 0.13           | 0.20            | 0.15            |
| NYISO Cost of Operations        | 0.65           | 0.65            | 0.65         | 0.65         | 0.62       | 0.63        | 0.63        | 0.63          | 0.63             | 0.62           | 0.61            | 0.60            |
| FERC Fee Recovery               | 0.09           | 0.10            | 0.10         | 0.12         | 0.10       | 0.09        | 0.07        | 0.08          | 0.09             | 0.10           | 0.10            | 0.08            |
| Uplift                          | (0.73)         | (0.54)          | (0.46)       | 0.12         | 0.10       | (0.37)      | (0.43)      | (0.19)        | (0.34)           | (0.36)         | (0.40)          | (0.68)          |
| Uplift: Local Reliability Share | 0.10           | 0.13            | 0.21         | 0.20         | 0.24       | 0.15        | 0.11        | 0.12          | 0.16             | 0.14           | 0.20            | 0.09            |
| Uplift: Statewide Share         | (0.83)         | (0.67)          | (0.67)       | (0.08)       | (0.13)     | (0.52)      | (0.54)      | (0.31)        | (0.50)           | (0.50)         | (0.60)          | (0.78)          |
| Voltage Support and Black Start | 0.37           | 0.37            | 0.38         | 0.38         | 0.38       | 0.38        | 0.38        | 0.38          | 0.38             | 0.38           | 0.37            | 0.37            |
| <b>Avg Monthly Cost</b>         | 41.96          | 33.44           | 37.38        | 34.26        | 34.52      | 33.80       | 37.94       | 32.60         | 31.54            | 30.31          | 32.79           | 54.67           |
| Avg YTD Cost                    | 41.96          | 38.02           | 37.81        | 37.05        | 36.54      | 36.01       | 36.35       | 35.80         | 35.34            | 34.89          | 34.72           | 36.56           |
| TSA \$ per NYC MWh              | 0.00           | 0.00            | 0.00         | 0.08         | 0.12       | 0.56        | 0.42        | 0.23          | 0.00             | 0.00           | 0.00            | 0.00            |

\* Excludes ICAP payments.  
Market Mitigation and Analysis  
Prepared: 11/7/2018 1:43 PM

# NYISO Dollar Flows - Uplift - OATT Schedule 1 components - Data through October 31, 2018



## NYISO Markets Transactions

| 2018   | January    | February   | March      | April      | May        | June       | July       | August     | September  | October    | November | December |
|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|----------|----------|
| <b>Day Ahead Market MWh</b>                                    | 15,153,751 | 12,643,854 | 13,521,386 | 12,158,686 | 12,721,073 | 13,983,384 | 16,839,994 | 17,195,447 | 14,432,632 | 13,548,828 |          |          |
| DAM LSE Internal LBMP Energy Sales                             | 59%        | 57%        | 58%        | 60%        | 61%        | 61%        | 65%        | 65%        | 61%        | 57%        |          |          |
| DAM External TC LBMP Energy Sales                              | 4%         | 3%         | 2%         | 2%         | 2%         | 1%         | 1%         | 2%         | 3%         | 6%         |          |          |
| DAM Bilateral - Internal Bilaterals                            | 29%        | 31%        | 32%        | 30%        | 29%        | 30%        | 26%        | 25%        | 28%        | 29%        |          |          |
| DAM Bilateral - Import/Non-LBMP Market Bilaterals              | 5%         | 5%         | 5%         | 5%         | 5%         | 5%         | 4%         | 4%         | 5%         | 5%         |          |          |
| DAM Bilateral - Export/Non-LBMP Market Bilaterals              | 2%         | 2%         | 2%         | 2%         | 2%         | 1%         | 1%         | 1%         | 1%         | 2%         |          |          |
| DAM Bilateral - Wheel Through Bilaterals                       | 1%         | 2%         | 2%         | 2%         | 2%         | 2%         | 2%         | 2%         | 2%         | 1%         |          |          |
| <b>Balancing Energy Market MWh</b>                             | -149,619   | -299,377   | -386,811   | -72,862    | -29,539    | -354,112   | -80,438    | -44,732    | -210,436   | -314,885   |          |          |
| Balancing Energy LSE Internal LBMP Energy Sales                | -147%      | -101%      | -128%      | -208%      | -458%      | -113%      | -123%      | -75%       | -82%       | -105%      |          |          |
| Balancing Energy External TC LBMP Energy Sales                 | 74%        | 24%        | 37%        | 189%       | 564%       | 29%        | 129%       | 209%       | 14%        | 30%        |          |          |
| Balancing Energy Bilateral - Internal Bilaterals               | 9%         | 5%         | 0%         | -11%       | 29%        | 5%         | 18%        | 23%        | 7%         | 2%         |          |          |
| Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals | 0%         | 0%         | 0%         | 0%         | 0%         | 0%         | 0%         | 0%         | 0%         | 0%         |          |          |
| Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals | 22%        | 9%         | 6%         | 34%        | 51%        | 3%         | 14%        | 25%        | 3%         | 0%         |          |          |
| Balancing Energy Bilateral - Wheel Through Bilaterals          | -58%       | -36%       | -15%       | -103%      | -287%      | -23%       | -138%      | -281%      | -42%       | -27%       |          |          |
| <b>Transactions Summary</b>                                    |            |            |            |            |            |            |            |            |            |            |          |          |
| LBMP   | 63%        | 59%        | 59%        | 62%        | 63%        | 61%        | 66%        | 68%        | 64%        | 63%        |          |          |
| Internal Bilaterals  | 30%        | 32%        | 33%        | 30%        | 29%        | 31%        | 27%        | 25%        | 28%        | 30%        |          |          |
| Import Bilaterals  | 5%         | 5%         | 6%         | 5%         | 5%         | 5%         | 4%         | 4%         | 5%         | 5%         |          |          |
| Export Bilaterals  | 2%         | 2%         | 2%         | 2%         | 2%         | 1%         | 1%         | 1%         | 1%         | 2%         |          |          |
| Wheels Through   | 1%         | 1%         | 1%         | 1%         | 1%         | 2%         | 1%         | 1%         | 2%         | 1%         |          |          |
| <b>Market Share of Total Load</b>                              |            |            |            |            |            |            |            |            |            |            |          |          |
| Day Ahead Market   | 101.0%     | 102.4%     | 102.9%     | 100.6%     | 100.2%     | 102.6%     | 100.5%     | 100.3%     | 101.5%     | 102.4%     |          |          |
| Balancing Energy +   | -1.0%      | -2.4%      | -2.9%      | -0.6%      | -0.2%      | -2.6%      | -0.5%      | -0.3%      | -1.5%      | -2.4%      |          |          |
| Total MWh  | 15,004,132 | 12,344,477 | 13,134,575 | 12,085,824 | 12,691,534 | 13,629,272 | 16,759,556 | 17,150,715 | 14,222,196 | 13,233,943 |          |          |
| Average Daily Energy Sendout/Month GWh                         | 463        | 426        | 413        | 390        | 397        | 445        | 529        | 537        | 458        | 399        |          |          |

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

+ Balancing Energy: Load(MW) purchased at Real Time LBMP.

\* The signs for the detail section intuitively reflect the direction of power flow eliminating the use of double negatives when Balancing Energy is negative.

Notes: Percent totals may not equal 100% due to rounding.

Virtual Transactions are not reflected in this chart.

### NYISO Markets 2018 Energy Statistics

|  | <u>January</u> | <u>February</u> | <u>March</u> | <u>April</u> | <u>May</u> | <u>June</u> | <u>July</u> | <u>August</u> | <u>September</u> | <u>October</u> | <u>November</u> | <u>December</u> |
|--|----------------|-----------------|--------------|--------------|------------|-------------|-------------|---------------|------------------|----------------|-----------------|-----------------|
| <b><u>DAY AHEAD LBMP</u></b>           |                |                 |              |              |            |             |             |               |                  |                |                 |                 |
| Price *                                | \$83.53        | \$30.37         | \$27.37      | \$32.40      | \$25.97    | \$28.41     | \$35.73     | \$38.00       | \$33.28          | \$33.27        |                 |                 |
| Standard Deviation                     | \$58.94        | \$12.38         | \$6.34       | \$9.06       | \$9.22     | \$11.42     | \$15.25     | \$16.51       | \$12.01          | \$9.24         |                 |                 |
| Load Weighted Price **                 | \$88.42        | \$31.44         | \$27.95      | \$33.14      | \$27.26    | \$30.27     | \$38.14     | \$40.64       | \$35.33          | \$34.33        |                 |                 |
| <b><u>RTC LBMP</u></b>                 |                |                 |              |              |            |             |             |               |                  |                |                 |                 |
| Price *                                | \$81.65        | \$27.73         | \$25.99      | \$30.80      | \$25.40    | \$26.06     | \$34.65     | \$38.13       | \$39.52          | \$30.92        |                 |                 |
| Standard Deviation                     | \$60.83        | \$11.96         | \$8.99       | \$14.30      | \$20.37    | \$12.78     | \$17.44     | \$20.05       | \$61.50          | \$13.43        |                 |                 |
| Load Weighted Price **                 | \$85.85        | \$28.54         | \$26.46      | \$31.47      | \$27.08    | \$27.35     | \$36.93     | \$40.40       | \$43.83          | \$31.55        |                 |                 |
| <b><u>REAL TIME LBMP</u></b>           |                |                 |              |              |            |             |             |               |                  |                |                 |                 |
| Price *                                | \$87.94        | \$28.50         | \$26.49      | \$34.53      | \$25.57    | \$26.31     | \$34.34     | \$38.07       | \$38.15          | \$33.88        |                 |                 |
| Standard Deviation                     | \$87.41        | \$17.36         | \$12.25      | \$26.57      | \$23.49    | \$24.34     | \$18.44     | \$27.21       | \$46.81          | \$37.42        |                 |                 |
| Load Weighted Price **                 | \$93.59        | \$29.49         | \$27.09      | \$35.72      | \$27.47    | \$28.38     | \$36.84     | \$40.87       | \$42.87          | \$34.94        |                 |                 |
| Average Daily Energy Sendout/Month GWh | 463            | 426             | 413          | 390          | 397        | 445         | 529         | 537           | 458              | 399            |                 |                 |

### NYISO Markets 2017 Energy Statistics

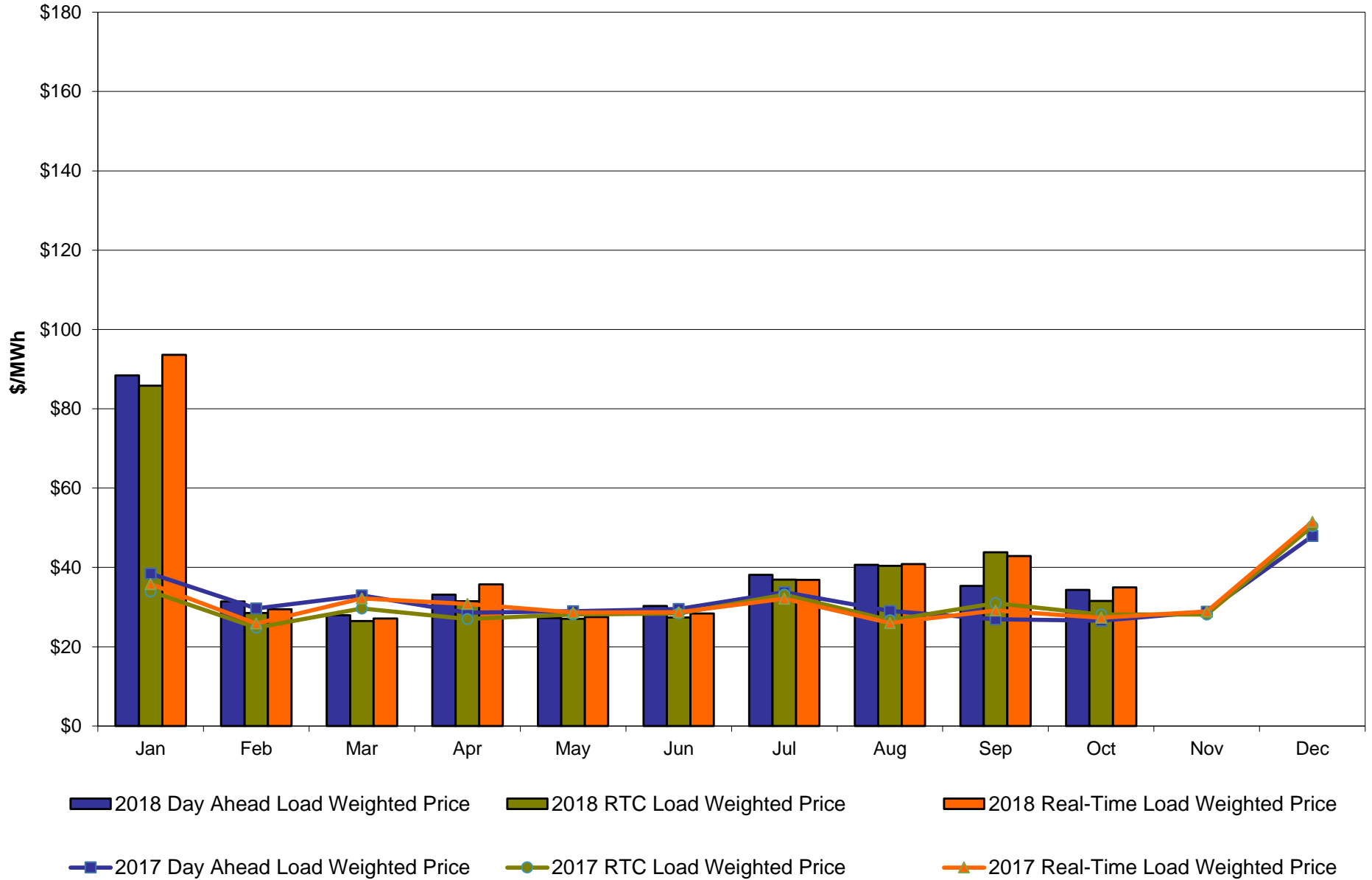
|  | <u>January</u> | <u>February</u> | <u>March</u> | <u>April</u> | <u>May</u> | <u>June</u> | <u>July</u> | <u>August</u> | <u>September</u> | <u>October</u> | <u>November</u> | <u>December</u> |
|--|----------------|-----------------|--------------|--------------|------------|-------------|-------------|---------------|------------------|----------------|---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

\* Average zonal load weighted prices.

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



## NYISO Monthly Average Internal LBMPs 2017- 2018

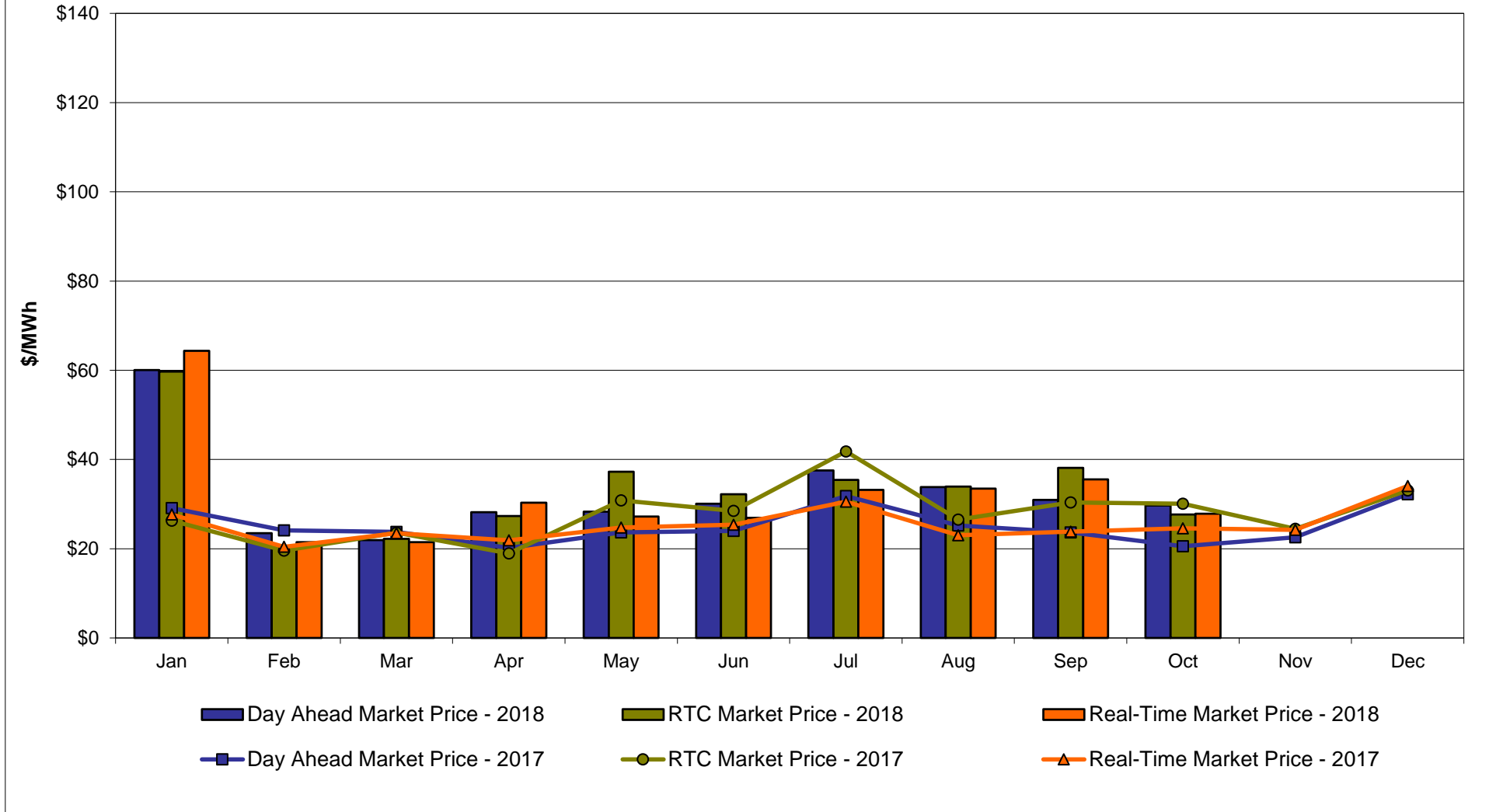


**October 2018 Zonal LBMP Statistics for NYISO (\$/MWh)**

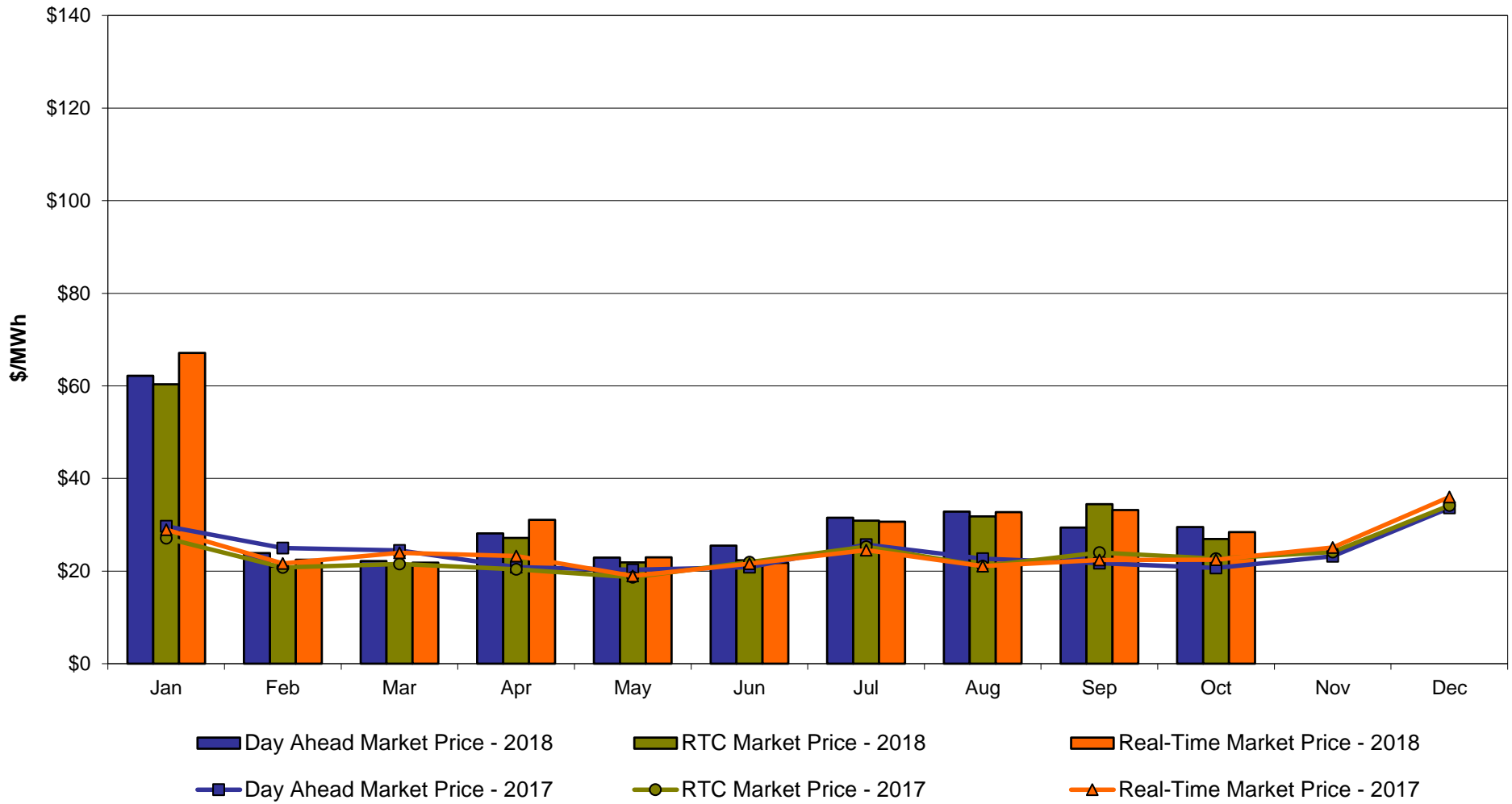
|                       | <u>WEST<br/>Zone A</u>             | <u>GENESEE<br/>Zone B</u>                      | <u>NORTH<br/>Zone D</u>                                | <u>CENTRAL<br/>Zone C</u> | <u>MOHAWK<br/>VALLEY<br/>Zone E</u> | <u>CAPITAL<br/>Zone F</u>                                  | <u>HUDSON<br/>VALLEY<br/>Zone G</u>                     | <u>MILLWOOD<br/>Zone H</u>               | <u>DUNWOODIE<br/>Zone I</u>                 | <u>NEW YORK<br/>CITY<br/>Zone J</u>     | <u>LONG<br/>ISLAND<br/>Zone K</u>         |
|-----------------------|------------------------------------|--|--|---------------------------|-------------------------------------|--|---|--|---|---|---|
| <b>DAY AHEAD LBMP</b> |                                    |  |  |                           |                                     |  |   |  |   |   |   |
| Unweighted Price *    | 29.66                              | 28.80  | 17.82  | 29.50                     | 29.07                               | 34.11  | 33.41   | 33.74                                    | 33.80                                       | 34.70                                   | 41.80                                     |
| Standard Deviation    | 10.52                              | 9.71   | 8.29   | 9.85                      | 9.76                                | 8.13   | 8.62  | 8.74                                     | 8.80  | 9.19                                    | 11.86                                     |
| <b>RTC LBMP</b>       |                                    |  |  |                           |                                     |  |   |  |   |   |   |
| Unweighted Price *    | 27.67                              | 26.16  | 18.77  | 26.92                     | 26.83                               | 31.85  | 30.42   | 31.40                                    | 31.87                                       | 32.40                                   | 38.74                                     |
| Standard Deviation    | 18.97                              | 13.62  | 16.59  | 13.72                     | 13.74                               | 12.24  | 12.71   | 12.31                                    | 14.15                                       | 15.43                                   | 27.85                                     |
| <b>REAL TIME LBMP</b> |                                    |  |  |                           |                                     |  |   |  |   |   |   |
| Unweighted Price *    | 27.84                              | 27.88  | 19.59  | 28.45                     | 28.37                               | 35.13  | 32.25   | 34.74                                    | 35.95                                       | 37.30                                   | 41.14                                     |
| Standard Deviation    | 31.10                              | 31.28  | 32.26  | 31.43                     | 31.62                               | 38.37  | 33.79   | 38.57                                    | 48.50                                       | 48.11                                   | 49.06                                     |
|                       | <u>ONTARIO<br/>IESO<br/>Zone O</u> | <u>HYDRO<br/>QUEBEC<br/>(Wheel)<br/>Zone M</u> | <u>HYDRO<br/>QUEBEC<br/>(Import/Export)<br/>Zone M</u> | <u>PJM<br/>Zone P</u>     | <u>NEW<br/>ENGLAND<br/>Zone N</u>   | <u>CROSS<br/>SOUND<br/>CABLE<br/>Controllable<br/>Line</u> | <u>NORTHPORT-<br/>NORWALK<br/>Controllable<br/>Line</u> | <u>NEPTUNE<br/>Controllable<br/>Line</u> | <u>LINDEN VFT<br/>Controllable<br/>Line</u> | <u>HUDSON<br/>Controllable<br/>Line</u> | <u>Dennison<br/>Controllable<br/>Line</u> |
| <b>DAY AHEAD LBMP</b> |                                    |  |  |                           |                                     |  |   |  |   |   |   |
| Unweighted Price *    | 25.19                              | 24.37  | 24.37  | 30.99                     | 36.06                               | 40.86  | 39.36   | 37.43                                    | 34.18                                       | 34.41                                   | 17.27                                     |
| Standard Deviation    | 8.59                               | 10.16  | 10.16  | 8.86                      | 8.70                                | 11.09  | 9.55  | 9.78                                     | 8.99  | 9.12                                    | 7.99                                      |
| <b>RTC LBMP</b>       |                                    |  |  |                           |                                     |  |   |  |   |   |   |
| Unweighted Price *    | 24.74                              | 23.83  | 23.83  | 27.52                     | 34.74                               | 37.54  | 37.21   | 34.64                                    | 28.60                                       | 32.68                                   | 19.72                                     |
| Standard Deviation    | 9.81                               | 12.18  | 12.18  | 10.93                     | 11.96                               | 25.86  | 25.75   | 16.88                                    | 36.74                                       | 11.07                                   | 17.01                                     |
| <b>REAL TIME LBMP</b> |                                    |  |  |                           |                                     |  |   |  |   |   |   |
| Unweighted Price *    | 26.56                              | 24.76  | 24.76  | 28.00                     | 36.68                               | 40.59  | 39.84   | 38.08                                    | 22.03                                       | 37.36                                   | 20.65                                     |
| Standard Deviation    | 30.45                              | 28.91  | 28.91  | 29.63                     | 35.36                               | 49.06  | 48.88   | 44.69                                    | 86.01                                       | 45.41                                   | 32.68                                     |

\* Straight LBMP averages

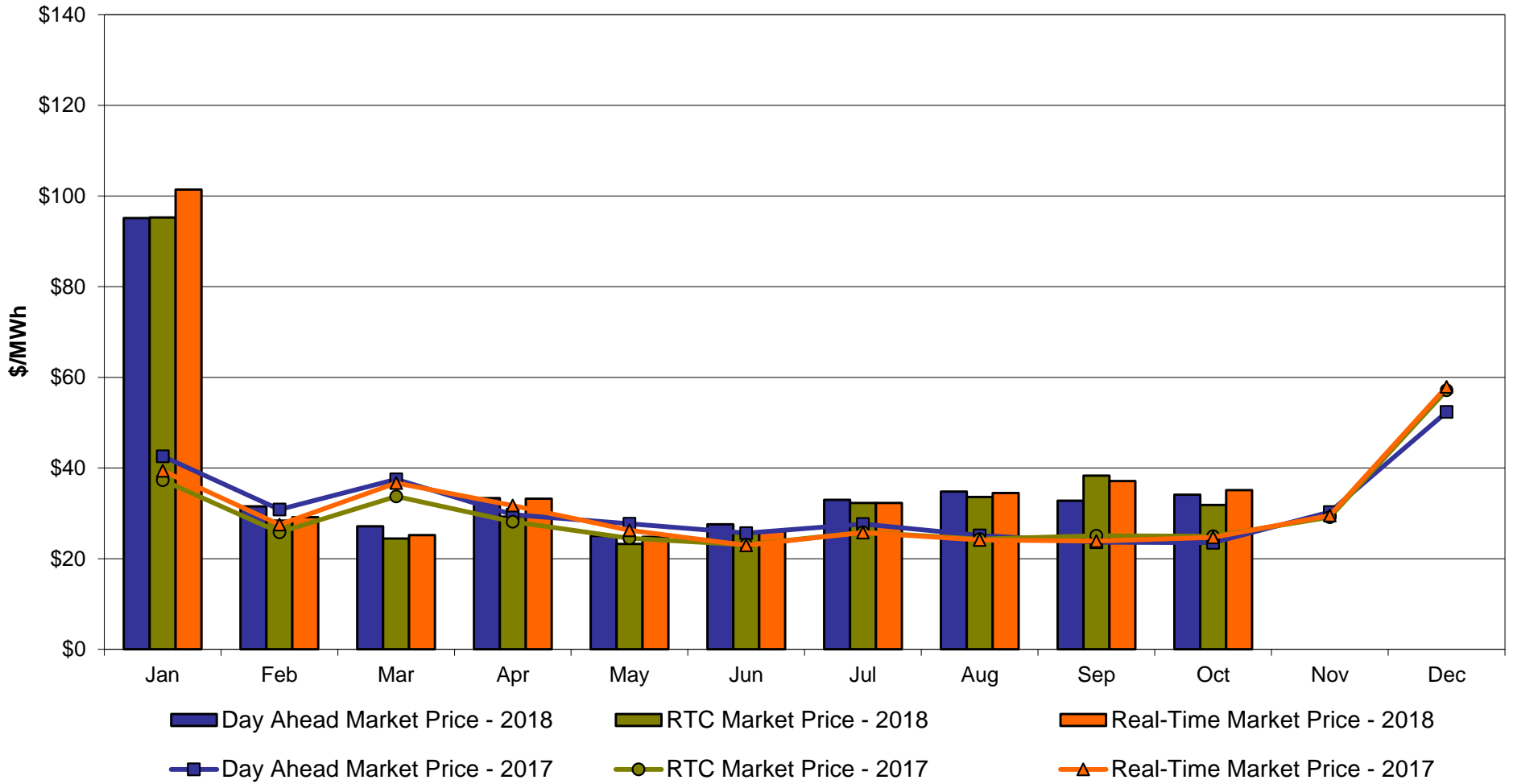
**West Zone A**  
**Monthly Average LBMP Prices 2017 - 2018**



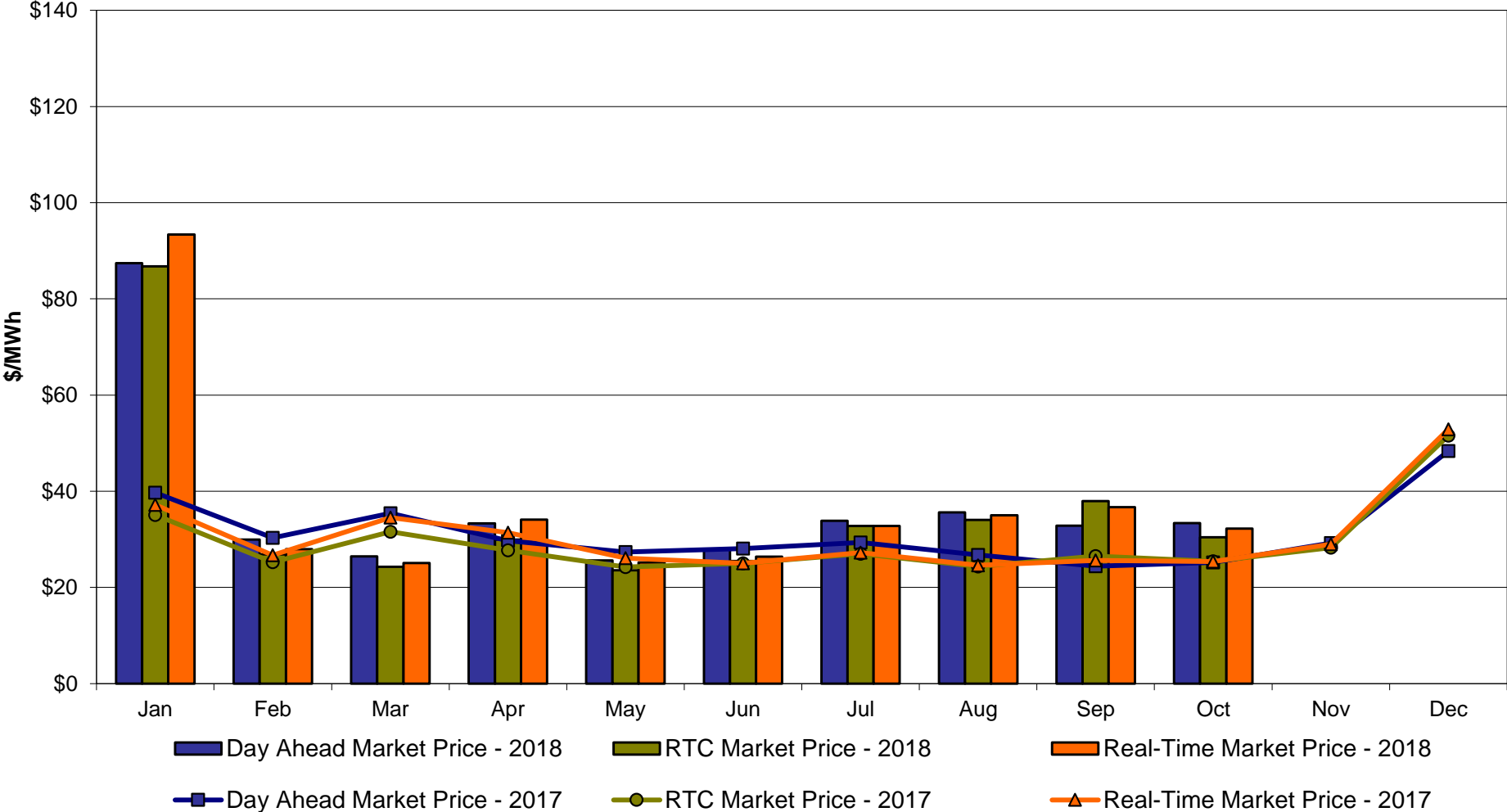
**Central Zone C  
Monthly Average LBMP Prices 2017 - 2018**



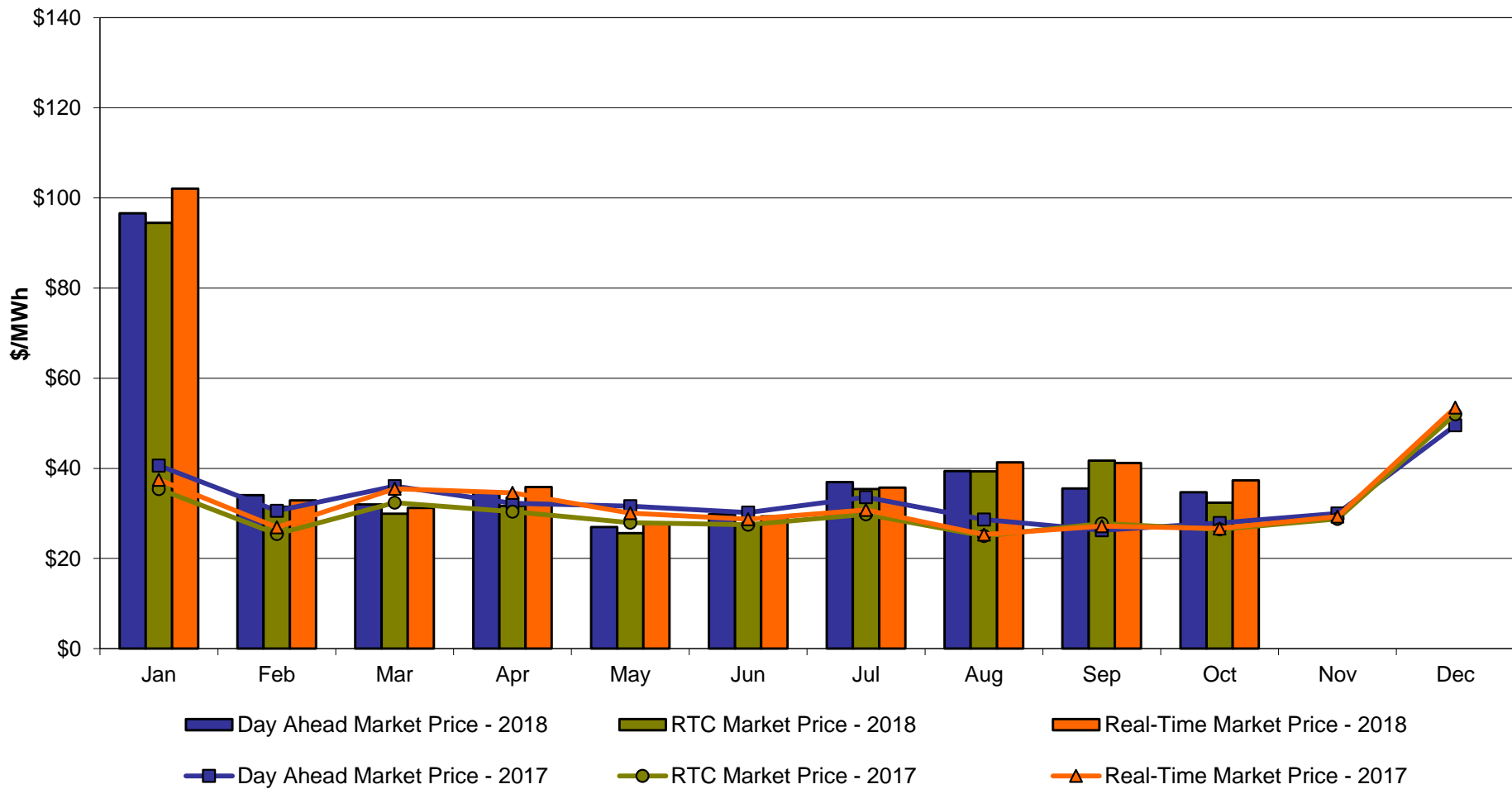
## Capital Zone F Monthly Average LBMP Prices 2017 - 2018



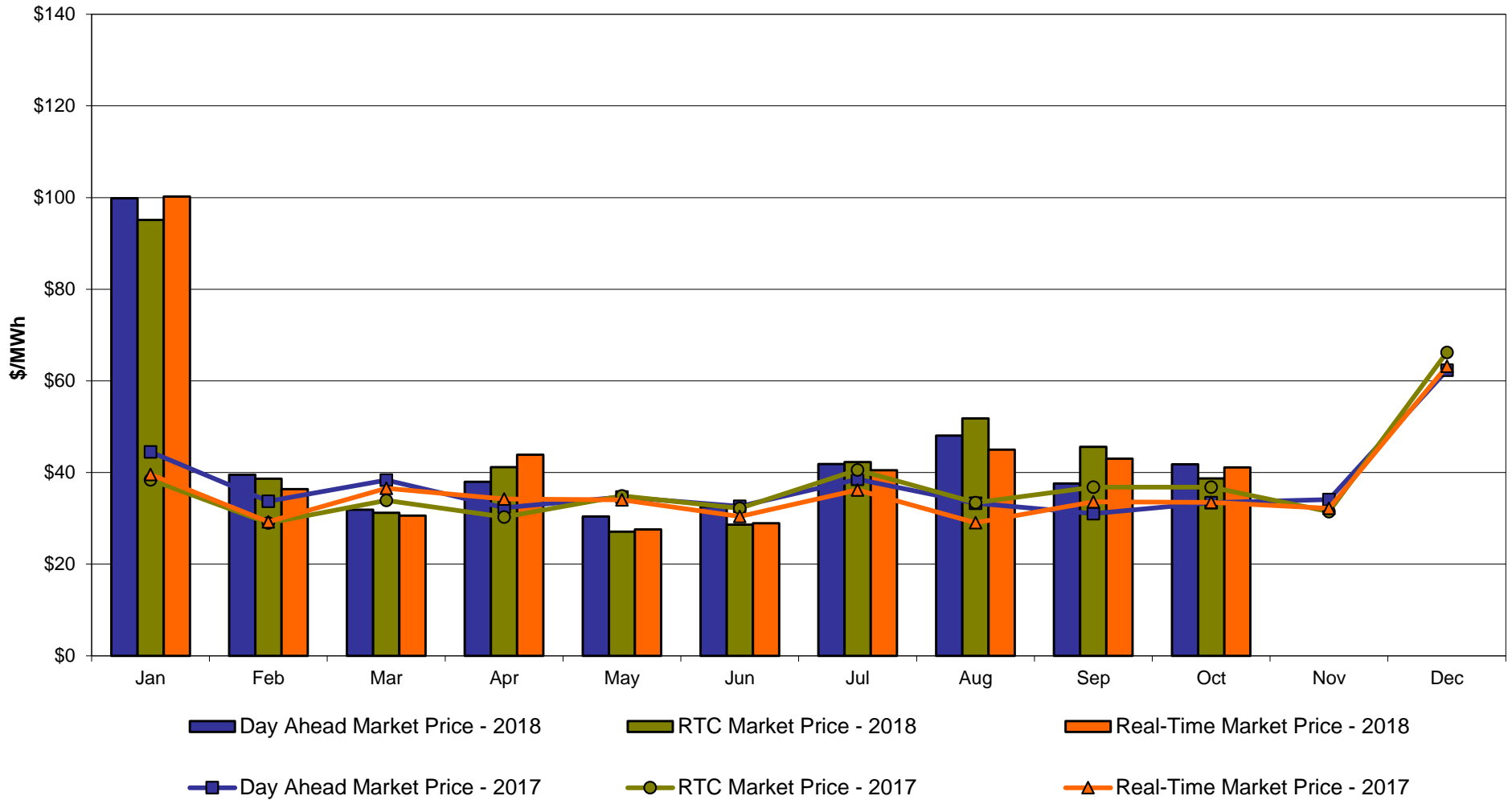
### Hudson Valley Zone G Monthly Average LBMP Prices 2017 - 2018



## NYC Zone J Monthly Average LBMP Prices 2017 - 2018

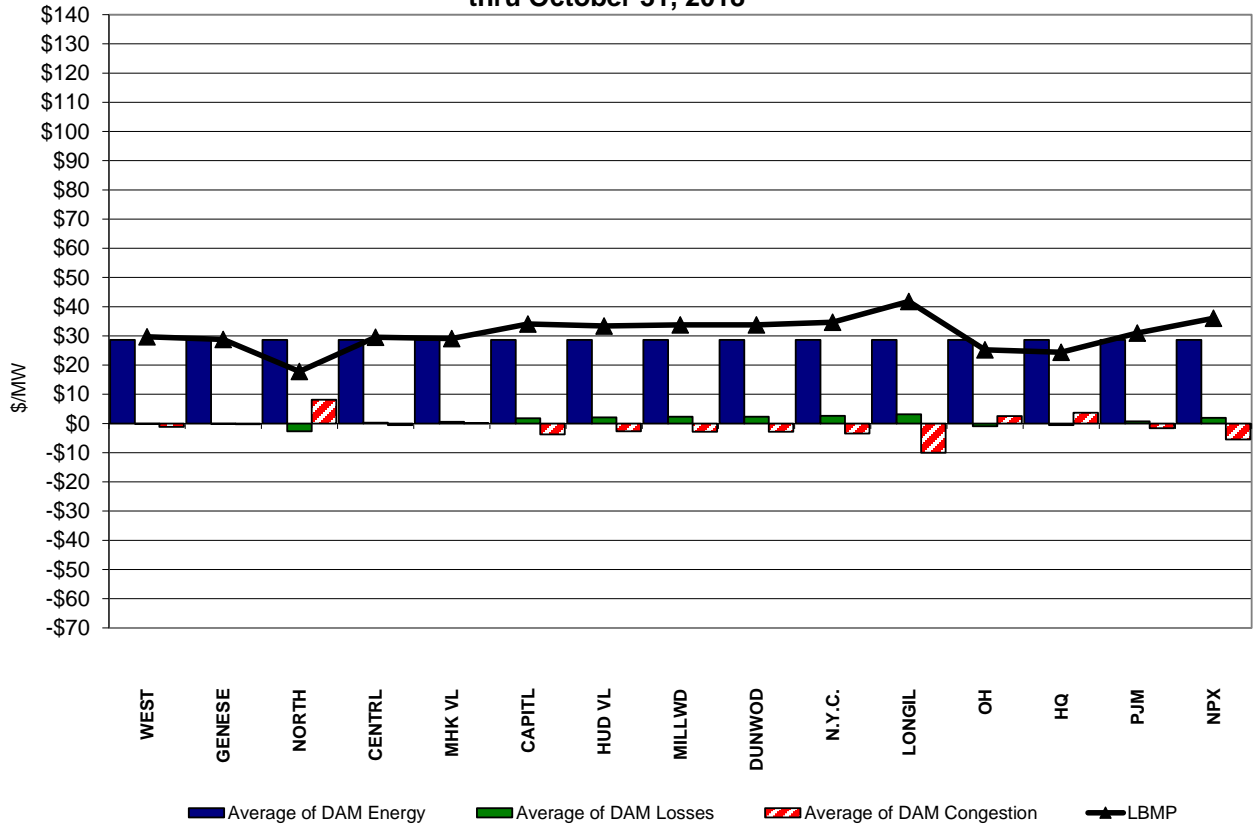


## Long Island Zone K Monthly Average LBMP Prices 2017 - 2018

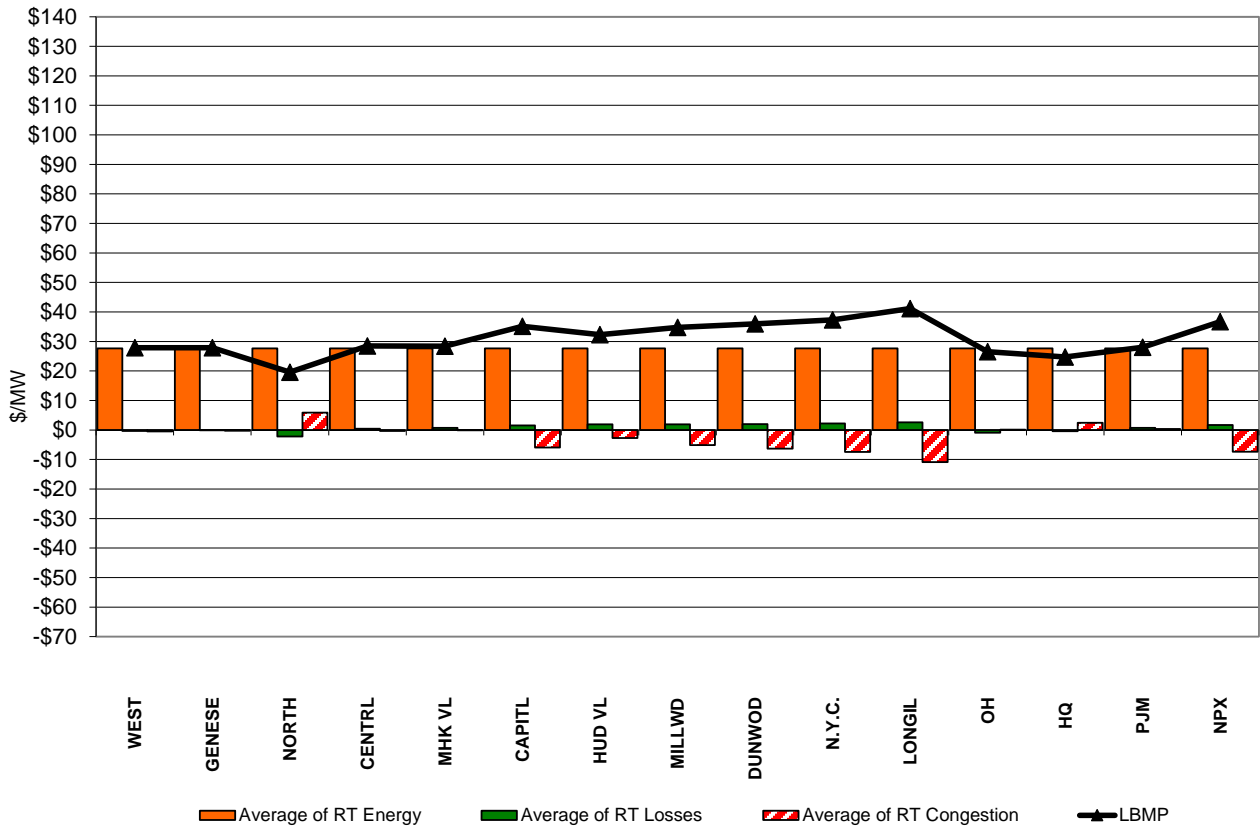




**DAM Zonal Unweighted Monthly Average LBMP Components  
thru October 31, 2018**

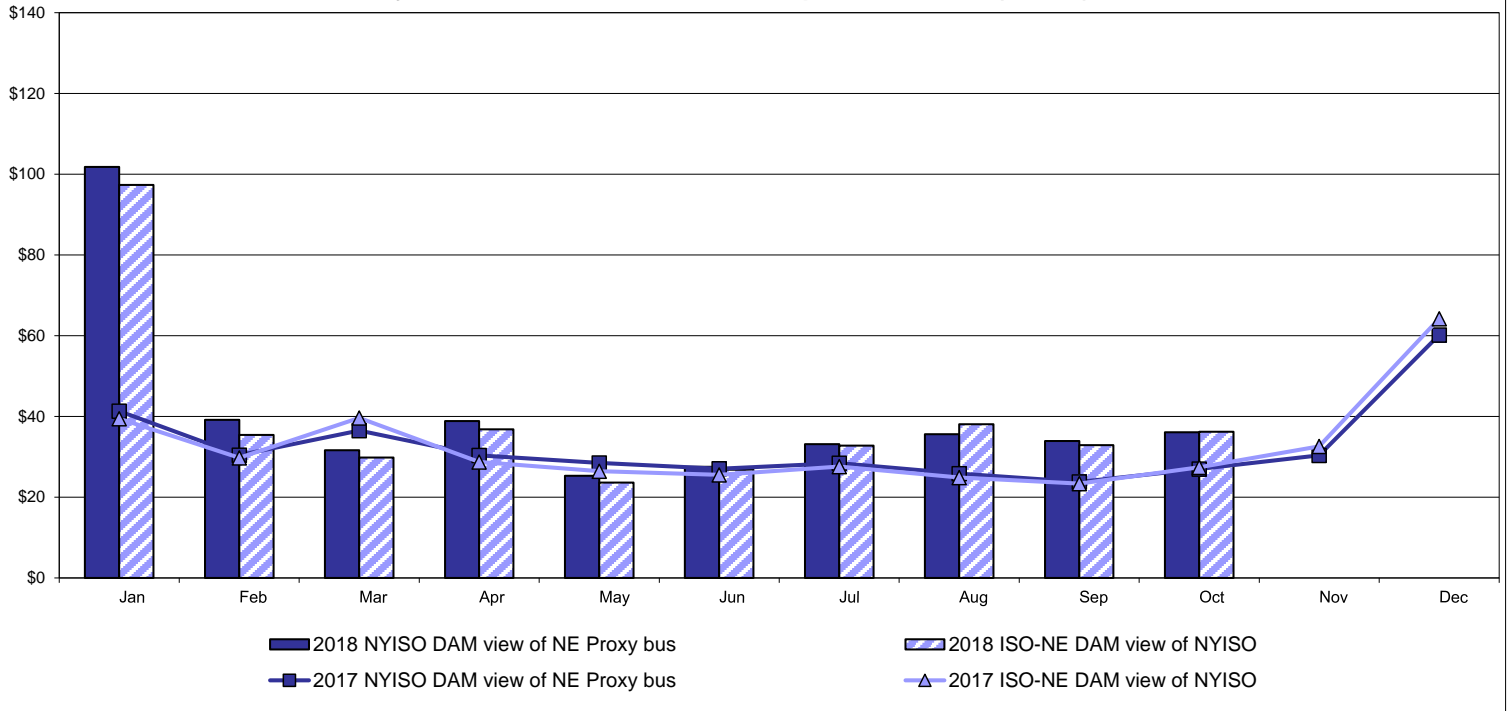


**RT Zonal Unweighted Monthly Average LBMP Components  
thru October 31, 2018**

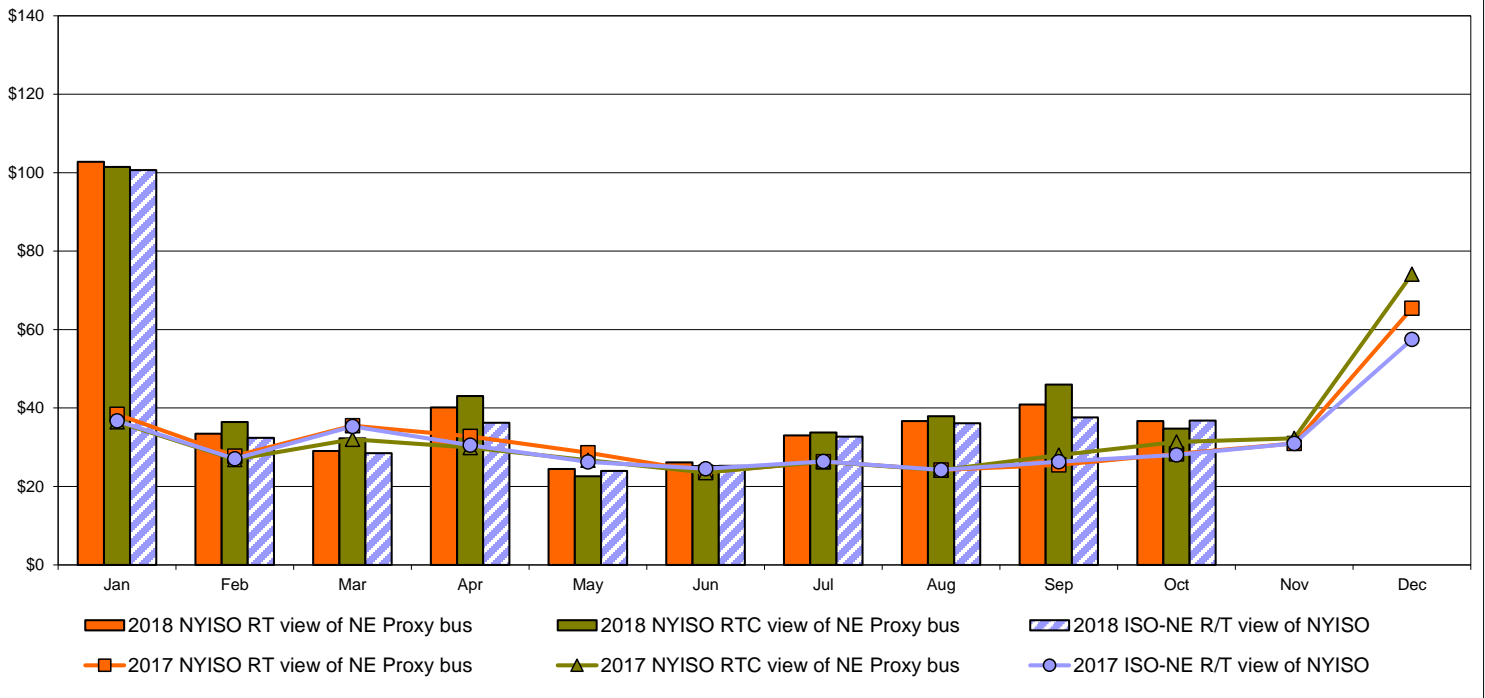


# External Comparison ISO-New England

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

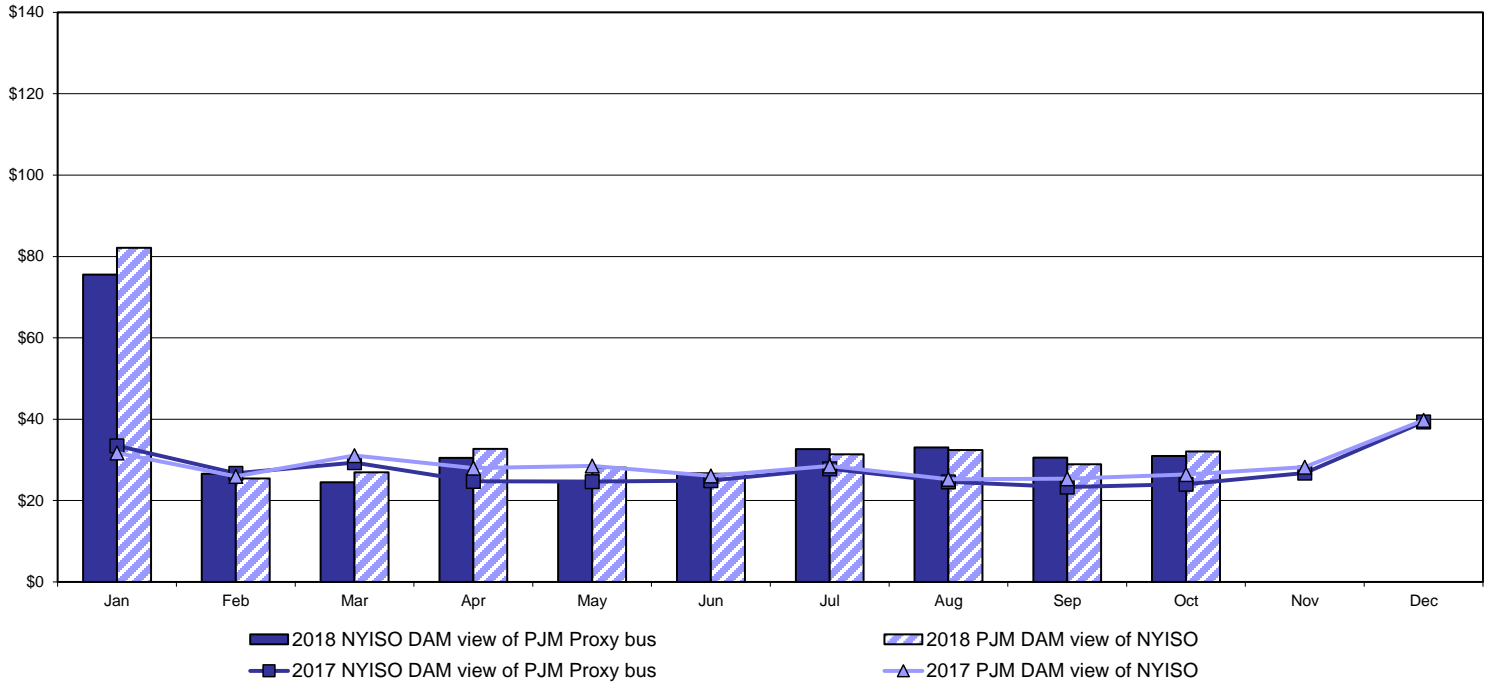


## Real Time Market External Zone Comparison: ISO-NE (\$/MWh)

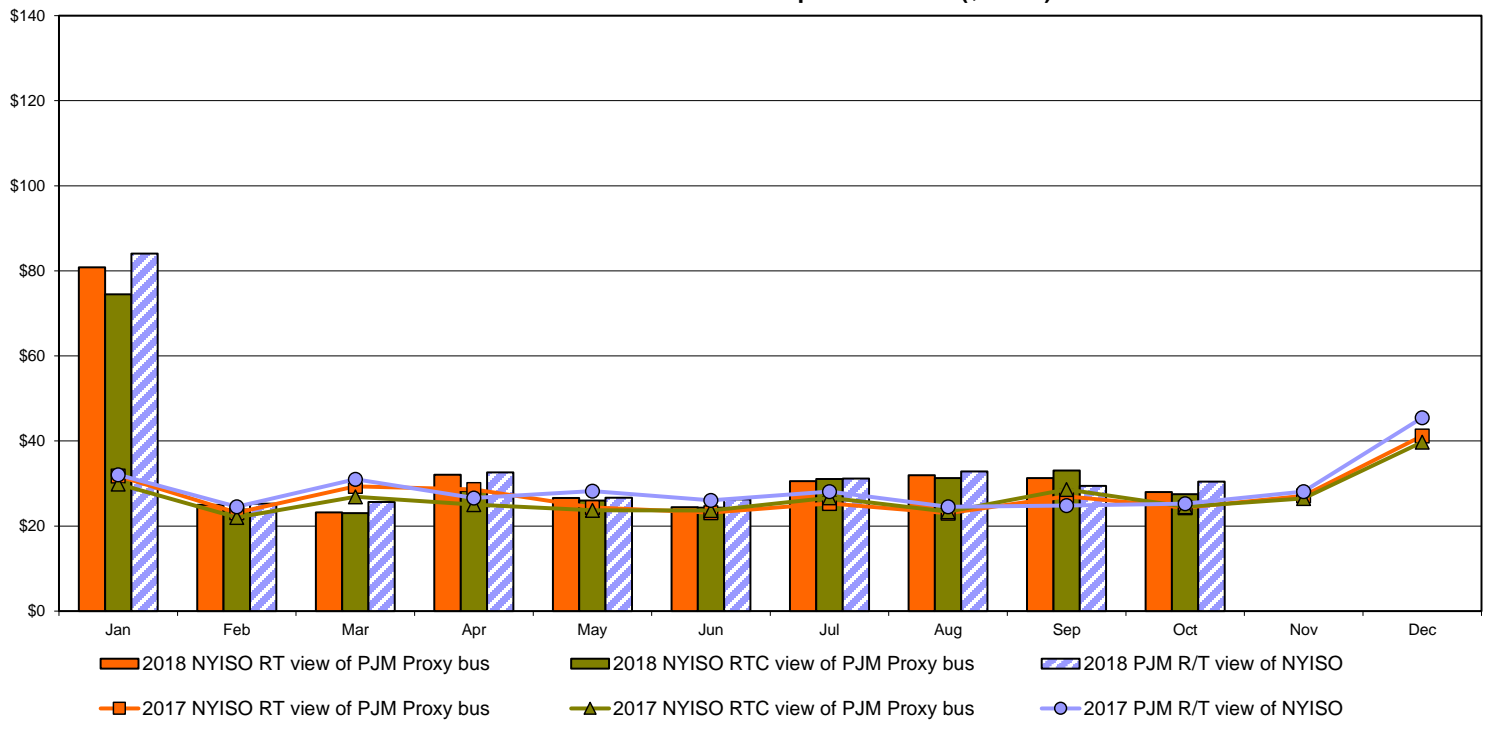


# External Comparison PJM

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

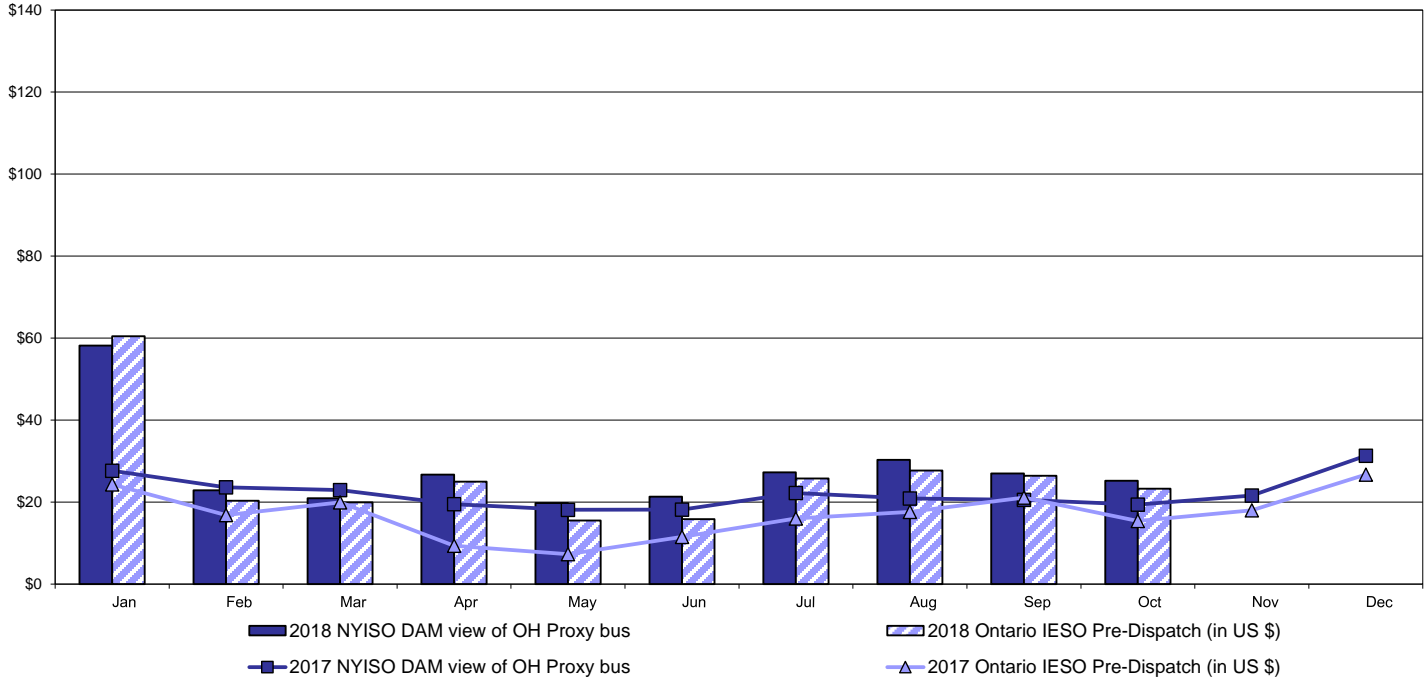


## Real Time Market External Zone Comparison - PJM (\$/MWh)

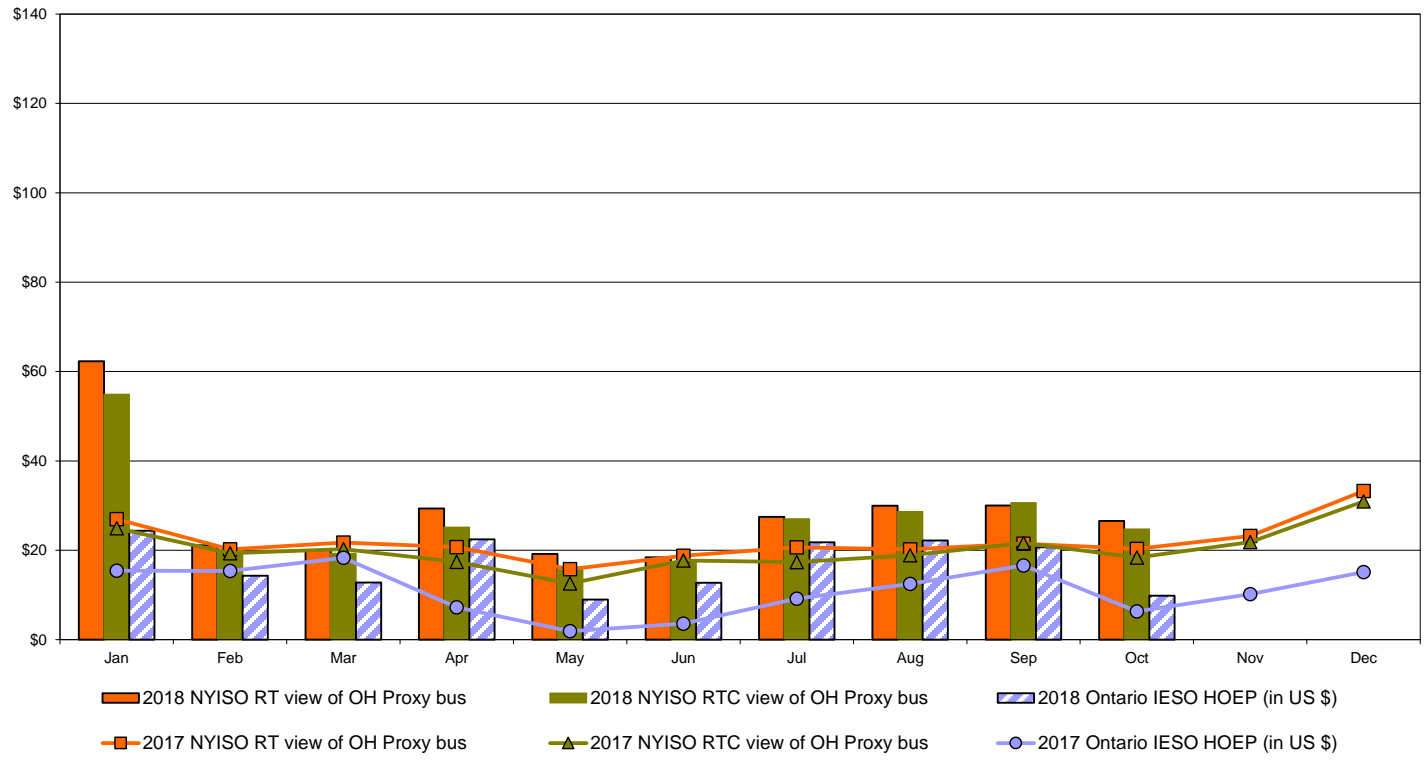


# External Comparison Ontario IESO

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

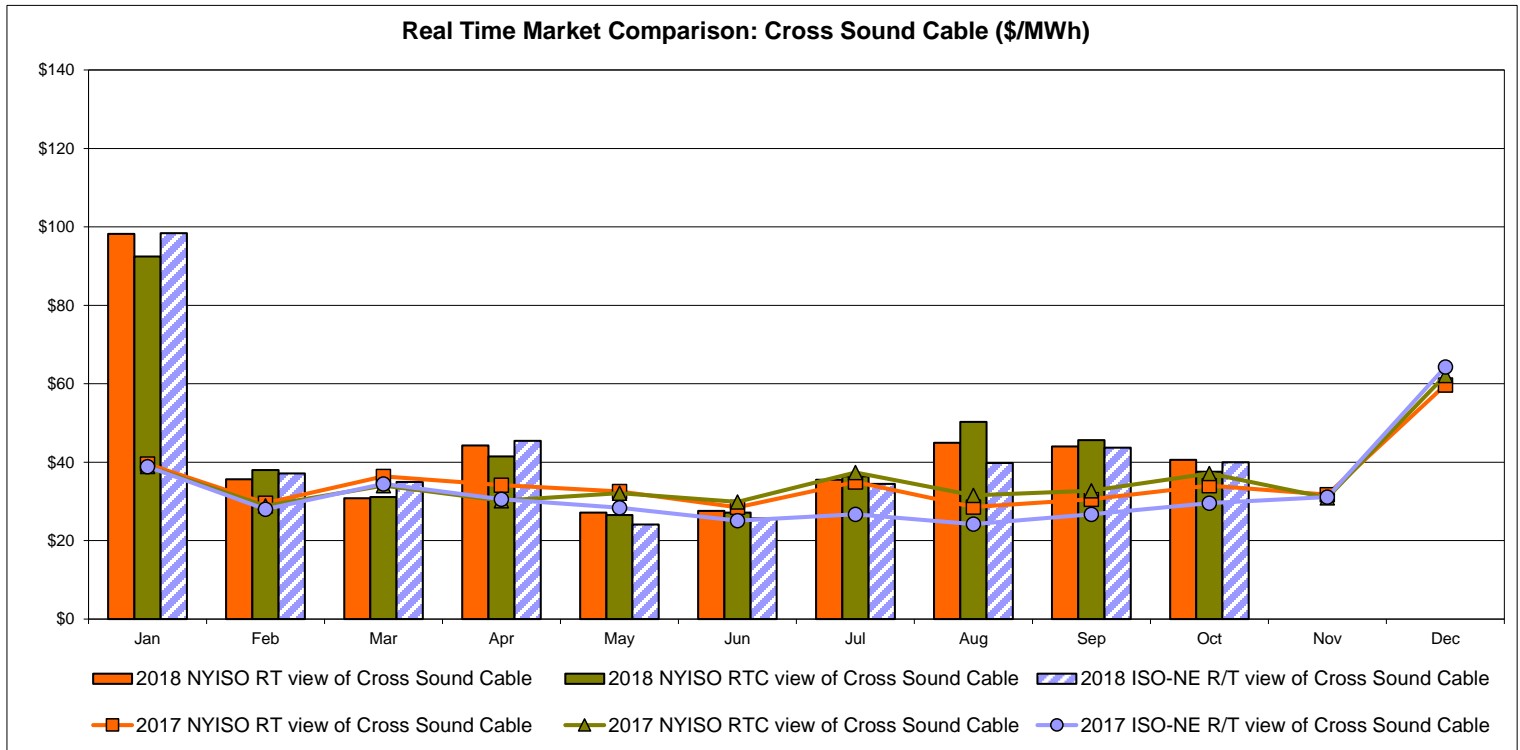
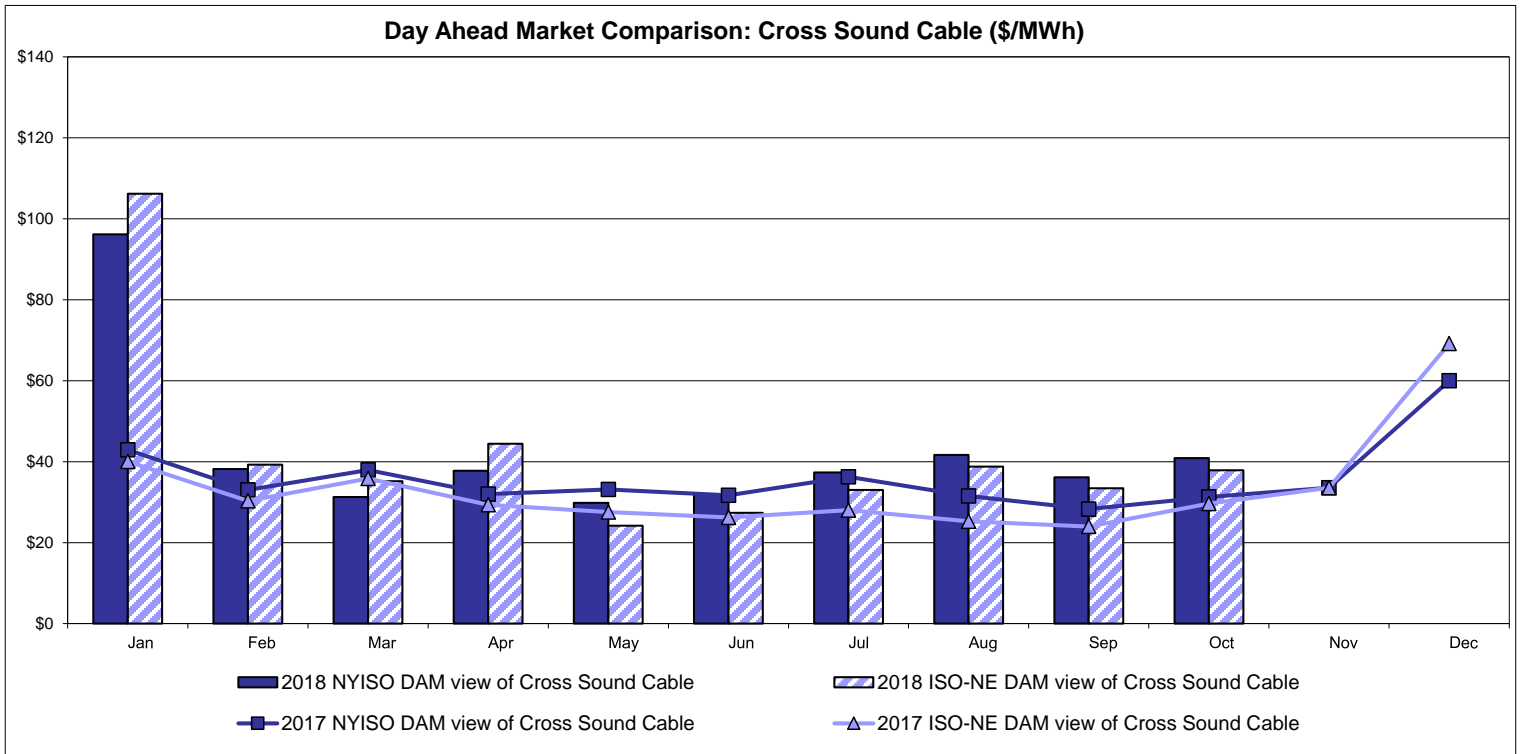


## Real Time Market External Zone Comparison - Ontario IESO (\$/MWh)



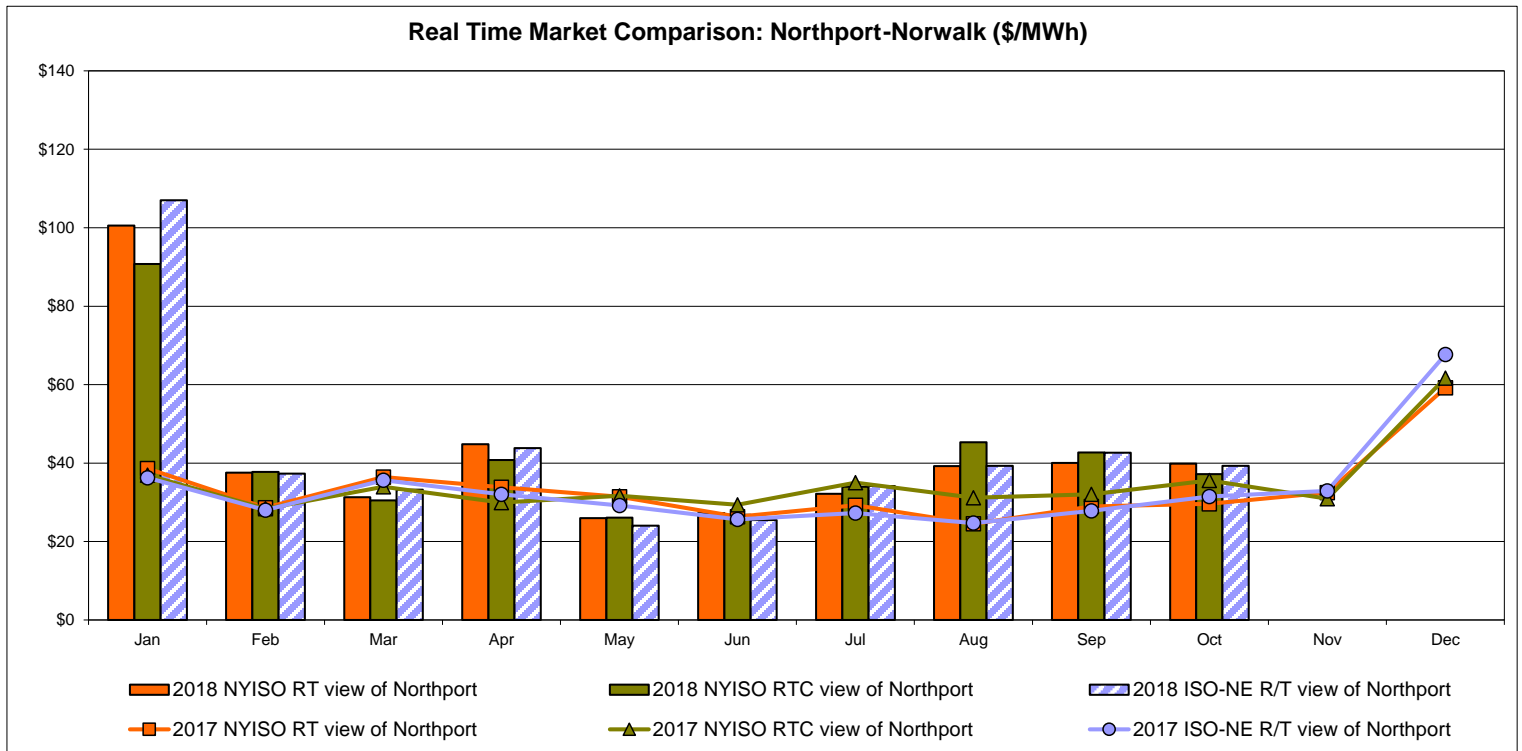
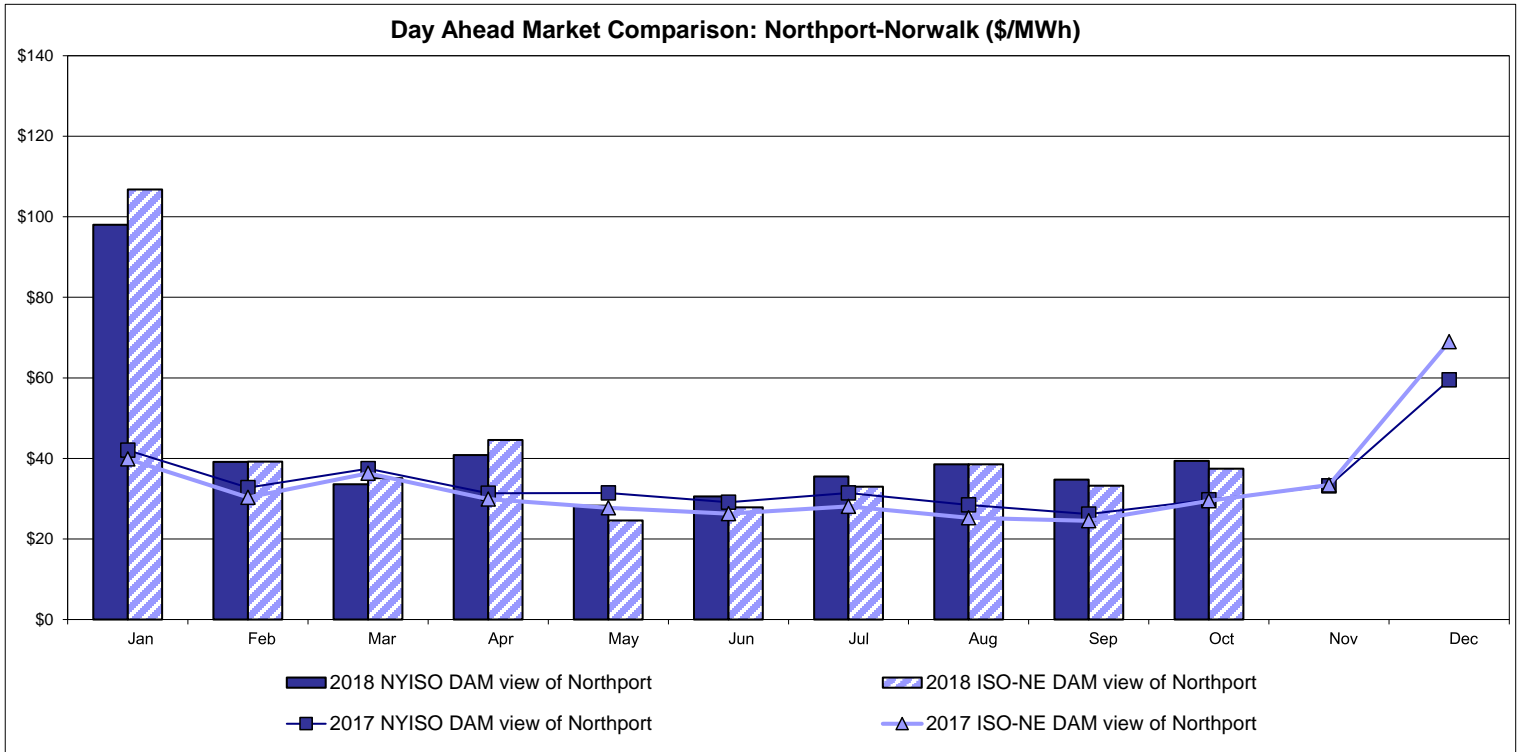
Notes: Exchange factor used for October 2018 was 0.768994155644417 to US  
 HOEP: Hourly Ontario Energy Price  
 Pre-Dispatch: Projected Energy Price

# 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.

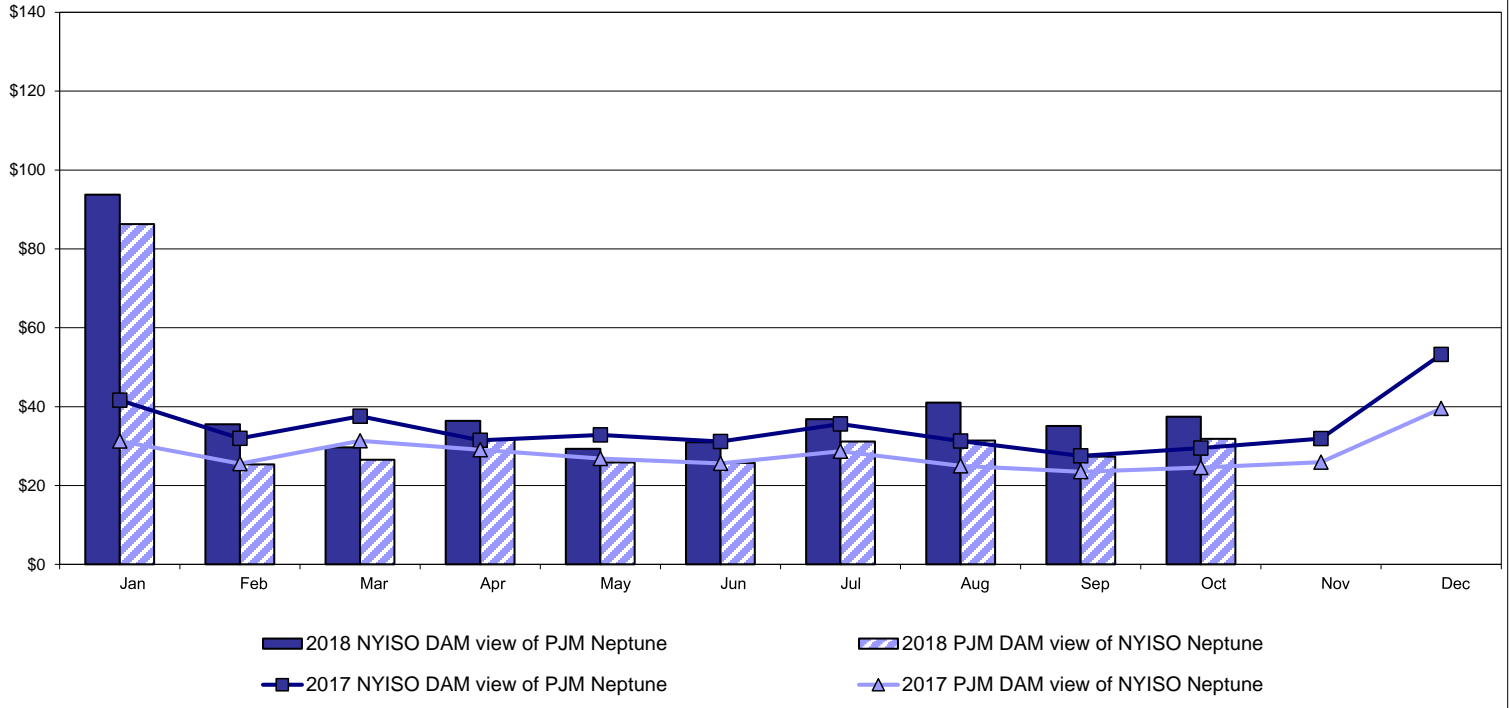
# External Controllable Line: Northport - Norwalk (New England)



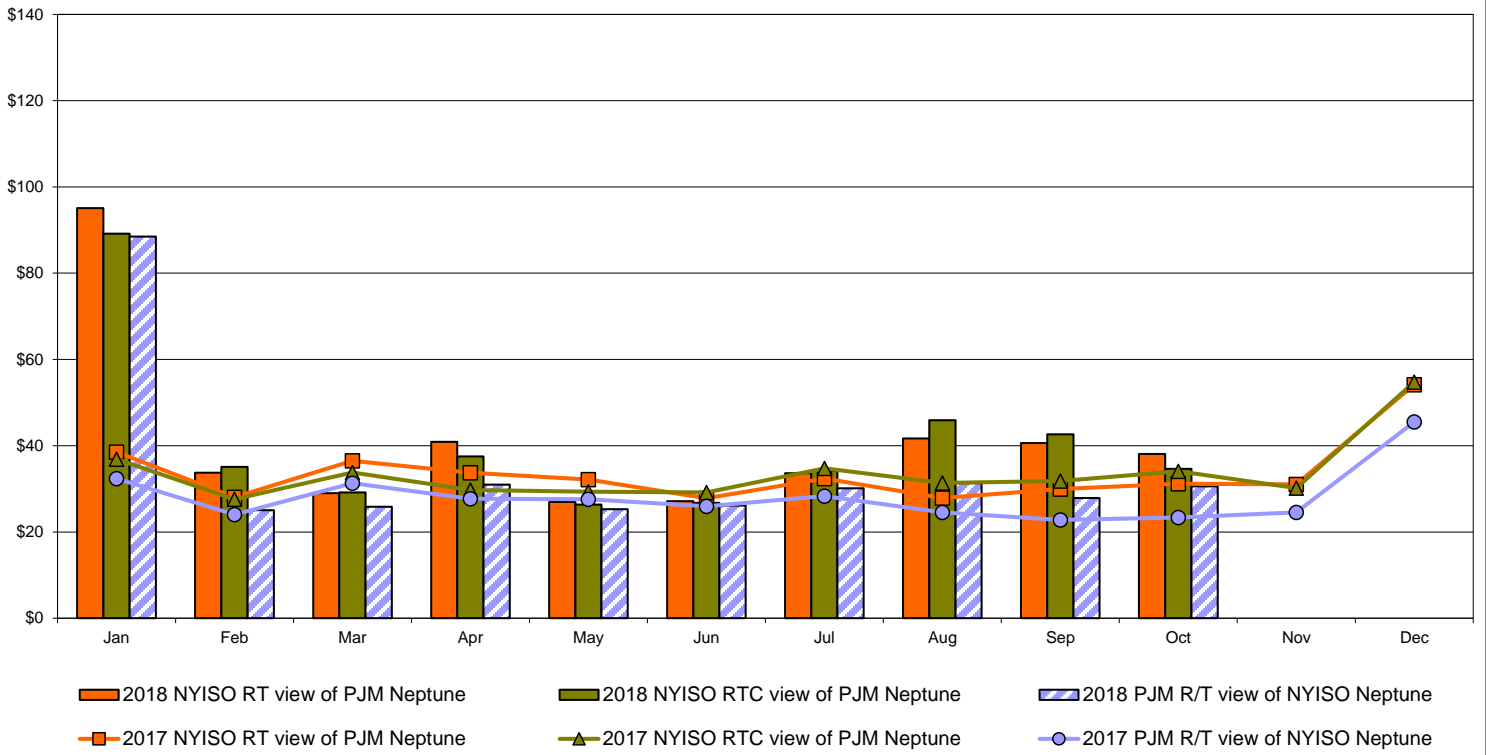
Note:  
 ISO-NE Forecast is an advisory posting @ 18:00 day before.  
 The DAM and R/T prices at the Northport 138 interface are used for ISO-NE.  
 The DAM and R/T prices at the 1385 interface are used for NYISO.

# External Controllable Line: Neptune (PJM)

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

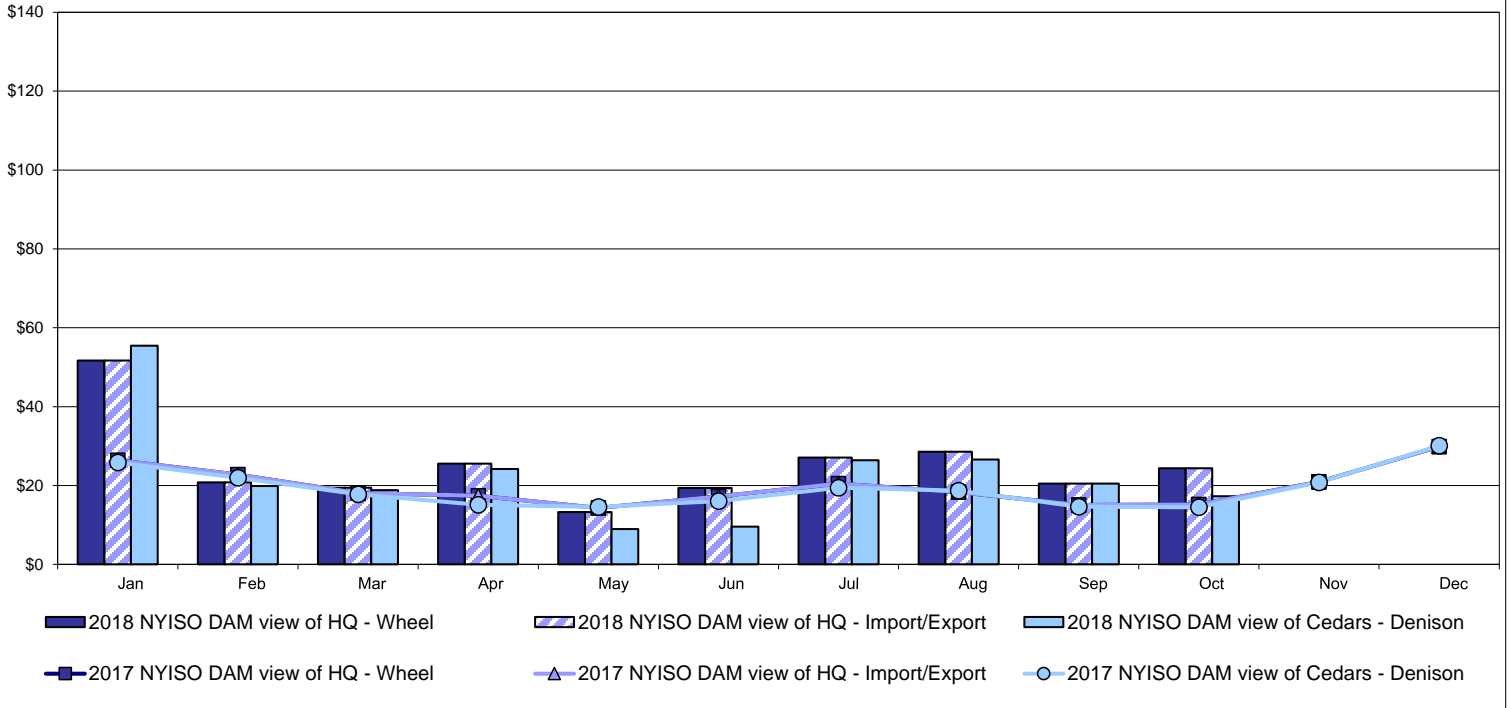


## Real Time Market Comparison: Neptune (\$/MWh)

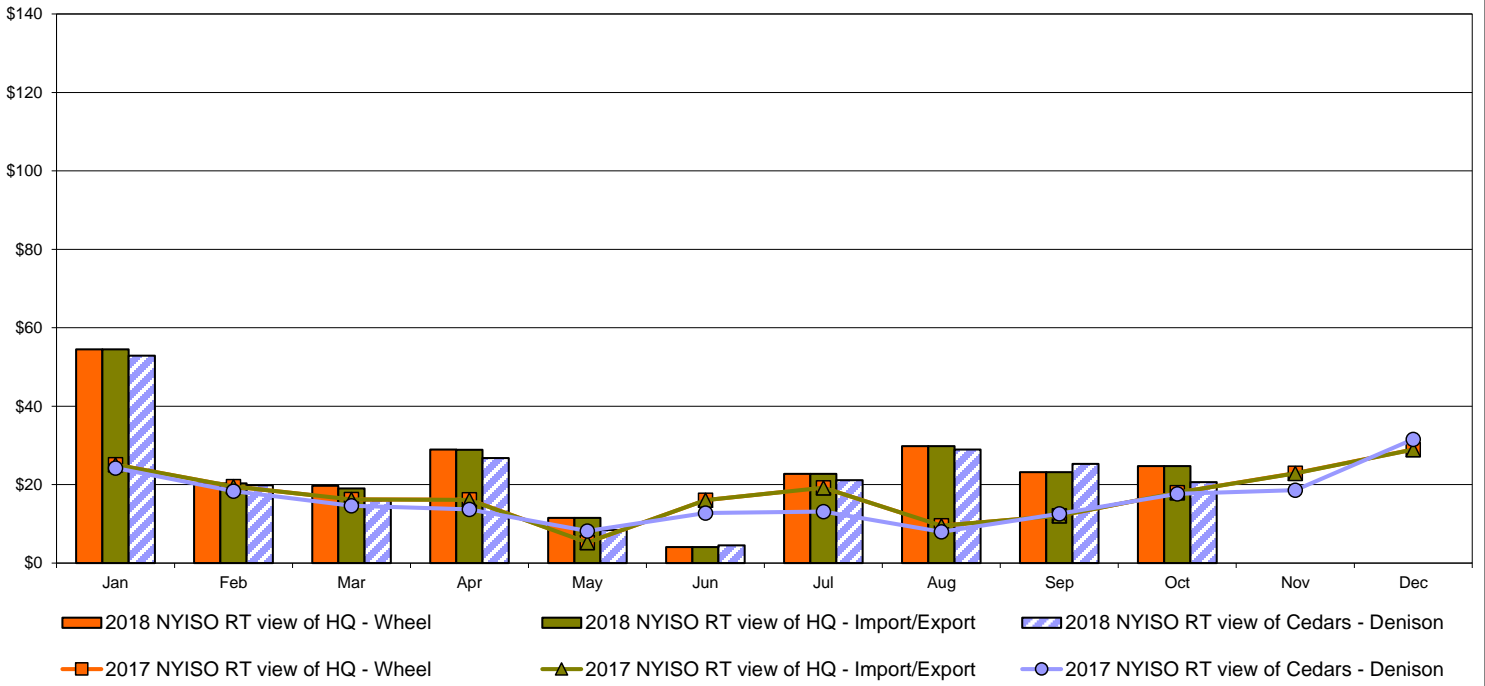


# External Comparison Hydro-Quebec

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



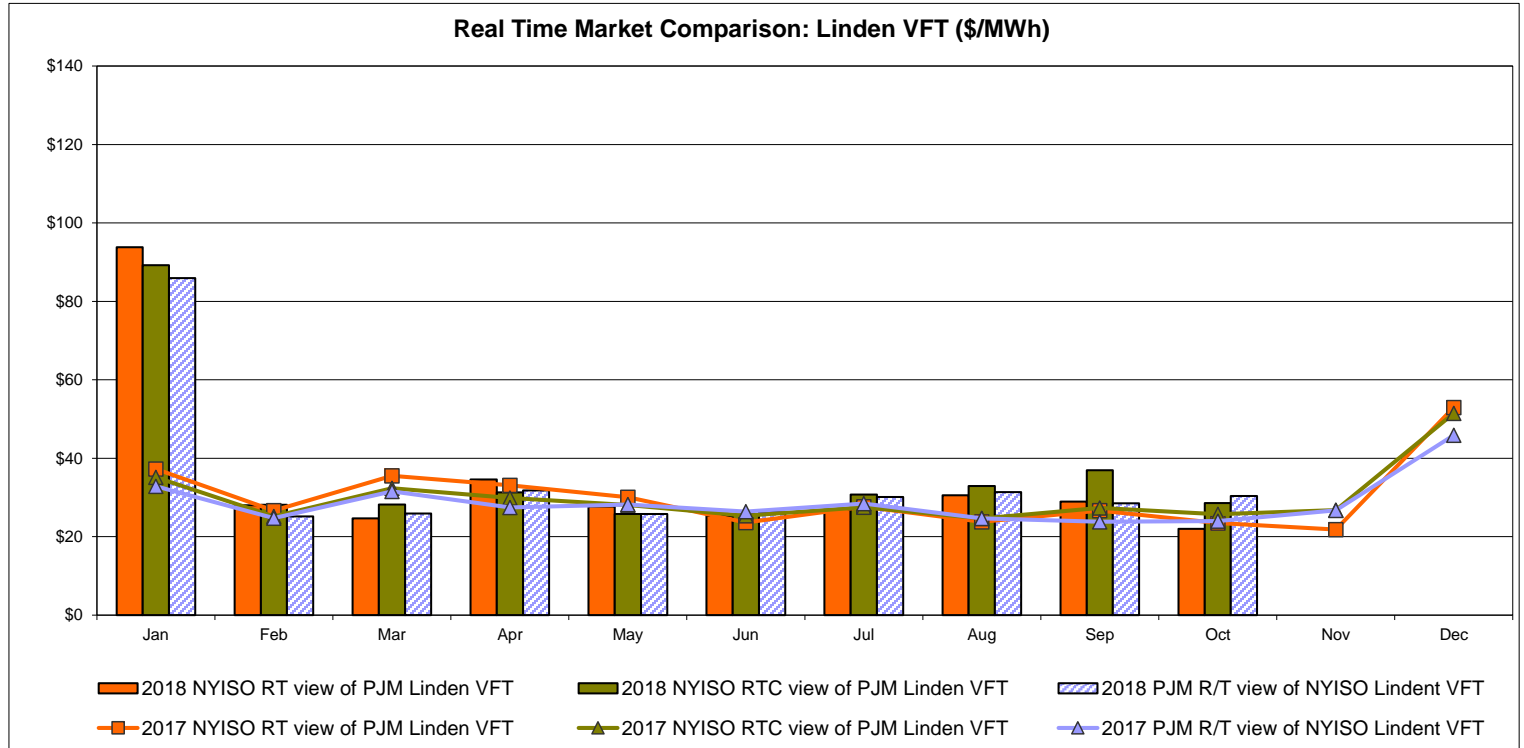
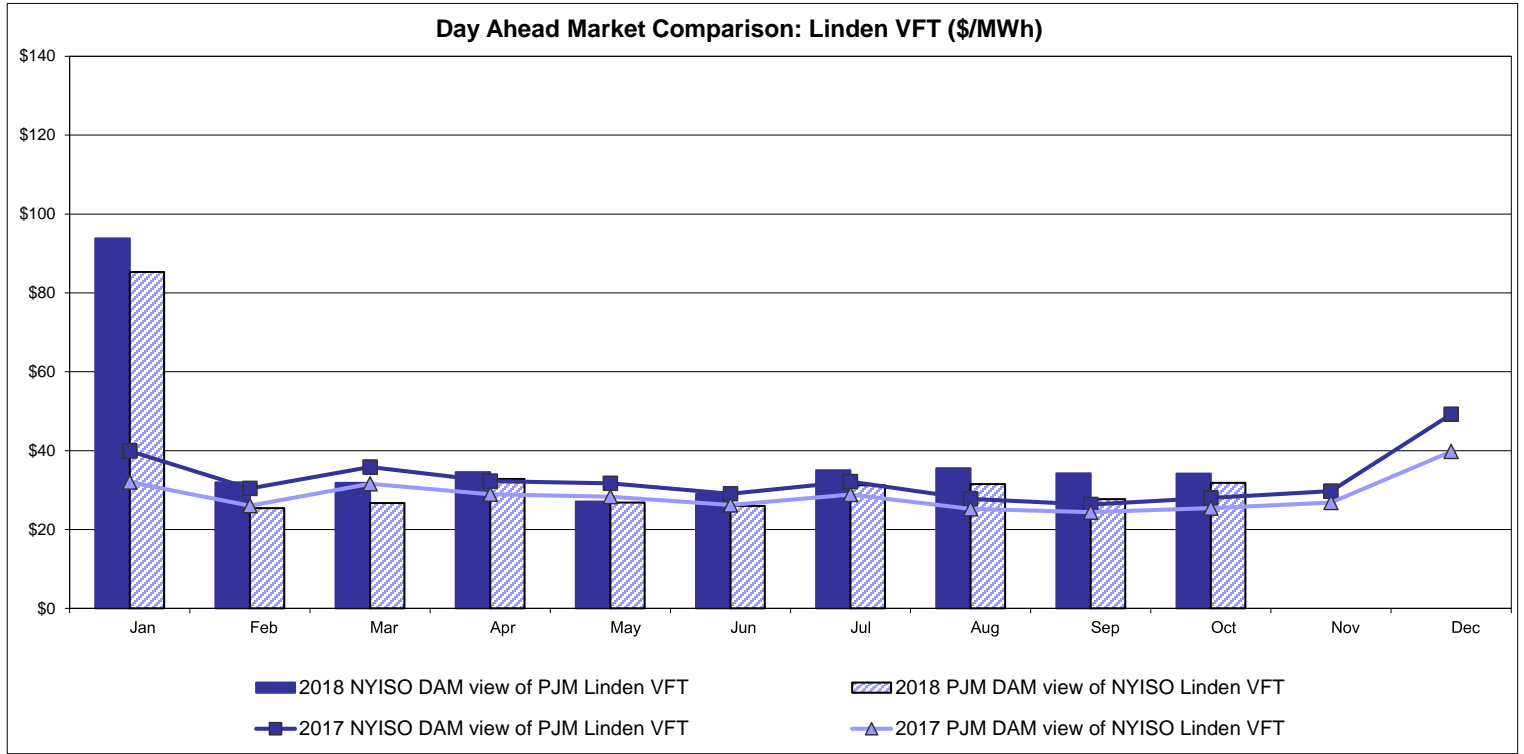
## Real Time Market External Zone Comparison - HQ (\$/MWh)



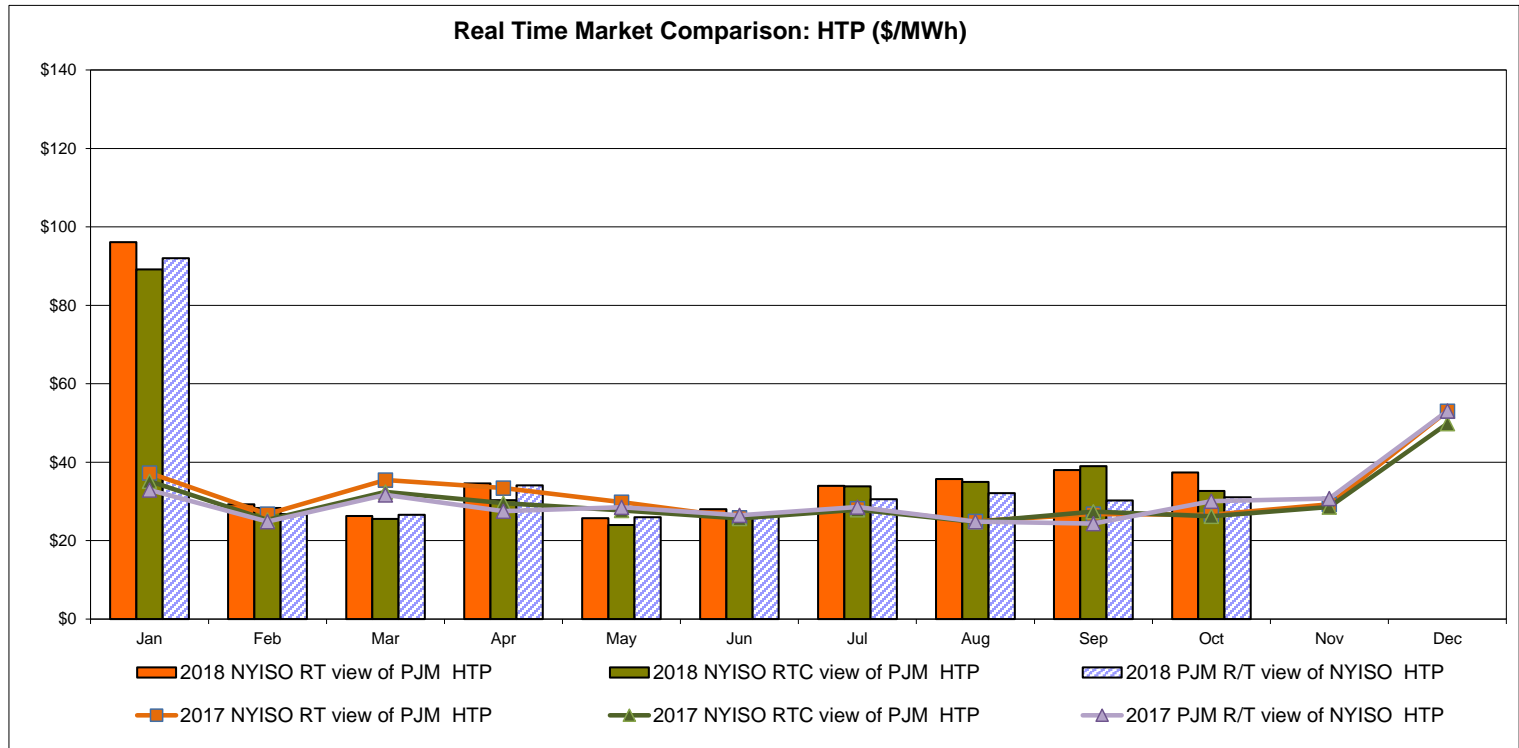
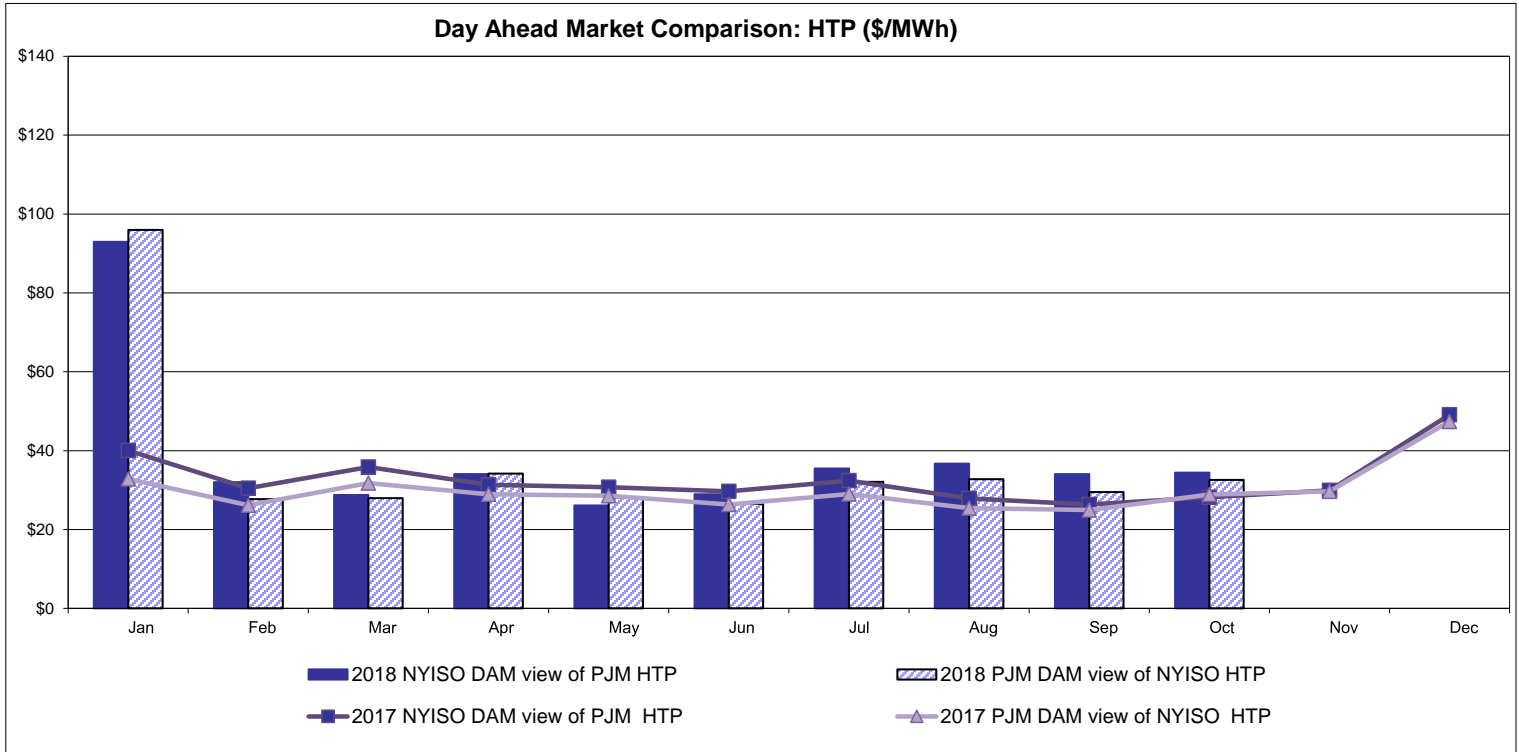
Note:  
Hydro-Quebec Prices are unavailable.



# External Controllable Line: Linden VFT (PJM)



## External Controllable Line: Hudson (PJM)

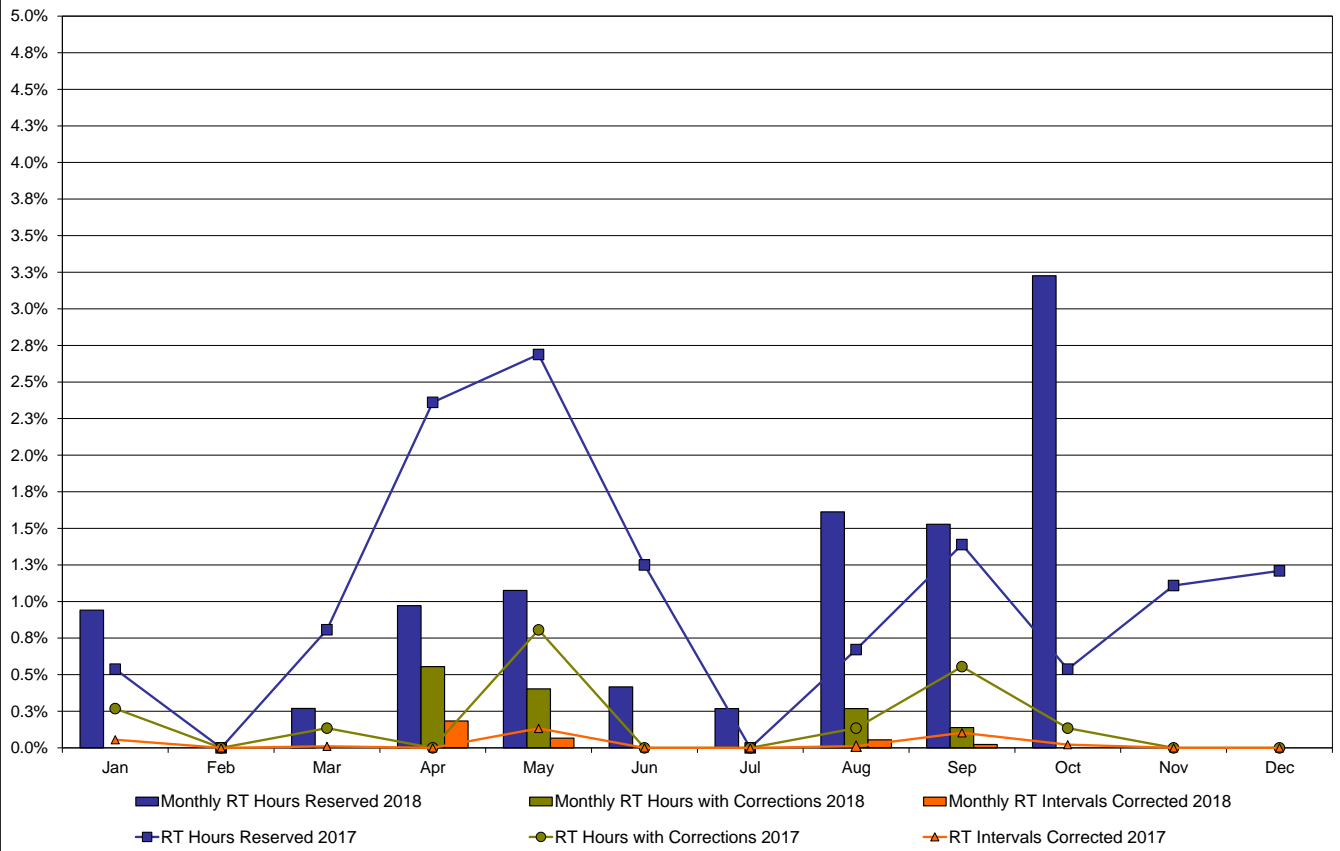


### NYISO Real Time Price Correction Statistics

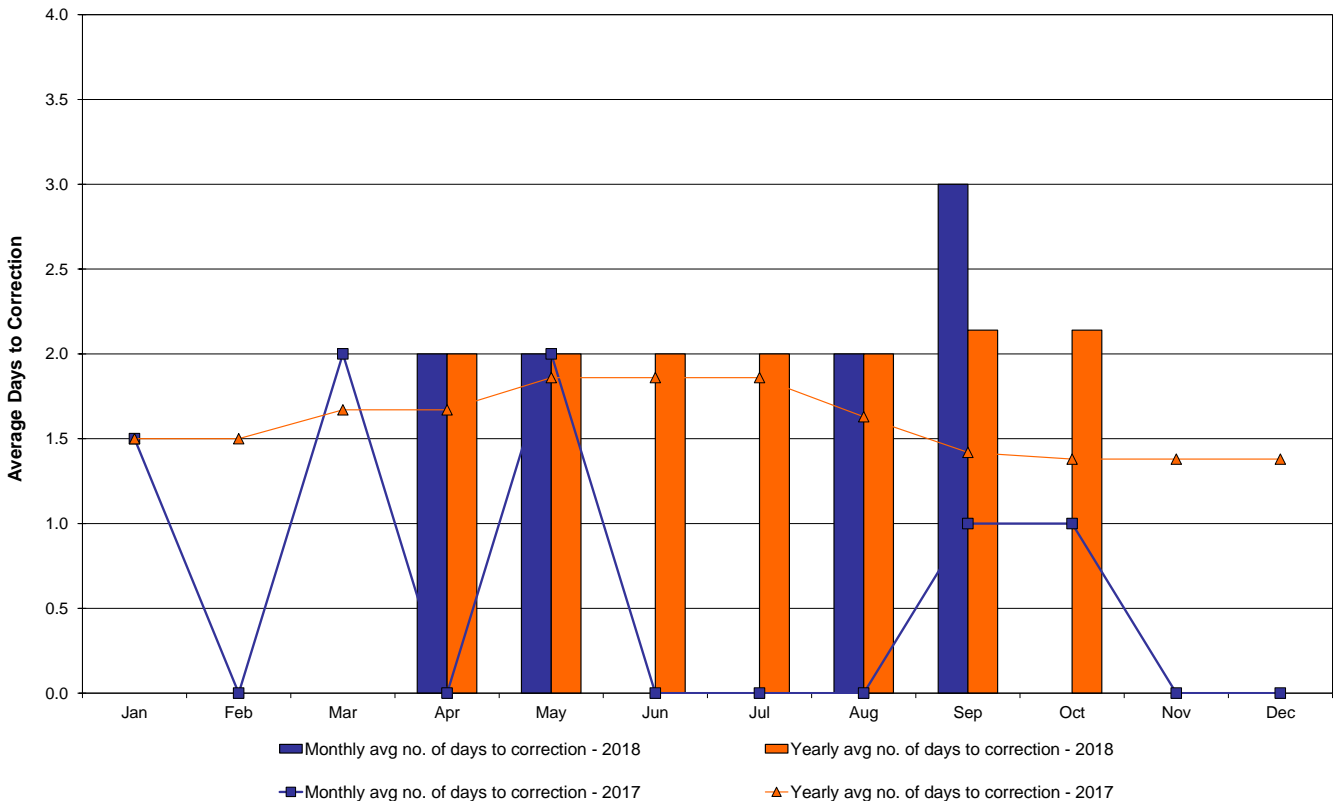
| 2018                              |              | January | February | March | April | May   | June  | July  | August | September | October | November | December |
|-----------------------------------|--------------|---------|----------|-------|-------|-------|-------|-------|--------|-----------|---------|----------|----------|
| <b>Hour Corrections</b>           |              |         |          |       |       |       |       |       |        |           |         |          |          |
| Number of hours with corrections  | in the month | 0       | 0        | 0     | 4     | 3     | 0     | 0     | 2      | 1         | 0       |          |          |
| Number of hours                   | in the month | 744     | 672      | 743   | 720   | 744   | 720   | 744   | 744    | 720       | 744     |          |          |
| % of hours with corrections       | in the month | 0.00%   | 0.00%    | 0.00% | 0.56% | 0.40% | 0.00% | 0.00% | 0.27%  | 0.14%     | 0.00%   |          |          |
| % of hours with corrections       | year-to-date | 0.00%   | 0.00%    | 0.00% | 0.14% | 0.19% | 0.16% | 0.14% | 0.15%  | 0.15%     | 0.14%   |          |          |
| <b>Interval Corrections</b>       |              |         |          |       |       |       |       |       |        |           |         |          |          |
| Number of intervals corrected     | in the month | 0       | 0        | 0     | 16    | 6     | 0     | 0     | 5      | 2         | 0       |          |          |
| Number of intervals               | in the month | 9,021   | 8,112    | 9,002 | 8,717 | 9,033 | 8,723 | 9,021 | 9,071  | 8,723     | 8,990   |          |          |
| % of intervals corrected          | in the month | 0.00%   | 0.00%    | 0.00% | 0.18% | 0.07% | 0.00% | 0.00% | 0.06%  | 0.02%     | 0.00%   |          |          |
| % of intervals corrected          | year-to-date | 0.00%   | 0.00%    | 0.00% | 0.05% | 0.05% | 0.04% | 0.04% | 0.04%  | 0.04%     | 0.03%   |          |          |
| <b>Hours Reserved</b>             |              |         |          |       |       |       |       |       |        |           |         |          |          |
| Number of hours reserved          | in the month | 7       | 0        | 2     | 7     | 8     | 3     | 2     | 12     | 11        | 24      |          |          |
| Number of hours                   | in the month | 744     | 672      | 743   | 720   | 744   | 720   | 744   | 744    | 720       | 744     |          |          |
| % of hours reserved               | in the month | 0.94%   | 0.00%    | 0.27% | 0.97% | 1.08% | 0.42% | 0.27% | 1.61%  | 1.53%     | 3.23%   |          |          |
| % of hours reserved               | year-to-date | 0.94%   | 0.49%    | 0.42% | 0.56% | 0.66% | 0.62% | 0.57% | 0.70%  | 0.79%     | 1.04%   |          |          |
| <b>Days to Correction *</b>       |              |         |          |       |       |       |       |       |        |           |         |          |          |
| Avg. number of days to correction | in the month | 0.00    | 0.00     | 0.00  | 2.00  | 2.00  | 0.00  | 0.00  | 2.00   | 3.00      | 0.00    |          |          |
| Avg. number of days to correction | year-to-date | 0.00    | 0.00     | 0.00  | 2.00  | 2.00  | 2.00  | 2.00  | 2.00   | 2.14      | 2.14    |          |          |
| <b>Days Without Corrections</b>   |              |         |          |       |       |       |       |       |        |           |         |          |          |
| Days without corrections          | in the month | 31      | 28       | 31    | 28    | 28    | 30    | 31    | 30     | 29        | 31      |          |          |
| Days without corrections          | year-to-date | 31      | 59       | 90    | 118   | 146   | 176   | 207   | 237    | 266       | 297     |          |          |
| 2017                              |              | January | February | March | April | May   | June  | July  | August | September | October | November | December |
| <b>Hour Corrections</b>           |              |         |          |       |       |       |       |       |        |           |         |          |          |
| Number of hours with corrections  | in the month | 2       | 0        | 1     | 0     | 6     | 0     | 0     | 1      | 4         | 1       | 0        | 0        |
| Number of hours                   | in the month | 744     | 672      | 743   | 720   | 744   | 720   | 744   | 744    | 720       | 744     | 721      | 744      |
| % of hours with corrections       | in the month | 0.27%   | 0.00%    | 0.13% | 0.00% | 0.81% | 0.00% | 0.00% | 0.13%  | 0.56%     | 0.13%   | 0.00%    | 0.00%    |
| % of hours with corrections       | year-to-date | 0.27%   | 0.14%    | 0.14% | 0.10% | 0.25% | 0.21% | 0.18% | 0.17%  | 0.21%     | 0.21%   | 0.19%    | 0.17%    |
| <b>Interval Corrections</b>       |              |         |          |       |       |       |       |       |        |           |         |          |          |
| Number of intervals corrected     | in the month | 5       | 0        | 1     | 0     | 12    | 0     | 0     | 1      | 9         | 2       | 0        | 0        |
| Number of intervals               | in the month | 8,983   | 8,101    | 9,026 | 8,745 | 9,004 | 8,712 | 8,968 | 8,980  | 8,701     | 9,006   | 8,712    | 9,063    |
| % of intervals corrected          | in the month | 0.06%   | 0.00%    | 0.01% | 0.00% | 0.13% | 0.00% | 0.00% | 0.01%  | 0.10%     | 0.02%   | 0.00%    | 0.00%    |
| % of intervals corrected          | year-to-date | 0.06%   | 0.03%    | 0.02% | 0.02% | 0.04% | 0.03% | 0.03% | 0.03%  | 0.04%     | 0.03%   | 0.03%    | 0.03%    |
| <b>Hours Reserved</b>             |              |         |          |       |       |       |       |       |        |           |         |          |          |
| Number of hours reserved          | in the month | 4       | 0        | 6     | 17    | 20    | 9     | 0     | 5      | 10        | 4       | 8        | 9        |
| Number of hours                   | in the month | 744     | 672      | 743   | 720   | 744   | 720   | 744   | 744    | 720       | 744     | 721      | 744      |
| % of hours reserved               | in the month | 0.54%   | 0.00%    | 0.81% | 2.36% | 2.69% | 1.25% | 0.00% | 0.67%  | 1.39%     | 0.54%   | 1.11%    | 1.21%    |
| % of hours reserved               | year-to-date | 0.54%   | 0.28%    | 0.46% | 0.94% | 1.30% | 1.29% | 1.10% | 1.05%  | 1.08%     | 1.03%   | 1.04%    | 1.05%    |
| <b>Days to Correction *</b>       |              |         |          |       |       |       |       |       |        |           |         |          |          |
| Avg. number of days to correction | in the month | 1.50    | 0.00     | 2.00  | 0.00  | 2.00  | 0.00  | 0.00  | 0.00   | 1.00      | 1.00    | 0.00     | 0.00     |
| Avg. number of days to correction | year-to-date | 1.50    | 1.50     | 1.67  | 1.67  | 1.86  | 1.86  | 1.86  | 1.63   | 1.42      | 1.38    | 1.38     | 1.38     |
| <b>Days Without Corrections</b>   |              |         |          |       |       |       |       |       |        |           |         |          |          |
| Days without corrections          | in the month | 29      | 28       | 30    | 30    | 27    | 30    | 31    | 30     | 26        | 30      | 30       | 31       |
| Days without corrections          | year-to-date | 29      | 57       | 87    | 117   | 144   | 174   | 205   | 235    | 261       | 291     | 321      | 352      |

\*Calendar days from reservation date; for June 2018 forward, business days from market date

### Percentage of Real-Time Corrections

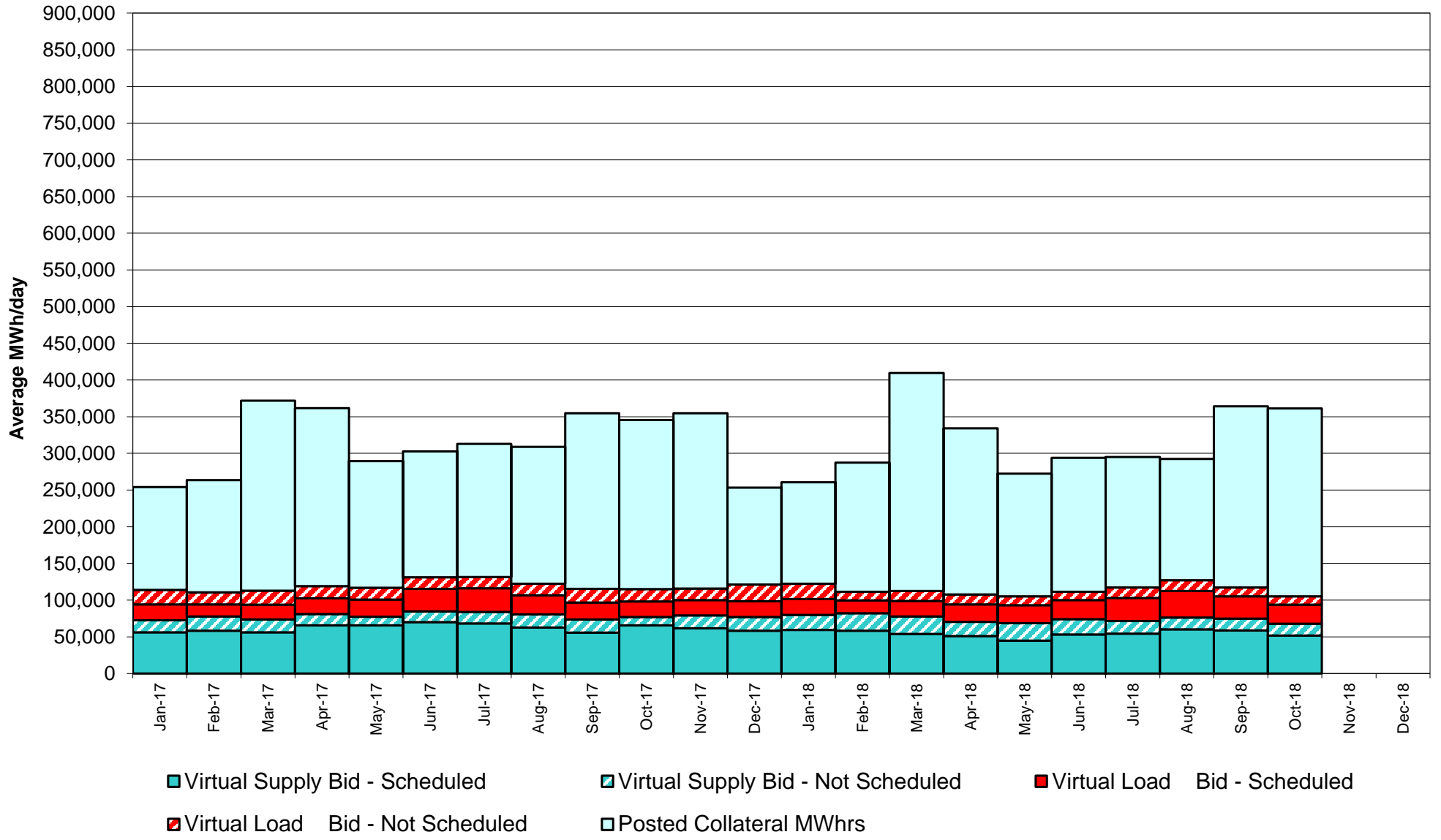


### Annual average time period for making Price Corrections (from reservation date) \*

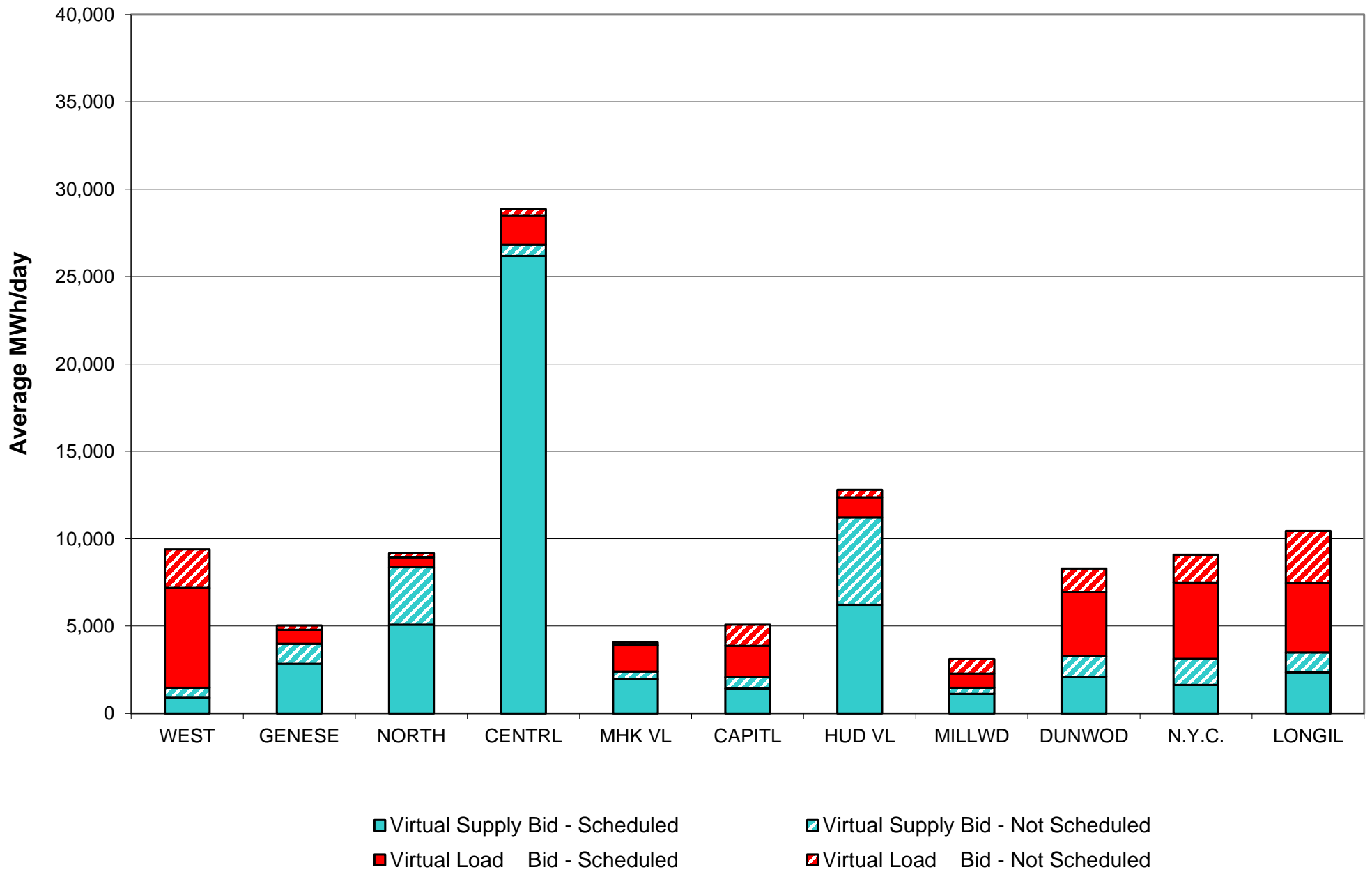


\*Calendar days from reservation date; for June 2018 forward, business days from market date

## NYISO Virtual Trading Average MWh per day



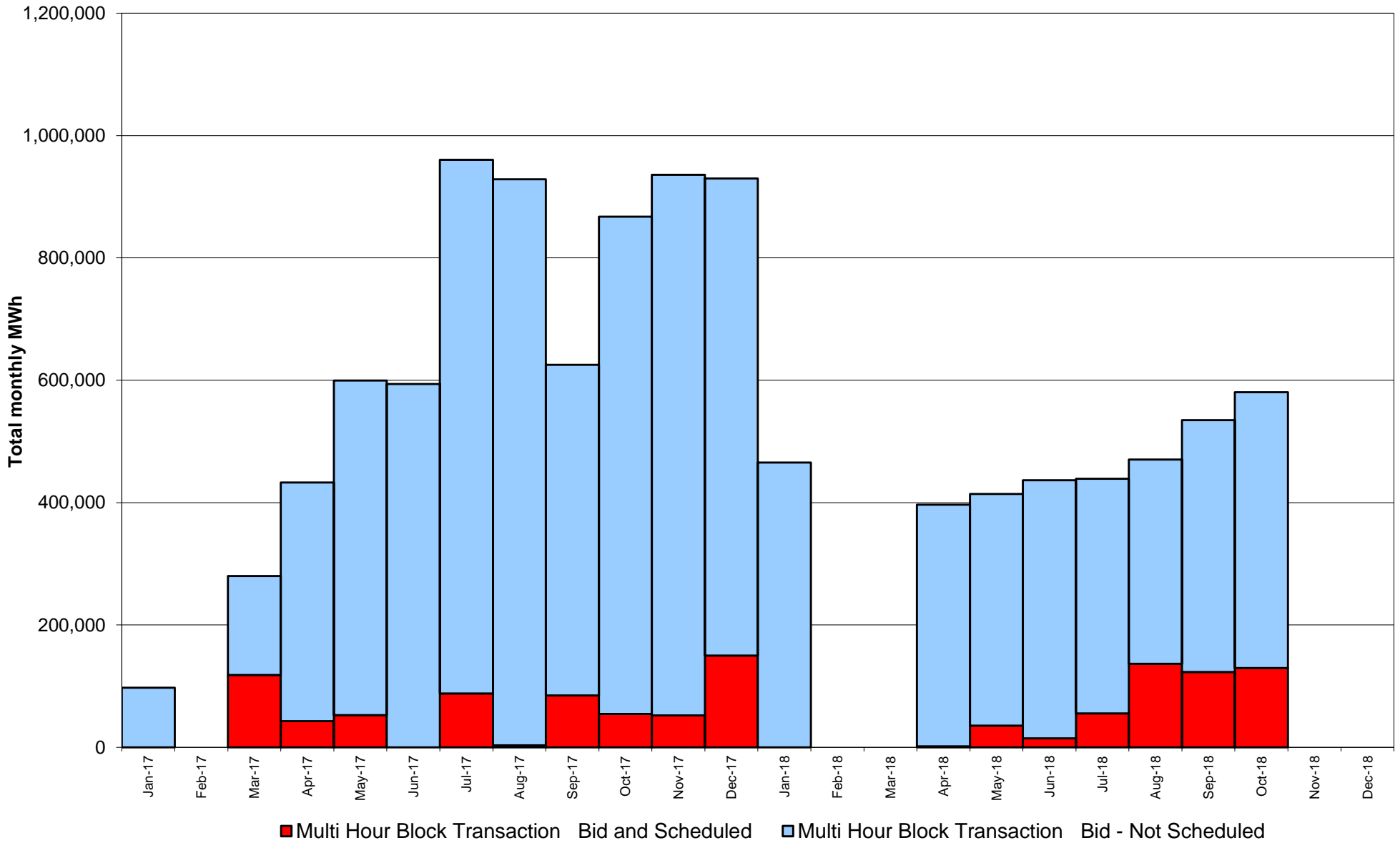
## Virtual Load and Supply Zonal Statistics through October 31, 2018



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

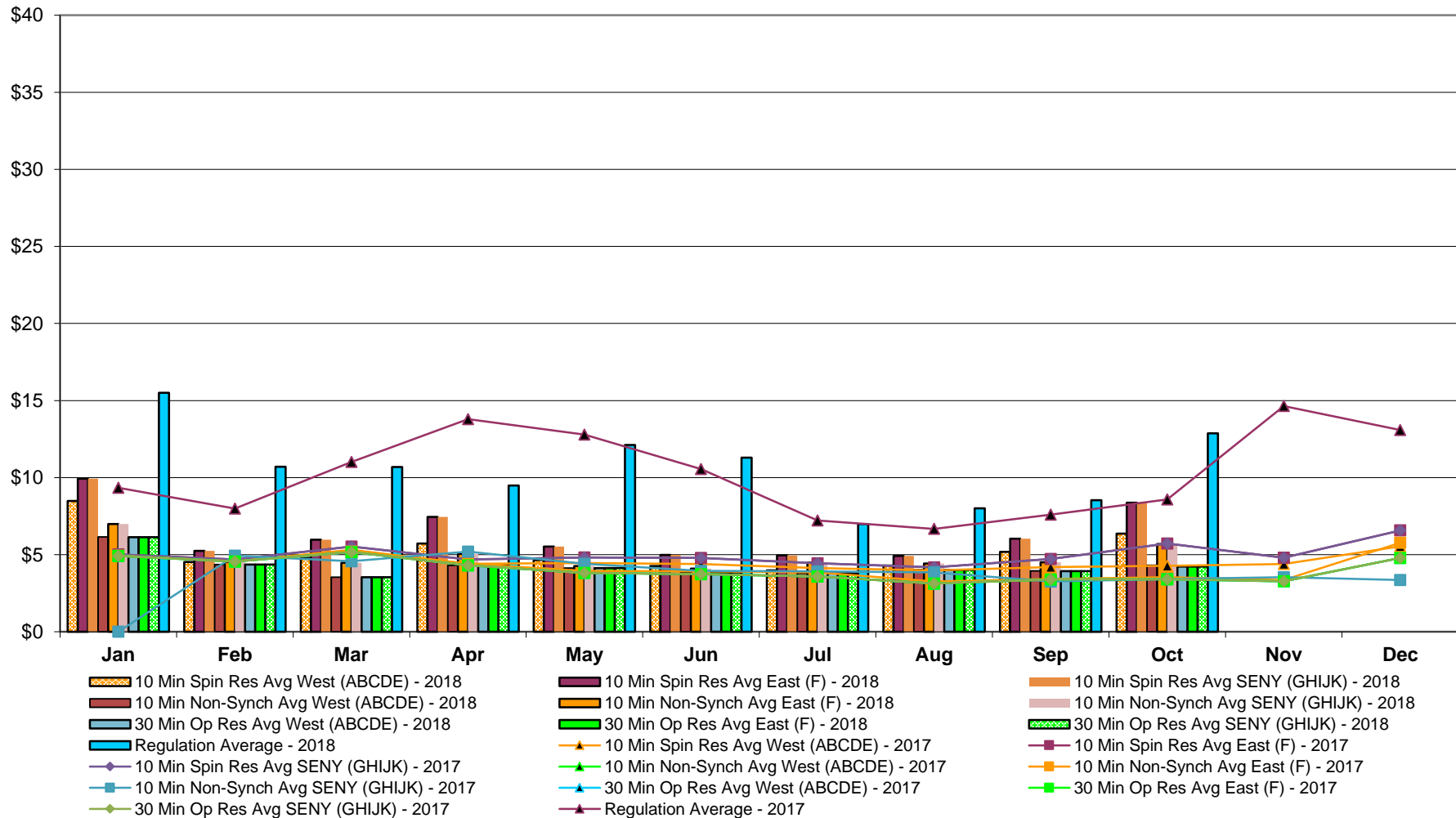
|        |        | Virtual Load Bid |               | Virtual Supply Bid |               |        |        | Virtual Load Bid |               | Virtual Supply Bid |               |        |        | Virtual Load Bid |               | Virtual Supply Bid |               |
|--------|--------|------------------|---------------|--------------------|---------------|--------|--------|------------------|---------------|--------------------|---------------|--------|--------|------------------|---------------|--------------------|---------------|
| Zone   | Date   | Scheduled        | Not Scheduled | Scheduled          | Not Scheduled | Zone   | Date   | Scheduled        | Not Scheduled | Scheduled          | Not Scheduled | Zone   | Date   | Scheduled        | Not Scheduled | Scheduled          | Not Scheduled |
| WEST   | Jan-18 | 4,761            | 4,241         | 1,938              | 427           | MHK VL | Jan-18 | 763              | 456           | 2,040              | 266           | DUNWOD | Jan-18 | 1,795            | 1,509         | 2,215              | 620           |
|        | Feb-18 | 3,058            | 1,941         | 1,478              | 603           |        | Feb-18 | 512              | 130           | 1,910              | 269           |        | Feb-18 | 742              | 658           | 5,891              | 824           |
|        | Mar-18 | 7,263            | 2,535         | 860                | 659           |        | Mar-18 | 569              | 139           | 1,896              | 309           |        | Mar-18 | 1,367            | 755           | 3,530              | 487           |
|        | Apr-18 | 8,154            | 3,433         | 926                | 393           |        | Apr-18 | 670              | 173           | 1,986              | 470           |        | Apr-18 | 1,781            | 1,047         | 2,395              | 333           |
|        | May-18 | 7,658            | 4,266         | 516                | 478           |        | May-18 | 413              | 95            | 3,242              | 758           |        | May-18 | 1,933            | 183           | 2,052              | 440           |
|        | Jun-18 | 7,003            | 4,102         | 760                | 681           |        | Jun-18 | 440              | 100           | 3,697              | 603           |        | Jun-18 | 2,261            | 258           | 2,023              | 515           |
|        | Jul-18 | 6,144            | 4,151         | 894                | 795           |        | Jul-18 | 740              | 152           | 3,340              | 393           |        | Jul-18 | 3,884            | 685           | 2,764              | 566           |
|        | Aug-18 | 7,058            | 3,301         | 1,826              | 720           |        | Aug-18 | 714              | 253           | 3,007              | 293           |        | Aug-18 | 4,756            | 1,343         | 2,720              | 997           |
|        | Sep-18 | 7,300            | 3,587         | 869                | 527           |        | Sep-18 | 863              | 185           | 2,513              | 411           |        | Sep-18 | 2,694            | 742           | 3,280              | 448           |
|        | Oct-18 | 5,715            | 2,202         | 894                | 580           |        | Oct-18 | 1,510            | 162           | 1,958              | 434           |        | Oct-18 | 3,682            | 1,342         | 2,108              | 1,157         |
|        | Nov-18 |                  |               |                    |               |        | Nov-18 |                  |               |                    |               |        | Nov-18 |                  |               |                    |               |
|        | Dec-18 |                  |               |                    |               |        | Dec-18 |                  |               |                    |               |        | Dec-18 |                  |               |                    |               |
|        | GENESE | Jan-18           | 554           | 310                | 3,772         |        | 2,739  | CAPITL           | Jan-18        | 2,291              | 1,751         |        | 1,887  | 2,212            | N.Y.C.        | Jan-18             | 4,302         |
| Feb-18 |        | 525              | 172           | 1,723              | 2,671         | Feb-18 | 1,822  |                  | 269           | 1,331              | 2,799         | Feb-18 | 5,644  | 4,187            |               | 1,181              | 1,086         |
| Mar-18 |        | 537              | 143           | 1,381              | 2,488         | Mar-18 | 1,731  |                  | 156           | 1,330              | 2,851         | Mar-18 | 2,346  | 4,931            |               | 1,727              | 1,285         |
| Apr-18 |        | 587              | 234           | 1,818              | 1,047         | Apr-18 | 1,743  |                  | 263           | 2,032              | 1,826         | Apr-18 | 3,190  | 2,460            |               | 2,212              | 1,376         |
| May-18 |        | 405              | 123           | 2,353              | 649           | May-18 | 911    |                  | 95            | 1,430              | 1,303         | May-18 | 5,464  | 3,912            |               | 1,152              | 1,476         |
| Jun-18 |        | 389              | 100           | 2,222              | 563           | Jun-18 | 812    |                  | 112           | 1,818              | 1,336         | Jun-18 | 6,786  | 2,924            |               | 2,210              | 1,888         |
| Jul-18 |        | 476              | 123           | 2,913              | 1,062         | Jul-18 | 869    |                  | 219           | 2,818              | 1,381         | Jul-18 | 9,126  | 3,514            |               | 3,011              | 1,420         |
| Aug-18 |        | 535              | 269           | 2,994              | 1,264         | Aug-18 | 1,361  |                  | 242           | 3,509              | 1,578         | Aug-18 | 11,778 | 3,421            |               | 2,802              | 1,494         |
| Sep-18 |        | 684              | 294           | 3,261              | 716           | Sep-18 | 1,328  |                  | 373           | 1,878              | 1,521         | Sep-18 | 6,762  | 1,754            |               | 2,029              | 1,501         |
| Oct-18 |        | 796              | 241           | 2,836              | 1,158         | Oct-18 | 1,800  |                  | 1,204         | 1,418              | 659           | Oct-18 | 4,376  | 1,599            |               | 1,635              | 1,479         |
| Nov-18 |        |                  |               |                    |               | Nov-18 |        |                  |               |                    |               | Nov-18 |        |                  |               |                    |               |
| Dec-18 |        |                  |               |                    |               | Dec-18 |        |                  |               |                    |               | Dec-18 |        |                  |               |                    |               |
| NORTH  |        | Jan-18           | 274           | 282                | 8,259         | 3,265  | HUD VL |                  | Jan-18        | 1,562              | 1,285         | 5,029  | 7,218  | LONGIL           |               | Jan-18             | 3,335         |
|        | Feb-18 | 352              | 369           | 7,449              | 2,777         | Feb-18 |        | 888              | 740           | 4,703              | 8,761         | Feb-18 | 2,800  |                  | 2,591         | 3,061              | 2,605         |
|        | Mar-18 | 249              | 367           | 6,995              | 2,136         | Mar-18 |        | 845              | 1,098         | 5,169              | 10,837        | Mar-18 | 3,613  |                  | 3,021         | 3,308              | 1,768         |
|        | Apr-18 | 189              | 269           | 7,479              | 1,848         | Apr-18 |        | 639              | 973           | 5,990              | 9,863         | Apr-18 | 4,649  |                  | 3,620         | 2,505              | 1,620         |
|        | May-18 | 215              | 79            | 6,001              | 4,717         | May-18 |        | 773              | 539           | 3,727              | 11,304        | May-18 | 5,128  |                  | 2,420         | 1,436              | 2,031         |
|        | Jun-18 | 514              | 317           | 5,178              | 3,657         | Jun-18 |        | 1,408            | 573           | 4,144              | 8,407         | Jun-18 | 4,621  |                  | 2,235         | 1,618              | 2,440         |
|        | Jul-18 | 428              | 423           | 5,684              | 2,542         | Jul-18 |        | 2,796            | 550           | 3,087              | 5,200         | Jul-18 | 4,610  |                  | 3,179         | 1,278              | 2,775         |
|        | Aug-18 | 578              | 340           | 5,639              | 2,650         | Aug-18 |        | 2,088            | 476           | 7,039              | 4,344         | Aug-18 | 4,112  |                  | 3,156         | 3,475              | 1,715         |
|        | Sep-18 | 815              | 247           | 6,331              | 4,123         | Sep-18 |        | 1,364            | 576           | 6,306              | 4,253         | Sep-18 | 4,881  |                  | 3,205         | 3,104              | 1,556         |
|        | Oct-18 | 578              | 237           | 5,077              | 3,287         | Oct-18 |        | 1,156            | 429           | 6,205              | 5,009         | Oct-18 | 3,972  |                  | 2,986         | 2,353              | 1,135         |
|        | Nov-18 |                  |               |                    |               | Nov-18 |        |                  |               |                    |               | Nov-18 |        |                  |               |                    |               |
|        | Dec-18 |                  |               |                    |               | Dec-18 |        |                  |               |                    |               | Dec-18 |        |                  |               |                    |               |
|        | CENTRL | Jan-18           | 983           | 434                | 28,975        | 647    |        | MILLWD           | Jan-18        | 923                | 988           | 2,033  | 757    |                  | NYISO         | Jan-18             | 21,542        |
| Feb-18 |        | 595              | 215           | 28,161             | 483           | Feb-18 | 486    |                  | 337           | 1,284              | 1,197         | Feb-18 | 17,423 | 11,608           |               | 58,172             | 24,075        |
| Mar-18 |        | 1,977            | 208           | 26,643             | 614           | Mar-18 | 720    |                  | 141           | 1,144              | 421           | Mar-18 | 21,217 | 13,494           |               | 53,984             | 23,855        |
| Apr-18 |        | 1,753            | 334           | 22,490             | 677           | Apr-18 | 466    |                  | 526           | 1,031              | 163           | Apr-18 | 23,821 | 13,330           |               | 50,864             | 19,613        |
| May-18 |        | 1,033            | 221           | 21,769             | 470           | May-18 | 790    |                  | 140           | 1,050              | 188           | May-18 | 24,723 | 12,074           |               | 44,726             | 23,814        |
| Jun-18 |        | 730              | 164           | 28,504             | 501           | Jun-18 | 938    |                  | 302           | 1,223              | 234           | Jun-18 | 25,903 | 11,189           |               | 53,397             | 20,825        |
| Jul-18 |        | 1,093            | 273           | 27,687             | 534           | Jul-18 | 1,193  |                  | 1,051         | 940                | 358           | Jul-18 | 31,359 | 14,319           |               | 54,416             | 17,027        |
| Aug-18 |        | 1,911            | 408           | 26,279             | 566           | Aug-18 | 1,112  |                  | 1,580         | 916                | 520           | Aug-18 | 36,003 | 14,790           |               | 60,205             | 16,141        |
| Sep-18 |        | 2,648            | 356           | 28,114             | 671           | Sep-18 | 912    |                  | 813           | 1,087              | 403           | Sep-18 | 30,252 | 12,132           |               | 58,770             | 16,130        |
| Oct-18 |        | 1,682            | 358           | 26,189             | 642           | Oct-18 | 803    |                  | 832           | 1,115              | 357           | Oct-18 | 26,069 | 11,590           |               | 51,789             | 15,896        |
| Nov-18 |        |                  |               |                    |               | Nov-18 |        |                  |               |                    |               | Nov-18 |        |                  |               |                    |               |
| Dec-18 |        |                  |               |                    |               | Dec-18 |        |                  |               |                    |               | Dec-18 |        |                  |               |                    |               |

## NYISO Multi Hour Block Transactions Monthly Total MWh

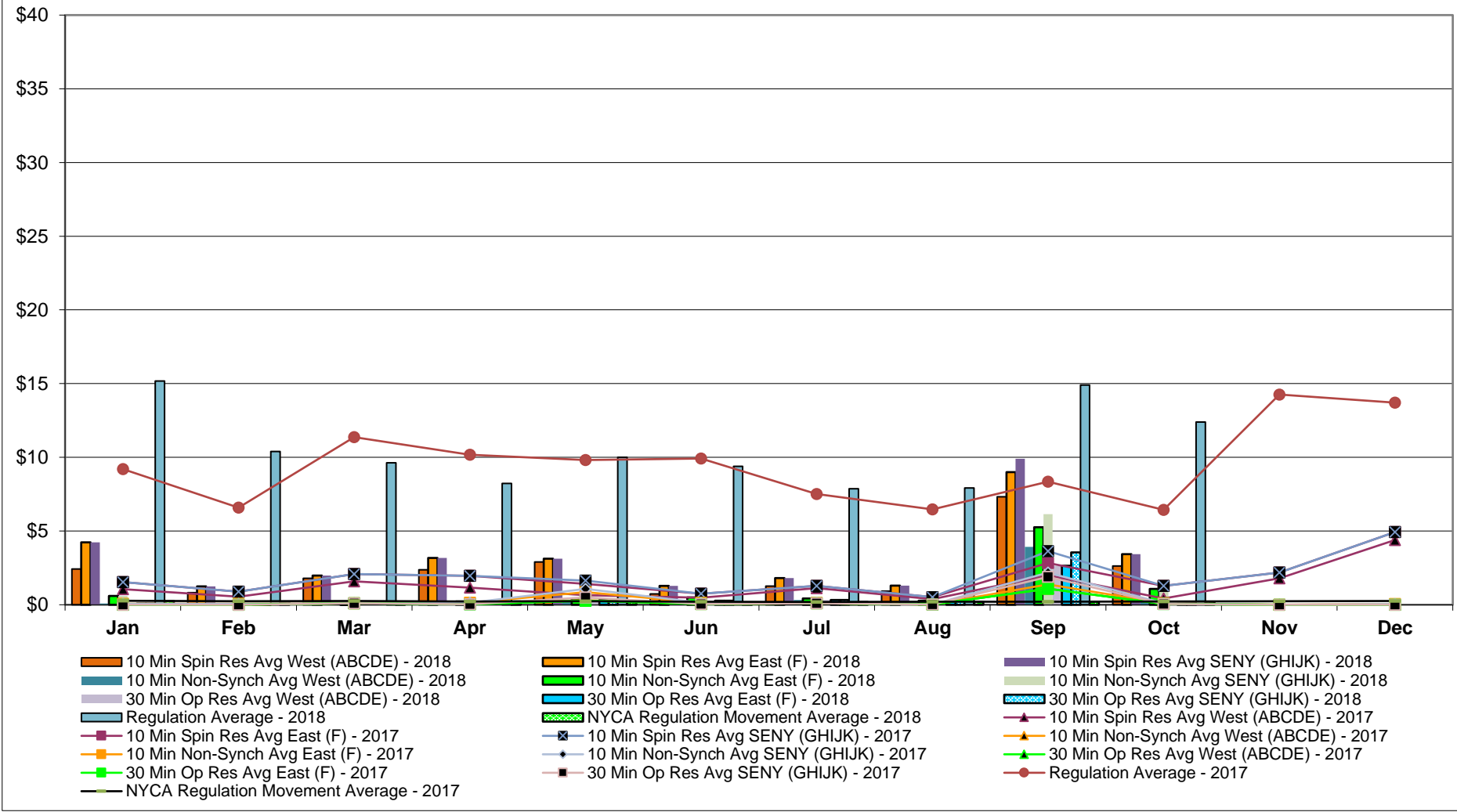




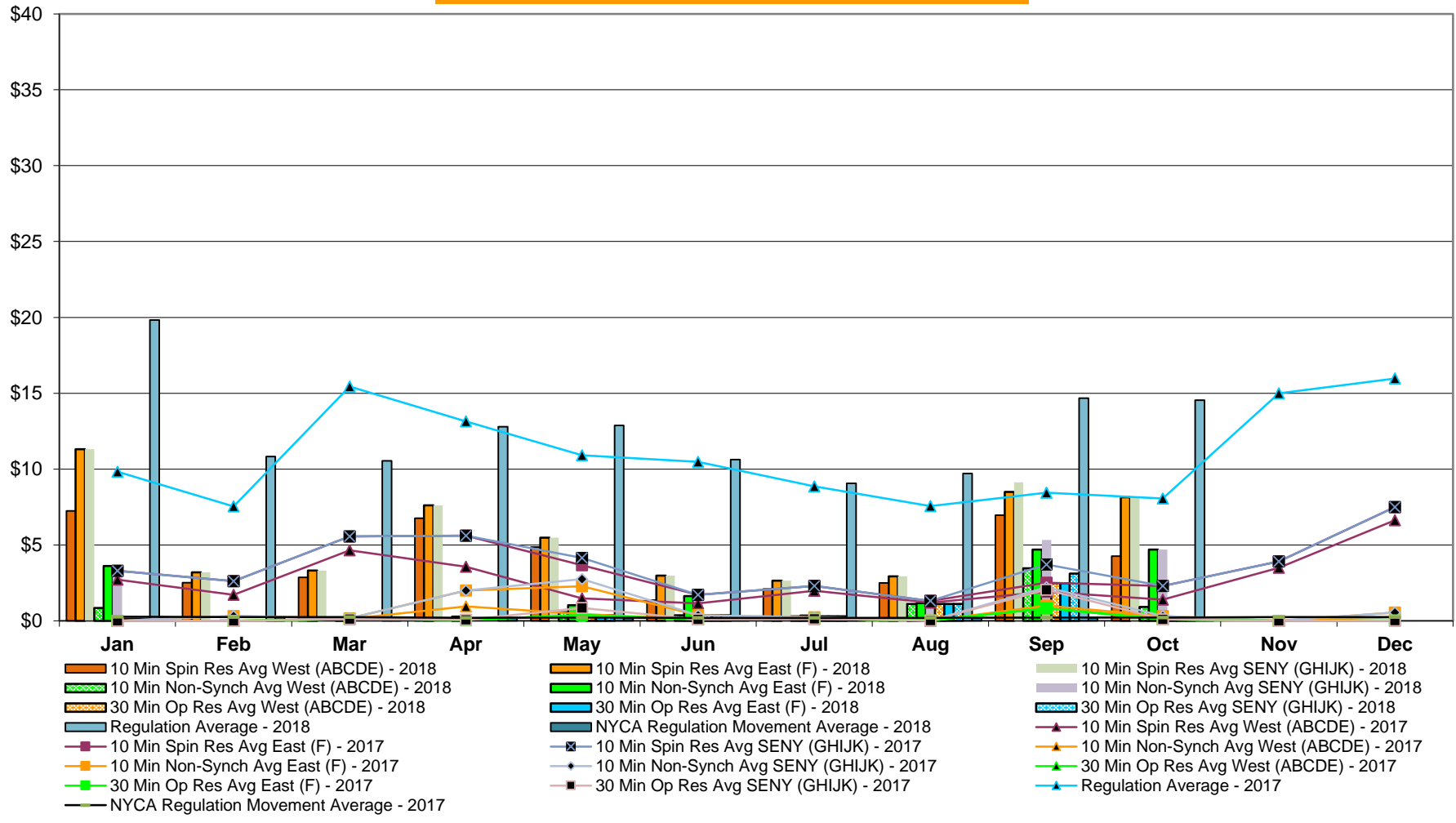
### NYISO Monthly Average Ancillary Service Prices Day Ahead Market 2017 - 2018



## NYISO Monthly Average Ancillary Service Prices RTC Market 2017 - 2018



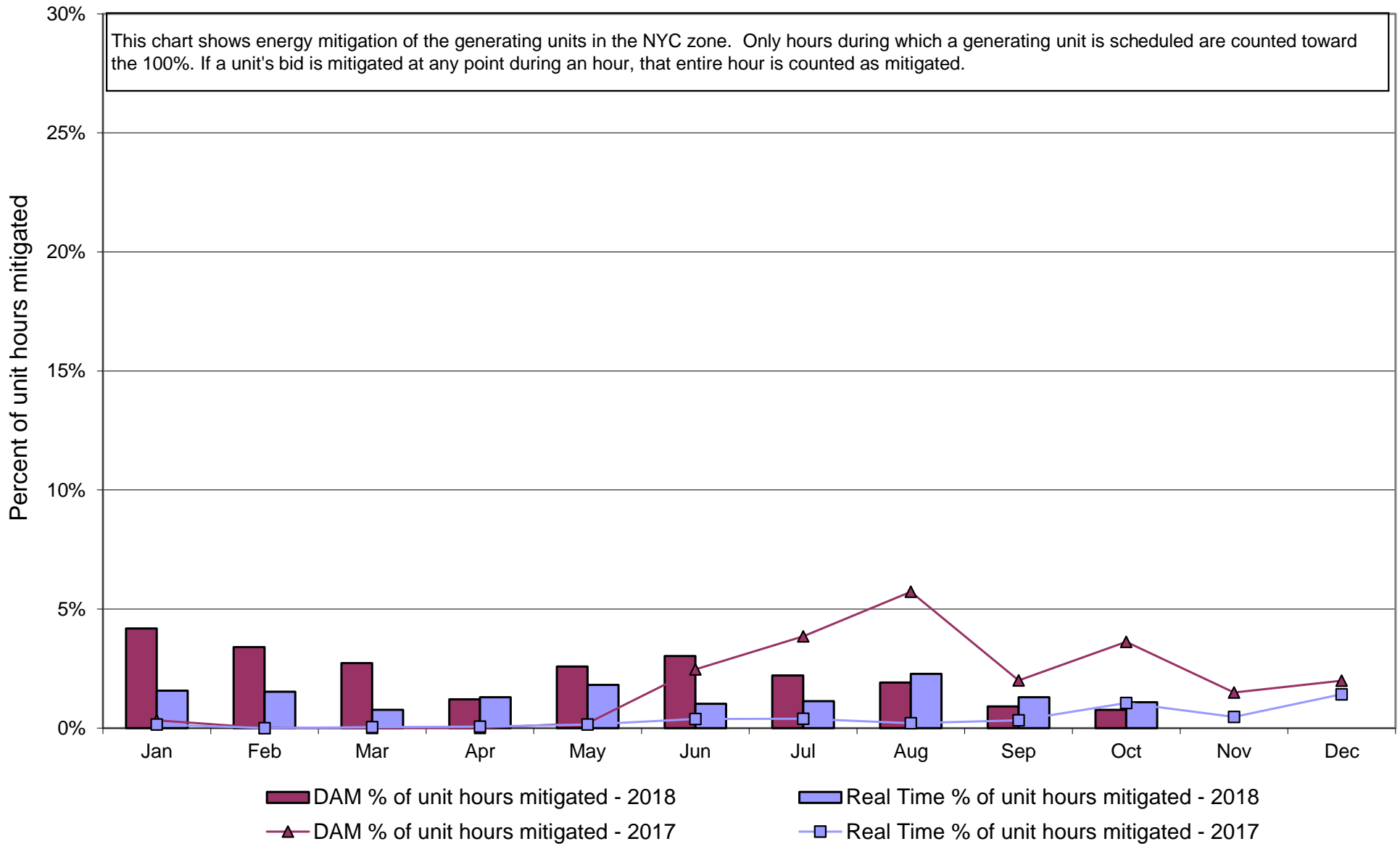
### NYISO Monthly Average Ancillary Service Prices Real Time Market 2017 - 2018



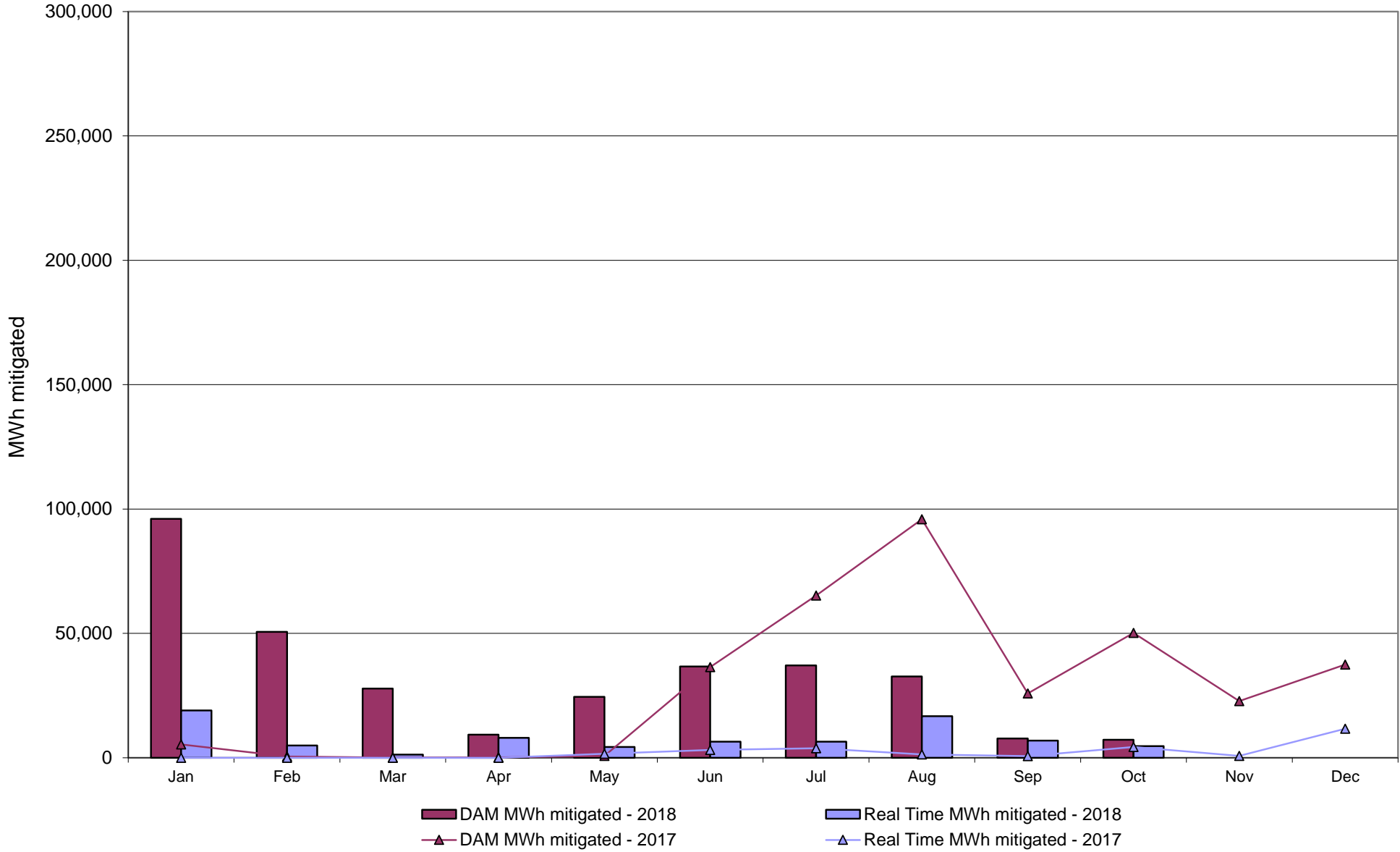
## NYISO Markets Ancillary Services Statistics - Unweighted Price (\$/MWH)

| <u>2018</u>                    | <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 SENEY (GHIJK)      | 9.93           | 5.24            | 5.97         | 7.45         | 5.52       | 4.98        | 4.95        | 4.91          | 6.04             | 8.37           |                 |                 |
| 10 Min Spin East (F)           | 9.93           | 5.24            | 5.97         | 7.45         | 5.52       | 4.98        | 4.95        | 4.91          | 6.04             | 8.37           |                 |                 |
| 10 Min Spin West (ABCDE)       | 8.49           | 4.53            | 4.78         | 5.73         | 4.65       | 4.26        | 3.98        | 4.30          | 5.18             | 6.36           |                 |                 |
| 10 Min Non Synch SENEY (GHIJK) | 6.99           | 4.54            | 4.48         | 5.05         | 4.26       | 4.09        | 4.49        | 4.43          | 4.51             | 5.69           |                 |                 |
| 10 Min Non Synch East (F)      | 6.99           | 4.54            | 4.48         | 5.05         | 4.26       | 4.09        | 4.49        | 4.43          | 4.51             | 5.69           |                 |                 |
| 10 Min Non Synch West (ABCDE)  | 6.15           | 4.36            | 3.54         | 4.31         | 4.13       | 3.85        | 3.80        | 4.03          | 3.95             | 4.31           |                 |                 |
| 30 Min SENEY (GHIJK)           | 6.14           | 4.36            | 3.54         | 4.31         | 4.13       | 3.85        | 3.79        | 4.02          | 3.94             | 4.22           |                 |                 |
| 30 Min East (F)                | 6.14           | 4.36            | 3.54         | 4.31         | 4.13       | 3.85        | 3.79        | 4.02          | 3.94             | 4.22           |                 |                 |
| 30 Min West (ABCDE)            | 6.14           | 4.36            | 3.54         | 4.31         | 4.13       | 3.85        | 3.79        | 4.02          | 3.94             | 4.22           |                 |                 |
| Regulation                     | 15.51          | 10.70           | 10.68        | 9.49         | 12.11      | 11.30       | 6.99        | 8.00          | 8.54             | 12.88          |                 |                 |
| <b>RTC Market</b>              |                |                 |              |              |            |             |             |               |                  |                |                 |                 |
| 10 Min Spin SENEY (GHIJK)      | 4.23           | 1.24            | 1.98         | 3.17         | 3.13       | 1.28        | 1.81        | 1.29          | 9.90             | 3.43           |                 |                 |
| 10 Min Spin East (F)           | 4.23           | 1.24            | 1.98         | 3.17         | 3.13       | 1.28        | 1.81        | 1.29          | 9.90             | 3.43           |                 |                 |
| 10 Min Spin West (ABCDE)       | 2.43           | 0.82            | 1.79         | 2.38         | 2.91       | 0.74        | 1.27        | 0.93          | 7.33             | 2.63           |                 |                 |
| 10 Min Non Synch SENEY (GHIJK) | 0.59           | 0.03            | 0.01         | 0.22         | 0.42       | 0.49        | 0.42        | 0.27          | 6.14             | 1.07           |                 |                 |
| 10 Min Non Synch East (F)      | 0.59           | 0.03            | 0.01         | 0.22         | 0.42       | 0.49        | 0.42        | 0.27          | 5.25             | 1.07           |                 |                 |
| 10 Min Non Synch West (ABCDE)  | 0.08           | 0.02            | 0.00         | 0.00         | 0.33       | 0.27        | 0.33        | 0.25          | 3.92             | 0.38           |                 |                 |
| 30 Min SENEY (GHIJK)           | 0.08           | 0.02            | 0.00         | 0.00         | 0.32       | 0.27        | 0.33        | 0.25          | 3.55             | 0.11           |                 |                 |
| 30 Min East (F)                | 0.08           | 0.02            | 0.00         | 0.00         | 0.32       | 0.27        | 0.33        | 0.25          | 2.65             | 0.11           |                 |                 |
| 30 Min West (ABCDE)            | 0.08           | 0.02            | 0.00         | 0.00         | 0.32       | 0.27        | 0.33        | 0.25          | 2.65             | 0.11           |                 |                 |
| Regulation                     | 15.17          | 10.40           | 9.63         | 8.22         | 10.01      | 9.39        | 7.87        | 7.92          | 14.90            | 12.40          |                 |                 |
| NYCA Regulation Movement       | 0.26           | 0.21            | 0.20         | 0.22         | 0.19       | 0.16        | 0.19        | 0.19          | 0.20             | 0.21           |                 |                 |
| <b>Real Time Market</b>        |                |                 |              |              |            |             |             |               |                  |                |                 |                 |
| 10 Min Spin SENEY (GHIJK)      | 11.31          | 3.19            | 3.31         | 7.62         | 5.48       | 2.98        | 2.65        | 2.93          | 9.13             | 8.14           |                 |                 |
| 10 Min Spin East (F)           | 11.31          | 3.19            | 3.31         | 7.62         | 5.48       | 2.98        | 2.65        | 2.93          | 8.50             | 8.14           |                 |                 |
| 10 Min Spin West (ABCDE)       | 7.24           | 2.52            | 2.86         | 6.77         | 4.86       | 1.37        | 2.10        | 2.50          | 6.96             | 4.26           |                 |                 |
| 10 Min Non Synch SENEY (GHIJK) | 3.61           | 0.01            | 0.19         | 0.28         | 1.03       | 1.63        | 0.35        | 1.16          | 5.33             | 4.70           |                 |                 |
| 10 Min Non Synch East (F)      | 3.61           | 0.01            | 0.19         | 0.28         | 1.03       | 1.63        | 0.35        | 1.16          | 4.70             | 4.70           |                 |                 |
| 10 Min Non Synch West (ABCDE)  | 0.85           | 0.00            | 0.00         | 0.00         | 0.57       | 0.37        | 0.29        | 1.12          | 3.47             | 0.92           |                 |                 |
| 30 Min SENEY (GHIJK)           | 0.13           | 0.00            | 0.00         | 0.00         | 0.37       | 0.37        | 0.29        | 1.12          | 3.11             | 0.06           |                 |                 |
| 30 Min East (F)                | 0.13           | 0.00            | 0.00         | 0.00         | 0.37       | 0.37        | 0.29        | 1.12          | 2.48             | 0.06           |                 |                 |
| 30 Min West (ABCDE)            | 0.13           | 0.00            | 0.00         | 0.00         | 0.37       | 0.37        | 0.29        | 1.12          | 2.48             | 0.06           |                 |                 |
| Regulation                     | 19.82          | 10.82           | 10.54        | 12.80        | 12.88      | 10.62       | 9.06        | 9.71          | 14.67            | 14.54          |                 |                 |
| NYCA Regulation Movement       | 0.24           | 0.21            | 0.20         | 0.21         | 0.17       | 0.15        | 0.18        | 0.18          | 0.20             | 0.21           |                 |                 |
| <b>2017</b>                    |                |                 |              |              |            |             |             |               |                  |                |                 |                 |
| <b>Day Ahead Market</b>        |                |                 |              |              |            |             |             |               |                  |                |                 |                 |
| 10 Min Spin SENEY (GHIJK)      | 5.01           | 5.38            | 5.04         | 6.31         | 4.93       | 4.62        | 6.41        | 7.12          | 5.57             | 5.37           | 4.83            | 4.89            |
| 10 Min Spin East (F)           | 5.01           | 5.38            | 5.04         | 6.31         | 4.93       | 4.62        | 6.41        | 7.12          | 5.57             | 5.37           | 4.83            | 4.89            |
| 10 Min Spin West (ABCDE)       | 4.94           | 5.25            | 4.84         | 5.60         | 4.77       | 4.52        | 5.78        | 6.20          | 5.14             | 4.89           | 4.50            | 4.73            |
| 10 Min Non Synch SENEY (GHIJK) | 4.94           | 5.25            | 4.88         | 5.80         | 4.83       | 4.36        | 6.34        | 7.07          | 5.52             | 5.09           | 4.43            | 4.49            |
| 10 Min Non Synch East (F)      | 4.94           | 5.25            | 4.88         | 5.80         | 4.83       | 4.36        | 6.34        | 7.07          | 5.52             | 5.09           | 4.43            | 4.49            |
| 10 Min Non Synch West (ABCDE)  | 4.92           | 5.20            | 4.84         | 5.58         | 4.68       | 4.32        | 5.72        | 6.15          | 5.10             | 4.82           | 4.39            | 4.43            |
| 30 Min SENEY (GHIJK)           | 4.92           | 5.20            | 4.84         | 5.58         | 4.67       | 4.32        | 5.70        | 6.15          | 5.10             | 4.82           | 4.39            | 4.43            |
| 30 Min East (F)                | 4.92           | 5.20            | 4.84         | 5.58         | 4.67       | 4.32        | 5.70        | 6.15          | 5.10             | 4.82           | 4.39            | 4.43            |
| 30 Min West (ABCDE)            | 4.92           | 5.20            | 4.84         | 5.58         | 4.67       | 4.32        | 5.70        | 6.15          | 5.10             | 4.82           | 4.39            | 4.43            |
| Regulation                     | 9.34           | 8.19            | 8.05         | 7.93         | 6.11       | 7.00        | 8.19        | 8.61          | 7.00             | 8.57           | 7.77            | 13.80           |
| <b>RTC Market</b>              |                |                 |              |              |            |             |             |               |                  |                |                 |                 |
| 10 Min Spin SENEY (GHIJK)      | 1.53           | 0.59            | 0.71         | 1.81         | 0.43       | 0.49        | 2.79        | 7.26          | 0.61             | 0.99           | 1.05            | 1.92            |
| 10 Min Spin East (F)           | 1.53           | 0.59            | 0.71         | 1.81         | 0.43       | 0.46        | 2.77        | 6.88          | 0.61             | 0.99           | 1.05            | 1.92            |
| 10 Min Spin West (ABCDE)       | 1.06           | 0.26            | 0.08         | 0.95         | 0.23       | 0.24        | 1.72        | 4.80          | 0.30             | 0.29           | 0.82            | 1.14            |
| 10 Min Non Synch SENEY (GHIJK) | 0.06           | 0.00            | 0.17         | 0.14         | 0.05       | 0.05        | 1.89        | 6.06          | 0.21             | 0.09           | 0.00            | 0.00            |
| 10 Min Non Synch East (F)      | 0.06           | 0.00            | 0.17         | 0.14         | 0.05       | 0.02        | 1.87        | 5.67          | 0.21             | 0.09           | 0.00            | 0.00            |
| 10 Min Non Synch West (ABCDE)  | 0.00           | 0.00            | 0.00         | 0.14         | 0.04       | 0.02        | 1.18        | 3.80          | 0.16             | 0.08           | 0.00            | 0.00            |
| 30 Min SENEY (GHIJK)           | 0.00           | 0.00            | 0.00         | 0.14         | 0.04       | 0.04        | 0.94        | 3.65          | 0.15             | 0.08           | 0.00            | 0.00            |
| 30 Min East (F)                | 0.00           | 0.00            | 0.00         | 0.14         | 0.04       | 0.02        | 0.93        | 3.27          | 0.15             | 0.08           | 0.00            | 0.00            |
| 30 Min West (ABCDE)            | 0.00           | 0.00            | 0.00         | 0.14         | 0.04       | 0.02        | 0.93        | 3.27          | 0.15             | 0.08           | 0.00            | 0.00            |
| Regulation                     | 9.21           | 6.86            | 7.15         | 7.07         | 5.43       | 6.09        | 7.51        | 10.25         | 5.52             | 6.86           | 7.00            | 16.70           |
| NYCA Regulation Movement       | 0.27           | 0.21            | 0.20         | 0.25         | 0.25       | 0.23        | 0.23        | 0.24          | 0.24             | 0.26           | 0.24            | 0.26            |
| <b>Real Time Market</b>        |                |                 |              |              |            |             |             |               |                  |                |                 |                 |
| 10 Min Spin SENEY (GHIJK)      | 3.29           | 1.12            | 1.73         | 4.34         | 1.19       | 1.43        | 4.73        | 8.04          | 1.59             | 1.96           | 2.69            | 3.18            |
| 10 Min Spin East (F)           | 3.29           | 1.12            | 1.73         | 4.34         | 1.19       | 1.40        | 4.72        | 7.68          | 1.59             | 1.96           | 2.69            | 3.18            |
| 10 Min Spin West (ABCDE)       | 2.71           | 0.58            | 0.48         | 2.23         | 0.79       | 1.00        | 2.51        | 4.72          | 0.90             | 1.16           | 2.29            | 2.33            |
| 10 Min Non Synch SENEY (GHIJK) | 0.00           | 0.00            | 0.22         | 1.20         | 0.06       | 0.15        | 3.49        | 6.70          | 0.59             | 0.18           | 0.00            | 0.00            |
| 10 Min Non Synch East (F)      | 0.00           | 0.00            | 0.22         | 1.20         | 0.06       | 0.11        | 3.48        | 6.34          | 0.59             | 0.18           | 0.00            | 0.00            |
| 10 Min Non Synch West (ABCDE)  | 0.00           | 0.00            | 0.00         | 0.26         | 0.03       | 0.04        | 1.65        | 3.56          | 0.21             | 0.11           | 0.00            | 0.00            |
| 30 Min SENEY (GHIJK)           | 0.00           | 0.00            | 0.00         | 0.25         | 0.03       | 0.07        | 0.98        | 3.48          | 0.21             | 0.11           | 0.00            | 0.00            |
| 30 Min East (F)                | 0.00           | 0.00            | 0.00         | 0.25         | 0.03       | 0.04        | 0.97        | 3.12          | 0.21             | 0.11           | 0.00            | 0.00            |
| 30 Min West (ABCDE)            | 0.00           | 0.00            | 0.00         | 0.25         | 0.03       | 0.04        | 0.97        | 3.12          | 0.21             | 0.11           | 0.00            | 0.00            |
| Regulation                     | 9.83           | 7.21            | 7.73         | 8.30         | 6.06       | 6.92        | 8.37        | 10.31         | 6.42             | 7.70           | 8.21            | 14.88           |
| NYCA Regulation Movement       | 0.27           | 0.22            | 0.20         | 0.25         | 0.25       | 0.23        | 0.23        | 0.24          | 0.24             | 0.26           | 0.23            | 0.24            |

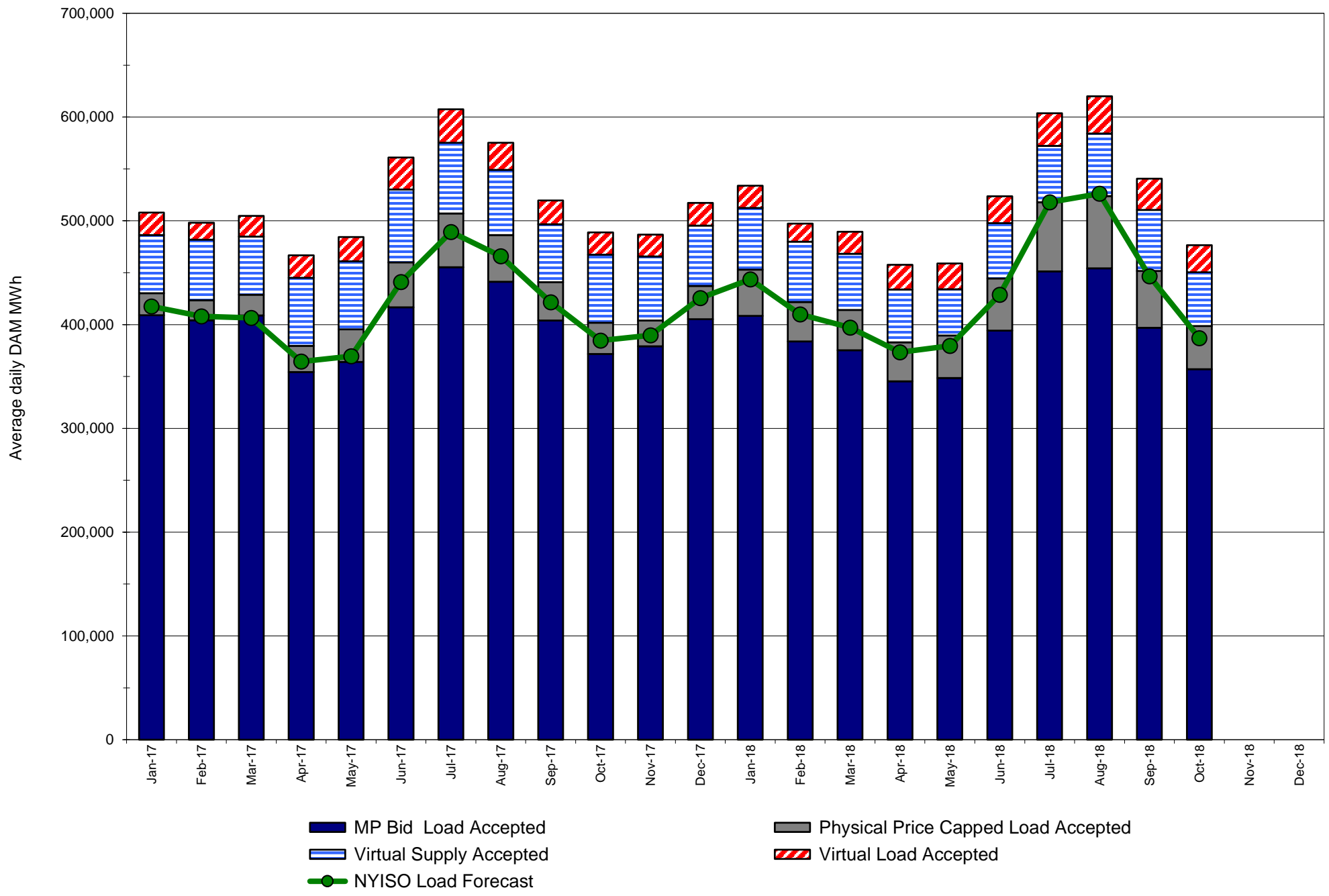
## NYISO In City Energy Mitigation - AMP (NYC Zone) 2017 - 2018 Percentage of committed unit-hours mitigated



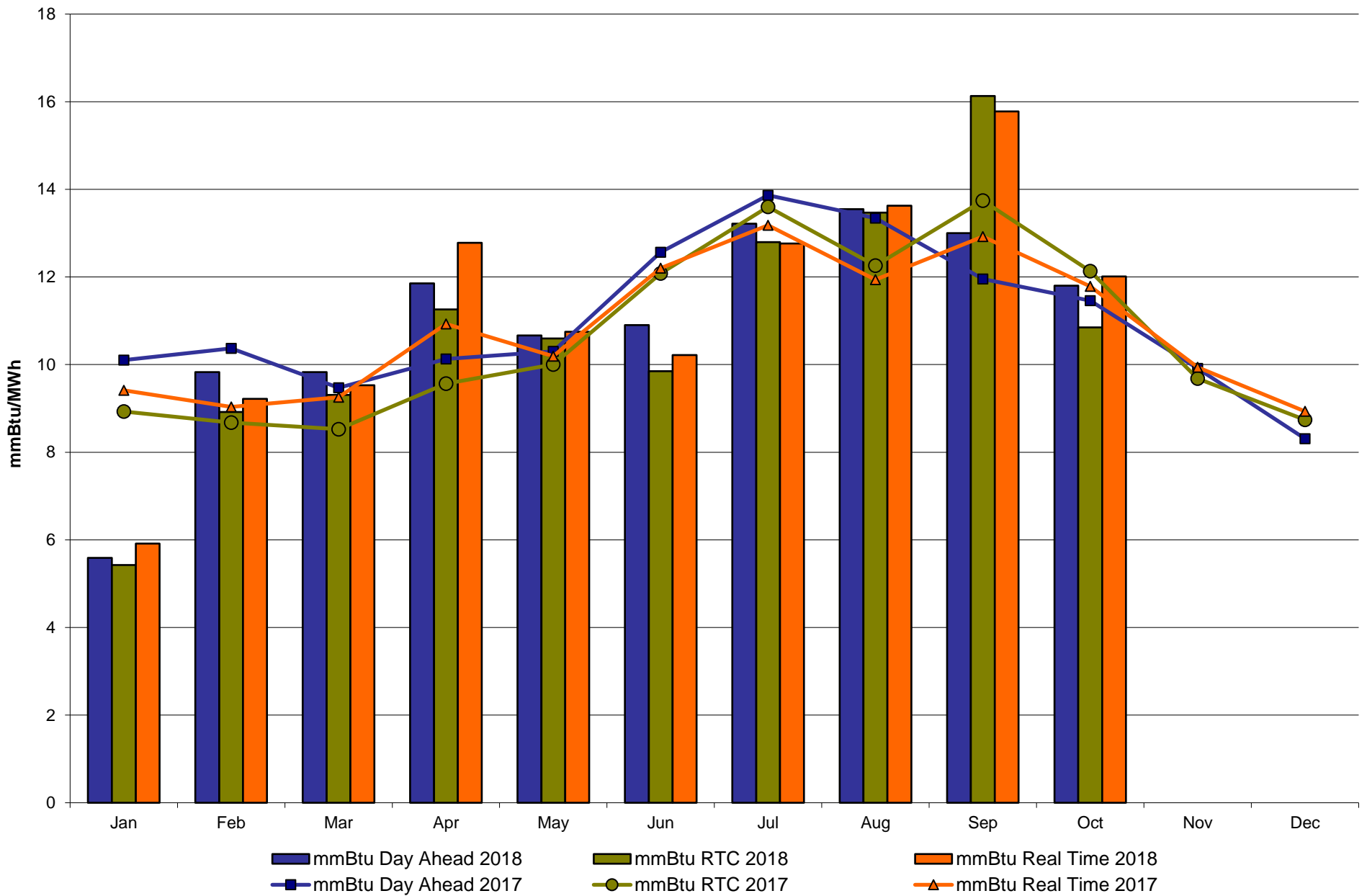
**NYISO In City Energy Mitigation (NYC Zone) 2017 - 2018**  
**Monthly megawatt hours mitigated**



## NYISO Average Daily DAM Load Bid Summary

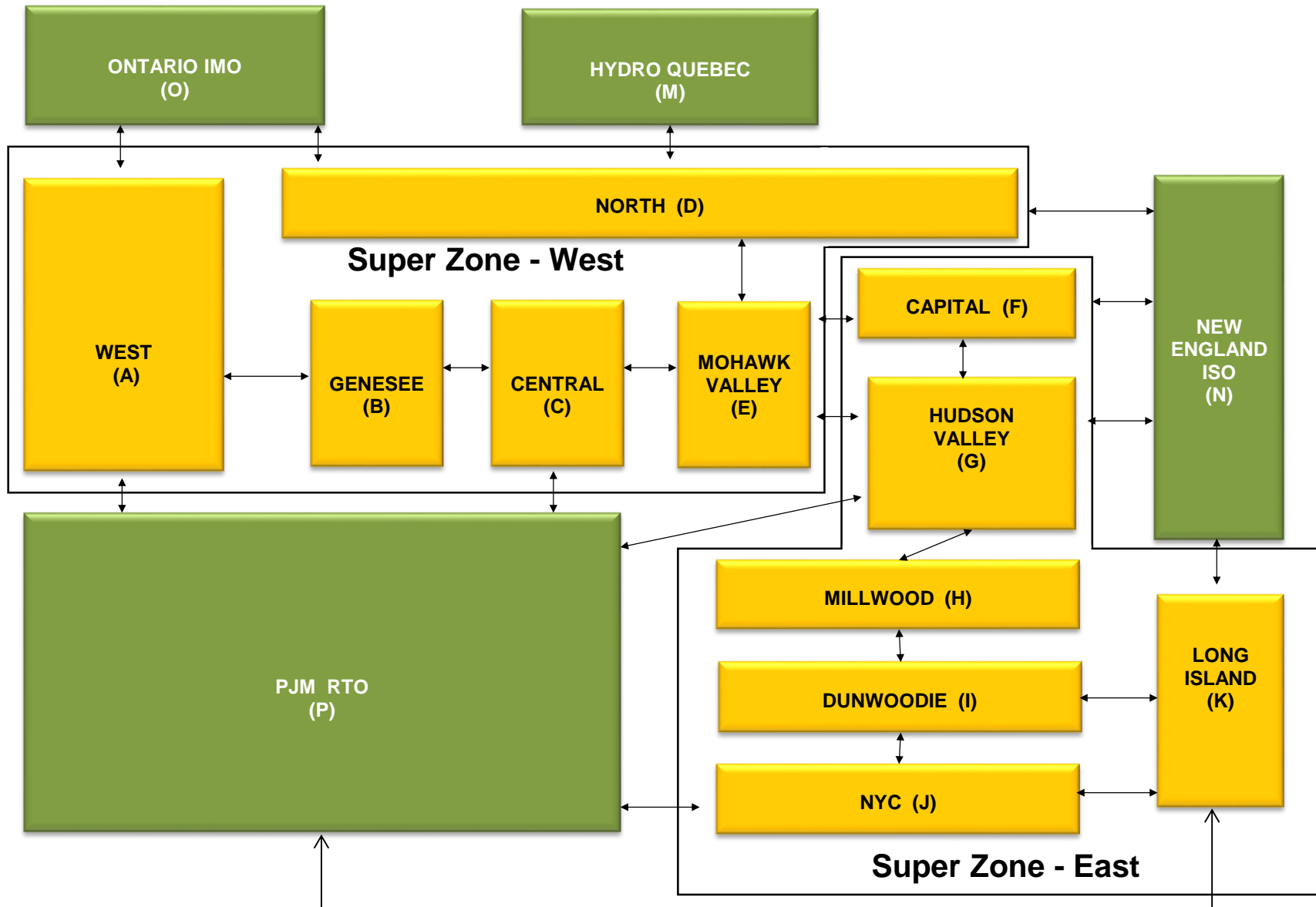


## Monthly Implied Heat Rate 2017-2018





# NYISO LBMP ZONES



**Billing Codes for Chart C**

| <b><u>Chart - C Category Name</u></b>     | <b><u>Billing Code</u></b> | <b><u>Billing Category Name</u></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 Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system



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