



Monthly Report

November 2018

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Operations Performance Metrics Monthly Report



November 2018 Report

Operations & Reliability Department New York Independent System Operator

Prepared by NYISO Operations Analysis and Services, based on settlements initial invoice data collected on or before December 08, 2018.

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November 2018 Operations Performance Highlights

- Peak load of 21,503 MW occurred on 11/15/2018 HB 17
- All-time winter capability period peak load of 25,738 MW occurred on 1/7/2014 HB 18
- 0 hours of Thunder Storm Alerts were declared
- 0 hours of NERC TLR level 3 curtailment
- The following table identifies the estimated production cost savings associated with the Broader Regional Market initiatives.

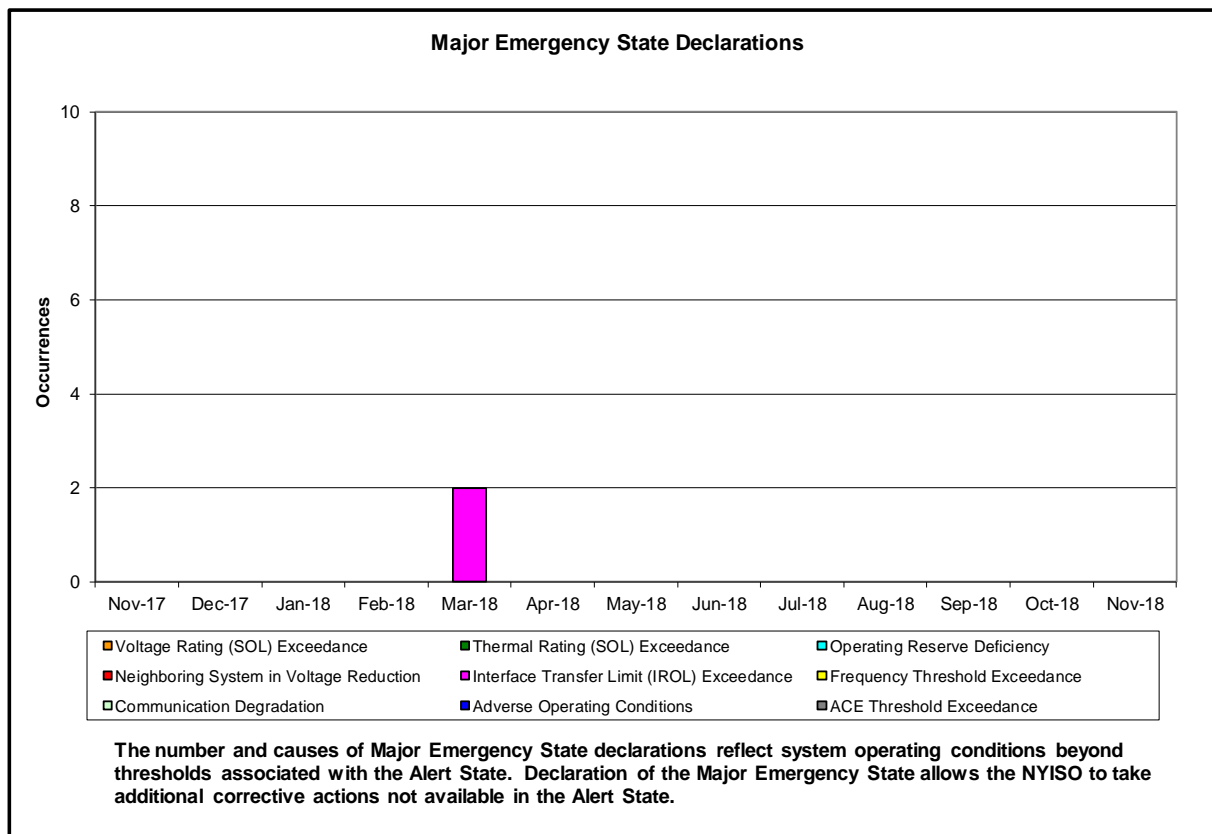
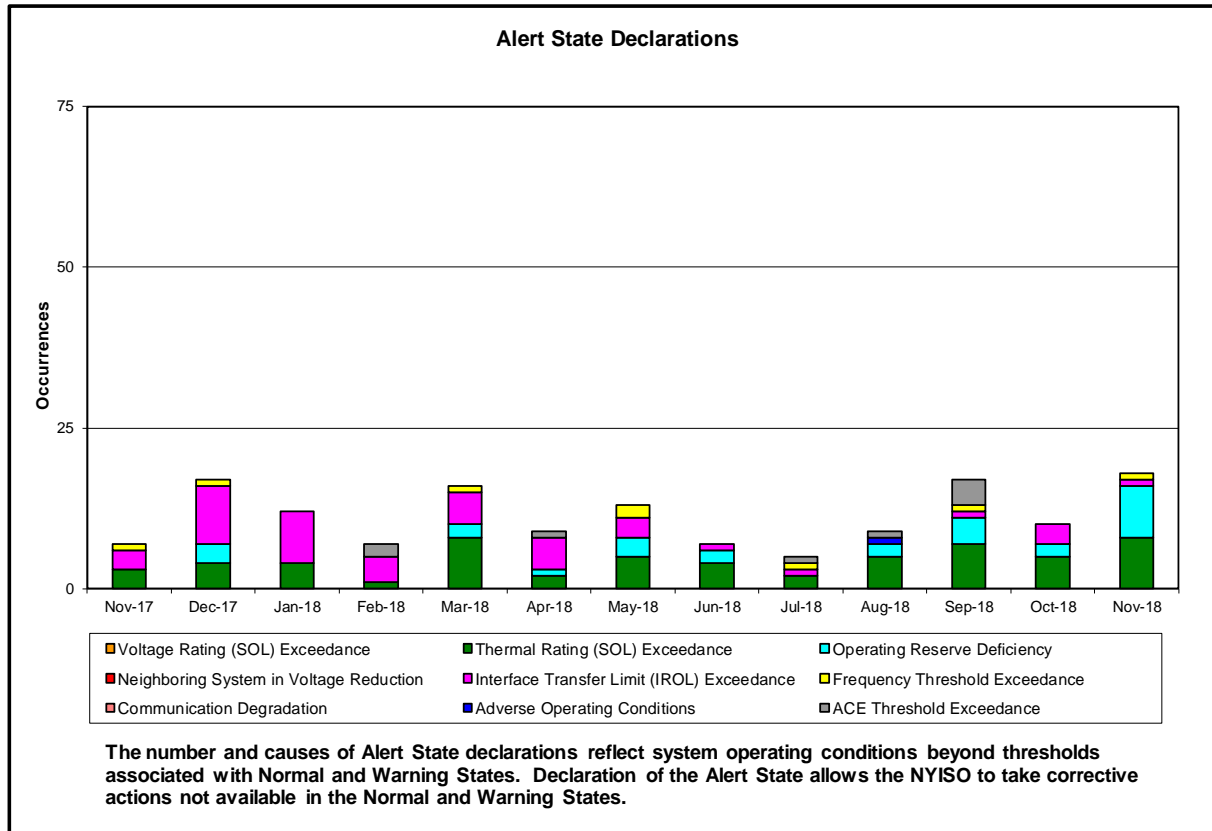
	Current Month Value (\$M)	Year-to-Date Value (\$M)
NY Savings from PJM-NY Congestion Coordination	(\$0.06)	\$12.95
NY Savings from PJM-NY Coordinated Transaction Scheduling	(\$0.39)	(\$0.50)
NY Savings from NE-NY Coordinated Transaction Scheduling	\$0.36	(\$0.09)
Total NY Savings	(\$0.09)	\$12.36
Regional Savings from PJM-NY Coordinated Transaction Scheduling	\$0.51	\$3.99
Regional Savings from NE-NY Coordinated Transaction Scheduling	\$0.03	\$0.74
Total Regional Savings	\$0.54	\$4.73

- Statewide uplift cost monthly average was (\$0.52)/MWh
- The following table identifies the Monthly ICAP spot market prices and the price delta.

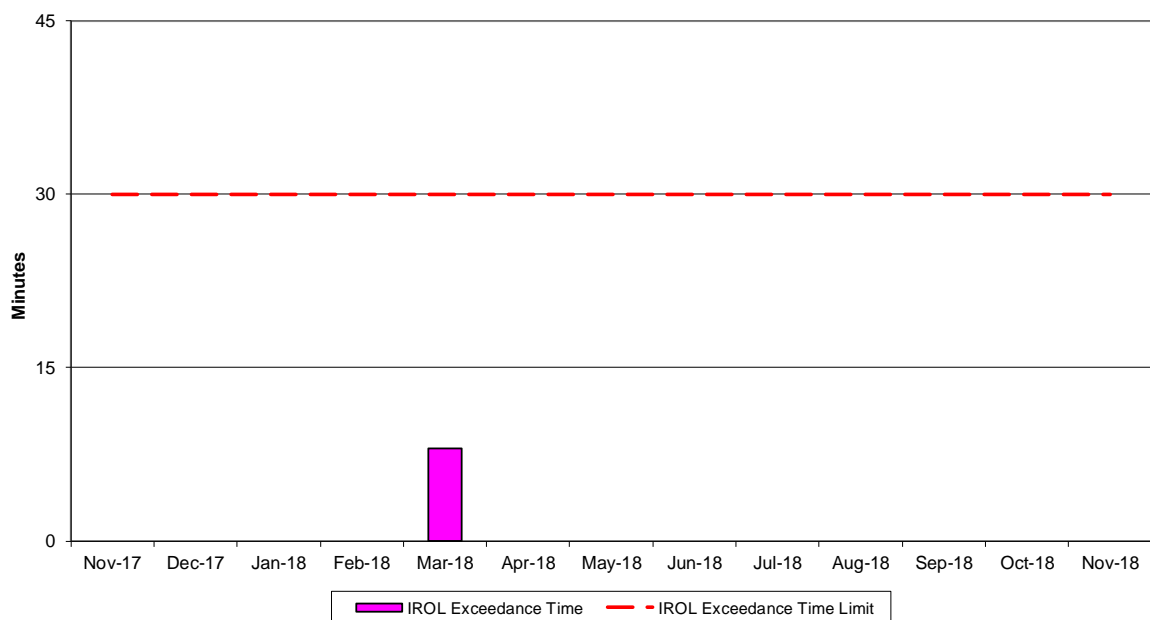
Spot Auction Price Results	NYCA	Lower Hudson Valley Zones	New York City Zone	Long Island Zone
December 2018 Spot Price	\$0.10	\$1.52	\$1.52	\$1.95
November 2018 Spot Price	\$0.10	\$1.59	\$1.59	\$0.67
Delta	\$0.00	(\$0.07)	(\$0.07)	\$1.28

- LI - Price increase by \$1.28 due to increase in unoffered capacity

Reliability Performance Metrics

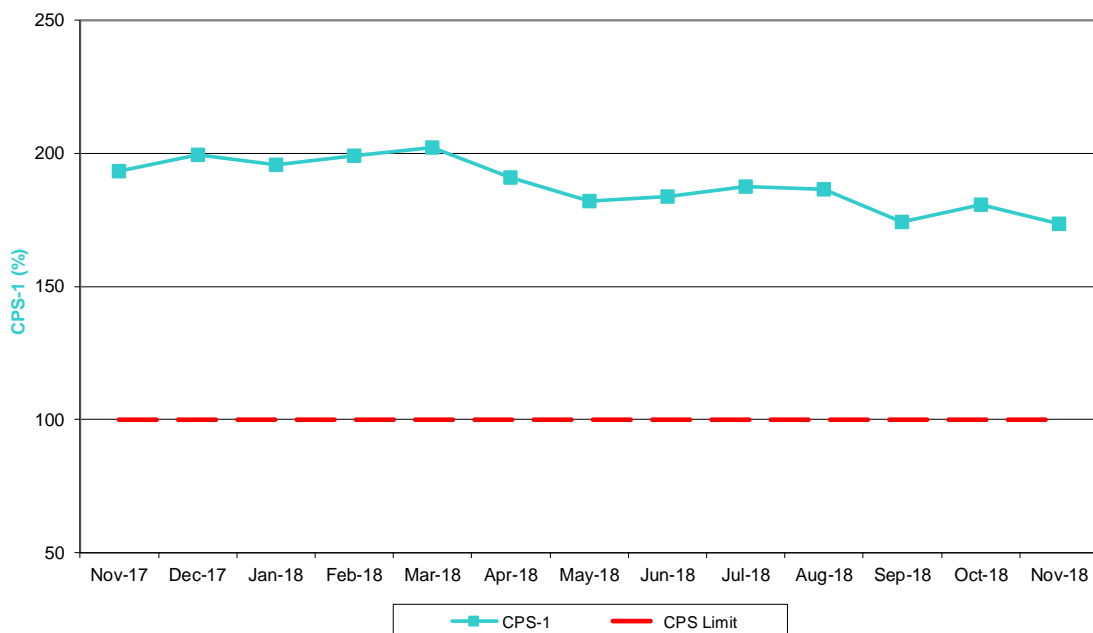


NERC IROL Time Over Limit



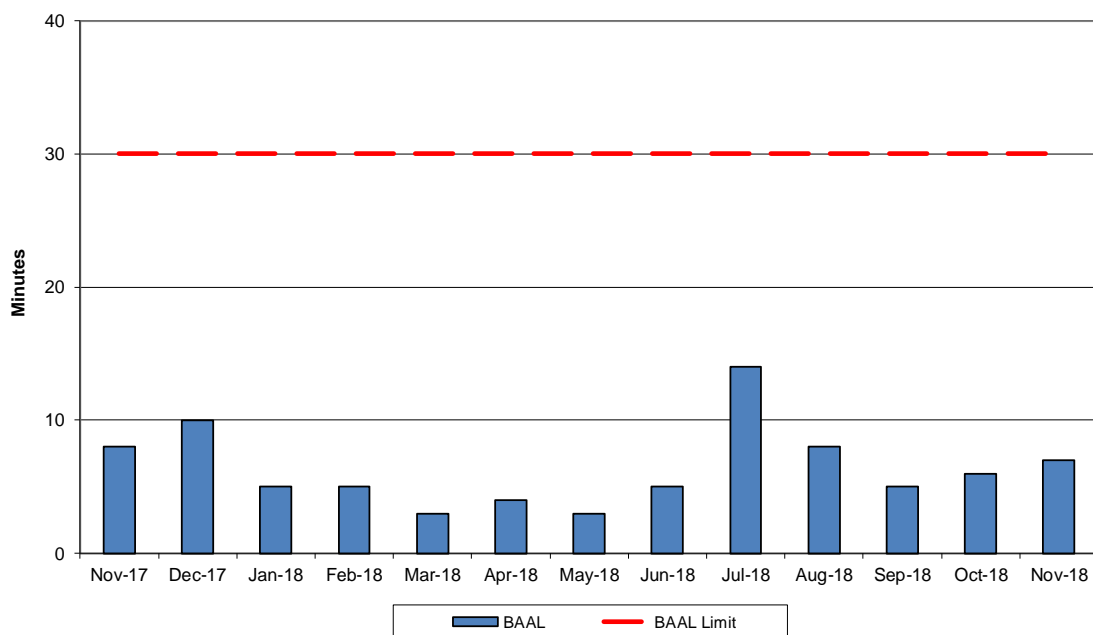
For IROL exceedances leading to Major Emergency State declarations, the maximum IROL exceedance time is identified. IROL exceedances of less than thirty minutes are considered NERC compliant.

NERC Control Performance Standards



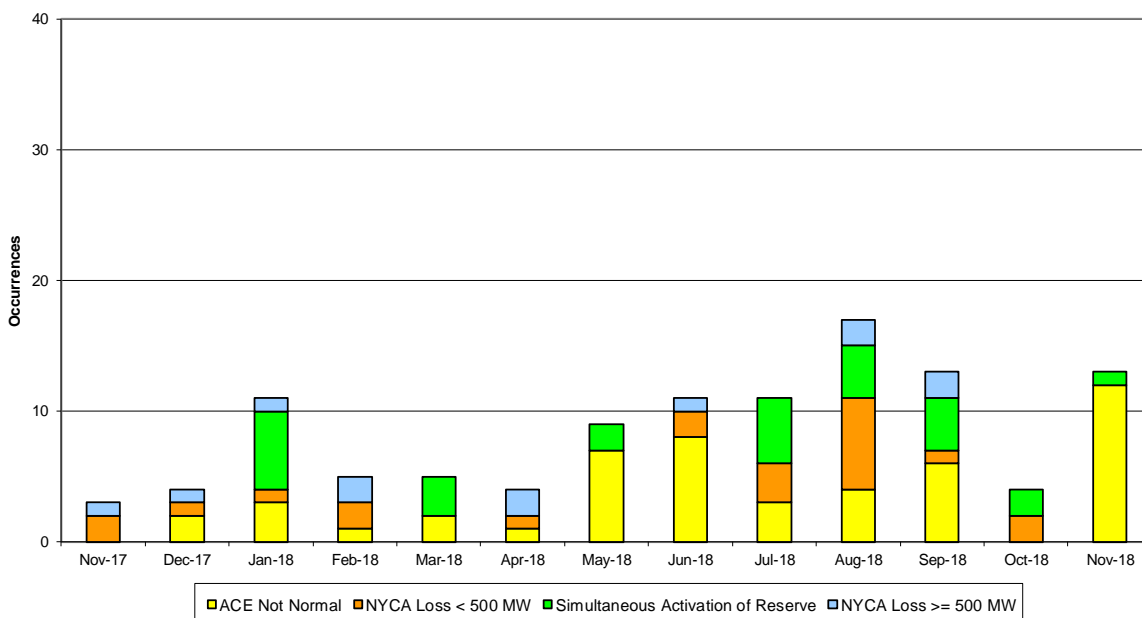
The value of NERC Control Performance Standards (CPS-1) is an indicator of the NYISO Area resource and demand balancing. Values exceeding the identified threshold are NERC compliant.

NERC Balancing Authority ACE Limit Standard



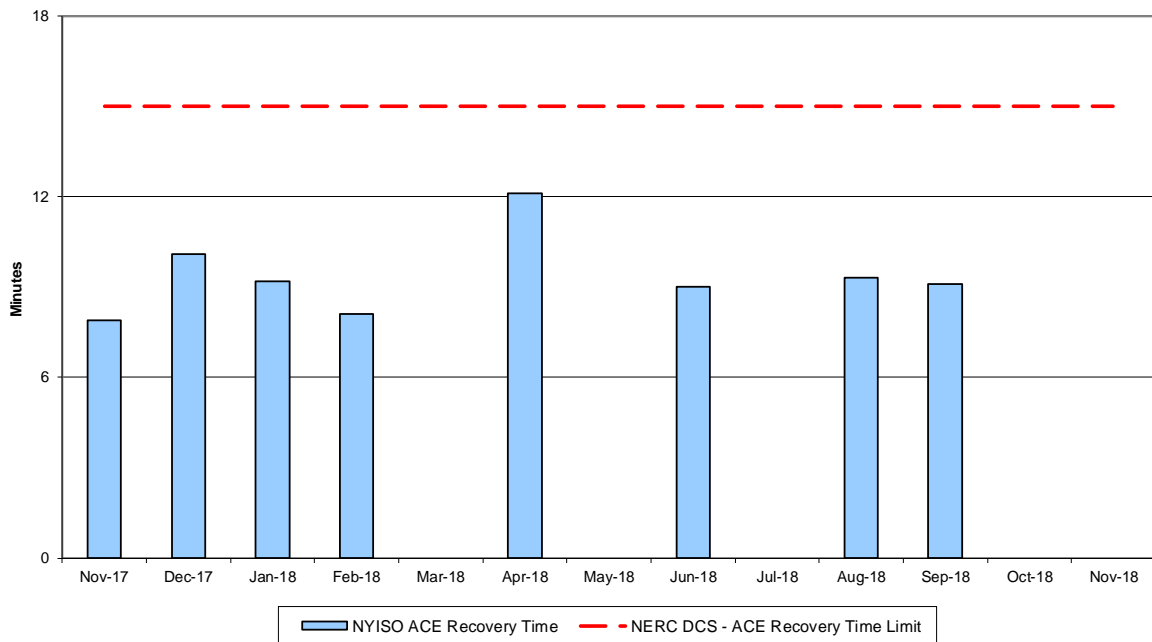
The amount of time the clock-minute average ACE exceeds the clock-minute Balancing Authority ACE Limit (BAAL) is an indicator of the NYISO Area resource and demand balancing. The maximum BAAL exceedance time is identified. BAAL exceedances of less than 30 consecutive clock-minutes are NERC compliant.

Reserve Activations



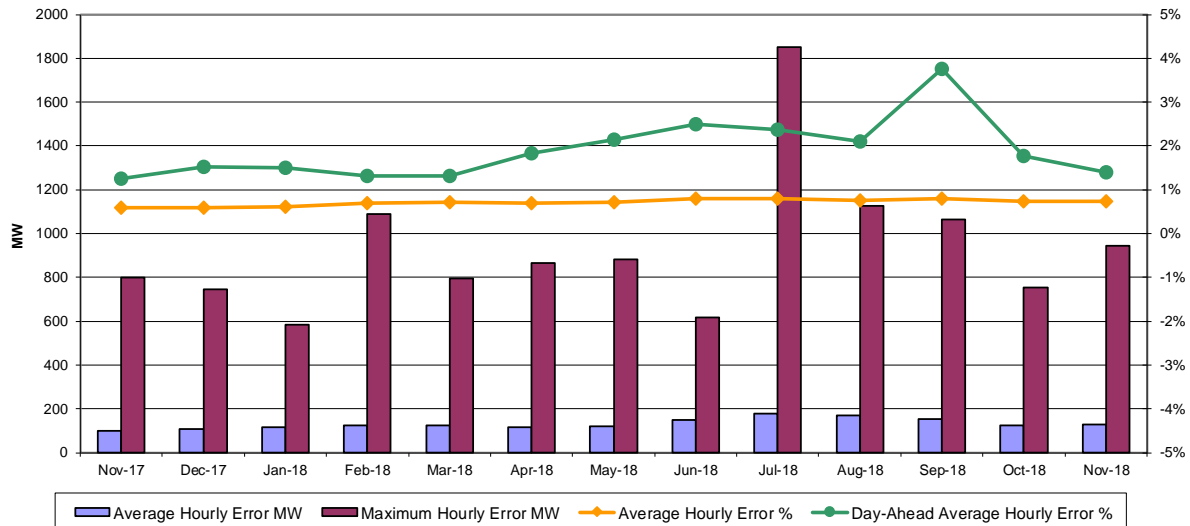
NYISO Reserve Activations are indicators of the need to respond to unexpected operational conditions within the NYISO Area or to assist a neighboring Area (Simultaneous Activation of Reserves) by activating an immediate resource and demand balancing operation.

DCS Event Time to ACE Recovery



For NYISO initiated Reportable Disturbances, the maximum ACE recovery time is identified. Recovery times of less than 15 minutes are considered NERC compliant.

Load Forecast Performance

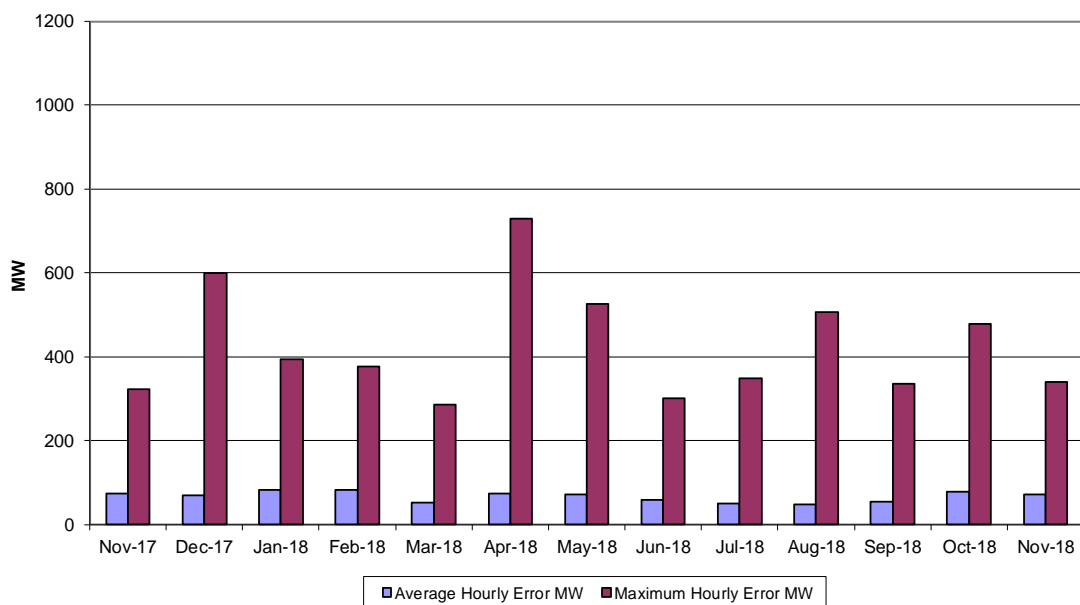


Hourly Error MW - Absolute value of the difference between the hourly average actual load demand and the average hour ahead forecast load demand.

Average Hourly Error % - Average value of the ratio of hourly average error magnitude to hourly average actual load demand.

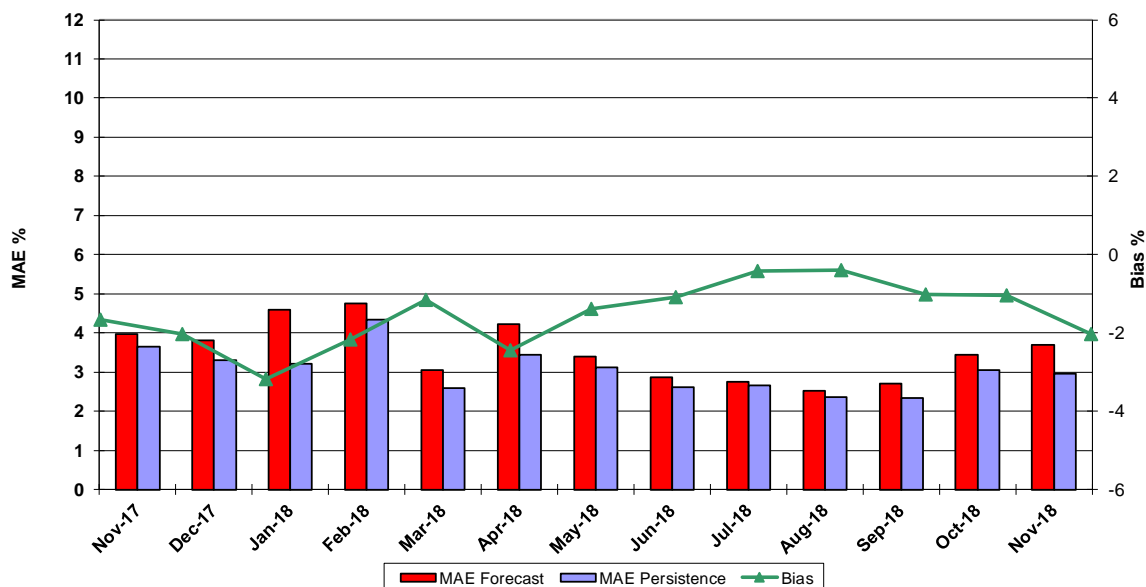
Day-Ahead Average Hourly Error % - Average across all hours of the month of the absolute value of the difference between actual load demand and the Day-Ahead forecast load demand, divided by the actual load demand.

Wind Forecast Performance Hour Ahead MW Error

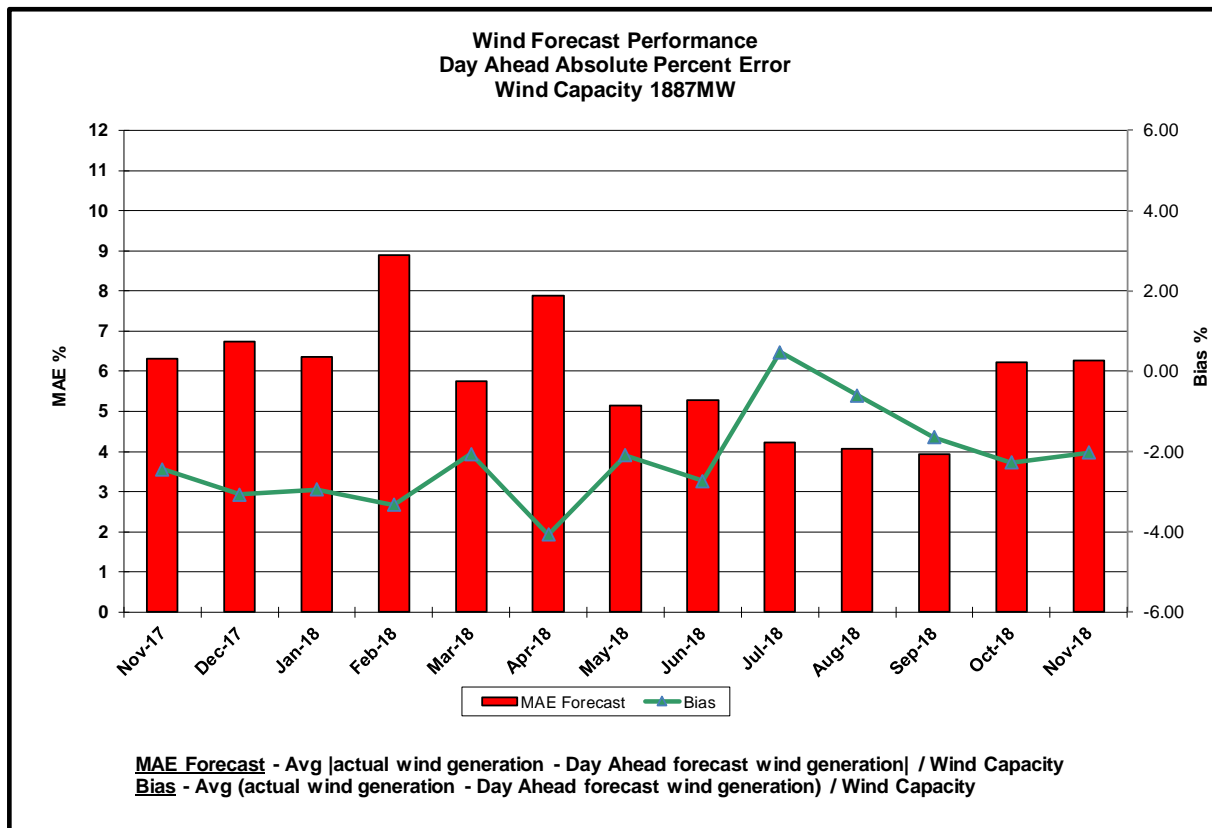
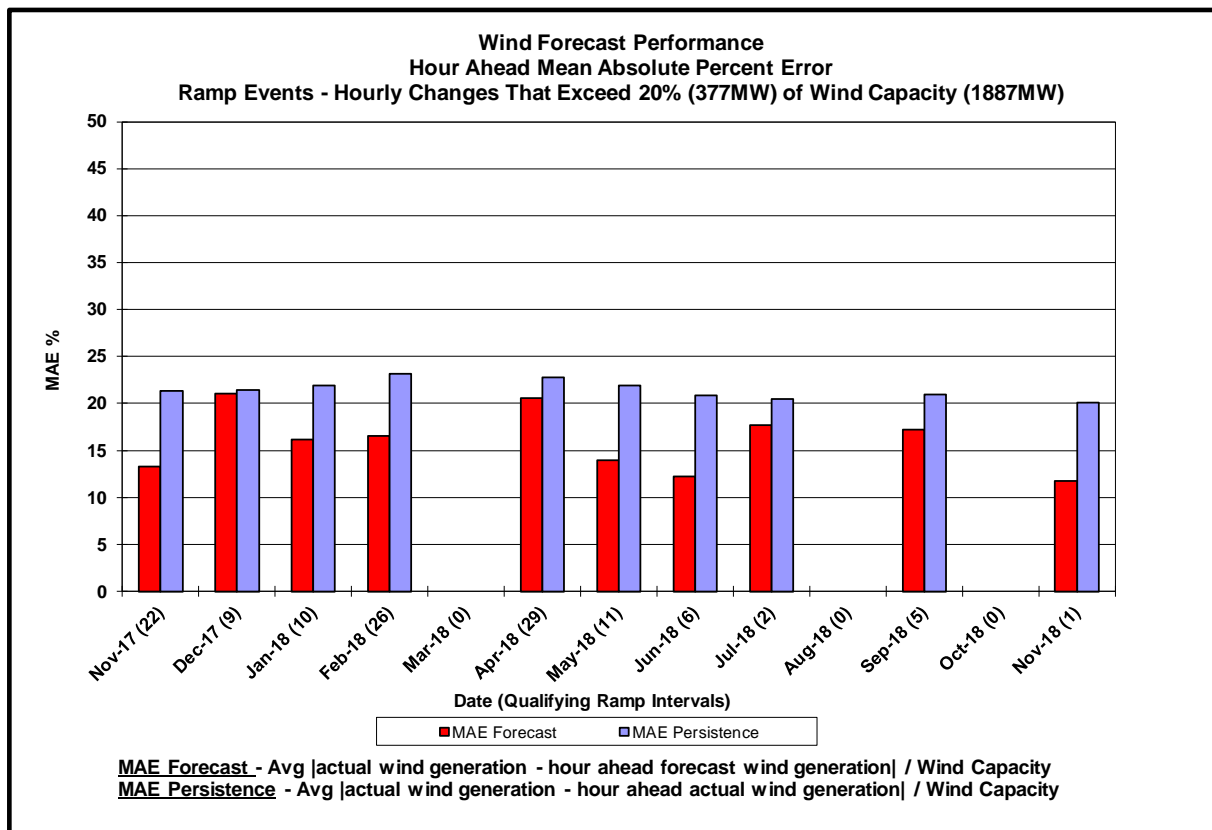


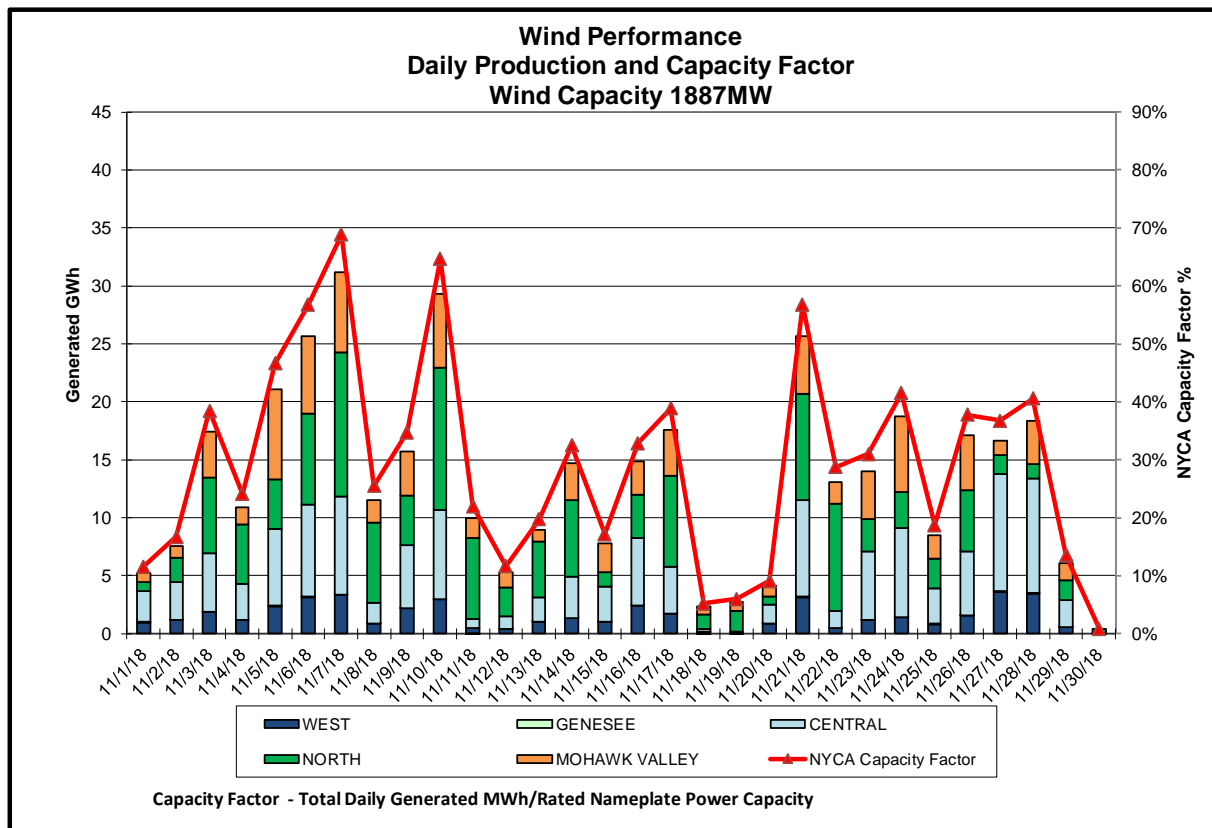
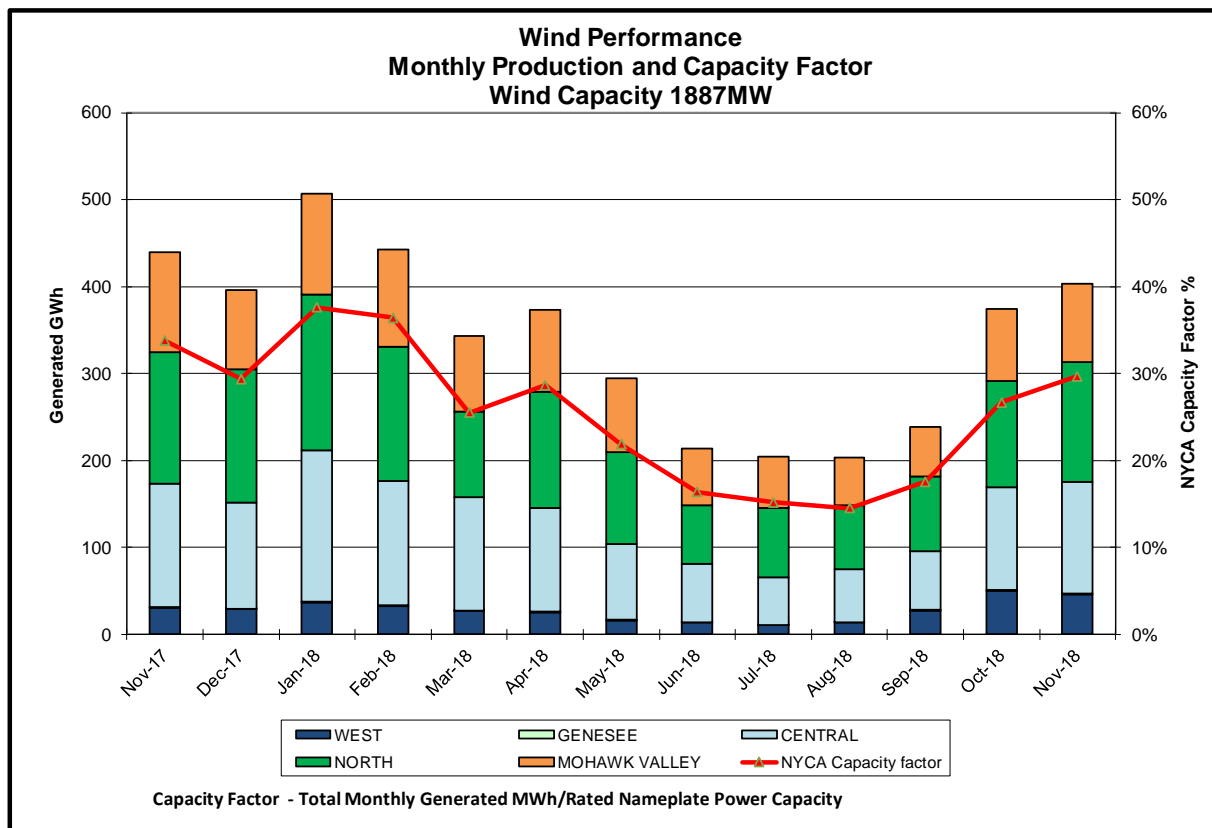
Hourly Error MW - Absolute value of the difference between the hourly average actual wind generation and the average hour ahead forecast wind generation.

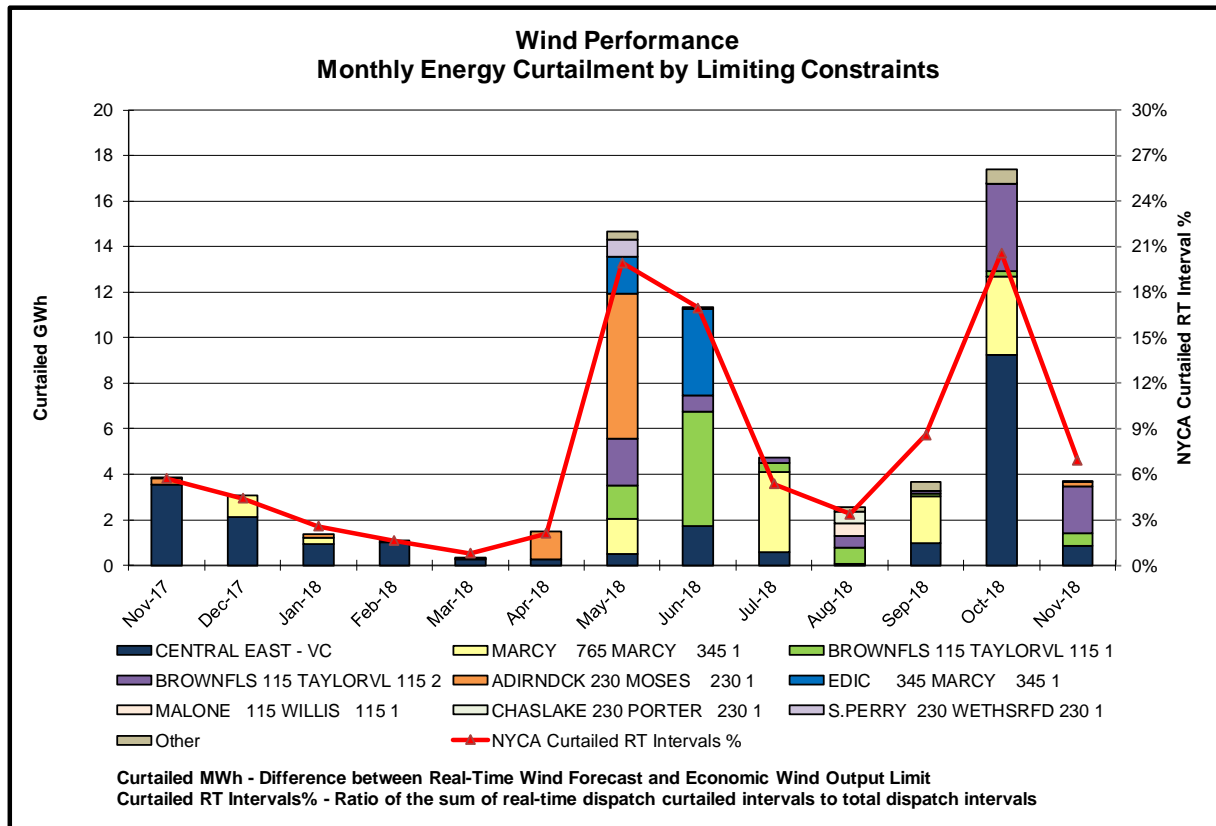
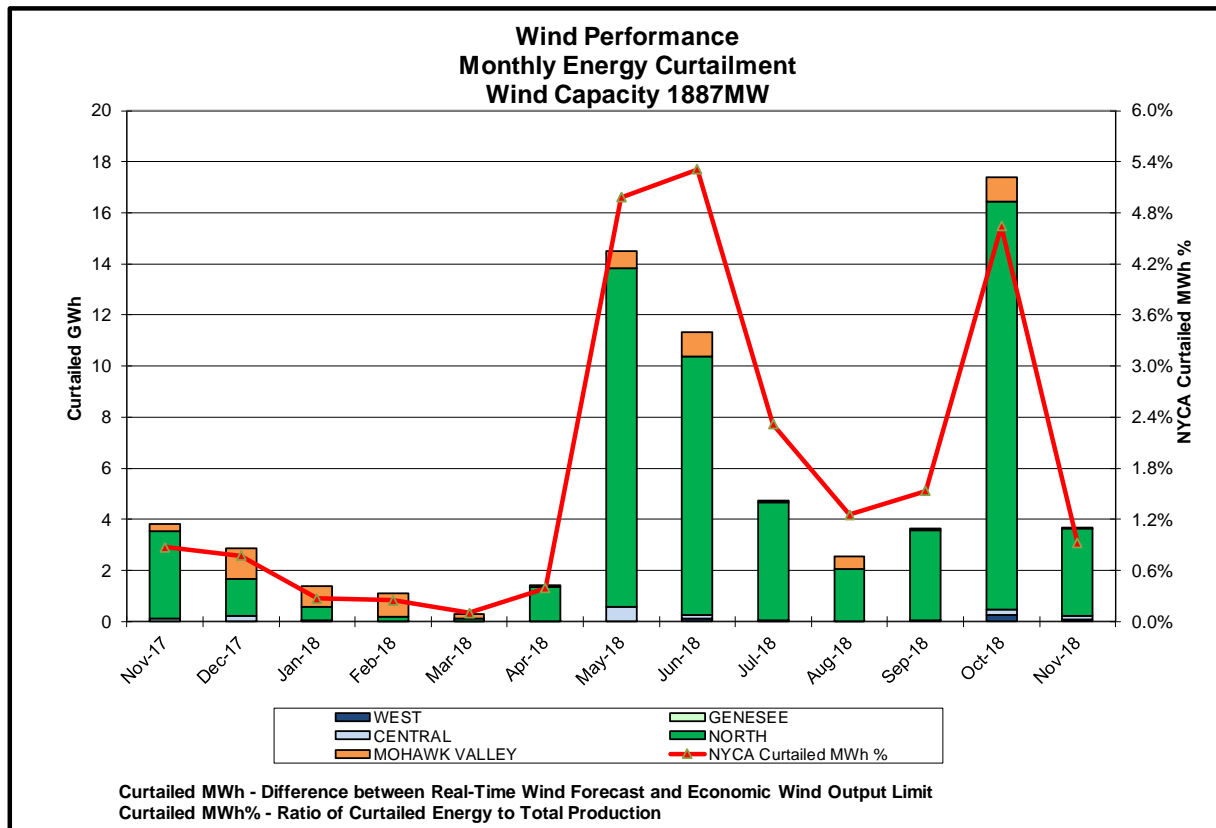
Wind Forecast Performance Hour Ahead Percent Error Wind Capacity 1887MW

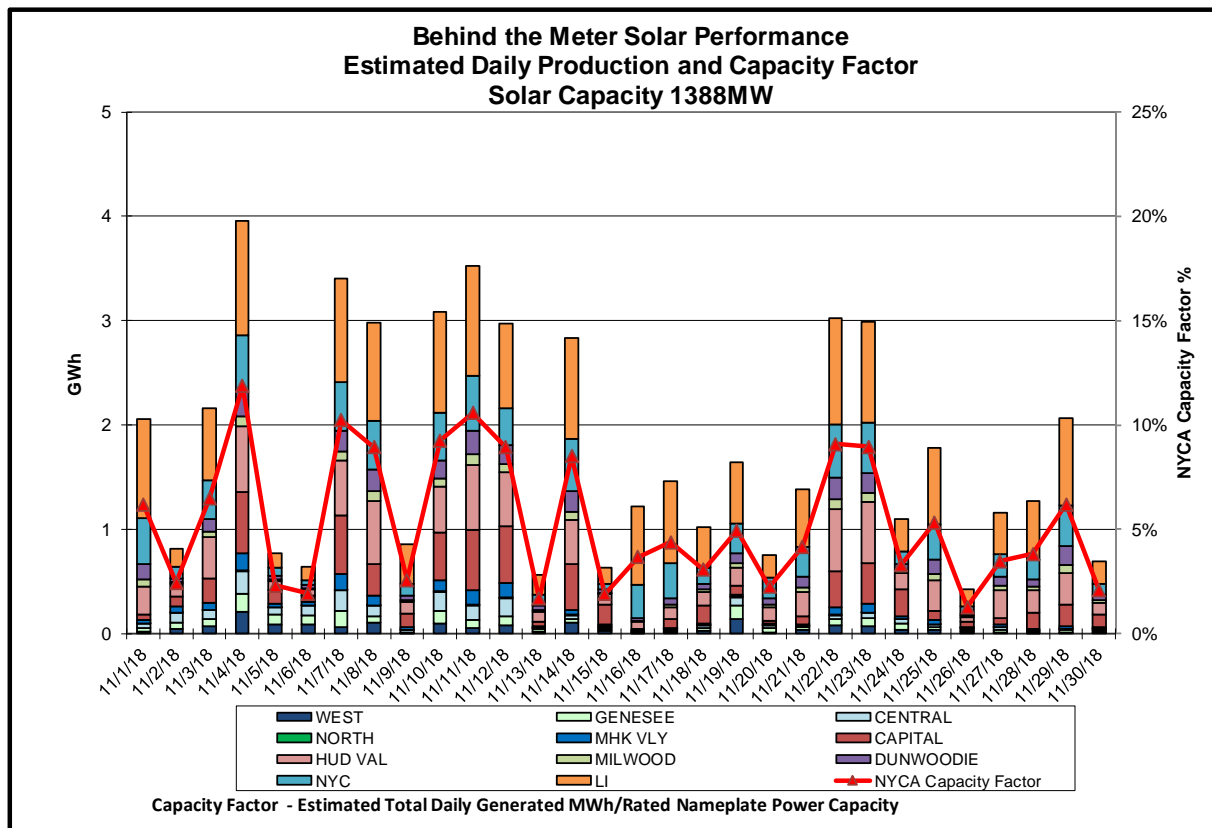
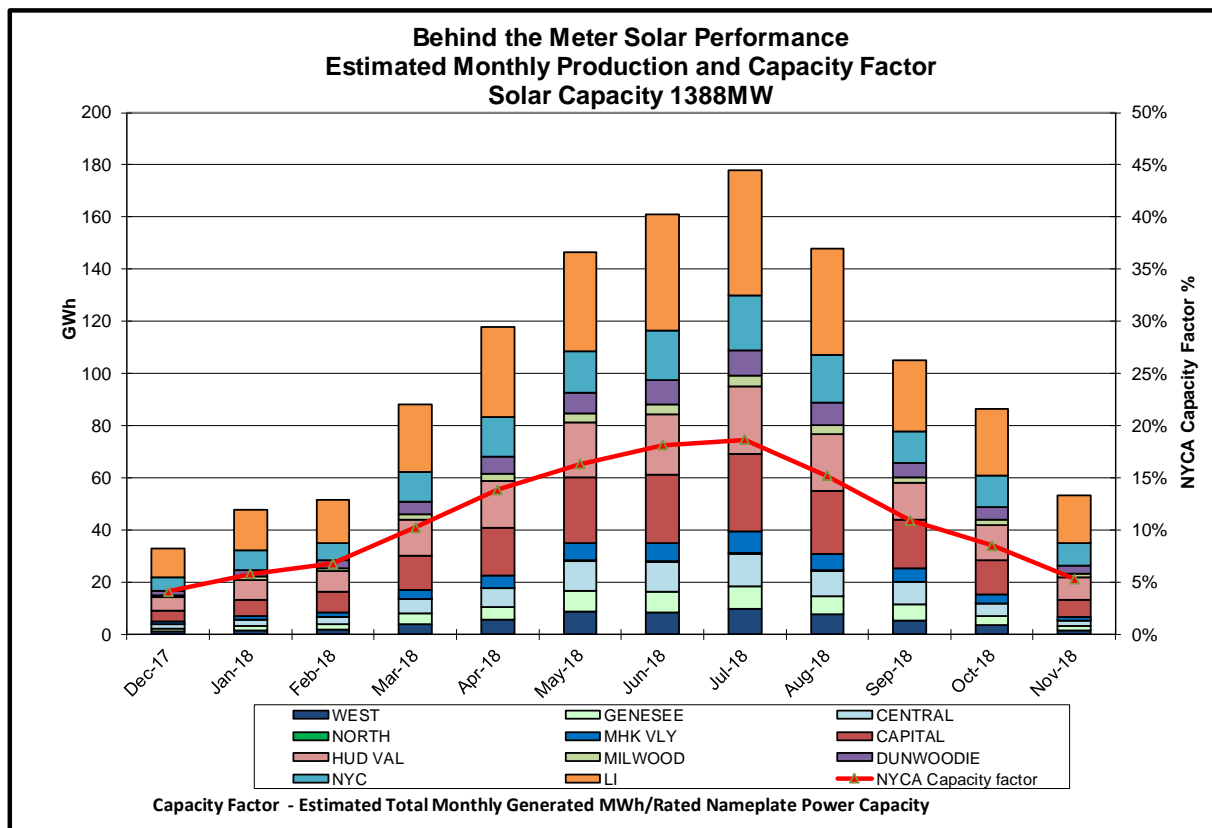


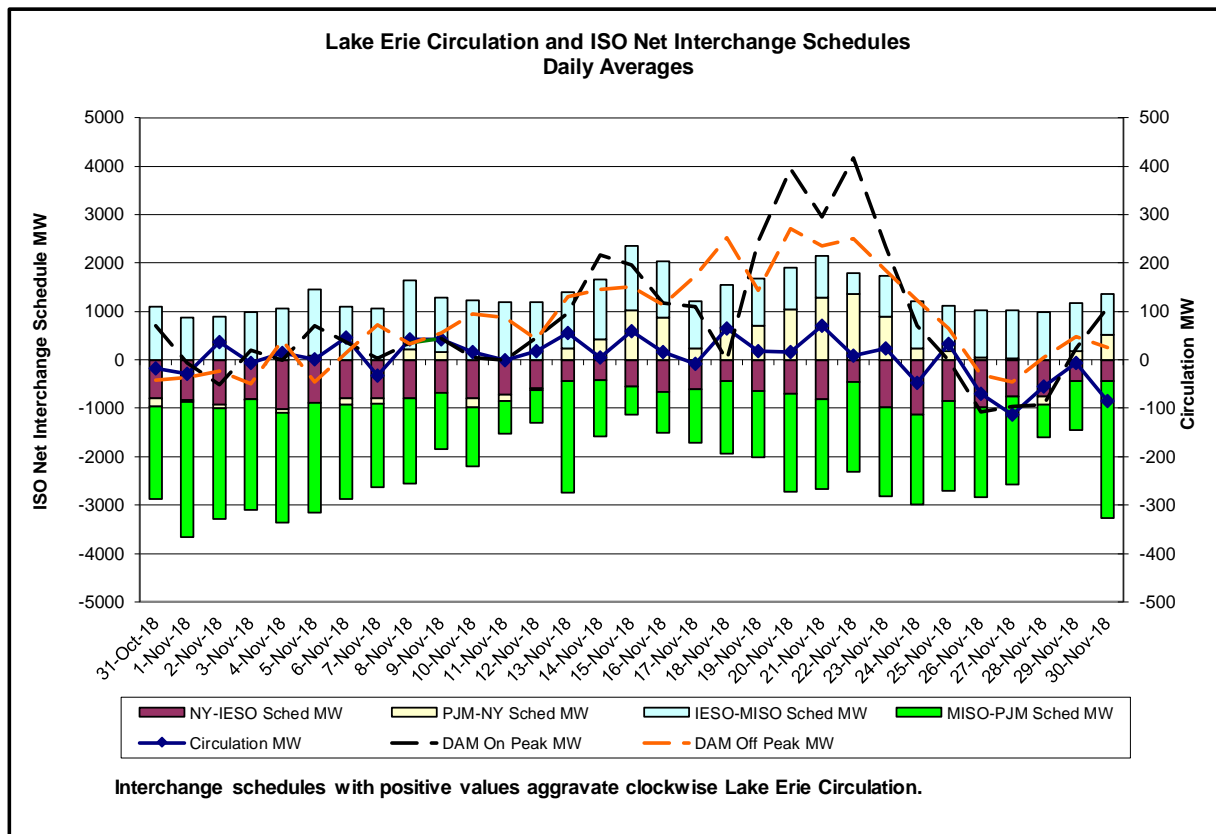
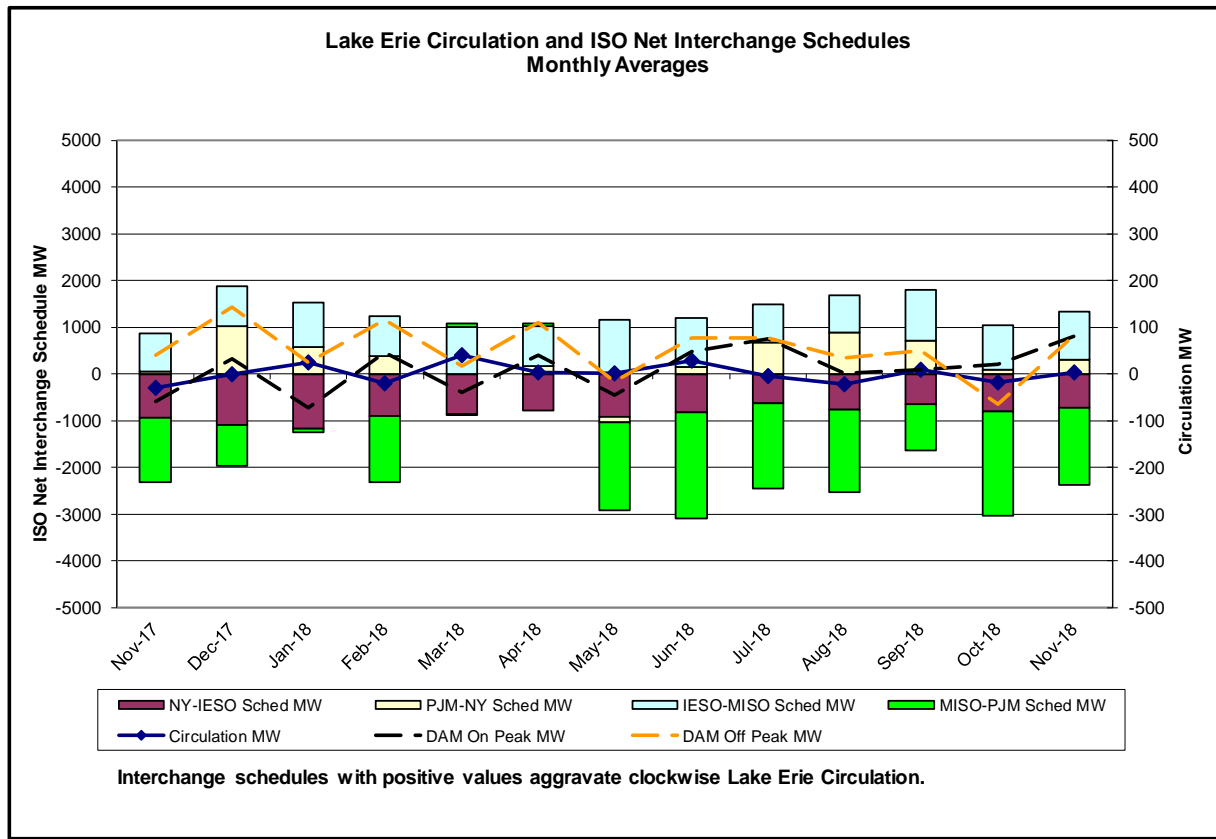
MAE Forecast - Avg [actual wind generation - hour ahead forecast wind generation] / Wind Capacity
MAE Persistence - Avg [actual wind generation - hour ahead actual wind generation] / Wind Capacity
Bias - Avg (actual wind generation - hour ahead forecast wind generation) / Wind Capacity



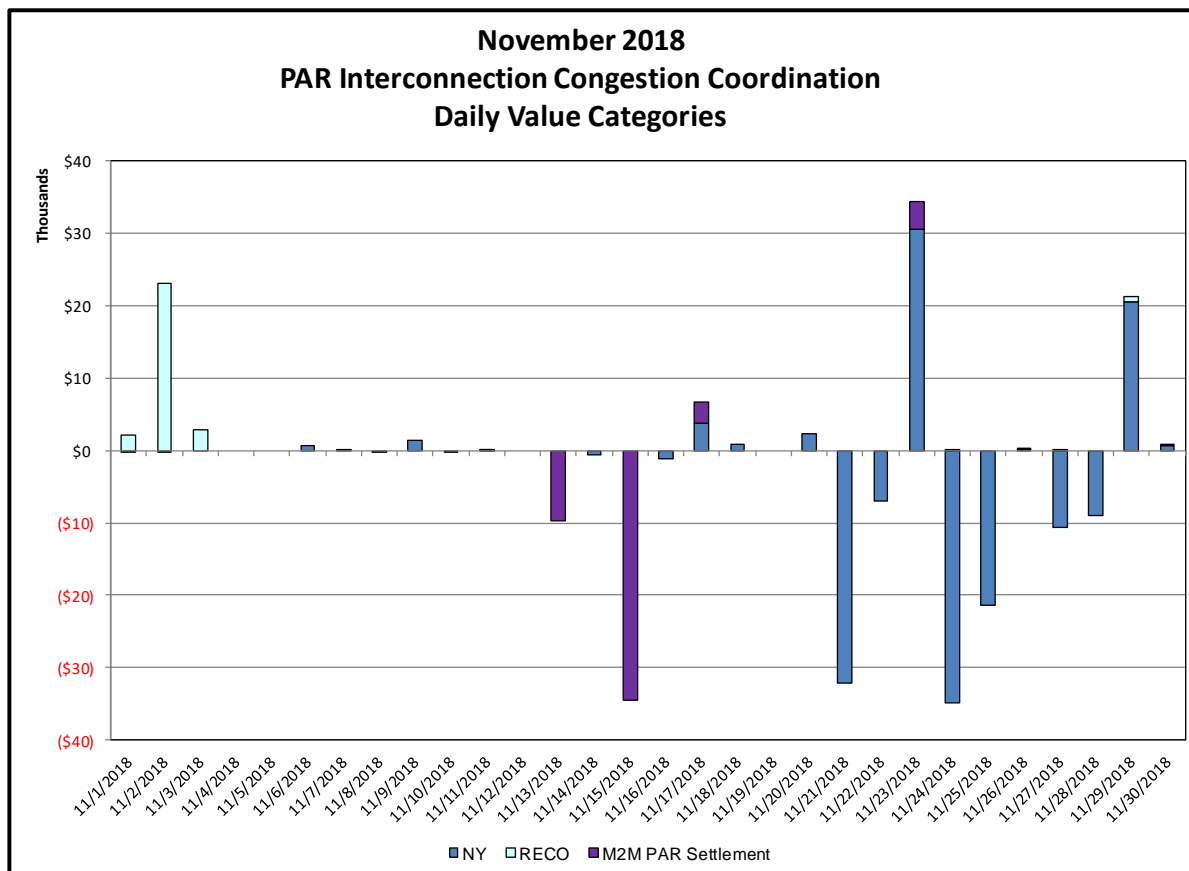
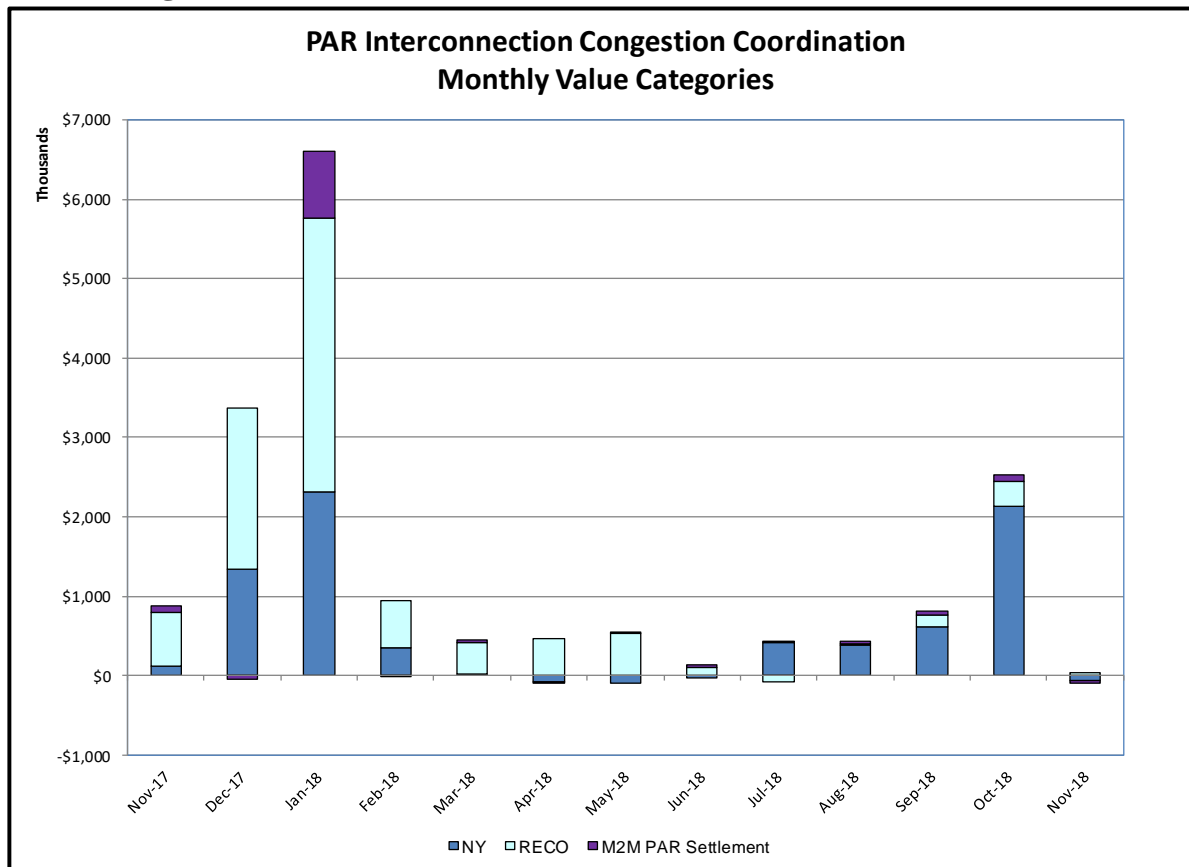






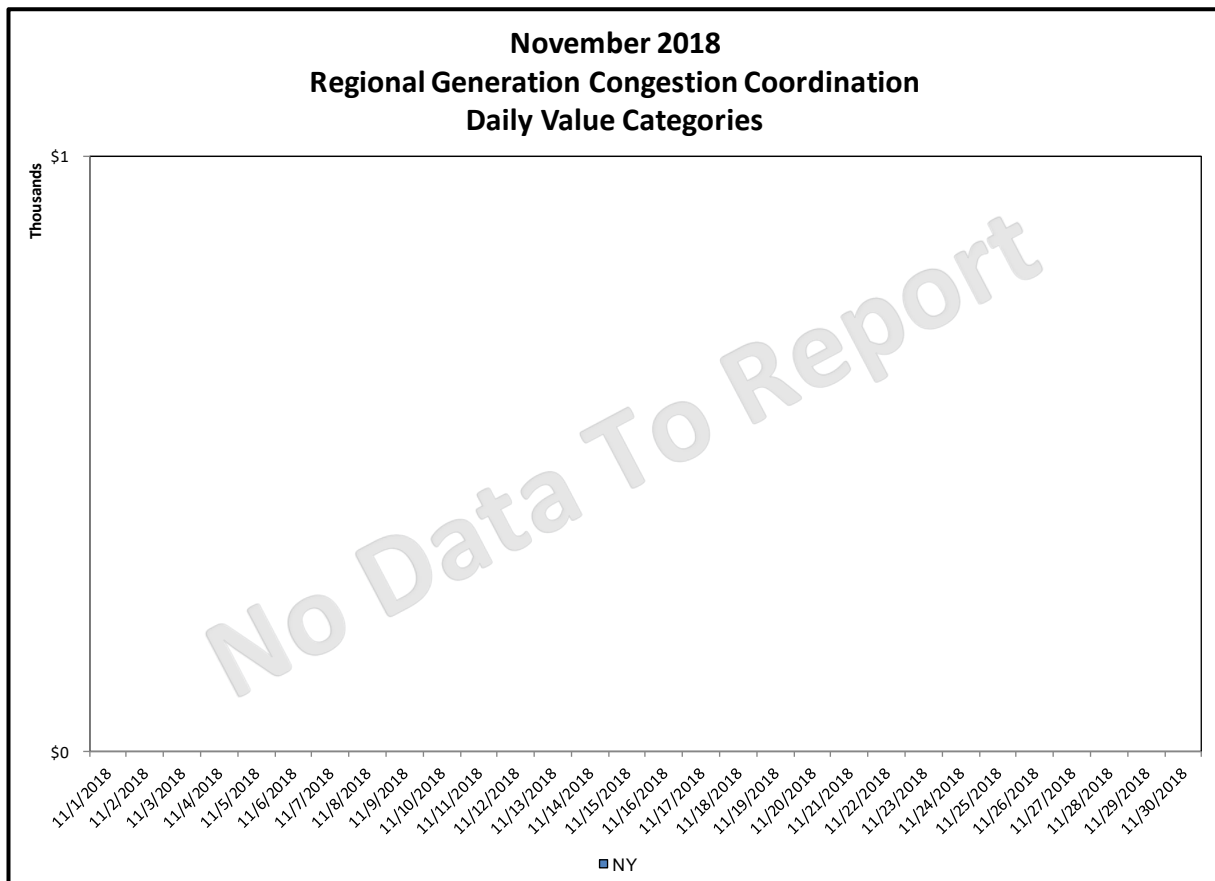
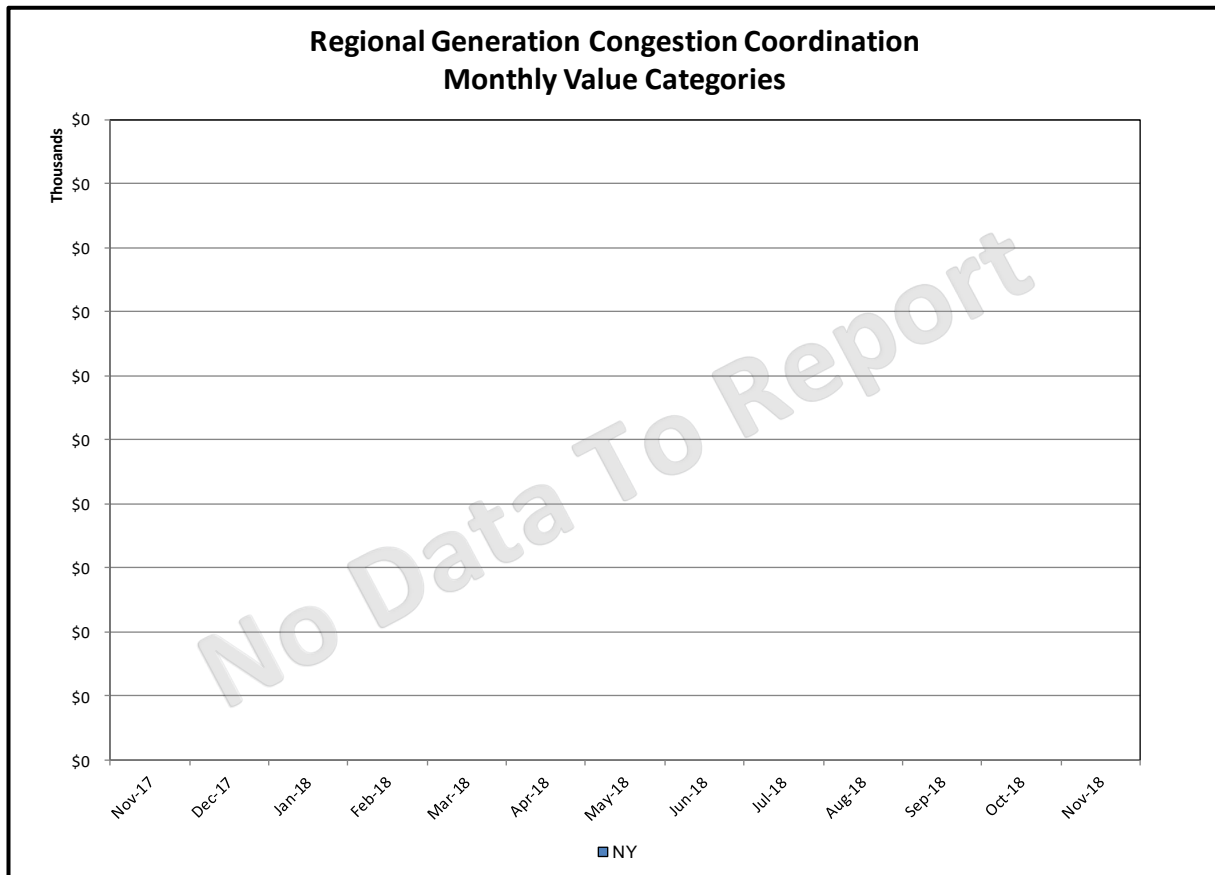


Broader Regional Market Performance Metrics



PAR Interconnection Congestion Coordination

<u>Category</u>	<u>Description</u>
NY	Represents the value NY realizes from Market-to-Market PAR Coordination when experiencing congestion. This is the estimated savings to NY for additional deliveries into NY
RECO	Represents the value of PJM's obligation to deliver 80% of service to RECO load over Ramapo 5018. This is the estimated reduction in NYCA congestion due to the PJM delivery of RECO over Ramapo 5018.
M2M PAR Settlement	Market-to-Market PAR Coordination settlement on coordinated flowgates. Through April 2017 this value was included in the NY and RECO categories. The positive sign convention indicates settlement to NY while the negative indicates settlement to PJM.



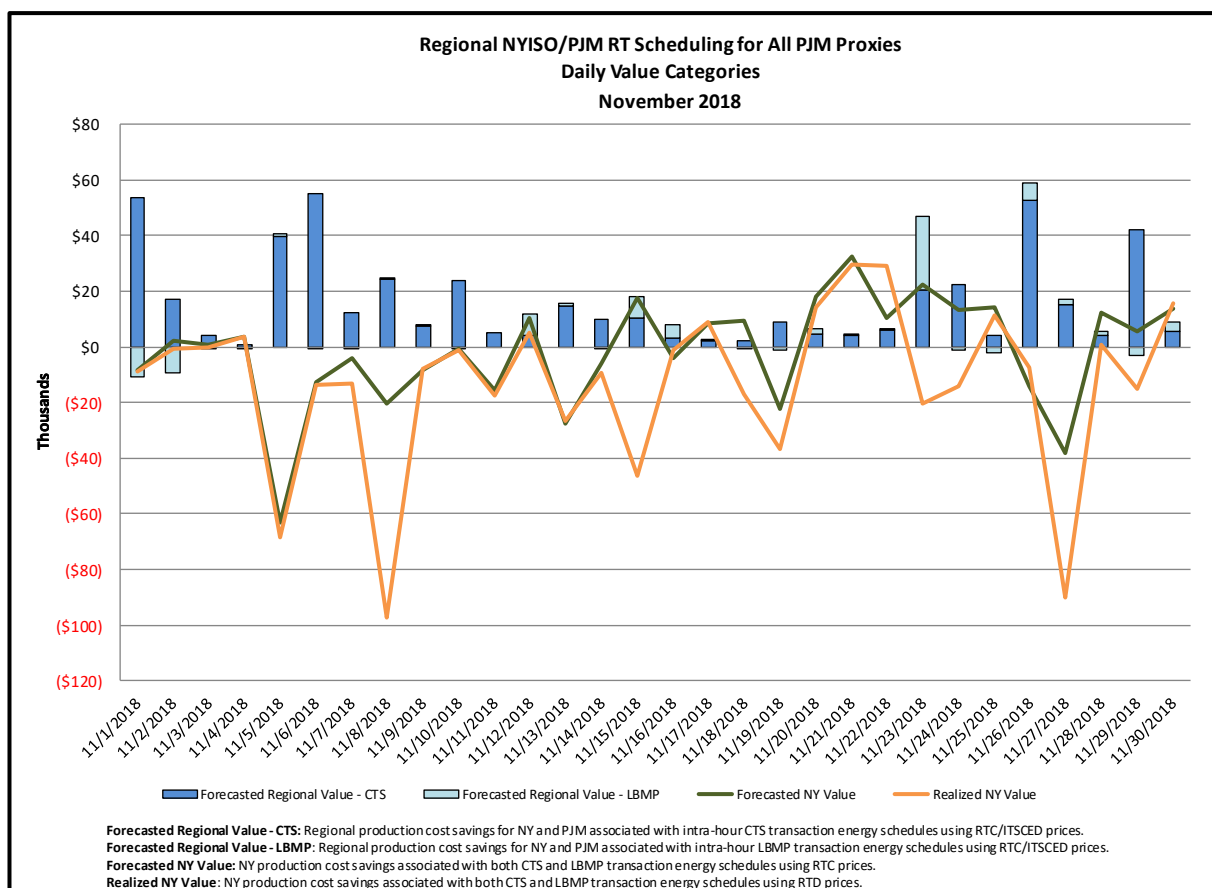
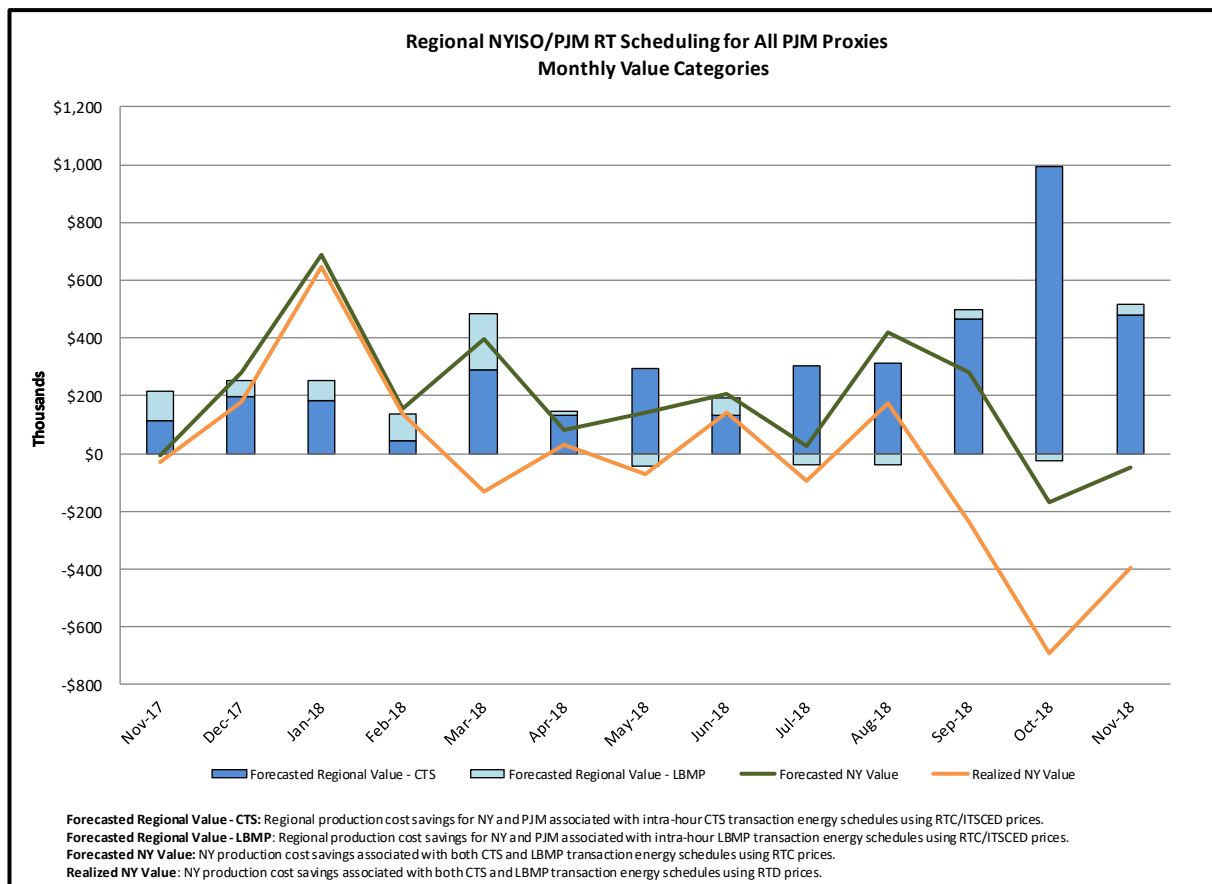
Regional Generation Congestion Coordination

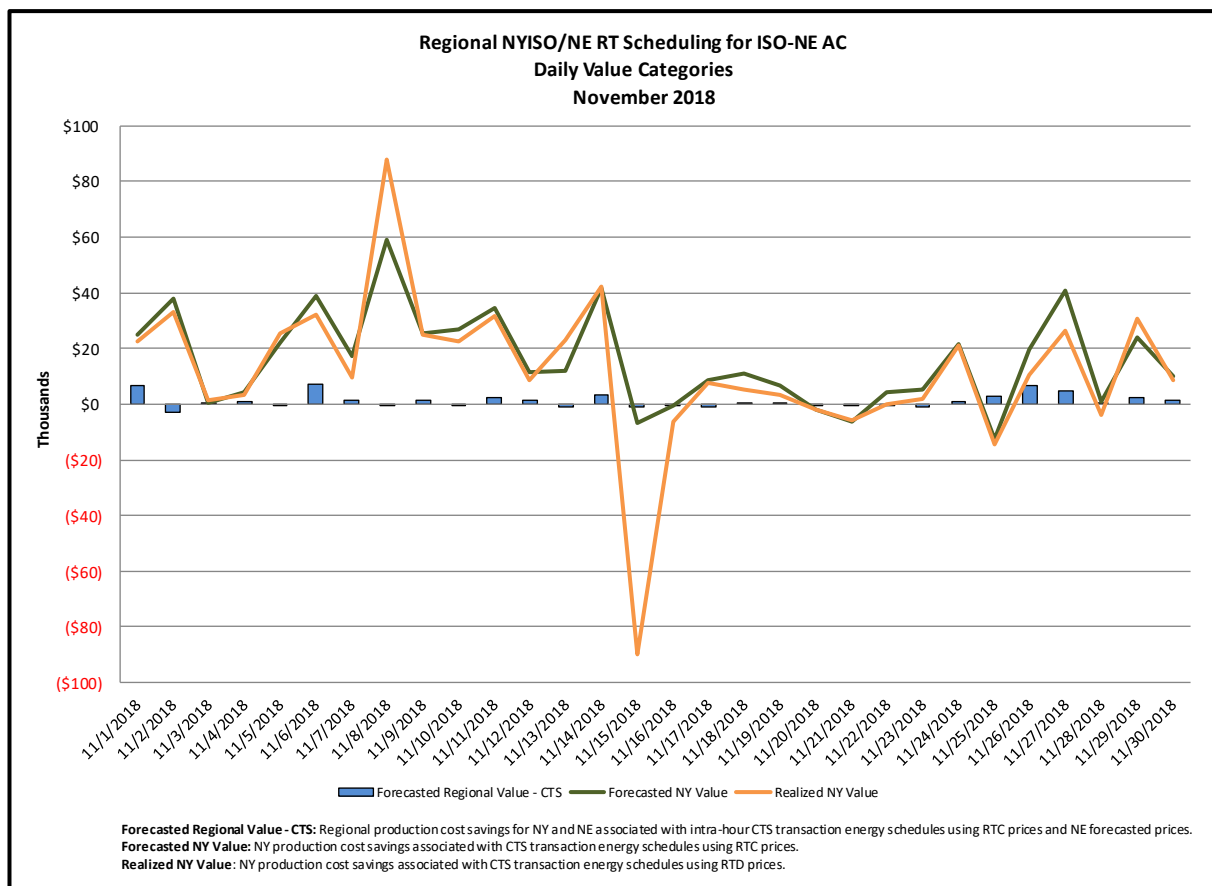
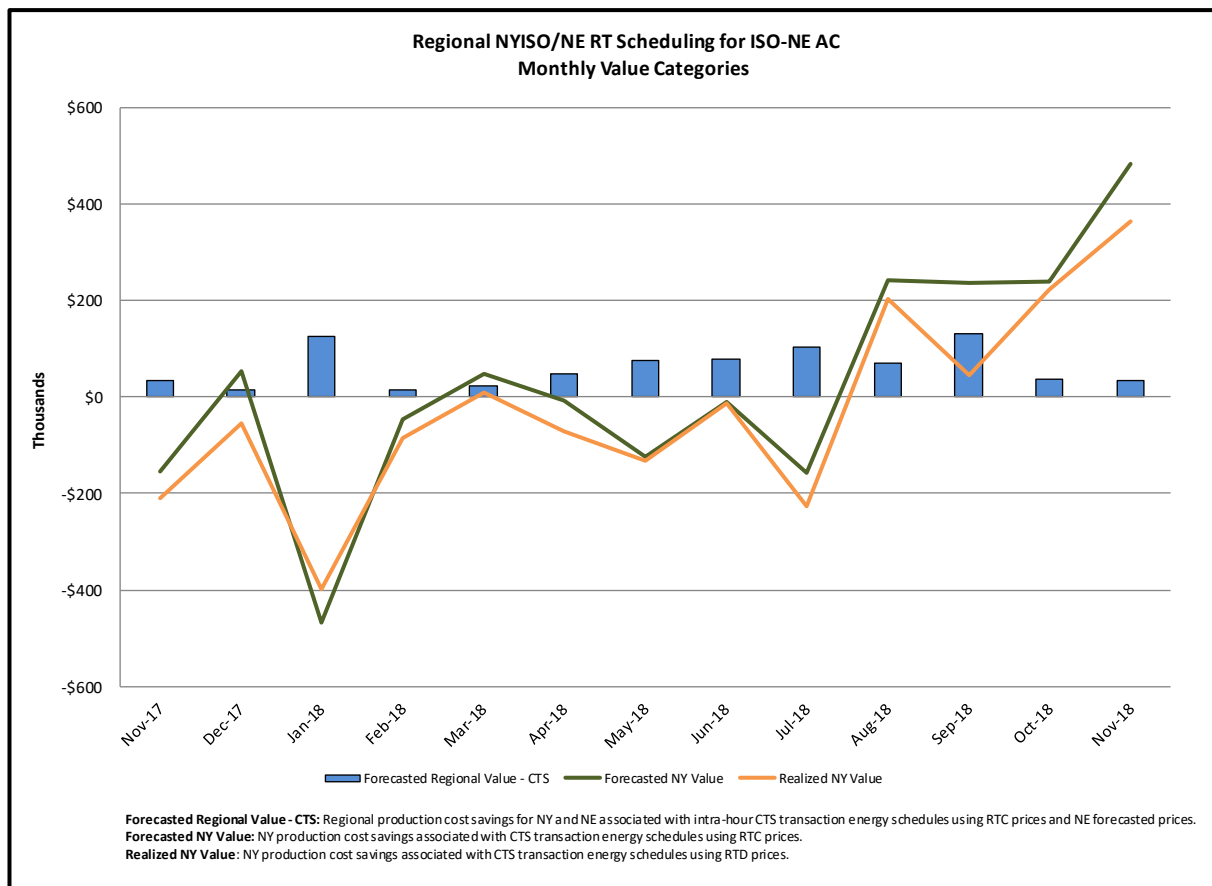
Category

NY

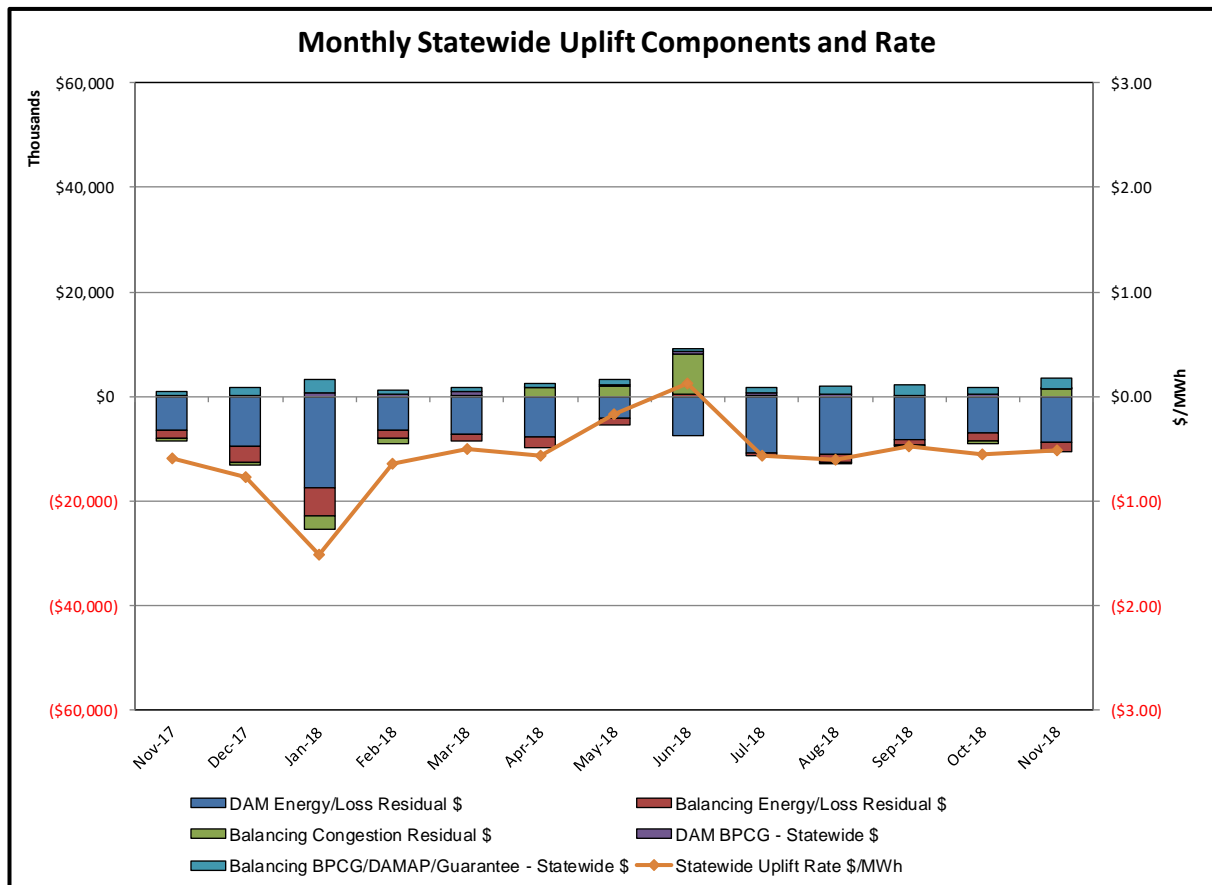
Description

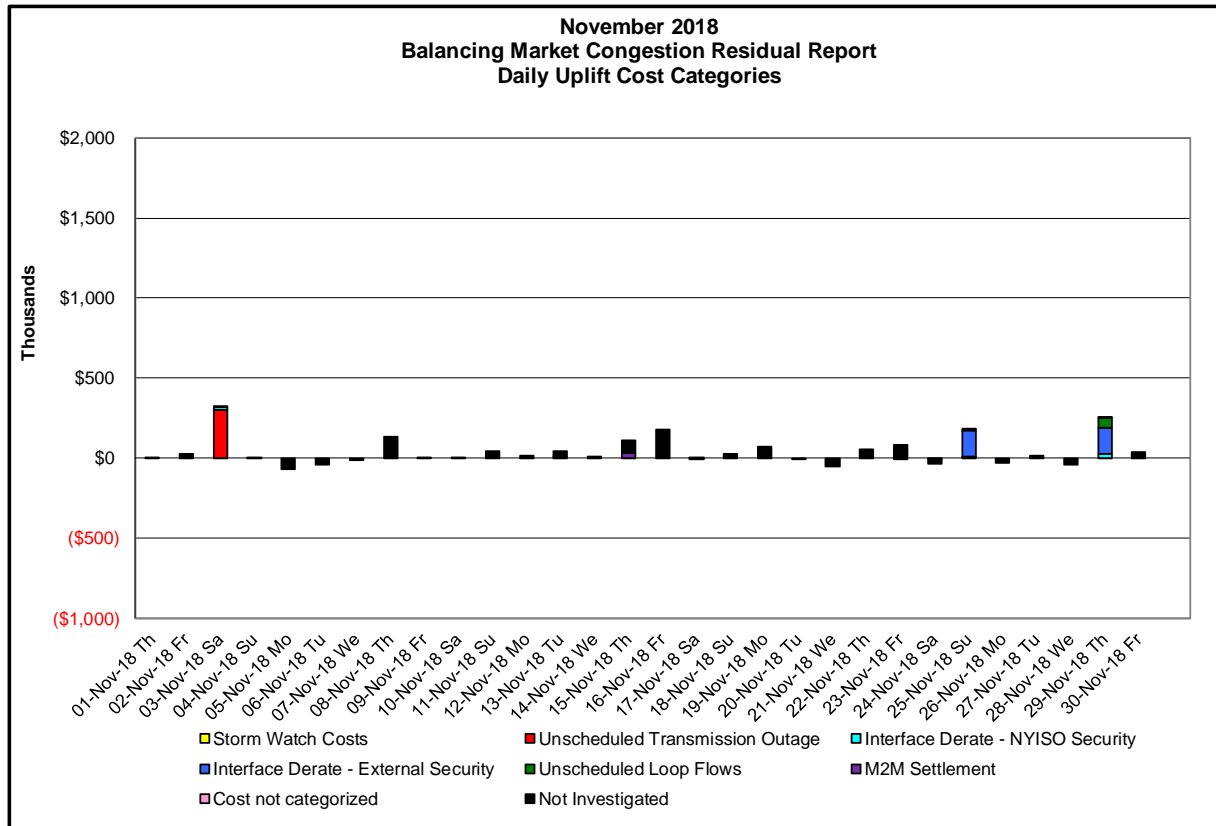
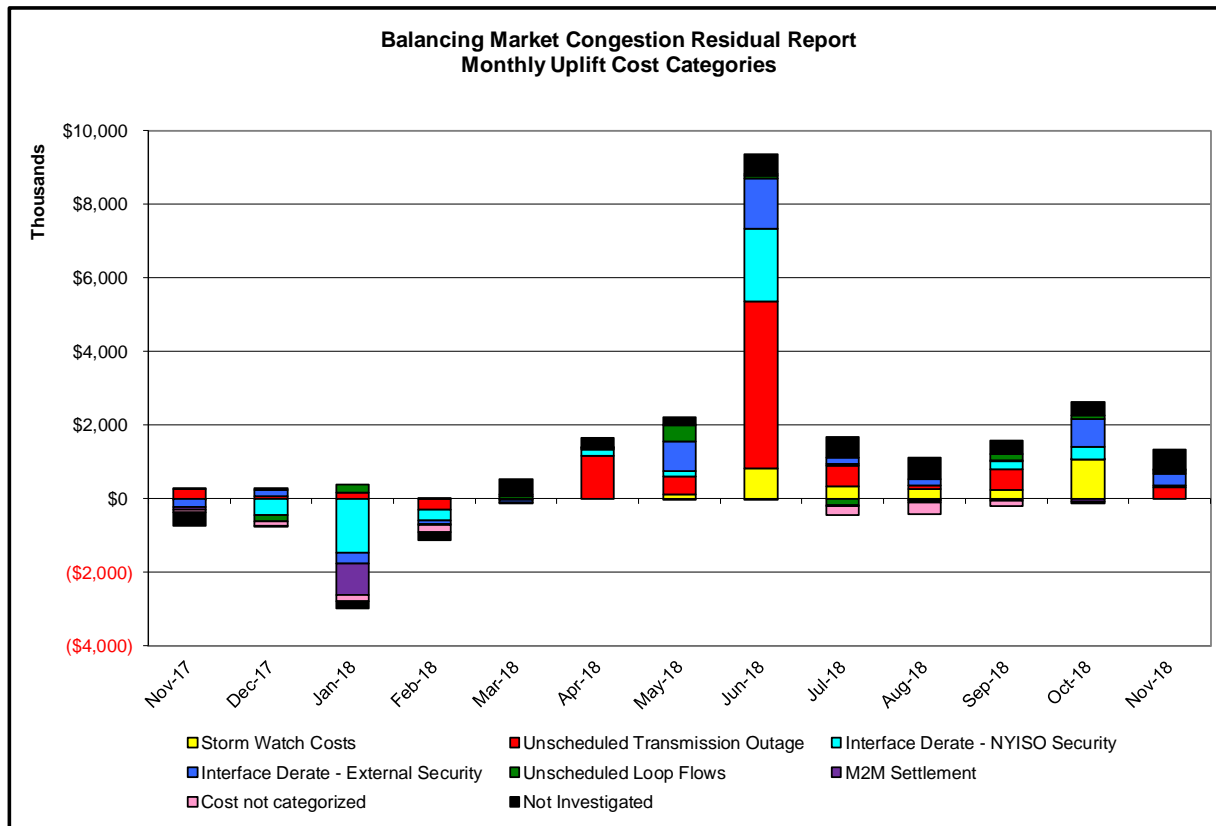
NYISO savings that result from PJM payments to NYISO when PJM's transmission use (PJM's market flow) is greater than PJM's entitlement of the NY transmission system and NYISO is incurring Western or Central NY congestion. Additionally, NYISO savings may result from the more efficient regional utilization of PJM's generation resources to directly address Western or Central NY transmission congestion.





Market Performance Metrics





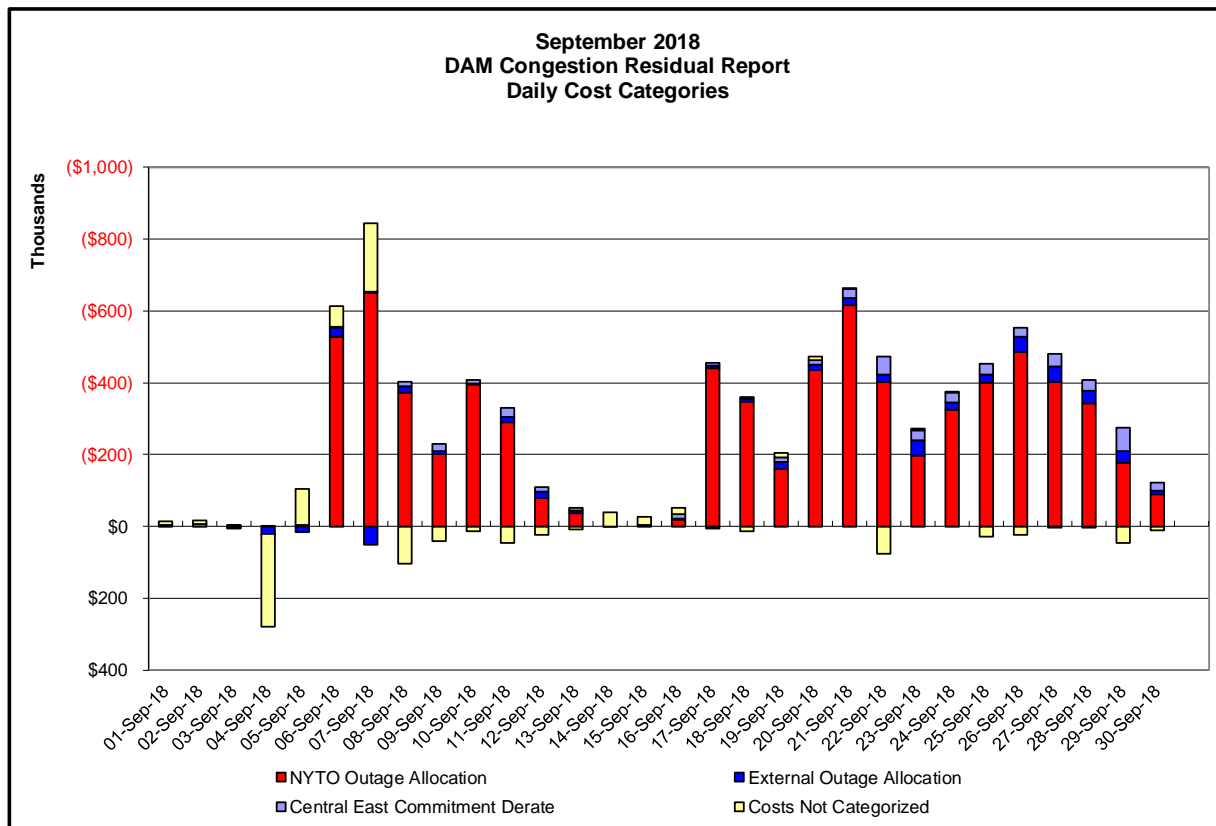
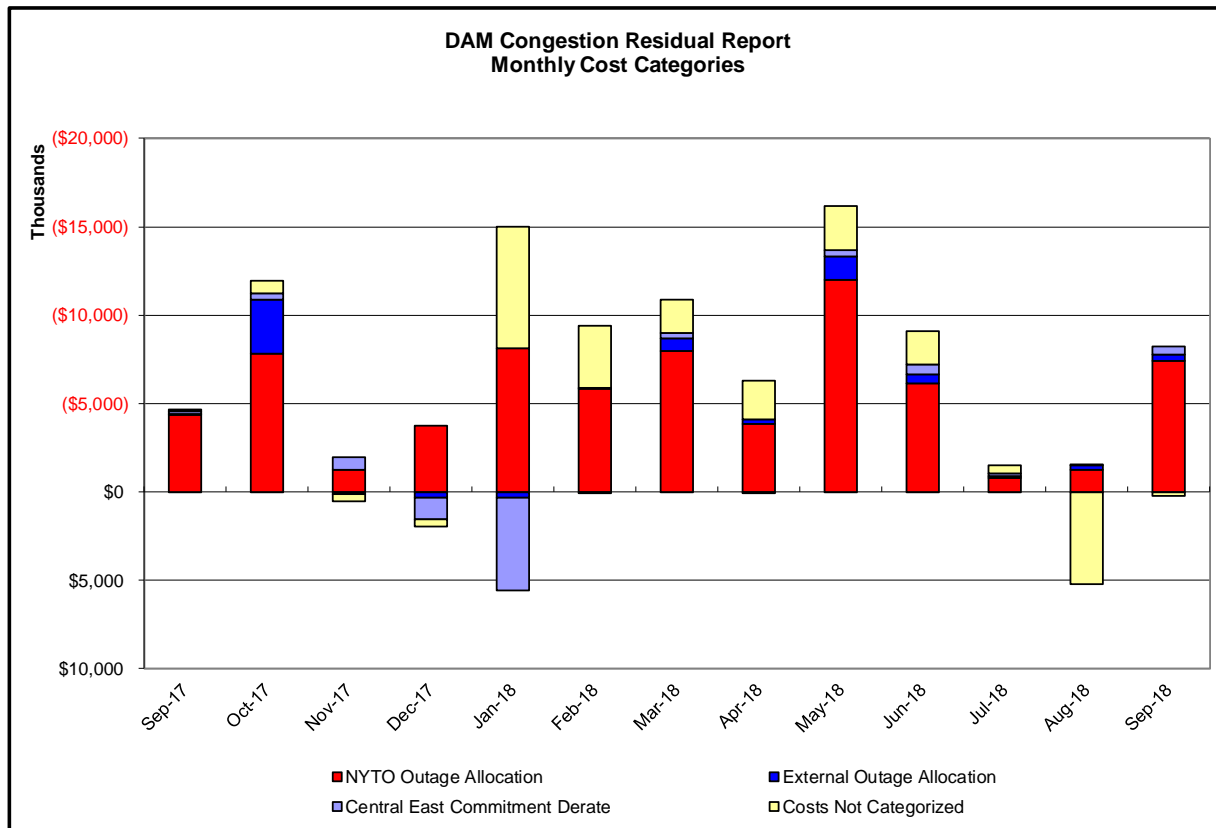
Day's investigated in November: 3, 25, 29			
Event	Date (yyyymmdd)	Hours	Description
	11/3/2018	6-17	Forced outage Scriba-Volney 345kV (#21)
	11/3/2018	3-9	Extended outage Sprainbrook-East Garden City 345kV (#Y49)
	11/3/2018	12, 13	Derate Dunwoodie-Shore Road 345kV (#Y50) for I/o SCB:SPBK(RNS2):Y49&M29&Y49 ST
	11/25/2018	23	NYCA DNI Ramp Limit
	11/25/2018	23	Derate Dunwoodie-Shore Road 345kV (#Y50) for I/o SPRNBRK -EGRDNCTR 345 Y49
	11/25/2018	4	IESO AC-NY Scheduling Limit
	11/25/2018	23	NE AC DNI Ramp Limit
	11/29/2018	17	NYCA DNI Ramp Limit
	11/29/2018	4	IESO AC-NY Scheduling Limit
	11/29/2018	7	NE AC-NY Scheduling Limit
	11/29/2018	8	PJM AC DNI Ramp Limit
	11/29/2018	6, 17	Lake Erie Circulation, DAM-RTM exceeds +/-125MW; Niagara-Packard

Real-Time Balancing Market Congestion Residual (Uplift Cost) Categories

<u>Category</u>	<u>Cost Assignment</u>	<u>Events Types</u>	<u>Event Examples</u>
Storm Watch	Zone J	Thunderstorm Alert (TSA)	TSA Activations
Unscheduled Transmission Outage	Market-wide	Reduction in DAM to RTM transfers related to unscheduled transmission outage	Forced Line Outage, Unit AVR Outages
Interface Derate - NYISO Security	Market-wide	Reduction in DAM to RTM transfers not related to transmission outage	Interface Derates due to RTM voltages
Interface Derate - External Security	Market-wide	Reduction in DAM to RTM transfers related to External Control Area Security Events	TLR Events, External Transaction Curtailments
Unscheduled Loop Flows	Market-wide	Changes in DAM to RTM unscheduled loop flows impacting NYISO Interface transmission constraints	DAM to RTM Lake Erie Loop Flows exceeding +/- 125 MW
M2M Settlement	Market-wide	Settlement result inclusive of coordinated redispatch and Ramapo flowgates	

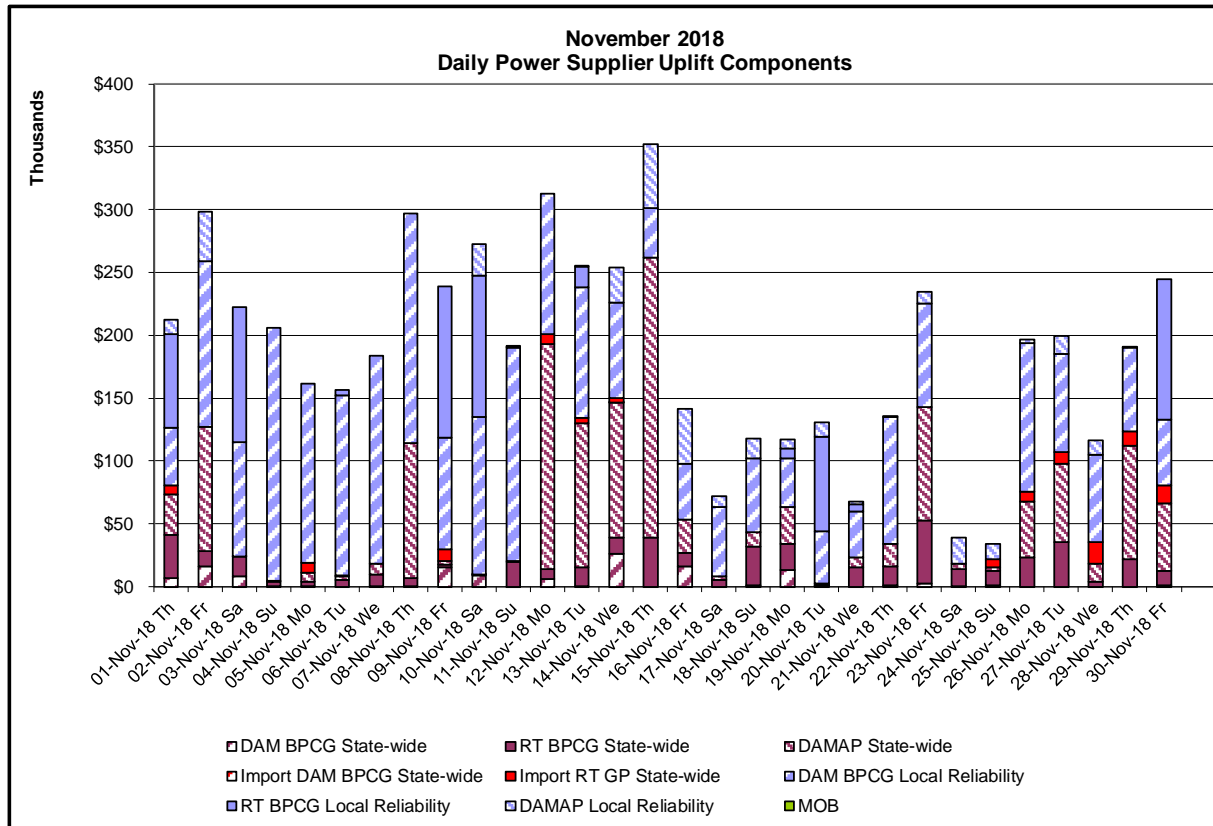
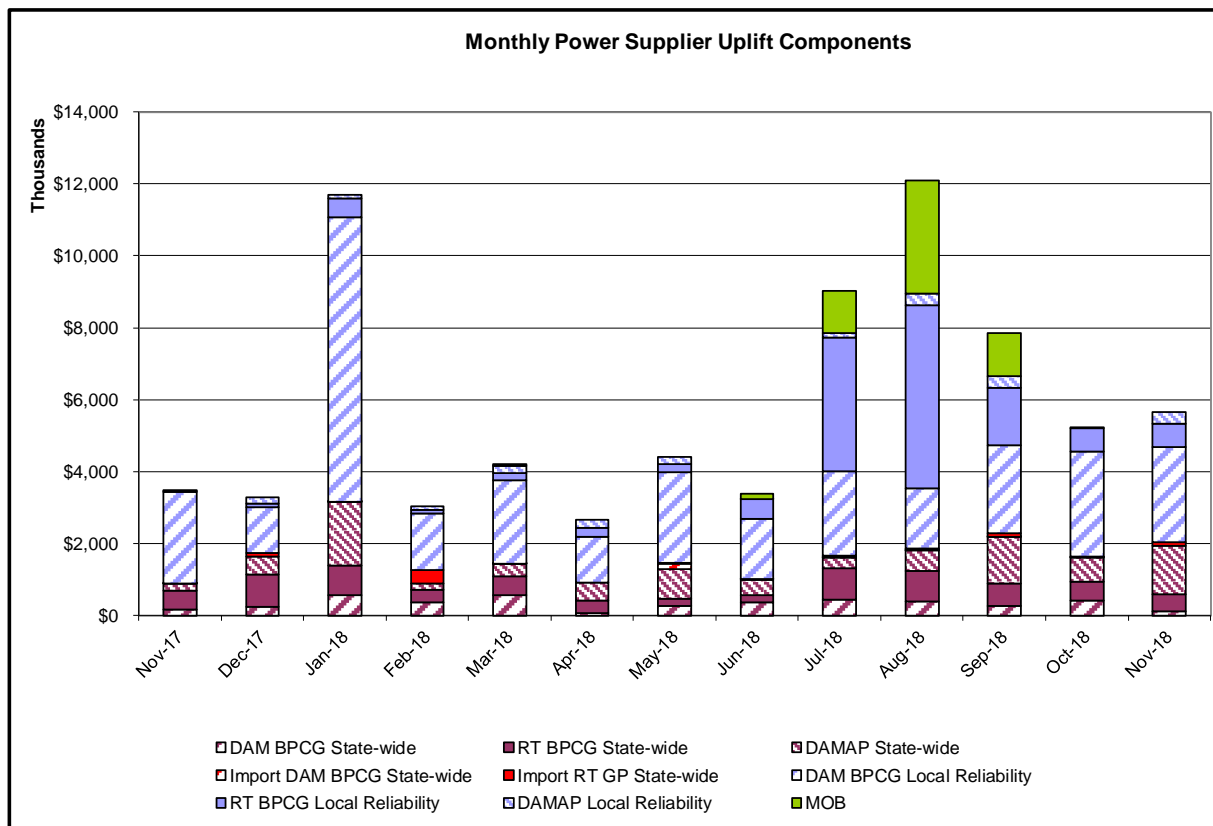
Monthly Balancing Market Congestion Report Assumptions/Notes

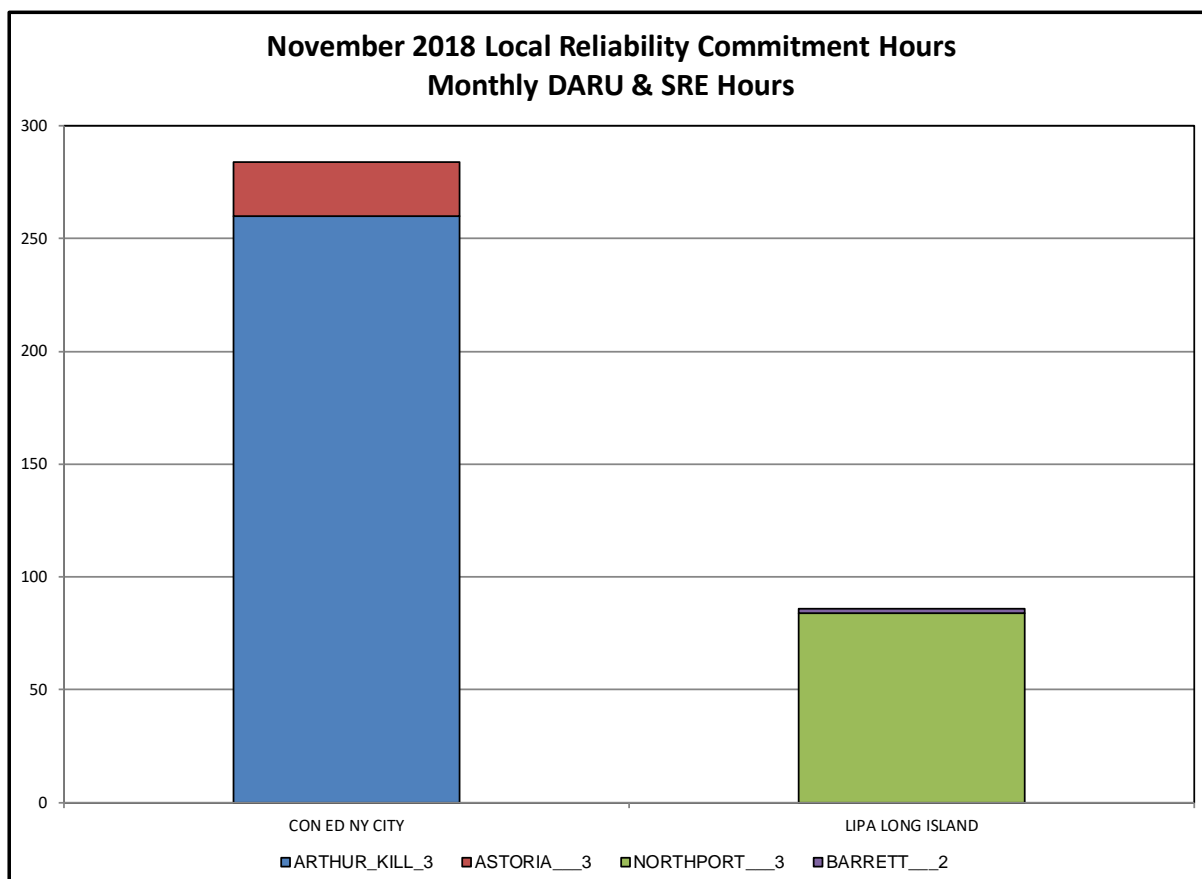
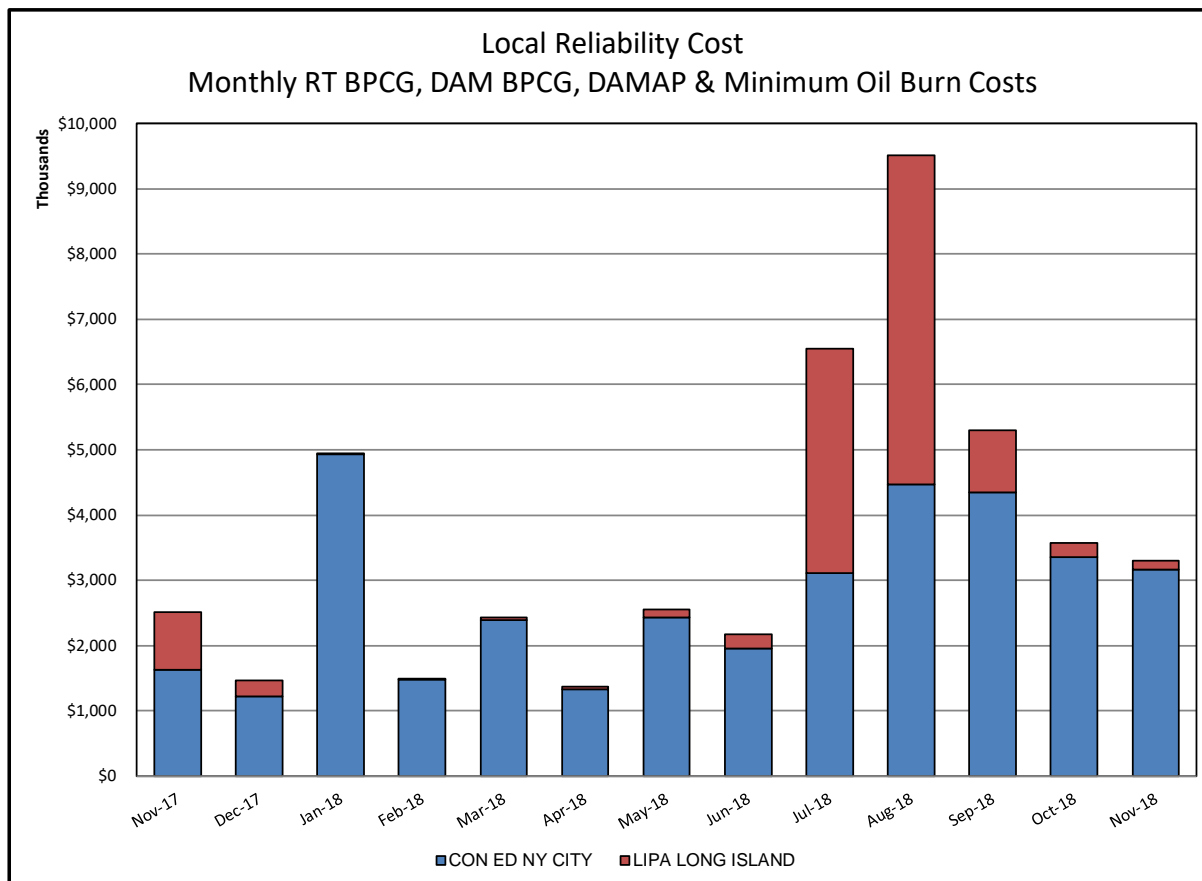
- 1) Storm Watch Costs are identified as daily total uplift costs
- 2) Days with a value of BMCR less M2M Settlement of \$100K/HR, shortfall of \$200K/Day or more, or surplus of \$100K/Day or more are investigated.
- 3) Uplift costs associated with multiple event types are apportioned equally by hour

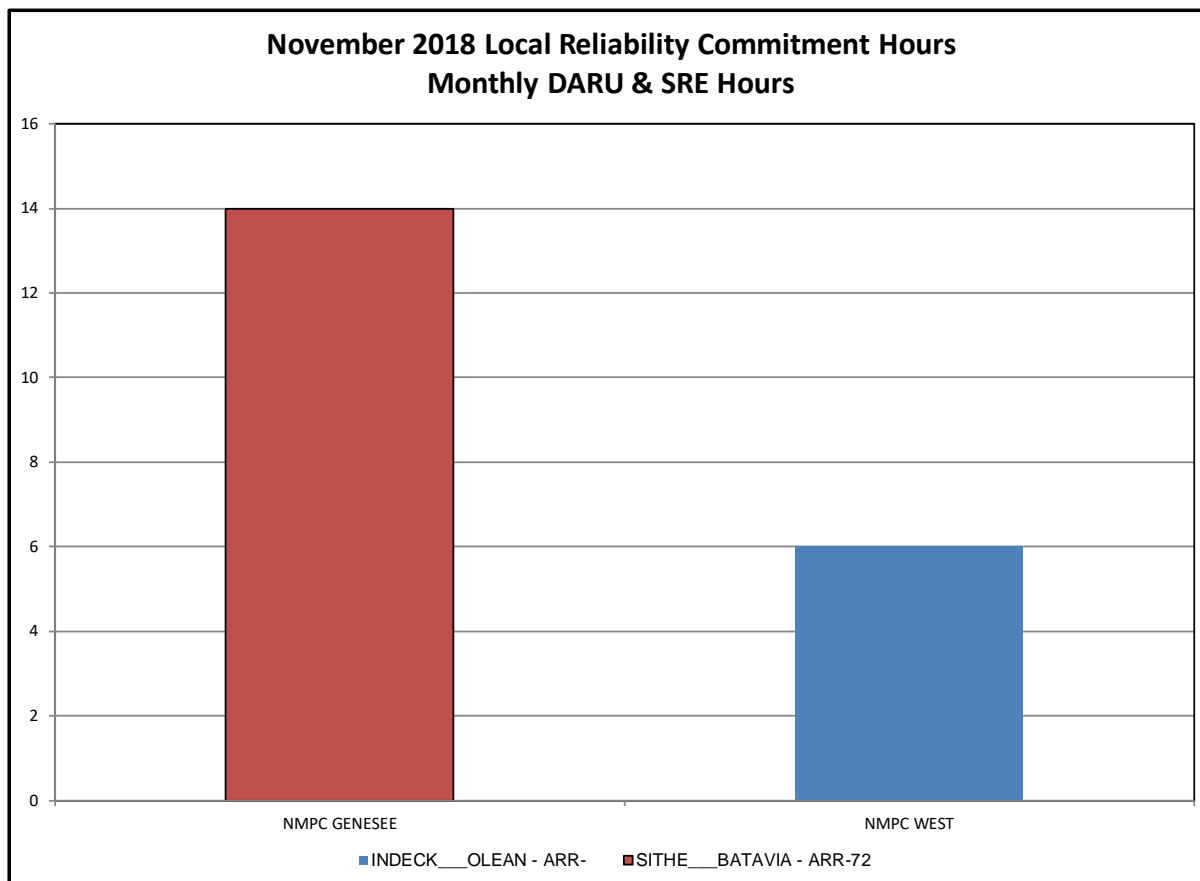
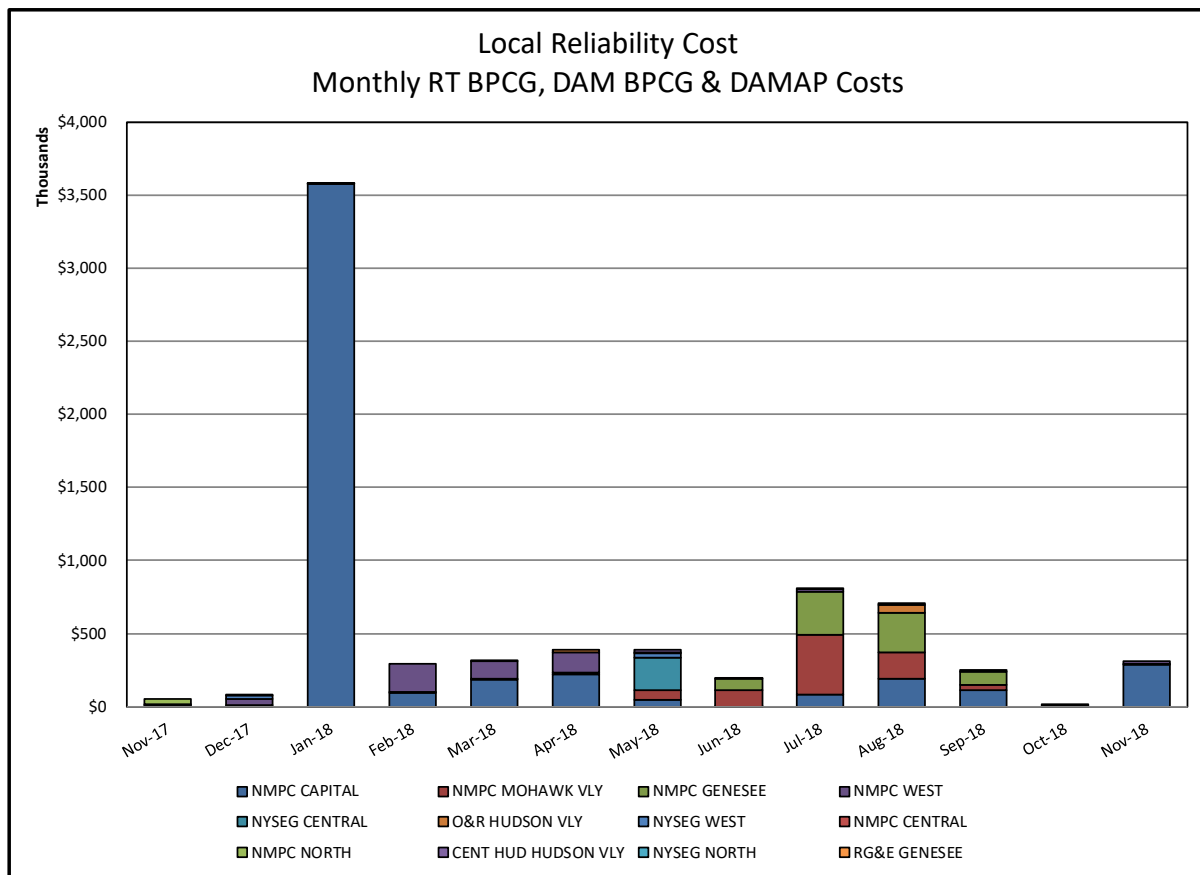


Day-Ahead Market Congestion Residual Categories

<u>Category</u>	<u>Cost Assignment</u>	<u>Events Types</u>	<u>Event Examples</u>
NYTO Outage Allocation	Responsible TO	Direct allocation to NYTO's responsible for transmission equipment status change.	DAM scheduled outage for equipment modeled in-service for the TCC Auction.
External Outage Allocation	All TO by Monthly Allocation Factor	Direct allocation to transmission equipment status change caused by change in status of external equipment.	Tie line required out-of-service by TO of neighboring control area.
Central East Commitment Derate	All TO by Monthly Allocation Factor	Reductions in the DAM Central East_VC limit as compared to the TCC Auction limit, which are not associated with transmission line outages.	

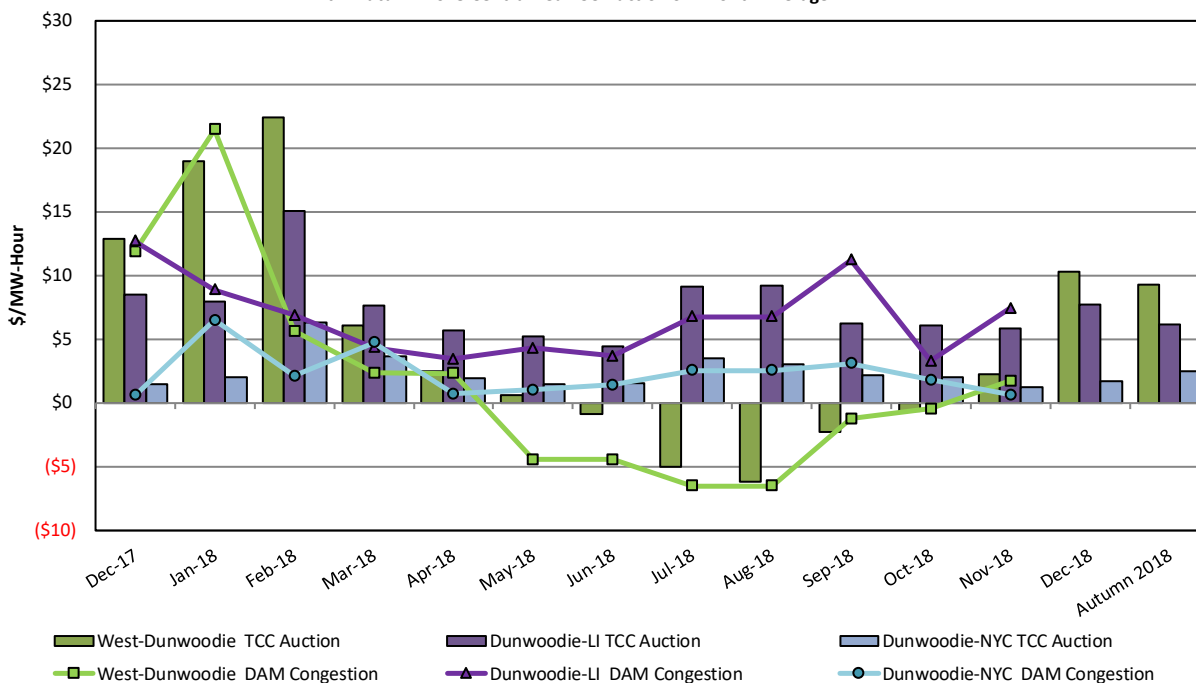






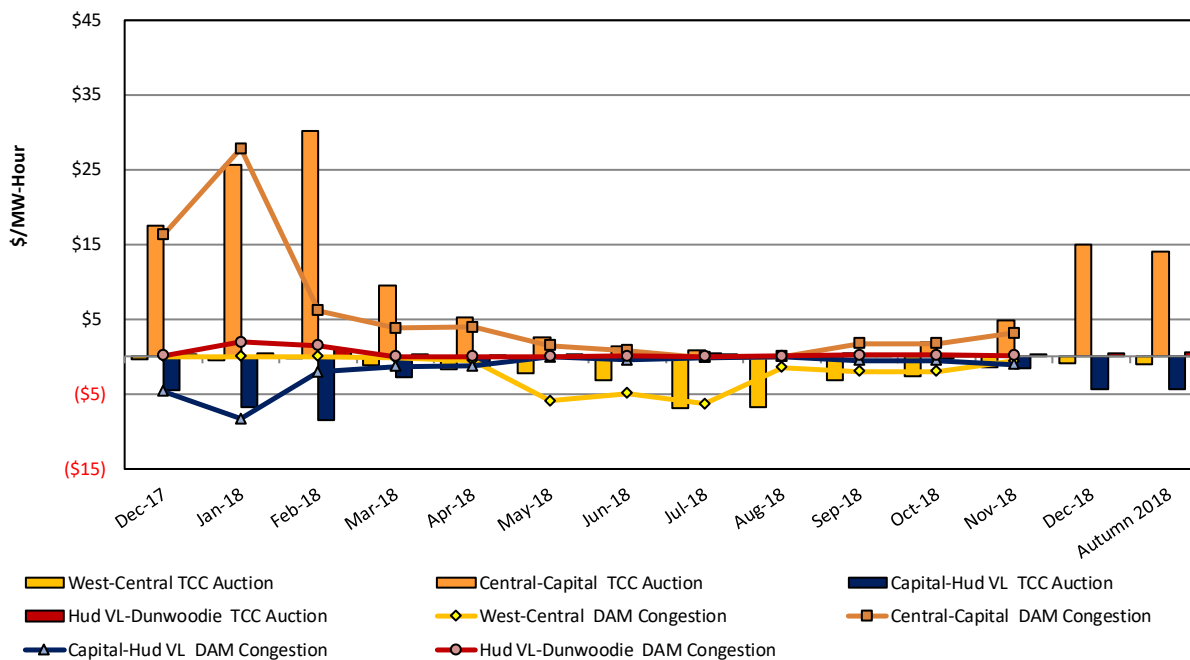
TCC & Day Ahead Market Selected Internal Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average
with Autumn 2018 Centralized TCC Auction Six-Month Average



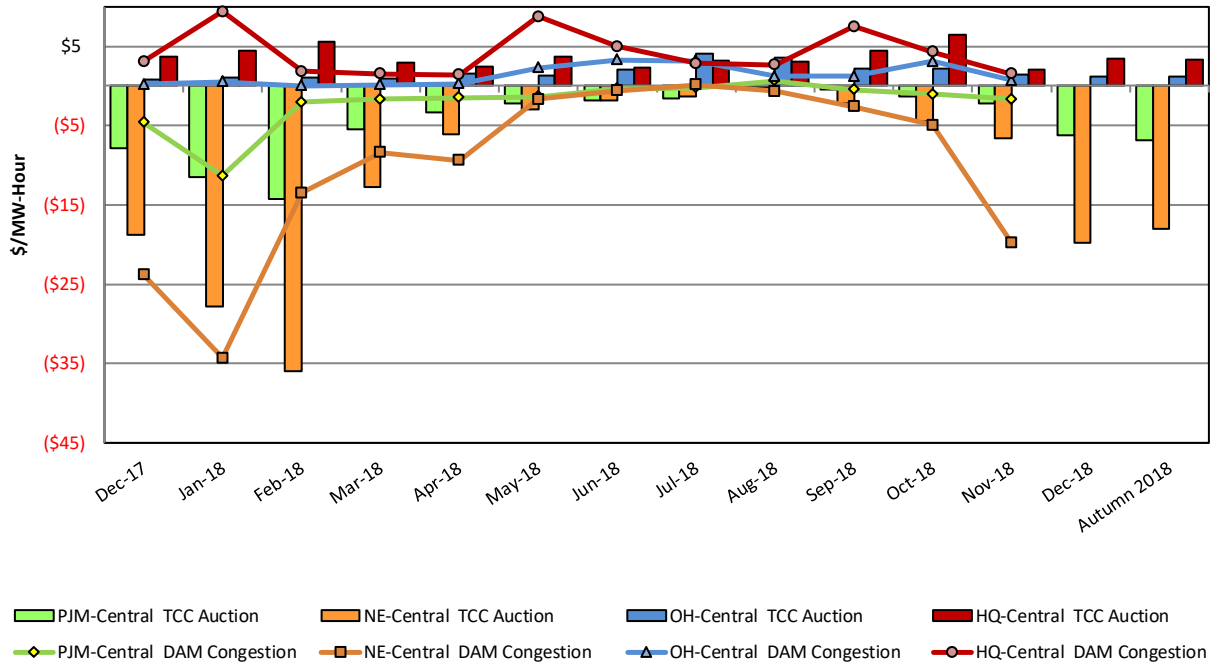
TCC & Day Ahead Market West to Dunwoodie Path Congestion

TCC Monthly Reconfiguration Auction vs. Monthly DAM Average
with Autumn 2018 Centralized TCC Auction Six-Month Average

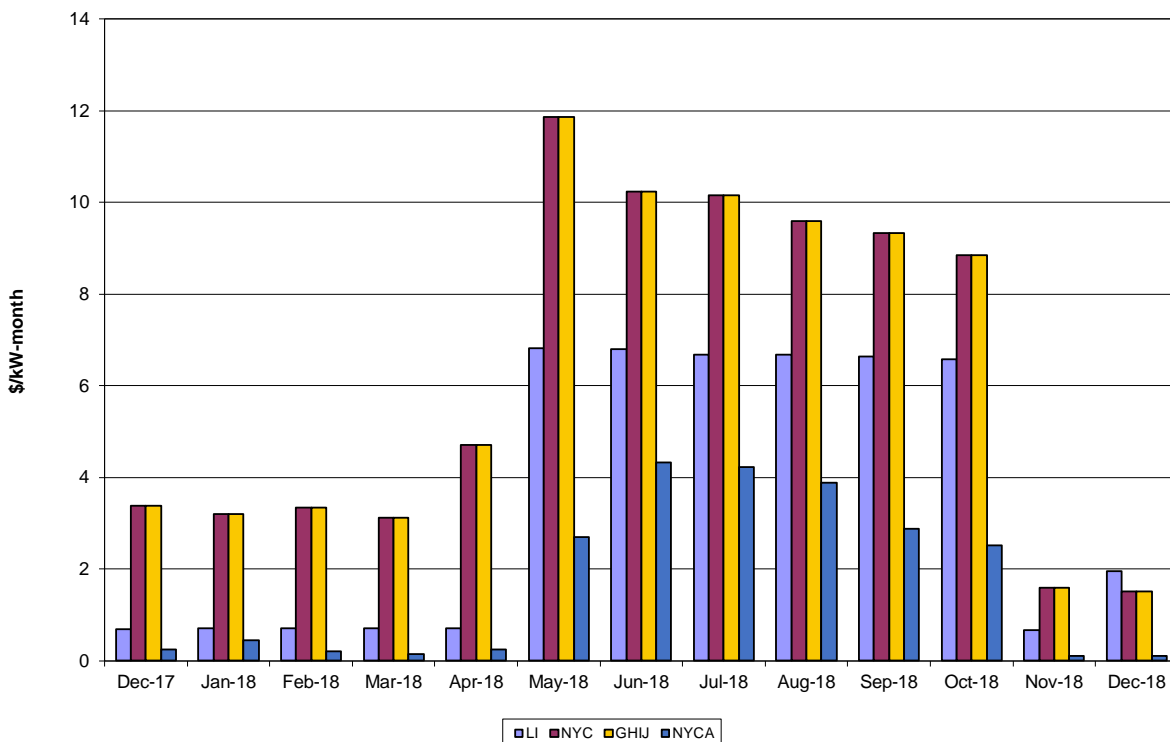


TCC & Day Ahead Market Selected External Path Congestion

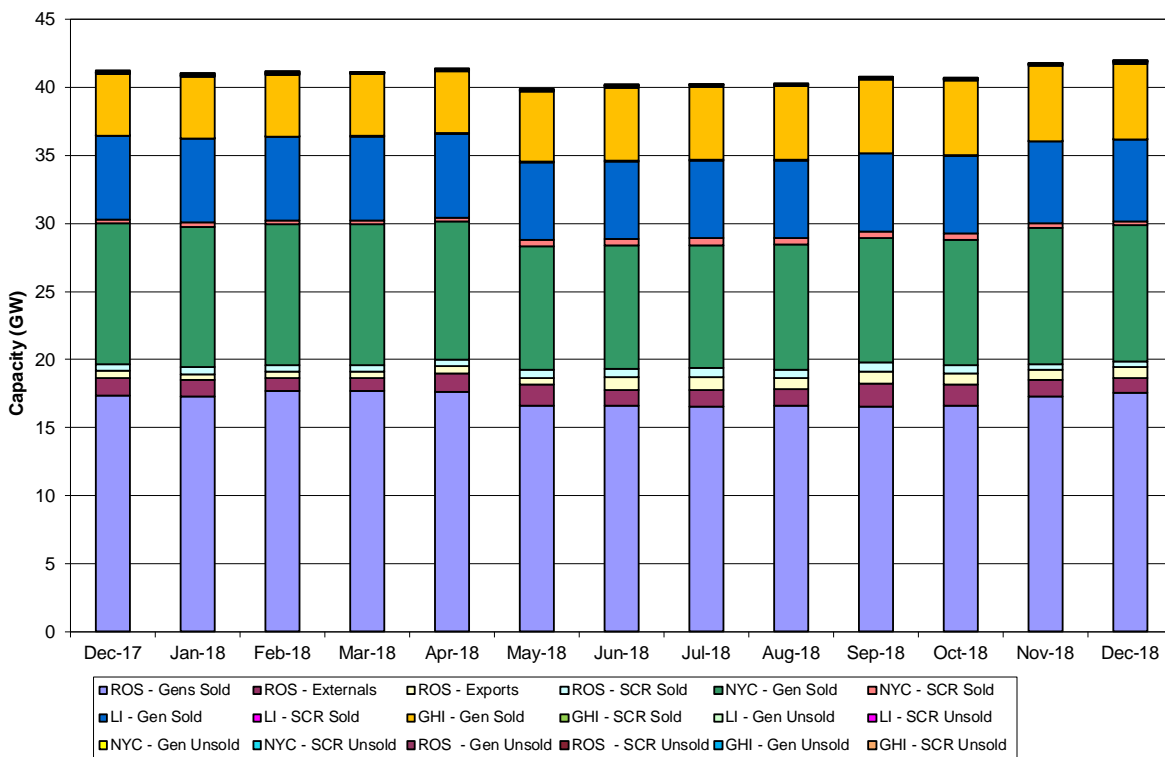
TCC Monthly Reconfiguration Auction vs. Monthly DAM Average
with Autumn 2018 Centralized TCC Auction Six-Month Average



ICAP Spot Market Clearing Price



UCAP Sales

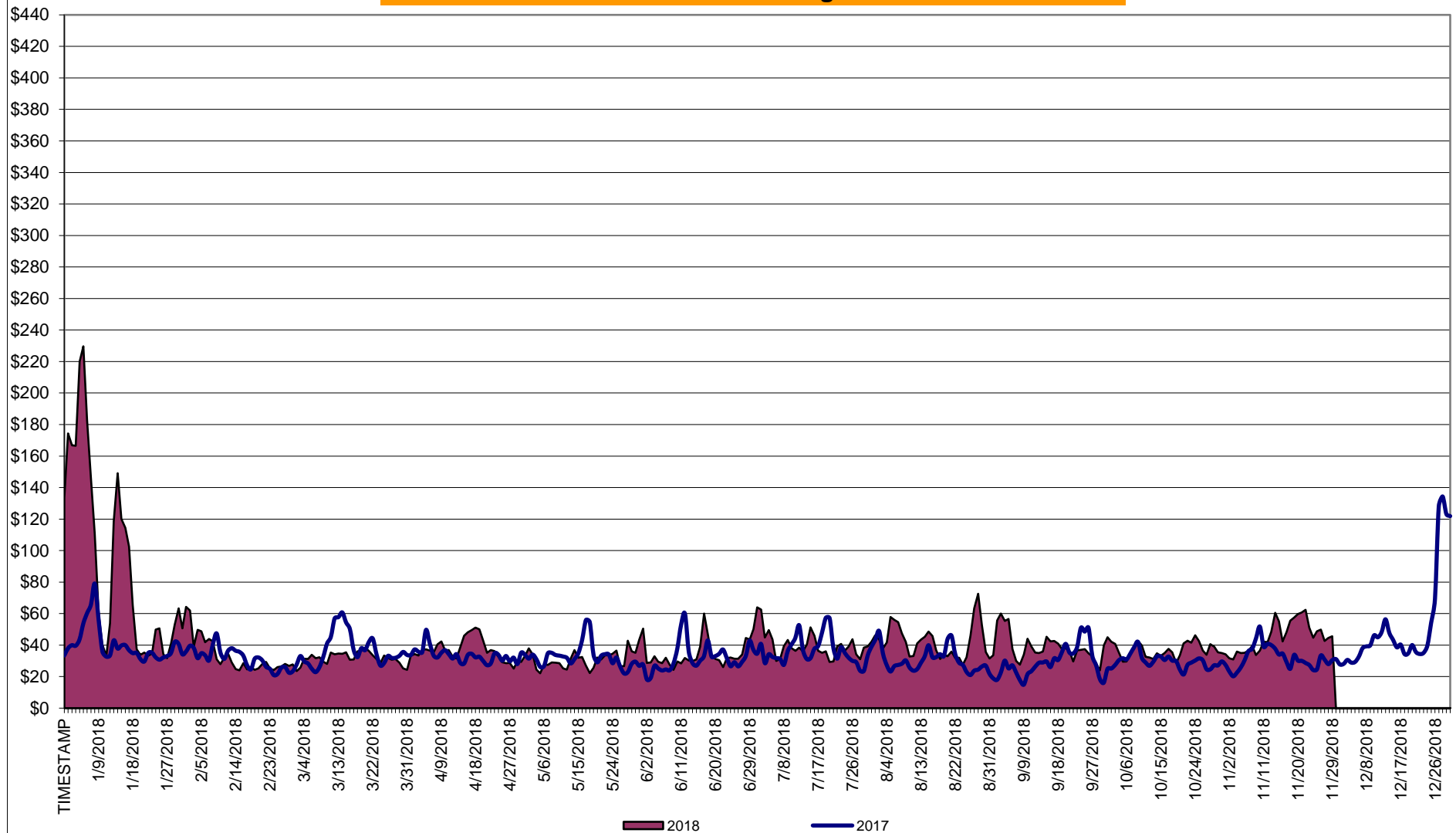


Market Performance Highlights

November 2018

- LBMP for November is \$43.15/MWh; higher than \$35.85/MWh in October 2018 and \$30.60/MWh in November 2017.
 - Day Ahead and Real Time Load Weighted LBMPs are higher compared to October.
- November 2018 average year-to-date monthly cost of \$45.11/MWh is a 30% increase from \$34.72/MWh in November 2017.
- Average daily sendout is 411 GWh/day in November; higher than 399 GWh/day in October 2018 and higher than 403 GWh/day in November 2017.
- Natural gas prices were higher and distillate prices were lower compared to the previous month.
 - Natural Gas (Transco Z6 NY) was \$4.23/MMBtu, up from \$2.91/MMBtu in October.
 - Natural gas prices are up 44.8% year-over-year.
 - Jet Kerosene Gulf Coast was \$14.50/MMBtu, down from \$16.65/MMBtu in October.
 - Ultra Low Sulfur No.2 Diesel NY Harbor was \$14.72/MMBtu, down from \$16.66/MMBtu in October.
 - Distillate prices are up 9.3% year-over-year.
- Uplift per MWh is higher compared to the previous month.
 - Uplift (not including NYISO cost of operations) is (\$0.27)/MWh; higher than (\$0.30)/MWh in October.
 - Local Reliability Share is \$0.25/MWh, lower than \$0.27/MWh in October.
 - Statewide Share is (\$0.52)/MWh, higher than (\$0.56)/MWh in October.
 - TSA \$ per NYC MWh is \$0.00/MWh.
 - Total uplift costs (Schedule 1 components including NYISO Cost of Operations) are lower than October.

Daily NYISO Average Cost/MWh (Energy & Ancillary Services)*
2017 Annual Average \$36.56/MWh
November 2017 YTD Average \$34.80/MWh
November 2018 YTD Average \$45.11/MWh



* Excludes ICAP payments.

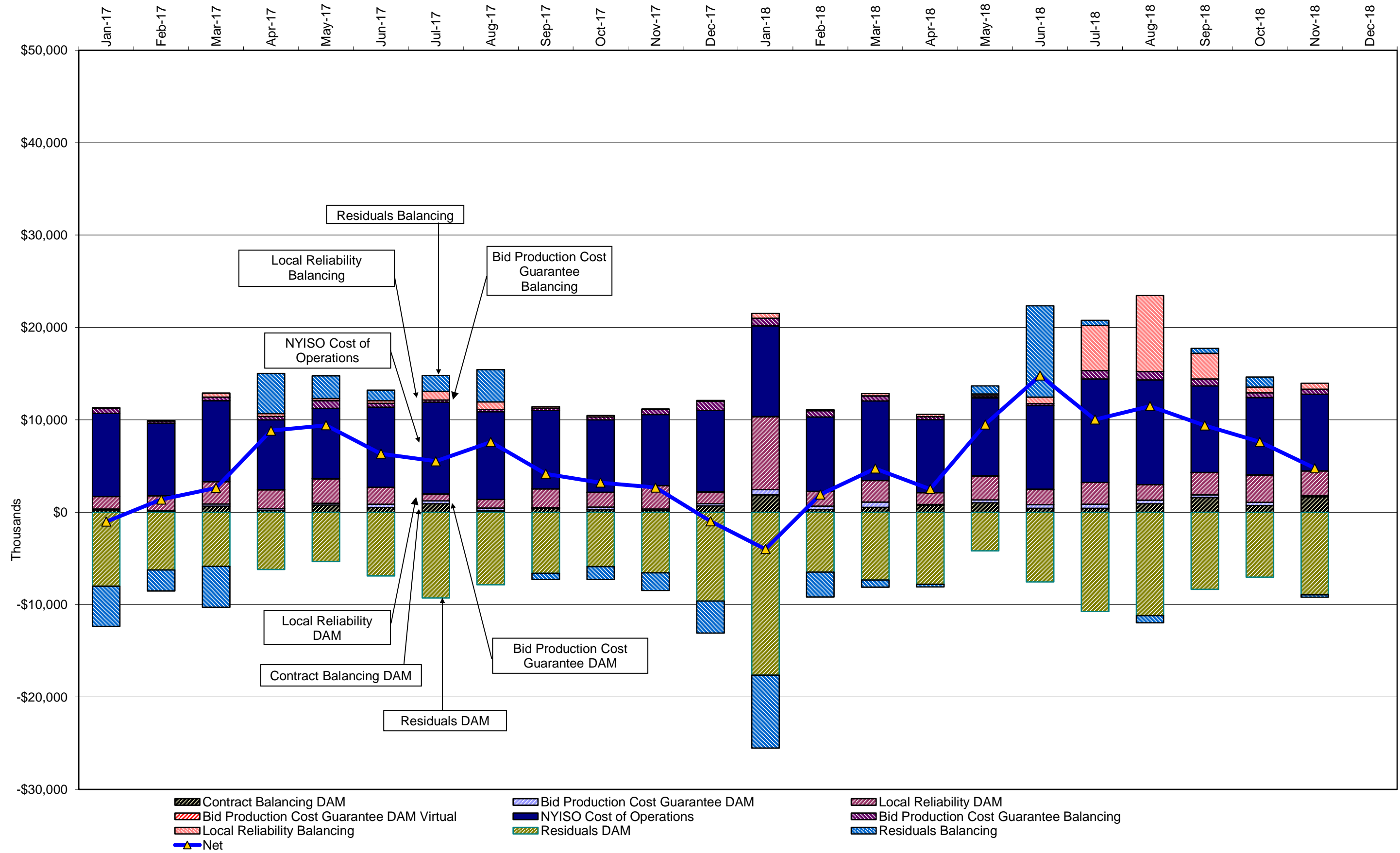
NYISO Average Cost/MWh (Energy and Ancillary Services) *
from the LBMP Customer point of view

2018	<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	43.15	
NTAC	0.71	0.58	0.88	1.09	0.88	1.00	0.93	0.72	0.40	0.36	1.18	
Reserve	0.92	0.65	0.64	0.81	0.68	0.57	0.49	0.51	0.52	0.80	0.66	
Regulation	0.15	0.15	0.16	0.12	0.14	0.16	0.09	0.09	0.09	0.16	0.17	
NYISO Cost of Operations	0.65	0.65	0.66	0.65	0.66	0.67	0.67	0.66	0.66	0.63	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	0.09	
Uplift	(0.92)	(0.50)	(0.31)	(0.45)	0.05	0.30	(0.13)	(0.02)	(0.11)	(0.30)	(0.27)	
Uplift: Local Reliability Share	0.59	0.14	0.19	0.12	0.22	0.18	0.44	0.59	0.37	0.27	0.25	
Uplift: Statewide Share	(1.52)	(0.64)	(0.51)	(0.57)	(0.17)	0.12	(0.57)	(0.61)	(0.48)	(0.56)	(0.52)	
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	0.40	
Avg Monthly Cost	101.54	35.87	32.45	37.74	31.70	35.73	42.12	45.01	40.76	38.00	46.01	
 Avg YTD Cost	101.54	72.85	60.06	54.82	50.20	47.70	46.64	46.37	45.75	45.03	45.11	
 TSA \$ per NYC MWh	0.00	0.00	0.04	0.00	0.08	0.39	0.21	0.14	0.33	0.75	0.00	
 2017	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
LBMP	40.07	30.95	34.97	31.06	31.74	31.76	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
Avg Monthly Cost	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: 12/7/2018 4:52 PM

As of Jan. 2016, the annual FERC fee is recovered separately from Cost of Ops.

NYISO Dollar Flows - Uplift - OATT Schedule 1 components - Data through November 30, 2018



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

2018	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<u>Day Ahead Market MWh</u>	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	13,506,134	
DAM LSE Internal LBMP Energy Sales	59%	57%	58%	60%	61%	61%	65%	65%	61%	57%	58%	
DAM External TC LBMP Energy Sales	4%	3%	2%	2%	2%	1%	1%	2%	3%	6%	6%	
DAM Bilateral - Internal Bilaterals	29%	31%	32%	30%	29%	30%	26%	25%	28%	29%	30%	
DAM Bilateral - Import/Non-LBMP Market Bilaterals	5%	5%	5%	5%	5%	5%	4%	4%	5%	5%	2%	
DAM Bilateral - Export/Non-LBMP Market Bilaterals	2%	2%	2%	2%	2%	1%	1%	1%	1%	2%	2%	
DAM Bilateral - Wheel Through Bilaterals	1%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	
<u>Balancing Energy Market MWh</u>	-149,619	-299,377	-386,811	-72,862	-29,539	-354,112	-80,438	-44,732	-210,436	-314,885	-304,277	
Balancing Energy LSE Internal LBMP Energy Sales	-147%	-101%	-128%	-208%	-458%	-113%	-123%	-75%	-82%	-105%	-100%	
Balancing Energy External TC LBMP Energy Sales	74%	24%	37%	189%	564%	29%	129%	209%	14%	30%	18%	
Balancing Energy Bilateral - Internal Bilaterals	9%	5%	0%	-11%	29%	5%	18%	23%	7%	2%	3%	
Balancing Energy Bilateral - Import/Non-LBMP Market Bilaterals	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	
Balancing Energy Bilateral - Export/Non-LBMP Market Bilaterals	22%	9%	6%	34%	51%	3%	14%	25%	3%	0%	0%	
Balancing Energy Bilateral - Wheel Through Bilaterals	-58%	-36%	-15%	-103%	-287%	-23%	-138%	-281%	-42%	-27%	-31%	
<u>Transactions Summary</u>												
LBMP	63%	59%	59%	62%	63%	61%	66%	68%	64%	63%	64%	
Internal Bilaterals	30%	32%	33%	30%	29%	31%	27%	25%	28%	30%	31%	
Import Bilaterals	5%	5%	6%	5%	5%	5%	4%	4%	5%	5%	3%	
Export Bilaterals	2%	2%	2%	2%	2%	1%	1%	1%	1%	2%	2%	
Wheels Through	1%	1%	1%	1%	1%	2%	1%	1%	2%	1%	1%	
<u>Market Share of Total Load</u>												
Day Ahead Market	101.0%	102.4%	102.9%	100.6%	100.2%	102.6%	100.5%	100.3%	101.5%	102.4%	102.3%	
Balancing Energy +	-1.0%	-2.4%	-2.9%	-0.6%	-0.2%	-2.6%	-0.5%	-0.3%	-1.5%	-2.4%	-2.3%	
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	13,201,857	
Average Daily Energy Sendout/Month GWh	463	426	413	390	397	445	529	537	458	399	411	

2017	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<u>Day Ahead Market MWh</u>	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%
<u>Balancing Energy Market MWh</u>	-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%
<u>Transactions Summary</u>												
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%
<u>Market Share of Total Load</u>												
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>
<u>DAY AHEAD LBMP</u>												
Price *	\$83.53	\$30.37	\$27.37	\$32.40	\$25.97	\$28.41	\$35.73	\$38.00	\$33.28	\$33.27	\$38.36	
Standard Deviation	\$58.94	\$12.38	\$6.34	\$9.06	\$9.22	\$11.42	\$15.25	\$16.51	\$12.01	\$9.24	\$11.36	
Load Weighted Price **	\$88.42	\$31.44	\$27.95	\$33.14	\$27.26	\$30.27	\$38.14	\$40.64	\$35.33	\$34.33	\$39.55	
<u>RTC LBMP</u>												
Price *	\$81.65	\$27.73	\$25.99	\$30.80	\$25.40	\$26.06	\$34.65	\$38.13	\$39.52	\$30.92	\$38.37	
Standard Deviation	\$60.83	\$11.96	\$8.99	\$14.30	\$20.37	\$12.78	\$17.44	\$20.05	\$61.50	\$13.43	\$17.24	
Load Weighted Price **	\$85.85	\$28.54	\$26.46	\$31.47	\$27.08	\$27.35	\$36.93	\$40.40	\$43.83	\$31.55	\$39.53	
<u>REAL TIME LBMP</u>												
Price *	\$87.94	\$28.50	\$26.49	\$34.53	\$25.57	\$26.31	\$34.34	\$38.07	\$38.15	\$33.88	\$39.18	
Standard Deviation	\$87.41	\$17.36	\$12.25	\$26.57	\$23.49	\$24.34	\$18.44	\$27.21	\$46.81	\$37.42	\$26.15	
Load Weighted Price **	\$93.59	\$29.49	\$27.09	\$35.72	\$27.47	\$28.38	\$36.84	\$40.87	\$42.87	\$34.94	\$40.63	
Average Daily Energy Sendout/Month GWh	463	426	413	390	397	445	529	537	458	399	411	

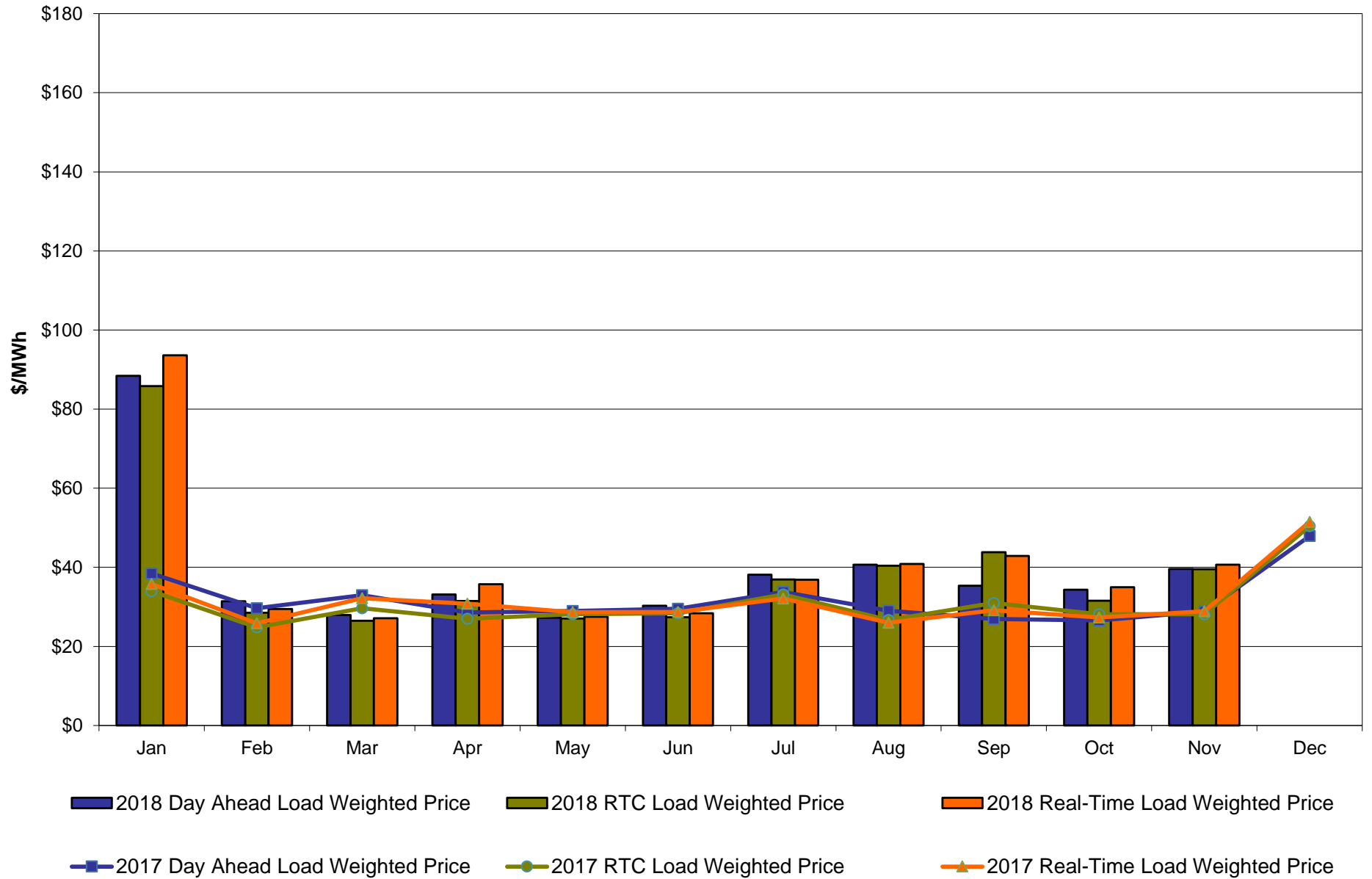
NYISO Markets 2017 Energy Statistics

	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<u>DAY AHEAD LBMP</u>												
Price *	\$37.22	\$28.84	\$32.04	\$27.70	\$27.66	\$27.37	\$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
<u>RTC LBMP</u>												
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
<u>REAL TIME LBMP</u>												
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

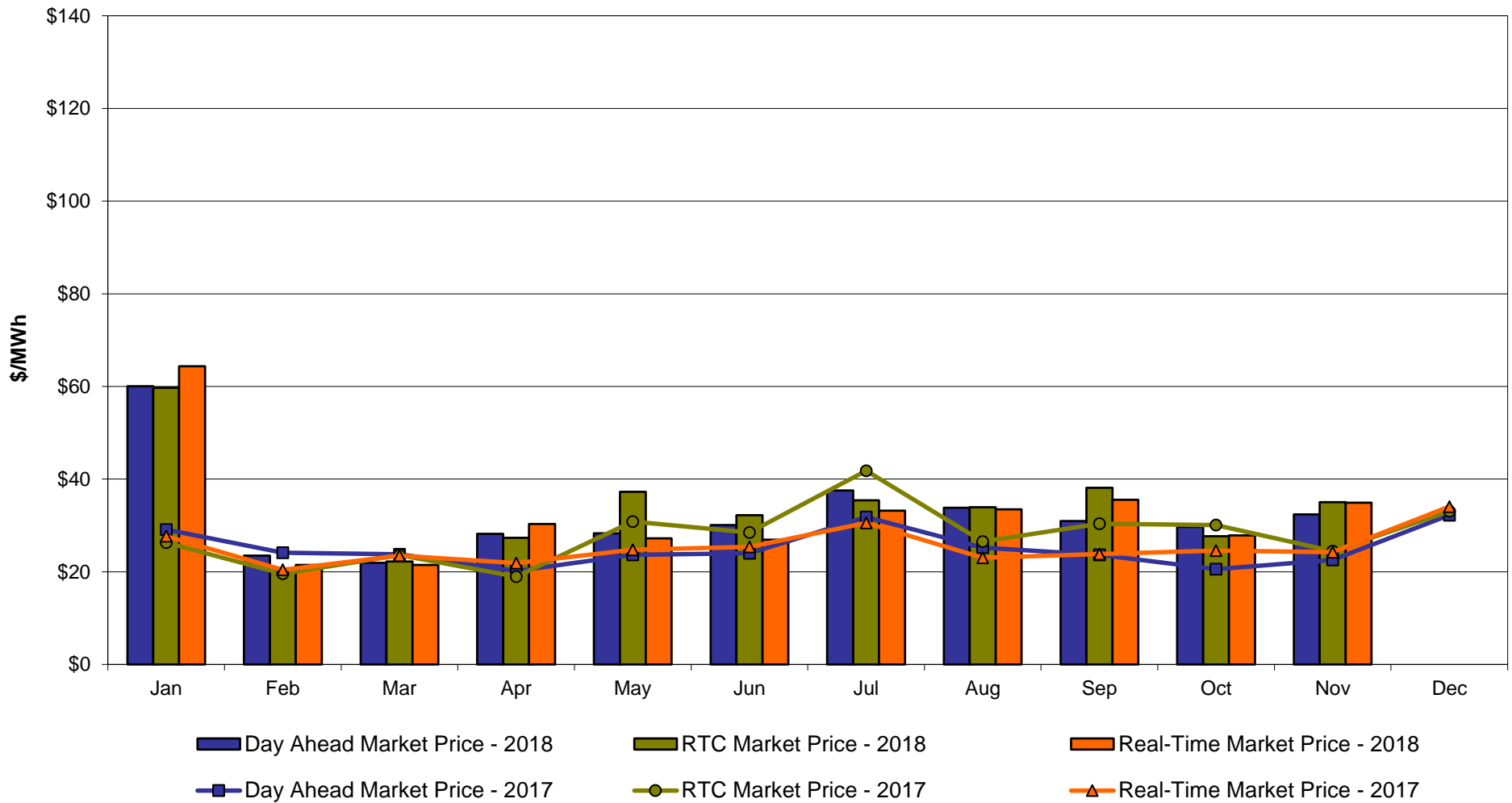


November 2018 Zonal LBMP Statistics for NYISO (\$/MWh)

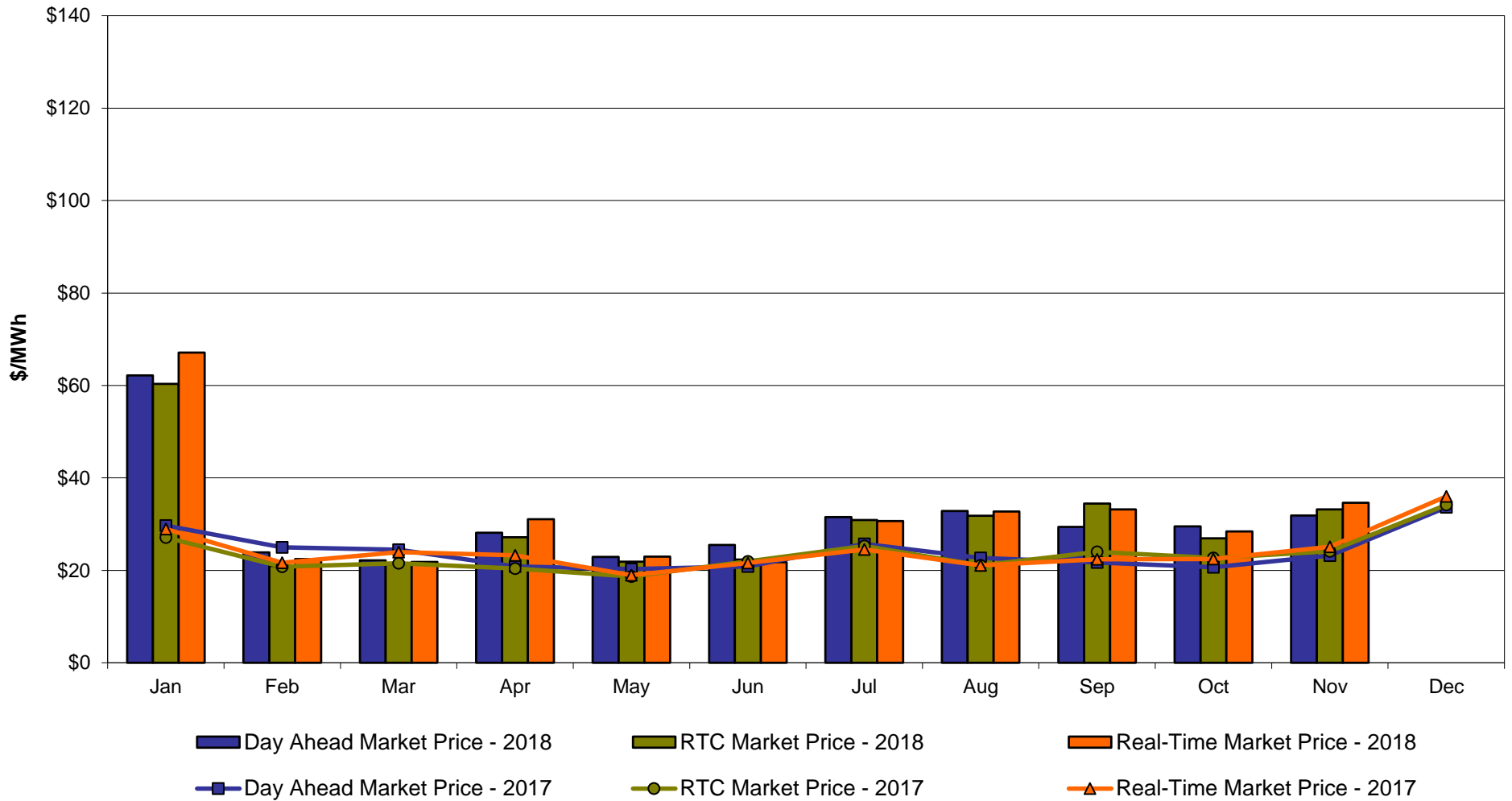
	<u>WEST</u> <u>Zone A</u>	<u>GENESEE</u> <u>Zone B</u>	<u>NORTH</u> <u>Zone D</u>	<u>CENTRAL</u> <u>Zone C</u>	<u>MOHAWK</u> <u>VALLEY</u> <u>Zone E</u>	<u>CAPITAL</u> <u>Zone F</u>	<u>HUDSON</u> <u>VALLEY</u> <u>Zone G</u>	<u>MILLWOOD</u> <u>Zone H</u>	<u>DUNWOODIE</u> <u>Zone I</u>	<u>NEW YORK</u> <u>CITY</u> <u>Zone J</u>	<u>LONG</u> <u>ISLAND</u> <u>Zone K</u>
<u>DAY AHEAD LBMP</u>											
Unweighted Price *	32.39	30.97	27.82	31.86	32.21	39.03	37.72	37.96	38.02	38.60	56.83
Standard Deviation	12.77	10.39	10.88	10.53	10.73	10.41	10.11	10.21	10.21	10.26	23.50
<u>RTC LBMP</u>											
Unweighted Price *	35.05	32.35	29.25	33.19	33.37	37.45	36.93	37.04	37.06	37.42	56.88
Standard Deviation	30.89	15.08	16.74	15.27	15.42	15.86	15.43	15.45	15.41	15.49	49.35
<u>REAL TIME LBMP</u>											
Unweighted Price *	34.90	33.87	30.64	34.65	34.95	38.86	38.41	38.53	38.55	38.89	55.00
Standard Deviation	29.79	24.67	25.58	25.04	25.36	25.91	25.82	25.84	25.82	25.91	41.19
	<u>ONTARIO</u> <u>IESO</u>	<u>HYDRO</u> <u>QUEBEC</u> <u>(Wheel)</u>	<u>HYDRO</u> <u>QUEBEC</u> <u>(Import/Export)</u>	<u>PJM</u>	<u>NEW</u> <u>ENGLAND</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>
	<u>Zone O</u>	<u>Zone M</u>	<u>Zone M</u>	<u>Zone P</u>	<u>Zone N</u>						
<u>DAY AHEAD LBMP</u>											
Unweighted Price *	29.77	29.00	28.77	34.19	53.71	55.62	55.39	54.77	38.36	38.42	27.09
Standard Deviation	9.31	10.36	10.31	9.65	23.78	23.36	24.33	23.21	10.15	10.20	10.77
<u>RTC LBMP</u>											
Unweighted Price *	30.72	25.53	25.53	34.64	51.02	56.25	56.02	55.19	36.76	37.36	28.45
Standard Deviation	14.94	17.86	17.86	15.49	27.30	49.08	48.90	47.74	18.48	15.39	16.78
<u>REAL TIME LBMP</u>											
Unweighted Price *	29.81	27.46	27.46	36.02	45.83	54.33	53.87	53.52	37.88	38.85	25.24
Standard Deviation	45.73	22.43	22.43	25.46	29.67	40.39	43.38	39.80	30.77	25.87	22.44

* Straight LBMP averages

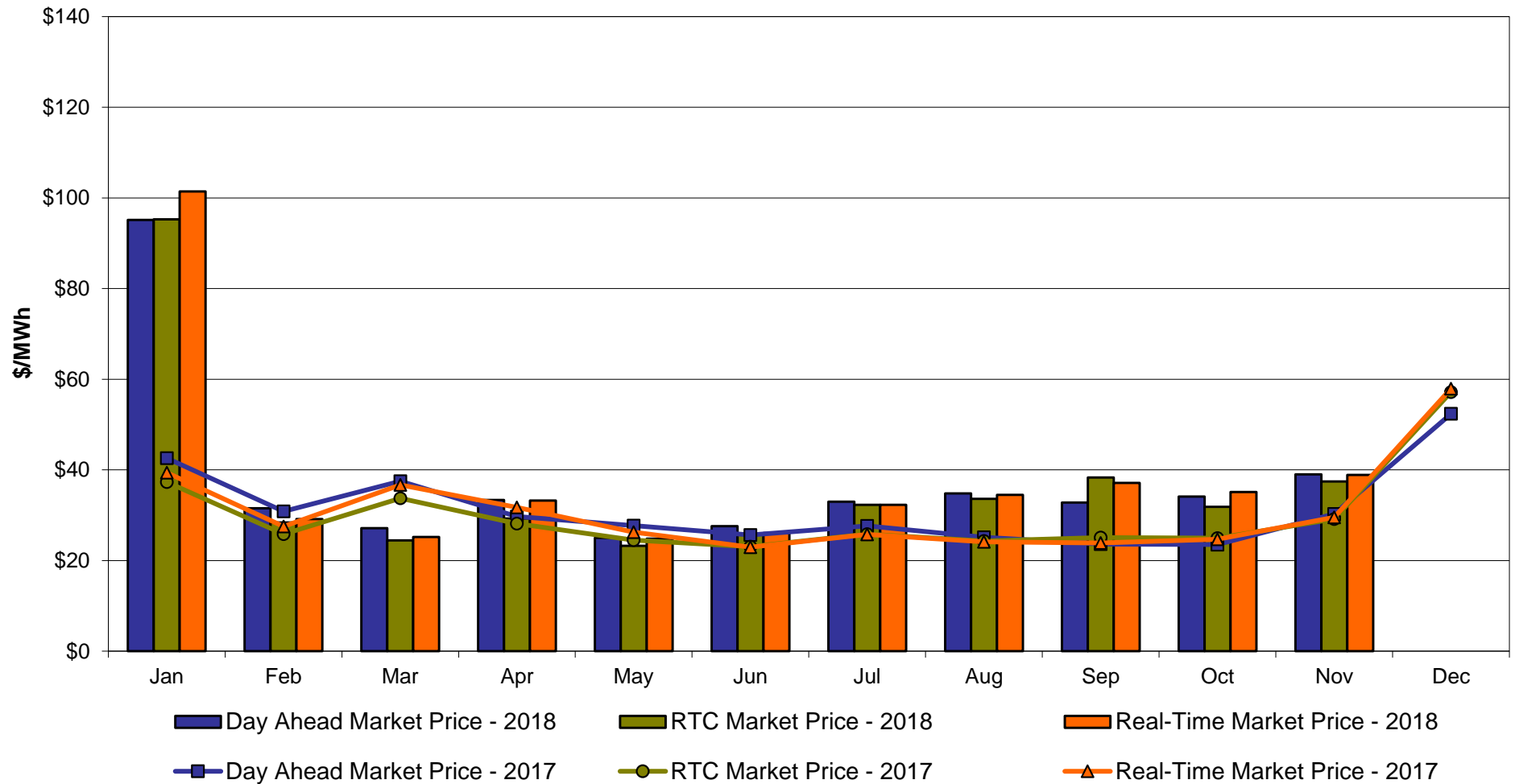
West Zone A
Monthly Average LBMP Prices 2017 - 2018



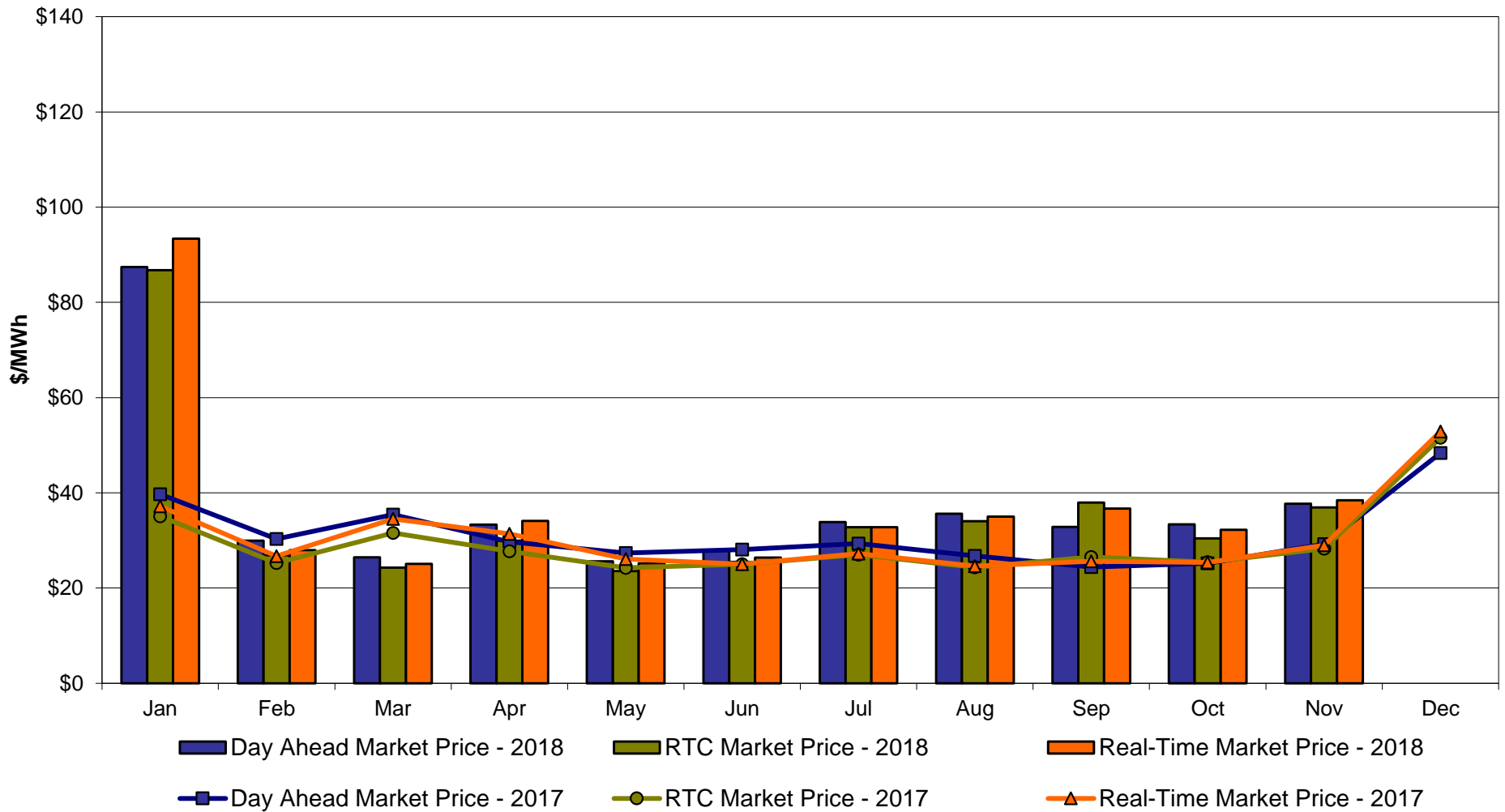
Central Zone C
Monthly Average LBMP Prices 2017 - 2018



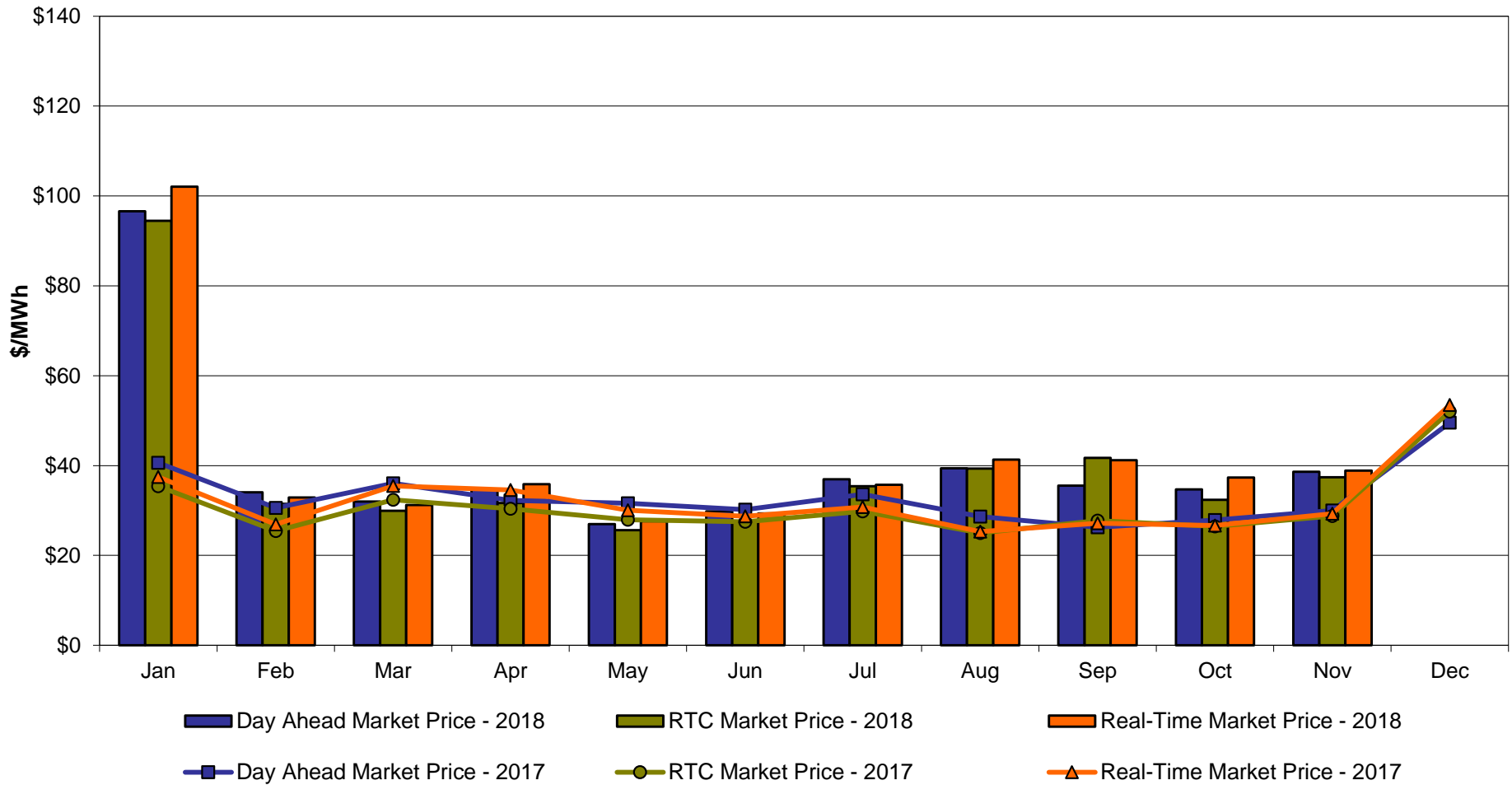
Capital Zone F **Monthly Average LBMP Prices 2017 - 2018**



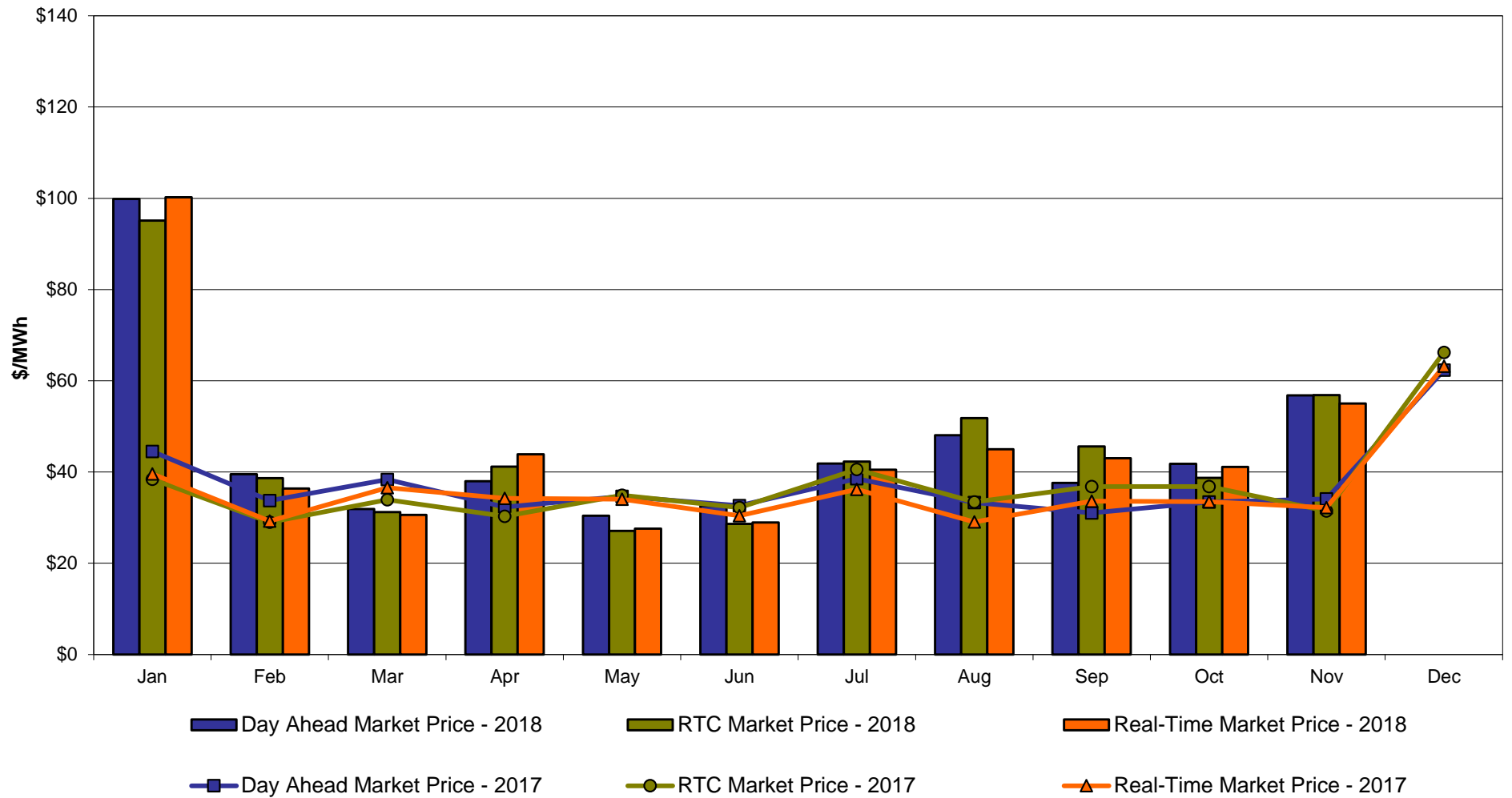
Hudson Valley Zone G Monthly Average LBMP Prices 2017 - 2018



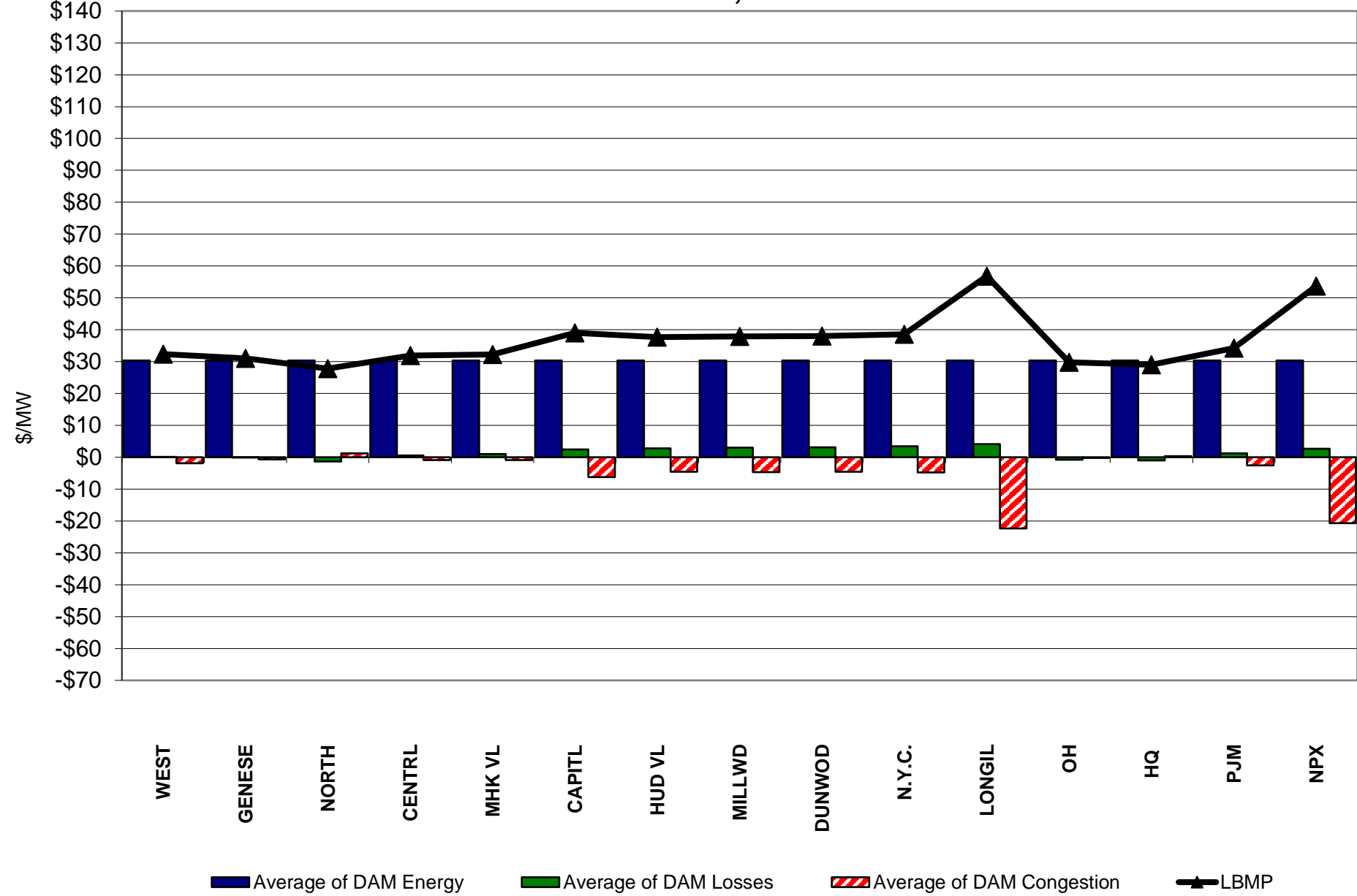
NYC Zone J Monthly Average LBMP Prices 2017 - 2018



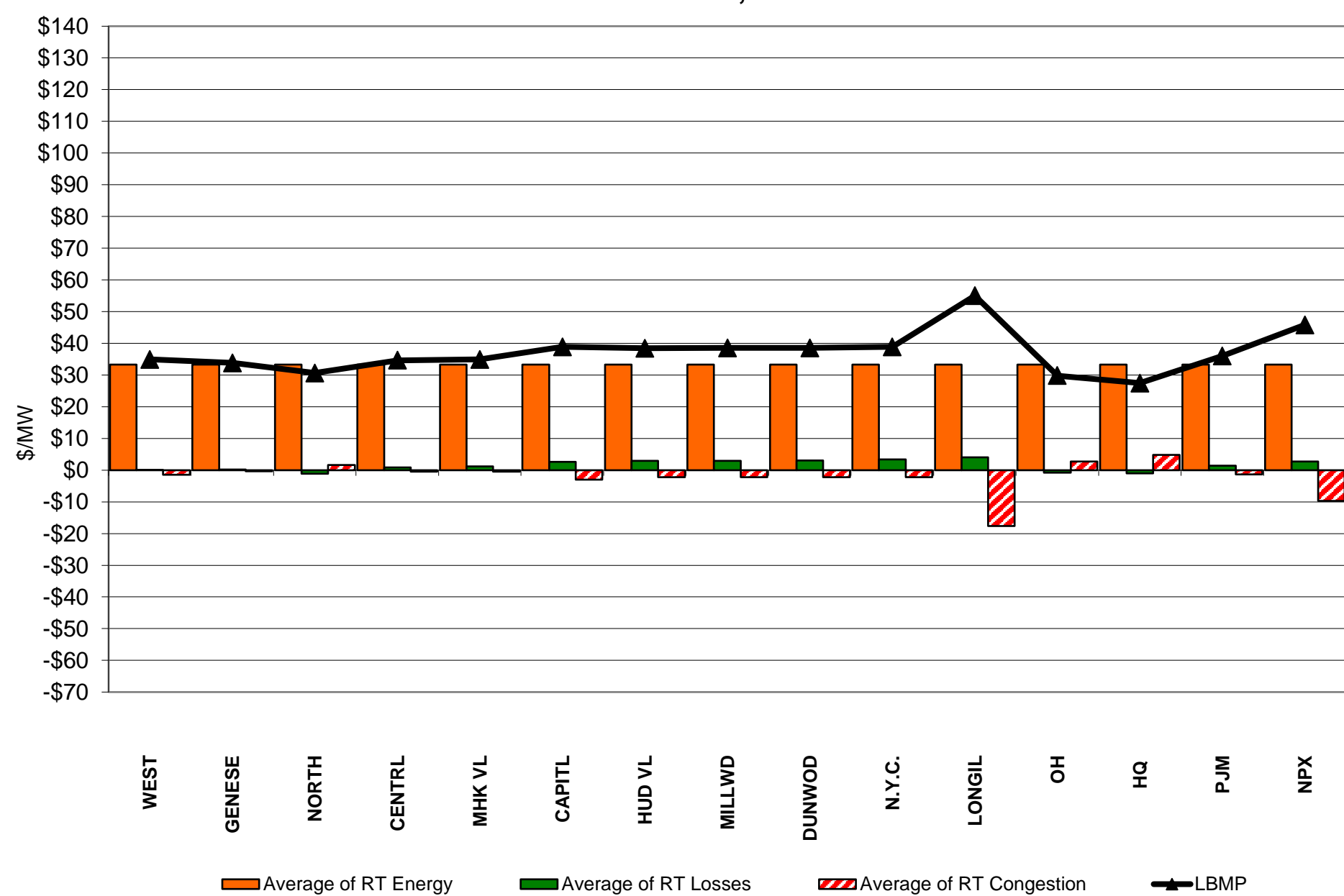
Long Island Zone K Monthly Average LBMP Prices 2017 - 2018



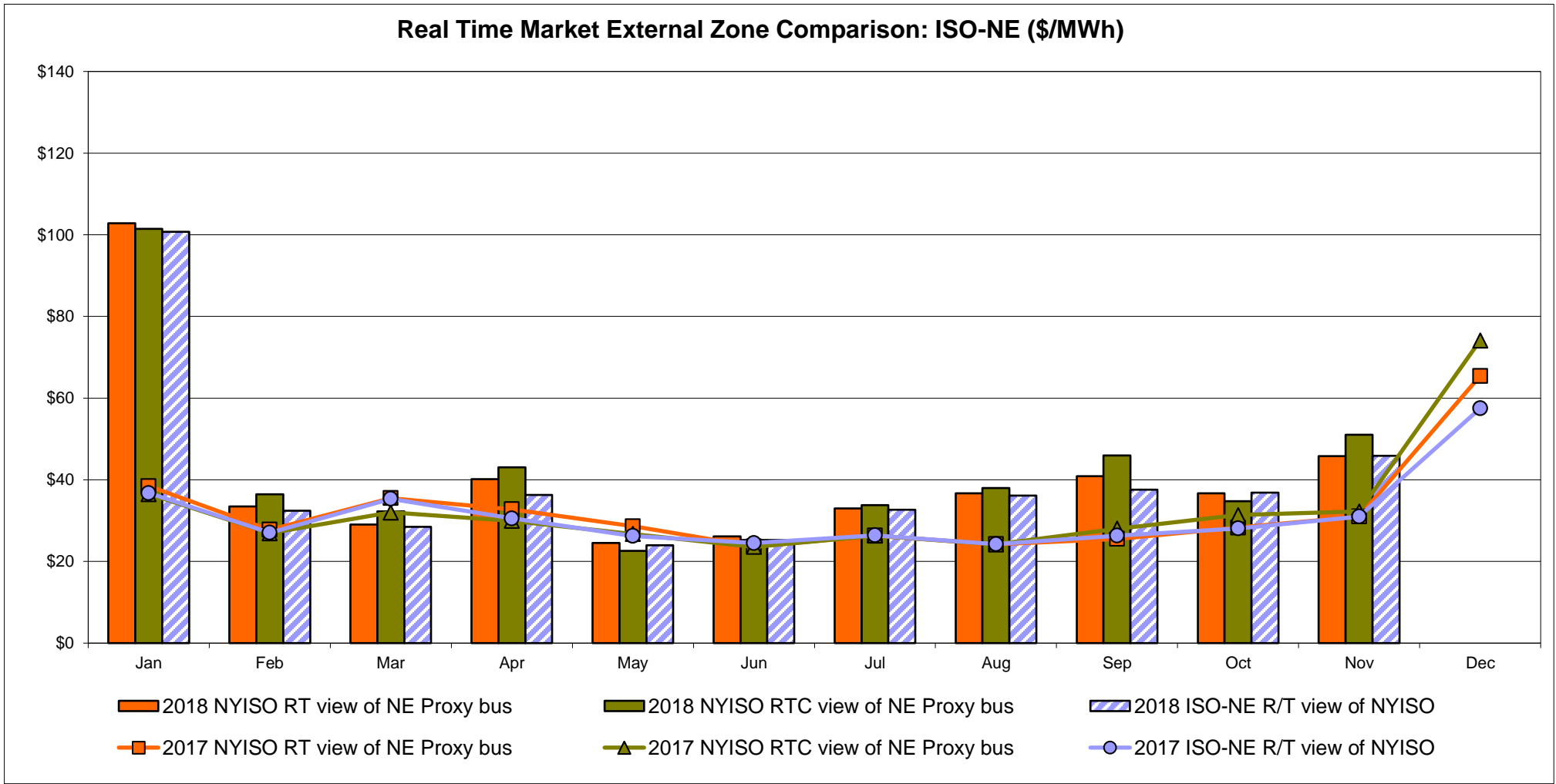
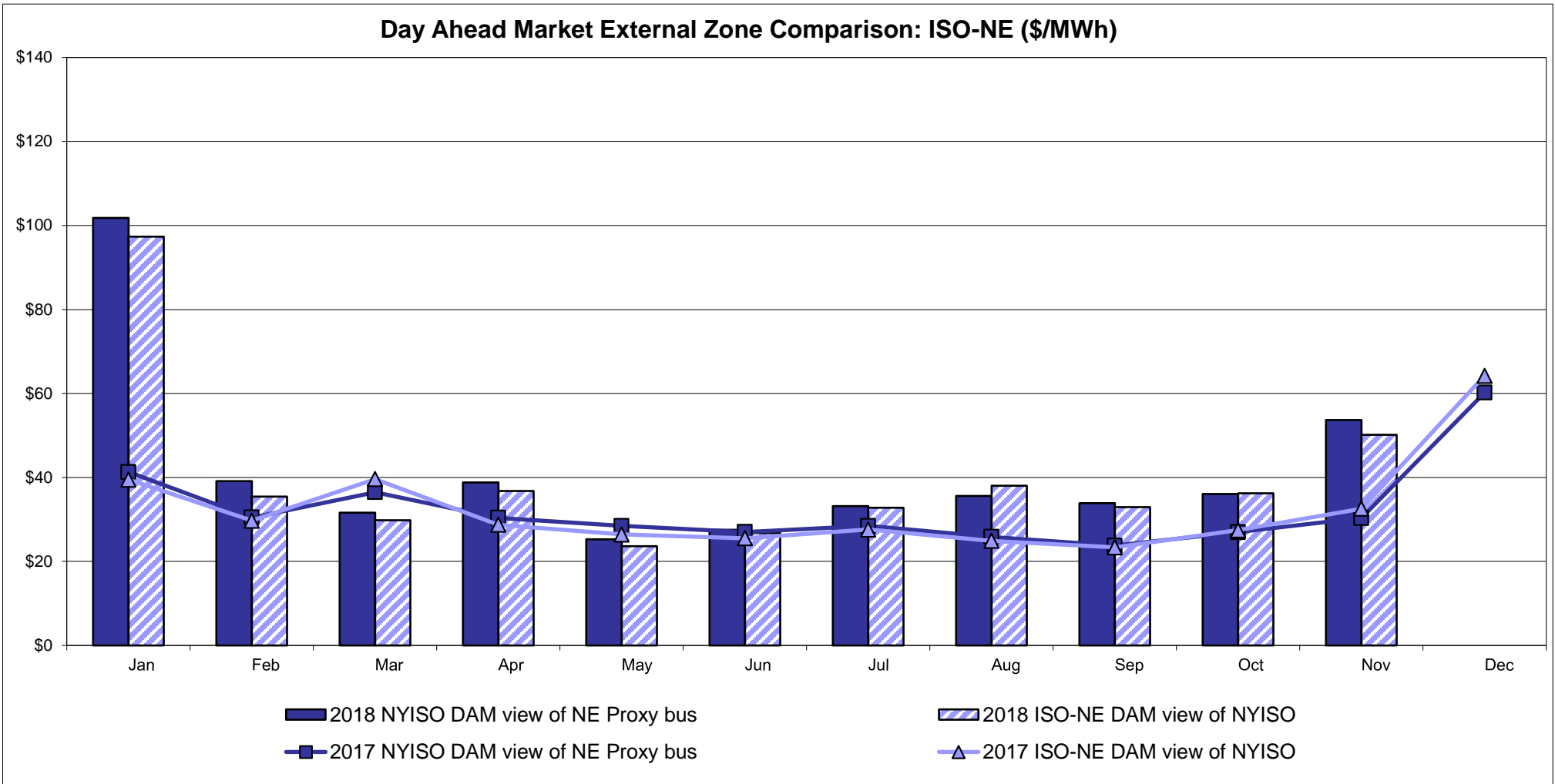
DAM Zonal Unweighted Monthly Average LBMP Components
thru November 30, 2018



RT Zonal Unweighted Monthly Average LBMP Components
thru November 30, 2018

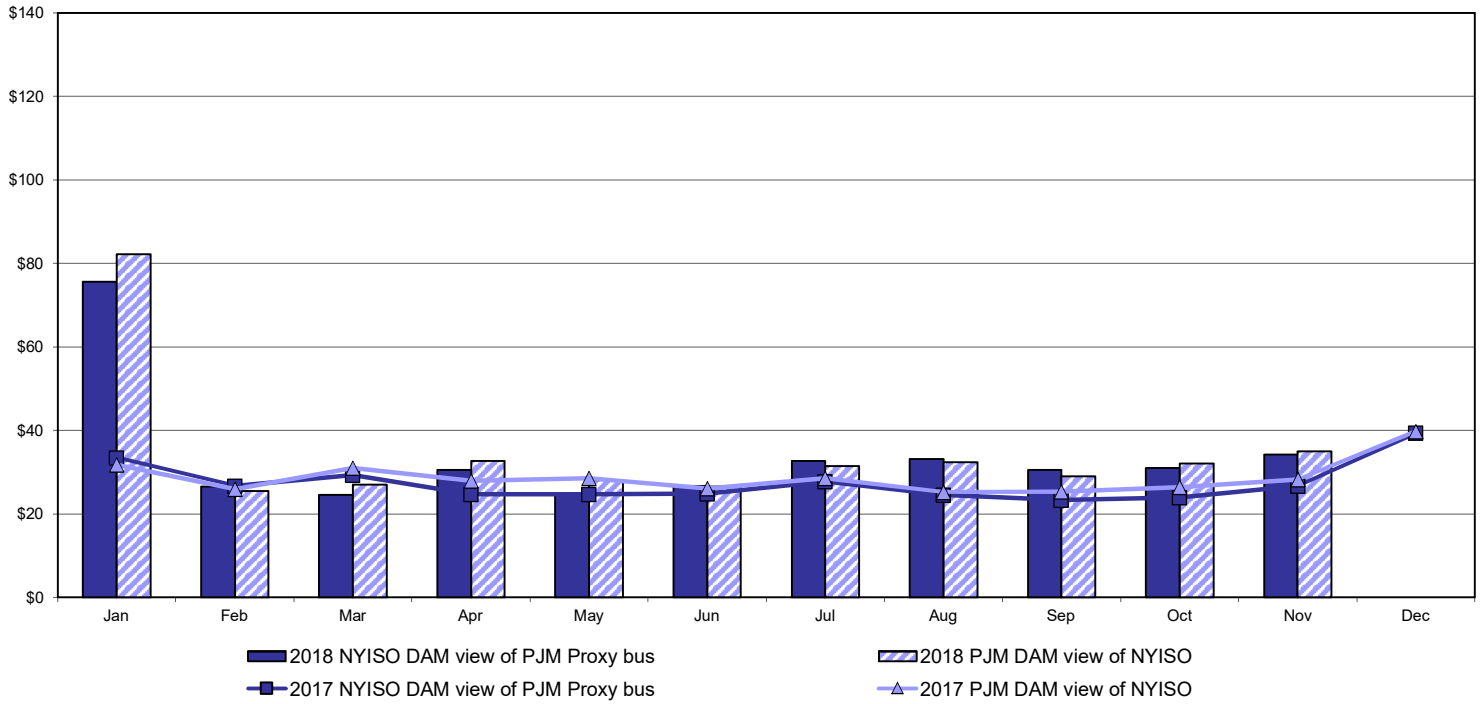


External Comparison ISO-New England

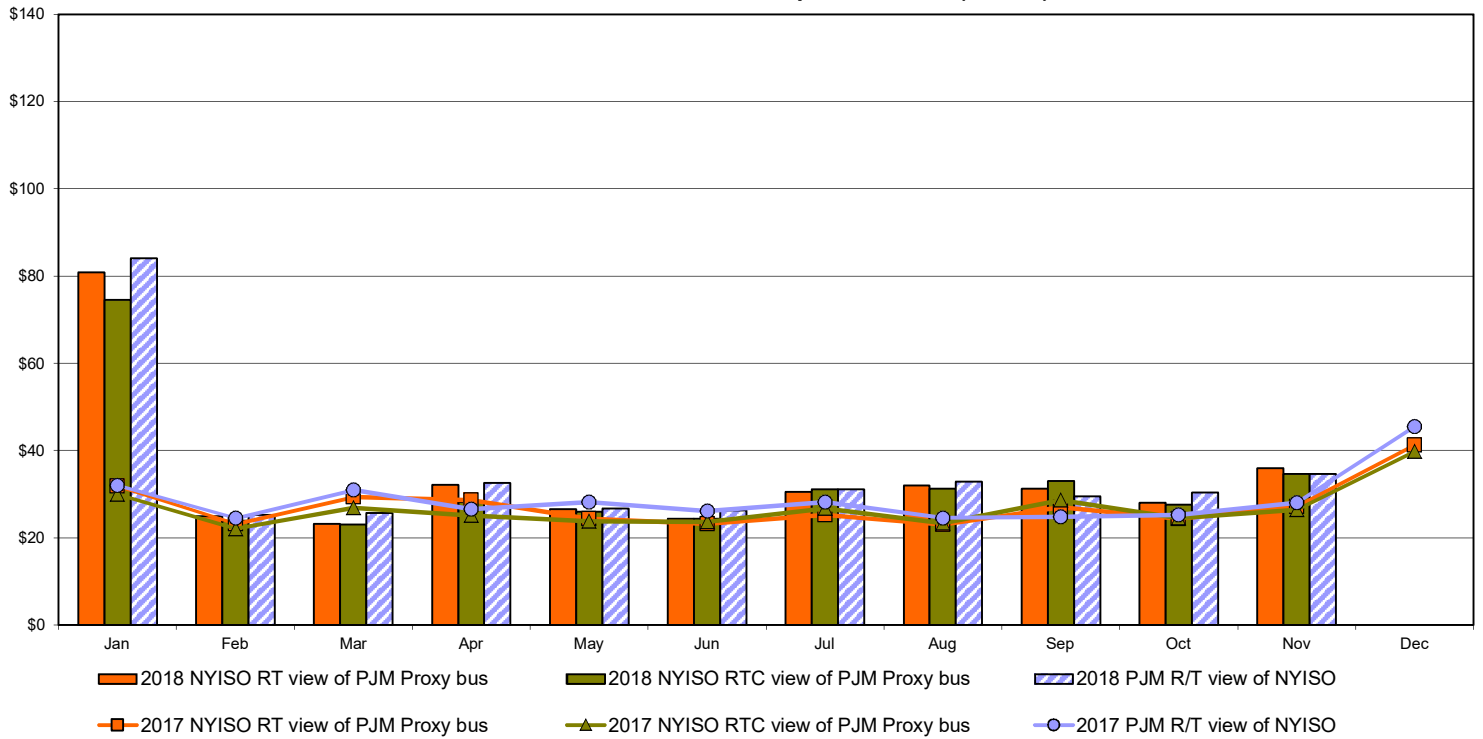


External Comparison PJM

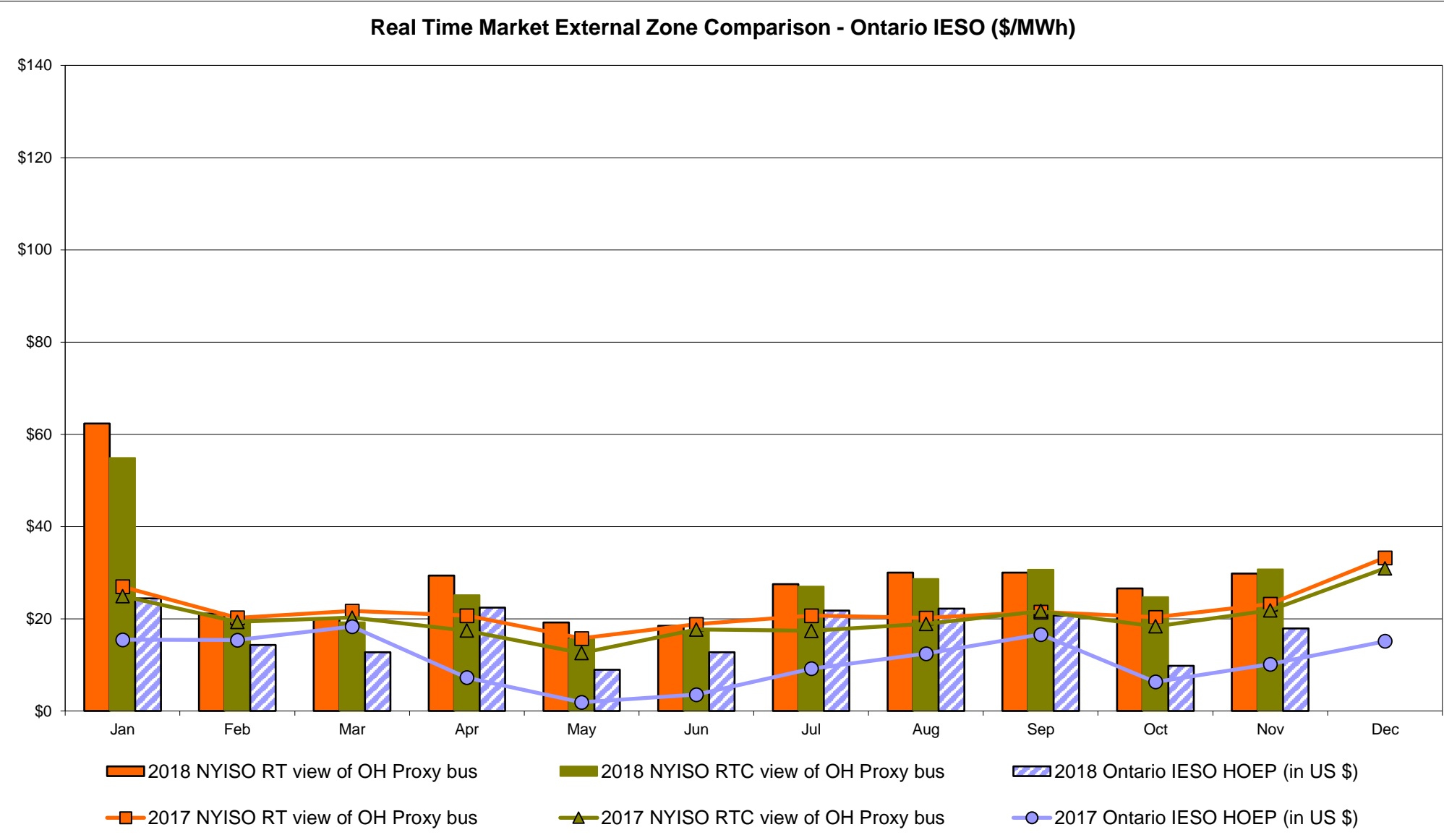
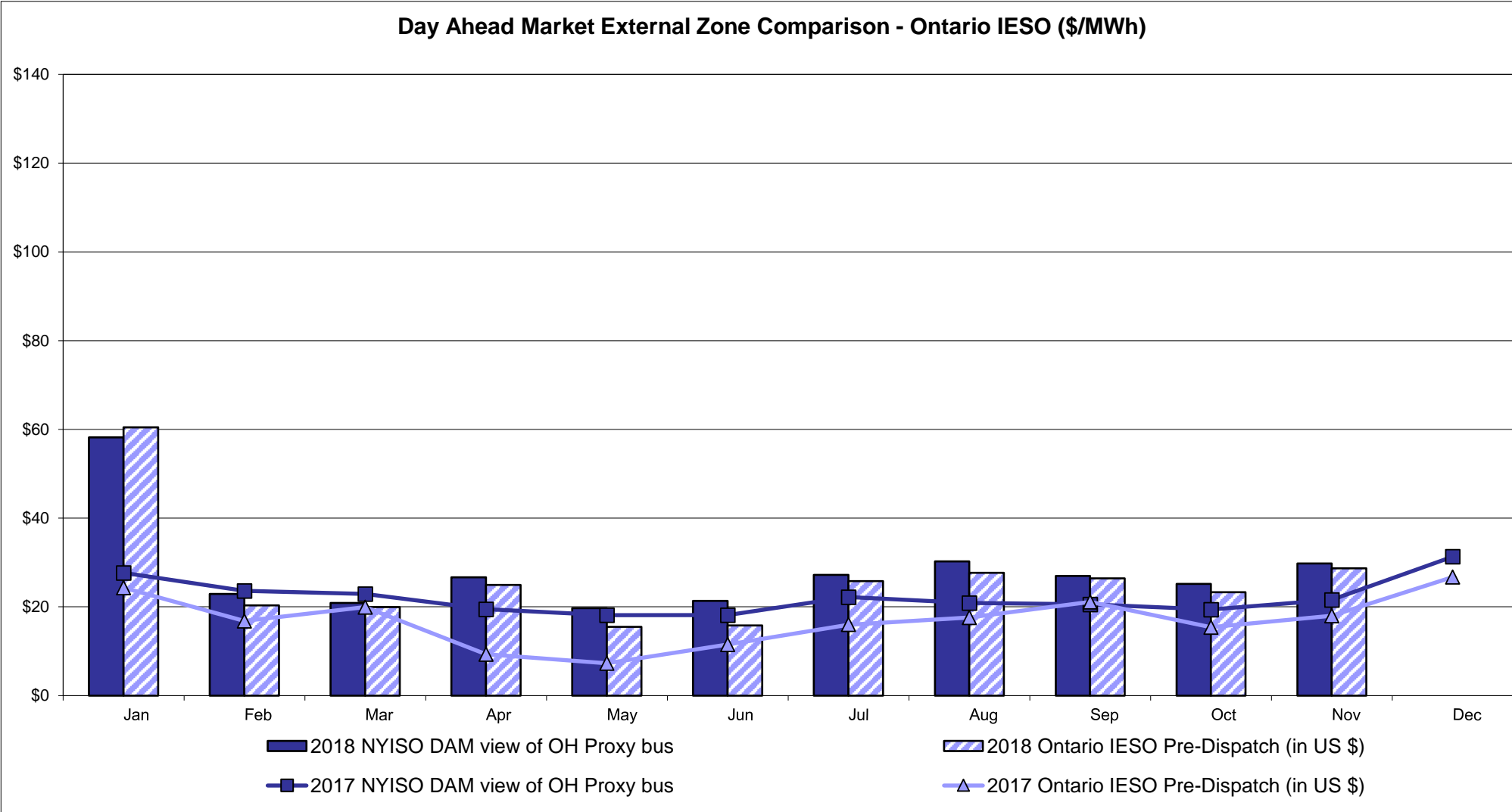
Day Ahead Market External Zone Comparison - PJM (\$/MWh)



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



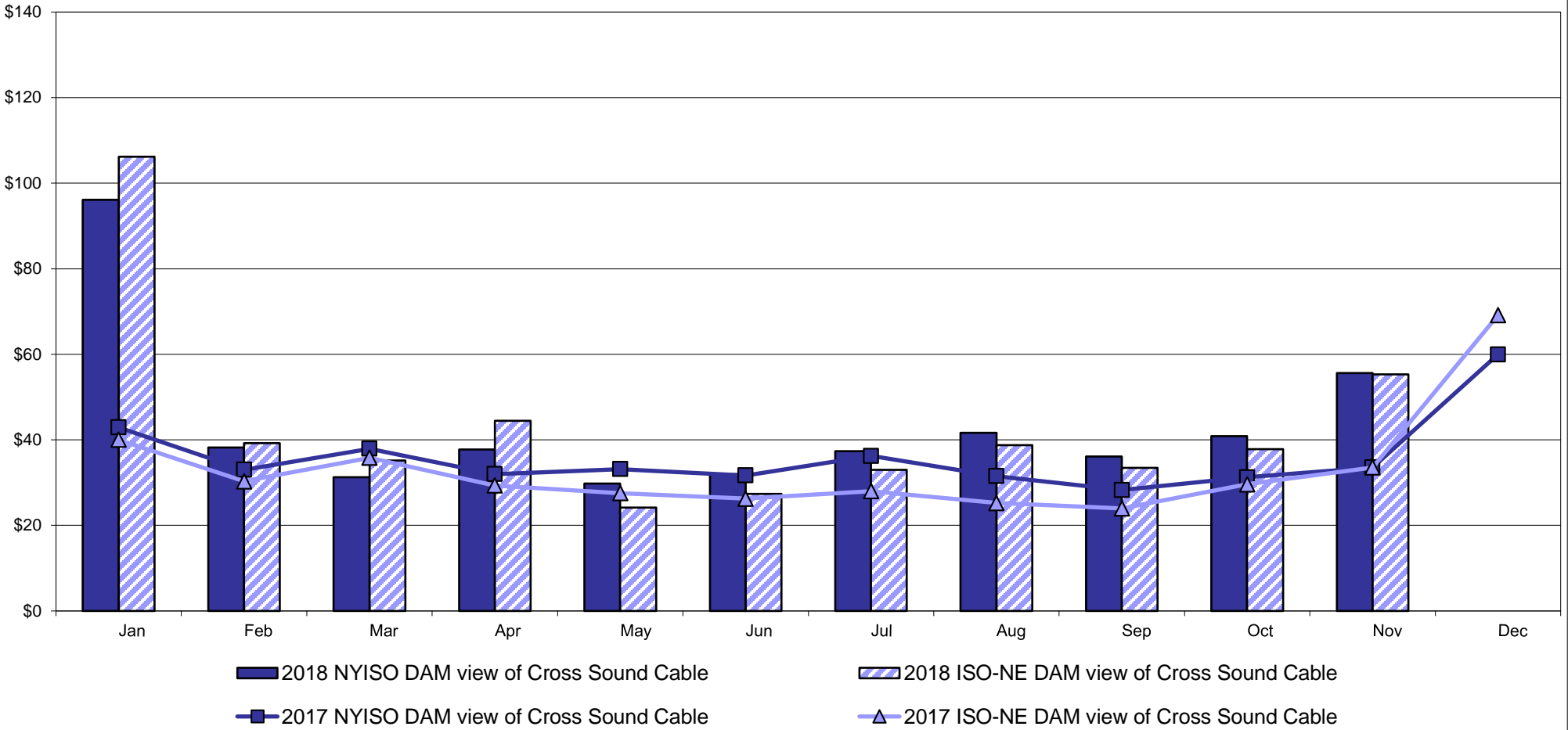
External Comparison Ontario IESO



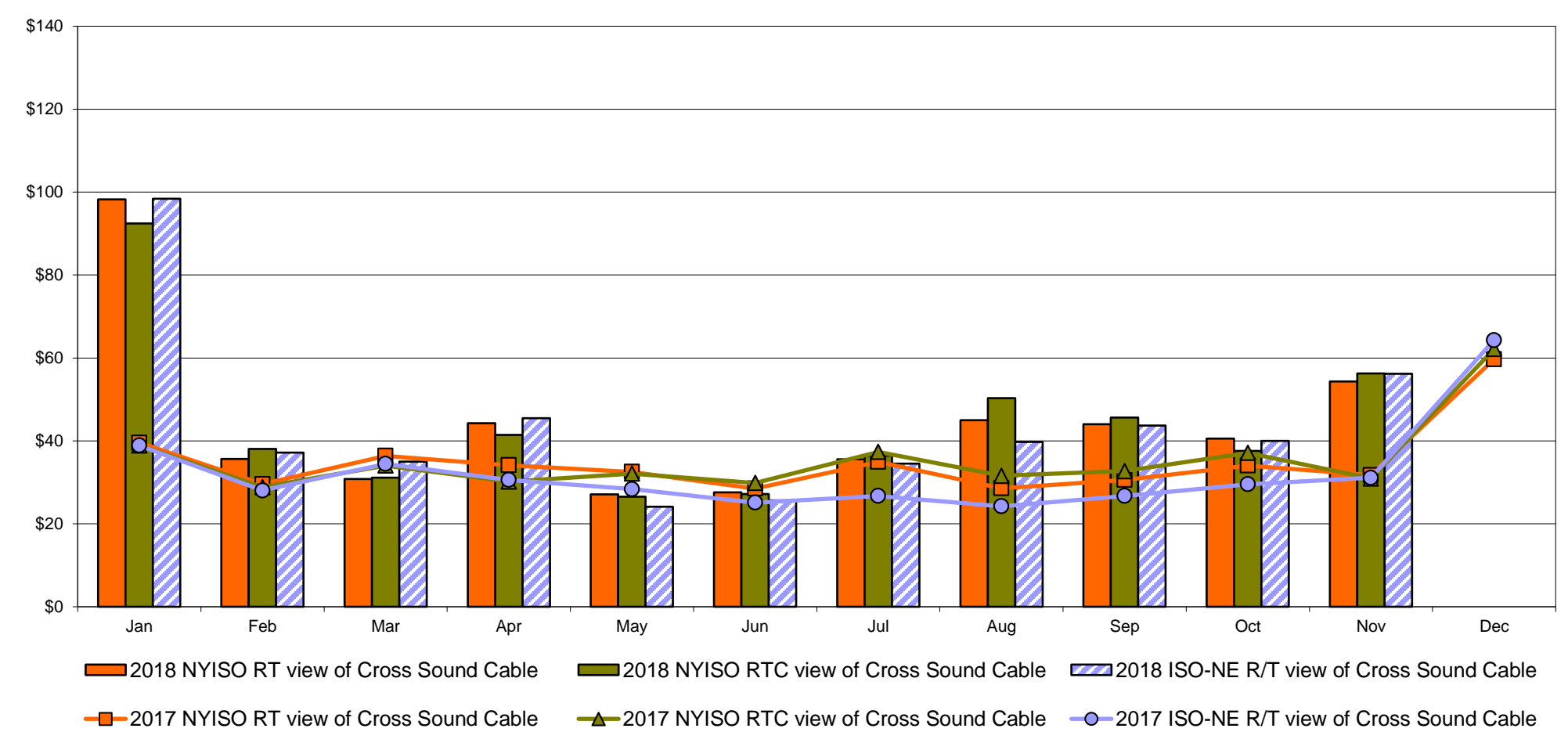
Notes: Exchange factor used for November 2018 was 0.757288905717531 to US
HOEP: Hourly Ontario Energy Price
Pre-Dispatch: Projected Energy Price

External Controllable Line: Cross Sound Cable (New England)

Day Ahead Market Comparison: Cross Sound Cable (\$/MWh)

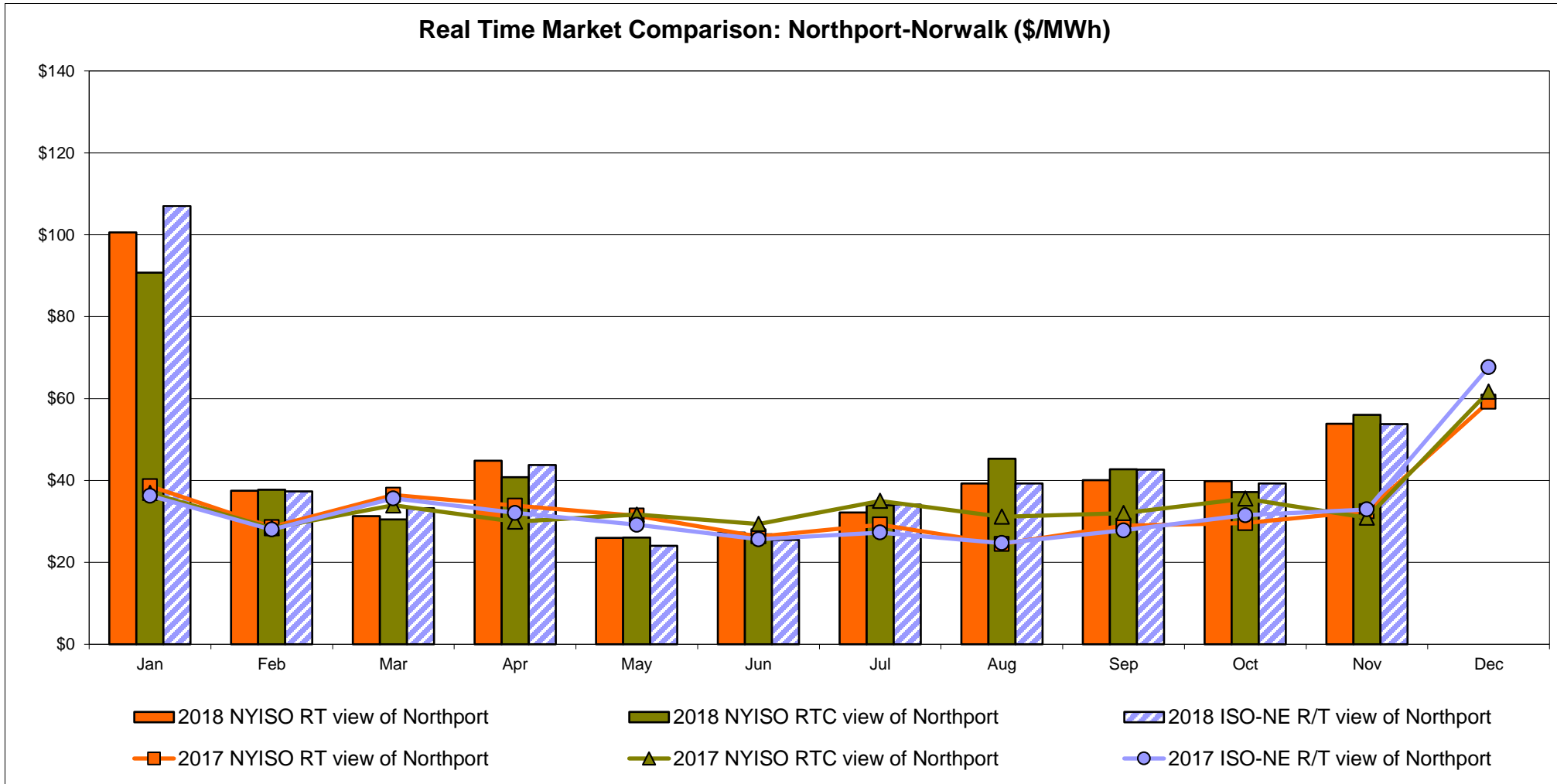
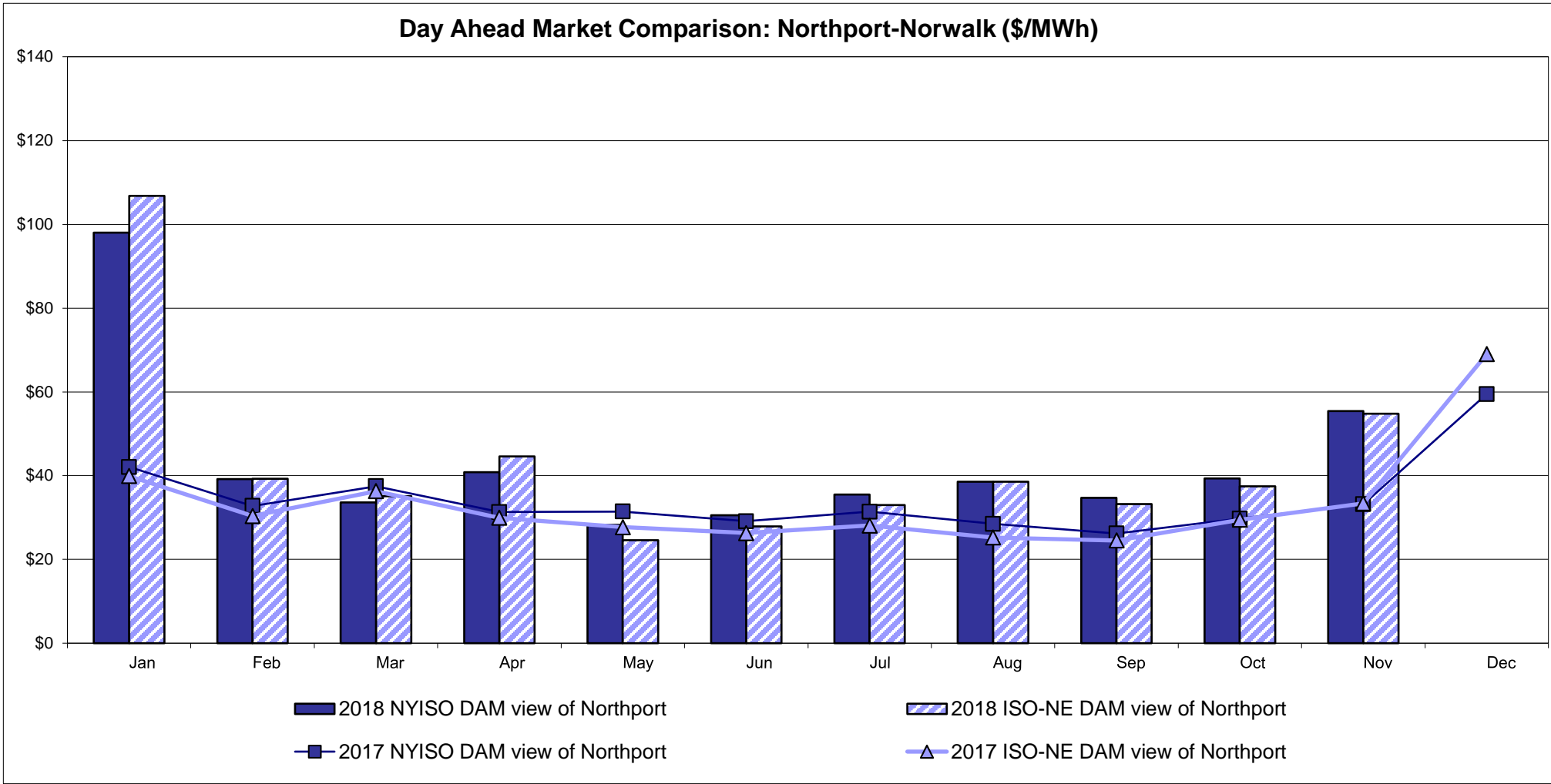


Real Time Market Comparison: Cross Sound Cable (\$/MWh)



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

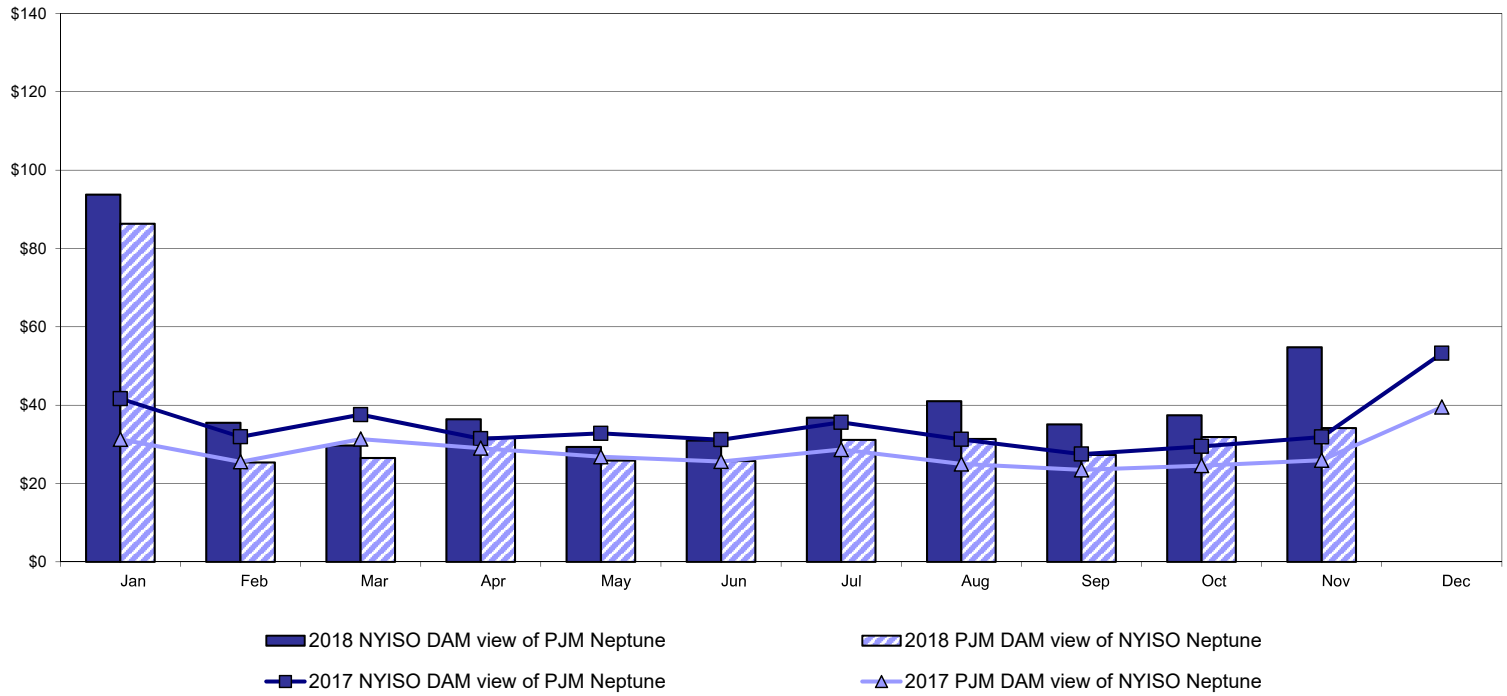
External Controllable Line: Northport - Norwalk (New England)



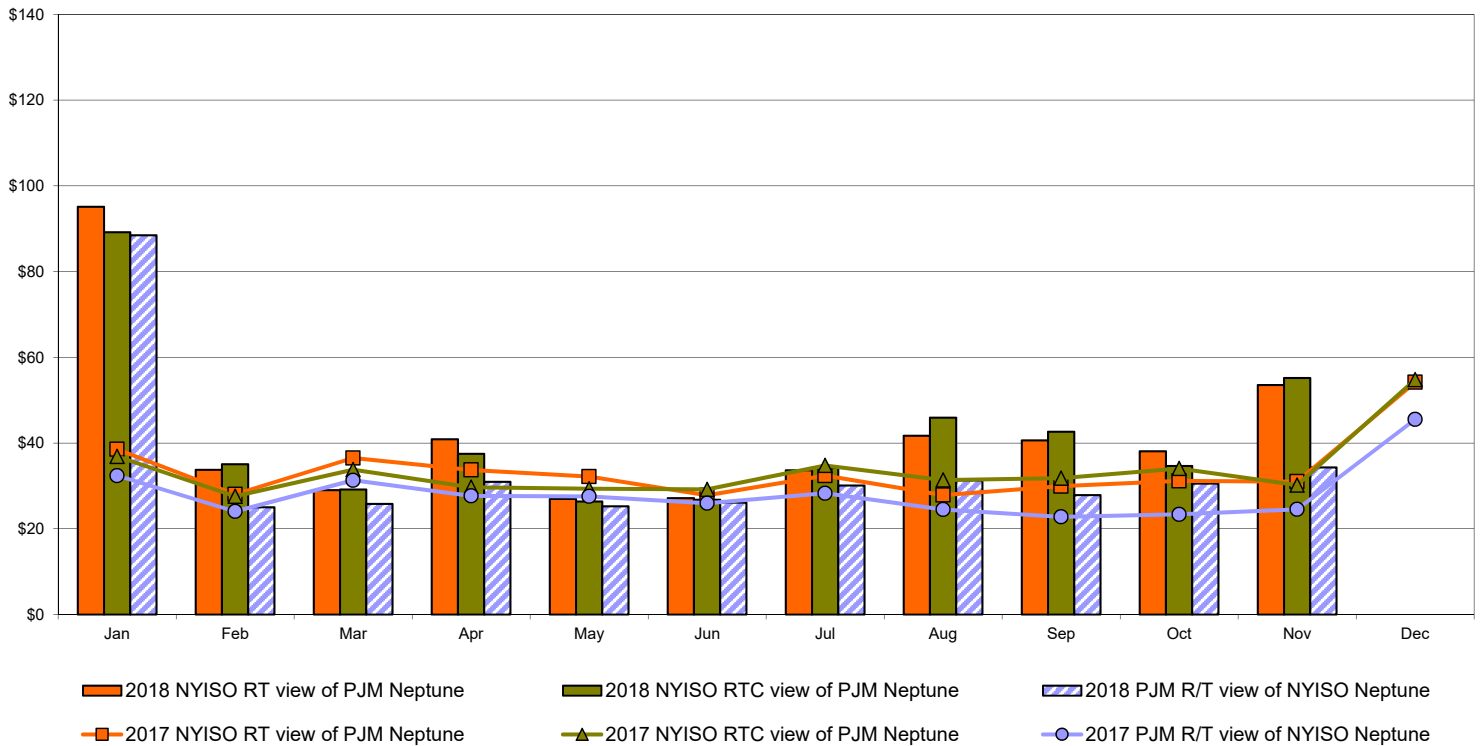
Note:
ISO-NE Forecast is an advisory posting @ 18:00 day before.
The DAM and R/T prices at the Northport 138 interface are used for ISO-NE.
The DAM and R/T prices at the 1385 interface are used for NYISO.

External Controllable Line: Neptune (PJM)

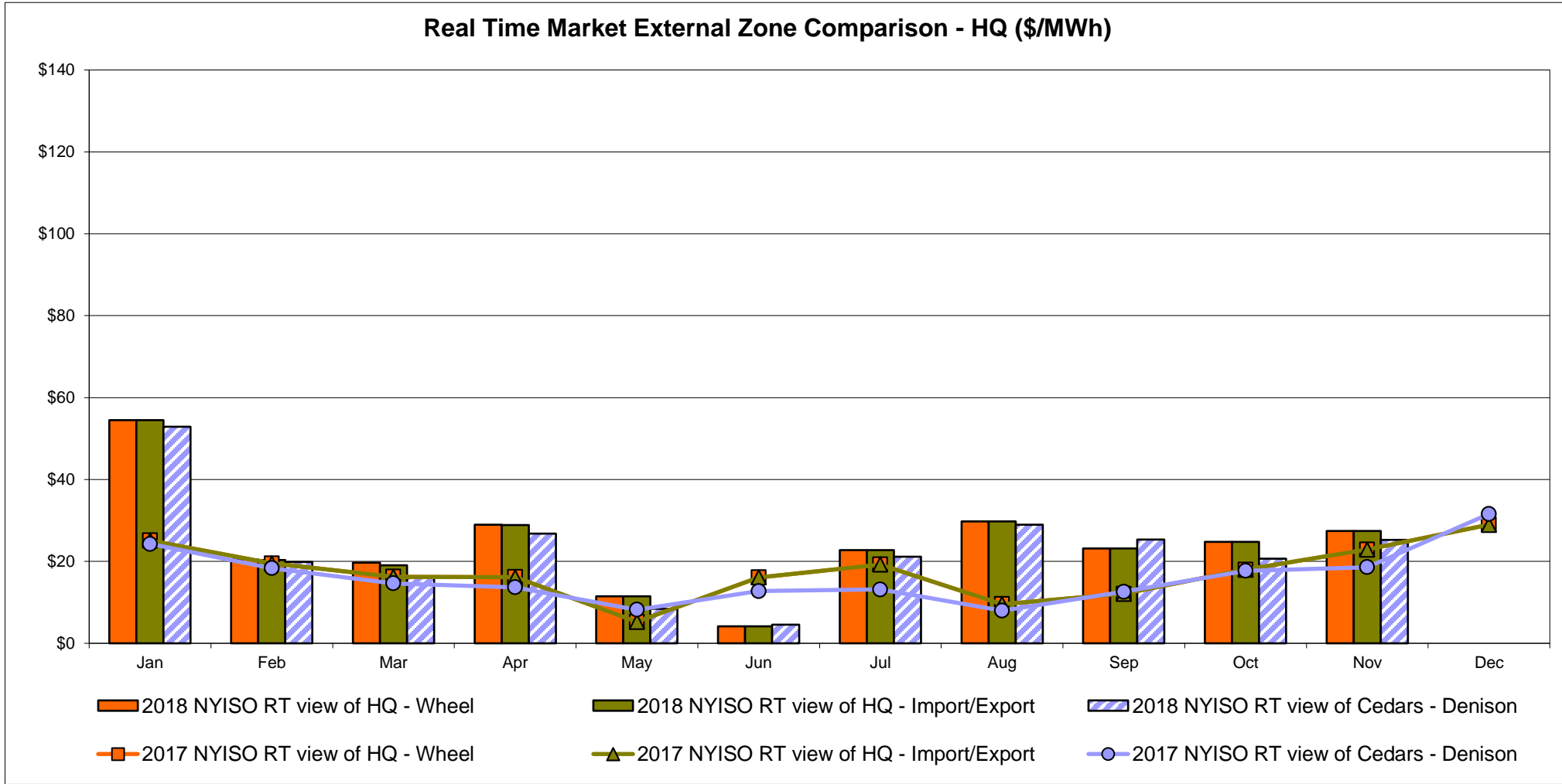
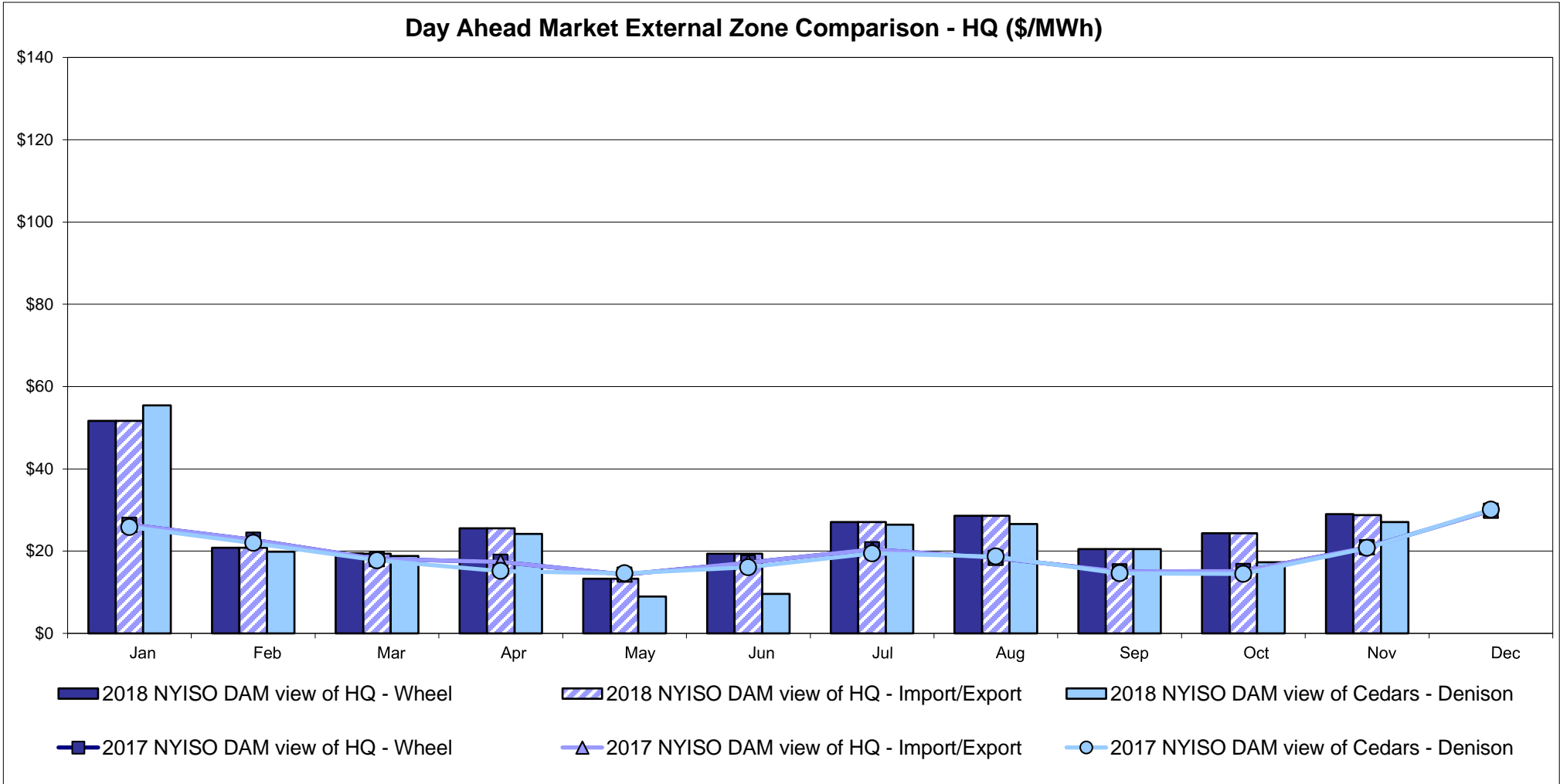
Day Ahead Market Comparison: Neptune (\$/MWh)



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

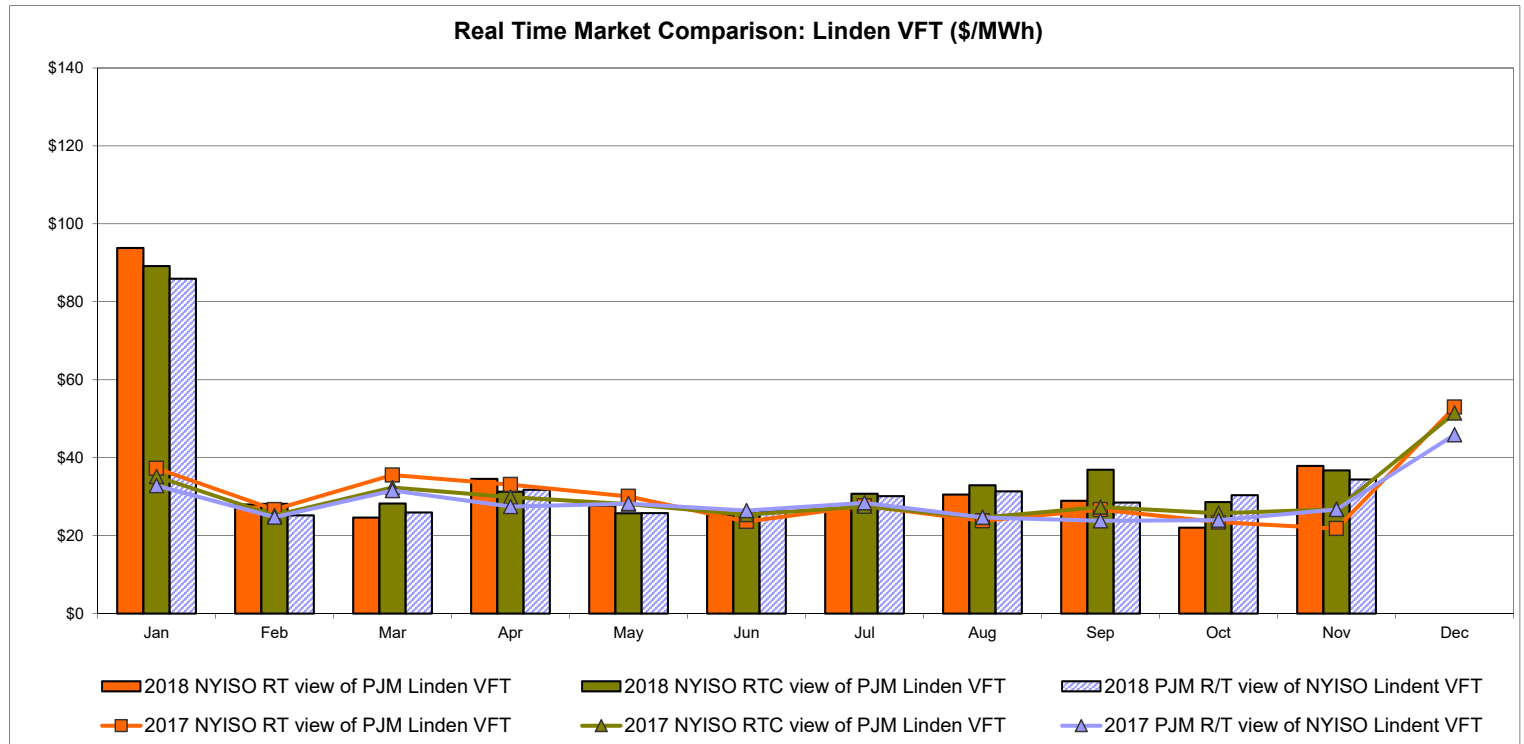
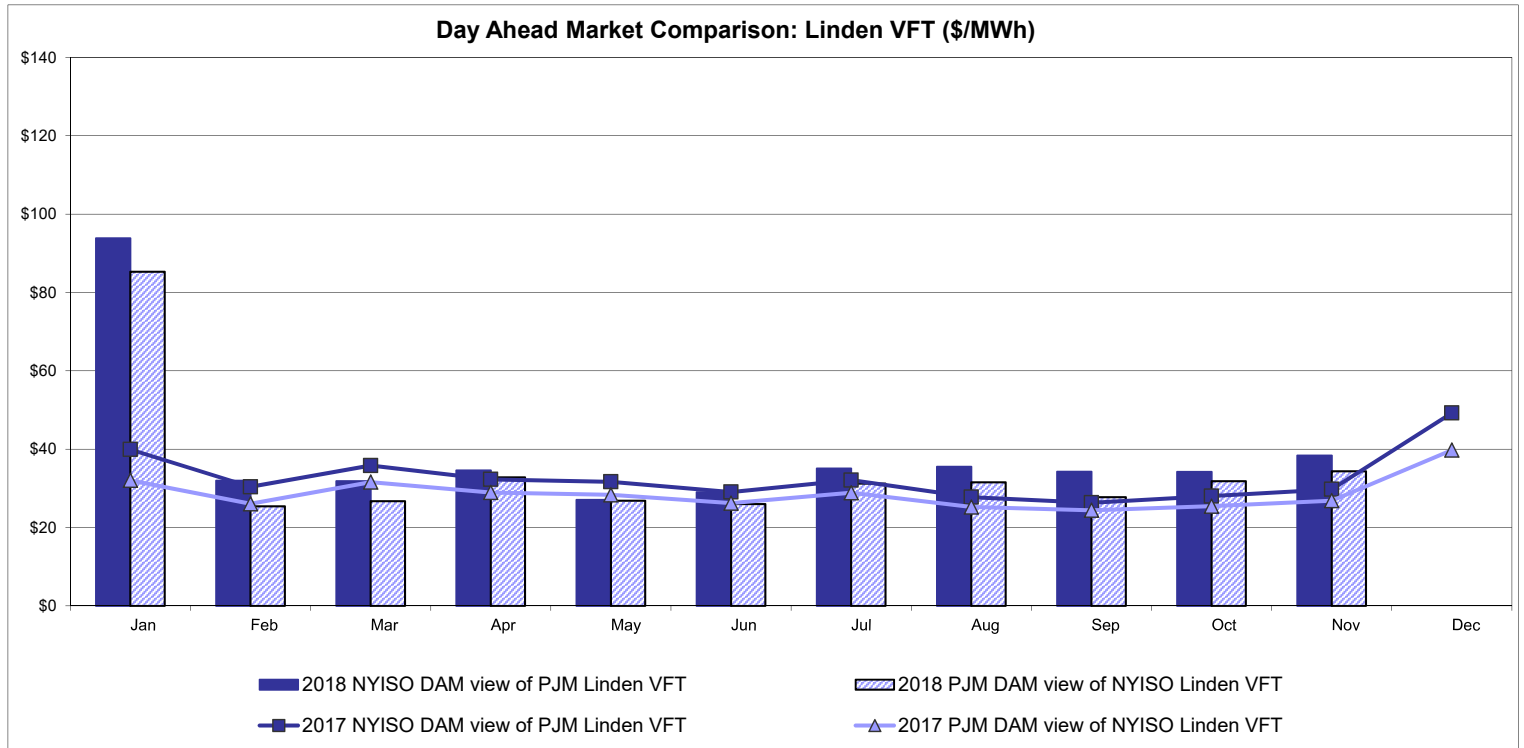


External Comparison Hydro-Quebec

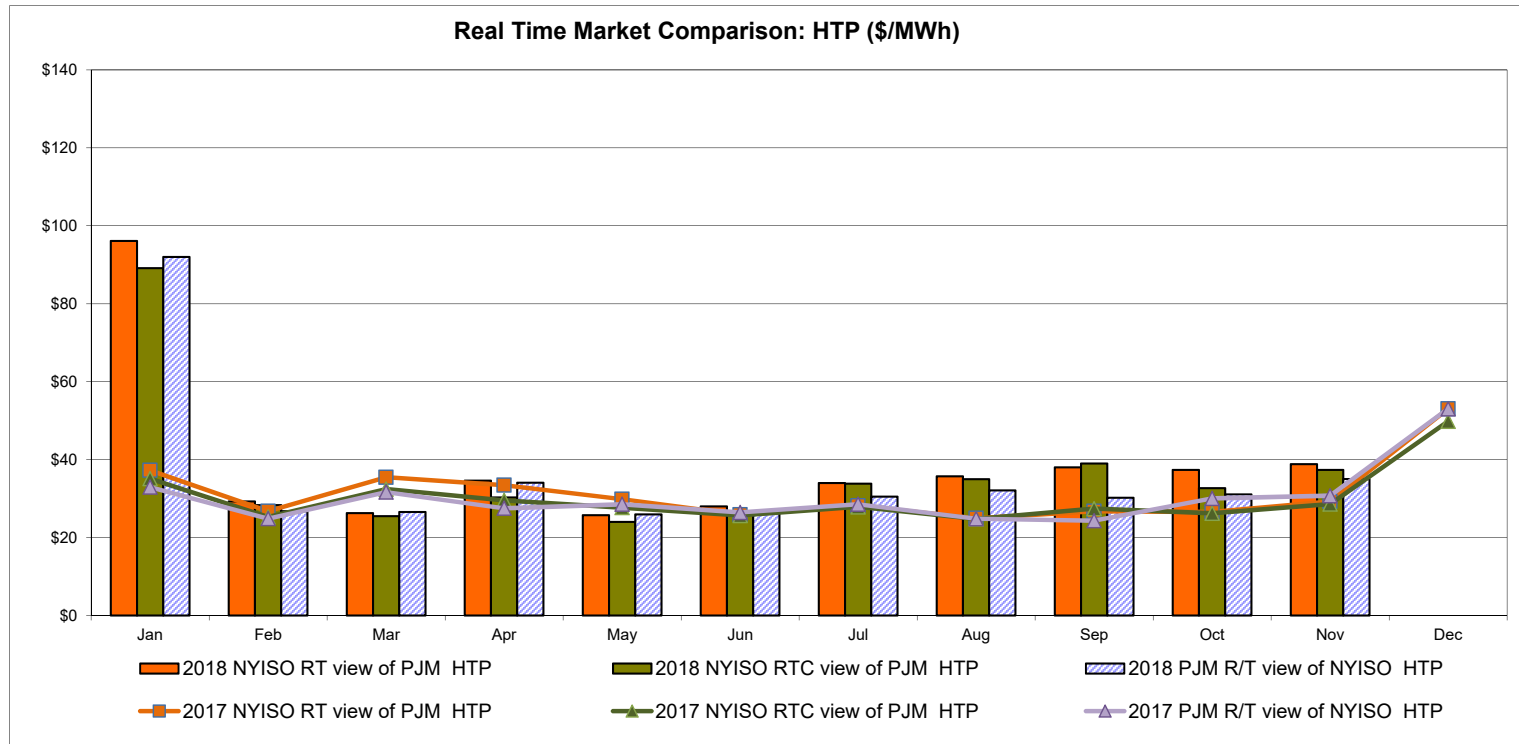
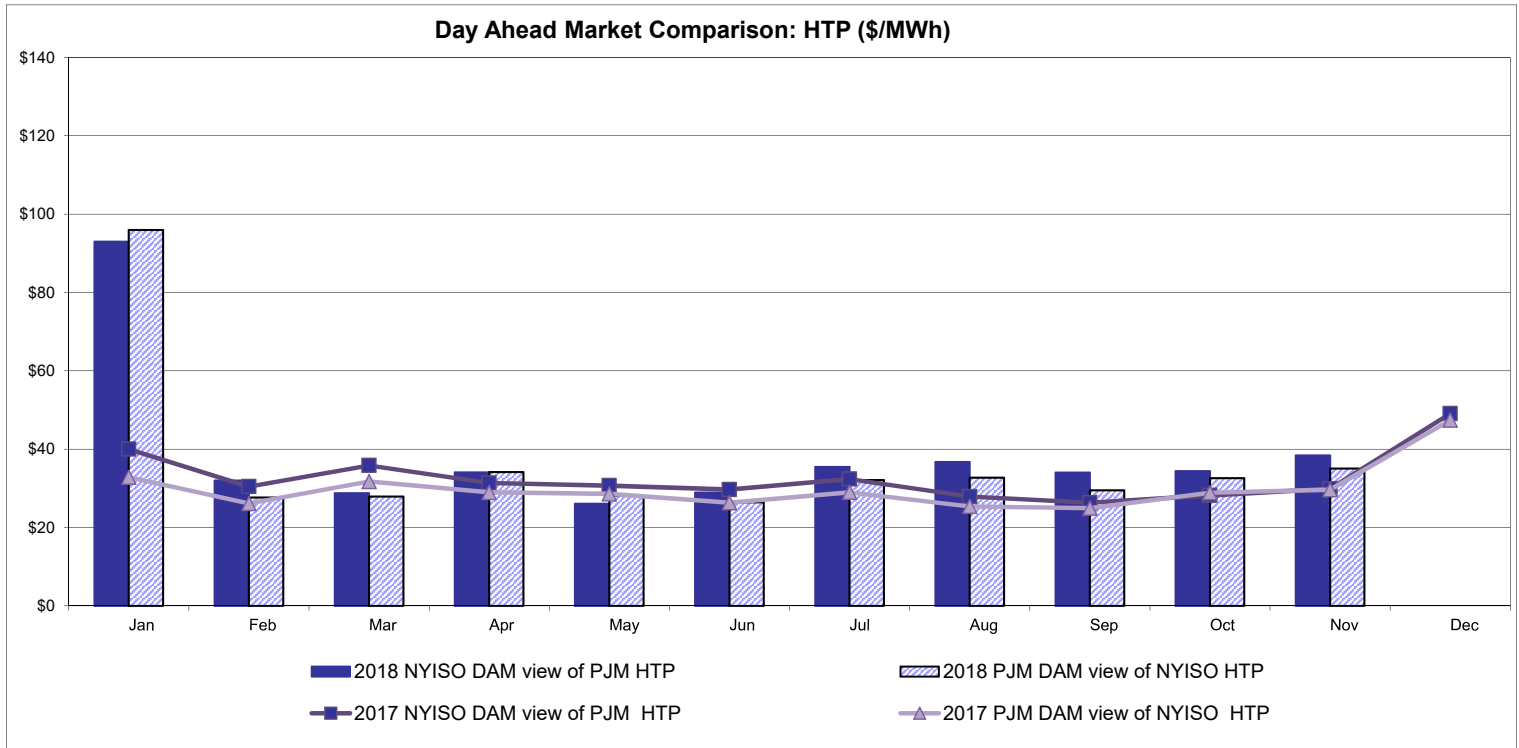


Note:
Hydro-Quebec Prices are unavailable.

External Controllable Line: Linden VFT (PJM)



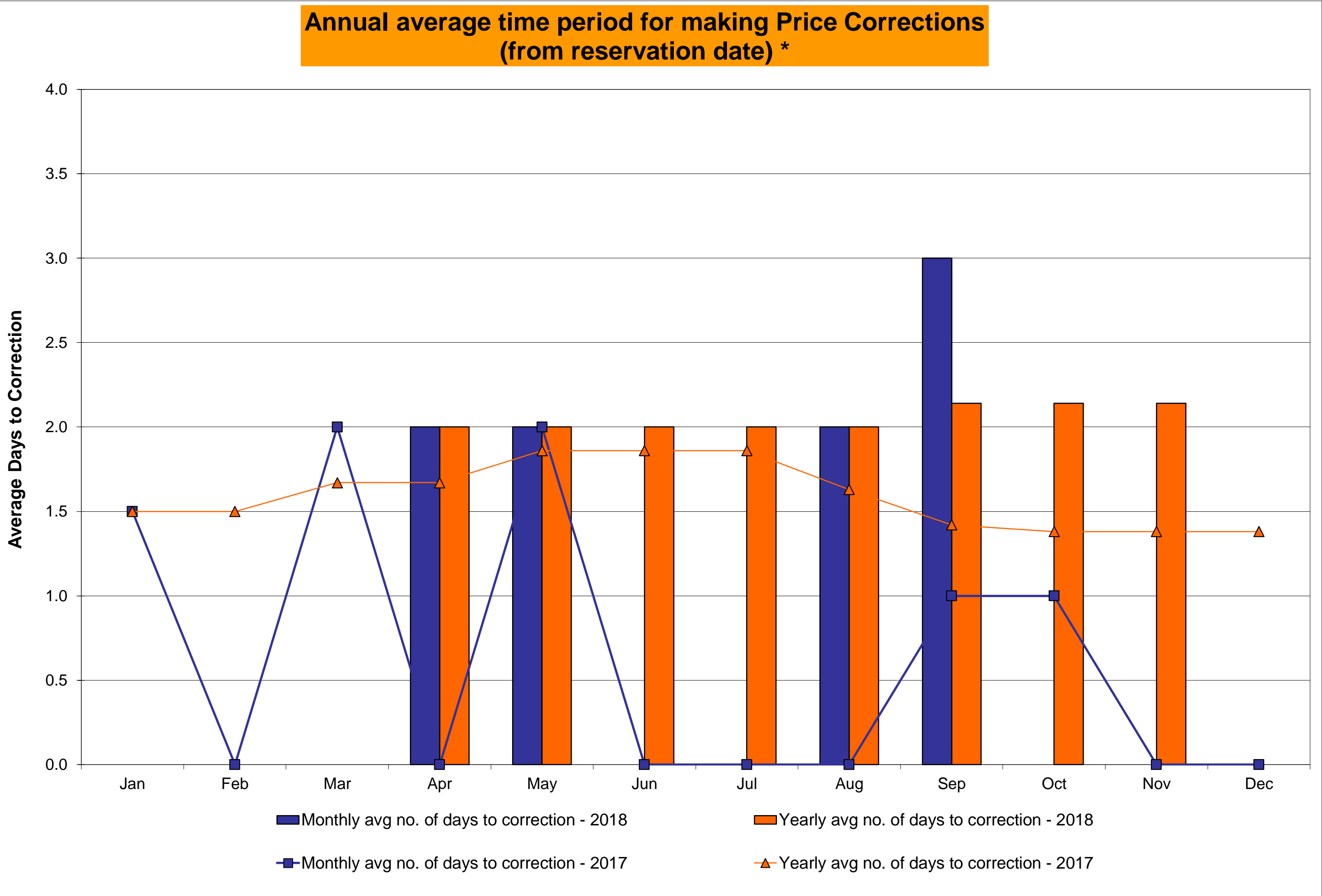
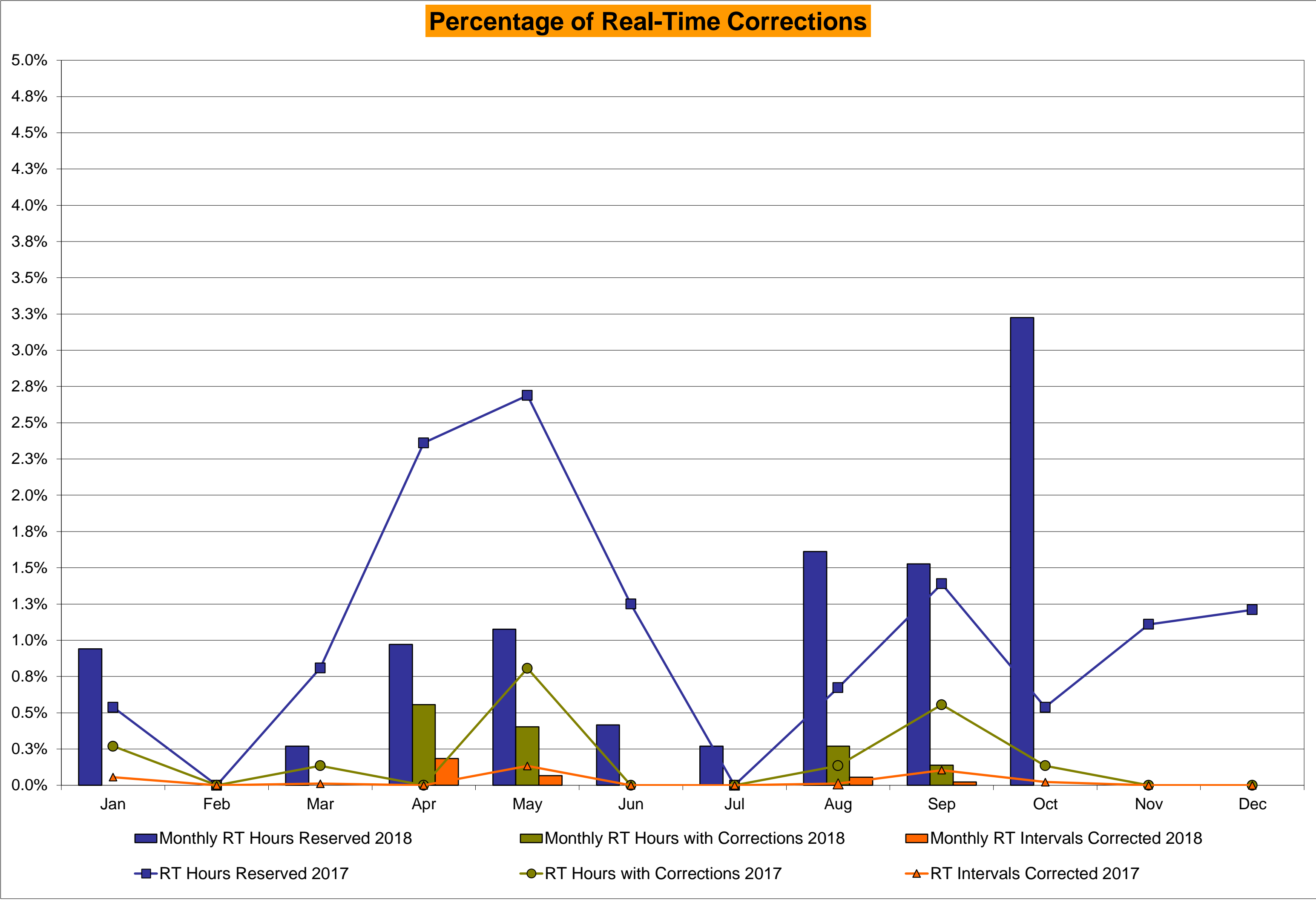
External Controllable Line: Hudson (PJM)



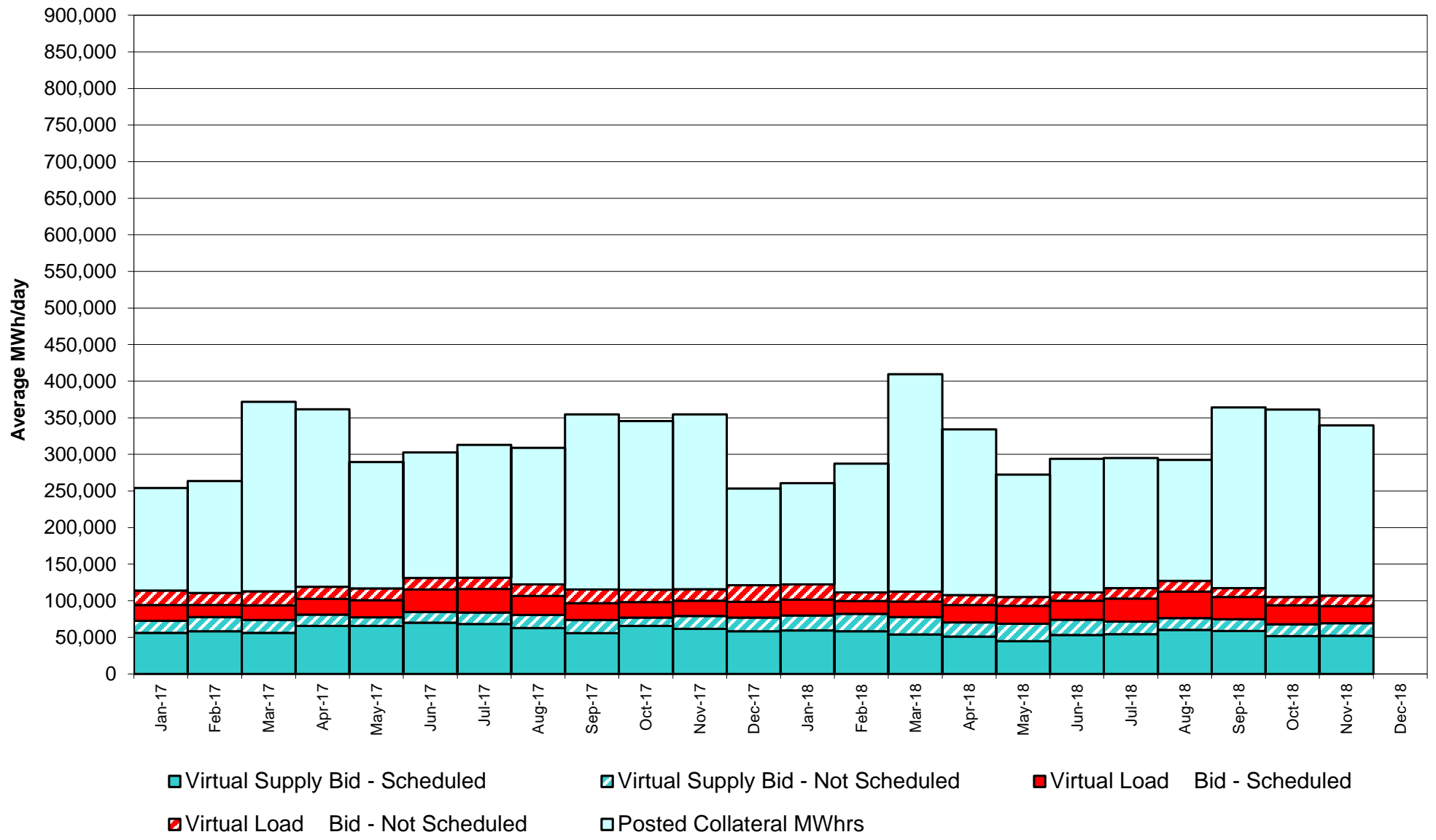
NYISO Real Time Price Correction Statistics

2018		<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<u>Hour Corrections</u>													
Number of hours with corrections	in the month	0	0	0	4	3	0	0	2	1	0	0	
Number of hours	in the month	744	672	743	720	744	720	744	744	720	744	721	
% 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%	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%	0.12%	
<u>Interval Corrections</u>													
Number of intervals corrected	in the month	0	0	0	16	6	0	0	5	2	0	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	8,763	
% 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%	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%	0.03%	
<u>Hours Reserved</u>													
Number of hours reserved	in the month	7	0	2	7	8	3	2	12	11	24	0	
Number of hours	in the month	744	672	743	720	744	720	744	744	720	744	721	
% 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%	0.00%	
% 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%	0.95%	
<u>Days to Correction</u> *													
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	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	2.14	
<u>Days Without Corrections</u>													
Days without corrections	in the month	31	28	31	28	28	30	31	30	29	31	30	
Days without corrections	year-to-date	31	59	90	118	146	176	207	237	266	297	327	
2017		<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<u>Hour Corrections</u>													
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%
<u>Interval Corrections</u>													
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%
<u>Hours Reserved</u>													
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%
<u>Days to Correction</u> *													
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
<u>Days Without Corrections</u>													
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

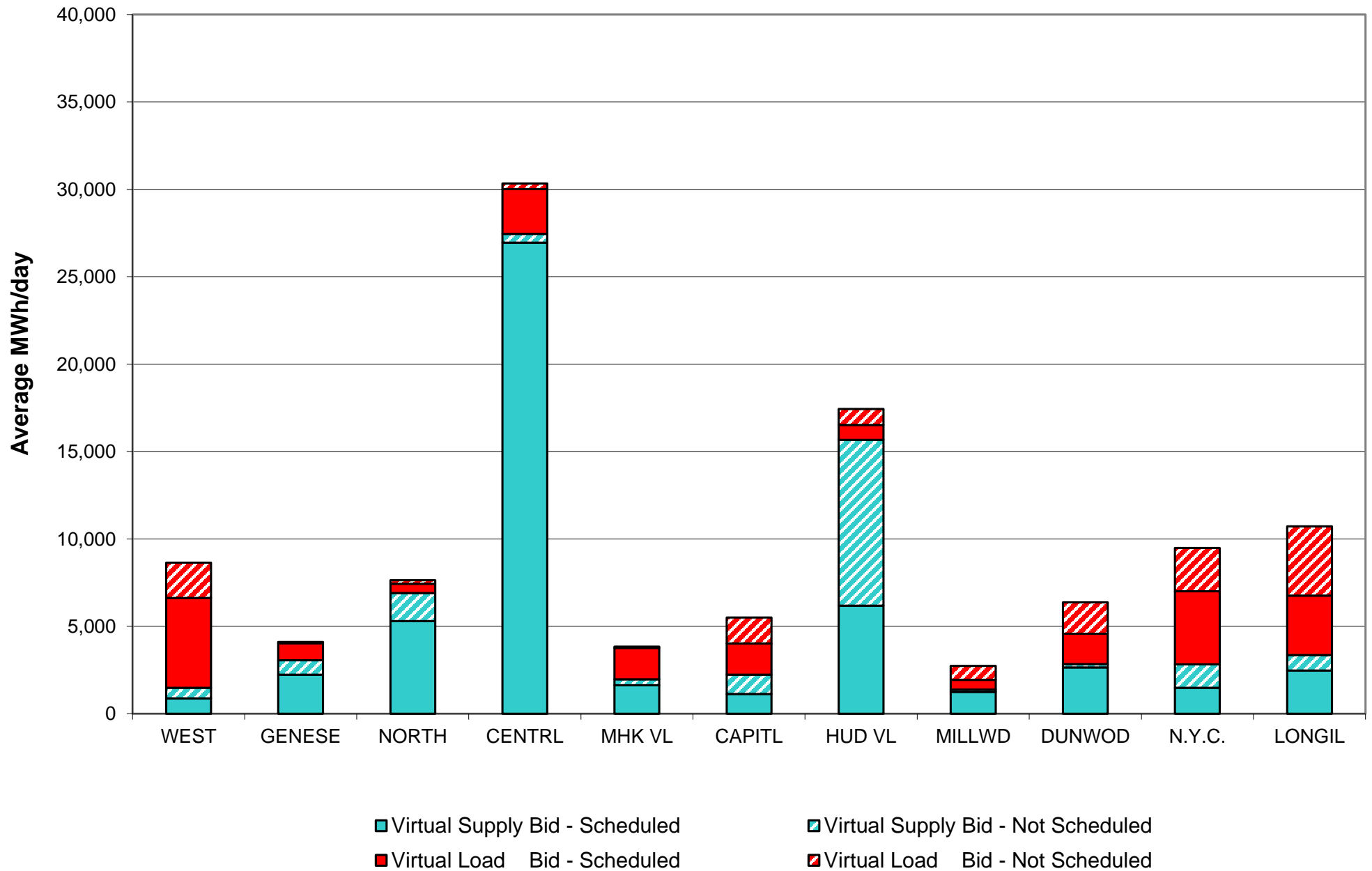
*Calendar days from reservation date; for June 2018 forward, business days from market date



NYISO Virtual Trading Average MWh per day



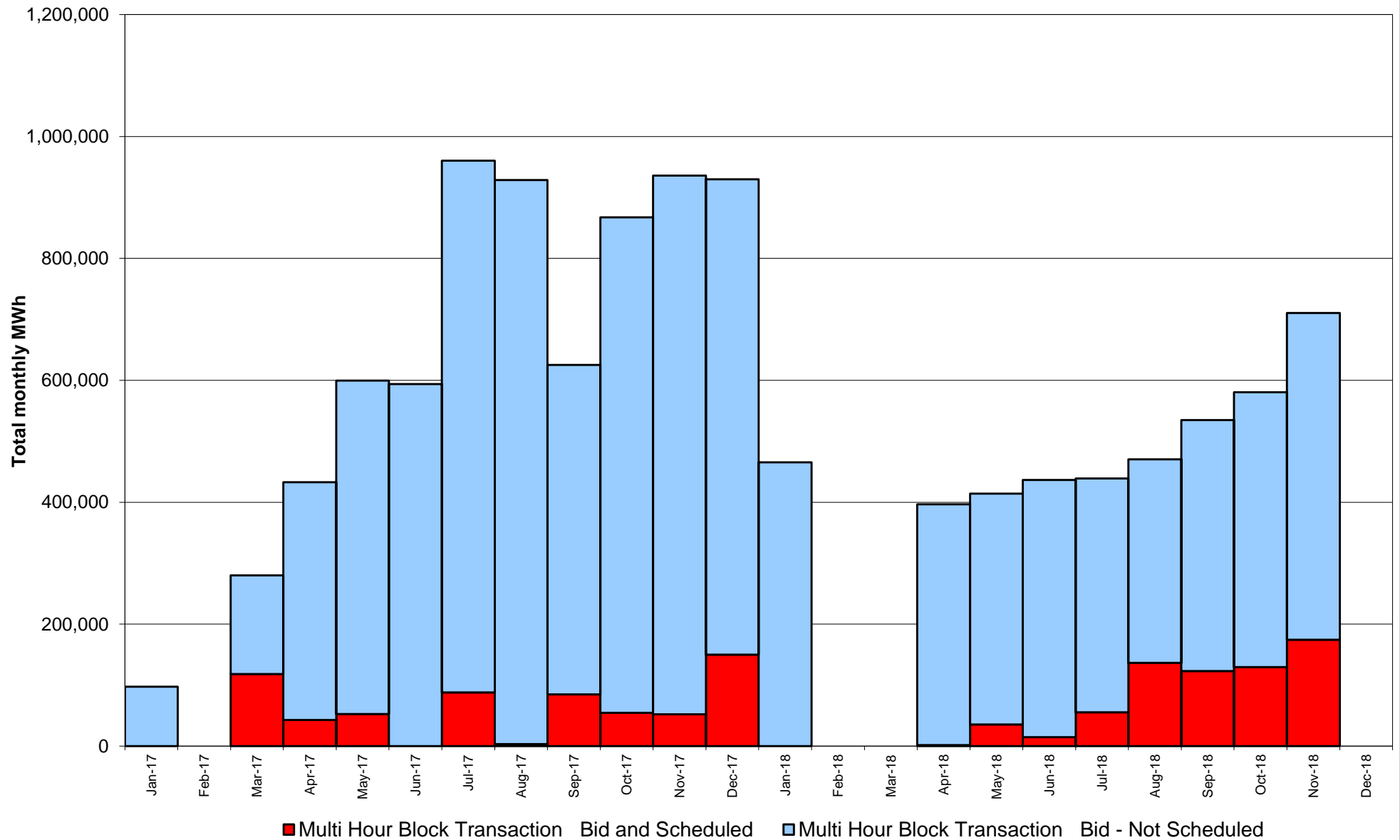
Virtual Load and Supply Zonal Statistics through November 30, 2018



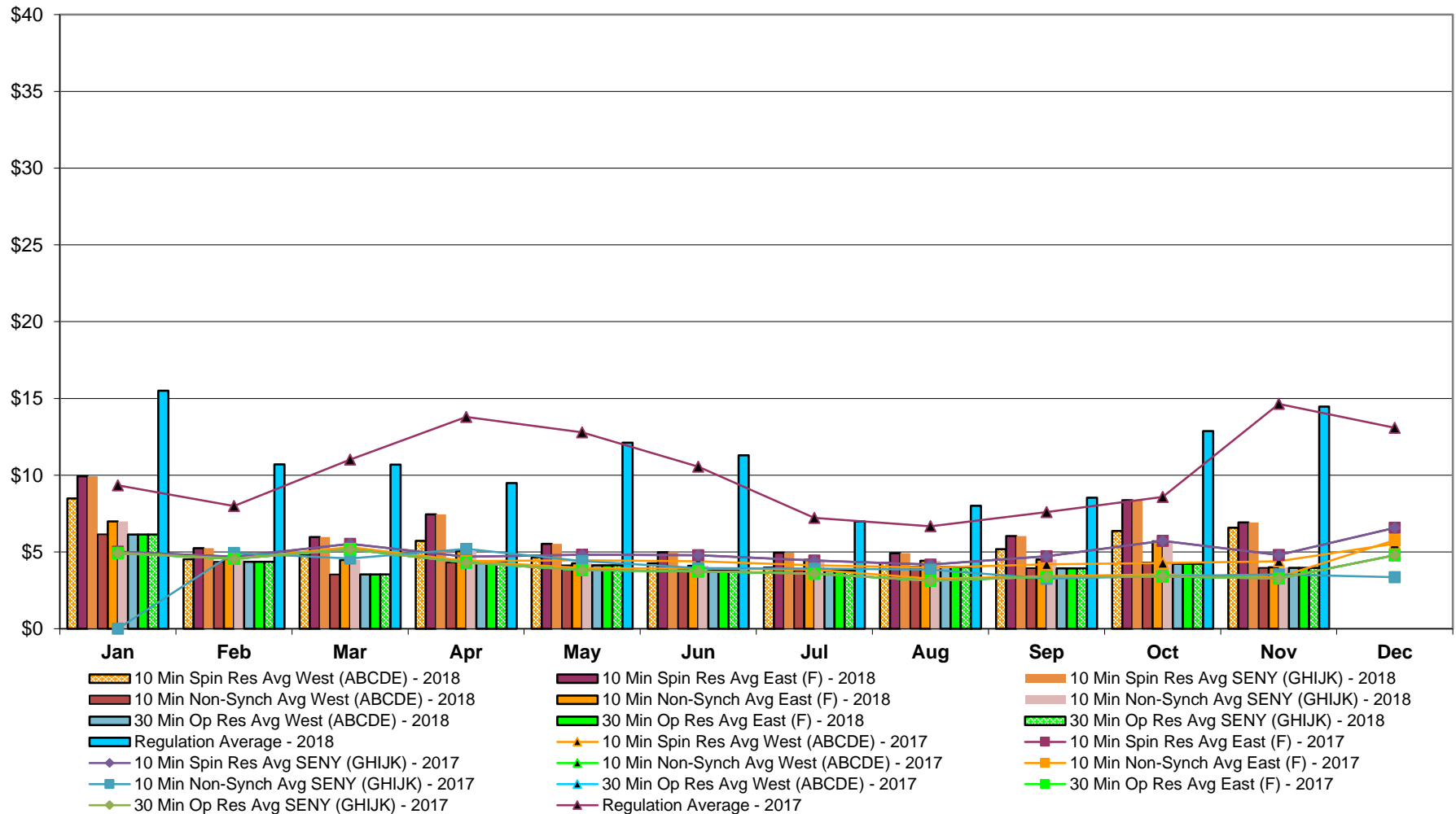
Virtual Load and Supply Zonal Statistics (Average MWh/day) - 2018

		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
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
	Feb-18	3,058	1,941	1,478	603			Feb-18	512	130	1,910	269			Feb-18	742	658
	Mar-18	7,263	2,535	860	659			Mar-18	569	139	1,896	309			Mar-18	1,367	755
	Apr-18	8,154	3,433	926	393			Apr-18	670	173	1,986	470			Apr-18	1,781	1,047
	May-18	7,658	4,266	516	478			May-18	413	95	3,242	758			May-18	1,933	183
	Jun-18	7,003	4,102	760	681			Jun-18	440	100	3,697	603			Jun-18	2,261	258
	Jul-18	6,144	4,151	894	795			Jul-18	740	152	3,340	393			Jul-18	3,884	685
	Aug-18	7,058	3,301	1,826	720			Aug-18	714	253	3,007	293			Aug-18	4,756	1,343
	Sep-18	7,300	3,587	869	527			Sep-18	863	185	2,513	411			Sep-18	2,694	742
	Oct-18	5,715	2,202	894	580			Oct-18	1,510	162	1,958	434			Oct-18	3,682	1,342
	Nov-18	5,127	2,031	883	608			Nov-18	1,791	72	1,628	345			Nov-18	1,743	1,789
	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	5,885
	Feb-18	525	172	1,723	2,671			Feb-18	1,822	269	1,331	2,799			Feb-18	5,644	4,187
	Mar-18	537	143	1,381	2,488			Mar-18	1,731	156	1,330	2,851			Mar-18	2,346	4,931
	Apr-18	587	234	1,818	1,047			Apr-18	1,743	263	2,032	1,826			Apr-18	3,190	2,460
	May-18	405	123	2,353	649			May-18	911	95	1,430	1,303			May-18	5,464	3,912
	Jun-18	389	100	2,222	563			Jun-18	812	112	1,818	1,336			Jun-18	6,786	2,924
	Jul-18	476	123	2,913	1,062			Jul-18	869	219	2,818	1,381			Jul-18	9,126	3,514
	Aug-18	535	269	2,994	1,264			Aug-18	1,361	242	3,509	1,578			Aug-18	11,778	3,421
	Sep-18	684	294	3,261	716			Sep-18	1,328	373	1,878	1,521			Sep-18	6,762	1,754
	Oct-18	796	241	2,836	1,158			Oct-18	1,800	1,204	1,418	659			Oct-18	4,376	1,599
	Nov-18	967	82	2,234	824			Nov-18	1,782	1,479	1,126	1,113			Nov-18	4,185	2,469
	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	3,714
	Feb-18	352	369	7,449	2,777			Feb-18	888	740	4,703	8,761			Feb-18	2,800	2,591
	Mar-18	249	367	6,995	2,136			Mar-18	845	1,098	5,169	10,837			Mar-18	3,613	3,021
	Apr-18	189	269	7,479	1,848			Apr-18	639	973	5,990	9,863			Apr-18	4,649	3,620
	May-18	215	79	6,001	4,717			May-18	773	539	3,727	11,304			May-18	5,128	2,420
	Jun-18	514	317	5,178	3,657			Jun-18	1,408	573	4,144	8,407			Jun-18	4,621	2,235
	Jul-18	428	423	5,684	2,542			Jul-18	2,796	550	3,087	5,200			Jul-18	4,610	3,179
	Aug-18	578	340	5,639	2,650			Aug-18	2,088	476	7,039	4,344			Aug-18	4,112	3,156
	Sep-18	815	247	6,331	4,123			Sep-18	1,364	576	6,306	4,253			Sep-18	4,881	3,205
	Oct-18	578	237	5,077	3,287			Oct-18	1,156	429	6,205	5,009			Oct-18	3,972	2,986
	Nov-18	535	204	5,292	1,611			Nov-18	863	913	6,184	9,480			Nov-18	3,407	3,963
	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	20,854
	Feb-18	595	215	28,161	483			Feb-18	486	337	1,284	1,197			Feb-18	17,423	11,608
	Mar-18	1,977	208	26,643	614			Mar-18	720	141	1,144	421			Mar-18	21,217	13,494
	Apr-18	1,753	334	22,490	677			Apr-18	466	526	1,031	163			Apr-18	23,821	13,330
	May-18	1,033	221	21,769	470			May-18	790	140	1,050	188			May-18	24,723	12,074
	Jun-18	730	164	28,504	501			Jun-18	938	302	1,223	234			Jun-18	25,903	11,189
	Jul-18	1,093	273	27,687	534			Jul-18	1,193	1,051	940	358			Jul-18	31,359	14,319
	Aug-18	1,911	408	26,279	566			Aug-18	1,112	1,580	916	520			Aug-18	36,003	14,790
	Sep-18	2,648	356	28,114	671			Sep-18	912	813	1,087	403			Sep-18	30,252	12,132
	Oct-18	1,682	358	26,189	642			Oct-18	803	832	1,115	357			Oct-18	26,069	11,590
	Nov-18	2,567	332	26,956	488			Nov-18	570	786	1,241	133			Nov-18	23,537	14,121
	Dec-18							Dec-18							Dec-18		

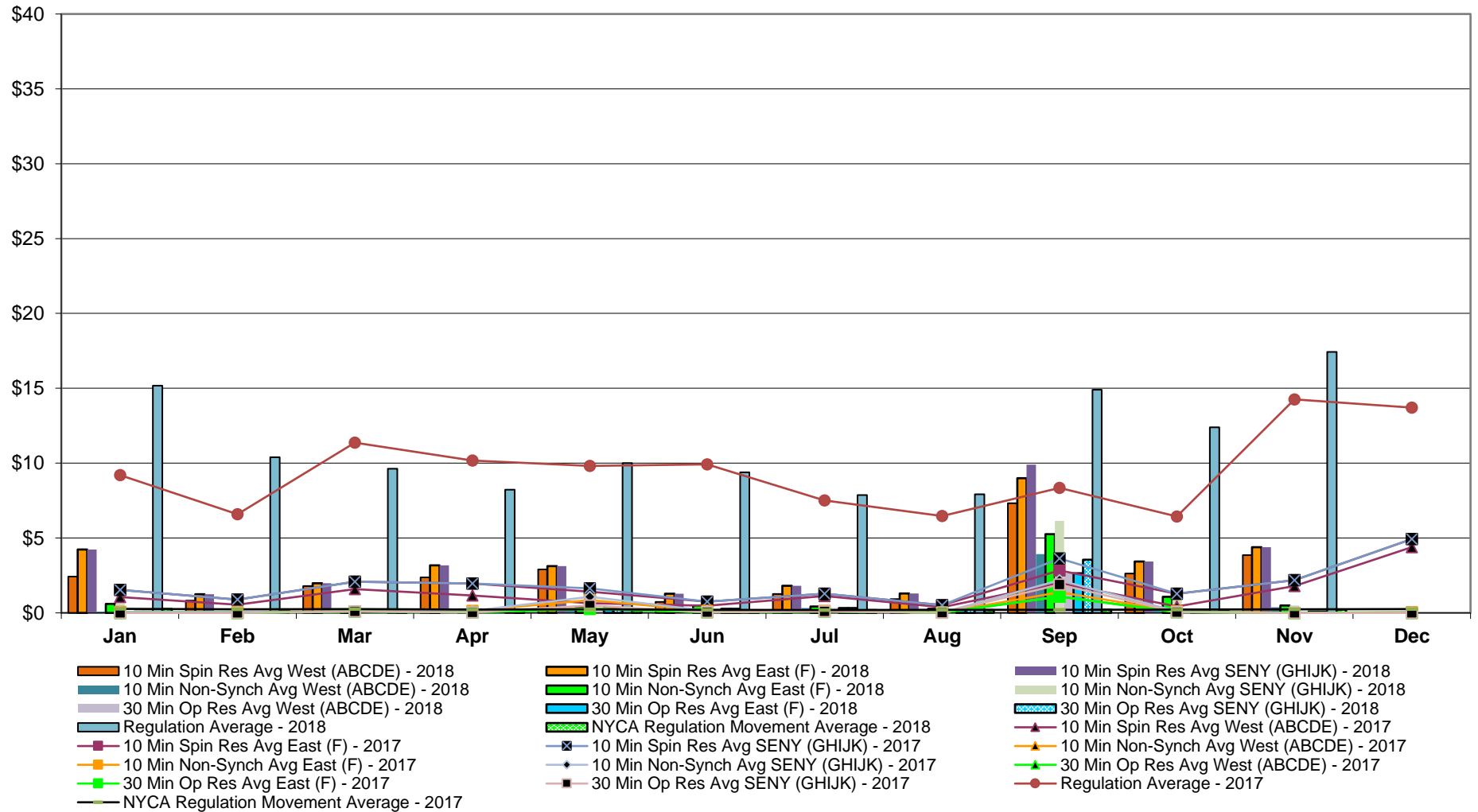
NYISO Multi Hour Block Transactions Monthly Total MWh



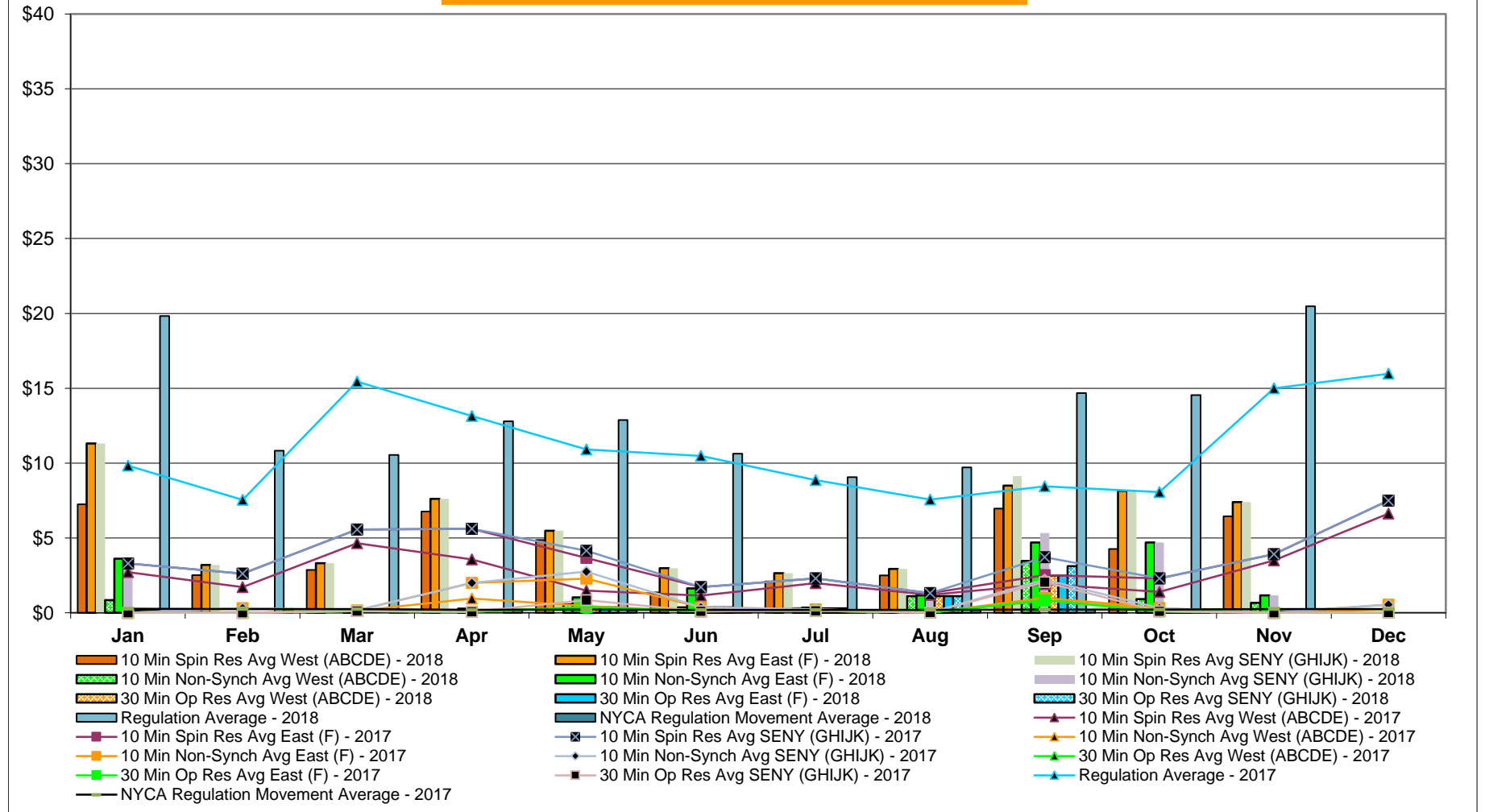
NYISO Monthly Average Ancillary Service Prices Day Ahead Market 2017 - 2018



NYISO Monthly Average Ancillary Service Prices RTC Market 2017 - 2018



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

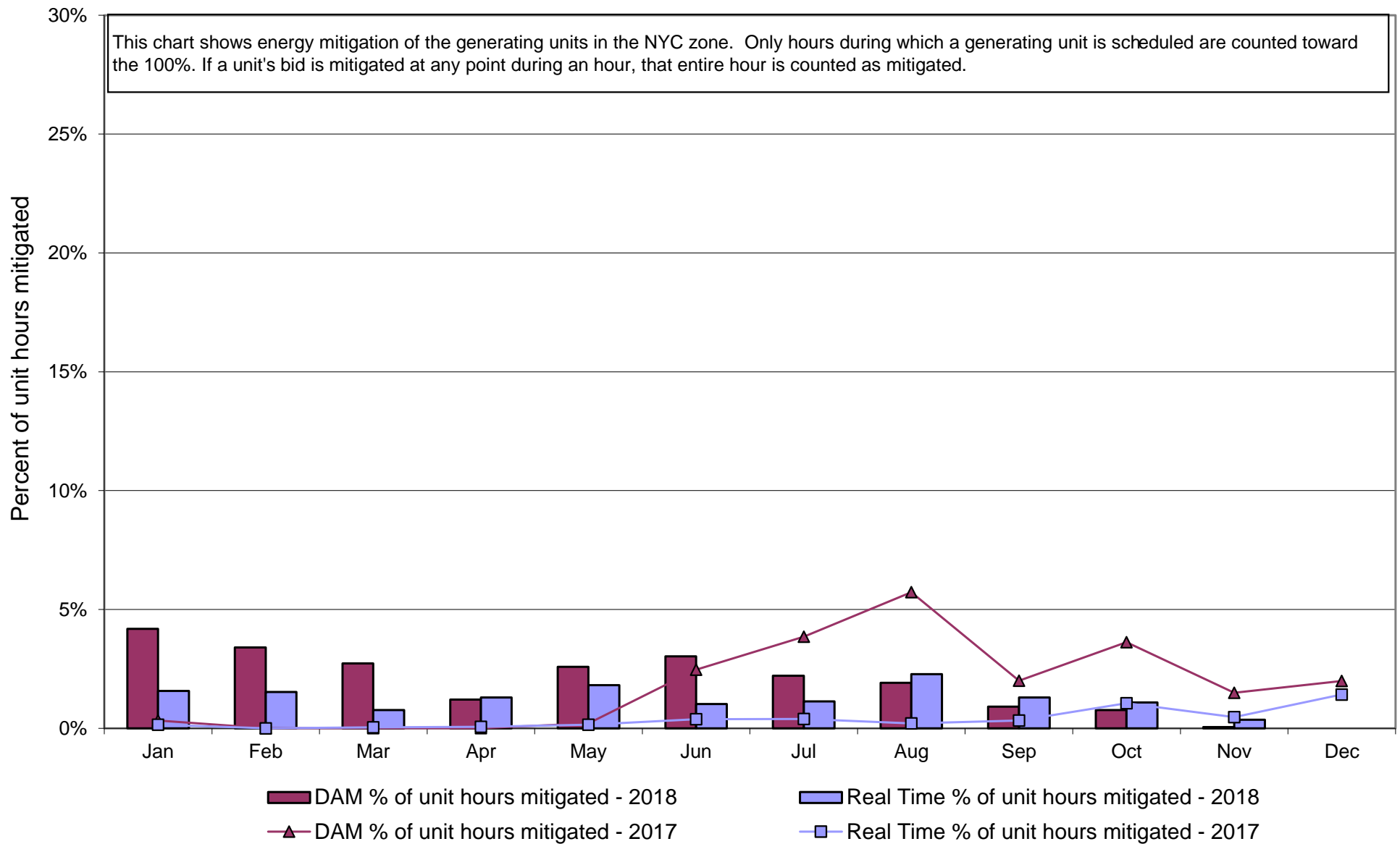


NYISO Markets Ancillary Services Statistics - Unweighted Price (\$/MWH)

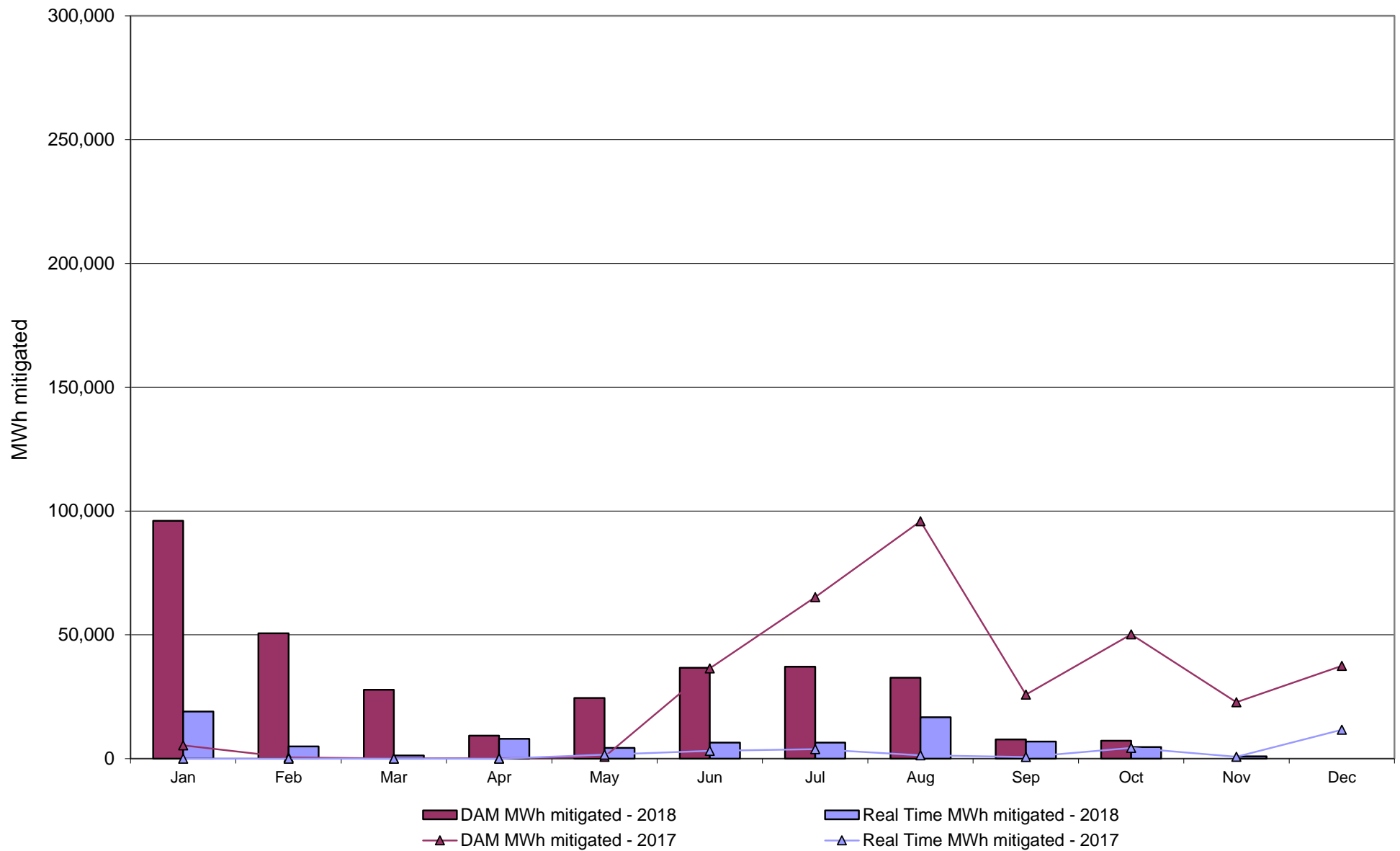
2018	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<u>Day Ahead Market</u>												
10 Min Spin SENY (GHIJK)	9.93	5.24	5.97	7.45	5.52	4.98	4.95	4.91	6.04	8.37	6.93	
10 Min Spin East (F)	9.93	5.24	5.97	7.45	5.52	4.98	4.95	4.91	6.04	8.37	6.93	
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	6.57	
10 Min Non Synch SENY (GHIJK)	6.99	4.54	4.48	5.05	4.26	4.09	4.49	4.43	4.51	5.69	4.00	
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	4.00	
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	3.97	
30 Min SENY (GHIJK)	6.14	4.36	3.54	4.31	4.13	3.85	3.79	4.02	3.94	4.22	3.97	
30 Min East (F)	6.14	4.36	3.54	4.31	4.13	3.85	3.79	4.02	3.94	4.22	3.97	
30 Min West (ABCDE)	6.14	4.36	3.54	4.31	4.13	3.85	3.79	4.02	3.94	4.22	3.97	
Regulation	15.51	10.70	10.68	9.49	12.11	11.30	6.99	8.00	8.54	12.88	14.47	
<u>RTC Market</u>												
10 Min Spin SENY (GHIJK)	4.23	1.24	1.98	3.17	3.13	1.28	1.81	1.29	9.90	3.43	4.39	
10 Min Spin East (F)	4.23	1.24	1.98	3.17	3.13	1.28	1.81	1.29	9.00	3.43	4.39	
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	3.85	
10 Min Non Synch SENY (GHIJK)	0.59	0.03	0.01	0.22	0.42	0.49	0.42	0.27	6.14	1.07	0.50	
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	0.50	
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	0.38	
30 Min SENY (GHIJK)	0.08	0.02	0.00	0.00	0.32	0.27	0.33	0.25	3.55	0.11	0.09	
30 Min East (F)	0.08	0.02	0.00	0.00	0.32	0.27	0.33	0.25	2.65	0.11	0.09	
30 Min West (ABCDE)	0.08	0.02	0.00	0.00	0.32	0.27	0.33	0.25	2.65	0.11	0.09	
Regulation	15.17	10.40	9.63	8.22	10.01	9.39	7.87	7.92	14.90	12.40	17.43	
NYCA Regulation Movement	0.26	0.21	0.20	0.22	0.19	0.16	0.19	0.19	0.20	0.21	0.22	
<u>Real Time Market</u>												
10 Min Spin SENY (GHIJK)	11.31	3.19	3.31	7.62	5.48	2.98	2.65	2.93	9.13	8.14	7.39	
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	7.39	
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	6.45	
10 Min Non Synch SENY (GHIJK)	3.61	0.01	0.19	0.28	1.03	1.63	0.35	1.16	5.33	4.70	1.16	
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	1.16	
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	0.67	
30 Min SENY (GHIJK)	0.13	0.00	0.00	0.00	0.37	0.37	0.29	1.12	3.11	0.06	0.10	
30 Min East (F)	0.13	0.00	0.00	0.00	0.37	0.37	0.29	1.12	2.48	0.06	0.10	
30 Min West (ABCDE)	0.13	0.00	0.00	0.00	0.37	0.37	0.29	1.12	2.48	0.06	0.10	
Regulation	19.82	10.82	10.54	12.80	12.88	10.62	9.06	9.71	14.67	14.54	20.48	
NYCA Regulation Movement	0.24	0.21	0.20	0.21	0.17	0.15	0.18	0.18	0.20	0.21	0.22	
2017	<u>January</u>	<u>February</u>	<u>March</u>	<u>April</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
<u>Day Ahead Market</u>												
10 Min Spin SENY (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 SENY (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 SENY (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
<u>RTC Market</u>												
10 Min Spin SENY (GHIJK)	1.53	0.59	0.71	1.81	0.43	0.49	2.79	7.26	0.61	0.99	1.05	1.92
10 Min Spin East (F)	1.53	0.59	0.71	1.81	0.43	0.46	2.77	6.88	0.61	0.99	1.05	1.92
10 Min Spin West (ABCDE)	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 SENY (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 SENY (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
<u>Real Time Market</u>												
10 Min Spin SENY (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 SENY (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 SENY (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

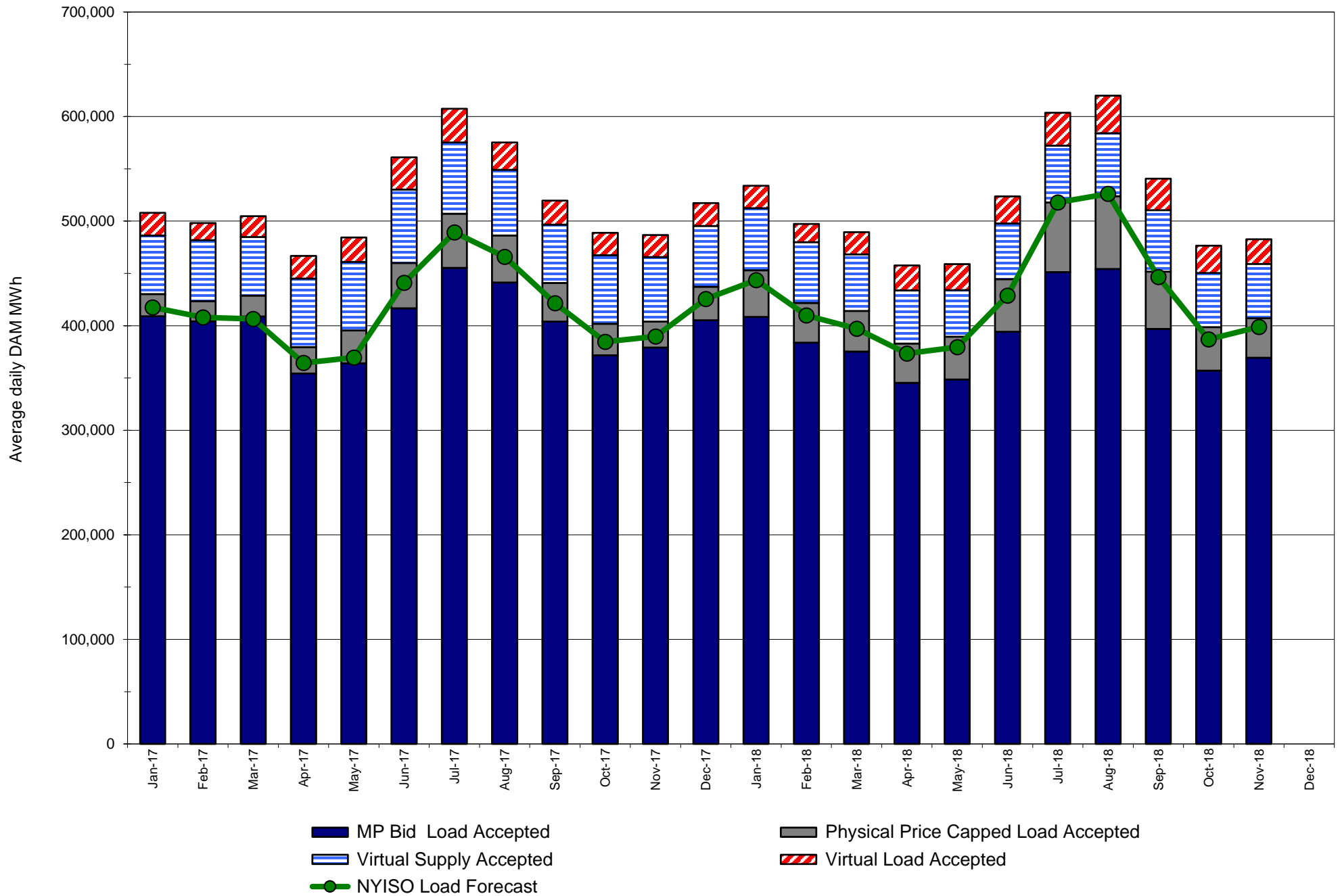
Percentage of committed unit-hours mitigated



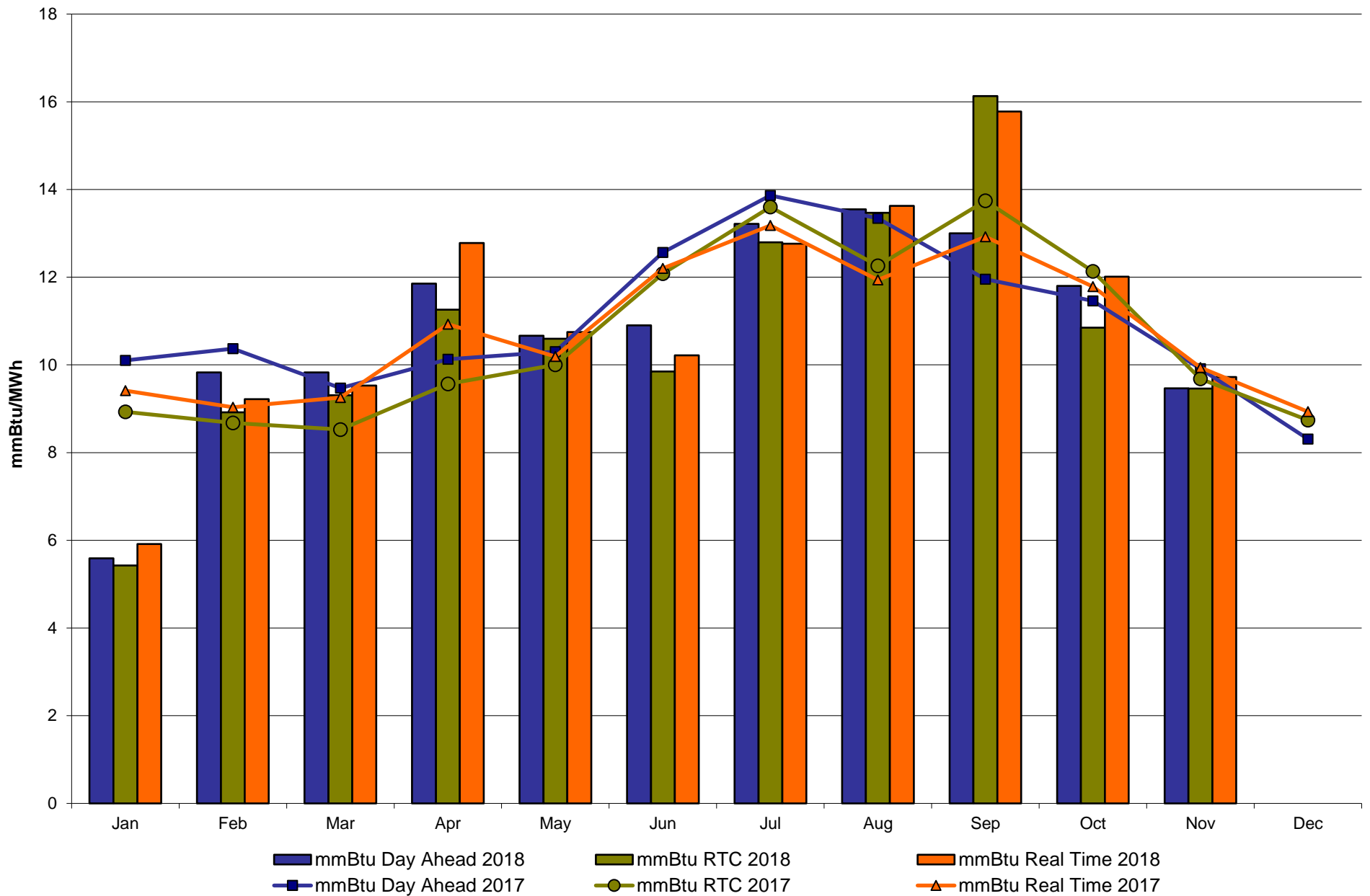
NYISO In City Energy Mitigation (NYC Zone) 2017 - 2018 **Monthly megawatt hours mitigated**



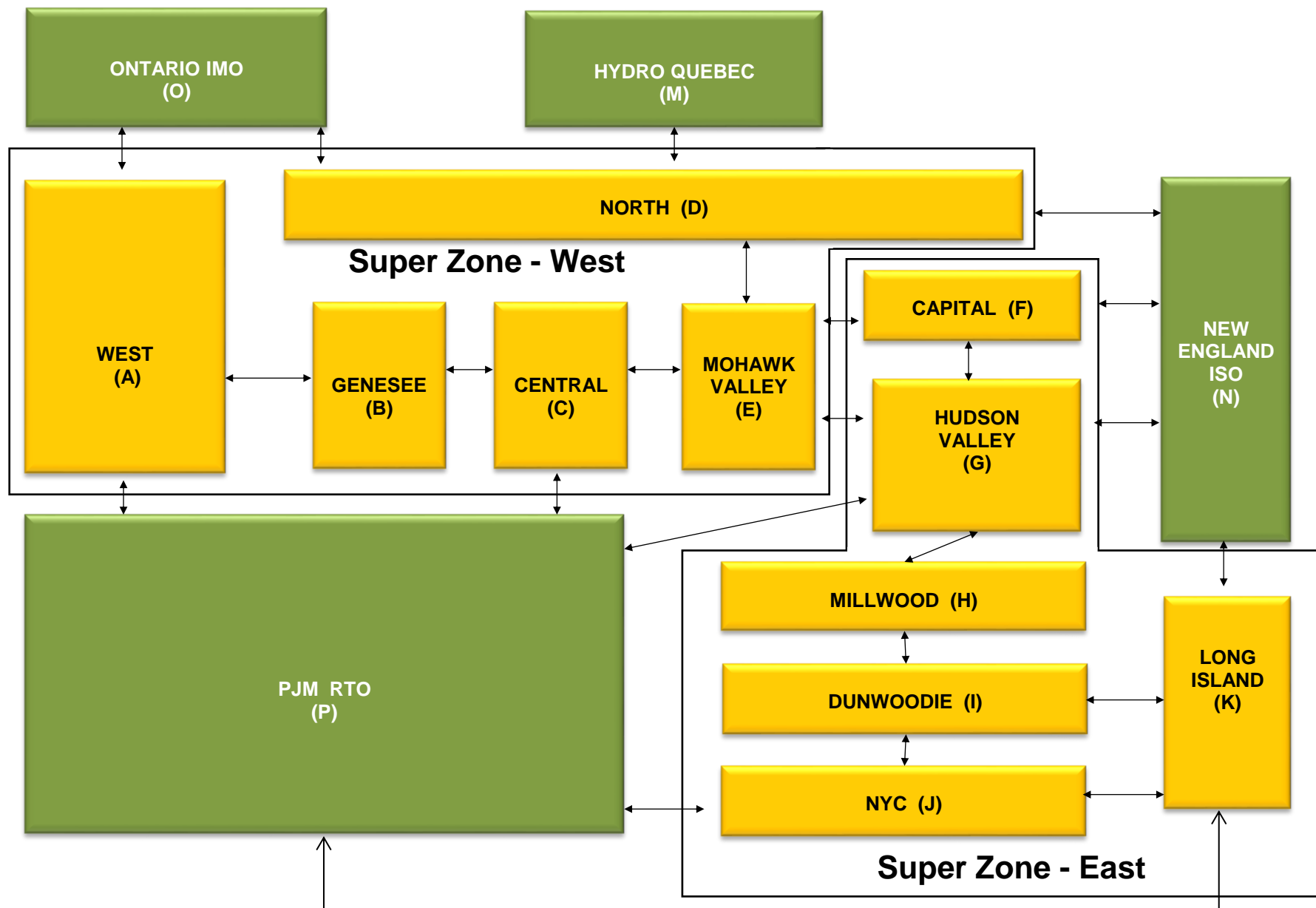
NYISO Average Daily DAM Load Bid Summary



Monthly Implied Heat Rate 2017-2018



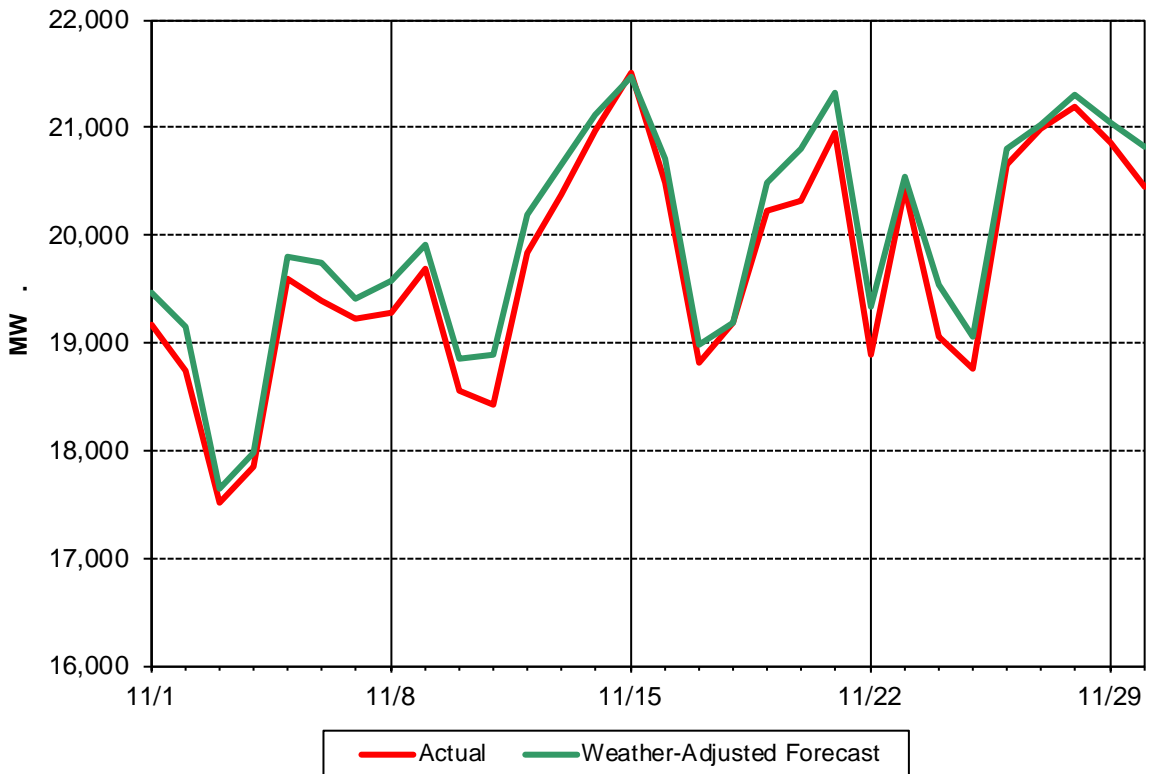
NYISO LBMP ZONES



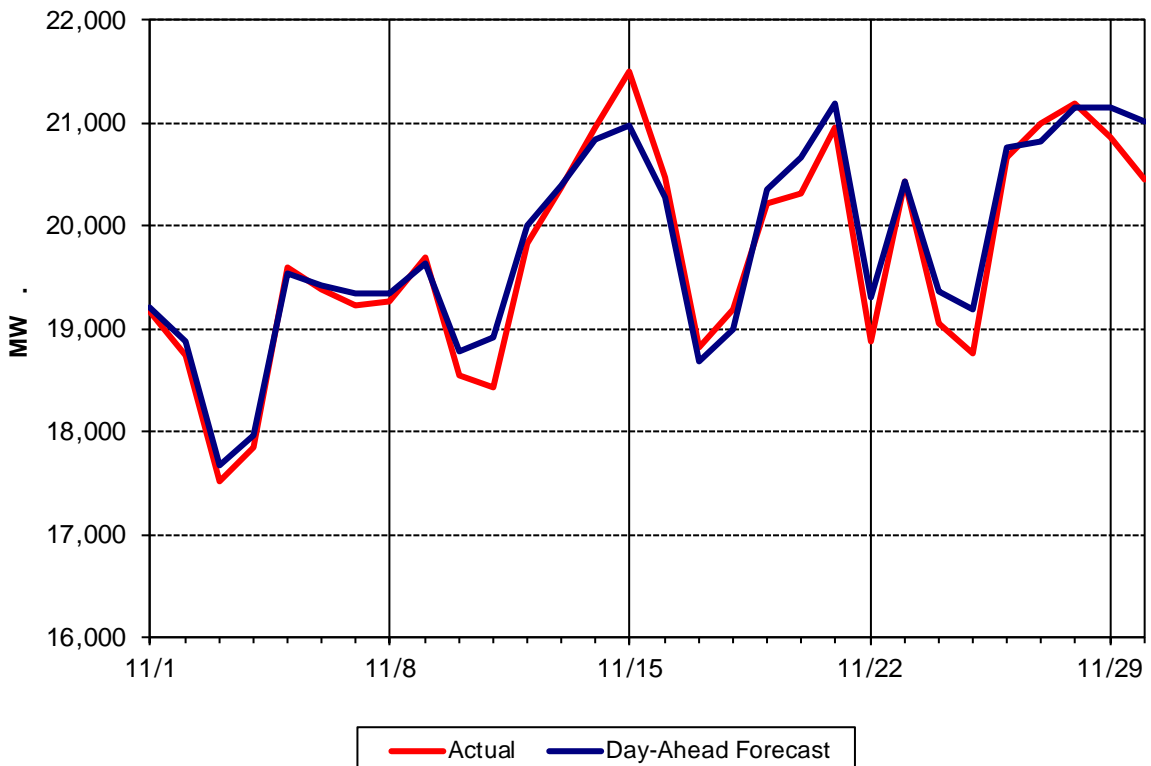
Billing Codes for Chart C

<u>Chart - C Category Name</u>	<u>Billing Code</u>	<u>Billing Category Name</u>
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

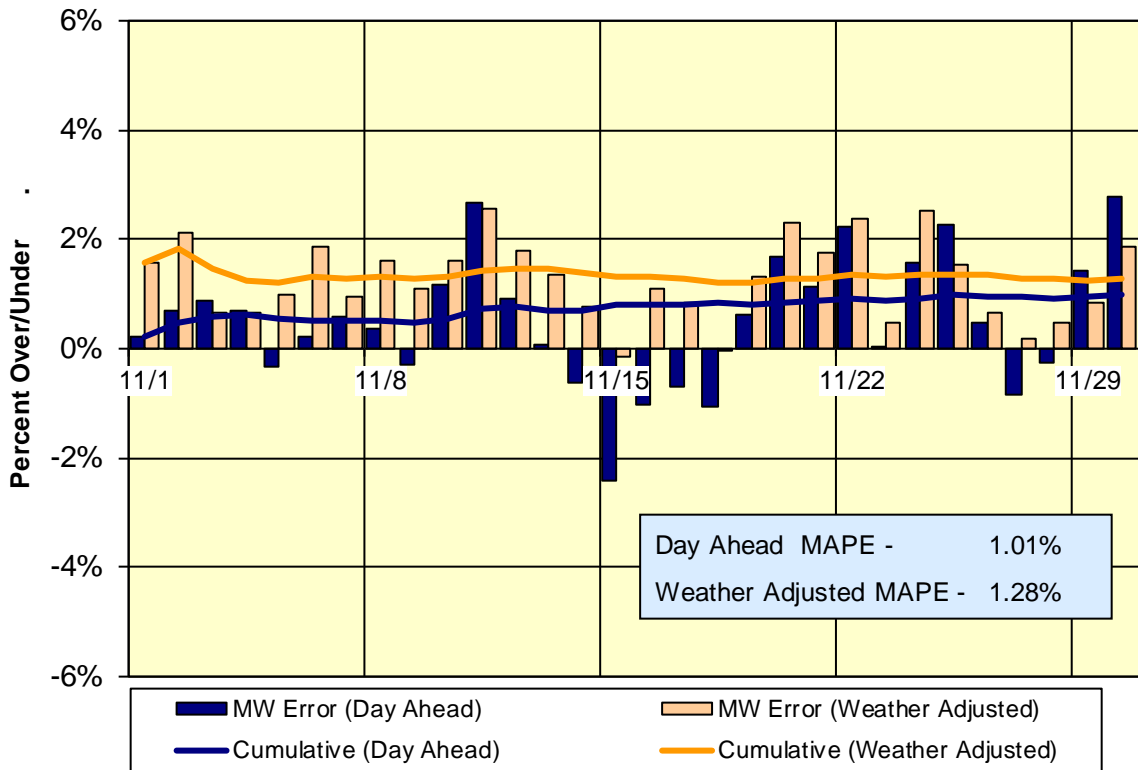
NYISO Daily Peak Load - November 2018
Actual vs. Weather-Adjusted Forecast



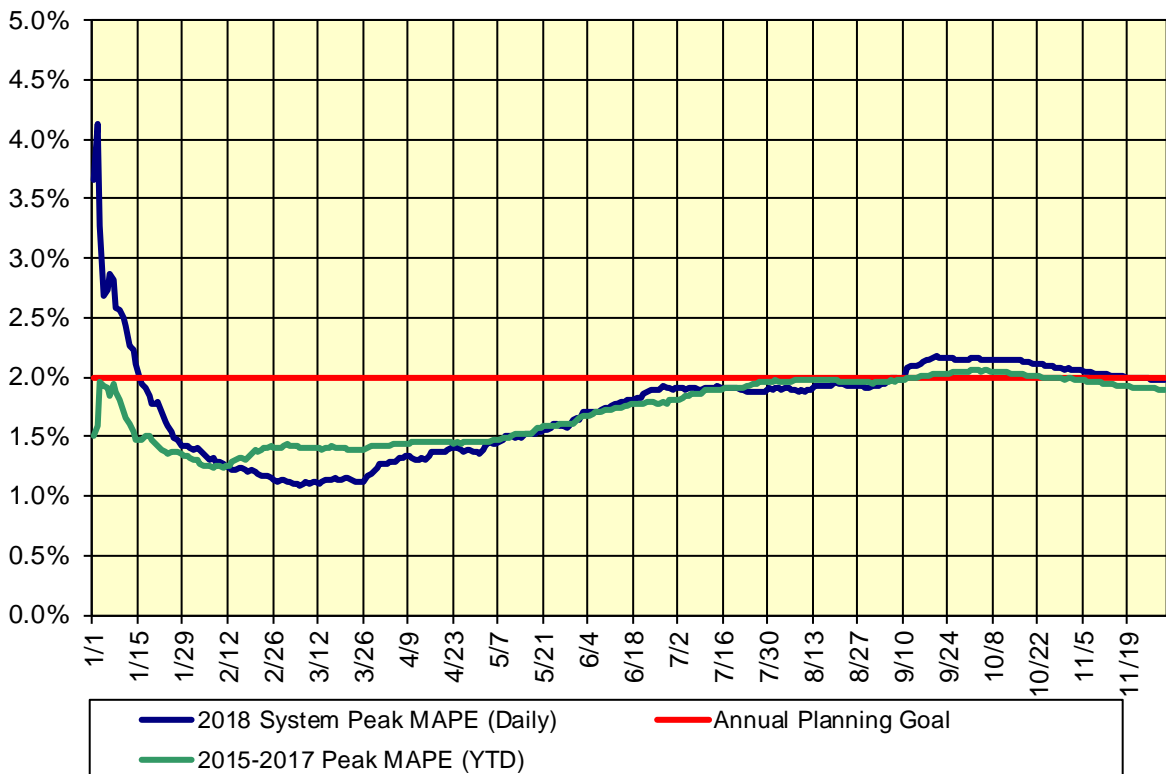
NYISO Daily Peak Load - November 2018
Actual vs. Forecast



Day Ahead Peak Forecast - November 2018 Percent Error - Actual & Weather Adjusted



Day-Ahead Forecast Accuracy - Cumulative Performance 2018 Year-to-Date



**Summary Description of Regulatory Filings, Investigations,
Rulemakings and Related Orders in NYISO Matters – November 2018**

Filing Date	Filing Summary	Docket	Order Date	Order Summary
07/13/2018 08/07/2018	NYISO filing to the NYPSC re: petition for authority to incur indebtedness for a term in excess of twelve months	PSC Case No. 18-E-0439	11/16/2018	Order granted request to incur indebtedness subject to compliance obligations
09/17/2018	NYISO and PJM joint filing re: limited waiver request of the Market-to-Market redispatch requirements in the NYISO/PJM Joint Operating Agreement	ER18-2442-000	11/19/2018	Order granted waiver request effective 09/18/18, as requested
10/16/2018	NYISO compliance filing re: notice of effective date for Order No. 745 demand response tariff revisions	ER11-4338-002	11/26/2018	Order accepted 10/31/2018 effective date, as requested
11/01/2018	NYISO filing on behalf of Niagara Mohawk Power Corporation re: cost reimbursement agreement (SA 2437) between Niagara Mohawk and Mid-Atlantic Interstate Transmission, LLC	ER19-253-000		
11/07/2018	NYISO filing re: notice of termination of Ameristar Energy, LLC from the ISO-Administered Markets	No Docket No.		
11/09/2018	NYISO 205 filing re: unsecured credit scoring model revisions	ER19-315-000		
11/14/2018	NYISO confidential filing to the NYPSC re: three-month Reliability Commitment Data Report for the period ending 10/31/2018	PSC Matter No. 10-02007		
11/15/2018	NYISO Order 844 amended compliance filing re: reporting of uplift paid to Suppliers at external proxy generator buses	ER18-2400-001		
11/27/2018	NYISO filing re: notice of termination of Clear Choice Energy, LLC from the ISO-Administered Markets	No Docket No.		
11/28/2018	NYISO filing to the NYPSC re: letter stating unconditional acceptance of the 11/16/2018 order granting its request to incur indebtedness for a term in excess of twelve months subject to compliance obligations	PSC Case No. 18-E-0439		
11/29/2018	NYISO filing re: request for extension of time to file Form No. 3-Q, Quarterly Financial Report of Electric Utilities, Licensees, and Natural Gas Companies	RM08-5-000		