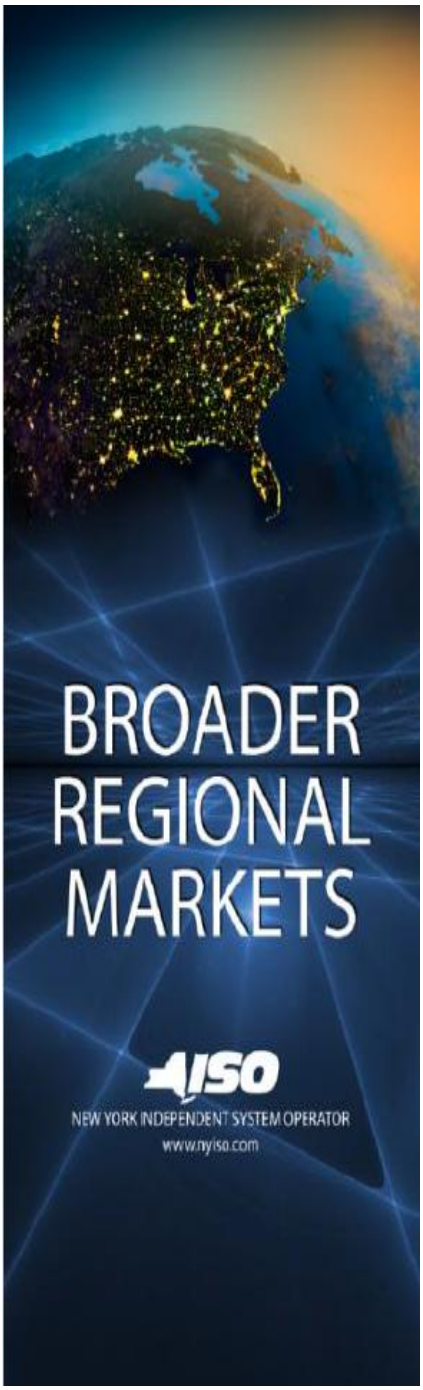


Broader Regional Market Metrics (CTS)

New York Independent System Operator

October 2017

Prepared by NYISO Operations Regional Market Coordination

October 2017 Broader Regional Markets Highlights

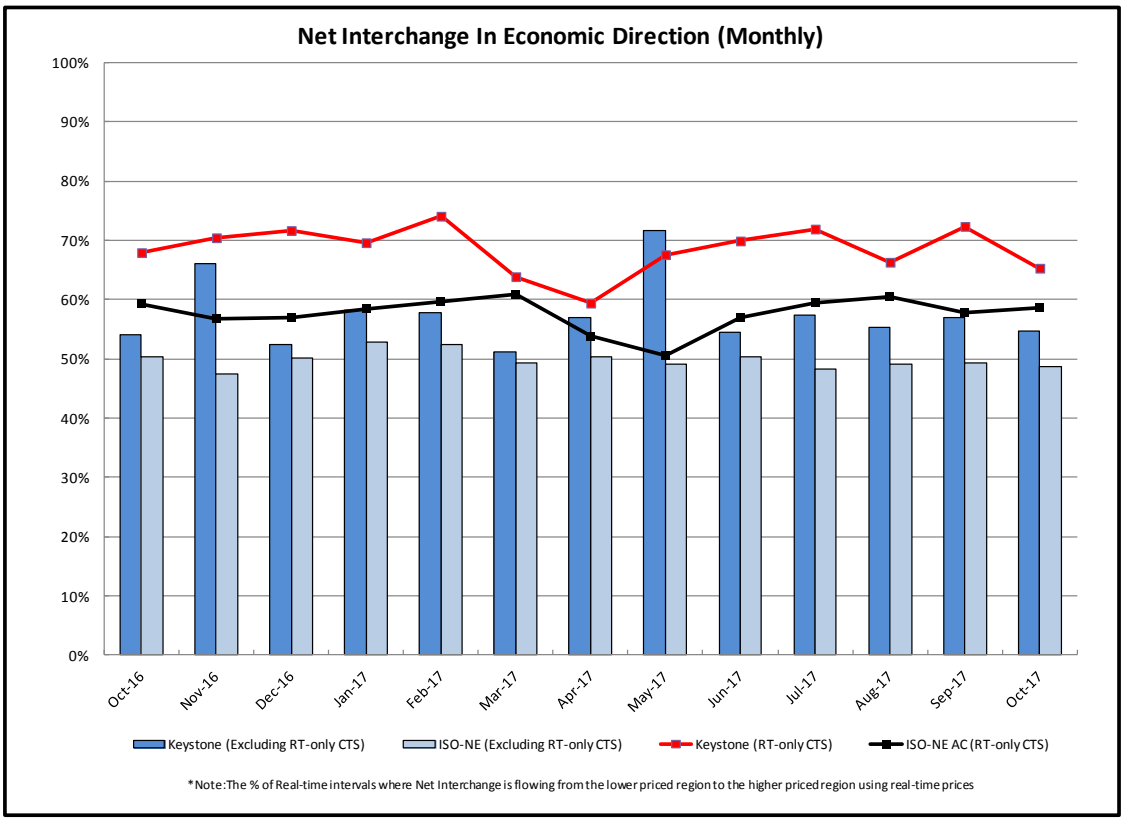
- PJM
  - At PJM Keystone, there was an average of 460 MWs[1] per hour of CTS offers and an average of 141 MWs per hour of CTS schedules.
  - Interchange at PJM Keystone associated with CTS transactions scheduled only in real-time flowed in the economic direction in 65.3% of the real-time intervals, as compared to all other interchange at the interface which flowed in the economic direction in 54.7% of the real-time intervals.

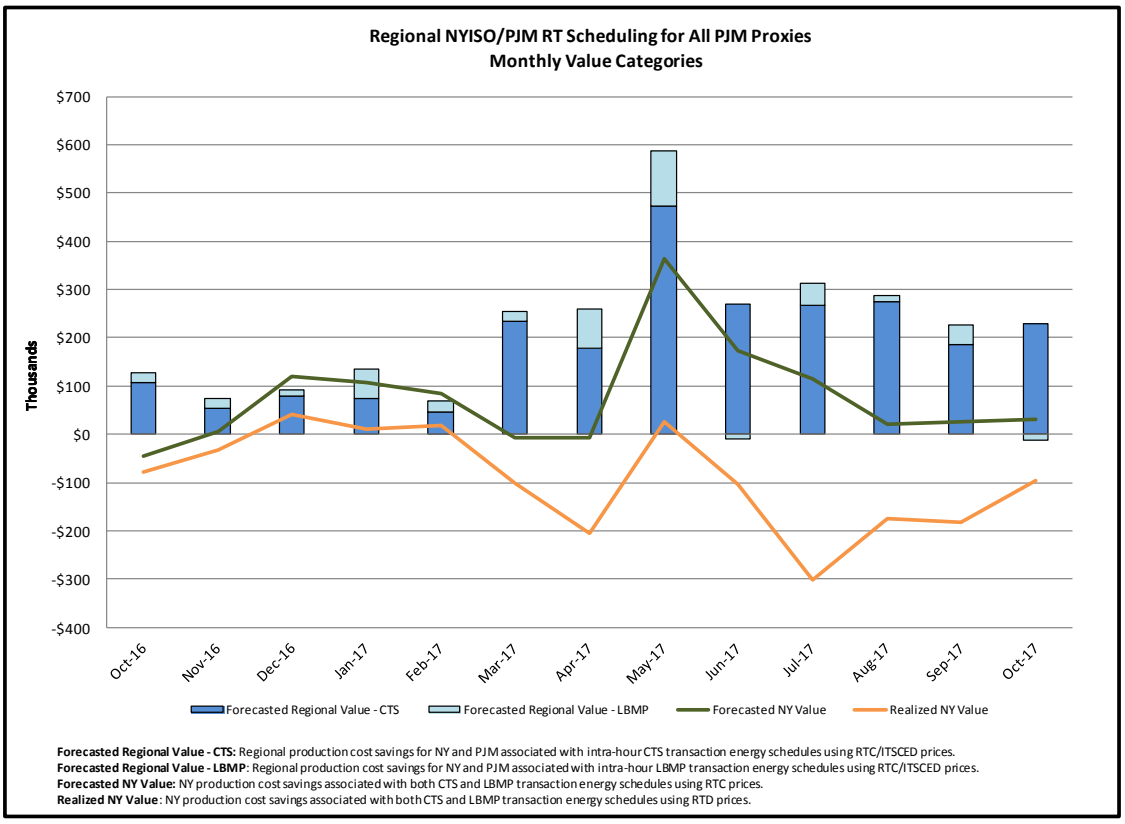
- ISO-NE
  - At NE Sandy Pond, there was an average of 2338 MWs[1] per hour of CTS offers, and an average of 939 MWs per hour of CTS schedules.
  - Interchange at NE Sandy Pond associated with CTS transactions scheduled only in real-time flowed in the economic direction in 58.6% of the real-time intervals, as compared to all other interchange which flowed in the economic direction in 48.7% of the real-time intervals.

Pricing Data[2]

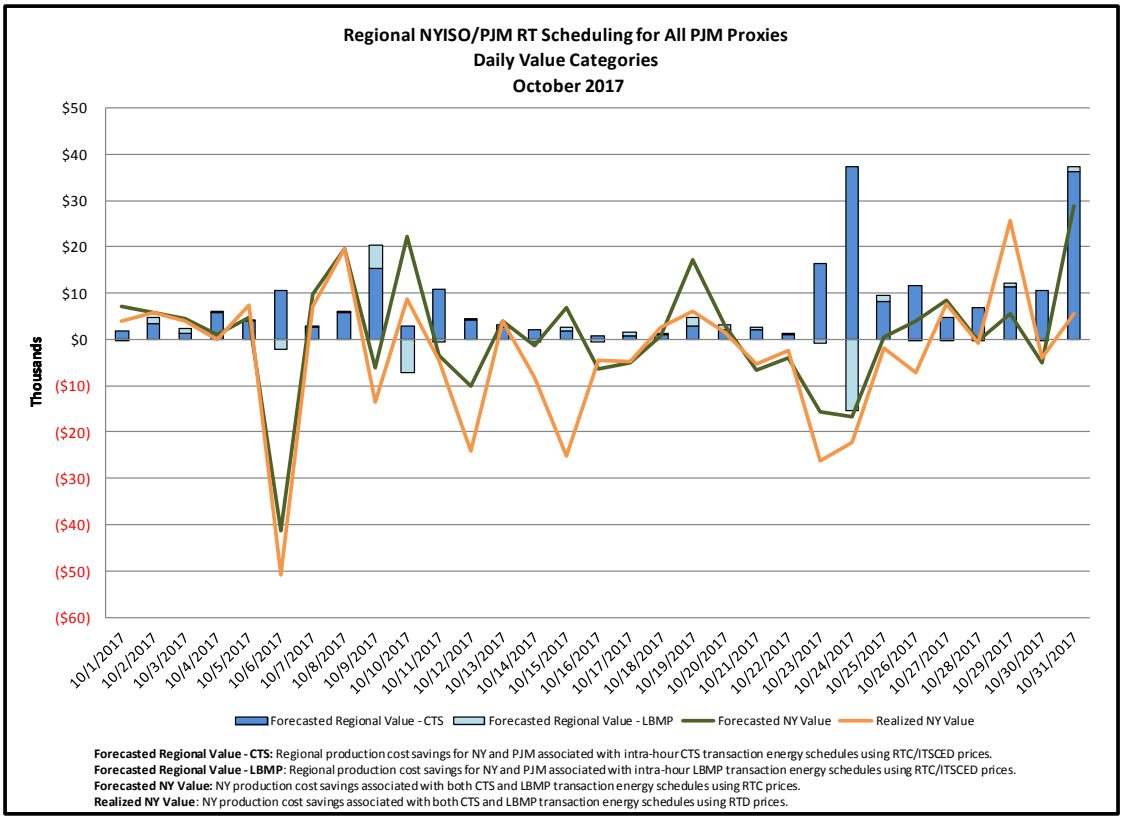
Interface	Max Forecasted Price Spread	Min Forecasted Price Spread	Forecasted Price Spreads minus Real-time Price Spreads					
			< $-20	$-20 to $-10	$-10 to $0	$0 to $10	$10 to $20	> $20
Keystone	$92.43	($191.26)	6.9%	7.9%	35.6%	38.4%	7.1%	4.2%
HTP	$39.17	($1,130.55)	7.4%	8.4%	34.9%	36.8%	7.6%	4.8%
NEPTUNE	$1,179.91	($195.83)	7.2%	7.8%	34.2%	37.0%	8.3%	5.5%
VFT	$39.24	($342.14)	7.3%	8.8%	35.6%	36.7%	7.5%	4.1%
Sandy Pond	$48.04	($211.31)	5.6%	5.4%	25.5%	45.2%	10.7%	7.7%

1. All MW Values include the absolute sum of both imports + exports. Wheels have been excluded.
2. "Forecasted Prices" refer to NYISO's RTC LBMP and RTO's LMP used in RTC. "Real-time Prices" refer to NYISO's RTD LBMP and RTO's Real-time LMP. Forecasted Prices are used during NYISO's RTC evaluation to schedule transactions. Real-time Prices are used to settle transactions. Price Spreads are always calculated as NYISO's LBMP minus RTO's LMP.

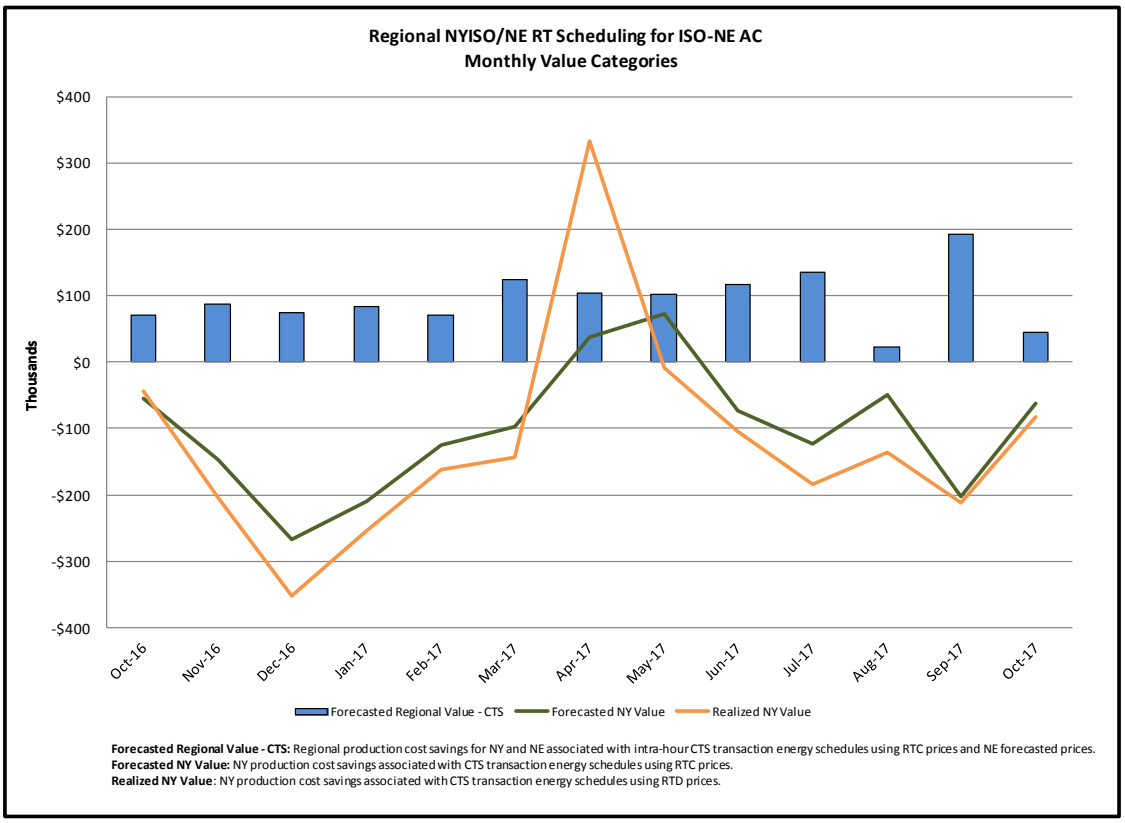

Net Interchange In Economic Direction (Monthly)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Keystone (Excluding RT-only CTS)
ISO-NE (Excluding RT-only CTS)
Keystone (RT-only CTS)
ISO-NE AC (RT-only CTS)
*Note:The % of Real-time intervals where Net Interchange is flowing from the lower priced region to the higher priced region using real-time prices

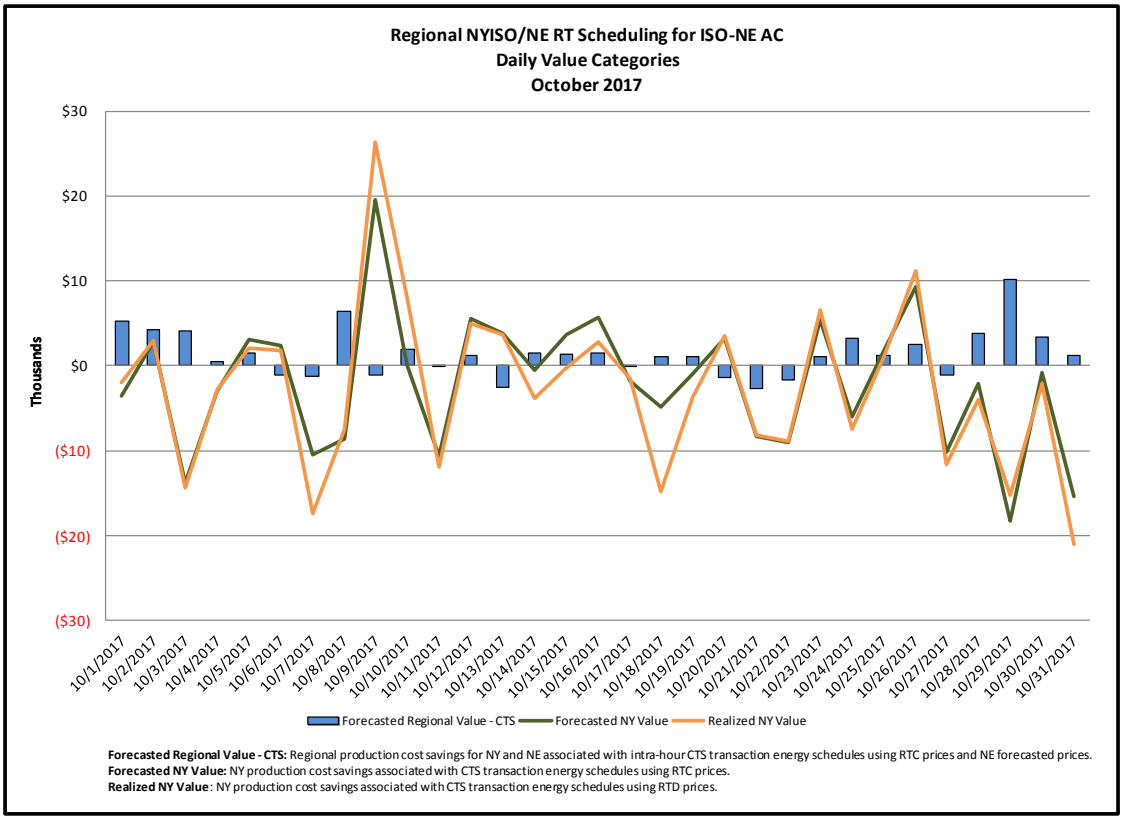


Forecasted Regional Value - CTS: Regional production cost savings for NY and PJM associated with intra-hour CTS transaction energy schedules using RTC/ITSCED prices.
Forecasted Regional Value - LBMP: Regional production cost savings for NY and PJM associated with intra-hour LBMP transaction energy schedules using RTC/ITSCED prices.
Forecasted NY Value: NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTC prices.
Realized NY Value: NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTD prices.



Forecasted Regional Value - CTS: Regional production cost savings for NY and PJM associated with intra-hour CTS transaction energy schedules using RTC/ITSCED prices.
Forecasted Regional Value - LBMP: Regional production cost savings for NY and PJM associated with intra-hour LBMP transaction energy schedules using RTC/ITSCED prices.
Forecasted NY Value: NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTC prices.
Realized NY Value: NY production cost savings associated with both CTS and LBMP transaction energy schedules using RTD prices.

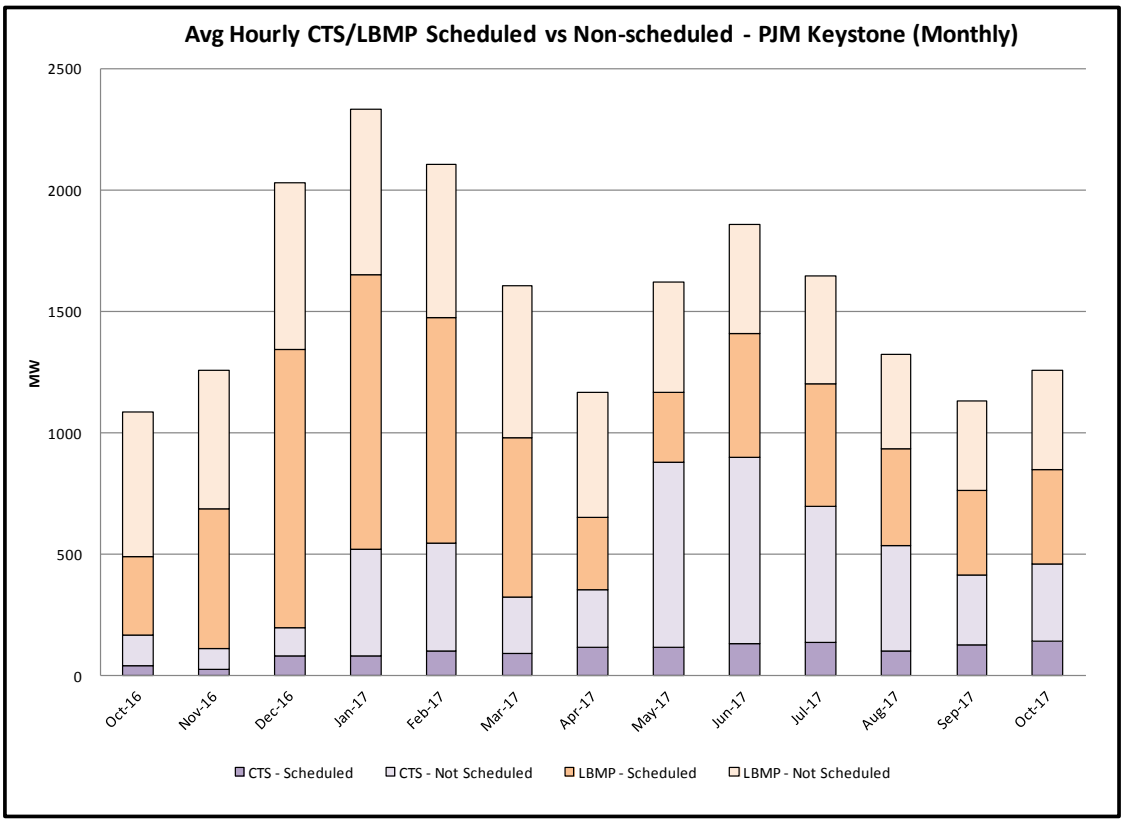

Regional NYISO/NE RT Scheduling for ISO-NE AC
Monthly Value Categories
Thousands
$400
$300
$200
$100
$0
-$100
-$200
-$300
-$400
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
Forecasted Regional Value - CTS
Forecasted NY Value
Realized NY Value
Forecasted Regional Value - CTS: Regional production cost savings for NY and NE associated with intra-hour CTS transaction energy schedules using RTC prices and NE forecasted prices.
Forecasted NY Value: NY production cost savings associated with CTS transaction energy schedules using RTC prices.
Realized NY Value: NY production cost savings associated with CTS transaction energy schedules using RTD prices.

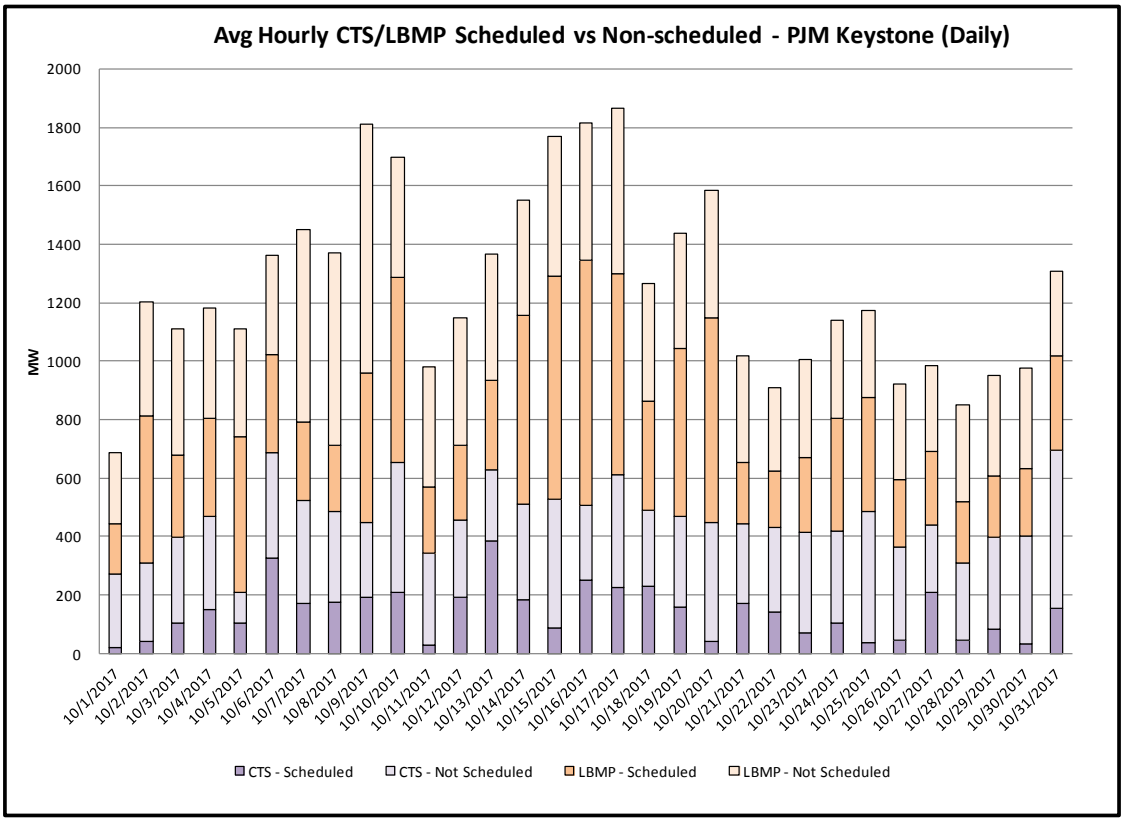

Regional NYISO/NE RT Scheduling for ISO-NE AC
Daily Value Categories
October 2017
Thousands
$30
$20
$10
$0
($10)
($20)
($30)
10/1/2017
10/2/2017
10/3/2017
10/4/2017
10/5/2017
10/6/2017
10/7/2017
10/8/2017
10/9/2017
10/10/2017
10/11/2017
10/12/2017
10/13/2017
10/14/2017
10/15/2017
10/16/2017
10/17/2017
10/18/2017
10/19/2017
10/20/2017
10/21/2017
10/22/2017
10/23/2017
10/24/2017
10/25/2017
10/26/2017
10/27/2017
10/28/2017
10/29/2017
10/30/2017
10/31/2017
Forecasted Regional Value - CTS
Forecasted NY Value
Realized NY Value
Forecasted Regional Value - CTS: Regional production cost savings for NY and NE associated with intra-hour CTS transaction energy schedules using RTC prices and NE forecasted prices.
Forecasted NY Value: NY production cost savings associated with CTS transaction energy schedules using RTC prices.
Realized NY Value: NY production cost savings associated with CTS transaction energy schedules using RTD prices.

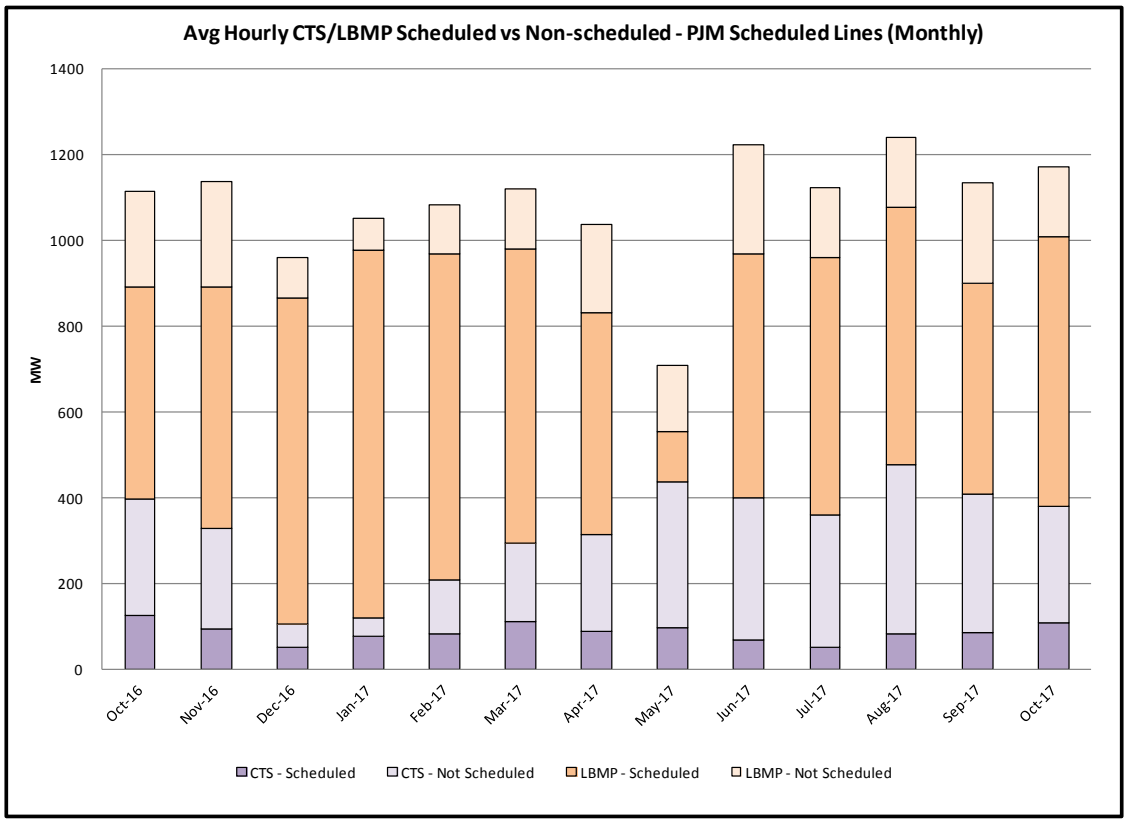
Regional NYISO RT Scheduling

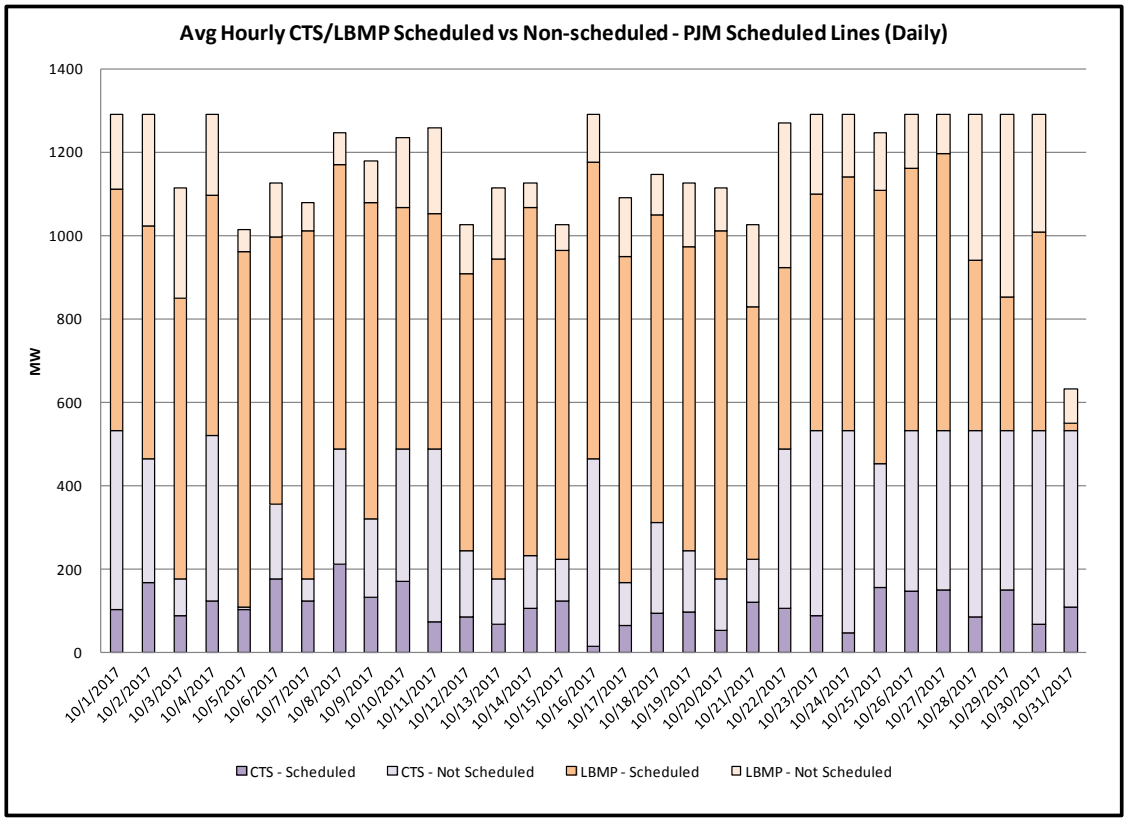
Category	*Description*
Forecasted Regional Value - CTS	Forecasted regional production cost savings from the intra-hour (non-TOH) energy schedule changes[1] on CTS bids (Intra-hour CTS Schedule Changes * [NY RTC LBMP – PJM or ISO-NE's Forecasted LMP]).
Forecasted Regional Value - LBMP	Forecasted regional production cost savings from the intra-hour (non-TOH) energy schedule changes[1] on LBMP bids (Intra-hour LBMP Schedule Changes * [NY RTC LBMP - PJM or ISO-NE's Forecasted LMP]).
Forecasted NY Value	Forecasted NY production cost savings from the intra-hour (non-TOH) energy schedule changes[1] on CTS and LBMP bids (Total Intra-hour CTS & LBMP Schedule Changes * NY RTC LBMP).
Realized NY Value	Realized NY production cost savings from the intra-hour (non-TOH) energy schedule changes[1] on CTS and LBMP bids (Total Intra-hour CTS & LBMP Schedule Changes * NY RTD LBMP).

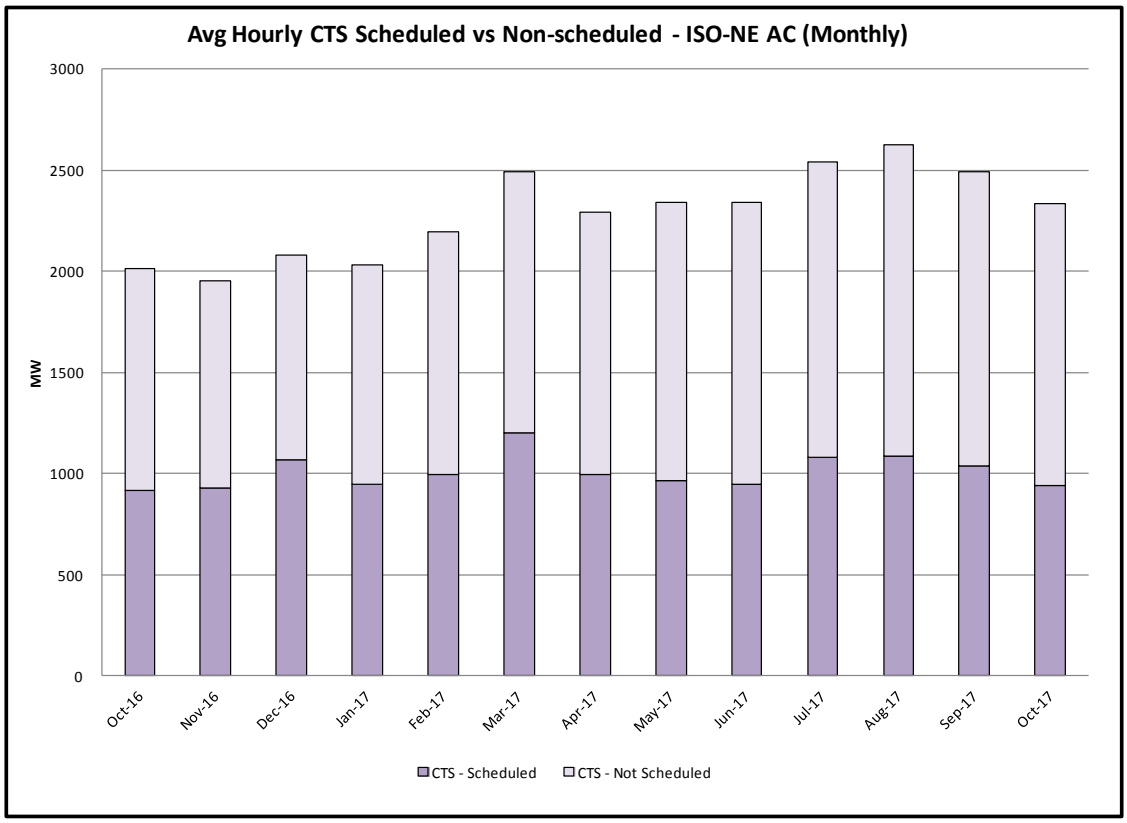
[1] Note: Schedule changes associated with manual Operator actions such as curtailments and/or transaction derates, and that have a significant impact (either positive or negative) to the above metrics, are generally excluded.

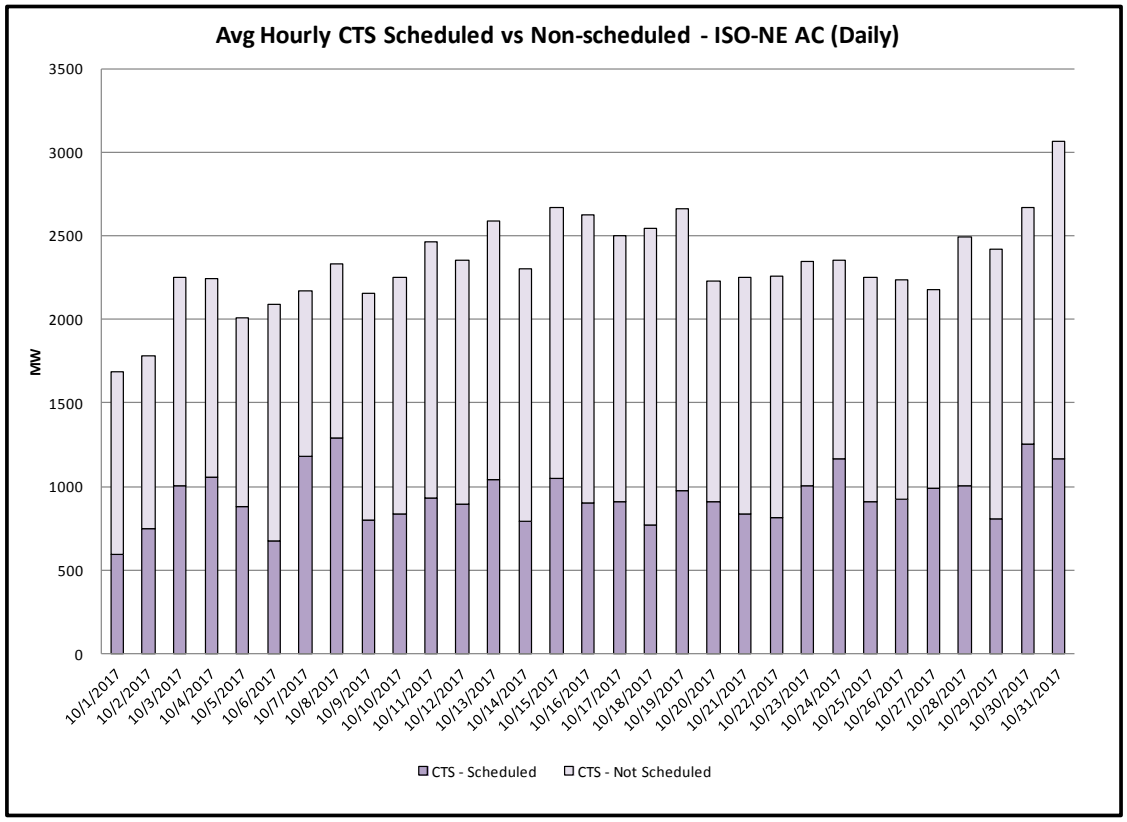

Avg Hourly CTS/LBMP Scheduled vs Non-scheduled - PJM Keystone (Monthly)
MW
2500
2000
1500
1000
500
0
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
CTS - Scheduled
CTS - Not Scheduled
LBMP - Scheduled
LBMP - Not Scheduled

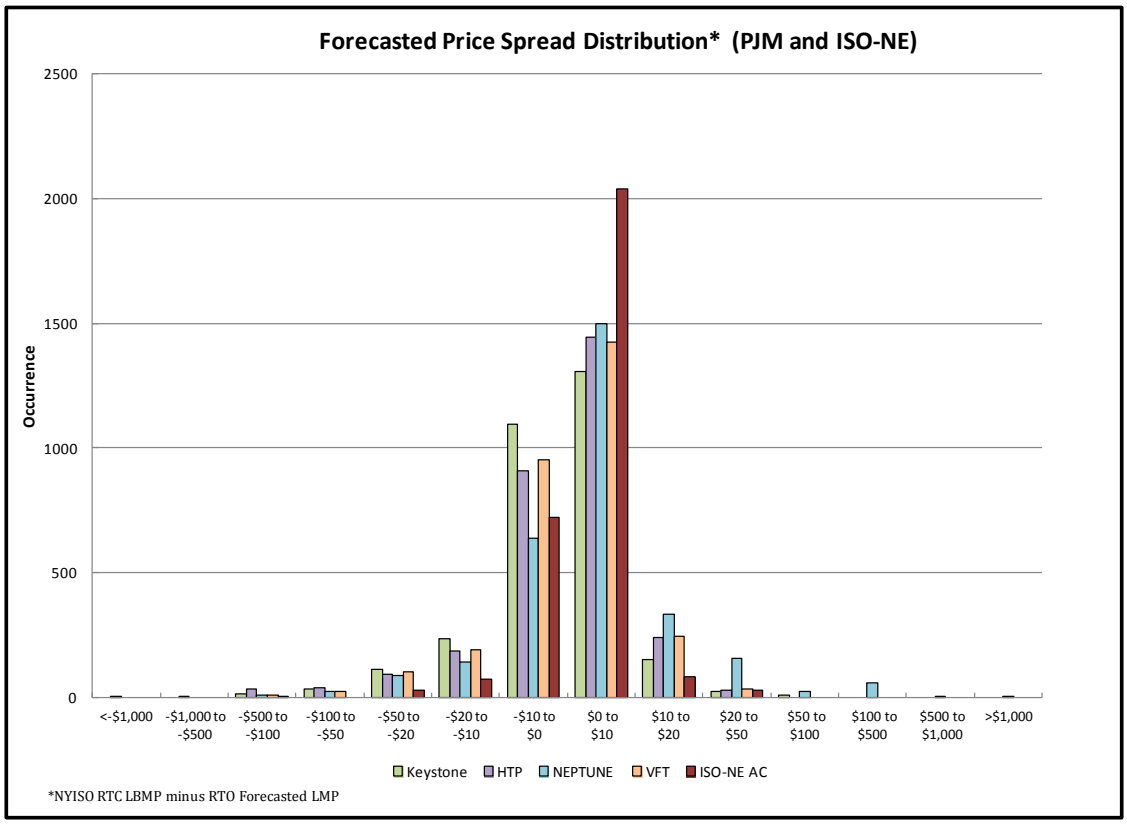

Avg Hourly CTS/LBMP Scheduled vs Non-scheduled - PJM Keystone (Daily)
MW
2000
1800
1600
1400
1200
1000
800
600
400
200
0
10/1/2017
10/2/2017
10/3/2017
10/4/2017
10/5/2017
10/6/2017
10/7/2017
10/8/2017
10/9/2017
10/10/2017
10/11/2017
10/12/2017
10/13/2017
10/14/2017
10/15/2017
10/16/2017
10/17/2017
10/18/2017
10/19/2017
10/20/2017
10/21/2017
10/22/2017
10/23/2017
10/24/2017
10/25/2017
10/26/2017
10/27/2017
10/28/2017
10/29/2017
10/30/2017
10/31/2017
CTS - Scheduled
CTS - Not Scheduled
LBMP - Scheduled
LBMP - Not Scheduled

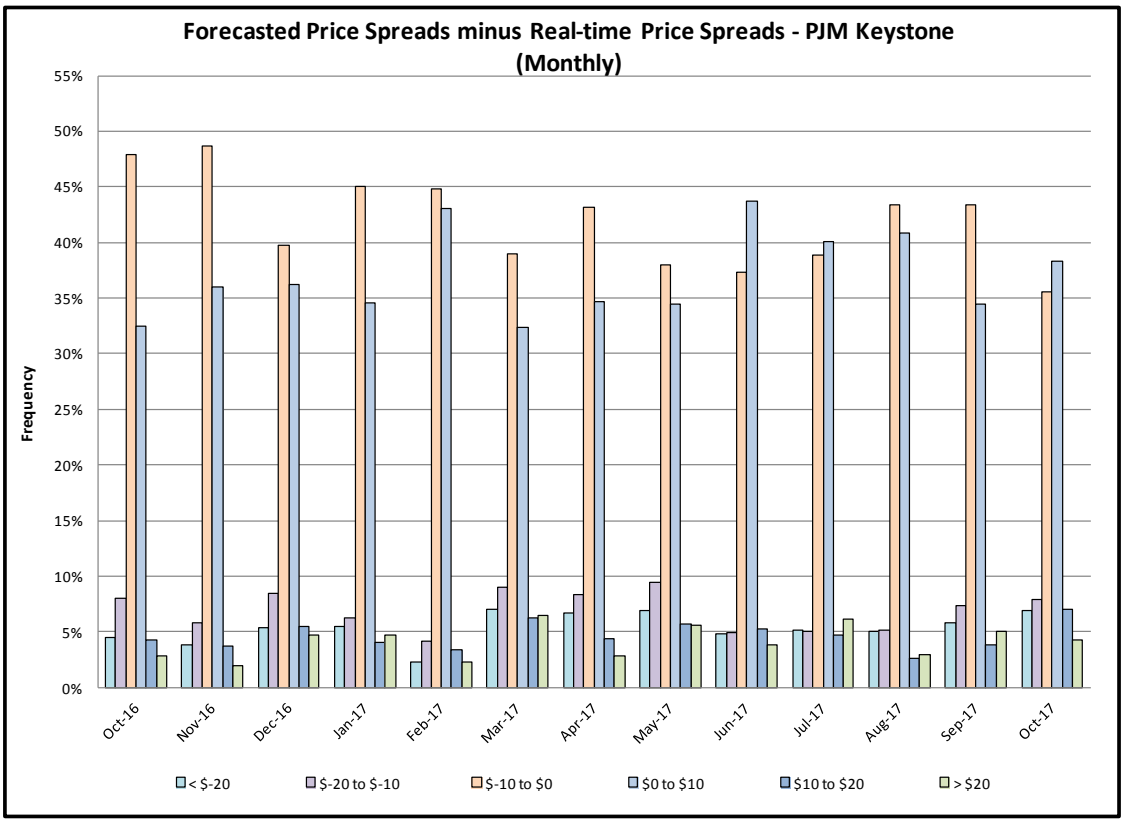

Avg Hourly CTS/LBMP Scheduled vs Non-scheduled - PJM Scheduled Lines (Monthly)
MW
1400
1200
1000
800
600
400
200
0
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
CTS - Scheduled
CTS - Not Scheduled
LBMP - Scheduled
LBMP - Not Scheduled

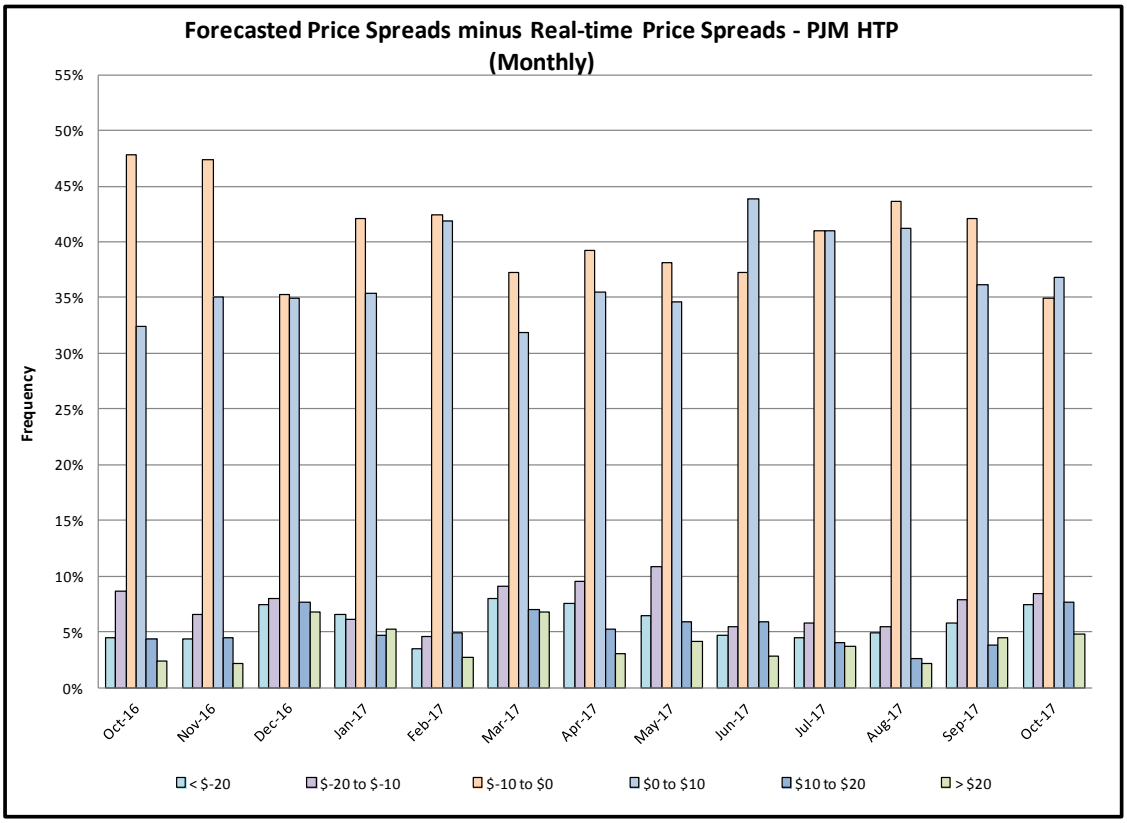

Avg Hourly CTS/LBMP Scheduled vs Non-scheduled - PJM Scheduled Lines (Daily)
MW
1400
1200
1000
800
600
400
200
0
10/1/2017
10/2/2017
10/3/2017
10/4/2017
10/5/2017
10/6/2017
10/7/2017
10/8/2017
10/9/2017
10/10/2017
10/11/2017
10/12/2017
10/13/2017
10/14/2017
10/15/2017
10/16/2017
10/17/2017
10/18/2017
10/19/2017
10/20/2017
10/21/2017
10/22/2017
10/23/2017
10/24/2017
10/25/2017
10/26/2017
10/27/2017
10/28/2017
10/29/2017
10/30/2017
10/31/2017
CTS - Scheduled
CTS - Not Scheduled
LBMP - Scheduled
LBMP - Not Scheduled

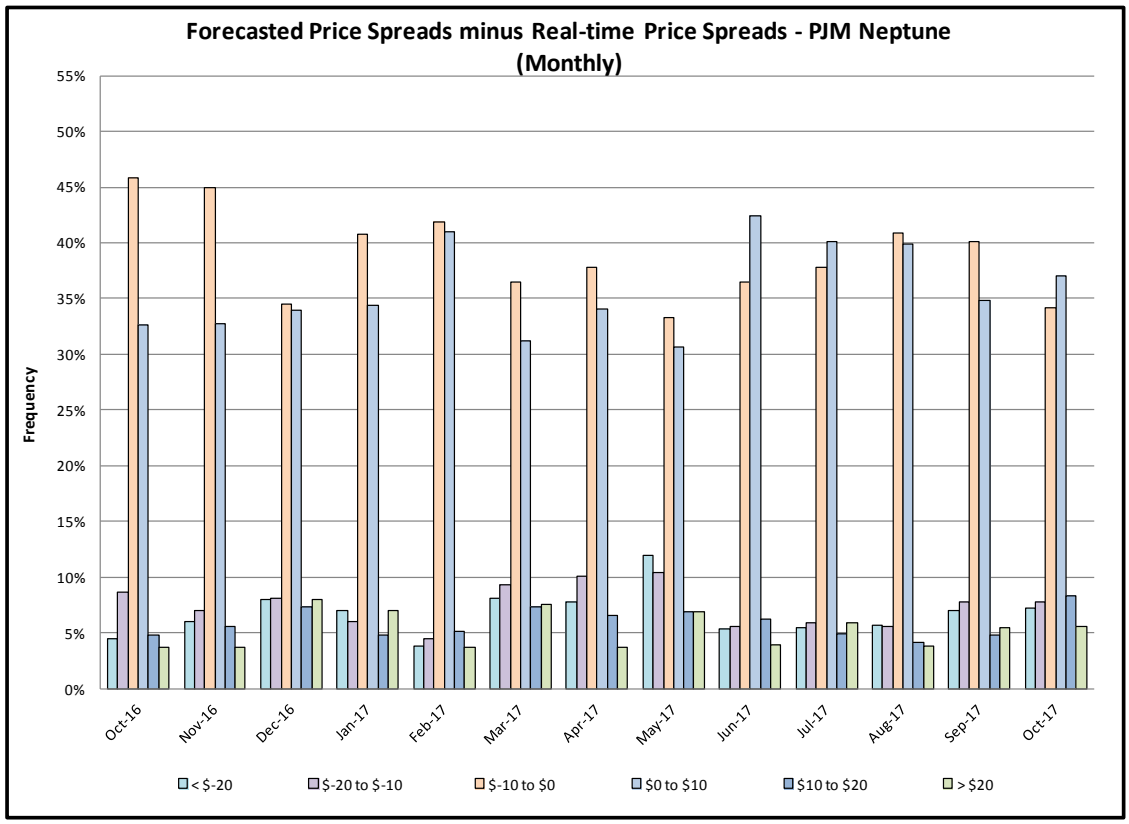

Avg Hourly CTS Scheduled vs Non-scheduled - ISO-NE AC (Monthly)
MW
3000
2500
2000
1500
1000
500
0
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
CTS - Scheduled
CTS - Not Scheduled

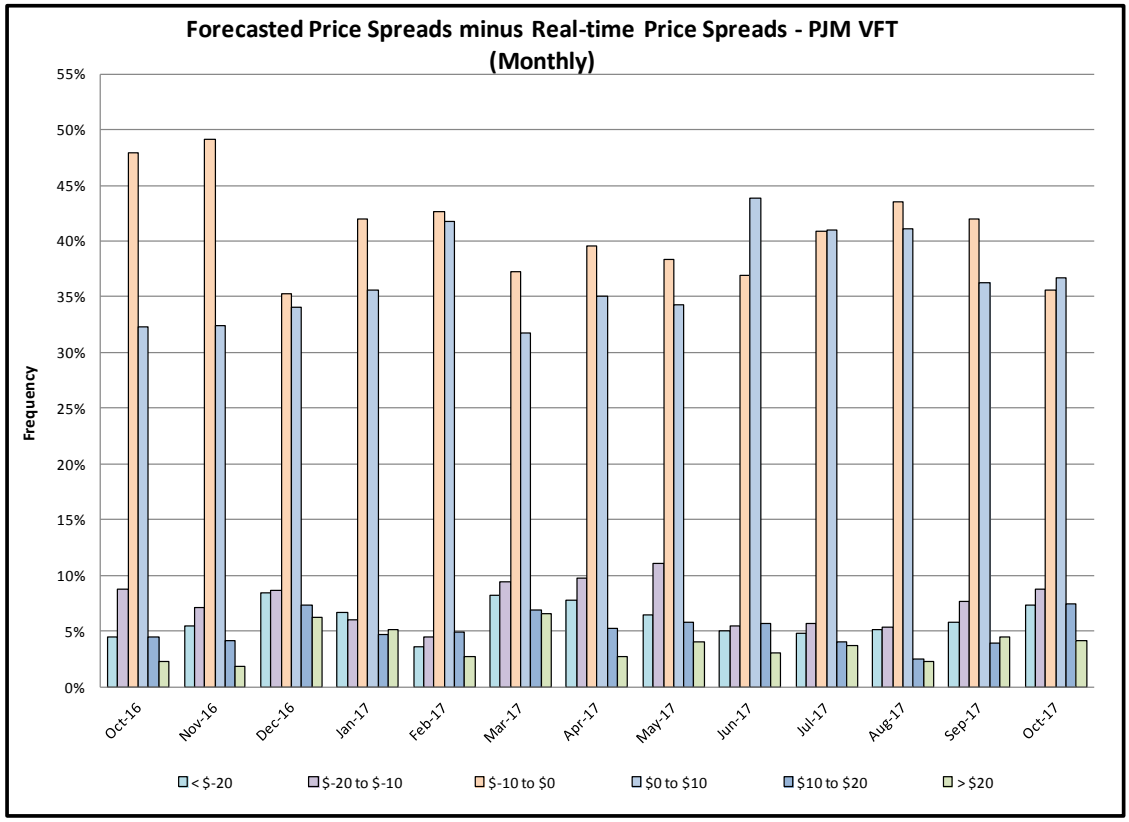

Avg Hourly CTS Scheduled vs Non-scheduled - ISO-NE AC (Daily)
MW
3500
3000
2500
2000
1500
1000
500
0
10/1/2017
10/2/2017
10/3/2017
10/4/2017
10/5/2017
10/6/2017
10/7/2017
10/8/2017
10/9/2017
10/10/2017
10/11/2017
10/12/2017
10/13/2017
10/14/2017
10/15/2017
10/16/2017
10/17/2017
10/18/2017
10/19/2017
10/20/2017
10/21/2017
10/22/2017
10/23/2017
10/24/2017
10/25/2017
10/26/2017
10/27/2017
10/28/2017
10/29/2017
10/30/2017
10/31/2017
CTS - Scheduled
CTS - Not Scheduled

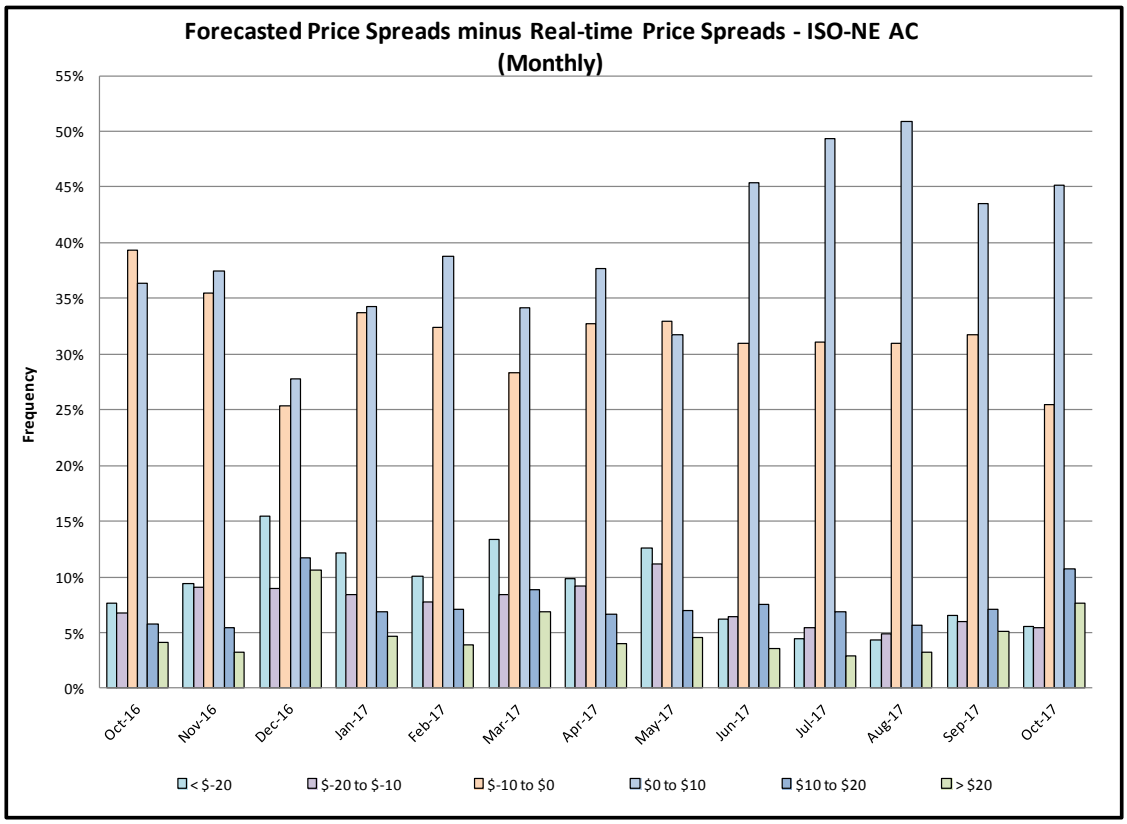

Forecasted Price Spread Distribution* (PJM and ISO-NE)
Occurrence
2500
2000
1500
1000
500
0
<-$1,000
-$1,000 to -$500
-$500 to -$100
-$100 to -$50
-$50 to -$20
-$20 to -$10
-$10 to $0
$0 to $10
$10 to $20
$20 to $50
$50 to $100
$100 to $500
$500 to $1,000
>$1,000
Keystone
HTP
NEPTUNE
VFT
ISO-NE AC
*NYISO RTC LBMP minus RTO Forecasted LMP


Forecasted Price Spreads minus Real-time Price Spreads - PJM Keystone
(Monthly)
Frequency
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
< $-20
$-20 to $-10
$-10 to $0
$0 to $10
$10 to $20
> $20


Forecasted Price Spreads minus Real-time Price Spreads - PJM HTP
(Monthly)
Frequency
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
< $-20
$-20 to $-10
$-10 to $0
$0 to $10
$10 to $20
> $20


Forecasted Price Spreads minus Real-time Price Spreads - PJM Neptune
(Monthly)
Frequency
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
< $-20
$-20 to $-10
$-10 to $0
$0 to $10
$10 to $20
> $20


Forecasted Price Spreads minus Real-time Price Spreads - PJM VFT
(Monthly)
Frequency
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
< $-20
$-20 to $-10
$-10 to $0
$0 to $10
$10 to $20
> $20


Forecasted Price Spreads minus Real-time Price Spreads - ISO-NE AC
(Monthly)
Frequency
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
Oct-17
< $-20
$-20 to $-10
$-10 to $0
$0 to $10
$10 to $20
> $20