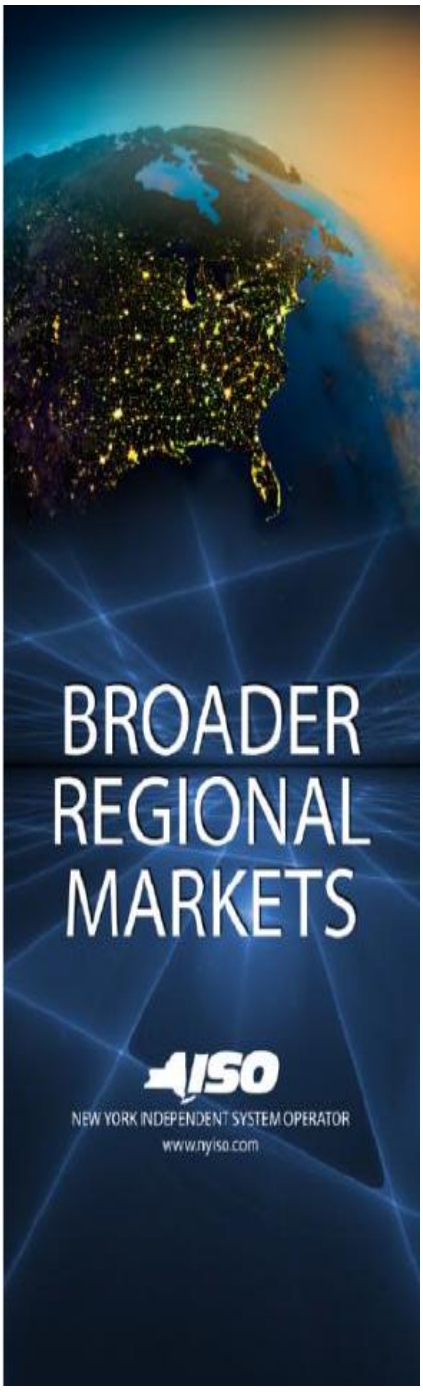


Broader Regional Market Metrics (CTS)

New York Independent System Operator

May 2017

Prepared by NYISO Operations Regional Market Coordination

May 2017 Broader Regional Markets Highlights (CTS)

May 2017 Broader Regional Markets Highlights

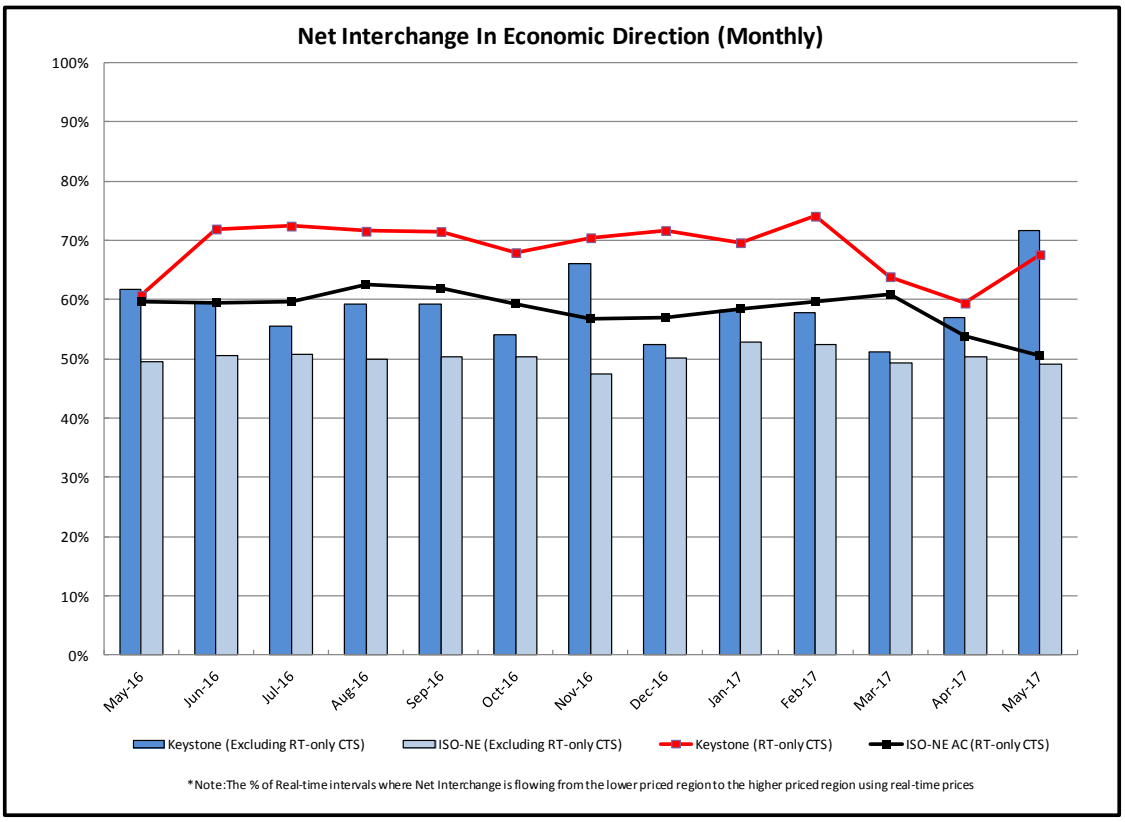
- PJM
  - At PJM Keystone, there was an average of 843 MWs[1] per hour of CTS offers and an average of 127 MWs per hour of CTS schedules.
  - Interchange at PJM Keystone associated with CTS transactions scheduled only in real-time flowed in the economic direction in 67.6% of the real-time intervals, as compared to all other interchange at the interface which flowed in the economic direction in 71.5% of the real-time intervals.

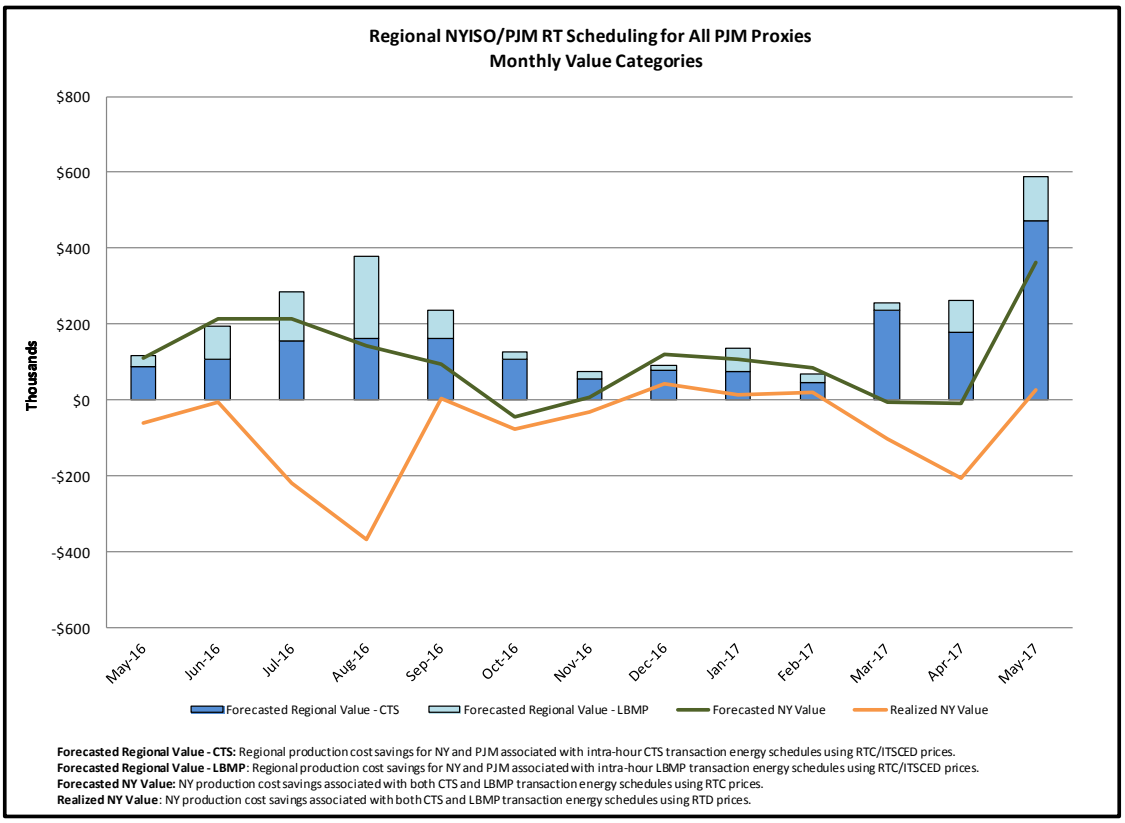
- ISO-NE
  - At NE Sandy Pond, there was an average of 2283 MWs[1] per hour of CTS offers, and an average of 924 MWs per hour of CTS schedules.
  - Interchange at NE Sandy Pond associated with CTS transactions scheduled only in real-time flowed in the economic direction in 50.5% of the real-time intervals, as compared to all other interchange which flowed in the economic direction in 49.0% of the real-time intervals.

Pricing Data[2]

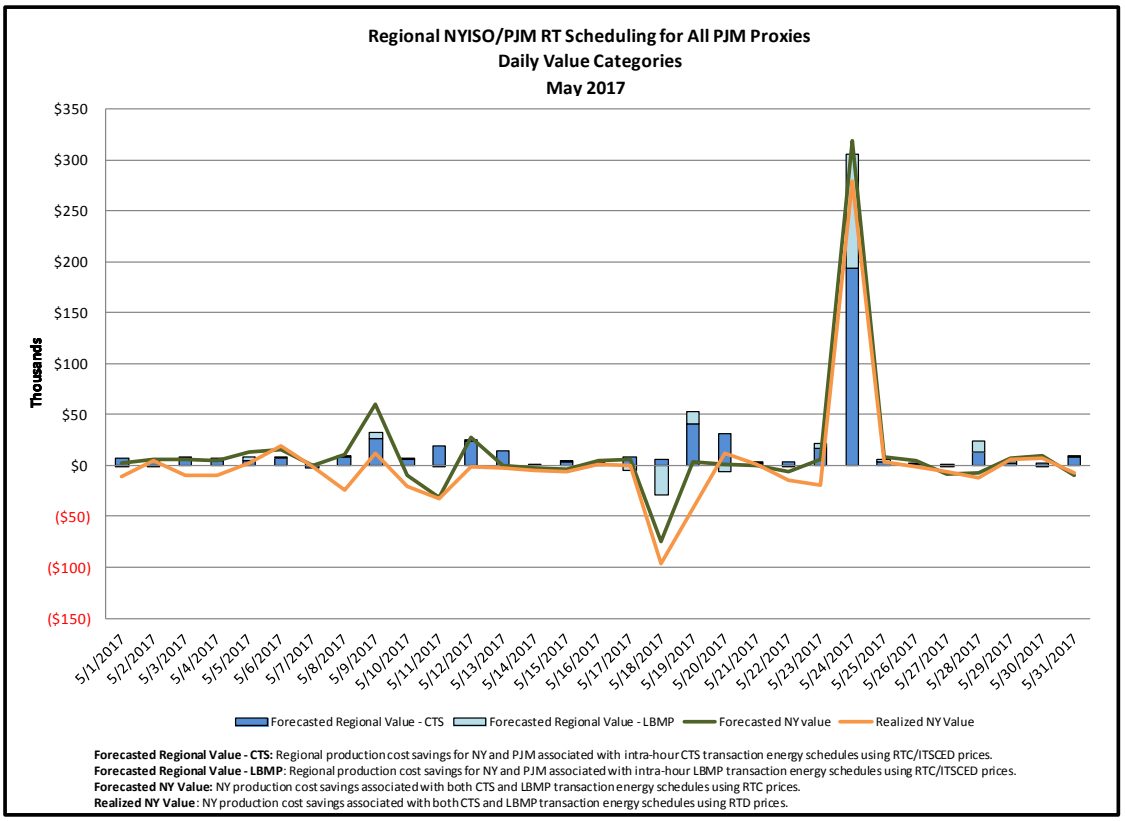
Interface	Max Forecasted Price Spread	Min Forecasted Price Spread	Forecasted Price Spreads minus Real-time Price Spreads					
			< $-20	$-20 to $-10	$-10 to $0	$0 to $10	$10 to $20	> $20
Keystone	$967.58	($1,000.00)	6.9%	9.5%	38.0%	34.4%	5.7%	5.6%
HTP	$1,272.19	($174.63)	6.5%	10.8%	38.1%	34.6%	5.9%	4.1%
NEPTUNE	$978.36	($199.39)	11.9%	10.4%	33.2%	30.7%	6.8%	6.9%
VFT	$1,681.33	($172.74)	6.5%	11.0%	38.4%	34.3%	5.7%	4.0%
Sandy Pond	$59.83	($1,188.49)	12.6%	11.2%	32.9%	31.8%	6.9%	4.6%

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.

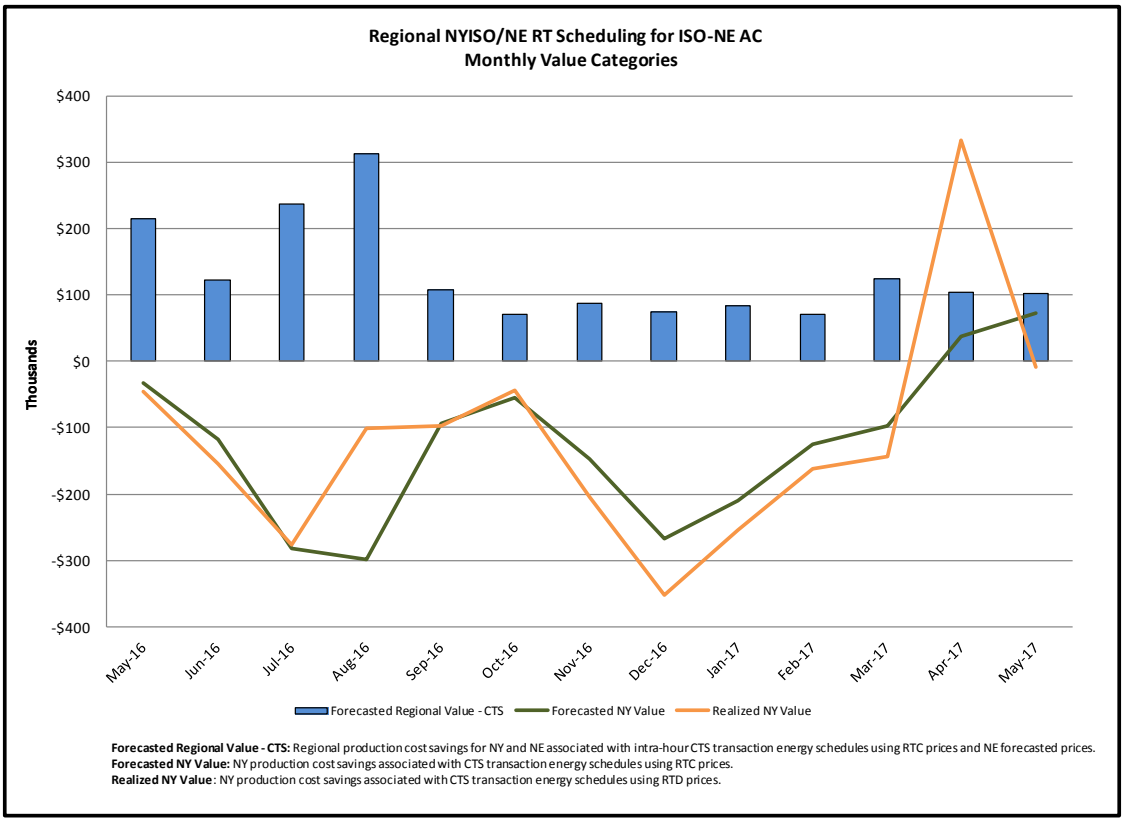

Net Interchange In Economic Direction (Monthly)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Keystone (Excluding RT-only CTS)
ISO-NE (Excluding RT-only CTS)
Keystone (RT-only CTS)
ISO-NE AC (RT-only CTS)
*Note:The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

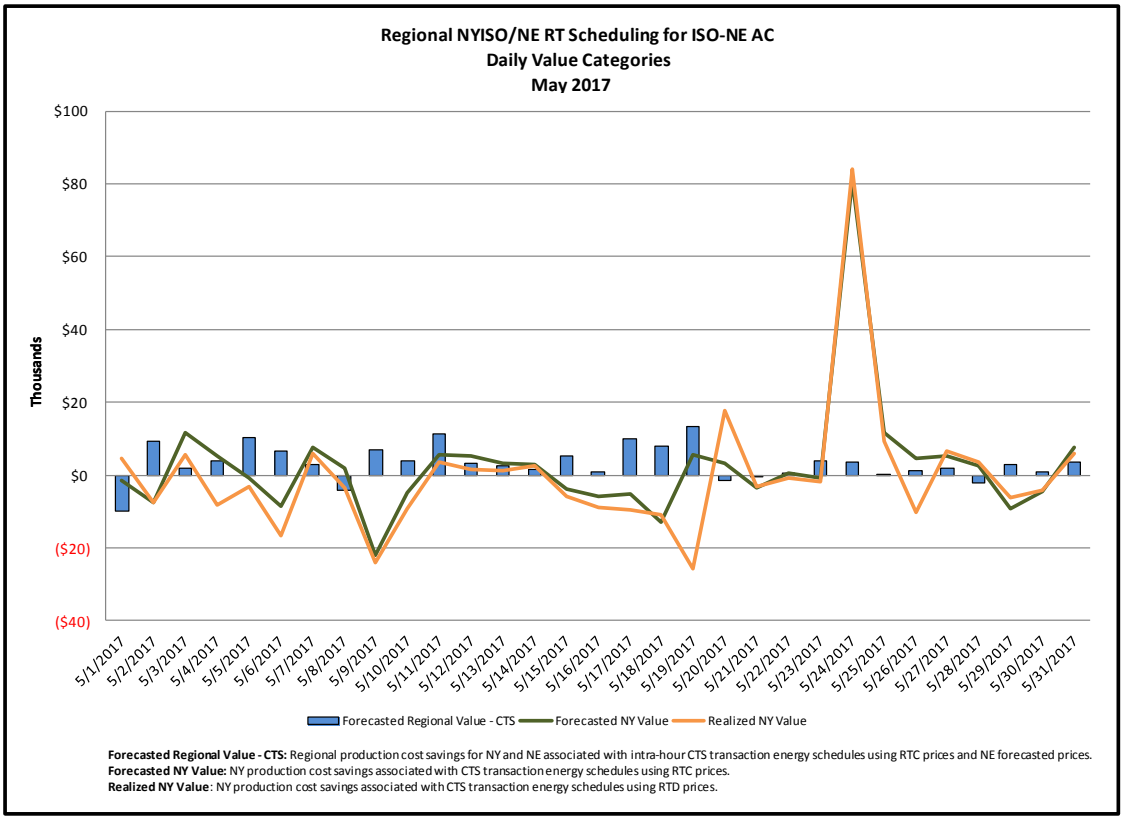


Forecasted Regional Value - CTS: Regional production cost savings for NY and PJM associated with intra-hour CTS transaction energy schedules using RTC/ITSCED prices.
Forecasted Regional Value - LBMP: Regional production cost savings for NY and PJM associated with intra-hour LBMP transaction energy schedules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

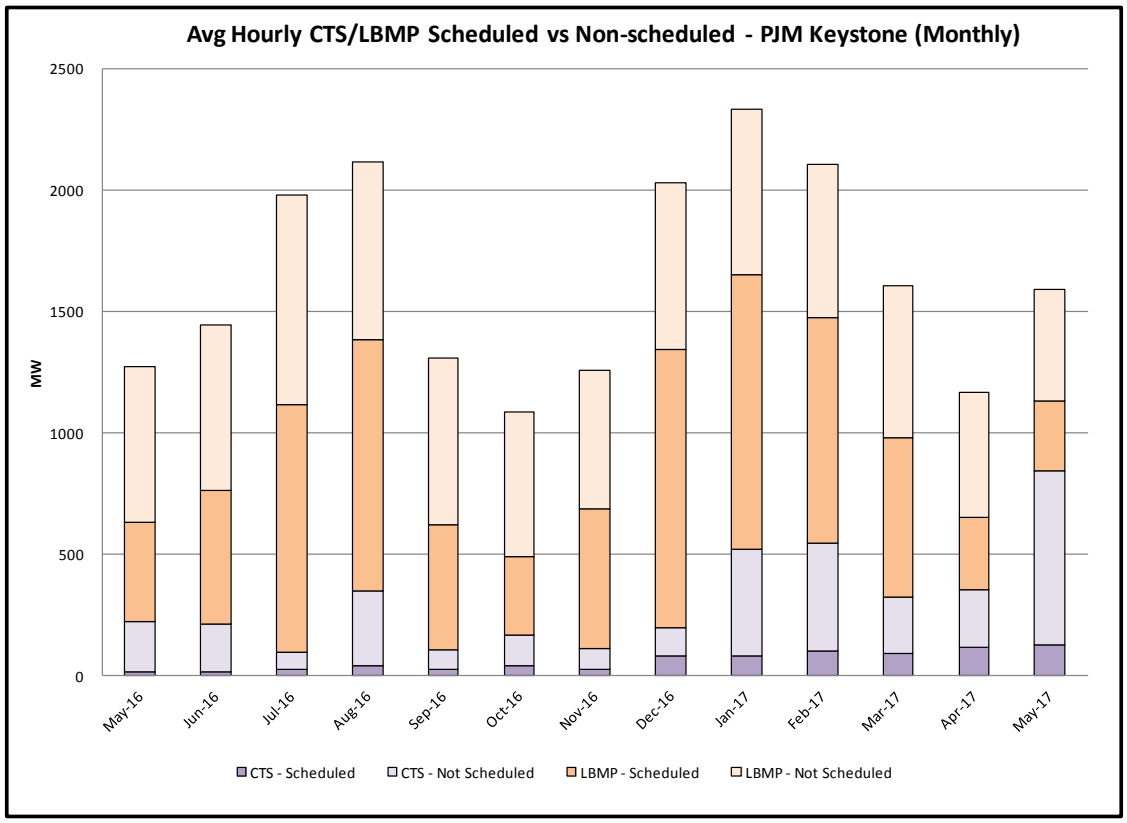

Regional NYISO/NE RT Scheduling for ISO-NE AC
Monthly Value Categories
Thousands
$400
$300
$200
$100
$0
-$100
-$200
-$300
-$400
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Forecasted Regional Value - CTS
Forecasted NY Value
Realized NY Value
Forecasted Regional 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.

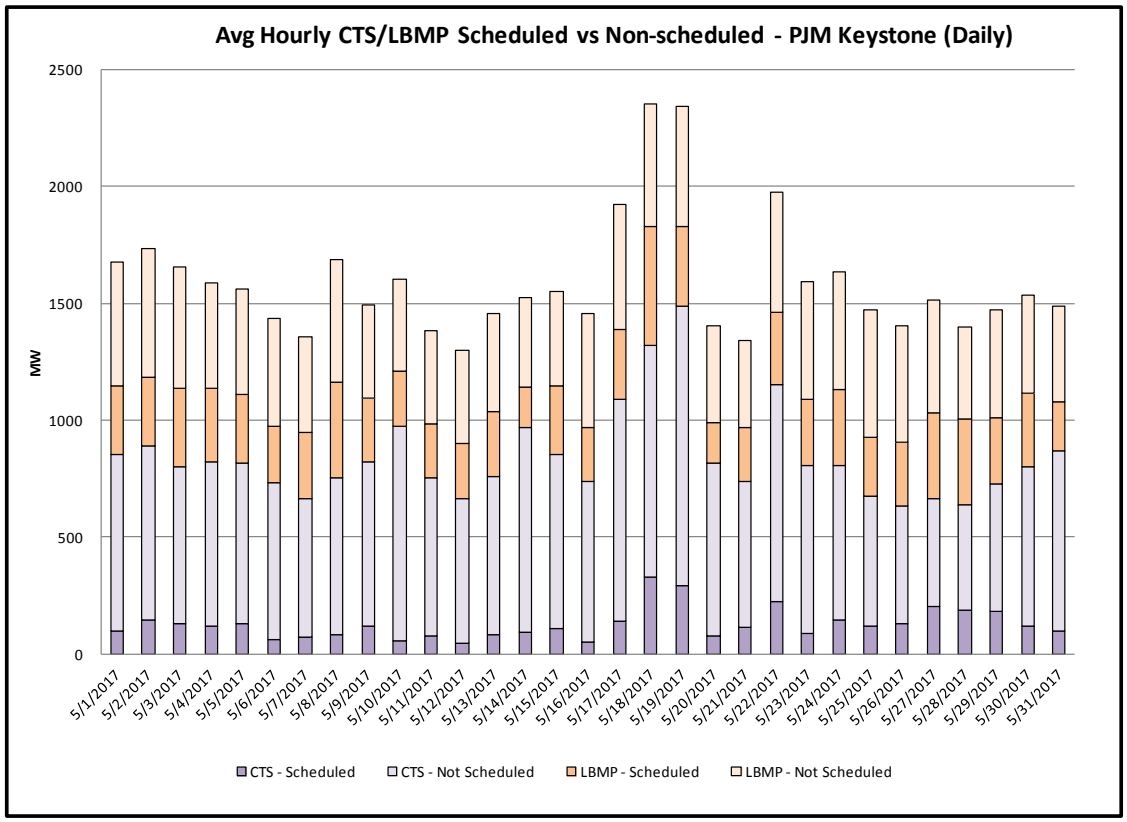

Regional NYISO/NE RT Scheduling for ISO-NE AC
Daily Value Categories
May 2017
Thousands
$100
$80
$60
$40
$20
$0
($20)
($40)
5/1/2017
5/2/2017
5/3/2017
5/4/2017
5/5/2017
5/6/2017
5/7/2017
5/8/2017
5/9/2017
5/10/2017
5/11/2017
5/12/2017
5/13/2017
5/14/2017
5/15/2017
5/16/2017
5/17/2017
5/18/2017
5/19/2017
5/20/2017
5/21/2017
5/22/2017
5/23/2017
5/24/2017
5/25/2017
5/26/2017
5/27/2017
5/28/2017
5/29/2017
5/30/2017
5/31/2017
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.

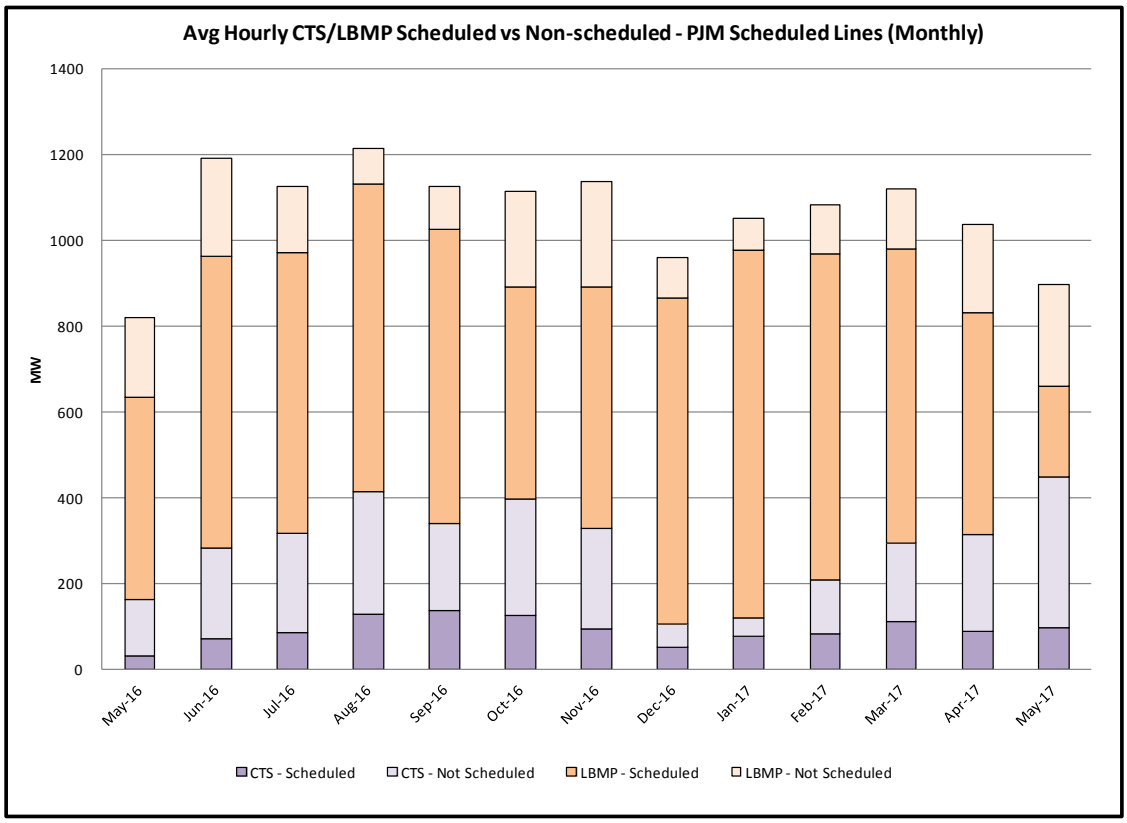
Regional NYISO RT Scheduling

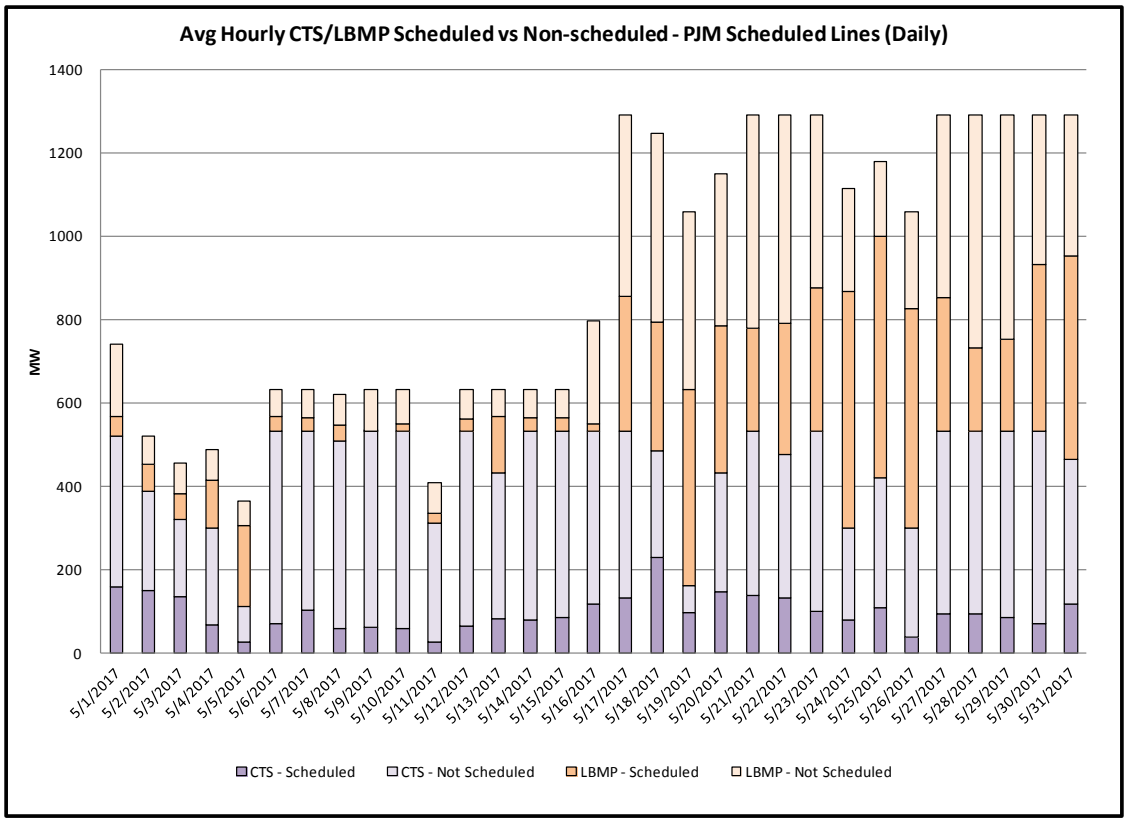
Category	*Description*
Forecasted Regional Value - CTS	Forecasted regional production cost savings from the intra-hour (non-TOH) energy schedule changes[1] on CTS bids (Intra-hour CTS Schedule Changes * [NY RTC LBMP – PJM or ISO-NE's Forecasted LMP]).
Forecasted Regional Value - LBMP	Forecasted regional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

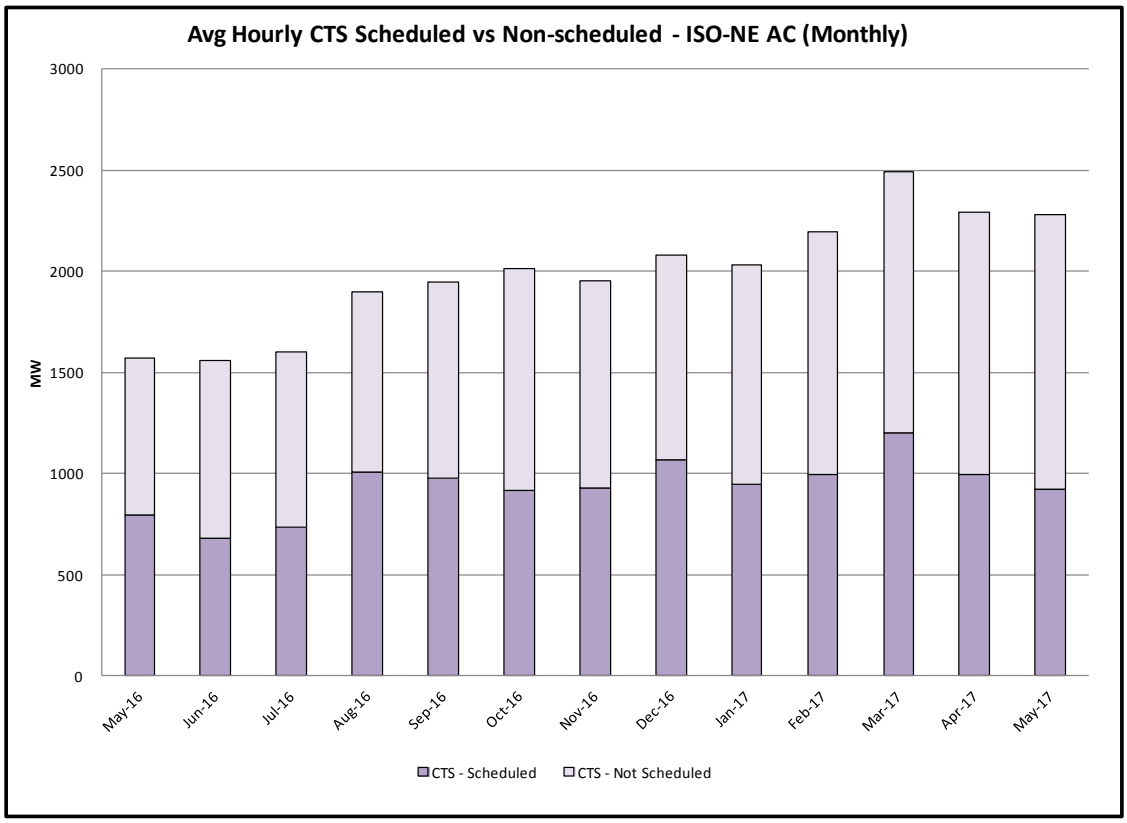
[1] Note: Schedule changes associated with manual Operator actions such as curtailments and/or transaction derates, and that have a significant impact (either positive or negative) to the above metrics, are generally excluded.

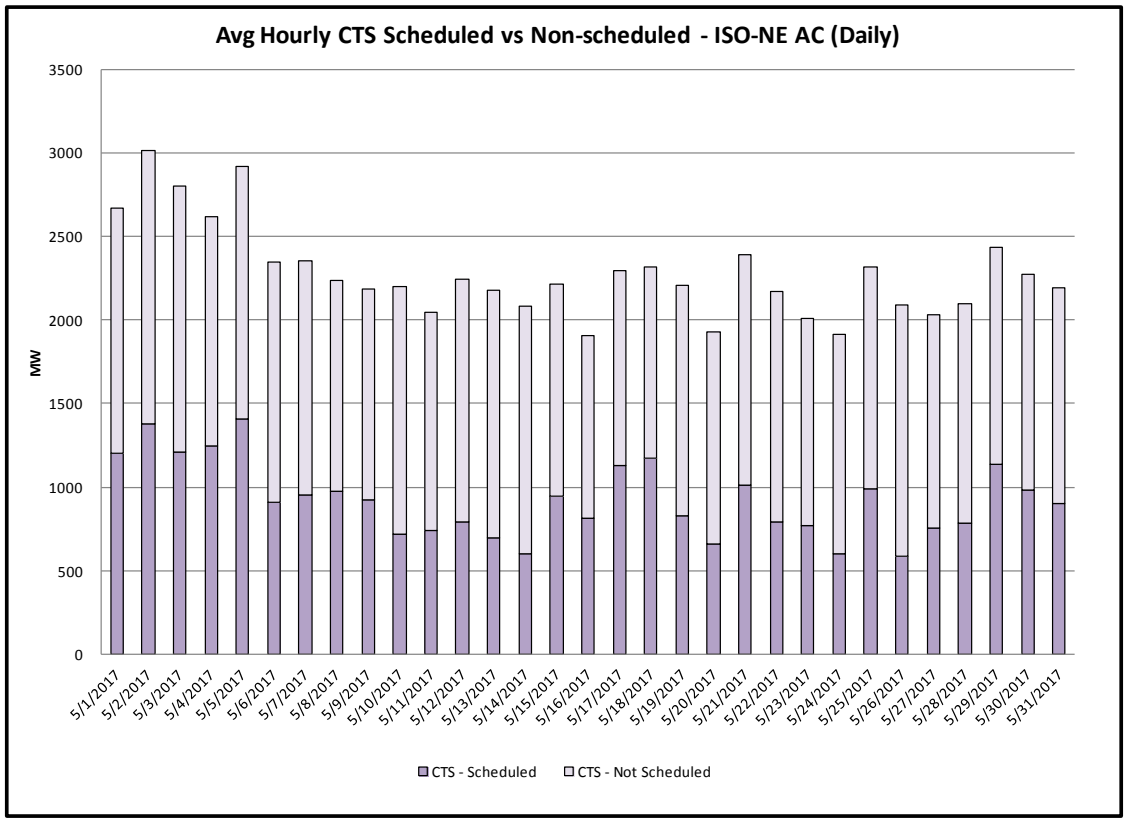

Avg Hourly CTS/LBMP Scheduled vs Non-scheduled - PJM Keystone (Monthly)
MW
2500
2000
1500
1000
500
0
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
CTS - Scheduled
CTS - Not Scheduled
LBMP - Scheduled
LBMP - Not Scheduled

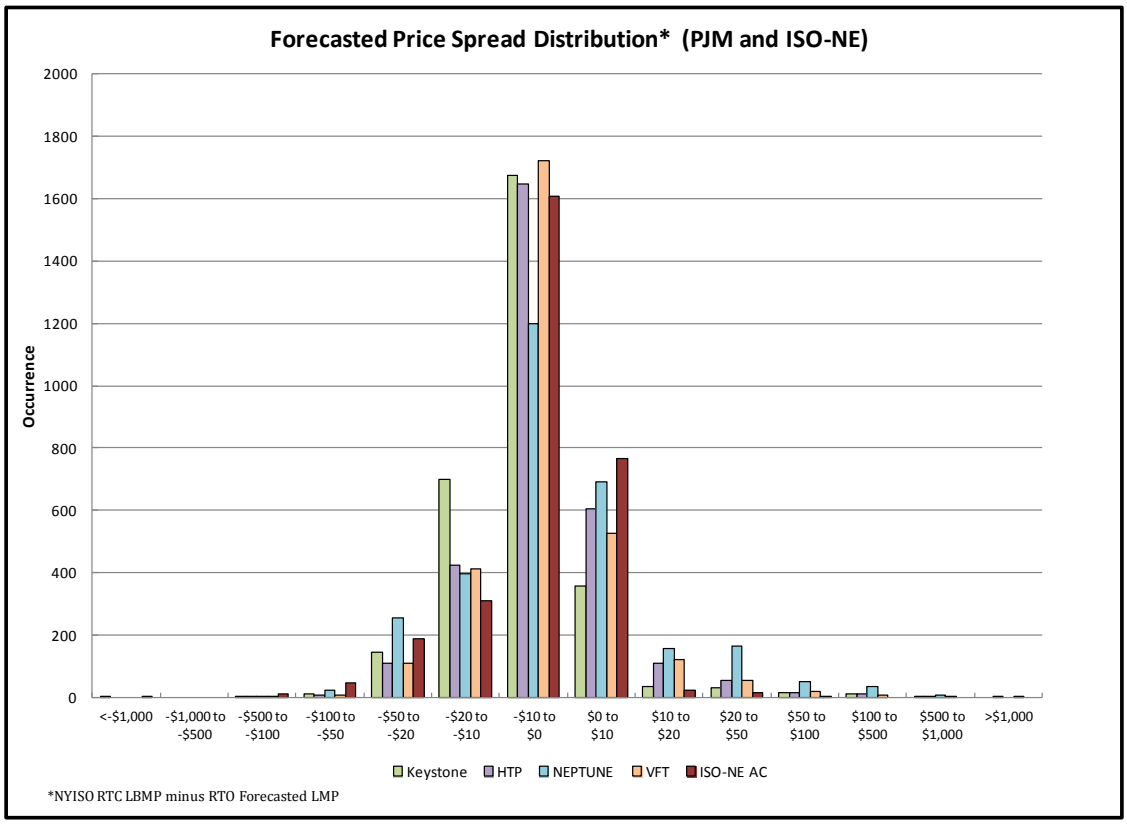

Avg Hourly CTS/LBMP Scheduled vs Non-scheduled - PJM Keystone (Daily)
MW
2500
2000
1500
1000
500
0
5/1/2017
5/2/2017
5/3/2017
5/4/2017
5/5/2017
5/6/2017
5/7/2017
5/8/2017
5/9/2017
5/10/2017
5/11/2017
5/12/2017
5/13/2017
5/14/2017
5/15/2017
5/16/2017
5/17/2017
5/18/2017
5/19/2017
5/20/2017
5/21/2017
5/22/2017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

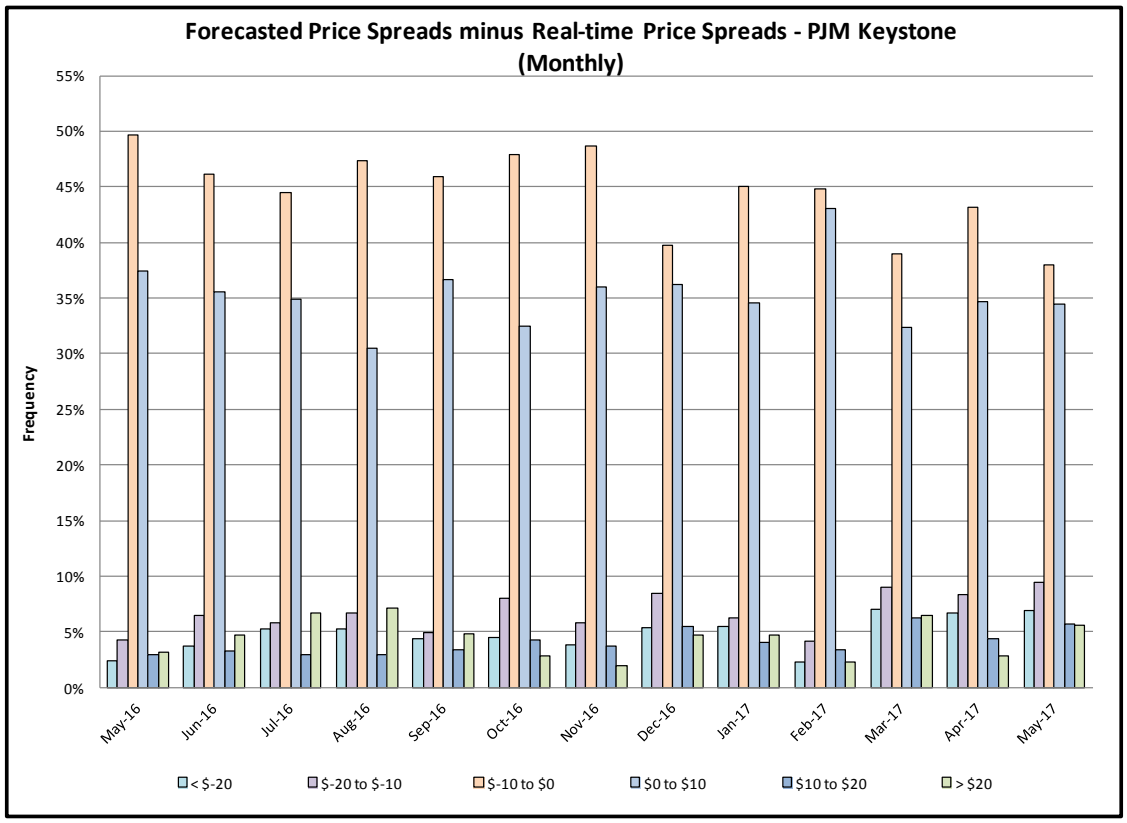

Avg Hourly CTS/LBMP Scheduled vs Non-scheduled - PJM Scheduled Lines (Monthly)
MW
1400
1200
1000
800
600
400
200
0
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
CTS - Scheduled
CTS - Not Scheduled
LBMP - Scheduled
LBMP - Not Scheduled

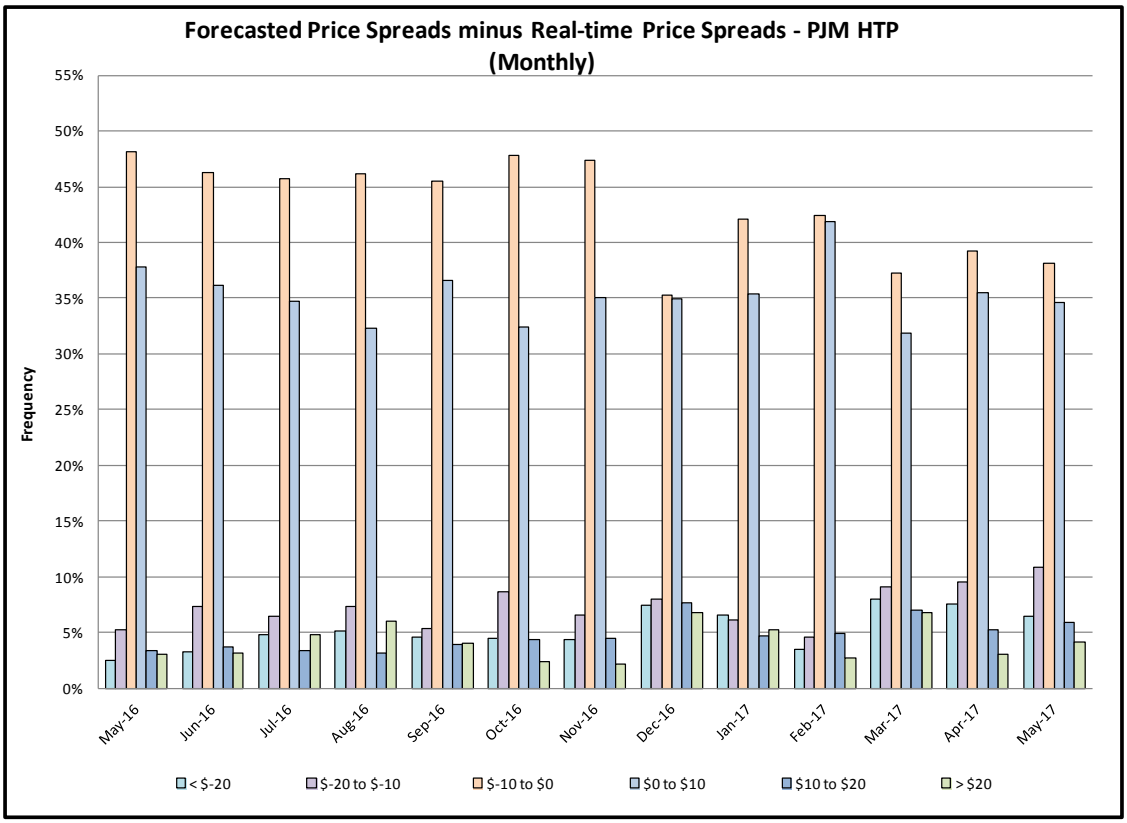

Avg Hourly CTS/LBMP Scheduled vs Non-scheduled - PJM Scheduled Lines (Daily)
MW
1400
1200
1000
800
600
400
200
0
5/1/2017
5/2/2017
5/3/2017
5/4/2017
5/5/2017
5/6/2017
5/7/2017
5/8/2017
5/9/2017
5/10/2017
5/11/2017
5/12/2017
5/13/2017
5/14/2017
5/15/2017
5/16/2017
5/17/2017
5/18/2017
5/19/2017
5/20/2017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

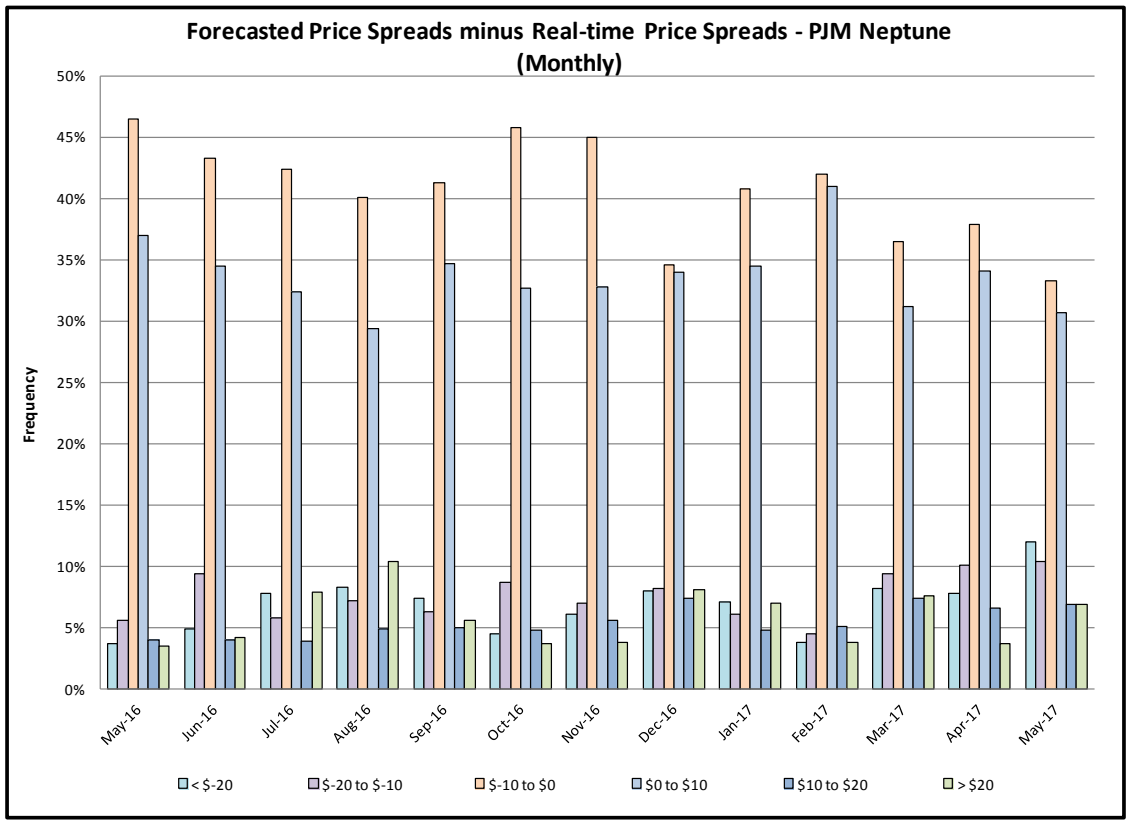

Avg Hourly CTS Scheduled vs Non-scheduled - ISO-NE AC (Monthly)
MW
3000
2500
2000
1500
1000
500
0
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
CTS - Scheduled
CTS - Not Scheduled

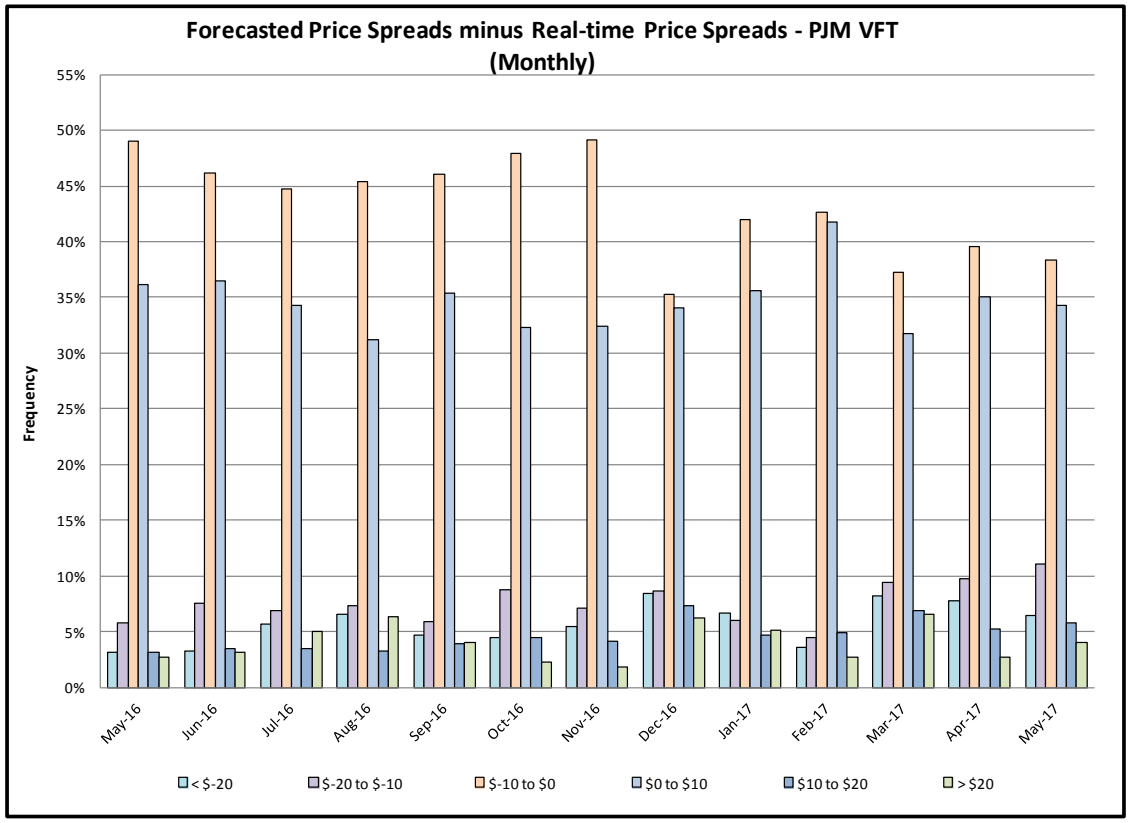

Avg Hourly CTS Scheduled vs Non-scheduled - ISO-NE AC (Daily)
MW
3500
3000
2500
2000
1500
1000
500
0
5/1/2017
5/2/2017
5/3/2017
5/4/2017
5/5/2017
5/6/2017
5/7/2017
5/8/2017
5/9/2017
5/10/2017
5/11/2017
5/12/2017
5/13/2017
5/14/2017
5/15/2017
5/16/2017
5/17/2017
5/18/2017
5/19/2017
5/20/2017
5/21/2017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

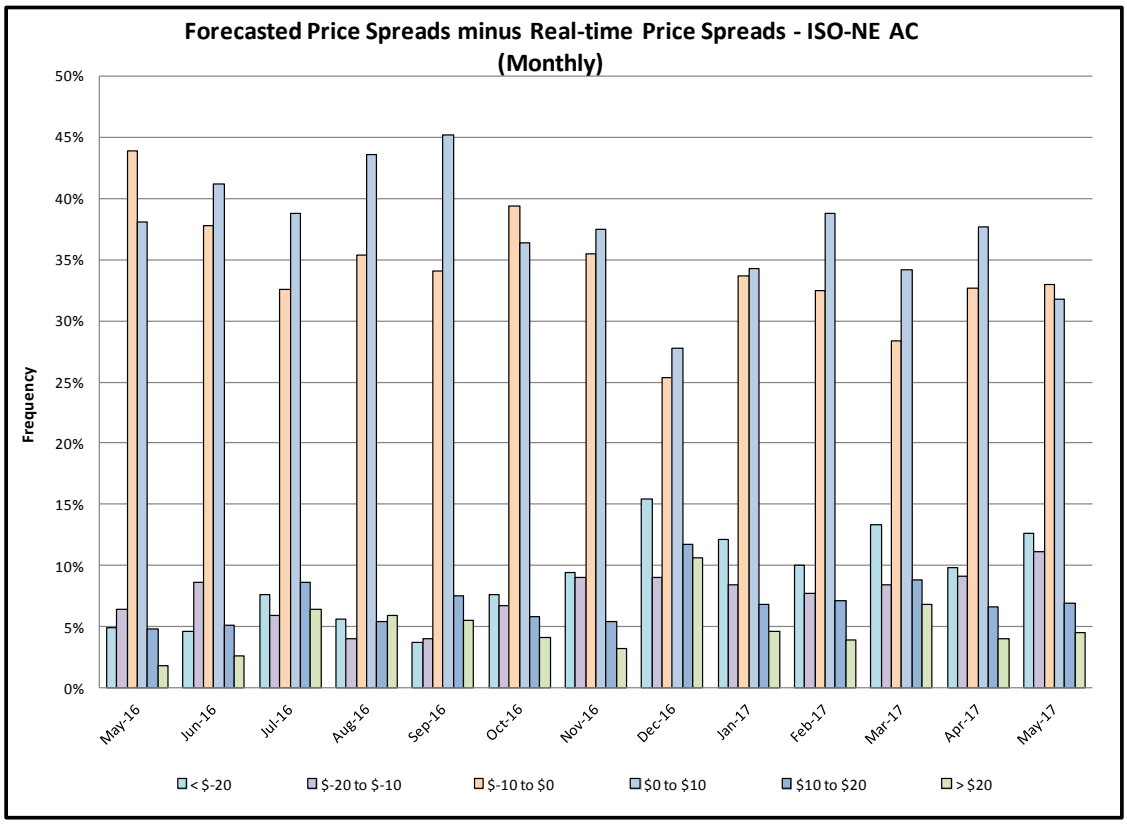

Forecasted Price Spread Distribution* (PJM and ISO-NE)
Occurrence
2000
1800
1600
1400
1200
1000
800
600
400
200
0
<-$1,000
-$1,000 to -$500
-$500 to -$100
-$100 to -$50
-$50 to -$20
-$20 to -$10
-$10 to $0
$0 to $10
$10 to $20
$20 to $50
$50 to $100
$100 to $500
$500 to $1,000
>$1,000
Keystone
HTP
NEPTUNE
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%
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-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%
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-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
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-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%
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-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
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
< $-20
$-20 to $-10
$-10 to $0
$0 to $10
$10 to $20
> $20