Markets Report

Jennifer Warner-Freeman
Senior Economist, Market Analysis
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• PJM Wholesale Cost through May 2017 was $47.80/MWh, up from full-year 2016 costs of $47.49/MWh. (Slides 5 & 6)

• Operating Reserve cost contribution to wholesale energy costs remains at its lowest level in the 2011-2017 time period. (Slide 6)

• Load-weighted average LMP for 2017 was $30.26/MWh: (Slide 18)
  – May 2017 was $31.5/MWh, which is higher than May 2016 ($24) but more in line, seasonally, with May 2015 ($34.5).

• In May, the sum of Heating and Cooling Degree Days was above its historic average, indicating cooler than average weather. Energy use was slightly lower than its historic average. (Slides 16-17)
• FTR revenue adequacy for the month of May is 92%. The 2016-2017 Planning Year is fully funded. (Slides 33-36)
• May 2017 experienced below normal congestion for the seventh month in a row. (Slide 33)
• Regulation and Synchronized Reserve market costs have generally tracked with energy prices over time. (Slides 49-51)
Markets Report
Operating Reserve
Percent of Total CC, CT and Steam Hours with LMP < Offer
• Beginning in December 2008, the daily Balancing Operating Reserves (BOR) rate was replaced with six different BOR rates: RTO BOR for Reliability Rate, RTO BOR for Deviations Rate, East BOR for Reliability Rate, East BOR for Deviations Rate, West BOR for Reliability Rate, West BOR for Deviations Rate.

• Reliability rates are charged to all real-time load and exports, whereas deviation rates, as before, are charged only to real-time deviations. RTO rates are charged to the whole footprint, whereas East and West rate adders are charged based on location.
Reliability Balancing Operating Reserve Rates

$/MWh

<table>
<thead>
<tr>
<th>MAY15</th>
<th>JUL15</th>
<th>OCT15</th>
<th>JAN16</th>
<th>APR16</th>
<th>JUL16</th>
<th>OCT16</th>
<th>JAN17</th>
<th>MAY17</th>
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<tbody>
<tr>
<td>$0.00</td>
<td>$0.03</td>
<td>$0.05</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.10</td>
<td>$0.05</td>
<td>$0.02</td>
<td>$0.04</td>
</tr>
</tbody>
</table>

RTO
East
West
Deviations Balancing Operating Reserve Rates

$/MWh

- RTO
- East
- West
Energy Market
LMP Summary
• The weather parameter shown in the following slide is a monthly sum of daily Heating Degree Days (HDD) and Cooling Degree Days (CDD).

• Degree days represent a deviation from a baseline temperature, in this case 60 degrees for HDD and 65 degrees for CDD. As temperatures get more extreme, colder or hotter, either HDDs or CDDs, respectively, will increase.

• Typically, winter months will only record HDDs, while summer months will only record CDDs. Shoulder months may have both HDDs and CDDs.

• Degree Days are calculated using a daily load weighting that weights values from stations in each TO zone according to the zonal contribution to the RTO peak on that day.

• Average values use data from 1998 to the most recent complete year, in this case, 2015. Averages include load data for all of TO zones in the current RTO footprint.
Fuel Cost Adjusted LMP (Referenced to 1999 Fuel Prices)

$/MWh

$0 $10 $20 $30 $40 $50 $60 $70 $80


Fuel Cost Adjusted LMP
Load Weighted LMP
In September 2014 the method for calculating LMP re-run intervals was changed to only include intervals that actually impacted LMP.
Energy Market

Demand Response Summary
Demand Side Response Estimated Revenue

Capacity revenue prior to RPM implementation on 6-01-2007 estimated based on average daily ALM capacity credits and weighted average daily PJM capacity market clearing price.
Economic Demand Response Activity

*Data for the last few months are subject to significant change due to the settlement window.
Total Registered MW in PJM's Economic Demand Response

MW

MAY15  JUL15  OCT15  JAN16  APR16  JUL16  OCT16  JAN17  MAY17
Energy Market
Virtual Activity Summary
The following six charts depict trends in submitted and cleared virtual and up-to-congestion transactions, in terms of number and volume, into the PJM Energy Market. The first two of these charts show the submitted and cleared increment and decrement bids (virtual transactions or virtuals) and they are the same as what was previously being presented in this report. The two charts after them display the trends in submitted and cleared up-to-congestion transactions into the PJM Energy Market. The last two of these six charts combine the virtual and up-to-congestion transactions and show the sum of these two categories.

To clarify what a bid or transaction is, please consider the following example: An offer (increment, decrement or up-to-congestion) of 10 MW, valid for eight hours for a given day, is captured in the charts as eight submitted bids/transactions and 80 submitted MWh. If this offer fully clears for three of the hours it was submitted for, it shows in the charts as three cleared bids/transactions and 30 cleared MWh.
Virtual Bids (INCAs & DECs) - Total Number

Number of Bids (Millions)

- Submitted Bids
- Cleared Bids

MAY15, JUN15, JUL15, AUG15, SEP15, OCT15, NOV15, DEC15, JAN16, FEB16, MAR16, APR16, MAY16, JUN16, JUL16, AUG16, SEP16, OCT16, NOV16, DEC16, JAN17, FEB17, MAR17, APR17, MAY17
Up-To-Congestion Transactions - Total Number

Number of Transactions (Millions)

- Submitted Transactions
- Cleared Transactions

MAY15 | JUN15 | JUL15 | AUG15 | SEP15 | OCT15 | NOV15 | DEC15 | JAN16 | FEB16 | MAR16 | APR16 | MAY16 | JUN16 | JUL16 | AUG16 | SEP16 | OCT16 | NOV16 | DEC16 | JAN17 | FEB17 | MAR17 | APR17 | MAY17
Up-To-Congestion Transactions - Total Volume

MWh (Millions)

- Submitted MWh
- Cleared MWh

MAY 15, JUN 15, JUL 15, AUG 15, SEP 15, OCT 15, NOV 15, DEC 15, JAN 16, FEB 16, MAR 16, APR 16, 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
INCs, DECs and Up-To-Congestion Transactions - Total Number

Number of Transactions (Millions)

- Submitted Transactions
- Cleared Transactions
INCs, DECs and Up-To-Congestion Transactions - Total Volume

Submitted MWh

Cleared MWh

MWh (Millions)
Energy Market

Congestion and FTR Summary
Monthly FTR Payout Ratio

MAY15
JUN15
JUL15
AUG15
SEP15
OCT15
NOV15
DEC15
JAN16
FEB16
MAR16
APR16
MAY16
JUN16
JUL16
AUG16
SEP16
OCT16
NOV16
DEC16
JAN17
FEB17
MAR17
APR17
MAY17
<table>
<thead>
<tr>
<th>Period</th>
<th>Surplus / Underfunding</th>
<th>Payout Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>May, 2017</td>
<td>-$2,387,867</td>
<td>92%</td>
</tr>
<tr>
<td>2017</td>
<td>$8,505,860</td>
<td>100%</td>
</tr>
<tr>
<td>2016/2017</td>
<td>$74,681,939</td>
<td>100%</td>
</tr>
</tbody>
</table>
Ten Most Heavily Congested Transmission Facilities - Overall, May

- Ashburn-Pleasant View 230 274D (DOM)
- Westwood 345/138 (MISO)
- Aetna-Lake George 138 (MISO)
- Jackson-TMI 230 (METED)
- Byron-Cherry Valley 345 0622 6 (COMED)
- APSOUTH Interface (EHV)
- Kilmer-Sayreville 230 1 (PSEG)
- Conastone-Otter Creek 230 (BGE-ME)
- Maple 138 B22 CB (FE PP)
- Chichester-Eddystone 230 (PECO)
Energy Market

Interchange/Seams Summary
Monthly Average MISO Interface Pricing

$/MWh

MAY15  JUL15  OCT15  JAN16  APR16  JUL16  OCT16  JAN17  MAY17

- PJM MISO Price (RT)
- MISO PJM Price (RT)
- PJM MISO Price (DA)
- MISO PJM Price (DA)
Hourly Difference Between PJM and MISO Real-Time Prices

Positive values represent hours when the PJM price was higher. Negative values represent hours when the PJM price was lower.

Average price difference for May = $-1.24
Percent of hours in which the direction of flow is consistent with price differentials = 50.00%
Hourly Difference Between PJM and MISO Day-Ahead Prices

Positive values represent hours when the PJM price was higher. Negative values represent hours when the PJM price was lower.

Average price difference for May = $-0.92
Hourly Difference Between PJM and NYISO Real-Time Prices

Positive values represent hours when the PJM price was higher. Negative values represent hours when the PJM price was lower.

Average price difference for May = $3.78
Percent of hours in which the direction of flow is consistent with price differentials = 62.23%
Hourly Difference Between PJM and NYISO Day-Ahead Prices

Positive values represent hours when the PJM price was higher. Negative values represent hours when the PJM price was lower.

Average price difference for May = $3.84
Negative M2M Credit represents PJM payment to MISO.
Negative M2M Credit represents PJM payment to NYISO
Ancillary Service Market

Summary
Average Synchronous Condenser Payments equals the 36-month rolling average plus one standard deviation.
Average Synchronous Condenser Payments equals the 36-month rolling average plus one standard deviation.
DR Participation in PJM Synchronized Reserve Markets

- **Total Payments ($ Millions)**
- **MWh Cleared (MWh)**
Synchronized Reserve Market Daily Prices and Charges

- **Total Daily Synchronized Reserve Charges ($ Millions)**
- **Minimum Hourly Price ($/MWh)**
- **Average Hourly Price ($/MWh)**
- **Maximum Hourly Price ($/MWh)**

$ Millions

- 0.60
- 0.40
- 0.20
- 0.00

CH/M$/$

- $90
- $60
- $30
- $0

Dates:
- 01 MAY 17
- 02 MAY 17
- 03 MAY 17
- 04 MAY 17
- 05 MAY 17
- 06 MAY 17
- 07 MAY 17
- 08 MAY 17
- 09 MAY 17
- 10 MAY 17
- 11 MAY 17
- 12 MAY 17
- 13 MAY 17
- 14 MAY 17
- 15 MAY 17
- 16 MAY 17
- 17 MAY 17
- 18 MAY 17
- 19 MAY 17
- 20 MAY 17
- 21 MAY 17
- 22 MAY 17
- 23 MAY 17
- 24 MAY 17
- 25 MAY 17
- 26 MAY 17
- 27 MAY 17
- 28 MAY 17
- 29 MAY 17
- 30 MAY 17
- 31 MAY 17