PJM Wholesale Cost through December 2018 was $59.96/MWh, up from full-year 2017 costs of $49.64/MWh. (Slides 5 & 6)

Slides pertaining to weather conditions, in addition to slides showing average fuel prices, generation on-line fuel mixes, and System Marginal Prices have been combined into a Market Conditions section. (Slides 7-16)

In December, temperatures were mild, thus the sum of Heating and Cooling Degree Days was below its historic average (Slides 8-10).

Energy use was also slightly below its historic average. (Slides 8-10)

In December, uplift did not exceeded $800,000 on any days. (Slides 21 & 22)
• Load-weighted average LMP through December 2018 is $37.83/MWh: (Slides 28-29)
  – December 2018 was $31.03/MWh, which is considerably lower than December 2017 ($40.77/MWh) but in line with December 2016 ($32.57/MWh).

• In June 2017, the calculation of FTR surplus was changed to no longer include Balancing congestion and Market to Market payments. (Slide 45)

• FTR revenue adequacy for the month of December is 97% and the 2018-2019 Planning Year is currently fully funded. (Slides 44-47)

• Congestion remained at relatively low levels in December. (Slide 45)

• Regulation and Synchronized Reserve market costs have generally tracked with energy prices over time. (Slides 60-62)
Markets Report
PJM Wholesale Cost

<table>
<thead>
<tr>
<th>Year</th>
<th>Energy</th>
<th>Reliability Capacity</th>
<th>Transmission</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>$53.13</td>
<td>$8.91</td>
<td>$5.75</td>
<td>$70.37</td>
</tr>
<tr>
<td>2015</td>
<td>$36.25</td>
<td>$9.39</td>
<td>$6.93</td>
<td>$55.89</td>
</tr>
<tr>
<td>2016</td>
<td>$29.27</td>
<td>$8.73</td>
<td>$7.63</td>
<td>$47.49</td>
</tr>
<tr>
<td>2017</td>
<td>$31.06</td>
<td>$8.58</td>
<td>$8.73</td>
<td>$49.64</td>
</tr>
<tr>
<td>2018</td>
<td>$37.83</td>
<td>$11.89</td>
<td>$8.84</td>
<td>$59.96</td>
</tr>
</tbody>
</table>
Market Conditions
• 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, 2017. Averages include load data for all of TO zones in the current RTO footprint.
Historic Average Weather and Energy versus Current Month

- Current Month Total Energy
- Current Month HDD+CDD
- Average Monthly Total Energy
- Average Monthly HDD + CDD

TWh

Dec17 Jan18 Feb18 Mar18 Apr18 May18 Jun18 Jul18 Aug18 Sep18 Oct18 Nov18 Dec18

Heating Degree Days + Cooling Degree Days
Historic Average Weather and Energy versus Current Month - Daily

- Daily Energy as a Percent of the Historic Average for December
- Daily HDD + CDD as a Percent of the Historic Average for December
- Daily Temperature as a Percent of the Historic Average for December

Percent of Daily Average

0% 50% 100% 150% 200% 250%

Daily Difference Between Day-Ahead and Real-Time System Marginal Prices

Positive values represent days when the DA daily average price was higher than RT. Negative values represent days when the DA price was lower.
Monthly Generation by Fuel, Other

'Other' includes Flywheels, Multiple Fuels, Storage, and Other Renewables
'Other' includes Hydro, Oil, Solar, Wind, and Other
Daily Generation by Fuel, Other - December

'Mother' includes Flywheels, Multiple Fuels, Storage, and Other Renewables
Operating Reserve (Uplift)
In December uplift did not exceed $800,000 on any days.

More information on Uplift can be found on PJM’s website at [Drivers of Uplift](http://www.pjm.com).
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

- RTO
- East
- West

$/MWh

DEC16     MAR17     JUN17     AUG17     DEC17     MAR18     JUN18     AUG18     DEC18
Deviations Balancing Operating Reserve Rates
Energy Market

LMP Summary
Fuel Cost Adjusted LMP (Referenced to 1999 Fuel Prices)
LMP Price Posting Suspensions and Reruns

Percentage of Intervals Price Posting Suspended
Percentage of Intervals Rerun prior to Final LMP Posting

Percentage of 5-Minute Intervals

- Dec 16
- Jan 17
- Feb 17
- Mar 17
- Apr 17
- May 17
- Jun 17
- Jul 17
- Aug 17
- Sep 17
- Oct 17
- Nov 17
- Dec 17
- Jan 18
- Feb 18
- Mar 18
- Apr 18
- May 18
- Jun 18
- Jul 18
- Aug 18
- Sep 18
- Oct 18
- Nov 18
- Dec 18
Energy Market

Demand Response Summary
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

DEC16 MAR17 JUN17 AUG17 DEC17 MAR18 JUN18 AUG18 DEC18

1,500 1,800 2,100 2,400 2,700 3,000
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 (INCs & DECs) - Total Volume

- Submitted MWh
- Cleared MWh

MWh (Millions)

DEC16 | JAN17 | FEB17 | MAR17 | APR17 | MAY17 | JUN17 | JUL17 | AUG17 | SEP17 | OCT17 | NOV17 | DEC17 | JUN18 | JUL18 | AUG18 | SEP18 | OCT18 | NOV18 | DEC18
Up-To-Congestion Transactions - Total Volume

MWh (Millions)

- Submitted MWh
- Cleared MWh

Dec 16: 100
Jan 17: 150
Feb 17: 120
Mar 17: 80
Apr 17: 100
May 17: 80
Jun 17: 60
Jul 17: 40
Aug 17: 20
Sep 17: 0
Oct 17: 0
Nov 17: 0
Dec 17: 0
Jan 18: 0
Feb 18: 0
Mar 18: 0
Apr 18: 0
May 18: 0
Jun 18: 0
Jul 18: 0
Aug 18: 0
Sep 18: 0
Oct 18: 0
Nov 18: 0
Dec 18: 0
INCs, DECs and Up-To-Congestion Transactions - Total Number
INCs, DECs and Up-To-Congestion Transactions - Total Volume

- Submitted MWh
- Cleared MWh
Energy Market

Congestion and FTR Summary
<table>
<thead>
<tr>
<th>Period</th>
<th>Surplus / Underfunding</th>
<th>Payout Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>December, 2018</td>
<td>$-2,052,012</td>
<td>97%</td>
</tr>
<tr>
<td>2018</td>
<td>$320,058,421</td>
<td>100%</td>
</tr>
<tr>
<td>2018/2019</td>
<td>$31,876,980</td>
<td>100%</td>
</tr>
</tbody>
</table>
FTR Revenue vs. FTR Target Allocation

$ Millions

Total FTR Revenues
Total FTR Targets

DEC16 JAN17 FEB17 MAR17 APR17 MAY17 JUN17 JUL17 AUG17 SEP17 OCT17 NOV17 DEC17 JAN18 FEB18 MAR18 APR18 MAY18 JUN18 JUL18 AUG18 SEP18 OCT18 NOV18 DEC18

$0 $100 $200 $300 $400 $500 $600
Ten Most Heavily Congested Transmission Facilities - Overall, December

The ten most heavily congested facilities account for 52% of total congestion for December.
Ten Most Heavily Congested Transmission Facilities - Overall, 2018

The ten most heavily congested facilities account for 40% of total congestion for 2018.

AEP-DOM Interface (EHV)
Cloverdale 765/345 T.10 (AEP AP)
Miami Fort-Tanners Creek 345 (AEP IM-DEOK)
Graceton-Safe Harbor 230 (BGE)
50045005 Interface (EHV)
Batesville-Hubble 138 (MISO)
Conastone-Peach Bottom 500 (EHV)
Greenfield-Lakeview 138 (ATSI)
Ashburn-Pleasant View 230 274D (DOM)
BED-BLA Interface (EHV)
Energy Market

Interchange/Seams Summary
Monthly Average MISO Interface Pricing

$/MWh

- PJM MISO Price (RT)
- MISO PJM Price (RT)
- PJM MISO Price (DA)
- MISO PJM Price (DA)

DEC16  MAR17  JUN17  AUG17  DEC17  MAR18  JUN18  AUG18  DEC18
Monthly Average NYISO Interface Pricing

- PJM NYISO Price (RT)
- NYISO PJM Price (RT)
- PJM NYISO Price (DA)
- NYISO 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 December = $-0.48
Percent of hours in which the direction of flow is consistent with price differentials = 59.01%
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 December = $-1.98
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 December = $1.82
Percent of hours in which the direction of flow is consistent with price differentials = 50.00%
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 December = $0.26
Negative M2M Credit represents PJM payment to MISO.
Negative M2M Credit represents PJM payment to NYISO.
Ancillary Service Market
Summary
Load-Adjusted Synchronized Reserve and Synchronous Condenser Costs

- Synchronized Reserve Market Payments / MWh
- Synchronous Condenser Payments / MWh

Bar chart showing the costs in cents per MWh from December 2016 to December 2018.
DR Participation in PJM Regulation Markets

- Total Payments ($ Millions)
- MWh Cleared (MWh)

$ Millions

MMWh

DEC16 JAN17 FEB17 MAR17 APR17 MAY17 JUN17 JUL17 AUG17 SEP17 OCT17 NOV17 DEC17 JAN18 FEB18 MAR18 APR18 MAY18 JUN18 JUL18 AUG18 SEP18 OCT18 NOV18 DEC18

0 $0.0 $0.2 $0.4 $0.6 0 5,000 10,000 15,000
Regulation Market Daily Prices and Charges

- Total Daily Regulation Charges ($ Millions)
- Minimum Hourly Price ($/MWh)
- Average Hourly Price ($/MWh)
- Maximum Hourly Price ($/MWh)