Market Monitor Report

Members Committee Webinar

November 27, 2017

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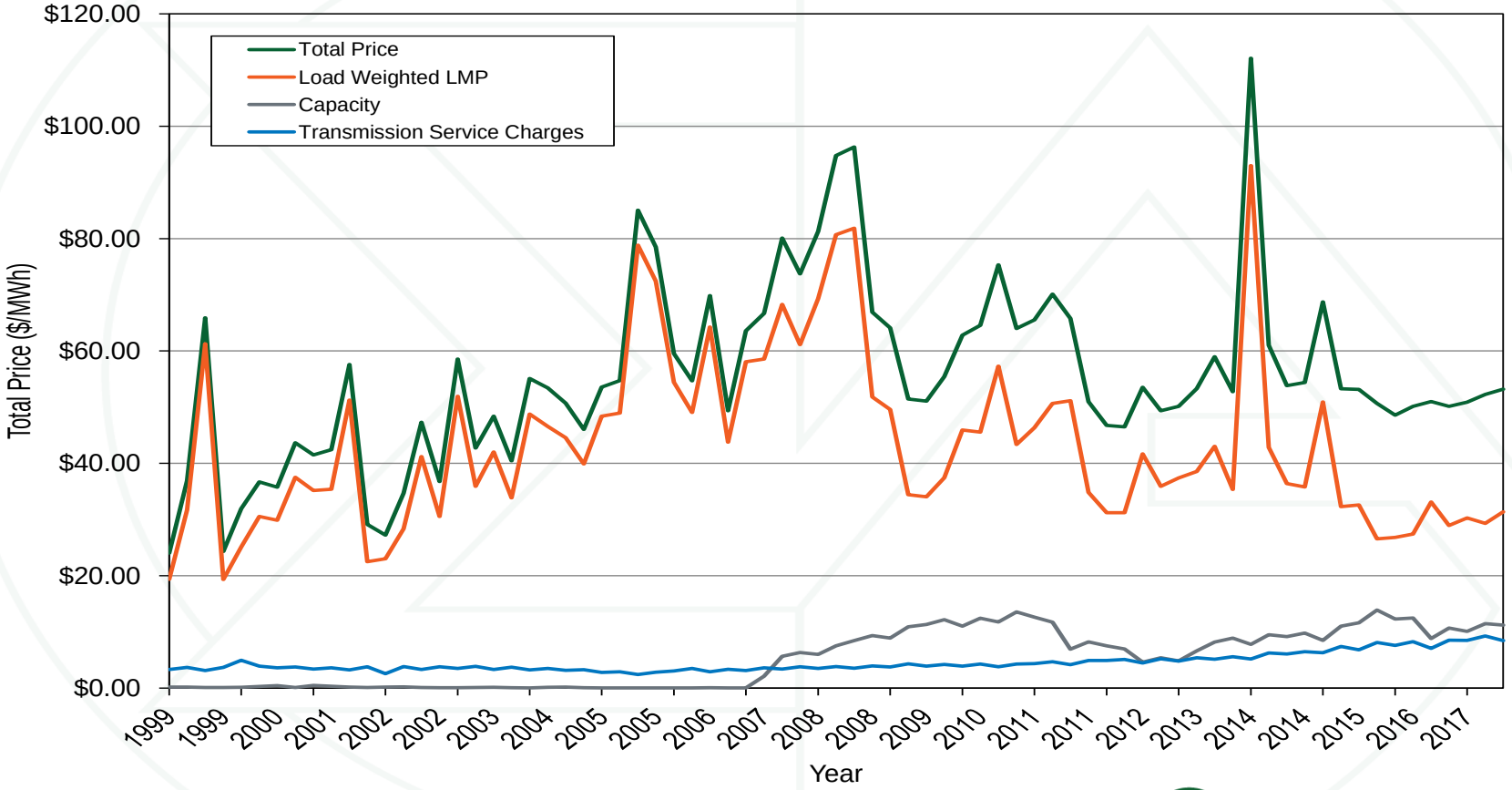
Monitoring Analytics

Total price per MWh

Category	Jan-Sep 2016 $/MWh	Jan-Sep 2016 Percent of Total	Jan-Sep 2017 $/MWh	Jan-Sep 2017 Percent of Total	Percent Change Totals
Load Weighted Energy	$29.32	58.7%	$30.36	58.2%	3.5%
Capacity	$11.05	22.1%	$10.91	20.9%	(1.3%)
Capacity	$11.05	22.1%	$10.91	20.9%	(1.3%)
Capacity (FRR)	$0.00	0.0%	$0.00	0.0%	0.0%
Transmission	$8.20	16.4%	$9.44	18.1%	15.1%
Transmission Service Charges	$7.59	15.2%	$8.71	16.7%	14.7%
Transmission Enhancement Cost Recovery	$0.52	1.0%	$0.63	1.2%	22.6%
Transmission Owner (Schedule 1A)	$0.09	0.2%	$0.10	0.2%	4.3%
Transmission Facility Charges	$0.00	0.0%	$0.00	0.0%	(100.0%)
Ancillary	$0.72	1.5%	$0.78	1.5%	8.1%
Reactive	$0.37	0.7%	$0.44	0.8%	17.3%
Regulation	$0.11	0.2%	$0.13	0.2%	16.3%
Black Start	$0.08	0.2%	$0.09	0.2%	8.7%
Synchronized Reserves	$0.05	0.1%	$0.06	0.1%	11.6%
Non-Synchronized Reserves	$0.01	0.0%	$0.01	0.0%	(15.0%)
Day Ahead Scheduling Reserve (DASR)	$0.10	0.2%	$0.06	0.1%	(37.2%)
Administration	$0.47	0.9%	$0.53	1.0%	12.8%
PJM Administrative Fees	$0.44	0.9%	$0.50	1.0%	13.6%
NERC/RFC	$0.03	0.1%	$0.03	0.1%	1.1%
RTO Startup and Expansion	$0.00	0.0%	$0.00	0.0%	3.3%
Energy Uplift (Operating Reserves)	$0.17	0.3%	$0.13	0.2%	(25.9%)
Demand Response	$0.01	0.0%	$0.01	0.0%	(25.8%)
Load Response	$0.01	0.0%	$0.01	0.0%	(25.8%)
Emergency Load Response	$0.00	0.0%	$0.00	0.0%	0.0%
Emergency Energy	$0.00	0.0%	$0.00	0.0%	0.0%
Total Price	$49.95	100.0%	$52.15	100.0%	4.4%

Top components of quarterly total price



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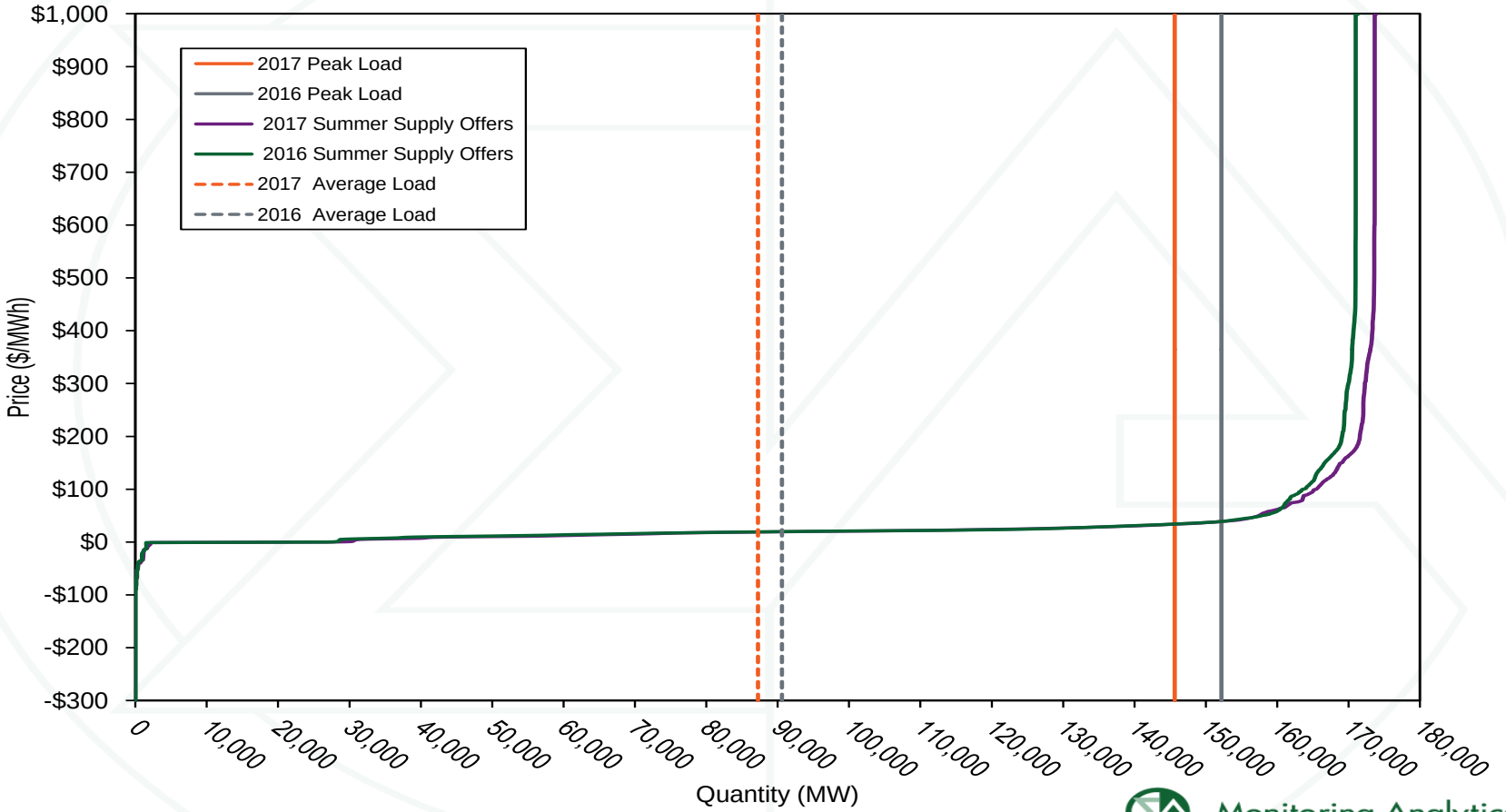
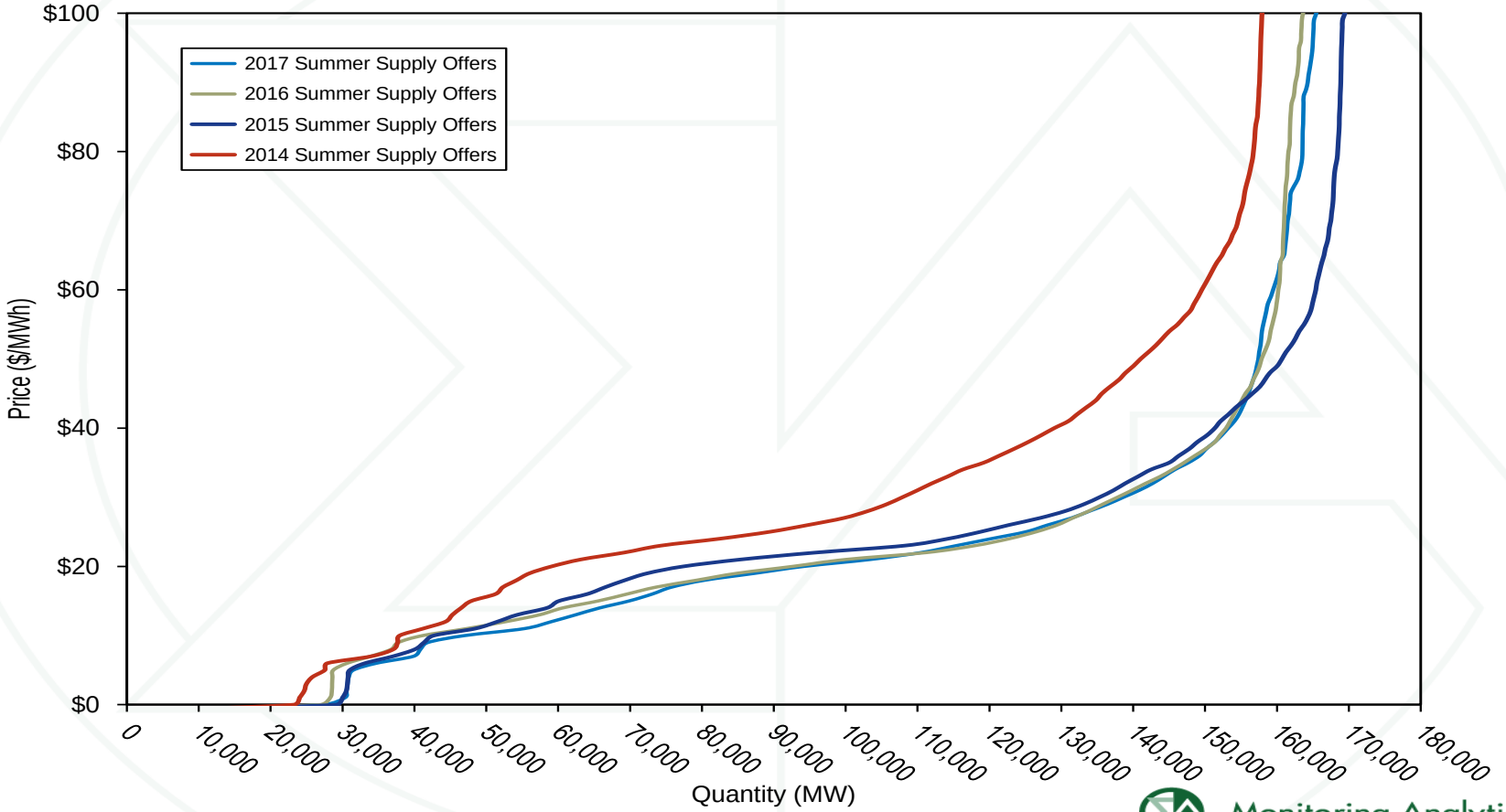
PJM real-time supply curves



Monitoring Analytics

PJM real-time supply curves



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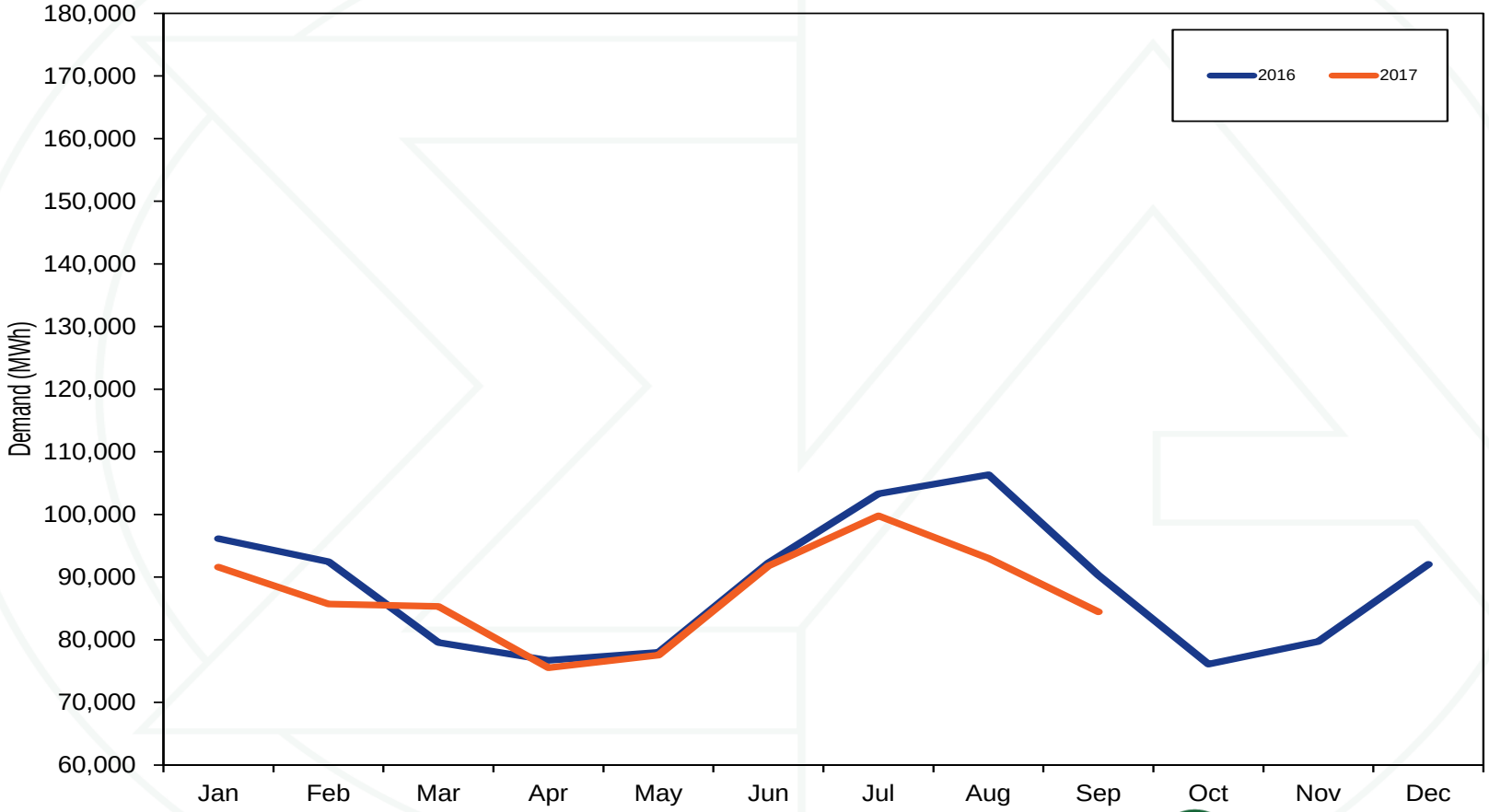
PJM real-time monthly average hourly load



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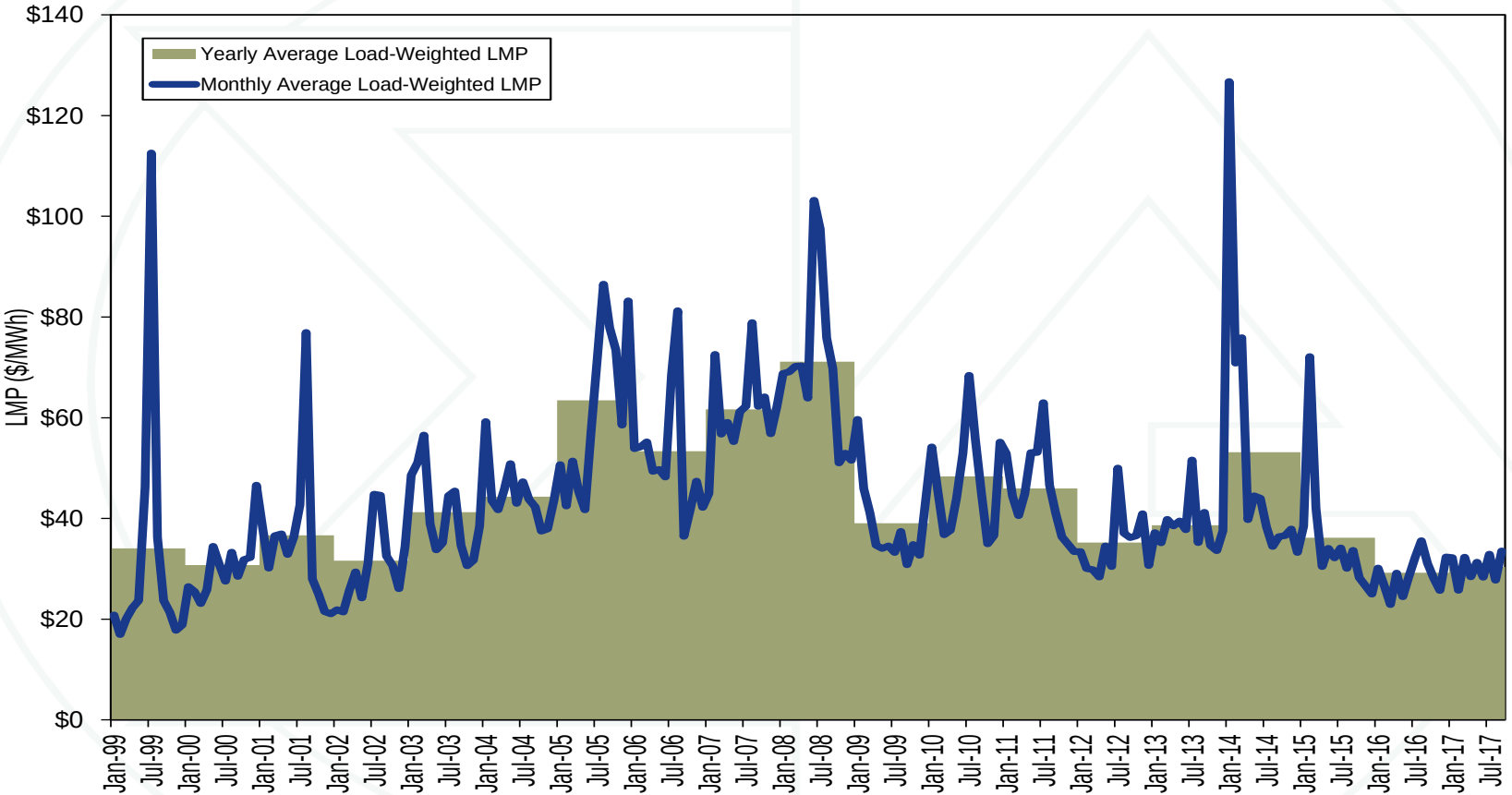
PJM real-time, load-weighted, average LMP



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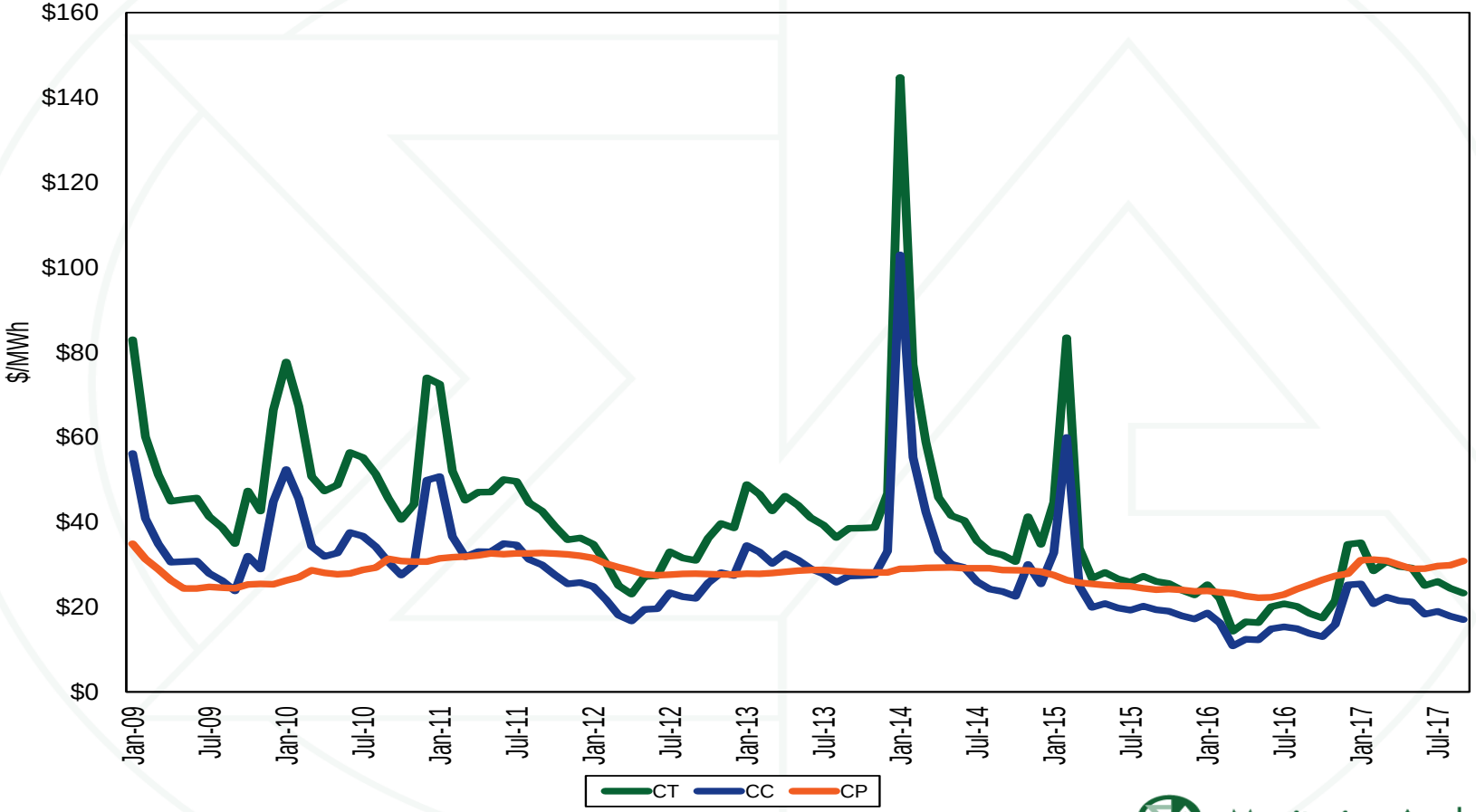
Short run marginal costs



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PJM RT annual average LMP

	2017 Load-Weighted LMP	2017 Fuel-Cost Adjusted, Load-Weighted LMP	Change
Average	$30.36	$23.75	(21.8%)

	2016 Load-Weighted LMP	2017 Fuel-Cost Adjusted, Load-Weighted LMP	Change
Average	$29.32	$23.75	(19.0%)

	2016 Load-Weighted LMP	2017 Load-Weighted LMP	Change
Average	$29.32	$30.36	3.5%

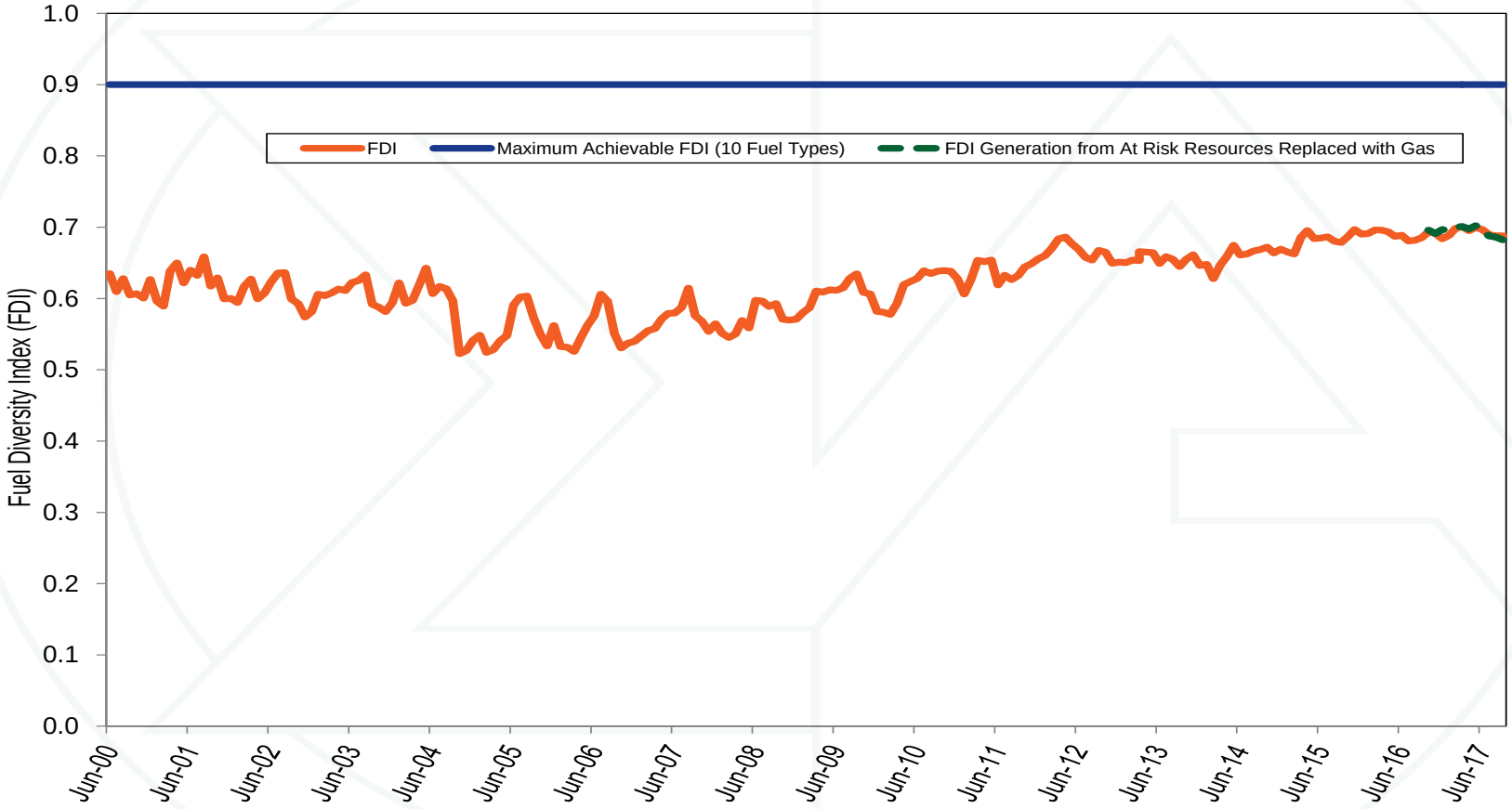
PJM RT load-weighted, average LMP

Jan-Sep	Load-Weighted, Average LMP	Inflation Adjusted Load-Weighted, Average LMP
1998	$26.06	$25.86
1999	$38.65	$37.55
2000	$28.49	$26.82
2001	$40.96	$37.39
2002	$31.95	$28.72
2003	$43.57	$38.33
2004	$46.44	$39.85
2005	$60.44	$50.09
2006	$56.39	$45.16
2007	$61.83	$48.36
2008	$77.27	$57.70
2009	$39.57	$29.93
2010	$49.91	$37.04
2011	$49.48	$35.59
2012	$35.02	$24.68
2013	$39.75	$27.58
2014	$58.60	$40.11
2015	$38.94	$26.60
2016	$29.32	$19.77
2017	$30.36	$20.05

PJM generation by fuel source

Jan - Sep	2016 GWh	2016 Percent	2017 GWh	2017 Percent	Change in Output
Coal	209,032.7	33.8%	195,979.8	32.2%	(6.24%)
Bituminous	183,859.0	29.7%	169,203.3	27.8%	(7.97%)
Sub Bituminous	21,119.7	3.4%	20,884.1	3.4%	(1.12%)
Other Coal	4,054.0	0.7%	5,892.4	1.0%	45.35%
Nuclear	209,893.3	33.9%	215,089.3	35.3%	2.48%
Gas	169,493.9	27.4%	165,018.5	27.1%	(2.64%)
Natural Gas	167,890.0	27.1%	163,207.1	26.8%	(2.79%)
Landfill Gas	1,603.6	0.3%	1,797.0	0.3%	12.06%
Other Gas	0.3	0.0%	14.3	0.0%	4,100.00%
Hydroelectric	10,930.0	1.8%	11,929.1	2.0%	9.14%
Pumped Storage	3,862.2	0.6%	3,989.2	0.7%	3.29%
Run of River	5,782.2	0.9%	6,633.4	1.1%	14.72%
Other Hydro	1,285.6	0.2%	1,306.5	0.2%	1.62%
Wind	11,963.2	1.9%	14,268.3	2.3%	19.27%
Waste	3,089.0	0.5%	2,764.2	0.5%	(10.51%)
Solid Waste	3,089.0	0.5%	2,764.2	0.5%	(10.51%)
Miscellaneous	0.0	0.0%	0.0	0.0%	NA
Oil	1,752.6	0.3%	1,667.7	0.3%	(4.85%)
Heavy Oil	256.1	0.0%	154.5	0.0%	(39.65%)
Light Oil	298.3	0.0%	195.7	0.0%	(34.39%)
Diesel	50.1	0.0%	24.8	0.0%	(50.59%)
Gasoline	0.0	0.0%	0.0	0.0%	NA
Kerosene	68.4	0.0%	1.2	0.0%	(98.28%)
Jet Oil	0.0	0.0%	0.0	0.0%	NA
Other Oil	1,079.7	0.2%	1,291.5	0.2%	19.62%
Solar, Net Energy Metering	799.2	0.1%	1,156.6	0.2%	44.71%
Energy Storage	12.0	0.0%	20.5	0.0%	70.75%
Battery	12.0	0.0%	20.5	0.0%	70.75%
Compressed Air	0.0	0.0%	0.0	0.0%	NA
Biofuel	1,414.3	0.2%	1,342.7	0.2%	(5.07%)
Geothermal	0.0	0.0%	0.0	0.0%	NA
Other Fuel Type	0.0	0.0%	48.2	0.0%	NA
Total	618,380.2	100.0%	609,284.8	100.0%	(1.5%)

Fuel diversity index for PJM generation



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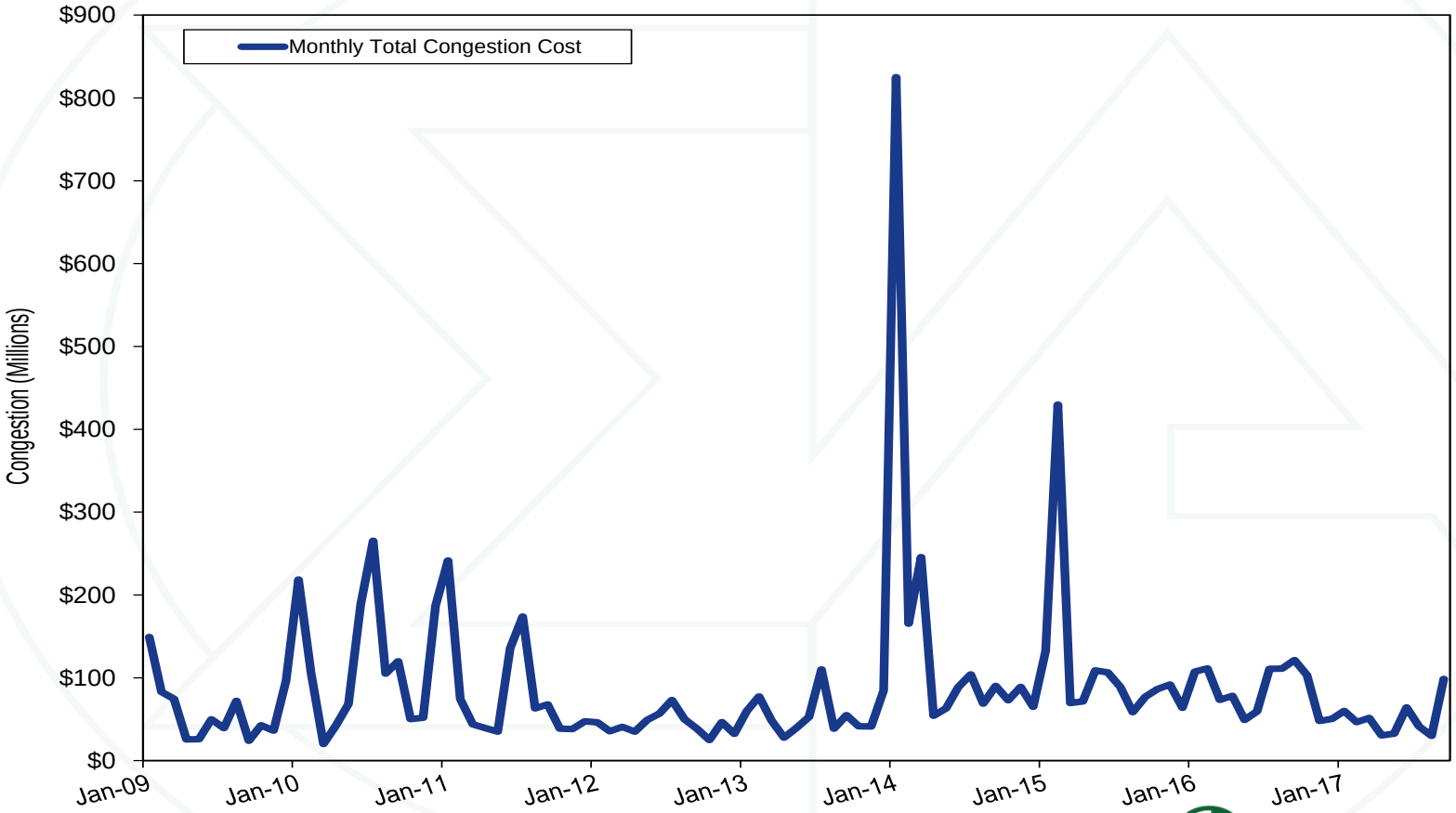
PJM monthly total congestion cost



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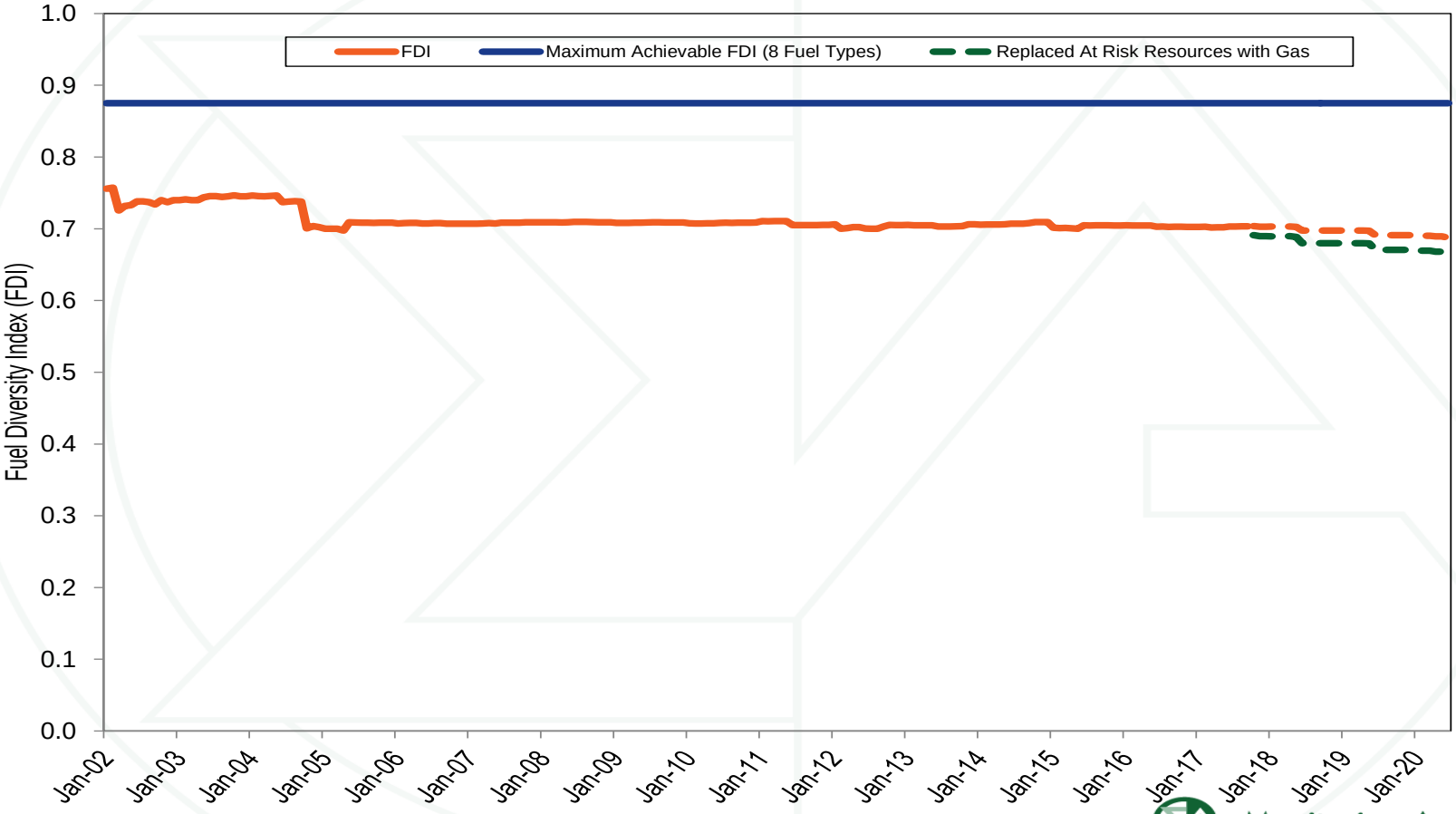
PJM installed capacity (By fuel source)

	1-Jan-17		31-May-17		1-Jun-17		30-Sep-17	
	MW	Percent	MW	Percent	MW	Percent	MW	Percent
Coal	66,622.2	36.5%	66,941.3	36.5%	65,688.0	35.9%	65,111.0	35.7%
Gas	65,110.3	35.7%	65,787.1	35.9%	66,397.6	36.3%	66,335.9	36.4%
Hydroelectric	8,850.4	4.9%	8,850.4	4.8%	8,870.2	4.8%	8,870.2	4.9%
Nuclear	33,043.4	18.1%	33,103.7	18.0%	33,163.5	18.1%	33,163.5	18.2%
Oil	6,733.6	3.7%	6,687.0	3.6%	6,684.4	3.7%	6,683.3	3.7%
Solar	262.3	0.1%	268.0	0.1%	366.8	0.2%	373.2	0.2%
Solid waste	769.4	0.4%	769.4	0.4%	814.4	0.4%	809.4	0.4%
Wind	1,019.1	0.6%	1,079.1	0.6%	1,114.3	0.6%	1,112.7	0.6%
Total	182,410.7	100.0%	183,486.0	100.0%	183,099.2	100.0%	182,459.2	100.0%

Fuel Diversity Index for installed capacity



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Scenario summary: 2020/2021 BRA Revenue

Scenario	Scenario Description	RPM Revenue ($ per Delivery Year)	Scenario Impact RPM Revenue ($ per Delivery Year)	Scenario Impact Percent
0	Actual Results	$6,964,679,748	NA	NA
1	Decrease in the ComEd CETL	$6,879,241,720	$85,438,029	1.2%
2	Impact of CETL Assumptions	$7,195,144,017	($230,464,269)	(3.2%)
3	Impact of Load Forecast	$5,489,678,329	$1,475,001,419	26.9%
4	Inclusion of DR/EE Offers	$8,048,320,630	($1,083,640,882)	(13.5%)
5	Inclusion of EE Offers and EE Add Back	$6,673,183,027	$291,496,721	4.4%
6	Inclusion of Annual DR/EE Offers	$7,937,273,776	($972,594,027)	(12.3%)
7	Inclusion of Seasonal DR/EE Offers	$6,951,735,280	$12,944,468	0.2%
8	Inclusion of Seasonal Products	$6,993,615,290	($28,935,542)	(0.4%)
9	Inclusion of DR/EE and Seasonal Resources	$8,134,983,164	($1,170,303,415)	(14.4%)
10	Inclusion of 50 Percent of Offers from Winter Resources	$6,970,014,319	($5,334,571)	(0.1%)
11	Inclusion of Seasonal Matching Across LDAs	$6,993,516,300	($28,836,552)	(0.4%)
12	Inclusion of 75 Percent of Offers for External Generation	$7,010,987,176	($46,307,427)	(0.7%)
13	Inclusion of 50 Percent of Offers for External Generation	$7,183,521,438	($218,841,690)	(3.0%)
14	Inclusion of 25 Percent of Offers for External Generation	$7,401,236,623	($436,556,875)	(5.9%)
15	Inclusion of DR/EE, Seasonal Capacity, and 25 Percent of Offers from External Generation	$9,127,165,743	($2,162,485,995)	(23.7%)
16	Impact of Adjusting the VRR Curve by EE Add Back Amount that Differs from Cleared EE	$6,802,281,900	$162,397,848	2.4%
17	Inclusion of PRD	$7,103,194,078	($138,514,329)	(2.0%)

Scenario summary: 2020/2021 BRA UCAP

Scenario	Scenario Description	Cleared UCAP (MW)	Scenario Impact Cleared UCAP (MW)	Scenario Impact Percent
0	Actual Results	165,109.2	NA	NA
1	Decrease in the ComEd CETL	164,954.6	154.6	0.1%
2	Impact of CETL Assumptions	165,130.3	(21.1)	0.0%
3	Impact of Load Forecast	154,571.1	10,538.1	6.8%
4	Inclusion of DR/EE Offers	161,737.1	3,372.1	2.1%
5	Inclusion of EE Offers and EE Add Back	162,748.5	2,360.7	1.5%
6	Inclusion of Annual DR/EE Offers	161,997.5	3,111.7	1.9%
7	Inclusion of Seasonal DR/EE Offers	164,928.5	180.7	0.1%
8	Inclusion of Seasonal Products	164,875.4	233.8	0.1%
9	Inclusion of DR/EE and Seasonal Resources	161,689.2	3,420.0	2.1%
10	Inclusion of 50 Percent of Offers from Winter Resources	164,763.3	345.9	0.2%
11	Inclusion of Seasonal Matching Across LDAs	165,122.9	(13.7)	(0.0%)
12	Inclusion of 75 Percent of Offers for External Generation	164,925.2	184.0	0.1%
13	Inclusion of 50 Percent of Offers for External Generation	164,724.4	384.8	0.2%
14	Inclusion of 25 Percent of Offers for External Generation	164,552.6	556.6	0.3%
15	Inclusion of DR/EE, Seasonal Capacity, and 25 Percent of Offers from External Generation	160,748.5	4,360.7	2.7%
16	Impact of Adjusting the VRR Curve by EE Add Back Amount that Differs from Cleared EE	164,429.0	680.2	0.4%
17	Inclusion of PRD	165,701.6	(592.4)	(0.4%)

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