

Market Monitor Report

Members Committee
Webinar

November 27, 2017

Joe Bowring

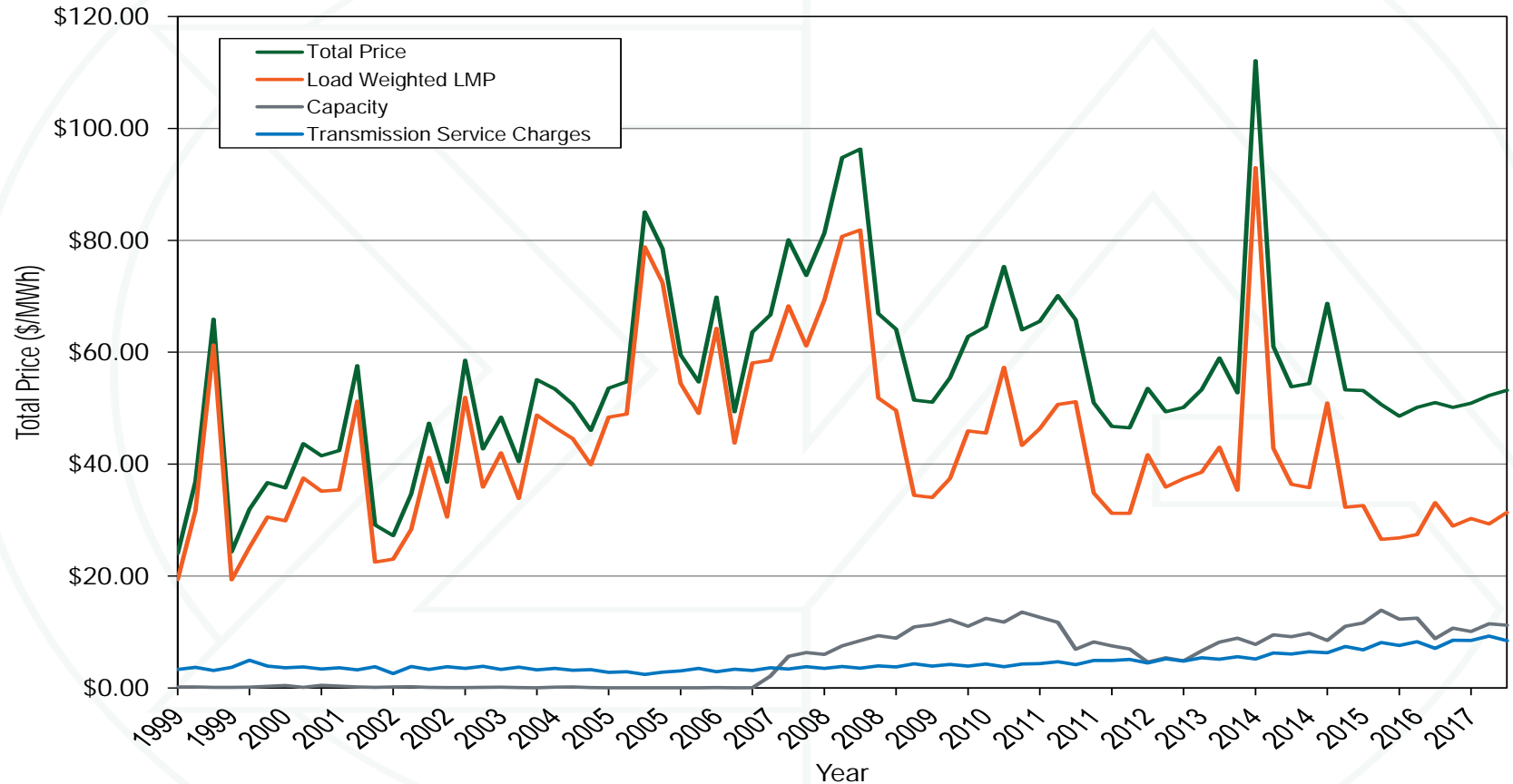


Monitoring Analytics

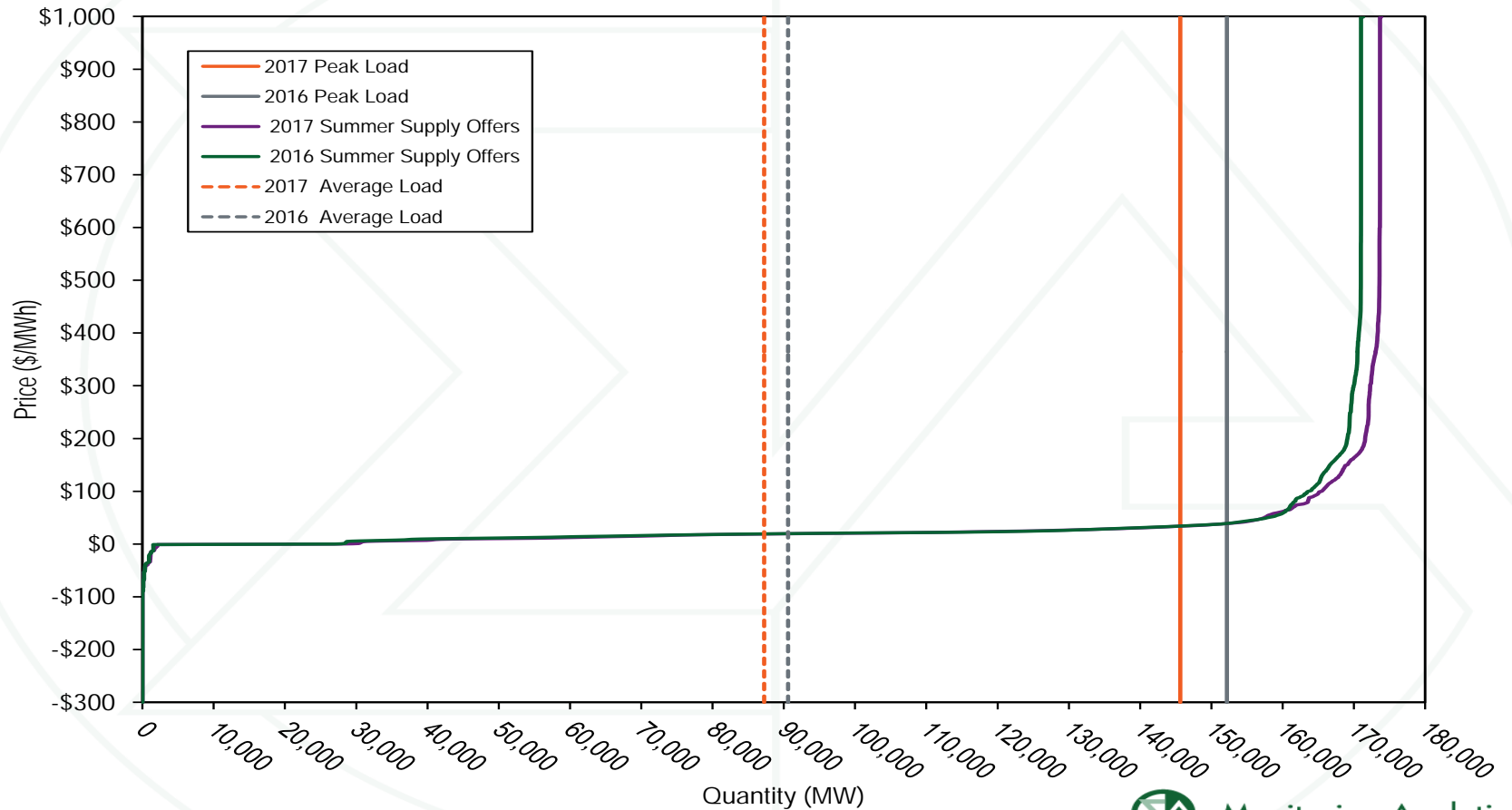
Total price per MWh

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%

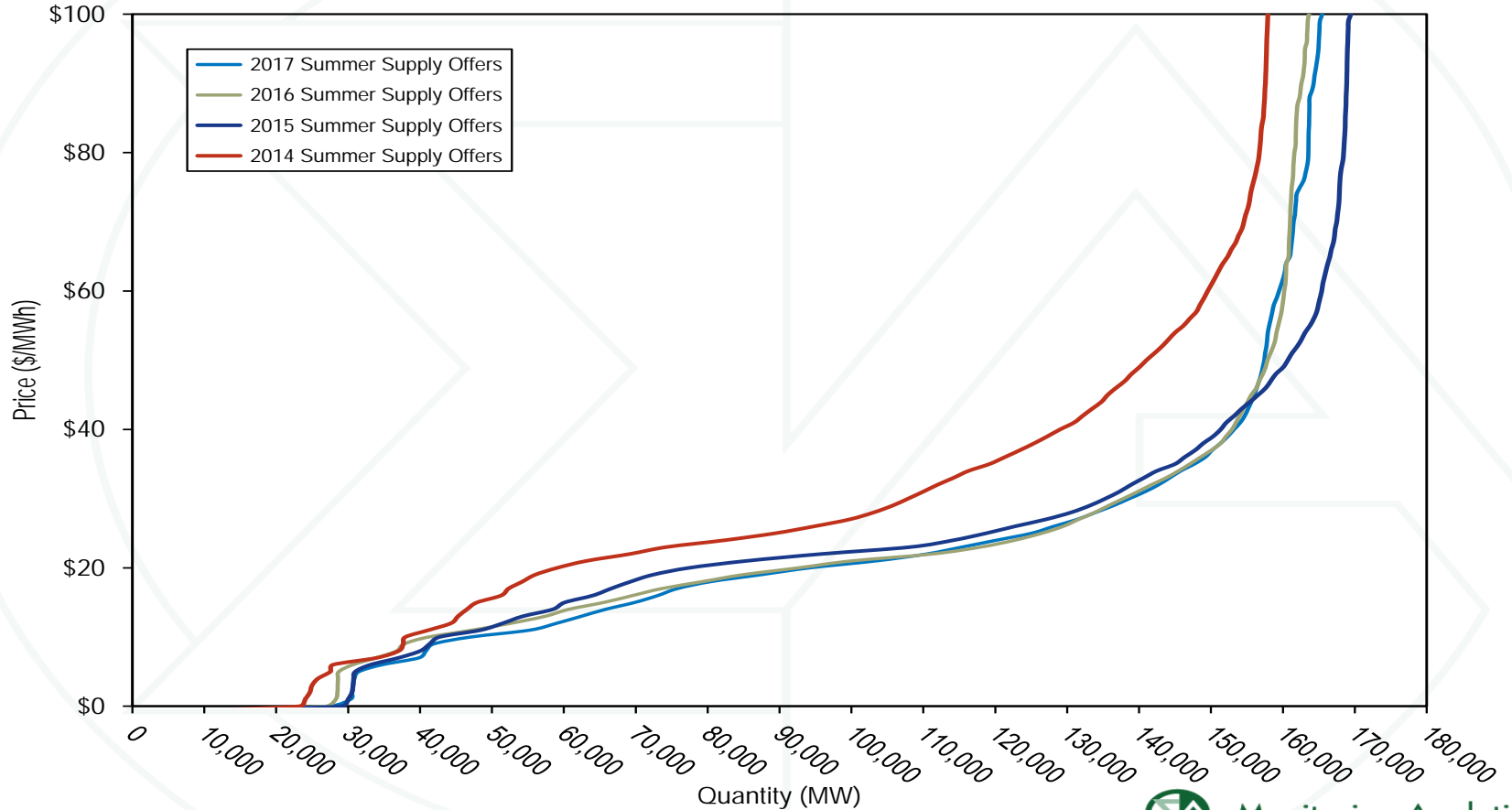
Top components of quarterly total price



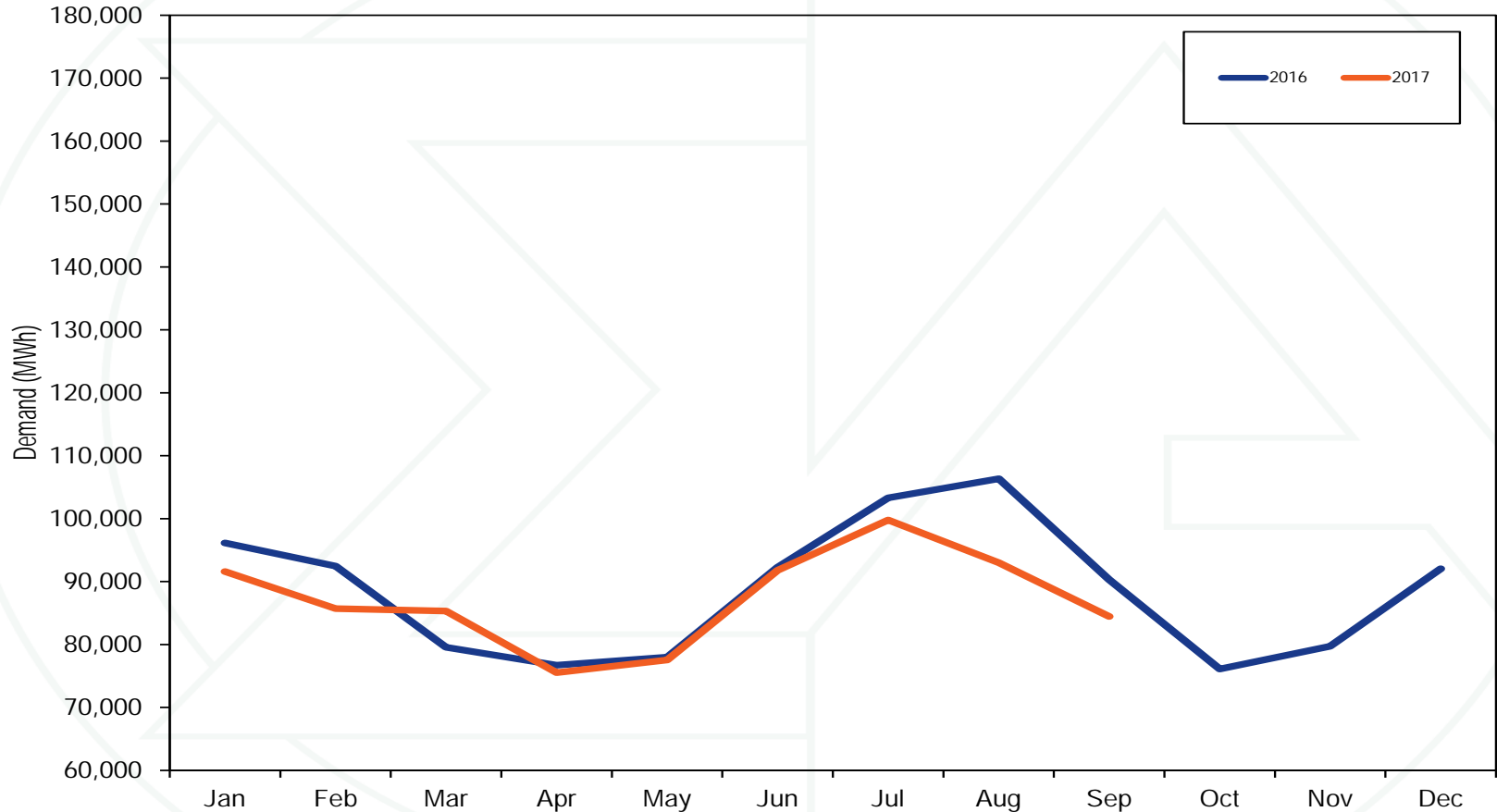
PJM real-time supply curves



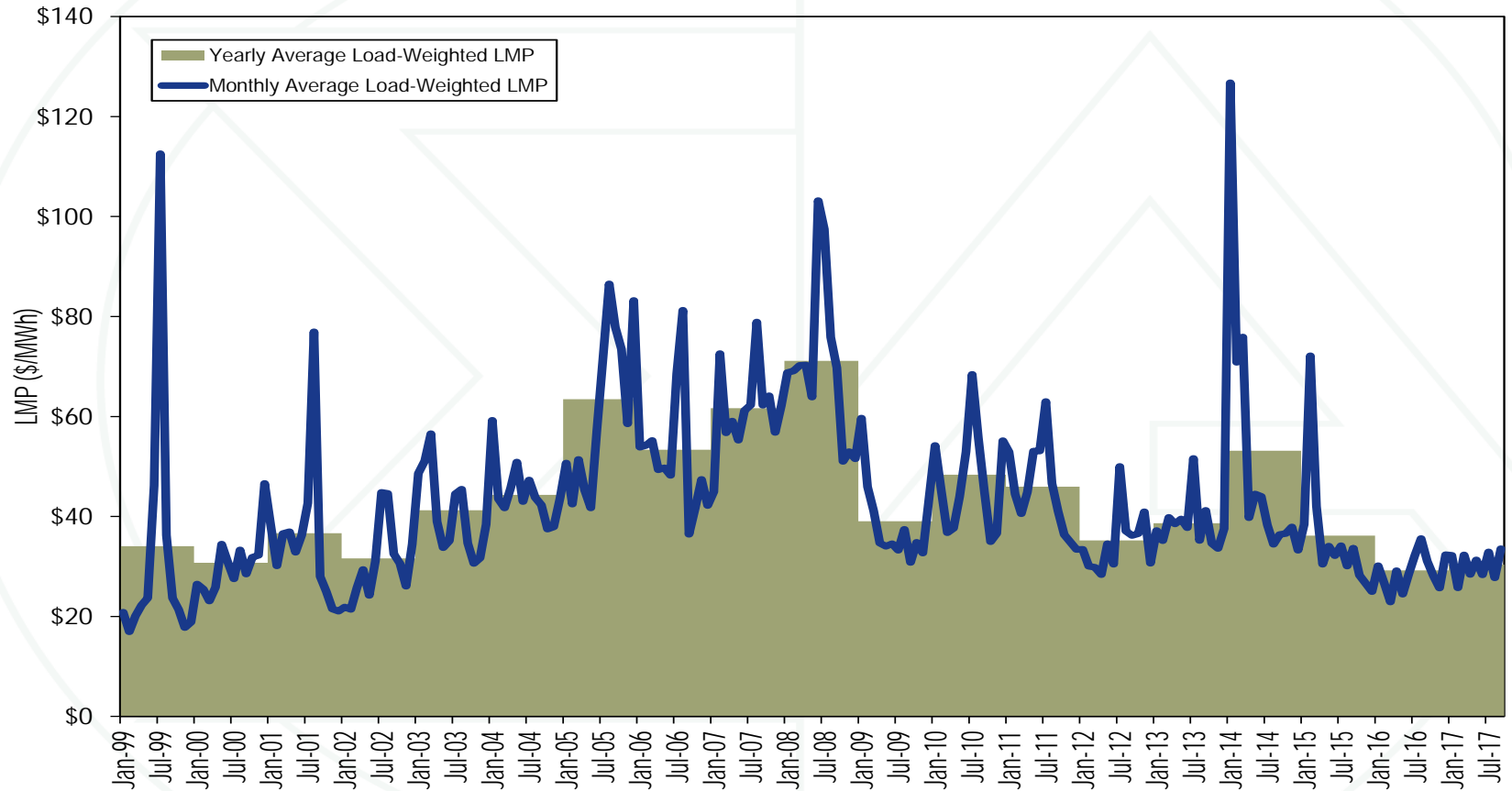
PJM real-time supply curves



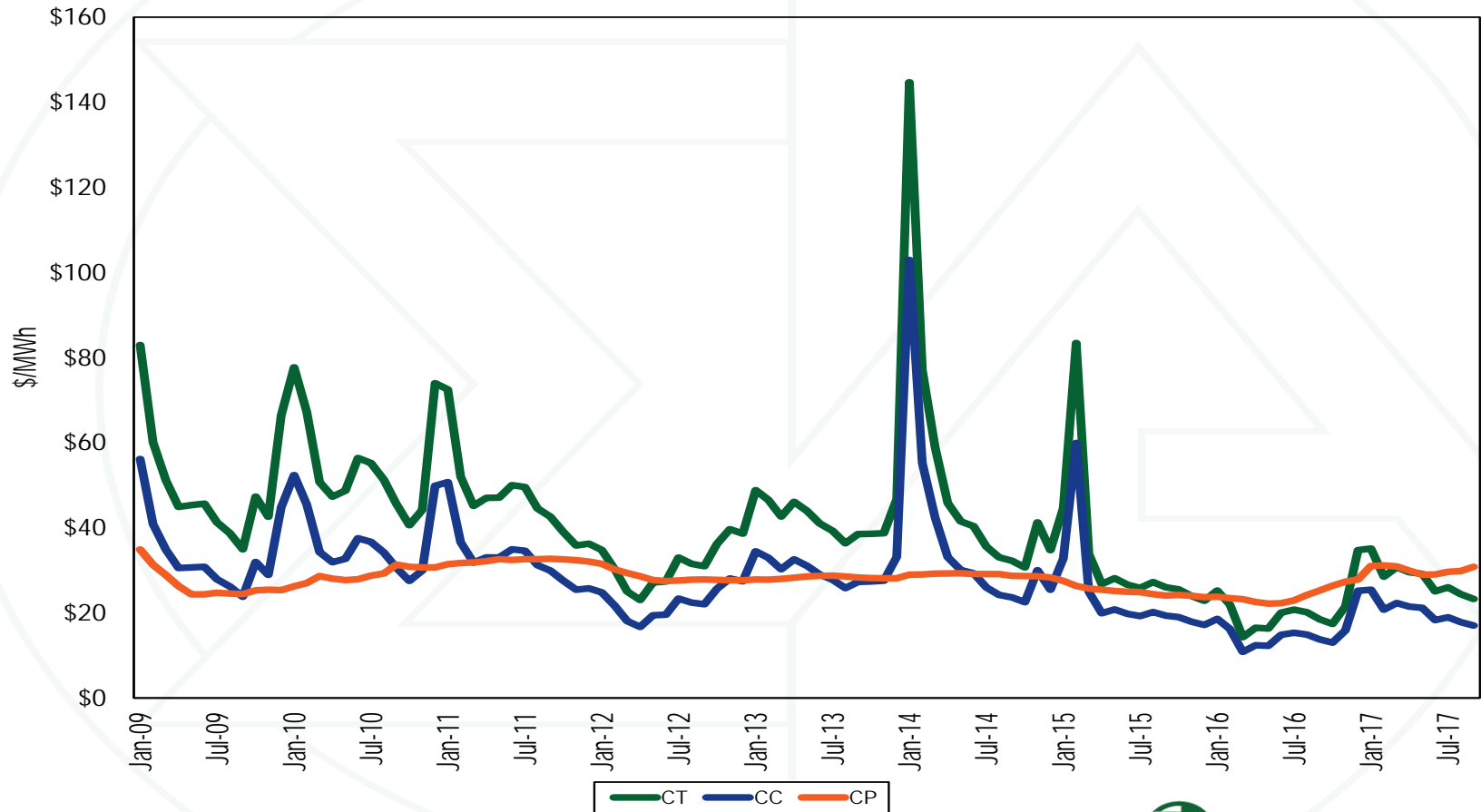
PJM real-time monthly average hourly load



PJM real-time, load-weighted, average LMP



Short run marginal costs



PJM real-time annual, fuel-cost adjusted, load-weighted 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%

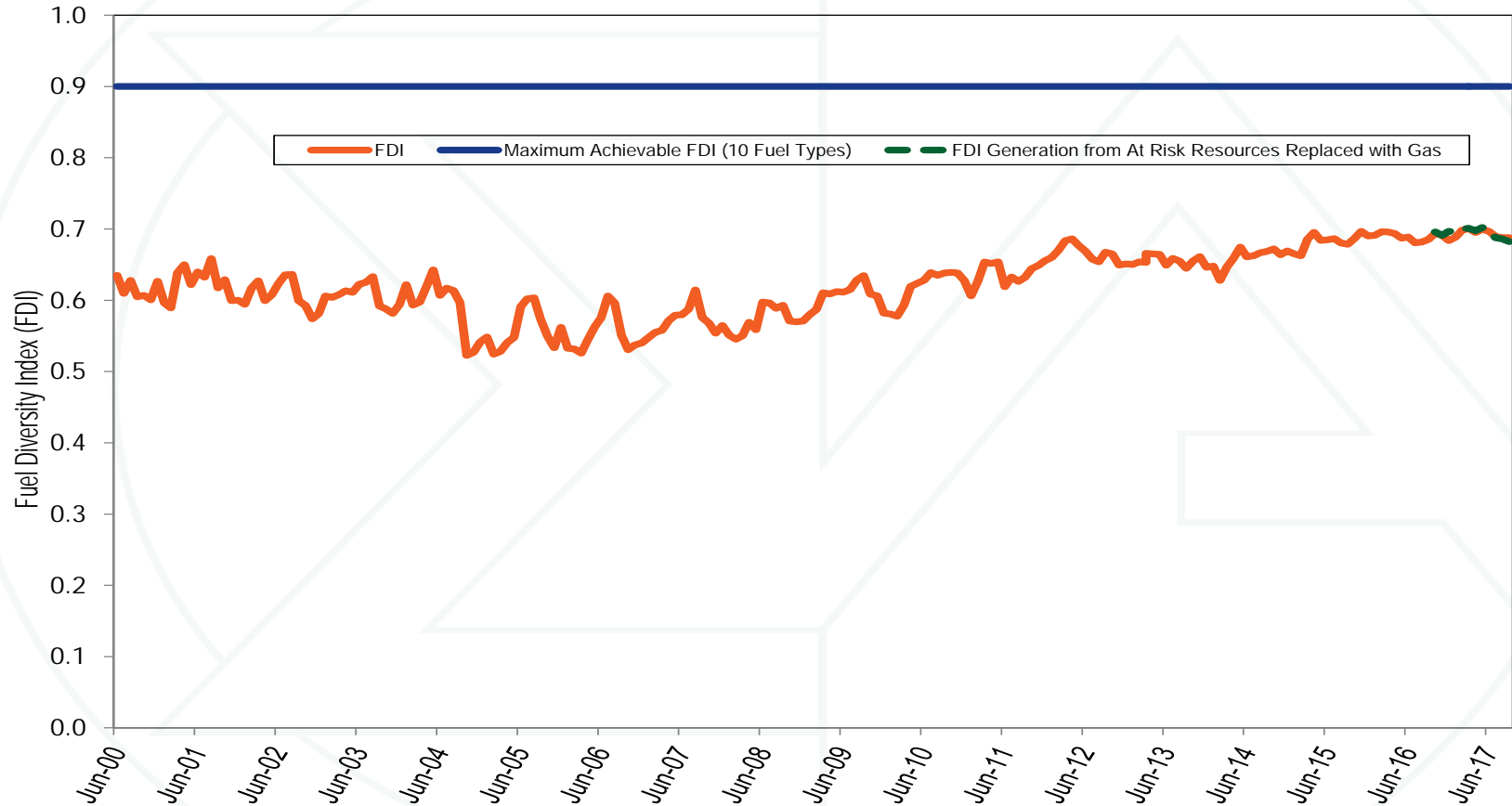
PJM real-time, load-weighted, average LMP : January 1 through September 30, 1998 through 2017

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

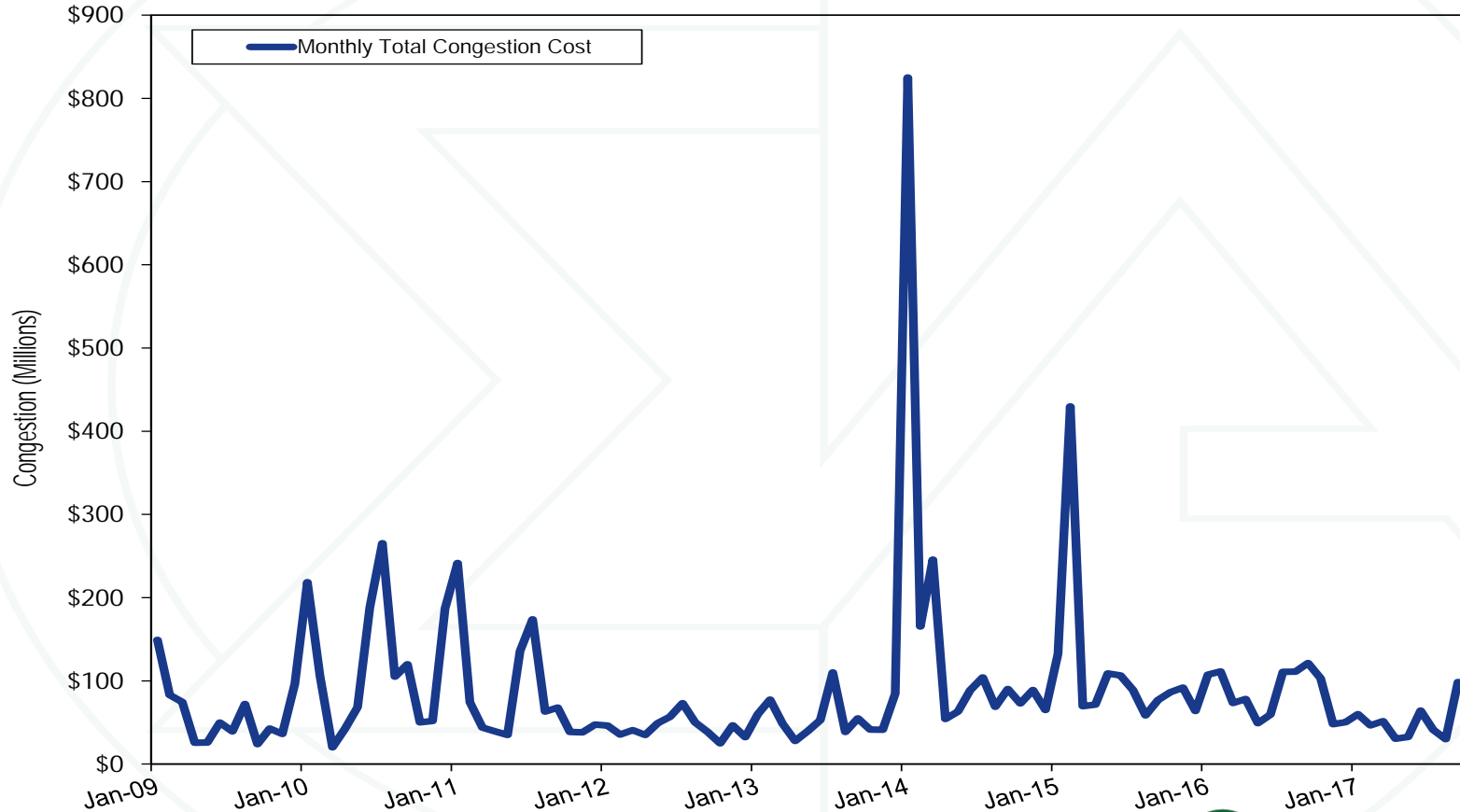
PJM generation by fuel source

	2016		2017		Change in Output	
	Jan - Sep	GWh	Percent	GWh		Percent
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



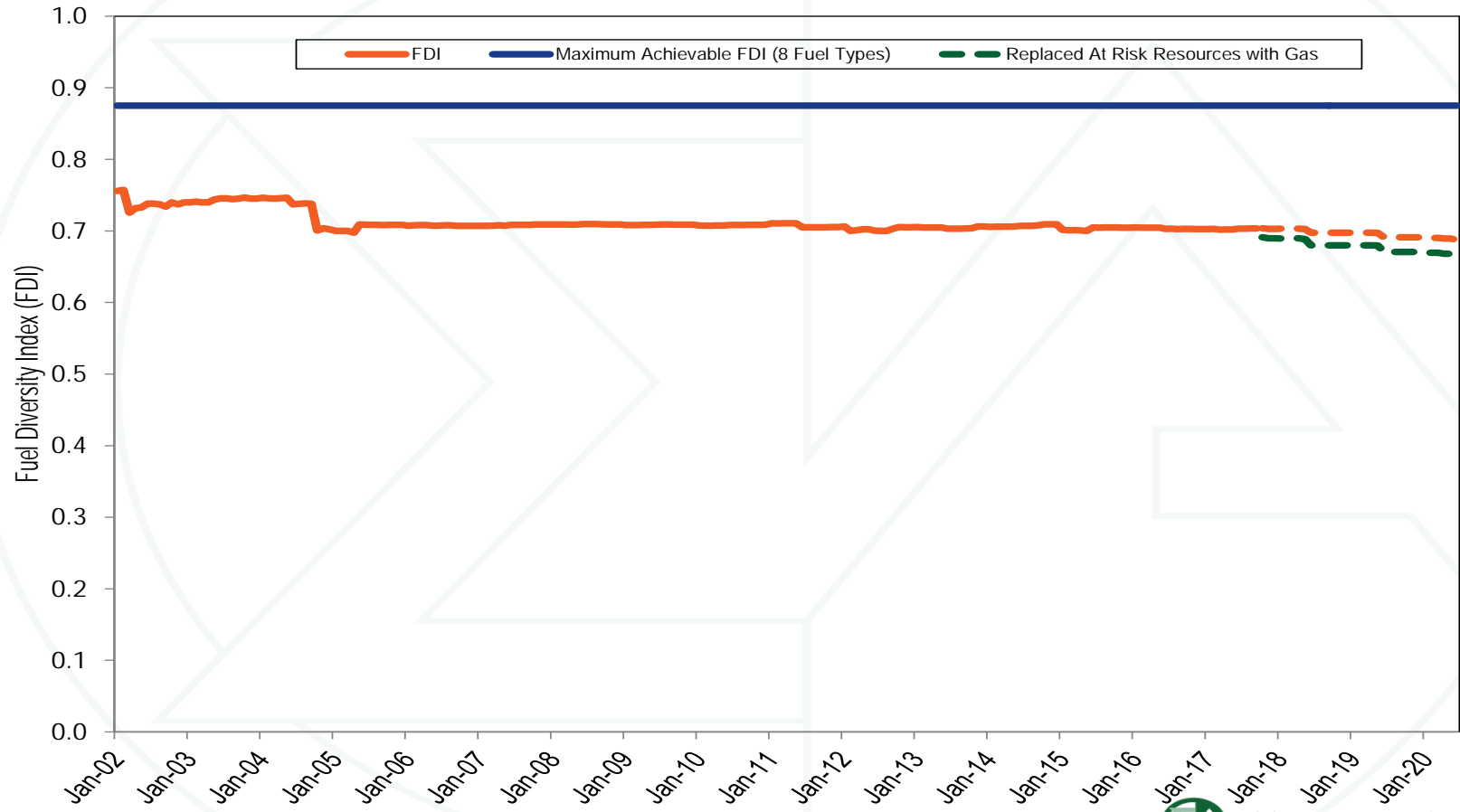
PJM monthly total congestion cost



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



Scenario summary: 2020/2021 BRA Revenue

Scenario	Scenario Description	Scenario Impact		
		RPM Revenue (\$ per Delivery Year)	RPM Revenue (\$ per Delivery Year)	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	Scenario Impact		
		Cleared UCAP (MW)	Cleared UCAP (MW)	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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