

2016 Demand Response Operations Markets Activity Report: February 2016

James McAnany

PJM Demand Side Response Operations

February 16, 2016



This page intentionally left blank

Figure 1: Delivery Year 15/16 Active Participants in PJM Economic and Load Management DR Programs

State	Zone	EDC	Economic Program		Load Management DR		Unique	
			Locations	MW	Locations	MW	Locations	MW
DC	PEPCO	PEPCO	16	20.7	265	112.6	270	113.7
DE	DPL	DEMEC	12	5.7	26	14.4	26	14.4
DE	DPL	DOVDE			8	3.3	8	3.3
DE	DPL	DPL	8	142.3	263	210.5	263	210.5
DE	DPL	ODEC			8	1.1	8	1.1
IL	COMED	BATAV			1	1.0	1	1.0
IL	COMED	COMED	1,620	445.0	2,426	1,635.1	4,002	1,937.4
IL	COMED	IMEAA1			2	49.6	2	49.6
IN	AEP	AEPIMP			127	345.1	127	345.1
IN	AEP	HEREC	1	39.0	1	26.7	1	26.7
IN	AEP	WVPA			68	2.0	68	2.0
IN	AEP	WVSDI			1	55.6	1	55.6
KY	DEOK	DEK			68	35.0	68	35.0
KY	EKPC	EKPC			11	135.8	11	135.8
MD	APS	AETSAP	57	21.7	192	113.6	192	113.6
MD	APS	AETSHG			5	0.8	5	0.8
MD	APS	AETSTH			3	0.3	3	0.3
MD	APS	AETSWP			1	0.1	1	0.1
MD	BGE	BC	69	1,238.2	880	801.1	892	1,503.1
MD	DPL	DPL	1	26.5	206	76.5	206	76.5
MD	DPL	EASTON			8	2.2	8	2.2
MD	DPL	ODEC	1	1.5	19	8.9	19	8.9
MD	PEPCO	PEPCO	8	279.6	405	427.7	406	427.8
MD	PEPCO	SMECO	6	1.7	109	54.7	109	54.7
NJ	AECO	AE	12	56.3	277	132.2	277	132.2
NJ	AECO	VMEU			25	5.8	25	5.8
NJ	JCPL	AECI			1	0.2	1	0.2
NJ	JCPL	BSHNJ	1	3.0	1	2.2	1	2.2
NJ	JCPL	JCBGS	15	58.8	494	180.1	498	230.6
NJ	PSEG	PSEG	22	54.3	1,146	392.0	1,151	413.7
NJ	RECO	RECO			21	7.2	21	7.2
NY	PENELEC	PaElec			2	1.5	2	1.5
OH	AEP	AEPOPT	16	159.6	975	705.8	977	711.2
OH	AEP	AMPO			47	110.1	47	110.1
OH	AEP	BUCK			2	20.2	2	20.2
OH	ATSI	AMPO			35	165.6	35	165.6
OH	ATSI	BUCK			2	5.5	2	5.5
OH	ATSI	CPP	1	0.9	18	42.4	18	42.4
OH	ATSI	OEEDC	53	118.1	1,186	825.6	1,224	876.2
OH	DAY	AMPO			16	37.1	16	37.1
OH	DAY	BUCK			2	4.1	2	4.1
OH	DAY	DAYEDC	6	6.8	231	152.2	231	152.2
OH	DEOK	AMPO			5	7.7	5	7.7
OH	DEOK	BUCK			2	2.0	2	2.0
OH	DEOK	DEOHIO	13	88.1	456	280.7	456	280.7
PA	APS	AECI			4	0.3	4	0.3

State	Zone	EDC	Economic Program		Load Management DR		Unique	
			Locations	MW	Locations	MW	Locations	MW
PA	APS	AETSAP	10	130.8	673	425.1	675	432.4
PA	APS	CHBDTE			5	2.7	5	2.7
PA	ATSI	PAPWR	2	0.6	99	77.2	99	77.2
PA	DUQ	DLCO	4	17.2	378	184.3	379	199.3
PA	METED	AECI			1	1.6	1	1.6
PA	METED	MetEd	35	51.7	535	281.7	536	284.7
PA	PECO	PE	128	95.2	1,474	492.9	1,481	504.7
PA	PENELEC	AECI			28	14.3	28	14.3
PA	PENELEC	PaElec	4	11.9	624	282.9	625	289.9
PA	PENELEC	WELLSB			1	1.5	1	1.5
PA	PPL	AMPO			11	2.4	11	2.4
PA	PPL	CTZECL			5	1.7	5	1.7
PA	PPL	PPL	257	181.4	1,520	796.1	1,538	880.3
PA	PPL	UGI-UI			14	7.5	14	7.5
TN	AEP	AEPAPT	1	30.0	10	3.1	11	33.1
VA	AEP	AEPAPT	1	0.1	243	233.0	243	233.0
VA	AEP	AMPO			18	14.3	18	14.3
VA	AEP	RADFRD			1	2.0	1	2.0
VA	AEP	SALEM			1	0.1	1	0.1
VA	AEP	VATECH			1	6.3	1	6.3
VA	APS	ODEC			42	35.2	42	35.2
VA	DOM	CVEC			6	4.5	6	4.5
VA	DOM	DOMEDC	33	53.1	1,134	780.7	1,135	791.7
VA	DOM	DOMVME			22	95.6	22	95.6
VA	DOM	NVEC	2	14.6	57	35.8	59	50.4
VA	DOM	ODEC	2	50.2	44	63.1	44	63.1
VA	DPL	ODEC			14	8.6	14	8.6
WV	AEP	AEPAPT	2	4.3	363	364.9	363	364.9
WV	AEP	APWVP			4	0.3	4	0.3
WV	APS	AETSAP	132	53.7	341	221.8	342	231.8
Total			2,551	3,463	17,720	11,635	19,398	12,963

Note:

- 1) Data as of 2/9/2016.
- 2) Load Management MW are in ICAP.
- 3) Economic MW are CSP reported Load Reduction values.
- 4) Residential Load Control (DLC) reported as one location not a total number of end use customers in that program.
- 5) Unique MW: represents total estimated demand reduction assuming full DR compliance and economic reductions.
- 6) As of February 9, 2016, DY15/16 RPM Committed value is 10,926 MW.
- 7) No Emergency Energy Only registrations to report.

Figure 2: Delivery Year 15/16 MWs in PJM Load Management DR by Resource, Product, and Lead Times

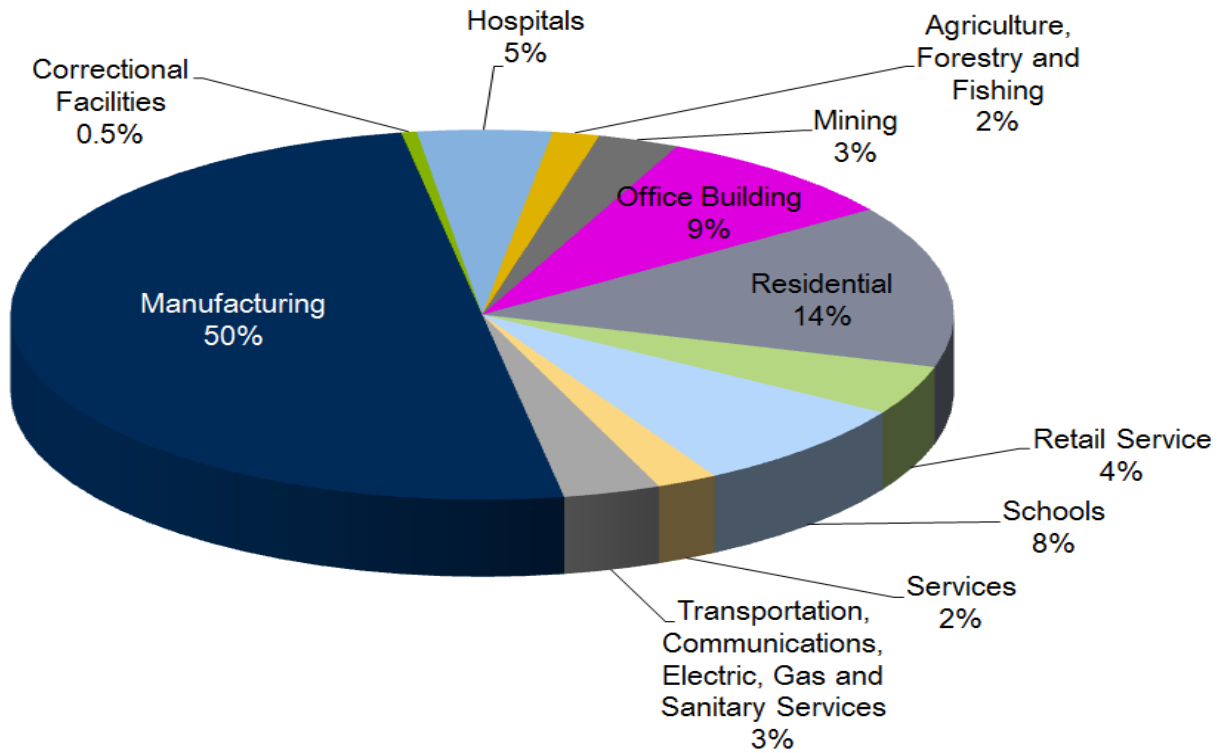
Zone		Product			Lead Times (minutes)			Total MW	Committed MWs
		Limited	Extended	Annual	30	60	120		
AECO									
	Pre-Emergency	59.5	77.5	0.0	122.5	6.2	8.3	137.0	
	Emergency	1.0	0.0	0.0	1.0	0.0	0.0	1.0	
	Total	60.4	77.5	0.0	123.5	6.2	8.3	138.0	130.5
AEP									
	Pre-Emergency	1,522.5	62.4	82.4	960.0	37.0	670.4	1,667.4	
	Emergency	199.8	22.5	0.0	148.6	13.5	60.2	222.3	
	Total	1,722.3	84.9	82.4	1,108.5	50.5	730.6	1,889.6	1,733.3
APS									
	Pre-Emergency	512.1	180.4	12.7	311.9	20.4	372.9	705.2	
	Emergency	88.5	6.2	0.0	71.8	0.4	22.5	94.7	
	Total	600.6	186.6	12.7	383.7	20.8	395.4	799.9	746.1
ATSI									
	Pre-Emergency	509.9	311.5	45.4	400.6	53.1	413.2	866.9	
	Emergency	58.2	182.5	8.8	168.3	8.8	72.3	249.5	
	Total	568.1	494.1	54.2	568.9	62.0	485.5	1,116.4	1,046.2
BGE									
	Pre-Emergency	648.0	44.8	3.8	650.3	10.2	36.0	696.5	
	Emergency	81.6	20.5	2.5	60.4	2.9	41.4	104.6	
	Total	729.6	65.2	6.3	710.6	13.1	77.4	801.1	759.8
COMED									
	Pre-Emergency	821.1	426.7	16.0	972.1	31.8	259.8	1,263.7	
	Emergency	307.8	114.2	0.0	274.9	14.8	132.3	422.0	
	Total	1,128.9	540.9	16.0	1,247.1	46.7	392.0	1,685.8	1,605.3
DAY									
	Pre-Emergency	139.1	13.5	16.6	114.2	0.5	54.4	169.1	
	Emergency	23.2	1.1	0.0	20.1	0.0	4.2	24.3	
	Total	162.3	14.5	16.6	134.3	0.5	58.6	193.4	174.8
DEOK									
	Pre-Emergency	170.2	99.0	0.0	86.4	74.8	108.1	269.3	
	Emergency	54.7	1.6	0.0	30.6	8.7	17.0	56.2	
	Total	224.9	100.6	0.0	116.9	83.5	125.1	325.5	305.9
DOM									
	Pre-Emergency	492.5	29.6	56.8	332.9	35.8	210.2	579.0	
	Emergency	337.7	63.0	0.0	240.3	63.7	96.8	400.8	
	Total	830.2	92.7	56.8	573.2	99.5	307.0	979.7	886.8
DPL									
	Pre-Emergency	192.6	105.1	0.0	182.9	1.3	113.5	297.8	
	Emergency	23.6	4.2	0.0	14.5	2.9	10.4	27.8	
	Total	216.2	109.3	0.0	197.4	4.2	123.9	325.6	295.0
DUQ									
	Pre-Emergency	127.0	32.5	1.1	71.3	7.2	82.2	160.6	
	Emergency	21.4	2.2	0.0	11.9	0.0	11.7	23.6	
	Total	148.5	34.7	1.1	83.1	7.2	93.9	184.3	170.6
EKPC									
	Pre-Emergency	133.3	0.0	0.0	19.1	6.1	108.1	133.3	
	Emergency	2.5	0.0	0.0	2.5	0.0	0.0	2.5	
	Total	135.8	0.0	0.0	21.6	6.1	108.1	135.8	132.4



Zone		Limited	Product Extended	Annual	Lead Times (minutes)			Total MW	Committed MWs
					30	60	120		
JCPL									
	Pre-Emergency	121.6	47.2	0.0	118.4	18.3	32.1	168.7	
	Emergency	11.0	2.8	0.0	13.6	0.0	0.2	13.8	
	Total	132.6	50.0	0.0	132.0	18.3	32.3	182.5	173.1
METED									
	Pre-Emergency	157.4	73.9	0.0	135.6	19.7	75.9	231.3	
	Emergency	40.5	11.6	0.0	30.6	10.1	11.3	52.0	
	Total	197.8	85.4	0.0	166.2	29.8	87.3	283.3	272.4
PECO									
	Pre-Emergency	233.1	127.1	0.0	259.5	58.5	42.3	360.3	
	Emergency	96.8	35.8	0.0	87.5	7.7	37.5	132.6	
	Total	329.9	163.0	0.0	346.9	66.1	79.8	492.9	479.3
PENELEC									
	Pre-Emergency	185.5	62.1	0.0	117.9	8.1	121.6	247.6	
	Emergency	50.5	2.1	0.0	23.3	0.4	28.9	52.6	
	Total	236.0	64.2	0.0	141.1	8.6	150.5	300.2	286.7
PEPCO									
	Pre-Emergency	326.0	219.8	0.0	370.0	0.6	175.2	545.7	
	Emergency	45.4	3.9	0.0	26.6	7.2	15.5	49.3	
	Total	371.4	223.7	0.0	396.6	7.8	190.7	595.1	535.7
PPL									
	Pre-Emergency	459.2	245.2	0.2	436.3	32.0	236.2	704.5	
	Emergency	92.4	10.8	0.0	63.6	6.7	32.8	103.2	
	Total	551.5	256.0	0.2	499.9	38.8	269.1	807.7	774.3
PSEG									
	Pre-Emergency	233.9	109.5	8.3	303.7	9.6	38.3	351.6	
	Emergency	12.5	6.3	21.6	31.1	4.0	5.2	40.4	
	Total	246.4	115.8	29.8	334.8	13.7	43.5	392.0	410.6
RECO									
	Pre-Emergency	6.5	0.1	0.0	6.3	0.0	0.3	6.6	
	Emergency	0.6	0.0	0.0	0.6	0.0	0.0	0.6	
	Total	7.1	0.1	0.0	6.9	0.0	0.3	7.2	7.0
TOTAL									
	Pre-Emergency	7,050.9	2,267.8	243.3	5,971.8	431.3	3,158.9	9,562.0	
	Emergency	1,549.7	491.3	32.8	1,321.5	151.9	600.4	2,073.8	
	Total	8,600.5	2,759.2	276.1	7,293.3	583.2	3,759.3	11,635.8	10,925.8

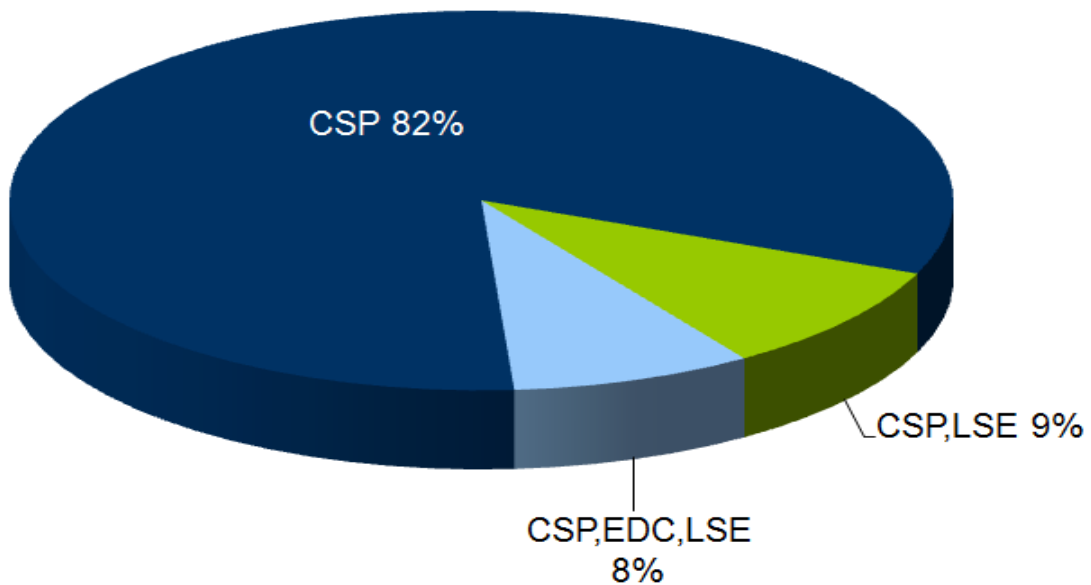
Note: MWs are Nominated Capacity (MWs)

Figure 3: DY 15/16 Confirmed Load Management DR Registrations Business Segments



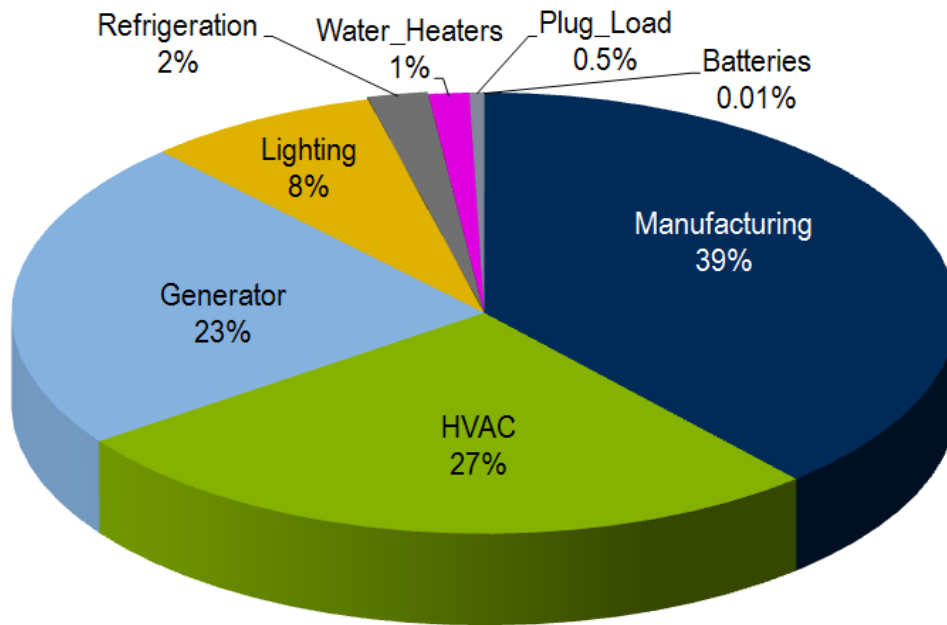
Note: Percent of Nominated Capacity (MWs)

Figure 4: DY 15/16 Confirmed Load Management DR Registrations Owner/Company Type



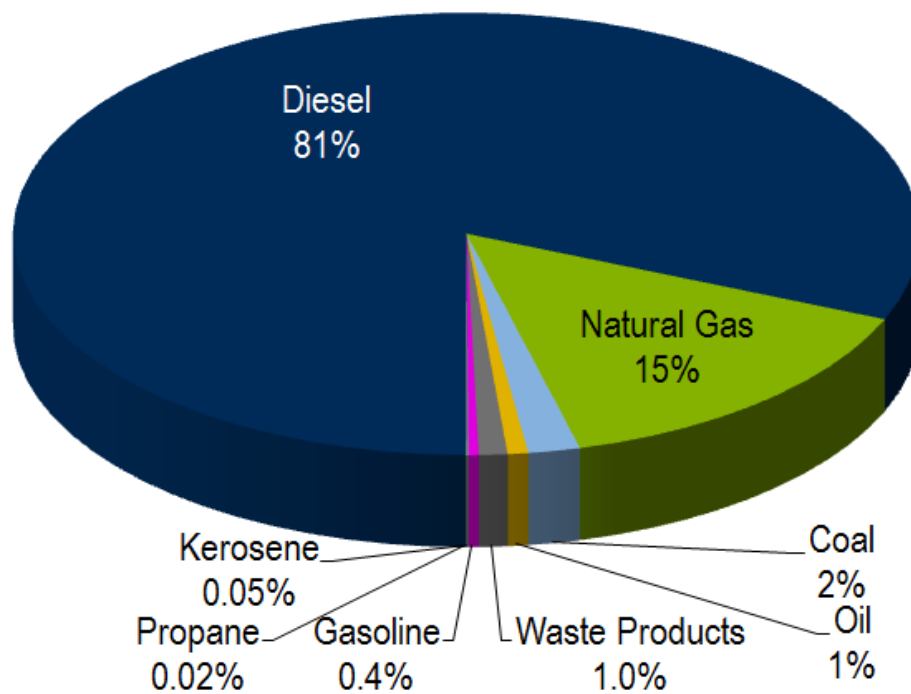
Note: Percent of Nominated Capacity (MWs)

Figure 5: DY 15/16 Confirmed Load Management DR Registrations Customer Load Reduction Methods



Note: Percent of Nominated Capacity (MWs)

Figure 6: DY 15/16 Confirmed Load Management DR Registrations Fuel Mix with Behind the Meter Generation



Note: Percent of Nominated Capacity (MWs)

Figure 7: DY 15/16 Confirmed Load Management DR Registrations Generator and Permit Type

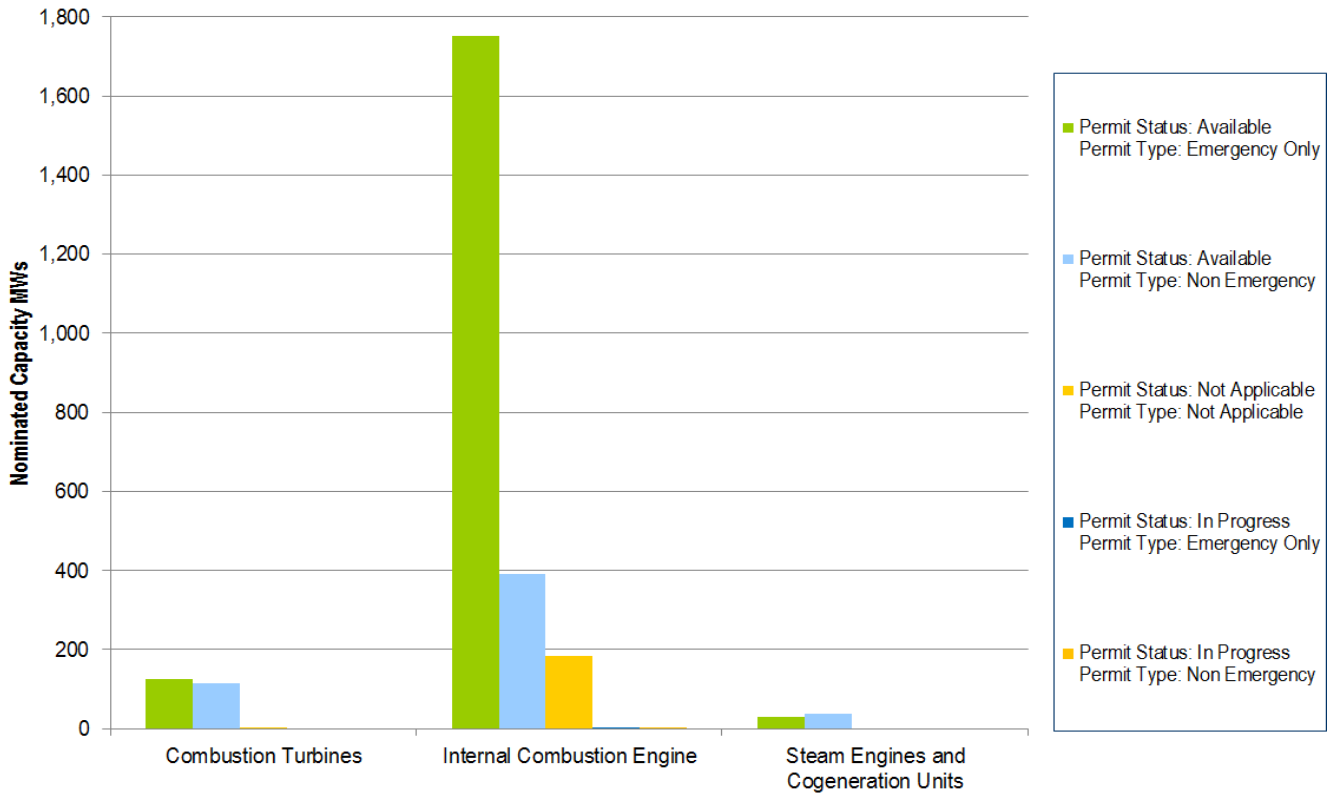


Figure 8: DY 15/16 Confirmed Load Management DR Registrations Fuel Mix with Behind the Meter Generation

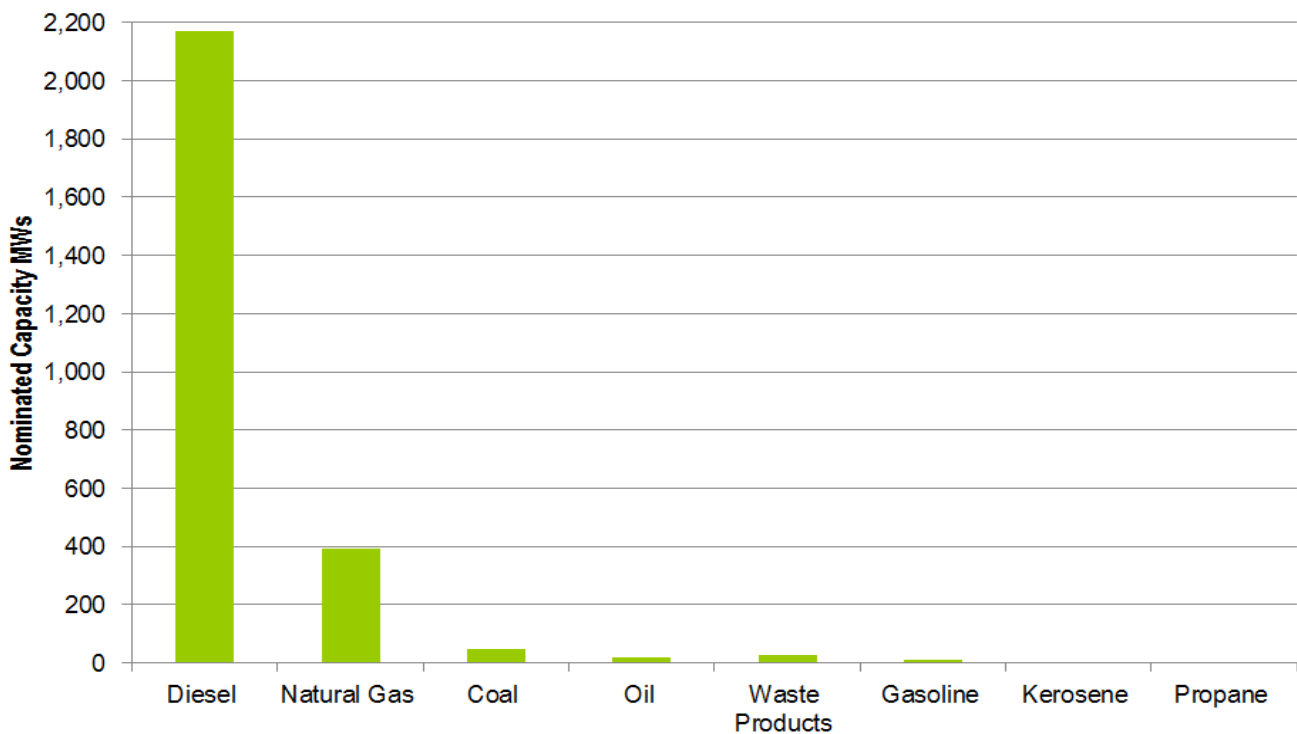
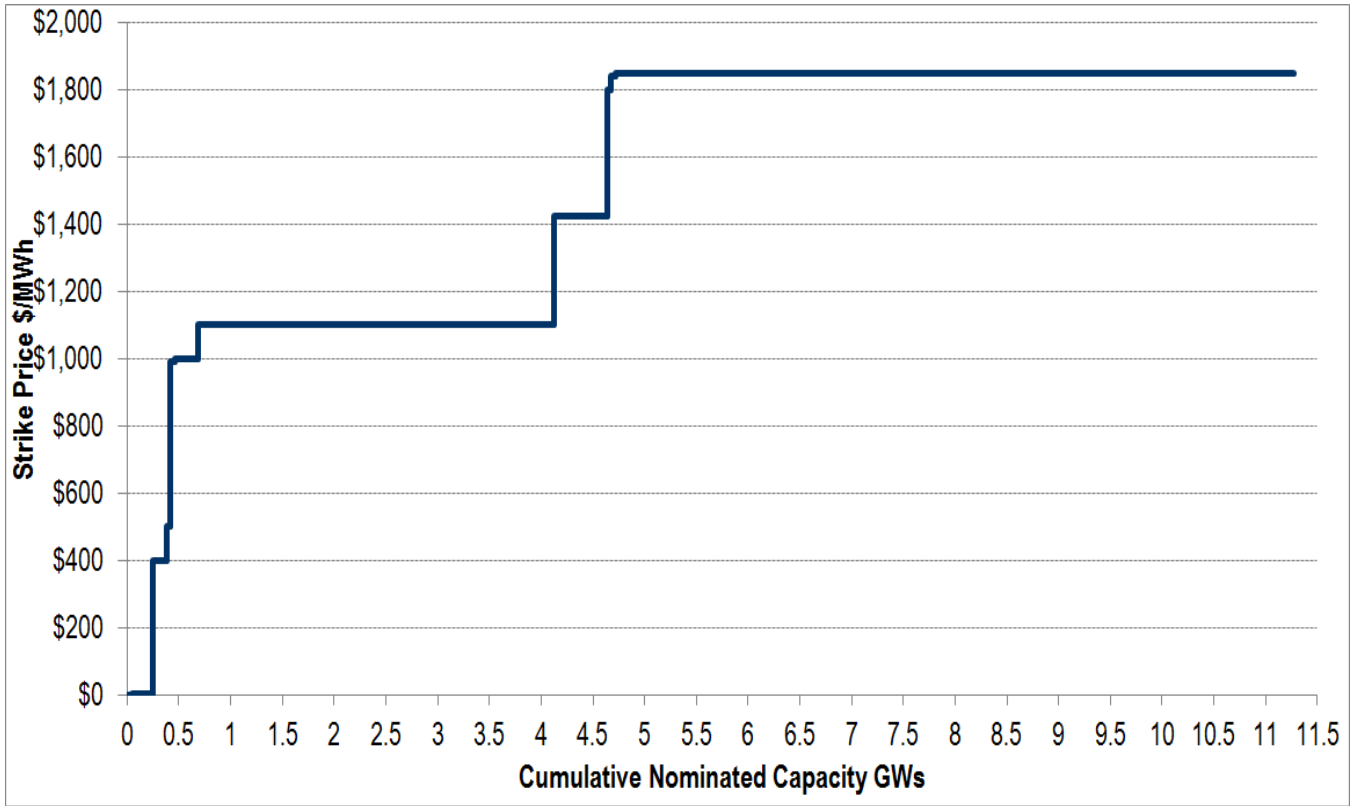


Figure 9: DY 15/16 Confirmed Load Management Full DR Registrations Energy Supply Curve:



This area intentionally left blank

Figure 10: Preliminary DY 16/17 Active Participants in PJM Load Management DR Programs

State	Zone	EDC	Load Management DR	
			Locations	MW
IL	COMED	COMED	37	65.4
IN	AEP	WVPA	68	2.0
IN	AEP	WVSDI	1	23.3
KY	EKPC	EKPC	1	1.1
MD	APS	AETSAP	1	1.9
MD	BGE	BC	44	18.8
NJ	JCPL	JCBGS	4	5.9
NJ	PSEG	PSEG	31	10.7
OH	AEP	AEPOPT	90	125.1
OH	ATSI	OEEDC	26	14.6
OH	DAY	DAYEDC	18	3.1
OH	DEOK	DEOEDC	51	13.9
PA	APS	AETSAP	134	70.5
PA	METED	AECI	1	1.9
PA	METED	MetEd	8	2.7
PA	PECO	PE	49	23.5
PA	PENELEC	AECI	11	10.1
PA	PENELEC	PaElec	64	43.6
WV	AEP	AEPAPT	1	0.6
WV	APS	AETSAP	87	12.1
Total			727	450.8

Note:

- 1) Data as of 2/9/2016.
- 2) Load Management MW are in ICAP.

This area intentionally left blank

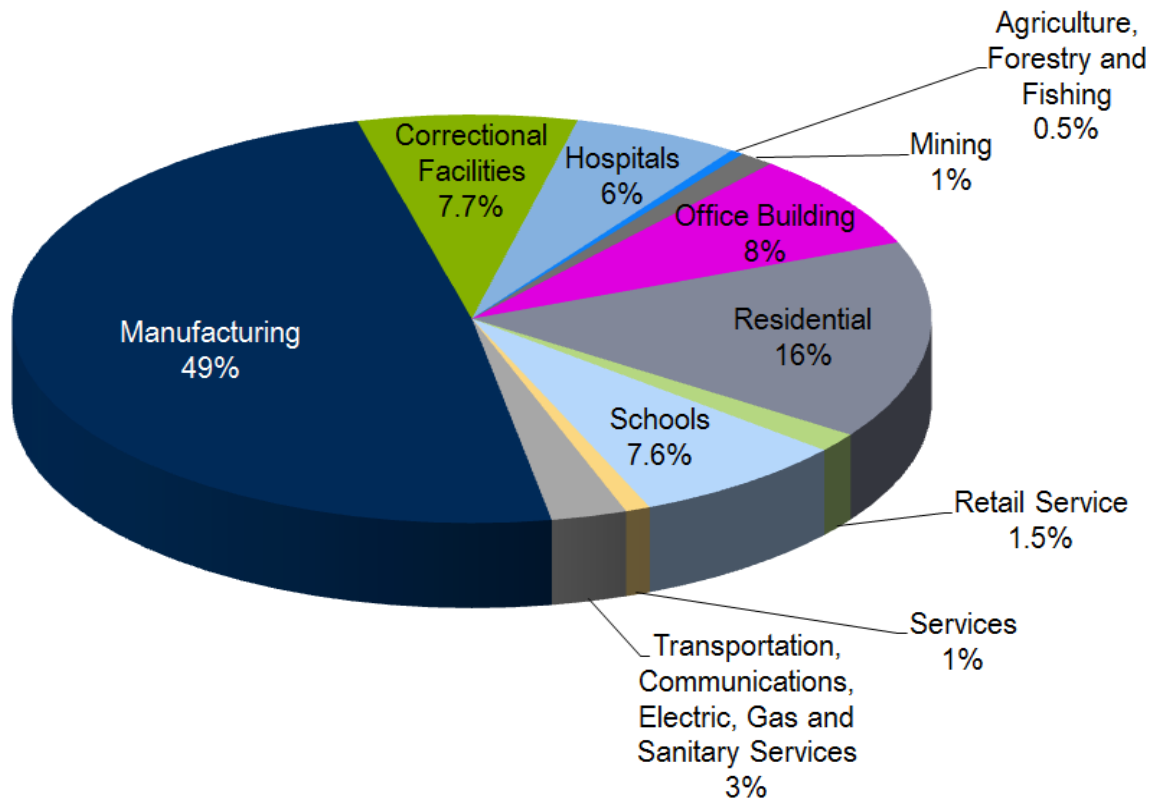
Figure 11: Preliminary DY 16/17 MWs in PJM Load Management DR by Resource, Product, and Lead Times

Zone		Product			Lead Times (minutes)			Total MW
		Limited	Extended	Annual	30	60	120	
AEP								
	Pre-Emergency	108.9	0.0	40.0	88.2	0.0	60.7	148.9
	Emergency	2.2	0.0	0.0	2.2	0.0	0.0	2.2
	Total	111.1	0.0	40.0	90.4	0.0	60.7	151.1
APS								
	Pre-Emergency	84.2	0.0	0.0	14.7	0.0	69.5	84.2
	Emergency	0.3	0.0	0.0	0.3	0.0	0.0	0.3
	Total	84.5	0.0	0.0	15.1	0.0	69.5	84.5
ATSI								
	Pre-Emergency	13.7	0.9	0.0	1.6	0.0	13.0	14.6
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	13.7	0.9	0.0	1.6	0.0	13.0	14.6
BGE								
	Pre-Emergency	6.3	0.0	0.0	2.9	1.4	2.0	6.3
	Emergency	12.5	0.0	0.0	3.4	0.0	9.2	12.5
	Total	18.8	0.0	0.0	6.3	1.4	11.2	18.8
COMED								
	Pre-Emergency	65.4	0.0	0.0	62.2	0.3	2.8	65.4
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	65.4	0.0	0.0	62.2	0.3	2.8	65.4
DAY								
	Pre-Emergency	3.1	0.0	0.0	0.3	0.0	2.8	3.1
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	3.1	0.0	0.0	0.3	0.0	2.8	3.1
DEOK								
	Pre-Emergency	11.4	2.5	0.0	12.2	0.0	1.7	13.9
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	11.4	2.5	0.0	12.2	0.0	1.7	13.9
EKPC								
	Pre-Emergency	1.1	0.0	0.0	1.1	0.0	0.0	1.1
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	1.1	0.0	0.0	1.1	0.0	0.0	1.1
JCPL								
	Pre-Emergency	0.7	0.0	0.0	0.3	0.0	0.4	0.7
	Emergency	5.2	0.0	0.0	5.2	0.0	0.0	5.2
	Total	5.9	0.0	0.0	5.5	0.0	0.4	5.9
METED								
	Pre-Emergency	4.6	0.0	0.0	3.7	0.0	0.9	4.6
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	4.6	0.0	0.0	3.7	0.0	0.9	4.6
PECO								
	Pre-Emergency	15.9	0.0	0.0	15.7	0.0	0.2	15.9
	Emergency	7.6	0.0	0.0	7.6	0.0	0.0	7.6
	Total	23.5	0.0	0.0	23.3	0.0	0.2	23.5
PENELEC								
	Pre-Emergency	53.2	0.0	0.0	13.6	0.0	39.6	53.2
	Emergency	0.5	0.0	0.0	0.5	0.0	0.0	0.5
	Total	53.7	0.0	0.0	14.1	0.0	39.6	53.7

Zone		Product			Lead Times (minutes)			Total MW
		Limited	Extended	Annual	30	60	120	
PSEG								
	Pre-Emergency	8.2	0.0	2.5	7.5	1.5	1.7	10.7
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	8.2	0.0	2.5	7.5	1.5	1.7	10.7
TOTAL								
	Pre-Emergency	376.8	3.4	42.5	224.2	3.2	195.3	422.7
	Emergency	28.3	0.0	0.0	19.1	0.0	9.2	28.3
	Total	405.0	3.4	42.5	243.3	3.2	204.5	451.0

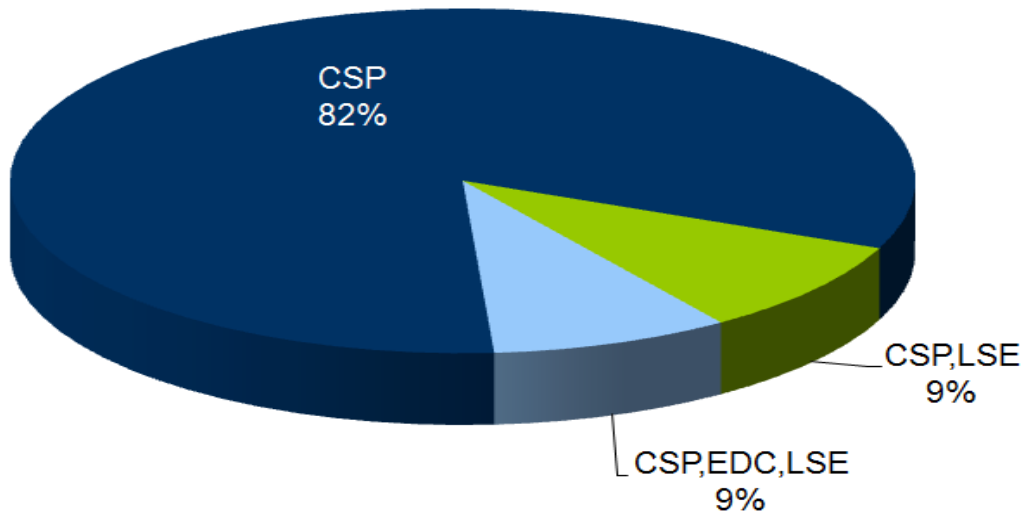
Note: MWs are Nominated Capacity (MWs)

Figure 12: Preliminary DY 16/17 Confirmed Load Management DR Registrations Business Segments



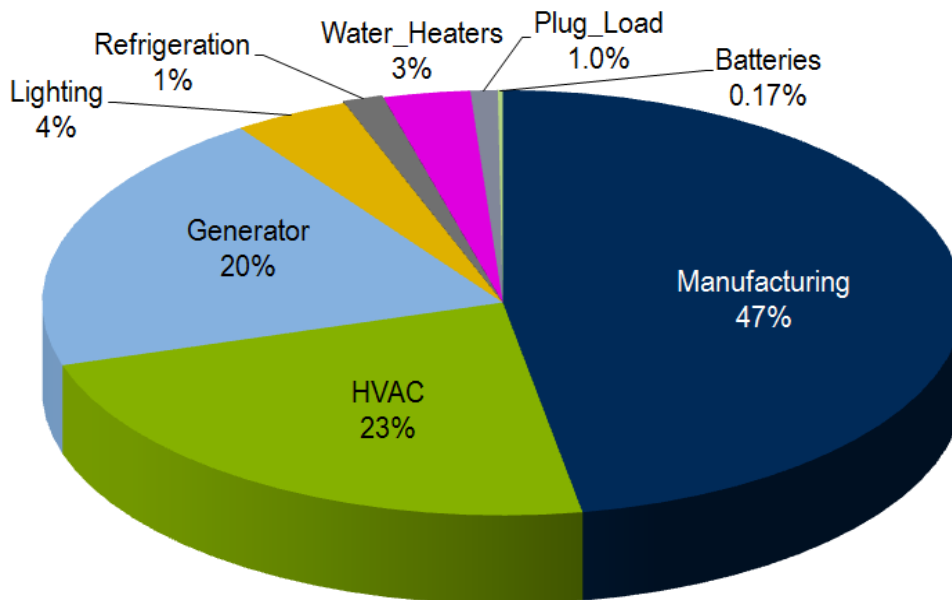
Note: Percent of Nominated Capacity (MWs)

Figure 13: Preliminary DY 16/17 Confirmed Load Management DR Registrations Owner/Company Type



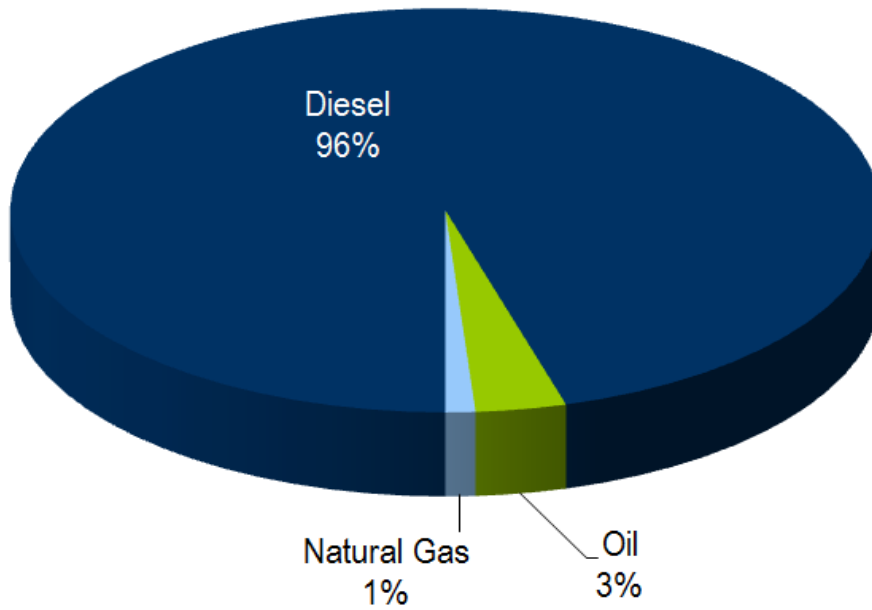
Note: Percent of Nominated Capacity (MWs)

Figure 14: Preliminary DY 16/17 Confirmed Load Management DR Registrations Customer Load Reduction Methods



Note: Percent of Nominated Capacity (MWs)

Figure 15: Preliminary DY 16/17 Confirmed Load Management DR Registrations Fuel Mix with Behind the Meter Generation



Note: Percent of Nominated Capacity (MWs)

Figure 16: Preliminary DY 16/17 Confirmed Load Management DR Registrations Generator and Permit Type

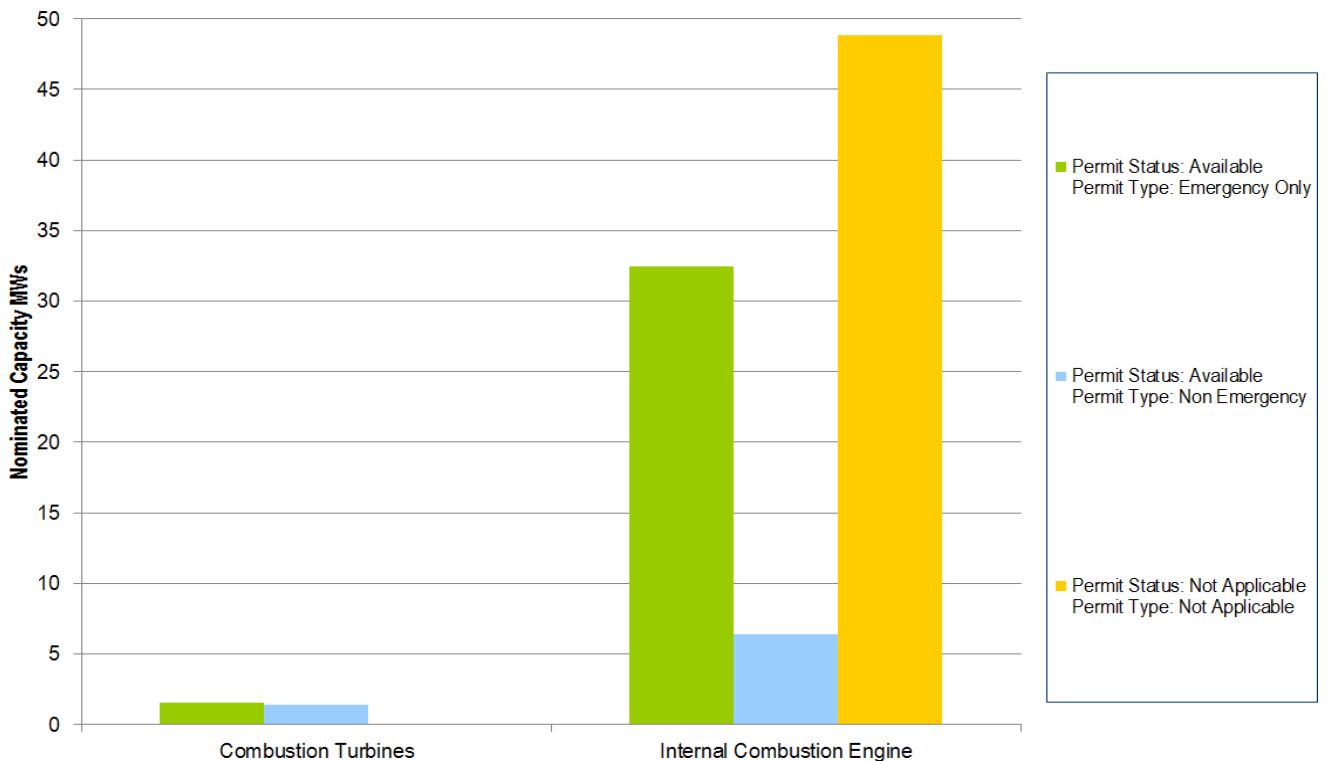


Figure 17: Preliminary DY 16/17 Confirmed Load Management DR Registrations Fuel Mix with Behind the Meter Generation

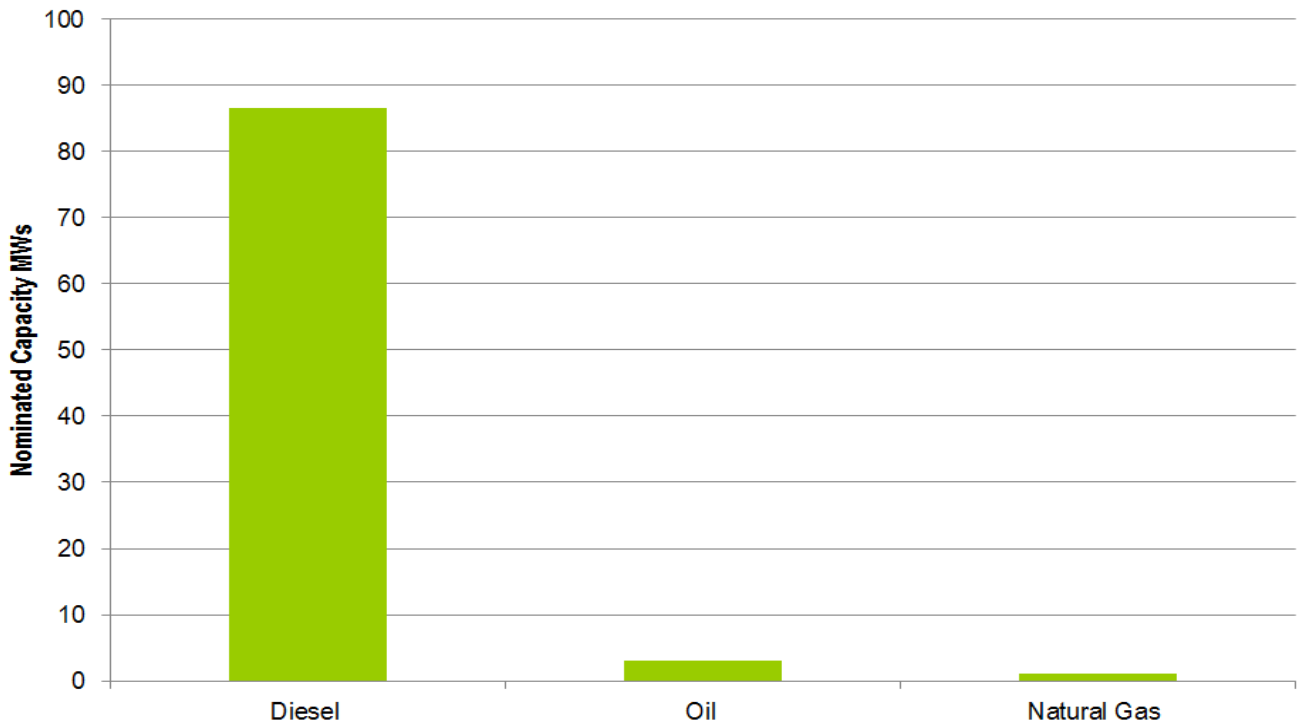


Figure 18: Preliminary DY 16/17 Confirmed Load Management Full DR Registrations Energy Supply Curve:

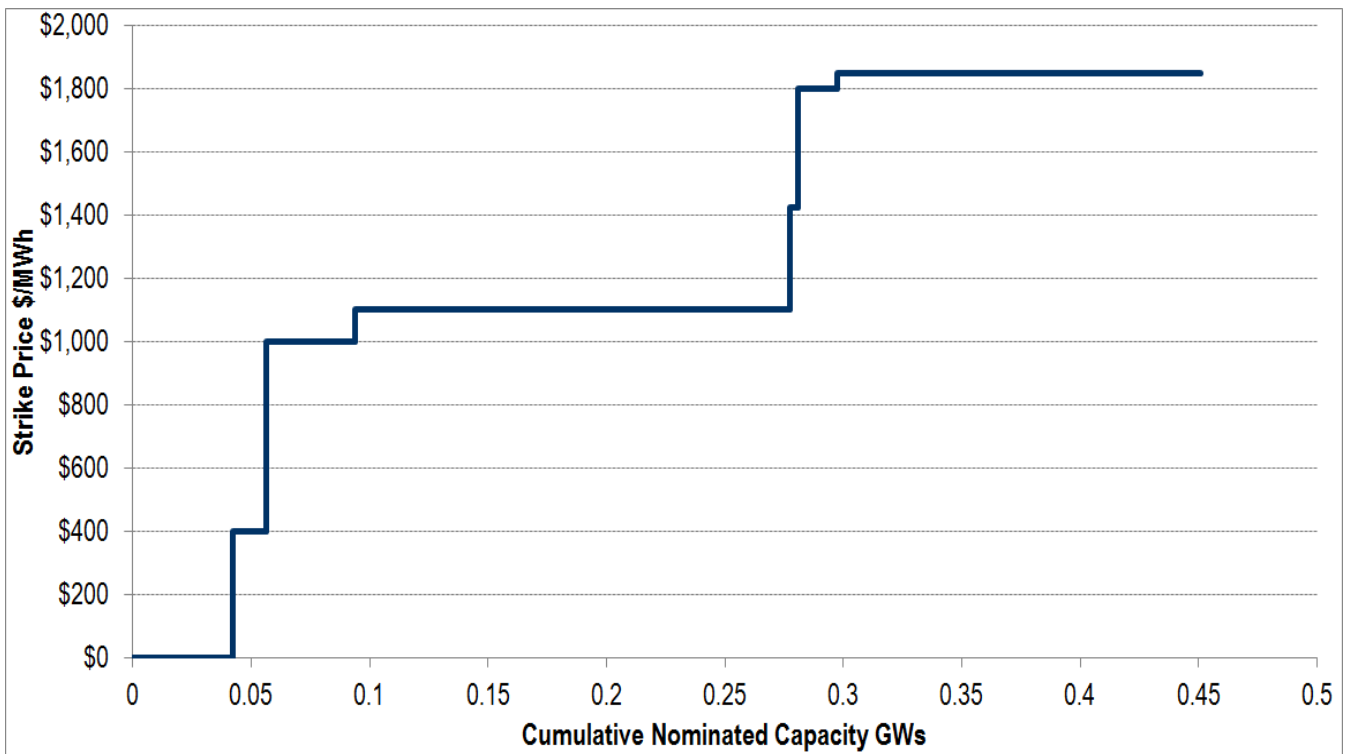
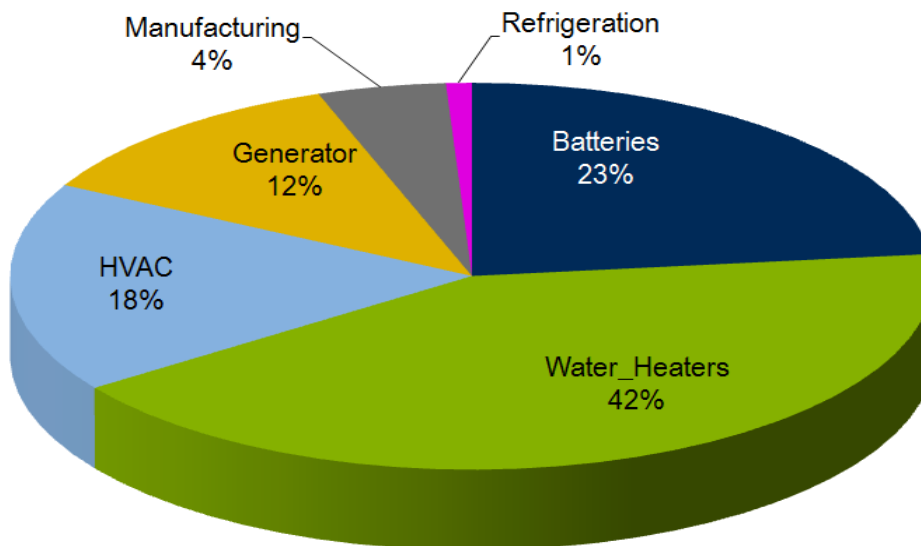


Figure 19: 2016 PJM Economic Demand Response Capability in Ancillary Service Markets

Synch Reserves		Zone	Jan
Locations		MAD	135
		Non-MAD	10
Average Number of Unique Participating Locations per Month:			145
MWs		MAD	377
		Non-MAD	198
		RTO	575
Average MWs per Month:			575
Regulation		Zone	Jan
Locations		RTO	293
	Average Number of Unique Participating Locations per Month:		
MWs		RTO	22
Average MWs per Month:			22

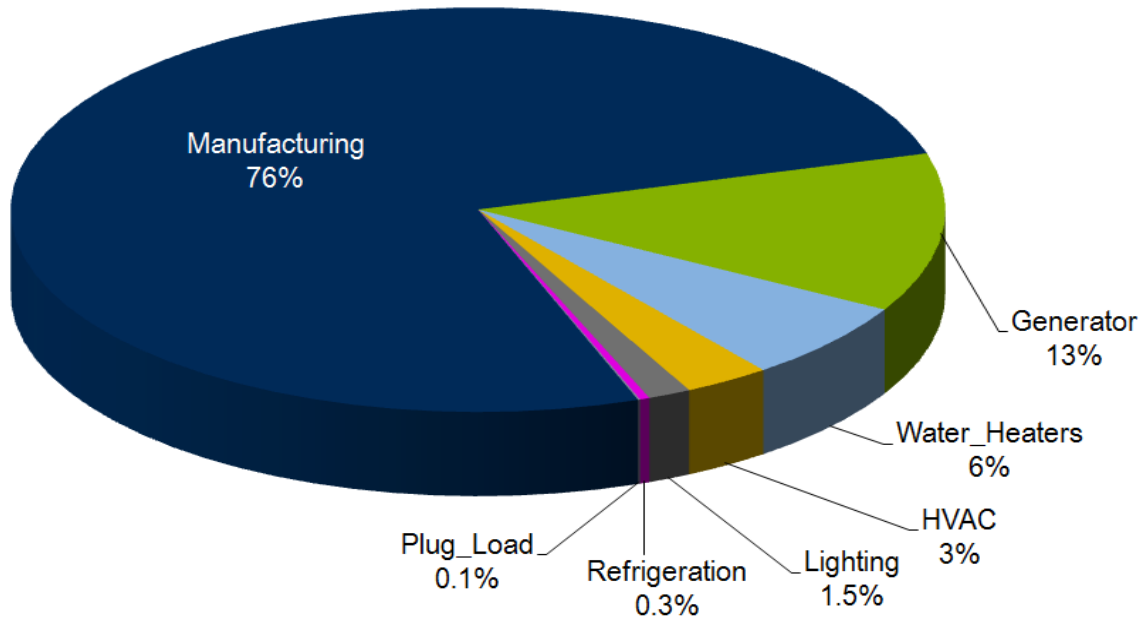
Capability represents total amount that may be offered. Actual offered and cleared volume may be significantly lower and is represented in subsequent figures/tables in report

Figure 20: 2016 PJM Demand Response Confirmed Regulation Registrations Load Reduction Methods



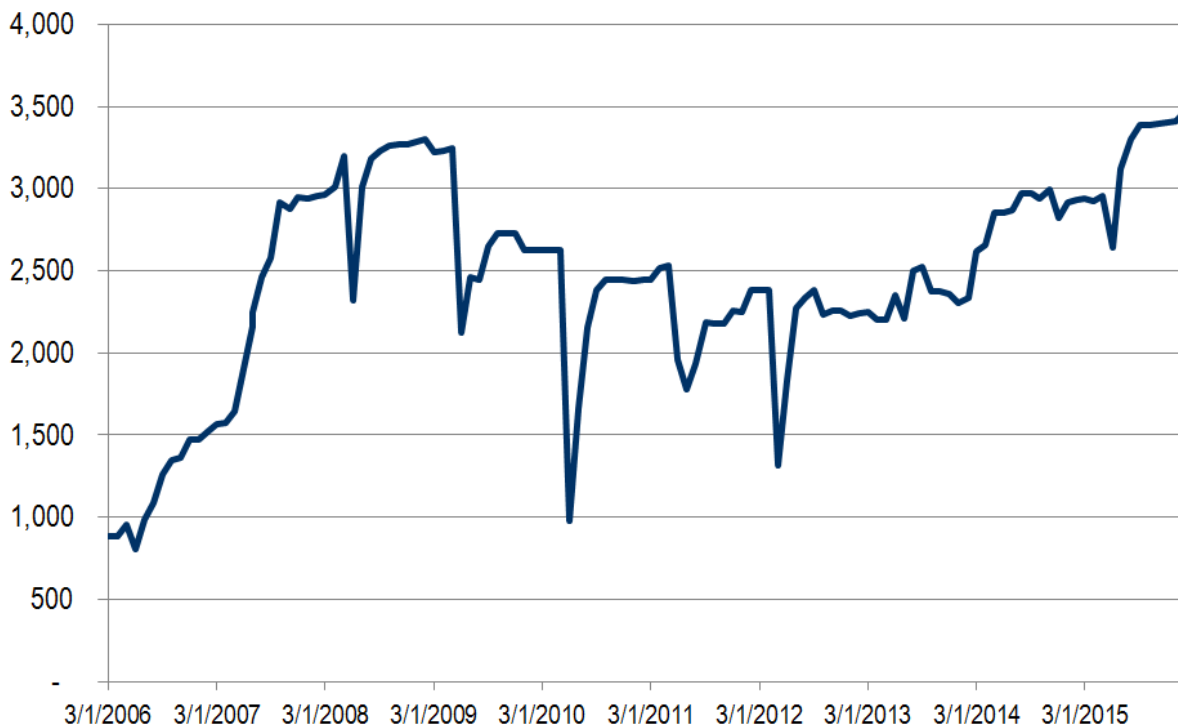
Note: Percent of CSP Reported Load Reduction MWs

Figure 21: 2016 PJM Demand Response Confirmed Synch Reserve Registrations Load Reduction Methods:



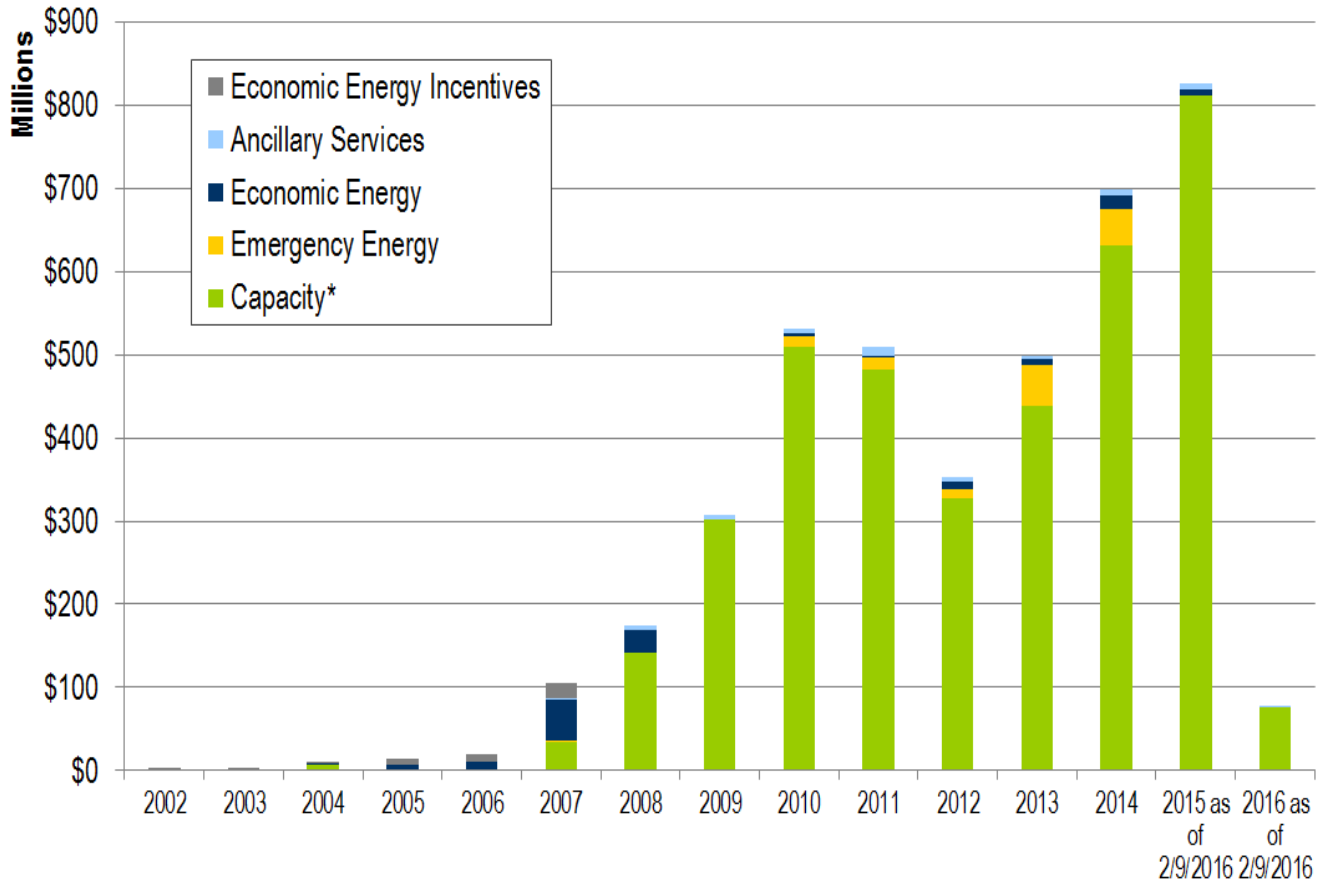
Note: Percent of CSP Reported Load Reduction MWs

Figure 22: PJM Economic Demand Response Capability in Energy Market (3/1/2006-2/9/2016)



Capability represents total amount that may be offered. Actual offered and cleared volume may be significantly lower and is represented in subsequent figures/tables in report.

Figure 23: PJM Estimated Revenue for Economic and Load Management DR Markets



*Capacity Net Revenue inclusive of Capacity Credits and Charges.

This area intentionally left blank

Figure 24: 2016 Economic Demand Response Monthly Registration Participation

State	Zone	Jan
IL	COMED	1
NJ	PSEG	1
OH	ATSI	1
PA	PENELEC	1
VA	DOM	2
WV	APS	1
Total		7

Average Unique Participating Registrations per Month: 7

Figure 25: 2016 Economic Demand Response Monthly Registration Participation Day-Ahead Activity

State	Zone	Jan
IL	COMED	
NJ	PSEG	1
OH	ATSI	
PA	PENELEC	1
VA	DOM	1
WV	APS	
Total		3

Average Unique Participating Registrations per Month (Day-Ahead): 3

Figure 26: 2016 Economic Demand Response Monthly Registration Participation Real-Time Activity

State	Zone	Jan
IL	COMED	1
NJ	PSEG	
OH	ATSI	1
PA	PENELEC	
VA	DOM	1
WV	APS	1
Total		4

Average Unique Participating Registrations per Month (Real-Time): 4

Figure 27: 2016 Economic Demand Response Monthly MWh Reductions

State	Zone	Jan
IL	COMED	3
NJ	PSEG	88
OH	ATSI	232
PA	PENELEC	64
VA	DOM	2,328
WV	APS	104
Total		2,818

Total MWh: 2,818

Figure 28: 2016 Economic Demand Response Monthly MWh Reductions Day-Ahead Activity

State	Zone	Jan
IL	COMED	
NJ	PSEG	88
OH	ATSI	
PA	PENELEC	64
VA	DOM	912
WV	APS	
Total		1,064

Total Day-Ahead MWh: 1,064

Figure 29: 2016 Economic Demand Response Monthly MWh Reductions Real-Time Activity

State	Zone	Jan
IL	COMED	3
NJ	PSEG	
OH	ATSI	232
PA	PENELEC	
VA	DOM	1,415
WV	APS	104
Total		1,754

Total Real-Time MWh: 1,754

Figure 30: 2016 Economic Demand Response Monthly Energy Market Revenue

State	Zone	Jan
IL	COMED	\$91
NJ	PSEG	\$2,986
OH	ATSI	\$7,379
PA	PENELEC	\$1,972
VA	DOM	\$126,266
WV	APS	\$2,153
Total		\$140,848

Total CSP Credits: \$140,848

Figure 31: 2016 Economic Demand Response Monthly Energy Market Revenue Day-Ahead Activity

State	Zone	Jan
IL	COMED	
NJ	PSEG	\$2,986
OH	ATSI	
PA	PENELEC	\$1,972
VA	DOM	\$43,482
WV	APS	
Total		\$48,441

Total Day-Ahead CSP Credits: \$48,441

Figure 32: 2016 Economic Demand Response Monthly Energy Market Revenue Real-Time Activity

State	Zone	Jan
IL	COMED	\$91
NJ	PSEG	
OH	ATSI	\$7,379
PA	PENELEC	
VA	DOM	\$82,784
WV	APS	\$2,153
Total		\$92,407

Total Real-Time CSP Credits: \$92,407

Figure 33: 2016 Economic Demand Response Energy Market Cost Allocation by Zone

Zone	Jan
AECO	\$1,379
AEP	\$22,863
APS	\$9,665
ATSI	\$11,165
BGE	\$6,745
COMED	\$11,824
DAY	\$3,178
DEOK	\$4,492
DOM	\$20,706
DPL	\$3,348
DUQ	\$2,188
EKPC	\$2,551
JCPL	\$3,486
METED	\$2,468
PECO	\$6,150
PENELEC	\$2,878
PEPCO	\$6,314
PPL	\$7,371
PSEG	\$6,505
RECO	\$222
Exports	\$5,351
TOTAL	\$140,848

Total Zonal Charges: \$140,848

Figure 34: 2016 Economic Demand Response Day-Ahead Energy Market Cost Allocation by Zone

Zone	Jan
AECO	\$422
AEP	\$6,806
APS	\$2,682
ATSI	\$3,386
BGE	\$1,687
COMED	\$4,320
DAY	\$945
DEOK	\$1,411
DOM	\$4,725
DPL	\$963
DUQ	\$676
EKPC	\$772
JCPL	\$1,048
METED	\$770
PECO	\$1,906
PENELEC	\$868
PEPCO	\$1,609
PPL	\$2,174
PSEG	\$2,029
RECO	\$76
Exports	\$1,872
TOTAL	\$41,146

Total Day-Ahead Zonal Charges: \$41,146

Figure 35: 2016 Economic Demand Response Real-Time Energy Market Cost Allocation by Zone

Zone	Jan
AECO	\$957
AEP	\$16,057
APS	\$6,983
ATSI	\$7,779
BGE	\$5,059
COMED	\$7,505
DAY	\$2,232
DEOK	\$3,081
DOM	\$15,981
DPL	\$2,385
DUQ	\$1,512
EKPC	\$1,779
JCPL	\$2,439
METED	\$1,698
PECO	\$4,244
PENELEC	\$2,010
PEPCO	\$4,704
PPL	\$5,197
PSEG	\$4,476
RECO	\$146
Exports	\$3,479
TOTAL	\$99,702

Total Real-Time Zonal Charges: \$99,702

Figure 36: 2016 Load Management Demand Response Monthly Capacity Revenue from RPM

Zone	Jan
AECO	\$1,018,226
AEP	\$6,833,359
APS	\$3,279,835
ATSI	\$19,097,783
BGE	\$5,546,155
COMED	\$6,679,174
DAY	\$760,832
DEOK	\$1,319,812
DOM	\$5,235,719
DPL	\$2,201,083
DUQ	\$878,296
EKPC	\$47,787
JCPL	\$1,720,510
METED	\$1,667,231
PECO	\$3,824,221
PENELEC	\$2,625,490
PEPCO	\$4,232,745
PPL	\$5,591,452
PSEG	\$3,862,880
RECO	\$103,031
Total	\$76,525,621

Total Capacity Credits: \$76,525,621

Figure 37: 2016 Economic Demand Response Dispatched vs Settled Real-Time Energy Market Summary

Time		CSPs		Zone		Registrations			MWh			Registration Hours		
Year	Month	Dispatched	Settled	Dispatched	Settled	Dispatched	Settled	%	Dispatched	Settled	%	Dispatched	Settled	%
2016	1	4	3	8	4	14	4	29%	3,621	1,754	48%	610	100	16%
2016	2	3		3		3		0%	148		0%	14		0%
2016	3													
2016	4													
2016	5													
2016	6													
2016	7													
2016	8													
2016	9													
2016	10													
2016	11													
2016	12													
YTD Totals						17	4	24%	3,769	1,754	47%	624	100	16%
YTD Average		4	3	6	4									

Figure 38: 2016 Economic Demand Response Cleared vs Settled Day-Ahead Energy Market Summary

Time		CSPs		Zone		Registrations			MWh			Registration Hours		
Year	Month	Cleared	Settled	Cleared	Settled	Cleared	Settled	%	Cleared	Settled	%	Cleared	Settled	%
2016	1	3	3	3	3	7	3	43%	3,557	1,064	30%	872	54	6%
2016	2	1		1		1		0%	27		0%	7		0%
2016	3													
2016	4													
2016	5													
2016	6													
2016	7													
2016	8													
2016	9													
2016	10													
2016	11													
2016	12													
YTD Totals						8	3	38%	3,584	1,064	30%	879	54	6%
YTD Average		2	3	2	3									

Note: For Figures 37 and 38 above, Settlement information submitted up to 60 days after the event. Therefore, YTD performance reflected in these reports for the current 2 months is artificially low due to incomplete information at the time of report preparation.

Figure 39: 2016 Economic Demand Response Regulation Market Participation

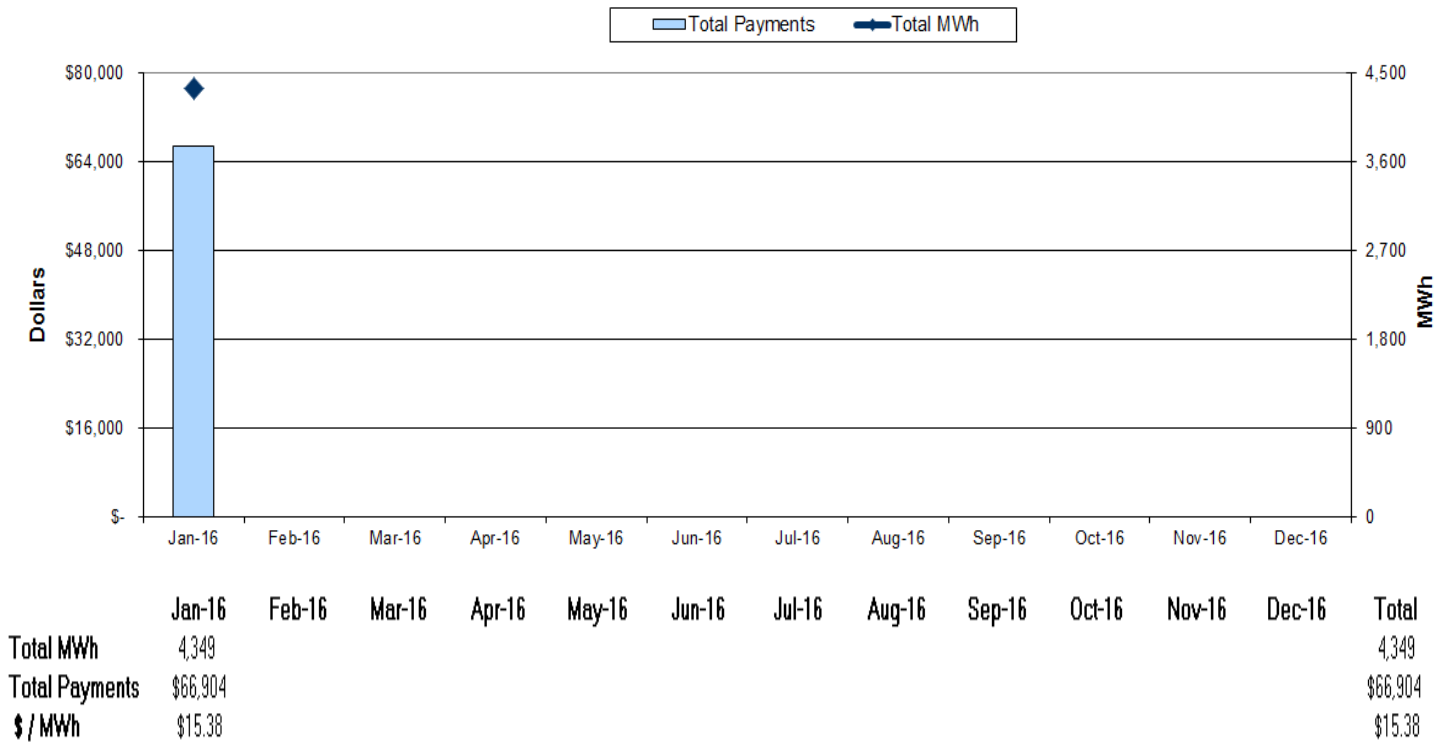
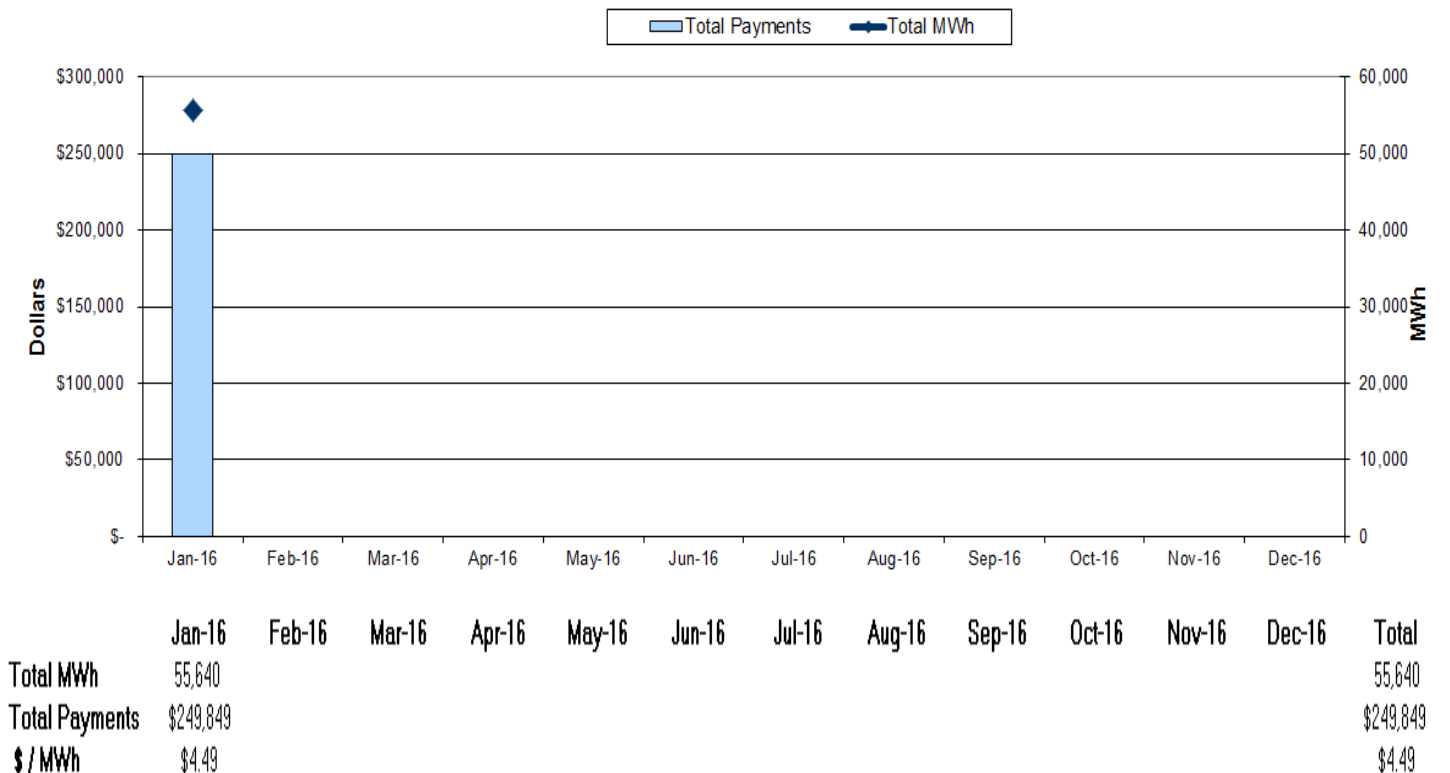
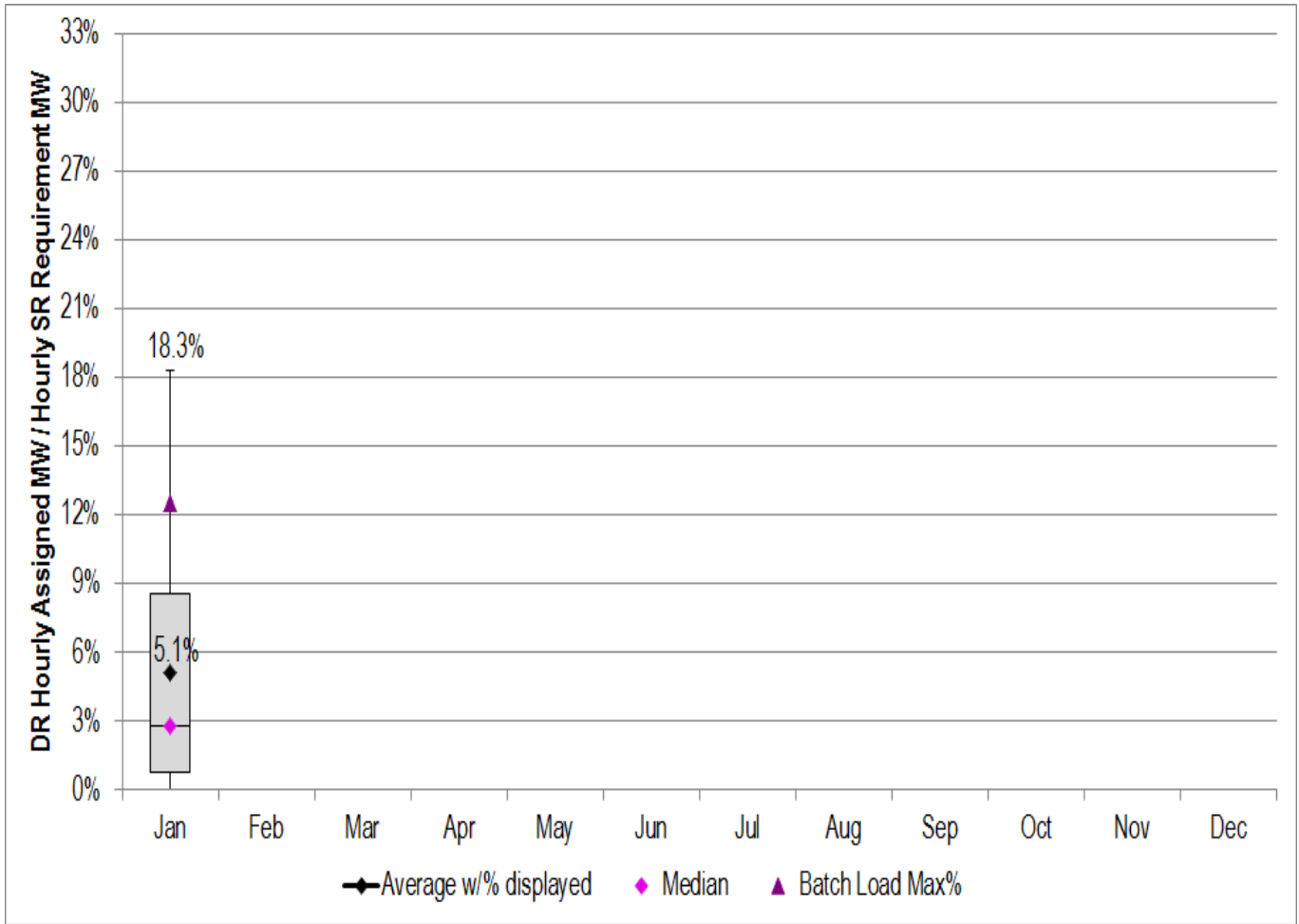


Figure 40: 2016 Economic Demand Response Synchronous Reserve Market Participation



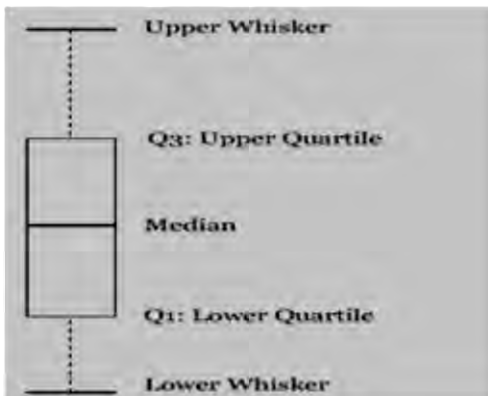
Note: For Figures 39 and 40 above, MWh=sum of the settled MW. Example: 1 MW load available for 12 hours = 12 MWh.

Figure 41: Economic DR Synchronous Reserve Penetration Distribution (Box-plot) for 2016



Notes:

- 1) Economic Demand Response are Tier2 resources.
- 2) Percents shown on upper whisker are maximum hourly DR percentage of Total SR Requirement.
- 3) The Box-plot depicts the distribution of DR hourly assigned (as a percentage of the Total requirement) for a month:



The upper whisker is the maximum value

The box top is the Upper Quartile (75%) value

The line inside the box is the median (50%) value

The box bottom is the Lower Quartile (25%) value

The lower whisker is the minimum value