

2017 Demand Response Operations Markets Activity Report: April 2019

James McAnany

PJM Demand Side Response Operations

April 11, 2019



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Figure 1: DY 17/18 Active Participants in Load Management DR Programs

State	Zone	EDC	Economic		Load Management		Unique	
			Locations	MW	Locations	MW	Locations	MW
DC	PEPCO	PEPCO	2	18.6	330	95.3	330	95.3
DE	DPL	DEMEC	1	4.6	28	15.0	29	19.6
DE	DPL	DOVDE			15	4.9	15	4.9
DE	DPL	DPL	9	155.9	246	205.2	246	205.2
DE	DPL	ODEC			13	3.8	13	3.8
IL	COMED	BATAV			1	1.7	1	1.7
IL	COMED	COMED	22	59.0	2,277	1,296.0	2,277	1,296.1
IL	COMED	GENEVA	1	1.0	0	0.0	1	1.0
IL	COMED	IMEAA1	1	0.3	2	20.7	2	20.7
IN	AEP	AEPIMP			106	272.6	106	272.6
IN	AEP	HEREC	1	23.1	1	19.0	1	19.0
IN	AEP	WVSDI			1	9.6	1	9.6
KY	AEP	AEPKPT			1	1.1	1	1.1
KY	DEOK	DEK			59	26.0	59	26.0
KY	EKPC	EKPC			11	118.0	11	118.0
MD	APS	AETSAP	53	12.1	168	47.8	169	50.4
MD	APS	AETSHG	1	1.8	1	0.2	1	0.2
MD	APS	AETSTH			4	1.3	4	1.3
MD	BGE	BC	42	590.9	778	758.9	784	765.3
MD	DPL	DPL	6	74.4	184	116.1	184	116.1
MD	DPL	EASTON			8	6.0	8	6.0
MD	DPL	ODEC	1	2.2	17	10.3	17	10.3
MD	PEPCO	PEPCO	6	334.0	367	428.4	367	428.4
MD	PEPCO	SMECO	5	1.0	132	48.1	132	48.1
MI	AEP	COSEDC			1	5.2	1	5.2
NJ	AECO	AE	8	54.9	232	108.4	232	108.3
NJ	AECO	VMEU			22	6.4	22	6.4
NJ	JCPL	JCBGS	8	46.2	446	114.1	451	159.8
NJ	PSEG	PSEG	13	42.2	1,071	338.2	1,075	361.2
NJ	RECO	RECO			19	3.0	19	3.0
NY	PENELEC	PaElec			1	1.2	1	1.2
OH	AEP	AEPOPT	32	89.4	926	402.9	931	412.7
OH	AEP	AMPO			52	55.8	52	55.8
OH	AEP	BUCK			2	19.7	2	19.7
OH	ATSI	AMPO			12	41.0	12	41.0
OH	ATSI	BUCK			2	5.6	2	5.6
OH	ATSI	CPP			14	10.2	14	10.2
OH	ATSI	OEEDC	14	16.4	995	703.7	995	703.7
OH	DAY	AMPO	1	7.0	9	15.8	9	15.8
OH	DAY	BUCK			2	3.9	2	3.9
OH	DAY	DAYEDC	24	17.3	208	160.5	208	160.5
OH	DEOK	AMPO			7	11.7	7	11.6
OH	DEOK	BUCK			2	1.7	2	1.7
OH	DEOK	DEOEDC	49	109.6	413	187.9	414	222.9
PA	APS	AETSAP	10	33.9	603	359.9	604	364.4
PA	APS	CHBDTE			5	2.6	5	2.6
PA	ATSI	PAPWR	2	14.9	90	94.9	91	95.1
PA	DUQ	DLCO	10	17.7	337	123.2	338	138.2

State	Zone	EDC	Economic		Load Management		Unique	
			Locations	MW	Locations	MW	Locations	MW
PA	METED	MetEd	40	39.3	480	205.9	484	212.6
PA	PECO	PE	59	114.5	1,143	249.1	1,148	306.4
PA	PENELEC	AECI			17	10.4	17	10.4
PA	PENELEC	AMPO			1	2.9	1	2.9
PA	PENELEC	PaElec	7	22.1	535	224.7	537	231.8
PA	PENELEC	WELLSB			3	0.1	3	0.1
PA	PPL	AMPO			12	1.6	12	1.6
PA	PPL	CTZECL			5	1.9	5	1.9
PA	PPL	PPL	120	157.3	1,256	548.3	1,261	632.0
PA	PPL	UGI-UI			15	3.4	15	3.4
TN	AEP	AEPAPT			11	6.5	11	6.5
VA	AEP	AEPAPT	2	0.4	246	306.5	246	306.5
VA	AEP	AMPO			17	20.7	17	20.7
VA	AEP	ODEC			2	0.1	2	0.1
VA	AEP	RADFRD			1	2.4	1	2.4
VA	AEP	SALEM			1	0.2	1	0.2
VA	AEP	VATECH			1	6.9	1	6.9
VA	APS	ODEC	3	0.9	62	30.7	62	30.7
VA	DOM	CVEC			6	4.2	6	4.2
VA	DOM	DOMEDC	49	139.5	923	493.4	925	573.8
VA	DOM	DOMVME	1	0.3	24	86.4	24	86.4
VA	DOM	NVEC	3	15.1	42	2.5	44	17.1
VA	DOM	ODEC	1	0.2	45	14.8	45	14.8
VA	DPL	ODEC			15	2.2	15	2.2
WV	AEP	AEPAPT	35	3.5	310	415.9	310	415.9
WV	AEP	APWVP			4	0.5	4	0.5
WV	APS	AETSAP	133	47.1	297	197.3	297	197.3
Total			775	2,269	15,695	9,123	15,742	9,520

Note:

- 1) Data as of 4/9/2018.
- 2) Load Management MW are in ICAP.
- 3) Load Management includes Capacity Performance values.
- 4) Economic MW are CSP reported Load Reduction values.
- 5) Residential Locations reported as one location not a total number of end use customers in that program.
- 6) Unique MW: represents total estimated demand reduction assuming full Load Management and Economic reductions.
- 7) As of April 9, 2018, DY17/18 RPM Committed Values is 8,121 MW for Load Management.
- 8) No Emergency Energy Only registrations to report.

Figure 2: DY 17/18 MWs in Load Management DR by Resource, Product, and Lead Times

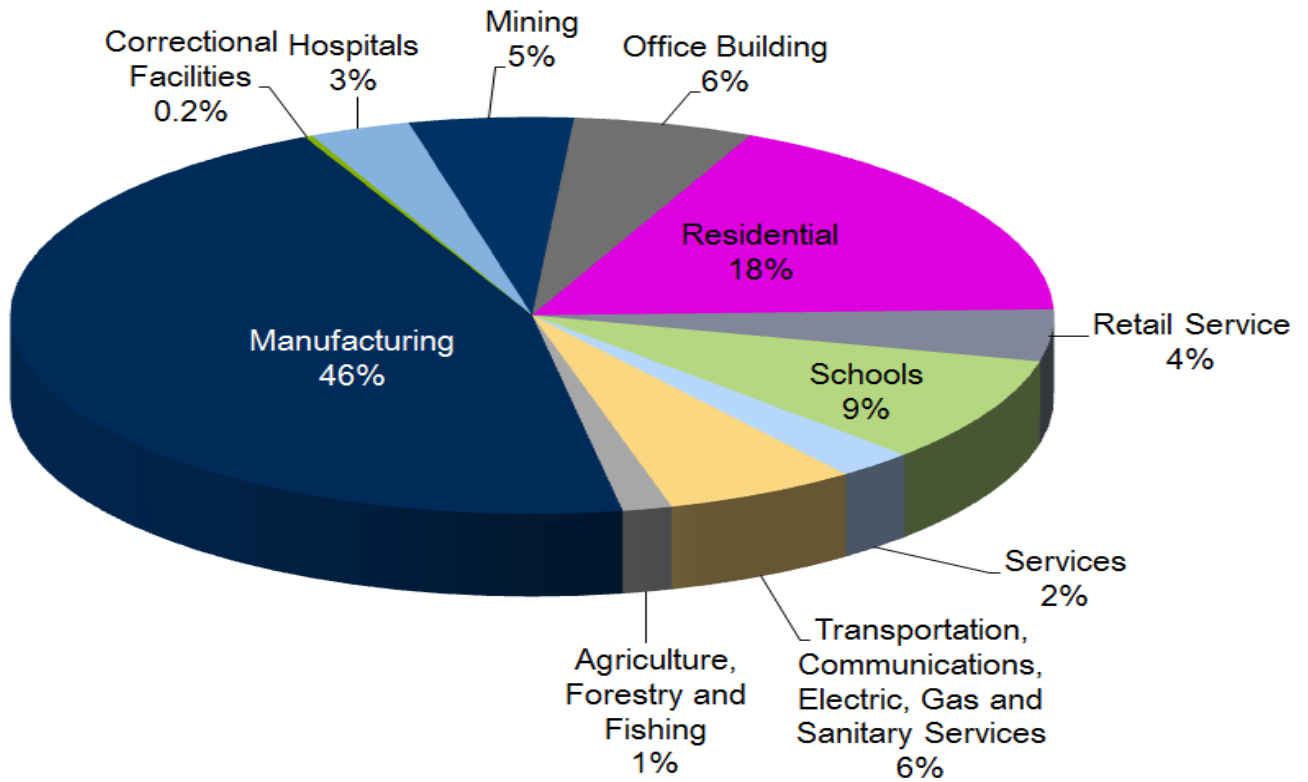
Zone		Product			Lead Times (minutes)			Total MW
		Limited	Extended	Annual	30	60	120	
AECO								
	Pre-Emergency	23.6	83.3	7.6	99.8	5.1	9.6	114.5
	Emergency	0.2	0.0	0.0	0.2	0.0	0.0	0.2
	Total	23.8	83.3	7.6	100.0	5.1	9.6	114.7
AEP								
	Pre-Emergency	621.9	654.7	219.7	788.6	56.5	651.2	1,496.3
	Emergency	1.4	35.8	12.0	30.9	0.0	18.2	49.1
	Total	623.3	690.6	231.7	819.6	56.5	669.4	1,545.5
APS								
	Pre-Emergency	158.1	310.2	150.9	303.3	17.8	298.1	619.3
	Emergency	1.8	18.7	0.0	13.9	0.0	6.7	20.6
	Total	160.0	329.0	150.9	317.2	17.8	304.8	639.9
ATSI								
	Pre-Emergency	301.8	382.3	132.6	350.5	29.9	436.2	816.7
	Emergency	1.2	27.1	10.5	27.8	0.3	10.6	38.7
	Total	303.0	409.4	143.1	378.3	30.2	446.9	855.4
BGE								
	Pre-Emergency	62.3	678.9	7.7	684.6	2.7	61.6	748.9
	Emergency	0.0	10.0	0.0	10.1	0.0	0.0	10.1
	Total	62.4	688.9	7.7	694.7	2.7	61.6	758.9
COMED								
	Pre-Emergency	231.5	879.4	154.5	935.5	23.7	306.3	1,265.5
	Emergency	2.0	39.7	11.3	23.3	5.4	24.2	52.9
	Total	233.5	919.1	165.8	958.8	29.1	330.5	1,318.4
DAY								
	Pre-Emergency	27.0	101.5	42.4	102.7	5.1	63.2	170.9
	Emergency	0.0	8.6	0.6	8.6	0.0	0.6	9.2
	Total	27.0	110.1	43.0	111.3	5.1	63.7	180.1
DEOK								
	Pre-Emergency	114.7	32.2	78.1	97.9	79.7	47.4	225.0
	Emergency	0.3	2.0	0.0	2.3	0.0	0.0	2.3
	Total	115.0	34.2	78.1	100.1	79.7	47.4	227.3
DOM								
	Pre-Emergency	183.4	297.3	18.7	168.2	35.3	295.9	499.4
	Emergency	1.2	72.2	28.5	59.6	7.3	35.1	102.0
	Total	184.6	369.6	47.2	227.8	42.6	331.0	601.4
DPL								
	Pre-Emergency	48.5	292.1	14.9	171.9	15.1	168.5	355.5
	Emergency	2.6	5.4	0.0	5.3	2.2	0.4	8.0
	Total	51.1	297.5	14.9	177.3	17.3	168.9	363.5
DUQ								
	Pre-Emergency	20.9	93.1	7.9	76.5	7.8	37.6	121.9
	Emergency	0.0	1.3	0.0	1.3	0.0	0.0	1.3
	Total	20.9	94.4	7.9	77.8	7.8	37.6	123.2
EKPC								
	Pre-Emergency	18.5	0.0	97.8	36.4	5.3	74.5	116.2
	Emergency	0.0	0.0	1.7	1.7	0.0	0.0	1.7
	Total	18.5	0.0	99.5	38.1	5.3	74.5	118.0

Zone		Limited	Product		Lead Times (minutes)			Total MW
			Extended	Annual	30	60	120	
JCPL								
	Pre-Emergency	24.2	67.9	17.1	75.4	1.9	31.9	109.2
	Emergency	4.9	0.0	0.0	4.9	0.0	0.0	4.9
	Total	29.0	67.9	17.1	80.3	1.9	31.9	114.1
METED								
	Pre-Emergency	82.7	107.5	14.0	117.2	23.6	63.4	204.2
	Emergency	0.6	1.1	0.0	1.7	0.0	0.0	1.7
	Total	83.4	108.6	14.0	118.9	23.6	63.4	205.9
PECO								
	Pre-Emergency	97.7	102.1	18.8	172.8	5.2	40.6	218.6
	Emergency	30.5	0.0	0.0	26.9	2.8	0.8	30.5
	Total	128.3	102.1	18.8	199.7	8.0	41.4	249.2
PENELEC								
	Pre-Emergency	65.4	120.0	52.8	114.9	7.7	115.6	238.2
	Emergency	0.5	0.7	0.0	0.9	0.0	0.3	1.2
	Total	65.9	120.7	52.8	115.8	7.7	115.9	239.3
PEPCO								
	Pre-Emergency	81.8	477.8	6.0	364.0	1.2	200.4	565.6
	Emergency	4.4	1.8	0.0	6.2	0.0	0.0	6.2
	Total	86.2	479.5	6.0	370.2	1.2	200.4	571.8
PPL								
	Pre-Emergency	71.8	146.6	331.7	298.6	61.2	190.4	550.1
	Emergency	4.1	0.0	0.8	2.0	0.0	3.0	5.0
	Total	75.9	146.6	332.6	300.6	61.2	193.4	555.1
PSEG								
	Pre-Emergency	138.8	141.4	53.8	274.0	6.8	53.3	334.1
	Emergency	4.2	0.0	0.0	1.0	0.0	3.2	4.2
	Total	143.0	141.4	53.8	275.0	6.8	56.5	338.2
RECO								
	Pre-Emergency	1.1	1.3	0.7	3.0	0.0	0.0	3.0
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	1.1	1.3	0.7	3.0	0.0	0.0	3.0
TOTAL								
	Pre-Emergency	2,375.6	4,969.7	1,427.9	5,235.8	391.6	3,145.8	8,773.2
	Emergency	60.0	224.3	65.3	228.6	18.0	103.0	349.6
	Total	2,435.6	5,194.0	1,493.3	5,464.5	409.6	3,248.7	9,122.8

Note:

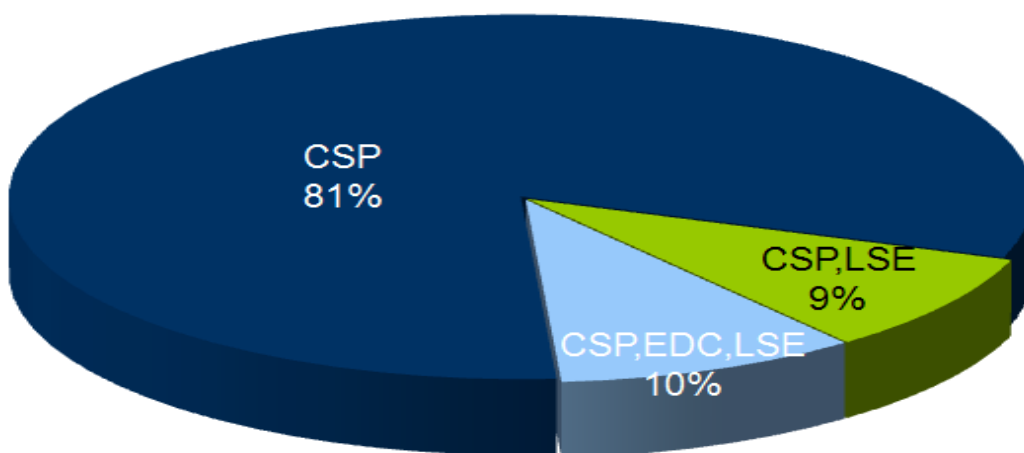
- 1) Data as of 4/3/2018.
- 2) MWs values from Capacity Performance registrations are included in the Annual Product.
- 3) DY17/18 Registered values are 8,625 MW for Legacy Products and 498 MW for Capacity Performance.
- 4) MW are in ICAP.

Figure 3: DY 17/18 Confirmed Load Management DR Registrations Business Segments



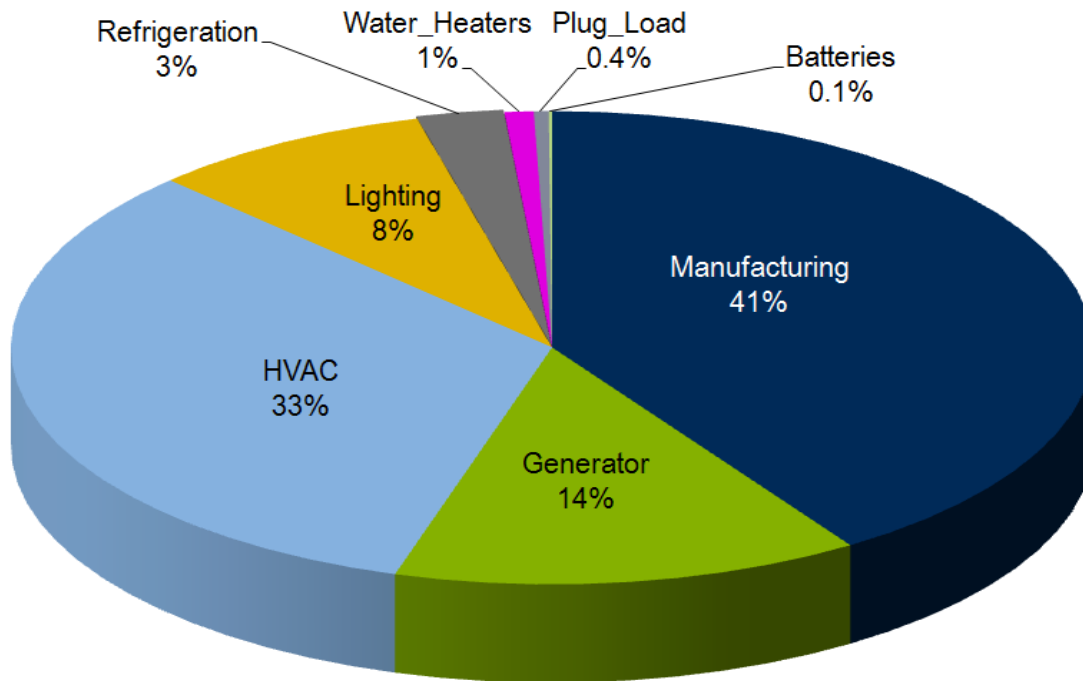
Note: Percent of Nominated Capacity (MWs). Includes Capacity Performance nominated MWs.

Figure 4: DY 17/18 Confirmed Load Management DR Registrations Owner/Company Type



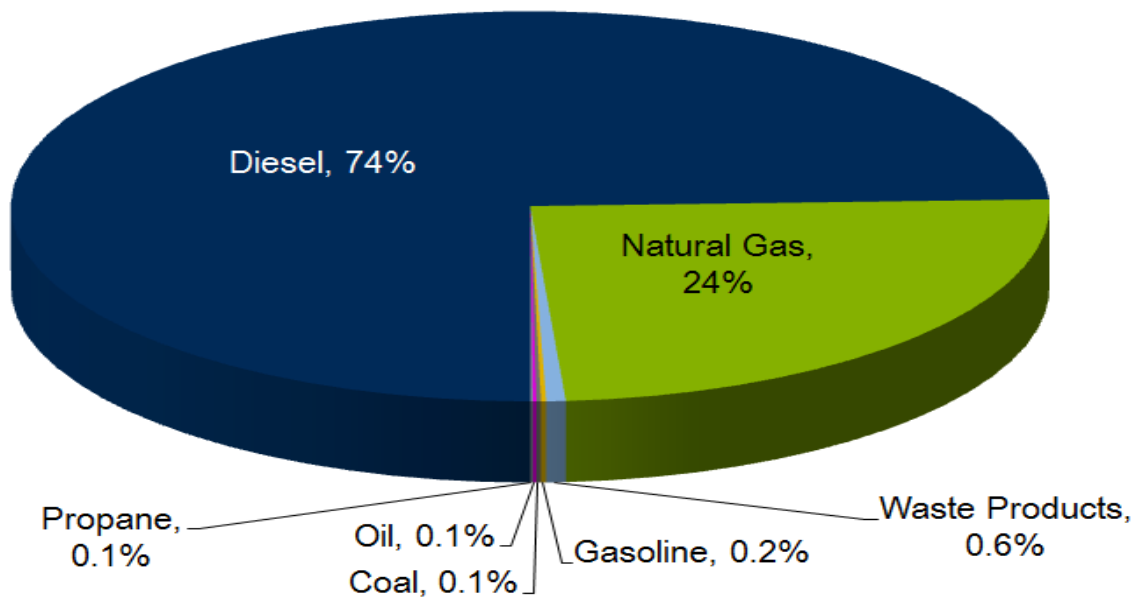
Note: Percent of Nominated Capacity (MWs). Includes Capacity Performance nominated MWs.

Figure 5: DY 17/18 Confirmed Load Management DR Registrations Customer Load Reduction Methods



Note: Percent of Nominated Capacity (MWs). Includes Capacity Performance nominated MWs.

Figure 6: DY 17/18 Confirmed Load Management DR Registrations Fuel Mix with Behind the Meter Generation



Note: Percent of Nominated Capacity (MWs). Includes Capacity Performance nominated MWs.

Figure 7: DY 17/18 Confirmed Load Management DR Registrations Generator and Permit Type

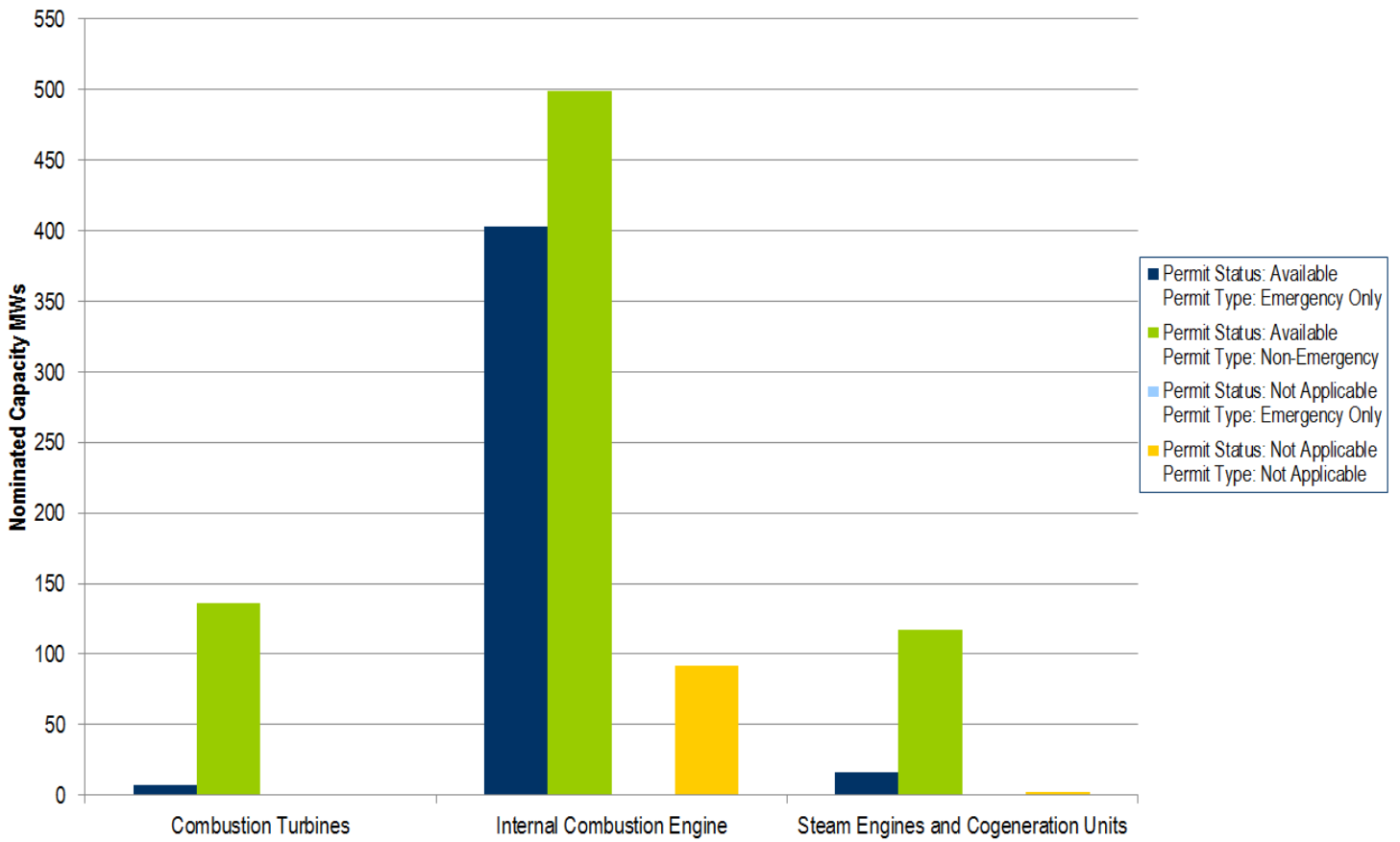


Figure 8: 2017 DY 17/18 Confirmed Load Management DR Registrations Fuel Mix with Behind the Meter Generation

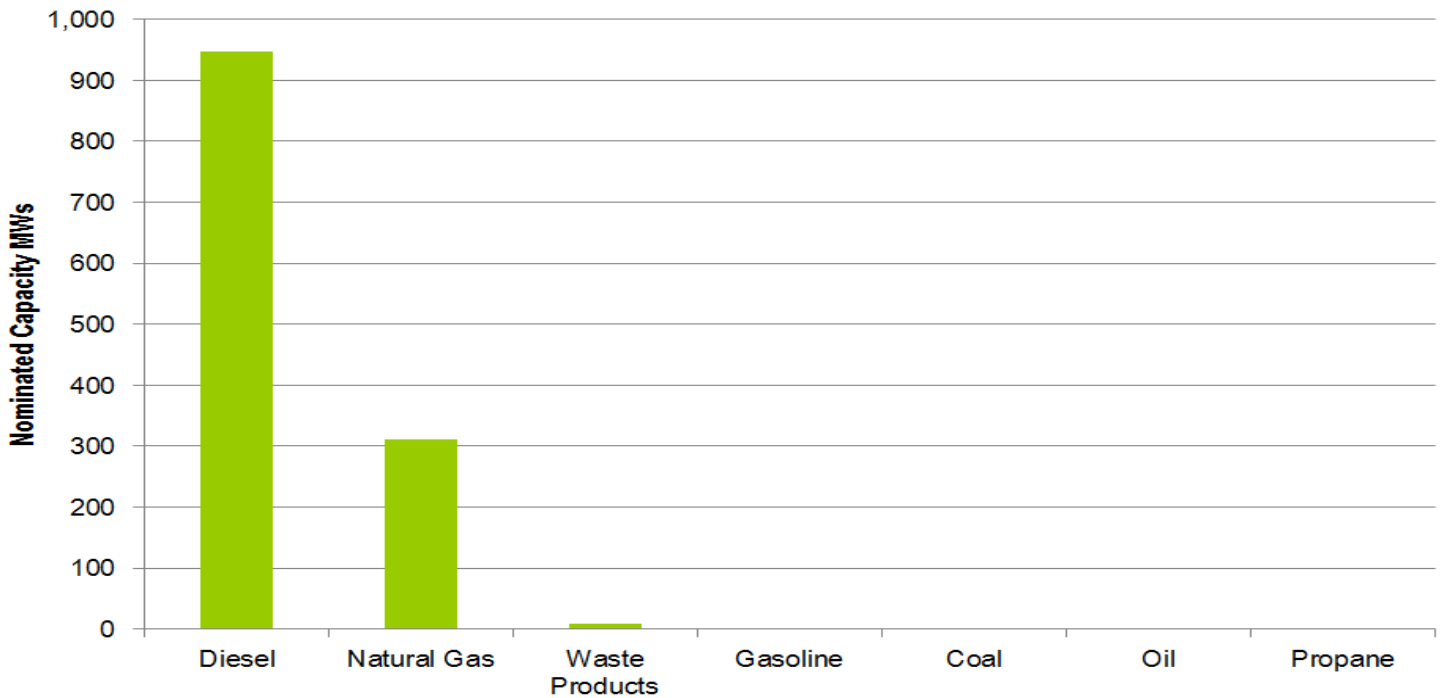
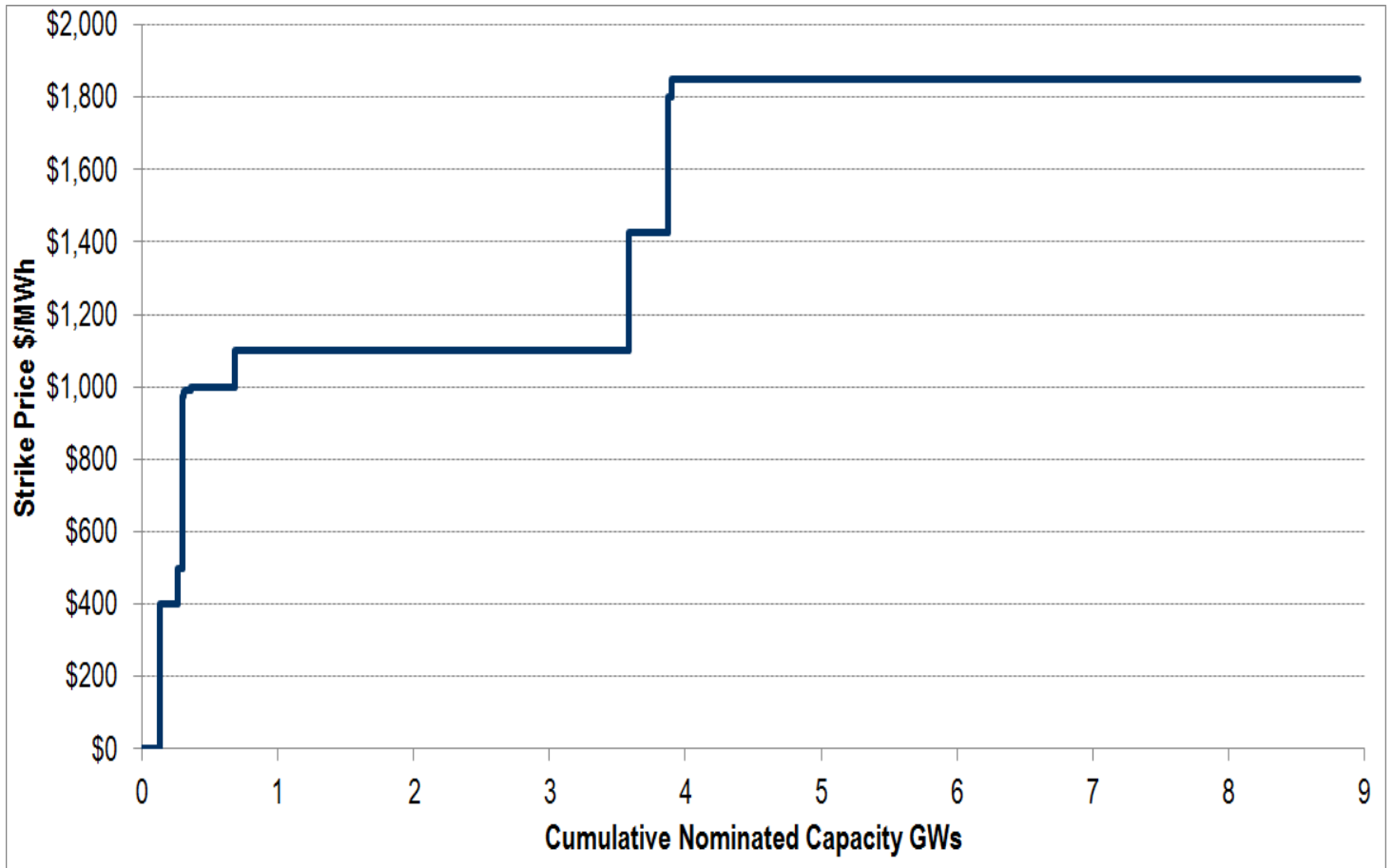


Figure 9: DY 17/18 Confirmed Load Management Full DR Registrations Energy Supply Curve:



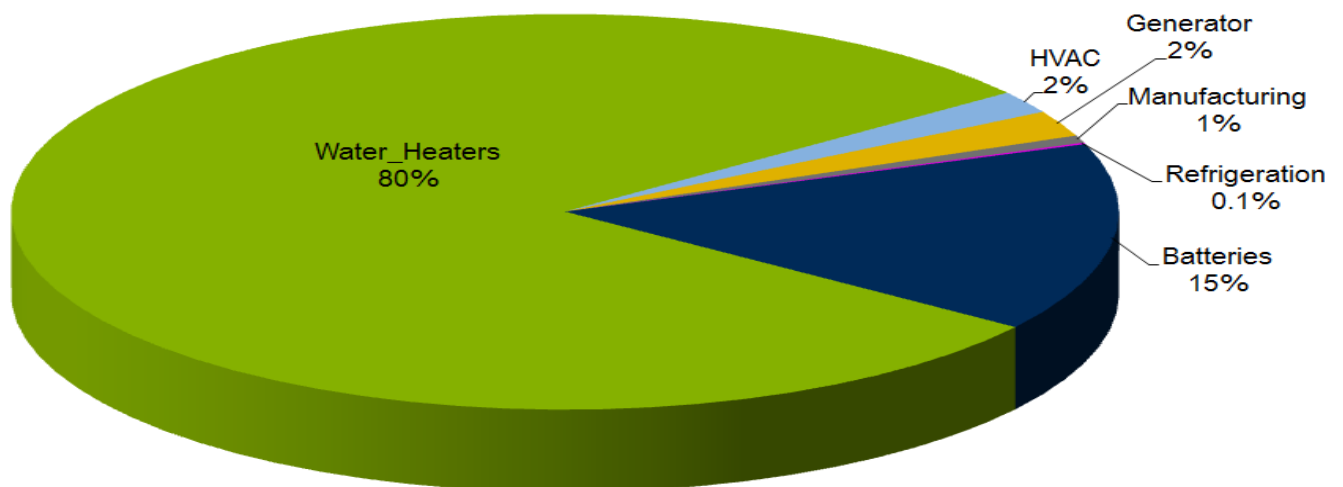
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Figure 10: 2017 Economic Demand Response Capability in the Ancillary Service Markets

Synch Reserves	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Locations	MAD	155	159	162	160	160	141	140	136	138	138	138	139
	Non-MAD	18	20	20	20	20	20	20	21	21	22	22	22
RTO		173	179	182	180	180	161	160	157	159	160	160	161
Average Number of Unique Participating Locations per Month:		168											
MWs	MAD	360	366	368	332	324	253	252	247	325	325	327	333
	Non-MAD	151	152	150	149	149	107	107	109	109	111	111	111
RTO		511	518	517	481	473	360	359	355	433	436	438	444
Average MWs per Month:		444											

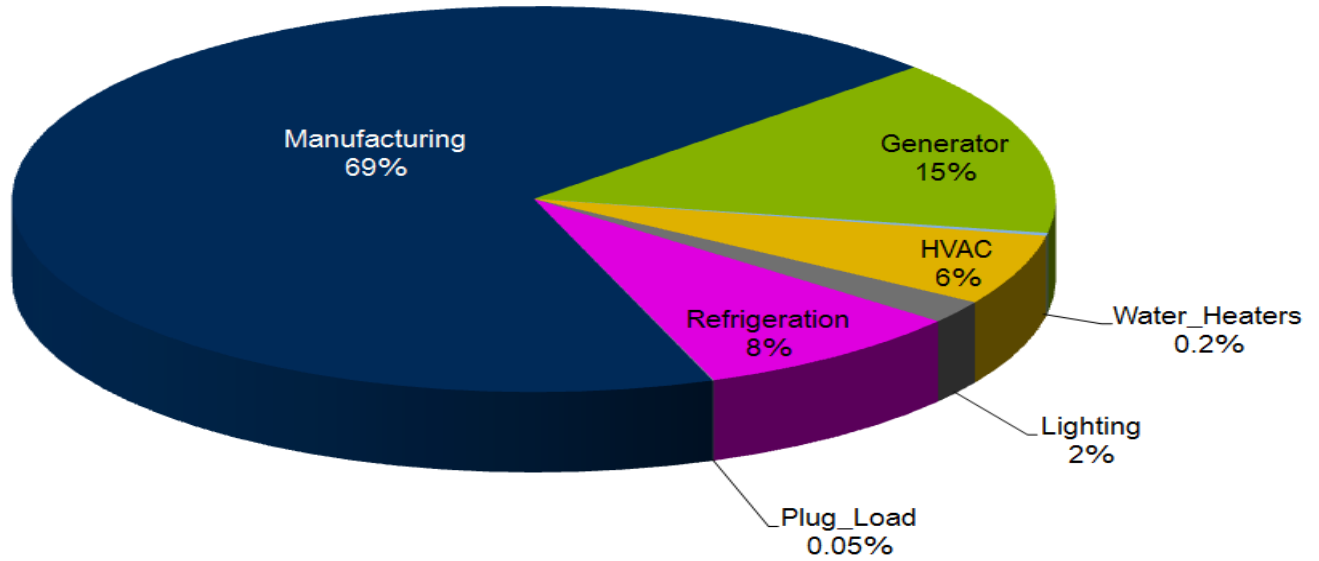
Regulation	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Locations	RTO	414	428	423	368	364	408	551	503	495	489	465	379
Average Number of Unique Participating Locations per Month:		441											
MWs	RTO	64	65	65	80	83	125	182	186	179	166	162	164
Average MWs per Month:		127											

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 11: 2017 PJM Demand Response Confirmed Regulation Registrations Load Reduction Methods


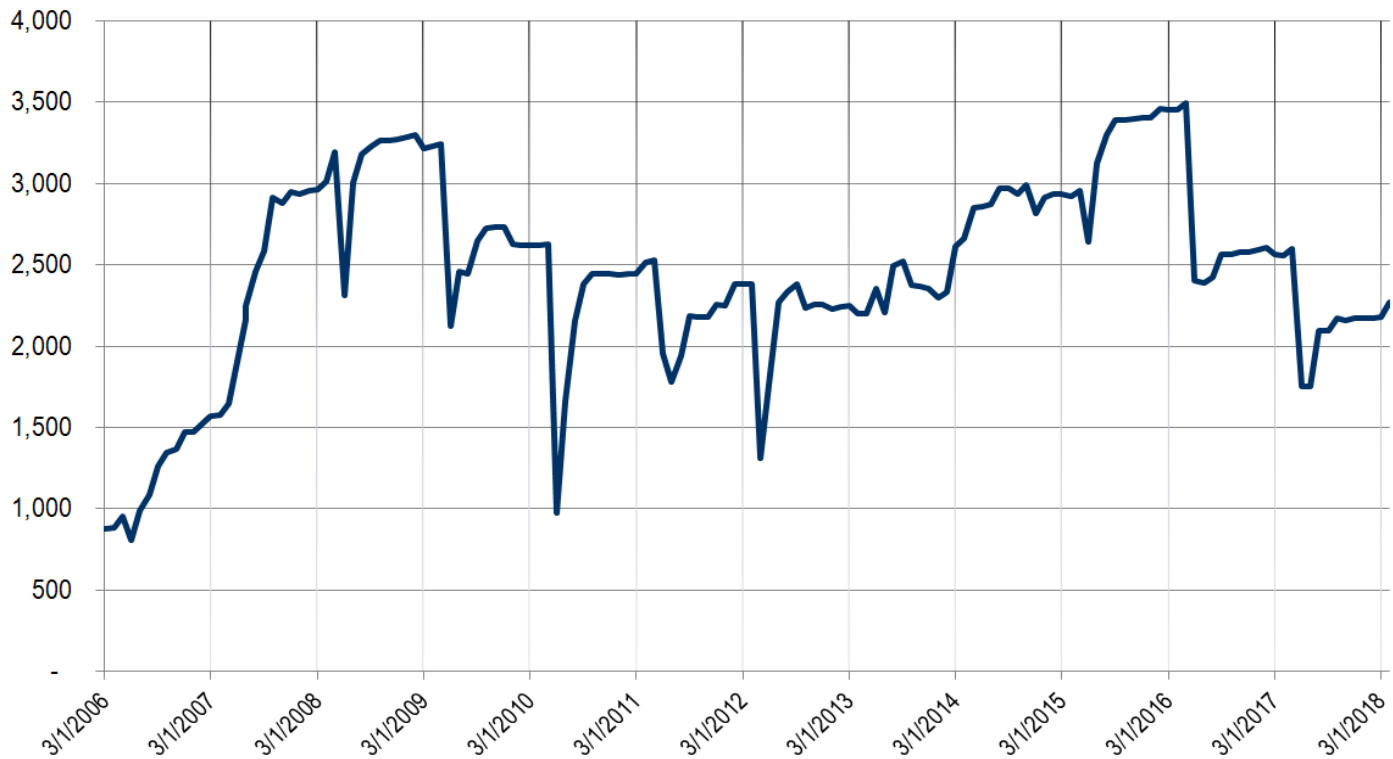
Note: Percent of CSP Reported Load Reduction MWs

Figure 12: 2017 PJM Demand Response Confirmed Synch Reserve Registrations Load Reduction Methods:



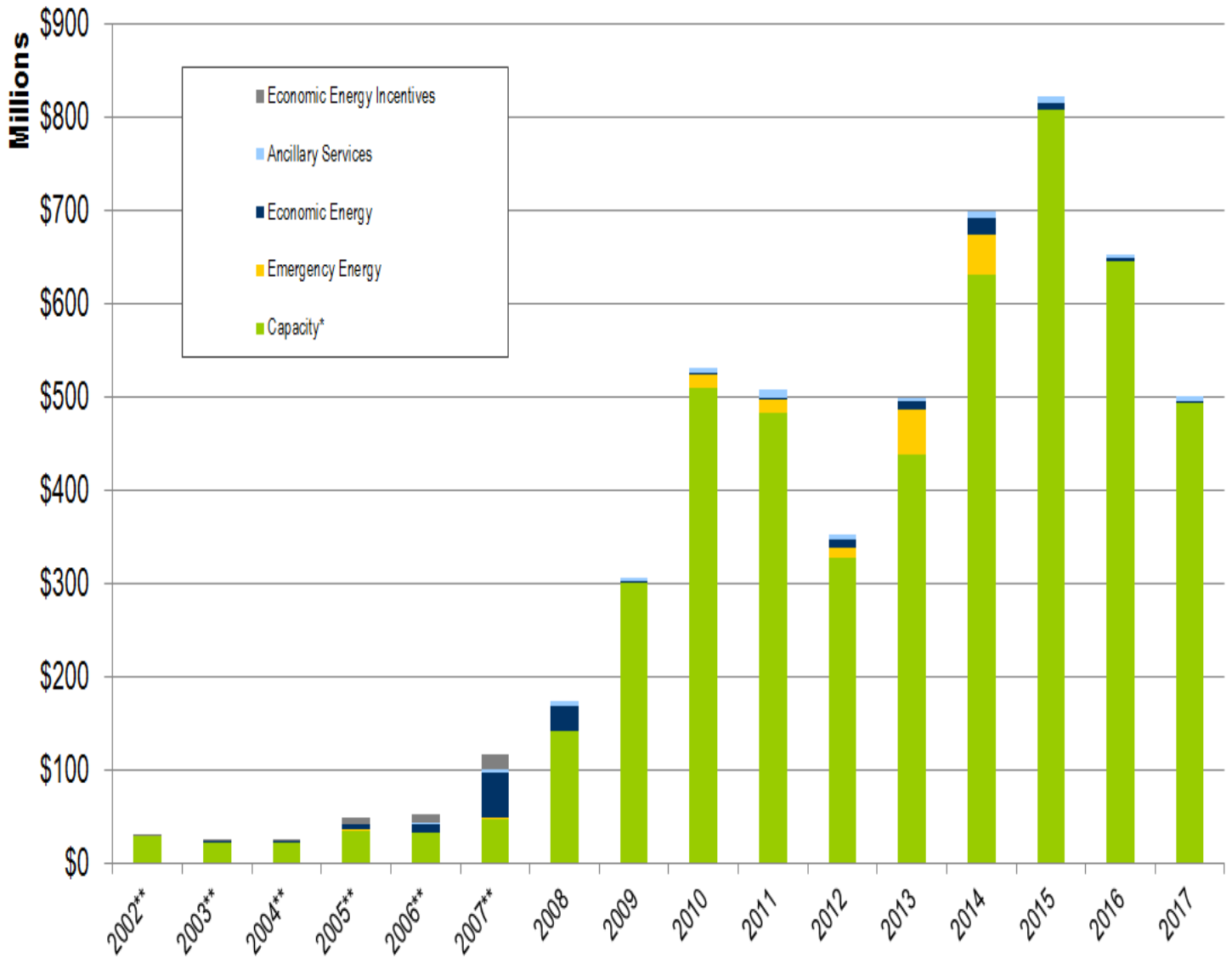
Note: Percent of CSP Reported Load Reduction MWs

Figure 13: PJM Economic Demand Response Capability in Energy Market (3/1/2006-4/5/2018)



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 14: PJM Estimated Revenue for Economic and Load Management DR Markets

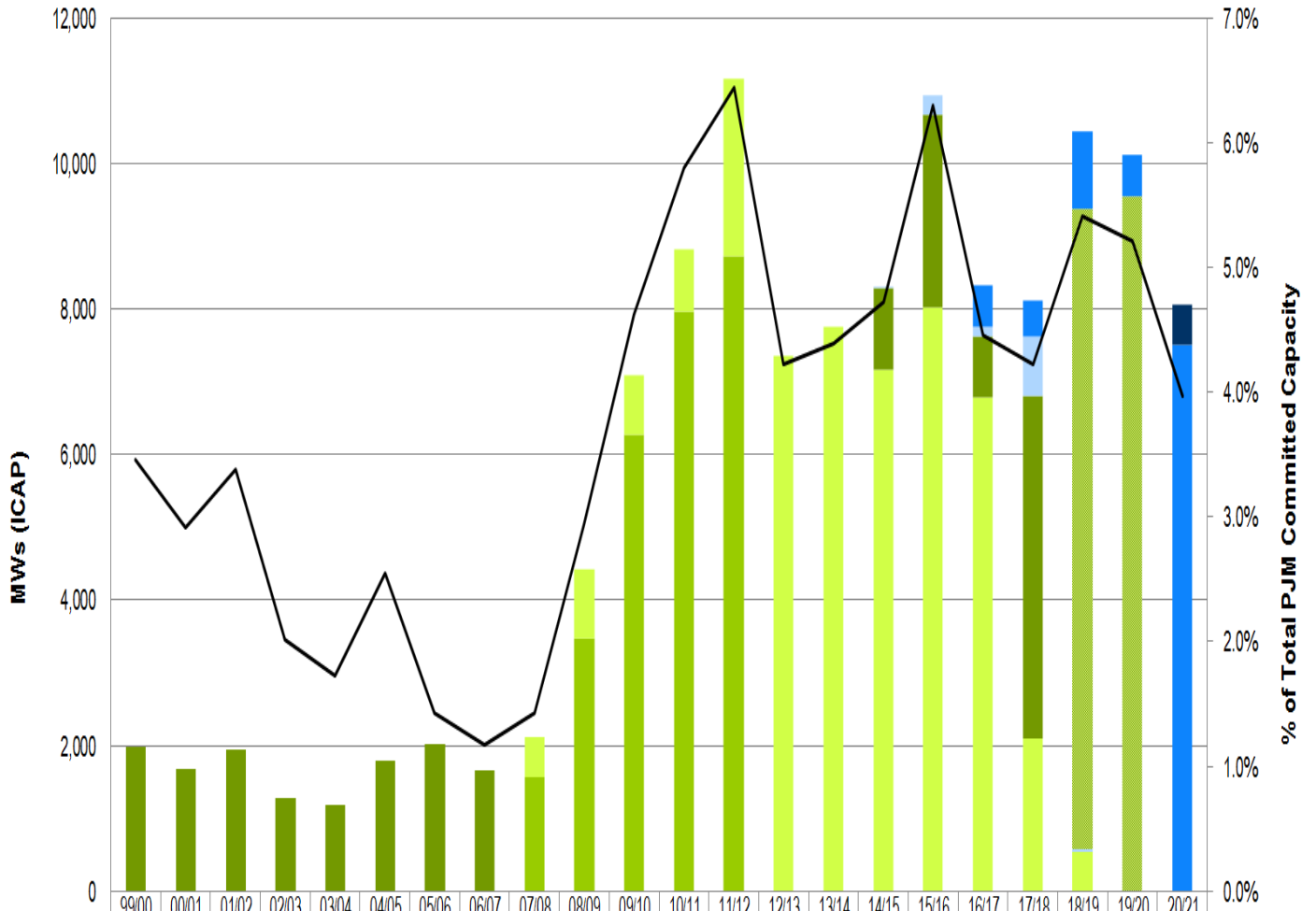


*Capacity Net Revenue inclusive of Capacity Credits and Charges.

**PJM assumes capacity value at \$50 MW Day (PJM does not know the value of capacity credits in the forward market prior to RPM; only a portion of capacity was purchased through the daily capacity market at the time).

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Figure 15: PJM Demand Response Committed MWs by Delivery Year



	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	
PRD																			0	0	0	0	558
Annual - CP																		574	493	1075	563	7508	
Base - CP																		0	0	8774	9553	0	
Annual - DR																22	266	144	822	44	0	0	
Extended Summer - DR																1,126	2,635	836	4694	0	0	0	
Limited - DR									555	940	815	869	2,425	7,361	7,753	7,166	8,027	6,783	2,111	555	0	0	
Limited - ILR									1,585	3,489	6,274	7,961	8,731					0	0	0	0	0	
Limited - ALM	2,005	1,693	1,962	1,292	1,207	1,806	2,042	1,677										0	0	0	0	0	
DR as % of Total PJM Committed Capacity	3.5%	2.9%	3.4%	2.0%	1.7%	2.5%	1.4%	1.2%	1.4%	2.9%	4.6%	5.8%	6.4%	4.2%	4.4%	4.7%	6.3%	4.5%	4.2%	5.4%	5.2%	4.0%	

Notes:

- 1) Data as of 4/9/2018.
- 2) RPM was implemented DY 07/08.
- 3) DY 18/19 MWs include results from Base, First, Second, and Third Incremental Auction.
- 4) DY 19/20 MWs include results from Base and First Incremental Auction.
- 5) DY 20/21 MWs include results from Base Residual Auction.
- 6) ALM MWs are seasonal averages for Delivery Years before 07/08.

Figure 16: 2017 Economic Demand Response Monthly Registration Participation

State	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC	PEPCO							1					
IL	COMED	4	3	3	3	5	6	6	5	6	3	3	3
MD	BGE							7	1	1	1		
	DPL							2					
	PEPCO							2					
NJ	AECO			1									
	JCPL						1	1	1				
	PSEG	8	6	7	8	8	9	10	8	6	7	8	10
OH	AEP			1									
	ATSI				1	1	1	2	1	1	1	1	1
	DEOK							7		7			
PA	APS							1	1	1	1		
	METED	2	2	2	1	2		2	1		2	1	1
	PECO	1		2		3	2	3	2	3		1	3
	PENELEC	2	2	2	2	2	2	3	2	2	2	2	2
	PPL					2	4	7	2	4	2	1	3
VA	DOM	1	1	1		2	3	1	1	3			
WV	APS	1		1	1	1	1	3		1	1	1	1
Total		19	14	20	16	26	29	58	25	35	20	18	24

Average Unique Participating Registrations per Month: 25

Figure 17: 2017 Economic Demand Response Monthly Registration Participation Day-Ahead Activity

State	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC	PEPCO												
IL	COMED												
MD	BGE												
	DPL												
	PEPCO												
NJ	AECO												
	JCPL						1	1	1				
	PSEG	5	3	3	3	3	3	3	2	2	3	3	3
OH	AEP												
	ATSI							1					
	DEOK							7		7			
PA	APS												
	METED	1	1	1	1	1					1	1	1
	PECO			1		1	1	1		1			1
	PENELEC	1	1	1	1	1	1	1	1	1	1	1	1
	PPL						1	2					
VA	DOM												
WV	APS												
Total		7	5	6	5	6	7	16	4	11	5	5	6

Average Unique Participating Registrations per Month (Day-Ahead): 7

Figure 18: 2017 Economic Demand Response Monthly Registration Participation Real-Time Activity

State	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC	PEPCO							1					
IL	COMED	4	3	3	3	5	6	6	5	6	3	3	3
MD	BGE							7	1	1	1		
	DPL							2					
	PEPCO							2					
NJ	AECO			1									
	JCPL												
	PSEG	3	3	4	5	5	6	7	6	4	4	5	7
OH	AEP			1									
	ATSI				1	1	1	1	1	1	1	1	1
	DEOK												
PA	APS							1	1	1	1		
	METED	1	1	1		1		2	1		1		
	PECO	1		1		2	1	2	2	2		1	2
	PENELEC	1	1	1	1	1	1	2	1	1	1	1	1
	PPL					2	3	5	2	4	2	1	3
VA	DOM	1	1	1		2	3	1	1	3			
WV	APS	1		1	1	1	1	3		1	1	1	1
Total		12	9	14	11	20	22	42	21	24	15	13	18

Average Unique Participating Registrations per Month (Real-Time): 18

Figure 19: 2017 Economic Demand Response Monthly MWh Reductions

State	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC	PEPCO							57					
IL	COMED	56	28	519	279	997	271	862	563	383	740	859	303
MD	BGE							2,484	10	6	3		
	DPL							516					
	PEPCO							1,038					
NJ	AECO			0									
	JCPL						472	563	207				
	PSEG	1,790	1,121	1,981	1,914	2,432	2,086	1,407	2,267	1,151	2,076	922	1,555
OH	AEP			0									
	ATSI				90	18	775	1,008	958	1,094	1,817	505	891
	DEOK							91		68			
PA	APS							3	-3	26	9		
	METED	3	8	42	49	15		16	1		27	25	12
	PECO	19		28		162	15	61	28	100		19	156
	PENELEC	583	807	499	1,209	1,034	911	244	1,101	789	823	842	646
	PPL					75	775	613	46	70	188	8	115
VA	DOM	3,585	209	424		1,725	1,905	0	2	12			
WV	APS	0		0	0	0	158	109		140	115	75	95
Total		6,036	2,174	3,494	3,541	6,456	7,368	9,071	5,179	3,840	5,799	3,255	3,775

Total MWh: 59,989

Figure 20: 2017 Economic Demand Response Monthly MWh Reductions Day-Ahead Activity

State	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC	PEPCO												
IL	COMED												
MD	BGE												
	DPL												
	PEPCO												
NJ	AECO												
	JCPL						472	563	207				
	PSEG	564	504	679	1,318	1,107	1,258	624	522	361	1,510	358	1022.68
OH	AEP												
	ATSI							44					
	DEOK							91		68			
PA	APS												
	METED	2	7	41	49	14					25	25	12.2621
	PECO			27		82	0	46		58			129.3
	PENELEC	357	539	309	695	451	745	80	886	595	545	254	482.007
	PPL						661	231					
VA	DOM												
WV	APS												
Total		923	1,050	1,056	2,062	1,654	3,135	1,680	1,614	1,081	2,081	637	1,646

Total Day-Ahead MWh: 18,619

Figure 21: 2017 Economic Demand Response Monthly MWh Reductions Real-Time Activity

State	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC	PEPCO							57					
IL	COMED	56	28	519	279	997	271	862	563	383	740	859	303
MD	BGE							2,484	10	6	3		
	DPL							516					
	PEPCO							1,038					
NJ	AECO			0									
	JCPL												
	PSEG	1,226	618	1,302	596	1,325	828	784	1,745	790	566	565	533
OH	AEP			0									
	ATSI				90	18	775	964	958	1,094	1,817	505	891
	DEOK												
PA	APS							3	-3	26	9		
	METED	1	1	1		1		16	1		2		
	PECO	19		1		80	15	15	28	43		19	27
	PENELEC	226	269	189	514	583	167	163	215	194	278	588	164
	PPL					75	114	382	46	70	188	8	115
VA	DOM	3,585	209	424		1,725	1,905	0	2	12			
WV	APS	0		0	0	0	158	109		140	115	75	95
Total		5,113	1,124	2,438	1,480	4,802	4,233	7,392	3,565	2,759	3,718	2,618	2,128

Total Real-Time MWh: 41,370

Figure 22: 2017 Economic Demand Response Monthly Energy Market Revenue

State	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC	PEPCO							\$2,823					
IL	COMED	\$2,832	\$261	\$13,524	\$6,251	\$31,122	\$9,029	\$38,292	\$19,103	\$15,691	\$21,184	\$25,881	\$10,639
MD	BGE							\$132,077	\$491	\$266	\$251		
	DPL							\$23,732					
	PEPCO							\$50,820					
NJ	AECO			\$0									
	JCPL						\$29,517	\$45,083	\$10,979				
	PSEG	\$56,409	\$20,863	\$53,951	\$56,078	\$73,938	\$79,778	\$55,275	\$85,616	\$65,062	\$74,018	\$28,877	\$88,091
OH	AEP			\$4									
	ATSI				\$3,593	\$571	\$32,029	\$43,658	\$39,204	\$72,851	\$64,091	\$19,139	\$40,997
	DEOK							\$12,682		\$8,440			
PA	APS							\$10	\$139	\$5,416	\$863		
	METED	\$125	\$258	\$1,594	\$2,011	\$957		\$1,373	\$59		\$926	\$960	\$489
	PECO	\$2,130		\$2,816		\$22,205	\$851	\$4,967	\$939	\$15,630		\$1,110	\$21,939
	PENELEC	\$11,567	\$15,905	\$13,598	\$31,496	\$28,593	\$26,455	\$8,460	\$38,216	\$26,227	\$30,179	\$35,598	\$12,720
	PPL					\$6,546	\$25,607	\$23,586	\$1,546	\$5,376	\$8,128	\$271	\$10,868
VA	DOM	\$259,396	\$4,883	\$21,303		\$139,793	\$85,430	\$0	\$44	\$2,544			
WV	APS	\$0		\$0	\$0	\$0	\$4,717	\$4,548		\$4,808	\$3,682	\$3,155	\$3,704
Total		\$332,458	\$42,170	\$106,790	\$99,429	\$303,724	\$293,414	\$447,387	\$196,335	\$222,313	\$203,321	\$114,991	\$189,446

Total CSP Credits: \$2,551,777

Figure 23: 2017 Economic Demand Response Monthly Energy Market Revenue Day-Ahead Activity

State	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC	PEPCO												
IL	COMED												
MD	BGE												
	DPL												
	PEPCO												
NJ	AECO												
	JCPL						\$29,517	\$45,083	\$10,979				
	PSEG	\$20,419	\$12,787	\$27,159	\$46,965	\$43,097	\$48,656	\$23,742	\$19,592	\$14,826	\$50,385	\$12,685	\$58,427
OH	AEP												
	ATSI							\$4,202					
	DEOK							\$12,682		\$8,440			
PA	APS												
	METED	\$90	\$258	\$1,588	\$2,011	\$886					\$882	\$960	\$489
	PECO			\$2,767		\$9,081	\$9	\$4,200		\$8,413			\$17,114
	PENELEC	\$6,443	\$12,518	\$10,584	\$22,998	\$13,610	\$22,377	\$3,094	\$30,421	\$19,462	\$20,467	\$9,828	\$7,824
	PPL						\$20,043	\$7,521					
VA	DOM												
WV	APS												
Total		\$26,952	\$25,562	\$42,098	\$71,974	\$66,675	\$120,602	\$100,525	\$60,991	\$51,141	\$71,734	\$23,472	\$83,854

Total Day-Ahead CSP Credits: \$745,580

Figure 24: 2017 Economic Demand Response Monthly Energy Market Revenue Real-Time Activity

State	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
DC	PEPCO							\$2,823					
IL	COMED	\$2,832	\$261	\$13,524	\$6,251	\$31,122	\$9,029	\$38,292	\$19,103	\$15,691	\$21,184	\$25,881	\$10,639
MD	BGE							\$132,077	\$491	\$266	\$251		
	DPL							\$23,732					
	PEPCO							\$50,820					
NJ	AECO			\$0									
	JCPL												
	PSEG	\$35,990	\$8,076	\$26,792	\$9,114	\$30,841	\$31,123	\$31,533	\$66,024	\$50,237	\$23,633	\$16,193	\$29,664
OH	AEP			\$4									
	ATSI				\$3,593	\$571	\$32,029	\$39,456	\$39,204	\$72,851	\$64,091	\$19,139	\$40,997
	DEOK												
PA	APS							\$10	\$139	\$5,416	\$863		
	METED	\$34	\$0	\$5		\$70		\$1,373	\$59		\$43		
	PECO	\$2,130		\$49		\$13,123	\$842	\$767	\$939	\$7,217		\$1,110	\$4,825
	PENELEC	\$5,124	\$3,387	\$3,014	\$8,498	\$14,983	\$4,078	\$5,365	\$7,795	\$6,765	\$9,712	\$25,770	\$4,896
	PPL					\$6,546	\$5,564	\$16,066	\$1,546	\$5,376	\$8,128	\$271	\$10,868
VA	DOM	\$259,396	\$4,883	\$21,303		\$139,793	\$85,430	\$0	\$44	\$2,544			
WV	APS	\$0		\$0	\$0	\$0	\$4,717	\$4,548		\$4,808	\$3,682	\$3,155	\$3,704
Total		\$305,506	\$16,607	\$64,691	\$27,455	\$237,050	\$172,812	\$346,862	\$135,343	\$171,172	\$131,587	\$91,519	\$105,592

Total Real-Time CSP Credits: \$1,806,197

Figure 25: 2017 Economic Demand Response Energy Market Cost Allocation by Zone

Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AECO	\$4,160	\$180	\$1,086	\$660	\$3,727	\$3,864	\$7,146	\$2,904	\$2,680	\$2,127	\$1,058	\$2,123
AEP	\$50,143	\$3,130	\$15,249	\$11,648	\$44,824	\$40,535	\$63,720	\$29,780	\$33,960	\$33,870	\$19,826	\$28,363
APS	\$21,854	\$1,432	\$6,088	\$4,755	\$17,324	\$15,935	\$24,253	\$11,370	\$12,357	\$12,736	\$7,941	\$12,582
ATSI	\$25,806	\$2,148	\$9,013	\$7,146	\$24,409	\$23,764	\$35,204	\$16,342	\$18,855	\$18,004	\$10,947	\$15,131
BGE	\$15,920	\$1,896	\$4,725	\$3,871	\$12,792	\$13,079	\$18,921	\$7,966	\$8,888	\$8,169	\$4,493	\$8,279
COMED	\$16,978	\$1,894	\$9,037	\$6,669	\$23,757	\$33,879	\$54,834	\$23,557	\$30,264	\$24,691	\$13,269	\$14,381
DAY	\$6,344	\$573	\$2,147	\$2,095	\$6,798	\$5,889	\$8,898	\$4,285	\$4,997	\$4,719	\$2,821	\$3,916
DEOK	\$8,847	\$540	\$2,818	\$2,266	\$10,007	\$8,789	\$14,564	\$6,871	\$7,661	\$7,056	\$3,790	\$5,403
DOM	\$48,400	\$2,916	\$12,894	\$11,389	\$39,920	\$36,372	\$58,576	\$24,974	\$26,620	\$25,568	\$14,145	\$25,699
DPL	\$8,957	\$3,014	\$2,314	\$1,500	\$6,482	\$6,631	\$11,370	\$4,656	\$4,587	\$4,411	\$2,157	\$4,890
DUQ	\$5,006	\$348	\$1,601	\$1,318	\$5,322	\$4,867	\$7,590	\$3,522	\$3,917	\$3,724	\$2,079	\$2,984
EKPC	\$5,477	\$280	\$1,436	\$947	\$4,157	\$3,783	\$6,827	\$2,919	\$3,211	\$3,107	\$1,614	\$2,458
JCPL	\$9,659	\$1,228	\$2,909	\$1,955	\$9,705	\$10,036	\$15,617	\$6,382	\$6,396	\$4,741	\$2,458	\$5,244
METED	\$6,649	\$560	\$2,173	\$2,435	\$5,852	\$5,373	\$8,117	\$3,660	\$4,000	\$3,123	\$2,042	\$3,881
PECO	\$16,350	\$695	\$4,668	\$3,797	\$15,501	\$14,295	\$23,282	\$9,907	\$10,671	\$9,013	\$4,407	\$9,445
PENELEC	\$7,135	\$818	\$2,150	\$2,520	\$5,883	\$4,792	\$7,223	\$3,609	\$4,259	\$4,632	\$2,760	\$4,198
PEPCO	\$14,083	\$1,257	\$4,181	\$3,641	\$12,730	\$12,202	\$18,568	\$7,773	\$8,570	\$8,094	\$4,374	\$7,675
PPL	\$18,651	\$1,853	\$6,005	\$3,622	\$13,780	\$13,310	\$19,520	\$9,048	\$9,906	\$8,059	\$4,099	\$10,266
PSEG	\$18,036	\$2,762	\$5,475	\$3,851	\$17,873	\$18,210	\$27,026	\$11,378	\$12,110	\$10,204	\$5,445	\$9,923
RECO	\$574	\$88	\$169	\$131	\$701	\$721	\$1,044	\$431	\$456	\$359	\$197	\$318
Exports	\$23,430	\$14,557	\$10,651	\$23,211	\$22,182	\$17,088	\$15,086	\$5,001	\$7,948	\$6,915	\$5,068	\$12,284
TOTAL	\$332,458	\$42,170	\$106,790	\$99,429	\$303,724	\$293,414	\$447,387	\$196,335	\$222,313	\$203,321	\$114,991	\$189,446

 Total Zonal Charges: **\$2,551,777**
Figure 26: 2017 Economic Demand Response Day-Ahead Energy Market Cost Allocation by Zone

Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AECO	\$297	\$32	\$318	\$321	\$369	\$1,041	\$1,891	\$451	\$504	\$669	\$181	\$1,079
AEP	\$1,767	\$427	\$4,563	\$5,777	\$5,717	\$10,221	\$16,374	\$4,574	\$6,419	\$10,608	\$3,785	\$13,962
APS	\$826	\$197	\$1,722	\$2,285	\$2,058	\$4,072	\$6,325	\$1,751	\$2,286	\$3,979	\$1,497	\$6,383
ATSI	\$1,051	\$334	\$2,916	\$3,645	\$3,390	\$6,058	\$9,164	\$2,528	\$3,577	\$5,656	\$2,149	\$7,625
BGE	\$1,417	\$511	\$1,586	\$1,998	\$1,579	\$3,367	\$4,929	\$1,224	\$1,689	\$2,507	\$958	\$4,239
COMED	\$985	\$257	\$2,120	\$3,035	\$3,710	\$8,623	\$13,908	\$3,631	\$5,762	\$7,686	\$2,411	\$7,502
DAY	\$300	\$102	\$669	\$1,161	\$1,006	\$1,493	\$2,259	\$657	\$968	\$1,484	\$546	\$1,935
DEOK	\$306	\$58	\$797	\$1,094	\$1,234	\$2,225	\$3,718	\$1,062	\$1,445	\$2,202	\$668	\$2,674
DOM	\$2,039	\$373	\$3,894	\$5,475	\$5,251	\$9,228	\$14,904	\$3,831	\$4,989	\$7,874	\$2,854	\$13,149
DPL	\$525	\$1,167	\$684	\$726	\$668	\$1,767	\$2,960	\$726	\$855	\$1,429	\$367	\$2,564
DUQ	\$197	\$43	\$478	\$630	\$649	\$1,248	\$1,992	\$543	\$735	\$1,162	\$400	\$1,522
EKPC	\$186	\$27	\$398	\$443	\$517	\$960	\$1,737	\$455	\$601	\$956	\$282	\$1,231
JCPL	\$448	\$304	\$868	\$940	\$941	\$2,716	\$4,177	\$1,003	\$1,247	\$1,556	\$436	\$2,656
METED	\$297	\$133	\$637	\$1,630	\$705	\$1,412	\$2,153	\$573	\$768	\$1,007	\$346	\$1,958
PECO	\$642	\$100	\$1,434	\$1,843	\$1,590	\$3,737	\$6,146	\$1,554	\$2,042	\$2,859	\$689	\$4,852
PENELEC	\$306	\$143	\$622	\$1,394	\$730	\$1,223	\$2,037	\$564	\$784	\$1,471	\$482	\$2,104
PEPCO	\$750	\$278	\$1,321	\$1,851	\$1,600	\$3,087	\$4,763	\$1,199	\$1,645	\$2,494	\$871	\$3,928
PPL	\$757	\$338	\$1,738	\$1,764	\$1,437	\$3,511	\$5,209	\$1,406	\$1,887	\$2,645	\$669	\$5,244
PSEG	\$834	\$699	\$1,589	\$1,857	\$1,799	\$4,971	\$7,165	\$1,785	\$2,327	\$3,337	\$958	\$5,042
RECO	\$33	\$22	\$48	\$63	\$74	\$197	\$277	\$68	\$89	\$117	\$35	\$160
Exports	\$4,112	\$4,513	\$4,948	\$15,205	\$5,802	\$4,459	\$4,025	\$769	\$1,568	\$2,244	\$2,347	\$5,992
TOTAL	\$18,074	\$10,057	\$33,350	\$53,137	\$40,828	\$75,619	\$116,113	\$30,352	\$42,187	\$63,939	\$22,930	\$95,802

 Total Day-Ahead Zonal Charges: **\$602,388**

Figure 27: 2017 Economic Demand Response Real-Time Energy Market Cost Allocation by Zone

Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AECO	\$3,863	\$148	\$767	\$339	\$3,357	\$2,823	\$5,255	\$2,453	\$2,176	\$1,458	\$877	\$1,044
AEP	\$48,376	\$2,703	\$10,686	\$5,871	\$39,107	\$30,314	\$47,346	\$25,206	\$27,541	\$23,262	\$16,041	\$14,401
APS	\$21,027	\$1,235	\$4,366	\$2,469	\$15,266	\$11,862	\$17,929	\$9,620	\$10,071	\$8,757	\$6,444	\$6,198
ATSI	\$24,755	\$1,814	\$6,097	\$3,501	\$21,019	\$17,707	\$26,041	\$13,814	\$15,278	\$12,347	\$8,798	\$7,507
BGE	\$14,503	\$1,385	\$3,139	\$1,873	\$11,212	\$9,712	\$13,993	\$6,742	\$7,199	\$5,663	\$3,535	\$4,041
COMED	\$15,993	\$1,637	\$6,917	\$3,633	\$20,047	\$25,256	\$40,926	\$19,925	\$24,502	\$17,005	\$10,858	\$6,880
DAY	\$6,044	\$471	\$1,478	\$934	\$5,791	\$4,396	\$6,639	\$3,628	\$4,029	\$3,235	\$2,275	\$1,981
DEOK	\$8,541	\$482	\$2,021	\$1,172	\$8,773	\$6,564	\$10,846	\$5,809	\$6,216	\$4,854	\$3,122	\$2,729
DOM	\$46,361	\$2,544	\$9,000	\$5,914	\$34,669	\$27,144	\$43,672	\$21,143	\$21,631	\$17,694	\$11,291	\$12,550
DPL	\$8,432	\$1,847	\$1,629	\$774	\$5,813	\$4,864	\$8,410	\$3,931	\$3,732	\$2,981	\$1,790	\$2,326
DUQ	\$4,809	\$305	\$1,122	\$689	\$4,673	\$3,619	\$5,598	\$2,979	\$3,182	\$2,562	\$1,678	\$1,462
EKPC	\$5,291	\$253	\$1,038	\$504	\$3,640	\$2,823	\$5,089	\$2,464	\$2,610	\$2,151	\$1,332	\$1,226
JCPL	\$9,211	\$924	\$2,041	\$1,015	\$8,764	\$7,320	\$11,440	\$5,380	\$5,149	\$3,185	\$2,023	\$2,588
METED	\$6,352	\$427	\$1,536	\$805	\$5,148	\$3,961	\$5,964	\$3,087	\$3,232	\$2,116	\$1,696	\$1,923
PECO	\$15,708	\$595	\$3,235	\$1,954	\$13,912	\$10,557	\$17,136	\$8,353	\$8,629	\$6,154	\$3,718	\$4,593
PENELEC	\$6,829	\$675	\$1,528	\$1,126	\$5,153	\$3,569	\$5,187	\$3,045	\$3,476	\$3,161	\$2,279	\$2,095
PEPCO	\$13,333	\$980	\$2,860	\$1,791	\$11,130	\$9,115	\$13,806	\$6,574	\$6,924	\$5,600	\$3,504	\$3,747
PPL	\$17,894	\$1,515	\$4,267	\$1,858	\$12,342	\$9,799	\$14,311	\$7,642	\$8,020	\$5,414	\$3,430	\$5,022
PSEG	\$17,202	\$2,063	\$3,886	\$1,994	\$16,074	\$13,239	\$19,862	\$9,593	\$9,784	\$6,866	\$4,488	\$4,881
RECO	\$541	\$66	\$121	\$68	\$627	\$523	\$767	\$363	\$367	\$242	\$162	\$158
Exports	\$19,318	\$10,044	\$5,703	\$8,007	\$16,380	\$12,630	\$11,060	\$4,233	\$6,380	\$4,671	\$2,721	\$6,292
TOTAL	\$314,384	\$32,113	\$73,439	\$46,292	\$262,896	\$217,795	\$331,274	\$165,983	\$180,126	\$139,381	\$92,061	\$93,644

Total Real-Time Zonal Charges: \$1,949,389

Figure 28: 2017 Load Management Demand Response Monthly Capacity Revenue from RPM

Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AECO	\$638,888	\$577,060	\$638,888	\$618,278	\$638,888	\$474,310	\$490,121	\$490,121	\$474,310	\$490,121	\$474,310	\$490,121
AEP	\$2,880,461	\$2,601,707	\$2,880,461	\$2,787,543	\$2,880,461	\$5,468,015	\$5,650,283	\$5,650,283	\$5,468,015	\$5,650,283	\$5,468,015	\$5,650,283
APS	\$1,666,929	\$1,505,613	\$1,666,929	\$1,613,157	\$1,666,929	\$3,518,353	\$3,635,631	\$3,635,631	\$3,518,353	\$3,635,631	\$3,518,353	\$3,635,631
ATSI	\$5,891,717	\$5,321,551	\$5,891,717	\$5,701,661	\$5,891,717	\$3,937,233	\$4,068,474	\$4,068,474	\$3,937,233	\$4,068,474	\$3,937,233	\$4,068,474
BGE	\$3,467,109	\$3,131,582	\$3,467,109	\$3,355,267	\$3,467,109	\$2,882,337	\$2,978,415	\$2,978,415	\$2,882,337	\$2,978,415	\$2,882,337	\$2,978,415
COMED	\$3,079,815	\$2,781,769	\$3,079,815	\$2,980,466	\$3,079,815	\$5,739,694	\$5,931,017	\$5,931,017	\$5,739,694	\$5,931,017	\$5,739,694	\$5,931,017
DAY	\$463,438	\$418,589	\$463,438	\$448,489	\$463,438	\$732,787	\$757,213	\$757,213	\$732,787	\$757,213	\$732,787	\$757,213
DEOK	\$596,264	\$538,561	\$596,264	\$577,029	\$596,264	\$658,601	\$680,554	\$680,554	\$658,601	\$680,554	\$658,601	\$680,554
DOM	\$2,475,103	\$2,235,577	\$2,475,103	\$2,395,261	\$2,475,103	\$4,301,456	\$4,444,838	\$4,444,838	\$4,301,456	\$4,444,838	\$4,301,456	\$4,444,838
DPL	\$1,624,702	\$1,467,472	\$1,624,702	\$1,572,292	\$1,624,702	\$1,445,005	\$1,493,172	\$1,493,172	\$1,445,005	\$1,493,172	\$1,445,005	\$1,493,172
DUQ	\$401,741	\$362,863	\$401,741	\$388,781	\$401,741	\$643,123	\$664,561	\$664,561	\$643,123	\$664,561	\$643,123	\$664,561
EKPC	\$521,545	\$471,073	\$521,545	\$504,721	\$521,545	\$607,451	\$627,700	\$627,700	\$607,451	\$627,700	\$607,451	\$627,700
JCPL	\$824,053	\$744,306	\$824,053	\$797,471	\$824,053	\$596,570	\$616,455	\$616,455	\$596,570	\$616,455	\$596,570	\$616,455
METED	\$1,158,290	\$1,046,198	\$1,158,290	\$1,120,926	\$1,158,290	\$1,085,982	\$1,122,182	\$1,122,182	\$1,085,982	\$1,122,182	\$1,085,982	\$1,122,182
PECO	\$1,961,524	\$1,771,699	\$1,961,524	\$1,898,249	\$1,961,524	\$1,800,302	\$1,860,312	\$1,860,312	\$1,800,302	\$1,860,312	\$1,800,302	\$1,860,312
PENELEC	\$1,596,528	\$1,442,025	\$1,596,528	\$1,545,027	\$1,596,528	\$1,287,278	\$1,330,187	\$1,330,187	\$1,287,278	\$1,330,187	\$1,287,278	\$1,330,187
PEPCO	\$2,458,692	\$2,220,754	\$2,458,692	\$2,379,379	\$2,458,692	\$2,245,984	\$2,320,851	\$2,320,851	\$2,245,984	\$2,320,851	\$2,245,985	\$2,320,851
PPL	\$3,690,484	\$3,333,341	\$3,690,484	\$3,571,436	\$3,690,484	\$2,410,862	\$2,491,224	\$2,491,224	\$2,410,862	\$2,491,224	\$2,410,862	\$2,491,224
PSEG	\$4,224,394	\$3,815,581	\$4,224,394	\$4,088,123	\$4,224,394	\$2,493,066	\$2,576,169	\$2,576,169	\$2,493,066	\$2,576,169	\$2,493,066	\$2,576,169
RECO	\$37,300	\$33,690	\$37,300	\$36,097	\$37,300	\$12,072	\$12,475	\$12,475	\$12,072	\$12,475	\$12,072	\$12,475
Total	\$39,658,975	\$35,821,010	\$39,658,975	\$38,379,653	\$39,658,975	\$42,340,483	\$43,751,832	\$43,751,832	\$42,340,483	\$43,751,832	\$42,340,483	\$43,751,832

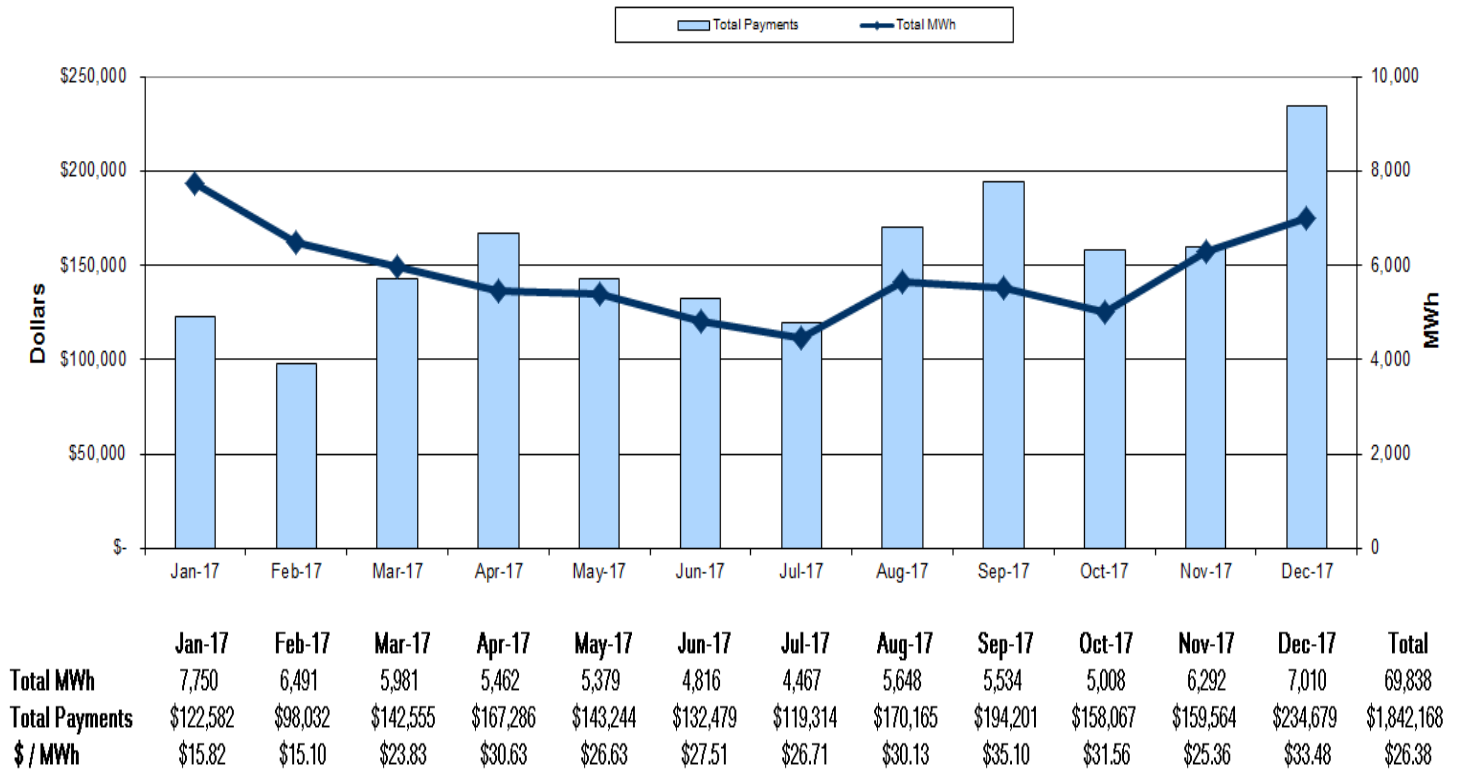
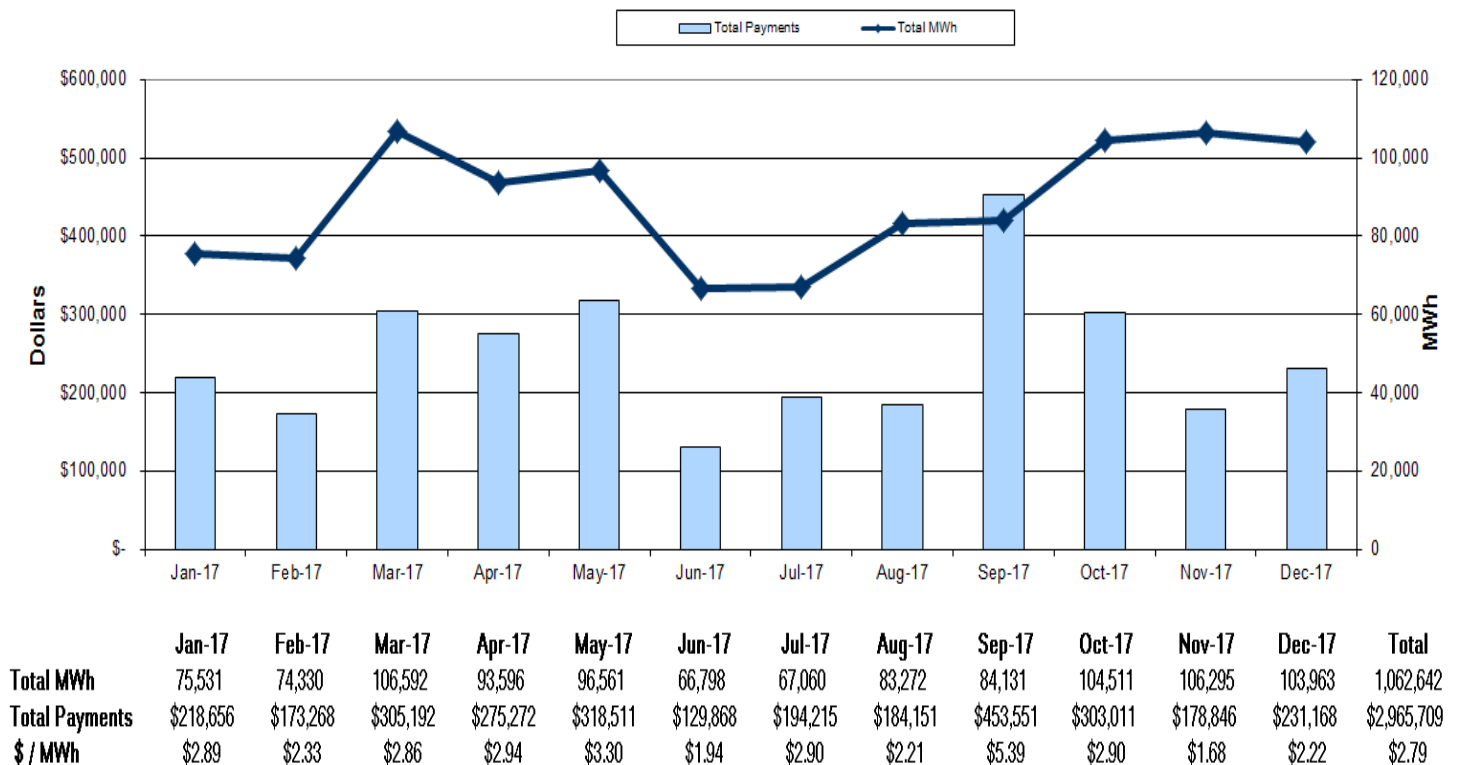
Total Capacity Credits: \$495,206,365

Figure 29: 2017 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	%
2017	1	5	5	7	7	12	12	100%	2,212	5,113	231%	711	711	100%
2017	2	3	3	5	5	9	9	100%	522	1,124	215%	285	285	100%
2017	3	5	5	9	9	14	14	100%	2,739	2,438	89%	920	920	100%
2017	4	4	4	5	5	11	11	100%	1,303	1,480	114%	648	648	100%
2017	5	7	7	9	9	20	20	100%	3,754	4,802	128%	1,208	1,208	100%
2017	6	5	5	8	8	22	22	100%	4,101	4,233	103%	915	915	100%
2017	7	9	9	12	12	42	42	100%	12,774	7,392	58%	1,752	1,752	100%
2017	8	4	4	10	10	21	21	100%	3,037	3,565	117%	1,314	1,314	100%
2017	9	6	6	9	9	24	24	100%	2,979	2,759	93%	1,114	1,114	100%
2017	10	5	5	8	8	15	15	100%	3,172	3,718	117%	1,345	1,345	100%
2017	11	4	4	7	7	13	13	100%	1,699	2,618	154%	833	833	100%
2017	12	4	4	7	7	18	18	100%	2,230	2,128	95%	891	891	100%
YTD Totals						221	221	100%	40,522	41,370	102%	11,936	11,936	100%
YTD Average		5	5	8	8									

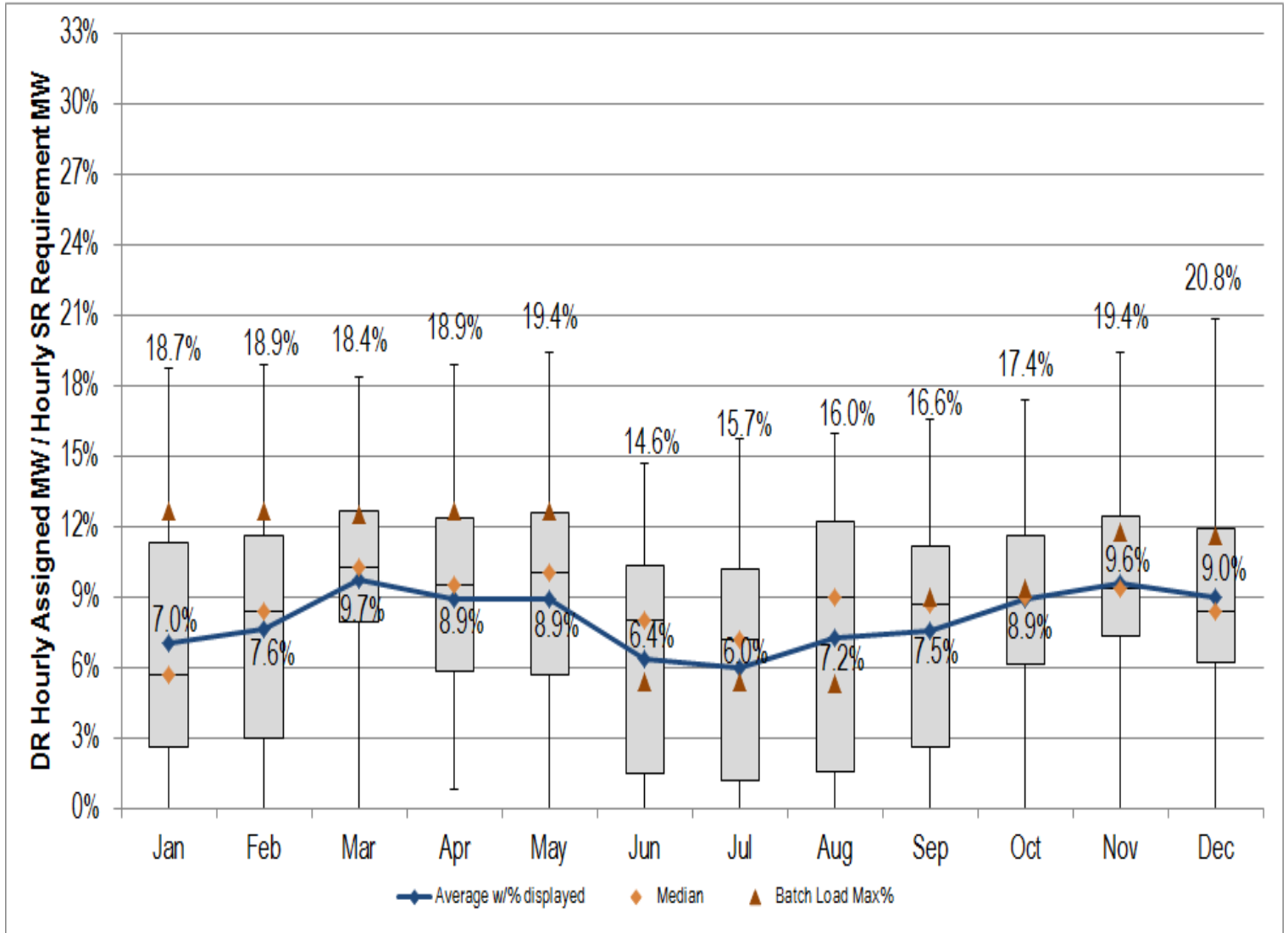
Figure 30: 2017 Economic Demand Response Cleared vs Settled Day-Ahead Energy Market Summary

Time		CSPs		Zone		Registrations			MWh			Registration Hours		
Year	Month	Cleared	Settled	Cleared	Settled	Cleared	Settled	%	Cleared	Settled	%	Cleared	Settled	%
2017	1	4	4	3	3	7	7	100%	637	923	145%	324	324	100%
2017	2	3	3	3	3	5	5	100%	535	1,050	196%	245	245	100%
2017	3	4	4	4	4	6	6	100%	826	1,056	128%	371	371	100%
2017	4	3	3	3	3	5	5	100%	1,532	2,062	135%	611	611	100%
2017	5	4	4	4	4	6	6	100%	998	1,654	166%	372	372	100%
2017	6	4	4	5	5	7	7	100%	1,947	3,135	161%	696	696	100%
2017	7	6	6	7	7	16	16	100%	1,891	1,680	89%	466	466	100%
2017	8	2	2	3	3	4	4	100%	745	1,614	217%	370	370	100%
2017	9	3	3	4	4	11	11	100%	643	1,081	168%	369	369	100%
2017	10	3	3	3	3	5	5	100%	1,901	2,081	109%	652	652	100%
2017	11	3	3	3	3	5	5	100%	651	637	98%	314	314	100%
2017	12	4	4	4	4	6	6	100%	1,561	1,646	105%	599	599	100%
YTD Totals						83	83	100%	13,868	18,619	134%	5,389	5,389	100%
YTD Average		4	4	4	4									

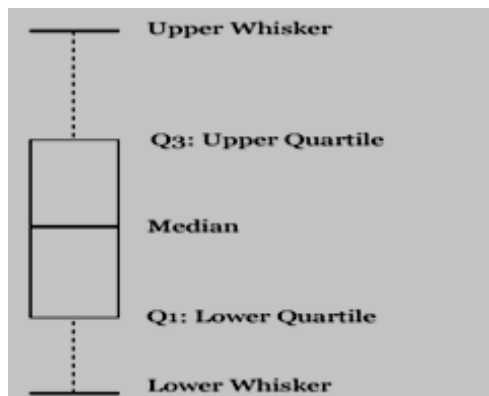
Figure 31: 2017 Economic Demand Response Regulation Market Participation

Figure 32: 2017 Economic Demand Response Synchronous Reserve Market Participation


Note: For Figures 31 and 32 above, MWh=sum of the settled MW. Example: 1 MW load available for 12 hours = 12 MWh.

Figure 33: Economic DR Synchronous Reserve Penetration Distribution (Box-plot) for 2017



- 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