

2017 Demand Response Operations Markets Activity Report: February 2017

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PJM Demand Side Response Operations

February 9, 2017



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

State	Zone	EDC	Load Management	
			Locations	MW
IL	COMED	COMED	1	1.1
IN	AEP	WVSDI	1	9.6
KY	EKPC	EKPC	3	9.0
MD	BGE	BC	10	12.9
MD	PEPCO	PEPCO	1	4.4
NJ	JCPL	JCBGS	2	5.3
NJ	PSEG	PSEG	1	0.1
OH	AEP	AEPOPT	66	26.6
OH	ATSI	OEEDC	26	14.6
OH	DAY	DAYEDC	9	2.6
OH	DEOK	DEOEDC	1	22.6
PA	APS	AETSAP	35	21.6
PA	ATSI	PAPWR	4	1.1
PA	METED	MetEd	2	0.7
PA	PENELEC	PaElec	46	31.1
WV	AEP	AEPAPT	3	2.1
Total			211	165.4

Note:

- 1) Data as of 2/3/2017.
- 2) Includes Capacity Performance registrations.
- 3) MWs are in Nominated ICAP.

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

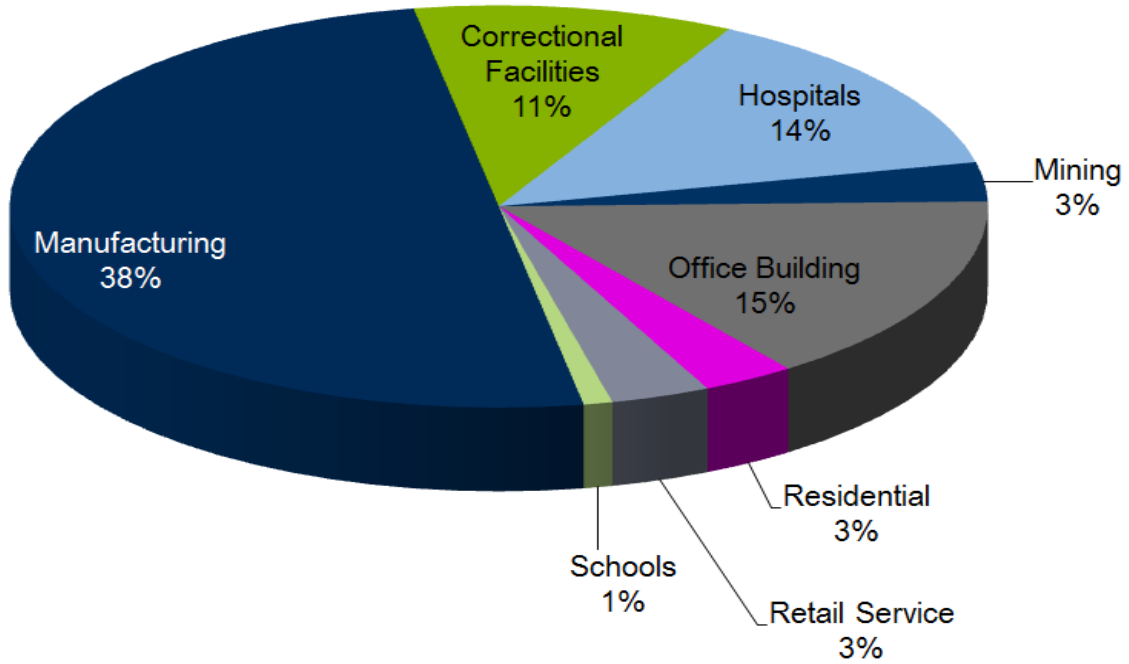
Zone		Product			Lead Times (minutes)			Total MW
		Limited	Extended	Annual	30	60	120	
AEP								
	Pre-Emergency	9.6	2.0	26.7	2.0	0.0	36.4	38.4
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	9.6	2.0	26.7	2.0	0.0	36.4	38.4
APS								
	Pre-Emergency	0.0	0.0	21.6	0.0	0.0	21.6	21.6
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	21.6	0.0	0.0	21.6	21.6
ATSI								
	Pre-Emergency	0.0	0.0	15.7	0.0	0.0	15.7	15.7
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	15.7	0.0	0.0	15.7	15.7

Zone		Limited	Product		Lead Times (minutes)			Total MW
			Extended	Annual	30	60	120	
BGE								
	Pre-Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Emergency	12.9	0.0	0.0	3.0	0.0	9.9	12.9
	Total	12.9	0.0	0.0	3.0	0.0	9.9	12.9
COMED								
	Pre-Emergency	0.0	1.1	0.0	0.0	0.0	1.1	1.1
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	1.1	0.0	0.0	0.0	1.1	1.1
DAY								
	Pre-Emergency	0.0	0.0	2.6	0.0	0.0	2.6	2.6
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	2.6	0.0	0.0	2.6	2.6
DEOK								
	Pre-Emergency	0.0	0.0	22.6	0.0	0.0	22.6	22.6
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	22.6	0.0	0.0	22.6	22.6
EKPC								
	Pre-Emergency	0.0	0.0	9.0	9.0	0.0	0.0	9.0
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	9.0	9.0	0.0	0.0	9.0
JCPL								
	Pre-Emergency	0.4	0.0	0.0	0.0	0.0	0.4	0.4
	Emergency	4.9	0.0	0.0	4.9	0.0	0.0	4.9
	Total	5.3	0.0	0.0	4.9	0.0	0.4	5.3
METED								
	Pre-Emergency	0.0	0.0	0.7	0.0	0.0	0.7	0.7
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.0	0.0	0.7	0.0	0.0	0.7	0.7
PENELEC								
	Pre-Emergency	10.0	2.7	18.0	0.0	0.0	30.7	30.7
	Emergency	0.5	0.0	0.0	0.5	0.0	0.0	0.5
	Total	10.5	2.7	18.0	0.5	0.0	30.7	31.1
PEPCO								
	Pre-Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Emergency	4.4	0.0	0.0	4.4	0.0	0.0	4.4
	Total	4.4	0.0	0.0	4.4	0.0	0.0	4.4
PSEG								
	Pre-Emergency	0.1	0.0	0.0	0.0	0.1	0.0	0.1
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total	0.1	0.0	0.0	0.0	0.1	0.0	0.1
TOTAL								
	Pre-Emergency	20.1	5.8	116.9	11.0	0.1	131.8	142.9
	Emergency	22.7	0.0	0.0	12.8	0.0	9.9	22.7
	Total	42.8	5.8	116.9	23.8	0.1	141.7	165.6

Note:

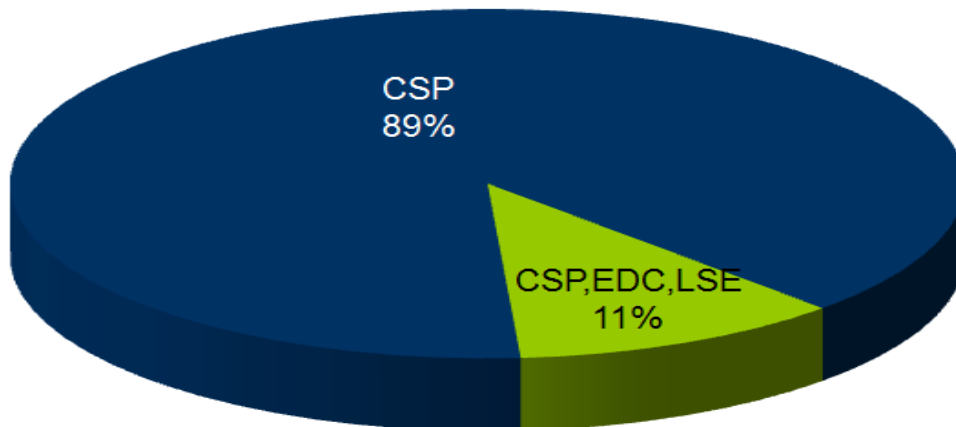
- 1) Data as of 2/3/2017.
- 2) Includes Capacity Performance registrations.
- 3) MWs are Nominated ICAP.

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



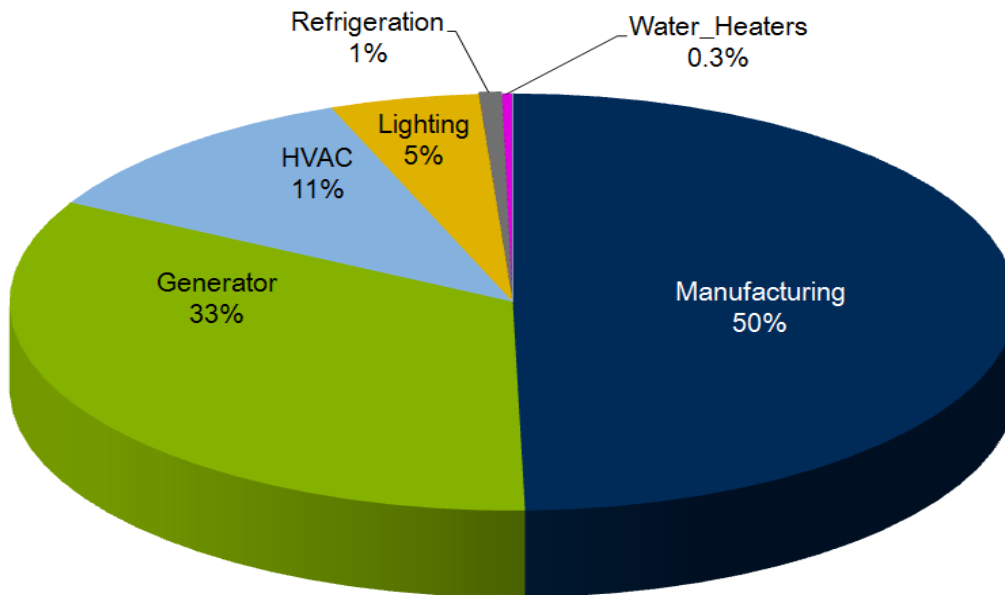
Note: Percent of Nominated Capacity (MWs)

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



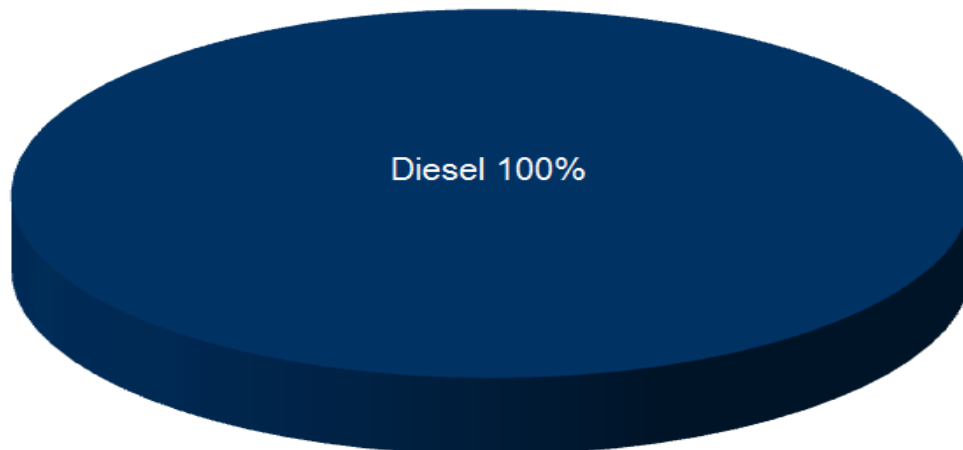
Note: Percent of Nominated Capacity (MWs)

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



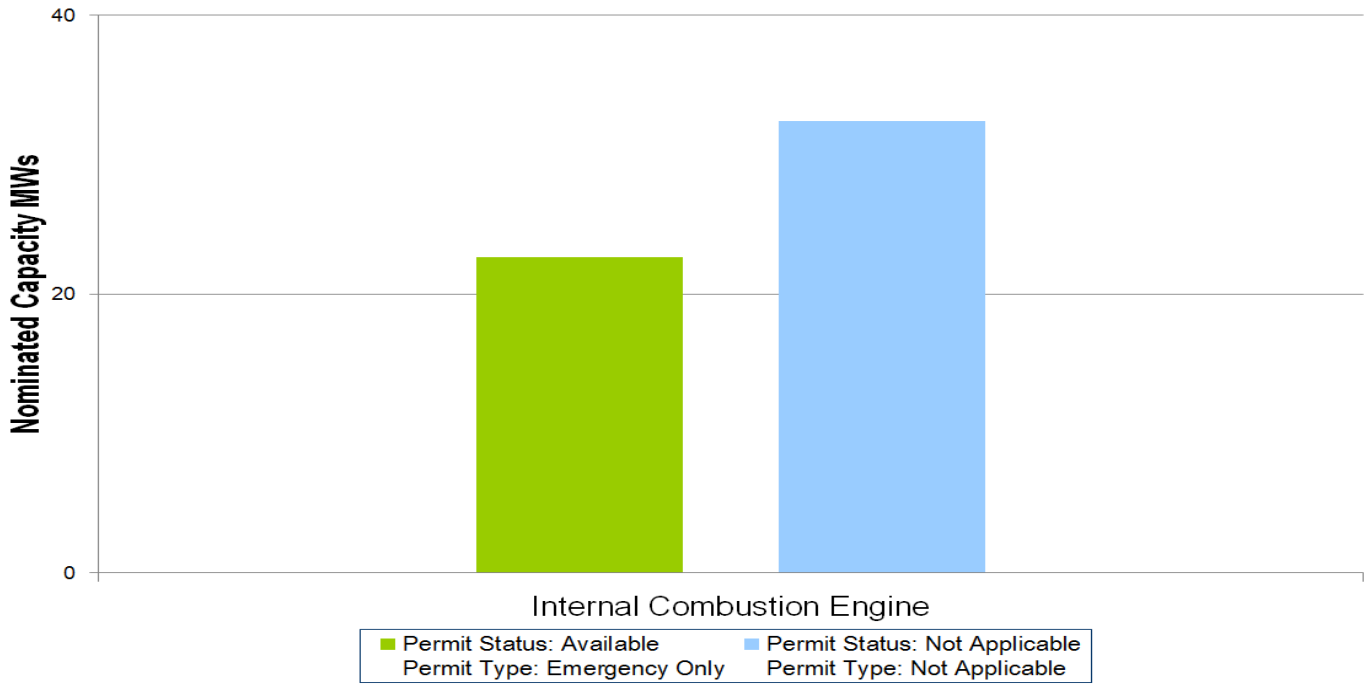
Note: Percent of Nominated Capacity (MWs)

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



Note: Percent of Nominated Capacity (MWs)

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



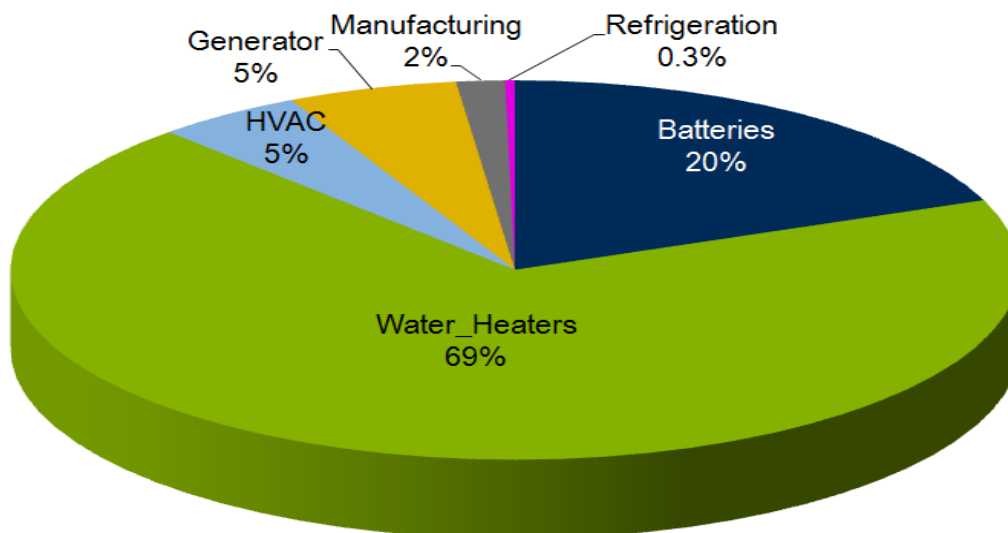
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Figure 8: 2017 Economic Demand Response Capability in the Ancillary Service Markets

Synch Reserves	Zone	Jan
Locations	MAD	155
	Non-MAD	18
	Average Number of Unique Participating Locations per Month:	173
MWs	MAD	360
	Non-MAD	151
	Average MWs per Month:	511

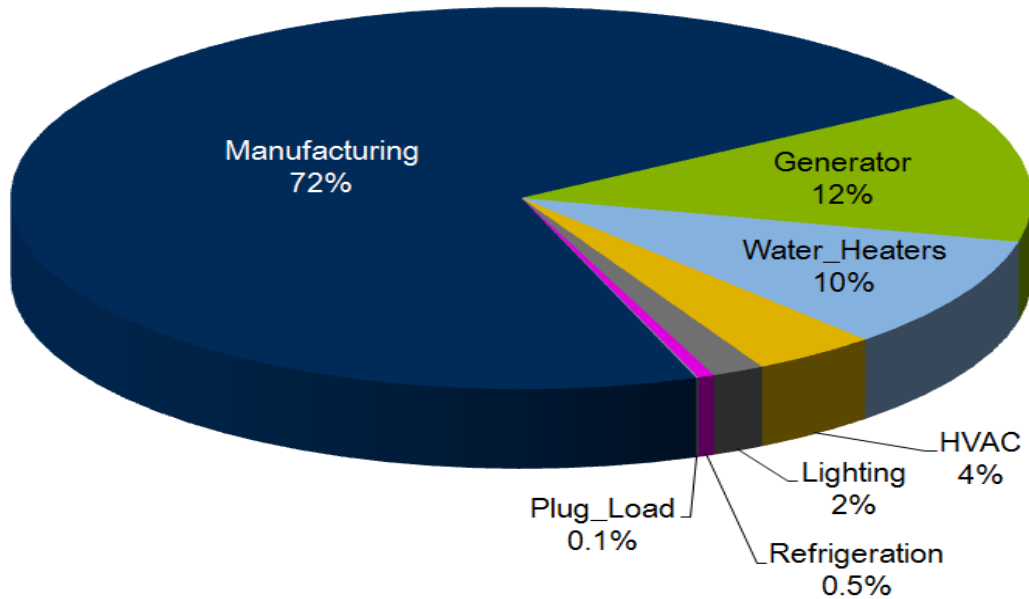
Regulation	Zone	Jan
Locations	RTO	414
	Average Number of Unique Participating Locations per Month:	414
MWs	RTO	64
Average MWs per Month:	64	

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 9: 2017 PJM Demand Response Confirmed Regulation Registrations Load Reduction Methods


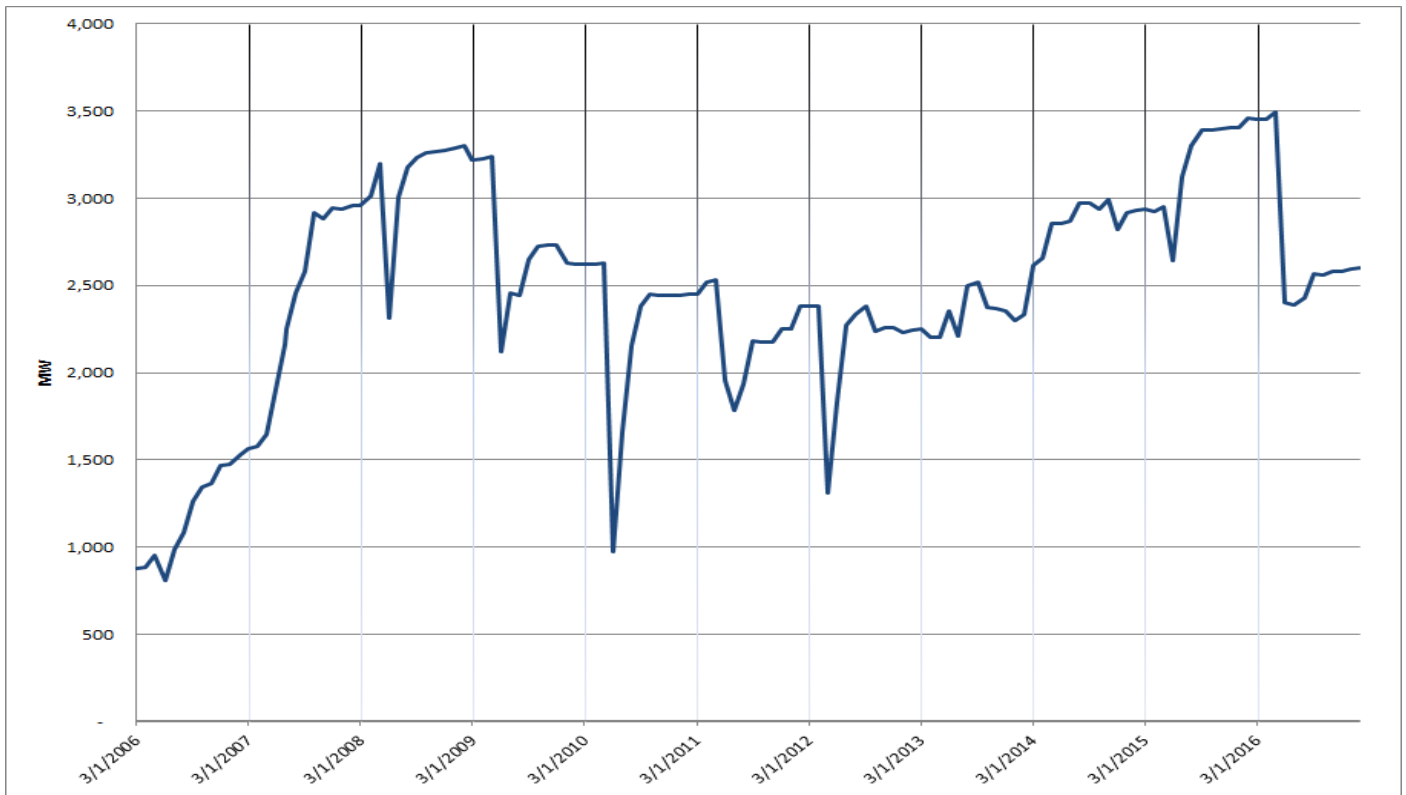
Note: Percent of CSP Reported Load Reduction MWs

Figure 10: 2017 PJM Demand Response Confirmed Synch Reserve Registrations Load Reduction Methods:



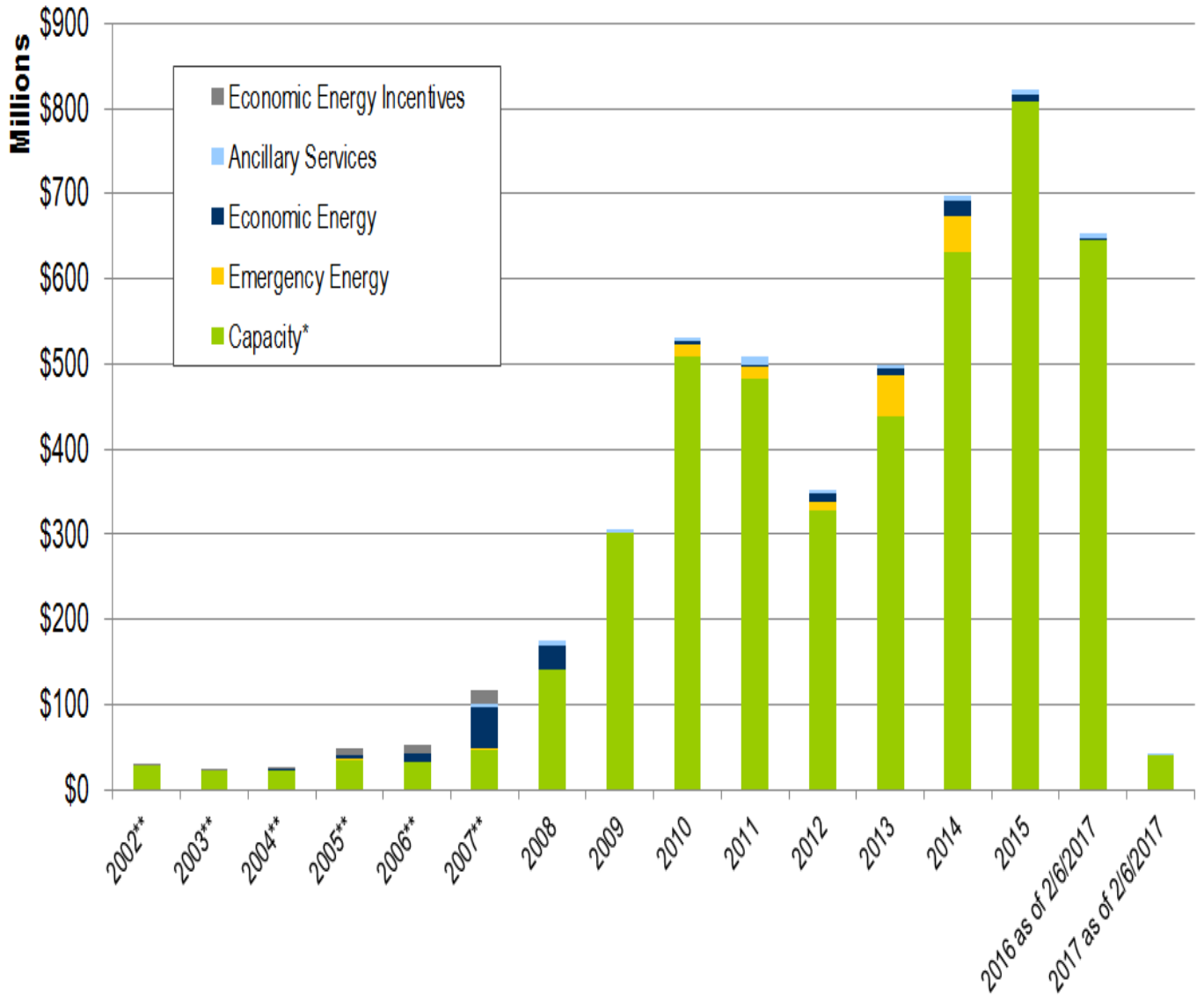
Note: Percent of CSP Reported Load Reduction MWs

Figure 11: PJM Economic Demand Response Capability in Energy Market (3/1/2006-02/3/2017)



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.

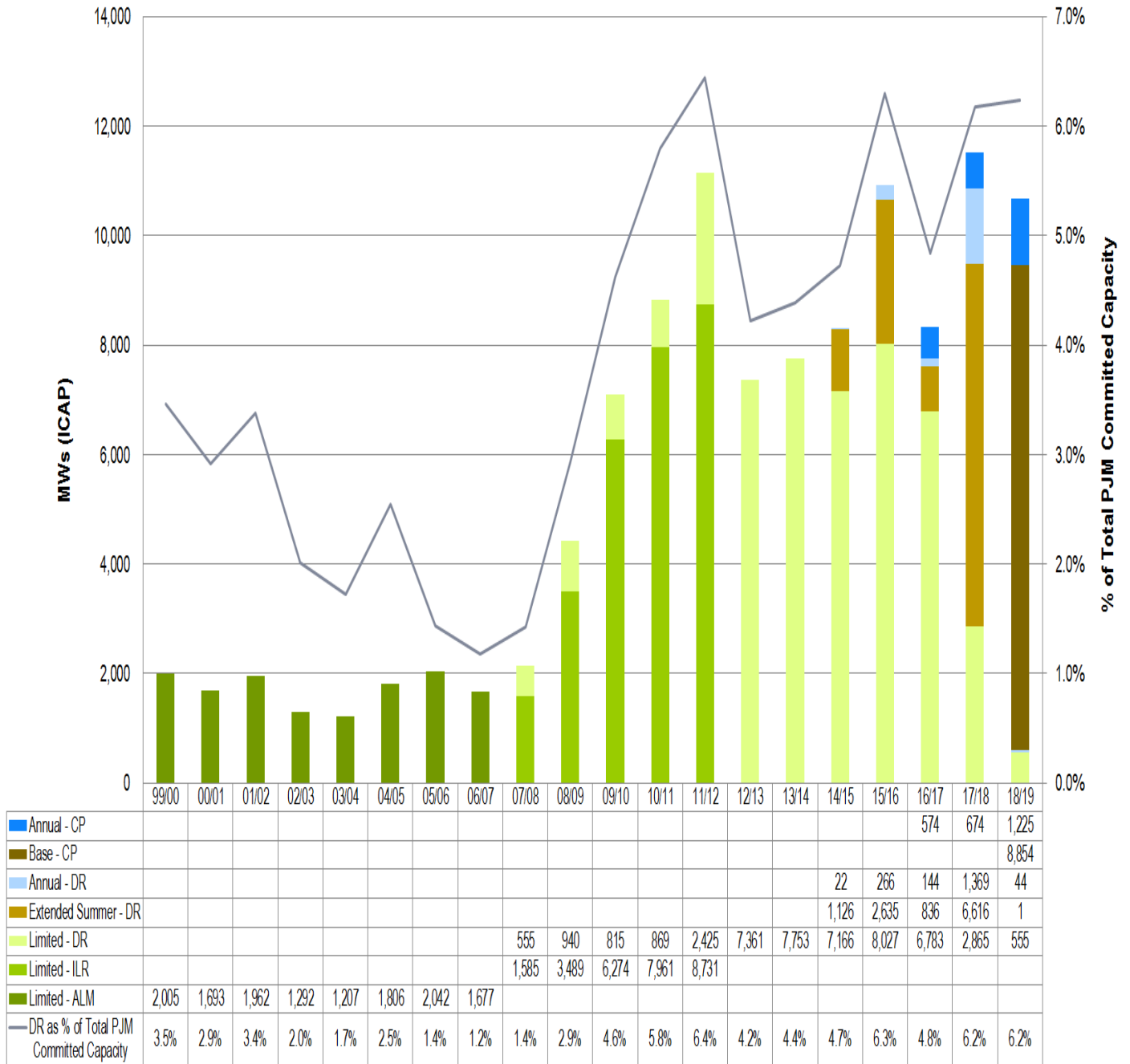
Figure 12: PJM Estimated Revenue for Economic and Load Management DR Markets



*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 13: PJM Demand Response Committed MWs by Delivery Year

Notes:

- 1) Data as of 2/7/2017.
- 2) RPM was implemented DY 07/08.
- 3) DY 17/18 MWs include results from Base, First, and Second Incremental Auction.
- 4) DY 18/19 MWs include results from Base and First Incremental Auction.
- 5) ALM MWs are seasonal averages for Delivery Years before 07/08.

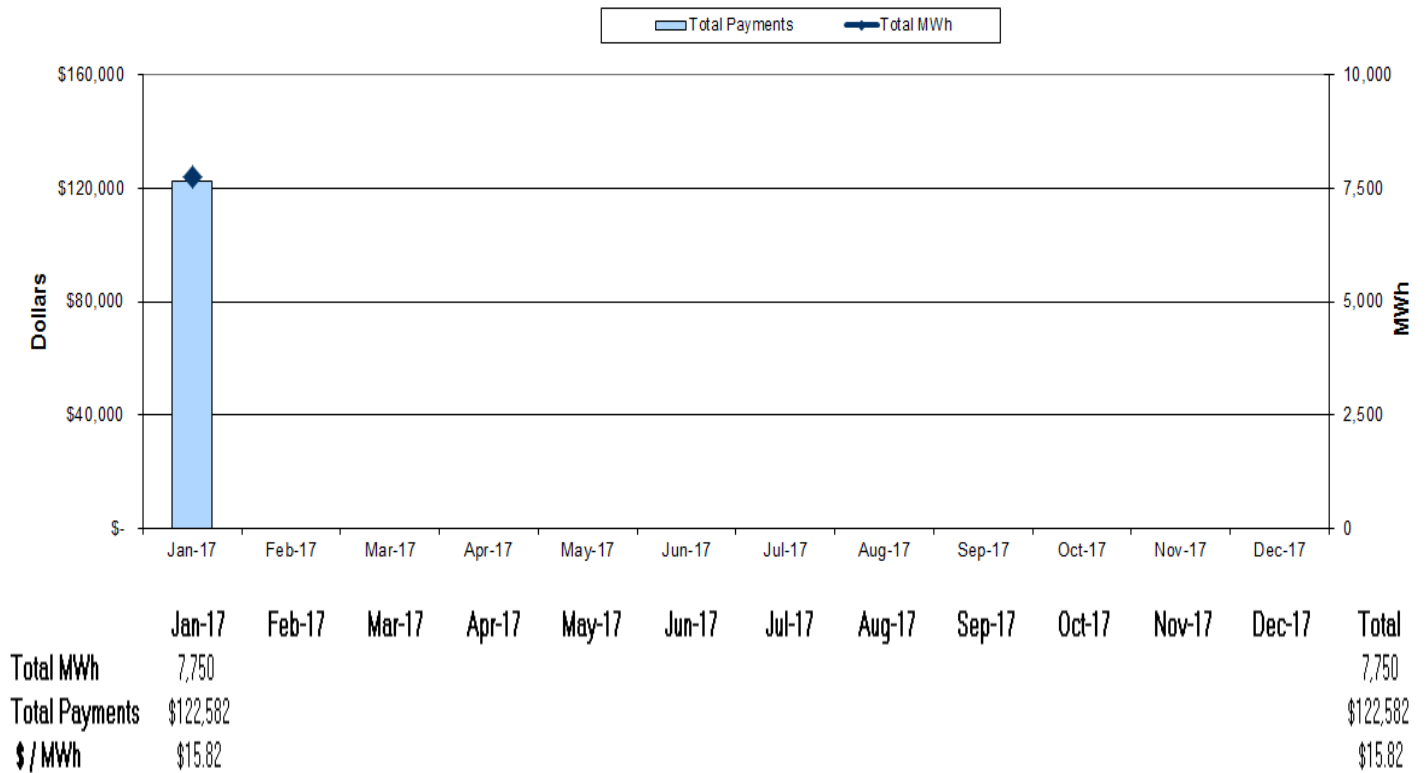
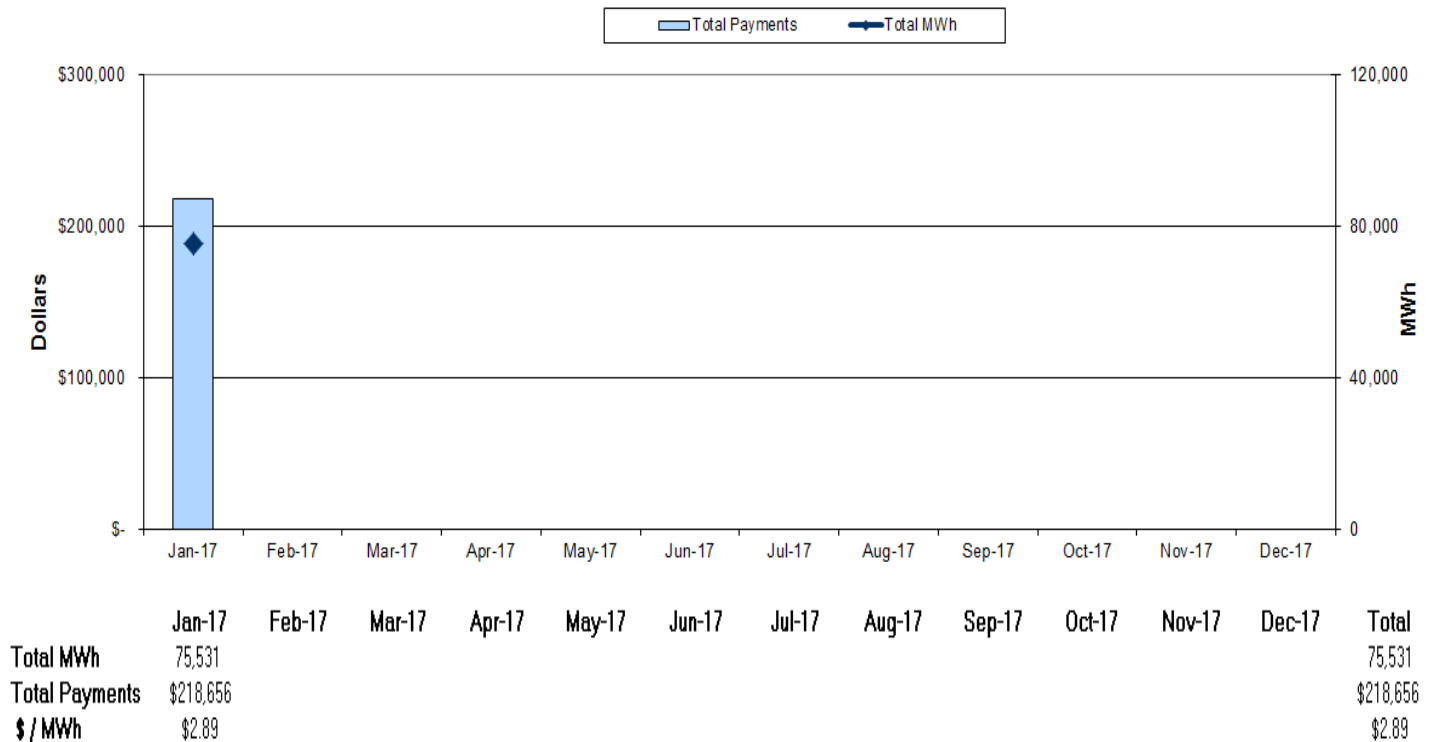
Note: Economic Tables not included due to minimal amount of data.

Figure 14: 2017 Load Management Demand Response Monthly Capacity Revenue from RPM

Zone	Jan
AECO	\$638,888
AEP	\$2,880,461
APS	\$1,666,929
ATSI	\$5,891,717
BGE	\$3,467,109
COMED	\$3,079,815
DAY	\$463,438
DEOK	\$596,264
DOM	\$2,475,103
DPL	\$1,624,702
DUQ	\$401,741
EKPC	\$521,545
JCPL	\$824,053
METED	\$1,158,290
PECO	\$1,961,524
PENELEC	\$1,596,528
PEPCO	\$2,458,692
PPL	\$3,690,484
PSEG	\$4,224,394
RECO	\$37,300
Total	\$39,658,975

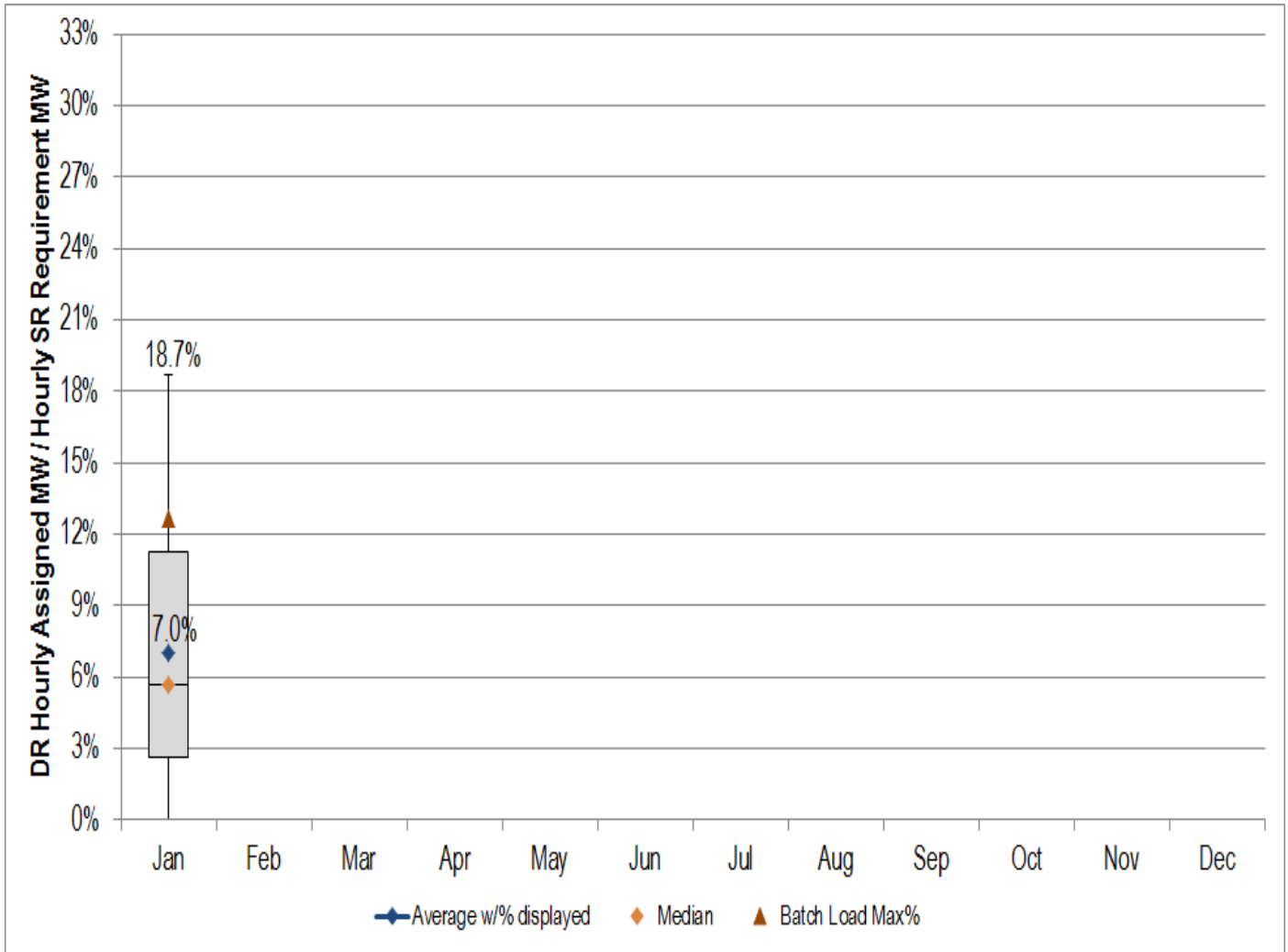
Total Capacity Credits: \$39,658,975

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Figure 15: 2017 Economic Demand Response Regulation Market Participation

Figure 16: 2017 Economic Demand Response Synchronous Reserve Market Participation


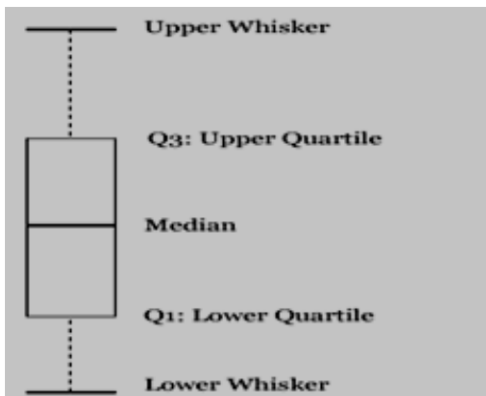
Note: For Figures 15 and 16 above, MWh=sum of the settled MW. Example: 1 MW load available for 12 hours = 12 MWh.

Figure 17: 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