

# 2020 Demand Response Operations Markets Activity Report: February 2020

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PJM Demand Side Response Operations

February 11, 2020



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Figure 1: DY 19/20 Active Participants in DR Programs

State	Zone	EDC	Economic		Emergency Energy Only		Load Management		Unique	
			Locations	MW	Locations	MW	Locations	MW	Locations	MW
DC	PEPCO	PEPCO	2	19.3			187	67.9	187	67.9
DE	DPL	DEMEC	9	5.1			28	17.9	29	22.5
DE	DPL	DOVDE					16	5.1	16	5.1
DE	DPL	DPL	5	158.4			181	214.0	181	214.0
DE	DPL	ODEC					11	4.3	11	4.3
IL	COMED	COMED	21	87.0			2,356	1,542.8	2,361	1,597.9
IL	COMED	GENEVA	1	1.0					1	1.0
IL	COMED	IMEAA1	1	0.3			1	1.7	1	1.7
IN	AEP	AEPIMP					143	315.1	143	315.1
IN	AEP	HEREC					1	22.2	1	22.2
IN	AEP	WVPA	1	6.1			1	6.1	2	12.2
IN	AEP	WVSDI					1	14.2	1	14.2
KY	AEP	AEPKPT					4	3.6	4	3.6
KY	DEOK	DEK					65	19.4	65	19.4
KY	EKPC	EKPC					9	123.2	9	123.2
MD	APS	AETSAP	14	35.3			127	105.9	128	109.4
MD	APS	FESCTH	1	1.8					1	1.8
MD	APS	FESCHG					4	1.2	4	1.2
MD	BGE	BC	48	647.8			675	713.4	681	731.1
MD	DPL	DPL	8	78.3			147	117.3	147	117.3
MD	DPL	EASTON					8	2.0	8	2.0
MD	DPL	ODEC	1	2.2			15	10.4	15	10.4
MD	PEPCO	PEPCO	4	367.9			154	442.0	154	442.0
MD	PEPCO	SMECO	4	0.7			116	42.1	116	42.1
MI	AEP	COSEDC					1	5.2	1	5.2
NJ	AECO	AE	6	52.0			212	108.6	212	108.6
NJ	AECO	VMEU					21	6.7	21	6.7
NJ	JCPL	JCBGS	11	83.1			353	136.7	359	217.9
NJ	PSEG	PSEG	19	60.3	1.0	0.5	909	253.8	915	282.2
NJ	RECO	RECO					16	2.6	16	2.6
NY	PENELEC	PaElec					1	1.4	1	1.4
OH	AEP	AEPOPT	36	315.7			813	483.7	817	620.9
OH	AEP	AMPO					60	60.0	60	60.0
OH	AEP	BUCK					2	20.2	2	20.2
OH	ATSI	AMPO					14	20.2	14	20.2
OH	ATSI	BUCK					2	6.0	2	6.0
OH	ATSI	CPP					14	15.2	14	15.2
OH	ATSI	OEEDC	11	22.1			920	762.9	921	765.9
OH	DAY	AMPO	1	7.0			9	4.7	9	4.7
OH	DAY	BUCK					2	4.2	2	4.2
OH	DAY	DAYEDC	6	4.4			186	147.7	186	147.7
OH	DEOK	AMPO					7	12.8	7	12.8
OH	DEOK	BUCK					2	1.6	2	1.6
OH	DEOK	DEOEDC	16	129.3			404	168.7	404	168.7
PA	APS	AECI					2	0.3	2	0.3
PA	APS	AETSAP	11	48.6			565	315.9	566	316.9
PA	ATSI	PAPWR	4	85.8			92	67.2	93	67.8
PA	DUQ	DLCO	5	16.0			357	109.8	359	125.6

State	Zone	EDC	Economic		Emergency Energy Only		Load Management		Unique	
			Locations	MW	Locations	MW	Locations	MW	Locations	MW
PA	METED	MetEd	29	37.6			429	210.9	433	217.6
PA	PECO	PE	39	130.3			994	320.4	1,004	392.4
PA	PENELEC	AECI					12	7.0	12	7.0
PA	PENELEC	PaElec	2	62.0			490	260.5	491	282.5
PA	PENELEC	WELLSB					3	0.2	3	0.2
PA	PPL	AMPO					6	1.1	6	1.1
PA	PPL	CTZECL					4	1.9	4	1.9
PA	PPL	PPL	26	211.5			1,107	518.6	1,117	626.8
PA	PPL	UGI-UI					14	3.1	14	3.1
TN	AEP	AEPAPT					11	6.2	11	6.2
VA	AEP	AEPAPT	3	6.4			206	250.0	206	250.0
VA	AEP	AMPO					16	11.5	16	11.5
VA	AEP	RADFRD					1	2.5	1	2.5
VA	AEP	VATECH					1	6.5	1	6.5
VA	APS	ODEC	3	0.9			55	36.5	55	36.5
VA	DOM	CVEC					4	3.2	4	3.2
VA	DOM	DOMEDC	40	34.4			783	632.7	783	632.7
VA	DOM	DOMVME					26	95.3	26	95.3
VA	DOM	NVEC	3	15.1			50	5.0	52	19.6
VA	DOM	ODEC	2	0.4			43	15.3	43	15.3
VA	DPL	ODEC					14	1.0	14	1.0
WV	AEP	AEPAPT	1	0.2			195	473.9	195	473.9
WV	APS	AETSAP	23	42.0			254	211.8	256	233.4
<b>Total</b>			<b>417</b>	<b>2,776</b>	<b>1</b>	<b>0.5</b>	<b>13,932</b>	<b>9,583</b>	<b>13,998</b>	<b>10,185</b>

- Note:
- 1) Data as of 2/3/2020.
  - 2) Load Management MW are in ICAP.
  - 3) Economic MW are CSP reported Load Reduction values.
  - 4) Residential Locations 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 Load Management and Economic reductions.
  - 6) As of February 3, 2020, DY19/20 RPM Committed Values is 8,152 MW for Load Management.

Figure 2: DY 19/20 MWs in Load Management DR by Resource, Product, and Lead Times

Zone		BASE	CAPACITY PERFORMANCE	Lead Times (Minutes)			Total MW
				30	60	120	
<b>AECO</b>							
	Pre-Emergency	115.2	0.0	105.0	3.3	6.9	115.2
	Emergency	0.2	0.0	0.2	0.0	0.0	0.2
	Total	115.4	0.0	105.2	3.3	6.9	115.4
<b>AEP</b>							
	Pre-Emergency	1,604.1	28.8	848.1	134.6	650.2	1,632.9
	Emergency	48.0	0.0	28.2	0.8	19.0	48.0
	Total	1,652.2	28.8	876.3	135.5	669.2	1,680.9
<b>APS</b>							
	Pre-Emergency	601.8	39.2	401.1	9.2	230.7	641.0
	Emergency	30.6	0.0	21.7	0.0	8.9	30.6
	Total	632.4	39.2	422.8	9.2	239.6	671.6
<b>ATSI</b>							
	Pre-Emergency	571.9	210.4	350.3	27.3	404.8	782.3
	Emergency	89.1	0.0	22.9	2.6	63.6	89.1
	Total	661.0	210.4	373.1	29.9	468.4	871.4
<b>BGE</b>							
	Pre-Emergency	694.7	8.5	660.5	4.7	38.0	703.2
	Emergency	10.2	0.0	10.2	0.0	0.0	10.2
	Total	704.8	8.5	670.7	4.7	38.0	713.4
<b>COMED</b>							
	Pre-Emergency	1,484.2	1.3	1,064.6	40.3	380.5	1,485.4
	Emergency	59.1	0.0	30.2	4.1	24.7	59.1
	Total	1,543.2	1.3	1,094.8	44.5	405.3	1,544.5
<b>DAY</b>							
	Pre-Emergency	146.1	2.6	84.2	3.9	60.7	148.8
	Emergency	7.8	0.0	6.9	0.0	0.9	7.8
	Total	154.0	2.6	91.1	3.9	61.6	156.6
<b>DEOK</b>							
	Pre-Emergency	176.8	23.3	165.7	15.2	19.2	200.1
	Emergency	2.4	0.0	2.4	0.0	0.0	2.4
	Total	179.2	23.3	168.1	15.2	19.2	202.5
<b>DOM</b>							
	Pre-Emergency	623.5	0.0	148.4	34.0	441.2	623.5
	Emergency	127.9	0.0	89.8	13.0	25.1	127.9
	Total	751.5	0.0	238.1	47.0	466.3	751.5
<b>DPL</b>							
	Pre-Emergency	351.2	15.3	178.7	12.0	175.9	366.6
	Emergency	5.4	0.0	3.6	1.4	0.4	5.4
	Total	356.6	15.3	182.2	13.4	176.4	371.9
<b>DUQ</b>							
	Pre-Emergency	105.7	3.4	69.5	1.8	37.8	109.1
	Emergency	0.7	0.0	0.2	0.5	0.0	0.7
	Total	106.4	3.4	69.7	2.3	37.8	109.8
<b>EKPC</b>							
	Pre-Emergency	0.0	122.2	21.5	5.0	95.6	122.2
	Emergency	0.0	1.1	1.1	0.0	0.0	1.1
	Total	0.0	123.2	22.6	5.0	95.6	123.2

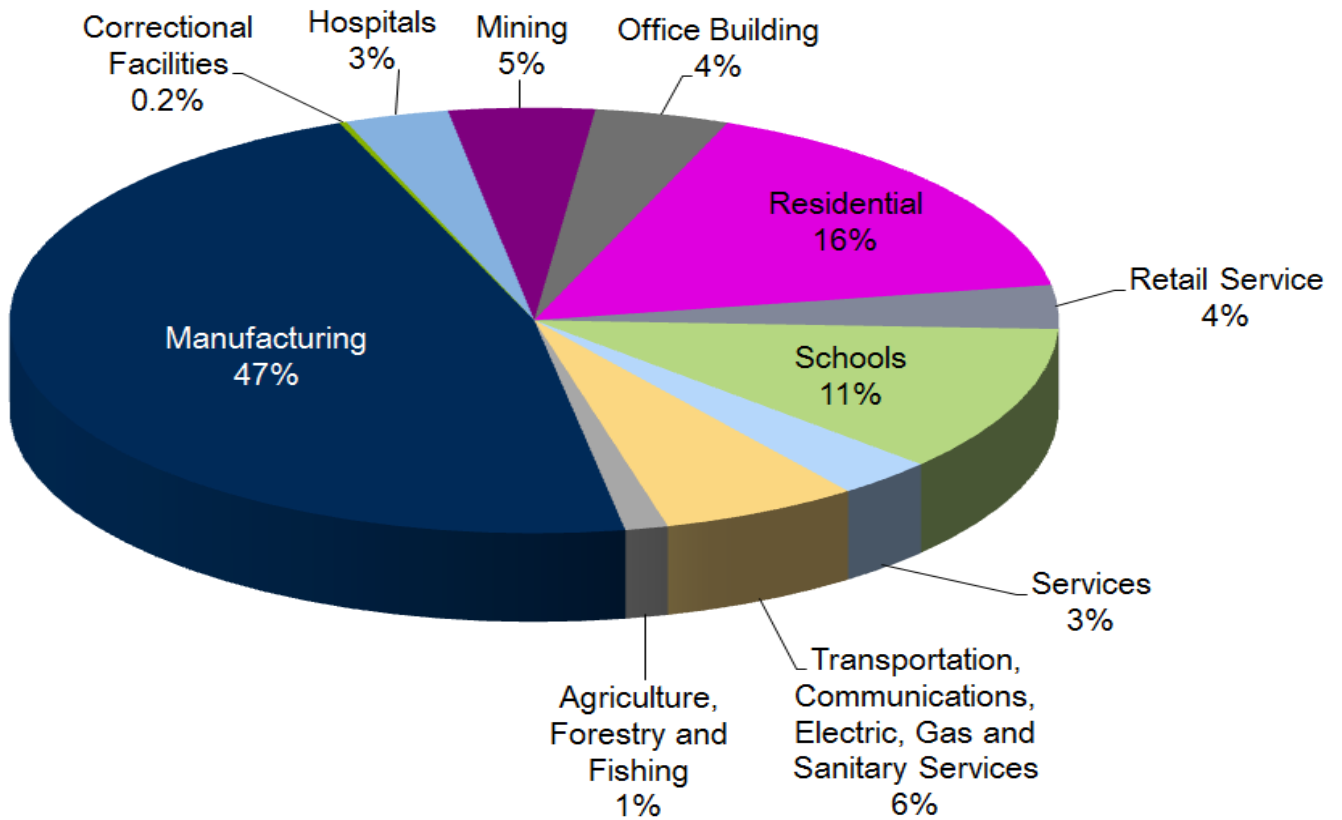
## Lead Times (Minutes)

Zone		BASE	CAPACITY PERFORMANCE	30	60	120	Total MW
<b>JCPL</b>							
	Pre-Emergency	131.6	0.4	100.9	2.1	29.0	132.0
	Emergency	0.0	4.7	4.7	0.0	0.0	4.7
	Total	131.6	5.1	105.6	2.1	29.0	136.7
<b>METED</b>							
	Pre-Emergency	209.4	0.0	115.4	13.8	80.2	209.4
	Emergency	1.5	0.0	1.5	0.0	0.0	1.5
	Total	210.9	0.0	116.9	13.8	80.2	210.9
<b>PECO</b>							
	Pre-Emergency	294.1	1.7	222.5	7.0	66.4	295.8
	Emergency	23.1	1.4	20.4	2.7	1.5	24.6
	Total	317.2	3.2	242.9	9.6	67.9	320.4
<b>PENELEC</b>							
	Pre-Emergency	249.2	16.8	109.4	9.3	147.3	266.0
	Emergency	2.9	0.3	1.0	2.1	0.0	3.1
	Total	252.1	17.0	110.4	11.4	147.3	269.1
<b>PEPCO</b>							
	Pre-Emergency	485.7	58.4	318.9	1.6	223.6	544.1
	Emergency	0.0	7.9	7.3	0.0	0.6	7.9
	Total	485.7	66.3	326.2	1.6	224.2	552.0
<b>PPL</b>							
	Pre-Emergency	489.4	32.5	273.5	30.4	218.0	521.9
	Emergency	2.0	0.8	1.1	0.0	1.7	2.8
	Total	491.4	33.3	274.6	30.4	219.6	524.7
<b>PSEG</b>							
	Pre-Emergency	221.6	29.0	202.0	4.7	43.8	250.6
	Emergency	3.2	0.0	0.0	0.0	3.2	3.2
	Total	224.8	29.0	202.0	4.7	47.0	253.8
<b>RECO</b>							
	Pre-Emergency	2.6	0.0	2.6	0.0	0.0	2.6
	Emergency	0.0	0.0	0.0	0.0	0.0	0.0
	Total	2.6	0.0	2.6	0.0	0.0	2.6
<b>TOTAL</b>							
	Pre-Emergency	8,559.0	593.9	5,442.8	360.3	3,349.8	9,152.9
	Emergency	414.0	16.1	253.2	27.2	149.7	430.1
	Total	8,973.0	610.1	5,696.0	387.6	3,499.5	9,583.0

## Note:

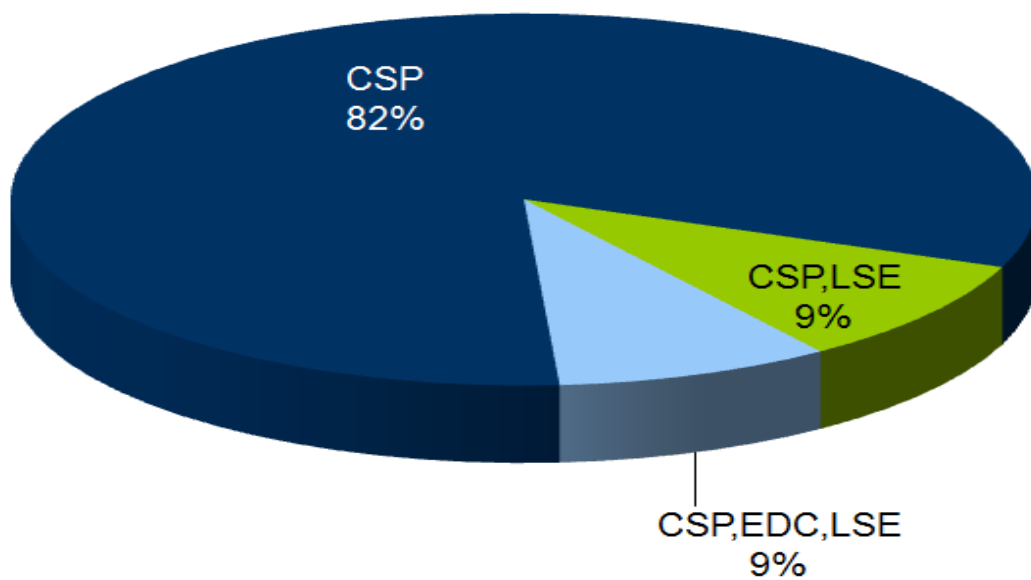
- 1) Data as of 2/3/2020.
- 2) Load Management MW are in ICAP.

Figure 3: DY 19/20 Confirmed Load Management DR Registrations Business Segments



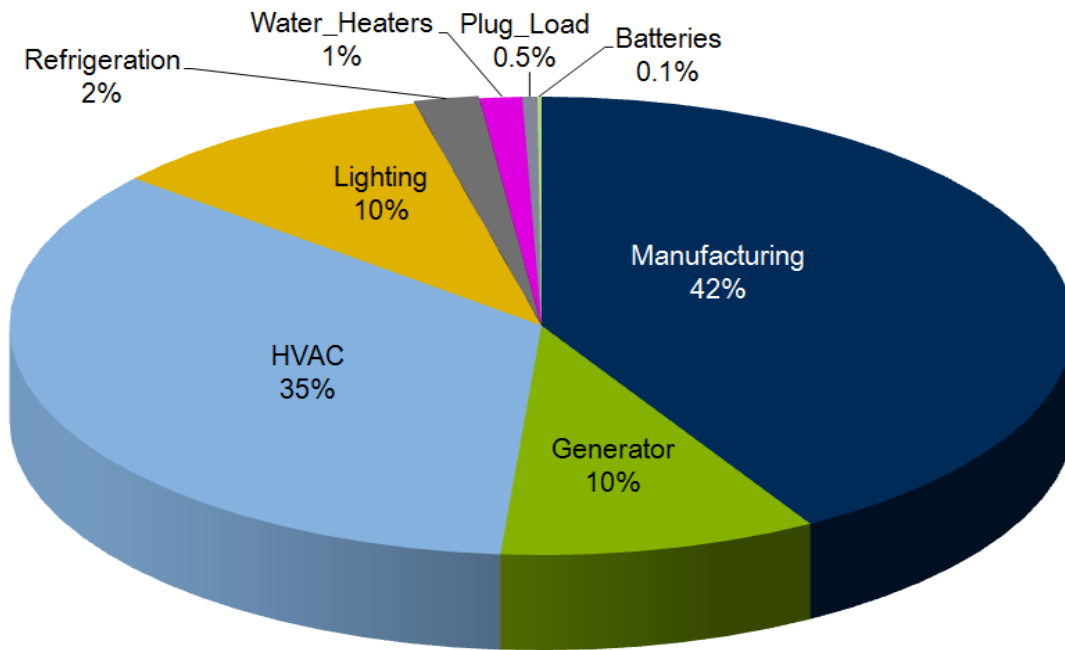
Note: Percent of Nominated Capacity (MWs). Includes Capacity Performance nominated MWs.

Figure 4: DY 19/20 Confirmed Load Management DR Registrations Owner/Company Type



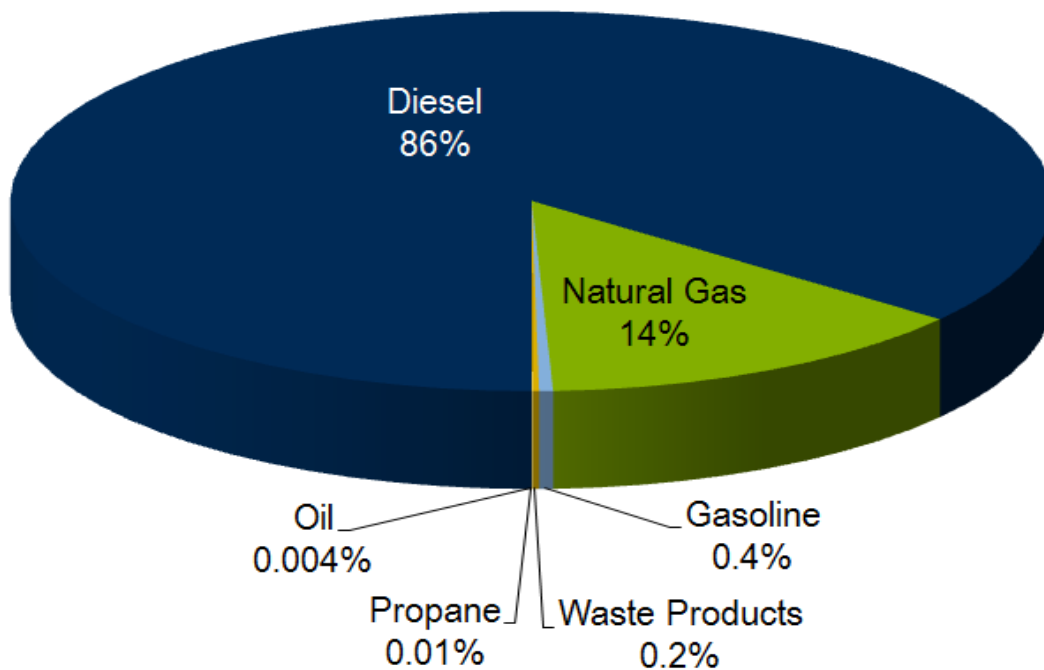
Note: Percent of Nominated Capacity (MWs). Includes Capacity Performance nominated MWs.

Figure 5: DY 19/20 Confirmed Load Management DR Registrations Customer Load Reduction Methods



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

Figure 6: DY 19/20 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 19/20 Confirmed Load Management DR Registrations Generator and Permit Type

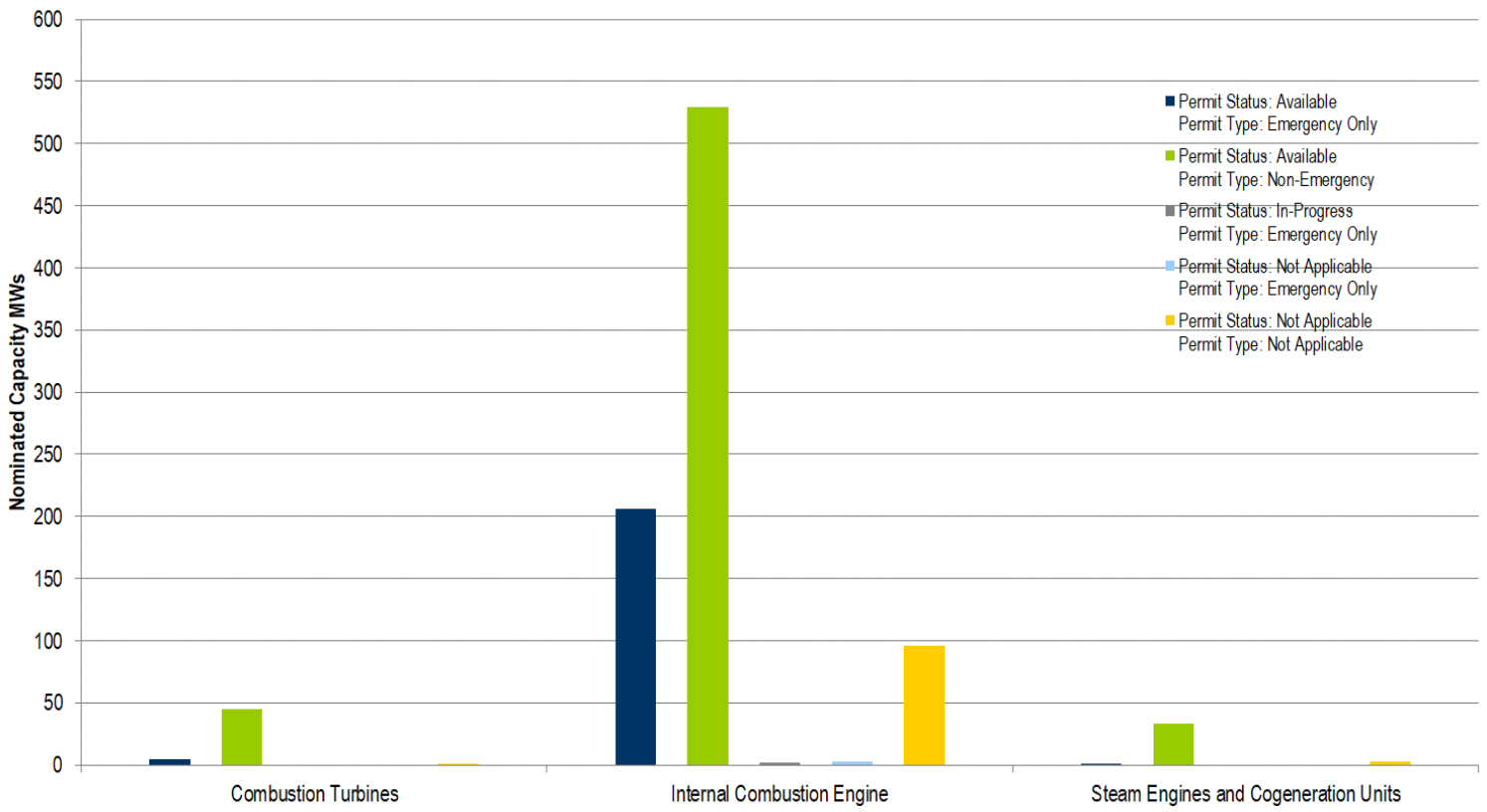


Figure 8: DY 19/20 Confirmed Load Management DR Registrations Fuel Mix with Behind the Meter Generation

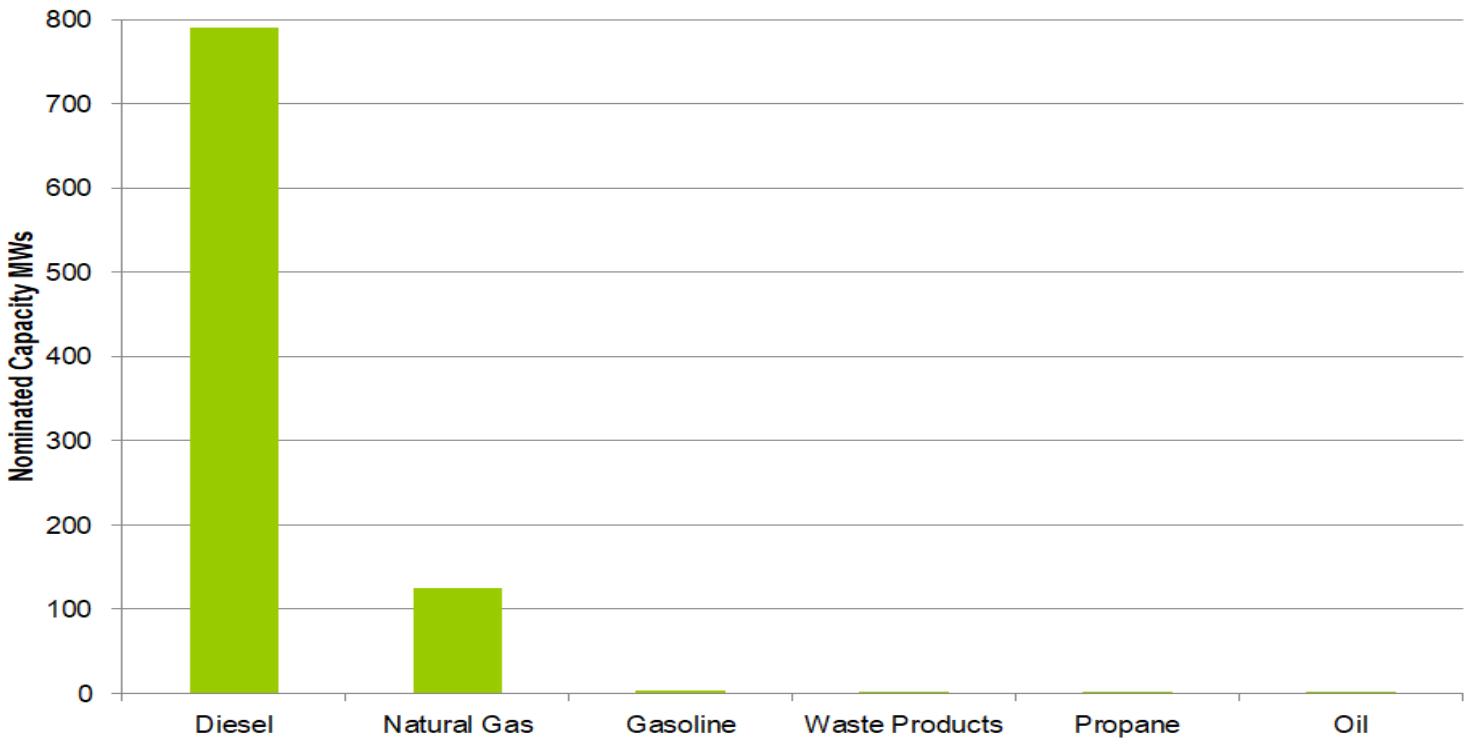
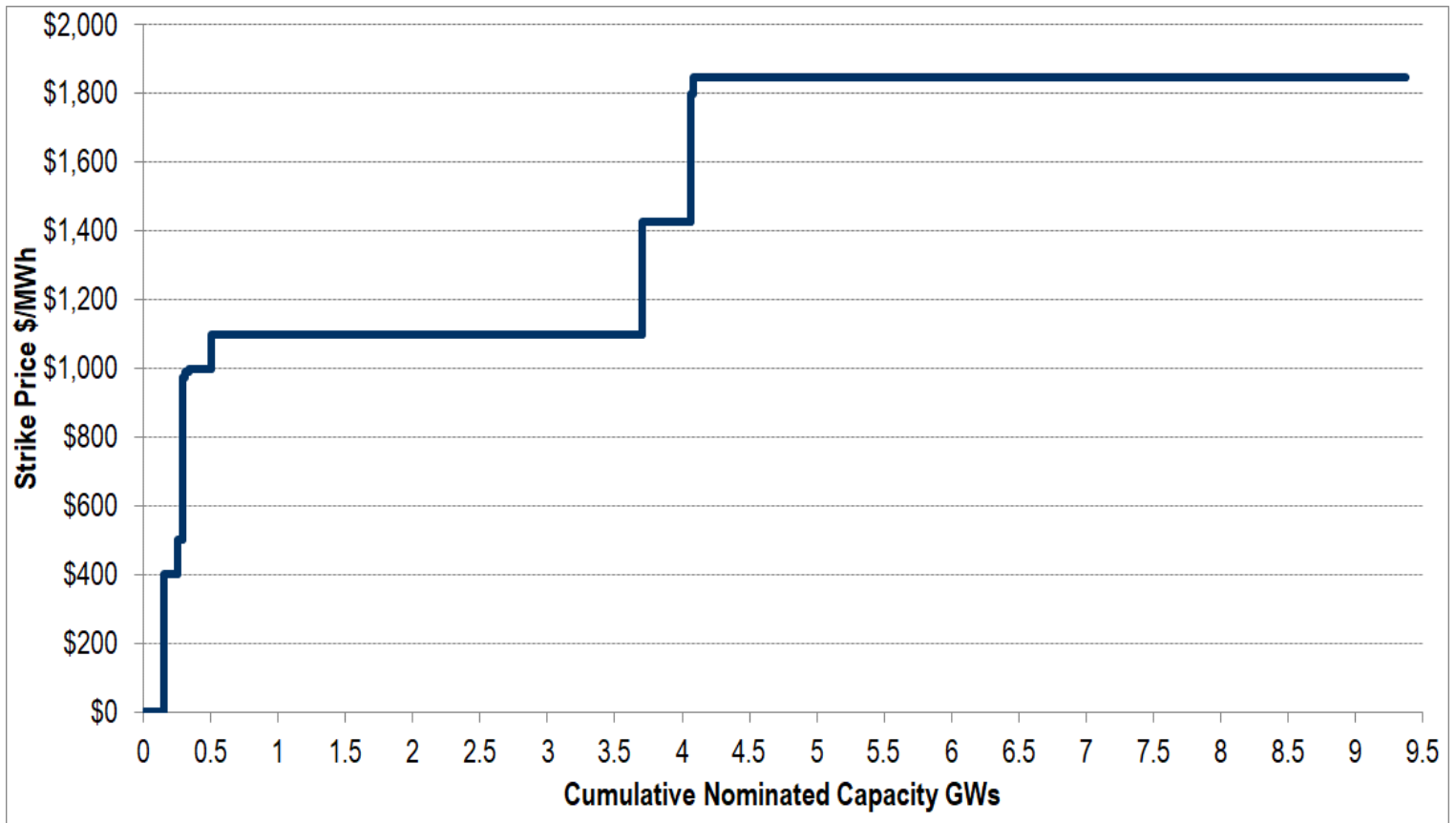


Figure 9: DY 19/20 Confirmed Load Management Full DR Registrations Energy Supply Curve:



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**Figure 10: 2020 Economic Demand Response Capability in the Ancillary Service Markets**

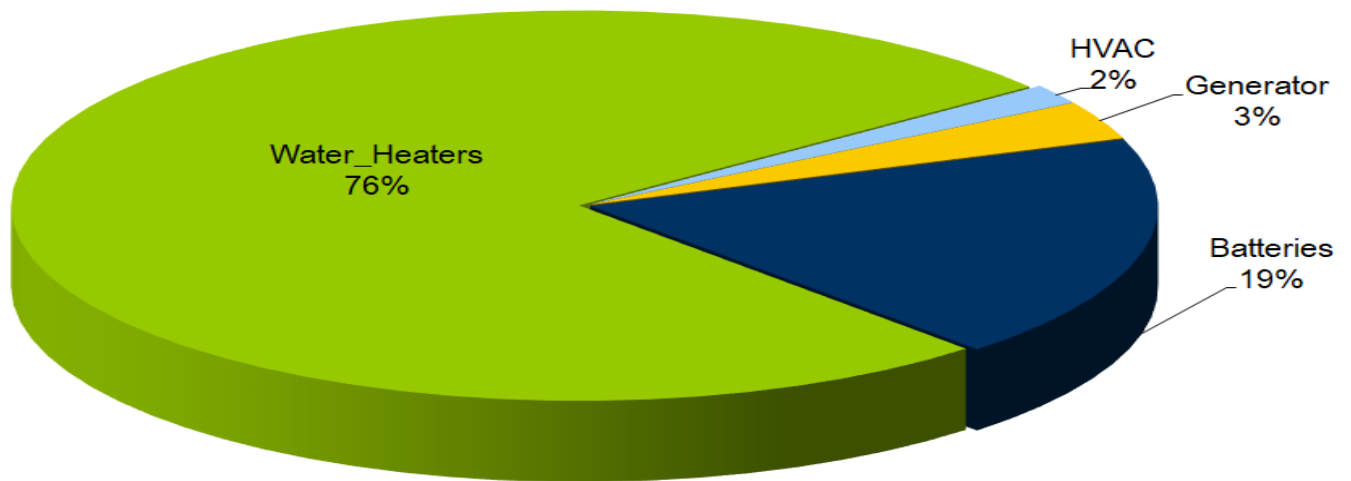
Synch Reserves	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Locations	MAD	103											
	Non-MAD	29											
	RTO	132											
<b>Average Number of Unique Participating Locations per Month:</b>					<b>132</b>								
MWs	MAD	511											
	Non-MAD	347											
	RTO	857											
<b>Average MWs per Month:</b>		<b>857</b>											

Regulation	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Locations	RTO	149											
	<b>Average Number of Unique Participating Locations per Month:</b>					<b>149</b>							
	MWs	RTO	98										
<b>Average MWs per Month:</b>		<b>98</b>											

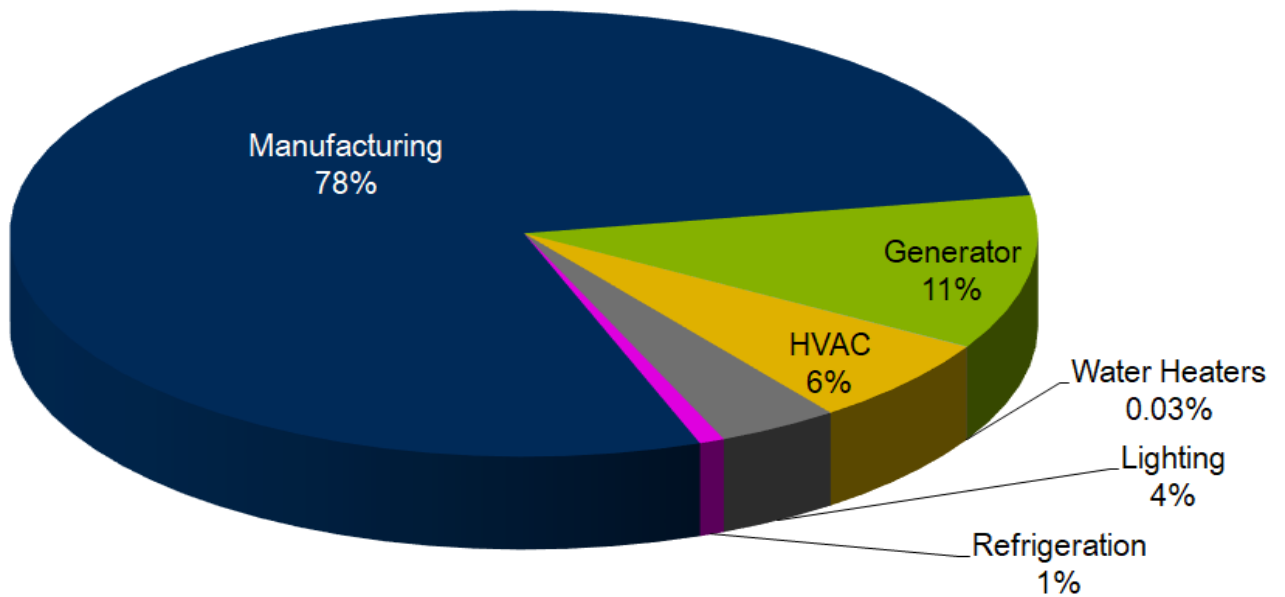
Capability represents total amount that may be offered. Actual offered and cleared volume may be significantly lower and is represented in subsequent figures/tables in report

**Figure 11: 2020 PJM Demand Response Confirmed Regulation Registrations Load Reduction Methods**



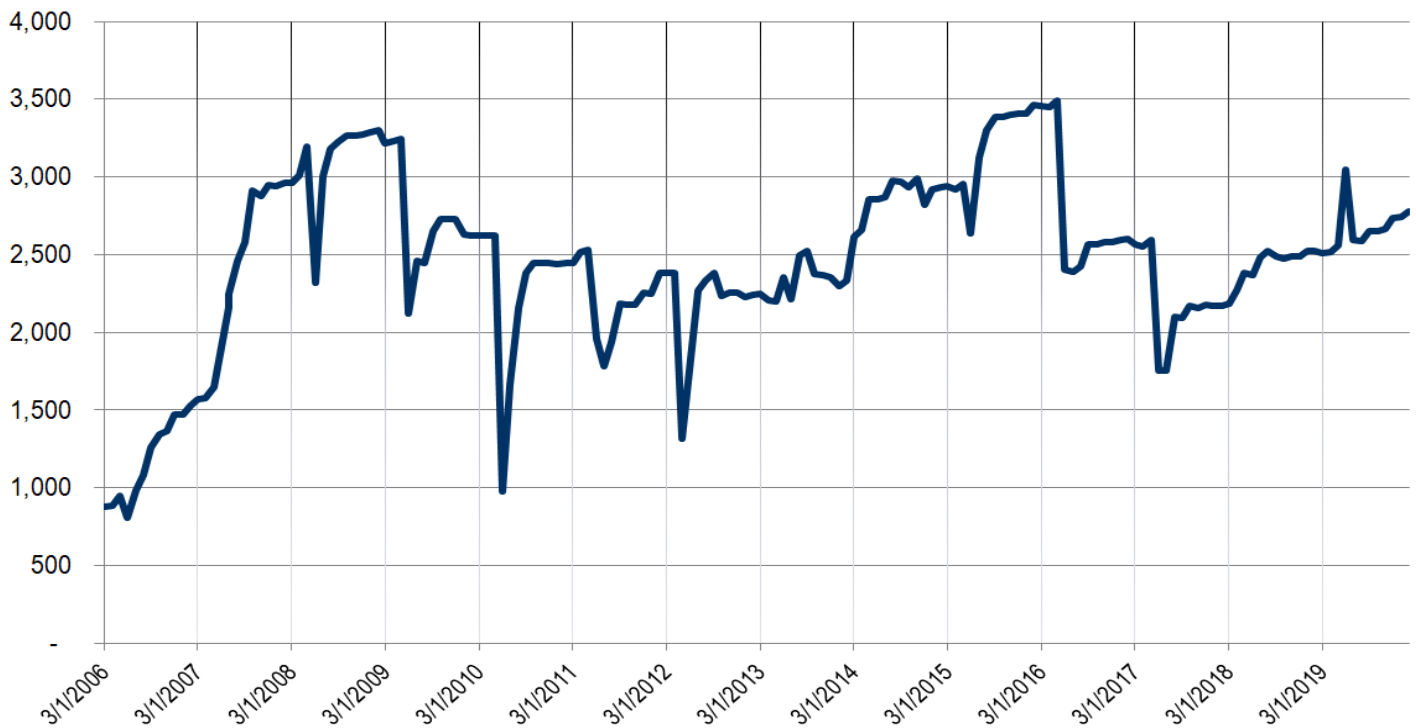
Note: Percent of CSP Reported Load Reduction MWs

Figure 12: 2020 PJM Demand Response Confirmed Synch Reserve Registrations Load Reduction Methods:



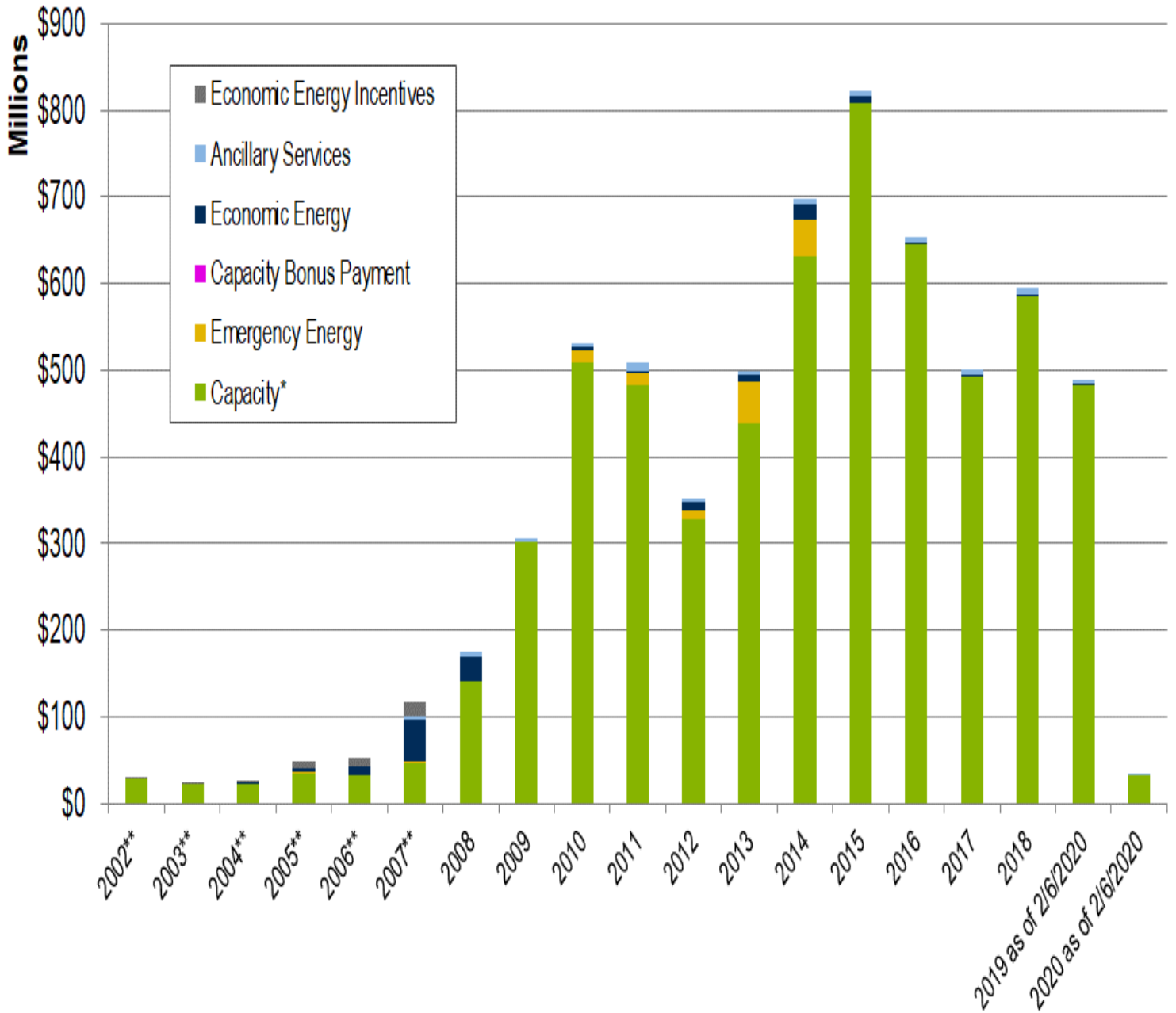
Note: Percent of CSP Reported Load Reduction MWs

Figure 13: PJM Economic Demand Response Capability in Energy Market (3/1/2006-2/3/2020)



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.

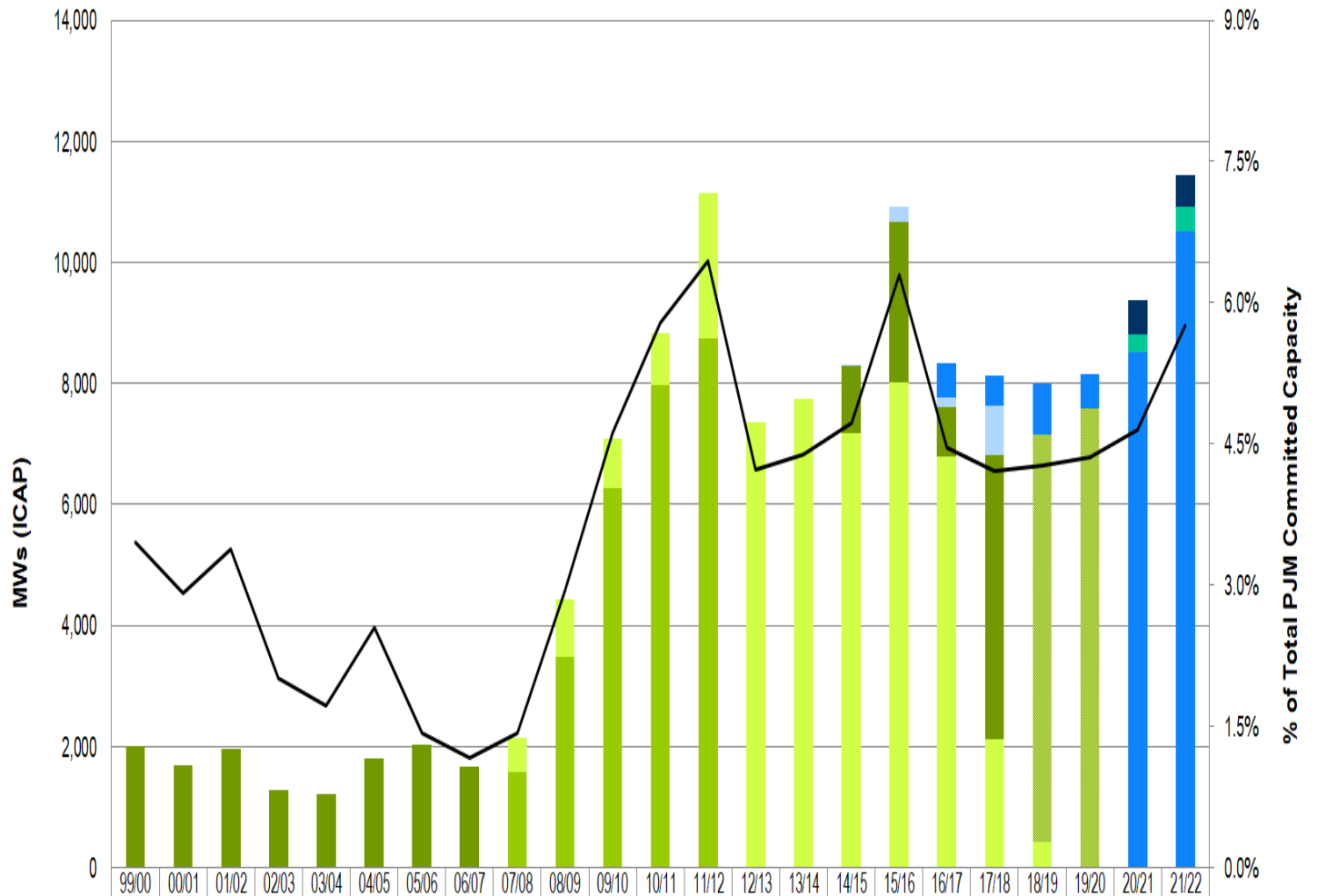
Figure 14: PJM Estimated Revenue for Economic and Load Management DR Markets



\*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	21/22	
PRD																						558	510	
Summer - CP																						289	415	
Annual - CP																			574	493	843	556	8523	10504
Base DR																					6,717	7,596		
Annual - DR																22	266	144	822					
Extended Summer - DR																1,126	2,635	836	4,694					
Limited - DR									555	940	815	869	2,425	7,361	7,753	7,166	8,027	6,783	2,111	427				
Limited - ILR									1,585	3,489	6,274	7,961	8,731											
Limited - ALM	2,005	1,693	1,962	1,292	1,207	1,806	2,042	1,677																
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%	4.3%	4.4%	4.7%	5.8%	

**Notes:**

- 1) Data represents net commitment value (for each product specified) on 2/3/2020.
- 2) RPM was implemented DY 07/08.
- 3) DY 20/21 MWs include results from Base, First, and Second Incremental Auction.
- 4) DY 21/22 MWs include results from Base and First Incremental Auction.
- 5) ALM MWs are seasonal averages for Delivery Years before 07/08.

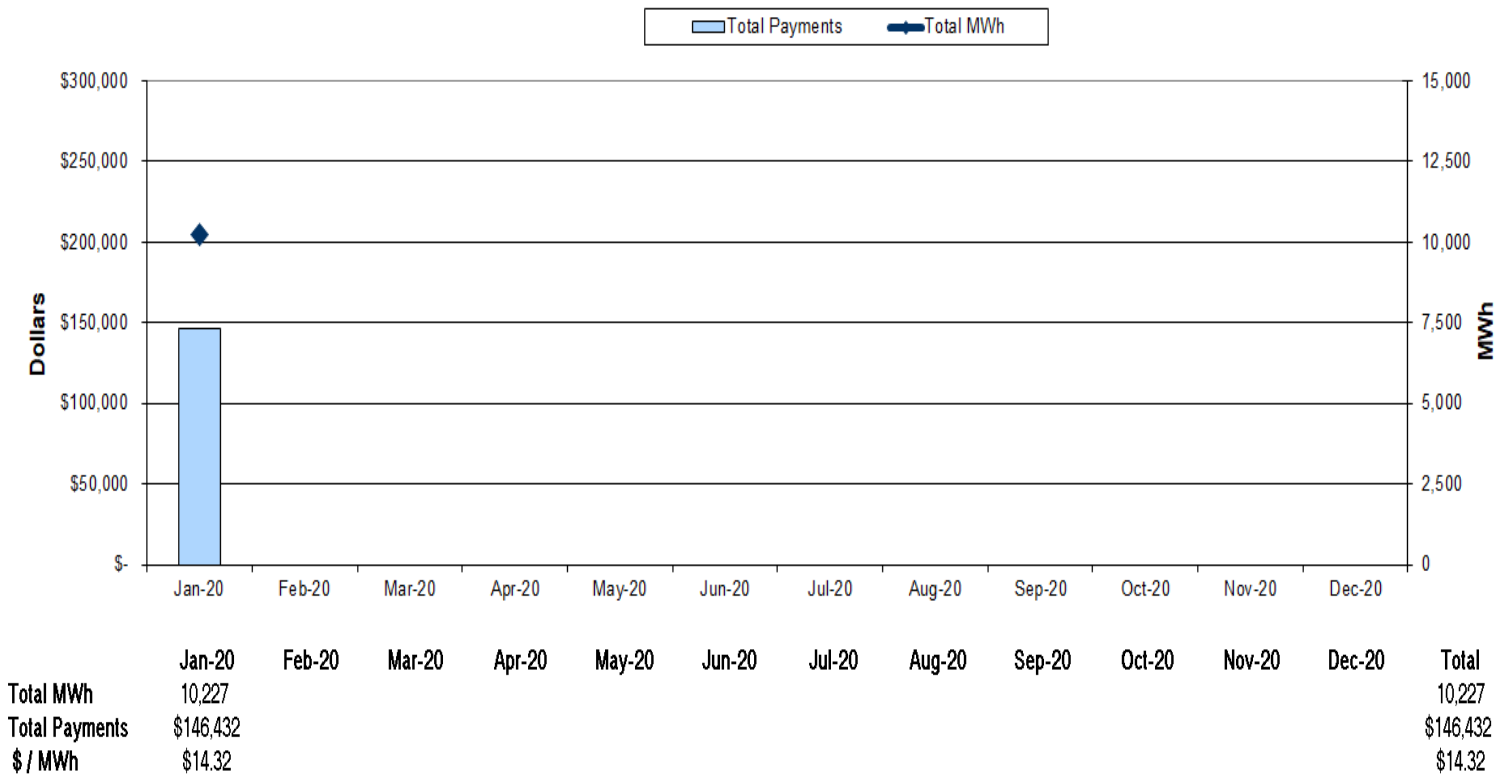
**Figure 16: 2020 Load Management Demand Response Monthly Capacity Revenue from RPM**

Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AECO	\$451,066											
AEP	\$3,565,436											
APS	\$2,361,289											
ATSI	\$2,422,538											
BGE	\$651,153											
COMED	\$9,961,211											
DAY	\$551,678											
DEOK	\$628,567											
DOM	\$1,818,792											
DPL	\$1,171,216											
DUQ	\$619,442											
EKPC	\$431,396											
JCPL	\$626,062											
METED	\$801,598											
PECO	\$1,635,718											
PENELEC	\$857,760											
PEPCO	\$147,322											
PPL	\$1,862,026											
PSEG	\$1,196,021											
RECO	\$31,919											
<b>Total</b>	<b>\$31,792,211</b>											

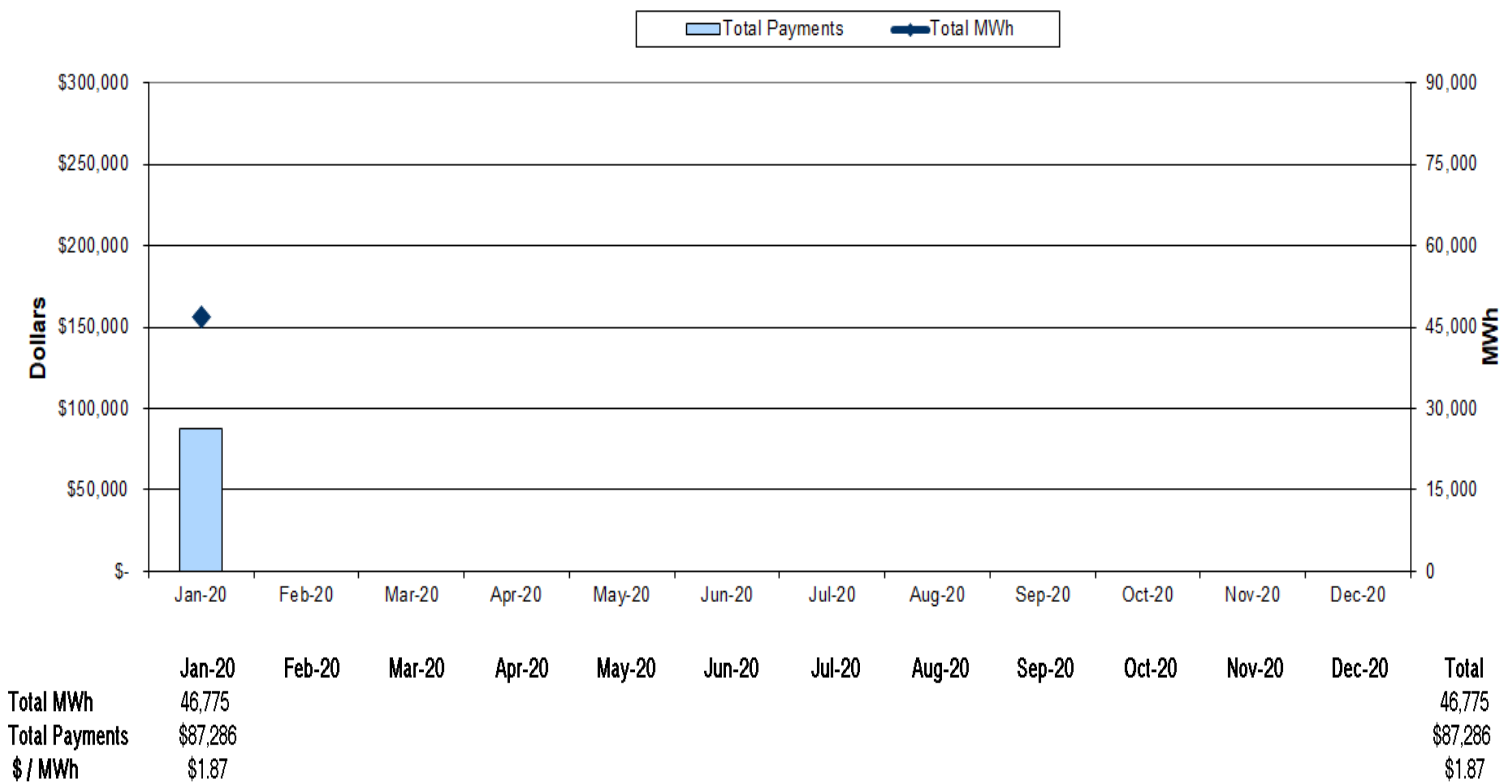
**Total Capacity Credits: \$31,792,211**

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**Figure 17: 2020 Economic Demand Response Regulation Market Participation**



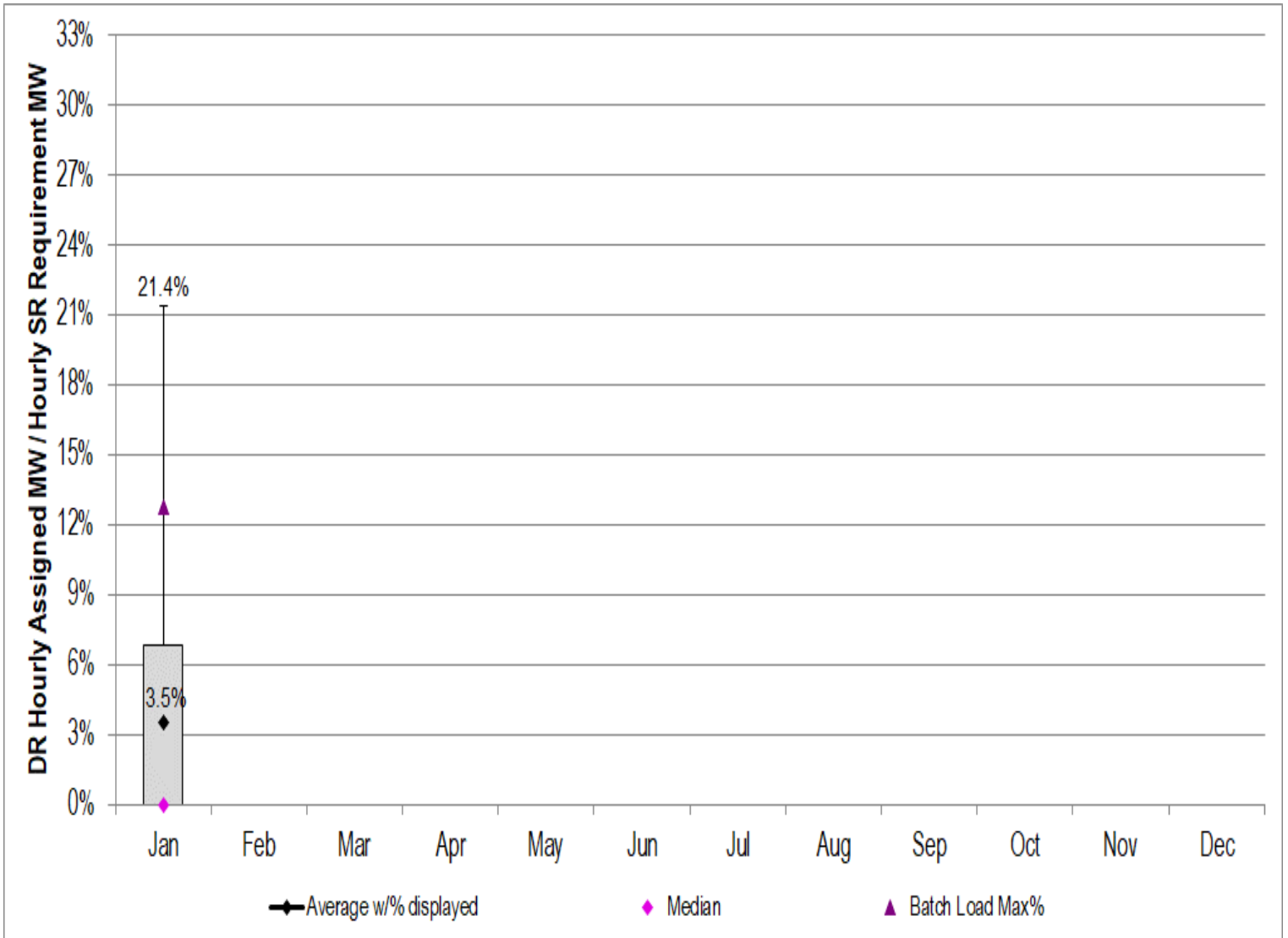
**Figure 18: 2020 Economic Demand Response Synchronous Reserve Market Participation**



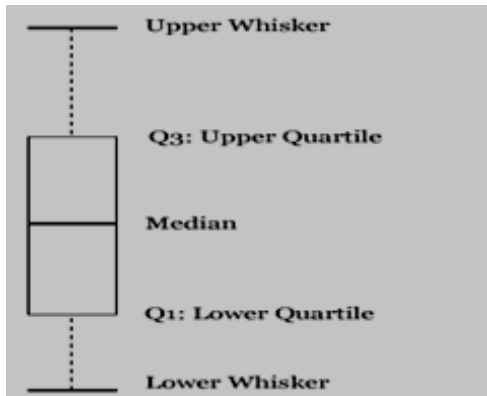
Note: For Figures 17 and 18 above, MWh=sum of the settled MW. Example: 1 MW load available for 12 hours = 12 MWh.



Figure 19: Economic DR Synchronous Reserve Penetration Distribution (Box-plot) for 2020



- 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