

2024 Demand Response Operations Markets Activity Report: July 2024

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PJM Demand Side Response Operations

July 10, 2024



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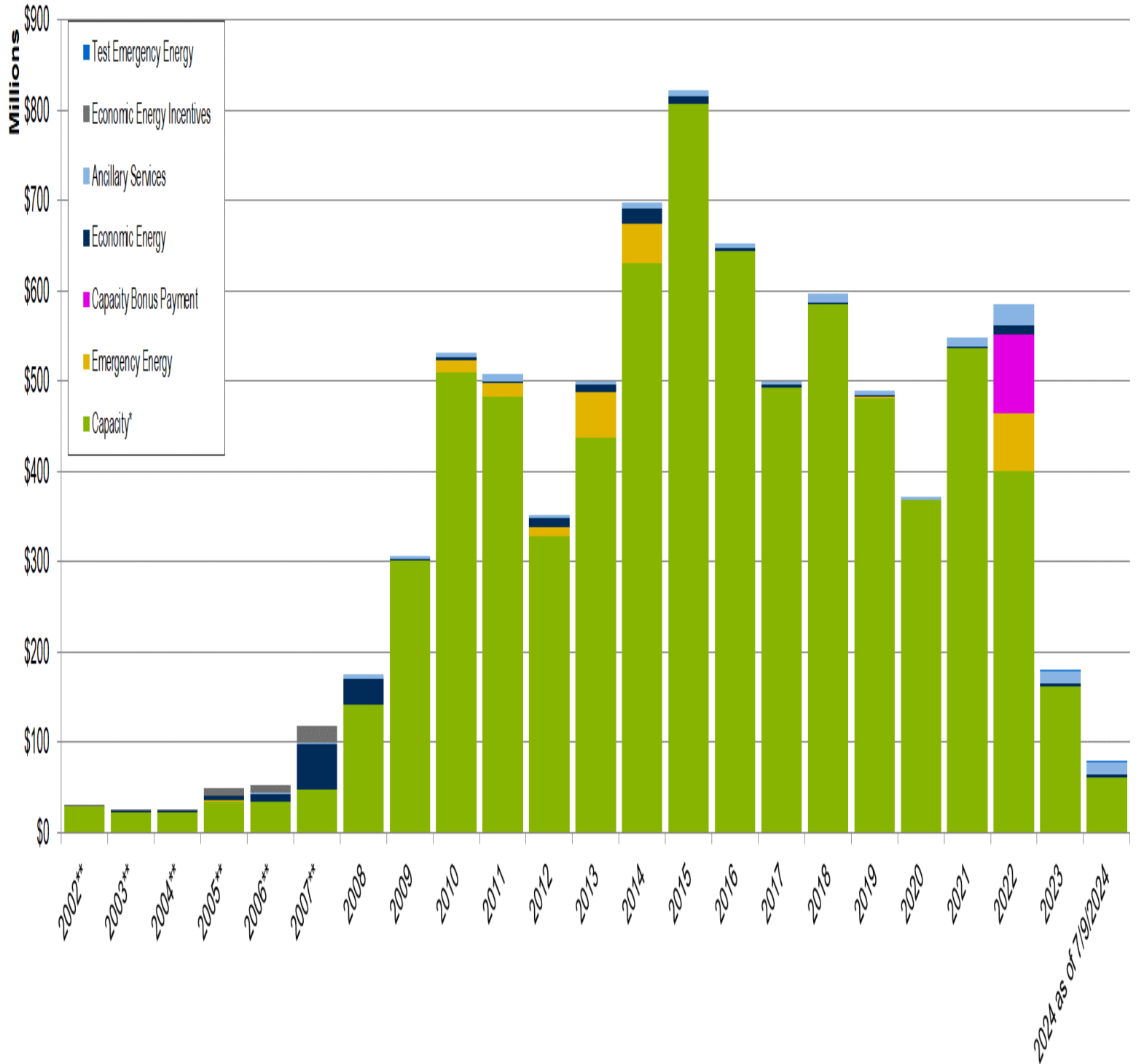
Figure 1: DY 24/25 Active Participants in DR Programs

Zone	Economic		Load Management		Unique	
	Locations	MW	Locations	MW	Locations	MW
AECO	16	6.7	172	34.0	176	37.3
AEP	166	667.1	1,782	1,418.3	1,817	1,625.7
APS	54	305.2	1,222	451.0	1,233	471.4
ATSI	53	507.5	1,334	677.4	1,365	1,017.1
BGE	27	277.1	819	198.2	823	448.5
COMED	81	69.0	2,537	1,283.6	2,582	1,290.9
DAY	9	18.0	199	181.7	203	193.3
DEOK	15	161.9	458	214.5	459	254.8
DOM	72	144.5	1,282	664.9	1,332	777.2
DPL	135	34.6	577	136.5	578	136.6
DUQ	14	127.8	494	101.3	502	123.1
EKPC			22	203.9	22	203.9
JCPL	19	45.8	305	106.3	308	146.5
METED	16	105.0	548	139.7	556	231.9
PECO	40	70.6	1,265	334.9	1,275	368.9
PENELEC	12	54.9	611	225.2	615	230.6
PEPCO	14	15.2	634	165.1	644	170.6
PPL	26	91.0	1,403	419.8	1,418	460.1
PSEG	39	42.6	941	256.9	952	272.9
RECO			16	2.5	16	2.5
Total	808	2,745	16,621	7,216	16,876	8,464

Note:

- 1) Data as of July 1, 2024.
- 2) Load Management MW are ICAP and include FRR values.
- 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) For the summer period of DY24/25, Total DR Commitment Value is 7,334 MW (includes FRR value of 457 MW and DR Summer Only value of 234 MW)

Figure 2: PJM Estimated Revenue for Economic and Load Management DR by Wholesale Markets

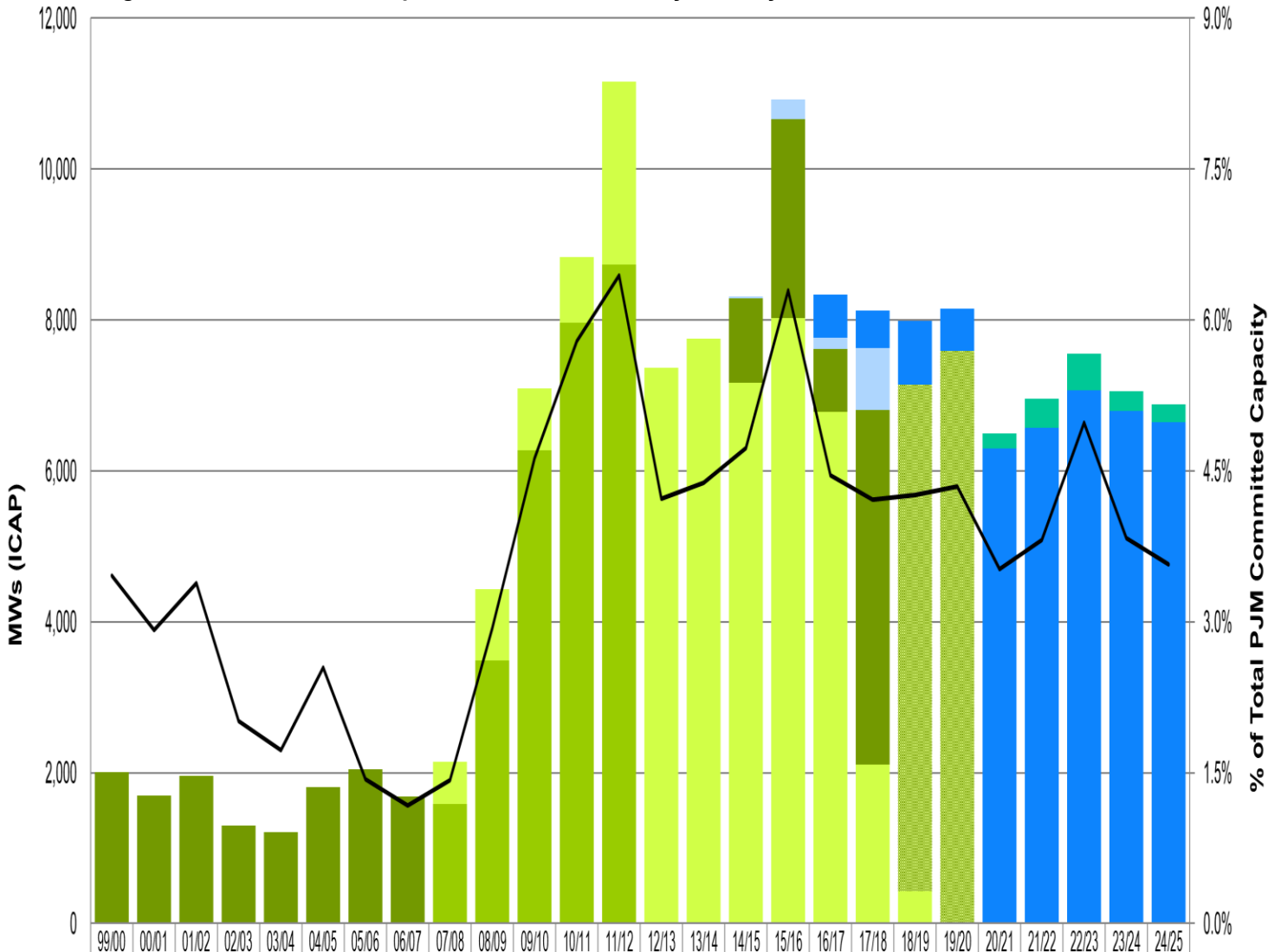


* Capacity Net Revenue inclusive of Capacity Credits and Charges. From 2020 on this value also includes Price Responsive Demand Credits.

** 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).

Note: Capacity Bonus Payments include payments for Load Management, Economic (includes Ancillary Services) and Price Responsive Demand registrations.

Figure 3: PJM Demand Response Committed MWs by Delivery Year

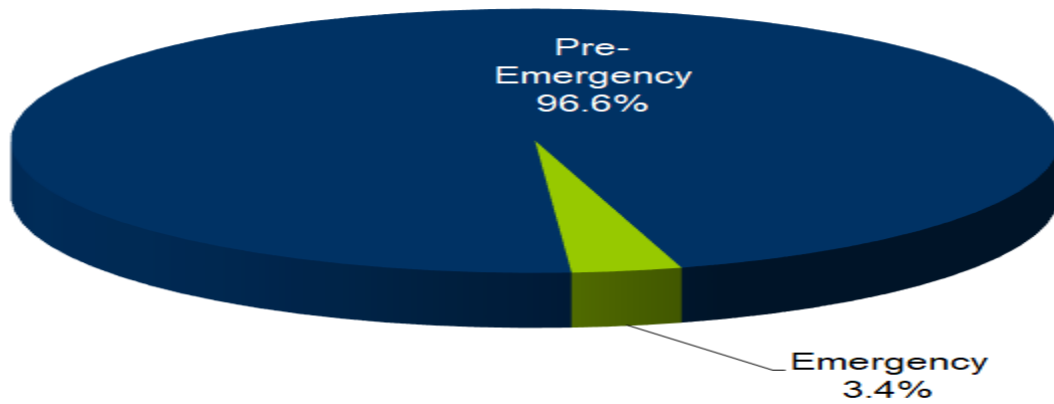


	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Summer - CP																						196	394	489	258	234
Annual - CP																		574	493	843	556	6,296	6,568	7,066	6,793	6,644
Base DR																				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																		
Total PJM MWs	58,000	58,000	58,000	64,076	69,969	70,852	142,494	142,864	150,041	150,720	153,274	152,413	173,188	174,272	176,717	175,994	173,499	187,076	192,489	187,322	187,492	184,098	182,747	151,698	184,179	192,486
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%	4.3%	3.5%	3.8%	5.0%	3.8%	3.6%

Notes:

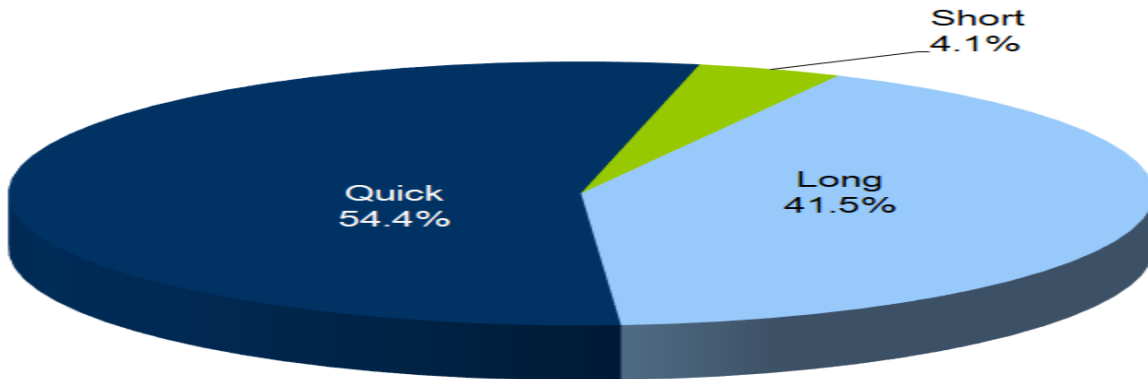
- 1) Data represents net commitment ICAP value (for each product) as of 6/1/2024. Does not include FRR values.
- 2) RPM was implemented DY 07/08.
- 3) ALM MWs are seasonal averages for Delivery Years before 07/08.

Figure 4: DY 24/25 Confirmed Load Management DR Registrations by Resource



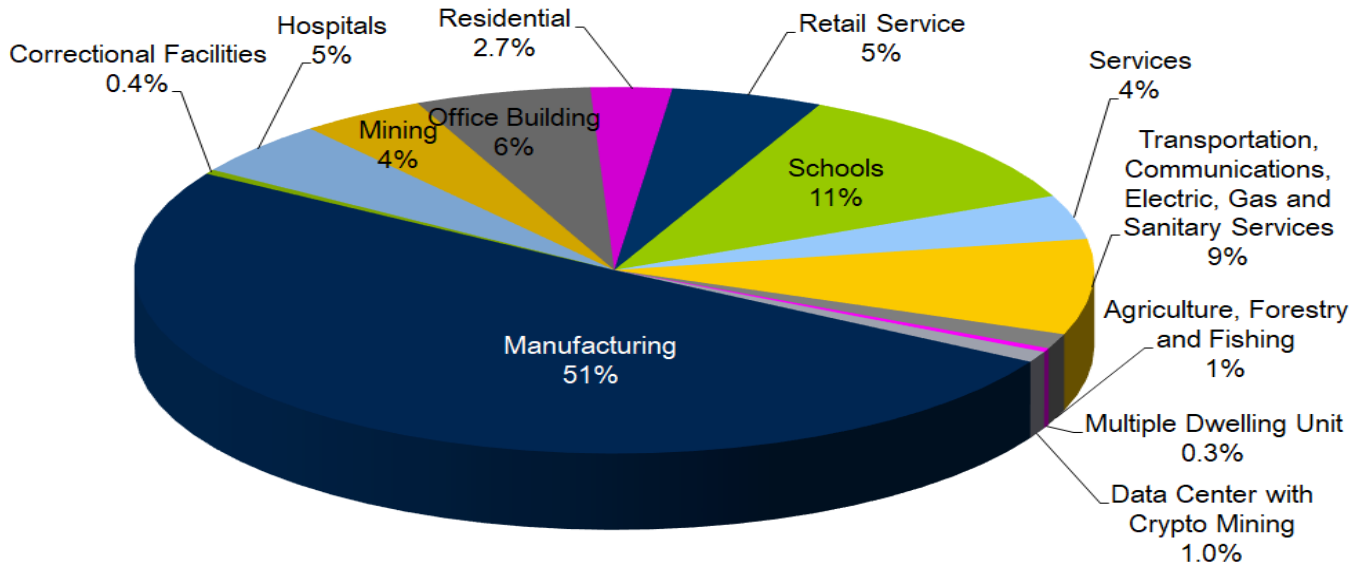
Note: Percent of Summer Nominated Capacity (MWs) based on Figure 1 Load Management MW Total.

Figure 5: DY 24/25 Confirmed Load Management DR Registrations Lead Times



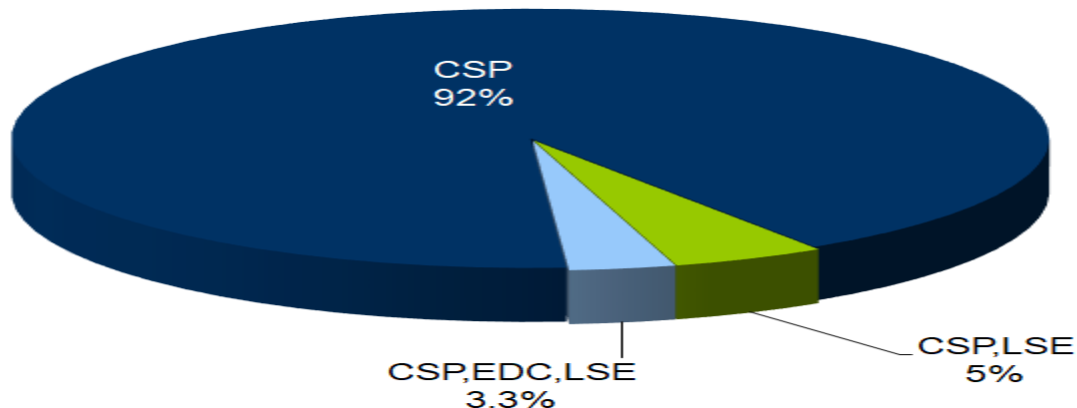
Note: Percent of Summer Nominated Capacity (MWs) based on Figure 1 Load Management MW Total.

Figure 6: DY 24/25 Confirmed Load Management DR Registrations Business Segments



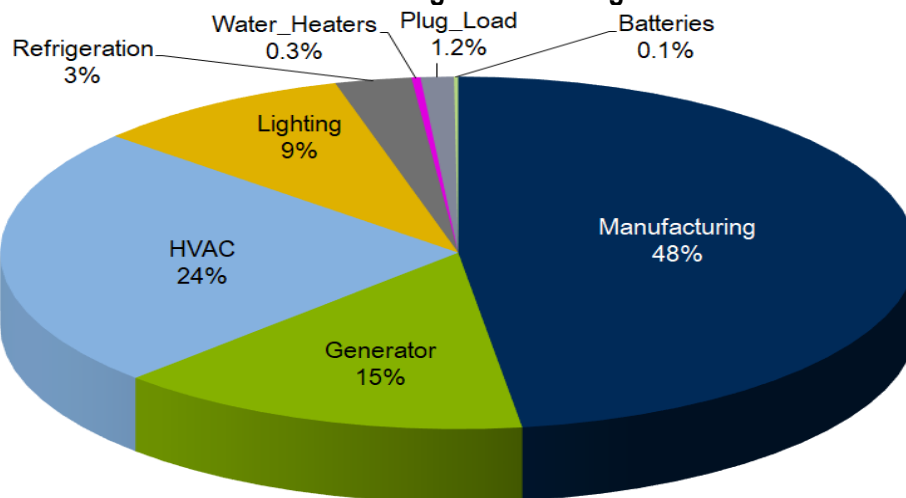
Note: Percent of Summer Nominated Capacity (MWs) based on Figure 1 Load Management MW Total.

Figure 7: DY 24/25 Confirmed Load Management DR Registrations Owner/Company Type



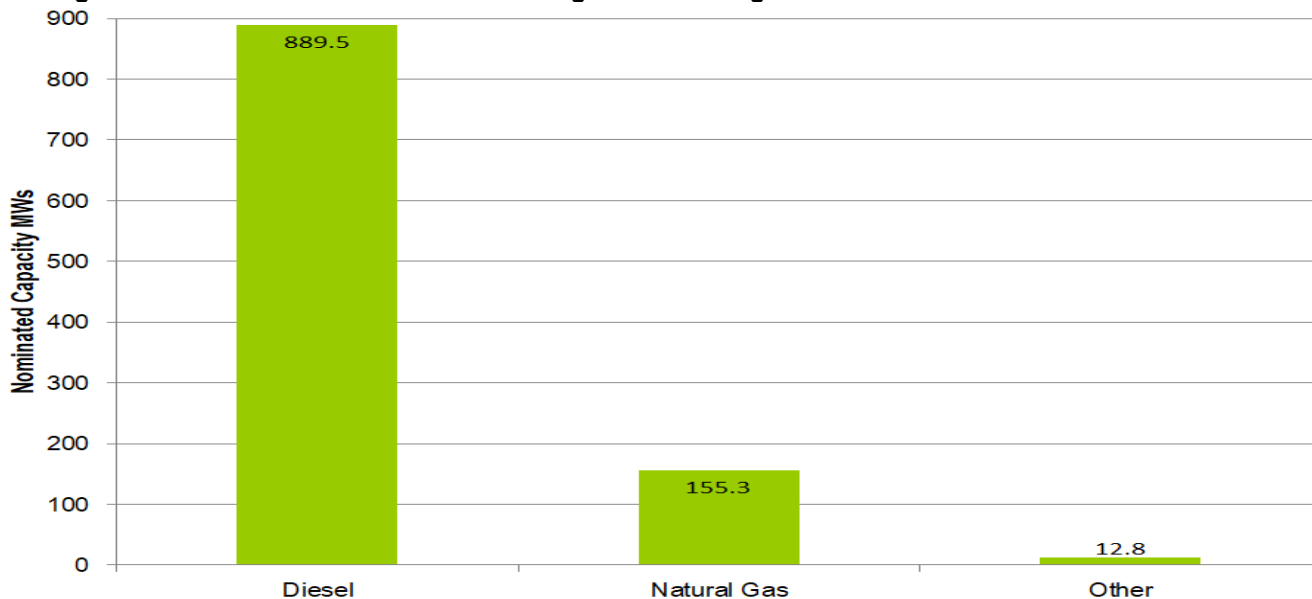
Note: Percent of Summer Nominated Capacity (MWs) based on Figure 1 Load Management MW Total.

Figure 8: DY 24/25 Confirmed Load Management DR Registrations Customer Load Reduction Methods



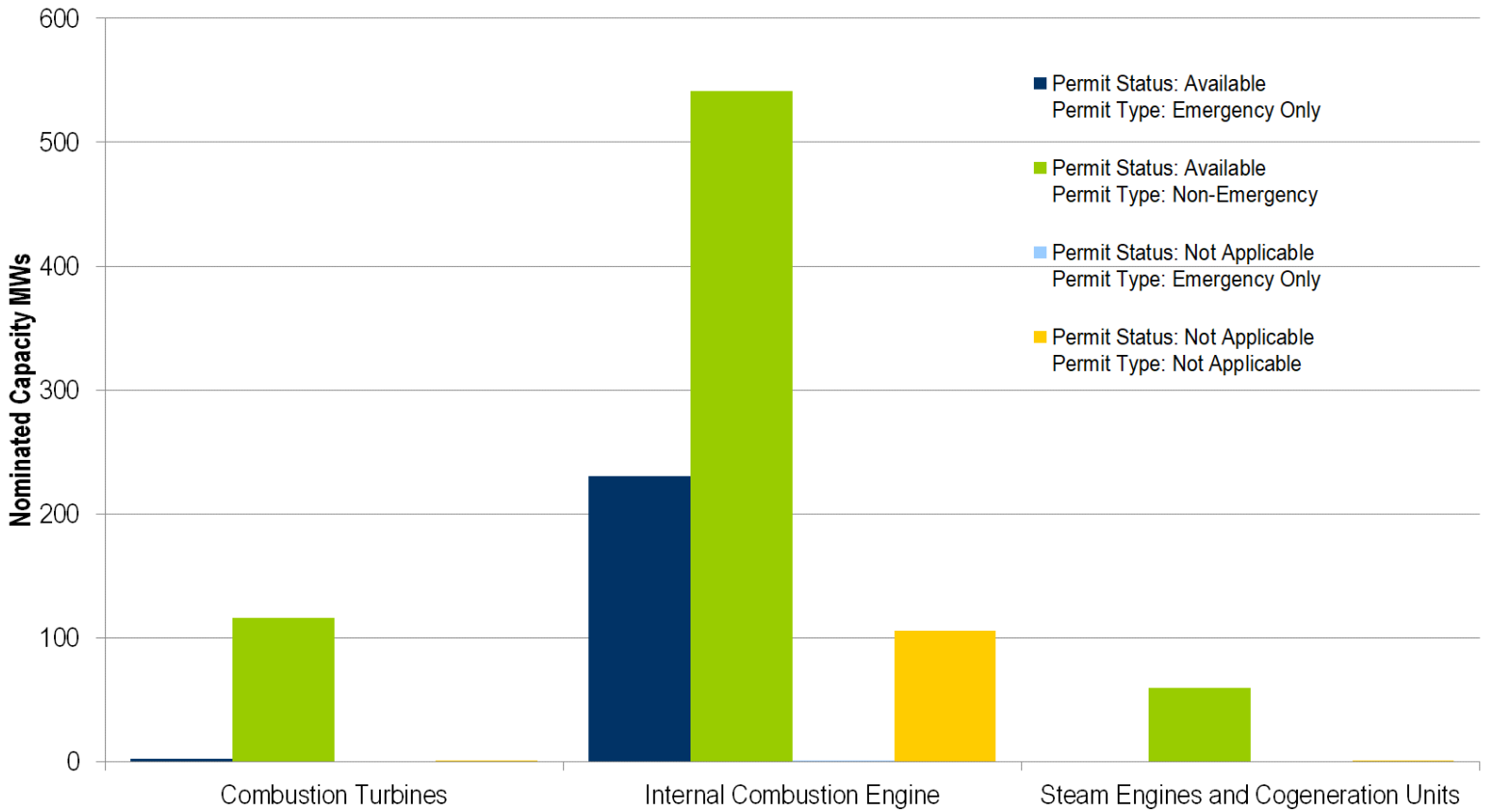
Note: Percent of Summer Nominated Capacity (MWs) based on Figure 1 Load Management MW Total. Plug Load includes nominated capacity from Data Centers with Crypto Mining.

Figure 9: DY 24/25 Confirmed Load Management DR Registration Fuel Mix with Behind the Meter Generation



Note: Portion of Summer Nominated Capacity (MWs) based on Figure 1 Load Management MW Total. The category "Other" includes Oil, Propane, Waste Products and Coal

Figure 10: DY 24/25 Confirmed Load Management DR Registrations Generator and Permit Type



Note: Portion of Summer Nominated Capacity (MWh) based on Figure 1 Load Management MW Total.

Figure 11: DY 24/25 Confirmed Load Management Full DR Registrations Energy Supply Curve:

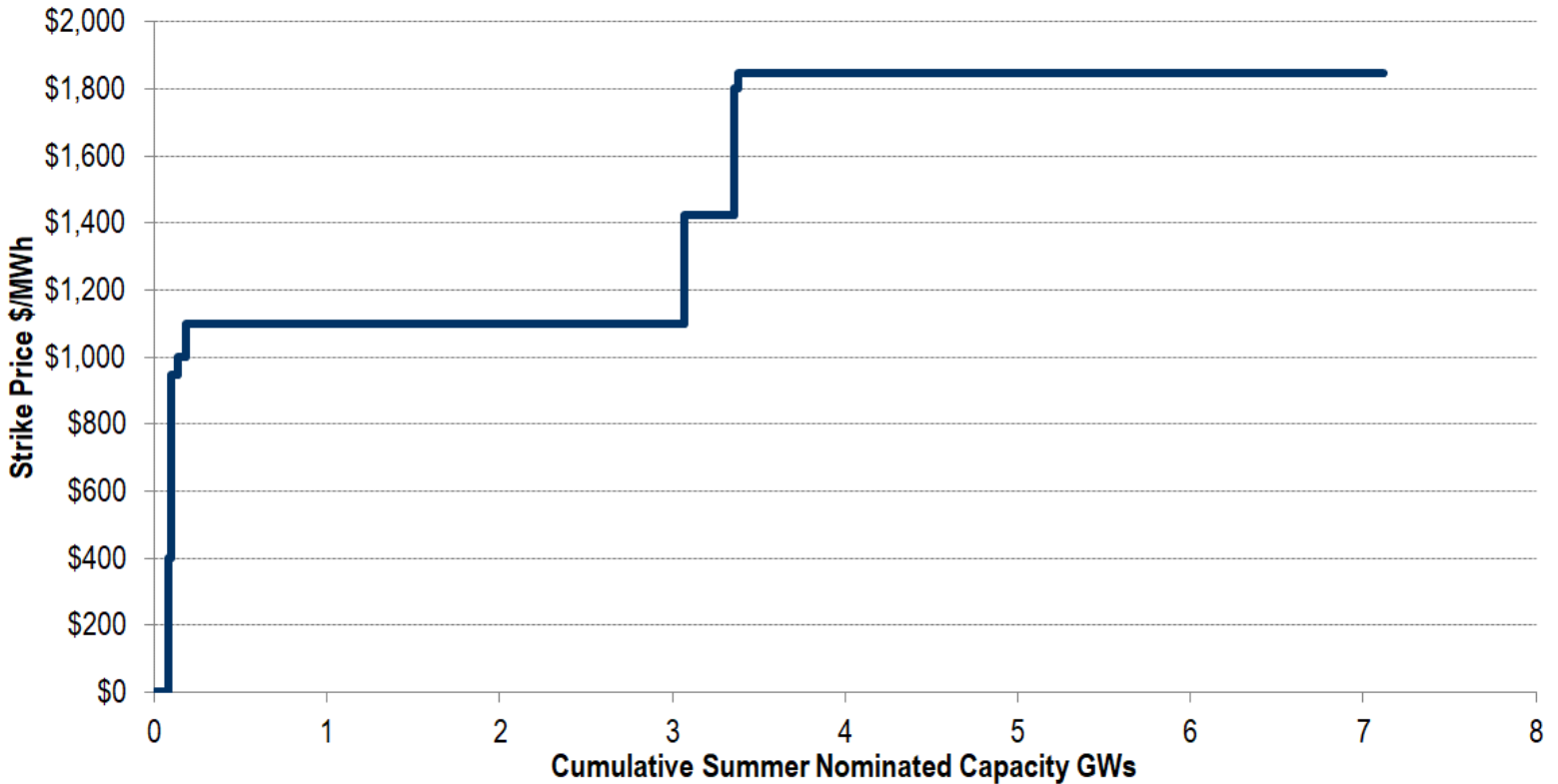


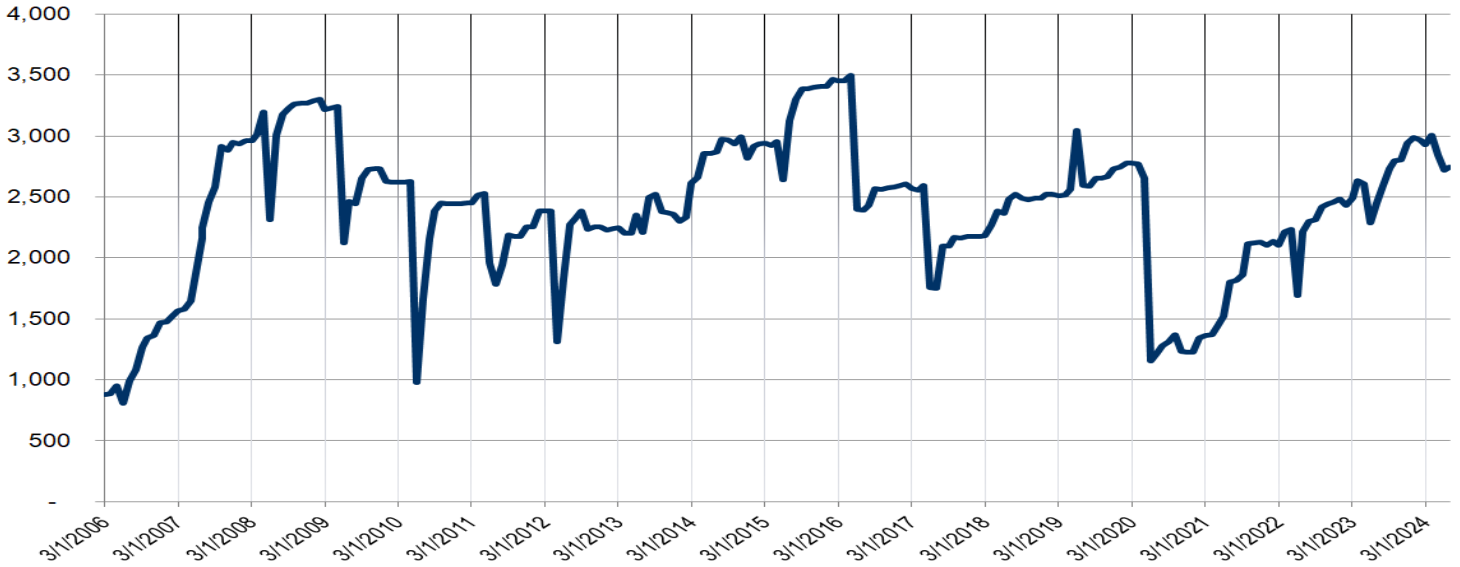
Figure 12: 2024 Load Management Demand Response Monthly Capacity Revenue from RPM

Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AECO	\$84,687	\$79,224	\$84,687	\$81,956	\$84,687	\$107,414						
AEP	\$1,351,740	\$1,264,531	\$1,351,740	\$1,308,135	\$1,351,740	\$949,875						
APS	\$757,761	\$708,873	\$757,761	\$733,317	\$757,761	\$554,841						
ATSI	\$976,187	\$913,207	\$976,187	\$944,697	\$976,187	\$599,203						
BGE	\$365,167	\$341,608	\$365,167	\$353,388	\$365,167	\$433,839						
COMED	\$1,169,652	\$1,094,191	\$1,169,652	\$1,131,922	\$1,169,652	\$1,224,155						
DAY	\$221,445	\$207,159	\$221,445	\$214,302	\$221,445	\$168,930						
DEOK	\$185,579	\$173,606	\$185,579	\$179,592	\$185,579	\$640,670						
DOM	\$845,472	\$790,925	\$845,472	\$818,198	\$845,472	\$703,256						
DPL	\$258,481	\$241,805	\$258,481	\$250,143	\$258,481	\$757,919						
DUQ	\$125,059	\$116,991	\$125,059	\$121,025	\$125,059	\$104,632						
EKPC	\$285,562	\$267,139	\$285,562	\$276,351	\$285,562	\$250,736						
JCPL	\$184,870	\$172,943	\$184,870	\$178,907	\$184,870	\$211,934						
METED	\$331,692	\$310,293	\$331,692	\$320,993	\$331,692	\$323,368						
PECO	\$580,538	\$543,084	\$580,538	\$561,811	\$580,538	\$587,563						
PENELEC	\$448,444	\$419,512	\$448,444	\$433,978	\$448,444	\$466,048						
PEPCO	\$245,777	\$229,921	\$245,777	\$237,849	\$245,777	\$217,212						
PPL	\$895,046	\$837,301	\$895,046	\$866,174	\$895,046	\$895,868						
PSEG	\$418,374	\$391,382	\$418,374	\$404,878	\$418,374	\$459,406						
RECO	\$3,375	\$3,158	\$3,375	\$3,266	\$3,375	\$4,342						
Total	\$9,734,911	\$9,106,852	\$9,734,911	\$9,420,882	\$9,734,911	\$9,661,211						

Total Capacity Credits: \$57,393,678

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Figure 13: PJM Economic Demand Response Capability in Energy Market (3/1/2006-7/1/2024)

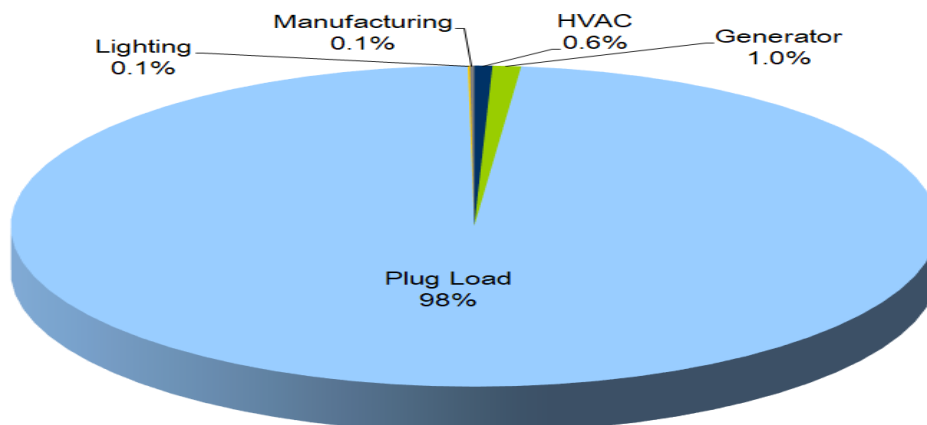


Capability represents total amount that may be offered. Actual offered and cleared volume may be significantly lower and is represented in subsequent figures/tables in report.

Figure 14: 2024 Economic Demand Response Total Energy Market Summary (Dispatch/Cleared vs Settled)

Year	Month	Zone		MWh			Registration Hours			Credits
		Dispatched/Cleared	Settled	Dispatched/Cleared	Settled	%	Dispatched/Cleared	Settled	%	\$
2024	1	9	9	24,576	25,484	104%	1,617	1,617	100%	\$2,621,636
2024	2	4	4	1,295	1,468	113%	271	271	100%	\$67,555
2024	3	4	4	1,169	1,210	104%	224	224	100%	\$75,606
2024	4	4	4	2,557	2,654	104%	409	390	95%	\$103,731
2024	5	6	3	20,866	20,517	98%	1,246	900	72%	\$925,663
2024	6	8	3	14,639	3,130	21%	1,568	138	9%	\$139,131
2024	7									
2024	8									
2024	9									
2024	10									
2024	11									
2024	12									
YTD Totals				65,101	54,463	84%	5,335	3,540	66%	\$3,933,321
YTD Average		6	5							

Figure 15: 2024 Economic Demand Response Energy Market Year to Date Total Settled MWh by Load Reduction Method



Note: Pie chart based on YTD Totals for MWh Settled based on Figure 14. Plug Load includes reductions from Data Centers with Crypto Mining.

Figure 16: 2024 Economic Demand Response Dispatched vs Settled Real-Time Energy Market Summary

Year	Month	Zone		MWh			Registration Hours			Credits
		Dispatched	Settled	Dispatched	Settled	%	Dispatched	Settled	%	\$
2024	1	6	6	282	345	122%	397	397	100%	\$23,442
2024	2	2	2	13	168	1317%	147	147	100%	\$3,723
2024	3	1	1	8	21	272%	87	87	100%	\$586
2024	4	2	2	22	64	290%	180	161	89%	\$2,021
2024	5	3	1	28	1	5%	221	2	1%	\$455
2024	6	3		315			202			
2024	7									
2024	8									
2024	9									
2024	10									
2024	11									
2024	12									
YTD Totals				668	599	90%	1,234	794	64%	\$30,227
YTD Average		3	2							

Figure 17: 2024 Economic Demand Response Cleared vs Settled Day-Ahead Energy Market Summary

Year	Month	Zone		MWh			Registration Hours			Credits
		Cleared	Settled	Cleared	Settled	%	Cleared	Settled	%	\$
2024	1	8	8	24,294	25,139	103%	1,220	1,220	100%	\$2,598,194
2024	2	3	3	1,282	1,299	101%	124	124	100%	\$63,832
2024	3	3	3	1,161	1,190	102%	137	137	100%	\$75,020
2024	4	3	3	2,535	2,590	102%	229	229	100%	\$101,710
2024	5	5	3	20,838	20,515	98%	1,025	898	88%	\$925,208
2024	6	6	3	14,324	3,130	22%	1,366	138	10%	\$139,131
2024	7									
2024	8									
2024	9									
2024	10									
2024	11									
2024	12									
YTD Totals				64,434	53,864	84%	4,101	2,746	67%	\$3,903,095
YTD Average		5	4							

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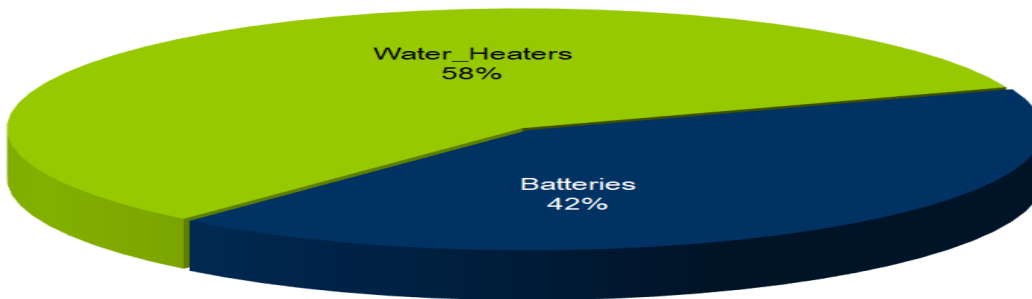
Figure 18: 2024 Economic Demand Response Locations and Capability MWs in the Ancillary Service Markets

Synch Reserves	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Locations	MAD	215	214	217	223	225	227						
	Non-MAD	199	203	205	210	235	233						
	RTO	414	417	422	433	460	460						
Average Number of Unique Participating Locations per Month:		434											
MWs	MAD	631	547	550	493	497	499						
	Non-MAD	1,701	1,836	1,831	1,714	1,765	1,593						
	RTO	2,332	2,383	2,381	2,207	2,262	2,092						
Average MWs per Month:		2,276											

Regulation	Zone	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Locations	RTO	180	176	166	119	133	133						
Average Number of Unique Participating Locations per Month:		151											
MWs	RTO	157	160	157	143	155	156						
Average MWs per Month:		155											

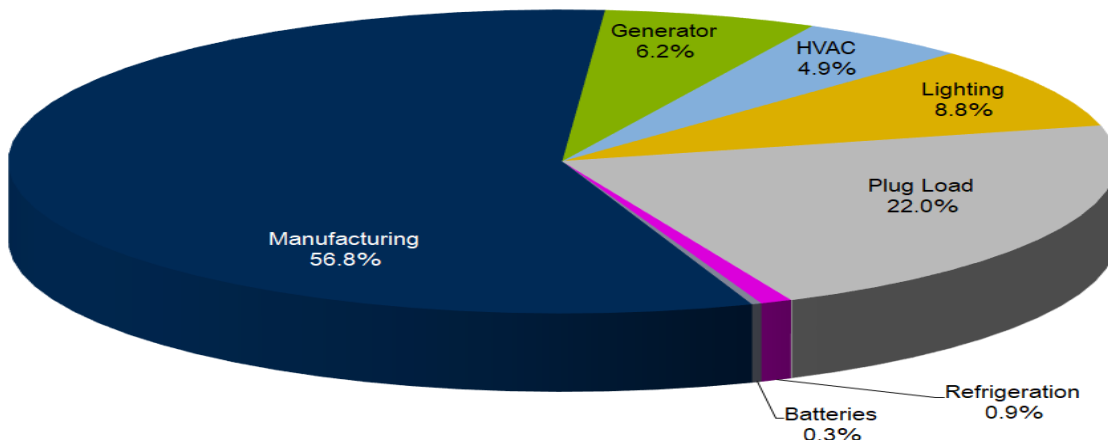
Capability represents total amount that may be offered. Actual offered and cleared volume may be significantly lower and is represented in subsequent figures/tables in report

Figure 19: 2024 PJM Demand Response Confirmed Regulation Registrations Load Reduction Methods



Note: Percent of CSP Reported Load Reduction MWs based on latest month RTO MWs based on Figure 18 for Regulation.

Figure 20: 2024 PJM Demand Response Confirmed Synch Reserve Registrations Load Reduction Methods



Note: Percent of CSP Reported Load Reduction MWs based on latest month RTO MWs based on Figure 18 for Synch Reserves. Plug Load includes reported reductions from Data Centers with Crypto Mining.

Figure 21: 2024 Economic Demand Response Regulation Market Participation

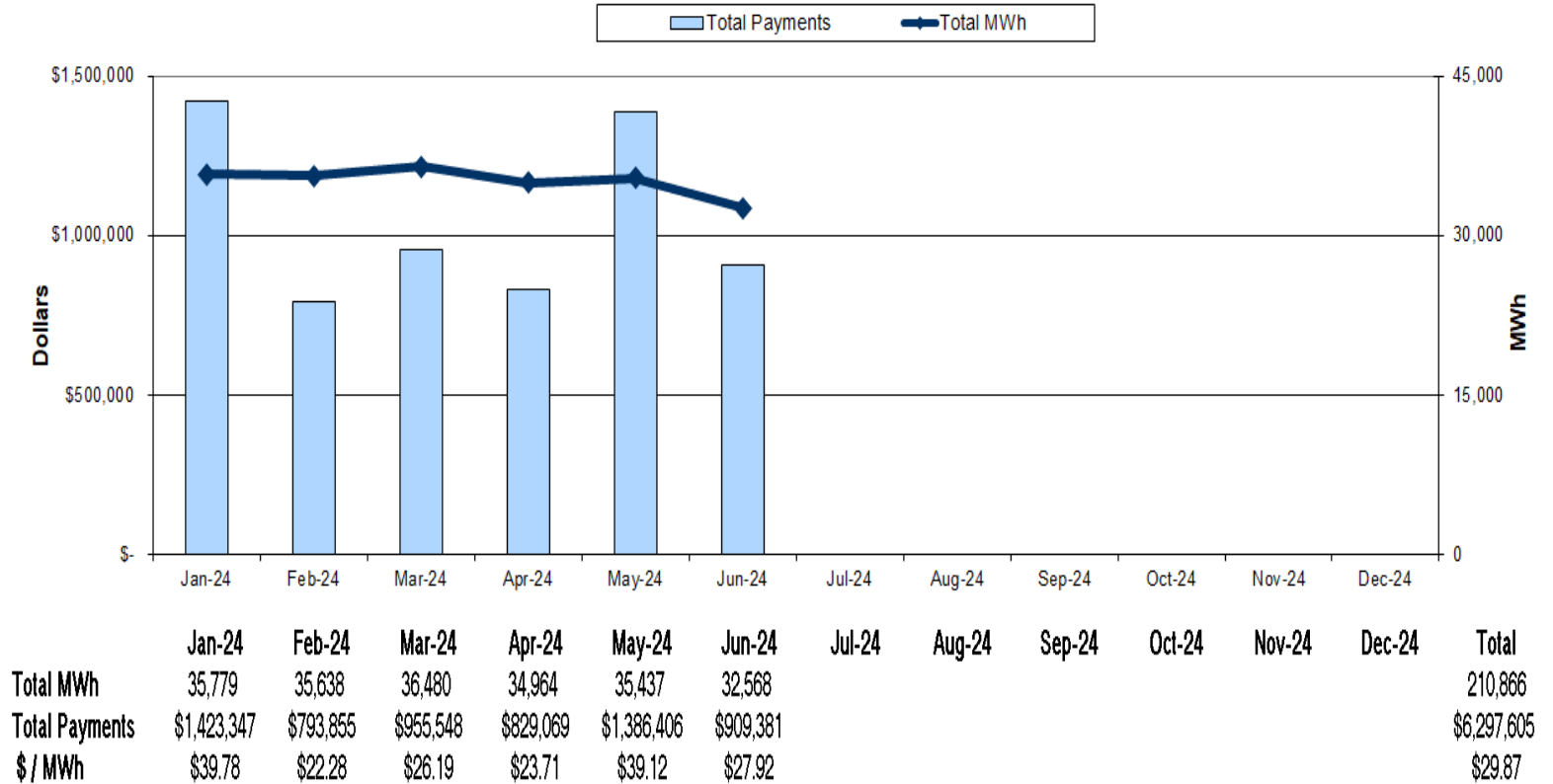
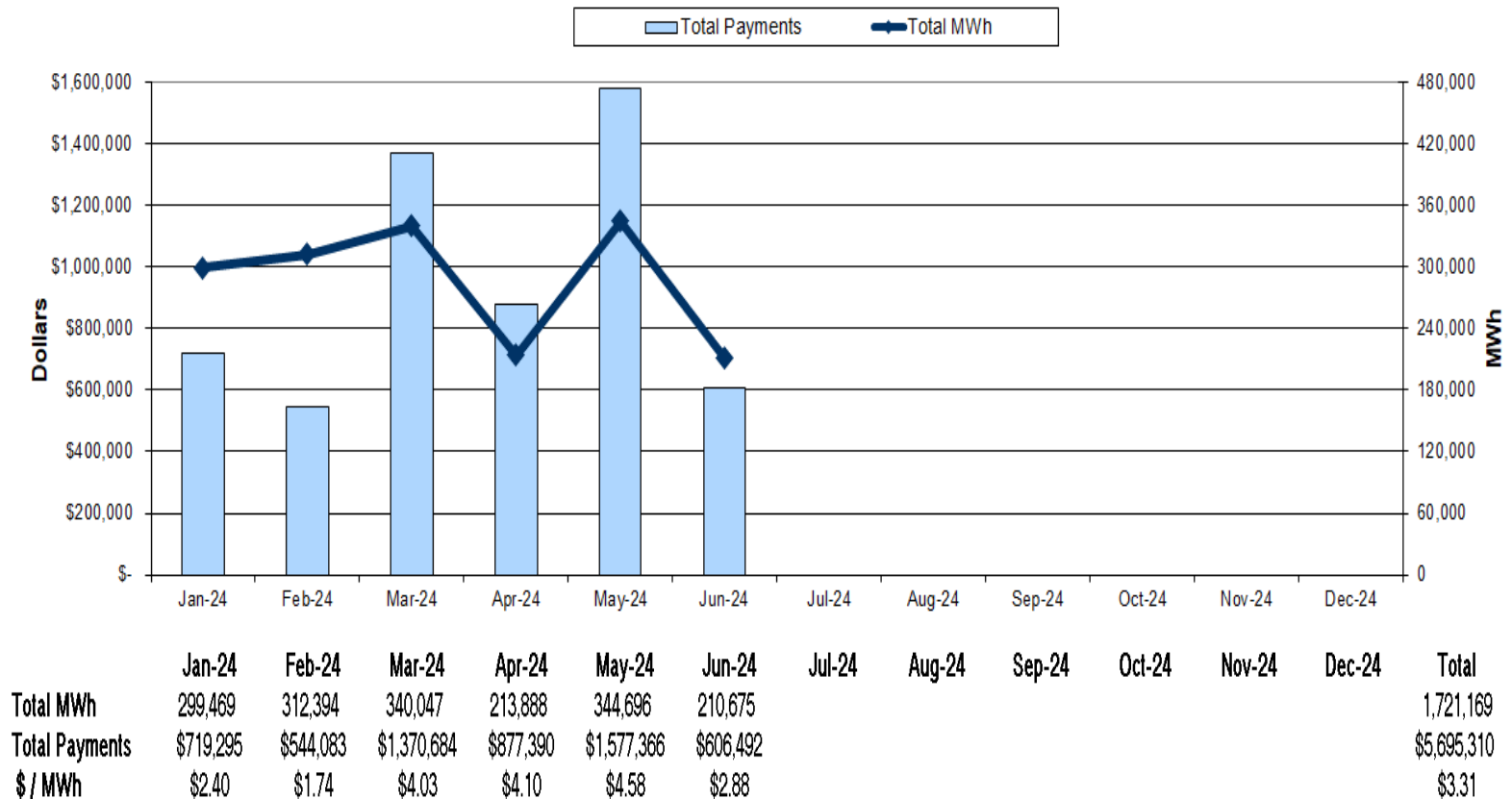
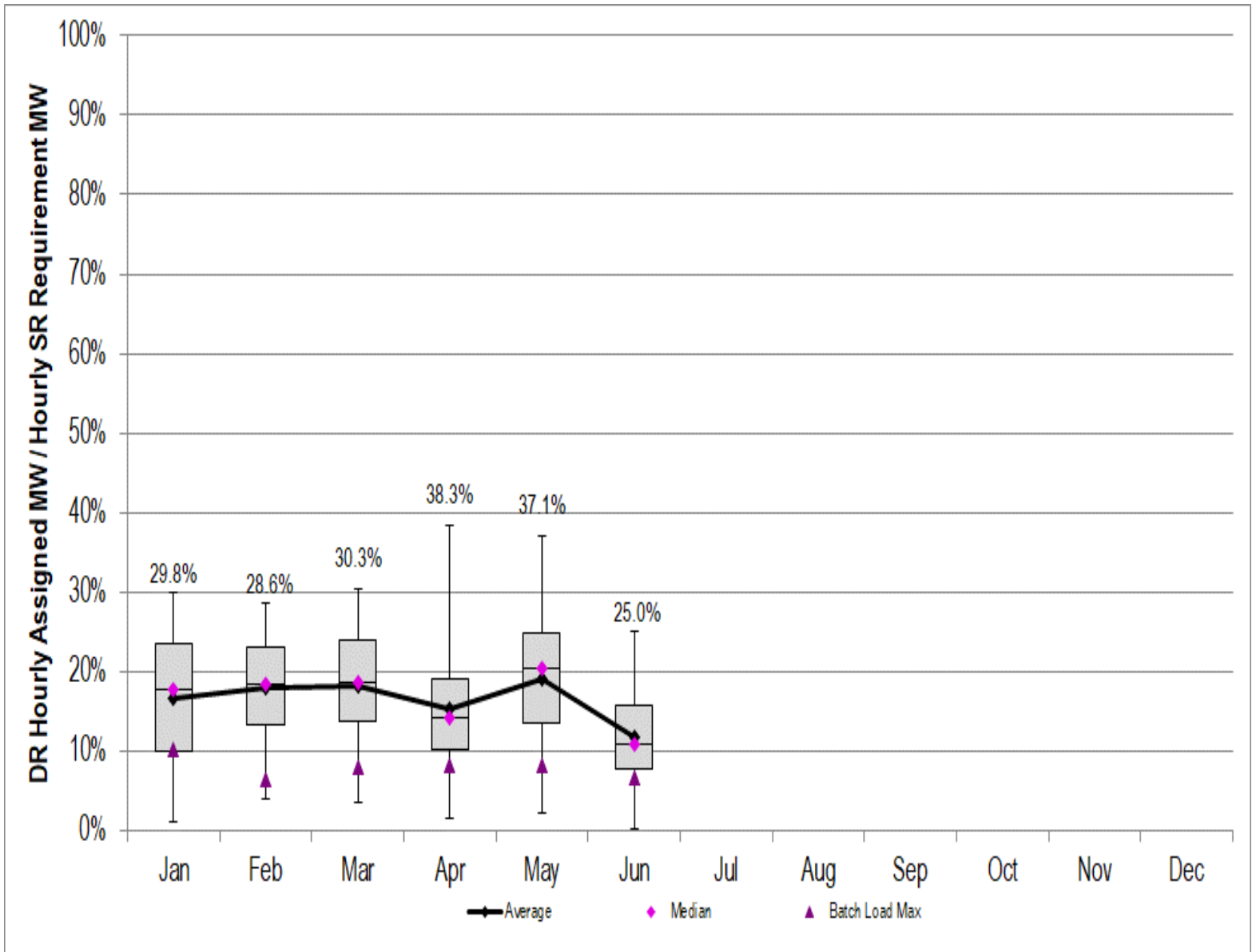


Figure 22: 2024 Economic Demand Response Synchronous Reserve Market Participation



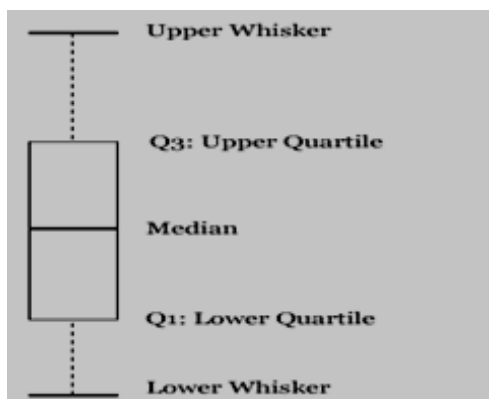
Note: For Figures 21 and 22 above, MWh=sum of the settled MW. Example: 1 MW load available for 12 hours = 12 MWh.

Figure 23: Economic DR Synchronous Reserve Penetration Distribution (Box-plot) for 2024



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 boxtop is the Upper Quartile (75%) value

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

The boxbottom is the Lower Quartile (25%) value

The lower whisker is the minimum value