

2019 Demand Response Operations Markets Activity Report: February 2019

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PJM Demand Side Response Operations

February 11, 2019



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Figure 1: DY 18/19 Active Participants in Load Management DR Programs

| State | Zone | EDC | Economic | | Emergency Energy Only | | Load Management | | Unique | |
|-------|---------|--------|-----------|-------|-----------------------|-----|-----------------|---------|-----------|---------|
| | | | Locations | MW | Locations | MW | Locations | MW | Locations | MW |
| DC | PEPCO | PEPCO | 3 | 20.3 | | | 290 | 78.6 | 290 | 78.6 |
| DE | DPL | DEMEC | 9 | 5.1 | | | 22 | 15.1 | 23 | 19.7 |
| DE | DPL | DOVDE | | | | | 17 | 4.8 | 17 | 4.8 |
| DE | DPL | DPL | 5 | 155.1 | | | 180 | 208.4 | 180 | 208.4 |
| DE | DPL | ODEC | | | | | 14 | 4.7 | 14 | 4.7 |
| IL | COMED | BATAV | | | | | 1 | 0.9 | 1 | 0.9 |
| IL | COMED | COMED | 23 | 86.7 | | | 2,269 | 1,376.7 | 2,269 | 1,376.7 |
| IL | COMED | IMEAA1 | 1 | 0.3 | | | 2 | 6.8 | 2 | 6.8 |
| IN | AEP | AEPIMP | | | | | 140 | 290.4 | 140 | 290.4 |
| IN | AEP | HEREC | 1 | 23.1 | | | 1 | 22.4 | 1 | 22.4 |
| IN | AEP | WVSDI | | | | | 1 | 15.3 | 1 | 15.3 |
| KY | DEOK | DEK | | | | | 60 | 30.9 | 60 | 30.9 |
| KY | EKPC | EKPC | | | | | 9 | 118.8 | 9 | 118.8 |
| MD | APS | AETSAP | 17 | 24.3 | | | 145 | 55.1 | 145 | 55.1 |
| MD | APS | FESCHG | 1 | 1.8 | | | 1 | 0.0 | 1 | 0.0 |
| MD | APS | FESCTH | | | | | 4 | 1.4 | 4 | 1.4 |
| MD | BGE | BC | 48 | 581.6 | | | 668 | 600.9 | 671 | 616.3 |
| MD | DPL | DPL | 8 | 80.7 | | | 146 | 114.3 | 147 | 118.7 |
| MD | DPL | EASTON | | | | | 8 | 1.9 | 8 | 1.9 |
| MD | DPL | ODEC | 1 | 2.2 | | | 15 | 8.5 | 15 | 8.5 |
| MD | PEPCO | PEPCO | 8 | 377.6 | | | 309 | 448.3 | 313 | 450.7 |
| MD | PEPCO | SMECO | 5 | 1.0 | | | 118 | 41.3 | 118 | 41.3 |
| MI | AEP | COSEDC | | | | | 1 | 2.1 | 1 | 2.1 |
| NJ | AECO | AE | 6 | 50.5 | | | 206 | 107.6 | 206 | 107.6 |
| NJ | AECO | VMEU | | | | | 21 | 5.7 | 21 | 5.7 |
| NJ | JCPL | JCBGS | 8 | 81.4 | | | 367 | 114.7 | 372 | 195.4 |
| NJ | PSEG | PSEG | 16 | 51.2 | 1 | 0.5 | 934 | 254.2 | 940 | 280.2 |
| NJ | RECO | RECO | | | | | 16 | 2.9 | 16 | 2.9 |
| NY | PENELEC | PaElec | | | | | 2 | 1.2 | 2 | 1.2 |
| OH | AEP | AEPOPT | 37 | 180.2 | | | 766 | 457.7 | 768 | 458.6 |
| OH | AEP | AMPO | | | | | 57 | 33.1 | 57 | 33.1 |
| OH | AEP | BUCK | | | | | 2 | 19.9 | 2 | 19.9 |
| OH | ATSI | AMPO | | | | | 14 | 40.7 | 14 | 40.7 |
| OH | ATSI | BUCK | | | | | 2 | 5.8 | 2 | 5.8 |
| OH | ATSI | CPP | | | | | 16 | 11.7 | 16 | 11.7 |
| OH | ATSI | OEEDC | 9 | 12.0 | | | 833 | 637.5 | 833 | 637.5 |
| OH | DAY | AMPO | 1 | 7.0 | | | 10 | 13.0 | 10 | 13.0 |
| OH | DAY | BUCK | | | | | 2 | 4.1 | 2 | 4.1 |
| OH | DAY | DAYEDC | 1 | 1.5 | | | 165 | 165.3 | 165 | 165.3 |
| OH | DEOK | AMPO | | | | | 7 | 12.5 | 7 | 12.5 |
| OH | DEOK | BUCK | | | | | 2 | 1.7 | 2 | 1.7 |
| OH | DEOK | DEOEDC | 14 | 133.3 | | | 398 | 201.3 | 398 | 201.3 |
| PA | APS | AECI | | | | | 2 | 0.8 | 2 | 0.8 |
| PA | APS | AETSAP | 10 | 38.1 | | | 530 | 333.0 | 532 | 338.5 |
| PA | ATSI | PAPWR | 2 | 50.2 | | | 68 | 60.7 | 69 | 60.9 |
| PA | DUQ | DLCO | 4 | 15.2 | | | 307 | 95.4 | 307 | 95.4 |
| PA | METED | MetEd | 34 | 47.1 | | | 419 | 192.4 | 425 | 202.0 |
| PA | PECO | PE | 45 | 126.3 | | | 1,013 | 282.1 | 1,020 | 349.3 |

| State | Zone | EDC | Economic | | Emergency Energy Only | | Load Management | | Unique | |
|--------------|---------|--------|------------|--------------|-----------------------|------------|-----------------|--------------|---------------|--------------|
| | | | Locations | MW | Locations | MW | Locations | MW | Locations | MW |
| PA | PENELEC | AECI | | | | | 12 | 7.9 | 12 | 7.9 |
| PA | PENELEC | PaElec | 5 | 39.6 | | | 478 | 250.9 | 482 | 260.5 |
| PA | PENELEC | WELLSB | | | | | 3 | 0.9 | 3 | 0.9 |
| PA | PPL | AMPO | | | | | 11 | 1.2 | 11 | 1.2 |
| PA | PPL | CTZECL | | | | | 3 | 1.6 | 3 | 1.6 |
| PA | PPL | PPL | 29 | 204.8 | | | 1,069 | 477.4 | 1,078 | 582.1 |
| PA | PPL | UGI-UI | | | | | 13 | 3.6 | 13 | 3.6 |
| TN | AEP | AEPAPT | | | | | 11 | 6.1 | 11 | 6.1 |
| VA | AEP | AEPAPT | 3 | 4.5 | | | 225 | 314.1 | 225 | 314.1 |
| VA | AEP | AMPO | | | | | 17 | 15.1 | 17 | 15.1 |
| VA | AEP | RADFRD | | | | | 1 | 2.3 | 1 | 2.3 |
| VA | AEP | VATECH | | | | | 1 | 5.3 | 1 | 5.3 |
| VA | APS | ODEC | 3 | 0.9 | | | 58 | 44.8 | 58 | 44.8 |
| VA | DOM | CVEC | 1 | 5.4 | | | 6 | 3.6 | 6 | 3.6 |
| VA | DOM | DOMEDC | 43 | 48.7 | | | 758 | 526.2 | 759 | 526.6 |
| VA | DOM | DOMVME | 2 | 0.4 | | | 26 | 96.1 | 26 | 96.1 |
| VA | DOM | NVEC | 3 | 15.1 | | | 39 | 1.8 | 41 | 16.4 |
| VA | DOM | ODEC | 2 | 0.4 | | | 41 | 12.8 | 41 | 12.8 |
| VA | DPL | ODEC | | | | | 16 | 0.7 | 16 | 0.7 |
| WV | AEP | AEPAPT | 9 | 1.4 | | | 183 | 463.8 | 183 | 463.8 |
| WV | APS | AETSAP | 41 | 46.4 | | | 210 | 207.1 | 210 | 207.1 |
| Total | | | 458 | 2,521 | 1 | 0.5 | 13,761 | 8,946 | 13,815 | 9,292 |

Note:

- 1) Data as of 2/5/2019.
- 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 1, 2019, DY18/19 RPM Committed Values is 7,994 MW for Load Management.

Figure 2: DY 18/19 MWs in Load Management DR by Resource, Product, and Lead Times

| Zone | | DR Product | | | | Lead Times (minutes) | | | Total MW |
|--------------|---------------|------------|--------|---------|-------------------------|----------------------|-------|-------|-------------|
| | | Limited | Annual | Base | Capacity Performance | 30 | 60 | 120 | |
| AECO | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 113.1 | 0.0 | 97.6 | 4.7 | 10.8 | 113.1 |
| | Emergency | 0.0 | 0.0 | 0.2 | 0.0 | 0.2 | 0.0 | 0.0 | 0.2 |
| | Total | 0.0 | 0.0 | 113.3 | 0.0 | 97.8 | 4.7 | 10.8 | 113.3 |
| AEP | | | | | | | | | |
| | Pre-Emergency | 427.0 | 0.0 | 1,106.5 | 68.7 | 728.7 | 150.9 | 722.5 | 1,602.1 |
| | Emergency | 0.2 | 0.0 | 45.4 | 0.0 | 28.6 | 0.8 | 16.2 | 45.6 |
| | Total | 427.2 | 0.0 | 1,151.9 | 68.7 | 757.3 | 151.7 | 738.7 | 1,647.7 |
| APS | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 551.6 | 65.7 | 348.6 | 18.3 | 250.3 | 617.3 |
| | Emergency | 0.0 | 0.0 | 25.0 | 0.0 | 19.3 | 0.0 | 5.6 | 25.0 |
| | Total | 0.0 | 0.0 | 576.6 | 65.7 | 368.0 | 18.3 | 255.9 | 642.2 |
| ATSI | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 496.2 | 170.8 | 295.7 | 30.9 | 340.3 | 667.0 |
| | Emergency | 0.0 | 0.0 | 89.5 | 0.0 | 25.3 | 3.2 | 60.9 | 89.5 |
| | Total | 0.0 | 0.0 | 585.7 | 170.8 | 321.0 | 34.1 | 401.3 | 756.4 |
| BGE | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 530.2 | 62.9 | 557.7 | 2.7 | 32.8 | 593.1 |
| | Emergency | 0.0 | 0.0 | 0.1 | 7.6 | 7.7 | 0.0 | 0.0 | 7.7 |
| | Total | 0.0 | 0.0 | 530.3 | 70.6 | 565.4 | 2.7 | 32.8 | 600.9 |
| COMED | | | | | | | | | |
| | Pre-Emergency | 0.0 | 6.8 | 1,288.1 | 26.2 | 916.7 | 30.4 | 373.8 | 1,321.0 |
| | Emergency | 0.0 | 0.0 | 63.4 | 0.0 | 32.5 | 4.5 | 26.4 | 63.4 |
| | Total | 0.0 | 6.8 | 1,351.5 | 26.2 | 949.2 | 34.9 | 400.2 | 1,384.4 |
| DAY | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 162.6 | 13.2 | 87.4 | 5.7 | 82.8 | 175.8 |
| | Emergency | 0.0 | 0.0 | 6.5 | 0.0 | 6.1 | 0.0 | 0.4 | 6.5 |
| | Total | 0.0 | 0.0 | 169.2 | 13.2 | 93.4 | 5.7 | 83.2 | 182.3 |
| DEOK | | | | | | | | | |
| | Pre-Emergency | 30.9 | 0.0 | 168.0 | 44.6 | 126.5 | 75.1 | 41.9 | 243.5 |
| | Emergency | 0.0 | 0.0 | 2.9 | 0.0 | 2.9 | 0.0 | 0.0 | 2.9 |
| | Total | 30.9 | 0.0 | 170.9 | 44.6 | 129.4 | 75.1 | 41.9 | 246.4 |
| DOM | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 513.0 | 12.5 | 149.2 | 38.8 | 337.4 | 525.5 |
| | Emergency | 0.0 | 0.0 | 115.1 | 0.0 | 75.0 | 14.0 | 26.1 | 115.1 |
| | Total | 0.0 | 0.0 | 628.0 | 12.5 | 224.2 | 52.8 | 363.5 | 640.5 |
| DPL | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 334.1 | 18.0 | 157.8 | 18.3 | 176.0 | 352.1 |
| | Emergency | 0.0 | 0.0 | 6.3 | 0.0 | 4.4 | 1.6 | 0.3 | 6.3 |
| | Total | 0.0 | 0.0 | 340.3 | 18.0 | 162.1 | 19.9 | 176.3 | 358.3 |
| DUQ | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 89.8 | 4.9 | 65.3 | 6.6 | 22.9 | 94.8 |
| | Emergency | 0.0 | 0.0 | 0.6 | 0.0 | 0.6 | 0.0 | 0.0 | 0.6 |
| | Total | 0.0 | 0.0 | 90.4 | 4.9 | 65.9 | 6.6 | 22.9 | 95.4 |
| EKPC | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 0.0 | 117.8 | 18.8 | 3.9 | 95.1 | 117.8 |
| | Emergency | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 |
| | Total | 0.0 | 0.0 | 0.0 | 118.8 | 19.9 | 3.9 | 95.1 | 118.8 |

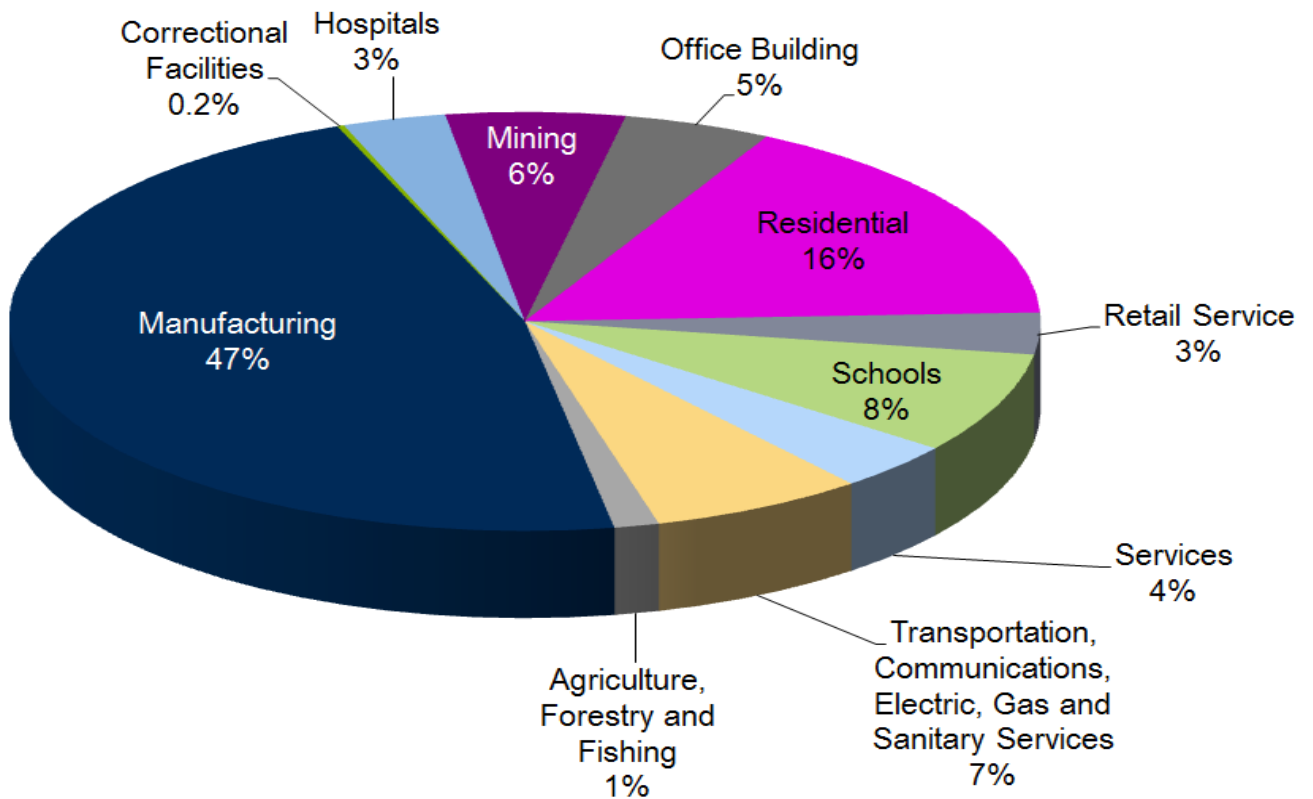


| Zone | | DR Product | | | | Lead Times (minutes) | | | Total |
|----------------|---------------|------------|--------|---------|----------------------|----------------------|-------|---------|---------|
| | | Limited | Annual | Base | Capacity Performance | 30 | 60 | 120 | MW |
| JCPL | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 110.4 | 0.0 | 86.8 | 2.0 | 21.6 | 110.4 |
| | Emergency | 0.0 | 0.0 | 4.3 | 0.0 | 4.3 | 0.0 | 0.0 | 4.3 |
| | Total | 0.0 | 0.0 | 114.7 | 0.0 | 91.1 | 2.0 | 21.6 | 114.7 |
| METED | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 189.8 | 0.9 | 99.1 | 15.2 | 76.4 | 190.7 |
| | Emergency | 0.0 | 0.0 | 1.7 | 0.0 | 1.7 | 0.0 | 0.0 | 1.7 |
| | Total | 0.0 | 0.0 | 191.5 | 0.9 | 100.8 | 15.2 | 76.4 | 192.4 |
| PECO | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 254.0 | 4.1 | 195.7 | 8.5 | 53.8 | 258.1 |
| | Emergency | 0.0 | 0.0 | 22.8 | 1.3 | 20.5 | 2.3 | 1.2 | 24.1 |
| | Total | 0.0 | 0.0 | 276.7 | 5.4 | 216.2 | 10.8 | 55.0 | 282.1 |
| PENELEC | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 209.5 | 50.1 | 99.9 | 11.0 | 148.7 | 259.6 |
| | Emergency | 0.0 | 0.0 | 1.4 | 0.0 | 1.1 | 0.0 | 0.3 | 1.4 |
| | Total | 0.0 | 0.0 | 210.8 | 50.1 | 101.1 | 11.0 | 148.9 | 261.0 |
| PEPCO | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 538.8 | 21.5 | 332.3 | 1.3 | 226.8 | 560.4 |
| | Emergency | 0.0 | 0.0 | 1.4 | 6.4 | 7.1 | 0.0 | 0.7 | 7.8 |
| | Total | 0.0 | 0.0 | 540.2 | 28.0 | 339.4 | 1.3 | 227.6 | 568.2 |
| PPL | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 304.1 | 176.2 | 224.1 | 23.7 | 232.4 | 480.3 |
| | Emergency | 0.0 | 0.0 | 2.8 | 0.7 | 0.7 | 0.0 | 2.8 | 3.5 |
| | Total | 0.0 | 0.0 | 306.9 | 176.9 | 224.9 | 23.7 | 235.2 | 483.8 |
| PSEG | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 250.9 | 0.1 | 195.8 | 4.8 | 50.4 | 251.0 |
| | Emergency | 0.0 | 0.0 | 3.2 | 0.0 | 0.0 | 0.0 | 3.2 | 3.2 |
| | Total | 0.0 | 0.0 | 254.1 | 0.1 | 195.8 | 4.8 | 53.6 | 254.2 |
| RECO | | | | | | | | | |
| | Pre-Emergency | 0.0 | 0.0 | 2.9 | 0.0 | 2.9 | 0.0 | 0.0 | 2.9 |
| | Emergency | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Total | 0.0 | 0.0 | 2.9 | 0.0 | 2.9 | 0.0 | 0.0 | 2.9 |
| TOTAL | | | | | | | | | |
| | Pre-Emergency | 457.9 | 6.8 | 7,213.6 | 858.1 | 4,786.9 | 452.7 | 3,296.8 | 8,536.4 |
| | Emergency | 0.2 | 0.0 | 392.3 | 17.1 | 238.9 | 26.4 | 144.2 | 409.6 |
| | Total | 458.1 | 6.8 | 7,605.9 | 875.2 | 5,025.8 | 479.2 | 3,441.0 | 8,946.0 |

Note:

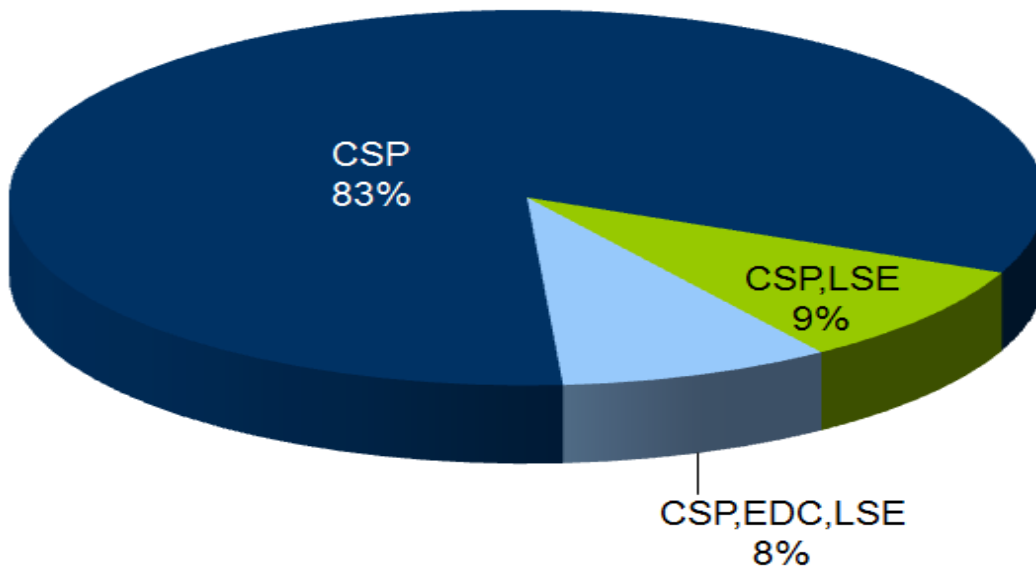
- 1) Data as of 2/5/2019.
- 2) MW are in ICAP.

Figure 3: DY 18/19 Confirmed Load Management DR Registrations Business Segments



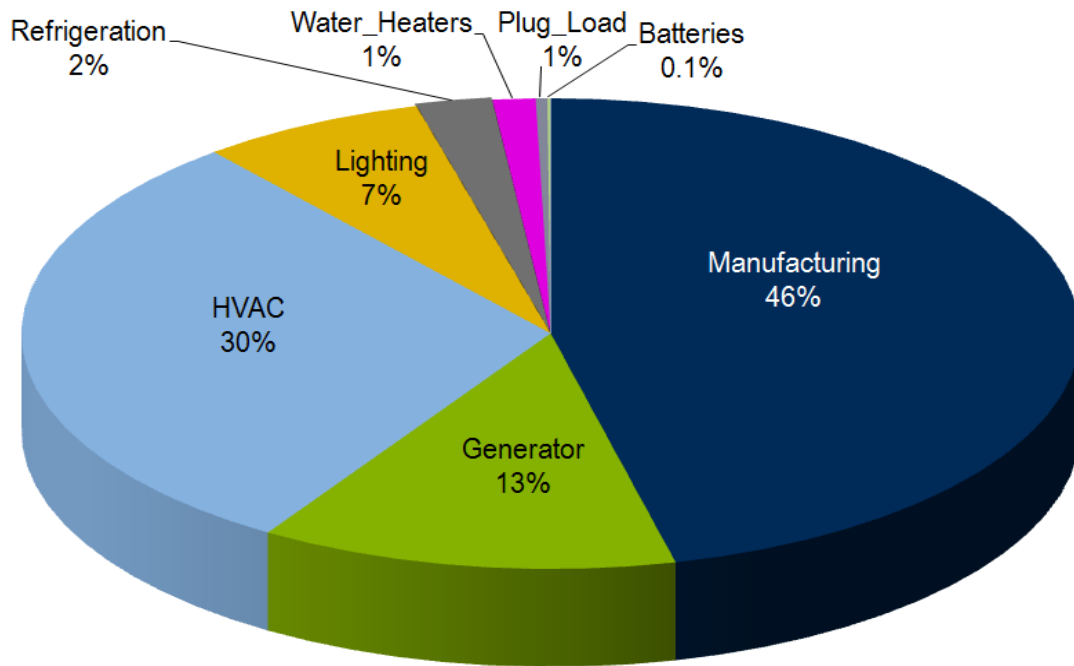
Note: Percent of Nominated Capacity (MWs). Includes Capacity Performance nominated MWs.

Figure 4: DY 18/19 Confirmed Load Management DR Registrations Owner/Company Type



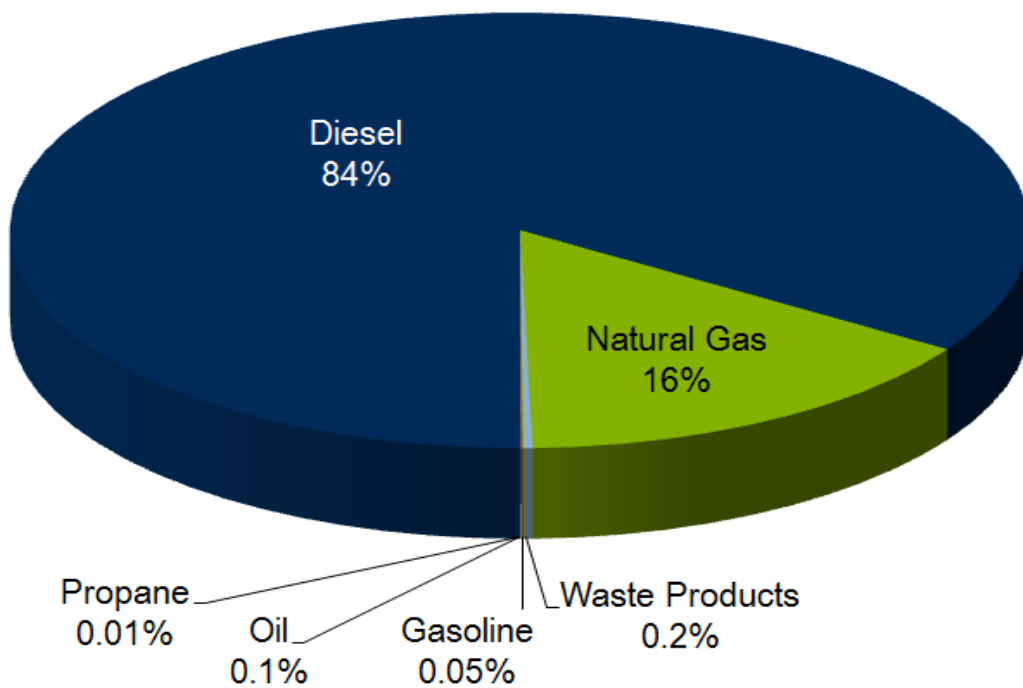
Note: Percent of Nominated Capacity (MWs). Includes Capacity Performance nominated MWs.

Figure 5: DY 18/19 Confirmed Load Management DR Registrations Customer Load Reduction Methods



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

Figure 6: DY 18/19 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 18/19 Confirmed Load Management DR Registrations Generator and Permit Type

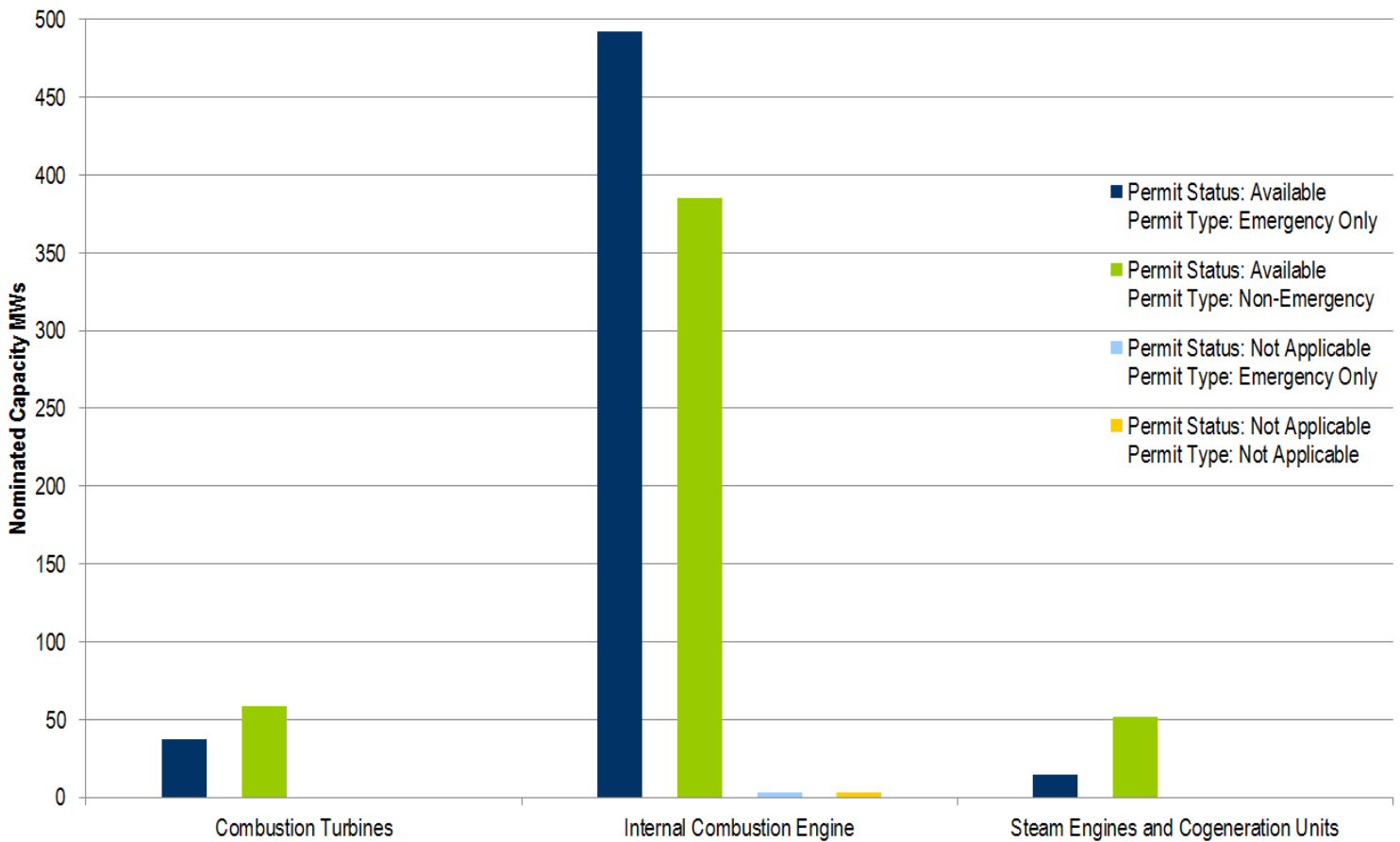


Figure 8: DY 18/19 Confirmed Load Management DR Registrations Fuel Mix with Behind the Meter Generation

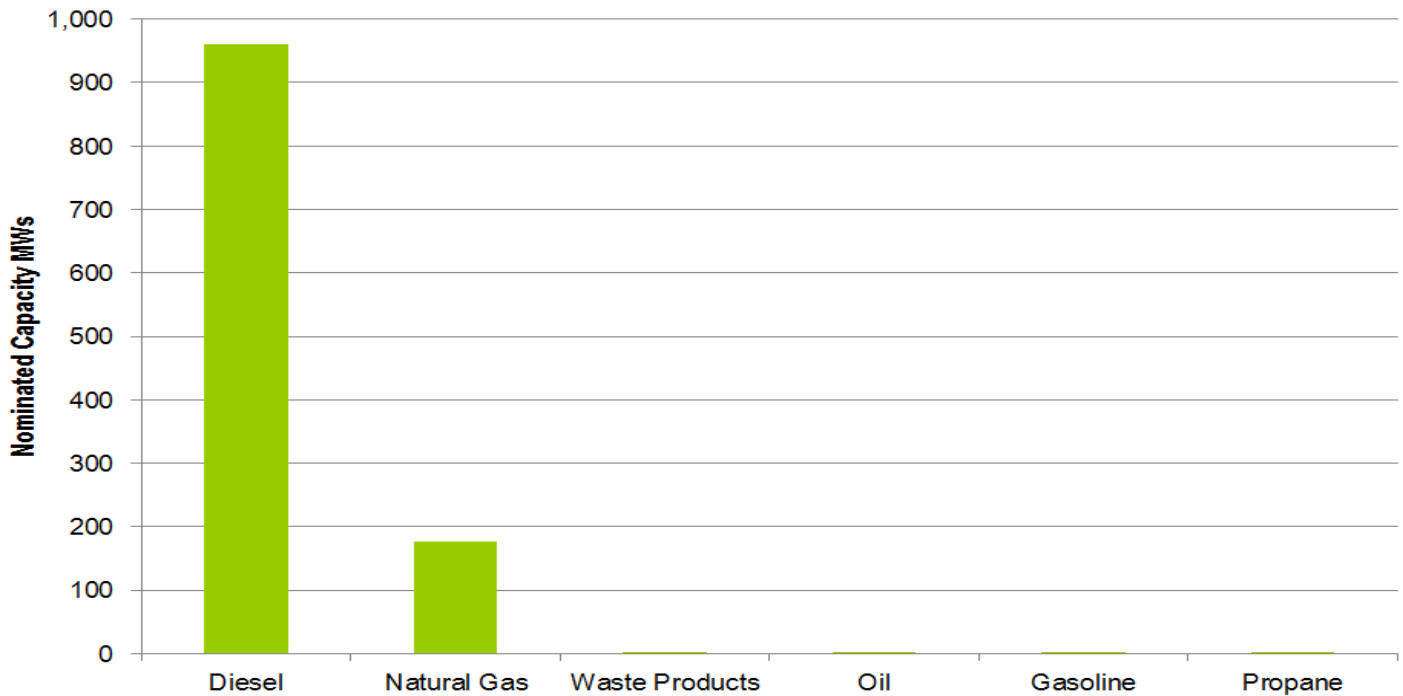
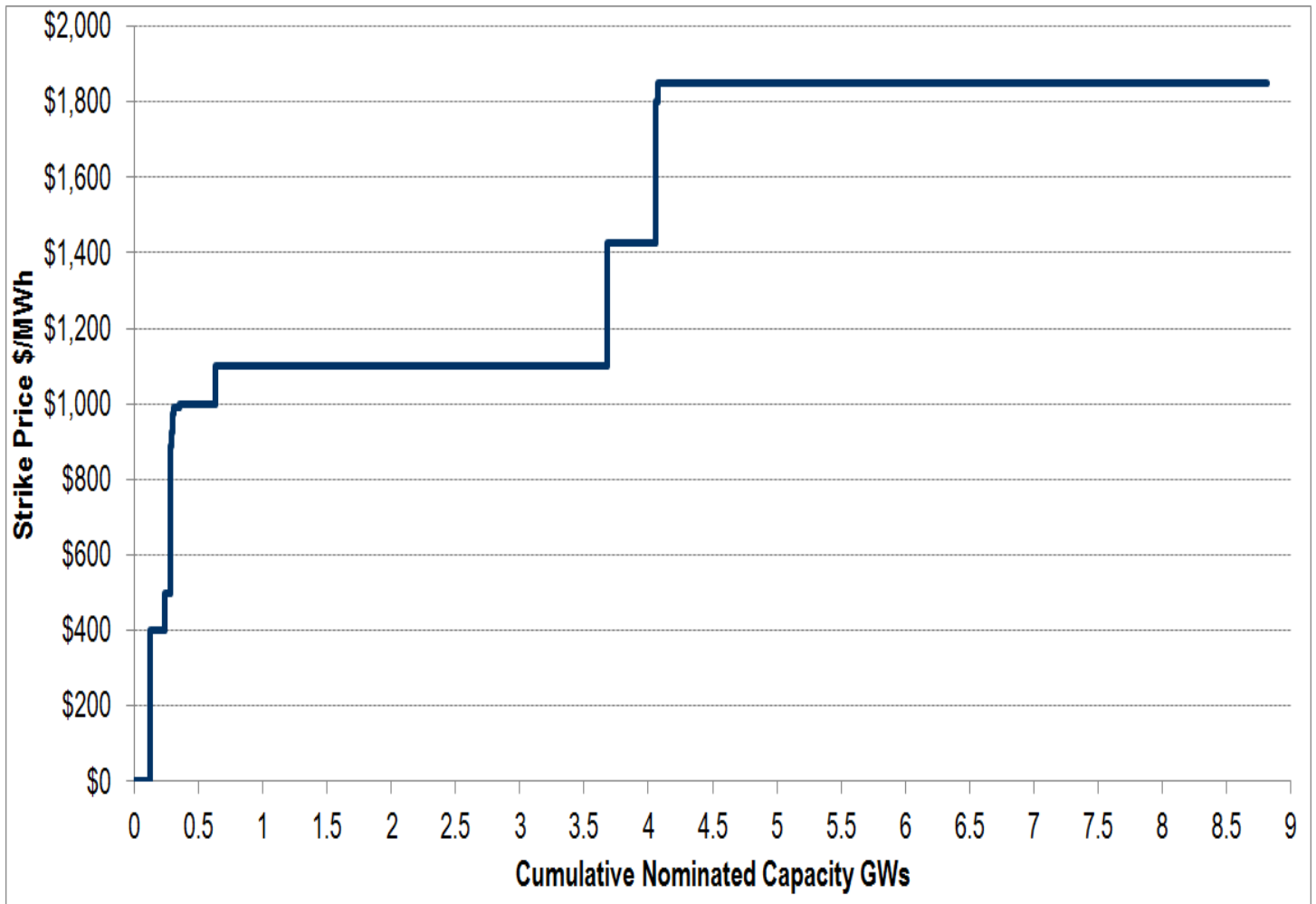


Figure 9: DY 18/19 Confirmed Load Management Full DR Registrations Energy Supply Curve:



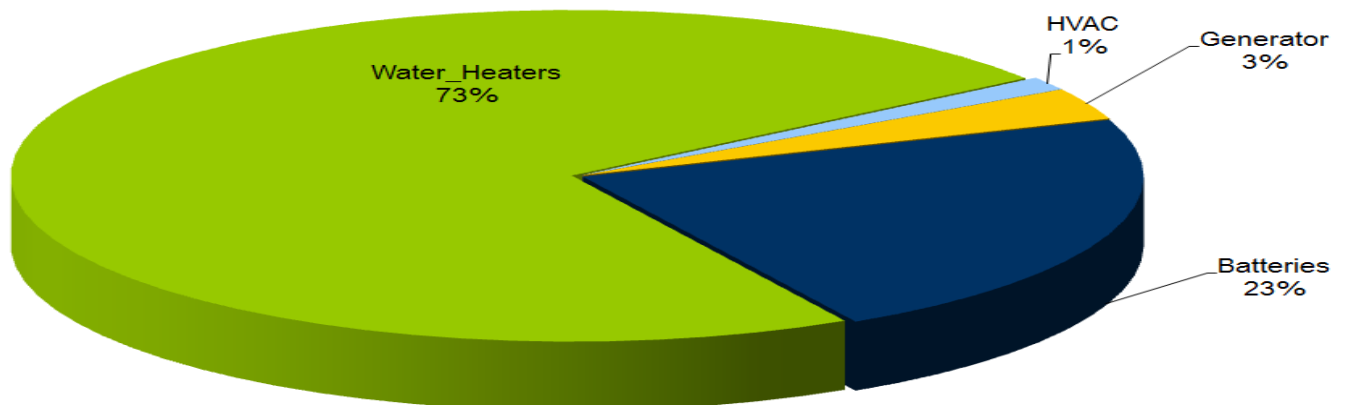
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Figure 10: 2019 Economic Demand Response Capability in the Ancillary Service Markets

| Synch Reserves | Zone | Jan |
|--|---------|------------|
| Locations | MAD | 108 |
| | Non-MAD | 28 |
| Average Number of Unique Participating Locations per Month: | | 136 |
| MWs | MAD | 498 |
| | Non-MAD | 341 |
| | RTO | 839 |
| Average MWs per Month: | | 839 |

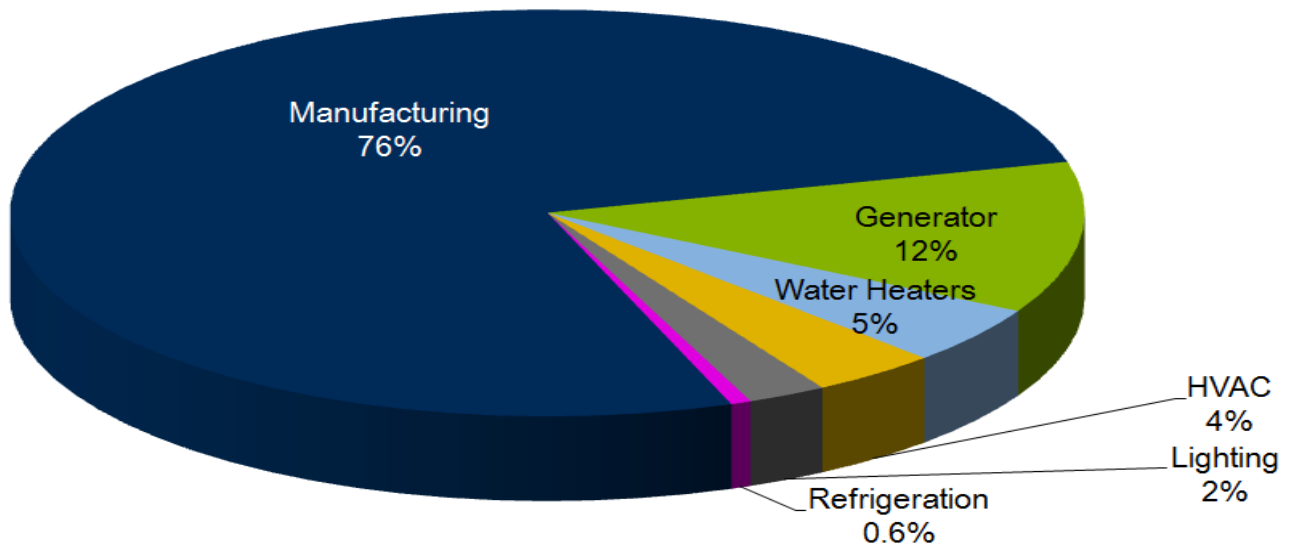
| Regulation | Zone | Jan |
|--|------|------------|
| Locations | RTO | 170 |
| Average Number of Unique Participating Locations per Month: | | 170 |
| MWs | RTO | 106 |
| Average MWs per Month: | | 106 |

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: 2019 PJM Demand Response Confirmed Regulation Registrations Load Reduction Methods


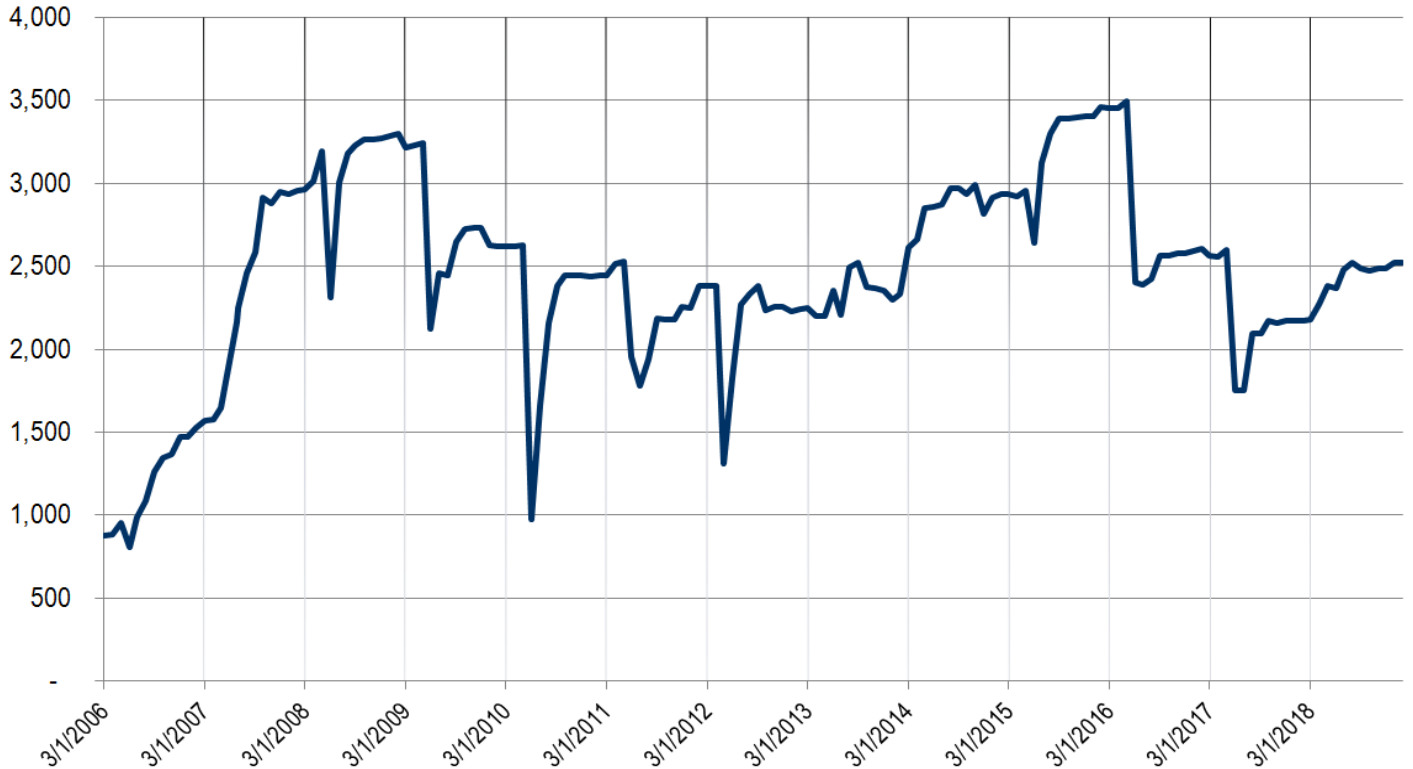
Note: Percent of CSP Reported Load Reduction MWs

Figure 12: 2019 PJM Demand Response Confirmed Synch Reserve Registrations Load Reduction Methods:



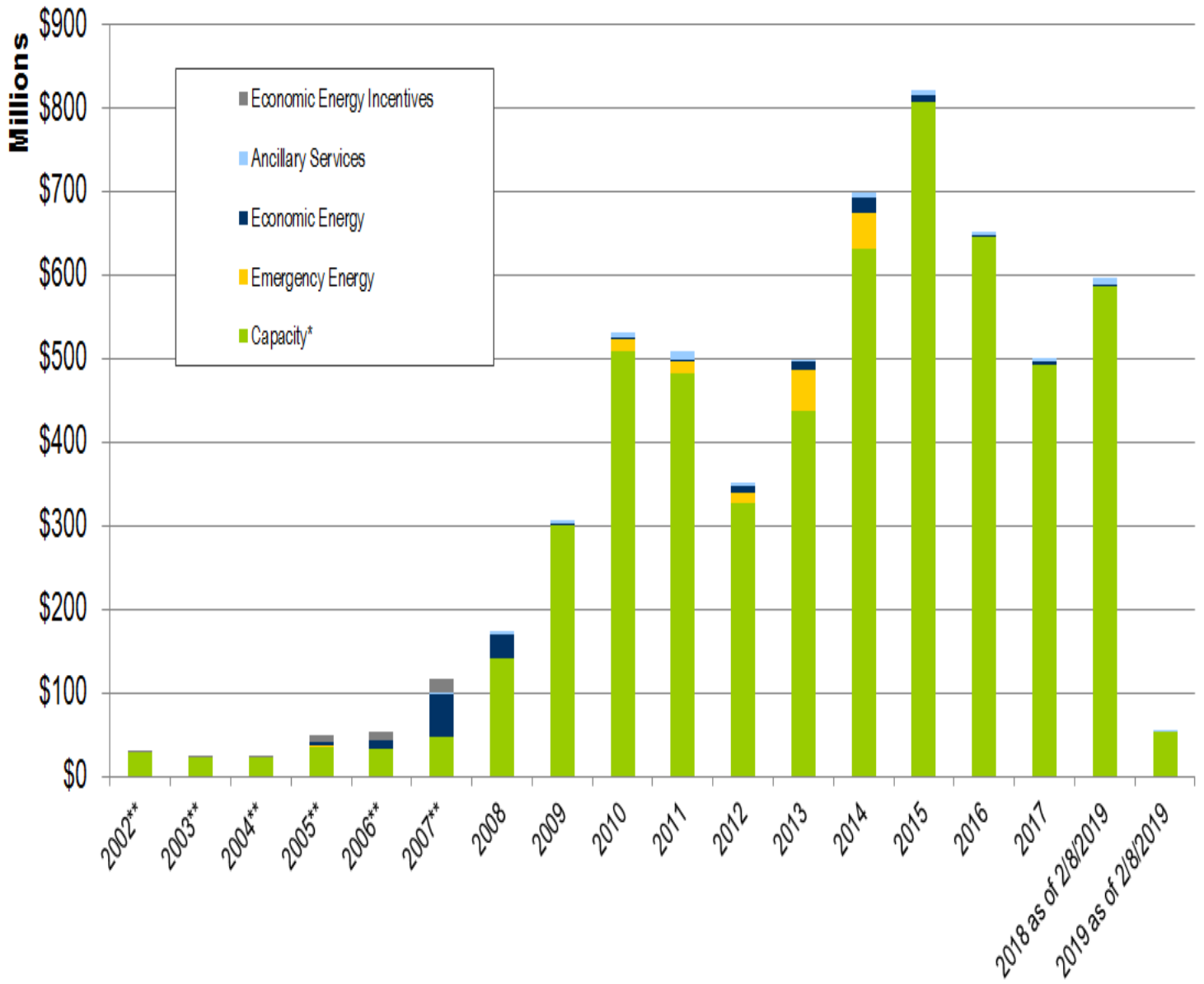
Note: Percent of CSP Reported Load Reduction MWs

Figure 13: PJM Economic Demand Response Capability in Energy Market (3/1/2006-2/5/2019)



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

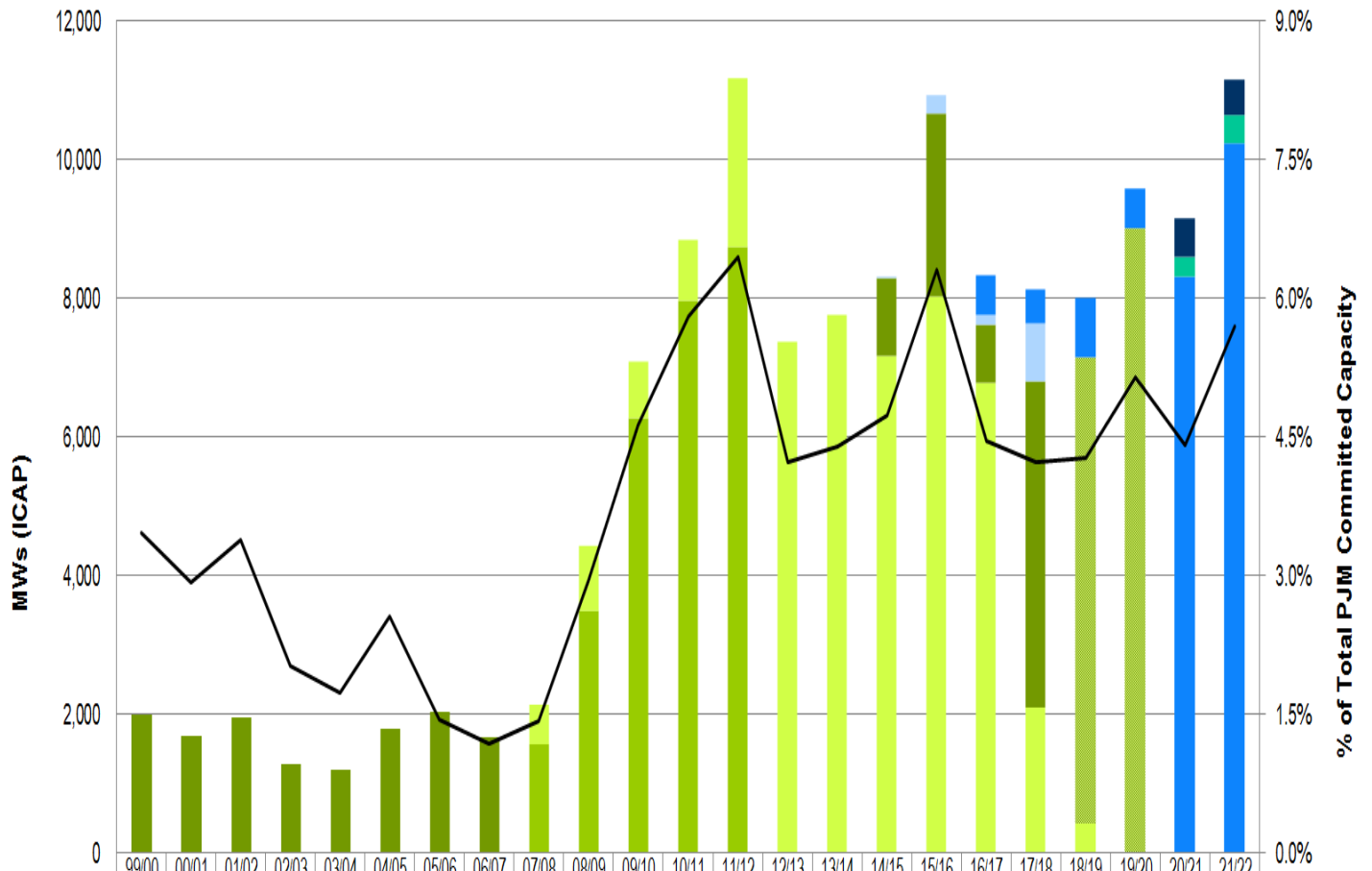


*Capacity Net Revenue inclusive of Capacity Credits and Charges.

**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 | | | | | | | | | | | | | | | | | | 0 | 0 | 0 | 0 | 558 | 510 | |
| Summer - CP | | | | | | | | | | | | | | | | | | | | | | | 287 | 415 |
| Annual - CP | | | | | | | | | | | | | | | | | | 574 | 493 | 850 | 569 | 8308 | 10226 | |
| Base DR | | | | | | | | | | | | | | | | | | 0 | 0 | 6,717 | 8,997 | 0 | 0 | |
| Annual - DR | | | | | | | | | | | | | | | 22 | 266 | 144 | 822 | 0 | 0 | 0 | 0 | 0 | |
| Extended Summer - DR | | | | | | | | | | | | | | | | 1,126 | 2,635 | 836 | 4,694 | 0 | 0 | 0 | 0 | |
| Limited - DR | | | | | | | | 555 | 940 | 815 | 869 | 2,425 | 7,361 | 7,753 | 7,166 | 8,027 | 6,783 | 2,111 | 427 | 0 | 0 | 0 | 0 | |
| 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 | | | | | | | | | | 0 | 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% | 4.3% | 5.1% | 4.4% | 5.7% | |

Notes:

- 1) Data as of 2/1/2019.
- 2) RPM was implemented DY 07/08.
- 3) DY 19/20 MWs include results from Base, First, and Second Incremental Auction.
- 4) DY 20/21 MWs include results from Base and First Incremental Auction.
- 5) DY 21/22 MWs include results from Base Residual Auction.
- 6) ALM MWs are seasonal averages for Delivery Years before 07/08.

Figure 16: 2019 Load Management Demand Response Monthly Capacity Revenue from RPM

| Zone | Jan |
|--------------|---------------------|
| AECO | \$1,063,052 |
| AEP | \$6,675,669 |
| APS | \$4,638,234 |
| ATSI | \$4,254,499 |
| BGE | \$1,471,812 |
| COMED | \$11,763,628 |
| DAY | \$1,082,665 |
| DEOK | \$996,130 |
| DOM | \$3,841,793 |
| DPL | \$2,760,840 |
| DUQ | \$1,229,930 |
| EKPC | \$688,069 |
| JCPL | \$1,324,124 |
| METED | \$1,527,708 |
| PECO | \$3,342,110 |
| PENELEC | \$1,811,449 |
| PEPCO | \$806,881 |
| PPL | \$2,314,965 |
| PSEG | \$2,521,890 |
| RECO | \$48,971 |
| Total | \$54,164,419 |

Total Capacity Credits: \$54,164,419

This area intentionally left blank

Figure 17: 2019 Economic Demand Response Dispatched vs Settled Real-Time Energy Market Summary

| Year | Month | CSPs | | Zone | | Registrations | | | MWh | | | Registration Hours | | |
|--------------------|-------|------------|---------|------------|---------|---------------|----------|-----------|--------------|----------|-----------|--------------------|----------|-----------|
| | | Dispatched | Settled | Dispatched | Settled | Dispatched | Settled | % | Dispatched | Settled | % | Dispatched | Settled | % |
| 2019 | 1 | 7 | | 8 | | 13 | | 0% | 1,630 | | 0% | 488 | | 0% |
| 2019 | 2 | 3 | | 3 | | 4 | | 0% | 138 | | 0% | 24 | | 0% |
| 2019 | 3 | | | | | | | | | | | | | |
| 2019 | 4 | | | | | | | | | | | | | |
| 2019 | 5 | | | | | | | | | | | | | |
| 2019 | 6 | | | | | | | | | | | | | |
| 2019 | 7 | | | | | | | | | | | | | |
| 2019 | 8 | | | | | | | | | | | | | |
| 2019 | 9 | | | | | | | | | | | | | |
| 2019 | 10 | | | | | | | | | | | | | |
| 2019 | 11 | | | | | | | | | | | | | |
| 2019 | 12 | | | | | | | | | | | | | |
| YTD Totals | | | | | | 17 | 0 | 0% | 1,768 | 0 | 0% | 512 | 0 | 0% |
| YTD Average | | 5 | | 6 | | | | | | | | | | |

Figure 18: 2019 Economic Demand Response Cleared vs Settled Day-Ahead Energy Market Summary

| Year | Month | CSPs | | Zone | | Registrations | | | MWh | | | Registration Hours | | |
|--------------------|-------|----------|---------|----------|---------|---------------|----------|-----------|--------------|----------|-----------|--------------------|----------|-----------|
| | | Cleared | Settled | Cleared | Settled | Cleared | Settled | % | Cleared | Settled | % | Cleared | Settled | % |
| 2019 | 1 | 6 | | 5 | | 8 | | 0% | 1,900 | | 0% | 355 | | 0% |
| 2019 | 2 | 4 | | 3 | | 4 | | 0% | 154 | | 0% | 28 | | 0% |
| 2019 | 3 | | | | | | | | | | | | | |
| 2019 | 4 | | | | | | | | | | | | | |
| 2019 | 5 | | | | | | | | | | | | | |
| 2019 | 6 | | | | | | | | | | | | | |
| 2019 | 7 | | | | | | | | | | | | | |
| 2019 | 8 | | | | | | | | | | | | | |
| 2019 | 9 | | | | | | | | | | | | | |
| 2019 | 10 | | | | | | | | | | | | | |
| 2019 | 11 | | | | | | | | | | | | | |
| 2019 | 12 | | | | | | | | | | | | | |
| YTD Totals | | | | | | 12 | 0 | 0% | 2,054 | 0 | 0% | 383 | 0 | 0% |
| YTD Average | | 5 | | 4 | | | | | | | | | | |

Figure 19: 2019 Economic Demand Response Regulation Market Participation

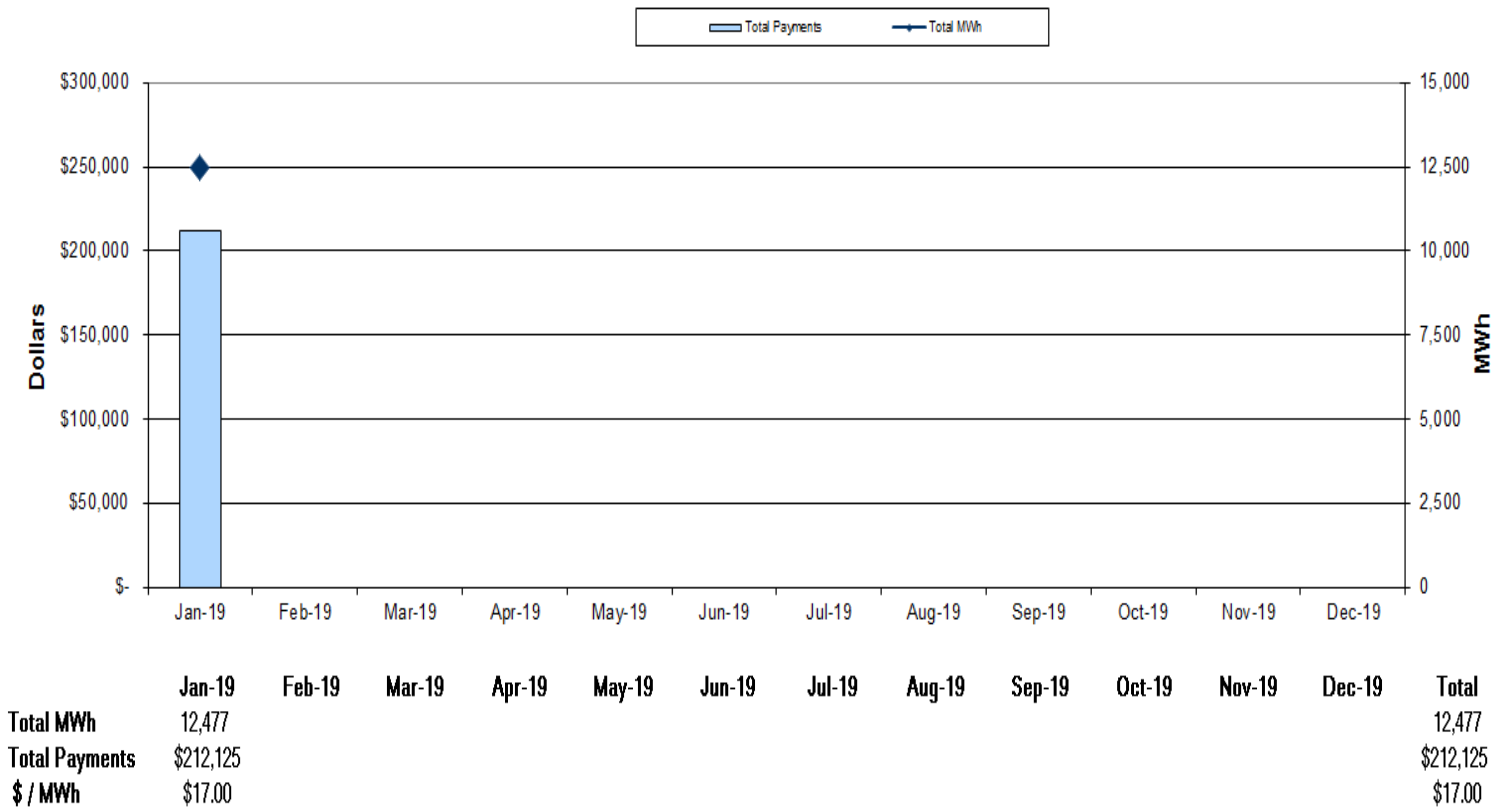
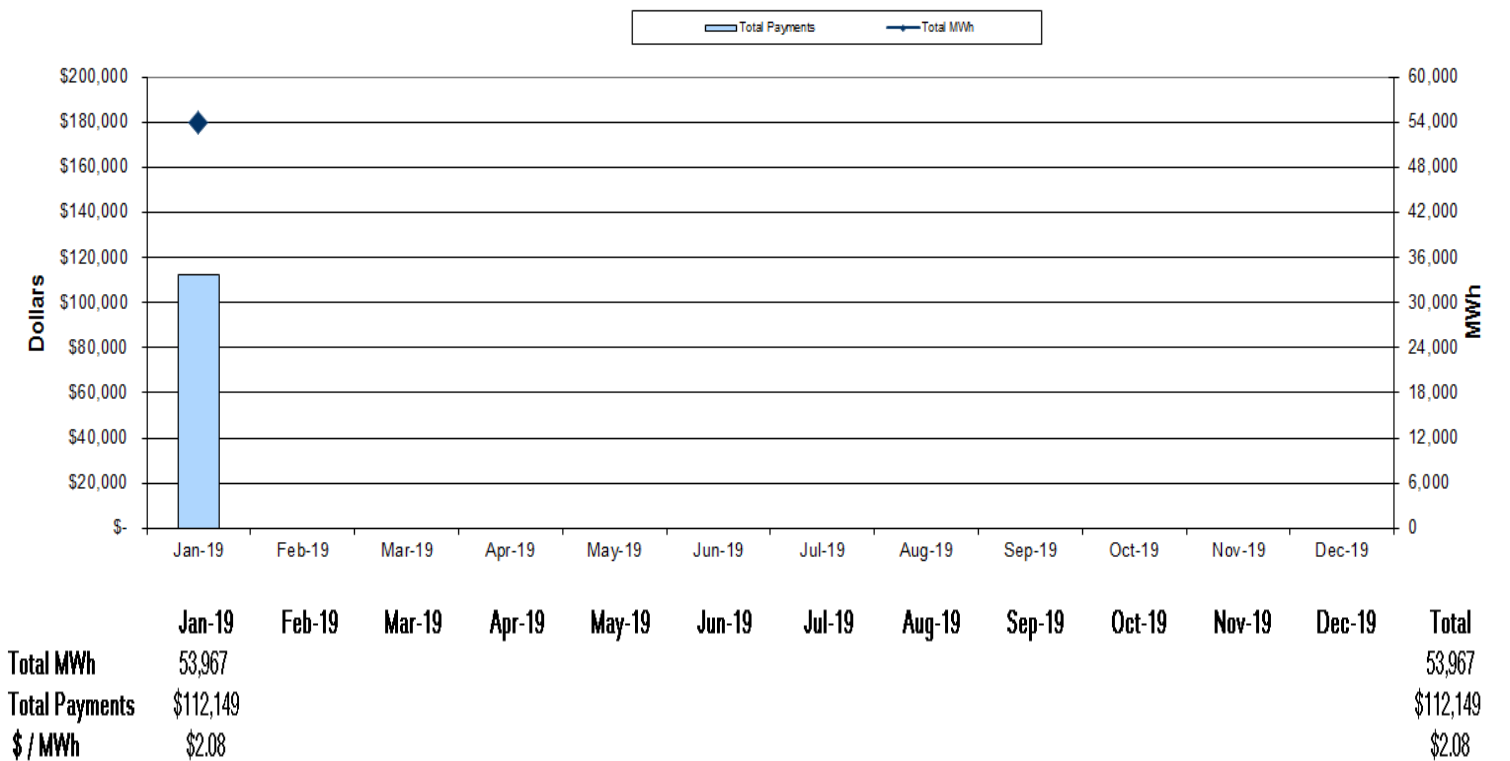
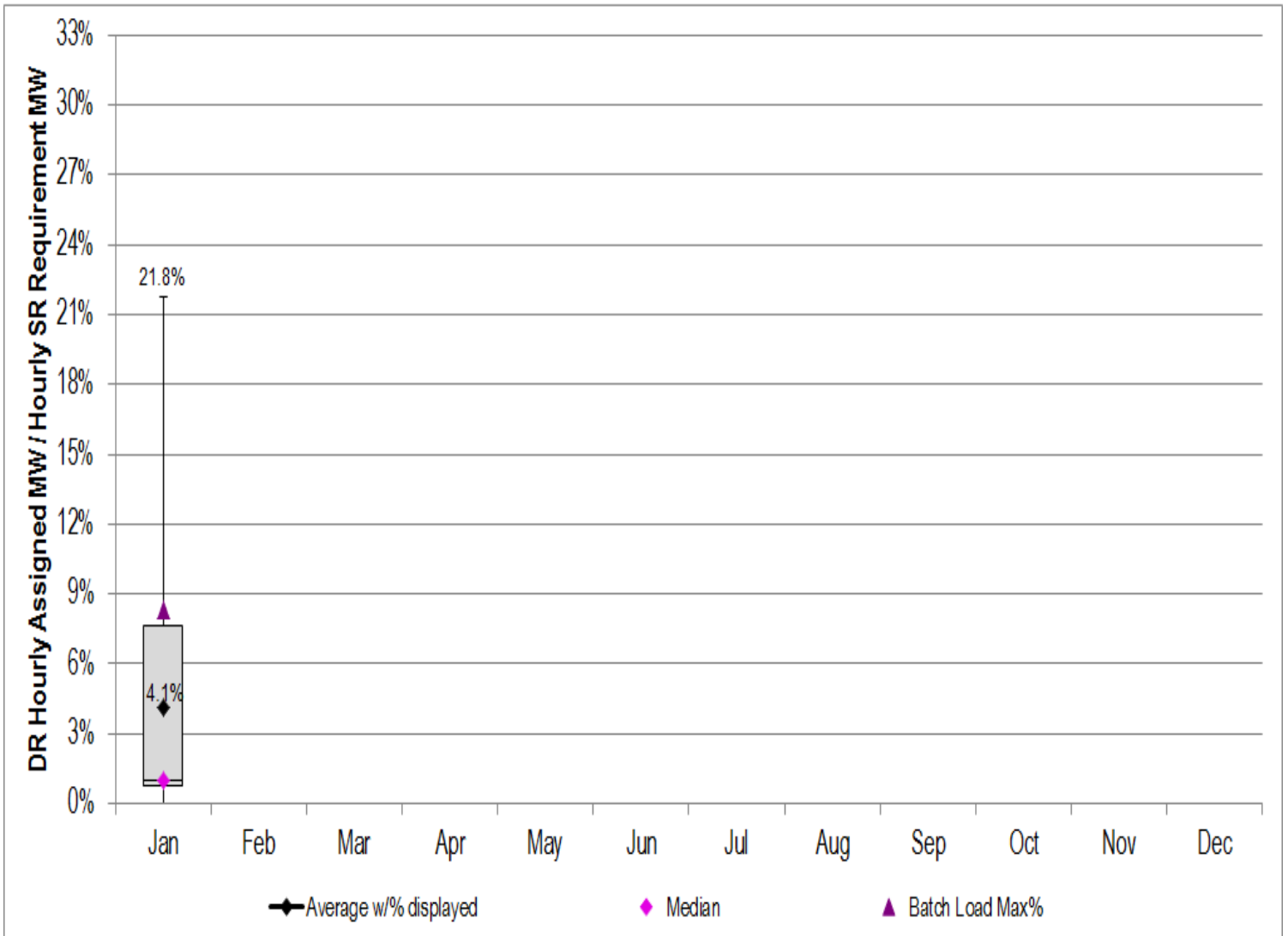


Figure 20: 2019 Economic Demand Response Synchronous Reserve Market Participation

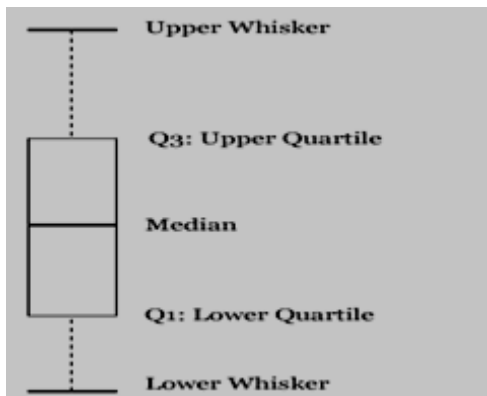


Note: For Figures 32 and 33 above, MWh=sum of the settled MW. Example: 1 MW load available for 12 hours = 12 MWh.

Figure 21: Economic DR Synchronous Reserve Penetration Distribution (Box-plot) for 2019



- 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