Monitoring Analytics

Analysis of Replacement Capacity for RPM Commitments:

June 1, 2007 to June 1, 2013

The Independent Market Monitor for PJM

September 12, 2013

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Introduction

The IMM has, in State of the Market Reports, reported on total Demand Resources ("DR") cleared in RPM Auctions for specific Delivery Years compared to the level of DR available in each Delivery Year. This report includes the results of a more comprehensive analysis by the IMM of the extent to which all types of Capacity Resources clear in RPM Auctions and are available during Delivery Years. When a capacity resource is not available for a Delivery Year, the owner of the capacity resource may purchase replacement capacity. Replacement capacity is the vehicle used to offset any reduction in capacity from a resource which is not available for a Delivery Year. This report is an update to the IMM report, *Analysis of Replacement Capacity for RPM Commitments: June 1, 2007 to June 1, 2012* (December 11, 2012).[1] This report includes data through June 1, 2013 and additional tables. This report also includes new conclusions and recommendations which supersede those in the prior report.

Cleared and make-whole sell offers in RPM Auctions are binding commitments to provide capacity for the relevant Delivery Year.[2] [3] Replacement capacity can be used to fulfill a Capacity Resource commitment and avoid deficiency and penalty charges.[4] [5] The RPM rules addressing the need to purchase replacement capacity in RPM Incremental Auctions (IAs) list only reasons related to physical reductions in the capacity of the sold resources:

> The need to purchase replacement Capacity Resources may arise for any reason, including but not limited to resource retirement, resource cancellation or construction delay, resource derating, EFORd increase, a decrease in the Nominated Demand Resource Value of a Planned Demand

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1 Monitoring Analytics, LLC. *Analysis of Replacement Capacity for RPM Commitments: June 1, 2007 to June 1 2012. Monitoring Analytics* (December 11, 2012), which can be accessed at: <http://www.monitoringanalytics.com/reports/Reports/2012/IMM_Report_Replacement_Capacity_Activity_20121211.pdf>.

2 PJM. "Manual 18: PJM Capacity Market," Revision 19 (June 1, 2013), p. 77.

3 See definition of Capacity Resource in PJM Reliability Assurance Agreement among Load-Serving Entities in the PJM Region, Article 1. See also PJM Reliability Assurance Agreement among Load-Serving Entities in the PJM Region Schedule 6, 9, & 10.

4 PJM. "Manual 18: PJM Capacity Market," Revision 19 (June 1, 2013), p. 127.

5 OATT Attachment DD (Reliability Pricing Model) § 8.1.

> Resource, delay or cancellation of a Qualifying Transmission Upgrade, or similar occurrences.[6]

The RPM rules do not define qualifying reasons for approval of replacement capacity transactions. Capacity Market Sellers do not have to identify the reasons for purchasing replacement capacity.[7]

Replacement capacity transactions can be completed only after the EFORds for the Delivery Year are finalized, November 30 prior to the Delivery Year, but before the start of the delivery day.[8] Replacement capacity can be from a range of sources: cleared buy bids in RPM Incremental Auctions; available capacity from Capacity Resources within a Capacity Market Seller's portfolio; Excess Commitment Credits for the 2010/2011 Delivery Year forward;[9] Excess Interruptible Load for Reliability (ILR) MW Credits for the 2009/2010 through 2011/2012 Delivery Years;[10] and Locational UCAP transactions from another Capacity Market Seller.[11] Replacement capacity must be located in the same Locational Deliverability Area (LDA) or a constrained child LDA within that LDA, and, beginning with the 2014/2015 Delivery Year, have the same or better temporal availability characteristics (Annual, Extended Summer, Limited). Replacement capacity used to reduce DR commitments must be specified for no less than the balance of the Delivery Year.[12]

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6 OATT Attachment DD § 5.4(d).

7 There are other potential reasons Capacity Market Sellers could utilize replacement capacity, including opportunities to commit a specific unit to an FRR capacity plan or to export capacity from a specific unit from PJM. These were not analyzed in this report.

8 PJM. "Manual 18: PJM Capacity Market," Revision 19 (June 1, 2013), p. 127.

9 Effective with the 2010/2011 Delivery Year, Excess Commitment Credits are allocated to Load Serving Entities (LSEs) that are charged a Locational Reliability Charge when the PJM Reliability Requirement decreases resulting in excess procured capacity. See OATT Attachment DD § 5.12(b)(viii).

10 For the 2009/2010 through the 2011/2012 Delivery Years, Excess ILR MW Credits are allocated to LSEs that are charged a Locational Reliability Charge when the certified ILR exceeds the Forecast ILR Obligation for the LDA, provided the amount does not exceed the ratio of increase in load charges divided by the Final Zonal ILR Price within the LDA. See OATT Attachment DD § 5.13.

11 OATT Attachment DD § 5.3A.

12 PJM. "Manual 18: PJM Capacity Market," Revision 19 (June 1, 2013), p. 127.

The following related RPM Market rule changes were implemented during the period analyzed:

- For the 2007/2008 and 2008/2009 Delivery Years, the RPM rules did not permit certified ILR to be withdrawn after certification.
- Effective for the 2009/2010 through 2011/2012 Delivery Years, certified ILR could withdraw at any time up until one day prior to the start of the Delivery Year.[13]
- For the 2007/2008, 2008/2009, and 2010/2011 Delivery Years, the deadline for ILR certification was three months prior to the start of the Delivery Year.
- Effective for the 2009/2010 Delivery Year, the deadline for ILR certification was May 1, 2009, or one month prior to the start of the Delivery Year.[14]
- Effective for the 2011/2012 Delivery Year, the ILR certification deadline changed from three months to two months prior to the start of the Delivery Year.[15]
- Effective with the 2012/2013 Delivery Year, the ILR demand side product was eliminated.[16]
- Effective with the 2012/2013 Delivery Year, the Short Term Resource Procurement Target (STRPT) and the related RPM Incremental Auction redesign were implemented.
- Effective March 27, 2009, the penalty structure changed, including a revision to the Daily Deficiency Rate.[17] The prior Daily Deficiency Rate was equal to the higher of two times the seller's weighted average resource clearing price for the resource or the Net Cost of New Entry in an LDA. The revised Daily Deficiency Rate is equal to the seller's weighted average resource clearing price for the resource plus the higher of 0.20 times the seller's weighted average resource clearing price for the resource or $20 per MW-day.
- Effective with the 2012/2013 Delivery year, the Reporting and Compliance provisions of the Emergency Load Response Program were revised.[18] For Guaranteed Load Drop (GLD) end-use customers, the calculation of load reduction for event and test compliance was revised to be capped at the end-use customer's peak load contribution (PLC).

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13 See 126 FERC ¶ 61,275 at P 200(B) (2009).

14 See 126 FERC ¶ 61,275 at P 89 (2009).

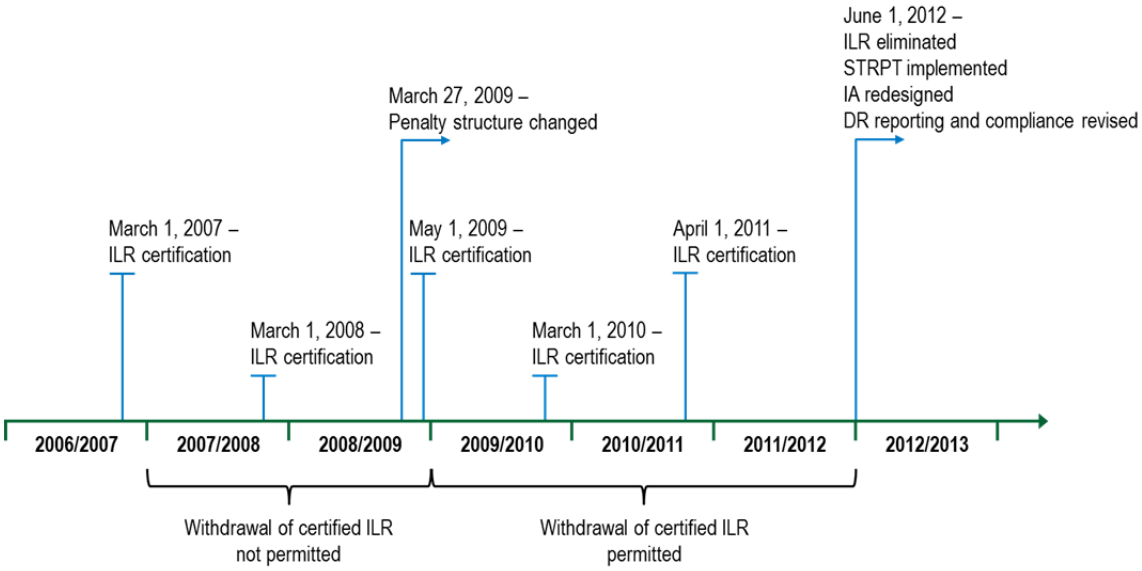
15 See PJM Interconnection, L.L.C., Letter Order in Docket No. ER10-366-000 (January 22, 2010).

16 See 126 FERC ¶ 61,275 at P 38 (2009).

17 See 126 FERC ¶ 61,275 at P 180 (2009).

18 138 FERC ¶ 61,138 (2012).

Figure 1 Timeline of relevant RPM deadlines and changes



Analysis

The following resource classifications are considered in this report: Generation Resources, internal Generation Resources, internal Generation Resources that are in service, internal Generation Resources that are not in service, external Generation Resources, Demand Resources (DR), and Energy Efficiency (EE) Resources.[19] [20] For this analysis, Generation Resources are defined as not in service for a Delivery Year if the resource was not in service at the time of its initial offer in an RPM Auction for the Delivery Year. This distinction is designed to provide insights into whether replacement behavior differed between resources in service and not in service at the time of the initial offer. As replacement capacity can vary on a daily basis, the data presented in this report are for June 1 of each year from 2007 through 2013.[21]

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[19] FRR commitments are not included in this report.

[20] RPM data for Energy Efficiency Resources are not available prior to the 2011/2012 Delivery Year. The Energy Efficiency Resource type was eligible to be offered in RPM Auctions beginning with the 2012/2013 Delivery Year and also for RPM Incremental Auctions in the 2011/2012 Deliver Year.

[21] Delivery Years are from June 1 through May 31.

RPM Commitments and Replacements

Table 1 through Table 7 show the following information by identified resource classifications:

- RPM Cleared – MW cleared in RPM Auctions for the given delivery year.
- Net Replacements – RPM commitment reductions using replacement capacity less RPM commitment additions, including Locational UCAP transactions.
- RPM Commitments – RPM cleared capacity plus Net Replacements.
- RPM Commitment Shortages – a failure to satisfy an RPM commitment for which replacement capacity was not obtained and for which Daily Capacity Resource Deficiency Charges are assessed.

For any identified resource classification, Net Replacements include all the capacity for which RPM commitments were replaced from a replacement source other than that identified resource classification (negative) plus capacity from that identified resource classification used to replace capacity from another resource classification (positive). For Net Replacements, the replacement capacity provided from an identified resource classification that is used to replace capacity in the same resource classification nets to zero, regardless of the owners of the resources. For example, Table 11 shows the total RPM commitments for Generation Resources which were replaced for June 1, 2013 was 13,054.4 MW and the total RPM commitment additions on Generation Resources which were used as replacement resources for June 1, 2013 was 4,012.9 MW, or net replacements of 9,041.5 MW.

Table 1 through Table 5 include this information for Generation Resources. Table 1 includes information on all Generation Resources while Table 2 through Table 5 include this information for subcategories of Generation Resources. Table 6 includes this information for Demand Resources including the MW associated with Relief from Deficiency Charges. Under the RPM rules, DR sellers can request relief from Capacity Resource Deficiency Charges due to the permanent departure of the associated load from the system.[22] Table 6 also includes MW of registered DR. A Demand Resource with RPM commitments and certified ILR must be registered in PJM's Load Response System (eLRS) prior to the start of the relevant delivery year.[23] Table 7 includes information for Energy Efficiency resources.

For example, in Table 1, of 148,160.7 MW of Generation Resources cleared in RPM Auctions for the 2013/2014 Delivery Year, 9,041.5 MW of RPM commitments for

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22 OATT Attachment DD § 8.4.

23 PJM. "Manual 18: PJM Capacity Market," Revision 19 (June 1, 2013), p. 45.

Generation Resources were replaced by purchases in RPM Incremental Auctions, by some other resource type, or Excess Commitment Credits after accounting for some Generation Resources being used to replace other resource types.

Table 1 RPM commitments for Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)				
	RPM Cleared	Net Replacements	RPM Commitments	RPM Commitment Shortage	RPM Commitments Less Commitment Shortage
01-Jun-07	129,281.6	0.0	129,281.6	(8.1)	129,273.5
01-Jun-08	130,070.4	(726.5)	129,343.9	(187.9)	129,156.0
01-Jun-09	133,137.3	(1,593.5)	131,543.8	(0.4)	131,543.4
01-Jun-10	133,073.3	(3,662.7)	129,410.6	(1.1)	129,409.5
01-Jun-11	132,279.6	(5,775.4)	126,504.2	(79.3)	126,424.9
01-Jun-12	131,876.9	(7,112.1)	124,764.8	(117.2)	124,647.6
01-Jun-13	148,160.7	(9,041.5)	139,119.2	(21.4)	139,097.8

Table 2 RPM commitments for internal Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)				
	RPM Cleared	Net Replacements	RPM Commitments	RPM Commitment Shortage	RPM Commitments Less Commitment Shortage
01-Jun-07	127,660.8	0.0	127,660.8	(8.1)	127,652.7
01-Jun-08	128,444.0	(715.7)	127,728.3	(187.9)	127,540.4
01-Jun-09	131,415.2	(1,827.8)	129,587.4	(0.4)	129,587.0
01-Jun-10	130,952.3	(3,445.7)	127,506.6	(1.1)	127,505.5
01-Jun-11	130,457.6	(5,761.0)	124,696.6	(79.3)	124,617.3
01-Jun-12	130,360.4	(6,988.8)	123,371.6	(60.8)	123,310.8
01-Jun-13	145,732.2	(8,562.3)	137,169.9	(21.4)	137,148.5

Table 3 RPM commitments for internal Generation Resources in service: June 1, 2007 to June 1, 2013

	UCAP (MW)				
	RPM Cleared	Net Replacements	RPM Commitments	RPM Commitment Shortage	RPM Commitments Less Commitment Shortage
01-Jun-07	127,614.0	0.0	127,614.0	(8.1)	127,605.9
01-Jun-08	128,334.1	(707.2)	127,626.9	(182.8)	127,444.1
01-Jun-09	130,930.7	(2,030.3)	128,900.4	(0.4)	128,900.0
01-Jun-10	130,251.4	(3,403.1)	126,848.3	(1.1)	126,847.2
01-Jun-11	127,784.0	(4,983.1)	122,800.9	(2.2)	122,798.7
01-Jun-12	127,362.4	(7,057.2)	120,305.2	(13.2)	120,292.0
01-Jun-13	141,717.7	(8,086.4)	133,631.3	(21.4)	133,609.9

Table 4 RPM commitments for internal Generation Resources not in service: June 1, 2007 to June 1, 2013

	UCAP (MW)				
	RPM Cleared	Net Replacements	RPM Commitments	RPM Commitment Shortage	RPM Commitments Less Commitment Shortage
01-Jun-07	46.8	0.0	46.8	0.0	46.8
01-Jun-08	109.9	(8.5)	101.4	(5.1)	96.3
01-Jun-09	484.5	202.5	687.0	0.0	687.0
01-Jun-10	700.9	(42.6)	658.3	0.0	658.3
01-Jun-11	2,673.6	(777.9)	1,895.7	(77.1)	1,818.6
01-Jun-12	2,998.0	68.4	3,066.4	(47.6)	3,018.8
01-Jun-13	4,014.5	(475.9)	3,538.6	0.0	3,538.6

Table 5 RPM commitments for external Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)				
	RPM Cleared	Net Replacements	RPM Commitments	RPM Commitment Shortage	RPM Commitments Less Commitment Shortage
01-Jun-07	1,620.8	0.0	1,620.8	0.0	1,620.8
01-Jun-08	1,626.4	(10.8)	1,615.6	0.0	1,615.6
01-Jun-09	1,722.1	234.3	1,956.4	0.0	1,956.4
01-Jun-10	2,121.0	(217.0)	1,904.0	0.0	1,904.0
01-Jun-11	1,822.0	(14.4)	1,807.6	0.0	1,807.6
01-Jun-12	1,516.5	(123.3)	1,393.2	(56.4)	1,336.8
01-Jun-13	2,428.5	(479.2)	1,949.3	0.0	1,949.3

Table 6 RPM commitments and registrations for Demand Resources: June 1, 2007 to June 1, 2013[24]

	UCAP (MW)						Registered DR		
	RPM Cleared	Net Replacements	Relief from Charges	RPM Commitments	RPM Commitment Shortage	RPM Commitments Less Commitment Shortage	ICAP (MW)	UCAP Conversion Factor	UCAP (MW)
01-Jun-07	127.6	0.0	0.0	127.6	0.0	127.6		1.03260	
01-Jun-08	559.4	(40.0)	0.0	519.4	(58.4)	461.0	488.0	1.03426	504.7
01-Jun-09	892.9	(474.7)	0.0	418.2	(14.3)	403.9	570.3	1.03308	589.2
01-Jun-10	962.9	(516.3)	0.0	446.6	(7.7)	438.9	572.8	1.03455	592.6
01-Jun-11	1,826.6	(1,052.4)	0.0	774.2	0.0	774.2	1,117.9	1.03455	1,156.5
01-Jun-12	8,752.6	(2,253.6)	(11.7)	6,487.3	(34.9)	6,452.4	7,443.7	1.03690	7,718.4
01-Jun-13	10,779.6	(3,314.4)	0.0	7,465.2	(30.5)	7,434.7	8,240.1	1.04208	8,586.8

[24] Registered DR data are not available from PJM for the 2007/2008 Delivery Year.

Table 7 RPM commitments for Energy Efficiency Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)				
	RPM Cleared	Net Replacements	RPM Commitments	RPM Commitment Shortage	RPM Commitments Less Commitment Shortage
01-Jun-07	0.0	0.0	0.0	0.0	0.0
01-Jun-08	0.0	0.0	0.0	0.0	0.0
01-Jun-09	0.0	0.0	0.0	0.0	0.0
01-Jun-10	0.0	0.0	0.0	0.0	0.0
01-Jun-11	76.4	0.2	76.6	0.0	76.6
01-Jun-12	666.1	(34.9)	631.2	(5.1)	626.1
01-Jun-13	904.2	120.6	1,024.8	(13.5)	1,011.3

Table 8 shows the percentage of cleared capacity which was replaced for each of the identified resource classifications, net of the replacement capacity provided from that resource classification. Of the identified resource classifications, the percent of net replacement capacity to cleared capacity was highest for DR on average. Beginning in 2009/2010, the percentage of net replacement for DR RPM commitments was the highest of the categories by a substantial amount. The percentage of net replacement capacity for DR RPM commitments was more than 50 percent on June 1, 2009, 2010 and 2011 and more than 25 percent on June 1, 2012 and 2013. The next highest resource classification percent of net replacement capacity was for internal Generation Resources not in service. The percentage of net replacement capacity to cleared capacity for internal Generation Resources not in service also showed the greatest variability, with a net addition of RPM commitments for some delivery years.[25]

Table 9 shows the percentage of total cleared capacity which was replaced for each of the identified resource classifications. The gross replacement capacity values for DR used to determine the percentages in Table 9 include transactions that shift RPM commitments from a planned resource to an existing resource based on revised registered sites in PJM's eLRS. Of the identified resource classifications, the percent of gross replacement capacity to cleared capacity was highest for DR on average. Beginning in 2009/2010, the percentage of gross replacement for DR RPM commitments was the highest of the categories by a substantial amount. The percentage of gross replacement capacity for DR RPM commitments was more than 55 percent on June 1, 2009 and 2010, more than 65 percent on June 1, 2011 more than 40 percent on June 1, 2012, and more than 70 percent on June 1, 2013. The next highest resource classification percent of gross replacement capacity was for external Generation Resources. The

[25] A net addition of RPM commitments means that, on a net basis, the resources in the identified resource classification were the replacement resources for other resources and added RPM commitments.

percentage of gross replacement capacity to cleared capacity for internal Generation Resources not in service also showed substantial variability.

The level of DR gross replacement activity declined after the termination of the ILR product, from 63.7 percent for June 1, 2011 to 44.2 percent for June 1, 2012 but then increased to 71.8 percent for June 1, 2013.

In Table 9, the percentage values reported for total replacements to cleared capacity for DR on June 1, 2012 and 2013 reflect replacement capacity for non-viable MW under the revised Reporting and Compliance provisions of the Emergency Load Response Program.[26] Non-viable MW are cleared MW for DR in RPM Auctions held under the former Reporting and Compliance rules and which were determined to be ineligible as capacity under the revised rules governing measurement and verification.[27] After accounting for the non-viable MW based on DR Capacity Transition Credit nominations to PJM, the percentage of gross replacements to cleared capacity for DR would be 33.4 percent for June 1, 2012 and 61.8 percent for June 1, 2013.

Table 8 Net replacements to cleared capacity by resource classifications: June 1, 2007 to June 1, 2013

	Generation	Internal Generation	Internal Generation in Service	Internal Generation Not in Service	External Generation	Demand Resources	Energy Efficiency Resources
01-Jun-07	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
01-Jun-08	(0.6%)	(0.6%)	(0.6%)	(7.7%)	(0.7%)	(7.2%)	
01-Jun-09	(1.2%)	(1.4%)	(1.6%)	41.8%	13.6%	(53.2%)	
01-Jun-10	(2.8%)	(2.6%)	(2.6%)	(6.1%)	(10.2%)	(53.6%)	
01-Jun-11	(4.4%)	(4.4%)	(3.9%)	(29.1%)	(0.8%)	(57.6%)	0.3%
01-Jun-12	(5.4%)	(5.4%)	(5.5%)	2.3%	(8.1%)	(25.7%)	(5.2%)
01-Jun-13	(6.1%)	(5.9%)	(5.7%)	(11.9%)	(19.7%)	(30.7%)	13.3%

[26] For the Demand Response Transition Provision, see OATT Attachment DD § 5.14A.

[27] See 138 FERC ¶ 61,138 at PP 42–44 (2011); 137 FERC ¶ 61,108 at P 81 (2011).

Table 9 Total replacements to cleared capacity by resource classification: June 1, 2007 to June 1, 2013

	Generation	Internal Generation	Internal Generation in Service	Internal Generation Not in Service	External Generation	Demand Resources	Energy Efficiency Resources
01-Jun-07	(0.1%)	(0.1%)	(0.1%)	0.0%	0.0%	0.0%	
01-Jun-08	(2.0%)	(2.0%)	(2.0%)	(7.7%)	(1.3%)	(9.8%)	
01-Jun-09	(3.7%)	(3.6%)	(3.5%)	(4.8%)	(12.5%)	(56.6%)	
01-Jun-10	(5.0%)	(4.8%)	(4.8%)	(6.2%)	(12.1%)	(55.6%)	
01-Jun-11	(7.4%)	(7.3%)	(6.8%)	(29.5%)	(13.1%)	(63.7%)	(1.0%)
01-Jun-12	(10.4%)	(10.3%)	(10.4%)	(3.4%)	(19.2%)	(44.2%)	(25.2%)
01-Jun-13	(8.8%)	(8.6%)	(8.5%)	(12.5%)	(21.4%)	(71.8%)	(70.4%)

Sources of Replacement Capacity

Table 11 through Table 17 show for each identified resource classification:

- Replacement capacity from the following sources:
  - Cleared Buy Bids – replacement capacity purchased in an RPM Incremental Auction.
  - Replacement Transactions – available capacity from a Generation Resource, Demand Resource, and/or Energy Efficiency Resource within a provider's portfolio.
  - Locational UCAP Transactions – available capacity from another Capacity Market Seller's Generation Resource, Demand Resource, and/or Energy Efficiency Resource.[28]
  - Excess Commitment Credits – replacement capacity from Excess Commitment Credits.
  - Excess ILR MW Credits – replacement capacity from Excess ILR MW Credits.
- Commitment Reductions using Replacements – RPM commitment reductions using replacement capacity; or the sum of the Cleared Buy Bids, Replacement Transactions (Gen, DR, EE), Locational UCAP Transactions (Gen, DR, EE), Excess Commitment Credits, and Excess ILR MW Credits columns.
- Commitment Additions on Replacement Resources – RPM commitment additions for resources that were the replacement resources for other resources from the identified resource classification.
- Net Replacements – RPM commitment reductions using replacement capacity less RPM commitment additions on the replacement resources.

[28] To assign MW to the replacement resource types for resources utilizing Locational UCAP based replacement capacity, the Buyer's LDA-specific Locational UCAP MW associated with each replacement resource type were allocated to the resource level based on the resource's share of the Locational UCAP based replacement MW.

The Commitment Reductions using Replacements results are the gross replacement values, or the total RPM commitments for the identified resource classification that were replaced. The reported gross replacement capacity values for DR in Table 16 include transactions that shift RPM commitments from a planned resource to an existing resource based on revised registered sites in PJM's eLRS. The Commitment Additions on Replacement Resources are resources from the identified resource classification that were used as replacement capacity either for the same resource classification or another resource classification. The Net Replacements are the net amount of the identified resource classification which was replaced, after accounting for the fact that some in the same identified resource classification was used as replacement capacity. The gross replacement value is the best measure of the total amount of capacity for an identified resource classification that was replaced in a year. The net replacement value is a measure of the extent to which an overall resource classification was replaced.

Table 10 shows the similar information as Table 11 through Table 17 for all Capacity Resources, with the Commitment Reductions value broken out by the following:

- Commitment Reductions using Replacement Resources – RPM commitment reductions using replacement capacity from replacement resources; or the sum of Replacement Transactions (Gen, DR, EE) and Locational UCAP Transactions (Gen, DR, EE).
- Commitment Reductions using Other Sources – RPM commitment reductions using replacement capacity from sources other than replacement resources; or the sum of the Cleared Buy Bids, Excess Commitment Credits, and Excess ILR MW Credits columns.

Table 10 shows that the Commitment Reductions using Replacement Resources column and the Commitment Additions on Replacement Resources column should net to zero.[29]

Table 10 Sources of replacement capacity for all Capacity Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
		Replacement Transactions			Locational UCAP Transactions								
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Commitment Reductions using Replacement Resources	Commitment Reductions using Other Sources	Commitment Additions on Replacement Resources	Net Replacements
01-Jun-07	0.0	118.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	118.5	0.0	118.5	0.0
01-Jun-08	766.5	1,819.4	15.0	0.0	0.0	0.0	0.0	0.0	0.0	1,834.4	766.5	1,834.4	766.5
01-Jun-09	1,708.6	3,253.1	31.1	0.0	35.8	0.0	0.0	0.0	359.7	3,320.0	2,068.3	3,320.1	2,068.2
01-Jun-10	1,816.4	2,595.5	19.4	0.0	335.7	0.0	0.0	959.9	1,403.5	2,950.6	4,179.8	2,951.4	4,179.0
01-Jun-11	1,805.2	3,467.1	98.3	1.0	538.1	12.7	0.0	2,735.2	2,287.2	4,117.2	6,827.6	4,117.2	6,827.6
01-Jun-12	9,185.9	4,650.0	1,597.5	133.0	1,937.6	13.2	0.0	213.4	0.0	8,331.3	9,399.3	8,330.0	9,400.6
01-Jun-13	12,021.2	3,214.3	4,403.9	708.4	798.6	26.3	48.9	214.2	0.0	9,200.4	12,235.4	9,200.5	12,235.3

[29] The small difference between these two values for some delivery years is the result of under or over utilization of replacement capacity associated with Locational UCAP transactions.

Table 11 Sources of replacement capacity for Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)											
		Replacement Transactions			Locational UCAP Transactions							
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Commitment Reductions using Replacements	Commitment Additions on Replacement Resources	Net Replacements
01-Jun-07	0.0	118.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	118.5	118.5	0.0
01-Jun-08	726.5	1,819.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,545.9	1,819.4	726.5
01-Jun-09	1,322.6	3,201.4	0.0	0.0	0.0	0.0	0.0	0.0	358.5	4,882.5	3,289.0	1,593.5
01-Jun-10	1,384.8	2,595.5	0.0	0.0	285.7	0.0	0.0	955.8	1,372.9	6,594.7	2,932.0	3,662.7
01-Jun-11	1,192.6	3,437.1	0.0	0.0	538.1	0.0	0.0	2,601.9	2,010.9	9,780.6	4,005.2	5,775.4
01-Jun-12	6,976.2	4,647.6	52.6	0.0	1,862.6	0.0	0.0	159.4	0.0	13,698.4	6,586.3	7,112.1
01-Jun-13	8,772.2	3,212.2	167.2	0.0	718.6	0.0	0.0	184.2	0.0	13,054.4	4,012.9	9,041.5

Table 12 Sources of replacement capacity for internal Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)											
		Replacement Transactions			Locational UCAP Transactions							
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Commitment Reductions using Replacements	Commitment Additions on Replacement Resources	Net Replacements
01-Jun-07	0.0	118.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	118.5	118.5	0.0
01-Jun-08	726.5	1,797.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,524.1	1,808.4	715.7
01-Jun-09	1,319.8	3,077.4	0.0	0.0	0.0	0.0	0.0	0.0	270.1	4,667.3	2,839.5	1,827.8
01-Jun-10	1,380.0	2,497.6	0.0	0.0	285.7	0.0	0.0	848.2	1,325.9	6,337.4	2,891.7	3,445.7
01-Jun-11	1,192.1	3,436.4	0.0	0.0	538.1	0.0	0.0	2,433.4	1,942.4	9,542.4	3,781.4	5,761.0
01-Jun-12	6,758.7	4,609.3	52.6	0.0	1,827.6	0.0	0.0	159.4	0.0	13,407.6	6,418.8	6,988.8
01-Jun-13	8,294.8	3,173.7	162.3	0.0	718.6	0.0	0.0	184.2	0.0	12,533.6	3,971.3	8,562.3

Table 13 Source of replacement capacity for internal Generation Resource in service: June 1, 2007 to June 1, 2013

	UCAP (MW)											
		Replacement Transactions			Locational UCAP Transactions							
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Commitment Reductions using Replacements	Commitment Additions on Replacement Resources	Net Replacements
01-Jun-07	0.0	118.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	118.5	118.5	0.0
01-Jun-08	718.1	1,797.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,515.6	1,808.4	707.2
01-Jun-09	1,312.9	3,065.5	0.0	0.0	0.0	0.0	0.0	0.0	265.6	4,644.0	2,613.7	2,030.3
01-Jun-10	1,356.6	2,477.9	0.0	0.0	285.7	0.0	0.0	848.2	1,325.8	6,294.2	2,891.1	3,403.1
01-Jun-11	1,180.6	3,409.5	0.0	0.0	238.1	0.0	0.0	2,023.1	1,901.5	8,752.8	3,769.7	4,983.1
01-Jun-12	6,709.5	4,557.1	52.6	0.0	1,827.6	0.0	0.0	159.4	0.0	13,306.2	6,249.0	7,057.2
01-Jun-13	7,828.2	3,140.0	162.3	0.0	718.6	0.0	0.0	184.2	0.0	12,033.3	3,946.9	8,086.4

Table 14 Sources of replacement capacity for internal Generation Resources not in service: June 1, 2007 to June 1, 2013

	UCAP (MW)											
		Replacement Transactions			Locational UCAP Transactions							
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Commitment Reductions using Replacements	Commitment Additions on Replacement Resources	Net Replacements
01-Jun-07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-08	8.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.5	0.0	8.5
01-Jun-09	6.9	11.9	0.0	0.0	0.0	0.0	0.0	0.0	4.5	23.3	225.8	(202.5)
01-Jun-10	23.4	19.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	43.2	0.6	42.6
01-Jun-11	11.5	26.9	0.0	0.0	300.0	0.0	0.0	410.3	40.9	789.6	11.7	777.9
01-Jun-12	49.2	52.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	101.4	169.8	(68.4)
01-Jun-13	466.6	33.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	500.3	24.4	475.9

Table 15 Sources of replacement capacity for external Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)											
		Replacement Transactions			Locational UCAP Transactions							
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Commitment Reductions using Replacements	Commitment Additions on Replacement Resources	Net Replacements
01-Jun-07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-08	0.0	21.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.8	11.0	10.8
01-Jun-09	2.8	124.0	0.0	0.0	0.0	0.0	0.0	0.0	88.4	215.2	449.5	(234.3)
01-Jun-10	4.8	97.9	0.0	0.0	0.0	0.0	0.0	107.6	47.0	257.3	40.3	217.0
01-Jun-11	0.5	0.7	0.0	0.0	0.0	0.0	0.0	168.5	68.5	238.2	223.8	14.4
01-Jun-12	217.5	38.3	0.0	0.0	35.0	0.0	0.0	0.0	0.0	290.8	167.5	123.3
01-Jun-13	477.4	38.5	4.9	0.0	0.0	0.0	0.0	0.0	0.0	520.8	41.6	479.2

Table 16 Sources of replacement capacity for Demand Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)											
		Replacement Transactions			Locational UCAP Transactions							
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Commitment Reductions using Replacements	Commitment Additions on Replacement Resources	Net Replacements
01-Jun-07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-08	40.0	0.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	55.0	15.0	40.0
01-Jun-09	386.0	51.7	31.1	0.0	35.8	0.0	0.0	0.0	1.2	505.8	31.1	474.7
01-Jun-10	431.6	0.0	19.4	0.0	50.0	0.0	0.0	4.1	30.6	535.7	19.4	516.3
01-Jun-11	612.6	30.0	98.3	0.2	0.0	12.7	0.0	133.3	276.3	1,163.4	111.0	1,052.4
01-Jun-12	2,169.6	2.4	1,544.7	12.7	67.7	13.2	0.0	54.0	0.0	3,864.3	1,610.7	2,253.6
01-Jun-13	3,212.3	2.1	4,208.6	144.6	80.0	25.1	46.3	25.6	0.0	7,744.6	4,430.2	3,314.4

Table 17 Sources of replacement capacity for Energy Efficiency Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)											
		Replacement Transactions			Locational UCAP Transactions							
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Commitment Reductions using Replacements	Commitment Additions on Replacement Resources	Net Replacements
01-Jun-07	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-08	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-09	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-11	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.8	1.0	(0.2)
01-Jun-12	40.1	0.0	0.2	120.3	7.3	0.0	0.0	0.0	0.0	167.9	133.0	34.9
01-Jun-13	36.7	0.0	28.1	563.8	0.0	1.2	2.6	4.4	0.0	636.8	757.4	(120.6)

Table 18 through Table 24 show the percentage of MW associated with each of the sources of replacement capacity to total replacement capacity for the identified resource classifications along with an indication of the major source of replacement capacity. The gross replacement capacity values for DR used to determine the percentages in Table 23 include transactions that shift RPM commitments from a planned resource to an existing resource based on revised registered sites in PJM's eLRS. For the days analyzed with the exception of June 1, 2012 and 2013, the major source of replacement capacity for Generation Resources, internal Generation Resources, and internal Generation Resources in service was available capacity from other Generation Resources completed through a replacement capacity transaction from within a provider's portfolio. The sources of replacement capacity for internal Generation Resources not in service and external Generation Resources varied by Delivery Year, with the major sources including cleared buy bids, available capacity from other Generation Resources completed through a replacement capacity transaction from within a provider's portfolio, and Excess Commitment Credits.

The major source of replacement capacity for DR was cleared buy bids for each of the days analyzed with the exception of June 1, 2013, where the major source was available capacity from other DR. In Table 16, the values reported for commitment reductions using replacements on June 1, 2012 and 2013 reflect replacement capacity for non-viable MW under the revised Reporting and Compliance provisions of the Emergency Load Response Program.[30] Non-viable MW are cleared MW for DR in RPM Auctions held under the former Reporting and Compliance rules and which were determined to be ineligible as capacity under the revised rules governing measurement and verification. Of the 3,864.3 MW of replacement capacity for DR on June 1, 2012, 939.4 MW were associated with non-viable MW based on DR Capacity Transition Credit nominations to PJM. Of the 7,744.6 MW of replacement capacity for DR on June 1, 2013, 1,081.7 MW

[30] For the Demand Response Transition Provision, see OATT Attachment DD § 5.14A.

were associated with non-viable MW based on DR Capacity Transition Credit nominations to PJM.

The major source of replacement capacity for EE Resources was available capacity from other EE Resources completed through a replacement capacity transaction from within a provider's portfolio.

Table 18 Sources of replacement capacity to total replacements for Generation Resources: June 1, 2007 to June 1, 2013

		Replacement Transactions			Locational UCAP Transactions						
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Total Replacements	Major Source of Replacements
01-Jun-07	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Replacement Transactions - Gen
01-Jun-08	28.5%	71.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Replacement Transactions - Gen
01-Jun-09	27.1%	65.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.3%	100.0%	Replacement Transactions - Gen
01-Jun-10	21.0%	39.4%	0.0%	0.0%	4.3%	0.0%	0.0%	14.5%	20.8%	100.0%	Replacement Transactions - Gen
01-Jun-11	12.2%	35.1%	0.0%	0.0%	5.5%	0.0%	0.0%	26.6%	20.6%	100.0%	Replacement Transactions - Gen
01-Jun-12	50.9%	33.9%	0.4%	0.0%	13.6%	0.0%	0.0%	1.2%	0.0%	100.0%	Cleared Buy Bids
01-Jun-13	67.2%	24.6%	1.3%	0.0%	5.5%	0.0%	0.0%	1.4%	0.0%	100.0%	Cleared Buy Bids

Table 19 Sources of replacement capacity to total replacements for internal Generation Resources: June 1, 2007 to June 1, 2013

		Replacement Transactions			Locational UCAP Transactions						
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Total Replacements	Major Source of Replacements
01-Jun-07	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Replacement Transactions - Gen
01-Jun-08	28.8%	71.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Replacement Transactions - Gen
01-Jun-09	28.3%	65.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.8%	100.0%	Replacement Transactions - Gen
01-Jun-10	21.8%	39.4%	0.0%	0.0%	4.5%	0.0%	0.0%	13.4%	20.9%	100.0%	Replacement Transactions - Gen
01-Jun-11	12.5%	36.0%	0.0%	0.0%	5.6%	0.0%	0.0%	25.5%	20.4%	100.0%	Replacement Transactions - Gen
01-Jun-12	50.4%	34.4%	0.4%	0.0%	13.6%	0.0%	0.0%	1.2%	0.0%	100.0%	Cleared Buy Bids
01-Jun-13	66.2%	25.3%	1.3%	0.0%	5.7%	0.0%	0.0%	1.5%	0.0%	100.0%	Cleared Buy Bids

Table 20 Sources of replacement capacity to total replacements for internal Generation Resources in service: June 1, 2007 to June 1, 2013

		Replacement Transactions			Locational UCAP Transactions						
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Total Replacements	Major Source of Replacements
01-Jun-07	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Replacement Transactions - Gen
01-Jun-08	28.5%	71.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Replacement Transactions - Gen
01-Jun-09	28.3%	66.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.7%	100.0%	Replacement Transactions - Gen
01-Jun-10	21.6%	39.4%	0.0%	0.0%	4.5%	0.0%	0.0%	13.5%	21.1%	100.0%	Replacement Transactions - Gen
01-Jun-11	13.5%	39.0%	0.0%	0.0%	2.7%	0.0%	0.0%	23.1%	21.7%	100.0%	Replacement Transactions - Gen
01-Jun-12	50.4%	34.2%	0.4%	0.0%	13.7%	0.0%	0.0%	1.2%	0.0%	100.0%	Cleared Buy Bids
01-Jun-13	65.1%	26.1%	1.3%	0.0%	6.0%	0.0%	0.0%	1.5%	0.0%	100.0%	Cleared Buy Bids

Table 21 Sources of replacement capacity to total replacements for internal Generation Resources not in service: June 1, 2007 to June 1, 2013

		Replacement Transactions			Locational UCAP Transactions						
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Total Replacements	Major Source of Replacements
01-Jun-07											
01-Jun-08	98.8%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Cleared Buy Bids
01-Jun-09	29.6%	51.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.3%	100.0%	Replacement Transactions - Gen
01-Jun-10	54.2%	45.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	100.0%	Cleared Buy Bids
01-Jun-11	1.5%	3.4%	0.0%	0.0%	38.0%	0.0%	0.0%	52.0%	5.2%	100.0%	Excess Commitment Credits
01-Jun-12	48.5%	51.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Replacement Transactions - Gen
01-Jun-13	93.3%	6.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Cleared Buy Bids

Table 22 Sources of replacement capacity to total replacements for external Generation Resources: June 1, 2007 to June 1, 2013

		Replacement Transactions			Locational UCAP Transactions						
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Total Replacements	Major Source of Replacements
01-Jun-07											
01-Jun-08	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Replacement Transactions - Gen
01-Jun-09	1.3%	57.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.1%	100.0%	Replacement Transactions - Gen
01-Jun-10	1.9%	38.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.8%	18.3%	100.0%	Excess Commitment Credits
01-Jun-11	0.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	70.7%	28.8%	100.0%	Excess Commitment Credits
01-Jun-12	74.8%	13.2%	0.0%	0.0%	12.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Cleared Buy Bids
01-Jun-13	91.7%	7.4%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Cleared Buy Bids

Table 23 Sources of replacement capacity to total replacements for Demand Resources: June 1, 2007 to June 1, 2013

		Replacement Transactions			Locational UCAP Transactions						
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Total Replacements	Major Source of Replacements
01-Jun-07											
01-Jun-08	72.7%	0.0%	27.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Cleared Buy Bids
01-Jun-09	76.3%	10.2%	6.1%	0.0%	7.1%	0.0%	0.0%	0.0%	0.2%	100.0%	Cleared Buy Bids
01-Jun-10	80.6%	0.0%	3.6%	0.0%	9.3%	0.0%	0.0%	0.8%	5.7%	100.0%	Cleared Buy Bids
01-Jun-11	52.7%	2.6%	8.4%	0.0%	0.0%	1.1%	0.0%	11.5%	23.7%	100.0%	Cleared Buy Bids
01-Jun-12	56.1%	0.1%	40.0%	0.3%	1.8%	0.3%	0.0%	1.4%	0.0%	100.0%	Cleared Buy Bids
01-Jun-13	41.5%	0.0%	54.3%	1.9%	1.0%	0.3%	0.6%	0.3%	0.0%	100.0%	Replacement Transactions - DR

Table 24 Sources of replacement capacity to total replacements for Energy Efficiency Resources: June 1, 2007 to June 1, 2013

		UCAP (MW)									
		Replacement Transactions			Locational UCAP Transactions						
	Cleared Buy Bids	Gen	DR	EE	Gen	DR	EE	Excess Commitment Credits	Excess ILR MW Credits	Total Replacements	Major Source of Replacements
01-Jun-07											
01-Jun-08											
01-Jun-09											
01-Jun-10											
01-Jun-11	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Replacement Transactions - EE
01-Jun-12	23.9%	0.0%	0.1%	71.6%	4.3%	0.0%	0.0%	0.0%	0.0%	100.0%	Replacement Transactions - EE
01-Jun-13	5.8%	0.0%	4.4%	88.5%	0.0%	0.2%	0.4%	0.7%	0.0%	100.0%	Replacement Transactions - EE

To better understand the supply associated with cleared buy bids used as replacement capacity in Table 10, the cleared Generation Resources, Demand Resources, Energy Efficiency Resources, and PJM sell offers in RPM Incremental Auction were allocated on

a pro rata basis to the cleared buy bids used as replacement capacity. Table 25 through Table 32 show the cleared buy bids in the specified RPM Incremental Auction used as replacement capacity for each of the identified resource classifications broken out by the type of cleared sell offer (Generation, DR, EE, or PJM) based on this allocation method.[31]

For example, Table 10 shows that the replacement capacity which came from cleared buy bids in RPM Incremental Auctions is 12,021.2 MW for June 1, 2013. That amount is pro rated, by Incremental Auction, to Generation, DR, EE and PJM sell offers in Table 25. The total in Table 25, on June 1, 2013, is 12,021.2.

Table 25 Cleared buy bids used as replacement capacity for all Capacity Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	First Incremental Auction				Second Incremental Auction				Third Incremental Auction				
	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Total
01-Jun-07													
01-Jun-08									747.0	19.5	0.0	0.0	766.5
01-Jun-09									1,708.6	0.0	0.0	0.0	1,708.6
01-Jun-10									1,784.1	32.3	0.0	0.0	1,816.4
01-Jun-11	346.7	0.0	0.0						954.4	432.5	71.6	0.0	1,805.2
01-Jun-12	376.4	566.3	0.0	743.6	623.6	236.0	20.3	2,311.8	1,122.8	953.1	94.0	2,138.0	9,185.9
01-Jun-13	1,529.7	421.4	39.0	2,834.3	894.8	453.9	102.9	2,633.8	2,166.0	380.8	56.4	508.4	12,021.2

Table 26 Cleared buy bids used as replacement capacity for Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	First Incremental Auction				Second Incremental Auction				Third Incremental Auction				
	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Total
01-Jun-07													
01-Jun-08									707.0	19.5	0.0	0.0	726.5
01-Jun-09									1,322.6	0.0	0.0	0.0	1,322.6
01-Jun-10									1,361.1	23.7	0.0	0.0	1,384.8
01-Jun-11	126.6	0.0	0.0	0.0					697.6	316.1	52.3	0.0	1,192.6
01-Jun-12	259.0	525.5	0.0	605.8	553.7	205.3	17.6	1,955.0	933.2	723.2	53.7	1,144.2	6,976.2
01-Jun-13	1,372.8	397.5	25.2	2,480.1	599.3	337.9	63.3	1,710.8	1,428.5	269.8	39.5	47.5	8,772.2

Table 27 Cleared buy bids used as replacement capacity for internal Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	First Incremental Auction				Second Incremental Auction				Third Incremental Auction				
	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Total
01-Jun-07													
01-Jun-08									707.0	19.5	0.0	0.0	726.5
01-Jun-09									1,319.8	0.0	0.0	0.0	1,319.8
01-Jun-10									1,356.3	23.7	0.0	0.0	1,380.0
01-Jun-11	126.6	0.0	0.0	0.0					697.3	316.0	52.3	0.0	1,192.1
01-Jun-12	248.4	503.8	0.0	592.4	553.7	205.3	17.6	1,955.0	858.2	671.9	52.8	1,099.8	6,758.7
01-Jun-13	1,269.9	367.3	23.9	2,324.6	598.2	337.3	63.2	1,707.6	1,267.3	250.7	37.9	46.9	8,294.8

[31] The rules introducing the potential inclusion of PJM sell offers or buy bids in RPM Incremental Auctions were effective with the 2012/2013 Delivery Year.

Table 28 Cleared buy bids used as replacement capacity for internal Generation Resources in service: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	First Incremental Auction				Second Incremental Auction				Third Incremental Auction				
	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Total
01-Jun-07													
01-Jun-08									698.9	19.2	0.0	0.0	718.1
01-Jun-09									1,312.9	0.0	0.0	0.0	1,312.9
01-Jun-10									1,333.2	23.4	0.0	0.0	1,356.6
01-Jun-11	126.4	0.0	0.0	0.0					689.9	312.6	51.7	0.0	1,180.6
01-Jun-12	248.4	503.8	0.0	592.4	544.2	204.5	16.9	1,940.0	850.4	665.7	52.1	1,091.1	6,709.5
01-Jun-13	1,247.1	360.9	19.9	2,043.6	589.8	332.2	61.3	1,669.5	1,180.6	240.5	37.0	45.7	7,828.2

Table 29 Cleared buy bids used as replacement capacity for internal Generation Resources not in service: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	First Incremental Auction				Second Incremental Auction				Third Incremental Auction				
	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Total
01-Jun-07													
01-Jun-08									8.1	0.3	0.0	0.0	8.4
01-Jun-09									6.9	0.0	0.0	0.0	6.9
01-Jun-10									23.1	0.3	0.0	0.0	23.4
01-Jun-11	0.2	0.0	0.0	0.0					7.4	3.4	0.6	0.0	11.5
01-Jun-12	0.0	0.0	0.0	0.0	9.5	0.8	0.6	15.0	7.8	6.2	0.7	8.7	49.2
01-Jun-13	22.8	6.3	4.0	281.0	8.4	5.1	2.0	38.1	86.6	10.2	0.9	1.1	466.6

Table 30 Cleared buy bids used as replacement capacity for external Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	First Incremental Auction				Second Incremental Auction				Third Incremental Auction				
	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Total
01-Jun-07													
01-Jun-08									0.0	0.0	0.0	0.0	0.0
01-Jun-09									2.8	0.0	0.0	0.0	2.8
01-Jun-10									4.8	0.0	0.0	0.0	4.8
01-Jun-11	0.0	0.0	0.0	0.0					0.3	0.1	0.0	0.0	0.5
01-Jun-12	10.6	21.7	0.0	13.4	0.0	0.0	0.0	0.0	75.0	51.3	1.0	44.5	217.5
01-Jun-13	103.0	30.2	1.3	155.5	1.1	0.5	0.1	3.2	161.2	19.1	1.6	0.6	477.4

Table 31 Cleared buy bids used as replacement capacity for Demand Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	First Incremental Auction				Second Incremental Auction				Third Incremental Auction				
	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Total
01-Jun-07													
01-Jun-08									40.0	0.0	0.0	0.0	40.0
01-Jun-09									386.0	0.0	0.0	0.0	386.0
01-Jun-10									423.0	8.6	0.0	0.0	431.6
01-Jun-11	220.1	0.0	0.0	0.0					256.9	116.4	19.3	0.0	612.6
01-Jun-12	98.2	39.0	0.0	136.5	70.0	30.7	2.7	356.8	187.7	227.7	40.0	980.3	2,169.6
01-Jun-13	156.9	23.9	13.8	354.2	293.1	113.5	39.5	904.7	726.2	109.0	16.8	460.7	3,212.3

Table 32 Cleared buy bids used as replacement capacity for Energy Efficiency Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	First Incremental Auction				Second Incremental Auction				Third Incremental Auction				
	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Gen	DR	EE	PJM	Total
01-Jun-07													
01-Jun-08													
01-Jun-09													
01-Jun-10													
01-Jun-11	0.0	0.0	0.0	0.0					0.0	0.0	0.0	0.0	0.0
01-Jun-12	19.2	1.7	0.0	1.2	0.0	0.0	0.0	0.0	1.9	2.3	0.2	13.5	40.1
01-Jun-13	0.0	0.0	0.0	0.0	2.4	2.5	0.1	18.3	11.3	1.9	0.0	0.2	36.7

Revenue

If a capacity resource is committed for a Delivery Year but is unable to satisfy the RPM commitment during the Delivery Year, the Capacity Market Seller receives RPM revenue based on the market clearing price(s) and is charged for any replacement capacity and/or RPM commitment shortages. Table 33 through Table 39 show the following for the identified resource classifications:

- RPM Cleared – RPM revenue per day for cleared capacity in RPM Auctions for the given delivery year, or cleared MW in RPM Auctions times the LDA clearing price.
- Net Replacements – charges per day for net replacement capacity. For replacement transactions associated with cleared buy bids in RPM Incremental Auctions, the charge is equal to the LDA clearing price in the RPM Auction. For sources of replacement capacity other than cleared buy bids, the LDA clearing price in the last RPM Auction for the Delivery Year was imputed as the charge for replacement capacity. There is a defined price, the clearing price, for replacement capacity associated with cleared buy bids in RPM Incremental Auctions, whereas there is no defined price captured in PJM's eRPM for replacement capacity sourced from a provider's own capacity portfolio or transacted through a locational UCAP. The LDA clearing price is the best available information as to the market value of the resources.
- Capacity Resource Deficiency Charge – charges per day assessed on RPM Commitment Shortages. Deficiency charges decreased effective in the 2009/2010 Delivery Year as a result of the change in the penalty structure.

Table 33 RPM revenue for Generation Resources: June 1, 2007 to June 1, 2013

	Revenue ($ per Day)				
	RPM Cleared	Net Replacements	RPM Commitments	Capacity Resource Deficiency Charge	RPM Commitments Less Commitment Shortage
01-Jun-07	$11,603,143	$0	$11,603,143	($3,202)	$11,599,941
01-Jun-08	$16,580,270	($11,670)	$16,568,599	($73,791)	$16,494,808
01-Jun-09	$20,376,592	($109,372)	$20,267,220	($92)	$20,267,128
01-Jun-10	$22,984,703	($183,135)	$22,801,568	($230)	$22,801,338
01-Jun-11	$14,423,911	($35,274)	$14,388,637	($2,293)	$14,386,344
01-Jun-12	$9,851,831	($77,479)	$9,774,351	($4,237)	$9,770,114
01-Jun-13	$17,039,629	($184,838)	$16,854,792	($5,384)	$16,849,408

Table 34 RPM revenue for internal Generation Resources: June 1, 2007 to June 1, 2013

	Revenue ($ per Day)				
	RPM Cleared	Net Replacements	RPM Commitments	Capacity Resource Deficiency Charge	RPM Commitments Less Commitment Shortage
01-Jun-07	$11,534,520	$0	$11,534,520	($3,202)	$11,531,318
01-Jun-08	$16,397,655	($11,562)	$16,386,093	($73,791)	$16,312,301
01-Jun-09	$20,196,185	($118,744)	$20,077,441	($92)	$20,077,349
01-Jun-10	$22,664,116	($172,285)	$22,491,831	($230)	$22,491,601
01-Jun-11	$14,229,190	($35,202)	$14,193,987	($2,293)	$14,191,694
01-Jun-12	$9,829,086	($76,532)	$9,752,553	($2,181)	$9,750,372
01-Jun-13	$16,977,778	($178,257)	$16,799,521	($5,384)	$16,794,137

Table 35 RPM revenue for internal Generation Resources in service: June 1, 2007 to June 1, 2013

	Revenue ($ per Day)				
	RPM Cleared	Net Replacements	RPM Commitments	Capacity Resource Deficiency Charge	RPM Commitments Less Commitment Shortage
01-Jun-07	$11,531,795	$0	$11,531,795	($3,202)	$11,528,593
01-Jun-08	$16,385,365	($11,477)	$16,373,888	($72,650)	$16,301,238
01-Jun-09	$20,133,201	($125,892)	$20,007,309	($92)	$20,007,217
01-Jun-10	$22,548,233	($170,155)	$22,378,078	($230)	$22,377,848
01-Jun-11	$13,956,624	($31,303)	$13,925,321	($290)	$13,925,031
01-Jun-12	$9,655,114	($75,502)	$9,579,612	($1,109)	$9,578,503
01-Jun-13	$16,608,499	($162,974)	$16,445,526	($5,384)	$16,440,142

Table 36 RPM revenue for internal Generation Resources not in service: June 1, 2007 to June 1, 2013

	Revenue ($ per Day)				
	RPM Cleared	Net Replacements	RPM Commitments	Capacity Resource Deficiency Charge	RPM Commitments Less Commitment Shortage
01-Jun-07	$2,725	$0	$2,725	$0	$2,725
01-Jun-08	$12,290	($85)	$12,205	($1,142)	$11,063
01-Jun-09	$62,983	$7,148	$70,131	$0	$70,131
01-Jun-10	$115,883	($2,130)	$113,753	$0	$113,753
01-Jun-11	$272,566	($3,900)	$268,666	($2,002)	$266,664
01-Jun-12	$173,971	($1,030)	$172,941	($1,071)	$171,870
01-Jun-13	$369,278	($15,283)	$353,995	$0	$353,995

Table 37 RPM revenue for external Generation Resources: June 1, 2007 to June 1, 2013

	Revenue ($ per Day)				
	RPM Cleared	Net Replacements	RPM Commitments	Capacity Resource Deficiency Charge	RPM Commitments Less Commitment Shortage
01-Jun-07	$68,623	$0	$68,623	$0	$68,623
01-Jun-08	$182,615	($108)	$182,507	$0	$182,507
01-Jun-09	$180,408	$9,372	$189,780	$0	$189,780
01-Jun-10	$320,587	($10,850)	$309,737	$0	$309,737
01-Jun-11	$194,722	($72)	$194,650	$0	$194,650
01-Jun-12	$22,745	($947)	$21,798	($2,056)	$19,742
01-Jun-13	$61,852	($6,581)	$55,271	$0	$55,271

Table 38 RPM revenue for Demand Resources: June 1, 2007 to June 1, 2013

	Revenue ($ per Day)					
	RPM Cleared	Net Replacements	Relief from Charges	RPM Commitments	Capacity Resource Deficiency Charge	RPM Commitments Less Commitment Shortage
01-Jun-07	$15,129	$0	$0	$15,129	$0	$15,129
01-Jun-08	$96,847	($400)	$0	$96,447	($21,267)	$75,180
01-Jun-09	$180,170	($40,465)	$0	$139,704	($3,478)	$136,226
01-Jun-10	$165,030	($25,815)	$0	$139,215	($1,513)	$137,702
01-Jun-11	$152,448	($16,267)	$0	$136,181	$0	$136,181
01-Jun-12	$724,543	($19,067)	($193)	$705,283	($5,478)	$699,806
01-Jun-13	$1,530,726	($229,965)	$0	$1,300,761	($3,569)	$1,297,192

Table 39 RPM revenue for Energy Efficiency Resources: June 1, 2007 to June 1, 2013

	Revenue ($ per Day)				
	RPM Cleared	Net Replacements	RPM Commitments	Capacity Resource Deficiency Charge	RPM Commitments Less Commitment Shortage
01-Jun-07	$0	$0	$0	$0	$0
01-Jun-08	$0	$0	$0	$0	$0
01-Jun-09	$0	$0	$0	$0	$0
01-Jun-10	$0	$0	$0	$0	$0
01-Jun-11	$382	$1	$383	$0	$383
01-Jun-12	$31,256	($1,221)	$30,036	($207)	$29,829
01-Jun-13	$59,173	$4,346	$63,519	($1,277)	$62,242

Parent Company Analysis

Given the results for replacement capacity transactions on a resource basis, this section reports data on net replacement activities aggregated to a parent company level.

Table 40 through Table 46 show the number of companies by net replacement percentage for the identified resource classifications. The number of companies includes both companies that replaced RPM commitments and companies that provided replacement capacity. Figure 2 through Figure 8 show scatter plots of company replacement percentages for the identified resource classifications. For companies with cleared Generation Resources, internal Generation Resources, internal Generation Resources in service, and external Generation Resources, the majority of companies replaced 0 to 25 percent of the cleared capacity for Generation Resources. The distribution of replacement percentages was more scattered for companies with cleared DR, EE Resources, and internal Generation Resources not in service than for companies with cleared resources in the other identified resource classifications. A higher percentage of companies with cleared DR, EE Resources, and internal Generation Resources not in service replaced 75 to 100 percent of cleared capacity for the given resource type than companies with cleared resources in the other identified resources classifications.

Table 40 Number of parent companies by replacement percentage for Generation Resources: June 1, 2007 to June 1, 2013

	Number of Companies					
	0 Percent	> 0 Percent and <= 25 Percent	> 25 Percent and <= 50 Percent	> 50 Percent and <= 75 Percent	> 75 Percent and < 100 Percent	100 Percent
01-Jun-07	54	0	0	0	0	0
01-Jun-08	27	32	1	0	0	0
01-Jun-09	34	33	1	0	0	0
01-Jun-10	37	26	5	1	0	3
01-Jun-11	37	35	3	0	2	3
01-Jun-12	51	34	3	2	1	4
01-Jun-13	61	41	3	2	0	2

Table 41 Number of parent companies by replacement percentage for internal Generation Resources: June 1, 2007 to June 1, 2013

	Number of Companies					
	0 Percent	> 0 Percent and <= 25 Percent	> 25 Percent and <= 50 Percent	> 50 Percent and <= 75 Percent	> 75 Percent and < 100 Percent	100 Percent
01-Jun-07	51	0	0	0	0	0
01-Jun-08	22	32	1	0	0	0
01-Jun-09	29	31	1	0	0	0
01-Jun-10	31	26	5	1	0	3
01-Jun-11	30	36	3	0	2	3
01-Jun-12	44	32	3	1	1	3
01-Jun-13	54	38	3	2	0	1

Table 42 Number of parent companies by replacement percentage for internal Generation Resources in service: June 1, 2007 to June 1, 2013

	Number of Companies					
	0 Percent	> 0 Percent and <= 25 Percent	> 25 Percent and <= 50 Percent	> 50 Percent and <= 75 Percent	> 75 Percent and < 100 Percent	100 Percent
01-Jun-07	51	0	0	0	0	0
01-Jun-08	22	32	1	0	0	0
01-Jun-09	29	31	1	0	0	0
01-Jun-10	31	26	5	1	0	2
01-Jun-11	31	35	2	0	2	2
01-Jun-12	40	30	2	2	1	3
01-Jun-13	50	38	2	2	0	1

Table 43 Number of parent companies by replacement percentage for internal Generation Resources not in service: June 1, 2007 to June 1, 2013

	Number of Companies					
	0 Percent	> 0 Percent and <= 25 Percent	> 25 Percent and <= 50 Percent	> 50 Percent and <= 75 Percent	> 75 Percent and < 100 Percent	100 Percent
01-Jun-07	2	0	0	0	0	0
01-Jun-08	2	2	0	0	0	1
01-Jun-09	4	3	0	1	0	0
01-Jun-10	2	5	1	1	0	1
01-Jun-11	3	6	3	0	0	3
01-Jun-12	15	5	2	0	0	1
01-Jun-13	17	3	3	0	0	2

Table 44 Number of parent companies by replacement percentage for external Generation Resources: June 1, 2007 to June 1, 2013

	Number of Companies					
	0 Percent	> 0 Percent and <= 25 Percent	> 25 Percent and <= 50 Percent	> 50 Percent and <= 75 Percent	> 75 Percent and < 100 Percent	100 Percent
01-Jun-07	14	0	0	0	0	0
01-Jun-08	12	4	0	0	0	0
01-Jun-09	15	3	0	0	0	0
01-Jun-10	15	2	0	0	0	0
01-Jun-11	16	1	0	0	0	0
01-Jun-12	17	3	0	1	0	1
01-Jun-13	18	6	0	0	1	1

Table 45 Number of parent companies by replacement percentage for Demand Resources: June 1, 2007 to June 1, 2013

	Number of Companies					
	0 Percent	> 0 Percent and <= 25 Percent	> 25 Percent and <= 50 Percent	> 50 Percent and <= 75 Percent	> 75 Percent and < 100 Percent	100 Percent
01-Jun-07	4	0	0	0	0	0
01-Jun-08	4	1	0	0	0	0
01-Jun-09	4	1	0	1	1	0
01-Jun-10	4	1	0	0	0	2
01-Jun-11	14	0	3	1	0	2
01-Jun-12	26	9	6	0	4	2
01-Jun-13	21	9	8	3	5	8

Table 46 Number of parent companies by replacement percentage for Energy Efficiency Resources: June 1, 2007 to June 1, 2013

	Number of Companies					
	0 Percent	> 0 Percent and <= 25 Percent	> 25 Percent and <= 50 Percent	> 50 Percent and <= 75 Percent	> 75 Percent and < 100 Percent	100 Percent
01-Jun-07						
01-Jun-08						
01-Jun-09						
01-Jun-10						
01-Jun-11	4	0	0	0	0	0
01-Jun-12	6	0	1	1	0	1
01-Jun-13	7	0	1	0	1	2

Table 47 through Table 53 show the following for the identified resource classifications:

- RPM Cleared – MW cleared in RPM Auctions for the given delivery year and the net replacement percentage range at the parent company level.
- Net Replacements – RPM commitment additions on the replacement resources for the given replacement percentage range at the parent company level less RPM commitment reductions using replacement capacity.

- Total Net Replacements – RPM commitment additions on the replacement resources less RPM commitment reductions using replacement capacity, or the sum of Net Replacements for all the replacement percentage ranges.

Table 47 RPM cleared and replacement capacity by replacement percentage at parent company level for Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	0 Percent		> 0 Percent and <= 25 Percent		> 25 Percent and <= 50 Percent		> 50 Percent and <= 75 Percent		> 75 Percent and < 100 Percent		100 Percent		
	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	Total Net Replacements
01-Jun-07	129,281.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-08	24,252.7	0.0	105,687.0	(678.4)	130.7	(48.1)	0.0	0.0	0.0	0.0	0.0	0.0	(726.5)
01-Jun-09	27,524.7	13.3	105,605.8	(1,604.0)	6.8	(2.8)	0.0	0.0	0.0	0.0	0.0	0.0	(1,593.5)
01-Jun-10	41,145.5	172.6	90,981.4	(3,313.1)	721.0	(299.3)	5.8	(3.3)	0.0	0.0	219.6	(219.6)	(3,662.7)
01-Jun-11	13,689.7	53.3	117,522.9	(4,883.2)	164.9	(55.0)	0.0	0.0	233.4	(221.8)	668.7	(668.7)	(5,775.4)
01-Jun-12	12,503.2	1,001.7	115,539.5	(5,776.8)	450.2	(154.9)	2,859.0	(1,659.0)	44.8	(42.9)	480.2	(480.2)	(7,112.1)
01-Jun-13	13,081.3	105.3	130,869.9	(6,538.5)	591.6	(238.9)	3,281.0	(2,032.5)	0.0	0.0	336.9	(336.9)	(9,041.5)

Table 48 RPM cleared and replacement capacity by replacement percentage at parent company level for internal Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	0 Percent		> 0 Percent and <= 25 Percent		> 25 Percent and <= 50 Percent		> 50 Percent and <= 75 Percent		> 75 Percent and < 100 Percent		100 Percent		
	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	Total Net Replacements
01-Jun-07	127,660.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-08	22,756.0	9.7	105,557.3	(677.3)	130.7	(48.1)	0.0	0.0	0.0	0.0	0.0	0.0	(715.7)
01-Jun-09	29,838.8	86.7	101,569.6	(1,911.7)	6.8	(2.8)	0.0	0.0	0.0	0.0	0.0	0.0	(1,827.8)
01-Jun-10	40,487.3	159.3	89,522.6	(3,082.8)	717.0	(299.3)	5.8	(3.3)	0.0	0.0	219.6	(219.6)	(3,445.7)
01-Jun-11	11,943.1	53.3	117,479.3	(4,868.8)	137.1	(55.0)	0.0	0.0	229.4	(221.8)	668.7	(668.7)	(5,761.0)
01-Jun-12	11,738.3	1,001.8	114,988.8	(5,778.3)	409.0	(154.9)	2,745.0	(1,580.0)	44.8	(42.9)	434.5	(434.5)	(6,988.8)
01-Jun-13	12,346.8	105.3	129,468.5	(6,348.1)	587.8	(238.9)	3,281.0	(2,032.5)	0.0	0.0	48.1	(48.1)	(8,562.3)

Table 49 RPM cleared and replacement capacity by replacement percentage at parent company level for internal Generation Resources in service: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	0 Percent		> 0 Percent and <= 25 Percent		> 25 Percent and <= 50 Percent		> 50 Percent and <= 75 Percent		> 75 Percent and < 100 Percent		100 Percent		
	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	Total Net Replacements
01-Jun-07	127,614.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-08	22,756.0	9.7	105,447.4	(668.8)	130.7	(48.1)	0.0	0.0	0.0	0.0	0.0	0.0	(707.2)
01-Jun-09	10,551.4	80.8	120,372.5	(2,108.3)	6.8	(2.8)	0.0	0.0	0.0	0.0	0.0	0.0	(2,030.3)
01-Jun-10	40,425.6	161.0	88,904.9	(3,061.7)	715.3	(299.3)	5.8	(3.3)	0.0	0.0	199.8	(199.8)	(3,403.1)
01-Jun-11	11,919.6	67.0	115,516.8	(4,771.3)	104.8	(43.6)	0.0	0.0	229.4	(221.8)	13.4	(13.4)	(4,983.1)
01-Jun-12	11,749.1	1,005.5	112,035.1	(5,854.1)	287.9	(106.8)	2,811.0	(1,624.4)	44.8	(42.9)	434.5	(434.5)	(7,057.2)
01-Jun-13	36,890.3	207.4	101,170.3	(6,098.7)	466.7	(206.5)	3,142.3	(1,940.5)	0.0	0.0	48.1	(48.1)	(8,086.4)

Table 50 RPM cleared and replacement capacity by replacement percentage at parent company level for internal Generation Resources not in service: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	0 Percent		> 0 Percent and <= 25 Percent		> 25 Percent and <= 50 Percent		> 50 Percent and <= 75 Percent		> 75 Percent and < 100 Percent		100 Percent		
	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	Total Net Replacements
01-Jun-07	46.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-08	37.3	0.0	65.0	(0.9)	0.0	0.0	0.0	0.0	0.0	0.0	7.6	(7.6)	(8.5)
01-Jun-09	366.5	216.2	106.5	(5.2)	0.0	0.0	11.5	(8.5)	0.0	0.0	0.0	0.0	202.5
01-Jun-10	51.5	0.0	607.7	(11.1)	7.6	(3.4)	14.3	(8.3)	0.0	0.0	19.8	(19.8)	(42.6)
01-Jun-11	57.2	0.0	1,772.1	(43.6)	167.7	(57.7)	0.0	0.0	0.0	0.0	676.6	(676.6)	(777.9)
01-Jun-12	1,945.8	141.2	943.5	(33.6)	102.2	(32.7)	0.0	0.0	0.0	0.0	6.5	(6.5)	68.4
01-Jun-13	1,575.9	14.1	1,365.5	(84.7)	961.9	(294.1)	0.0	0.0	0.0	0.0	111.2	(111.2)	(475.9)

Table 51 RPM cleared and replacement capacity by replacement percentage at parent company level for external Generation Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	0 Percent		> 0 Percent and <= 25 Percent		> 25 Percent and <= 50 Percent		> 50 Percent and <= 75 Percent		> 75 Percent and < 100 Percent		100 Percent		
	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	Total Net Replacements
01-Jun-07	1,620.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-08	143.2	0.0	1,483.2	(10.8)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(10.8)
01-Jun-09	460.9	399.4	1,261.2	(165.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	234.3
01-Jun-10	957.3	14.1	1,163.7	(231.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(217.0)
01-Jun-11	663.2	219.7	1,158.8	(234.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(14.4)
01-Jun-12	1,118.5	37.0	238.3	(35.6)	0.0	0.0	114.0	(79.0)	0.0	0.0	45.7	(45.7)	(123.3)
01-Jun-13	837.8	1.1	1,084.3	(17.3)	0.0	0.0	0.0	0.0	217.6	(174.2)	288.8	(288.8)	(479.2)

Table 52 RPM cleared and replacement capacity by replacement percentage at parent company level for Demand Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	0 Percent		> 0 Percent and <= 25 Percent		> 25 Percent and <= 50 Percent		> 50 Percent and <= 75 Percent		> 75 Percent and < 100 Percent		100 Percent		
	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	Total Net Replacements
01-Jun-07	127.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
01-Jun-08	376.5	0.0	182.9	(40.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(40.0)
01-Jun-09	100.1	0.0	335.2	(52.9)	0.0	0.0	51.6	(35.8)	406.0	(386.0)	0.0	0.0	(474.7)
01-Jun-10	42.0	0.0	439.3	(34.7)	0.0	0.0	0.0	0.0	0.0	0.0	481.6	(481.6)	(516.3)
01-Jun-11	97.1	12.7	0.0	0.0	903.5	(299.9)	196.4	(135.6)	0.0	0.0	629.6	(629.6)	(1,052.4)
01-Jun-12	1,494.8	54.3	1,970.3	(356.0)	4,727.4	(1,469.2)	0.0	0.0	493.8	(416.4)	66.3	(66.3)	(2,253.6)
01-Jun-13	558.6	175.0	2,859.0	(400.1)	5,659.5	(1,696.6)	631.3	(385.7)	430.1	(365.9)	641.1	(641.1)	(3,314.4)

Table 53 RPM cleared and replacement capacity by replacement percentage at parent company level for Energy Efficiency Resources: June 1, 2007 to June 1, 2013

	UCAP (MW)												
	0 Percent		> 0 Percent and <= 25 Percent		> 25 Percent and <= 50 Percent		> 50 Percent and <= 75 Percent		> 75 Percent and < 100 Percent		100 Percent		
	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	RPM Cleared	Net Replacements	Total Net Replacements
01-Jun-07													
01-Jun-08													
01-Jun-09													
01-Jun-10													
01-Jun-11	76.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
01-Jun-12	594.1	5.2	0.0	0.0	57.7	(28.6)	10.3	(7.5)	0.0	0.0	4.0	(4.0)	(34.9)
01-Jun-13	870.5	143.5	0.0	0.0	16.6	(6.6)	0.0	0.0	14.0	(13.2)	3.1	(3.1)	120.6

Figure 2 Company replacement percentages for Generation Resources: June 1, 2007 to June 1, 2013

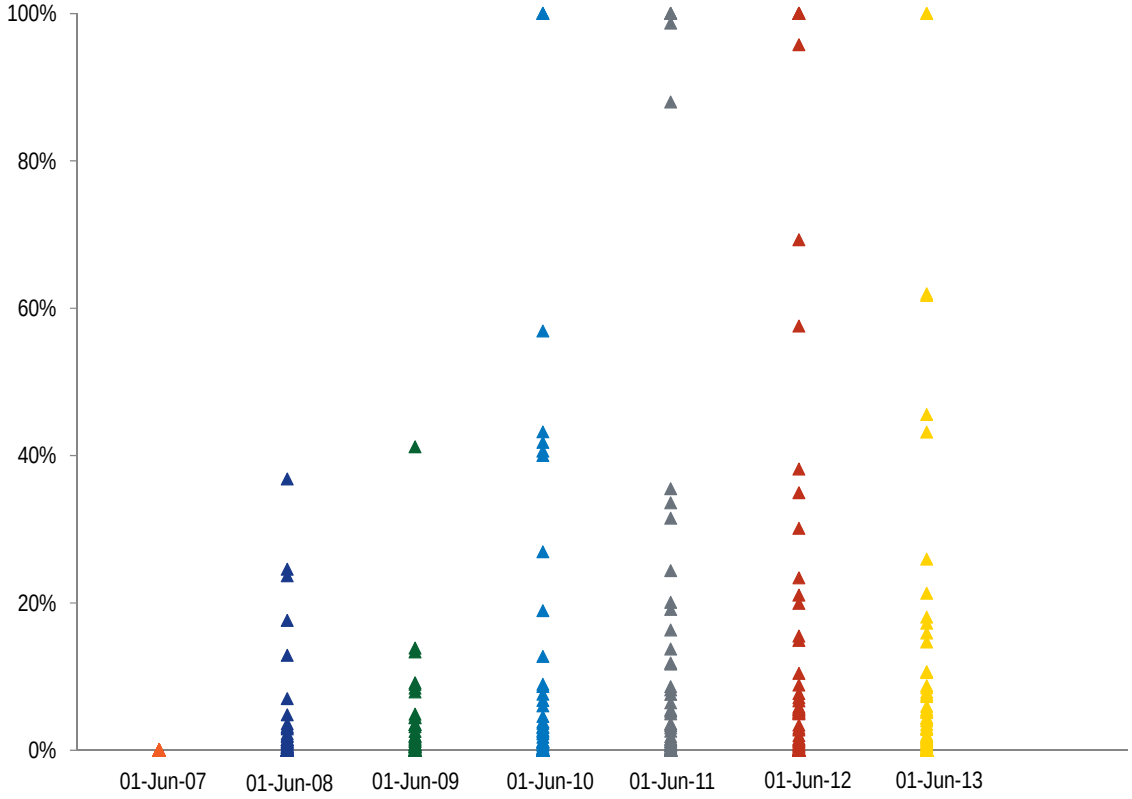


Figure 3 Company replacement percentages for internal Generation Resources: June 1, 2007 to June 1, 2013

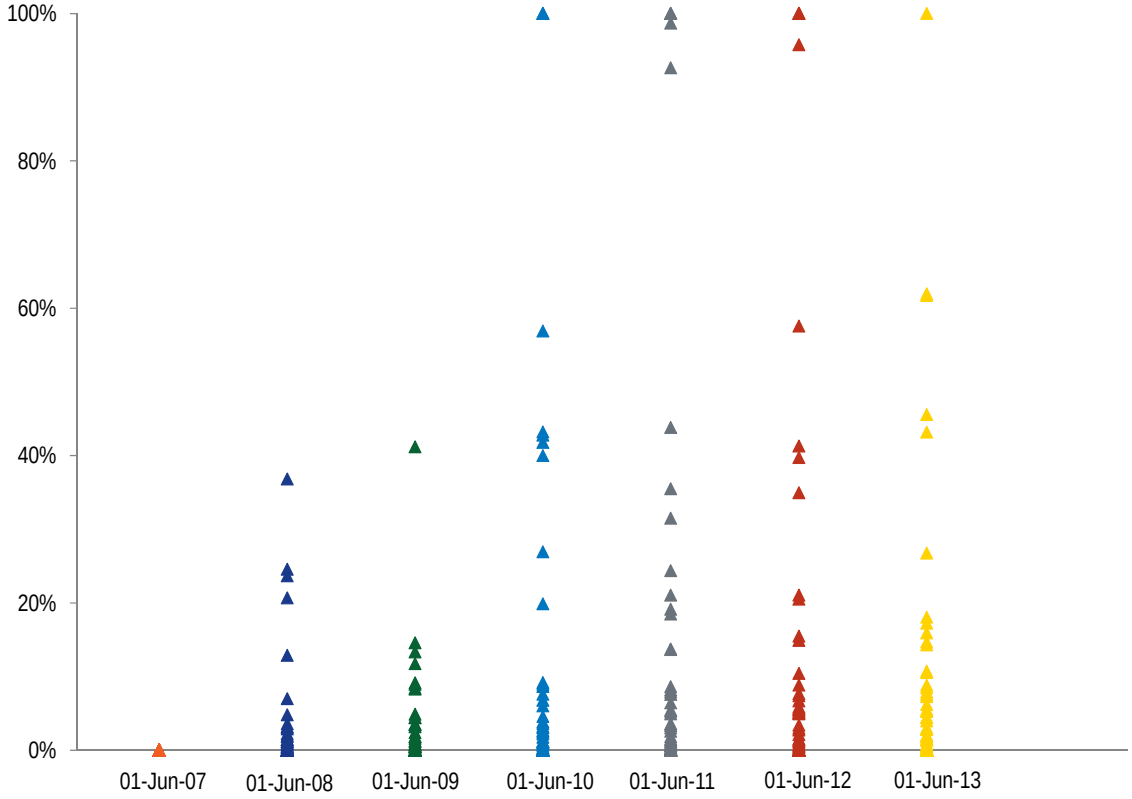


Figure 4 Company replacement percentages for internal Generation Resources in service: June 1, 2007 to June 1, 2013

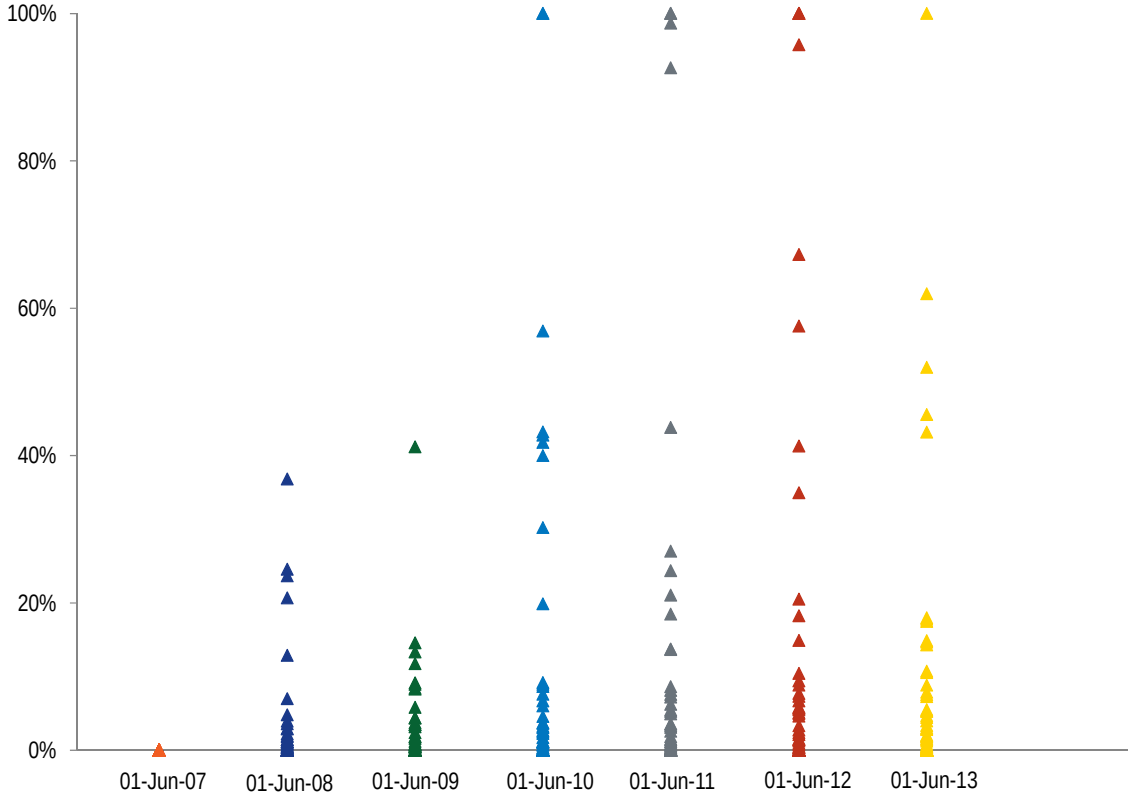


Figure 5 Company replacement percentages for internal Generation Resources not in service: June 1, 2007 to June 1, 2013

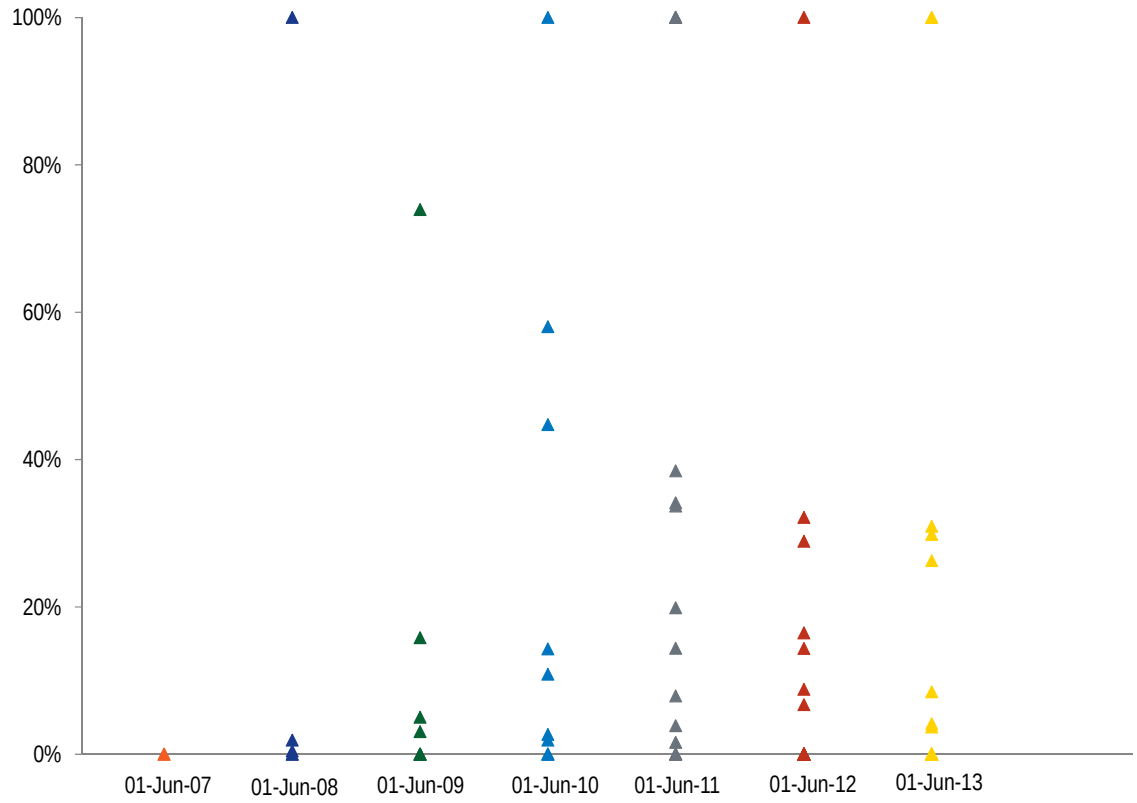


Figure 6 Company replacement percentages for external Generation Resources: June 1, 2007 to June 1, 2013

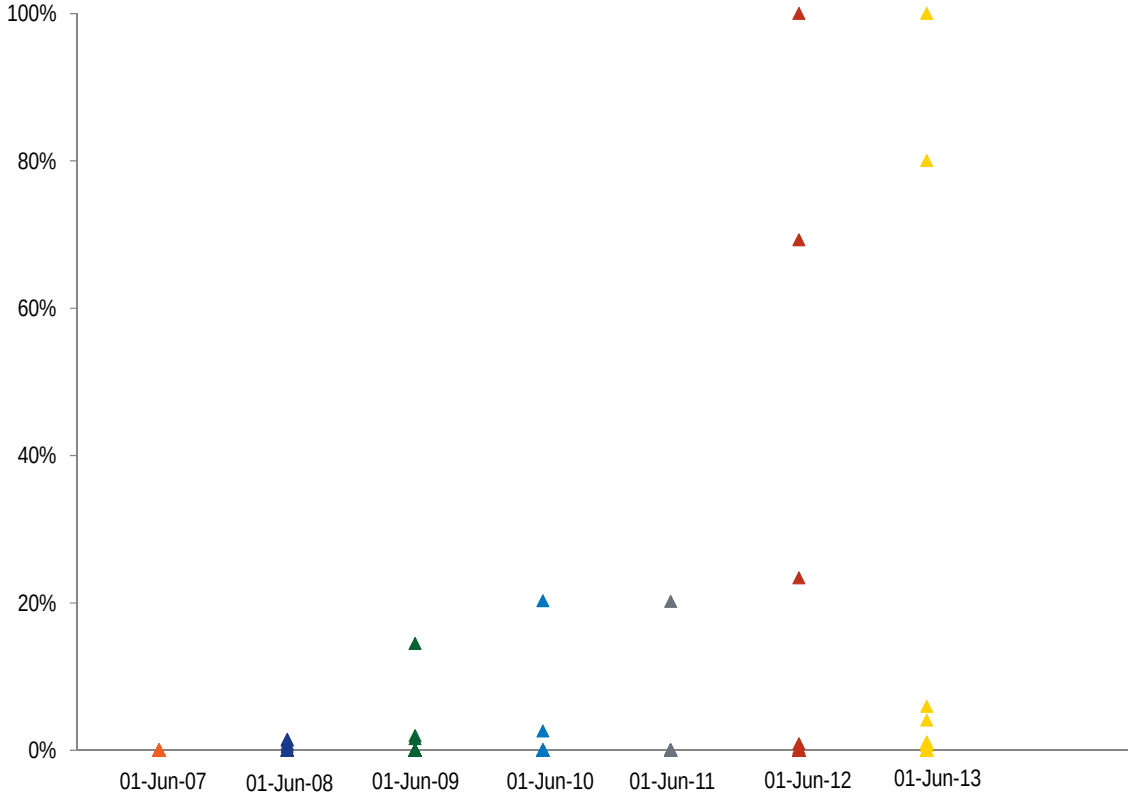


Figure 7 Company replacement percentages for Demand Resources: June 1, 2007 to June 1, 2013

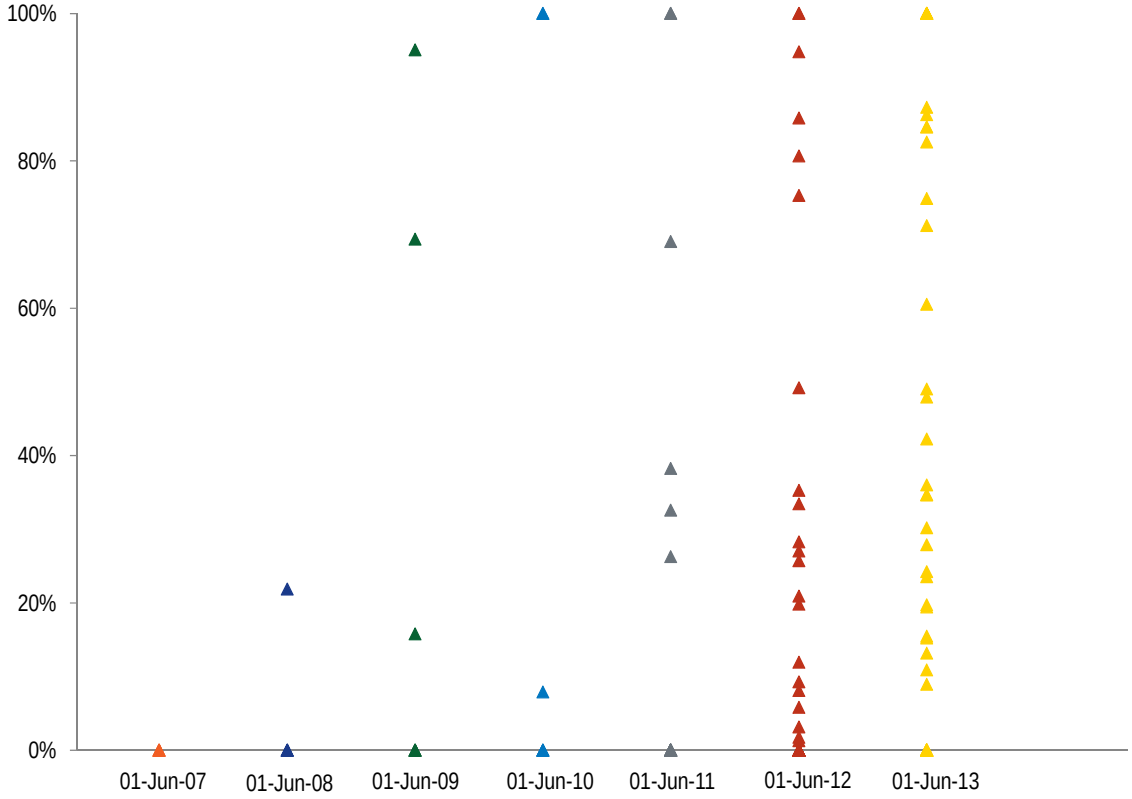
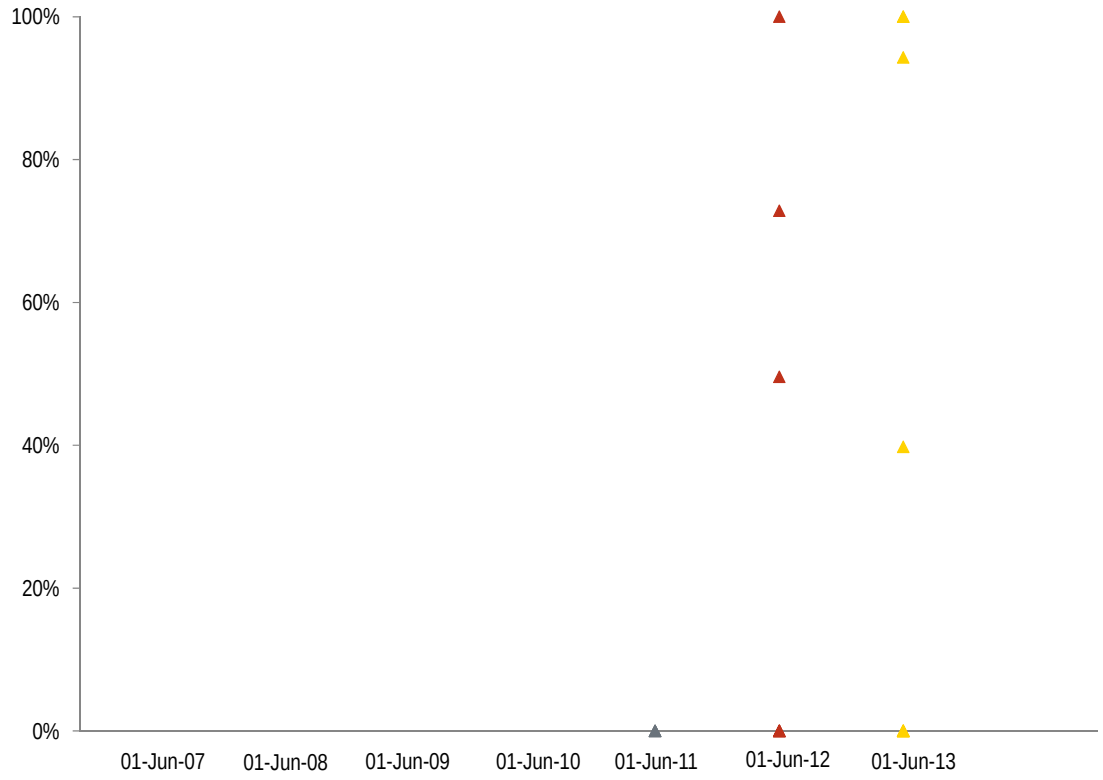


Figure 8 Company replacement percentages for Energy Efficiency Resources: June 1, 2007 to June 1, 2013



Conclusion

Sellers of Demand Resources in RPM Auctions disproportionately replace those commitments compared to sellers of other resource types.

Contrary to the current application of the PJM rules, the sellers of DR in BRAs must be based on real customers and provide a timeline for providing that DR. This is precisely what the current rules require.

Section A.5 of Schedule 6 to the PJM Reliability Reassurance Agreement (RAA) provides:

> An entity offering for sale, designating for self-supply, or including in any FRR Capacity Plan any Planned Demand Resource must demonstrate, in accordance with standards and procedures set forth in the PJM Manuals, that such resource shall have the capability to provide a reduction in demand, or otherwise control load, on or before the start of the Delivery Year for which such resource is committed. Providers of Planned Demand Resources must provide a

> timeline including the milestones, which demonstrates to PJM's satisfaction that the Planned Demand Resources will be available for the start of the Delivery Year, *15 business days prior to a Base Residual Auction* or Incremental Auction. PJM may verify the Provider's adherence to the timetable at any time." [Emphasis added.][32]

The definition of "Planned Demand Resource" in Section 1.69 of the RAA confirms the Market Monitor's interpretation:

> Planned Demand Resource shall mean a Demand Resource that does not currently have the capability to provide a reduction in demand or to otherwise control load, but that is *scheduled* to be capable of providing such reduction or control on or before the start of the Delivery Year for which such resource is to be committed, as determined in accordance with the requirements of Schedule 6 [emphasis added].

The rules require that Planned DR must be a specific, physical resource that shall be able to provide the identified reduction in the Delivery Year, and that the entity offering the Planned DR must demonstrate how its capability will be provided, prior to the offer whether in a BRA or IA or FRR capacity plan. The timetable and milestones to meet this obligation are subject to verification by PJM at any time prior to the Delivery Year. This rule requires a specific customer and a specific site, but does not require a contract.

The Market Monitor recommends that this rule be implemented as written.

Under the current application of the rules, DR providers may not have identified customers, may not have clear plans for implementing DR measures and may not receive commitments from new customers until relatively close to the delivery year and well after the RPM BRA is run for that delivery year. This is not consistent with the rules.

The current application of the rules allows DR providers to register sites relatively close to the Delivery Year. The rules for registering end-use customer sites just before the commencement of the Delivery Year, however, have created confusion about the nature of DR that may be offered into Base Residual Auctions. It has been incorrectly assumed that the rules permit a seller of DR to offer DR without having commitments from customers to provide DR. Curtailment Service Providers (CSPs) have routinely offered

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[32] This rule is also codified in Section A.5 of Attachment DD-1 to the OATT.

Planned DR in BRAs without having identified the specific customers, evaluated their capabilities at the sites of their operation, evaluated the willingness of the customers to develop such capabilities, or determined that the site was not already committed to another party. This has meant acceptance of DR in Base Residual Auctions that reflects only a CSP's speculation about whether or not it could sign up actual customers. There is no reason to expect that the Planned DR offered in a BRA, under the rules as currently applied, represents DR expected to be physically available in the Delivery Year. The evidence shows that DR providers, including CSPs and individual customers, do regularly purchase replacement capacity for a substantial portion of their BRA commitments for DR at a significant discount to the initial sale price.

The risks to the markets associated with the sale of DR without any supporting information on the plausibility of the underlying assets include the risk that multiple CSPs could be assuming that they will win the same customers and the risk that sellers are taking speculative positions with a low probability of fulfilling them. The result in both cases is that the system is less reliable than it might otherwise be because the full amount of DR that cleared the RPM Auction is not actually available, the price to other capacity resources has been suppressed by the sale of the speculative DR, new entry of other capacity resources could have been forestalled by the sale of speculative DR, and there may not be adequate replacement resources available with short notice prior to the delivery year.

The dynamic that can result is the speculative DR suppresses prices in the BRA and displaces physical generation assets. Those generation assets then have an incentive to offer at a low price, including offers at zero and below cost, in IAs in order to ensure some capacity market revenue for long lived physical resources which the owners expect to maintain for multiple years. The result is lower IA prices which permit the buyback of the speculative DR at prices below the BRA prices which encourages the greater use of speculative DR.

It has been asserted that selling high and buying low is just a market transaction and therefore does not constitute a problem. But permitting DR to be effectively an option in the BRA rather than requiring DR to be a commitment to provide a physical asset gives DR an unfair advantage and creates a self fulfilling dynamic that incents more of the same behavior. The result is an increasing share of total capacity resources that are limited DR, which are clearly not a substitute for generating capacity which is on call 8,760 hours per year.

The rationale for the Short Term Resource Procurement Target (2.5 percent demand curve offset) has been that this will permit some short lead time DR to compete in the Incremental Auctions. It has been established that this did not occur in the 2014/2015 BRA, because the Limited DR and Extended Summer DR were fully subscribed in the BRA. One way to ensure that this option remains is to reserve all Limited DR and

Extended Summer DR sales to the Third Incremental Auction and to purchase no Limited DR or Extended Summer DR in the BRA or First and Second IAs. This would ensure the sale of such resources closer to the delivery year and increase the incentives to have actual customer locations to provide the DR.

The IMM has pointed out that both the 2.5 percent demand curve offset and the definition of Limited DR as an inferior product significantly suppress capacity market prices. It would be ironic if speculative Limited DR is permitted in the RPM in order to give it a chance to compete when it has already been provided extraordinary advantages at the expense of a significantly less efficient market design.[33]

DR should be treated like any other capacity resource and be required to provide annual service and be required to make offers in capacity auctions based on verifiable evidence of a physical commitment. That the DR business model may have relied on speculative offers is no reason to continue that practice. The practice has had demonstrable negative impacts on capacity markets. If DR aggregators cannot get commitments three years ahead for new customers, they should get such commitments in the year of the delivery year for Third IAs. Once customers are established and understand the market and the associated risks and benefits, they can be offered into BRAs, consistent with the tariff rules.

The requirement to be a physical resource should be applied to all resource types, including planned generation and imports. The same logic applies to all resource types and the rules should be applied to all resource types in order to ensure an effective and efficient capacity market in PJM.

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[33] See the *2012 State of the Market Report for PJM*, Volume II, Section 4 – Capacity Market available at <http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2012/2012-som-pjm-volume2-sec4.pdf>.