2015/2016 RPM Base Residual Auction Results

Executive Summary

The 2015/2016 Reliability Pricing Model (RPM) Base Residual Auction cleared 164,561.2 megawatts (MW) of capacity. The actual reserve margin for the entire RTO will be 20.2%.

This RPM auction was impacted by an unprecedented amount of planned generation retirements (more than 14,000 MW) driven largely by environmental regulations, which drove prices higher than last year's auction. The auction produced record amounts of offers of new generation, demand response and energy efficiency. A record number of new generation resources were procured compared to any single RPM auction.

Megawatts of New and Alternative Capacity Procured by Type

	New Generation	Generation Uprates	Demand Response	Energy Efficiency
2015/2016 BRA	4,898.9	447.4	14,832.8	922.5
2014/2015 BRA	415.5	341.1	14,118.4	822.1

Because of transmission constraints, the capacity prices in two areas are higher than the rest of the PJM (i.e. the "RTO" price). The RTO price for annual resources is $136.00 per megawatt-day (MW-day). The RTO prices for Limited Demand Response and Extended Summer Demand Response are $118.54/MW-day and $136.00/MW-day, respectively.

In PJM's MAAC area, the price for annual resources is $167.46/MW-day. The MAAC price for Limited Demand Response and Extended Summer Demand Response are $150/MW-day and $167.46/MW-day, respectively. The MAAC area consists of the transmission system of Atlantic City Electric, Baltimore Gas and Electric Company, Delmarva Power, Jersey Central Power and Light Company (JCP&L), Metropolitan Edison Company (Met-Ed), PECO, Pennsylvania Electric Company (Penelec), Pepco, PPL Electric Utilities, Public Service Electric and Gas Company (PSE&G), and Rockland Electric Company.

In northern Ohio for the ATSI LDA, the price for annual resources is $357.00/MW-day. The ATSI price for Limited Demand Response and Extended Summer Demand Response are $304.62/MW-day and $322.08/MW-day, respectively.

A further discussion of the 2015/2016 auction results and additional information are detailed in the body of this report. The discussion also provides a comparison of the 2015/2016 auction results to the results from the 2007/2008 through 2014/2015 RPM auctions.

2015/2016 RPM Base Residual Auction Results

Introduction

This document provides information for PJM stakeholders regarding the results of the 2015/2016 Reliability Pricing Model (RPM) Base Residual Auction (BRA). The 2015/2016 BRA opened on May 7, 2012 and the results were posted on May 18, 2012.

In each BRA, PJM seeks to procure a target capacity reserve level for the RTO in a least cost manner while recognizing locational constraints and minimum requirements on the commitment of less limited capacity products. Locational constraints are established by setting up Locational Deliverability Areas (LDAs) with each LDA having a separate target capacity reserve level and a maximum limit on the amount of capacity that it can import from resources located outside of the LDA. A Minimum Annual Resource Requirement and a Minimum Extended Summer Resource Requirement is established for the RTO and each modeled LDA and the auction clearing process can select Extended Summer Demand Resources (DR) or Annual Resources (Annual Resources include generation capacity resources, energy efficiency resources and Annual DR) out of merit order, if necessary, to procure the minimum required quantities, similar to the way in which RPM auctions can select resources out of merit order to address locational constraints. In those cases where one or both on the minimum resource requirements do bind in the auction solution, just as with resources selected to resolve locational constraints, resources selected out of merit order to meet the necessary minimum resource requirements will receive a minimum resource requirement adder to the system marginal price of capacity (in addition to any locational price adder(s) received to resolve locational constraints).

This document begins with a high level Executive Summary of the BRA results followed by sections containing detailed descriptions of the auction results.

Summary of Results

The 2015/2016 Reliability Pricing Model (RPM) Base Residual Auction (BRA) cleared 164,561.2 MW of unforced capacity in the RTO representing a 20.6% reserve margin. When the Fixed Resource Requirement (FRR) load and resources are considered the reserve margin for the entire RTO is 20.2%.

This RPM auction was impacted by a series of significant developments. Over the next three years an unprecedented amount, over 14,000 MW, of generation retirements have been announced driven largely by environmental regulations, primarily EPA Mercury and Air Toxics Standards (MATS) and the High Electricity Demand Day Rule (HEDD) in New Jersey which have compliance deadlines of April 16, 2015 and May 1, 2015 respectively. These environmental rules and resulting resource retirements significantly impacted the RPM auction results. The announced generation retirements send a strong signal that there would be a need for new resources, and this auction witnessed a record number of new generation offers, 6,854 MW; a record number of demand resource offers, 19,956.3

MW; and a record number of energy efficiency resource offers, 940.3 MW. This significant amount of additional resource offers also impacted the RPM auction results. The auction results also represent the continuing trend, starting in the 2014/2015 BRA, of a significant decline in the amount of coal-fired generation cleared and a significant shift to increased amounts of new natural gas-fired generation cleared. The auction clearing prices are higher than the previous auction driven largely by the impact of environmental regulations.

The MAAC LDA and ATSI LDA are locationally constrained in the 2015/2016 BRA; therefore, Resource Clearing Prices in these LDAs differ from the Resources Clearing Prices of the rest of the RTO. The Resource Clearing Price for Limited DR, Extended Summer DR and Annual Resources located in the RTO is $118.54/MW-day, $136.00/MW-day and $136.00/MW-day, respectively. The Resource Clearing Price for Limited DR, Extended Summer DR and Annual Resources located in the MAAC LDA is $150.00/MW-day, $167.46/MW-day and $167.46/MW-day, respectively. The Resource Clearing Price for Limited DR, Extended Summer DR and Annual Resources located in the ATSI LDA is $304.62/MW-day, $322.08/MW-day and $357.00/MW-day, respectively. The Minimum Extended Summer Resource Requirement was a binding constraint for the entire RTO and since both Annual Resources and Extended Summer DR may be used to satisfy this constraint, Annual Resources and Extended Summer DR received a higher Resource Clearing Price than did Limited DR. Annual Resources in the ATSI LDA received a higher Resource Clearing Price than did Extended Summer DR in the ATSI LDA since the Minimum Annual Resource Requirement was an additional binding constraint in the ATSI LDA.

The annual resource clearing price in the MAAC region increased from $136.50 in the 2014/2015 Delivery Year to $167.46 in the 2015/2016 Delivery Year; the annual resource clearing price in the ATSI LDA increased from $125.99 in the 2014/2015 Delivery Year to $357.00 in the 2015/2016 Delivery year; the annual resource clearing price in the rest of RTO region increased from $125.99 in the 2014/2015 Delivery year to $136.00 in the 2015/2016 Delivery year and the annual resource clearing price in the Northern PSEG LDA decreased from $225.00 in the 2014/2015 Delivery year to $167.46 in the 2015/2016 Delivery year.

A total of 12,508.8 MW of incrementally new capacity in PJM was available for the 2015/2016 Base Residual Auction. This incrementally new capacity includes new generation capacity resources, capacity upgrades to existing generation capacity resources, new demand resources, upgrades to existing demand resources, and new energy efficiency resources. The increase is partially offset by generation capacity retirements and derations to existing generation capacity resources to yield a net increase of 6,076.2 MW of capacity.

The total quantity of new generation resources offered into the auction was 6,843.7 MW (UCAP) and the total existing generation uprates offered was 478.6 MW (UCAP). The amount of new generation capacity resources cleared was 4,898.9 MW (UCAP) and the

total amount of existing generation uprates that cleared was 447.4 MW (UCAP). This auction resulted in a record number of new generation resources cleared in any single RPM auction. Total imports offered into the auction from resources located in regions west of the PJM RTO increased by about 325 MW to 4,335.2 MW.

The total quantity of demand resources offered into the 2015/2016 BRA was 19,956.3 MW (UCAP) which represents an increase of 4,410.7 MW (28.4%) over the demand resources that offered into the 2014/2015 BRA. Approximately 74% (14,832.8 MW) of these demand resources cleared in the auction. Demand resources totaling 356.8 MW were included in FRR capacity plans for a total DR capacity market participation of 20,313.1 MW.

The total quantity of energy efficiency (EE) resources offered into the 2015/2016 BRA was 940.3 MW (UCAP) which represents an increase of 13% over the EE resources that offered into the 2014/2015 BRA. Approximately 98% (922.5 MW) of these EE resources cleared in the auction.

All existing generation sell offers into the 2015/2016 Base Residual Auction were subject to market power mitigation through the application of the Market Structure Test (i.e., the Three-Pivotal Supplier Test). The RTO as a whole failed the Market Structure Test, resulting in mitigation of any existing generation resources. Mitigation was applied to a supplier's existing generation resources resulting in utilizing the lesser of the supplier's approved offer cap for such resource or the supplier's submitted offer price for such resource in the RPM Auction clearing

All new generation capacity resource offers were subject to the Minimum Offer Price Rule (MOPR). The PJM IMM had submitted a complaint to FERC on May 1, 2012 regarding its concerns with the application of the MOPR exception process. The issues specified in the IMM complaint regarding application of the MOPR exception process had no impact on the auction results. The complaint was withdrawn by the IMM on May 17, 2012.

A further discussion of the 2015/2016 Base Residual Auction results and additional information regarding the 2015/2016 Reliability Pricing Model (RPM) Base Residual Auction results are detailed in the body of this report. The discussion also provides a comparison of the 2015/2016 auction results to the results from the 2007/2008 through 2014/2015 RPM auctions.

2015/2016 RPM Base Residual Auction Results

2015/2016 Base Residual Auction Results Discussion

Table 1 contains a summary of the RTO clearing prices resulting from the 2015/2016 RPM Base Residual Auction in comparison to those from 2007/2008 through 2014/2015 RPM Base Residual Auctions.

Table 1 –RPM Base Residual Auction Resource Clearing Price Results in the RTO

	RTO								
Auction Results	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012*	2012/2013	2013/2014**	2014/2015***	2015/2016
Resource Clearing Price	$40.80	$111.92	$102.04	$174.29	$110.00	$16.46	$27.73	$125.99	$136.00
Cleared UCAP (MW)	129,409.2	129,597.6	132,231.8	132,190.4	132,221.5	136,143.5	152,743.3	149,974.7	164,561.2
Reserve Margin	19.2%	17.5%	17.8%	16.5%	18.1%	20.9%	20.2%	19.6%	20.2%

*2011/2012 BRA was conducted without Duquesne zone load.

**2013/2014 BRA includes ATSI zone load

***2014/2015 BRA includes Duke zone

****2015/2016 BRA includes a significant portion of AEP and DEOK zone load previously under the FRR Alternative

The cleared UCAP is the amount of unforced capacity that was procured in the auction to meet the RTO demand for capacity. The 2015/2016 Reliability Pricing Model (RPM) Base Residual Auction cleared 164,561.2 MW of unforced capacity in the RTO representing a 20.6% reserve margin. When the Fixed Resource Requirement (FRR) load and associated resources are considered the actual reserve margin for the entire RTO is 20.2%. The Reserve Margin presented in Table 1 represents the percentage of installed capacity cleared in RPM and committed by FRR entities excess of the RTO load (including load served under the Fixed Resource Requirement alternative).

The 2015/2016 Base Residual Auction results reflect very strong participation by planned generation, demand resources and meaningful participation from energy efficiency resources.

New Generation Resource Participation

There was 8,207 MW ICAP of new generation resource participation, in the 2015/2016 Base Residual Auction including new generation and uprates at existing generating facilities. This figure is nearly 5 times greater than in the 2014/2015 Base Residual Auction value of 1,582.8 MW and more than double the previous high of 3,576.3 MW seen in the 2011/2012 Base Residual Auction which holds the distinction as the first Base Residual Auction held a full three years prior to the delivery year. Table 2A shows the

increase in generation participation across broken down by new units and uprates at existing resources since the 2007/2008 Delivery Year.

Table 2A –Incremental Capacity Resource Increases

	RTO									
Capacity Changes (in ICAP)	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	Total
Increase in Generation Capacity	602.0	724.2	1,272.3	1,776.2	3,576.3	1,893.5	1,737.5	1,582.8	8,207.0	21,371.8

This marked increase in new generation participation is driven by the 2015 compliance deadlines for the EPA's Mercury and Air Toxics Standard (MATS) applicable to coal and oil steam generation, and New Jersey's High Electricity Demand Day (HEDD) rule setting NOx emissions rate standards for generation in New Jersey and the continued trend in the relative competitiveness of natural gas relative to coal with the continued increase in production from shale gas regions such as the Marcellus formation in Pennsylvania. Of the new generation made available, 1,382.5 MW ICAP are natural gas CTs, and 5,914.5 MW ICAP are natural gas combined cycle facilities. In total, new natural gas generation accounts for 95 percent of new generation participation in the 2015/2016 Base Residual Auction.

Table 2B shows the breakdown of new generation participation by major Locational Deliverability Area (LDA) in ICAP terms. Values are not reported at a more granular level so as to protect confidentiality and commercially sensitive information of market participants. Table 3B shows that new generation is relatively evenly distributed throughout the RTO with just over half of the new generation located in MAAC or east of historic transmission constraints associated with west to east flows of power.

Table 2B –Location of Generation Capacity Increase (in ICAP MW)

LDA Name	Gen Capacity Increase
EMAAC	3528.5
MAAC	4576.2
Total RTO	8207

**All Values in ICAP terms
*MAAC includes EMAAC
**RTO includes MAAC

Table 2C shows the breakdown, by major LDA, of capacity in UCAP terms of new units and uprates at existing units offered in the auction and capacity actually clearing in the auction. Of the new generation capacity offered into the 2015/2016 BRA, 70 percent cleared the auction.

Table 2C – Offered and Cleared New Generation Capacity by LDA (in UCAP MW)

	Offered			Cleared		
LDA	Uprate	New Unit	Total	Uprate	New Unit	Total
EMAAC	180.7	3,145.9	**3,326.6**	164.9	2,313.5	**2,478.4**
MAAC	220.7	4,105.5	**4,326.2**	189.5	2,990.7	**3,180.2**
Total RTO	478.6	6,843.7	**7,322.3**	447.4	4,898.9	**5,346.3**

*All MW Values are in UCAP Terms

*MAAC includes EMAAC

**RTO includes MAAC

Demand Resource Participation

The total quantity of demand resources offered into the 2015/2016 BRA, 19,956.3 MW (UCAP), representing an increase of 28.4% over the demand resources that offered into the 2014/2015 BRA. Of the 19,956.3 MW of total demand response that offered in this auction, 14,832.8 MW cleared and will be awarded capacity payments. The cleared demand response is 714.4 MW greater than that which cleared in the 2014/2015 BRA representing a 5% increase. Of this change, 588.1 fewer MWs of DR cleared in the MAAC LDA and 1,302.5 additional MWs of DR cleared outside of the MAAC LDA. *Table 3A* contains a comparison of the Demand Resources Offered and Cleared in 2014/2015 BRA & 2015/2016 BRA represented in UCAP.

Table 3A – Comparison of Demand Resources Offered and Cleared in 2014/15 BRA & 2015/16 BRA represented in UCAP

		Offered MW*			Cleared MW*		
LDA	Zone	2014/2015	2015/2016	Increase in Offered MW	2014/2015	2015/2016	Increase in Cleared MW
EMAAC	AECO	268.2	249.2	**(19.0)**	205.4	207.9	**2.5**
EMAAC/DPL-S	DPL	470.9	524.3	**53.4**	391.5	433.5	**42.0**
EMAAC	JCPL	553.0	524.0	**(29.0)**	444.0	350.2	**(93.8)**
EMAAC	PECO	992.4	1,458.1	**465.7**	830.5	801.8	**(28.7)**
PSEG/PS-N	PSEG	1,140.1	1,081.9	**(58.2)**	964.2	796.1	**(168.1)**
EMAAC	RECO	42.0	37.4	**(4.6)**	31.2	20.9	**(10.3)**
EMAAC Sub Total		**3,466.6**	**3,874.9**	**408.3**	**2,866.8**	**2,610.4**	**(256.4)**
PEPCO	PEPCO	1,022.5	966.4	**(56.1)**	893.1	867.4	**(25.7)**
SWMAAC	BGE	1,450.9	1,328.8	**(122.1)**	1,341.3	1,141.7	**(199.6)**
MAAC	METED	469.9	472.2	**2.3**	398.4	348.6	**(49.8)**
MAAC	PENELEC	498.6	710.7	**212.1**	437.7	525.6	**87.9**
MAAC	PPL	1,505.3	1,810.3	**305.0**	1,299.5	1,155.0	**(144.5)**
MAAC Sub Total**		**8,413.8**	**9,163.3**	**749.5**	**7,236.8**	**6,648.7**	**(588.1)**
RTO	AEP	1,665.4	2,175.6	**510.2**	1,635.1	1,684.4	**49.3**
RTO	APS	912.0	1,175.1	**263.1**	886.8	935.5	**48.7**
ATSI	ATSI	1,055.1	2,038.5	**983.4**	955.7	1,763.7	**808.0**
RTO	COMED	1,546.9	2,765.9	**1,219.0**	1,535.7	1,698.2	**162.5**
RTO	DAY	265.1	324.8	**59.7**	231.9	196.9	**(35.0)**
RTO	DEOK	60.4	358.8	**298.4**	54.6	278.9	**224.3**
RTO	DOM	1,381.3	1,653.1	**271.8**	1,359.5	1,381.8	**22.3**
RTO	DUQ	245.6	301.2	**55.6**	222.3	244.7	**22.4**
Grand Total		**15,545.6**	**19,956.3**	**4,410.7**	**14,118.4**	**14,832.8**	**714.4**

*All MW values are expressed in UCAP
**MAAC sub-total includes all MAAC Zones

Each demand resource (DR) offering into the 2015/2016 RPM BRA was identified by the DR provider as being one of three DR product types: (1) Annual DR, (2) Extended Summer DR or (3) Limited DR. A DR provider with a resource that can potentially qualify as more than one of the three DR product types may submit separate but coupled sell offers for each DR product type for

which it qualifies. By coupling separate DR offers, the seller informs PJM and the RPM auction clearing engine that only one of the coupled demand resources may clear at most. Submitting DR offers in a coupled manner is not a requirement; it is an optional offer type available to the seller in addition to the conventional, non-coupled offer type. DR offers that are not specified as being coupled offers are cleared independent of each other and each offer could potentially clear.

Table 3B shows a breakdown of Demand Resources Offered and Cleared in the 2015/2016 BRA grouped by the potential Demand Resource coupling scenarios.

Table 3B – Breakdown of Demand Resources Offered versus Cleared by Product Type in the 2015/16 BRA represented in UCAP

	Resource Offer MW (UCAP)			Cleared MW (UCAP)		
Coupling Scenario	Limited Product Type	Extended Summer Product Type	Annual Product Type	Limited Product Type	Extended Summer Product Type	Annual Product Type
Annual, Extended Summer, and Limited	7,228.2	7,228.0	7,226.2	3,964.9	2,279.3	320.0
Annual and Extended Summer	-	-	-	-	-	-
Annual and Limited	92.4	-	79.7	30.9	-	-
Extended Summer and Limited	4,067.8	4,031.9		616.2	2,410.7	-
Annual Only	-	-	66.0	-	-	63.3
Extended Summer Only	-	1,798.2	-	-	512.3	-
Limited Only	6,703.1	-	-	4,635.2	-	-
Grand Total	**18,091.5**	**13,058.1**	**7,371.9**	**9,247.2**	**5,202.3**	**383.3**

Energy Efficiency Resource Participation

An energy efficiency (EE) resource is a project that involves the installation of more efficient devices/equipment or the implementation of more efficient processes/systems exceeding then-current building codes, appliance standards, or other relevant standards at the time of installation as known at the time of commitment. The EE resource must achieve a permanent, continuous reduction in electric energy consumption (during the defined EE performance hours) that is not reflected in the peak load forecast used for the Base Residual Auction for the Delivery Year for which the EE resource is proposed. The EE resource must be fully implemented at all times during the delivery year, without any requirement of notice, dispatch, or operator intervention. Of the 940.3 MWs of energy efficiency that offered into the 2015/2016 Base Residual Auction, 922.7 MW of EE resources cleared in the auction and will be awarded capacity payments.

Table 3C contains a summary of the demand resources and energy efficiency resources that offered and cleared by zone in the 2015/2016 Base Residual Auction. Approximately 74% of the demand resources and 98% of the energy efficiency resources that were offered into the BRA cleared. The uncleared resources were offered at a price above the clearing price for the LDA in which the resource was offered.

Figure 1 illustrates the demand side participation in the PJM Capacity Market from 2005/2006 Delivery Year to the 2015/2016 Delivery Year. Demand side participation includes active load management (ALM) prior to 2007/2008 Delivery Year, Interruptible Load for Reliability (ILR) and demand resources offered into each BRA and nominated in FRR Plans, and energy efficiency resources starting with the 2012/2013 Delivery Year. The demand side participation in the capacity market has increased dramatically since the inception of RPM in the 2007/2008 Delivery Year.

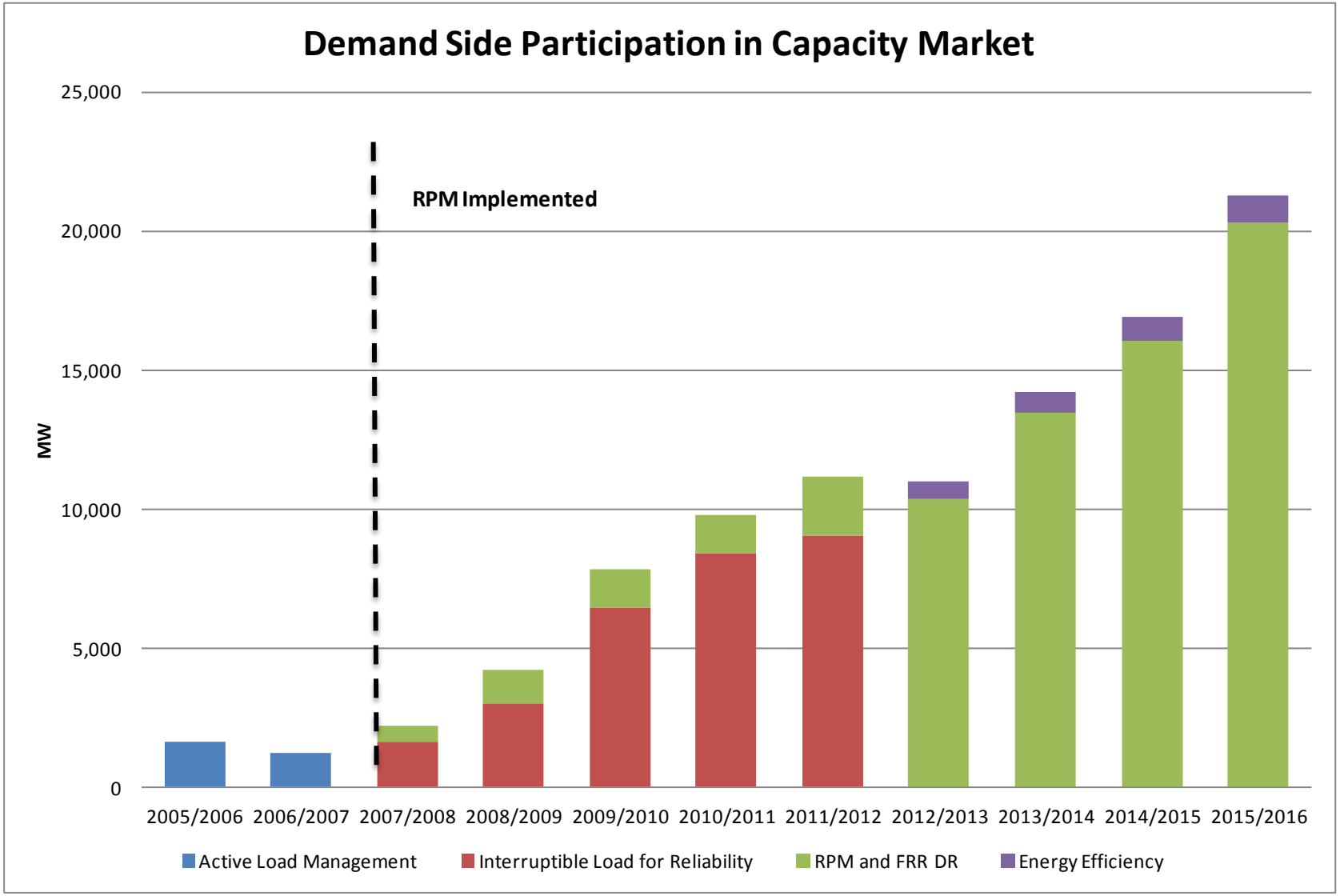
2015/2016 RPM Base Residual Auction Results

Table 3C – Comparison of Demand Resources and Energy Efficiency Resources Offered versus Cleared in the 2015/16 BRA represented in UCAP

		Offered MW*			Cleared MW*		
LDA	Zone	Demand	EE	Total	Demand	EE	Total
EMAAC	AECO	249.2	1.6	**250.8**	207.9	1.2	**209.1**
EMAAC/DPL-S	DPL	524.3	16.2	**540.5**	433.5	15.5	**449.0**
EMAAC	JCPL	524.0	-	**524.0**	350.2	-	**350.2**
EMAAC	PECO	1,458.1	20.8	**1,478.9**	801.8	14.8	**816.6**
PSEG/PS-N	PSEG	1,081.9	11.9	**1,093.8**	796.1	10.7	**806.8**
EMAAC	RECO	37.4	-	**37.4**	20.9	-	**20.9**
EMAAC Sub Total		**3,874.9**	**50.5**	**3,925.4**	**2,610.4**	**42.2**	**2,652.6**
PEPCO	PEPCO	966.4	56.2	**1,022.6**	867.4	55.8	**923.2**
SWMAAC	BGE	1,328.8	103.6	**1,432.4**	1,141.7	103.6	**1,245.3**
MAAC	METED	472.2	4.1	**476.3**	348.6	3.4	**352.0**
MAAC	PENELEC	710.7	4.1	**714.8**	525.6	3.4	**529.0**
MAAC	PPL	1,810.3	18.7	**1,829.0**	1,155.0	14.2	**1,169.2**
MAAC Sub Total**		**9,163.3**	**237.2**	**9,400.5**	**6,648.7**	**222.6**	**6,871.3**
RTO	AEP	2,175.6	213.9	**2,389.5**	1,684.4	213.9	**1,898.3**
RTO	APS	1,175.1	0.8	**1,175.9**	935.5	0.8	**936.3**
ATSI	ATSI	2,038.5	48.1	**2,086.6**	1,763.7	44.9	**1,808.6**
RTO	COMED	2,765.9	422.4	**3,188.3**	1,698.2	422.4	**2,120.6**
RTO	DAY	324.8	2.0	**326.8**	196.9	2.0	**198.9**
RTO	DEOK	358.8	4.6	**363.4**	278.9	4.6	**283.5**
RTO	DOM	1,653.1	7.2	**1,660.3**	1,381.8	7.2	**1,389.0**
RTO	DUQ	301.2	4.1	**305.3**	244.7	4.1	**248.8**
Grand Total		**19,956.3**	**940.3**	**20,896.6**	**14,832.8**	**922.5**	**15,755.3**

*All MW values are expressed in UCAP
**MAAC sub-total includes all MAAC Zones

Figure 1 – Demand Side Participation in the PJM Capacity Market



Renewable Resource Participation

796.3 MW of wind resources were offered into and cleared the 2015/2016 Base Residual Auction. The capacity factor applied to wind resources is 13%, meaning that for every 100 MW of wind energy, 13 MW are eligible to meet capacity requirements. The 796.3 MW of cleared wind capacity translates to 6,125 MW of wind energy that is expected to be available in the 2015/2016 Delivery Year.

56.2 MW of solar resources were offered into and cleared the 2015/2016 Base Residual Auction. The capacity factor applied to solar resources is 38%, meaning that for every 100 MW of solar energy, 38 MW are eligible to meet capacity requirements. The 56.2 MW of cleared solar capacity translates to 147.8 MW of solar energy that is expected to be available in the 2015/2016 Delivery Year.

LDA Results

An LDA was modeled in the Base Residual Auction and had a separate VRR Curve if (1) the LDA has a CETO/CETL margin that is less than 115%; or (2) the LDA had a locational price adder in any of the three immediately preceding Base Residual Auctions; or (3) the LDA is likely to have a locational price adder based on a PJM analysis using historic offer price levels; or (4) the LDA is EMAAC, SWMAAC, and MAAC.

As a result of the above criteria, MAAC, EMAAC, SWMAAC, PSEG, PS-NORTH, DPL-SOUTH, PEPCO and ATSI were modeled as LDAs in the 2015/2016 RPM Base Residual Auction; however, only the MAAC and ATSI LDAs were binding constraints resulting in a Locational Price Adder for these LDAs. A Locational Price Adder represents the difference in Resource Clearing Prices for the Limited capacity product between a resource in a constrained LDA and the immediate higher level LDA.

2015/2016 RPM Base Residual Auction Results

Table 4 contains a summary of the clearing results in the LDAs from the 2015/2016 RPM Base Residual Auction.

Table 4 –RPM Base Residual Auction Clearing Results in the LDAs

Auction Results	RTO	MAAC	SWMAAC	PEPCO	EMAAC	DPL-SOUTH	PSEG	PS-NORTH	ATSI
Offered MW (UCAP)	178,587.7	74,260.5	12,721.9	6,235.1	37,226.4	1,767.7	8,964.1	4,930.5	11,777.1
Cleared MW (UCAP)	164,561.2	65,790.4	10,999.8	6,135.7	33,047.7	1,722.1	6,729.8	3,641.2	10,667.6
System Marginal Price	$118.54	$118.54	$118.54	$118.54	$118.54	$118.54	$118.54	$118.54	$118.54
Locational Price Adder*	$0.00	$31.46	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$186.08
Extended Summer Price Adder**	$17.46	$17.46	$17.46	$17.46	$17.46	$17.46	$17.46	$17.46	$17.46
Annual Price Adder	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$34.92
Resource Clearing Price for Limited Resources	$118.54	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$150.00	$304.62
Resource Clearing Price for Extended Summer Resources	$136.00	$167.46	$167.46	$167.46	$167.46	$167.46	$167.46	$167.46	$322.08
Resource Clearing Price for Annual Resources	$136.00	$167.46	$167.46	$167.46	$167.46	$167.46	$167.46	$167.46	$357.00

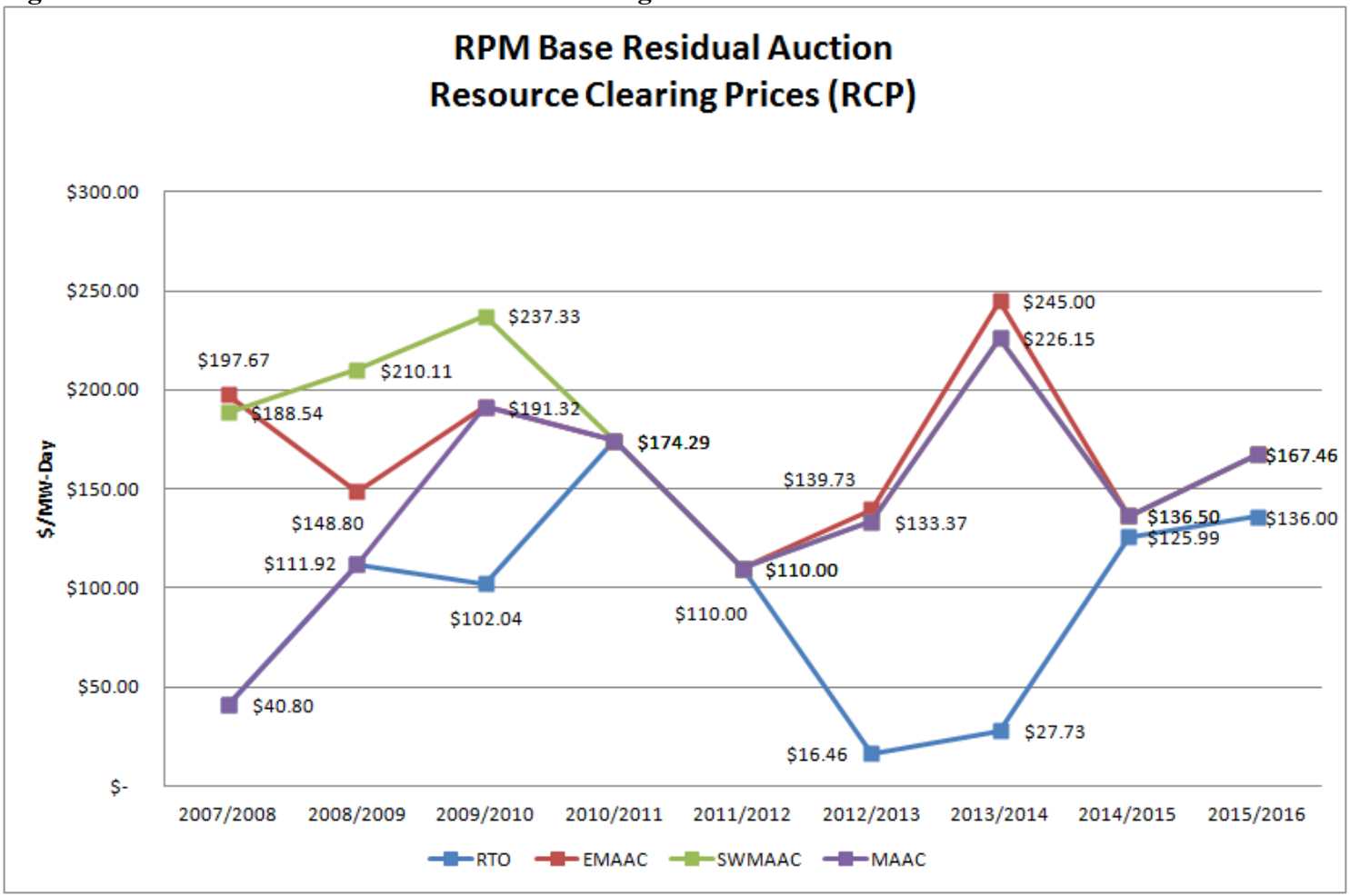
*Locational Price Adder is with respect to the immediate parent LDA

**Annual Resources and Extended Summer DR receive the Extended Summer Price Adder

Since the MAAC and ATSI were constrained LDAs, Capacity Transfer Rights (CTRs) will be allocated to loads in the constrained LDAs for the 2015/2016 Delivery Year. CTRs are allocated by load ratio share to all Load Serving Entities (LSEs) in a constrained LDA that has a higher clearing price than the unconstrained region. CTRs serve as a credit back to the LSEs in the constrained LDA for use of the transmission system to import less expensive capacity into that constrained LDA and are valued at the difference in the clearing prices of the constrained and unconstrained regions.

2015/2016 RPM Base Residual Auction Results

Figure 2 – Base Residual Auction Resource Clearing Prices



* RTO and MAAC Resource Clearing Prices for the 2007/2008, 2008/2009, 2010/2011, and 2011/2012 BRA are equal.
**EMMAC and MAAC Resource Clearing Prices for the 2009/2010, and 2010/2011, and 2011/2012, 2015/2016 BRA are equal.
**SWMAAC and MAAC Resource Clearing Prices for the 2010/2011, 2011/2012, and 2012/2013, 2015/2016 BRA are equal.
***2014/2015 and 2015/2016 Prices reflect the Annual Resource Clearing Prices

Table 5 contains a summary of the offer and resultant data in the RTO for each cleared Base Residual Auction from 2008/09 through the 2015/2016 Delivery Years. The summary includes all resources located in the RTO (including all LDAs within the RTO) and notes the capacity located outside the PJM footprint that was offered into the auction.

Table 5 –RPM Base Residual Auction Generation, Demand, and Energy Efficiency Resource Information in the RTO

	RTO[1]							
Auction Supply (all values in ICAP)	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2012[2]**	**2012/2013**	**2013/20143**	**2014/2015[4]**	**2015/2016**
Internal PJM Capacity	166,037.9	167,026.3	168,457.3	169,241.6	179,791.2	195,633.4	199,375.5	207,559.1
Imports Offered	2,612.0	2,563.2	2,982.4	6,814.2	4,152.4	4,766.1	4,299.4	4,649.7
Total Eligible RPM Capacity	**168,649.9**	**169,589.5**	**171,439.7**	**176,055.8**	**183,943.6**	**200,399.5**	**203,674.9**	**212,208.8**
Exports / Delistings	4,205.8	2,240.9	3,378.2	3,389.2	2,783.9	2,624.5	1,230.1	1,218.8
FRR Commitments	24,953.5	25,316.2	26,305.7	25,921.2	26,302.1	25,793.1	33,612.7	15,997.9
Excused	722.0	1,121.9	1,290.7	1,580.0	1,732.2	1,825.7	3,255.2	8,712.9
Total Eligible RPM Capacity - Excused	**29,881.3**	**28,679.0**	**30,974.6**	**30,890.4**	**30,818.2**	**30,243.3**	**38,098.0**	**25,929.6**
Remaining Eligible RPM Capacity	**138,768.6**	**140,910.5**	**140,465.1**	**145,165.4**	**153,125.4**	**170,156.2**	**168,897.7**	**186,279.2**
Generation Offered	138,076.7	140,003.6	139,529.5	143,568.1	142,957.7	156,894.1	153,048.1	166,127.8
DR Offered	691.9	906.9	935.6	1,597.3	9,535.4	12,528.7	15,043.1	19,243.6
EE Offered	0.0	0.0	0.0	0.0	632.3	733.4	806.5	907.8
Total Eligible RPM Capacity Offered	**138,768.6**	**140,910.5**	**140,465.1**	**145,165.4**	**153,125.4**	**170,156.2**	**168,897.7**	**186,279.2**
Total Eligible RPM Capacity Unoffered	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

[1]RTO numbers include all LDAs.

[2]All generation in the Duquesne zone is considered external to PJM for the 2011/2012 BRA.

[3]2013/2014 includes ATSI zone and generation

[4]2014/2015 includes Duke zone and generation

2015/2016 RPM Base Residual Auction Results

A total of 212,208.8 MW of installed capacity was eligible to be offered into the 2015/2016 Base Residual Auction. Of this eligible amount, 4,649.7 MW were from external resources that had fulfilled the eligibility requirements to be considered a PJM Capacity Resource. A portion of the external resource total was included in FRR Capacity Plans, and the remainder was offered into the auction. As illustrated in *Table 4*, the amount of capacity exports decreased in the 2015/2016 auction compared to the previous auction. FRR commitments decreased by 17,614.8 MW from the 2014/2015 Delivery Year due to load located in the AEP and DEOK zones which used the FRR Alternative in 2014/2015 but elected to move into RPM with the 2015/2016 BRA.

A total of 186,279.2 MW of installed capacity was offered into the Base Residual Auction. This is an increase of 17,381.5 MW from that which was offered into the 2014/2015 BRA. A total of 8,712.9 MW was eligible, but not offered due to either (1) inclusion in an FRR Capacity Plan, (2) export of the resource, or (3) having been excused from offering into the auction. Resources were excused from the must offer requirement for the following reasons: environmental restrictions, approved retirement requests not yet reflected in eRPM, and excess capacity owned by an FRR entity.

Participants' sell offer EFORd values were used to translate the generation installed capacity values into unforced capacity (UCAP) values. Demand resource (DR) sell offers and energy efficiency resource (EE) sell offers were converted into UCAP using the appropriate Demand Resource (DR) Factor and Forecast Pool Requirement (FPR) for the delivery year. In UCAP, a total of 178,587.7 MW were offered into the 2015/2016 Base Residual Action, comprised of 157,691.1 MW of generation capacity, 19,956.3 MW of capacity from demand resources, and 940.3 MW of capacity from energy efficiency resources. Of those offered, a total of 164,561.2 MW of capacity was cleared in the auction.

Of the 164,561.2 MW of capacity that cleared in the auction, 148,805.9 MW were from generation capacity, 14,832.8 MW were from demand resources, and 922.5 MW were from energy efficiency resources. Capacity that was offered but not cleared in the Base Residual Auction will be eligible to offer into the First, Second and Third Incremental Auctions for the 2015/2016 Delivery Year.

Table 6 illustrates the Generation, Demand Resources, and Energy Efficiency Resources Offered and Cleared in the RTO translated into Unforced Capacity MW amounts.

Table 6 – Generation, Demand Resources, and Energy Efficiency Resources Offered and Cleared Represented in Unforced Capacity MW

	RTO*							
Auction Results (all values in UCAP)**	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2012**	**2012/2013**	**2013/2014**	**2014/2015**	**2015/2016**
Generation Offered	131,164.8	132,614.2	132,124.8	136,067.9	134,873.0	147,188.6	144,108.8	157,691.1
DR Offered	715.8	936.8	967.9	1,652.4	9,847.6	12,952.7	15,545.6	19,956.3
EE Offered	-	-	-	-	652.7	756.8	831.9	940.3
Total Offered	**131,880.6**	**133,551.0**	**133,092.7**	**137,720.3**	**145,373.3**	**160,898.1**	**160,486.3**	**178,587.7**
Generation Cleared	129,061.4	131,338.9	131,251.5	130,856.6	128,527.4	142,782.0	135,034.2	148,805.9
DR Cleared	536.2	892.9	939.0	1,364.9	7,047.2	9,281.9	14,118.4	14,832.8
EE Cleared	0.0	0.0	0.0	0.0	568.9	679.4	822.1	922.5
Total Cleared	**129,597.6**	**132,231.8**	**132,190.5**	**132,221.5**	**136,143.5**	**152,743.3**	**149,974.7**	**164,561.2**
Uncleared	2,283.0	1,319.2	902.2	5,498.8	9,229.8	8,154.8	10,511.6	14,026.5

* RTO numbers include all LDAs

** UCAP calculated using sell offer EFORd for Generation Resources. DR and EE UCAP values include appropriate FPR and DR Factor.

Table 7 contains a summary of capacity additions and reductions from the 2007/2008 Base Residual Auction to the 2015/2016 Base Residual Auction. A total of 11,858.8 MW of incrementally new capacity in PJM was available for the 2015/2016 Base Residual Auction. This incrementally new capacity includes new generation capacity resources, capacity upgrades to existing generation capacity resources, new demand resources, upgrades to existing demand resources, and new energy efficiency resources. The increase is partially offset by generation capacity derations to existing generation capacity resources to yield a net increase of 5,426.2 MW of installed capacity.

Table 7 also illustrates the total amount of resource additions and reductions over nine Delivery Years since the implementation of the RPM construct. Over the period covering the first nine RPM Base Residual Auctions, 20,721.8 MW of new generation capacity was added which was partially offset by 15,327.4 MW of capacity de-ratings or retirements over the same period. Additionally, 19,681.4 MW of new demand resources and 907.8 MW of new energy efficiency resources were offered in the 2015/2016 auction. The total net increase in installed capacity in PJM over the period of the last seven RPM auctions was 25,983.6 MW.

2015/2016 RPM Base Residual Auction Results

Table 7 – Incremental Capacity Resource Additions and Reductions to Date

	RTO*									
Capacity Changes (in ICAP)	**2007/2008**	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2012**	**2012/2013**	**2013/2014*** **	**2014/2015+**	**2015/2016**	**Total**
Increase in Generation Capacity	602.0	724.2	1,272.3	1,776.2	3,576.3	1,893.5	1,737.5	1,582.8	8,207.0	21,371.8
Decrease in Generation Capacity	-674.6	-375.4	-550.2	-301.8	-264.7	-3,253.9	-1,924.1	-1,550.1	-6,432.6	-15,327.4
Net Increase in Demand Resource Capacity**	555.0	574.7	215.0	28.7	661.7	7,938.1	2,993.3	2,514.4	4,200.5	19,681.4
Net Increase in Energy Efficiency Capacity**	0	0	0	0	0	632.3	101.1	73.1	101.3	907.8
Net Increase in Installed Capacity	**482.4**	**923.5**	**937.1**	**1503.1**	**3973.3**	**7,210.00**	**2,907.80**	**2,620.20**	**6,076.20**	**26,633.6**

* RTO numbers include all LDAs

** Values are w ith respect to the quantity offered in the previous year's Base Residual Auction.

***Does not include Existing Generation located in ATSI Zone

+Does not include Existing Generation located in Duke Zone

Table 7A provides a further breakdown of the generation increases and decreases for the 2015/2016 Delivery Year on an LDA basis.

Table 7A – Generation Increases and Decreases by LDA Effective 2015/2016 Delivery Year

LDA Name	Increase	Decrease
EMAAC	3528.5	-346.5
MAAC	4576.2	-861.3
Total RTO	8207	-6432.6

**All Values in ICAP terms
*MAAC includes EMAAC
**RTO includes MAAC

Table 7B provides a further breakdown of the new capacity offered and cleared in the 2015/2016 Base Residual Auction in UCAP terms.

Table 7B – New Generation Capacity in the 2015/2016 BRA

	Offered			Cleared		
LDA	Uprate	New Unit	Total	Uprate	New Unit	Total
EMAAC	180.7	3,145.9	**3,326.6**	164.9	2,313.5	**2,478.4**
MAAC	220.7	4,105.5	**4,326.2**	189.5	2,990.7	**3,180.2**
Total RTO	478.6	6,843.7	**7,322.3**	447.4	4,898.9	**5,346.3**

*All MW Values are in UCAP Terms
*MAAC includes EMAAC
**RTO includes MAAC

Table 8 provides a further breakdown of the new capacity offered into the each BRA into the categories of new resources, reactivated units, and uprates to existing capacity, and then further down into resource type. As shown in this table, there was an increase in the amount of generating capacity from new resources offered into the 2015/2016 BRA in comparison with the 2014/15 BRA. The capacity offered in the 2015/2016 BRA resulted from both new generating resources and uprates to existing resources including gas,

diesel, coal, wind, and nuclear resources. While the largest growth remains in gas turbines and combined cycle plants, a fair amount of incremental capacity in Steam (coal) and Nuclear was offered into the recent auctions.

Figure 3 provides an illustration of the cumulative increase in new generation capacity by fuel type since the inception of RPM (June 1, 2007).

Table 8 – Further Breakdown of Incremental Capacity Resource Additions from 2007/2008 to 2015/16

	Delivery Year	CT/GT	Combined Cycle	Diesel	Hydro	Steam	Nuclear	Solar	Wind	Fuel Cell	Total
New Capacity Units (ICAP MW)	2007/2008			18.7	0.3						19.0
	2008/2009			27.0					66.1		93.1
	2009/2010	399.5		23.8		53.0					476.3
	2010/2011	283.3	580.0	23.0					141.4		1,027.7
	2011/2012	416.4	1,135.0			704.8		1.1	75.2		2,332.5
	2012/2013	403.8		7.8		621.3			75.1		1,108.0
	2013/2014	329.0	705.0	6.0		25.0		9.5	245.7		1,320.2
	2014/2015	108.0	650.0	35.1	132.9			28.0	146.6		1,100.6
	2015/2016	1,382.5	5,914.5	19.4	148.4	45.4		13.8	104.9	30.0	7,658.9
Capacity from Reactivated Units (ICAP MW)	2007/2008					47.0					47.0
	2008/2009					131.0					131.0
	2009/2010										-
	2010/2011	160.0		10.7							170.7
	2011/2012	80.0				101.0					181.0
	2012/2013										-
	2013/2014										-
	2014/2015			9.0							9.0
	2015/2016										
Uprates to Existing Capacity Resources (ICAP MW)	2007/2008	114.5		13.9	80.0	235.6	92.0				536.0
	2008/2009	108.2	34.0	18.0	105.5	196.0	38.4				500.1
	2009/2010	152.2	206.0		162.5	61.4	197.4		16.5		796.0
	2010/2011	117.3	163.0		48.0	89.2	160.3				577.8
	2011/2012	369.2	148.6	57.4		186.8	292.1		8.7		1,062.8
	2012/2013	231.2	164.3	14.2		193.0	126.0		56.8		785.5
	2013/2014	56.4	59.0	0.3		215.0	47.0		39.6		417.3
	2014/2015	104.9		0.5	41.5	138.6	107.0	7.1	73.6		473.2
	2015/2016	216.8	72.0	4.7	15.7	63.4	149.2	2.2	24.1		548.1
	Total	5,033.2	9,831.4	289.5	734.8	3,107.5	1,209.4	61.7	1,074.3	30.0	21,371.8

Figure 3: Cumulative Generation Capacity Increases by Fuel Type

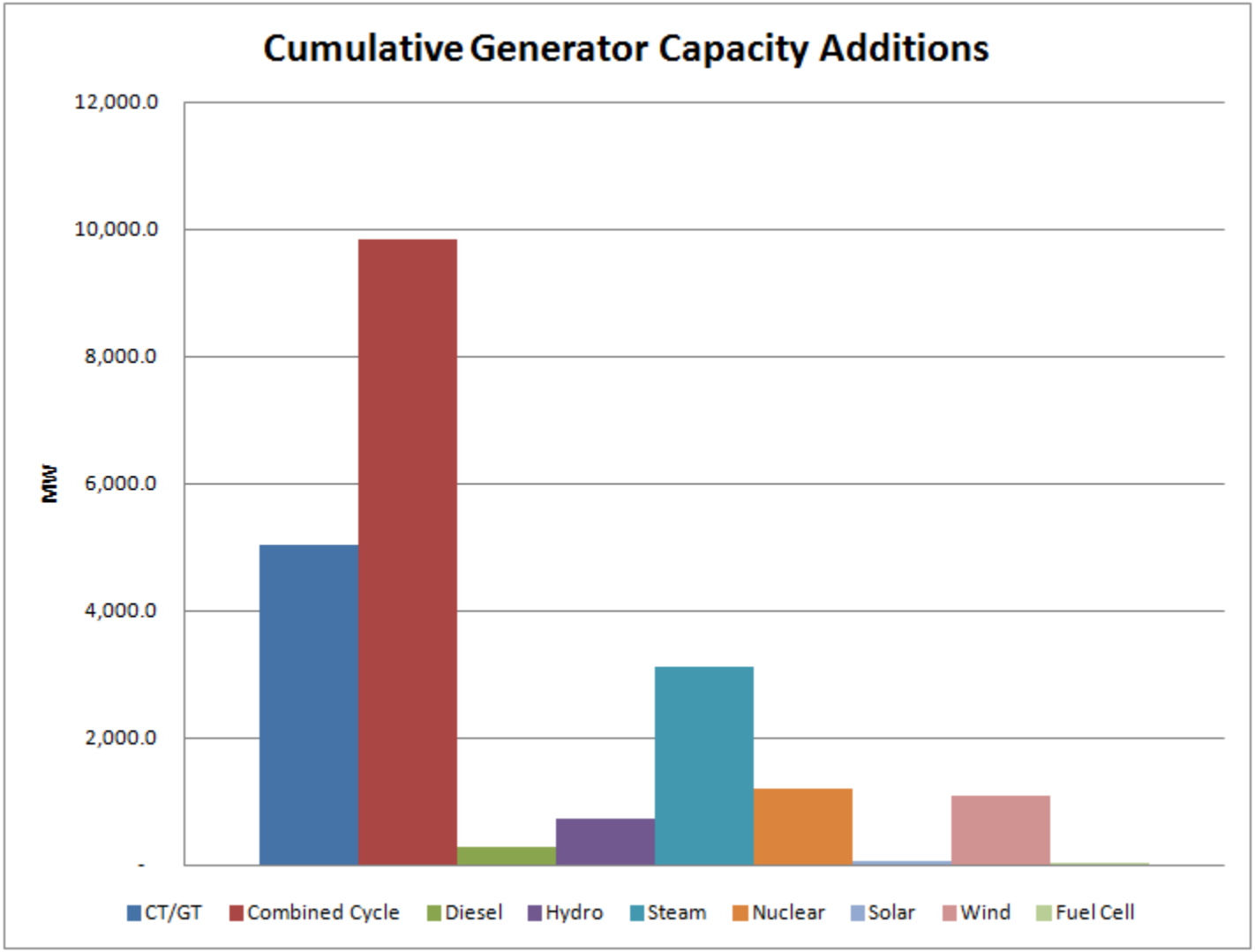


Table 9 shows the changes that have occurred regarding resource deactivation and retirement since the RPM was approved by FERC. The MW values illustrated in *Table 9* represent the quantity of unforced capacity cleared in 2015/2016 Base Residual Auction that came from resources that have either withdrawn their request to deactivate, postponed retirement, or been reactivated (i.e., came out of retirement or mothball state for the RPM auctions) since the RPM Settlement. This total accounts for 3,825.4 MW of cleared UCAP in the 2015/2016 BRA which equates to 5,169.6 MW of ICAP Offered.

Table 9 – Changes to Generation Retirement Decisions Since RPM Approval

	RTO*	
Generation Resource Decision Changes	ICAP Offered	UCAP Cleared
Withdrawn Deactivation Requests	1859.7	1097.8
Postponed or Cancelled Retirement	3027.9	2459.8
Reactivation	282.0	267.8
Total	**5169.6**	**3825.4**

RPM Impact To Date

As illustrated in *Table 4*, for the 2015/2016 auction, the capacity exports were 1218.9 MW and the capacity imports were 4,649.7 MW. The difference between the capacity imports and exports results is a net capacity import of 3,430.9 MW.

In the planning year preceding the RPM auction implementation, 2006/2007, there was a net capacity export of 2,616.0 MW. In this auction, PJM is now a net importer of 3,430.9 MW. Therefore RPM's impact on PJM capacity interchange is 6,047 MW.

The minimum net impact of the RPM implementation on the availability of Installed Capacity resources for the 2015/2016 planning year can be estimated by adding the net change in capacity imports and exports over the period, the forward demand and energy efficiency resources, the increase in Installed Capacity over the RPM implementation period from *Table 8* and the net change generation retirements from *Table 9*. Therefore, as illustrated in Table 10, the minimum estimated net impact of the RPM implementation on the availability of capacity in the 2015/2016 compared to what would have happened absent this implementation is 52,181.4 MW.

Table 10 shows the details on RPM's impact to date in ICAP terms.

Table 10 – RPM's Impact to Date

Change in Capacity Availability	Installed Capacity MW
New Generation	15,136.3
Generation Upgrades (not including reactivations)	5,696.8
Generation Reactivation	538.7
Forward Demand and Energy Efficiency Resources	20,589.2
Cleared ICAP from Withdrawn or Canceled Retirements	4,173.5
Net increase in Capacity Imports	6,046.9
Total Impact on Capacity Availability in 2015/2016 Delivery Year	**52,181.4**

Discussion of Factors Impacting the RPM Clearing Prices

The main factors impacting 2015/2016 RPM BRA clearing prices relative to 2014/2015 BRA clearing prices are provided below separated out by significant changes to the market design and effects on the demand-side and supply-side of the market. An overriding theme of these effects is that there are many different effects and they often are offset by other market fundamentals such that there was not a large change but for the ATSI LDA.

Significant Changes to RPM Design for the 2015/2016 Base Residual Auction

FERC approved in its January 30, 2012 Order in ER12-513 on PJM's filing for tariff changes stemming from the Brattle Group's RPM Performance Assessment, PJM's proposal to maintain the Short-term Resource Procurement Target (STRPT aka 2.5% holdback) but modify how the Minimum Annual and Extended Summer Resource Requirements would be reflected in the BRA. The change provides for the minimum resource requirements to be met in total through the BRA while maintaining the overall 2.5% holdback. This change increases the minimum requirements to be purchased in the BRA by 2.5% relative to the minimum requirements in place for the 2014/2015 BRA. The Minimum Annual Resource Requirement is the minimum amount of capacity sought to be procured in each auction from Annual Resources (Annual Resources include generation capacity resources, energy efficiency resources and annual demand resources). The Minimum Extended Summer Resource Requirement is the minimum amount of capacity sought to be procured in each auction from Extended Summer Demand Resources and Annual Resources.

On November 17, 2011 FERC approved PJM's May 12, 2011 compliance filing in ER11-2875 that set forth the procedures and the criteria by which Planned Generation Capacity Resources could seek an exception from the Minimum Offer Price Rule (MOPR) from the Independent Market Monitor and PJM. A potential new entrant can seek an exception by demonstrating lower costs or higher expected revenues resulting in a lower Net CONE value than is indicated by a 90% Net Asset Class CONE value threshold for combustion turbines and combined cycle gas facilities. This is the second BRA for which the revised MOPR has been in place, but the first with the articulated guidance approved by the Commission in the PJM tariff.

Changes that impacted the Demand Curve:

- Lower reliability requirements due to lower forecasted load. The RTO reliability requirement was 177,184 MW or just over 900 MW lower than the forecast reliability requirement of178,086 MW for the 2014/2015 BRA. The slightly lower reliability requirement has the effect of reducing demand, and all else equal would reduce clearing prices.
- The Fixed Resource Requirement (FRR) obligation for the 2015/2016 Delivery Year is just over 50 percent less at 14,406 MW than it was in 2014/2015 at 29,763 MW due to the election by AEP Ohio load and Duke Ohio load to participate in the BRA. The effect of this is to increase demand, and all else equal increase clearing prices.
- As approved by FERC in January, the manner in which the Short-term Resource Procurement Target (STRPT or aka 2.5% holdback) and Minimum Annual and Extended Summer Requirements are expressed leaves the STRPT in place, but requires the Minimum Annual and Minimum Extended Summer Requirements be procured in the BRA. This has the effect of increasing the demand for Annual and Extended Summer Resources which should, all else equal, increase the prices for these resources in the BRA.
- The Net Cost of New Entry (CONE) values that serve as the basis for price on the RTO and LDA demand curves increased by 7.6% (for the RTO) and by 5.3% to 6.5% (depending on the LDA) over the 2013/2014 values.[1] These changes are due to a 4.9% increase in the gross CONE coupled with updated Energy & Ancillary Services (E&AS) offset values. The Gross CONE value used in the BRA for the prior delivery year (2013/2014 DY) was adjusted using the most recently published twelve-month change in Total Other Plant Production Plant Index shown in the Handy Whitman (HWI) of Public Utility Construction Costs.

Changes that impacted the Supply Curve:

- There are over 14,000 MW of generation retirements pending by the beginning of the 2015/2016 Delivery Year. However, many of these units submitting retirement notices were not committed as Capacity Resources in the 2014/2015 Delivery Year, so while the unprecedented level of unit retirements has the effect, all else equal, of placing upward pressure on prices, the effect is likely muted by the fact many of the units retiring were not needed as capacity resources in the previous BRA.

- Supply resources in the DEOK and AEP Zones that were once committed to FRR load in these zones, and not slated for retirement, were included in the RTO supply curve for 2015/2016. This has the effect of increasing supply by 10,872 MW and

[1] Refer to 2015/2016 RPM BRA Planning Period Parameters Report

does offset to some extent the effect of increased demand in the BRA from load that has switched from FRR to participating in the BRA.

- The 2015/2016 BRA attracted nearly 5000 MW of additional Demand Resources of various types and Energy Efficiency from 15,779 MW in the 2014/2015 BRA to 20,896 MW in the 2015/2016 BRA. The increasing depth of the supply pool has the effect, all else being equal, of placing downward pressure on prices.

- The 2015/2016 BRA attracted 7,557 MW of new generation capacity in the form of new facilities and uprates at existing facilities. If all Planned Generation Capacity Resources are included this figure increases to about 8,200 MW. Again, the deepened pool of supply has the effect of putting downward pressure on clearing prices, but this effect is attenuated by the presence of the Minimum Offer Price Rule (MOPR) which requires new resource to offer at a floor price that is specific to a particular CONE Area if the resource is in a constrained LDA or to seek an exception with the Independent Market Monitor and PJM.

- The Avoidable Cost Rate (ACR) default values used a Handy-Whitman indexing method such that the 2015/2016 Delivery Year default ACR data was increased based on the ten-year annual average rate of change in the applicable Handy-Whitman Index of Public Utility Costs. The default ACR values are the default offer caps that suppliers may elect to use in the event the Market Structure Test is failed and the supplier chooses not to calculate a unit-specific ACR data. The offer caps are calculated as the ACR less net revenues. Participants may choose either the technology specific default rate or to calculate their own based on unit-specific data. All else equal, the increase in the ACR values increases the cost of supply and would lead to increasing prices.

- On February 16, 2012, the U.S. Environmental Protection Agency (EPA) published its final Mercury and Air Toxics Standard (MATS) in the Federal Register with the effective date to be 60 days after the publication, or April 16, 2012. Coal and Oil steam generators subject to the rule must comply by April 16, 2015, or just prior to the 2015/2016 Delivery Year. Compliance options include retirements (already mentioned above) or the installation of control technologies to achieve the emissions rate standard. In New Jersey, the so-called High Electricity Demand Day (HEDD) rule that institutes a NOx emission rate standard on intermediate and peaking units in the state goes into effect on May 1, 2015. And like the MATS rule, complainec requires either retirement or the installation of of control technologies to achieve the standard. The cost of such investment, if adequately supported and documented, could be included in the ACR cost calculations applicable to the 2015/2016 BRA for resources impacted by the rule. The impact of this would be to increase clearing prices, all other things being equal.

- Expected net energy market revenues which would go toward offsetting high retrofit costs for the purposes of calculating Market Seller Offer Caps were lower for many of the units offering in environmental retrofits based on the historic revenues from 2009-2011. This has the effect of raising the level of the offer caps used in market power mitigation and, all else equal, places upward pressure on prices.

Overall Effects on Market Outcomes:

There are many changes in both the supply and demand curves for the 2015/2016 BRA that have offsetting effects. For example, the reduced pool of generation supply from retirements and increasing costs due to environmental retrofits were in large measure offset by the slightly lower demand, and deeper pool of supply coming from additional demand-side resources and generation supply which have resulted in slightly higher prices in the RTO for Annual Resources, increasing from $125.99/MW-day to $136.00/MW-day and in MAAC increasing from $136.50/MW-day to $167.46/MW-day. The only outlier is the ATSI LDA which experienced a large concentration of generator retirements and resulting transmission constraints with relatively little lead time for new resources to make entry decisions coupled with the need for retrofits at existing coal units resulting in much higher prices than last year. ATSI cleared with the RTO last year at $125.99/MW-day but Annual Resources this year cleared at $357.00/MW-day.

Another effect seen in the 2015/2016 BRA was the increased capacity transfer limits due to addition of transmission upgrades especially in PSEG which did not separate from the rest of EMAAC or MAAC as had been the case in previous auctions. In the 2014/2015 BRA PS-North cleared Annual Resources at $225.00/MW-day, but with increase transfer capability, PS-North cleared with the rest of MAAC at $167.46/MW-day.