2013/2014 RPM Base Residual Auction Results

Executive Summary

The 2013/2014 Reliability Pricing Model (RPM) Base Residual Auction (BRA) cleared 152,743.3 MW of unforced capacity in the RTO at a Resource Clearing Price of $27.73/MW-day. This MW and price quantity pair on the RTO Variable Resource Requirement curve represents a 20.3% reserve margin; however when the Fixed Resource Requirement (FRR) load is considered the actual reserve margin for the entire RTO is 20.2%. The $27.73/MW-day RTO resource clearing price represents an increase of $11.27/MW-day from the 2012/2013 BRA.

A total of 4,831.9 MW of incrementally new capacity in PJM was available for the 2013/2014 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 over 2,907.8 MW of installed capacity.

The total quantity of Demand Resources offered into the 2013/2014 BRA was 12,952.7 MW (UCAP) which represents an increase of 3,105.1 MW (32%) over the Demand Resources that offered into the 2012/2013 BRA. Approximately 72% (9,281.9 MW) of these Demand Resources cleared in the auction. Part of this increase (1,384.8 MW) occurred in the new ATSI transmission zone that is participating for the first time in the Base Residual auction due to the ATSI integration. The remaining 1,720.3 MW increase was in the remaining zones of the market. The majority of the increased participation by demand response was driven by the forward capacity market incentives.

The total quantity of Energy Efficiency (EE) Resources offered into the 2013/2014 BRA was 756.8 MW (UCAP) which represents an increase of 33% over the EE Resources that offered into the 2012/2013 BRA. Approximately 90% (679.4 MW) of these EE Resources cleared in the auction.

MAAC, EMAAC, SWMAAC, PSEG, PSEG-North, DPL-South, and PEPCO were modeled as Locational Deliverability Areas (LDAs) in the 2013/14 RPM Base Residual Auction; however, only MAAC, EMAAC, and PEPCO were binding constraints that resulted in Locational Price Adders. The Resource Clearing Prices for resources cleared in MAAC, EMAAC, and PEPCO are $226.15/ MW-day, $245.00/MW-day, and $247.14/MW-day, respectively. The MAAC and EMAAC prices increased by $92.78/MW-day and $105.27/MW-day, respectively compared to the 2012/2013 BRA. These price increases were caused primarily by the reduced capacity transfer margin into these regions and to a lesser extent by the increases in the net Cost of New Entry. The

factors that resulted in the reduced capacity transfer margins are detailed in the Planning Period Parameter report that was posted on March 12, 2010.[1]

All existing generation sell offers into the 2013/2014 Base Residual Auction were subject to market power mitigation through the application of the Market Structure Test (i.e., the Three-Pivotal Supplier Test). Suppliers in all LDAs, including 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.

A further discussion of the 2013/2014 Base Residual Auction results and additional information regarding the 2013/2014 Reliability Pricing Model (RPM) Base Residual Auction results are detailed in the body of this report. The discussion also provides a comparison of the 2013/2014 auction results to the results from the 2007/2008 through 2012/2013 RPM auctions.

[1] Link to the report is : http://www.pjm.com/markets-and-operations/rpm/~/media/markets-ops/rpm/rpm-auction-info/planning-period-parameters-report.ashx

2013/2014 RPM Base Residual Auction Results

2013/2014 Base Residual Auction Results Discussion

Table 1 contains a summary of the RTO clearing prices resulting from the 2013/2014 RPM Base Residual Auction in comparison to those from 2007/2008 through 2012/2013 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**
Resource Clearing Prices	$40.80	$111.92	$102.04	$174.29	$110.00	$16.46	$27.73
Cleared UCAP (MW)	129,409.2	129,597.6	132,231.8	132,190.4	132,221.5	136,143.5	152,743.3
Reserve Margin	19.2%	17.5%	17.8%	16.5%	18.1%	20.9%	20.2%

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

**2013/2014 BRA includes ATSI zone load

The Resource Clearing Price is the marginal clearing price that will be paid to each cleared Capacity Resource in dollars per MW-day. The cleared UCAP is the amount of unforced capacity that was procured in the auction to meet the RTO demand for capacity. These two quantities represent the point on the Variable Resource Requirement curve where the RTO cleared for each particular auction. For the 2013/2014 Delivery Year, the point of the Variable Resource Requirement curve where the RTO cleared represents a 20.3% reserve margin; however, when the Fixed Resource Requirement (FRR) load is considered the actual resource margin for the entire RTO is 20.2%. The Reserve Margin presented in Table 1 represents the percentage of installed capacity cleared in excess the RTO load (including load served under the Fixed Resource Requirement alternative).

The 2013/2014 Base Residual Auction results reflect very strong participation by Demand Resources, meaningful participation from Energy Efficiency Resources, and growing development of renewable resources.

Demand Resource Participation

The total quantity of Demand Resources offered into the 2013/2014 BRA, 12,952.7 MW (UCAP), represented an increase of 32% over the Demand Resources that offered into the 2012/2013 BRA. Of the 12,952.7 MW of total demand response that offered in this auction, 9,281.9 MW cleared and will be awarded capacity payments. Of this cleared amount, 5,871.1 MW (63%) was located in the constrained regions. The demand response offered in the EMAAC LDA was 2,461.3 MW which is an increase of 674 MW (37.7%) from last year's auction and the demand response offered in the MAAC LDA was 5,871.1 MW which is an increase of 841.9 MW

(16.7%) from last year's auction. The demand response cleared in EMAAC and MAAC was 2,461.1 MW and 5,871.1 MW respectively which represents increases of 822.9 MW (50.2%) and 1,147.4 MW (24.3%). These results illustrate the increasing investment in demand response in higher price regions where such response is needed.

Existing DR followed a new pre-registration process in order to become eligible for participation in the 2013/2014 Base Residual Auction, and constituted over 58% of the total Demand Resources offered (7,473.4 MW UCAP). The pre-registration process allowed Curtailment Service Providers with Approved Load Response Registrations for the upcoming 2010/2011 Delivery Year to select those sites they expect to contract with for 2013/2014 and therefore register for the 2013/2014 Delivery Year as Existing Demand Resources. The remaining Demand Resources offered into the 2013/2014 BRA (5,479.3 MW UCAP) were comprised of Planned Demand Resources. Planned Demand Resources were required to meet the RPM credit requirements imposed on all new resources.

Table 2A contains a comparison of the Demand Resources Offered and Cleared in 2012/2013 BRA & 2013/2014 BRA represented in UCAP.

2013/2014 RPM Base Residual Auction Results

Table 2A – Comparison of Demand Resources Offered and Cleared in 2012/13 BRA & 2013/14 BRA represented in UCAP

		Offered MW*			Cleared MW*		
Constrained LDA	Zone	2012/2013	2013/2014	Increase in Offered MW	2012/2013	2013/2014	Increase in Cleared MW
EMAAC	AECO	78.9	122.1	**43.2**	75.1	122.1	**47**
EMAAC	DPL	289.6	245.7	**-43.9**	283	245.7	**-37.3**
EMAAC	JCPL	362.7	283.7	**-79**	321.8	283.7	**-38.1**
EMAAC	PECO	581.2	658.2	**77**	496.4	658.2	**161.8**
EMAAC	PSEG	472.9	1,119.2	**646.3**	460.1	1,119.2	**659.1**
EMAAC	RECO	2	32.4	**30.4**	2	32.4	**30.4**
EMAAC Sub Total		**1,787.3**	**2,461.3**	**674**	**1,638.4**	**2,461.3**	**822.9**
PEPCO	PEPCO	485.1	547.3	**62.2**	460.8	547.3	**86.5**
MAAC	BGE	1,370.6	1,102.5	**-268.1**	1,312.9	1,102.5	**-210.4**
MAAC	METED	267.2	318.1	**50.9**	252	318.1	**66.1**
MAAC	PENELEC	286.1	420.7	**134.6**	276.3	420.7	**144.4**
MAAC	PPL	832.9	1,021.2	**188.3**	783.3	1,021.2	**237.9**
MAAC Sub Total**		**5,029.2**	**5,871.1**	**841.9**	**4,723.7**	**5,871.1**	**1,147.4**
RTO	AEP	1,352.7	1,513.1	**160.4**	710.8	823.9	**113.1**
RTO	APS	582.4	721.9	**139.5**	272.9	523.2	**250.3**
RTO	ATSI	-	1,384.8	**1,384.8**	-	394.3	**394.3**
RTO	COMED	1,049	1,521.1	**472.1**	658	851.9	**193.9**
RTO	DAY	405.6	277.1	**-128.5**	112.3	42.5	**-69.8**
RTO	DOM	1,237.9	1,435	**197.1**	494.7	632.7	**138**
RTO	DUQ	190.8	228.6	**37.8**	74.8	142.3	**67.5**
Grand Total		**9,847.6**	**12,952.7**	**3,105.1**	**7,047.2**	**9,281.9**	**2,234.7**

*All MW Values are in UCAP Terms

**MAAC Subtotal includes all MAAC zones

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 756.8 MWs of Energy Efficiency that offered into the 2013/2014 Base Residual Auction, 679.4 MW of EE Resources cleared in the auction and will be awarded capacity payments.

Table 2B contains a summary of the demand resources and energy efficiency resources that offered and cleared by zone in the 2013/2014 Base Residual Auction. Approximately 72% of the Demand Resources and 90% 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 2013/2014 Delivery Year. Demand side participation includes active load management (ALM) prior to 2007/2008 Delivery Year, Interruptible Load for Reliability (ILR) and Demand Resources starting with 2007/2008 Delivery Year, 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.

2013/2014 RPM Base Residual Auction Results

Table 2B – Comparison of Demand Resources and Energy Efficiency Resources Offered versus Cleared in the 2013/14 BRA represented in UCAP

		Offered MW*			Cleared MW*		
Constrained LDA	Zone	Demand	EE	Total	Demand	EE	Total
EMAAC	AECO	122.1	3.1	**125.2**	122.1	3.1	**125.2**
EMAAC	DPL	245.7	3.4	**249.1**	245.7	3.4	**249.1**
EMAAC	JCPL	283.7	4.4	**288.1**	283.7	4.4	**288.1**
EMAAC	PECO	658.2	5.6	**663.8**	658.2	5.6	**663.8**
EMAAC	PSEG	1,119.2	7.4	**1,126.6**	1,119.2	7.4	**1,126.6**
EMAAC	RECO	32.4	0	**32.4**	32.4	0	**32.4**
EMAAC Sub Total		**2,461.3**	**23.9**	**2,485.2**	**2,461.3**	**23.9**	**2,485.2**
PEPCO	PEPCO	547.3	35.8	**583.1**	547.3	35.8	**583.1**
MAAC	BGE	1,102.5	74.8	**1,177.3**	1,102.5	74.8	**1,177.3**
MAAC	METED	318.1	7.2	**325.3**	318.1	7.2	**325.3**
MAAC	PENELEC	420.7	8	**428.7**	420.7	8	**428.7**
MAAC	PPL	1,021.2	2.3	**1,023.5**	1,021.2	2.3	**1,023.5**
MAAC Sub Total**		**5,871.1**	**152**	**6,023.1**	**5,871.1**	**152**	**6,023.1**
RTO	AEP	1,513.1	5.9	**1,519**	823.9	3.8	**827.7**
RTO	APS	721.9	3.7	**725.6**	523.2	2.5	**525.7**
RTO	ATSI	1,384.8	3	**1,387.8**	394.3	3	**397.3**
RTO	COMED	1,521.1	513.7	**2,034.8**	851.9	511.8	**1,363.7**
RTO	DAY	277.1	17.2	**294.3**	42.5	1.1	**43.6**
RTO	DOM	1,435	60.6	**1,495.6**	632.7	4.7	**637.4**
RTO	DUQ	228.6	0.7	**229.3**	142.3	0.5	**142.8**
Grand Total		**1,2952.7**	**756.8**	**13,709.5**	**9,281.9**	**679.4**	**9,961.3**

*All MW Values are in UCAP Terms

**MAAC Subtotal includes all MAAC zones

Figure 1 – Demand Side Participation in the PJM Capacity Market

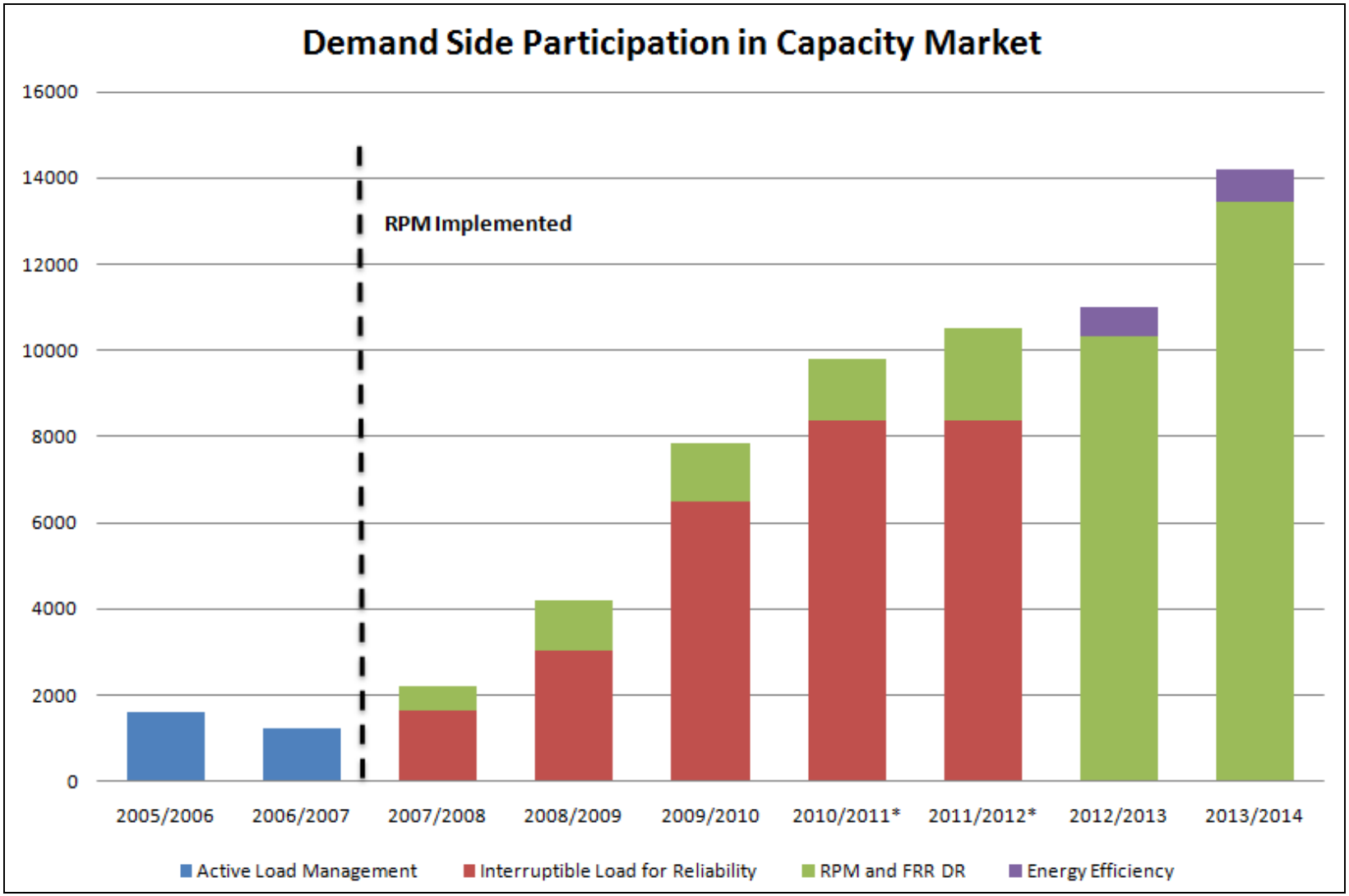


*Figure 1 represents in UCAP terms the DR offered into each Base Residual Auction and the DR nominated in an FRR plan, EE offered into the Base Residual Auction, actual ILR that was certified for 2007/2008 – 2010/2011 Delivery Years and estimated ILR for 2011/2012 Delivery Years (based on the 2010/2011 actual certification values).

Renewable Resource Participation

589.6 MW of wind resources were offered into the 2013/2014 Base Residual Auction. Of those, 589.6 MW of wind resources cleared in the 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 589.6 MW of cleared wind capacity translates to 4,535.4 MW of wind energy that is expected to be available in the 2013/2014 Delivery Year.

10.6 MW of solar resources were offered into the 2013/2014 Base Residual Auction. Of those, 10.6 MW of solar resources cleared in the 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 10.6 MW of cleared solar capacity translates to 27.9 MW of solar energy that is expected to be available in the 2013/2014 Delivery Year.

LDA Results

Similar to the 2012/2013 Base Residual Auction, 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, PSEG-North, DPL-South, and PEPCO were modeled as constrained Locational Deliverability Areas (LDAs) in the 2013/2014 RPM Base Residual Auction; however, only MAAC, EMAAC, and PEPCO LDAs had binding constraints that resulted in Locational Price Adders. A Locational Price Adder represents the difference in Resource Clearing Prices between a resource in a constrained LDA and the immediate higher level LDA.

Table 3 contains a summary of the clearing results in the LDAs from the 2013/2014 RPM Base Residual Auction.

Table 3 –RPM Base Residual Auction Clearing Results in the LDAs

Auction Results	RTO	MAAC	SWMAAC	PEPCO	EMAAC	DPL-SOUTH	PSEG	PS-NORTH
Offered MW (UCAP)	160,898.1	68,338.0	11,768.2	5,288.9	33,007.4	1,612.4	8,033.1	4,173.4
Cleared MW (UCAP)	152,743.3	67,639.9	11,242.1	4,791.7	32,835.4	1,612.4	8,019.1	4,159.4
Resource Clearing Price	$27.73	$226.15	$226.15	$247.14	$245.00	$245.00	$245.00	$245.00
Locational Price Adder*	$ -	$198.42	$ -	$20.99	$18.85	$ -	$ -	$ -

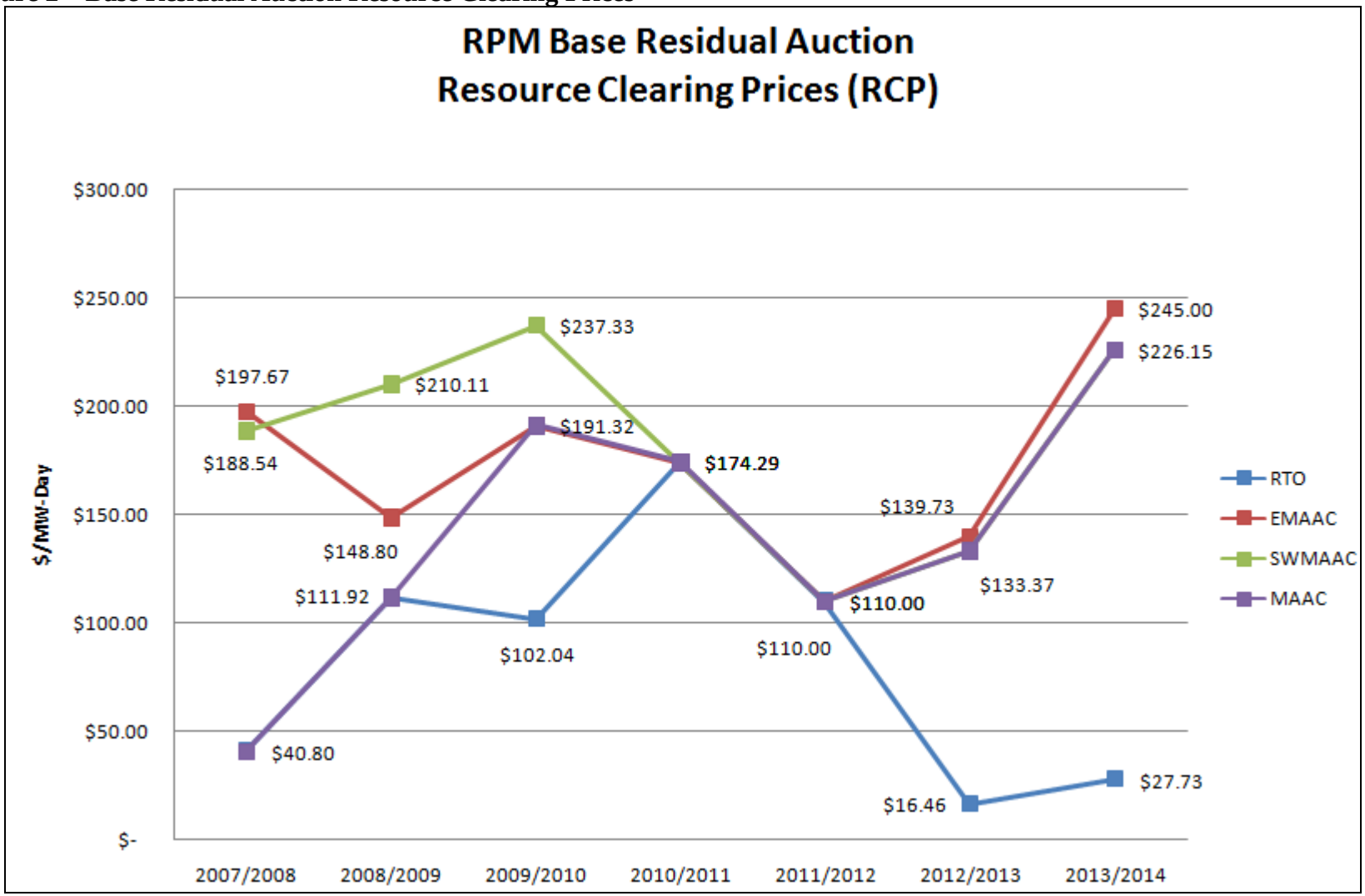
*Locational Price Adder is with respect to the immediate parent LDA

Since MAAC, EMAAC, and PEPCO were constrained LDAs that are importing capacity, Capacity Transfer Rights (CTRs) will be allocated to loads in those constrained LDAs for the 2013/2014 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.

Mitigation – All existing generation sell offers into the 2013/2014 Base Residual Auction were subject to market power mitigation through the application of the Market Structure Test (i.e., the Three-Pivotal Supplier Test). Suppliers in all LDAs, including 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.

Figure 2 illustrates the trends in Resource Clearing Prices for the RTO, MAAC, EMAAC, and SWMAAC LDAs for each RPM Base Residual Auction cleared to date.

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 BRA are equal.
**SWMAAC and MAAC Resource Clearing Prices for the 2010/2011, 2011/2012, and 2012/13 BRA are equal.

Table 4 contains a summary of the offer and resultant data in the RTO for each cleared Base Residual Auction from 2008/09 through the 2013/2014 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 4 –RPM Base Residual Auction Generation, Demand, and Energy Efficiency Resource Information in the RTO

	RTO*					
Auction Supply (all values in ICAP)	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2012****	**2012/2013**	**2013/2014*****
Internal PJM Capacity	166,037.9	167,026.3	168,457.3	169,241.6	179,791.2	195,633.4
Imports Offered	2,612.0	2,563.2	2,982.4	6,814.2	4,152.4	4,766.1
Total Eligible RPM Capacity	**168,649.9**	**169,589.5**	**171,439.7**	**176,055.8**	**183,943.6**	**200,399.5**
Exports / Delistings	4,205.8	2,240.9	3,378.2	3,389.2	2,783.9	2,624.5
FRR Commitments	24,953.5	25,316.2	26,305.7	25,921.2	26,302.1	25,793.1
Excused	722.0	1,121.9	1,290.7	1,580.0	1,732.2	1,825.7
Total Eligible RPM Capacity - Excused	**29,881.3**	**28,679.0**	**30,974.6**	**30,890.4**	**30,818.2**	**30,243.3**
Remaining Eligible RPM Capacity	**138,768.6**	**140,910.5**	**140,465.1**	**145,165.4**	**153,125.4**	**170,156.2**
Generation Offered	138,076.7	140,003.6	139,529.5	143,568.1	142,957.7	156,894.1
DR Offered	691.9	906.9	935.6	1,597.3	9,535.4	12,528.7
EE Offered	0.0	0.0	0.0	0.0	632.3	733.4
Total Eligible RPM Capacity Offered	**138,768.6**	**140,910.5**	**140,465.1**	**145,165.4**	**153,125.4**	**170,156.2**
Total Eligible RPM Capacity Unoffered	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

*RTO numbers include all LDAs.

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

***2013/2014 includes generation located in ATSI zone

2013/2014 RPM Base Residual Auction Results

A total of 200,399.5 MW of installed capacity was eligible to be offered into the 2013/2014 Base Residual Auction. Of this eligible amount, 4,766.1 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 2013/2014 auction compared to the previous auction. FRR commitments decreased by 509 MW from the 2012/2013 Delivery Year due to an LSE electing to participate in RPM after their initial five year FRR capacity obligation was satisfied, and a general reduction in Peak Load Forecast and the Forecast Pool Requirement.

A total of 170,156.2 MW of installed capacity was offered into the Base Residual Auction. This is an increase of 17,031 MW over what was offered into the 2012/2013 BRA, largely due to the participation of resources located in the ATSI zone as well as an increase of new generation, demand resource, and energy efficiency resources. A total of 30,243.3 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 160,898.1 MW were offered into the 2013/2014 Base Residual Action, comprised of 147,188.6 MW of generation capacity, 12,952.7 MW of capacity from Demand Resources, and 756.8 MW of capacity from Energy Efficiency Resources. Of those offered, a total of 152,743.3 MW of capacity was cleared in the auction.

Of the 152,743.3 MW of capacity that cleared in the auction, 142,782 MW were from generation capacity, 9,281.9 MW were from Demand Resources, and 679.4 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 2013/2014 Delivery Year.

Table 5 illustrates the Generation, Demand Resources, and Energy Efficiency Resources Offered and Cleared in the RTO translated into Unforced Capacity MW amounts.

Table 5 – 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**
Generation Offered	131,164.8	132,614.2	132,124.8	136,067.9	134,873.0	147,188.6
DR Offered	715.8	936.8	967.9	1,652.4	9,847.6	12,952.7
EE Offered	-	-	-	-	652.7	756.8
Total Offered	**131,880.6**	**133,551.0**	**133,092.7**	**137,720.3**	**145,373.3**	**160,898.1**
Generation Cleared	129,061.4	131,338.9	131,251.5	130,856.6	128,527.4	142,782.0
DR Cleared	536.2	892.9	939.0	1,364.9	7,047.2	9,281.9
EE Cleared	0.0	0.0	0.0	0.0	568.9	679.4
Total Cleared	**129,597.6**	**132,231.8**	**132,190.5**	**132,221.5**	**136,143.5**	**152,743.3**
Uncleared	2,283.0	1,319.2	902.2	5,498.8	9,229.8	8,154.8

* 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 6 contains a summary of capacity additions and reductions from the 2007/2008 Base Residual Auction to the 2013/2014 Base Residual Auction. A total of 4,831.9 MW of incrementally new capacity in PJM was available for the 2013/2014 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 2,907.8 MW of installed capacity.

Table 6 also illustrates the total amount of resource additions and reductions over seven Delivery Years since the implementation of the RPM construct. Over the period covering the first seven RPM Base Residual Auctions, 11,582 MW of new generation capacity was added which was partially offset by 7,184.7 MW of capacity derations or retirements over the same period. Additionally, 12,966.5 MW of new Demand Resources were offered over these last seven auctions, and 733.4 MW of new Energy Efficiency resources were offered in the 2013/2014 auction. The total net increase in installed capacity in PJM over the period of the last seven RPM auctions was 17,887.3 MW.

Table 6 – 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	Total
Increase in Generation Capacity	602.0	724.2	1,272.3	1,776.2	3,576.3	1,893.5	1,737.5	11,582.0
Decrease in Generation Capacity	-674.6	-375.4	-550.2	-301.8	-264.7	-3,093.9	-1,924.1	-7,184.7
Net Increase in Demand Resource Capacity**	555.0	574.7	215.0	28.7	661.7	7,938.1	2,993.3	12,966.5
Net Increase in Energy Efficiency Capacity**	0	0	0	0	0	632.3	101.1	733.4
Net Increase in Installed Capacity	**482.4**	**923.5**	**937.1**	**1,503.1**	**3,973.3**	**7,160.1**	**2,907.8**	**17,887.3**

* RTO numbers include all LDAs

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

**Does not include Existing Generation located in ATSI Zone

Table 6A provides a further breakdown of the generation increases and decreases for the 2013/2014 Delivery Year on an LDA basis.

Table 6A – Generation Increases and Decreases by LDA Effective 2013/2014 Delivery Year

LDA Name	Increases	Decreases
EMAAC	196.6	-1,148.7
MAAC	536.5	-1,548.8
Total RTO	1,737.5	-1,924.1

**All Values in ICAP terms

*MAAC includes EMAAC

**RTO includes MAAC

**Does not include Existing Generation located in ATSI Zone

Table 6B provides a further breakdown of the new capacity offered and cleared in the 2013/2014 Base Residual Auction in UCAP terms.

Table 6B – New Generation Capacity in the 2013/2014 BRA

	Offered			Cleared		
LDA	Uprate	New Unit	Total	Uprate	New Unit	Total
EMAAC	75.8	110.3	**186.1**	75.8	110.3	**186.1**
MAAC	110.7	412.5	**523.2**	110.7	412.5	**523.2**
Total RTO	392.2	1,278.2	**1,670.4**	392.2	1,278.2	**1,670.4**

*All MW Values are in UCAP Terms

*MAAC includes EMAAC

**RTO includes MAAC

**Does not include Existing Generation located in ATSI Zone

Table 7 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 2013/2014 BRA in comparison with the 2012/13 BRA. The capacity offered in the 2013/2014 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 7 – Further Breakdown of Incremental Capacity Resource Additions from 2007/2008 to 2013/14

	Delivery Year	CT/GT	Combined Cycle	Diesel	Hydro	Steam	Nuclear	Solar	Wind	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
Capacity from Reactivated Units (ICAP MW)	2007/2008					47.0				47.0
	2008/2009					131.0				131.0
	2009/2010									0.0
	2010/2011	160.0		10.7						170.7
	2011/2012	80.0				101.0				181.0
	2012/2013									0.0
	2013/2014									0.0
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
	Total	3,221.0	3,194.9	220.8	396.3	2,860.1	953.2	10.6	725.1	11,582.0

Figure 3: Cumulative Generation Capacity Increases by Fuel Type

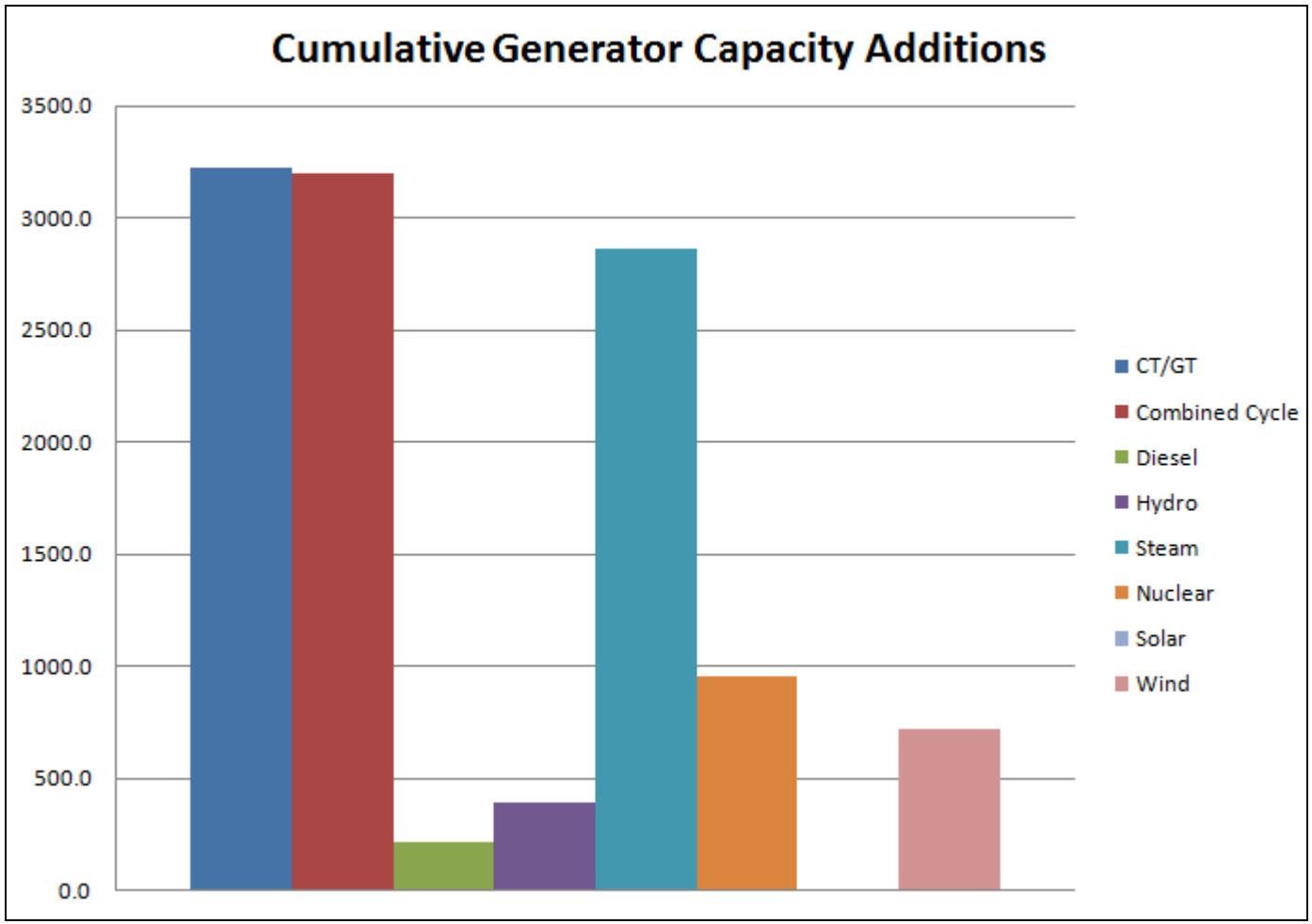


Table 8 shows the changes that have occurred regarding resource deactivation and retirement since the RPM was approved by FERC. The MW values illustrated in *Table 8* represent the quantity of unforced capacity cleared in 2013/2014 Base Residual Auction that came from resources that have either withdrawn 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 3,356.2 MW of cleared UCAP in the 2013/2014 BRA which equates to 4,231.4 MW of ICAP Offered.

Table 8 – Changes to Generation Retirement Decisions Since RPM Approval

	RTO*	
Generation Resource Decision Changes	ICAP Offered	UCAP Cleared
Withdrawn Deactivation Requests	2,083.1	1,831.2
Postponed or Cancelled Retirement	1,816.7	1,219.7
Reactivation	331.6	305.3
Total	**4,231.4**	**3,356.2**

Values Represent Offered ICAP and Cleared UCAP in the 2012/2013 BRA

* RTO numbers include all LDAs

Note: Not all survey data has been returned by participants. Values represent latest totals.

RPM Impact To Date

As illustrated in *Table 4*, for the 2013/2014 auction, the capacity exports were 2,624.5 MW and the capacity imports were 4,766.1 MW. The difference between the capacity imports and exports results is a net capacity import of 2,141.6 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 2,141.6 MW. Therefore RPM's impact on PJM capacity interchange is 4,757.6 MW.

The minimum net impact of the RPM implementation on the availability of Installed Capacity resources for the 2013/2014 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 7* and the net change generation retirements from *Table 8*. Therefore, as illustrated in Table 9, the minimum estimated net impact of the RPM

implementation on the availability of capacity in the 2013/2014 compared to what would have happened absent this implementation is 33,090.4 MW.

Table 9 shows the details on RPM's impact to date in ICAP terms.

Table 9 – RPM's Impact to Date

Change in Capacity Availability	Installed Capacity MW
New Generation	6,376.8
Generation Upgrades (not including reactivations)	4,675.5
Generation Reactivation	529.7
Forward Demand and Energy Efficiency Resources	13,699.9
Cleared ICAP from Withdrawn or Canceled Retirements	3,050.9
Net increase in Capacity Imports	4,757.6
Total Impact on Capacity Availability in 2013/2014 Delivery Year	**33,090.4**

Discussion of Factors Impacting the RPM Clearing Prices

RTO Clearing Price

The market clearing price of $27.73/ MW-Day in the RTO was set by the intersection of the Supply Curve with the Variable Resource Requirement (VRR) Curve on the vertical segment of the VRR Curve. This represents an increase of $11.27/MW-day from the 2012/2013 Base Residual Auction where the RTO clearing price was $16.46/MW-day. The 152,743.3 MW of UCAP cleared in the auction represents an increase in cleared UCAP of 16,599.8 MW over the 2012/2013 Base Residual Auction results and a reserve margin of over 20%.

Mitigated supply offers were used to clear the 2013/2014 Base Residual Auction, as all market participants failed the Market Structure Test for the RTO and were subject to offer capping for existing resources.

MAAC Clearing Price

The MAAC LDA was a constrained LDA in the 2013/2014 Base Residual Auction as a result of transmission limitations into the MAAC region. The MAAC region contains the Penelec, PPL, MetEd zones in addition to the zones contained within the EMAAC and SWMAAC LDAs. The clearing results for MAAC were determined by the intersection of the Supply Curve with the MAAC LDA Variable Resource Requirement (VRR) Curve at a price of $226.15/MW-day. The 67,639.9 MW of UCAP cleared in the LDA included 5,871.1 MW of demand resources and 152 MW of energy efficiency resources. The MAAC price increased by $92.78/MW-day compared to the 2012/2013 BRA. This price increase was caused primarily by the reduced capacity transfer margin into this region and to a lesser extent by the increases in the net Cost of New Entry. The factors that resulted in the reduced capacity transfer margins are detailed in the Planning Period Parameter report that was posted on March 12, 2010.[2]

SWMAAC Clearing Price

Though modeled in the 2013/2014 BRA, the SWMAAC region, comprised of the BGE transmission zone and the PEPCO LDA, was not a binding LDA in this auction. As SWMAAC resources are also located within the larger MAAC region, cleared resources from SWMAAC will be paid the MAAC resource clearing price of $226.15/MW-day.

[2] Link to the report is : http://www.pjm.com/markets-and-operations/rpm/~/media/markets-ops/rpm/rpm-auction-info/planning-period-parameters-report.ashx

EMAAC Clearing Price

EMAAC was a binding LDA in the 2013/14 RPM auction clearing as a result of transmission limitations into the EMAAC region. The EMAAC region is comprised of the AECO, JCPL, PECO, RECO, DPL, and PSEG transmission zones. The clearing results for EMAAC were determined by the intersection of the Supply Curve with the EMAAC LDA Variable Resource Requirement (VRR) Curve at a price of $245.00/MW-day. The 32,835.4 MW of UCAP cleared in the LDA included 2,461.3 MW of demand resources and 23.9 MW of energy efficiency resources. The EMAAC price increased by $105.27/MW-day compared to the 2012-13 BRA. This price increase was caused primarily by the reduced capacity transfer margin into this region and to a lesser extent by the increases in the net Cost of New Entry. The factors the resulted in the reduced capacity transfer margins are detailed in the Planning Period Parameter report that was posted on March 12, 2010.[3]

PS North Clearing Price

Though modeled in the 2013/2014, PS-North was not a binding LDA in the RPM auction clearing. The PS-North LDA is contained wholly within the PSEG transmission zone. As PS-North resources are also located within the larger EMAAC region, cleared resources from PS-NORTH will be paid the EMAAC resource clearing price of $245.00/MW-day.

DPL South Clearing Price

Though modeled in the 2013/2014, DPL-South was not a binding LDA in the RPM auction clearing. The DPL-South LDA is contained wholly within the DPL transmission zone. As DPL-South resources are also located within the larger EMAAC region, cleared resources from DPL-South will be paid the EMAAC resource clearing price of $245.00/MW-day.

PEPCO Clearing Price

Modeled for the first time in 2013/2014, PEPCO was a binding LDA in the RPM auction clearing as a result of transmission limitations into the PEPCO region. The PEPCO region is comprised only of the PEPCO transmission zone. The clearing results for PEPCO were determined by the intersection of the Supply Curve with the PEPCO LDA Variable Resource Requirement (VRR) Curve at a price of $247.14/MW-day. The 4,791.7 MW of UCAP cleared in the LDA included 547.3 MW of demand resources and 35.8 MW of energy efficiency resources.

[3] Link to the report is : http://www.pjm.com/markets-and-operations/rpm/~/media/markets-ops/rpm/rpm-auction-info/planning-period-parameters-report.ashx

Significant Changes to RPM Design since the 2012/2013 Base Residual Auction

FERC Order ER09-1679 and ER05-1410, dated October 29, 2009, and October 30, 2009, respectively, included the acceptance of several changes to the design of the Reliability Pricing Model that impacted the Demand Curve, Supply Curve or Settlements for the 2013/2014 Base Residual Auction. Highlights of the changes are included below, and additional details are located in the FERC documents, the PJM Tariff, and the PJM Capacity Market Manual (M-18), all available on the pjm.com website.

Changes that impacted the Demand Curve:

- Load in the ATSI Zone was included in the RTO demand curve for 2013/2014, but was not included in the 2012/2013 RTO demand curve.[4]

- The empirical Cost of New Entry (CONE) provision was replaced with a new provision that adjusts CONE each year in accordance with changes in the Handy-Whitman Index. The CONE value used in the Base Residual Auction for the prior delivery year (2012/2013 DY) was adjusted using the most recently published twelve-month change in Total Other Plant Production Plant Index shown in the Handy Whitman Index (HWI) of Public Utility Construction Costs. The Energy and Ancillary Services (E&AS) offset also decreased from the 2012/2013 value. The Net Cost of New Entry values (CONE – E&AS Offset) that serve as the basis for price on the RTO and LDA demand curves increased by 15% (for the RTO), 23% (for EMAAC) and 29% (for MAAC) over the 2012/2013 values[5]. These increases are due to an 8.3% increase in the gross CONE coupled with a decrease in the Energy & Ancillary Services (E&AS) offset.

Changes that impacted the Supply Curve:

[4] As a result of FERC's Realignment Order, the PJM Capacity Market was expanded to include the ATSI load zone.
[5] Refer to 2013/2014 RPM BRA Planning Period Parameters Report

- Supply resources in the ATSI Zone were included in the RTO supply curve for 2013/2014, but were not included in the 2012/2013 RTO supply curve. [6]

- The market rule that prohibited existing Demand and EE Resources from setting market clearing prices when they were determined to have structural market power was eliminated. Existing Demand and EE Resources are no longer required to offer at $0 in the event they fail the Market Structure Test

- New Entry Pricing Adjustment (NEPA) provision was revised to provide greater assurance of payment in the second and third years to qualified resources. If the NEPA qualified resource clears in the second or third year, the resource is paid the applicable Resource Clearing Price. If the NEPA qualified resource does not clear, the resource is deemed resubmitted at the highest price per MW that allows the amount of capacity the resource cleared in the first year to clear in the subsequent year. The NEPA qualified resource may displace one or more other resources in the supply stack that otherwise would have cleared, but it will do so at a prices that is just low enough to displace those other resources.

- The Avoidable Cost Rate (ACR) default values used a Handy-Whitman indexing method such that the 2012/2013 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. The participant may choose either the technology specific default rate or calculate their own based on unit-specific data.

Changes that impact Settlements:

- Demand Resources located in a sub-zone will be paid the Resource Clearing Price that applies to the sub-zone location as opposed to a Weighted Zonal Resource Clearing Price.

[6] As a result of FERC's Realignment Order, the PJM Capacity Market was expanded to include the ATSI load zone. The ATSI load zone will be integrated into the PJM Balancing Authority effective as of June 1, 2011. FERC authorized the ATSI Utilities to procure capacity for the 2011/2012 and 2012/2013 Delivery Years by means of a transition FRR Capacity Plan. Effective with the 2013/2014 Delivery Year, the load in the ATSI zone was to be included in RPM Auctions.

2013/2014 RPM Base Residual Auction Results

Revision History

5/14/2010: Original Version Posted
6/9/2010: Updated typos found in original version:

- Figure 2: the figure was updated to reflect the correct Resource Clearing Prices for RTO, MAAC, EMAAC, and SWMAAC resulting from the 12/13 BRA.
- Updated typo on last row of Table 9 to read 2013/2014