2011/2012 RPM Base Residual Auction Results

Executive Summary

The 2011/12 Reliability Pricing Model (RPM) Base Residual Auction (BRA) cleared 132,221.5 MW of unforced capacity in the RTO at a uniform Resource Clearing Price of $110.00/MW-day. This quantity represents an 18.1% reserve margin. There are no constrained Locational Deliverability Areas (LDAs) in the 2011/2012 BRA which results in a single Resource Clearing Price throughout the PJM RTO. There are no Capacity Transfer Rights (CTRs) allocated to loads as there are no constrained LDAs that are importing capacity.

The RTO as a whole failed the Three-Pivotal Supplier Test resulting in all existing resources being mitigated in the execution of the RPM auction clearing. Therefore, cost-based offers were utilized in the RPM auction clearing for all existing resources.

The $110.00/MW-day RTO resource clearing price represents a decrease of $64.29/MW-day from the 2010/2011 BRA. The RPM auction price was lower because growth in the available capacity was greater than the growth in demand. Supply increased because of significant increases in both new capacity and power imports from other regions. Demand growth was lower because the Duquesne Light Company zone was not included in this auction. The 4,238.0 MW increase in capacity can be broken down into 2,332.5 MW of new generation resources, 661.7 MW of new demand resources, and 1,243.8 MW of uprates to existing resources. There was also a 3,831.8 MW increase in capacity imports into PJM from external regions.

A further discussion of the 2011/2012 Base Residual Auction results can be found in the body of this report.

2011/2012 RPM Base Residual Auction Results

Introduction

This document provides additional information for PJM stakeholders regarding the 2011/2012 RPM Base Residual Auction results. The discussion also provides a comparison of the 2011/2012 auction results to the results in the RTO from the 2007/2008 through 2010/2011 RPM auctions.

2011/2012 Base Residual Auction Results Discussion

Table 1 contains a summary of the RTO clearing prices resulting from the 2011/2012 RPM Base Residual Auction in comparison to those from the 2007/2008 through 2010/2011 RPM Base Residual Auctions.

Table 1 –RPM Base Residual Auction Pricing Results in the RTO

	RTO				
Auction Results	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012
Resource Clearing Prices	$40.80	$111.92	$102.04	$174.29	$110.00
Cleared UCAP (MW)	129,409.2	129,597.6	132,231.8	132,190.4	132,221.5
Reserve Margin	19.2%	17.5%	17.8%	16.5%	18.1%

* 2011/2012 BRA was conducted without Duquesne 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 VRR curve where the RTO cleared for each particular auction. The Reserve Margin represents the percentage of installed capacity cleared in excess the RTO load. For the 2011/2012 BRA, the Reserve Margin is 18.1%.

Transmission upgrades planned for the 2011/2012 Delivery Year increased the import capability into the LDAs that were modeled as constrained LDAs in the 2010/2011 Delivery Year (i.e., DPL South, MAAC, and SWMAAC). For all LDAs, the Capacity Emergency Transfer Limit (CETL) was greater than 1.05 times the Capacity Emergency Transfer Objective (CETO). As a result, there were no constrained LDAs modeled in the 2011/2012 Base Residual Auction. Since there were no constrained LDAs modeled in the 2011/2012 Base Residual Auction, there is no possibility of price divergence between the LDAs. All resources cleared in 2011/2012 Base Residual Auction receive the clearing price of $110.00/MW-day.

2011/2012 RPM Base Residual Auction Results

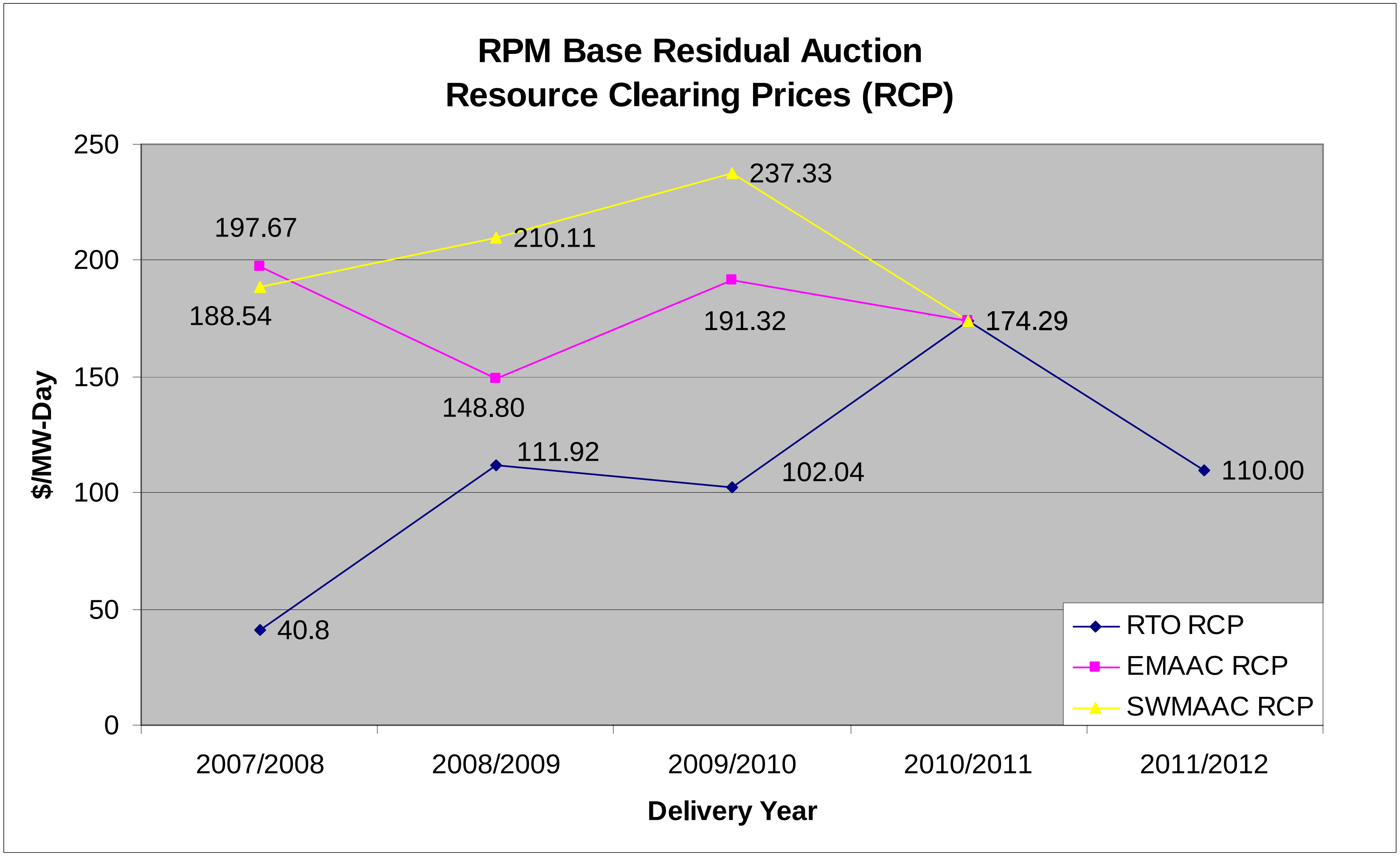
Because there is a uniform RTO clearing price for capacity and no constrained LDAs in the 2011/2012 BRA, no Capacity Transfer Rights (CTRs) are allocated to load. CTRs are allocated by load ratio share to all Load Serving Entities (LSEs) in a constrained LDA that has a higher clearing price than the unconstrained region. They 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 – The RTO as a whole failed the Three-Pivotal Supplier Test resulting in all existing resources being mitigated in the execution of the RPM auction clearing. Therefore, cost-based offers were utilized in the RPM auction clearing for all existing resources.

Figure 1 illustrates the trends in Resource Clearing Prices for each RPM Base Residual Auction cleared to date.

2011/2012 RPM Base Residual Auction Results

Figure 1 – Base Residual Auction Resource Clearing Prices



* EMAAC and SWMAAC Resource Clearing Prices for the 2011/2012 BRA are equal to the RTO Resource Clearing Price ($110.00/MW-day).

2011/2012 RPM Base Residual Auction Results

Table 2 contains a summary of the RTO offer and clearing data for the each cleared Base Residual Auction. The summary includes all resources located in the RTO and notes the capacity located outside the PJM footprint that was offered into the auction.

Table 2 –RPM Base Residual Auction Generation and Demand Information for the RTO

	RTO				
Auction Supply (all values in ICAP)	**2007/2008**	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2012**
Internal PJM Capacity	165,111.2	166,037.9	167,026.3	168,457.3	169,241.6
Imports Offered	2,983.8	2,612.0	2,563.2	2,982.4	6,814.2
Total Eligible RPM Capacity	**168,095.0**	**168,649.9**	**169,589.5**	**171,439.7**	**176,055.8**
Exports / Delistings	4,373.9	4,205.8	2,240.9	3,378.2	3,389.2
FRR Commitments	24,717.0	24,953.5	25,316.2	26,305.7	25,921.2
Excused	506.4	722.0	1,121.9	1,290.7	1,580.0
Total Eligible RPM Capacity - Excused	**29,597.3**	**29,881.3**	**28,679.0**	**30,974.6**	**30,890.4**
Remaining Eligible RPM Capacity	**138,497.7**	**138,768.6**	**140,910.5**	**140,465.1**	**145,165.4**
Generation Offered	138,369.0	138,076.7	140,003.6	139,529.5	143,568.1
DR Offered	123.5	691.9	906.9	935.6	1,597.3
Total Eligible RPM Capacity Offered	**138,492.5**	**138,768.6**	**140,910.5**	**140,465.1**	**145,165.4**
Total Eligible RPM Capacity Unoffered	**5.2**	**0.0**	**0.0**	**0.0**	**0.0**

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

A total of 176,055.8 MW of installed capacity was eligible to be offered into the 2011/2012 Base Residual Auction. Of this eligible amount, 6,814.2 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 2*, the amount of capacity exports increased in the 2011/2012 auction compared to the previous auction. FRR commitments also decreased by 384.5 MW from the 2010/2011 Delivery Year due to a reduction in non-zone load associated with the Dominion zone in the 2011/2012 Delivery Year.

2011/2012 RPM Base Residual Auction Results

A total of 145,165.4 MW of installed capacity was offered into the Base Residual Auction. This is an increase of about 4,700 MW over what was offered into the 2010/2011 BRA. A total of 30,890.4 MW was eligible, but was not offered due to 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, generation moving behind the meter, approved retirement requests not yet reflected in eRPM, excess owned by an FRR entity, and ownership changes.

Participants' sell offer EFORd values were used to translate the generation installed capacity values into unforced capacity (UCAP) values. DR sell offers were converted using the appropriate Demand Resource (DR) Factor and Forecast Pool Requirement (FPR) for the delivery year. In UCAP, a total of 137,720.3 MW were offered into the 2011/2012 Base Residual Action, comprised of 136,067.9 MW of generation capacity and 1,652.4 MW of capacity from Demand Resources. Of those offered, a total of 132,221.5 MW of capacity was cleared in the auction. Of the cleared amount, 130,856.6 MW were from generation capacity and 1,364.9MW were from Demand 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 2011/2012 Delivery Year. *Table 3* illustrates the Generation and Demand Response Offered and Cleared in the RTO translated into Unforced Capacity MW amounts.

Table 3 – RTO Generation and Demand Response Offered and Cleared Represented in Unforced Capacity MW

	RTO				
Auction Results (all values in UCAP MW)	**2007/2008**	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2012**
Generation Offered	130,716.1	131,164.8	132,614.2	132,124.8	136,067.9
DR Offered	127.6	715.8	936.8	967.9	1,652.4
Total Offered	**130,843.7**	**131,880.6**	**133,551.0**	**133,092.7**	**137,720.3**
Generation Cleared	129,281.6	129,061.4	131,338.9	131,251.4	130,856.6
DR Cleared	127.6	536.2	892.9	939.0	1,364.9
Total Cleared	**129,409.2**	**129,597.6**	**132,231.8**	**132,190.4**	**132,221.5**
Uncleared	1,434.5	2,283.0	1,319.2	902.3	5,498.8

Table 4 – Incremental Capacity Resource Additions and Reductions to Date

	RTO*					
Capacity Changes (in ICAP)	**2007/2008**	**2008/2009**	**2009/2010**	**2010/2011**	**2011/2012**	**Total**
Increase in Generation Capacity	602.0	724.2	1,272.3	1,776.2	3,576.3	7,951.0
Decrease in Generation Capacity	-674.6	-375.4	-550.2	-301.8	-264.7	-2,166.7
Net Increase in Demand Resource Capacity	555.0	574.7	215.0	28.7	661.7	2,035.1
Net Increase in Installed Capacity	**482.4**	**923.5**	**937.1**	**1,503.1**	**3,973.3**	**7,819.4**

Table 4 contains a summary of capacity additions and reductions from the 2010/2011 Base Residual Auction to the 2011/2012 Base Residual Auction. A total of 4,238.0 MW of incrementally new capacity in PJM was available for the 2011/2012 Base Residual Auction. This incrementally new capacity includes new generation capacity resources, capacity upgrades to existing generation capacity resources, new Demand Resources, and upgrades to existing Demand Resources. The increase is partially offset by generation capacity derations to existing generation capacity resources to yield a net increase of nearly 4,000 MW of installed capacity. The 3,973.3 MW net increase in capacity represents well over double the increase in net capacity growth as compared to the 2010/2011 Delivery Year and is the largest increase in capacity since the implementation of RPM and the largest single year increase thus far. This auction included offers from several large combined cycle plants and one large coal plant, all of which cleared to create the largest increase in new supply across the auctions held to date.

Table 4 also illustrates the total amount of resource additions and reductions over the five Delivery years since the implementation of the RPM construct. Over the period covering the first five RPM auctions, 7,951.0 MW of new generation capacity was added which was partially offset by 2,166.7 MW of capacity derations or retirements over the same period. Additionally, 2,035.1 MW of new Demand Resources were cleared over these first five auctions. The total net increase in installed capacity in PJM over the period of the first five RPM auctions was 7,819.4 MW.

Table 5 – Further Breakdown of Incremental Capacity Resource Additions from 2007/2008 to 2011/2012

	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		23.0					141.4	447.7
	2011/2012	416.4	1,135.0			704.8		1.1	75.2	2,332.5
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
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	209.0		162.5	61.4	194.4		16.5	796.0
	2010/2011	117.3	743.0		48.0	89.2	160.3			1,157.8
	2011/2012	369.2	148.6	57.4		186.8	292.1		8.7	1,062.8
	TOTAL	2,200.6	2,269.6	192.5	396.3	1,805.8	777.2	1.1	307.9	7,951.0

Table 5 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 is a significant increase in the amount of generating capacity from new resources offered into the 2011/2012 BRA. The capacity offered from both new generating resources and uprates to existing resources include gas, diesel, coal, hydroelectric, wind, nuclear, and solar powered resources. The most recent auction attracted more diverse unit types and a more diverse fuel mix than previous auctions. While the largest growth remains in gas turbines and combined cycle plants, a significant amount of incremental capacity in Steam (coal) and Nuclear was offered into the recent auctions. Figure 2 provides an illustration of the resource additions by fuel type. While the largest increase in fuel type is gas, a new coal unit and incremental nuclear upgrades have provided diversity by clearing nearly 1000 MW of base load capacity in the 2011/2012 auction. *Table 5* also shows a steady trend in uprates to existing generating capacity which shows that capacity revenues that are going to existing generators are being reinvested to maintain and enhance those units. There is also a significant increase in the amount of demand resource capacity that was offered into the 2011/2012.

Figure 2 illustrates the new generating capacity offered into the 2011/2012 BRA by fuel type.

Figure 2 – Graphical Representation of Installed Capacity Growth Offered Into the 2011/2012 Base Residual Auction

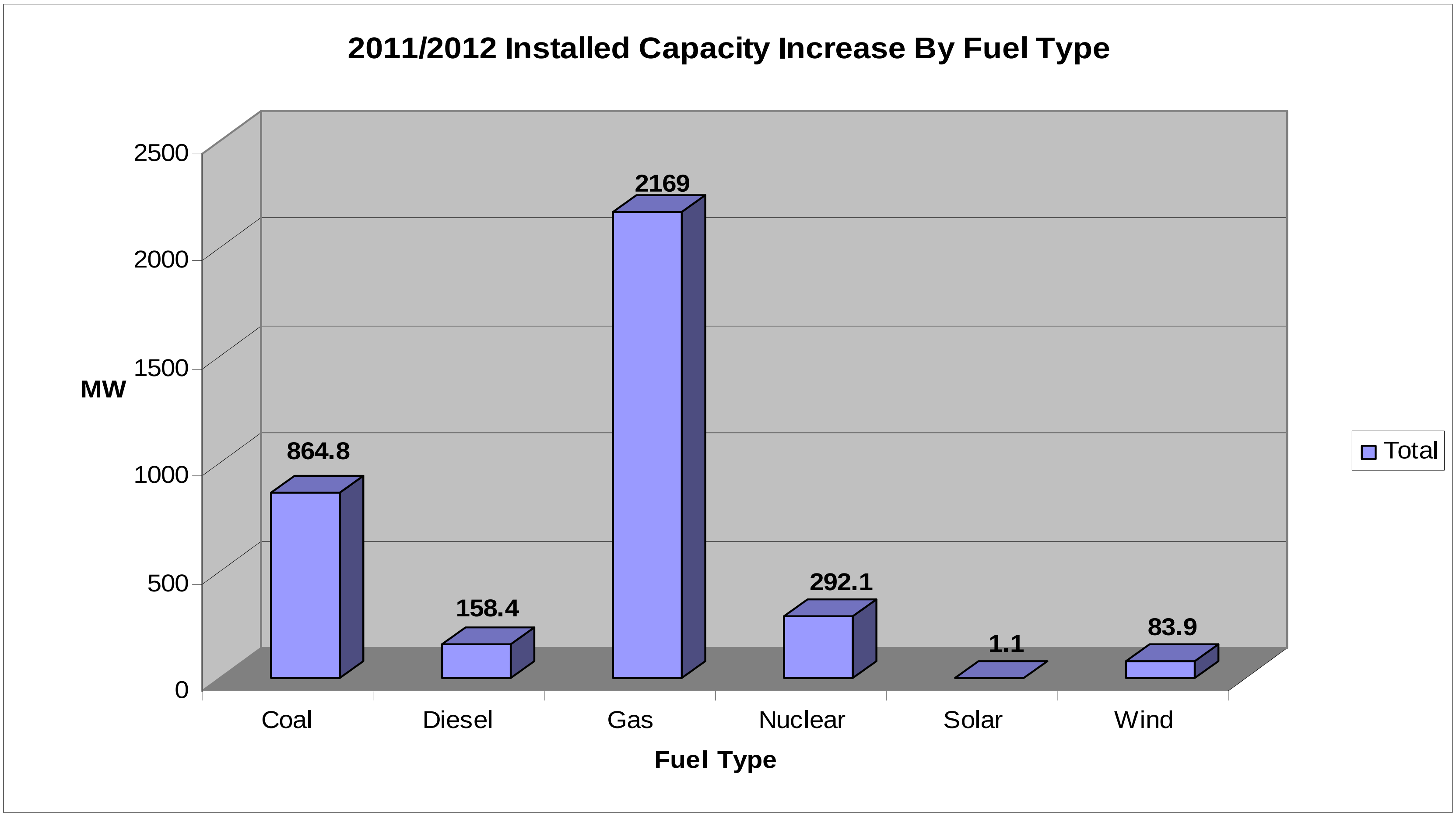


Table 6 shows the changes that have occurred regarding resource deactivation and retirement since the RPM was approved by FERC. The MW values illustrated in *Table 6* represent the quantity of unforced capacity cleared in 2011/2012 Base Residual Auction that came from resources that have either withdrawn 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 3,351.8 MW of cleared UCAP in the 2011/2012 BRA which equates to 3,914.1 MW of ICAP.

Table 6 – Changes to Generation Retirement Decisions Since RPM Approval

	RTO	
Generation Resource Decision Changes	**ICAP Offered**	**UCAP Cleared**
Withdrawn Deactivation Requests	2,038.1	1,793.9
Postponed or Cancelled Retirement	1,594.0	1,298.1
Reactivation	362.0	259.8
Total	**3,994.1**	**3,351.8**

* Values represent offered ICAP and cleared UCAP in the 2011/2012 BRA.
Note: Survey results not received from all resource owners.

RPM Impact To Date

As shown in *Table 2*, for the 2011/2012 auction, the capacity exports were 3,389.2 MW and the capacity imports were 6,814.2 MW. The 6,814.2 MW of capacity imports into PJM include any capacity that is in the Duquesne control zone that fulfilled the requirements and offered into the 2011/2012 BRA as an external resource. The difference between the capacity imports and exports results in a net capacity import of 3,425.0 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 3,425.0 MW. Therefore RPM's impact on PJM capacity interchange is 6,041.0 MW[1].

The minimum net impact of the RPM implementation on the availability of Installed Capacity resources for the 2011/2012 planning year can be estimated by adding the net change in capacity imports and exports over the period (adjusted to subtract the Duquesne zone generation imports), the forward demand resources, the increase in Installed Capacity over the RPM implementation period from

[1] RPM's impact to date on capacity interchange includes capacity in the Duquesne control zone that offered into the 2011/2012 Base Residual Auction as external resources.

Tables 4 and the net change generation retirements from *Table 6*. Therefore, as illustrated in Table 7, the minimum estimated net impact of the RPM implementation on the availability of capacity in the 2011/2012 compared to what would have happened absent this implementation was 16,747.2 MW.

Table 7 shows the details on RPM's impact to date in ICAP terms.

Table 7 – RPM's Impact To Date

Change in Capacity Availability	Installed Capacity MW
New Generation	3,368.6
Generation Upgrades (not including reactivations)	4,052.7
Generation Reactivation	529.7
Forward Demand Resources	2,035.1
Cleared ICAP from Withdrawn or Canceled Retirements	3,914.1
Net increase in Capacity Imports	2,847.0
Total Impact on Capacity Availability in 2011/2012 Delivery Year	16,747.2

Discussion of Factors Impacting the RPM Clearing Prices

RTO Clearing Results

The market clearing price of $110.00/MW-Day in the RTO was set by the intersection of the Supply Curve with the Variable Resource Requirement (VRR) Curve. This represents a decrease of $64.29/MW-day from the 2010/2011 Base Residual Auction where the clearing price was $174.29/MW-day. The primary reason for this price decrease is that the increase in capacity supply outpaced the growth of PJM's Reliability Requirement resulting in the decrease in the market clearing price for the 2011/2012 Base Residual Auction. The 132,221.5 MW of UCAP cleared in this auction is a slight increase in cleared UCAP from the previous auction.

2011/2012 RPM Base Residual Auction Results

A significant difference between the 2010/2011 BRA and the 2011/2012 BRA is that the Duquesne control zone load was not included in the 2011/2012 BRA and therefore was not considered in the calculation of the 2011/2012 RTO VRR curve. The result of this was a lower load forecast for the PJM RTO and a correspondingly lower Reliability Requirement as compared to 2010/2011. This lower Reliability Requirement was met with a significant increase in both new capacity being offered into an RPM auction for the first time and imports into PJM from external regions. The considerable amount of new capacity exceeded the growth in demand which caused the reduction in the RTO clearing price.

Figure 3 shows the clearing of the 2011/2012 Base Residual Auction. **The supply curve shown on the graph is the mitigated supply curve.**

2011/2012 RPM Base Residual Auction Results

Figure 3 – Graphical Illustration of RTO Clearing Results for 2011/2012 Base Residual Auction