



2013/2014 RPM First Incremental Auction Results

Introduction

This document provides information for PJM stakeholders regarding the results of the 2013/2014 Reliability Pricing Model (RPM) First Incremental Auction. Incremental Auctions provide both a forum for capacity suppliers to purchase replacement capacity, and a means for PJM to adjust previously committed capacity levels due to reliability requirement increases or decreases combined with the appropriate share of the deferred Short-Term Resource Procurement Target.

The 2013/2014 First Incremental Auction opened on September 12, 2011 and the results were posted on September 23, 2011. This document begins with a high level summary of the Incremental Auction results followed by sections containing detailed descriptions of the configuration and results of the 2013/2014 First Incremental Auction.

Summary of 2013/2014 RPM First Incremental Auction Results

Table 1 summarizes the results of the 2013/2014 First Incremental Auction. In the EMAAC LDA, the resource clearing price was \$178.85/MW-Day and cleared participant sell offers exceeded cleared participant buy bids by 316.6 MW. In the SWMAAC LDA, the resource clearing price was \$54.82/MW-Day and cleared participant buy bids exceeded cleared participant sell offers by 432.2 MW. In the remainder of the RTO (RTO minus EMAAC and SWMAAC LDAs), the resource clearing price was \$20.00/MW-Day and cleared participant buy bids exceeded cleared participant sell offers by 2,379.3 MW. Across the entire RTO region, cleared participant buy bids exceeded cleared participant sell offers by 2,494.9 MW. Cleared buy bids purchased in an Incremental Auction may be used as replacement capacity to cover Delivery Year commitment and compliance shortfalls.

Across the entire RTO, PJM released a total net capacity amount of 2,494.9 MW. The total net amount of capacity procured or released by PJM is a function of (1) the procurement and release of capacity to resolve the reduced LDA import limits introduced by the removal of delayed Backbone Projects from the model and (2) the clearing of the PJM sell offers and PJM buy bids submitted due to changes in RTO and LDA reliability requirements and the procurement of the deferred short-term resource procurement. As discussed in the Auction Configuration section of this report, PJM submitted only sell offers into this 1st Incremental Auction for the 2013/2014 Delivery Year.



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Table 1 – Summary of 2013/2014 First Incremental Auction Results

LDA	Clearing Price (\$/MW-Day)	Cleared Participant Sell Offers (MW UCAP)	Cleared Participant Buy Bids (MW UCAP)	Net Cleared Participant Buy Bids (MW UCAP) *
RTO minus SWMAAC, EMAAC Sub Total	\$20.00	1,848.0	4,227.3	2,379.3
SWMAAC Sub Total	\$54.82	7.1	439.3	432.2
EMAAC Sub Total	\$178.85	532.0	215.4	-316.6
RTO TOTAL		2,387.1	4,882.0	2,494.9

* A negative value indicates a net cleared sell offer

2013/2014 RPM First Incremental Auction Configuration

Participant Buy Bids and Sell Offers

RPM Incremental Auctions provide capacity suppliers with an opportunity to sell or purchase capacity for the Delivery Year through a PJM-administered auction process. Resource-specific sell offers are submitted into this auction by suppliers with available, uncommitted capacity. All resource-specific sell offers into an Incremental Auction are subject to market power mitigation through the application of the Market Structure Test.

Any party that desires to purchase LDA-specific replacement capacity for the Delivery Year may do so by submitting a buy bid into the Incremental Auction. Cleared Buy Bids purchased in an Incremental Auction may be used as replacement capacity to cover Delivery Year commitment and compliance shortfalls.

PJM Buy Bids and Sell Offers

Sections 5.4 and 5.12 of Attachment DD of the Tariff define the Incremental Auction requirements regarding the procurement or sale of capacity by PJM. Section 5.4 describes the triggering tests used by PJM prior to an Incremental Auction to determine the need for the procurement and/or sale of capacity by PJM in relation to updates of the reliability requirement and capacity already procured.



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Section 5.12 describes the determination of the MW amounts and prices of buy bids and/or sell offers that PJM will submit when the various tests in section 5.4 are triggered.

Prior to each Incremental Auction, PJM recalculates the RTO reliability requirement and each LDA reliability requirement based on an updated peak load forecast, updated Installed Reserve Margin and an updated CETO. The recalculated reliability requirements are compared to the reliability requirements used in the prior auction for the same Delivery Year and a determination is made as to the need for the procurement and/or sale of capacity by PJM.

For a 1st or 2nd Incremental Auction, if the RTO or LDA reliability requirement increases by more than the lesser of 500 MW or 1% then PJM will submit a buy bid in a MW amount equal to the increase in reliability requirement plus the Short-Term Resource Procurement Target Applicable Share (STRPTAS) plus/minus the amount of committed capacity that PJM sought to procure/release that did not clear in previous Incremental Auctions for the same Delivery Year. For a 1st or 2nd Incremental Auction, the STRPTAS is equal to 0.2 times the Short-Term Resource Procurement Target used in the Base Residual Auction (BRA). The price of the PJM buy bid is based on the Updated VRR Curve Increment which is the portion of the Updated VRR Curve remaining beyond the point representing all capacity already procured for the Delivery Year.

For a 1st or 2nd Incremental Auction, if the RTO or LDA reliability requirement decreases by more than the lesser of 500 MW or 1% then PJM will net the reliability requirement decrease with the STRPTAS and the amount of committed capacity that PJM sought to procure or release that did not clear in previous Incremental Auctions for the same Delivery Year and submit either a buy bid to procure additional capacity or a sell offer to release previously committed capacity depending on the outcome of the netting. If the magnitude of the reliability requirement decrease is less than the STRPTAS plus/minus the amount of committed capacity that PJM sought to procure/release that did not clear in previous Incremental Auctions for the same Delivery Year then PJM will submit a buy bid to procure additional capacity for the net amount. If the magnitude of the reliability requirement decrease is greater than the STRPTAS plus/minus the amount of committed capacity that PJM sought to procure/release that did not clear in previous Incremental Auctions for the same Delivery Year then PJM will submit a sell offer to release previously committed capacity for the net amount. The price of a PJM sell offer is based on the Updated VRR Curve Decrement which is the portion of the Updated VRR Curve to the left of the point representing all capacity already procured for the Delivery Year.



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If the amount of capacity previously procured for the Delivery Year is less than the prior RTO or LDA reliability requirement adjusted for the Short-Term Resource Procurement Target and the difference is more than the lesser of 500 MW or 1% then PJM will seek to procure additional capacity. In this case, PJM will employ the entire Updated VRR Curve Increment in the clearing of the Incremental Auction.

Based on an application of the Incremental Auction requirements of Sections 5.4 and 5.12 of Attachment DD of the Tariff and summarized above, PJM submitted the buy bids and sell offers, shown in Table 2, into the 1st Incremental Auction for the 2013/2014 Delivery Year¹. Note that a PJM sell offer is indicated by a negative PJM buy bid in Table 2 and that PJM submitted only sell offers for the 1st Incremental Auction for the 2013/2014 Delivery Year. Table 2 also defines the pricing points associated with the PJM buy bids and PJM sell offers.

Table 2 – PJM Buy Bids and PJM Sell Offers for 2013/2014 First Incremental Auction

Location	PJM Buy Bid (MW) *	Price Points for PJM Buy Bids and PJM Sell Offers									
		Point 1		Point 2		Point 3		Point 4		Point 5	
		x-axis (MW)	y-axis (\$/MW-Day)	x-axis (MW)	y-axis (\$/MW-Day)	x-axis (MW)	y-axis (\$/MW-Day)	x-axis (MW)	y-axis (\$/MW-Day)	x-axis (MW)	y-axis (\$/MW-Day)
RTO (Rest of)	-1,644.0	0.0	\$0.00	1644.0	\$0.00	--	--	--	--	--	--
MAAC (Rest of)	-228.4	0.0	\$105.61	228.4	\$122.41	--	--	--	--	--	--
EMAAC (Rest of)	-315.9	0.0	\$136.30	315.9	\$184.41	--	--	--	--	--	--
SWMAAC (Rest of)	-155.8	0.0	\$0.00	104.5	\$0.00	104.5	\$45.42	155.8	\$61.10	--	--
PS (Rest of)	-296.4	0.0	\$68.79	296.4	\$206.35	--	--	--	--	--	--
PS NORTH	-78.2	0.0	\$168.36	78.2	\$243.76	--	--	--	--	--	--
DPL SOUTH	-12.4	0.0	\$219.21	12.4	\$244.32	--	--	--	--	--	--
PEPCO	-532.7	0.0	\$0.00	172.3	\$0.00	172.3	\$45.42	480.0	\$227.08	532.7	\$246.52
TOTAL	-3,263.8										

* A PJM Sell Offer is indicated by a negative PJM Buy Bid.

¹ The determination of the PJM buy bid sell offer quantities is detailed in the 2013/2014 1nd IA Planning Parameters located at <http://www.pjm.com/markets-and-operations/rpm/~media/markets-ops/rpm/rpm-auction-info/2013-2014-1st-incremental-auction-planning-paramaters.ashx>.



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LDA Capacity Import Limits

Section 5.11A of Attachment DD of the Tariff describes the milestones that a Backbone Transmission Project must meet for it to be included and remain in the system model for a given Delivery Year. Prior to this 1st Incremental Auction for 2013/2014, the PSEG portion of the Susquehanna-Roseland project, the Jacks Mountain 500 kV substation (and associated reactive reinforcements), the Conemaugh 500 kV 250 MVAR capacitor and the Keystone-Conemaugh wavetrap replacements have been removed from the 2013/2014 Delivery Year model because the in-service dates of the projects have been deferred beyond the 2013/2014 Delivery Year. These Backbone Transmission Projects have been removed from the model for all subsequent Incremental Auctions for the 2013/2014 Delivery Year as stipulated by Section 5.11A of Attachment DD of the Tariff.

Table 3 shows each LDAs' Capacity Emergency Transfer Limit (CETL) for the Base Residual Auction and each LDAs' CETL updated for the 1st Incremental Auction for the 2013/2014 Delivery Year. The removal of the Backbone Transmission Projects from the 2013/2014 RPM model prior to the 1st IA reduced the CETL of each LDA with the exception of the DPL SOUTH LDA CETL which was unaffected². Table 3 also shows the total capacity import level into each LDA based on capacity imports into the LDA from the BRA. The CETL remaining for use in the 1st IA for the 2013/2014 Delivery Year shown in the last row of Table 3 represents the LDA capacity import limits that were employed in the 1st IA for the 2013/2014 Delivery Year and are equal to the LDA CETL as updated for the 1st IA minus the total capacity import levels into the LDA.

² Section 5.4(e) of Attachment DD of the Tariff stipulates that PJM must conduct a Conditional Incremental Auction for a given delivery year if the in-service date of a backbone transmission upgrade that was modeled in the BRA for that delivery year is delayed beyond July 1 of the delivery year and if such delay causes a reliability criteria violation. A reliability criteria violation is identified when an LDA's CETO exceeds the LDA's CETL. Although the CETLs of the MAAC, EMAAC, SWMAAC, PS, PS-NORTH and PEPCO LDAs are negatively impacted by the removal of several backbone transmission projects, all LDA CETL values remain above the respective LDA CETO values, therefore the removal of the projects do not cause a reliability criteria violation and do not trigger the need to conduct a Conditional Incremental Auction.



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Table 3 – LDA Capacity Import Capability for 2013/2014 First Incremental Auction

	LDA						
	MAAC	EMAAC	SWMAAC	PS	PS NORTH	DPL SOUTH	PEPCO
Base Residual Auction (BRA) CETL	4,460.0	7,095.0	6,724.9	5,868.4	2,570.0	2,123.0	4,483.0
1st Incremental Auction (IA) CETL *	4,116.0	6,251.0	6,527.0	5,373.0	2,526.0	2,123.0	4,346.0
Capacity Import Level (BRA Results)	4,460.0	7,095.0	6,418.3	5,231.6	2,120.5	1,354.5	4,483.0
Capacity Import Limit for 1st Incremental Auction	-344	-844	108.7	141.4	405.5	768.5	-137

* reflects removal of following backbone projects from 2013/2014 model: PSEG portion of Susquehanna-Roseland Project, Jacks Mountain 500 kV substation (and associated reactive reinforcement), Keystone 500kV capacitor and Keystone-Conemaugh 500 kV wavetrapp replacement

Incremental Auction Clearing

Participant supply offers and buy bids are combined with the PJM sell offers and buy bids shown in Table 2 to form the supply and demand curves. The solution algorithm clears all buy bids and sell offers in a least-cost manner while respecting the capacity import limits into each LDA.

To the extent possible, negative capacity import limits are resolved through the clearing of additional supply offers located in the constrained-side area of each transfer limit coupled with the clearing of an equal and off-setting amount of buy bids located in the unconstrained-side area of each transfer limit. Capacity transfers are forced from child LDA to parent LDA in order to resolve the negative capacity import limit but only if the cost to achieve the transfer is less than a predetermined cost threshold. The cost threshold assigned to each negative transfer limit is based on the price at the intersection of the updated VRR curve of the LDA with the level of previously procured capacity for the LDA adjusted by the reduction in CETL. Once the cost threshold is reached, the algorithm will no longer force the transfer even if the full desired capacity transfer was not accomplished and the constraint is relaxed even if continued transfers are available but at a higher cost.



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Participant Buy Bids and Sell Offers

Table 4 shows the offered and cleared quantities for participant buy bids and sell offers. A total of 7,470.7 MW of supply was offered into the First Incremental Auction composed of uncleared capacity from the 2013/2014 Base Residual Auction, new capacity in the form of uprates or new resources that were not previously capacity resources in PJM.

Participant demand in an Incremental Auction is composed of LDA-specific buy bids submitted by participants. The buy bids are specified in UCAP terms and, if cleared, are binding commitments to purchase capacity for the entire Delivery Year. Cleared Buy Bids purchased in an Incremental Auction may be used as replacement capacity to cover Delivery Year commitment and compliance shortfalls. There was a total of 16,446.1 MW of buy bids submitted by participants into the auction.

In the EMAAC LDA, 532.0 MW of participant supply offers and 215.4 MW of participant buy bids cleared at a clearing price of \$178.85/MW-Day. In the EMAAC LDA, cleared sell offers exceeded cleared buy bids by 316.6 MW. In the SWMAAC LDA, 7.1 MW of participant supply offers and 439.3 MW of participant buy bids cleared at a clearing price of \$54.82/MW-Day. In the SWMAAC LDA, cleared buy bids exceeded cleared sell offers by 432.2 MW. In the remainder of the RTO (RTO minus EMAAC and SWMAAC LDAs), 1,848.0 MW of participant supply offers and 4,227.3 MW of participant buy bids cleared at a clearing price of \$20.00/MW-Day. In this region, cleared participant buy bids exceeded cleared participant sell offers by 2,379.3 MW. Across the entire RTO, cleared participant buy bids exceeded cleared participant sell offers by 2,494.9.



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Table 4 - 2013/2014 First Incremental Auction Results / Participant Sell Offers and Buy Bids

LDA	Total Sell Offers (MW UCAP)	Total Buy Bids (MW UCAP)	Cleared Sell Offers (MW UCAP)	Cleared Buy Bids (MW UCAP)	Net Cleared Buy Bids (MW UCAP) *	Clearing Price (\$/MW-Day)
RTO (Rest of)	5,211.5	12,268.1	1,719.5	3,800.2	2,080.7	20.00
MAAC (Rest of)	424.9	2,541.9	128.5	427.1	298.6	20.00
Subtotal	5,636.4	14,810.0	1,848.0	4,227.3	2,379.3	20.00
SWMAAC (Rest of)	96.3	329.0	2.0	329.0	327.0	54.82
PEPCO	558.3	153.0	5.1	110.3	105.2	54.82
SWMAAC Subtotal	654.6	482.0	7.1	439.3	432.2	54.82
EMAAC (Rest of)	630.4	744.1	167.8	5.0	-162.8	178.85
PSEG (Rest of)	397.2	160.5	238.7	67.2	-171.5	178.85
PS-NORTH	147.4	215.4	124.2	125.6	1.4	178.85
DPL-SOUTH	4.7	34.1	1.3	17.6	16.3	178.85
EMAAC Subtotal	1,179.7	1,154.1	532.0	215.4	-316.6	178.85
TOTAL	7,470.7	16,446.1	2,387.1	4,882.0	2,494.9	

* A negative value indicates a net cleared sell offer

Table 5 provides a further breakdown of the capacity offered and cleared into the 2013/2014 First Incremental Auction. A total of 7,470.7 MW of supply was offered into the First Incremental Auction composed of uncleared capacity from the 2013/2014 Base Residual Auction, new capacity in the form of uprates or new resources that were not previously capacity resources in PJM.



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Table 5 - 2013/2014 First Incremental Auction Supply Resource Mix

LDA	Resource Type	Type	Total Sell Offers (MW UCAP)	Cleared Sell Offers (MW UCAP)
Remainder of RTO (RTO minus EMAAC and SWMAAC LDAs)	DEMAND		1683.9	392.9
	EE		38	35
	GEN	New Generation	5.1	0
		Uncleared from BRA	3815.5	1395.3
		Uprate	93.9	24.8
Remainder of RTO Subtotal		5,636.4	1,848.0	
SWMAAC	DEMAND		121.7	0.5
	EE		2.9	2.9
	GEN	New Generation	0	0
		Uncleared from BRA	530	3.7
		Uprate	0	0
SWMAAC Subtotal		654.6	7.1	
EMAAC	DEMAND		616.8	127.1
	EE		31.3	31.3
	GEN	New Generation	0	0
		Uncleared from BRA	526.3	368.3
		Uprate	5.3	5.3
EMAAC Subtotal		1,179.7	532.0	
RTO Total	DEMAND		2422.4	520.5
	EE		72.2	69.2
	GEN	New Generation	5.1	0
		Uncleared from BRA	4871.8	1767.3
		Uprate	99.2	30.1
RTO Total		7,470.7	2,387.1	

PJM's Procurement and Release of Capacity

Table 6 shows the offered and cleared quantities of PJM buy bids and sell offers in the 2013/2014 First Incremental Auction. PJM submitted only sell offers into this 1st Incremental Auction for the 2013/2014 Delivery Year. In the EMAAC LDA, cleared PJM sell offers totaled 527.4 MW. In the SWMAAC LDA, cleared PJM sell offers totaled 323.5 MW. In the remainder of the RTO (RTO



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minus EMAAC and SWMAAC LDAs), cleared PJM sell offers totaled 1,644 MW. Across the entire RTO, cleared PJM sell offers totaled 2,494.9 MW.

Table 6 - 2013/2014 First Incremental Auction Results / PJM's Sell Offers and Buy Bids

LDA	Total Sell Offers (MW UCAP)	Total Buy Bids (MW UCAP)	Cleared Sell Offers (MW UCAP)	Cleared Buy Bids (MW UCAP)	Net Cleared Buy Bids (MW UCAP) *
RTO (Rest of)	1,644.0	0.0	1,644.0	0.0	-1,644.0
MAAC (Rest of)	228.4	0.0	0.0	0.0	0.0
Subtotal	1,872.4	0.0	1,644.0	0.0	-1,644.0
SWMAAC (Rest of)	155.8	0.0	135.3	0.0	-135.3
PEPCO	532.7	0.0	188.2	0.0	-188.2
SWMAAC Subtotal	688.5	0.0	323.5	0.0	-323.5
EMAAC (Rest of)	315.9	0.0	279.4	0.0	-279.4
PSEG (Rest of)	296.4	0.0	237.1	0.0	-237.1
PS-NORTH	78.2	0.0	10.9	0.0	-10.9
DPL-SOUTH	12.4	0.0	0.0	0.0	0.0
EMAAC Subtotal	702.9	0.0	527.4	0.0	-527.4
TOTAL	3,263.8	0.0	2,494.9	0.0	-2,494.9

* A negative value indicates a net cleared sell offer

The LDA capacity import limit margins prior to and after the clearing of the First Incremental Auction for the 2013/2014 Delivery Year are shown on Table 7. The LDA capacity import limit margin represents the difference between the updated LDA capacity import limit and the capacity imported into the LDA. As discussed previously, the removal of several delayed Backbone Transmission Projects from the model reduced the CETL for most LDAs and resulted in negative capacity import limit margins for the MAAC, EMAAC and PEPCO LDAs indicating that the previously procured capacity import level exceeds the updated capacity import limit for these LDAs. This situation does not represent a reliability criteria violation since the CETL of each of these LDAs exceeds the respective LDA CETO; however, the auction is cleared in such a manner as to attempt to restore the capacity import margin to be non-negative (i.e. restore capacity import levels to be at or below updated capacity import limits). Table 7 shows that PJM's procurement and release of capacity in the First Incremental Auction has restored the LDA capacity import limit margins to a non-negative value for the MAAC and EMAAC LDAs enhancing the reliability in these regions. Total capacity imports into the PEPCO LDA were



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reduced; however, a negative capacity import margin still exists for this LDA. Again, this situation does not represent a reliability criteria violation but will be reflected in the parameters for future incremental auctions for 2013/2014.

Table 7 - 2013/2014 First Incremental Auction Results / LDA Capacity Import Limit Margins

	LDA						
	MAAC	EMAAC	SWMAAC	PSEG	PS-NORTH	DPL SOUTH	PEPCO
Capacity Import Limit Margin prior to 1st Incremental Auction	-344.0	-844.0	108.7	141.4	405.5	768.5	-137.0
Capacity Import Limit Margin after 1st Incremental Auction	92.7	0.0	0.0	559.5	415.0	752.2	-54.0

Mitigation in the 2013/2014 First Incremental Auction

All regions of the RTO, including the RTO as a whole, failed the Market Structure Test. As a result, mitigation was applied to all existing generation resources whose price-based offer exceeded the calculated offer cap. However, this mitigation had no impact on Resource Clearing Prices and therefore, no offer caps were applied in the clearing of the 2013/2014 First Incremental Auction.