2013/2014 RPM Second Incremental Auction Results

Introduction

This document provides information for PJM stakeholders regarding the results of the 2013/2014 Reliability Pricing Model (RPM) Second 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 Second Incremental Auction opened on July 16, 2012 and the results were posted on July 27, 2012. 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 Second Incremental Auction.

Summary of 2013/2014 RPM Second Incremental Auction Results

Table 1 summarizes the results of the 2013/2014 Second Incremental Auction. In the EMAAC LDA (which is comprised of the AECO, DPL, JCPL PECO, PSEG and RECO Zones), the resource clearing price was $40.00/MW-Day and cleared participant buy bids exceeded cleared participant sell offers by 770.5 MW. In the remainder of MAAC (MAAC minus EMAAC sub-region) which is comprised of the BGE, Met-Ed, Penelec, PEPCO and PPL Zones, the resource clearing price was $10.00/MW-Day and cleared participant buy bids exceeded cleared participant sell offers by 777.0 MW. In the remainder of the RTO (RTO minus MAAC) which is comprised of the AEP, APS, ATSI, ComEd, Dayton, DEOK, DOM, and Duquesne Zones, the resource clearing price was $7.01/MW-Day and cleared participant buy bids exceeded cleared participant sell offers by 2054.6 MW. Across the entire RTO, total cleared participant buy bids (5,598.8 MW) exceeded total cleared supplier sell offers (1996.7 MW) by 3,602.1 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 3,602.1 MW meaning total commitments were reduced by 3,602.1 MW. The total net amount of capacity procured or released by PJM is a function of the clearing of the PJM sell offers and PJM buy bids submitted due to changes in RTO and LDA reliability requirements, the procurement of the deferred short-term resource

procurement and consideration of the amount of capacity commitments that PJM sought to procure or release that did not clear in previous Incremental Auctions for the same Delivery Year.

Table 1 – Summary of 2013/2014 Second 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)	Cleared PJM Sell Offers (MW UCAP)
RTO minus MAAC Sub Total (1)	$7.01	1,143.7	3,198.3	2,054.6	2,147.3
MAAC minus EMAAC Sub Total (2)	$10.00	614.0	1,391.0	777.0	684.3
EMAAC Sub Total (3)	$40.00	239.0	1,009.5	770.5	770.5
RTO TOTAL		1,996.7	5,598.8	3,602.1	3,602.1

(1) Comprised of AEP, APS, ATSI, ComEd, Dayton, DEOK, DOM and Duquesne Zones
(2) Comprised of BGE, Met-Ed, Penelec, PEPCO and PPL Zones
(3) Comprised of AECO, DPL, JCPL, PECO, PSEG and RECO Zones

2013/2014 RPM Second 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. Section 5.12 describes the determination of the MW quantities 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 Capacity Emergency Transfer Objective (CETO). For the RTO and each LDA, PJM sums the following component quantities to determine the total quantity that it will seek to procure or release in each Incremental Auction:

- the Updated Reliability Requirement minus the Reliability Requirement utilized in the most recent prior auction conducted for that Delivery Year. Note that this quantity is negative if the Updated Reliability Requirement is less than the Reliability Requirement utilized in the most recent prior auction. For a 1st or 2nd Incremental Auction, this difference is only considered if the change in Reliability Requirement is greater than the lesser of 500 MW or 1% of the prior auction's Reliability Requirement,
- plus the Short-Term Resource Procurement Target Applicable Share (STRPTAS). For a 1st or 2nd Incremental Auction, the STRPTAS is equal to 0.2 times the Short-Term Resource Procurement Target (STRPT) used in the Base Residual Auction (BRA). For a 3rd Incremental Auction, the STRPTAS is equal to 0.6 times the STRPT used in the BRA,
- 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.
- minus any capacity PJM seeks to release in a parent LDA as a result of any Conditional Incremental Auction commitments for the same Delivery Year.

If the result of such summation is a positive quantity, PJM will seek to procure such quantity by employing a PJM buy bid. The price of the PJM buy bid is based on the Updated VRR Curve Increment which is the portion of the Updated VRR Curve located to the right of the point representing all capacity already procured for the Delivery year. If the result of such summation is a negative quantity, PJM will seek to release such quantity by employing a PJM sell offer. The price of the 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.

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 2nd Incremental Auction for the 2013/2014 Delivery Year[1]. 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 2nd Incremental Auction for the 2013/2014 Delivery Year in each LDA. Table 2 also defines the pricing points associated with the PJM sell offers.

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

					Price Points for PJM Buy Bids and PJM Sell Offers									
					Point 1		Point 2		Point 3		Point 4		Point 5	
Location	Change in Reliability Requirement (MW)	STRPT (MW)	Uncleared PJM Buy Bids from Prior IA (MW)	PJM Buy Bid (MW)*	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)	-2,559.0	411.7	0.0	-2,147.3	0.0	$0.00	2147.3	$0.00	--	--	--	--	--	--
MAAC (Rest of)	-306.9	73.6	-228.4	-461.7	0.0	$0.00	461.7	$0.00	--	--	--	--	--	--
EMAAC (Rest of)	-1,082.6	112.1	-36.5	-1,007.0	0.0	$0.00	500.0	$0.00	500.0	$51.99	1007.0	$132.42	--	--
SWMAAC (Rest of)	-273.3	41.2	-20.5	-252.6	0.0	$0.00	131.9	$0.00	131.9	$45.25	252.6	$82.95	--	--
PS (Rest of)	-516.7	32.6	-59.3	-543.4	0.0	$0.00	270.5	$0.00	270.5	$51.99	543.4	$184.25	--	--
PS NORTH	-72.1	27.8	-67.3	-111.6	0.0	$133.50	111.6	$242.05	--	--	--	--	--	--
DPL SOUTH	-18.8	12.6	-12.4	-18.6	0.0	$205.27	18.6	$243.08	--	--	--	--	--	--
PEPCO	-138.6	38.3	-344.5	-444.8	0.0	$0.00	90.7	$0.00	90.7	$45.25	393.4	$226.23	444.8	$245.44
TOTAL	-4,968.0	749.9	-768.9	-4,987.0										

[1] The determination of the PJM buy bid and sell offer quantities and prices is detailed in the 2013/2014 2nd IA Planning Parameters located at http://www.pjm.com/markets-and-operations/rpm/~/media/markets-ops/rpm/rpm-auction-info/2013-2014-2nd-incremental-auction-planning-parameters.ashx.

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. Based on an application of these milestone requirements, 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 were removed from the 2013/2014 Delivery Year model prior to the 1st Incremental Auction for 2013/2014. No additional changes have been made to the 2013/2014 system model for the Second Incremental Auction, therefore the LDA Capacity Emergency Transfer Limit (CETL) values for the 2nd IA are the same as those used in the 1st IA for the 2013/2014 Delivery Year.

Table 3 shows each LDAs' Capacity Emergency Transfer Limit (CETL) for the Base Residual Auction and each LDAs' CETL updated for each Incremental Auction for the 2013/2014 Delivery Year. The capacity import limit margin remaining for use in the 2nd 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 2nd IA for the 2013/2014 Delivery Year and are equal to the LDA CETL as updated for the 2nd IA minus the total capacity import levels into the LDA from the Base Residual Auction and 1st IA.

Table 3 – LDA Capacity Import Capability for 2013/2014 Second 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
2nd 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 plus 1st IA Imports)	4,023.3	6,251.0	6,527.0	4,813.5	2,111.0	1,370.8	4,400.0
Capacity Import Limit Margin for 2nd Incremental Auction	**92.7**	**0.0**	**0.0**	**559.5**	**415.0**	**752.2**	**-54.0**

* 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 wavetrap replacement

Incremental Auction Clearing
Participant supply offers and buy bids submitted during the auction offer window 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[2].

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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 6,072.9 MW of supply was offered into the Second Incremental Auction composed of uncleared capacity from prior 2013/2014 auctions and 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 16,385.8 MW of buy bids submitted by participants into the auction.

In the EMAAC LDA, 239.0 MW of participant sell offers and 1,009.5 MW of participant buy bids cleared at a clearing price of $40.00/MW-Day. In the EMAAC LDA, cleared buy bids exceeded cleared sell offers by 770.5 MW. In the remainder of MAAC (MAAC minus EMAAC sub-region), 614.0 MW of participant sell offers and 1,391.0 MW of participant buy bids cleared at a clearing price of $10.00/MW-Day; cleared buy bids exceeded cleared sell offers by 777.0 MW. In the remainder of the RTO (RTO minus MAAC), 1,143.7 MW of participant sell offers and 3,198.3 MW of participant buy bids cleared at a clearing price of $7.01/MW-Day.

[2] 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 quantity of the negative capacity import limit. 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.

In this region, cleared participant buy bids exceeded cleared participant sell offers by 2,054.6 MW. Across the entire RTO, cleared participant buy bids exceeded cleared participant sell offers by 3602.1.

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

LDA	Total Participant Sell Offers (MW UCAP)	Total Participant Buy Bids (MW UCAP)	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 MAAC SubTotal (1)	4,243.6	11,015.3	$7.01	1,143.7	3,198.3	2,054.6
MAAC minus EMAAC Sub Total (2)	1,313.5	2,381.3	$10.00	614.0	1,391.0	777.0
EMAAC Sub Total (3)	515.8	2,989.2	$40.00	239.0	1,009.5	770.5
RTO TOTAL	6,072.9	16,385.8		1,996.7	5,598.8	3,602.1

(1) Comprised of AEP, APS, ATSI, ComEd, Dayton, DEOK, DOM and Duquesne Zones
(2) Comprised of BGE, Met-Ed, Penelec, PEPCO and PPL Zones
(3) Comprised of AECO, DPL, JCPL, PECO, PSEG and RECO Zones

Table 5 provides a further breakdown of the capacity offered and cleared in the 2013/2014 Second Incremental Auction. A total of 6,072.9 MW of supply was offered into the Second Incremental Auction composed of uncleared capacity from prior 2013/2014 auctions, new capacity in the form of uprates or new resources that were not previously capacity resources in PJM.

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

Resource Type	Type	Total Sell Offers (MW UCAP)	Cleared Sell Offers (MW UCAP)
DEMAND	DEMAND	2,424.0	656.4
EE	EE	144.1	122.3
GEN	New Generation	76.4	36.4
	Uncleared from Prior Auction	3,360.0	1,139.9
	Uprates	68.4	41.7
		6,072.9	1,996.7

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PJM's Procurement and Release of Capacity

Table 6 shows the total amount of capacity procured and released by PJM by LDA in the 2013/2014 Second Incremental Auction. The total net amount of capacity procured or released by PJM is a function of the clearing of the PJM sell offers and buy bids listed in Table 2. For the 2013/2014 Second Incremental Auction, across the entire RTO region, PJM released a total net capacity amount of 3602.1 MW.

Table 6 - 2013/2014 Second Incremental Auction Results / PJM's Procurement and Release of Capacity

LDA	Total Sell Offers (MW UCAP)	Total Buy Bids (MW UCAP)	Cleared Sell Offers (MW UCAP)	Cleared Buy Bids (MW UCAP)	Net Cleared Sell Offers (MW UCAP)	Clearing Price ($/MW-Day)
RTO (Rest of)	2,147.3	0.0	2,147.3	0.0	2,147.3	$7.01
MAAC (Rest of)	461.7	0.0	461.7	0.0	461.7	$10.00
EMAAC (Rest of)	1,007.0	0.0	500.0	0.0	500.0	$40.00
SWMAAC (Rest of)	252.6	0.0	131.9	0.0	131.9	$10.00
PSEG (REST of)	543.4	0.0	270.5	0.0	270.5	$40.00
PS-NORTH	111.6	0.0	0.0	0.0	0.0	$40.00
DPL-SOUTH	18.6	0.0	0.0	0.0	0.0	$40.00
PEPCO	444.8	0.0	90.7	0.0	90.7	$10.00
TOTAL	4,987.0	0.0	3,602.1	0.0	3,602.1	

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The LDA capacity import limit margins prior to and after the clearing of the Second Incremental Auction for the 2013/2014 Delivery Year are shown in 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. The negative capacity import limit margin for the PEPCO LDA prior to the Second Incremental auction indicates that the previously procured capacity import level exceeded the updated capacity import limit for this LDA. This situation does not represent a reliability criteria violation since the CETL of this LDA 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 Second Incremental Auction has restored the LDA capacity import limit margin to a non-negative value for the PEPCO LDA enhancing the reliability in this region.

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

	LDA						
	MAAC	EMAAC	SWMAAC	PS	PS NORTH	DPL SOUTH	PEPCO
Capacity Import Limit Margin prior to 2nd Incremental Auction	92.7	0.0	0.0	559.5	415.0	752.2	-54.0
Capacity Import Limit Margin after 2nd Incremental Auction	0.0	0.0	134.5	470.5	258.0	794.0	106.0

Mitigation in the 2013/2014 Second 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 in the execution of the RPM auction clearing. Therefore in the event a generator's price-based offer exceeded the calculated offer cap, cost-based offers were utilized in the RPM auction clearing. Demand Resources and Energy Efficiency Resources are not subject to market mitigation.