

Introduction

The 2016/2017 Second Incremental Auction opened on July 13, 2015 and the results were posted on July 24, 2015. This document provides information for PJM stakeholders regarding the results of the 2016/2017 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.

2016/2017 RPM Second Incremental Auction Results

Table 1 summarizes the clearing prices and cleared participant activity of the 2016/2017 Second Incremental Auction. The Second Incremental Auction cleared with unique prices in five regions of the RTO. Price separation occurred due to locational capacity import limits, however, no price separation occurred across the capacity product types. In the ATSI LDA, the resource clearing price for Limited, Extended Summer and Annual capacity was \$101.50/MW-Day. In the PSEO region outside of the PS-NORTH LDA, the resource clearing price for Limited, Extended Summer and Annual capacity was \$99.01/MW-Day. In the MAAC region outside of the PSEO LDA, which is comprised of the AECO, BGE, DPL, JCPL, Met-Ed, PECO, Penelec, PEPCO, PPL and RECO Zones, the resource clearing price for Limited, Extended Summer and Annual capacity was \$71.00/MW-Day. In the rest of the RTO, which is comprised of the AEP, APS, ComEd, Dayton, DEOK, DOM, EKPC and Duquesne Zones, the resource clearing price for Limited, Extended Summer and Annual capacity was \$31.00/MW-Day.

Across the entire RTO, total cleared participant buy bids (5,058.5 MW) exceeded total cleared participant sell offers (764.8 MW) by 4,293.7 MW meaning that PJM effectively released 4,293.7 MW of previously procured capacity. Across the entire RTO, PJM effectively released 587.1 MW of previously procured Limited DR capacity, 562.7 MW of previously procured Extended Summer DR capacity, and 3,143.9 MW of previously procured capacity from Annual Resources.



Table 1 – Summary of 2016/2017 Second Incremental Auction Results

		Clearing Price	Cleared Participant Sell Offers	Buy Bids	Participant Buy Bids
Region	Capacity Type	(\$/MW-Day)	(UCAP MW)	(UCAP MW)	(UCAP MW)
	Limited	\$31.00	43.4	212.6	169.2
RTO (minus MAAC and ATSI) $_{(1)}$	Extended Summer	\$31.00	0.0	490.5	490.5
	Annual	\$31.00	405.3	2,504.9	2,099.6
	TOTAL		448.7	3,208.0	2,759.3
	Limited	\$71.00	0.0	404.2	404.2
MAAC (minus PSEG) ₍₂₎	Extended Summer	\$71.00	0.0	27.4	27.4
	Annual	\$71.00	187.9	1,101.5	913.6
	TOTAL		187.9	1,533.1	1,345.2
	Limited	\$99.01	0.0	25.5	25.5
PSEG (minus PS-NORTH)	Extended Summer	\$99.01	0.0	8.4	8.4
	Annual	\$99.01	10.7	6.0	-4.7
	TOTAL		10.7	39.9	29.2
	Limited	\$212.53	1.5	6.0	4.5
PS-NORTH	Extended Summer	\$212.53	0.0	0.6	
	Annual	\$212.53	5.2	0.7	-4.5
	TOTAL		6.7	7.3	0.6
	Limited	\$101.50	16.3	0.0	
ATSI	Extended Summer	\$101.50	0.0	35.8	
	Annual	\$101.50	94.5	234.4	139.9
	TOTAL		110.8	270.2	159.4
	Limited		61.2	648.3	587.1
TOTAL RTO	Extended Summer		0.0	562.7	562.7
	Annual		703.6	3,847.5	3,143.9
	TOTAL		764.8	5,058.5	4,293.7

⁽¹⁾ Comprised of AEP, APS, ComEd, Dayton, DEOK, DOM, EKPC and Duquesne Zones

⁽²⁾ Comprised of AECO, BGE, DPL, JCPL, Met-Ed, PECO, Penelec, PEPCO, PPL and RECO Zones



Participant Sell Offers and Buy Bids

Table 2 shows the offered and cleared quantities for participant sell offers. A total of 7,725.3 MW of supply was offered into the Second Incremental Auction composed of uncleared capacity from prior 2016/2017 auctions and new capacity in the form of uprates or new resources that were not previously capacity resources in PJM. Across the entire RTO, 764.8 MW of participant sell offers cleared, mostly in the form of Annual capacity.

Table 2 – Participant Sell Offers (Offered and Cleared Quantities)

		Sell Offers (U	ICAP MW) *	Cleared Sell Offers (UCAP MW)					
	Extended					Extended			
LDA	Limited	Summer	Annual	Total	Limited	Summer	Annual	Total	
DPL-SOUTH	4.1	0.0	0.0	4.1	0.0	0.0	0.0	0.0	
PS-NORTH	2.5	0.0	480.4	482.9	1.5	0.0	5.2	6.7	
PSEG (rest of)	0.0	0.0	12.7	12.7	0.0	0.0	10.7	10.7	
EMAAC (rest of)	107.8	36.6	604.6	749.0	0.0	0.0	81.0	81.0	
EMAAC Total	114.4	36.6	1,097.7	1,248.7	1.5	0.0	96.9	98.4	
PEPCO	15.5	0.0	5.4	20.9	0.0	0.0	0.0	0.0	
SWMAAC (rest of)	15.8	0.0	146.9	162.7	0.0	0.0	102.9	102.9	
SWMAAC Total	31.3	0.0	152.3	183.6	0.0	0.0	102.9	102.9	
MAAC (rest of)	59.3	7.6	2,421.4	2,488.3	0.0	0.0	4.0	4.0	
MAAC Total	205.0	44.2	3,671.4	3,920.6	1.5	0.0	203.8	205.3	
ATSI (rest of)	17.6	17.2	2,585.8	2,620.6	16.3	0.0	94.5	110.8	
ATSI-CLEVELAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ATSI Total	17.6	17.2	2,585.8	2,620.6	16.3	0.0	94.5	110.8	
RTO (rest of)	511.0	158.3	693.9	1,363.2	43.4	0.0	405.3	448.7	
RTO Total	733.6	219.7	6,951.1	7,904.4	61.2	0.0	703.6	764.8	

^{*} Sell Offers include the MW amounts offered from all Product Types of coupled DR sell offers, only one of which is capable of clearing in the auction.



Participant demand in an Incremental Auction is composed of 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. Table 3 shows bid and cleared quantities of participant buy bids. There was a total of 11,948.4 MW of buy bids submitted by participants into the auction. Across the entire RTO, 5,058.5 MW of participant buy bids cleared comprised of 648.3 MW of Limited capacity buy bids, 562.7 MW of Extended Summer buy bids and 3,847.5 MW of Annual capacity buy bids.

Table 3 – Participant Buy Bids (Bid and Cleared Quantities)

		Buy Bids (U	CAP MW)		Cleared Buy Bids (UCAP MW)				
		Extended				Extended			
LDA	Limited	Summer	Annual	Total	Limited	Summer	Annual	Total	
DPL-SOUTH	3.5	0.0	0.0	3.5	3.5	0.0	0.0	3.5	
PS-NORTH	24.2	7.7	1.0	32.9	6.0	0.6	0.7	7.3	
PSEG (rest of)	79.5	8.4	6.0	93.9	25.5	8.4	6.0	39.9	
EMAAC (rest of)	315.5	0.0	307.4	622.9	111.2	0.0	301.4	412.6	
EMAAC Total	422.7	16.1	314.4	753.2	146.2	9.0	308.1	463.3	
PEPCO	85.2	0.0	664.0	749.2	67.0	0.0	607.3	674.3	
SWMAAC (rest of)	39.3	0.0	55.5	94.8	28.0	0.0	55.5	83.5	
SWMAAC Total	124.5	0.0	719.5	844.0	95.0	0.0	662.8	757.8	
MAAC (rest of)	622.1	27.4	1,252.8	1,902.3	194.5	27.4	137.3	359.2	
MAAC Total	1,169.3	43.5	2,286.7	3,499.5	435.7	36.4	1,108.2	1,580.3	
ATSI (rest of)	179.6	66.2	336.3	582.1	0.0	33.2	129.2	162.4	
ATSI-CLEVELAND	76.1	2.6	124.2	202.9	0.0	2.6	105.2	107.8	
ATSI Total	255.7	68.8	460.5	785.0	0.0	35.8	234.4	270.2	
RTO (rest of)	854.9	553.5	6,255.5	7,663.9	212.6	490.5	2,504.9	3,208.0	
RTO Total	2,279.9	665.8	9,002.7	11,948.4	648.3	562.7	3,847.5	5,058.5	



Table 4 provides a further breakdown of the capacity offered and cleared into the 2016/2017 Second Incremental Auction. A total of 7,725.3 MW of supply was offered into the Second Incremental Auction composed of uncleared capacity from prior 2016/2017 auctions and new capacity in the form of uprates or new resources that were not previously capacity resources in PJM.

Table 4 - 2016/2017 Second Incremental Auction Supply Resource Mix

Resource Type	Туре	Total Sell Offers (MW UCAP)	Cleared Sell Offers (MW UCAP)
DEMAND	DEMAND	814.3	61.2
EE	EE	69.2	16.1
GEN	New Generation (including Uprates)	178.5	143.1
	Uncleared from Prior Auction	6,663.3	544.4
		7,725.3	764.8



PJM Sell Offers and Buy Bids

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. Tables 5a and 5b show the offered and cleared quantities of PJM sell offers and PJM buy bids, respectively, employed in the 2016/2017 Second Incremental Auction, across the entire RTO region, cleared PJM sell offers totaled 4,307.7 MW and cleared PJM buys bids totaled 14.0 MW; therefore PJM released a total net capacity amount of 4,293.7 MW.

Table 5a – PJM Sell Offers (Offered and Cleared Quantities)

		Sell Offers (UCAP MW)		Cleared Sell Offers (UCAP MW)					
	Extended					Extended				
LDA	Limited	Summer	Annual	Total	Limited	Summer	Annual	Total		
DPL-SOUTH	0.0	0.0	101.6	101.6	0.0	0.0	84.9	84.9		
PS-NORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PSEG (rest of)	0.0	0.0	239.2	239.2	0.0	0.0	43.8	43.8		
EMAAC (rest of)	0.0	0.0	630.1	630.1	0.0	0.0	630.1	630.1		
EMAAC Total	0.0	0.0	970.9	970.9	0.0	0.0	758.8	758.8		
PEPCO	0.0	0.0	320.4	320.4	0.0	0.0	278.5	278.5		
SWMAAC (rest of)	0.0	0.0	183.0	183.0	0.0	0.0	183.0	183.0		
SWMAAC Total	0.0	0.0	503.4	503.4	0.0	0.0	461.5	461.5		
MAAC (rest of)	0.0	0.0	168.7	168.7	0.0	0.0	168.7	168.7		
MAAC Total	0.0	0.0	1,643.0	1,643.0	0.0	0.0	1,389.0	1,389.0		
ATSI (rest of)	0.0	0.0	109.5	109.5	0.0	0.0	109.5	109.5		
ATSI-CLEVELAND	0.0	0.0	49.9	49.9	0.0	0.0	49.9	49.9		
ATSI Total	0.0	0.0	159.4	159.4	0.0	0.0	159.4	159.4		
RTO (rest of)	0.0	0.0	2,759.3	2,759.3	0.0	0.0	2,759.3	2,759.3		
RTO Total	0.0	0.0	4,561.7	4,561.7	0.0	0.0	4,307.7	4,307.7		



Table 5b – PJM Buy Bids (Bid and Cleared Quantities)

		Buy Bids (U	CAP MW)					
		Extended				Extended		
LDA	Limited	Summer	Annual	Total	Limited	Summer	Annual	Total
DPL-SOUTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PS-NORTH	14.0	0.0	0.0	14.0	14.0	0.0	0.0	14.0
PSEG (rest of)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EMAAC (rest of)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EMAAC Total	14.0	0.0	0.0	14.0	14.0	0.0	0.0	14.0
PEPCO	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SWMAAC (rest of)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SWMAAC Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAAC (rest of)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAAC Total	14.0	0.0	0.0	14.0	14.0	0.0	0.0	14.0
ATSI (rest of)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ATSI-CLEVELAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ATSI Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RTO (rest of)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RTO Total	14.0	0.0	0.0	14.0	14.0	0.0	0.0	14.0



2016/2017 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 sell offers into an Incremental Auction from existing generation capacity resources are subject to market power mitigation through the application of the Market Structure Test. All Generation Capacity Resources and Energy Efficiency Resources are of the Annual Capacity type. Demand Resources offering into the Incremental Auction must specify the type of Capacity being offered. A Demand Resource with the potential to qualify as two or more of the capacity types may submit separate but coupled Sell Offers for each Demand Resource type for which it qualifies at different prices and the auction clearing algorithm will select the Sell Offer that yields the least-cost solution. For such coupled Demand Resource offers, the offer price of an Annual Demand Resource offer must be at least \$.01 per MW-day greater than the offer price of a coupled Extended Summer Demand Resource offer must be at least \$.01 per MW-day greater than the offer price of a coupled Limited Demand Resource offer.

Any party that desires to purchase replacement capacity for the Delivery Year may do so by submitting a buy bid into the Incremental Auction. In addition to quantity, price and LDA-specific location, participants submitting a buy bid must also specify the desired capacity type (Annual, Extended Summer or Limited). Cleared Buy Bids purchased in an Incremental Auction may be used as replacement capacity to cover a Delivery Year commitment provided the cleared buy bid has the same locational characteristics and same or better temporal characteristics than the resource that it replaces. Cleared buy bids of Annual capacity type may replace commitments of Annual Resources, Extended Summer DR and/or Limited DR. Cleared buy bids of Extended Summer capacity type may replace commitments on Extended Summer DR and/or Limited DR but may not replace commitments of Annual Resources. Cleared buy bids of Limited capacity type may replace commitments of Limited DR but may not replace commitments of Annual Resources or Extended Summer DR.

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, capacity types 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 Reliability Requirement, Minimum Annual Resource Requirement and Minimum Extended Summer Resource Requirement for the RTO and each LDA 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 previously procured levels of Annual Resources and Extended Summer DR are short of the updated Minimum Annual and Extended Summer Resource Requirements then the PJM buy bid may be broken into multiple, smaller buy bids of the capacity types needed to make up any shortage. If no shortage exists then the PJM buy bid will be of the Limited capacity type.

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. The capacity type of a PJM sell offer is determined in a manner such that PJM will not release prior committed capacity from Annual Resources and Extended Summer DR below the updated Minimum Annual and Extended Summer Resource Requirements.



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 6, into the 2nd Incremental Auction for the 2016/2017 Delivery Year¹. Note that a PJM sell offer is indicated by a negative PJM buy bid in Table 6 and that PJM submitted sell offers for the 2nd Incremental Auction for the 2016/2017 Delivery Year in each LDA with the exception of the PS-NORTH LDA. All PJM sell offers were of the Annual capacity type. Table 6 also defines the pricing points associated with the PJM buy bids and PJM sell offers.

Table 6 - PJM Buy Bids and PJM Sell Offers for 2016/2017 Second Incremental Auction

						Price Points for PJM Buy Bids and PJM Sell Offers								
					РЈМ	Buy Bid	Point 1 Point 2		oint 2	Point 3		Point 4		
Location	Change in Reliability Requirement (MW)	STRPT (MW)	Uncleared PJM Buy Bids from Prior IA (MW)	Additional Buy Bids ₍₁₎	(MW) ₍₂₎	Capacity Type	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)	-3,184.5	425.2	0.0	0.0	-2759.3	Annual	0.0	\$0.00	2759.3	\$0.00				
MAAC (Rest of)	-243.3	74.6	0.0	0.0	-168.7	Annual	0.0	\$0.00	168.7	\$0.00				
EMAAC (Rest of)	-666.1	110.4	-74.4	0.0	-630.1	Annual	0.0	\$0.00	630.1	\$0.00				
SWMAAC (Rest of)	-222.7	39.7	0.0	0.0	-183.0	Annual	0.0	\$0.00	183.0	\$0.00				
PS (Rest of)	-239.6	29.8	-29.4	0.0	-239.2	Annual	0.0	\$72.21	239.2	\$218.55				
PS NORTH	-15.6	28.0	1.6	0.0	14.0	Limited	0.0	\$229.15	14.0	\$212.55				
DPL SOUTH	-114.9	13.3	0.0	0.0	-101.6	Annual	0.0	\$0.00	82.9	\$0.00	82.9	\$65.97	101.6	\$112.22
PEPCO	-357.5	37.1	0.0	0.0	-320.4	Annual	0.0	\$0.00	258.0	\$0.00	258.0	\$55.36	320.4	\$103.01
ATSI (Rest of)	-41.4	47.6	-115.7	0.0	-109.5	Annual	0.0	\$0.00	109.5	\$0.00				
ATSI-CLEVELAND	-74.8	24.9	0.0	0.0	-49.9	Annual	0.0	\$0.00	32.5	\$0.00	32.5	\$72.50	49.9	\$96.04
TOTAL	-5,160.4	830.6	-217.9	0.0	-4,547.7									

⁽¹⁾ Additional Buy Bids to account for Non-Viable DR commitments related to DR Operational Resource Flexibility Transition Provision. No requests received

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⁽²⁾ A PJM Sell Offer is indicated by a negative PJM Buy Bid.

¹ The determination of the PJM buy bid and sell offer quantities is detailed in the 2016/2017 2nd IA Planning Parameters located at http://www.pjm.com/~/media/markets-ops/rpm/rpm-auction-info/2016-2017-second-incremental-auction-results.ashx.



LDA Capacity Import Limits

Table 7 shows each LDA's CETL limits for the Base Residual Auction and each LDA's CETL as updated for each Incremental Auction for the 2016/2017 Delivery Year. The CETL remaining for use in the 2nd IA for the 2016/2017 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 2016/2017 Delivery Year and are equal to the LDA CETL as updated for the 2nd IA minus the total capacity import levels into the LDA.

Table 7 – LDA Capacity Import Capability for 2016/2017 Second Incremental Auction

	LDA										
	MAAC	EMAAC	SWMAAC	PS	PS NORTH	DPL SOUTH	PEPCO	ATSI	ATSI-C		
Base Residual Auction (BRA) CETL	6,495.0	8,916.0	8,786.0	6,581.0	2,936.0	1,901.0	6,846.0	7,881.0	5,245.0		
1st Incremental Auction (IA) CETL	6,495.0	8,916.0	8,786.0	6,581.0	2,936.0	1,901.0	6,846.0	7,881.0	5,245.0		
2nd Incremental Auction (IA) CETL	6,495.0	8,916.0	8,786.0	6,581.0	2,936.0	1,901.0	6,846.0	7,881.0	5,245.0		
Capacity Import Level (BRA + 1st IA Imports)	-6,495.0	-8,713.8	-5,183.1	-6,581.0	-2,921.4	-1,529.4	-2,814.3	-7,881.0	-3,739.4		
Capacity Import Limit for 2nd Incremental Auction	0.0	202.2	3,602.9	0.0	14.6	371.6	4,031.7	0.0	1,505.6		

Incremental Auction Clearing

Participant supply offers and buy bids are combined with the PJM sell offers and buy bids shown in Table 6 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. Annual capacity buy bids may only clear against sell offers from Annual Resources; Extended Summer buy bids may only clear against sell offers from Annual Resources and/or Extended Summer DR; and Limited buy bids may clear against sell offers of any capacity type.

Mitigation in the 2016/2017 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.