



2021/2022 RPM Second Incremental Auction Results

Introduction

The 2021/2022 Second Incremental Auction opened on July 6, 2020 and the results were posted on July 17, 2020. This document provides information for PJM stakeholders regarding the results of the 2021/2022 Second Incremental Auction. Incremental Auctions provide both a forum for capacity suppliers to sell and purchase capacity, and a means for PJM to adjust previously committed capacity levels due to Reliability Requirement increases or decreases.

The 2021/2022 Second Incremental Auction was conducted using a revised PJM load forecast that was updated in April 2020 due to an order issued on June 15, 2020, where FERC accepted PJM's waiver request (Docket No. ER20-1870-000) to allow PJM to base the parameters of the 2021/2022 2nd IA on an updated PJM load forecast that reflects a substantial change (as a result of the current pandemic) in the economic forecast relied on by the load forecast.

Summary of 2021/2022 RPM Second Incremental Auction Results

Table 1 summarizes the clearing prices and cleared participant activity of the 2021/2022 Second Incremental Auction. The RCP for CP Resources located in the rest of RTO is \$10.26/MW-day. EMAAC, PSEG and BGE were constrained LDAs in the 2021/2022 Second Incremental Auction with resource clearing prices of \$15.37/MW-day, \$125.00/MW-day, and \$70.00/MW-day, respectively.

By comparison, the RCP for CP Resources located in the rest of RTO in the 2021/2022 BRA was \$140.00/MW-day. The EMAAC, PSEG, BGE, ATSI and COMED were constrained LDAs in the 2021/2022 BRA with resource clearing prices of \$165.73/MW-day, \$204.29/MW-day, \$200.30/MW-day, \$171.33/MW-day and \$195.55/MW-day respectively.

Across the entire RTO, total cleared participant buy bids (6,484.6 MW) exceeded total cleared participant sell offers (3,707.5 MW) by 2,777.1 MW; thus, participants purchased a total net capacity amount of 2,777.1 MW. PJM effectively released a total net capacity amount of 2,777.1 MW, comprised of cleared PJM sell offers totaling 2,954.1 MW and cleared PJM buy bids totaling 177.0 MW. The cleared PJM buy bid quantity of 177.0 MW reflects an increase in the reliability requirement of the RTO and each applicable LDA. The cleared PJM buy bid quantity of 177.0 MW includes 118.1 MW of PJM buy bids associated with an increase in the RTO reliability requirement set equal to the MW quantity of EE Resources that cleared in the auction above the EE add-back margin that remained from all prior auctions. The cleared MW quantity of EE Resources above the EE add-back margin remaining from all prior auctions must be offset by a PJM buy bid in order to avoid double-counting of cleared EE Resource MW since energy efficiency measures are directly reflected in each peak load forecast.



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Table 1 – Summary of 2021/2022 Second Incremental Auction Results

Region	Clearing Price (\$/MW-Day)	Cleared Participant Sell Offers (UCAP MW)	Cleared Participant Buy Bids (UCAP MW)	Net Cleared Participant Buy Bids (UCAP MW)
RTO₍₁₎	\$10.26	2,760.8	2,935.0	174.2
MAAC₍₂₎	\$10.26	486.4	3,251.8	2,765.4
EMAAC₍₃₎	\$15.37	169.2	166.0	(3.2)
PSEG	\$125.00	195.1	70.4	(124.7)
BGE	\$70.00	96.0	61.4	(34.6)
RTO Total	--	3,707.5	6,484.6	2,777.1

(1) Comprised of AEP, APS, ATSI, COMED, Dayton, DEOK, DOM, EKPC, Duquesne and External Zones

(2) Comprised of MET-ED, PENELEC, PEPCO, and PPL Zones

(3) Comprised of AECO, JCPL, PECO, DPL and RECO Zones

Participant Sell Offers and Buy Bids

Table 2 shows the offered and cleared quantities for participant sell offers. A total of 16,754.5¹ MW of supply was offered into the Second Incremental Auction composed of uncleared capacity from prior 2021/2022 auctions and new capacity in the form of uprates or new resources that were not previously capacity resources in PJM. Across the entire RTO, 3,707.5 MW of participant sell offers cleared, all of which were annual Capacity Performance with none cleared as matched seasonal Capacity Performance.

¹ The total offered supply quantity was determined using the annual Capacity Performance, summer Capacity Performance and winter Capacity Performance sell offers.



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

LDA	Sell Offers (UCAP MW)*	Cleared Sell Offers (UCAP MW)*
DPL-SOUTH	56.0	39.3
PS-NORTH	369.2	98.1
PSEG (rest of)	253.1	97.0
EMAAC (rest of)	1,936.1	129.9
EMAAC Total	2,614.4	364.3
PEPCO	252.0	75.7
BGE	914.2	96.0
SWMAAC (rest of)	24.7	19.5
SWMAAC Total	1,190.9	191.2
PPL	110.5	55.4
MAAC (rest of)	928.9	335.8
MAAC Total	4,844.7	946.7
ATSI (rest of)	1,931.0	587.8
ATSI-Cleveland	1,121.5	629.0
COMED	4,824.2	205.9
DAY	33.1	22.1
DEOK	376.0	65.3
RTO (rest of)	3,624.0	1,250.7
RTO Total	16,754.5	3,707.5

*Values include Annual, Summer and Winter Offered and Cleared in the LDA where the resource is modeled



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There were no seasonal capacity sell offers cleared in an aggregated manner to form a year-round commitment. Total cleared summer-period sell offers must exactly equal total cleared winter-period sell offers across the entire RTO to ensure that seasonal CP sell offers clear to form annual CP commitments. Table 3 shows a breakdown of the seasonal resources offered and cleared in the 2021/2022 Second Incremental Auction.

Table 3 – Breakdown of Annual and Seasonal Capacity Performance Resources by Resource Type and Season that Offered and Cleared in the 2021/2022 Second Incremental Auction

Resource Type	Offered MW (UCAP)			Cleared MW (UCAP)		
	Annual Capacity Performance	Summer Capacity Performance	Winter Capacity Performance	Annual Capacity Performance	Summer Capacity Performance	Winter Capacity Performance
GEN	14,757.3	127.3	36.0	2,809.8	0.0	0.0
DR	8.3	216.6	0.0	4.3	0.0	0.0
EE	1,571.8	37.2	0.0	893.4	0.0	0.0
Grand Total	16,337.4	381.1	36.0	3,707.5	-	-



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Table 4 provides a further breakdown of the capacity offered and cleared in the 2021/2022 Second Incremental Auction.

Table 4 - 2021/2022 Second Incremental Auction Supply Resource Mix

Resource Type	Type	Total Sell Offers (MW UCAP)*	Cleared Sell Offers (MW UCAP)*
DEMAND	DEMAND	224.9	4.3
EE	EE	1,609.0	893.4
GEN	New Generation (including Uprates)	1,264.6	95.3
	Uncleared from Prior Auction	13,656.0	2,714.5
		16,754.5	3,707.5

*Values include Annual, Summer and Winter Offered and Cleared MW



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Participant demand in an Incremental Auction is composed of buy bids submitted by participants seeking replacement capacity for a previously committed capacity resource. The buy bids are specified in UCAP terms and, if cleared, are binding commitments to purchase capacity for the entire Delivery Year. Across the RTO participants submitted a total of 18,021.4 MW buy bids, of which 6,484.6 MW cleared. The bid and cleared quantities of participants buy bids are further illustrated by location in Table 5.

Table 5 – Participant Buy Bids (Bid and Cleared Quantities)

LDA	Buy Bids (UCAP MW)	Cleared Buy Bids (UCAP MW)
DPL-SOUTH	93.7	8.1
PS-NORTH	169.4	58.0
PSEG (rest of)	114.4	12.4
EMAAC (rest of)	1,140.6	157.9
EMAAC Total	1,518.1	236.4
PEPCO	1,098.5	983.3
BGE	265.9	61.4
SWMAAC (rest of)	0.0	0.0
SWMAAC Total	1,364.4	1,044.7
PPL	2,489.8	381.4
MAAC (rest of)	3,449.0	1,887.1
MAAC Total	8,821.3	3,549.6
ATSI (rest of)	772.7	122.0
ATSI-Cleveland	176.5	31.5
COMED	3,052.8	566.7
DAY	144.5	12.6
DEOK	158.2	61.5
RTO (rest of)	4,895.4	2,140.7
RTO Total	18,021.4	6,484.6



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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 6a and 6b show the offered and cleared quantities of PJM sell offers and PJM buy bids, respectively, employed in the 2021/2022 Second Incremental Auction. For the 2021/2022 Second Incremental Auction, across the entire RTO region, cleared PJM sell offers totaled 2,954.1 MW. The PJM cleared buy bid quantity was 177.0 MW; therefore, PJM released a total net capacity of 2,777.1 MW.

The cleared PJM buy bid quantity of 177.0 MW includes 118.1 MW of PJM buy bids associated with an increase in the RTO reliability requirement set equal to the MW quantity of EE Resources that cleared in the auction above the EE add-back margin that remained coming into the auction. In the 2021/2022 Second Incremental Auction, 893.4 MW of EE cleared across the entire RTO region relative to the 775.3 MW EE add-back margin that remained coming into the auction. The cleared MW quantity of EE Resources above the EE add-back margin remaining from all prior auctions must be offset by a PJM buy bid in order to avoid double-counting of cleared EE Resource MW since energy efficiency measures are directly reflected in each peak load forecast.



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Table 6a – PJM Sell Offers (Offered and Cleared Quantities)

LDA	Sell Offers (UCAP MW)	Cleared Sell Offers (UCAP MW)
DPL-SOUTH	0.0	0.0
PS-NORTH	0.0	0.0
PSEG (rest of)	0.0	0.0
EMAAC (rest of)	97.0	0.0
EMAAC Total	97.0	0.0
PEPCO	104.0	0.0
BGE	185.0	0.0
SWMAAC (rest of)	0.0	0.0
SWMAAC Total	289.0	0.0
PPL	0.0	0.0
MAAC (rest of)	477.0	0.0
MAAC Total	863.0	0.0
ATSI (rest of)	852.0	529.3
ATSI-Cleveland	165.0	0.0
COMED	2,191.0	1,388.0
DAY	302.0	210.5
DEOK	243.4	57.5
RTO (rest of)	768.8	768.8
RTO Total	5,385.2	2,954.1



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Table 6b – PJM Buy Bids (Offered and Cleared Quantities)

LDA	Buy Bids (UCAP MW)	Cleared Buy Bids (UCAP MW)
DPL-SOUTH	0.0	0.0
PS-NORTH	38.0	38.0
PSEG (rest of)	86.7	86.7
EMAAC (rest of)	3.2	3.2
EMAAC Total	127.9	127.9
PEPCO	1.2	1.2
BGE	34.6	34.6
SWMAAC (rest of)	0.0	0.0
SWMAAC Total	35.8	35.8
PPL	0.0	0.0
MAAC (rest of)	0.0	0.0
MAAC Total	163.7	163.7
ATSI (rest of)	0.0	0.0
ATSI-Cleveland	0.0	0.0
COMED	1.3	1.3
DAY	0.7	0.7
DEOK	0.0	0.0
RTO (rest of)	11.3	11.3
RTO Total	177.0	177.0



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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.

Any party that seeks to purchase replacement capacity for a previously committed capacity resource may do so by submitting a buy bid into the Incremental Auction. Participants submitting a buy bid must specify a MW quantity, price and LDA-specific location. All buy bids in Incremental Auctions for Delivery Years 2020/2021 and forward are of the annual Capacity Performance product type. 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 as the resource that it replaces.

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 Reliability Requirement based on an updated peak load forecast, updated Installed Reserve Margin and other updated planning information. 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 First or Second 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,



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- 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 7 into the Second Incremental Auction for the 2021/2022 Delivery Year². Note that a PJM sell offer is indicated by a negative PJM buy bid in Table 7. PJM submitted sell offers for the Second Incremental Auction for the 2021/2022 Delivery totaling 5,385.2 MW across the RTO, and a total buy bid quantity across the RTO of 58.9 MW due to an increase in the reliability requirement not related to the EE add back margin. All PJM sell offers and buy bids were for the annual Capacity Performance product type. Table 7 also defines the pricing points associated with the PJM sell offers and buy bids.

² The determination of the PJM buy bid and sell offer quantities is detailed in the 2021/2022 Second Incremental Auction Planning Parameters located at <https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2021-2022/2021-2022-second-incremental-auction-planning-parameters-april-2020-load-forecast.ashx?la=en> .



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Table 7 – PJM Buy Bids and PJM Sell Offers for 2021/2022 Second Incremental Auction

Location	PJM Buy Bid (MW) ₍₁₎	Price Points for PJM Buy Bids and PJM Sell Offers					
		Point 1		Point 2		Point 3	
		x-axis (MW)	y-axis (\$/MW-Day)	x-axis (MW)	y-axis (\$/MW-Day)	x-axis (MW)	y-axis (\$/MW-Day)
RTO (Rest of)	-768.8	0.0	\$0.00	768.8	\$0.00	--	--
MAAC (Rest of)	-477.0	0.0	\$85.30	477.0	\$116.99	--	--
EMAAC (Rest of)	-97.0	0.0	\$161.69	97.0	\$174.01	--	--
SWMAAC (Rest of)	0.0	--	--	--	--	--	--
PS (Rest of)	58.9	0.0	\$230.94	58.9	\$206.54	--	--
PS NORTH	0.0	--	--	--	--	--	--
DPL SOUTH	0.0	--	--	--	--	--	--
PEPCO	-104.0	0.0	\$54.04	104.0	\$108.55	--	--
ATSI (Rest of)	-852.0	0.0	\$0.00	495.9	\$0.00	852.0	\$109.27
ATSI-CLEVELAND	-165.0	0.0	\$47.37	165.0	\$180.53	--	--
COMED	-2191.0	0.0	\$0.00	1339.1	\$0.00	2191.0	\$178.81
BGE	-185.0	0.0	\$77.35	185.0	\$163.97	--	--
PL	0.0	--	--	--	--	--	--
DAYTON	-302.0	0.0	\$0.00	202.2	\$0.00	302.0	\$123.68
DEOK	-243.4	0.0	\$0.00	42.0	\$0.00	243.4	\$133.42
TOTAL	-5,326.3						

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



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LDA Capacity Import Limits

Table 8 shows each LDA’s CETL limits for the Base Residual Auction and each LDA’s CETL as updated for the Incremental Auctions for the 2021/2022 Delivery Year. For the Second Incremental Auction, MAAC, BGE and PEPCO CETLs were updated to reflect removal of a backbone projects (b2743.1 and b2743.2) that did not meet the applicable milestones of OATT section 5.11A of Attachment DD. The CETL remaining for use in the Second Incremental Auction for the 2021/2022 Delivery Year shown in the last row of Table 8 represents the LDA capacity import limits that were employed in the Second Incremental Auction for the 2021/2022 Delivery Year and are equal to the LDA CETL as updated for the Second Incremental Auction minus the total capacity import levels into the LDA.

Table 8 – LDA Capacity Import Capability for 2021/2022 Second Incremental Auction

	LDA													
	MAAC	EMAAC	SWMAAC	PS	PS NORTH	DPL SOUTH	PEPCO	ATSI	ATSI-C	COMED	BGE	PPL	DAY	DEOK
Base Residual Auction (BRA) CETL	4,019.0	9,000.0	9,082.0	6,902.0	3,180.0	1,624.0	6,915.0	8,439.0	5,256.0	5,574.0	6,005.0	6,609.0	3,502.0	4,959.0
1st Incremental Auction (IA) CETL	3,699.0	9,000.0	8,770.0	6,902.0	3,180.0	1,624.0	6,837.0	8,439.0	5,256.0	5,574.0	5,910.0	6,609.0	3,502.0	4,959.0
2nd Incremental Auction (IA) CETL	4,210.0	9,000.0	8,770.0	6,902.0	3,180.0	1,624.0	6,710.0	8,439.0	5,256.0	5,574.0	5,860.0	6,609.0	3,502.0	4,959.0
Capacity Import Level (1st IA)	1,389.4	9,000.0	5,828.0	6,902.0	3,180.0	1,517.6	2,643.2	7,776.6	4,489.2	5,391.6	5,860.0	-506.3	2,647.3	4,774.2
Capacity Import Limit for 2nd Incremental Auction	2,820.6	0.0	2,942.0	0.0	0.0	106.4	4,066.8	662.4	766.8	182.4	0.0	7,115.3	854.7	184.8

Incremental Auction Clearing

Participant sell offers and buy bids are combined with the PJM sell offers and buy bids shown in Table 7 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. Total cleared summer-period sell offers must exactly equal total cleared winter-period sell offers across the entire RTO to ensure that seasonal CP sell offers clear to form annual CP commitments.



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Mitigation in the 2021/2022 Second Incremental Auction

Mitigation was applied to Existing Generation Capacity Resources of all jointly pivotal suppliers that failed the Market Structure Test in the execution of the RPM auction clearing. In the event a price-based sell offer exceeded the calculated offer cap of a pivotal supplier's Existing Generation Capacity Resource, the cost-based sell offer was utilized in the RPM auction clearing³. Demand Resources and Energy Efficiency Resources are not subject to market power mitigation.

³ Furthermore, mitigation is only applied to sell offers that would, absent mitigation, increase the Capacity Resource Clearing Price.