

PJM 2026/27 BRA: Price impact of additional renewable & BESS supply

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Executive Summary

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This report estimates the impact that additional capacity supply would have had in PJM's 2026/27 Base Residual Auction (BRA), which took place in July 2025, using data and tools published by PJM.

Key findings include:

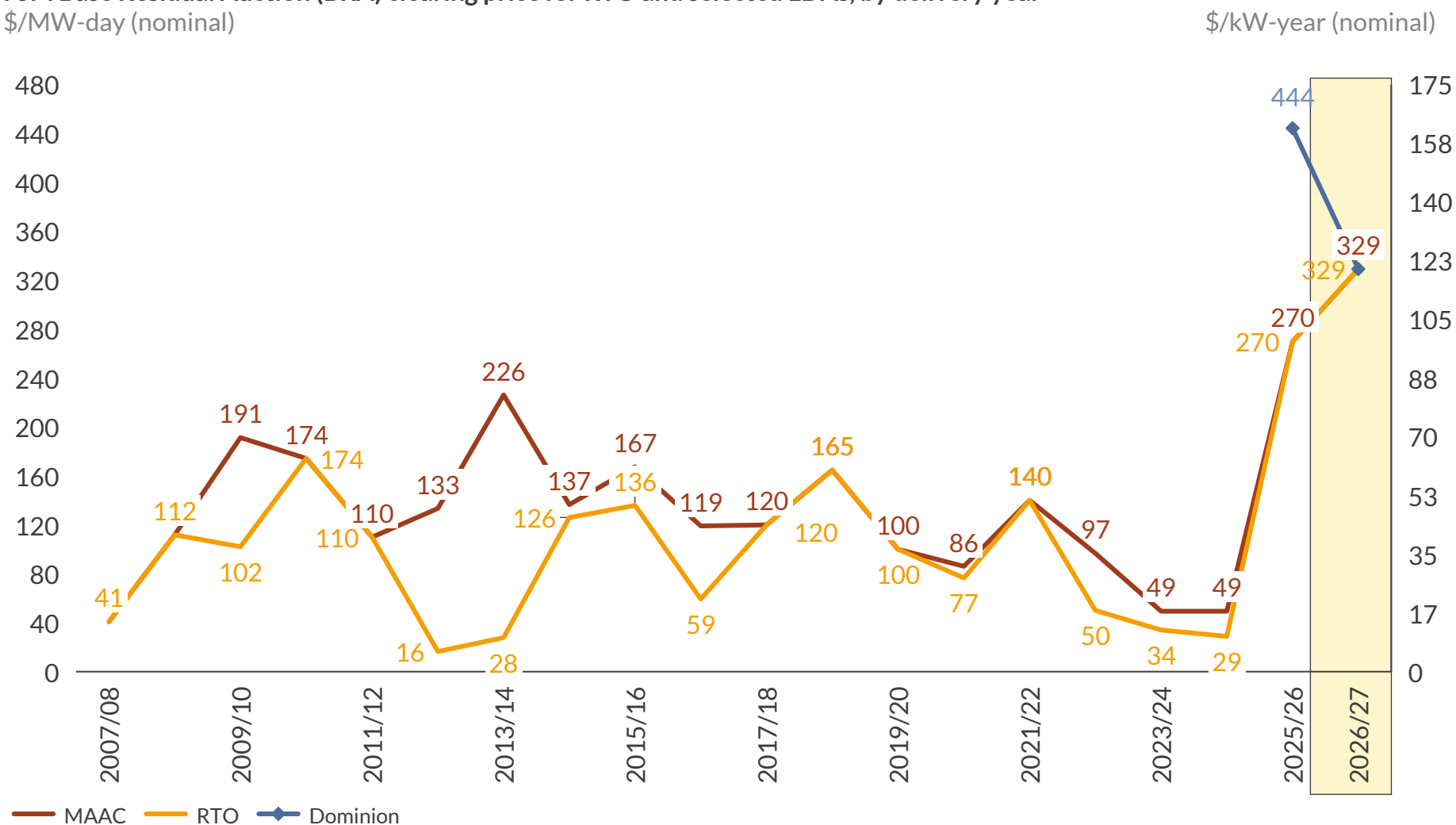
- The **2026/27 BRA cleared at its cap of \$329/MW-day**, the highest RTO clearing price ever seen in PJM's capacity market, representing **\$16.1bn in total costs**. This was the result of insufficient capacity supply, clearing the auction at its price cap.
- PJM currently has 130GW of capacity-eligible projects in its interconnection queue that entered before 2024¹—equal to 73% of capacity offered in the 2026/27 BRA—which is in part driven by major constraints in interconnecting, permitting, and constructing projects.
- We simulate the capacity cost savings that could have been achieved had a fraction of this capacity (10% of land-based renewables and batteries) built in time for the 2026/27 delivery year. Aurora estimates it would have represented **+1.5GW UCAP of net additional supply**², causing the auction to clear at **\$254/MW-day**. This would have represented **\$12.6bn in total costs**—\$3.5bn less than the auction's costs as actually cleared.

Note, PJM forecasts peak load growth of +5.9GW/year through 2030, on average.³ The resulting increases in capacity demand mean that the cost savings from supply additions estimated in this report may not persist through future auctions.

1) Nameplate capacity. Includes projects with status "Active" and "Engineering & procurement". This study excludes projects under construction or accepted into PJM's Reliability Resource Initiative (RRI) fast-track process. 2) The incremental supply is partially offset by reductions in existing supply's ELCC. 3) PJM 2025 Load Forecast.

The 2026/27 BRA's \$329/MW-day clearing price was the highest ever seen in PJM's capacity market at RTO-level

PJM Base Residual Auction (BRA) clearing price for RTO and selected LDAs, by delivery year
\$/MW-day (nominal)



RTO

- The 2026/27 Base Residual Auction cleared at the RTO-wide cap of **\$329.17/MW-day**, the highest in PJM's 19-year capacity market history.¹

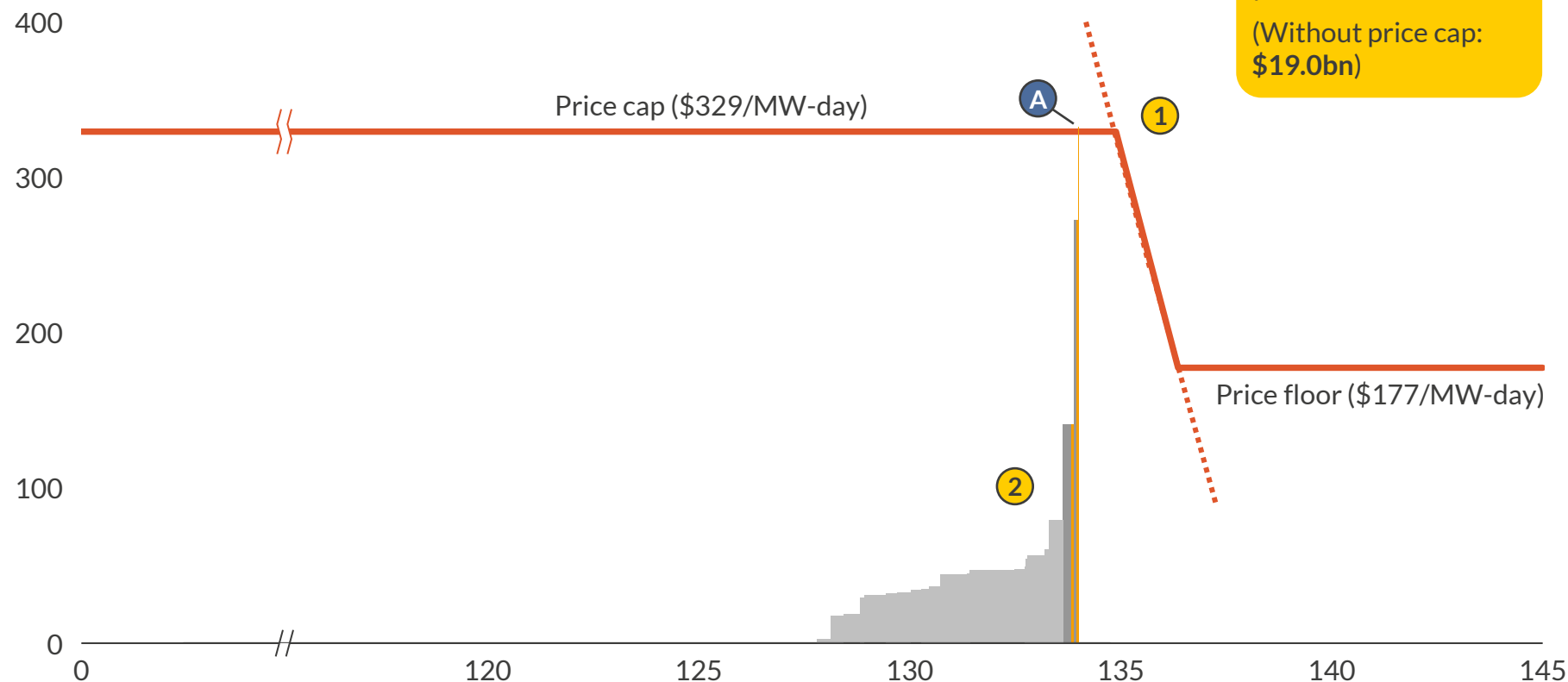
LDAs

- Locational Deliverability Areas (LDAs)** are subregions within PJM defined by transmission constraints. They ensure that enough capacity is located where it can be delivered to load even during peak system stress, with each LDA having its own procurement target.²
- In previous auctions, constrained LDAs like **MAAC** and **Dominion** typically cleared above the RTO prices.
- This year, because the RTO price reached the cap, **all LDAs cleared at the same level as the RTO.**

1) The first delivery year for which PJM held a capacity auction was 2007/08. 2) LDA auction procurement targets are based on existing capacity and Capacity Emergency Transfer Objectives (CETO).

The \$329/MW-day price was set by the auction cap, with nearly all offered supply clearing, resulting in \$16.1bn in total value

Demand curve (VRR)¹ and estimated supply bids² for PJM 2026/27 BRA
\$/MW-day (nominal)



A 26/27 BRA Clearing Point

... Pre-collar demand curve — Demand curve ■ Thermal uprates ■ Demand response ■ Illustrative²

1) Variable Resource Requirement. 2) Due to the price floor, this analysis focuses on bids >\$90/MW-day; lower bids illustrative. 3) Does not equate to total cost to load, as some capacity is hedged via self-supply or bilateral agreements. 4) Unforced Capacity: accredited capacity, using ELCCs to adjust for reliability benefit per MW. 5) Installed Capacity: capacity before adjusting to UCAP.

Sources: Aurora Energy Research, PJM

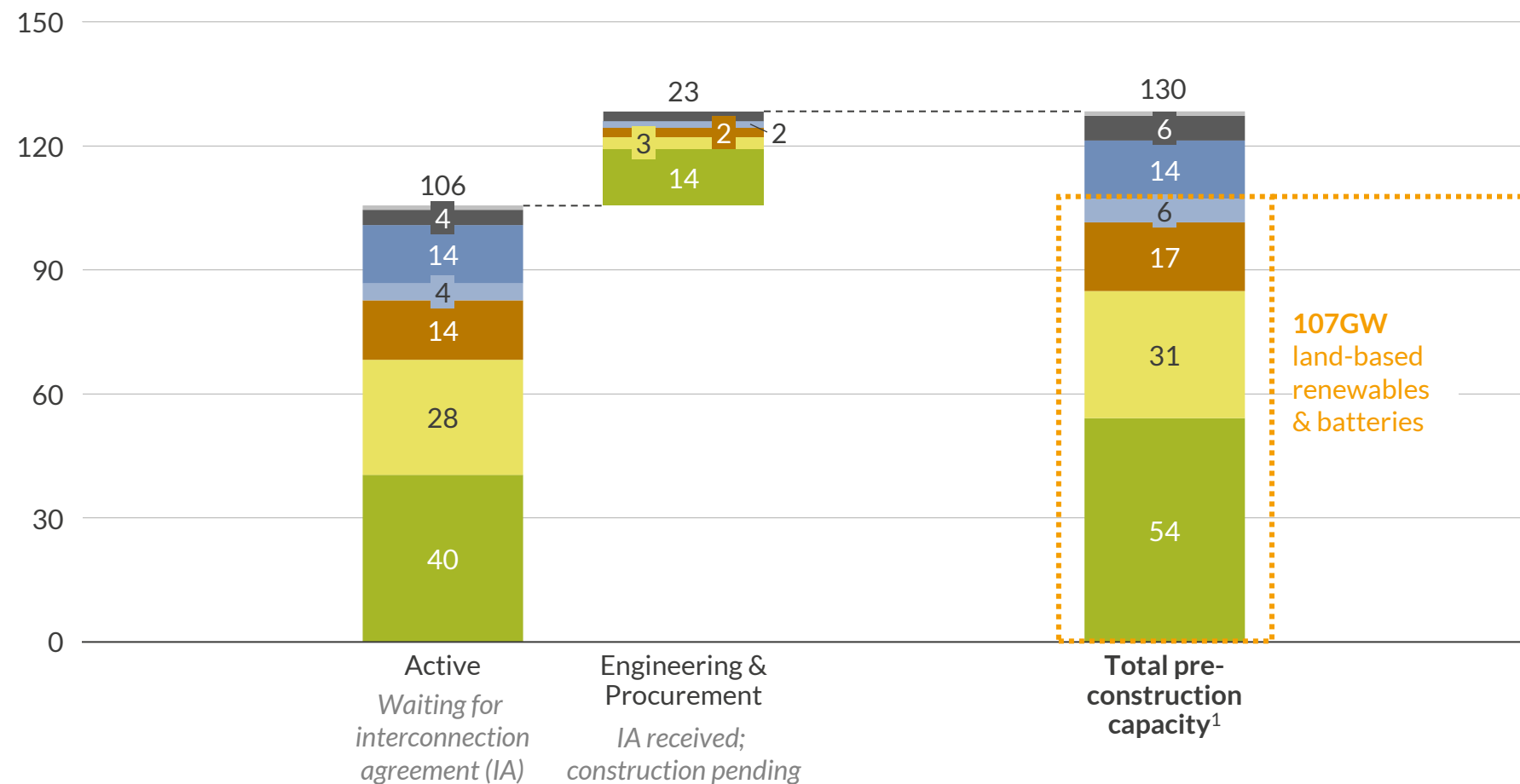
1 PJM's 2026/2027 BRA cleared 134.2 GW of capacity—nearly all that was bid—and cleared at the price cap of **\$329/MW-day** (point **A**), implying a shortfall in procurement compared to the targeted reliability requirement.

- Without the price cap, the auction would have cleared at **\$389/MW-day**.

2 This historically high clearing price was primarily driven by a **tight supply-demand ratio**. Compared to the 2025/26 BRA, peak load rose by 5.5GW, driven primarily by data center additions, driving a reliability requirement increase of 1.7GW UCAP.⁴ While the auction saw ca. 7GW ICAP⁵ new supply, total cleared UCAP fell by 1.5GW, due to a reduction in capacity accreditation (ELCCs).

106GW in PJM's queue are waiting for interconnection, and 23GW have an agreement but face further hurdles to getting built

Pre-construction capacity in PJM's interconnection queue by tech and status, submitted as capacity resources by June 2023¹
GW nameplate



This report aims to show that, with fewer challenges, **land-based renewables and batteries** could already be a major contributor to lower capacity prices in PJM.

We include:

- 10% of queue capacity, to simulate a conservative share that reasonably may have built and participated in the BRA.
- Projects with status *Active*, or *Engineering & Procurement*, as these might have progressed faster to operation but have faced constraints in interconnection, permitting, and construction.

We exclude:

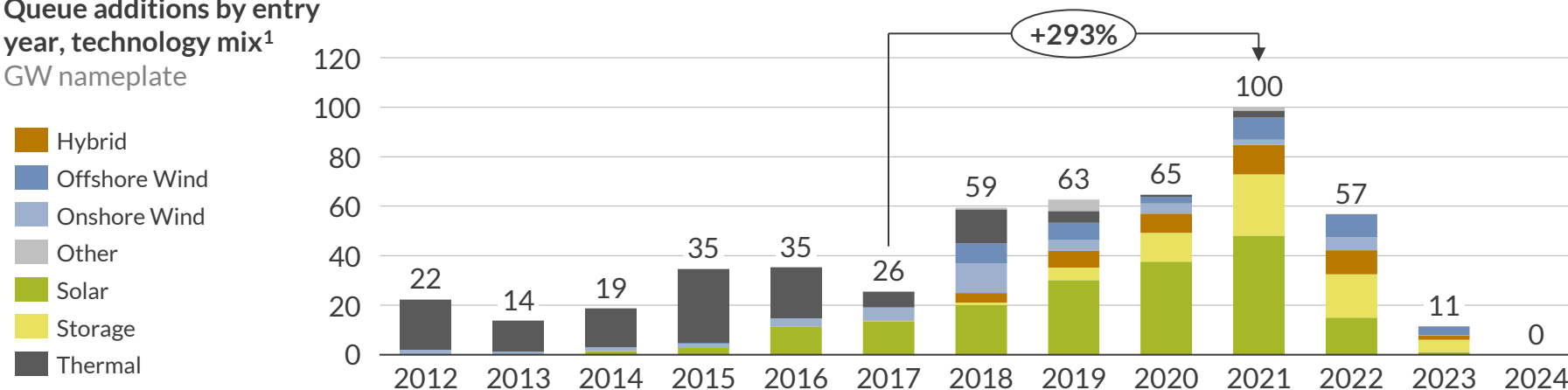
- Withdrawn projects, although a portion might have been built without the above-mentioned constraints.
- Projects *Under Construction*, to avoid double-counting any that participated in the 26/27 BRA.
- RRI projects, as these are already fast-tracked by PJM.
- Offshore wind, as its realization depends on unique factors, include state support and federal permitting.

¹ Pre-construction: Interconnection queue status "Active" or "Engineering & Procurement". Capacity aggregated from interconnection queue "MW Energy" listing. Data as of October 6th, 2025. RRI-selected projects and energy only projects are excluded. Only projects included that entered PJM's interconnection queue on or before June 30th, 2023.

Between 2018 and 2022, PJM's interconnection queue became backlogged with large numbers of entrants, slowing processing time

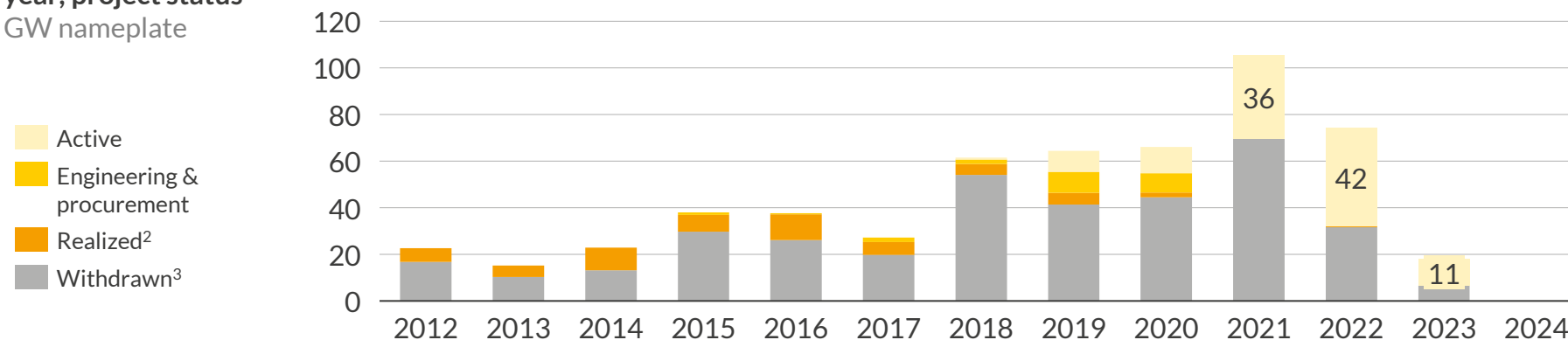
1 Annual queue entry rose more than 293 percent between 2017 and 2021, with an influx of renewable projects...

Queue additions by entry year, technology mix¹
GW nameplate



2 ...and only 2.3% of projects entered since the start of 2019 have reached commercial operation.

Queue additions by entry year, project status¹
GW nameplate



Queue entry increased 293% from 2017 to 2021

- Before reform was announced in 2022, PJM experienced rapid growth in interconnection queue capacity, yet most projects are speculative and not expected to come online.
- New entry decreased substantially in 2022, 2023, and 2024, after PJM announced that new queue entries would not be studied until 2026 under the reformed process.

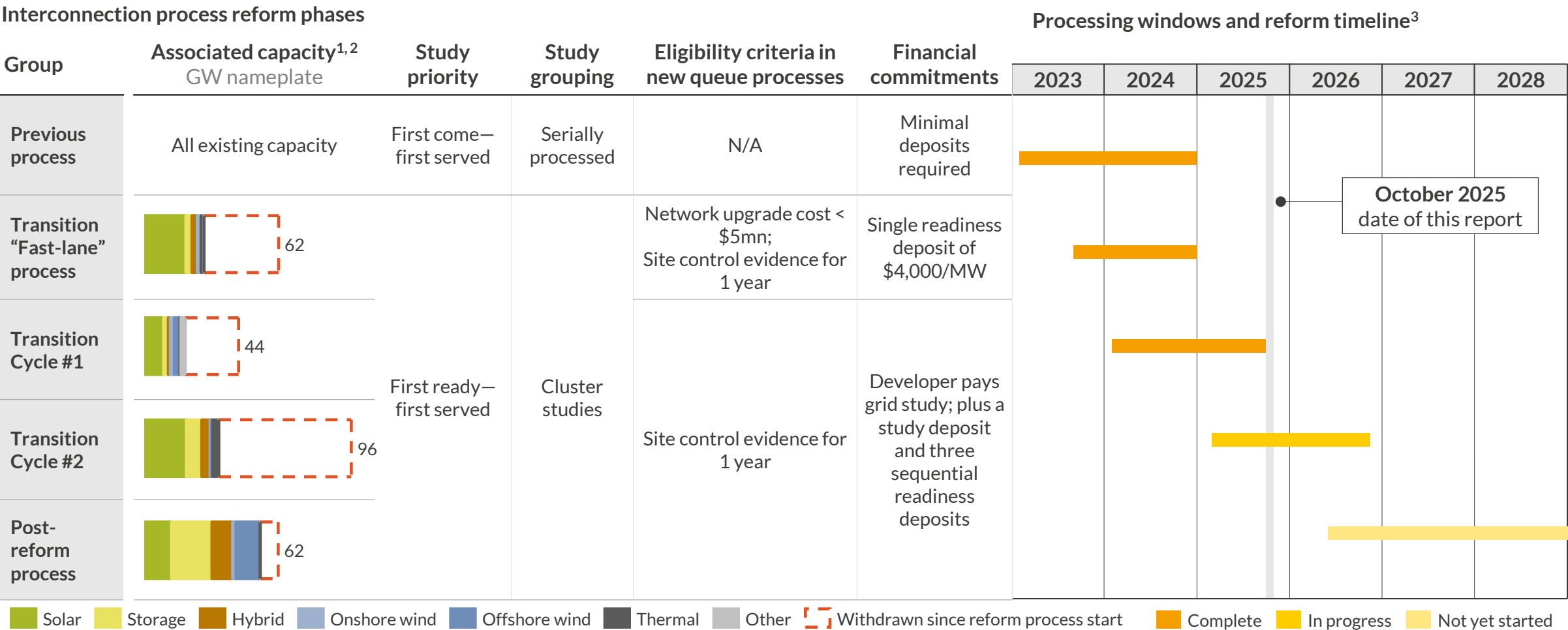
New queue entry has shifted from mostly thermal to mostly renewable

- In 2022, 99.6% of new interconnection queue entry were renewable or storage projects, whereas in 2012, only 8.4% of new interconnection queue entry were renewable projects.

1) Data updated through October 6th, 2025, based on project "MW Energy" in PJM interconnection queue data. 2) Includes projects that are partially in service, deactivated, in service, under construction, and pending. 3) Includes projects that are canceled, retracted, suspended and withdrawn.

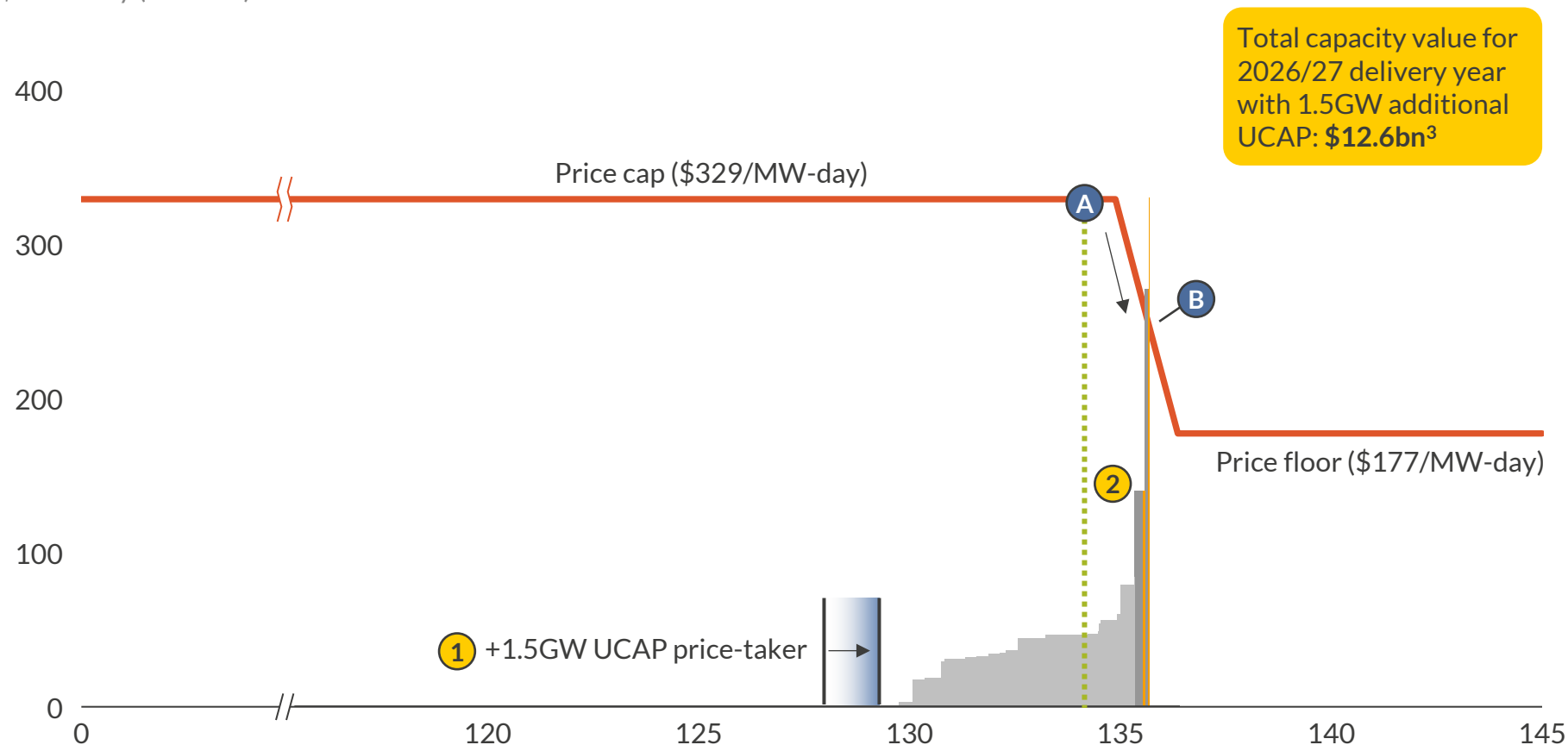
PJM aims to process its backlog of interconnection requests by 2026, but many projects are withdrawing or not building once processed

As part of its ongoing interconnection queue reform, PJM is processing its queue backlog through a series of “cluster” studies, where each project in the cluster is evaluated together and projects share required network upgrade costs. As of October 2025, PJM has completed all studies for the “Fast-lane” group and for Transition Cycle #1.



1.5GW additional UCAP from the interconnection queue could have lowered the clearing price to \$254/MW-day, saving up to \$3.5bn

Demand curve (VRR)¹ and estimated supply bids² for PJM 2026/27 BRA, with +1.5GW UCAP added
\$/MW-day (nominal)



A 26/27 BRA Clearing Point **B** Modeled Clearing Point Original 2026/27 cleared capacity
 — Demand curve ■ Thermal uprates ■ Demand response ■ Illustrative²

1) Variable Resource Requirement. Demand curve shown includes PJM's price collar, with pre-collar curve partially shown in dotted red. 2) Due to the BRA's floor, this analysis focuses on bid estimates above \$90/MW-day. Lower bids shown are illustrative only. 3) Does not equate to total cost to load, as some is hedged via self-supply & bilateral agreements.

Sources: Aurora Energy Research, PJM

- 1 With 1.5GW additional UCAP supply—representing 10% of land-based renewable and battery capacity in the queue, and thus assumed to bid as price-takers—the BRA would clear at **\$254/MW-day** (point **B**), a **24% drop** from \$329/MW-day.
- 2 Total cleared capacity rises by 1.4GW UCAP, as only a small number of the highest-price bids are pushed beyond the demand curve and no longer clear.
 - **Note:** Given the 2026/27 BRA's steep demand and supply curves, small differences in class-wide ELCCs can impact the clearing prices by >\$50/MW-day. Aurora has made its best estimate of ELCC impacts using PJM-provided tools and data, but actual UCAP impacts could vary significantly.

Different combinations of renewable and battery capacity could achieve +1.5GW UCAP, with wind generally cheapest per MW UCAP due to high ELCCs

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Summary of capacity market outcomes and additional capacity supply assumed in +1.5GW UCAP scenario

\$ (nominal)	Actual: 2026/27 BRA	Scenario: +1.5GW UCAP supply		
Clearing price, \$/MW-day	329	254		
Cleared capacity, GW UCAP	134.2	135.6 (+1.4GW, due to sloped demand curve)		
Total auction cost, \$bn	16.1	12.6		
Assumed additional capacity vs. actual 2026/27 BRA, GW nameplate, (%)	Reference: actual cleared (2026/27)	Pathway: +10% of interconnection queue	Pathway: Solar and BESS mix	Pathway: Wind only
Tracking solar, (ELCC ¹)	13.3 (11%)	+5.4 (9%)	+10 (9%)	-
Onshore wind, (ELCC)	11.7 (41%)	+0.6 (42%)	-	+4.5 (36%)
4h BESS, (ELCC)	0.3 (50%)	+3.1 (34%)	+5.8 (31%)	-
Solar-BESS hybrid, ² (ELCC)	0.0 (61%)	+1.7 (43%)	-	-
Total nameplate addition		+10.7	+15.8	+4.5
Other supply adjustments due to ELCC impacts, ³ GW UCAP	0	-1.0	-1.2	-0.1
Total CAPEX required, ⁴ \$bn	0	19.3	24.6	8.3

Note: Given the 2026/27 BRA's steep demand and supply curves, small differences in class-wide ELCCs can impact the clearing prices by >\$50/MW-day. Aurora has made its best estimate of ELCC impacts using PJM-provided tools and data, but actual UCAP impacts could vary significantly.

Capacity composition initially tested, that results in net +1.5GW UCAP.

Alternative capacity compositions that also would have added net +1.5GW UCAP in the 2026/27 BRA.

1) ELCC (Effective Load Carrying Capability) quantifies how much 1 MW of a resource reduces system outage risk. ELCC impacts estimated using PJM's ELCC Calculator tool. 2) Each 1 MW hybrid assumed to include 1 MW solar + 1 MW 4h battery. 3) Adding new capacity changes both its own and other resources' ELCC, most notably for pumped storage. Our analysis adjusts UCAP values to reflect these effects. 4) In real 2024 USD. Calculated using standard Aurora assumptions, excluding Investment Tax Credit. Sources: Aurora Energy Research, PJM

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Date

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Prepared by

Zachary Edelen
(Zachary.Edelen@auroraer.com)

Kaicheng Sun

(Kaicheng.Sun@auroraer.com)

Approved by

Julia Hoos
(Julia.Hoos@auroraer.com)

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