

PJM's Capacity Market: Clearing Prices, Power Plants, and Environmental Justice

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Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

Applied Economics Clinic

- Applied Economics Clinic (AEC) is a mission-based non-profit consulting group that offers expert services in the areas of energy, environment, consumer protection, and equity.
- AEC's clients are primarily public interest organizations—non-profits, government agencies, and green business associations—who work on issues related to AEC's areas of expertise.
- AEC works proactively to support and promote diversity in our areas of work by providing applied, on-the-job learning experiences to graduate students.
- AEC is committed to a just workplace that is diverse, pays a living wage, and is responsive to the needs of its eight full-time and seven part-time staff.



Our environmental justice work

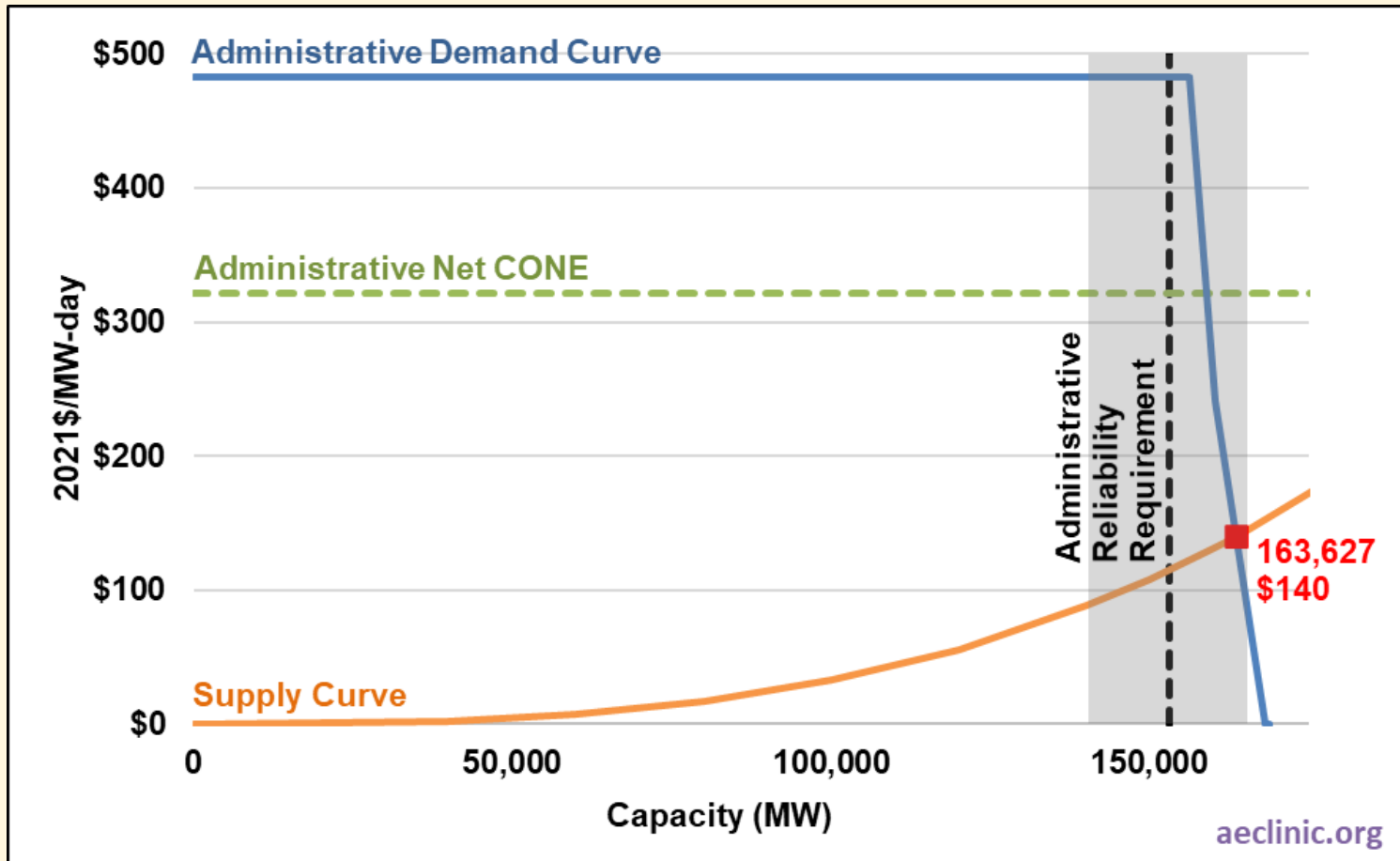
AEC's environmental justice (EJ) and equity work has included EJ community designation, location analyses, equity analyses, program and policy assessment, and recommendations.

For example:

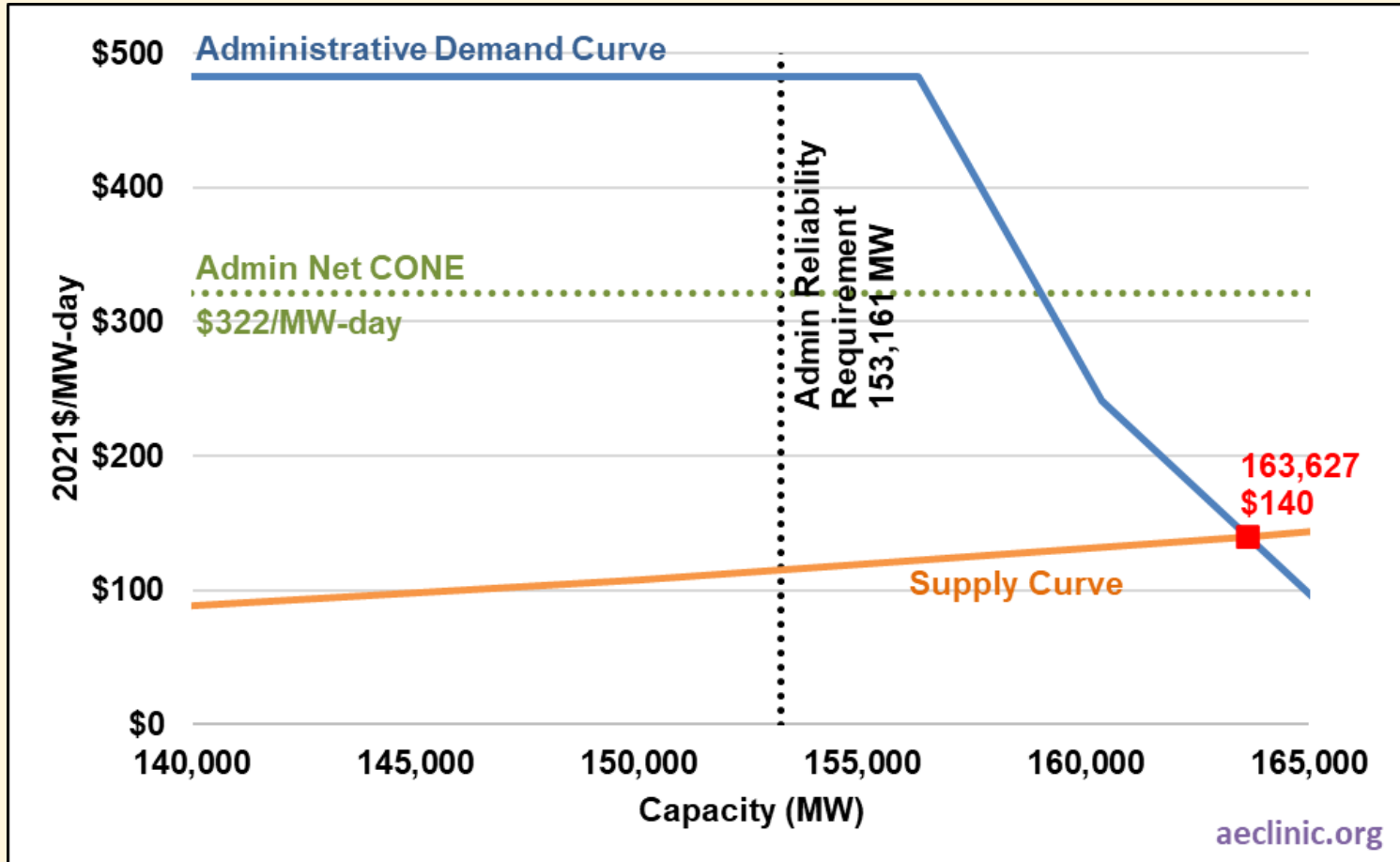
- [Equity Assessment of Electrification Incentives in the District of Columbia](#)
- [Assessment of Backup Diesel Generators in Massachusetts and New York City](#)
- [Initial Assessment of the Climate Justice Working Group's Recommended Policy Priorities – Tracking Equity and Justice](#)
- [Carbon Free Boston Social Equity Analysis](#)



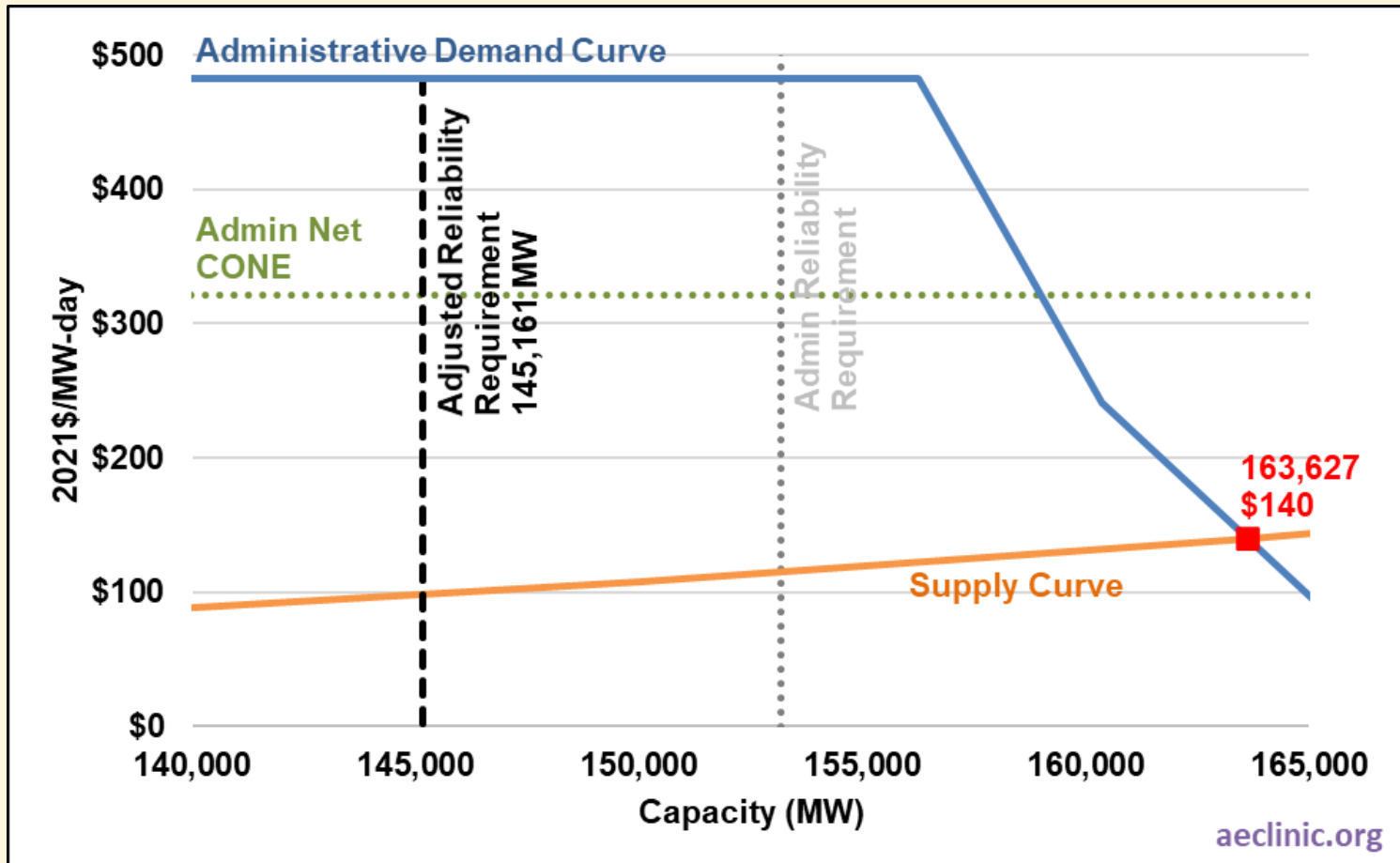
Customers paid \$140/MW-day for peak capacity in the 2021/22 auction, but PJM used a demand curve that was artificially high



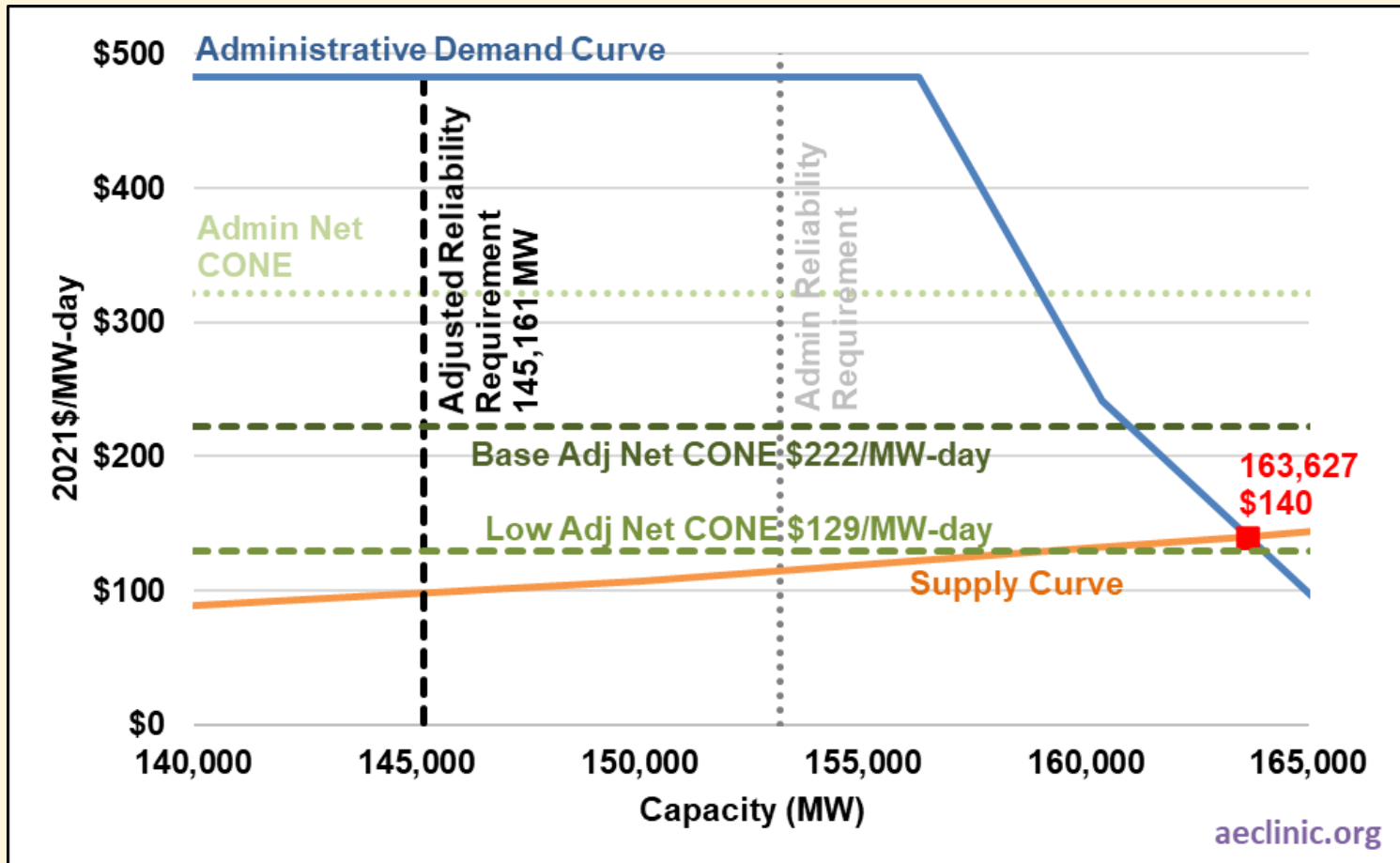
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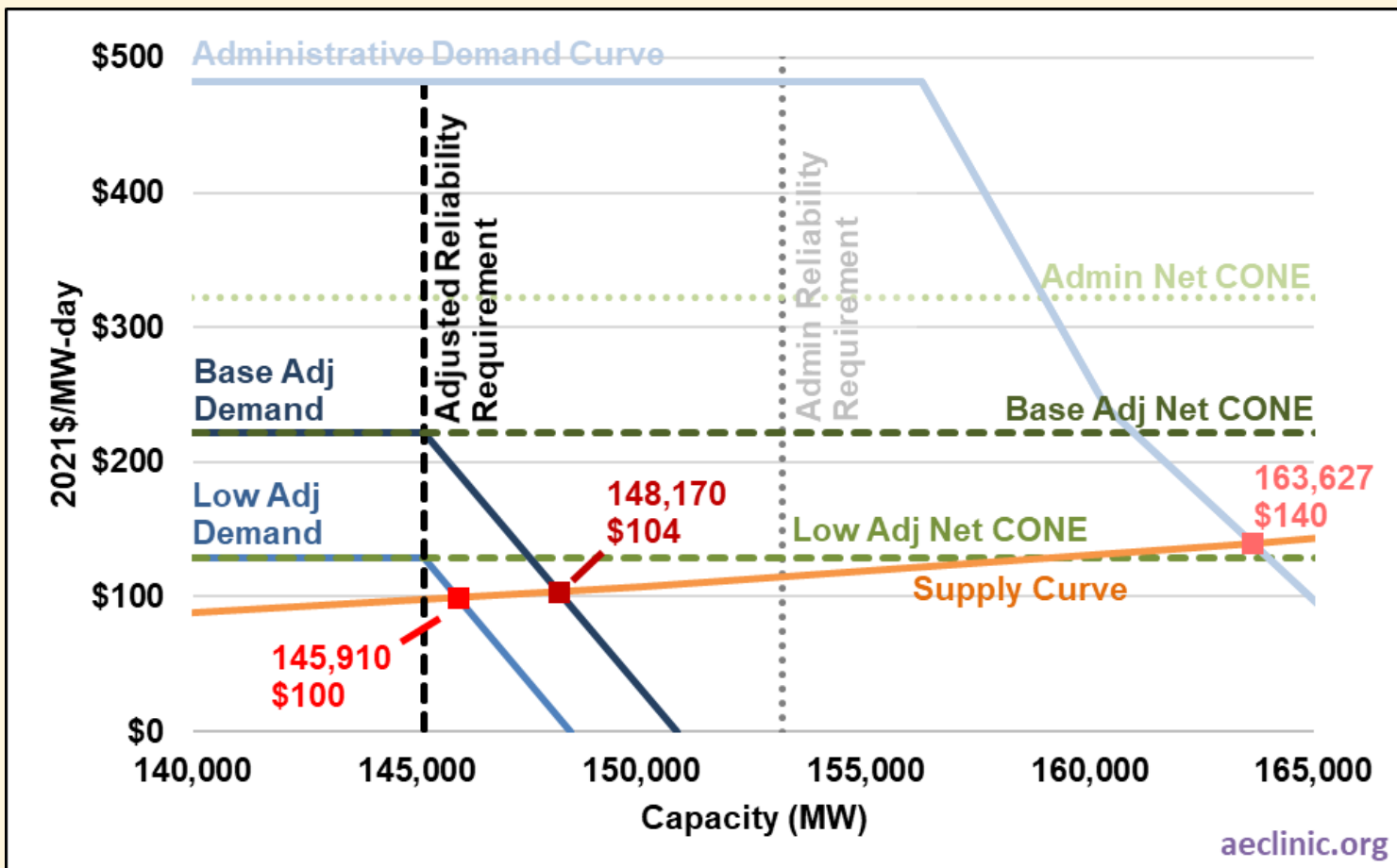
Adjustment #1: lower Reliability Requirement by 8,000 MW (or 5 percent)



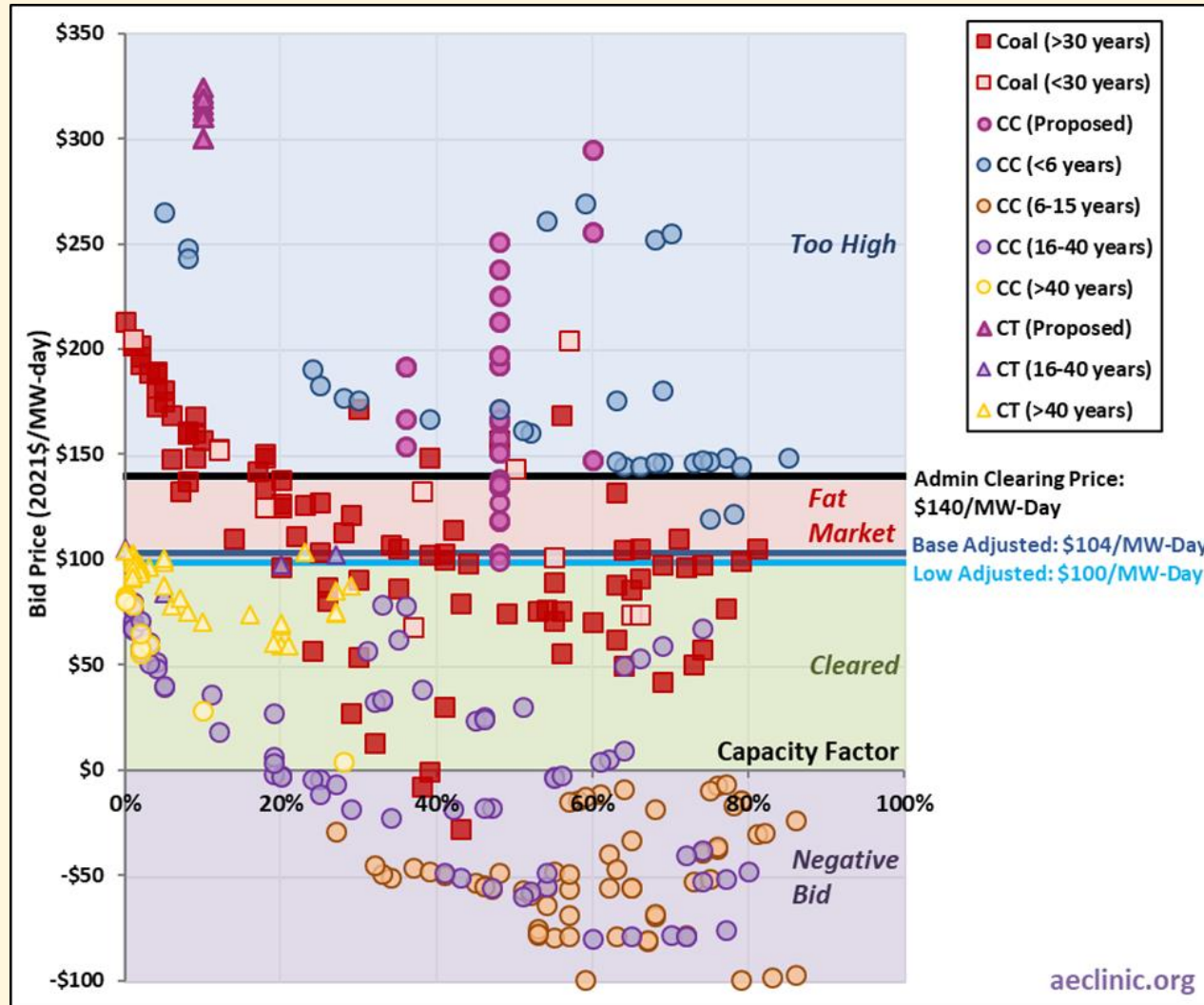
Adjustment #2: lower Net Cost of New Entry (CONE) from \$322 to \$129-\$222/MW-day



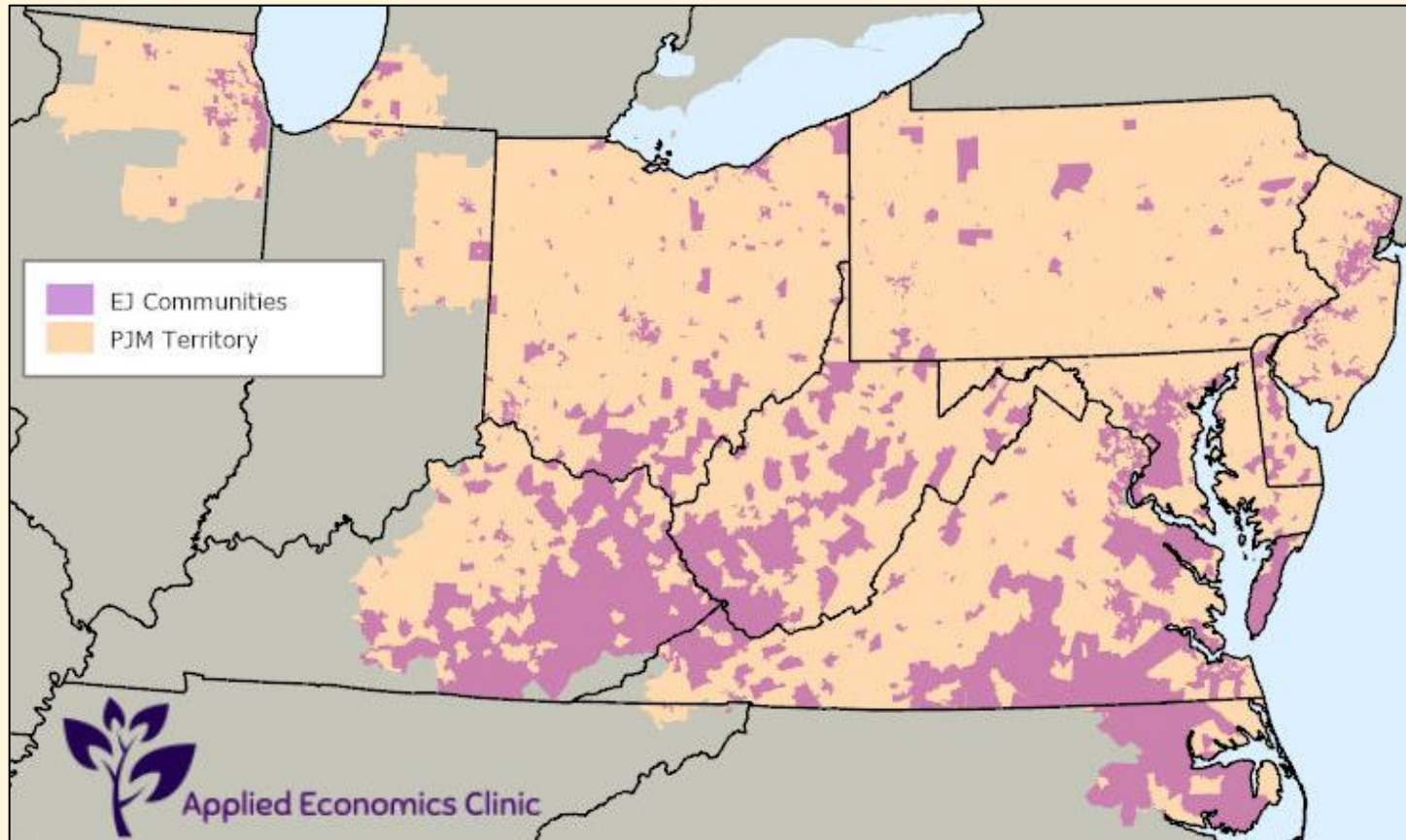
Result: adjusted market clearing price is \$36-\$40/MW-day lower; cleared capacity is about 15,500-17,700 MW lower



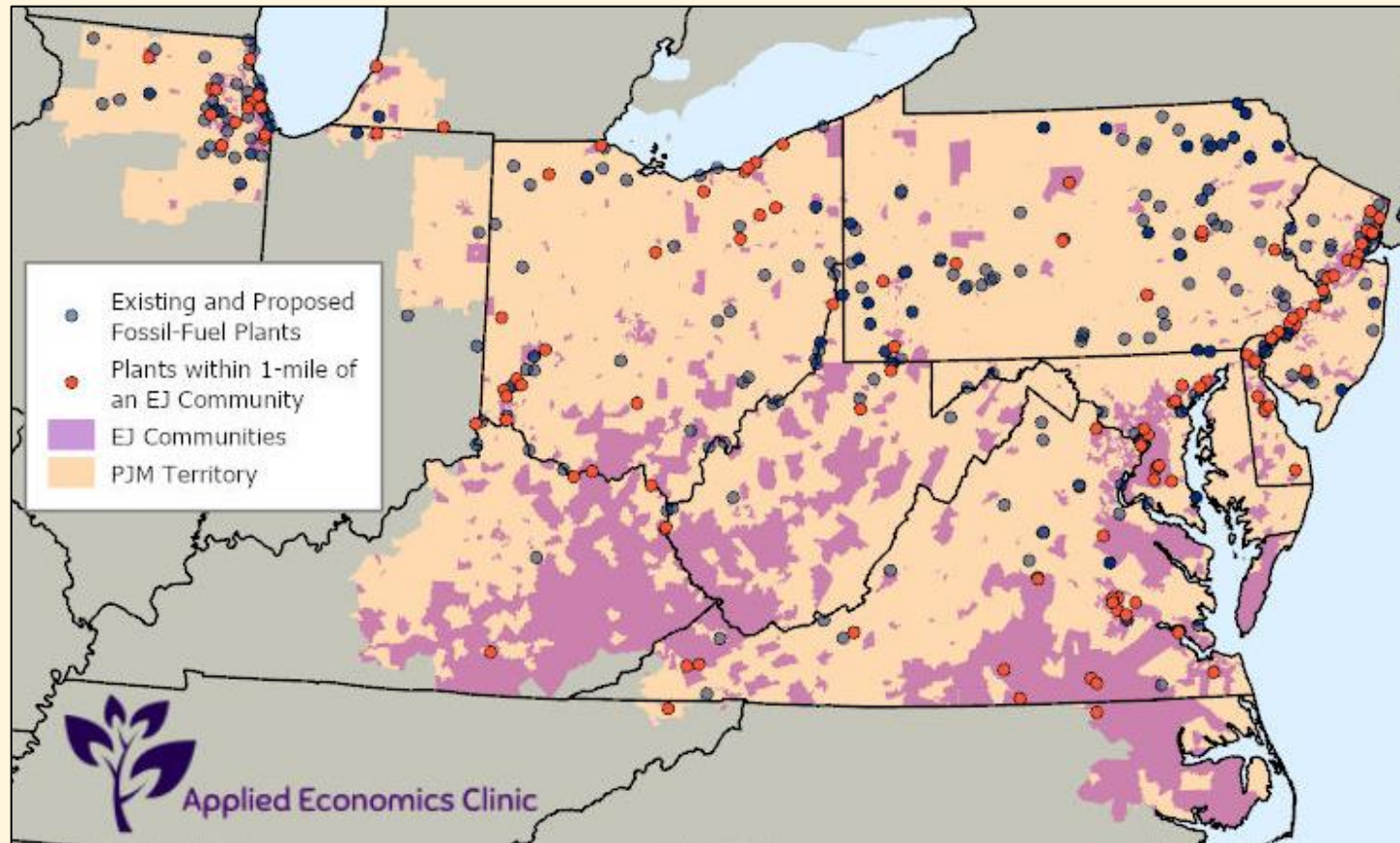
According to our analysis, 77 units are benefitting from PJM's "fat market"



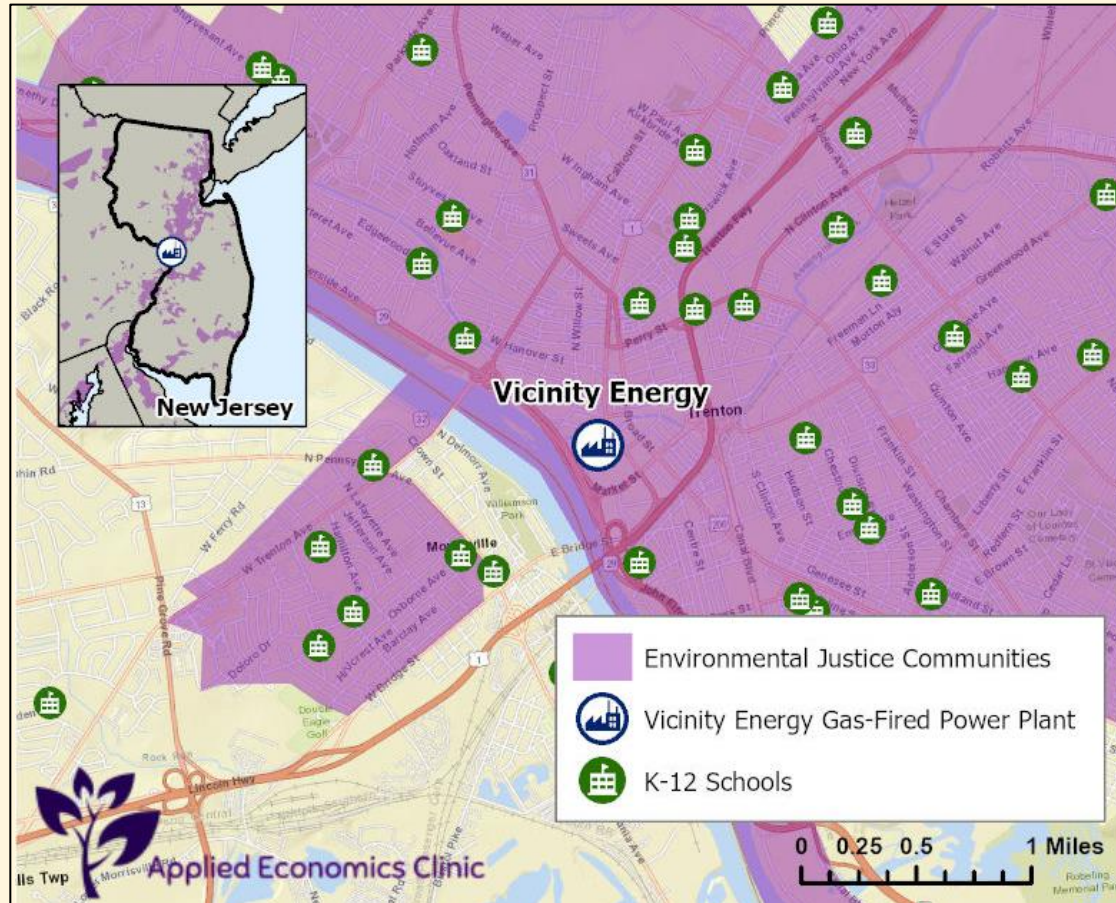
43 percent of PJM's census tracts are EJ communities



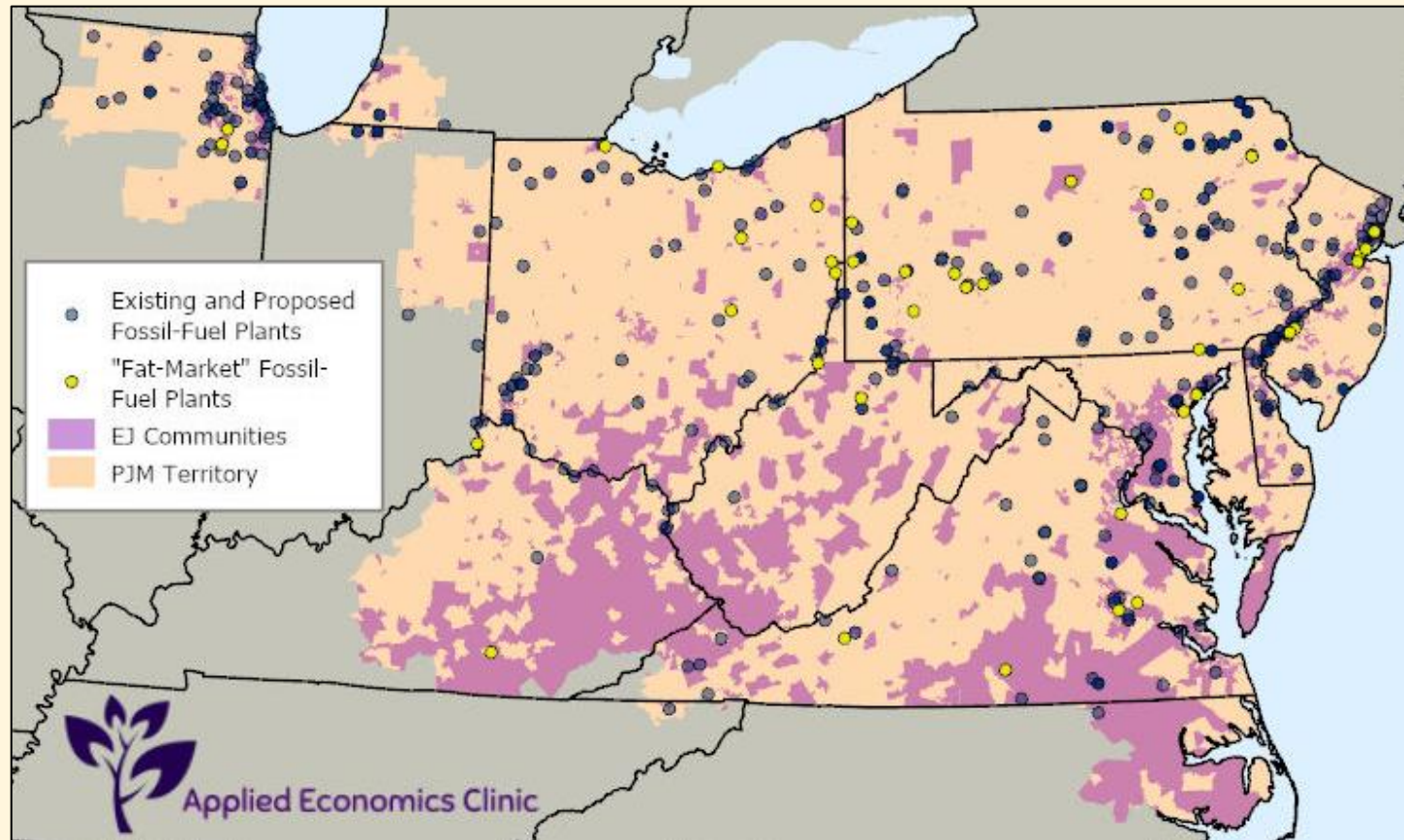
54 percent (635 units) of PJM power plants are located within 1 mile of an EJ community



Some PJM power plants are located directly within EJ communities



33 of PJM's 77 fat market beneficiaries are located within 1-mile of an EJ community



Most of PJM's existing coal and gas plants are either in or within 5 miles of an EJ community

Total coal and gas units

Proximity to an EJ Community	Number of Units	Percentage of Units	Combined Capacity (MW)
Within a community	396	33%	45,631
Less than 1-mile	635	54%	78,583
Less than 5-miles	918	78%	119,684
Total units	1,183	100%	172,191

Fat market coal and gas units

Proximity to an EJ Community	Number of Units	Percentage of Units	Combined Capacity (MW)
Within a community	17	22%	5,620
Less than 1-mile	33	43%	12,248
Less than 5-miles	48	62%	18,078
Total units	77	100%	35,469



Recommendations for PJM

- **Better demand forecasting:** Reconsider methodology for forecasting three-year ahead demand and design of capacity demand curve.
- **Stakeholder review:** Provide additional opportunities for a more diverse set of stakeholder comments and third-party review of proposed demand curve prior to each auction.
- **EJ community input:** Include the voices and concerns of power plant host communities when considering changes to market design.



FERC's 1/20/2022 order: PJM to stop using a 10 percent adder in its capacity bid method

“Sometimes I felt like we were just making stuff up in order just to increase prices...It's important that we go back to basics and figure out what is truly just and reasonable and not focus extensively on bolstering uneconomic generation.”
– FERC Chairman Richard Glick

- The **10 percent adder** was designed to reflect fuel risk costs and has been used in PJM's methodology for calculating net CONE (one of the key metrics used to construct PJM's demand curve).
- Two separate problems with the PJM capacity market result in higher-than-necessary electric bills for consumers: (1) high prices and (2) over-procurement.
- FERC's action to remove the **10 percent adder** addresses high prices and has a small impact on over-procurement
- PJM's overestimated peak demand (not addressed by the FERC order) leads to a large proportion of the over-procurement due to a fat-market



Questions?

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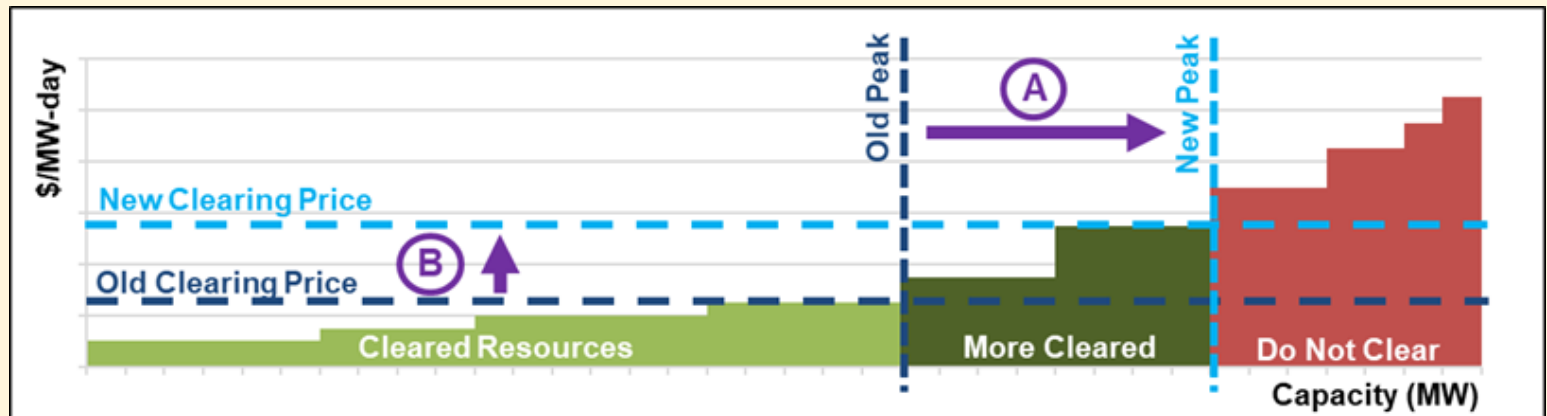
Thanks!



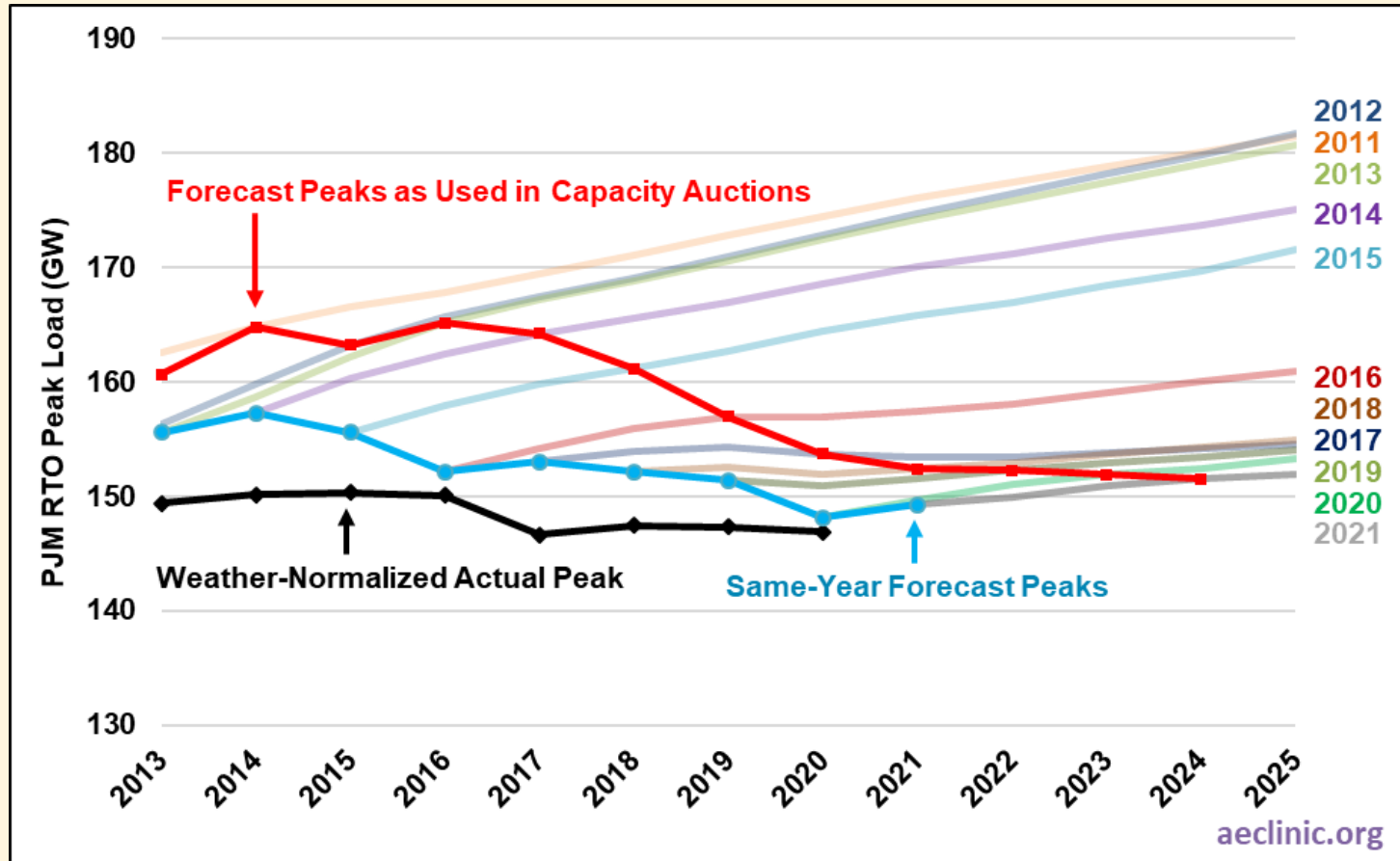
Appendix



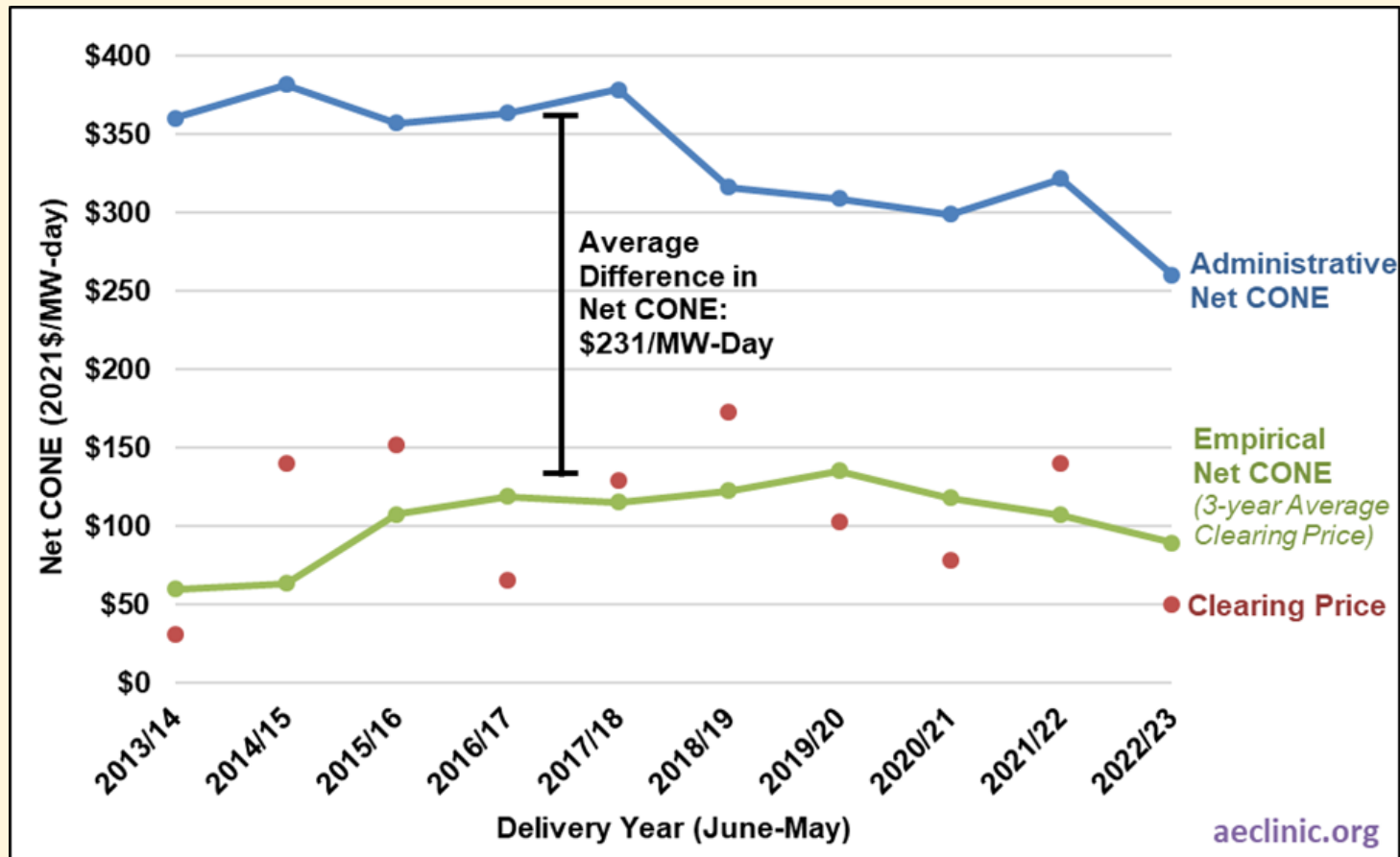
PJM has been overestimating its peak electric demand, a costly mistake for customers



PJM overestimated its customers' peak demand, as it does in every forecast it issues



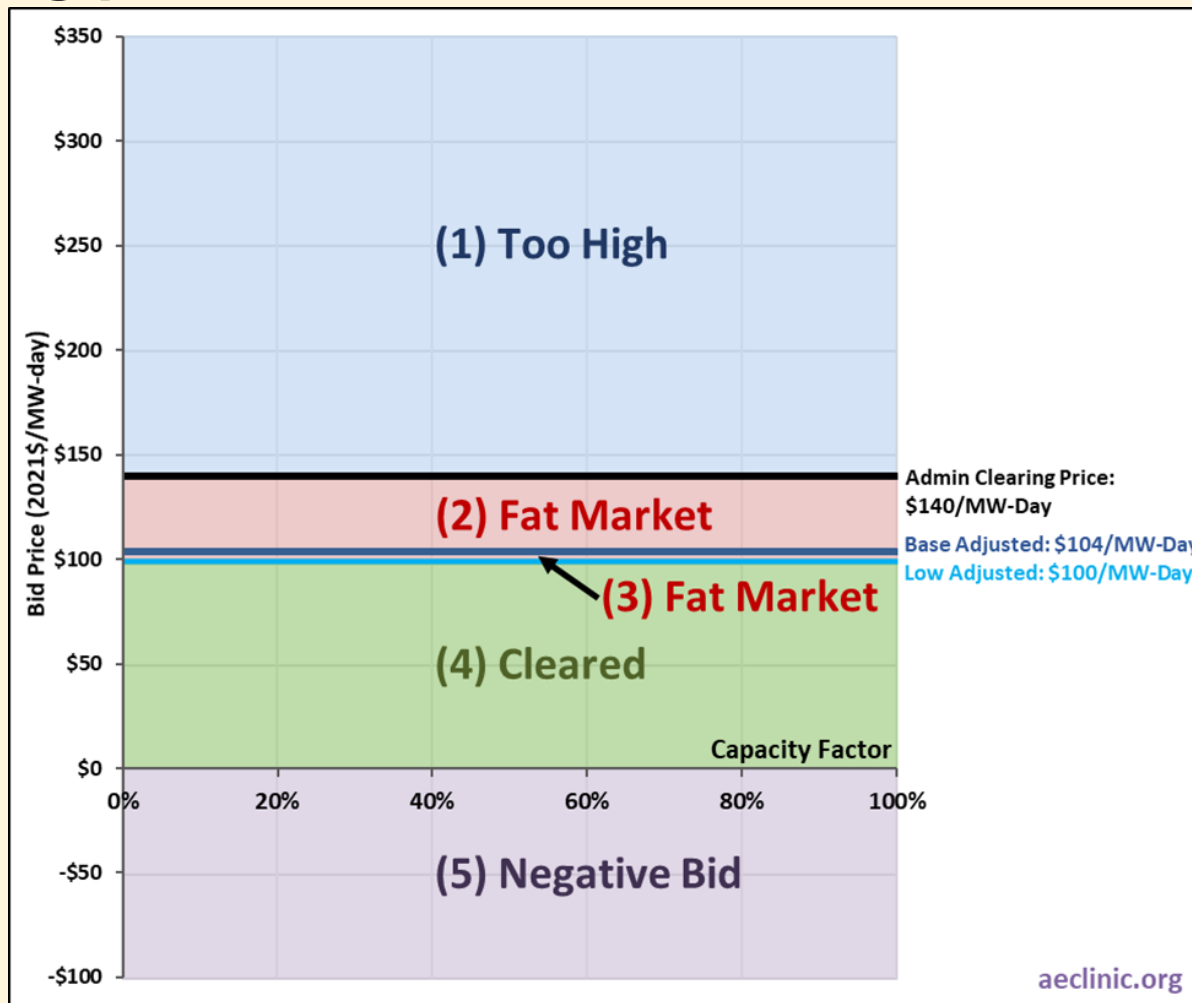
PJM also overestimated the cost of new power plants



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AEC estimated individual generator bid prices into the capacity market to see what would change if PJM had used a more accurate demand curve resulting in a lower clearing price



Some of these fat market beneficiaries were existing units, some proposed

Adjustments to Clearing Prices	Existing Units	Proposed Units	Total	Existing Units (MW)	Proposed Units (MW)	Total (MW)
(1) BID > Admin Clearing Price	48	99	147	13,950	14,508	28,457
(2) BASE Adjusted < BID ≤ Admin Clearing Price	41	20	61	17,705	9,391	27,096
(3) LOW Adjusted < BID ≤ BASE Adjusted	10	6	16	5,749	2,623	8,372
(4) \$0/MW-Day ≤ BID ≤ LOW Adjusted	124	1	125	40,483	485	40,968
(5) BID < \$0/MW-Day	101	0	101	20,774	0	20,774
TOTAL	324	126	450	98,661	27,007	125,668