ORAL ARGUMENT NOT YET SCHEDULED
Nos. 21-3068, 21-3205, 21-3243
(consolidated)

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

PJM POWER PROVIDERS GROUP, ET AL.,

Petitioners,

v.

FEDERAL ENERGY REGULATORY COMMISSION,

Respondent.

ON PETITION FOR REVIEW OF ORDERS OF THE
FEDERAL ENERGY REGULATORY COMMISSION

BRIEF OF *AMICUS CURIAE* INSTITUTE FOR POLICY INTEGRITY AT NEW YORK UNIVERSITY SCHOOL OF LAW IN SUPPORT OF RESPONDENT AND DENIAL OF THE PETITIONS

Richard L. Revesz
Donald L. R. Goodson
Sarah Ladin
139 MacDougal Street, 3rd Floor
New York, New York 10012
(212) 992-8932
Counsel for Amicus Curiae
Institute for Policy Integrity

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[1] This brief does not purport to represent the views, if any, of New York University School of Law.

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INTEREST OF AMICUS CURIAE

The Institute for Policy Integrity is a nonpartisan, not-for-profit think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy.[1]

Policy Integrity staff have published reports and papers on wholesale electricity market design. *E.g.*, S. Bialek & B. Ünel, *Efficiency in Wholesale Electricity Markets: On the Role of Externalities and Subsidies*, Energy Econ., May 2022 [hereinafter Bialek & Ünel (2022)]; S. Bialek & B. Ünel, Inst. for Pol'y Integrity, *Capacity Markets and Externalities: Avoiding Unnecessary and Problematic Reforms* (2018) [hereinafter Bialek & Ünel (2018)], https://perma.cc/9QQU-24C9.

Policy Integrity also submitted comments below on PJM's Focused MOPR.[2] *See* Comments of Pol'y Integrity, *PJM Interconnection, L.L.C.*, Dkt. No. ER21-2582 (Aug. 20, 2021).

Policy Integrity's expertise in wholesale electricity market design provides a unique perspective on Petitioners' arguments that the Focused MOPR threatens the efficient operation of PJM's capacity market.

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[1] Per Federal Rule of Appellate Procedure 29(a)(4)(E), no party's counsel authored this brief wholly or partly, and no person contributed money intended to fund its preparation or submission.

[2] Unless stated otherwise, defined terms have the same meaning as in Respondent's brief.

SUMMARY OF ARGUMENT

Petitioners' challenge rests on at least three faulty assumptions:

First, they assume that state policies requiring utilities to purchase credits from non-emitting generators ("externality payments") necessarily suppress capacity market prices. No empirical analysis supports that assumption. And a peer-reviewed analysis showed that it is wrong: Externality payments are unlikely to suppress capacity prices under foreseeable market conditions because of the interaction between energy and capacity markets.

Second, they assume that externality payments threaten resource adequacy. This assumption is wrong, too, because, by design, capacity markets adjust if resource adequacy is threatened and send appropriate price signals to ensure adequate supply.

Third, they assume that externality payments are economically inefficient. This assumption is also wrong: Externality payments address the energy market's failure to price negative externalities from carbon dioxide emissions and thus make wholesale market outcomes more economically efficient, not less.

Explaining why these assumptions are faulty requires discussion of complicated economic principles. Policy Integrity provided that analysis in the proceeding below, and it does so again here to aid the Court.

ARGUMENT

I. Externality Payments Are Unlikely To Suppress Capacity Market Prices.

Central to Petitioners' challenge is the assumption that externality payments necessarily suppress capacity market prices. *See* P3 Br. 2; Ass'n Br. 44–45; State Pet'rs Br. 26. To be fair, the assumption is intuitively appealing: When a market participant receives additional revenue, one naturally assumes it can offer lower prices than competitors. But the assumption overlooks how energy and capacity markets work and interact. As demonstrated in a peer-reviewed paper, a proper understanding of the markets reveals that externality payments are unlikely to lower capacity market prices. *See* Bialek & Ünel (2022), *supra*. PJM's outside economic expert reached a similar conclusion. Both analyses support finding PJM's Focused MOPR is just and reasonable.

A. Although energy and capacity markets are interconnected, they involve different "goods."

A short primer on energy and capacity markets helps set the stage. The "good" sold in the energy market is a MWh of electricity generation. *See* J. Macey & J. Salovaara, *Rate Regulation Redux*, 168 U. Pa. L. Rev. 1181, 1206 (2020). Auctions at set intervals during the day establish the per-MWh price for that time period based on generators' supply bids and end-users' demand. *See* Bialek & Ünel (2018), *supra*, at 3. The generator with the cheapest bid clears the market first, followed by the next cheapest until demand in that interval is met. *See* J. Macey & R. Ward, *MOPR Madness*, 42 Energy L.J. 67, 74 (2021). The price paid to all clearing generators is based on the bid of the last generator to clear, which is the "marginal" (or price-setting) generator for that time interval. *See id.*

Take the following simplified example (depicted below). Assume there are three demand periods: D_{low}, D_{medium}, and D_{peak}.[3] Further assume there are three types of generators (sometimes called resources) using different technology (e.g., solar, coal, and gas): A, B, and C. These resources constitute the blue supply curve. During low demand, A is the only resource needed (Q_A) and is the marginal resource in that period. During medium demand, both A and B are needed (Q_A+Q_B), and B is marginal. During peak demand, A, B, and C are needed ($Q_A+Q_B+Q_C$); C is marginal and thus the peak resource, while A and B are "inframarginal" (clearing resources that are not marginal). In economic terms, the "equilibrium" (or stable) energy market price (P) in each period largely reflects the marginal resource's marginal costs of generation (MC) and revenue needed to recover all remaining costs (the difference between P and MC).[4]

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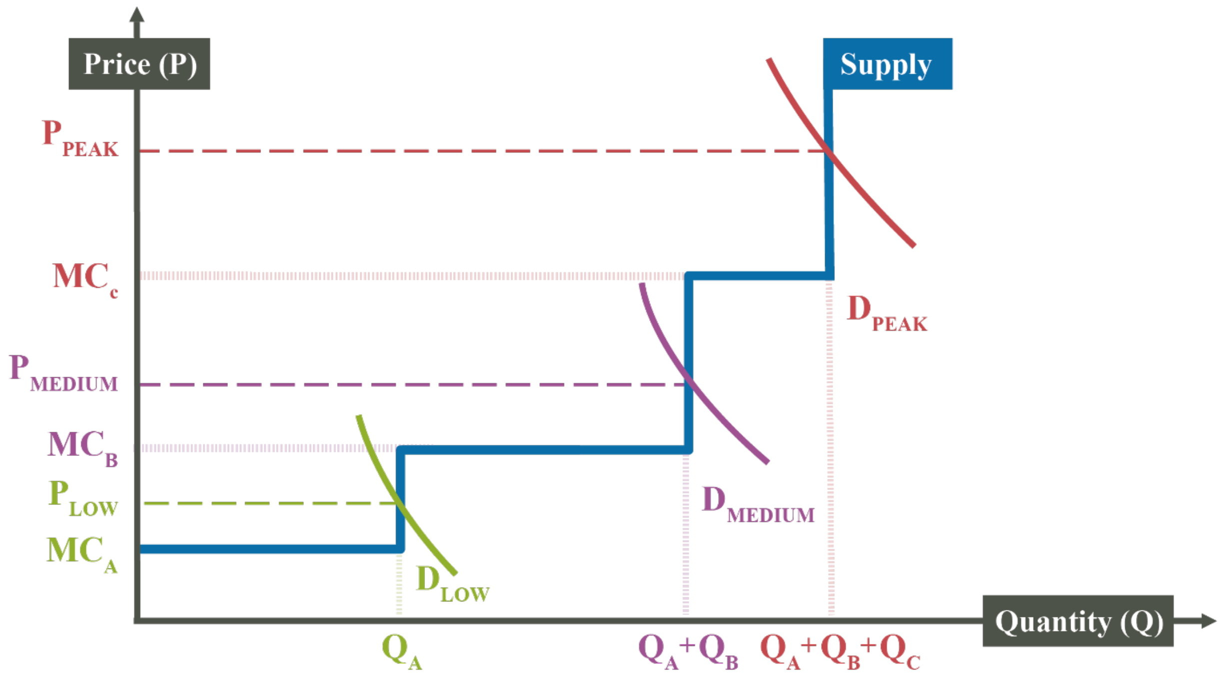
[3] Demand varies greatly over the course of a year and even the course of a day.

[4] In a given energy market auction, generators are incentivized to bid their marginal costs of generation—the cost incurred for producing one additional MWh of electricity—as that bid maximizes their chance of clearing while avoiding a loss for that transaction. In auctions over time, however, generators also need to recover their fixed costs (used broadly here to mean capital costs, opportunity costs, and the like).



Because energy markets can lead to high prices during peak demand, regulators, including PJM, typically impose price caps. *See id.* at 75. But that intervention creates a "missing money" problem: Price caps prevent peak generators, which may operate only a few days or hours per year, from recovering all their fixed costs. *See id.* at 76. This lack of remuneration could lead to blackouts if not enough generators choose to enter or remain in the energy market. *See id*. Returning to the example above, imposing a typical price cap below the "peak price" or P_{peak} (the

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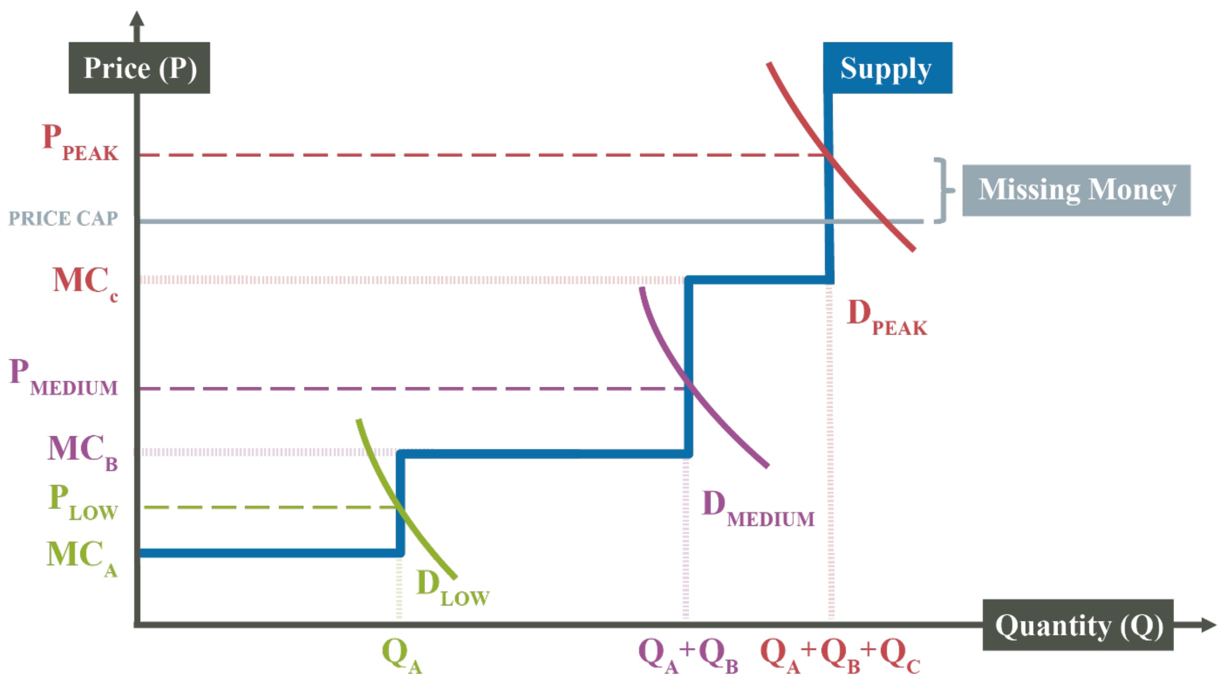
Peak resources can recover these costs during only peak demand, while inframarginal resources can recover them during peak and other periods. The equilibrium market price in each demand period reflects all these dynamics.

price the peak resource needs to stay in or enter the energy market) creates a missing-money problem, which is a function of the peak price and the price cap:



PJM created a capacity market to solve this missing-money problem and incentivize efficient capacity investments. *See id.* Unlike the energy market, the "good" sold in a capacity market is the obligation to be available to provide a megawatt (MW) of power when needed. *See N.J. Bd. of Pub. Utils. v. FERC*, 744 F.3d 74, 82, 85 n.9 (3d Cir. 2014). PJM determines how much capacity the grid needs in three years—the amount needed for peak demand plus a reserve—and crafts a curve to reflect this anticipated demand. *See id.* at 82.

Similar to the energy market, PJM uses an auction to determine the capacity price: The cheapest bid clears first, followed by the next cheapest until enough capacity to satisfy peak demand (plus the reserve) is met, with the last clearing generator setting the capacity price. *See* Macey & Ward, *supra*, at 76–77. But unlike the energy market auctions, generators have an incentive to bid their net costs of staying in or entering the energy market, which are their current and future costs less expected revenues from energy (and ancillary services) markets. *See* Bialek & Ünel (2018), *supra*, at 6. Generators' capacity market bids are thus expected to reflect their missing money from the energy market—but no more and no less to maximize their chance of clearing the capacity market and avoiding a loss. *See id.*

That incentive means the capacity price at equilibrium is expected to reflect a peak resource's missing money. This outcome occurs for two reasons: (a) the goal of the capacity market is to remedy the missing-money problem, which is a function of the peak price and the price cap, and (b) the grid needs the peak resource to satisfy peak demand. *See* Bialek & Ünel (2022), *supra*, at 8.

B. Externality payments are unlikely to lower capacity prices because of the interaction between energy and capacity markets.

The state policies at issue here are primarily renewable-energy credits (RECs) and zero-emission credits (ZECs). *See* 2018 MOPR Order, at PP 1, 15, 23 & n.32. They require utilities to purchase credits from non-emitting generators for avoiding externalities, providing payments per MWh (of clean generation); they do not provide payments per MW (of capacity). *See Coal. for Competitive Elec. v. Zibelman*, 272 F. Supp. 3d 554, 560–61 (S.D.N.Y. 2017) (describing similar policies).[5] Predicting how such per-MWh externality payments affect capacity prices turns on the interaction between energy and capacity markets.

Because externality payments provide revenue only per MWh, their immediate effect occurs in the energy market: They lower recipients' effective marginal costs of generation, which could lower energy prices when recipients are marginal (and thus price-setting). *See* Bialek & Ünel (2022), *supra*, at 5.

But such price changes are expected to occur *only* in lower demand periods—not during peak demand—for one simple reason: The marginal generator during peak demand typically uses fossil fuels. *See, e.g.*, Macey & Salovaara, *supra*, at 1208. The clean generators that receive externality payments will therefore be inframarginal—*not* price-setting—during peak demand. Bialek & Ünel (2022), *supra*, at 9–10. Stated differently, the peak price is unlikely to change in response to payments made to inframarginal clean generators. *Id.*

And if externality payments are unlikely to affect the peak price, they are also unlikely to affect peak resources' missing money. *See id.* at 9. That outcome explains

[5] Capacity subsidies operate differently, but they appear to be rare and more similar to the preempted subsidies in *Hughes v. Talen Energy Marketing, LLC*, 578 U.S. 150 (2016).

why externality payments are unlikely to suppress capacity market prices: As noted above, the capacity market clearing price is expected to reflect a peak resource's missing money, but, as just noted, externality payments are unlikely to reduce that missing money. *See id.*

Rather, externality payments can cause capacity prices to fall in only two circumstances. *See id.* at 9–10. First, if paid to peak resources in the energy market, the payments could reduce what they must recoup in the capacity market. But this is unlikely to occur because peak resources will be fossil-fuel resources that do not receive externality payments for the foreseeable future. Second, if the payments incentivize sufficient entry of new inframarginal clean resources, their added supply into the energy market could change the technology serving as the peaking resource to a lower-cost resource with less missing money and thus a lower capacity bid. But that would require such a drastic increase in supply from clean resources that it is unlikely anytime soon—and Petitioners do not suggest otherwise. *See* Marketing Analytics, *State of the Market Report for PJM* 115 (2021), https://perma.cc/A2FY-79MB; PJM, *Energy Transition in PJM: Frameworks for Analysis* 1, 10 (2021) (best-case scenario achieves 70% carbon-free generation by 2050), https://perma.cc/6MNP-ZBFR.

C. PJM's own expert reached a similar conclusion, justifying the Focused MOPR's course correction.

PJM's outside economic expert reached a similar conclusion. Using simulations that account for energy and capacity market interactions, Dr. Peter Cramton found that whether externality payments are mitigated (the Expanded MOPR) or not (the Focused MOPR), capacity prices are likely to be the same. *See* PJM Focused MOPR Filing, P. Cramton Aff. ¶ 59. That result is unsurprising given the analysis summarized above.

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Regardless, even if externality payments were to lower capacity prices, that effect would neither threaten resource adequacy nor produce inefficient market outcomes, as explained below.

II. Externality Payments Are Also Unlikely To Threaten Resource Adequacy or Reliability.

Petitioners also assume that "lower [capacity] prices" mean "electric reliability suffers" because "capacity [will be] underbuilt." State Pet'rs Br. 26. But the capacity market is already designed to adjust to ensure resource adequacy and reliability. *See* Bialek & Ünel (2018), *supra*, at 17–18.

All else being equal, if capacity is scarce, prices increase, incentivizing entry of new resources; if capacity is abundant, prices decrease, incentivizing exit. *See id.* The capacity market, by design, will thus ensure there is enough capacity to meet the highest demand in a given period and thereby ensure resource adequacy. *See id.* If PJM correctly specifies supply and demand parameters (specifications not at issue here), an outcome with low prices and inadequate capacity cannot be sustained for long. *See id.* The Focused MOPR will therefore not threaten resource adequacy, as PJM and the Joint Statement correctly concluded. *See* FERC Br. 98–99.

III. Regardless of Any Possible Effect on Capacity Prices, Well-Designed Externality Payments Improve Market Efficiency.

Petitioners also assume that externality payments make some resources artificially competitive, thereby hindering economic efficiency. *See, e.g.*, P3 Br. 39. To the contrary, externality payments enhance the efficiency of market outcomes by addressing an uncorrected market failure.

To ensure just and reasonable rates, FERC relies on market-based mechanisms that promote economic efficiency. *See FERC v. Elec. Power Supply Ass'n*, 577 U.S. 260, 267–68 (2016). Although FERC designs markets to emulate perfectly competitive markets, market failures inevitably exist, requiring intervention. *See* R. Pindyck & D. Rubinfield, *Microeconomics* 623–26 (8th ed. 2013). One such market failure is an externality: costs or benefits of market transactions incurred by third parties and not considered by market participants. *See* P. Krugman & R. Wells, *Microeconomics* 433–38 (2d ed. 2009). Externalities distort clearing prices and prevent them from guiding efficient resource allocation. *See* Pindyck & Rubinfield, *supra*, at 626.

FERC has intervened to address market failures, including externalities. *See* B. Davis Noll & B. Ünel, *Markets, Externalities, and the Federal Power Act: The Federal Energy Regulatory Commission's Authority to Price Carbon Dioxide Emissions*, 27 N.Y.U. Env't L.J. 1, 26–41 (2019). But FERC has not addressed negative externalities from carbon dioxide emissions. Emitting resources thus submit inefficiently low bids reflecting only their private costs and not their full external costs (imposed on society), thereby distorting market outcomes compared to a socially optimal outcome.

The most efficient solution for this externality is a corrective tax on carbon dioxide emissions. *See* A. Pigou, *Welfare Economics* (1920). When a corrective tax is not feasible, the next best option is to subsidize resources that do not produce the externality. *See* J. Gruber, *Public Finance and Public Policy* 138 (5th ed. 2016). That is what externality payments do: They reward non-emitting generators for avoiding externalities. Externality payments thereby enhance efficiency by more closely approximating perfectly competitive outcomes.

Ignoring these principles, Petitioners depict all state-directed payments as inherently market-distorting and uneconomic. *See, e.g.*, P3 Br. 39–40. Yet it is well understood that an economically-sound solution to addressing externalities is to pay for avoiding the externality. *See* Krugman & Wells, *supra*, at 445–50; PJM Focused MOPR Filing, Graf Aff. ¶ 17; *see also* Chao Aff. ¶ 5, Initial Comments of PJM

Interconnection, L.L.C., Dkt. No. EL16-49 (Oct. 2, 2018). And states are not simply picking externalities to advance social policies, as Petitioners contend. P3 Br. 41. They are using well-understood economic theory for enhancing market outcomes. Of course, to be efficient, externality payments must be correctly calibrated, but Petitioners do not contend the payments are too high (or low) in this regard.

PJM (and the Joint Statement) understood all of this, correctly concluding that efficiency-enhancing payments' ability to improve market outcomes was another reason to avoid over-mitigating state policies. *See* PJM Focused MOPR Filing 2–3, 6–20; Joint Statement PP 11, 36. This conclusion further supports the Focused MOPR's justness and reasonableness.

CONCLUSION

For the foregoing reasons this Court should deny the petitions.

DATED: August 12, 2022

Respectfully Submitted,

/s/ Sarah Ladin

Richard L. Revesz
Donald L. R. Goodson
Sarah Ladin
INSTITUTE FOR POLICY INTEGRITY
139 MacDougal Street, Third Floor
New York, NY 10012
(212) 992-8932
sarah.ladin@nyu.edu
Counsel for Amicus Curiae
Institute for Policy Integrity

COMBINED CERTIFICATES

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Counsel hereby certifies that, in accordance with Federal Rules of Appellate Procedure 29(a)(5), 32(a)(7)(B), and 32(f) and the Court's order dated April 18, 2022, Dkt. No. 127, this *amicus curiae* brief contains 2,599 words, as counted by counsel's word processing system. This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type-style requirements of Fed. R. App. P. 32(a)(6) because it has been prepared in a proportionally spaced typeface using Microsoft Word in 14-point Times New Roman font.

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/s/ Sarah Ladin
Sarah Ladin