UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.	)	Docket Nos. ER-18-1314-000
	)	ER-18-1314-001

PROTEST OF JOINT CONSUMER ADVOCATES

Pursuant to Rule 211 of the Federal Energy Regulatory Commission's ("Commission") Rules of Practice and Procedure,[1] the Illinois Citizens Utility Board, Illinois Attorney General, Delaware Division of the Public Advocate, West Virginia Consumer Advocate Division, Kentucky Attorney General, and Indiana Office of Utility Consumer Counselor (collectively, "Joint Consumer Advocates") hereby file this Protest in response to PJM Interconnection, L.L.C.'s ("PJM") April 9, 2018 Proposed Tariff Revisions.[2]

I. INTRODUCTION

On April 9, 2018, PJM filed two proposals and accompanying proposed tariff revisions ("the Petition") with the Commission seeking approval under Federal Power Act ("FPA" or "the Act") Section 205 of either its preferred proposal, Capacity Repricing, or in the alternative, its MOPR-Ex proposal.[3] PJM requested that the Commission "issue an Order on this filing by June 29, 2018" and an effective date of January 4, 2019.[4] Approval of either of these alternative proposals would exceed the Commission's statutory authority under FPA Section 205 and result in unjust and unreasonable rates.

[1] 18 C.F.R. § 358.211.
[2] PJM Interconnection, L.L.C., *Capacity Repricing or in the Alternative MOPR-Ex Proposal: Tariff Revisions to Address Impacts of State Public Policies on the PJM Capacity Market*, Docket No. ER18-34-000 (Apr. 9, 2018), *revised*, PJM Interconnection, L.L.C., Docket No. ER18-1314-001 (April 16, 2018) [hereinafter "Petition"].
[3] *Id.* at 6.
[4] *Id.* at 116.

If implemented, Capacity Repricing would leave the capacity commitment process unchanged, but the market clearing price would be determined by a simulated auction replacing actual bids with "reference prices" PJM produces.[5] Therefore, Capacity Repricing would result in the same resources receiving commitments as they would under the current rules, but at a higher price determined by PJM. The MOPR-Ex proposal entails a different approach to determining both which resources clear and what price they receive at auction. Under MOPR-Ex, PJM would replace its existing Minimum Offer Price Rule ("MOPR") with a new, extended version that applies a capacity auction bid price floor to a wider variety of resources, subject to exemptions.[6] Unlike Capacity Repricing, MOPR-Ex would allow PJM to administratively adjust bid prices for determining both resource commitments and price, resulting in both a higher price and a different group of resources clearing. Both the Capacity Repricing and MOPR-Ex proposals interject PJM into the auction, displacing actual market bids and driving up prices. These proposals would allow PJM to set prices that are not market-based and would not capture the efficiencies and price suppression effects market-based auctions exist to facilitate.

Without any evidence of a market failure, or any evidence of the potential cost impacts, PJM asks the Commission to make an improper determination between two proposals that PJM admits are not final.[7] Section 205 does not permit the Commission to make such broad policy determinations. Neither proposed method to inflate capacity prices is necessary to assure resource adequacy or reliable service. As discussed in this Protest, the Petition:

- Improperly asks the Commission to make a policy choice between two wholly separate approaches to setting rates;
- Requests that the Commission rewrite the tariff in violation of the FPA;

[5] *Id.* at 59–95.
[6] *Id.* at 96–114.
[7] Petition at 7.

- Fails to demonstrate that either proposal would result in just and reasonable rates;
- Lacks the required consideration of costs;
- Wrongly characterizes the proposed changes as promoting market principles that are in fact better served by the status quo;
- Ignores stakeholders' rejection of both proposals in favor of the status quo;
- Seeks approval of proposals that would result in undue discrimination between similarly situated resources; and
- Asks the Commission to approve one of two proposals that are insufficiently clear and complete for consideration under the FPA.

Adopting either proposal would undermine the Commission's stated goal for wholesale markets "to protect the public interest and ensure that electricity ratepayers pay the lowest price possible for reliable service."[8] Either proposal would compel consumers to pay more, with no resulting increase in service reliability. Capacity Repricing would force ratepayers to pay more for the same resources; MOPR-Ex would both artificially inflate prices and artificially prevent the new resources these state programs have attracted to the market from clearing, effectively forcing customers in some states to pay twice for capacity. Joint Consumer Advocates respectfully request that the Commission reject the Petition.

[8] Order No. 2000, 89 FERC ¶ 61,285, at 3 (1999).

II. PROTEST

A. Section 205 Does Not Enable the Commission to Choose Between Two Wholly Separate Approaches to Setting Rates.

The Petition improperly requests the Commission to exercise policymaking authority it does not have. In its Petition, PJM argues that both proposals are just and reasonable and requests that the Commission pick one purportedly just and reasonable proposal over another "guided by the Commission's policy objectives."[9] In defense of this unorthodox approach, PJM cites FPA Section 205 and Natural Gas Act Section 4 cases in which the Commission considered nuanced methodological choices.[10] PJM erroneously supposes all choices between "alternatives" are equivalent. They are not.

The Petition presents Capacity Repricing and MOPR-Ex as wholly separate proposals—because they *are* wholly separate proposals—and asks the Commission to pick one. The cases PJM cites demonstrate that the Commission may choose between two slightly different versions of the same approach, but asking the Commission to pick between two totally different approaches is unprecedented. FPA Section 205 affords the Commission no such authority. *Midcontinent Independent System Operator* concerned a choice between methods to calculate one input (avoidable costs) for market mitigation purposes.[11] *ISO New England* dealt with alternative time periods for amortizing merger transaction costs.[12] *Trailblazer Pipeline* considered different values for a pipeline's fuel adjustment charge on expansion facilities.[13] Finally, *El Paso Natural Gas Pipeline* addressed whether a particular subclass of ratepayers

[9] Petition at 7.
[10] *See* Petition at 48–49.
[11] *Midcontinent Indep. Sys. Operator, Inc.*, 157 FERC ¶ 61,242, at P 22 (2016).
[12] *ISO New England Inc.*, 155 FERC ¶ 61,136, at P 27 (2016).
[13] *Trailblazer Pipeline Co.*, 136 FERC ¶ 61,007 (2011).

would pay a share of new facility costs.[14] None presented the Commission with a request to select one of two mutually exclusive but supposedly just and reasonable rate designs.

Nor does ISO-New England's recent filing of competing proposals help PJM here. The Honorable Commissioner Cheryl LaFleur recently remarked that an RTO filing competing proposals is "unusual" but had "been tried by ISO-New-England before."[15] In its 2015 Winter Reliability Program petition, ISO-New England filed both its own proposal and NEPOOL's alternative proposal simultaneously under Section 205.[16] The Commission rejected ISO-New England's version and accepted the NEPOOL alternative.[17] In its order, the Commission referred to the ISO-New England and NEPOOL proposals as reflecting the same core approach, clarifying that "[t]he main difference between the proposals relates to the types of resources eligible for compensation under the program."[18] Thus, the two alternatives ISO-New England filed with the Commission differed not in approach but only in scope.

Unlike in these past cases, the Petition does not ask the Commission to resolve minor technical details within a single established rate design framework.[19] Rather, PJM has requested that the Commission improperly assume the RTO's role by picking between two wholly different approaches to determining rates. FPA Section 205 only authorizes the Commission to approve or reject a proposal based on whether it would result in rates that are just and reasonable and not unduly discriminatory.[20] The Act does not contemplate the Commission making a policy

[14] *El Paso Nat. Gas Co.*, 133 FERC ¶ 61,104 (2010).
[15] Gavin Bade, *LaFleur Warns Against PJM Plan Altering "Fundamental" Energy Market Mechanics*, UTILITY DIVE (Dec. 21, 2018), https://www.utilitydive.com/news/lafleur-warns-against-pjm-plan-altering-fundamental-energy-market-mechani/517568/. The quoted language above is taken from the article's paraphrase of remarks by the Honorable Commissioner Cheryl LaFleur.
LaFleur's comments.
[16] *ISO New England*, 152 FERC ¶ 61,190, Docket No. ER15-2202 (Sept. 11, 2015).
[17] *Id.*
[18] *ISO-New England*, 152 FERC ¶ 61,891, at P 1, Docket No. ER15-2208 (Sept. 11, 2015).
[19] *See* Petition at 7 (requesting additional proceedings to finalize the adopted proposal).
[20] 16 U.S.C. § 824d(a)–(b).

decision for the RTO as to which of two wholly separate proposals should be selected when the RTO is unwilling or unable to make the selection itself.

When acting on a rate filing under Section 205, the Commission undertakes "an essentially passive and reactive role" and restricts itself to evaluating the confined proposal.[21] Even where the utility—or in this case the RTO—consents to changes made by FERC, there are limits on FERC's authority to propose modifications under Section 205.[22] FERC violates Section 205 when "the Commission's proposal accepted by the utility [or RTO] involved the Commission's own original notion of a new form of rate or 'an entirely new rate scheme.'"[23] In such circumstances, "the power to initiate change through such rejection-plus-proposal removes the Commission from an essentially passive and reactive role envisioned by § 205."[24]

To demonstrate the difference, suppose there are two potential versions of the relevant tariff language: Option A and Option B. Option A has already been filed and adopted. The RTO now files Option B with the Commission. If the Commission could adopt Option B as an amendment of existing tariff language (Option A) without repealing it, then the differences between Options A and B may be subtle enough that were Options A and B filed together as tariff revisions, the Commission could consider them both and choose one over the other. If approving Option B would entail repealing Option A, then they represent two distinct rate design frameworks that the Commission cannot consider side-by-side. In every case where the Commission chose between alternative filings, the two alternatives were like dueling amendments, offering the Commission a choice that falls within its legal purview. In contrast, were Capacity Repricing in place already and MOPR-Ex the subject of a 205 filing or vice versa,

[21] *Advanced Energy Mgmt. Alliance v. FERC*, 860 F.3d 656, 662 (D.C. Cir. 2017) (citing *City of Winnfield v. FERC*, 774 F.2d 871, 875–76 (D.C. Cir. 1984).
[22] *NRG Power Marketing v. FERC*, 862 F.3d 108, 115 (D.C. Cir. 2017).
[23] *Id.* (citing *City of Winnfield*, 744 F.2d at 875–76.
[24] *Id.*

an amendment would not suffice to resolve the differences. The Commission could not implement one without repealing the other, so it cannot pick between them.

The Commission's role under Section 205 is to approve a tariff provision if it is legally sufficient and reject it if it is not. By supposing that both proposals are legally sufficient and asking the Commission to select one over the other, the Petition presents the Commission with a choice it is not authorized to make. A jump ball with a recommended outcome is still a jump ball. PJM's stated preference for one option does not change the fact that the RTO is asking the Commission to reject one proposal PJM considers just and reasonable in favor of another proposal it considers just and reasonable. The Commission cannot reject a proposal it finds legally sufficient without violating the Administrative Procedure Act's "arbitrary and capricious" standard.[25] Further, neither proposal should be found legally sufficient anyway because both are unjust and unreasonable or unduly discriminatory. The Commission's only options are either to dismiss the jump ball proposal as procedurally improper or to reject both proposals as unjust and unreasonable or unduly discriminatory.

B. The Petition Improperly Asks the Commission to Rewrite the Selected Alternative in Violation of the FPA.

In the Petition, PJM concedes that neither Capacity Repricing nor MOPR-Ex is complete as filed and requests that the Commission provide for settlement procedures to make the necessary changes after conditionally approving its preferred proposal.[26] If it accepts PJM's invitation, the Commission would exceed its authority under the FPA by deferring major changes

[25] *See Pub. Utils. Comm'n of Cal. v. FERC*, 254 F.3d 250, 253–54 (D.C. Cir. 2001) (citing *Sithe/Independence Power Partners, L.P. v. FERC*, 165 F.3d 944, 948 (D.C. Cir. 1999); 5 U.S.C. § 706(2)(A)).
[26] *See* Petition at 7 (requesting additional proceedings to finalize the adopted proposal).

to the proposal that PJM should have resolved before filing. Effectively, PJM is asking the Commission to conditionally approve a proposal and then oversee a rewrite of that proposal.

Under FPA Section 205, "the Commission undertakes 'an essentially passive and reactive role' and restricts itself to evaluating the confined proposal."[27] Though the Commission may suggest "minor" adjustments to a proposal, "Section 205 does not allow FERC to make modifications to a proposal that transform the proposal into an entirely new rate of FERC's own making."[28] The Commission may propose "minor deviations" from a proposal for PJM to adopt voluntarily, but the Commission oversteps its FPA authority if it responds to PJM's request with recommendations beyond a determination of whether proposals are just and reasonable, with no more than minor, optional tweaks.[29]

"[Natural Gas Act] Section 4(e) [analogous to Federal Power Act § 205(e)] . . . cannot be used by the Commission to institute any change in a rate-making component, such as cost allocation, that does not represent *at least partial approval of the change for which the enterprise had petitioned in its filing.* If the Commission seeks to make such changes, it has no alternative save compliance with the strictures of section 5(a) [analogous to Federal Power Act § 206(a)]."[30] If adopted, either Capacity Repricing or MOPR-Ex would fundamentally alter the means of determining capacity prices, and in the case of MOPR-Ex, also capacity commitments. Such a major modification by the Commission would result in a new rate. Therefore, any settlement

[27] *Advanced Energy Mgmt. Alliance v. FERC*, 860 F.3d 656, 662 (D.C. Cir. 2017) (citing *City of Winnfield v. FERC*, 774 F.2d 871, 875–76 (D.C. Cir. 1984).
[28] *NRG*, 862 F.3d at 110 (citing *W. Res., Inc. v. FERC*, 9 F.3d 1568, 1579 (D.C. Cir. 1993) (applying the provision of the Natural Gas Act equivalent to FPA Section 205)).
[29] *Id.* (citing *W. Res., Inc.*, 9 F.3d at 1579)
[30] *Pub. Serv. Comm'n of N.Y. v. FERC*, 642 F.2d 1335, 1345 (D.C. Cir. 1980) (applying provision of the Natural Gas Act equivalent to FPA Section 205).

process resolving the several "outstanding issues" to which the Petition refers would transform the proposal into an entirely new rate at the behest of the Commission.[31]

The D.C. Circuit's *NRG* and *City of Winnfield* decisions illustrate the distinction between changes that constitute an entirely new rate and those that represent only a minor deviation. In *NRG*, the court found that the Commission had exceeded its authority by: (1) accepting the proposed competitive entry and self-supply MOPR exemptions on the condition that PJM retain the unit-specific review process that the proposal would have eliminated; and (2) conditioning approval on PJM reducing the proposed extension of the mitigation period for new generators from one year to two.[32] In contrast, the court in *City of Winnfield* affirmed the Commission's order imposing "a new form of rate calculation but grant[ing] a rate increase under the form the utility had previously been using."[33]

Section 205 protects the utility's customers by ensuring "early notice – in the rate proposal itself – of the sort of increase that is sought."[34] When FERC imposes an entirely new rate scheme in response to a utility's proposal, the utility's customers do not have adequate notice of the proposed rate changes or an adequate opportunity to comment on the proposed changes.[35] Generators, load serving entities, and customers will not have an opportunity to comment on the potential settlement suggestions regarding either proposal PJM puts forth here. PJM acknowledges that both alternatives are incomplete and suggests to FERC how it may

[31] *See* Proposal at 7 (requesting that "the Commission provide the option for the parties to use settlement judge procedures to address" these "outstanding issues.").
[32] *NRG*, 862 F.3d at 114.
[33] *City of Winnfield*, 744 F.2d at 875 (emphasis in original).
[34] *NRG*, 862 F.3d at 116 (citing *City of Winnfield*, 744 F.2d at 876).
[35] *Id.*

proceed once its initial decision is made.[36] This opaque process falls well short of Section 205's requirement that customers have notice of the rate proposal's effects.[37]

Thus, the courts have drawn a line between (proper) changes in degree and (improper) changes in kind, as well as between voluntary and mandatory changes. The settlement process the Petition proposes might be appropriate for facilitating changes in degree, but leaving substantial revisions to after filing would violate FPA Section 205's assurance of "early notice—in the rate proposal itself—of the sort of increase that is sought."[38] Settlement proceedings cannot retroactively cure an incomplete proposal or insufficient notice. The D.C. Circuit has found that not even rehearing can.[39] Should any changes in kind be required to satisfy Section 205 standards, the only lawful course of action available to the Commission would be to reject the proposal and leave rewriting it to PJM.

C. The Petition Fails to Demonstrate that Either Proposal Would Result in Just and Reasonable Rates.

The Commission should reject PJM's Petition as legally deficient because it fails to support either proposal with evidence that it would result in just and reasonable rates. FPA Section 205 places the burden on the RTO "to show the increased rate … is just and reasonable."[40] The Act requires the Commission to reject any proposed tariff revisions that do not result in just and reasonable rates.[41] In determining whether a tariff change would result in just and reasonable rates, the Commission must "balance[] the need to provide both fair prices

[36] Petition at 7.
[37] *NRG*, 862 F.3d at 116 (citing *City of Winnfield*, 744 F.2d at 876).
[38] *Id.* (citing *City of Winnfield*, 744 F.2d at 876).
[39] *Id.* at 116–17.
[40] *AEMA*, 860 F.3d at 662.
[41] 16 U.S.C. § 824d(a).

and consistent service."[42] To justify either of the artificial price inflation measures it proposes, PJM must establish that the proposed changes are necessary to maintain a well-functioning capacity market (*i.e.*, consistent service). That is, PJM must present evidence that capacity market clearing prices are failing to attract sufficient supply to keep pace with demand growth and that the state policies it seeks to counter are to blame.

PJM has presented no evidence of a problem in the capacity markets. In fact, it has stated just the contrary: PJM has concluded that the capacity market is operating efficiently alongside the very state policies it alleges are problematic. PJM's own *Resource Investment Whitepaper* concludes that "PJM markets are efficiently and reliably managing entry and exit, even while adapting to changing circumstances."[43] PJM cites its whitepaper as offering "strong evidence that markets are providing adequate returns that incentivize new generation investment where needed" and finding "no evidence suggesting that PJM markets do not adequately compensate legacy units such that economically viable generators were being forced into premature retirement."[44] PJM reports that "PJM markets are producing prices that appropriately signal the exit of uneconomic legacy resources and the entry of efficient new resources."[45] PJM thereby acknowledges that the capacity market continues to operate effectively even as states within PJM have implemented state policies aimed at promoting specific resources (*e.g.*, renewable portfolio standards).[46] While statutory renewable portfolio standards have existed in several states for many years, the resulting renewable resources have not previously been subject to market

[42] *Consolidated Edison Co. of N.Y. v. FERC*, 510 F.3d 333, 341 (D.C. Cir. 2007).
[43] *Resource Investment Whitepaper* at i (quoted in the Proposal at 38).
[44] Proposal at 38 (citing *Resource Investment Whitepaper* at ii).
[45] *Id.* (citing *Resource Investment Whitepaper* at ii).
[46] *See generally* Jocelyn Durkay, *State Renewable Portfolio Standards and Goals*, NAT'L CONF. ST. LEGISLATURES (Aug. 1, 2017), http://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx.

mitigation measures,[47] and PJM's own market assessment shows there is no reason to impose them now.

At no point does PJM support its assertion that prices must be artificially inflated to ensure capacity resource adequacy. Indeed, this astonishing statement is belied by the fact that PJM has the most drastic capacity *oversupply* of any RTO in North America.[48] As the North American Electricity Reliability Corporation's 2017 Summer Reliability Assessment demonstrated, PJM's 28-percent anticipated reserve margin exceeds its reserve requirement of 16.6 percent by approximately two-thirds.[49] Capacity prices continue to be more than sufficient to incent supply growth far exceeding load growth.[50] Thus, adopting either proposal would result in higher rates with no expectation of a corresponding reliability benefit for ratepayers. Neither proposed rate hike can be deemed "just and reasonable" because there is no benefit or need to artificially raise prices by allowing PJM to administratively set bids and distort market pricing.

Conspicuously absent from PJM's request for the Commission to approve changes to inflate capacity prices is any demonstration that electric supply growth is insufficient or declining, let alone any evidence identifying the targeted state policies as responsible for any supply concerns. In fact, several of the very state policies PJM seeks approval to counter incent significant electric supply growth,[51] and either of these proposals would make this new build costlier for ratepayers.

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[47] MOPR, in its current form, applies only to new gas generation resources. PJM Open Access Transmission Tariff § 5.14(h).

[48] N. Am. Electricity Reliability Corp., *2017 Summer Reliability Assessment* 26 (2017), http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2017%20Summer%20Assessment.pdf. PJM's 2017 results are nearly identical to 2016, when these numbers were 28.85 and 16.4 percent. N. AM. ELECTRICITY RELIABILITY CORP., 2017 SUMMER RELIABILITY ASSESSMENT 15 (2016), http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2016%20SRA%20Report_Final.pdf.

[49] *Id.*

[50] Affidavit of James F. Wilson ¶ 19 [hereinafter "Wilson Affidavit"] (attached as Attachment A).

[51] For example, Illinois's Future Energy Jobs Act requires at least 4.3 gigawatts of new wind and solar generation resources to be built in the state by 2030. Rebecca Judd, Sierra Club Illinois, *Overview of the Future Energy Jobs*

Meanwhile, load has flattened—a trend that is expected to continue. PJM's 2018 *Load Forecast Report* projects average load growth of only 0.4 percent for both winter and summer peaks over both the next ten years and the next fifteen years.[52] No individual zone is expected to see annualized ten- or fifteen-year growth rates of even one percent.[53] As a result, there is no reason to believe that these state policies pose any threat of diminishing PJM's significant excess capacity to the point of threatening adequate supply for the foreseeable future. After almost two years of examining its capacity construct and developing these proposals, PJM has yet to identify a problem either of these proposals would address.

PJM justified the adoption of the Reliability Pricing Model ("RPM")—creating its capacity market—with an established record of price volatility and electric supply growth lagging behind electric demand growth.[54] There, PJM identified changes in supply and traced those outcomes to auction outcomes. Here, PJM cites lower prices as a problem in of itself and repeatedly speculates that low prices "could" or "threaten to" create supply problems that do not exist. PJM's Petition does not once refer to an existing problem stemming from low prices, but PJM speculates about the theoretical possibility of such a problem as if conjecture could be substantiated merely by repetition.[55] The Petition opines that lower prices "may" or "might" become a cause for concern, but never once asserts that low prices *are* causing, or even *will*

Act 6 (PowerPoint presentation), https://powerforwarddupage.com/wp-content/uploads/2018/01/JackDarin.pdf (estimating new capacity build necessary to comply with the Future Energy Jobs Act's renewable energy credit targets provided at 20 ILCS 3855/1-75(c)(1)(C)(iii)). New Jersey has to build an additional 3.5 gigawatts of offshore wind generation resources by 2030 to comply with Executive Order No. 8. N.J. Exec. Order No. 8 (Jan. 31, 2018), http://nj.gov/infobank/eo/056murphy/pdf/EO-8.pdf.

[52] PJM Res. Adequacy Planning Dep't, *PJM Load Forecast* 2 (2018), http://www.pjm.com/-/media/library/reports-notices/load-forecast/2018-load-forecast-report.ashx?la=en.

[53] *Id.*

[54] *See* Order Denying Rehearing and Approving Settlement Subject to Conditions, *PJM Interconnection*, 117 FERC ¶ 61,331 (Dec. 22, 2006).

[55] PJM attempts to put numbers to its conjecture by providing flawed sensitivity analysis. However, as the attached Affidavit of James F. Wilson demonstrates, PJM's analysis fits the Petition's narrative but contradicts how markets actually work in practice. Wilson Affidavit ¶¶ 26–33. As Wilson explains, PJM's "estimates are based on oversimplified calculations that vastly overstate the potential impacts of incremental resources." *Id.* at ¶ 26.

cause, a problem. Reticence in making factual assertions does not render a conclusion invalid, but lack of evidence to support the claims does.[56] PJM cannot speak with more confidence because it has no evidence of a problem.

By failing to provide evidence of a price-suppression problem, the Petition improperly asks the Commission to accept what the D.C. Circuit and the Commission would consider "unsupported assertions" that "confuse a theoretical threat … with a theory used in an academic discipline."[57] As the D.C. Circuit and the Commission have concluded before, speculation about academic questions occupies "an area of activity that is not comparable to the tasks or responsibilities entrusted to a regulatory agency."[58]

Either proposal would undermine the Commission's stated goal for wholesale markets "to protect the public interest and ensure that electricity ratepayers pay the lowest price possible for reliable service."[59] Both ask consumers to pay more, with no resulting increase in service reliability. Capacity Repricing would force ratepayers to pay more for the same resources; MOPR-Ex would both artificially inflate prices and artificially prevent the new resources these state programs have attracted to the market from clearing, effectively forcing customers in some states to pay twice for capacity.

D. The Petition Lacks the Required Consideration of Costs.

The D.C. Circuit has found that the Commission must balance the benefits of proposed tariff revisions against the costs of increasing rates.[60] In addition to failing to prove any benefits

[56] *See S.C. Pub. Serv. Auth. v. FERC*, 762 F.3d 41, 68 (D.C. Cir. 2014).
[57] *Id.* (citing *Algonquin Gas Transmission Co. v. FERC*, 948 F.2d 1305, 1313 (D.C. Cir. 1991); Order No. 1000-A ¶ 70, 77 Fed. Reg. 32,184, 32,197 (May 31, 2012); *Sacramento Mun. Util. Dist. v. FERC*, 616 F.3d 520, 530–31 (D.C. Cir. 2010)).
[58] *Id.*
[59] Order No. 2000, 89 FERC ¶ 61,285, at 3 (1999).
[60] *AEMA*, 860 F.3d at 660–61 (citing *Blumenthal v. FERC*, 552 F.3d 875, 885 (D.C. Cir. 2009)).

of either proposal, the Petition also fails to provide estimates of costs. By ignoring the costs of both proposals, PJM has rendered the Petition legally insufficient.

The U.S. Supreme Court has found that an agency "must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made'" and consider "the relevant factors" prescribed by Congress in the governing statute.[61] As part of this inquiry, the FPA requires the Commission to consider a proposal's costs in determining whether to approve it.[62] Thus, the Commission cannot declare any proposal just and reasonable without first conducting a sufficient cost analysis. The Petition offers the Commission no cost estimates for either proposal, denying the Commission the information it would need to approve either of them.

By ignoring costs, the Petition fails to clear a low bar for reasoned decision making. Courts defer to the Commission's judgment in weighing various considerations, including costs.[63] "FERC, in making these judgments, need not engage in painstaking cost-benefit analysis of the merits of research proposals on a project-by-project basis. Rather, the Commission is required to make only a candid, common-sense assessment as to the consistency of a project's objectives with the interests of the ratepayers providing the financing."[64] Yet the Petition fails to provide any basis for a meaningful cost assessment of either proposal, going so far as to ask the Commission to choose which of the two proposals it prefers without knowing how much either policy would cost. By neglecting costs, the Petition offers nothing to satisfy the legal standard of

[61] *Motor Vehicle Mfrs. Ass'n of U.S. v. State Farm Mut. Auto. Ins.*, 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962); citing *Bowman Transp. v. Ark.-Best Freight Sys.*, 419 U.S. 281, 285 (1974); *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 416 (1971)).
[62] *See, e.g.*, *Advanced Energy Mgmt. Alliance*, 860 F.3d 656, 662 (D.C. Cir. 2017) (citing *Michigan v. EPA*, 135 S. Ct. 2699, 2707 (2014)); *TransCanada Power Mktg.*, 811 F.3d 1, 11–12 (D.C. Cir. 2015)); *Process Gas Consumers Grp.*, 866 F.2d 470, 476–77 (D.C. Cir. 1989).
[63] *AEMA*, 860 F.3d at 662 (citing *Md. Pub. Serv. Comm'n v. FERC*, 632 F.3d 1283, 1286 (D.C. Cir. 2011).
[64] *Process Gas Consumers Grp.*, 866 F.2d at 477.

giving the Commission *some* reasonable basis for approving a proposal as just and reasonable from a cost perspective. As such, the Commission should reject the Petition.

E. Neither Proposal Adheres to the Principles of Capacity Markets.

Both Capacity Repricing and MOPR-Ex fail to advance the capacity market principles the Commission reaffirmed in its recent approval of ISO-New England's "CASPR" proposal.[65] These first principles state that a capacity market should:

1. "facilitate robust competition for capacity supply obligations;"
2. "provide price signals that guide the orderly entry and exit of capacity resources;"
3. "result in the selection of the least-cost set of resources that possess the attributes sought by the markets;"
4. "provide price transparency;
5. "shift risk as appropriate from customers to private capital;" and
6. "mitigate market power."[66]

Neither Capacity Repricing nor MOPR-Ex promotes these objectives. As stakeholders already have made clear to PJM through their votes, the best option to promote the objectives of the capacity market is to retain the status quo and reject both attempts to override the market's results.

Regarding the first two principles—competition for supply obligations and efficient price signals—PJM has excess capacity, so low capacity prices are sending the correct price signal to uneconomic resources: that they should retire. There is excessive supply. Supply growth is far outpacing load growth, which is flat.[67] Several of the policies PJM seeks to mitigate are, in fact,

[65] *ISO New England, Inc.*, 162 FERC ¶ 61,205, at P 21 (2018) ("CASPR Order").
[66] *Id.* at P 21.
[67] PJM Res. Adequacy Planning Dep't, *supra* note 52, at 2.

driving supply growth by incenting the development and retention of resources. If adopted, MOPR-Ex would pose a barrier to much of this new supply by preventing otherwise cost-competitive bids from clearing the capacity market.

Further, the Petition itself offers an illustration of how Capacity Repricing impedes efficient price signals and price transparency. In PJM's example demonstrating how Capacity Repricing's two-stage auction works,[68] the resulting price of capacity (calculated in the second pass) would be $40. That is the price signal the auction would send. For the purpose of efficiently "guiding the entry and exit of capacity resources," it is useless. Not a single watt of capacity bidding above $35 (the price resulting from the first pass) cleared. All cleared units were paid $40, but, only if they bid $35 or less. The $40 price tells generators (or potential generators) nothing about the price they would have to beat to secure a capacity commitment. Since the Capacity Repricing tariff language does not require that $35—the only price that would provide a meaningful signal—be disclosed,[69] it is not clear how market participants are supposed to discern a price signal. Hence, Capacity Repricing lacks price transparency to the detriment of the market's efficiency and needlessly inflates prices.

The principles call for market rules that "result in the selection of the least-cost set of resources that possess the attributes sought by the markets."[70] The point of the state policies these proposals seek to counteract is to select the least-cost set of resources that possess the attributes state policies support. State renewable portfolio standards enjoy broad public support.[71] Private sector initiatives demonstrate the accelerating market trend demanding low-emissions

[68] Petition at 61–67.
[69] *See* Petition Attachment DD § 5.11(e).
[70] CASPR Order at P 21.
[71] Sarah B. Mills, Barry G. Rabe & Christopher Borick, *Widespread Public Support for Renewable Energy Mandates Despite Proposed Rollbacks* 4, ISSUES IN ENERGY & ENVTL. POL'Y (June 2015), http://closup.umich.edu/files/ieep-nsee-2015-renewable-portfolio-standards.pdf.

resources as well. For example, the corporate Renewable Energy Buyers Alliance committed in 2013 to acquire at least 60 gigawatts of renewable energy by 2025, most of which remains to be procured.[72]

Either proposal would prevent states from ensuring that the generators that serve their residents provide the attributes supported by state law and regulation. This market principle refers to "attributes" (plural).[73] Absent any out-of-market payments, the market would select based on only one attribute: the financial expenditures necessary to bring the resource to the market. The Supreme Court has been clear that states "may pursue 'various . . . measures . . . to encourage development of new or clean generation' or other vital public policy goals."[74] States have a role in placing a value on attributes associated with generation resources, such as carbon pollution reduction, job retention, and low cost. By attempting to nullify the effect of state action, PJM seeks to undermine the market's ability to effectively accommodate state action and the attributes it supports.

Another of these capacity market design principles calls for the market to "provide price transparency."[75] Both proposals obscure price transparency by attenuating the relationship between bids and prices. Resources bid into the market and then receive an inflated, artificial price based on PJM's estimates of what certain resources theoretically would have bid if not for certain state policies. This added layer of abstraction and uncertainty in determining prices would interpose nonmarket bids that can be expected to drive up prices and lessen price transparency compared to the current market rules, which determine price based on a simple bid stack.

[72] *About*, REBA, http://rebuyers.org/ (last visited Apr. 20, 2018).
[73] *See id.*
[74] *Hughes v. Talen Energy Mktg.*, 136 S. Ct. 1288, 1299 (2016).
[75] CASPR Order at P 21.

The cited principles also prescribe that capacity markets should be designed to "mitigate market power."[76] PJM would have the Commission believe that Capacity Repricing mitigates "market power that may be involved in the submission of a below-cost offer."[77] This conclusion rests on the premise that out-of-market compensation allows subsidized resources to suppress prices, thereby driving otherwise competitive "in-the-money" or "at-the-money" resources out of the market. This premise is false,[78] but if PJM's price suppression concerns were valid, Capacity Repricing would exacerbate, not mitigate, market power. Assuming, *arguendo*, that subsidies do wind up creating meaningful price suppression, Capacity Repricing would protect the price paid to cleared resources from suppression but leave the clearing price unaffected. Thus, price suppression still would drive the same resources out of the market *and* the subsidized resources would collect even more revenue. That is not mitigating market power. That is doubling down on market power.

Moreover, the first principles described in the CASPR Order address only half of the equation in evaluating the performance of capacity markets. There are two types of stakeholders in markets: those who provide the product and those who consume it. The first principles focus heavily on suppliers, but markets exist to serve consumers: without customers, there are no markets Either of PJM's proposals would serve the financial interests of certain suppliers by increasing prices, but PJM has not demonstrated that either proposal would provide any value for consumers. All PJM has established either proposal would accomplish is to transfer funds from consumers to suppliers and burden ratepayers and the public generally by making state policy objectives more expensive to achieve.

[76] *Id.*
[77] Petition at 46.
[78] Wilson Affidavit at ¶¶ .

PJM is offering two proposals with no established value and a blank price tag and asking FERC to choose. Joint Consumer Advocates urge FERC to reject them both.

F. Stakeholders Rejected Both Proposals and Prefer the Status Quo.

In March, 2017, PJM convened the Capacity Construct/Public Policy Senior Task Force ("CCPPSTF") to investigate the relationship of PJM's capacity market and public policies. After twenty-two meetings over the course of eight months, the course of action that received the most support from stakeholders in the CCPPSTF (64 percent in favor) was to retain the status quo and not file any tariff revisions with the Commission.[79] PJM staff informed stakeholders that it would not offer status quo as the task force's recommendation to the Markets and Reliability Committee (composed of PJM members such as generators, transmission owners, and end-use consumers and tasked with voting on matters related to markets and reliability, including filing with the Commission). When PJM staff presented both their own Capacity Repricing proposal and MOPR-Ex to the MRC, the MRC also voted not to endorse either option.[80]

As the Commission stated in Order No. 494, "stakeholder consensus is an important factor to be considered in reviewing the just and reasonableness of a rate design."[81] PJM seeks to override the results of the stakeholder process. Both proposals failed to get the two-thirds sector-weighted stakeholder approval necessary for endorsement, and the stakeholders rejected Capacity Repricing by an especially drastic margin (74 percent opposed).[82] PJM ignored the results of the stakeholder process and now requests that the Commission approve one of the proposals the stakeholders rejected.

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[79] Markets & Reliability Comm., PJM Interconnection, L.L.C., Minutes 2 (Jan. 25, 2018), http://www.pjm.com/-/media/committeesgroups/committees/mrc/20180222/20180222-item-01-draft-minutes-mrc-20180125.ashx (Agenda item 5).
[80] PJM Interconnection, L.L.C., CCPPSTF Vote Results 5 (Nov. 21, 2017), http://www.pjm.com/-/media/committees-groups/taskforces/ccppstf/20171121/20171121-ccppstf-vote-results.ashx.
[81] *PJM Interconnection, L.L.C.*, 119 FERC ¶ 61,063, 61,370 (2007).
[82] *Id.*

The CCPPSTF and MRC alike resoundingly rejected Capacity Repricing, with over 70 percent against in both votes. PJM is within its rights to seek Commission approval of Capacity Repricing anyway, but the "weight" sometimes afforded to "the position of the majority of the transmission owning members" of the RTO pulls against approval.[83] MOPR-Ex likewise failed to meet PJM's established standard for support necessary for endorsement.

Even when a proposal has sufficient stakeholder support for endorsement—which neither of the PJM's proposals do—the FPA still applies the same robust standard of review. No degree of stakeholder support—much less a narrow majority insufficient for endorsement—can abrogate the Commission's statutory role as the arbiter of whether the proposal is just and reasonable. The RTO retains its burden of demonstrating that its proposed tariff changes would result in rates that are just, reasonable, and not unduly discriminatory. PJM has not met this burden.

For example, FERC rejected portions of PJM's 2012 MOPR reform package that had received PJM stakeholder endorsement with eighty-nine percent of the sector-weighted vote.[84] There is not nearly that level of support among stakeholders for either of the proposals PJM has filed here. Both fell short of the two-thirds sector-weighted support threshold for endorsement.[85] The Commission should be wary of PJM's attempt to have the Commission step in and approve proposals that even PJM's own members rejected. The Commission should follow suit and reject PJM's Petition.

[83] *See Am. Elec. Power Serv. Corp.*, 122 FERC ¶ 61,083, at P172 (Jan. 31, 2008).
[84] *PJM Interconnection*, 143 FERC ¶ 61,090, at PP 141, 210 (May 2, 2013).
[85] *See* PJM, *Manual 34: PJM Stakeholder Process*, App'x III: Process Charts (rev. 07, eff. May 19, 2016), http://www.pjm.com/-/media/documents/manuals/m34.ashx.

G. The Proposals Arbitrarily Target State Policies and Would Result in Undue Discrimination Among Resources and States.

Both the Capacity Repricing and the MOPR-Ex proposals are legally deficient because they target some state policies, taxes, and other practices and some resources that have already been integrated into market prices and rules without a clear rationale for distinguishing among either types of resources or state policies. State and federal policies, taxes and practices have permeated the economy and the energy markets for years. PJM's attempt to isolate some state polices, taxes, or other practices would treat similarly situated subsidized or benefited resources differently and result in undue discrimination.

PJM seeks approval of the proposed tariff revision under Federal Power Act Section 205, which prohibits the granting of "any undue preference or advantage to any person or subject[ing] any person to any undue preference or disadvantage."[86] In filing a tariff revision, the RTO "bears the ultimate burden of demonstrating that the rate is not unduly discriminatory."[87] PJM has failed to carry its burden here. Adopting MOPR-Ex or Capacity Repricing would subject resources to undue discrimination by manipulating some resources' bids and not others. This selective, artificial inflation of bids prejudices certain resources based only on stakeholder politics and PJM's objection to state policies that it has not shown pose any threat to the market.

The MOPR-Ex proposal would unduly discriminate by excluding certain resources from the capacity market while exempting other similarly situated resources from its MOPR.[88] First, in finding a resource to have an "actionable subsidy," either Capacity Repricing or MOPR-Ex would attempt to distinguish between state policies, taxes, and practices that only affect select

[86] 16 U.S.C. § 824d(b).
[87] *Transmission Agency of N. Cal. v. FERC*, 628 F.3d 538, 549 (D.C. Cir. 2010) (citing *Elec. Consumers Res. Council v. FERC*, 747 F.2d 1511, 1515 (D.C. Cir. 1984)).
[88] *See id.* (finding that discrimination is undue if disparately treated resources are "similarly situated") (citing *Sacramento Mun. Util. Dist.*, 474 F.3d at 802).

resources. MOPR-Ex includes a second layer of discrimination by displacing some subsidized resources from the capacity market while exempting other, similarly subsidized resources from the MOPR, leaving them free to participate in the market like an unsubsidized resource.

As discussed above in Section II.A, the Commission cannot rewrite a proposed tariff amendment.[89] Therefore, if the Commission finds (as it should) that MOPR-Ex would result in undue discrimination that no minor adjustment could resolve, the FPA leaves the Commission no choice but to reject the proposal altogether.

H. Both Proposals Are Invalid for Lacking a "Fixed, Predictable Nature."

Both proposals lack the requisite clarity for approval under FPA Section 205. The Commission has found that "acceptance of formula rates is premised on the rate design's 'fixed, predictable nature,' . . . which both allows a utility to recover costs that may fluctuate over time and prevents a utility from utilizing excessive discretion in determining the ultimate amounts charged to customers."[90] Unlike established formula rates, both of PJM's proposals lack sufficient specificity for potentially affected parties to determine whether their resource or policy would be actionable under either Capacity Repricing or MOPR-Ex.

Despite the efforts of PJM and the Independent Market Monitor ("IMM")—the authors of Capacity Repricing and MOPR-Ex, respectively—to answer stakeholders' questions regarding the scope of each proposal, the tariff language itself will govern. The proposed tariff revisions themselves must be explicit, and they are not. For example, the proposed tariff language to implement MOPR-Ex's exemption for renewable portfolio standards ("RPS"), on its face, is not clear as to which states' RPS it would exempt. Further, there is significant uncertainty over how

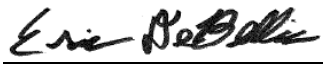
[89] *See infra* Section II.A.
[90] *Pub. Utils. Comm'n of Cal. v. FERC*, 254 F.3d 250, 254 (D.C. Cir. 2001) (citing *Ocean State Power II*, 69 FERC ¶ 61,146, 61,552 (1994)).

the proposed tariff language defining "actionable subsidies" would apply to a unit that may get in the delivery year some revenue from the sale of renewable energy credits ("RECs"). It is unclear how this proposed language would impact a project that does not have a contract to sell RECs yet but might sell them during or after the delivery year. It is also unclear how it would treat a project that sells all of its output to another firm, including the right to sell RECs, but does not control or know whether the other firm will in fact sell those RECs. In light of these and other unresolved ambiguities, the Commission should reject the Petition as unacceptably ambiguous in scope.

III. CONCLUSION

WHEREFORE, Joint Consumer Advocates respectfully request that the Commission deny PJM's Petition for the foregoing reasons.

Respectfully submitted,



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Dated: May 7, 2018

Attachment A

Affidavit of James F. Wilson

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.	)	Docket No. ER18-1314-000

AFFIDAVIT OF JAMES F. WILSON
IN SUPPORT OF THE PROTESTS OF
DC-MD-NJ CONSUMER COALITION, JOINT CONSUMER ADVOCATES,
AND CLEAN ENERGY ADVOCATES

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AND CLEAN ENERGY ADVOCATES

Table of Contents

AFFIDAVIT OF JAMES F. WILSON
IN SUPPORT OF THE PROTESTS OF
DC-MD-NJ CONSUMER COALITION, JOINT CONSUMER ADVOCATES,
AND CLEAN ENERGY ADVOCATES

I. Introduction

1. My name is James F. Wilson. I am an economist and independent consultant doing business as Wilson Energy Economics. My business address is 4800 Hampden Lane Suite 200, Bethesda, MD 20814.

2. I have over thirty years of consulting experience in the electric power and natural gas industries. Many of my past assignments have focused on the economic and policy issues arising from the introduction of competition into these industries, including restructuring policies, market design, market analysis and market power. Other recent engagements have included resource adequacy and capacity markets, contract litigation and damages, forecasting and market evaluation, pipeline rate cases and evaluating allegations of market manipulation. I also spent five years in Russia in the early 1990s advising on the reform, restructuring, and development of the Russian electricity and natural gas industries for the World Bank and other clients. I have submitted affidavits and presented testimony in proceedings of the Federal Energy Regulatory Commission ("Commission"), state regulatory agencies, and U.S. district court. I hold a B.A. in Mathematics from Oberlin College and an M.S. in Engineering-Economic Systems from Stanford University. My curriculum vitae, summarizing my experience and listing past testimony, is Attachment JFW-1 attached hereto.

3. I have been involved in electricity restructuring and wholesale market design for over twenty years in PJM, New England, Ontario, California, MISO, Russia, and other regions. With regard to the PJM system, I have also been involved in a broad range of other market design and planning issues over the past several years.

4. With regard to the capacity market design issues that are the subject of this proceeding, I have been involved in these issues in PJM, New England, California, the Midwest, and other regions. Since PJM Interconnection, L.L.C. ("PJM") proposed the Reliability Pricing Model ("RPM") capacity construct in 2005, I have prepared numerous affidavits, reports, and analyses of RPM and RPM-related issues, including the minimum offer price policies addressed in this docket. I submitted comments in the Commission's technical conference on state policies and wholesale markets in Docket No. AD17-11.[1] I also actively participated in the Capacity Construct Public Policy Senior Task Force ("CCPPSTF") stakeholder process that led to this filing.

5. On April 9, 2018, PJM filed proposed changes to its tariff to address the potential impacts on RPM prices of resources receiving state subsidies ("PJM Filing"). This affidavit was prepared at the request of the Maryland Office of People's Counsel, New Jersey Division of Rate Counsel, and District of Columbia Office of People's Counsel ("DC-MD-NJ Consumer Coalition"), Illinois Citizens Utility Board, Illinois Attorney General, Delaware Division of the Public Advocate, West Virginia Consumer Advocate Division, Kentucky Attorney General, and Indiana Office of Utility Consumer Counselor ("Joint Consumer Advocates"), and Sierra Club and Natural Resources Defense Council ("Clean Energy Advocates"). My assignment was to evaluate the need for and likely impacts of the proposed changes to RPM.

[1] Wilson, James F., *Post Technical Conference Comments*, State Policies and Wholesale Markets Operated by ISO New England Inc., New York Independent System Operator, Inc., and PJM Interconnection, L.L.C. Docket No. AD17-11-000, June 22, 2017, available at https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14625014.

II. Overview and Recommendations

A. The Issue: Capacity Price Formation in the Presence of Policy Resources

6. When states financially support the development or retention of resources with environmental or other attributes that satisfy public policy objectives not valued in the wholesale markets (hereafter, "public policy resources"), the Commission has found that the resulting "out-of-market" revenues provided to the public policy resources potentially create a conflict between three objectives for forward capacity constructs:[2]

1. that all resources, including public policy resources, should receive capacity supply obligations and payments, recognizing their contributions to resource adequacy, so consumers don't "pay twice" for duplicative excess capacity;
2. that capacity prices should not be suppressed by the presence of public policy resources, which price suppression could discourage "competitive", in-market resources, and compensate existing resources unfairly; and
3. that the capacity construct should clear a reasonable total quantity of capacity at a reasonable total cost.

7. The never-ending struggles around changes to minimum offer price ("MOPR") rules in PJM and elsewhere reflect, to a large extent, that different stakeholders disagree as to the impact of public policy resources on capacity prices, and place different priorities on these conflicting objectives. Not surprisingly, capacity sellers and RTOs tend to emphasize objective #2 while consumer interests place more importance on objectives #1 and #3.

8. The PJM Filing proposes two alternative packages of changes to RPM, both intended to support higher RPM price outcomes in the presence of resources receiving state policy support. PJM's preferred package is its Capacity Repricing Proposal (hereafter, "PJM's Repricing Proposal"). The alternate proposal, MOPR-Ex, was primarily developed by the PJM Independent

[2] See, for instance, *ISO New England Inc. and New England Power Pool Participants Committee*, 135 FERC ¶ 61,029 (2011), P 95.

Market Monitor, Monitoring Analytics, LLC. PJM claims that either proposal is just and reasonable (p. 42) and that Commission action is needed now (p. 18).

B. There is No Present Need for Comprehensive Revision or Expansion of the RPM MOPR Rules

9. Resource adequacy has been easily achieved in the PJM footprint in recent years, with large amounts of excess capacity cleared through RPM despite numerous retirements. There has been substantial entry and exit each year, large amounts of uncleared resources, and more and more offers at prices close to clearing prices (the supply curves are becoming more gently sloped). This means that RPM has substantial ability to absorb new resources of all types, while maintaining clearing prices within a range that balances entry and retirements. The RPM market is not nearly as fragile as suggested by PJM and other proponents of major tariff changes to support higher capacity price levels.

10. PJM's estimates of the potential impacts of new or retained resources on RPM prices (PJM Filing, pp. 28-29) ignore these dynamics and, as a result, greatly overstate the potential impacts. New entrants generally offer at low prices, whether or not they receive state policy support; and all new entry at low prices has the same potential impact on RPM prices. However, as market participants plan their entry and exit choices, they take into account the anticipated supply/demand balance and the anticipated actions of other market participants that affect that balance. As a result, despite entry and exit each year, the RPM supply curves end up being quite similar year to year.

11. Both of PJM's proposals (the Repricing Proposal, MOPR-Ex) represent fundamental changes to the RPM MOPR rules, which are designed to support higher capacity prices by imposing minimum offer prices on certain resources. Minimum offer price rules are market interventions that lead to administrative pricing. It should be a goal of the design of such

interventions that they have the minimum necessary impact for the minimum necessary duration, allowing the market to return to market-based pricing. Both proposals ignore the market's dynamic ability to absorb incremental resources with clearing prices maintaining, or quickly returning to, the levels that balance supply and demand, entry and exit.

C. PJM's Repricing Proposal is Fatally Flawed and Would Be Harmful to the Market and Costly to Consumers

12. PJM's Repricing Proposal contains three characteristics that I consider to be fatal flaws – each individually warrants rejection of the proposal. The first fatal flaw has to do specifically with RPM, while the other two are market design fatal flaws of a more generic nature.

1. The first fatal flaw is that PJM's Repricing Proposal establishes an auction clearing price and quantity pair that does not lie on the auction's sloped Variable Resource Requirement ("VRR") capacity demand curve; as discussed in detail below, under very likely circumstances, the auction result would lie well above the VRR curve. This violates a bedrock principle of capacity market design – auction outcomes must lie upon the agreed sloped demand curve. As noted below, the Commission has seen a proposal with this feature before, and rejected it on this basis. A proposal with this characteristic would require, among other things, a fundamental reconsideration of the interpretation and role of the sloped capacity demand curve, and of its shape and position. No such reconsideration has occurred.

2. The second fatal flaw is that PJM's Repricing Proposal divorces the determination of <u>who clears</u> in the auction from the determination of <u>what price</u> those winners will be paid, which will badly distort resources' offer prices. Functioning markets and workable market and auction designs share the characteristic that a seller's offer price will determine whether the seller will make a sale, and also the minimum price the seller might receive. This disciplines offer conduct, pushing sellers to offer based on cost. PJM's Repricing Proposal will determine who clears the auction based on one supply curve ("Stage 1"), but will determine the price to be paid based on a potentially very different supply curve ("Stage 2") that, as I will

show, is very likely to result in a much higher clearing price in Stage 2. This will create strong incentives for sellers in a broad cost range near the likely Stage 1 clearing price to "race to the bottom" – offer below their cost to try to clear in Stage 1, knowing that they will get paid the much higher price established in Stage 2. And higher-cost sellers that won't enter the "race to the bottom" will realize that their offer prices are not meaningless; they can contribute to higher Stage 2 clearing prices (that will be earned by all affiliated cleared resources) by "clearing out the top" and offering at the highest prices allowed. I am not aware of any market or auction that has this characteristic except perhaps under trivial circumstances (and as shown below, the impact in this instance is far from trivial). This design characteristic – one process determines who clears, a quite different one the price – is unworkable and should be considered an auction design non-starter.

3. The third fatal flaw is related to the second one. As noted, under quite reasonable assumptions, the Stage 2 clearing price can be well above the Stage 1 price that resources must offer under to be chosen in the auction. That means that the Stage 2 clearing price would likely be set by the offer from a resource that knew it would not be receiving a capacity commitment. In addition, as noted above, such resources have incentives to offer above cost, to support a higher Stage 2 clearing price. Thus, the Stage 2 clearing price is arguably quite arbitrary and not cost-based or the result of a workably competitive market mechanism. While it futile to attempt to administratively reconstruct the "competitive" price that would occur without subsidies – the market would adapt to that alternate world, adjusting entry and exit decisions – the Stage 2 price is a particularly flawed attempt to determine such a price. This design characteristic – a price that will determine billions in capacity payments may be set by an offer from a resource that had nothing at stake in selecting its offer price, and indeed had incentives to inflate its offer price – should also be considered an auction design non-starter.

13. I simulated the results of PJM's Repricing Proposal for the RTO Region using actual demand curves and supply curves based on recent auctions. Even assuming market participants naively do not adjust their offers based on the incentives created by PJM's Repricing

Proposal, if 5,000 MW (the minimum amount) is repriced, it would raise RPM prices and the cost to consumers by 28%; if 9,000 MW is repriced, it would raise prices and cost by 50%. Under the assumption that half of the market participants would adjust their offers due to the clear incentives created by the PJM Repricing Proposal, prices and cost would increase by 66% if 9,000 MW is repriced, or by 42% if only 5,000 MW is repriced. These examples are explained in detail and summarized in Figures 1 to 5 and Table 1 below.

14. The incentives created by the PJM Repricing Proposal would raise RPM prices and costs; as explained below, the incentives would also cause the RPM supply curves to become steeper in the relevant range near likely clearing prices. This is a highly undesirable result. Over recent years, RPM supply curves have become more gently sloped, which contributes to more competitive conduct and relatively stable prices over time. These conditions provide stronger incentives for investment in the PJM markets. The PJM Repricing Proposal would lead to steeper supply curves and more volatile prices, weakening investment incentives and increasing risk premiums.

15. PJM suggests that market participants may not act on the incentives resulting from its Repricing Proposal, because the RPM Stage 1 and Stage 2 prices and price differences might not be sufficiently predictable, so such action would be "speculative." This would seem to leave PJM, market participants and the Commission hoping for market uncertainty and volatility, because the market design would only work acceptably under such conditions.

D. The Proposed Applicability and Duration of Mitigation Are Excessive Under Both Proposals (Repricing and MOPR-Ex)

16. In addition to the issues raised above, both of PJM's proposals also share the following characteristic: Both call for mitigating (repricing) resources with actionable subsidies for an unlimited period, without regard to how many years the market may have had to adjust to

and absorb the resource, either before it enters the market, or after. In applying market interventions that result in administrative prices (such as MOPRs and repricing do), the goal should be to apply the minimum intervention for the minimum period, such that the market can absorb and adjust to the resource, and return to market-based pricing without interventions as soon as possible. MOPRing or repricing a resource year after year, despite plenty of time for the market to absorb the resource, leads to artificial prices that do not reflect the true supply/demand balance, and that delay the market's adjustment to the resource. Any tariff rules to expand the mitigation or repricing of resources with actionable subsidies should limit the mitigation or repricing in the following two ways:

1. Resources with actionable subsidies that meet criteria indicating that the market has been able to absorb them should not be mitigated or repriced. The criteria would have to do with a) how far in advance the resource's entry was known, and perhaps b) the size of the resource compared to its zone of entry.
2. When mitigation or repricing does apply to a resource, the duration of the mitigation or repricing should be limited, and should again depend upon the advance knowledge and the size of the resource compared to the zone of entry.

17. These changes would be more consistent with the recently-approved provisions of ISO New England's capacity construct to address policy resources, under which such resources are treated as existing resources and no longer mitigated once they clear in the new substitution auctions.[3]

18. The remainder of this affidavit is organized as follows. The next section discusses PJM capacity market conditions and the ability of the market to absorb new entry and retirements without impacts on prices. It suggests that there is not a crisis calling for urgent action on the

[3] 162 FERC ¶ 61,205 Order on Tariff Filing, issued March 9, 2018 in Docket No ER18-619.

issues raised in PJM's Filing. The final section evaluates PJM's Repricing Proposal, and describes in greater detail the three fatal flaws noted above, with numerical examples.

III. PJM's Capacity Market and Policy Resources

A. Resource Adequacy is in Good Shape in PJM; There is No Imminent Crisis

19. As PJM acknowledges, year after year, RPM clears substantial amounts of excess capacity, at prices well below the administrative Net CONE values. Resource adequacy in PJM is in good shape. This is largely due to flat loads, moderate natural gas prices, and declining costs for natural gas and renewable resources, as PJM also acknowledges (p. 11). These circumstances are not expected to end anytime soon. New resources are likely to continue to push into the PJM market through RPM, even if, as has been the case in recent years, many higher-cost existing resources are unwilling to retire.

B. The PJM Capacity Market has become Increasingly Dynamic and Competitive with Substantial Ability to Absorb New Resources of All Types

20. As the PJM Filing states (p. 37), "A properly designed competitive market will address excess or shortage positions over time through the actions of competitive market participants." Over the past several years, RPM base residual auctions have seen a substantial volume of entry and exit in each auction. Specifically, over the past six delivery years, the base residual auction has seen over 35,000 MW of incremental generation resources, while each auction

has also had 11,000 to 18,000 MW of uncleared resources;[4] and over six years from June 1, 2011 through June 1, 2017, just under 25,000 MW of installed capacity deactivated in PJM.[5]

21. Market participants generally will select the timing of retirements and new capacity additions in anticipation of the RPM supply-/demand balance and price level; if RPM prices are expected to rise, some retirements may be delayed or relatively more new entry may be offered, and if prices are expected to be soft there might be more retirements or some new entry may be delayed. Such adjustments have kept RPM prices within a limited range over the past several years despite the retirements and new entry. In addition, various short lead time resources that can efficiently take on RPM obligations, or not, on a year-by-year basis depending upon need and prices (such as some imports, some demand response, and resources that are economic on an energy-only basis) also tend to buffer the RPM price changes from year to year.

22. When certain additional resources are expected to enter or exit the market (be it "competitive" or sponsored resources), market participants will take these changes into account in planning the timing of retirements, other new entry, and other actions that affect the balance of supply and demand. If the additional resources or retirements are anticipated well in advance, it is reasonable to expect that they are fully anticipated and absorbed by market participants' adjustments, and have minimal, if any, impact on capacity prices.

23. In particular, with regard to resources with state policy support of some kind, states generally pursue lengthy regulatory processes before any procurement of new resources to meet state mandates. In most cases, state policies result in quantities of new capacity that are relatively

[4] PJM, *2020/2021 RPM Base Residual Auction Results*, Tables 6 and 8.

[5] PJM Generation Deactivation summaries accessed May 6, 2018, available at http://www.pjm.com/planning/services-requests/gen-deactivations.aspx.

small and known well in advance of the RPM auctions in which they first participate. To the extent the market has had ample time to see that these resources were coming, it is reasonable to assume that the incremental resources are reflected in market participants' various entry and exit decisions, and do not affect price appreciably.

24. While the entry of the public policy resources will likely correspond to some delay of other new entry, acceleration of retirements, or adjustments by resources able to enter and exit on a year-by-year basis, this displacement is a natural consequence of the policy, perhaps even an objective of the policy.

25. When, on the other hand, an incremental (or retained) resource was not fully anticipated by the market (due to, for example, a relatively last-minute state action affecting a large resource), it could have some impact on the RPM auction. However, even in this case, after a few delivery years it should again be the case that the market has adjusted to and absorbed the additional capacity, with RPM prices again finding the point that balances supply and demand, entry and exit. So while the resource may have had an impact initially, it is reasonable to assume that after it has participated in a few auctions there is no further lasting impact on RPM prices.

C. PJM's Estimates of the Impacts of State-Supported Resources on RPM Prices Are Vastly Overstated

26. The PJM Filing at pp. 28-29, citing to the affidavit of Mr. Adam J. Keech, Executive Director, PJM Market Operations (Attachment E), alleges that state subsidies can result in large impacts on RPM clearing prices. For example, citing to auction sensitivity analyses, Mr. Keech suggests (p. 2) that adding 6,000 MW in the Rest of RTO region (outside of the Mid-Atlantic) would reduce RPM prices by 21%. These estimates are based on oversimplified calculations that

vastly overstate the potential impacts of incremental resources. PJM's Independent Market Monitor has made similar claims, using the same flawed approach.

27. As a preliminary observation, note that new resources, whether subsidized or "competitive", generally offer at low prices that are very likely to clear in the RPM auctions; and all new entry that offers at low prices and clears, whether subsidized or "competitive", has exactly the same impact, if any, on RPM clearing prices. So the 50,792 MW of new generation capacity that has been added from 2010 to 2017 (PJM Filing, p. 9) would all have had the same impact on RPM prices, if any, as any future new entry, whether subsidized or "competitive".

28. If incremental resources have huge impacts on RPM prices (as PJM and Mr. Keech allege), how can RPM prices have remained well above zero? The answer was explained in the previous section: as entry and exit occur, other resources are adjusting entry and exit plans, resulting in a buffering of RPM clearing prices. The RPM supply curves are less steeply sloped than in the past, which moderates the price impact of changes in supply or demand. More important, market participants respond to other participants' entry and exit decisions by adjusting their own entry and exit plans. As a result, the RPM supply curves generally end up in about the same place year to year, and result in roughly similar prices, despite various new resources and removed resources.

29. By contrast, Mr. Keech's calculations simply add or remove resources, assuming all other resources' offer prices and quantities are unchanged, and ignoring how the market might adjust to the change in resources, if known in advance, with adjustments to new entry or retirements (among other adjustments, as described in the previous section). Mr. Keech's simple calculations would be accurate for a change in a resource that catches the market totally by surprise – for example, a last-minute action allowing a resource to participate in the auction that the market

expected would not participate. Such a "shock" could potentially have the impacts suggested by Mr. Keech's calculations, for a single auction. However, by the next RPM auction, the market would have reacted to and absorbed the resource, with its presence reflected in market participants' forecasts of prices and needs, and undoubtedly reflected in some participants' choices to adjust their actions or timing.

30. The fact that there has been so much entry (and exit) through RPM over the past several years, while RPM prices have remained in roughly the $70 to $170/MW-day range, reflects this dynamic – market participants are adjusting their entry and exit timing based on anticipated market supply/demand balance and resulting prices. In particular, gas-fired combined cycle units are apparently economic at recent RPM price levels, and will enter at such levels and keep prices from rising higher. There are many more new plants (mainly combined cycle) eligible for participation in RPM than participate and clear in each auction,[6] suggesting that some plants may be holding off and waiting for additional retirements and/or somewhat higher prices.

31. Mr. Keech also discusses the economic principles behind resources' offer price choices, and what constitutes a competitive offer (Attachment E, p. 4). His discussion is rather vague; he refers to a resource's "cost" or "revenue need" without indicating exactly which of the many cost concepts used by economists, and over what time frame, he has in mind. However, he apparently discusses going-forward costs, and makes no reference to opportunity costs. As such, his view contradicts PJM's position in the Capacity Performance docket, accepted by the

[6] For instance, in the 2020/2021 RPM base residual auction, while 12,161.0 MW of new resources received Competitive Entry exemptions from the MOPR, only 2,675.6 of these MW cleared the auction. 2020/2021 RPM Base Residual Auction Results report, p. 5.

Commission, that under Capacity Performance, any RPM offer up to Net CONE times the Balancing Ratio is competitive, due to the opportunity cost of taking on a commitment.[7]

32. The PJM Filing also includes an over-simplified and flawed example, not supported by an affidavit, upon which it alleges that a state subsidy program "is being underwritten by other participants in the wholesale market." First, note again that any entry, including purely merchant entry, would potentially lower market prices in the same manner, and, therefore, would also be "underwritten" by other market participants, under PJM's flawed logic in this example. Furthermore, the example includes a new entrant that needs $45/MW-day to enter, and incorrectly suggests that subsidized entry would harm the entrant. If there is no subsidized resource, the market clears at the entrant's $45/MW-day offer, but with the subsidized resource the entrant does not clear. The entrant, according to the example, is indifferent between these two outcomes (neither makes any net revenue over cost), but the PJM Filing incorrectly suggests the subsidized entry results in harm to the entrant, stating (p. 32) that the new entrant "forgoes the $45/MW-day it would have received."

33. To summarize, because the market is dynamic and market participants are adjusting their entry, exit, and other plans taking into account the anticipated supply/demand balance and prices, it is unclear what impact, if any, a new resource has on RPM prices, especially if its entry has been anticipated well in advance. PJM's impact estimates would, at best, be applicable only to resources that catch the market by total surprise.

[7] 155 FERC ¶ 61,157, *Order on Rehearing and Compliance*, P 184 (noting that the Commission accepted PJM's Capacity Performance default offer cap (Net CONE times the Balancing Ratio) on the grounds that it is based on a reasonable estimate of a low-end competitive offer, after accounting for all marginal costs, opportunity costs, and risks associated with assuming a Capacity Performance commitment).

D. Many of the Potentially Subsidized Resources Would Receive Payments to Reflect Value Not Captured in the PJM Markets

34. PJM suggests there is an imminent crisis calling for immediate Commission action, referring (at p. 24) to "a growing trend among the PJM states... to intervene in resource selection with targeted subsidies." Notably, the state programs PJM identifies all exclusively pertain to zero-carbon resources (p. 25, noting zero-emission credit programs, off-shore wind procurement, and renewable portfolio standards). Anticipated subsidies generally pursue legitimate policy goals of geographically broad value, such as carbon reduction and encouraging innovation, that are not valued in the PJM markets. While the preferred approach, in the face of such environmental and learning externalities, is generally to bring those values into the markets, in the meanwhile, subsidies to address such externalities arguably represent a second-best approach that enhances market efficiency.

35. Furthermore, these policies, which generally either support entry over time by new zero carbon resources, or further retention of zero carbon resources that have been in the market for decades, typically result from lengthy, transparent regulatory processes. The new zero carbon resources will typically be added to the market at a steady pace that is known to the market well in advance, and can easily be absorbed (especially since these resources are typically assigned capacity values well below their installed capacity ratings). The existing zero carbon resources that may be retained by such programs are already in the market so generally do not need to be absorbed.

IV. Evaluation of PJM's Repricing Proposal

A. PJM's Repricing Proposal: Description

36. The basic idea of PJM's Repricing Proposal (described in the PJM Filing, pp. 59-96), is as follows. When repricing is triggered (when the quantity of cleared resources with Actionable Subsidies exceeds 5,000 MW across the RTO, or 3.5% of the reliability requirement in any modeled zone; PJM Filing, p. 52), the RPM Base Residual Auction software would be run to solve the auction twice, in two "stages." In what PJM calls Stage 1, no resources are repriced; so capacity resources with Actionable Subsidies (hereafter, "CRAS" resources) would presumably be offered at low prices and "clear" the Stage 1 auction. Stage 1 would determine which resources will receive capacity supply obligations ("CSOs"); all resources that clear in Stage 1 would receive CSOs for their cleared quantities.

37. Then Stage 2 of the auction would be run, for the sole purpose of determining the price to be paid to the resources that cleared in Stage 1. In Stage 2, PJM would reprice the CRAS resources (substitute "Actionable Subsidy Reference Prices" for the CRAS resources' voluntary offer prices), while all other resources' offers are unchanged, with the goal of removing the impact of subsidies on the resulting Stage 2 clearing price. The repricing would generally associate very high offer prices to all or nearly all CRAS resources, pushing them out of the relevant portion of the supply curve. As a result, the supply curve would shift to the left for Stage 2, which would in general result in a higher clearing price. Then all resources that cleared in Stage 1, including any CRAS resources that cleared in Stage 1, would get CSOs and be paid the Stage 2 clearing price. The clearing price from Stage 1, and the cleared quantity from Stage 2, are not used.

38. Note that under PJM's Repricing Proposal there likely would be resources that offered at prices below the Stage 2 clearing price, but above the Stage 1 clearing price. Since these resources (sometimes referred to as "in-between" or "tweener" resources) were offered at prices

below the Stage 2 clearing price (which is intended to be a "competitive" price), they are presumably economic; but under PJM's proposal, having failed to clear in Stage 1, they do not receive CSOs.

39. With regard to the three conflicting objectives in MOPR design identified above, PJM's Repricing Proposal at least nominally addresses the first two objectives, while sacrificing the third objective:

1. All CRAS resources that clear get CSOs (as a result of Stage 1); and
2. The clearing price is set to a purportedly "competitive" level due to the repricing of CRAS resources (Stage 2); however
3. The reasonable total cost objective is compromised (discussed further below).

40. There are of course various other details to PJM's Repricing Proposal; these are not discussed here as they are not important to my evaluation of the proposal.

B. History of Proposals for Two-Stage Capacity Market Repricing

41. The New England ISO raised the possibility of such a two-stage capacity pricing approach (also sometimes called "two-tiered") in 2010, in a proceeding pertaining to its minimum offer price rules. The Commission rejected the proposal, finding that it would have cleared a quantity of capacity in excess of the Net Installed Capacity Requirement, thereby violating what it referred to as a "bedrock principle" of the New England capacity market (which at the time was designed to clear exactly the Net Installed Capacity Requirement).[8]

[8] 135 FERC ¶ 61,029, Order on Paper Hearing and Order on Rehearing, Docket Nos. ER10-787, EL10-50, April 13, 2011, P 164, available at http://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12619222.

42. Two-stage approaches were again proposed in New England in 2016, in the context of the New England "IMAPP" (Integrating Markets and Public Policy) stakeholder process.[9] The proposals did not receive sufficient support, and stakeholders ultimately settled on an entirely different approach.

43. PJM first proposed its two-stage capacity market concept in a white paper in June, 2016.[10] PJM's proposal was discussed at a Grid 20/20 event in August, 2016, and it remained one of the many proposals considered throughout the CCPPSTF stakeholder process in 2017. Two other two-stage proposals were also considered by CCPPSTF. In the final CCPPSTF poll, PJM's proposal gained only 26% support, while the other two-stage proposals gained less than 20% support.[11]

44. I am not aware of any market in which such a two-stage capacity pricing proposal has been implemented.

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[9] See, for instance, *Public Power Framework Document – Two-Tier FCM Pricing*, Memo from Brian Forshaw to NEPOOL Stakeholders, September 13, 2016, available at http://www.nepool.com/uploads/IMAPP_20160914_Framework_Pub_Power.pdf, and Pete Fuller, NRG: *Capacity markets & efficient renewable procurement in a carbon-constrained world: Two-Tier Pricing*, NEPOOL IMAPP Stakeholder Discussion August 30, 2016, available at http://www.nepool.com/uploads/IMAPP_20160830_Presentation_Two-Tier_Pricing.pdf; these proposals are discussed in *Some Analysis on Two-Tiered Pricing Proposals*, Memo from the New England States' Committee on Electricity ("NESCOE"), October 18, 2016, and the attached memo from James F. Wilson to NESCOE, *IMAPP "Two-Tier" FCM Pricing Proposals: Description and Critique*, available at http://www.nepool.com/uploads/IMAPP_20161021_NESCOE_2Tiered_Pricing_Analysis.pdf.

[10] Stu Bresler, Senior Vice President – Operations and Markets, PJM, *Potential Alternative Approach to Expanding the Minimum Offer Price Rule to Existing Resources*, August 11, 2016, available at http://www.pjm.com/-/media/committees-groups/stakeholder-meetings/grid-2020-focus-on-public-policy-market-efficiency/meeting-materials/20160816-potential-alt-solution-to-the-min-offer-price-rule-for-existing-resources.ashx.

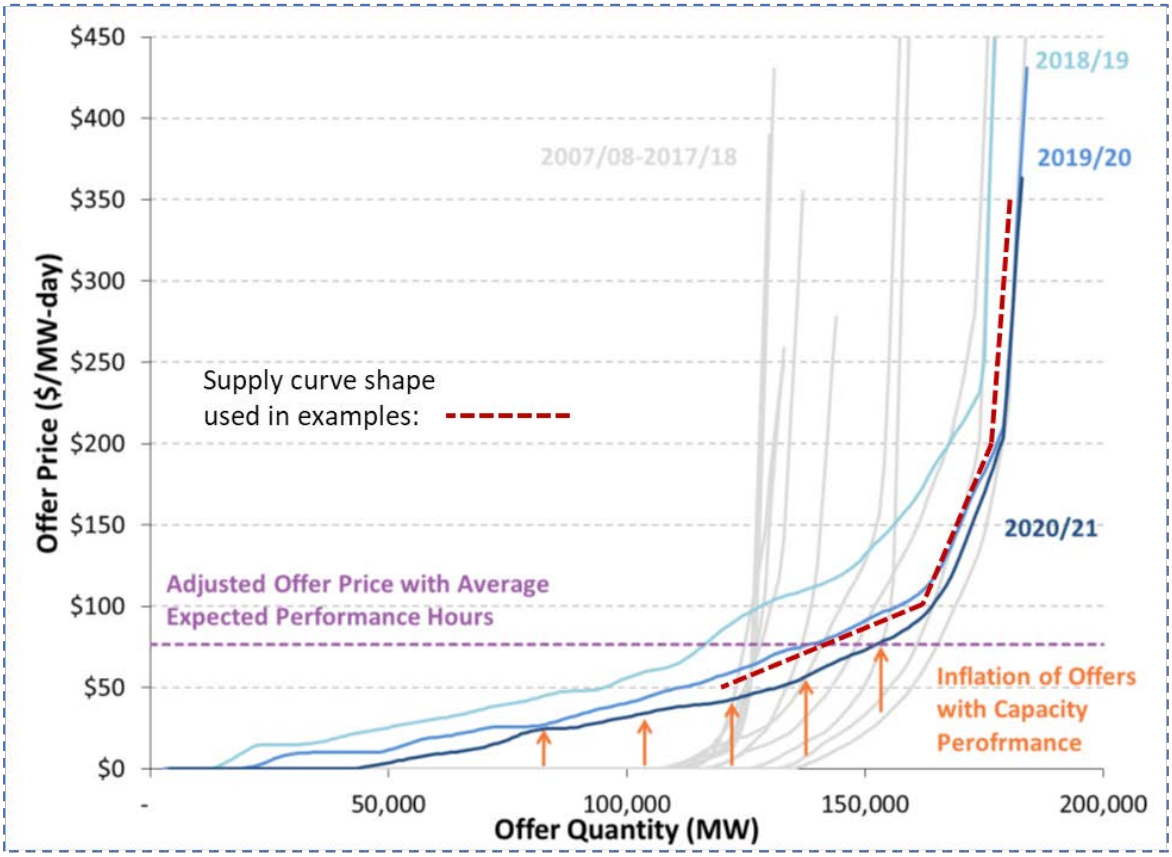
[11] David Anders, Director, Stakeholder Affairs, *Capacity Construct / Public Policy Sr. Task Force Update*, Markets & Reliability Committee meeting December 21, 2017, slide 5, available at http://www.pjm.com/-/media/committees-groups/committees/mrc/20171221/20171221-item-07-ccppstf-report.ashx.

C. PJM's Repricing Proposal: Evaluation

45. This section of my affidavit evaluates the market design elements of PJM's Repricing Proposal and their potential impacts on RPM, describing in further detail the three fatal flaws in the proposal. To help this discussion, I have prepared examples that illustrate the potential impacts of PJM's Repricing Proposal under realistic assumptions, focusing on the RTO Region. For these examples I used the VRR capacity demand curve and Net CONE value for the 2021-22 base residual auction.[12] I used an RTO region supply curve with shape and slope similar to the supply curves from recent base residual auctions, as reported by The Brattle Group in its

[12] PJM, *2021/2022 RPM Base Residual Auction Planning Parameters*, available at http://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2021-2022/2021-2022-rpm-bra-planning-parameters-report.ashx?la=en.

Figure 1: Supply Curve Shape Used in Examples



Source: The Brattle Group, Fourth Review of PJM's Variable Resource Requirement Curve, Figure 13, p. 42

Quadrennial Review report.[13] The supply curve (depicted in Figure 1, based on a graphic from the Quadrennial Review report) is relatively gently sloped (compared to earlier delivery years), with a slope of $1.25/MW-day/1000 MW up to a price of $100/MW-day, and a slope of $7/MW-day/1000 MW at prices above $100/MW-day up to $200/MW-day (while a case could be made for various other supply curve shapes, the nature of the results discussed below is not sensitive to this detail). I shifted the supply curve to give a clearing price near $100/MW-day, which I consider

[13] The Brattle Group, Fourth Review of PJM's Variable Resource Requirement Curve, prepared for PJM, April 19, 2018, Figure 13, p. 42.

to be a reasonable starting point. Although higher than the clearing price from the most recent auction result available at the time of this testimony ($76.53/MW-day, for the 2020/2021 delivery year), both the average, and median, RTO clearing prices over the past five delivery years are roughly $100/MW-day.[14]

46. Figure 2 shows the "base case" auction result with these assumptions, assuming no mitigation or repricing of resource offer prices. The clearing price is $102.80/MW-day, with a cleared quantity of 161,474 MW, resulting in a total market annual capacity cost of $6.1 billion.[15] The base case represents the result of "Stage 1" under PJM's Repricing Proposal, in which the CRAS resources are not mitigated; it also represents the status quo, assuming all CRAS resources would either not be subject to mitigation, or would qualify for an exemption.

47. I then assumed a quantity of CRAS resources (with actionable subsidies) of 9,000 MW. This assumption is supported by the PJM Filing, Attachment F, Affidavit of Dr. Anthony Giacomoni (suggesting 4,969 MW of "around-the-clock" capacity to meet renewable targets, and potentially similar amounts of zero emissions credits; pp. 6-10). This assumption represents about five percent of the total offered unforced generation capacity in RPM, which is usually about 180,000 MW.[16] I assumed these CRAS resources are re-priced in a manner that effectively removes them from the relevant portion of the supply curve; that is, to prices well above clearing prices under any of my examples.

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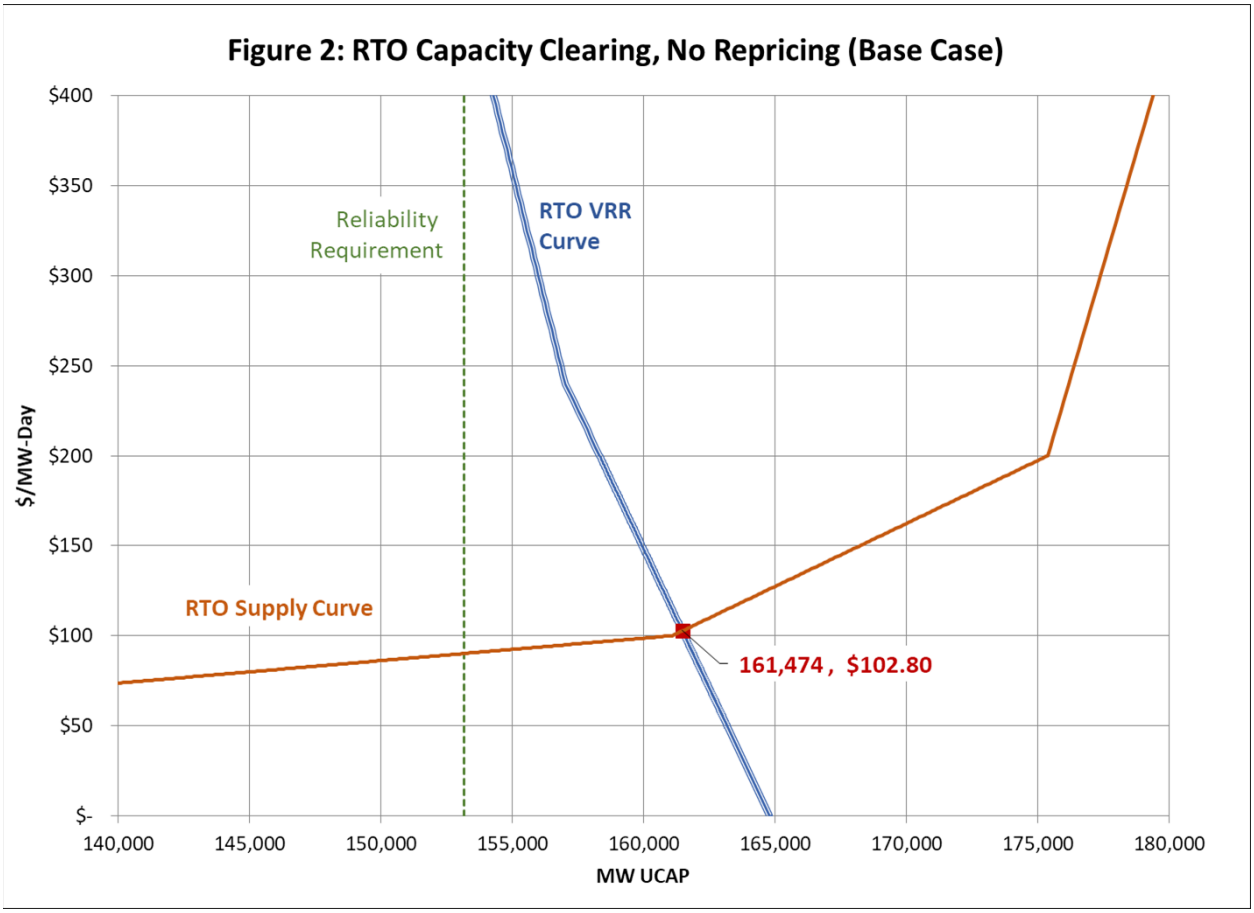
[14] PJM, *2020/2021 RPM Base Residual Auction Result*s, p. 1, available at http://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2020-2021-base-residual-auction-report.ashx?la=en.

[15] For brevity and simplicity in these examples, the reported cost will simply be the clearing price times the cleared quantity times 365 days; this calculation ignores, among other complexities, that some of the obligation clears in zones at higher prices, and some is self-supplied or hedged.

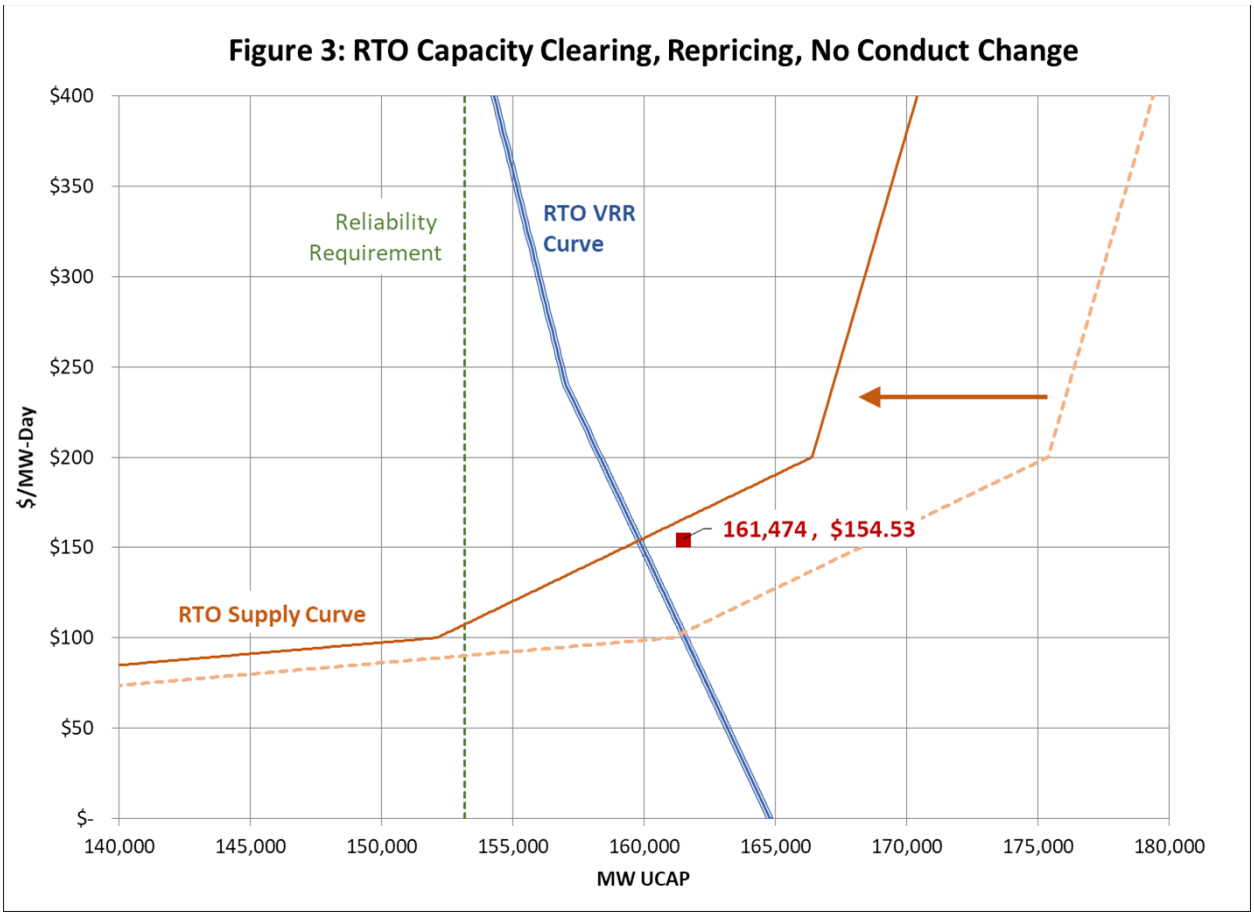
[16] 2020/2021 RPM Base Residual Auction Results, Table 5 p. 17.



1. Fatal Flaw #1: Under PJM's Repricing Proposal, the base residual auction price and quantity result are not consistent with the auction capacity demand (VRR) curve and would result in excessive cost to consumers

48. Figure 3 illustrates the result of "Stage 2" under PJM's proposal, with 9,000 MW repriced (and no change in conduct).[17] Under these assumptions, the Stage 2 result is a clearing price of $154.53/MW-day, an increase of 50 percent compared to the base case. This results in a total annual market capacity cost of $9.1 billion, also a 50% increase compared to the base case.

[17] Rather than suggesting where in the upper reaches of the supply curve the re-priced 9,000 MW might end up, Figure 3 (and later figures) simply shifts the entire supply curve by 9,000 MW.



This example shows that the PJM proposal can substantially increase the cost to consumers, under what I consider to be reasonably likely assumptions about the supply and demand curves, and CRAS resources.

49. The Stage 2 price corresponds to a quantity of 159,800 MW on the VRR curve; however, under PJM's proposal, this price will be paid to all resources that cleared in Stage 1 (161,474 MW). Figure 3 also shows the cleared price (from Stage 2) and the cleared quantity (from Stage 1) under PJM's proposal. This price, quantity pair lies above, not on, the VRR curve.

50. In the 2010 New England case mentioned above, the Commission rejected ISO New England's two-stage proposal because it would clear a total quantity in excess of the Net Installed Capacity Requirement, and thereby violate a "bedrock principle" of the capacity

construct. In a capacity construct with a sloped demand curve (such as RPM, or ISO New England's current construct), the analogous bedrock principle is that the auction result lie on the sloped demand curve; the sloped demand curve identifies the universe of acceptable auction clearing outcomes. PJM's proposal, by resulting in a cleared quantity and clearing price that are not on the VRR curve, violates the bedrock principle, as applied to a sloped demand curve.

51. In rejecting ISO New England's two-stage proposal for violation of a bedrock principle, the Commission did not have to evaluate the evidence and testimony regarding other fatal flaws of the proposed two-stage pricing approach. While Fatal Flaw #1 is sufficient to reject PJM's Repricing Proposal, the next fatal flaw is an even more serious problem.

2. Fatal Flaw #2: Under PJM's Repricing Proposal, incentives to submit competitive offers are distorted and will lead to undesirable conduct that affects quantity and price, and further raises the cost to consumers

52. The second issue is that the proposal reflects a fundamentally flawed market approach that would badly distort resources' choices with regard to offer prices, leading to unintended and undesirable results and further raising cost.

53. Under the current auction rules (or the rules of just about any well-structured auction or market process), a resource's offer price determines both whether the resource will be chosen in the auction, and also the minimum price the resource will be paid. This generally leads a resource to offer at the price the resource requires in order to want to clear in the auction. That is, the resource's offer price should be the price needed to make taking on a CSO worthwhile. If the auction clears at a price above a resource's offer price, it clears and gets a CSO, and is satisfied with this result because the price is enough (likely more than enough) to make taking on the CSO worthwhile. If, instead, the auction clears at a price below the resource's offer price, the resource does not receive a CSO and is again satisfied with this result, because at that clearing price it does

not want a CSO. An owner might determine the price its resource "needs" to make a CSO worthwhile based on its avoided cost, or an opportunity cost concept, or some other analysis, it does not matter; if the auction is well-structured, the incentive is to make an offer based on the price considered needed (setting aside market power considerations). For the discussion here, this price will be referred to as the resource's "cost-based" offer price, recognizing that this may be an opportunity cost or have some other basis.

54. However, under the PJM Repricing Proposal, a resource's offer price does not serve in this role. Under this proposal, the resource will get a CSO and be paid the higher Stage 2 price if and only if its offer is below the lower, Stage 1 clearing price. In the example above, if the resource offers at less than or equal to $102.80/MW-day (the Stage 1 price; Figure 2), it clears, and will be paid $154.53/MW-day (the Stage 2 price; Figure 3).

55. Now suppose the resource's cost-based offer price would be, say, $115/MW-day. If the resource offers at this price, it will not clear in Stage 1, and will not receive a CSO or payment. But the Stage 2 price (that it won't get, because it didn't clear in Stage 1) is well above the $115/MW-day price it needs. So if the owner suspects that Stage 1 may clear in the $90 to 110/MW-day range, and that Stage 2 will very likely clear above $115/MW-day (as in the example), the owner might quite rationally choose to offer somewhat lower than its $115/MW-day price, even though that is below the price it needs. With this strategy the owner would increase the chance that the resource will clear in Stage 1 and get paid the higher Stage 2 clearing price, without much risk of clearing and receiving a price less than its $115/MW-day cost. This strategy is of course more profitable than the initial approach of offering at $115/MW-day (the cost-based offer) and failing to clear.

56. So to the extent 1) it is likely that there will be a substantial wedge between the Stage 2 and Stage 1 prices (which, as shown below, will be the case when there are enough CRAS resources to trigger mitigation), and 2) the likely range of the auction Stage 1 clearing price is reasonably predictable, resources whose cost-based offers are close to or somewhat above the expected Stage 1 clearing price have incentives to lower their offer prices, to increase their chances of clearing in Stage 1 and earning the Stage 2 price. This incentive issue has frequently been noted and is called the "race to the bottom." To the extent this conduct occurs, Stage 1 will clear a somewhat larger quantity, at a lower Stage 1 price, than if all resources submitted their undistorted cost-based offers.

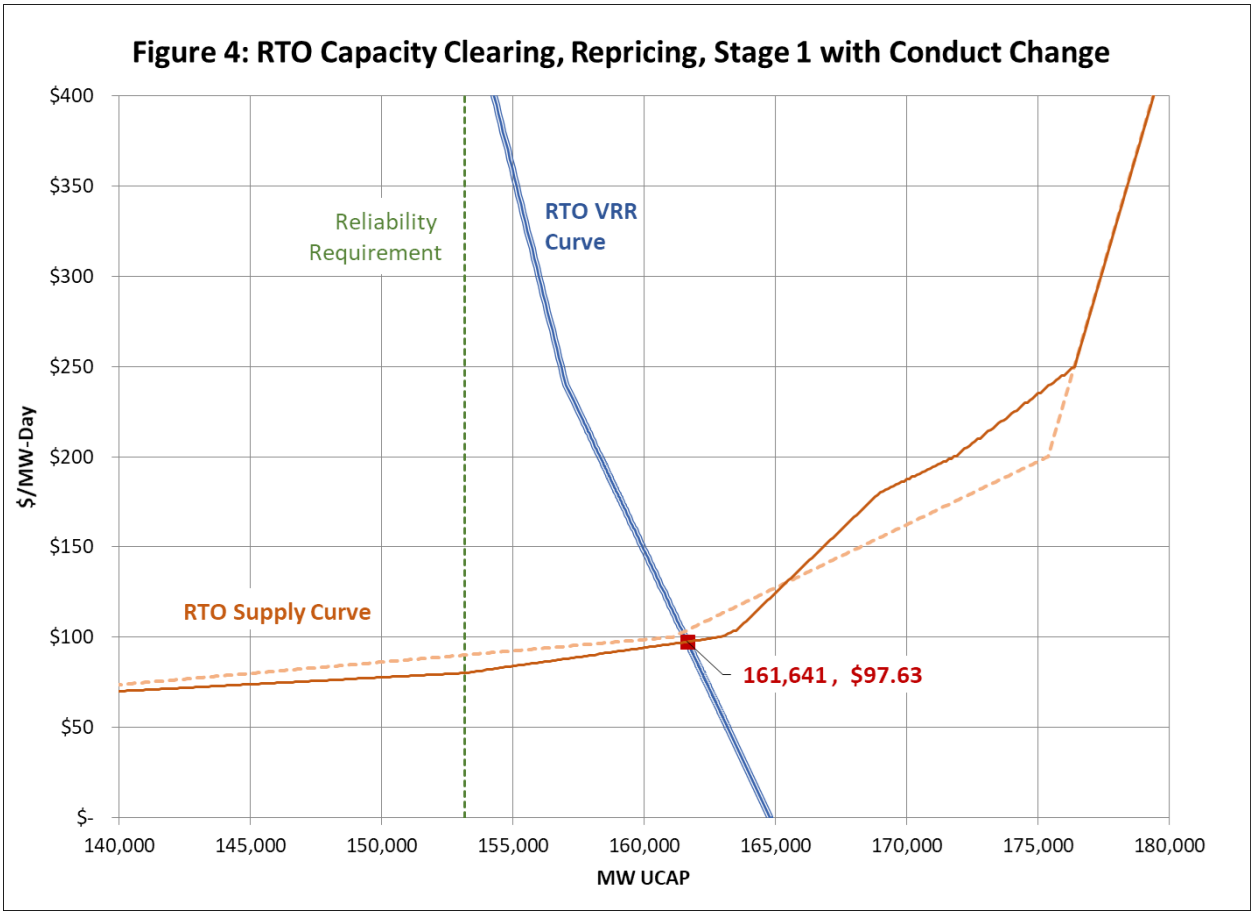
57. The "race to the bottom" – resources lowering their offer prices below cost, in order to clear the auction Stage 1 to earn the higher Stage 2 price – is one bad incentive created by PJM's proposal. There is a second one, applicable to higher-cost resources. Now consider a resource whose cost-based offer price is $140/MW-day. Suppose the owner considers it too risky to lower the offer price enough to be likely to clear in Stage 1 (that is, down to the $100/MW-day range, in my example). The owner chooses to not join the "race to the bottom" that he would likely not win (and could potentially regret, if he does clear, but Stage 2 clears below his cost, $140/MW-day). So does the owner offer the resource at $140/MW-day? If the owner accepts that the resource won't clear in Stage 1 and won't receive a CSO, it would appear that the selected offer price won't make any difference.

58. However, while the selected offer price for this resource won't determine whether the resource will clear (it won't), the offer price could very well affect the Stage 2 clearing price. Suppose the owner anticipates that Stage 2 will likely clear at a price in the $140 to $170/MW-day range, above his offer price, if the offer is based on his cost. If he instead offers at, say, $190/MW-

day, this removes the resource from the Stage 2 clearing result, and leads to Stage 2 likely clearing at a somewhat higher price than it would have. If the owner has only the one resource, this still makes no difference to the owner. But if the owner has other capacity that will clear Stage 1 in the auction and earn the Stage 2 price, then the owner will likely increase profits by offering this resource not at its cost-based $140/MW-day price, but at a higher price (consistent with applicable market power mitigation rules), in order to support a higher Stage 2 clearing price that will be earned by the rest of the owner's portfolio. This second incentive problem, applicable to higher-cost resources, has been called "clear out the top". While resources with costs reasonably close to the anticipated range of Stage 1 clearing prices will be tempted to join the "race to the bottom", higher cost resources that do not enter the race, especially if affiliated with other resources that will clear, will be tempted to "clear out the top" and help Stage 2 clear at a higher price.

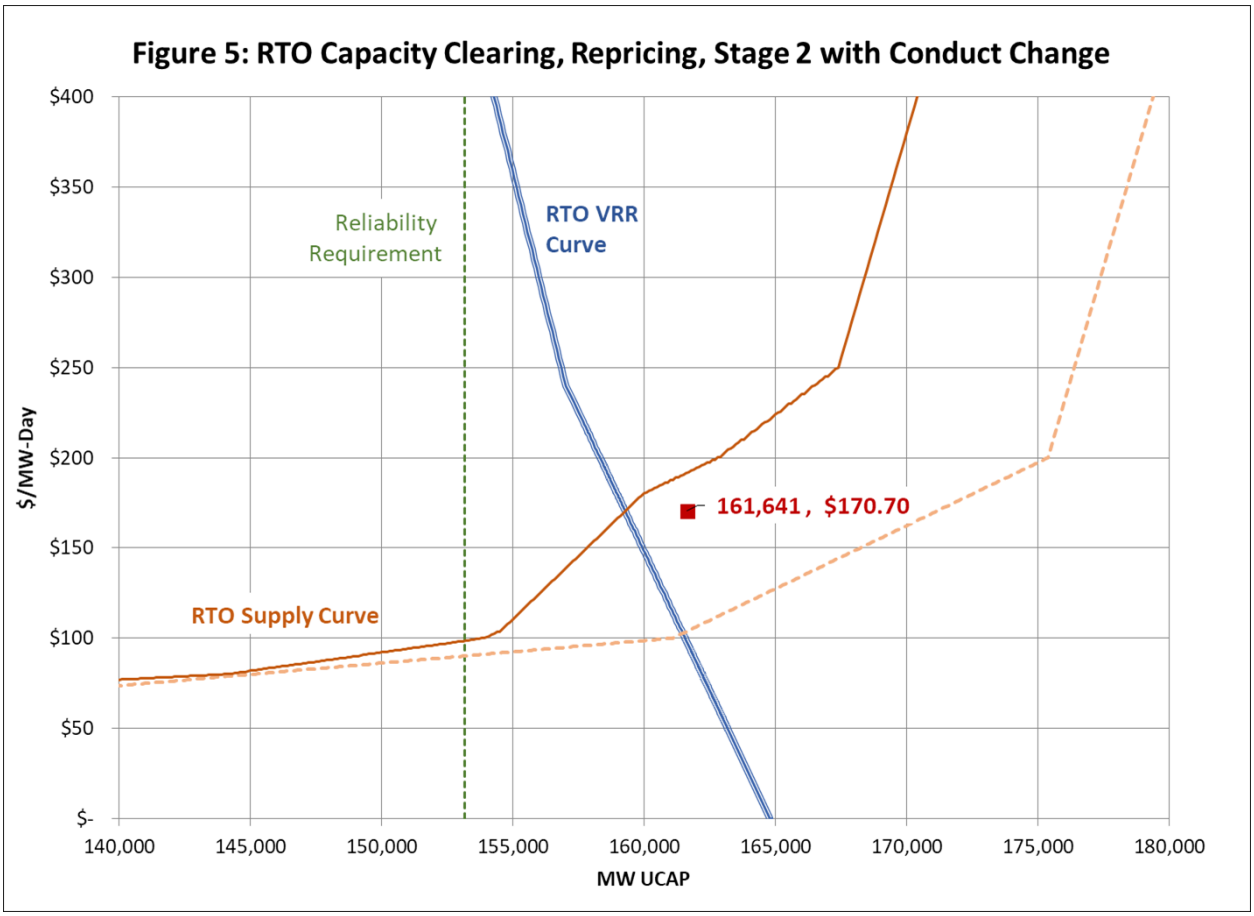
59. Note also that while the owners of CRAS resources can apply for lower, resource-specific repricing based on a resource's avoidable cost (PJM Filing, pp. 82-85), in many cases owners would have no incentive to do so; this is another perverse incentive resulting from PJM's Repricing Proposal. While a CRAS resource's actual cost might be considerably lower than the applicable Reference Price, if the resource is unlikely to clear in Stage 1, the owner would generally prefer a higher rather than lower price imposed on the resource, to support a higher Stage 2 clearing price earned by the owner's other resources that will clear in the auction.

60. I simulated the potential impact of these incentives issues, on the base of the numerical example discussed above. For the "race to the bottom", I assumed half of the resources with costs in the $80 to $130/MW-day range would lower their offer prices by 20%, to increase their chances of clearing in Stage 1, while half the resources would not change their offer prices. This assumption leads to the Stage 1 clearing result shown in Figure 4. The Stage 1 cleared



quantity increases by 167 MW, and the Stage 1 clearing price declines by $5.17/MW-day, compared to the results assuming no change in offer conduct. If sellers were more aggressive (if more were lowering their prices, or by larger amounts), the impact on the Stage 1 price and quantity could be larger.

61. I simulated the potential conduct of higher-cost resources by assuming that half of the resources with costs in the $130 to $170/MW-day range would raise their offer prices by $50/MW-day. The Stage 2 clearing results are shown in Figure 5. The Stage 2 clearing price now



increases to $170.70/MW-day,[18] a further 10% increase due to the conduct. The market cost under this scenario is now $10.1 billion, an 11% increase over the repricing result with no change in offer behavior, and 66% higher than the cost under the status quo. The resulting RPM auction price and quantity represent a point even further above the sloped VRR curve, due to the conduct.

62. Table 1 summarizes the results of these analyses. In addition to the 9,000 MW repricing assumption shown in the figures and discussed above, Table 1 also shows results for 5,000 MW of repricing (for this scenario, it was assumed half the resources with cost below

[18] Note that this clearing price is still well below the applicable Net CONE value, $321.57/MW-day. If Net CONE is substantially reduced in future auctions this would scale the VRR curve, and these examples, downward but not change the fundamental conclusions.

$110/MW-day would "race to the bottom", while half the resources with cost above this level would "clear out the top"). Even this minimum amount of repriced resource leads to substantial differences in price and cost, and large enough price differences to influence bidding behavior.

Table 1: Summary of Cases			
RTO Region, 9,000 MW Repriced:	**Quantity (MW)**	**Price ($/MW-day)**	**Cost ($ bil./year)**
Base Case (current rules; = Stage 1)	161,474	$102.80	$6.06
Repricing, No Conduct Change, Stage 2	*159,800*	$154.53	$9.11
Repricing, Conduct Change, Stage 1 Clearing	161,641	*$97.63*	*n.a.*
Repricing, conduct Change, Stage 2 Clearing	*159,277*	$170.70	$10.07
RTO Region, 5,000 MW Repriced:	**Quantity (MW)**	**Price ($/MW-day)**	**Cost ($ bil./year)**
Base Case (current rules; = Stage 1)	161,474	$102.80	$6.06
Repricing, No Conduct Change, Stage 2	*160,545*	$131.50	$7.75
Repricing, Conduct Change, Stage 1 Clearing	161,585	*$99.38*	*n.a.*
Repricing, conduct Change, Stage 2 Clearing	*160,092*	$145.50	$8.58
Note: The results shown in italics (Stage 1 prices and costs, and Stage 2 quantities) are not used if repricing is triggered. The Stage 2 cost is calculated using the Stage 1 quantity.			

63. The PJM Filing notes these incentive issues, but it notes them and dismisses them in a single paragraph, with only the following discussion (p. 58, citations omitted), and there is no discussion of the incentive issues in either attached affidavit:

> "Some stakeholders have raised a concern that this effect of repricing could distort participants' bidding behavior; for example, encouraging sellers to bid low so as to guarantee they clear in the face of a subsidized low-price offer. To the extent this posits that unsubsidized sellers would offer below their own net costs, so as to commit to provide PJM capacity for a full Delivery Year at a loss, such concerns are speculative, to say the least. It is worth noting, moreover, that in the current PJM capacity market, the high-cost, marginal sellers likely will be less efficient legacy units (with a limited future economic life), as opposed to the new entry units classically assumed to be at the margin."

64. PJM has been aware of the incentive issues raised by its Repricing Proposal since it was first proposed, in mid-2016. For example, the PJM re-pricing proposal was presented and discussed at the August 18, 2016 PJM-sponsored event, *Grid 20/20: Focus on Public Policy and Market Efficiency*. At that event, Stu Bresler, PJM's Senior Vice President – Operations and Markets, noted that stakeholders had raised the two incentive issues, and acknowledged the possibility that they could represent fatal flaws.[19] Throughout the twenty-two meetings of the CCPPSTF, the incentives issues were repeatedly raised by various stakeholders, including stakeholders representing public power, capacity seller, and consumer interests (perhaps among other interests).[20] However, PJM never responded to these concerns with any discussion or analysis; PJM's only response has been to dismiss the concern as speculative, as it has in the PJM Filing. In a question-and-answer document responding to questions about its proposal, PJM summarily dismissed the incentive issue as follows:[21]

> "7. How do you think your proposal will impact bidding behavior?
> Response: Minimum impact as the MW commitment is based on "as offered" with no adjustments."

65. While the fact that the commitments are based on "as offered with no adjustments" prevents some types of distortion of bidding behavior, it does not prevent behavior following the clear incentives created by PJM's Repricing Proposal, as discussed in detail above.

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[19] Stu Bresler, Senior Vice President – Operations and Markets, PJM, speaking at *Grid 20/20: Focus on Public Policy and Market Efficiency*, Thursday, August 18, 2016, event recording at 215:18 to 216:29, available at http://mediastream.pjm.com/2016/0818/grid2020/focus-on-public-policy-and-market-efficiency/html5/video.html.

[20] See, for instance, the following CCPPSTF presentations: LS Power, July 20, 2017, slides 2-3; James Wilson presentation, August 3, 2017, slide 12; ODEC presentation, September 11, 2017, slides 6-13; and NRG presentation, October 11, 2017, slide 6.

[21] PJM, *CCPPSTF Proposals: Responses to Questions: PJM Proposal*, CCPPSTF meeting September 12, 2017, available at http://www.pjm.com/-/media/committees-groups/task-forces/ccppstf/20170912/20170912-pjm-response-to-questions.ashx.

66. Although PJM has failed to provide any cogent response to concerns about bidding behavior, it could be argued that the incentive problems could be unimportant because RPM prices are somewhat unpredictable. While RPM prices have been somewhat variable (although less so recently), the market design should be robust and workable from a long-run, equilibrium point of view. If the RPM rules are reasonably stable over time, clearing prices should become more predictable. I believe RPM prices have been sufficiently stable recently such that many market participants would find it profitable to act according to the incentives created by PJM's Repricing Proposal, as suggested in the examples above. In any case, market participants and stakeholders should not be left hoping for uncertainty and volatility, because PJM has implemented a market design that only performs acceptably under such conditions.

67. It could also be argued that this incentive problem would be unimportant if the Stage 1 and Stage 2 prices are not very different, as would be the case if repricing does not shift the supply curve very much. However, as Table 1 above shows, if the minimum 5,000 MW is repriced such that it fails to clear in Stage 2, this can still drive a substantial wedge between the Stage 1 and Stage 2 prices, if the supply curve is shaped as in recent auctions. Again, the market design should be robust under a range of reasonably likely circumstances, including circumstances under which the quantities of CRAS resources may be large.

68. PJM dismisses the incentive issues as "speculative"; I do not consider the conduct assumptions adopted in my examples at all speculative. Perhaps more difficult to explain would be: faced with such an auction mechanism, why would profit-maximizing sellers <u>not</u> behave in this manner? If it is likely that repricing will be triggered (and this will generally be known before the auction), it is easy to roughly estimate the wedge the CRAS resources will create between the Stage 2 and Stage 1 prices. Much of the PJM capacity is owned in large portfolios, and these

owners would rationally segment their resources into those they desire to clear ("race to the bottom") and those they do not expect to clear ("clear out the top").

69. PJM apparently does not propose to publish the Stage 1 clearing prices.[22] That would mean that the determination of which resources clear the auction and are selected to provide capacity would be based on a non-transparent, unpublished clearing price. And while not publishing the Stage 1 price could contribute to keeping some market participants guessing about the price level they must beat to clear Stage 1 (deterring adjusting offer prices), market participants with portfolios could easily discover this price, by, say, ensuring that at least a small bit of the portfolio is offered within every $5/MW-day price interval through the range of likely clearing prices.

70. Furthermore, while perhaps many market participants would not adjust their offers very much in the first auctions held with such rules, the problem would likely increase over time. The RPM auctions are held every year. Market participants might approach the new market design somewhat tentatively in the first year or two, but over time it should be expected that conduct consistent with the incentives will increase. Note that in my example, some resources that did not engage in the conduct have regrets – that is, they would have a better outcome, had they pursued the conduct (lowering offer prices to clear in Stage 1, or raising offer prices to contribute to a higher clearing price in Stage 2). But no resources that engaged in either conduct have regrets. Thus, it should be expected that year to year, the distortion of offer prices would only increase.

71. As a result of these incentives and the resulting rational conduct, the RPM supply curves would become steeper and steeper over time (as suggested by the figures above). This is

[22] See proposed PJM Tariff, Attachment DD § 5.11 (Option A).

exactly the opposite of the result that is desired – gently sloped supply curves lead to competitive outcomes and relatively stable capacity prices over time, resulting in stronger investment incentives and weaker incentives to exercise market power. Steeper supply curves lead to more volatile prices, greater incentives to physically or economically withhold to raise prices, and weaker incentives for investors.

72. In dismissing the concerns about the distortion of offer price incentives, PJM states (as quoted above), "To the extent this posits that unsubsidized sellers would offer below their own net costs, so as to commit to provide PJM capacity for a full Delivery Year at a loss, such concerns are speculative, to say the least." As my examples have shown, with realistic supply curves, there will be a large difference in the Stage 1 and Stage 2 prices when repricing is triggered, and sellers that lower their offer prices will not be at much risk of providing capacity "at a loss."

73. PJM also suggests, in the above quote, that the price-setting offers may be from higher-cost existing units that are close to retirement rather than from new entrants. But the distortion of offer incentives is the same for existing or new units – if the likely Stage 2 price is attractive, it makes sense to lower the offer price in order to clear in Stage 1, if that is not too much of a reach. And if clearing in Stage 1 is too much of a reach, it makes sense to instead bid high to support a high Stage 2 clearing price, if there is affiliated generation in the auction.

74. Finally, I note that concerns about "bid shading" were raised in regard to ISO New England's "CASPR" (Competitive Auctions with Sponsored Policy Resources) mechanism, and the Commission was not persuaded that these concerns rendered the proposal unjust and unreasonable.[23] However, the distortion of offer incentives that would result from PJM's proposal

[23] 162 FERC ¶ 61,205 Order on Tariff Filing, issued March 9, 2018 in Docket No ER18-619, P. 85.

is easily distinguished from the CASPR circumstances, and is much more serious. One key difference is that the bid shading concern around CASPR had to do with opportunities following the forward capacity auctions; the forward capacity auction retains the necessary feature that the price used to clear resources is the price the cleared resources will be paid. By contrast, under PJM's Repricing Proposal, if repricing will be triggered, resources can be confident there will be a substantial wedge between the Stage 1 price that determines who clears, and the Stage 2 price that will actually be received.

3. Fatal Flaw #3: Under PJM's Repricing Proposal, the ultimate capacity price is arbitrary and not the result of a workable market mechanism

75. The third fatal flaw in PJM's Repricing Proposal has to do with the formation of the Stage 2 price that would be paid to all resources clearing in Stage 1. The Stage 2 clearing price would likely be set by an offer from a "competitive" resource (resources with actionable subsidies, that are repriced, are likely out of the money). Assuming the Stage 1 and Stage 2 prices are substantially different (which, as I have explained, is very likely to be the case when there are resources with actionable subsidies), the owner of the competitive resource that sets the Stage 2 price very likely knew the resource would not clear in Stage 1 and would not receive a CSO. Accordingly, the Stage 2 price would be set by an offer from a resource that had nothing at stake in the auction and in selecting its offer price (except for the incentive, described above, to inflate the offer price to support a higher Stage 2 clearing price, which only makes things worse). Thus, the Stage 2 price, which becomes a rate upon which billions of dollars in capacity payments will be based, is rather arbitrary and does not result from a workably competitive mechanism.

4. PJM's Repricing Proposal raises additional concerns as applied to capacity zones, of which some are quite small and/or have concentrated ownership

76. My illustrative examples have pertained to the very large and relatively competitive RTO Region. PJM's Repricing Proposal would apply to all zones modeled in RPM, of which, for the 2021/22 base residual auction there will be a total of fifteen. The modeled zones range in size from the Mid-Atlantic zone (about half the size of the RTO Region), down to DPL South, with a Reliability Requirement of 2,907 MW; eight zones are under 10,000 MW. Repricing would be triggered by 3.5% CRAS resources (350 MW, in a 10,000 MW zone), and any particular quantity of repriced resource will have a proportionally larger impact in smaller zones. Zonal supply curves can be quite steep, which would lead to relatively large differences between Stage 1 and Stage 2 quantity and price clearing results.

77. In addition, the smaller a zone, the larger the impact of any particular change in offer behavior. Ownership of capacity is generally much more concentrated in zones than in the RTO Region, with single sellers owning 50% or more of the capacity in some zones. Potential changes in conduct due to the PJM Repricing Proposal should be an even greater concern in zones.

78. PJM's Repricing Proposal could potentially result in repricing, and resulting high capacity prices, in some zones, while repricing is not triggered, and capacity prices remain at moderate levels, in adjacent or surrounding zones. This could result in large differences in capacity prices between zones in which the actual capacity supply and demand circumstances may be very similar. This would send confusing and misleading price signals, and result in unwarranted differences in the cost to consumers.

D. Applicability and Duration of Mitigation

79. The final issue with regard to PJM's Repricing Proposal (which is equally applicable to the MOPR-Ex proposal) has to do with the applicability and duration of repricing or

MOPR mitigation. As explained in Section III above, when the market has known well in advance that certain additional resources will be entering the market (whether "competitive", state sponsored, or of any other type), market participants will have factored those resources into their estimates of the supply/demand balance and RPM clearing prices, and adjusted their entry and exit plans accordingly. Therefore, resources known well in advance do not affect price when they enter; they are already "baked in". Repricing or MOPRing such resources distorts the RPM picture by effectively removing from the auction resources that are known to be present.

80. Furthermore, any repricing or application of the MOPR that is applied should last for no more than a few years, after which (if not sooner) the market will have fully absorbed the resource. The goal in applying repricing or the MOPR, as with any market intervention, should be to apply the minimum intervention for the minimum period, so that the market can return to pricing based on the true supply/demand balance without administrative interference.[24]

81. This concludes my affidavit.

[24] These concepts were proposed and discussed in the CCPPSTF process, but not included in either of PJM's proposals. See, for instance, Wilson, James F., Proposed Path for Policy Resources based on Substantial Advanced Notice, CCPPSTF meeting September 11-12, 2017.

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SUMMARY

James F. Wilson is an economist with over 30 years of consulting experience, primarily in the electric power and natural gas industries. Many of his assignments have pertained to the economic and policy issues arising from the interplay of competition and regulation in these industries, including restructuring policies, market design, market analysis and market power. Other recent engagements have involved resource adequacy and capacity markets, contract litigation and damages, forecasting and market evaluation, pipeline rate cases and evaluating allegations of market manipulation. Mr. Wilson has been involved in electricity restructuring and wholesale market design for over twenty years in California, PJM, New England, Russia and other regions. He also spent five years in Russia in the early 1990s advising on the reform, restructuring and development of the Russian electricity and natural gas industries.

Mr. Wilson has submitted affidavits and testified in Federal Energy Regulatory Commission and state regulatory proceedings. His papers have appeared in the *Energy Journal*, *Electricity Journal*, *Public Utilities Fortnightly* and other publications, and he often presents at industry conferences.

Prior to founding Wilson Energy Economics, Mr. Wilson was a Principal at LECG, LLC. He has also worked for ICF Resources, Decision Focus Inc., and as an independent consultant.

EDUCATION

MS, Engineering-Economic Systems, Stanford University, 1982

BA, Mathematics, Oberlin College, 1977

RECENT ENGAGEMENTS

- Evaluated the potential impact of an electricity generation operating reserve demand curve on a wholesale electricity market with a capacity construct.
- Developed wholesale capacity market enhancements to accommodate seasonal resources and resource adequacy requirements.
- Evaluation of wholesale electricity market design enhancements to accommodate state initiatives to promote state environmental and other policy objectives.
- Evaluation of proposals for natural gas distribution system expansions.
- Various consulting assignments on wholesale electric capacity market design issues in PJM, New England, the Midwest, Texas, and California.
- Cost-benefit analysis of a new natural gas pipeline.
- Evaluation of the impacts of demand response on electric generation capacity mix and emissions.
- Panelist on a FERC technical conference on capacity markets.
- Affidavit on the potential for market power over natural gas storage.
- Executive briefing on wind integration and linkages to short-term and longer-term resource adequacy approaches.

- Affidavit on the impact of a centralized capacity market on the potential benefits of participation in a Regional Transmission Organization (RTO).
- Participated in a panel teleseminar on resource adequacy policy and modeling.
- Affidavit on opt-out rules for centralized capacity markets.
- Affidavits on minimum offer price rules for RTO centralized capacity markets.
- Evaluated electric utility avoided cost in a tax dispute.
- Advised on pricing approaches for RTO backstop short-term capacity procurement.
- Affidavit evaluating the potential impact on reliability of demand response products limited in the number or duration of calls.
- Evaluated changing patterns of natural gas production and pipeline flows, developed approaches for pipeline tolls and cost recovery.
- Evaluated an electricity peak load forecasting methodology and forecast; evaluated regional transmission needs for resource adequacy.
- Participated on a panel teleseminar on natural gas price forecasting.
- Affidavit evaluating a shortage pricing mechanism and recommending changes.
- Testimony in support of proposed changes to a forward capacity market mechanism.
- Reviewed and critiqued an analysis of the economic impacts of restrictions on oil and gas development.
- Advised on the development of metrics for evaluating the performance of Regional Transmission Organizations and their markets.
- Prepared affidavit on the efficiency benefits of excess capacity sales in readjustment auctions for installed capacity.
- Prepared affidavit on the potential impacts of long lead time and multiple uncertainties on clearing prices in an auction for standard offer electric generation service.

EARLIER PROFESSIONAL EXPERIENCE

LECG, LCC, Washington, DC 1998–2009.
Principal

- Reviewed and commented on an analysis of the target installed capacity reserve margin for the Mid Atlantic region; recommended improvements to the analysis and assumptions.
- Evaluated an electric generating capacity mechanism and the price levels to support adequate capacity; recommended changes to improve efficiency.
- Analyzed and critiqued the methodology and assumptions used in preparation of a long run electricity peak load forecast.
- Evaluated results of an electric generating capacity incentive mechanism and critiqued the mechanism's design; prepared a detailed report. Evaluated the impacts of the mechanism's flaws on prices and costs and prepared testimony in support of a formal complaint.
- Analyzed impacts and potential damages of natural gas migration from a storage field.
- Evaluated allegations of manipulation of natural gas prices and assessed the potential impacts of natural gas trading strategies.
- Prepared affidavit evaluating a pipeline's application for market-based rates for interruptible transportation and the potential for market power.
- Prepared testimony on natural gas industry contracting practices and damages in a contract dispute.
- Prepared affidavits on design issues for an electric generating capacity mechanism for an eastern US regional transmission organization; participated in extensive settlement discussions.
- Prepared testimony on the appropriateness of zonal rates for a natural gas pipeline.
- Evaluated market power issues raised by a possible gas-electric merger.
- Prepared testimony on whether rates for a pipeline extension should be rolled-in or incremental under Federal Energy Regulatory Commission ("FERC") policy.

- Prepared an expert report on damages in a natural gas contract dispute.
- Prepared testimony regarding the incentive impacts of a ratemaking method for natural gas pipelines.
- Prepared testimony evaluating natural gas procurement incentive mechanisms.
- Analyzed the need for and value of additional natural gas storage in the southwestern US.
- Evaluated market issues in the restructured Russian electric power market, including the need to introduce financial transmission rights, and policies for evaluating mergers.
- Affidavit on market conditions in western US natural gas markets and the potential for a new merchant gas storage facility to exercise market power.
- Testimony on the advantages of a system of firm, tradable natural gas transmission and storage rights, and the performance of a market structure based on such policies.
- Testimony on the potential benefits of new independent natural gas storage and policies for providing transmission access to storage users.
- Testimony on the causes of California natural gas price increases during 2000-2001 and the possible exercise of market power to raise natural gas prices at the California border.
- Advised a major US utility with regard to the Federal Energy Regulatory Commission's proposed Standard Market Design and its potential impacts on the company.
- Reviewed and critiqued draft legislation and detailed market rules for reforming the Russian electricity industry, for a major investor in the sector.
- Analyzed the causes of high prices in California wholesale electric markets during 2000 and developed recommendations, including alternatives for price mitigation. Testimony on price mitigation measures.
- Summarized and critiqued wholesale and retail restructuring and competition policies for electric power and natural gas in select US states, for a Pacific Rim government contemplating energy reforms.
- Presented testimony regarding divestiture of hydroelectric generation assets, potential market power issues, and mitigation approaches to the California Public Utilities Commission.
- Reviewed the reasonableness of an electric utility's wholesale power purchases and sales in a restructured power market during a period of high prices.
- Presented an expert report on failure to perform and liquidated damages in a natural gas contract dispute.
- Presented a workshop on Market Monitoring to a group of electric utilities in the process of forming an RTO.
- Authored a report on the screening approaches used by market monitors for assessing exercise of market power, material impacts of conduct, and workable competition.
- Developed recommendations for mitigating locational market power, as part of a package of congestion management reforms.
- Provided analysis in support of a transmission owner involved in a contract dispute with generators providing services related to local grid reliability.
- Authored a report on the role of regional transmission organizations in market monitoring.
- Prepared market power analyses in support of electric generators' applications to FERC for market-based rates for energy and ancillary services.
- Analyzed western electricity markets and the potential market power of a large producer under various asset acquisition or divestiture strategies.
- Testified before a state commission regarding the potential benefits of retail electric competition and issues that must be addressed to implement it.
- Prepared a market power analysis in support of an acquisition of generating capacity in the New England market.
- Advised a California utility regarding reform strategies for the California natural gas industry, addressing market power issues and policy options for providing system balancing services.

ICF RESOURCES, INC., Fairfax, VA, 1997–1998.
Project Manager

- Reviewed, critiqued and submitted testimony on a New Jersey electric utility's restructuring proposal, as part of a management audit for the state regulatory commission.
- Assisted a group of US utilities in developing a proposal to form a regional Independent System Operator (ISO).
- Researched and reported on the emergence of Independent System Operators and their role in reliability, for the Department of Energy.
- Provided analytical support to the Secretary of Energy's Task Force on Electric System Reliability on various topics, including ISOs. Wrote white papers on the potential role of markets in ensuring reliability.
- Recommended near-term strategies for addressing the potential stranded costs of non-utility generator contracts for an eastern utility; analyzed and evaluated the potential benefits of various contract modifications, including buyout and buydown options; designed a reverse auction approach to stimulating competition in the renegotiation process.
- Designed an auction process for divestiture of a Northeastern electric utility's generation assets and entitlements (power purchase agreements).
- Participated in several projects involving analysis of regional power markets and valuation of existing or proposed generation assets.

IRIS MARKET ENVIRONMENT PROJECT, 1994–1996.
Project Director, Moscow, Russia

Established and led a policy analysis group advising the Russian Federal Energy Commission and Ministry of Economy on economic policies for the electric power, natural gas, oil pipeline, telecommunications, and rail transport industries (*the Program on Natural Monopolies,* a project of the IRIS Center of the University of Maryland Department of Economics, funded by USAID):

- Advised on industry reforms and the establishment of federal regulatory institutions.
- Advised the Russian Federal Energy Commission on electricity restructuring, development of a competitive wholesale market for electric power, tariff improvements, and other issues of electric power and natural gas industry reform.
- Developed policy conditions for the IMF's $10 billion Extended Funding Facility.
- Performed industry diagnostic analyses with detailed policy recommendations for electric power (1994), natural gas, rail transport and telecommunications (1995), oil transport (1996).

Independent Consultant stationed in Moscow, Russia, 1991–1996

Projects for the WORLD BANK, 1992-1996:

- Bank Strategy for the Russian Electricity Sector. Developed a policy paper outlining current industry problems and necessary policies, and recommending World Bank strategy.
- Russian Electric Power Industry Restructuring. Participated in work to develop recommendations to the Russian Government on electric power industry restructuring.
- Russian Electric Power Sector Update. Led project to review developments in sector restructuring, regulation, demand, supply, tariffs, and investment.
- Russian Coal Industry Restructuring. Analyzed Russian and export coal markets and developed forecasts of future demand for Russian coal.
- World Bank/IEA Electricity Options Study for the G-7. Analyzed mid- and long-term electric power demand and efficiency prospects and developed forecasts.
- Russian Energy Pricing and Taxation. Developed recommendations for liberalizing energy markets, eliminating subsidies and restructuring tariffs for all energy resources.

Other consulting assignments in Russia, 1991–1994:

- Advised on projects pertaining to Russian energy policy and the transition to a market economy in the energy industries, for the Institute for Energy Research of the Russian Academy of Sciences.
- Presented seminars on the structure, economics, planning, and regulation of the energy and electric power industries in the US, for various Russian clients.

DECISION FOCUS INC., Mountain View, CA, 1983–1992
Senior Associate, 1985-1992.

- For the Electric Power Research Institute, led projects to develop decision-analytic methodologies and models for evaluating long term fuel and electric power contracting and procurement strategies. Applied the methodologies and models in numerous case studies, and presented several workshops and training sessions on the approaches.
- Analyzed long-term and short-term natural gas supply decisions for a large California gas distribution company following gas industry unbundling and restructuring.
- Analyzed long term coal and rail alternatives for a midwest electric utility.
- Evaluated bulk power purchase alternatives and strategies for a New Jersey electric utility.
- Performed a financial and economic analysis of a proposed hydroelectric project.
- For a natural gas pipeline company serving the Northeastern US, forecasted long-term natural gas supply and transportation volumes. Developed a forecasting system for staff use.
- Analyzed potential benefits of diversification of suppliers for a natural gas pipeline company.
- Evaluated uranium contracting strategies for an electric utility.
- Analyzed telecommunications services markets under deregulation, developed and implemented a pricing strategy model. Evaluated potential responses of residential and business customers to changes in the client's and competitors' telecommunications services and prices.
- Analyzed coal contract terms and supplier diversification strategies for an eastern electric utility.
- Analyzed oil and natural gas contracting strategies for an electric utility.

TESTIMONY AND AFFIDAVITS

In the Matter of the Application of DTE Electric Company for Authority to Implement a Power Supply Cost Recovery Plan in its Rate Schedules for 2018 Metered Jurisdictional Sales of Electricity, Michigan Public Service Commission Case No. U-18403, Direct Testimony on behalf of Michigan Environmental Council and Sierra Club, April 20, 2018.

Virginia Electric and Power Company's Integrated Resource Plan filing, Virginia State Corporation Commission Case No. PUE-2017-00051, Direct Testimony on behalf of Environmental Respondents, August 11, 2017; testimony at hearings September 26, 2017.

Ohio House of Representatives Public Utilities Committee hearing on House Bill 178 (Zero Emission Nuclear Resource legislation), Opponent Testimony on Behalf of Natural Resources Defense Council, May 15, 2017.

In the Matter of the Application of Atlantic Coast Pipeline, Federal Energy Regulatory Commission Docket No. CP15-554, Evaluating Market Need for the Atlantic Coast Pipeline, Attachment 2 to the comments of Shenandoah Valley Network *et a*l, April 6, 2017.

In the Matter of the Application of DTE Electric Company for Authority to Implement a Power Supply Cost Recovery Plan in its Rate Schedules for 2017 Metered Jurisdictional Sales of Electricity, Michigan Public Service Commission Case No. U-18143, Direct Testimony on behalf of Michigan Environmental Council and Sierra Club, March 22, 2017.

In the Matter of the Petition of Washington Gas Light Company for Approval of Revised Tariff Provisions to Facilitate Access to Natural Gas in the Company's Maryland Franchise Area That Are Currently Without Natural Gas Service, Maryland Public Service Commission Case No. 9433, Direct Testimony on Behalf of the Mid-Atlantic Propane Gas Association and the Mid-Atlantic Petroleum Distributors Association, Inc., March 1, 2017; testimony at hearings, May 1, 2017.

In the Matter of Integrated Resource Plans and Related 2016 REPS Compliance Plans, North Carolina Utilities Commission Docket No. E-11 Sub 147, Review and Evaluation of the Peak Load Forecasts and Reserve Margin Determinations for the Duke Energy Carolinas and Duke Energy Progress 2016 Integrated Resource Plans, Attachments A and B to the comments of the Natural Resources Defense Council, Southern Alliance for Clean Energy, and the Sierra Club, February 17, 2017.

In the Matter of the Tariff Revisions Designated TA285-4 filed by ENSTAR Natural Gas Company, a Division of SEMCO Energy, Inc., Regulatory Commission of Alaska Case No. U-16-066, Testimony on Behalf of Matanuska Electric Association, Inc., February 7, 2017, testimony at hearings, June 21, 2017.

PJM Interconnection, L.L.C., FERC Docket No. ER17-367 (seasonal capacity), Prepared Testimony on Behalf of Advanced Energy Management Alliance, Environmental Law & Policy Center, Natural Resources Defense Council, Rockland Electric Company and Sierra Club, December 8, 2016; Declaration in support of Protest of Response to Deficiency Letter, February 13, 2017.

Natural Resources Defense Council, Sierra Club, and Union of Concerned Scientists v. Federal Energy Regulatory Commission, U.S. District Court of Appeals for the D.C. Circuit Case No. 16-1236 (Capacity Performance), Declaration, September 23, 2016.

Mountaineer Gas Company Infrastructure Replacement and Expansion Program Filing for 2016, West Virginia Public Service Commission Case No. 15-1256-G-390P, and Mountaineer Gas Company Infrastructure Replacement and Expansion Program Filing for 2017, West Virginia Public Service Commission Case No. 16-0922-G-390P, Direct Testimony on behalf of the West Virginia Propane Gas Association, September 9, 2016.

Application of Chesapeake Utilities Corporation for a General Increase in its Natural Gas Rates and for Approval of Certain Other Changes to its Natural Gas Tariff, Delaware P.S.C. Docket No. 15-1734, Direct Testimony on behalf of the Delaware Association Of Alternative Energy Providers, Inc., August 24, 2016.

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PROFESSIONAL ASSOCIATIONS

United States Association for Energy Economics

Natural Gas Roundtable

Energy Bar Association

April 2018

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.	)	Docket Nos. ER-18-1314-000
	)	ER-18-1314-001

CERTIFICATE OF SERVICE

To: (Attached Service List)

I HEREBY CERTIFY that I am on this date serving a copy of the foregoing document upon each person designated on the official service list compiled by the Federal Energy Regulatory Commission in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure.

Dated: March 7, 2018

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