

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.)))	Docket No. ER24-1772-000
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MOTION FOR LEAVE TO ANSWER AND ANSWER OF
PJM INTERCONNECTION, L.L.C.

PJM Interconnection, L.L.C. (“PJM”), pursuant to Federal Energy Regulatory Commission (“Commission”) Rules of Practice and Procedure 212 and 213,¹ submits this Motion for Leave to Answer and Answer to the protest of the Independent Market Monitor for PJM (“Market Monitor”)² filed in response to PJM’s April 16, 2024 proposed phased redesign of PJM’s Regulation³ market from a two-signal, one-product market to, ultimately, a one-signal, two-product market.⁴

PJM’s proposed phased Regulation market redesign is just and reasonable, and should be accepted effective on the dates proposed. Moving to a more granular Regulation market—in Phase 2, when the Regulation-Up (“RegUp”) and Regulation-Down (“RegDown”) Services are introduced—reduces barriers to entry by creating participation opportunities to resources that generally cannot provide Regulation bidirectionally, as required under the current rules. The redesign of the Regulation market rules also supports

¹ 18 C.F.R. §§ 385.212, 385.213.

² *PJM Interconnection, L.L.C.*, Protest of Independent Market Monitor, Docket No. ER24-1772-000 (May 7, 2024) (“IMM Protest”).

³ The PJM Open Access Transmission Tariff (“Tariff”) and the Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. (“Operating Agreement”) are currently located under PJM’s “Intra-PJM Tariffs” eTariff title. See *PJM Interconnection, L.L.C. - Intra-PJM Tariffs*, Federal Energy Regulatory Commission, <https://etariff.ferc.gov/TariffBrowser.aspx?tid=1731> (last visited May 23, 2024). Capitalized terms not otherwise defined herein shall have the same meaning as set forth in the Tariff, Operating Agreement, and the Reliability Assurance Agreement Among Load-Serving Entities in the PJM Region.

⁴ *PJM Interconnection, L.L.C.*, Regulation Market Design Filing of PJM Interconnection, L.L.C., Docket No. ER24-1772-000 (Apr. 16, 2024) (“April 16 Filing”).

the changing resources mix by allowing PJM to better address the unique challenges associated with increasing amounts of renewable resources serving loads in the PJM Region and will, simultaneously, achieve efficiencies in procurement and price formation. Dominion Energy Services, Inc. supports the redesign, explaining that it “comes at a crucial time” as the growth of renewable resources “will require PJM to have more control and specificity around the direction and amount of Regulation service it can dispatch.”⁵

Only the Market Monitor protested PJM’s proposal, but protested only certain aspects of Phase 2 of PJM’s Regulation market redesign, i.e., when the RegUp and RegDown products are added. In fact, the Market Monitor “supports the proposal to replace PJM’s one product, two signal, two input, one price, inconsistent settlement market design with a one product, one signal, one input, one price regulation market design found in PJM’s Phase 1 proposal,”⁶ and offers some suggested changes around the edges of PJM’s Phase 1 market design.⁷ The Market Monitor helpfully reiterated many of the reasons why PJM’s proposed redesign will improve several aspects of the current market.⁸

As discussed below, the Market Monitor’s comments on Phase 1 and concerns regarding Phase 2 do not undermine that PJM’s proposal is just and reasonable, and the Market Monitor’s preference for certain alternative approaches cannot prevent the Commission from accepting PJM’s proposal under section 205 of the Federal Power Act (“FPA”).⁹

⁵ *PJM Interconnection, L.L.C.*, Comments of Dominion Energy Services, Inc., Docket No. ER24-1772-000, at 1-2 (May 7, 2024).

⁶ IMM Protest at 9.

⁷ See IMM Protest at 9-18.

⁸ See IMM Protest at 21-40.

⁹ 16 U.S.C. § 824d; see, e.g., *Cal. Indep. Sys. Operator Corp.*, 128 FERC ¶ 61,265, at P 21 & n.26 (2009) (citing *Oxy USA, Inc. v. FERC*, 64 F.3d 679, 692 (D.C. Cir. 1995) (under the FPA, as long as the Commission finds a methodology to be just and reasonable, that methodology “need not be the only reasonable

I. MOTION FOR LEAVE TO ANSWER

Although Commission Rule 213(a)(2) does not generally permit answers to protests,¹⁰ the Commission permits answers for good cause shown, such as when an answer contributes to a more accurate and complete record or provides useful information that assists the Commission’s deliberative process.¹¹ This answer will aid the Commission’s decision-making process by providing responses to the protest filed in response to PJM’s proposal. PJM therefore asks that the Commission accept this answer.

II. ANSWER

A. *Contrary to the Market Monitor’s Claims, PJM Has Supported Phase 2 of the Regulation Market Redesign as Just and Reasonable.*

While the Market Monitor raises a few specific complaints about the substance of Phase 2, which PJM demonstrates below are misplaced, the Market Monitor also levies general complaints that the proposal is “unvetted”¹² and “has not been supported.”¹³ PJM

methodology, or even the most accurate one” (citation omitted)); *Cal. Indep. Sys. Operator*, 172 FERC ¶ 61,298, at P 23 (2020) (under FPA section 205, “the Commission limits its evaluation of a utility’s proposed tariff revisions to an inquiry into ‘whether the rates proposed by a utility are reasonable -- and not to extend to determining whether a proposed rate schedule is more or less reasonable to alternative rate designs.’” (citation omitted)).

¹⁰ 18 C.F.R. § 385.213(a)(2).

¹¹ *See, e.g., PJM Interconnection, L.L.C.*, 182 FERC ¶ 61,073, at P 13 (2023) (“We accept the answers of J-Power, P3, PJM, Public Interest Entities, and the Market Monitor because they have provided information that assisted us in our decision-making process.”); *N.Y. State Pub. Serv. Comm’n v. N.Y. Indep. Sys. Operator, Inc.*, 158 FERC ¶ 61,137, at P 29 (2017) (“We will accept the Companies’ and the Complainants’ answers because they have provided information that assisted us in our decision-making process.”); *Colonial Pipeline Co.*, 157 FERC ¶ 61,173, at P 23 (2016) (“In the instant case, the Commission will accept the Protestors’ Answers and Colonial [Pipeline Co.]’s Answer because they have provided information that assisted us in our decision-making process.”).

¹² IMM Protest at 5. Specifically, contrary to the Market Monitor’s assertion that PJM’s proposed approach for determining lost opportunity costs for resources providing RegUp, RegDown, or both was not vetted, in the Appendix to the July 2023 PJM Package Summary provided to the Regulation Market Design Senior Task Force, PJM provided two examples, with multiple illustrations, detailing how lost opportunity cost would be determined in Phase 2. *See* Regulation Market Design Senior Task Force, *PJM Package Summary*, PJM Interconnection, L.L.C., at 20-26 (July 2023), <https://www.pjm.com/-/media/committees-groups/task-forces/rmdstf/2023/20230718/20230718-item-5---rmdstf---pjm-package-summary.ashx> (“July 2023 Package”).

¹³ IMM Protest at 2.

respectfully disagrees with these assertions. First, PJM vetted this proposal through the stakeholder process (in which the Market Monitor actively participated) over a period of 18 months.¹⁴ Second, the April 16 Filing explains and justifies how each aspect of PJM’s proposal results in a just and reasonable Regulation market design. The April 16 Filing explained the general mechanics for how the Phase 2 market will function with two products.

In addition, the Market Monitor also complains that the proposal is “premature” and that the “design is not final,”¹⁵ because PJM has not completed the significant software development required to incorporate the RegUp and RegDown products into the market design. The fact that PJM has not completed the coding is irrelevant to whether the proposed market design is just and reasonable. The lack of coding does not preclude the Commission from evaluating the proposed market rule changes, and the Commission often accepts market rule changes well in advance of the software coding needed to implement them.¹⁶ Acceptance of the Market Monitor’s argument would effectively turn a rational process on its head by requiring the development and completion of complex software coding before the utility has received Commission approval of the underlying market rule changes requiring the software coding. As a matter of sound regulatory policy, the Commission should refuse to embrace an argument that makes completion of

¹⁴ See April 16 Filing at 3-4 (describing stakeholder process before the Regulation Market Design Senior Task Force (citing *See Regulation Market Design Senior Task Force*, PJM Interconnection, L.L.C., <https://www.pjm.com/committees-and-groups/task-forces/rmdstf> (last visited May 23, 2024))).

¹⁵ IMM Protest at 2.

¹⁶ See generally, *PJM Interconnection, L.L.C.*, 173 FERC ¶ 61,134, at P 225 (2020) (setting the effective date of tariff revisions two years in advance because “the revisions are complex and extensive, requiring software coding and extensive testing and quality assurance performance”); *N.Y. Indep. Sys. Operator, Inc.*, 108 FERC ¶ 61,188, at PP 20, 27 (2004) (accepting an extension to tariff revision implementation to account for the “extensive software coding and testing requirements”).

implementation steps a condition precedent to the Commission’s determination as to whether the filed Section 205 proposal is just and reasonable.

B. The Market Monitor’s Few Substantive Issues Regarding Phase 2 Are Each Without Merit and Do Not Justify Rejection of the Proposal.

The Market Monitor raises a few substantive issues with the Phase 2 and the implementation of the RegUp and RegDown products: (1) bifurcating the market will lead to doubling the amount of Regulation megawatts (“MW”) PJM procures, at increased cost;¹⁷ (2) lost opportunity cost determinations under Phase 2 are flawed and will result in payments greater in Phase 2 than under Phase 1’s one-product design,¹⁸ and (3) resources providing RegDown should not be allowed to recover costs associated with steady state heat rate increases.¹⁹ None of these substantive claims have merit. In addition, the Market Monitor errantly argues that it is not “logical” that the more granular market design will facilitate renewables participation in the Regulation market.²⁰ PJM will address each of these points in the following subsections II.B.1-5.

1. Under the Regulation market redesign, PJM will procure generally the same amount of Regulation MW, and at generally the same or less cost, than under the current Regulation market design.

The Market Monitor claims that bifurcating the Regulation market into the RegUp and RegDown products will “effectively double the number of regulation MW that PJM must procure.”²¹ This is incorrect. PJM will continue to procure the same amount of

¹⁷ See IMM Protest at 3-5.

¹⁸ See IMM Protest at 5-7.

¹⁹ See IMM Protest at 8-9.

²⁰ IMM Protest at 7.

²¹ See IMM Protest at 4.

Regulation MW to meet the applicable Regulation Requirement(s) as under the current rules.

Regulation commitments, under the current and proposed rules, are all keyed to the “Regulation set point.” The Regulation set point is the MW point at which the resource is operating for the energy market (or current load point for a demand resource) and is the focal MW value for defining a resource’s “Regulation range.” Under the current rules, resources committed to provide Regulation must do so in equal MW amounts above and below the set point. Thus, if a resource is committed to provide 10 MW of Regulation and the set point is 50 MW, then the resource actually is committed to provide 20 MW of Regulation in the Regulation range of 40 MW to 60 MW. In other words, 10 MW commitment is actually a 20 MW commitment of +/- 10 MW from the set point. Given that commitments are always for MW in equal amounts above and below, there is no need to separately identify the MW on either side of the set point. PJM’s proposal to establish separate commitments for the Regulation provided *above* (i.e., RegUp) and *below* (i.e., RegDown) a resource’s Regulation set point now requires the rules to separately identify the Regulation MW on either side of the set point.

For the same reasons, the Market Monitor’s claim that the cost of meeting the Regulation Requirement in Phase 2 “can be higher than Phase 1 market procuring the same fixed amount of regulation”²² lacks merit. Currently, offers to provide Regulation must price the cost for providing Regulation MW bidirectionally, i.e., both above and below the set point. Under the proposed Phase 2 rules, offers to provide Regulation will only consist of the costs to provide Regulation *in the direction offered*. As a result, in Phase 2, each

²² IMM Protest at 4.

offer will be for half the Regulation MW that support offers under the existing rules and under the Phase 1 rules.

PJM's proposed Phase 2 changes to the rules for cost-based offers reflect this, and show that costs will be disaggregated from the current unified offers to the separate RegUp and RegDown offers.²³ PJM proposes that the tariff-stated overall cost cap for the combined capability plus mileage offer would be halved from the current \$100/MWh for a bidirectional offer under the current rules to \$50/MWh for a RegUp or RegDown offer.²⁴ In the same vein, PJM proposes the "cost increase due to the steady-state heat rate increase resulting from operating the unit at lower megawatt output" may only be included in offers to provide RegDown, because providing RegDown would require the resource to move downward on their energy offer curve.²⁵ Thus, contrary to the Market Monitor, PJM's proposal to cut in half the cost adder is not because PJM is "acquiring twice as many MW"²⁶ (which PJM is not), but rather to reflect the bifurcation of the current bidirectional offers into discrete unidirectional offers (and for half the MWs).

2. *Contrary to the Market Monitor's assertions, the two-product, Phase 2 market design will increase market efficiencies and reduce costs to consumers.*

In an attempt to undermine PJM's demonstration that moving to a more granular market in Phase 2 will increase market efficiencies and likely reduce costs to consumers, the Market Monitor argues that the logic underlying the example lost opportunity cost

²³ See April 16 Filing at 31-32.

²⁴ See April 16 Filing at 31-32; *id.* at Attachment C at Phase 2 proposed Operating Agreement, Schedule 1, Section 1.10.1A(e).

²⁵ See April 16 Filing, Attachment C at Phase 2 proposed Operating Agreement, Schedule 1, section 1.10.1A(e)(i).

²⁶ IMM Protest at 4.

determination PJM provided in the April 16 Filing “is flawed.”²⁷ Specifically, the Market Monitor takes issue with the fact that the examples discussed in the April 16 Filing consider resources at their Economic Minimum and Economic Maximum points.²⁸

As an initial matter, the example is illustrative of the benefits and efficiencies available through PJM’s proposal. Generally speaking, the Regulation set point for most resources in Phase 2 will not be their Economic Minimum or Economic Maximum. But that does not detract from the examples’ ability to demonstrate that the RegUp and RegDown products can increase efficiency and reduce costs. Indeed, regardless of the set point of a Regulation resource, PJM’s propose market design will, on an aggregate basis, increase the accuracy of the lost opportunity cost determinations PJM makes for purposes of commitment, which will reduce the lost opportunity costs incurred by resources providing Regulation, and in turn, reduce the cost of the Regulation market.²⁹

PJM’s proposed redesign addresses the issue discussed in the stakeholder process “that some of the resources committed for regulation are not the most economical to provide the service during the actual operating hour. Analysis indicated that the forecasted [Locational Marginal Price (“LMP”)] and therefore estimated lost opportunity cost used for clearing could change drastically in real time.”³⁰ That is, as PJM explained in the April 16 Filing, switching to a 30-minute commitment interval and using a 30-minute look-ahead in committing resources for Regulation “would mitigate the disparity in the resource

²⁷ IMM Protest at 5.

²⁸ See IMM Protest at 5.

²⁹ See April 16 Filing at 39 (“By more accurately determining a resource’s lost opportunity cost, PJM’s Regulation market can better select the least cost set of resources to provide Regulation, and operate more efficiently in real-time, with more accurate pricing.”).

³⁰ July 2023 Package at 17.

opportunity cost estimated in the clearing and commitment process with that observed in real-time.”³¹ This would result in opportunity cost evaluations made for smaller periods and closer to the real-time operation interval, increasing the relative accuracy of the lost opportunity cost estimations. Additionally, by bifurcating the market and establishing products that can meet the region’s Regulation needs on a directionally specific level, PJM’s proposal has the potential to further increase the accuracy of PJM’s lost opportunity cost determinations, which will increase market efficiencies and, in turn, reduce cost.

The Market Monitor is incorrect in claiming that PJM offers “only speculative assertions of benefits.”³² PJM’s proposal is supported by logic and economic theory, on which the Commission is permitted to rely.³³ PJM discussed this proposal with stakeholders over 18 months, explaining in detail how the new market design would work in practice and evaluating potential pitfalls. The proposal is well thought out and well explained. Belying the speculative benefit of PJM’s Phase 2 approach is the fact that two-product regulation market designs, similar to that proposed by PJM, have been in place in the Southwest Power Pool, Inc. (“SPP”), California, and Texas markets for years. All of these markets have high proportion of renewables operating, and have used unidirectional Regulation products to maintain system balance effectively.³⁴ The benefits that would accrue to the PJM Region from two unidirectional products is apparent.

³¹ April 16 Filing at 26.

³² IMM Protest at 2.

³³ See, e.g., *ISO New England Inc.*, 173 FERC ¶ 61,161, at P 78 (2020) (“The Commission regularly accepts filings based on economic theory, assumptions, and projections[.]”); *Sacramento Mun. Util. Dist.*, 616 F.3d 520, 531 (D.C. Circ. 2010) (Commission may make findings “based on generic factual predictions derived from economic theory” (citation omitted)).

³⁴ See *Grid-Friendly Renewable Energy: Solar and Wind Participation in Automatic Generation Control Systems*, National Renewable Energy Laboratory (June 2019), <https://www.nrel.gov/docs/fy19osti/73866.pdf> at 11 (“Prior research found that in both ERCOT and California Independent System Operator (CAISO) territory, it is more lucrative for wind to offer regulation

Finally, the Market Monitor also misses the mark in arguing that “PJM’s assertion of lower [lost opportunity cost] and lower costs under Phase 2 is based on the incorrect assumption that the [lost opportunity cost] for regulation up only service, or regulation down only service, should be calculated assuming the regulation set point is the average output of the resource while providing regulation.”³⁵ As PJM explained, the ex ante lost opportunity cost determination used for setting the Regulation clearing prices of a resource providing RegUp and/or RegDown will be based on the resource’s Regulation set point. This approach will capture any change in the resource’s energy output to move to the Regulation set point. Then, when determining the lost opportunity costs used for settlements, PJM also proposes to account for the real-time signal movement requested from a Regulation resource *during* the commitment period by further adjusting the regulation set point by the Regulation signal bias.³⁶ As PJM explained in the April 16 Filing, “Regulation signal bias” is the discrepancy between the Regulation set point on which the resource was committed and the amount of energy PJM actually asked the resource to provide in that interval. Application of the Regulation signal bias reflects the fact that PJM may have requested more or less energy from the resources providing the Regulation service (e.g., RegUp or RegDown) than was contemplated at the time of commitment, through the Regulation set point.³⁷ Given that the requested movement of a Regulation resource is not known at the time of commitment, the Market Monitor’s

services during the night, because thermal generators are already operating close to their minimum generation level and cannot provide regulation down service.”).

³⁵ IMM Protest at 6.

³⁶ See April 16 Filing at 50.

³⁷ See April 16 Filing at 49-51 (explaining Regulation signal bias and the determination of lost opportunity cost in Phase 2).

proffered approach of using average output could, over time, result in over- or understating the applicable lost opportunity cost.

3. *In determining a resource's lost opportunity cost, PJM will consider simultaneously whether the resource provided RegUp, RegDown, or both.*

The Market Monitor also protests how PJM will determine the lost opportunity cost of a resource providing RegUp or RegDown (or both simultaneously). Pointing to PJM's statement that the Phase 2 lost opportunity cost determination will "consider whether the resource provided Regulation-Up, Regulation-Down, *or both—and consider that simultaneously*—in evaluating" lost opportunity cost,³⁸ the Market Monitor erroneously asserts that "PJM is working on logic to only count [lost opportunity cost] in the regulation up or the regulation down market, *not both*, for a given resource that clears the market, and in some cases no [lost opportunity cost] at all."³⁹ It is hard to discern how the Market Monitor drew its conclusion. As evident, the April 16 Filing clearly stated that, in the lost opportunity cost determination, PJM will consider whether a resource is providing one or both Regulation products.⁴⁰ This is further supported by the proposed market rules, which state that PJM "shall consider both the Regulation-Up Service and Regulation-Down Service selected MW assignments"⁴¹ in determining settlement credits for providing Regulation. Finally, during the stakeholder process, PJM provided detailed examples, with multiple illustrations, for determining lost opportunity cost for resources providing RegUp, RegDown, and both.⁴² Thus, in Phase 2, PJM will continue to determine lost opportunity

³⁸ April 16 Filing at 49 (emphasis added).

³⁹ IMM Protest at 5 (emphasis added).

⁴⁰ See April 16 Filing at 49-51.

⁴¹ April 16 Filing, Attachment C at Phase 2 proposed Operating Agreement, Schedule 1, section 3.2.2(e).

⁴² See July 2023 Package at 20-26.

costs for all resources providing Regulation, and PJM’s approach is not “undefined” or “unvetted,” as the Market Monitor claims.⁴³

4. *The Commission should reject the Market Monitor’s request to “eliminate” steady-state heat rate cost increases from Regulation offers.*

As part of Phase 2, PJM proposes to limit to only RegDown offers the recovery of the “cost increase due to the steady-state heat rate increase resulting from operating the unit at lower megawatt output” from the point on the resource’s energy offer curve to allow the resource to provide Regulation.⁴⁴ The current market rules require this cost to be included in any cost-based offer for Regulation.⁴⁵ The Market Monitor asserts that “[t]here are a number of issues with this proposal,” but then proceeds to attack the concept of including costs associated with steady-state heat rate increases in the Regulation market generally.⁴⁶ The Market Monitor concludes by asking the Commission to “eliminate” this cost “as a component of regulation cost offers.”⁴⁷

The Commission should reject this aspect of the Market Monitor’s protest. The Market Monitor does not object to PJM’s specific proposal of limiting these costs to RegDown offers, but rather generally to the inclusion of the steady-state heat rate-related costs. As such, the Market Monitor’s request goes beyond the scope of this proceeding.⁴⁸

⁴³ IMM Protest at 5.

⁴⁴ April 16 Filing at 31-32; *id.*, Attachment C at Phase 2 proposed Operating Agreement, Schedule 1, section 1.10.1A(e)(i).

⁴⁵ *See* Operating Agreement, Schedule 1, section 1.10.1A(e) & (i) (“[C]ost-based offer must be in the form specified in the PJM Manuals and consist of the following components as well as any other components specified in the PJM Manuals: (i) The costs (in \$/MW) of the fuel cost increase due to the steady-state heat rate increase resulting from operating the unit at lower megawatt output incurred from the provision of Regulation shall apply to the capability offer”).

⁴⁶ IMM Protest at 8-9.

⁴⁷ IMM Protest at 8-9.

⁴⁸ *See PJM Interconnection, L.L.C.*, 173 FERC ¶ 61,258, at P 15 (2020) (“We find the Market Monitor’s protest to be beyond the scope of this section 205 filing. The Market Monitor does not object to the PJM

In any event, steady-state heat rate increase is a legitimate cost of providing Regulation service downward from the resource's set point. The cost is associated with increased fuel cost from operating at a less efficient point along the resource's energy offer curve than would coincide with LMP and Regulation set point. These costs are appropriate in the RegDown Service as resources should be expected to 'move down' or operate at a less efficient point during the commitment interval if PJM requests movement from the RegDown resources.

5. *In an attempt to undermine Phase 2's benefits, the Market Monitor asserts that renewable resources will not provide RegUp or RegDown Services.*

In addition to protesting certain elements of Phase 2, the Market Monitor attempts to undercut one of the benefits that will result by PJM's Phase 2 reforms. Specifically, the Market Monitor asserts that "[t]here [i]s [n]o [b]asis" that, by offering separate RegUp and RegDown products, renewable resources will "[p]articipate in the Regulation [m]arket."⁴⁹ The Market Monitor questions how renewables can simultaneously be (1) a driver of bifurcating the market (by creating idiosyncratic uncertainties associated with their performance profiles⁵⁰) and (2) be a reliable source of regulation.⁵¹

The new design allows renewable resources to participate in unidirectional Regulation service, by allowing such resources, which that typically only operate at their Economic Minimum or Economic Maximum level, to offer and participate in Regulation

Proposed Revisions but to the current method in the Operating Agreement for calculating the costs and benefits of market efficiency projects.”).

⁴⁹ IMM Protest at 7.

⁵⁰ See April 16 Filing at 9.

⁵¹ See IMM Protest at 7.

service without having to be moved off that value to be committed to provide Regulation.⁵² Thus, in Phase 2, resources will only need to have sufficient capability in the direction of the Regulation product they offer to provide in order to participate in the Regulation market.⁵³ Only needing unidirectional capability inherently will open the door to greater opportunities to participate in the market. The Market Monitor’s presumption that renewable resources will not be able to “economically participate as regulation resources” under PJM’s Phase 2 market design⁵⁴ does not detract from the fact that such resources will have the opportunity and capability to do so.

The Market Monitor speculates that renewable resources will not have an economic incentive to provide regulation service because of the out-of-market subsidies paid they receive for producing energy.⁵⁵ This complaint is without merit. Whether these resources *currently* have an economic incentive to do so is beside the point. What is relevant is that the new market design will reduce the barriers for such resources to participate, and PJM understands that, for example, wind resources do provide the regulation down service in the SPP region.⁵⁶ Reducing participation barriers is important, as renewable resources will continue to comprise a growing percentage of the region’s resource mix.

⁵² April 16 Filing at 17-18.

⁵³ See April 16 Filing at 32-34.

⁵⁴ See IMM Protest at 7.

⁵⁵ IMM Protest at 7.

⁵⁶ SPP allows Variable Renewable Energy to provide downward regulation reserves. See SPP Open Access Transmission Tariff, Sixth Revised Volume No. 1; see also Market Monitoring Unit, *State of the Market 2022*, Southwest Power Pool, Inc. (May 15, 2023), <https://www.spp.org/documents/69330/2022%20annual%20state%20of%20the%20market%20report.pdf>.

C. *PJM’s Phase 1 Market Design Is Just and Reasonable, and The Market Monitor’s Support for the Underlying Conceptual Design, But With A Few Changes Around the Edges, Does Not Alter That Fact.*

The Market Monitor appears to generally support PJM’s Phase 1 market design. However, the Market Monitor disagrees with certain aspects of PJM’s reforms. As demonstrated below, none of these disagreements renders PJM’s suite of reforms unjust and unreasonable. Indeed, given that PJM submitted these changes under section 205, PJM does not have to demonstrate that is the best or most just and reasonable option.⁵⁷ Thus, even if the Market Monitor’s preferred approaches were just and reasonable, that does not preclude the Commission from accepting PJM’s proposal⁵⁸—which the Market Monitor agrees is an improvement over the current Regulation market design.⁵⁹

1. *The Market Monitor fails to demonstrate how PJM’s proposed performance score calculation is not just and reasonable.*

The Market Monitor agrees with much of PJM’s proposed changes to determining the performance score (which is used to measure how well the resource followed the Regulation signal and met the region’s needs for Regulation). The Market Monitor agrees that the current performance score should be updated, and with PJM’s proposal to remove the “correlation score” and “delay score” from the performance score determination.⁶⁰

⁵⁷ See *Midcontinent Indep. Sys. Operator, Inc.*, 180 FERC ¶ 61,141, at P 79 (2022) (utility bears the burden of showing that proposal under FPA section 205 is a just and reasonable proposal, but not that is the best or most just and reasonable option).

⁵⁸ *Cal. Indep. Sys. Operator*, 172 FERC ¶ 61,298, at P 23 (under FPA section 205, “the Commission limits its evaluation of a utility’s proposed tariff revisions to an inquiry into ‘whether the rates proposed by a utility are reasonable -- and not to extend to determining whether a proposed rate schedule is more or less reasonable to alternative rate designs.’” (citation omitted)); *Petal Gas Storage, LLC v. FERC*, 496 F.3d 695, 703 (D.C. Cir. 2007) (“[The Commission] is not required to choose the best solution, only a reasonable one.”); *ExxonMobil Oil Corp. v. FERC*, 487 F.3d 945, 955 (D.C. Cir. 2007) (“We need not decide whether the Commission has adopted the best possible policy as long as the agency has acted within the scope of its discretion and reasonably explained its actions.”).

⁵⁹ See IMM Protest at 12-40.

⁶⁰ See IMM Protest at 12-13.

However, the Market Monitor disagrees with PJM’s proposal to consider the magnitude of the Regulation assignment⁶¹ during the interval and offers an alternative formula for determining the performance score.⁶² But the Market Monitor fails to articulate how PJM’s proposed changes to calculate the performance score are not just and reasonable⁶³—as would be necessary for the Commission to reject PJM’s filing.

In particular, the Market Monitor objects to using the magnitude of Regulation assigned in the denominator of performance score equation,⁶⁴ arguing that “PJM’s calculation would lead to different results, based solely on the overall clearing interval average of the regulation signal; identical unit performance would yield different performance score results.”⁶⁵ While true, the Market Monitor overlooks that, by including the Regulation assigned during the interval in the denominator, the performance score will better reflect the resource’s performance over the interval—and the relative value of that performance to the system. That is, PJM’s proposal to consider equally in the denominator both the signal requested and the magnitude (in MWs) of the Regulation the resource is assigned will allow the performance score to provide a more accurate measure of a resource’s Regulation performance.⁶⁶

⁶¹ See April 16 Filing at 51-56 (detailing PJM’s proposed changes to the performance score).

⁶² See IMM Protest at 13-15.

⁶³ See IMM Protest at 12-14.

⁶⁴ See April 16 Filing at 54-55.

⁶⁵ IMM Protest at 14.

⁶⁶ See April 16 Filing at 54-56.

2. *The Market Monitor’s suggested changes to PJM’s proposed lost opportunity cost determination for resources committed in continuous intervals do not undermine that PJM’s proposal is just and reasonable.*

The Market Monitor generally agrees⁶⁷ with PJM’s proposal to determine a resource’s lost opportunity cost by continuously calculating a “resource’s tracking ramp-rate limited expected output level if it had been dispatched for energy in economic merit order, as further described in the PJM Manuals.”⁶⁸ The Market Monitor offers three suggestions on PJM’s proposed approach, but notably, does not criticize PJM’s approach or allege that PJM’s proposed approach is not just and reasonable. Rather, it only asserts that it “believes” in a different way to achieve a tracking ramp rate limited lost opportunity cost determination.⁶⁹ Each of these suggestions relates to an implementation detail that PJM intends to place in the PJM Manuals in accordance with the Commission’s “rule of reason.”⁷⁰

Two of the Market Monitor’s suggestions are already baked into PJM’s proposed approach. Specifically, as PJM discussed in the stakeholder process,⁷¹ under PJM’s approach, the lost opportunity cost determination would account for discontinuities in a

⁶⁷ See IMM Protest at 16-17.

⁶⁸ April 16 Filing, Attachment C at Phase 2 proposed Operating Agreement, Schedule 1, sections 3.2.2(d) & (e); April 16 Filing at 43-45.

⁶⁹ See IMM Protest at 16-17.

⁷⁰ See, e.g., *N.Y. Indep. Sys. Operator, Inc.*, 179 FERC ¶ 61,102, at P 108 (2022) (finding New York Independent System Operator, Inc.’s marginal capacity accreditation approach to be consistent with the rule of reason because it “provides sufficient detail to define ‘marginal reliability contribution,’ and in addition sets forth the process for calculating the marginal capacity accreditation”); *N.Y. Indep. Sys. Operator, Inc.*, 165 FERC ¶ 61,011, at P 53 (2018) (finding that NYISO’s tariff satisfied the rule of reason because it “sets forth the process for determining the [locational capacity requirements] for each Locality and outlines the parameters of the [locational capacity requirement] calculation”).

⁷¹ See Real-Time Market Operations, *PJM Proposed Package*, PJM Interconnection, L.L.C., at 21 (Apr. 18, 2023), <https://www.pjm.com/-/media/committees-groups/task-forces/rmdstf/2023/20230418/20230418-item-04---pjm-proposed-package-summary.ashx> (“April 2023 Presentation”).

resource's ramp profile (e.g., steps)⁷² and a resource's ramp profile would be an input into its ramp rate limited lost opportunity cost determination.⁷³

The Market Monitor's other suggestion would require a change to PJM's proposed approach. The Market Monitor appears to suggest that the lost opportunity cost determination should be made as a "snapshot" of how the resource is operating at that moment, without consideration of the level to which the resource had been dispatched by PJM to provide energy.⁷⁴ However, the Market Monitor alleges nothing wrong with PJM's approach, which provides additional benefits in addition to correctly determining lost opportunity cost.

As explained in the stakeholder process, under PJM's approach, PJM would continuously track a resource's ramp rate limited lost opportunity cost such that it would "incorporate consecutive market conditions to create the profile that units should have achieved if they had been following each dispatch signal based on their ramp rates."⁷⁵ To do so, PJM would track a resource's expected MW output "continuously from when a unit comes online [for energy], using its ramp rates, [committed] energy schedule, and independent of the initial MW at each [Regulation] interval."⁷⁶ Simply put, PJM plans to consider where the resource *should be* if it were correctly following dispatch.

Both approaches determine lost opportunity cost associated with providing Regulation instead of energy, but PJM's approach has the added benefit of providing an

⁷² See IMM Protest at 17.

⁷³ See IMM Protest at 17.

⁷⁴ See IMM Protest at 16 ("The Market Monitor believes that the shadow dispatch should be used to determine the desired MW over time within the commitment period, but the shadow dispatch should reset desired MW equal to regulation set point at the beginning of every commitment period.").

⁷⁵ April 2023 Presentation at 22.

⁷⁶ April 2023 Presentation at 22.

economic incentive for resources to follow PJM dispatch signals. The Commission has found “[o]ne important element of ensuring reliable grid operations is resources following dispatch instructions.”⁷⁷ Thus, by measuring against where a resource should be on its energy curve in accordance with PJM’s dispatch, PJM lost opportunity cost determinations will encourage the resource to follow energy dispatch signal so that the resource (1) is not over- or undervalued in PJM’s Regulation commitment process and (2) the resource is properly compensated for providing Regulation.

In addition, consistent with PJM’s overarching goals of incentivizing resources to follow dispatch signals and simplifying its market rules, PJM’s “continuous” approach is currently being discussed in the stakeholder process for application with balancing Operating Reserves. There, the Market Monitor, jointly with PJM, is advocating for the “continuous” approach, as it “[m]ore accurately measures how closely a resource is following dispatch over a period of time.”⁷⁸ Adoption of PJM’s approach here and there would provide the further benefit of a consistent lost opportunity cost determination across markets.

3. *Variable operation and maintenance expenses are rightfully included in and limited to Regulation-only resources’ mileage offers.*

In response to PJM’s proposal to limit the inclusion of variable operation and maintenance (“VOM”) costs to only offers by Regulation-only resources (i.e., resources

⁷⁷ *Settlement Intervals and Shortage Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 825, 155 FERC ¶ 61,276, at P 55 (2016); *see also id.* at P 54 (“[P]roviding the correct incentives for market participants to follow commitment and dispatch instructions, make efficient investments in facilities and equipment, maintain reliability, and increase transparency is fundamental to proper formation of energy prices, helping to ensure just and reasonable rates, terms and conditions of service.”).

⁷⁸ Monitoring Analytics, *Tracking Ramp Limited Desired*, PJM Interconnection, L.L.C., at 6 (May 13, 2024), <https://www.pjm.com/-/media/committees-groups/committees/mic/2024/20240513-special/item-02---tracking-ramp-limited-desired-recap.ashx>.

that do not participate in the energy market), the Market Monitor argues that VOM costs should be eliminated from all regulation offers “regardless of whether or not the regulation resource has an energy offer or not.”⁷⁹ The Market Monitor’s argument that resources only providing Regulation service should not be allowed to include VOM costs in their Regulation offers likely stems from the Market Monitor’s stated belief that VOM expenses are recoverable only in the capacity market. The Market Monitor has previously argued,⁸⁰ and the Commission has rejected,⁸¹ the notion that components of costs in the energy market, such as VOM, “are not recoverable in the energy market because they are already recovered in the capacity market.”⁸² However, PJM’s capacity market rules exclude these costs from the offers to provide capacity,⁸³ and PJM’s energy market rules provide that a cost-based offer to provide energy may include a Maintenance Adder “to account for variable operation and maintenance expenses,” i.e., VOM.⁸⁴ The Commission found this allocation of cost recovery between the two markets to be just and reasonable.⁸⁵

⁷⁹ IMM Protest at 17.

⁸⁰ *PJM Interconnection, L.L.C.*, Protest of the Independent Market Monitor for PJM, Docket ER16-372-001, at 48 (Sept. 19, 2016) (ER16-372 IMM Protest”).

⁸¹ *PJM Interconnection, L.L.C.*, 158 FERC ¶ 61,133, at P 125 (2016) (rejecting the IMM’s argument that including VOM components in cost-based offers in the energy market would create an unreasonable double recovery between the two markets).

⁸² *PJM Interconnection, L.L.C.*, 158 FERC ¶ 61,133, at P 123; *id.* at P 125 (rejecting the Market Monitor’s argument that VOM costs should not be included in energy market offers).

⁸³ See Tariff Attachment DD, Section 6.8(c) (“Variable costs that are directly attributable to the production of energy shall be excluded from a Market Seller’s generation resource Avoidable Cost Rate.”).

⁸⁴ See Operating Agreement, Schedule 2, section 1.1 (allowing Maintenance Adders to be included in cost-based offers in the energy market); Operating Agreement, Definitions M-N (“Maintenance Adder” is “an adder that may be included to account for *variable operation and maintenance expenses* in a Market Seller’s Fuel Cost Policy. The Maintenance Adder is calculated in accordance with the applicable provisions of PJM Manual 15, and may only include expenses incurred as a result of electric production.” (emphasis added)).

⁸⁵ *PJM Interconnection, L.L.C.*, 158 FERC ¶ 61,133, at P 125 (“We accept PJM’s proposal and find reasonable PJM’s clarification that its proposal explicitly provides that Schedule 2((j)(iv)) of the PJM Operating Agreement prohibits market participants from including Maintenance Adders as part of any costs that are included in the generation resource’s ACR [Avoided Cost Rate].”).

Because, for resources participating in the energy market, VOM costs can be included in energy market offers, these costs should not be eligible to be included in a resource's Regulation offer as well. However, to the extent a resource does not participate in the energy market and only participates in the Regulation market, it is just and reasonable to allow such a resource to recover VOM costs through the Regulation market. Accordingly and contrary to the Market Monitor's desire, PJM's proposal to allow Regulation-only resources to recover VOM costs is consistent with PJM's market rules and Commission precedent.

D. The Market Monitor's Comments on Matters PJM Does Not Propose to Change from the Status Quo Are Outside the Scope of This Proceeding and Should Be Rejected.

1. *Despite the Market Monitor's preference, PJM has not proposed to switch from ex ante pricing to ex post pricing, but PJM will continue to pay resources based on performance.*

Currently and as proposed, Regulation clearing prices reflect the estimated cost of the marginal resource to provide Regulation.⁸⁶ Clearing prices in PJM markets are and have long been determined on an ex ante basis, and not based on backward-looking settled cost to provide the product. The Market Monitor recognizes that "PJM proposes to keep this basic structure,"⁸⁷ but nonetheless contends that the prices "presented to the market should reflect actual 5 minute performance and mileage."⁸⁸ The Market Monitor does not object to the specific changes PJM proposes to the clearing price and settlement determinations,⁸⁹ but rather, it appears to object to the *concept* of setting clearing prices

⁸⁶ See Operating Agreement, Schedule 1, section 3.2.2(g).

⁸⁷ IMM Protest at 18.

⁸⁸ IMM Protest at 11.

⁸⁹ The Market Monitor notes that PJM proposes to commit resources and set clearing prices based on offers adjusted based on the resource's historic performance score—which is status quo—and the amount of historically dispatched Regulation (i.e., mileage)—which is a proposed change. But the Market Monitor

based on estimated costs of the marginal resource and then compensating resources based on actual performance (based on an adjusted priced).⁹⁰ The Market Monitor’s objection to the current clearing price determination approach may be rooted in its opposition to the two-part offer/payment structure, i.e., capability and mileage offers and payments, which the Commission required in Order No. 755.⁹¹ The Market Monitor argues that “PJM’s proposal to retain the current artificial break out of the components of total price into a ‘capability clearing price’ and a ‘performance clearing price’ should be rejected.”⁹²

The Commission should reject the Market Monitor’s comments on the determination of clearing prices as beyond the scope of this proceeding.⁹³ As the Market Monitor acknowledges, PJM does not propose to change the basic structure of determining prices on an ex ante basis, i.e., before actual performance, and then compensating resources on an ex post basis, i.e., after actual performance. In this sense, PJM’s Regulation market pricing and settlement approach is conceptually similar to the energy market, where LMP is based on the marginal resource’s *offer* to provide energy, and resources are compensated ex post based on how much energy they provide. Even if this issue were within the scope of this proceeding, the Market Monitor provides no reasoning that the current approach is unjust and unreasonable. Further, the Market Monitor’s comments on this issue are contrary to Order No. 755’s requirement that “all RTOs and [independent system

does not take issue with the specific change; the Market Monitor takes issue with the overall structure. IMM Protest at 18-19.

⁹⁰ See IMM Protest at 18.

⁹¹ See *Frequency Regulation Compensation in the Organized Wholesale Power Markets*, Order No. 755, 137 FERC ¶ 61,064 (2011), *reh’g denied*, Order No. 755-A, 138 FERC ¶ 61,123 (2012).

⁹² IMM Protest at 19.

⁹³ See generally *Cal. Indep. Sys. Operator Corp.*, 185 FERC ¶ 61,210, at P 55 (2023) (finding a protest “to be beyond the scope of this proceeding, in which [the Commission] consider[s] only whether [an RTO’s] *proposed Tariff revisions* are just and reasonable under FPA section 205” (emphasis added)).

operators] . . . institute a two-part payment for frequency regulation and to account for a resource's accuracy in its compensation."⁹⁴ PJM's proposal here continues to implement Order No. 755's pricing and compensation framework, and should be accepted.

2. *PJM is not proposing any changes to the net revenues in regards to uplift payments and this issue is beyond the scope of this proceeding.*

The Market Monitor asserts that PJM should have "recognize[d] that net revenues from the regulation market should count against uplift payments" with respect to its Phase 1 proposal.⁹⁵ However, this issue too is outside the scope of this proceeding. PJM is not proposing any changes to the existing uplift payments with regards to offsets by net revenues in this filing. Therefore, the Market Monitor's arguments are beyond the scope of this proceeding and should be rejected. PJM agrees that this is an area worth examining, but the proper forum for such an initial discussion would be in the PJM stakeholder process, not here.

⁹⁴ Order No. 755 at P 77.

⁹⁵ IMM Protest at 17.

III. CONCLUSION

PJM asks that the Commission consider this answer and accept the proposed Tariff and Operating Agreement revisions in this docket, effective as requested.

Respectfully submitted,

/s/ Ryan J. Collins

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*On behalf of
PJM Interconnection, L.L.C.*

May 23, 2024

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Washington, D.C., this 23rd day of May 2024.

/s/ Ryan J. Collins
Ryan J. Collins

Attorney for
PJM Interconnection, L.L.C.