

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

PJM Interconnection, L.L.C.)		
)	Docket Nos.	ER19-1486-000
Enhanced Price Formation in Reserve)		EL19-58-000
Markets of PJM Interconnection, L.L.C.)		

COMMENTS OF THE R STREET INSTITUTE

The Commission should welcome PJM’s proposal for a market-based solution that both rationalizes pricing of energy and capacity products¹ and sets the stage for a marketplace infused with a growing quantity of energy produced by weather-dependent renewables. R Street supports the adoption of more robust operating reserve demand curves (“ORDC”) to substitute for the deficiencies of PJM’s existing approach to procuring capacity in near-real-time. The Commission should recognize that an approach that uses a market-like mechanism—even one like ORDC, whose demand is constructed through administrative guesswork—is superior to the current approach of commandeering the capacity necessary to ensure system reliability.

While this proposed change in market design is laudable, it does come with a problem: It is not clear why consumers, having paid for capacity once through the forward capacity market, should be expected to pay again for a type of operational capacity in near-real-time. PJM argues only vaguely in its Application about the relationship between these two markets for capacity. Without modifications to the forward capacity market, the changes that PJM proposes in this docket may be, or may become, unreasonable. If the Commission approves the modifications PJM now proposes, the Commission should make clear that a market design shaped around an increasingly robust ORDC is an off-ramp from, and an eventual substitute for, the forward capacity market, which is an inferior vehicle to pay resources for the capacity that customers actually require.

I. PJM’s Proposed Reforms for Near-Real-Time Capacity Products Result in Prices that More Accurately Reflect System Conditions and the Value of Reserves

R Street takes no position on the particular reserve products that PJM has proposed.² However, we agree with PJM’s affiants—William Hogan and Susan Pope—that it is appropriate

¹ We use the term “capacity” or “near-real-time capacity” interchangeably to describe the various reserve products PJM proposes.

² PJM proposes moving from a two-tiered reserve product to a more complex, but co-optimized, procurement of three reserve products.

to look beyond the real-time dispatch interval when establishing a reserves-product framework given the challenge the market is attempting to solve.³

Meanwhile, PJM has demonstrated that the current pricing regime for short-run capacity products—specifically the distinction between the Tier I/Tier II synchronized reserve products—is unreasonable. The status quo’s shortcomings lead to behavior on the part of system operators that does not support market-based prices and on the part of resource owners that does not support reliability. In contrast, the design of ORDC in PJM’s proposal is superior, both because its sloped demand curves anticipate systemic uncertainty and because its more robust pricing sends an economic signal for capacity to be operational for system reliability.

A. The current method of paying for capacity in near-real-time is unreasonable

As PJM describes in its application, a market-like mechanism already exists to procure the type of capacity known as “spinning reserves” (also called “synchronized reserves”). In PJM, this short-run capacity market is made up of two tiers. Tier I consists of the residual dispatch range of those resources already online and providing energy; their provision of this residual capacity is not compensated (at least not through any price signal in the operating day) under PJM’s existing tariff. Meanwhile, Tier II resources are those dispatched away from their set point within the energy market in order to free up headroom to provide near-real-time capacity. Tier II resources face a penalty for non-performance; Tier I resources do not. Unsurprisingly, the Tier II resources, which are faced with an economic signal to provide these reliability services, have a better record of performance than do the Tier I resources, which do not.⁴

From their individual perspectives, these resources are not similarly situated because of the opportunity costs associated with providing this capacity for Tier II versus Tier I resources. However, from the wide-angle perspective of the system operator, these resources are all “providing the exact same product and are relied upon to respond.”⁵ Tier I’s performance rate was poorer than Tier II’s over the last three full calendar years, and it appears to be deteriorating. Meanwhile, even during extremely cold conditions in the PJM marketplace, the Tier II resources that are eligible for a payment are usually paid a trifling amount when compared to the overall cost of maintaining reliability during these times. During these times of system stress, system operators took actions outside this market-like mechanism to commit additional capacity to being available. Those out-of-market commitments were then paid for by socializing their costs across market participants after the fact.⁶ Clearly, the current market mechanism is not working as intended. It would be preferable to have actions that are undertaken for the sake of reliability at a given time incorporated into the market’s prices at that time.

³ Affidavit of William Hogan and Susan Pope, PJM Interconnection, L.L.C., “PJM Application for Enhanced Price Formation in Reserve Markets,” Attachment C, pp. 18–20.

⁴ PJM Application, pp. 17–21.

⁵ *Ibid.*, p. 16.

⁶ *Ibid.*, p. 21.

B. A sloped demand curve for reserves is appropriate, but reporting is necessary

A successful ORDC policy should have empirical, observable results. During the PJM stakeholder process, the independent market monitor supported a vertical demand curve—in other words, a reserves market that pays only for the level of reserves determined minimally necessary and no more.⁷ Meanwhile, PJM proposes sloped demand curves beyond the point at which the minimum quantity is procured. This slope is a sensible attempt to reflect in economic terms the operational reality of PJM: that system operators make out-of-market procurements of operating reserves at a level greater than their minimum level as a countermeasure to tightening system conditions and the uncertainty of intermittent resources on net load.⁸ PJM has used a significant quantity of historical data to inform sloped demand curves that are differentiated by each reserve product and by hours of the day and seasons of the year.⁹ Their selection is not arbitrary, even if it is not forward-looking in nature.

There is a risk, however, in the construction of this demand curve—namely that the curve will not actually reflect values associated with the operational reality. The Commission should ensure that this policy accomplishes its intended effects. If properly designed and successfully implemented, ORDC's effect should replace most administrative out-of-market commitments by system operators with a market-like mechanism to procure those reserves. Indeed, much of PJM's representations about the need for this reform are predicated on the market operator's desire to move away from the command procurement of reserves. The Commission, in adopting an ORDC reform, should require PJM and the independent market monitor to report on whether out-of-market actions by system operators diminish as a result of the market-based procurement of operating reserves.

The Commission should also require periodic re-evaluation of the causes of the demand for near-real-time capacity products and the appropriateness of the slopes of the demand curves. PJM asserts that part of the motivation for adopting ORDC is to prepare the PJM market for a significant growth in renewable resources.¹⁰ This trend will affect the need for and value of near-real-time capacity products, but presumably the shape of the ORDC proposed here does not yet reflect this change. It is therefore important that ORDC somehow include a mechanism for evaluating the assumptions underlying its administratively constructed minimum demand and sloping curves.

⁷ Joe Bowring and Catherine Tyler, "IMM Revised ORDC Proposal," Energy Price Formation Senior Task Force, Jan. 17, 2019.

⁸ Affidavit of Christopher Pilog, PJM Interconnection, L.L.C., "PJM Application for Enhanced Price Formation in Reserve Markets," Attachment E.

⁹ Affidavit of Dr. Patricio Rocha Garrido, PJM Interconnection, L.L.C., "PJM Application for Enhanced Price Formation in Reserve Markets," Attachment F.

¹⁰ Affidavit of Adam Keech, PJM Interconnection, L.L.C., "PJM Application for Enhanced Price Formation in Reserve Markets," Attachment D, Figure 2, ¶ 47.

II. PJM Vaguely Represents the Price Structure for Near-Real-Time Capacity Products and Does Not Adequately Address ORDC's Interrelationship with Forward Capacity Markets

PJM's application appears to argue that the design of ORDC's price cap serves a narrow purpose. Specifically, PJM's Adam Keech notes that it is intended to compensate for an opportunity cost of resources that may offer up to \$2,000 per megawatt-hour in the energy markets, even while they presently face an \$850-per-megawatt-hour penalty for failing to act as Tier II capacity resources in the near-real-time.¹¹ PJM then holds up this assertion as a demonstration that ORDC is not a substitute for its forward capacity market, which paradigmatically sets its price cap at an estimate of the value of lost load.¹² And yet, as Hogan and Pope point out, the practical effect of PJM's cascading ORDC may be to result in scarcity pricing that is equivalent to that achieved under a value of lost load methodology.¹³ They note that in tight conditions, "The resulting prices would be within the range of reasonable estimates of the value of loss load."¹⁴ The relationship between the short-run and long-run capacity markets was a topic of conversation in PJM's stakeholder process leading up to this filing.¹⁵ In its application in this docket, however, PJM offers only a more cryptic explanation: "While VOLL estimates have often been considered, and adopted, in shortage pricing programs, that option is not a compelling choice for the PJM Region, which has developed and relied upon a capacity market for over 10 years."¹⁶

The intentionality of ORDC's pricing structure should not matter so much as what the structure is actually paying for. Here, the results of PJM's modeling of the likely results of ORDC is instructive. If the Commission adopts PJM's proposal, a substantial increase in revenues from customers to energy and capacity resources is anticipated. Revenues are projected to increase \$555 million annually off a reasonable base case.¹⁷ Meanwhile, production costs rise only slightly, approximately \$30 million.¹⁸ In other words, the vast majority of ORDC revenue is paying for resources' fixed costs and not the costs associated with production under this new market design.¹⁹ At the same time, avoided uplift costs—one of the core reasons to adopt ORDC that PJM proffers, with which we agree—amount to little more than \$3 million.

¹¹ Ibid., ¶ 11.

¹² PJM Application, p. 51.

¹³ Hogan and Pope, pp. 43–47.

¹⁴ Ibid, p. 21.

¹⁵ A white paper preceding this filing and describing the anticipated market changes included a section titled "The Relationship between the Capacity Market and the Operating Reserve Markets." *Price Formation: Energy Price Formation Senior Task Force*, Dec. 14, 2018, pp. 4–5.

¹⁶ PJM Application, p. 51.

¹⁷ Keech, Table 5, ¶ 43.

¹⁸ Ibid.

¹⁹ At the same time, avoided uplift costs—one of the core policy reasons to adopt ORDC, besides paying for capacity at the times when it is actually needed—amount to little more than \$3 million.

ORDC is a well-founded design that needs a more full-throated policy rationale behind its adoption than merely avoiding uplift costs. It assists in accomplishing the weightier policy goal of more accurately reflecting scarcity in real-time prices, which will be necessary if the market is ever to send appropriate signals for demand bidding and resource flexibility. Additionally, ORDC relates to what “capacity” is and how it should be paid for. In this respect, the Commission can find a beginning of a compelling policy reason by looking to Hogan and Pope, who note, “Better scarcity pricing would reduce the ‘missing money’ in energy markets and the corresponding challenges of operating good capacity markets and ensuring long-term resource adequacy.”²⁰

ORDC is a more robust way of taking seriously the issues of ensuring reliability in a system that not only has the usual assortment of inclement weather events as well as plant and transmission outages, but whose energy needs are increasingly met by weather-dependent renewables. An ORDC with high price caps remains administrative in nature, but at least its administrative elements seek to correct blunter and worse administrative interventions in the markets—namely operator commitments and lower price caps.

Importantly, ORDC does not require the degree of speculative planning that forward capacity markets do. Either a resource has dispatchable headroom in near-real-time, or it does not. Forward capacity markets have begun to include penalties so that capacity resources awarded capacity obligations in one year face financial consequences if they do not perform several years thereafter when called upon. However, this is a poor substitute for simply paying resources for their capacity at those times when scarcity is present or threatened. By doing so, ORDC is highly compatible with the energy markets, establishing a clear feedback loop to the prices within them through co-optimization. ORDC’s demand is not wholly the product of the uncertainty of renewables’ delivery of energy, but it is tied closely to that forecast error. It is, unlike the forward capacity markets, highly compatible with a high-renewables future.²¹

III. Conclusion

PJM has offered several reasons to adopt a more robust ORDC for near-real-time capacity products, which militate in favor of its adoption. The Commission, as always, should closely evaluate the specifics of the proposal. Moreover, because of the administratively constructed nature of the demand for such products, the Commission should ensure that the design of ORDC stays current to the system conditions of PJM’s load and resource mix.

PJM has been reticent about the most persuasive reason (outside of having real-time prices that reflect scarce conditions) for adopting ORDC. It offers an off-ramp from the forward capacity markets, which have been the cause of so much undue trouble in recent years. In adopting ORDC, the Commission should speak with a voice that PJM is lacking in this regard.

²⁰ Hogan and Pope, p. 11.

²¹ For an elaboration of this policy argument, see Travis Kavulla and Gürçan Gülen, “Missing Money and the Off-Ramp to Forward Capacity Markets,” Working Paper, *Electricity Journal* (forthcoming 2019).

Clearly these markets cannot be reformed overnight. Yet this proceeding offers the Commission a rare opportunity to signal equitable reforms that would assist PJM and all its market participants in making a transition to a compensation model that pays resources for their capacity value at the times when consumers actually need them.

Respectfully submitted,



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