

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

PJM Interconnection, L.L.C.)	Docket No. ER18-1314-000
)	Docket No. ER18-1314-001
)	

PROTEST OF THE PJM POWER PROVIDERS GROUP

Pursuant to Rule 211 of the Federal Energy Regulatory Commission's ("Commission" or "FERC") Rules and Regulations,¹ the PJM Power Providers Group ("P3")² submits this Protest, along with the supporting affidavit from Dr. Roy J. Shanker (Attachment A: Affidavit of Roy J. Shanker, Ph.D. ["Shanker Affidavit"]), to PJM Interconnection, L.L.C.'s ("PJM") April 9, 2018 filing entitled, Capacity Repricing or in the Alternative MOPR-Ex Proposal: Tariff Revisions to Address Impacts of State Public Policies on the PJM Capacity Market, submitted pursuant to Section 205 of the Federal Power Act ("FPA"),³ proposing revisions to the Reliability Pricing Model ("RPM") rules in the PJM Open Access Transmission Tariff ("Tariff") to establish the appropriate federal and regional transmission organization ("RTO") response to address supply-side state subsidies and their impact on the determination of just and reasonable prices in the

¹ 18 C.F.R. § 385.211 (2017).

² P3 is a non-profit organization dedicated to advancing federal, state and regional policies that promote properly signed and well-functioning electricity markets in the PJM Interconnection, L.L.C. ("PJM") region. Combined, P3 members own over 84,000 MWs of generation assets, produce enough power to supply over 20 million homes and employ over 40,000 people in the PJM region covering 13 states and the District of Columbia. For more information on P3, visit www.p3powergroup.com. The comments contained in this filing represent the position of P3 as an organization, but not necessarily the views of any particular member with respect to any issue.

³ 16 U.S.C. § 824d (2012).

PJM capacity market. (“Capacity Reform Proposal”).⁴ PJM’s Capacity Reform Proposal presents two alternative (mutually exclusive) proposals in order to address potential market distorting effects of state subsidies in the RPM, its capacity market: Option A: Capacity Repricing, which is meant to “accommodate” state subsidies in the capacity market, and Option B: MOPR-Ex, an extension of the Minimum Offer Price Rule (“MOPR”) that is meant to “mitigate” state subsidies in the capacity market.

PJM proposes an effective date of January 4, 2019, for either Tariff revision, based, in part, on a waiver of the Commission’s 120-day maximum notice rule.⁵ PJM asks the Commission for an Order on its Capacity Reform Proposal by June 29, 2018, with an effective date of June 30, 2018, for a revised tariff record in each Option A and Option B. PJM suggests a “sequenced approach” to further proceedings, if need be, that would consist of paper hearing procedures and the possible use of settlement judge proceedings in lieu of trial-type proceedings, if the Commission finds that the Capacity Reform Proposal should be subject to suspension and further proceedings.

On April 9, 2018, the Commission issued a Combined Notice of Filings setting April 30, 2018, as the deadline for intervention and comments in this proceeding. On April 16, 2018, PJM submitted an amendment to the Capacity Reform Proposal, consisting of three corrections to the proposed Tariff revisions contained within Option A’s Capacity Repricing Proposal.⁶ On April

⁴ PJM Interconnection, L.L.C., *Capacity Repricing or in the Alternative MOPR-Ex Proposal: PJM Tariff Revisions to Address Impacts of State Public Policies on the PJM Capacity Market*, Docket No. ER18-1314-000, filed April 9, 2018 (“Capacity Reform Proposal”).

⁵ 18 C.F.R. § 35.3(a)(1).

⁶ PJM Interconnection, L.L.C., *Tariff Filing per 35.17(b): Amendment to April 9 Filing to be Effective 1/4/18 under ER18-1314-000*, dated April 16, 2018, Docket No. ER18-1314-001.

17, 2018, the Commission issued a Combined Notice of Filings setting May 7, 2018, as the deadline for intervention and comments in Docket No. ER18-1314-001. On April 17, 2018, the Commission also issued a Notice of Extension of Time, granting the Motions to Extend Time made by several parties to ER18-1314-000, and setting the deadline to intervene and comment to May 7, 2018.

P3 agrees that the threat to markets posed by subsidized and unmitigated units is real and that PJM's current MOPR, which mitigates only new natural gas resources in constrained delivery areas, is unjust and unreasonable because it does not address these current market threats. Consequently, P3 supports PJM's call for prompt action by this Commission to address the market-distorting effects that state subsidies have on PJM's capacity market. P3 disagrees, however, that either the Capacity Repricing or MOPR-Ex, as proposed, should be adopted by the Commission. Rather, the Commission should commence an appropriate proceeding to require PJM to revise its MOPR so that it would properly mitigate the effects of *any* subsidized resources – whether resulting from Renewable Energy Credits (“RECs”), Zero Emission Credits (“ZECs”) or any other yet to be imagined subsidy - that will lead to price suppression in PJM's wholesale capacity market. For all of these reasons, as more fully explained below, P3 provides this Protest.

I. BACKGROUND

P3 agrees with PJM's concerns regarding the growing trend of state policy initiatives providing subsidies for specified capacity resources that affect the prices in PJM's wholesale capacity market. P3 has been an active organization within the PJM since 2007. A core tenet of P3's mission statement is that “properly designed and well-functioning competitive wholesale electricity markets are the most effective means of ensuring a reliable supply of power to the

PJM region, facilitating investments in alternative energy and demand response technology and delivering beneficial results to consumers.”⁷ P3, therefore, is one of the many interested stakeholders that has a vested interest in PJM’s proposal to essentially redesign its capacity market in order to ensure just and reasonable rates resulting from its capacity markets and otherwise maintain the benefits of competitive markets given the growing presence of state subsidies in the wholesale capacity market.

As an initial matter, P3 agrees with PJM that its market is not adequately protected from the price suppressive effects of subsidized generation units. At present, the only avenue to address out-of-market subsidies in PJM is a MOPR that was designed to address challenges other than the ones facing PJM today. As PJM notes, its current MOPR is exceptionally limited. It only applies to new entry by gas-fired combined cycle and combustion turbine generating plants in constrained delivery areas. It does not apply to coal-fired, nuclear-powered or renewable generation resources, nor does it apply to demand response.⁸ PJM has no rules in place today to address subsidies to existing (as opposed to new) resources.⁹ These subsidies, which consist of established “state programs to maintain and support existing resources and, to a lesser degree, induce entry of alternate energy resources,”¹⁰ may carry with them legitimate state policy or legislative determinations. However, at the wholesale level, these subsidies detrimentally impact other participants in the wholesale market by distorting price signals and lowering capacity prices. Thus, as PJM notes, “plants that cannot clear based on their costs instead clear solely

⁷ www.p3powergroup.com

⁸ PJM Capacity Reform Proposal, p. 35.

⁹ *Id.*, p. 45.

¹⁰ *Id.*, p. 36.

because of the subsidy and reduce the price paid to all other resources to meet the reliability needs of loads in the relevant area.”¹¹

P3 agrees that out-of-market subsidies are harmful to PJM’s capacity market in both the short- and long-term. Selective subsidies are anti-competitive and inherently discriminatory towards those resources that are struggling to compete in the market without the benefit of out-of-market revenue streams. As time goes on, competition dissolves and the market crumbles from the weight of out-of-market subsidies. As PJM’s expert witness Mr. Adam Keech states, “. . . a zero-priced offer that is made possible only because a seller receives an out-of-market subsidy is not competitive behavior. The seller is relying on a state subsidy available only to select resources to submit an offer in the PJM capacity market that is well below what it needs if one looks only at its resource costs and the revenues available to it from PJM’s other markets”¹²

Moreover, PJM has demonstrated that even a small amount of subsidies result in price suppression. PJM correctly states that “a central premise of RPM is that sellers are expected to offer their capacity at a price sufficient to cover their costs, to the extent not recouped in other PJM markets.”¹³ As Mr. Keech points out, however, subsidies mask the true cost of generation units, due to the fact that they help create “below-cost offers.”¹⁴ These “[s]ubsidized, below-cost capacity offers can result in significant and widespread clearing price reductions that are attributable to the subsidies,”¹⁵ and “adding comparatively small quantities of subsidized offers

¹¹ *Id.*, p. 33.

¹² Affidavit of Adam J. Keech on Behalf of PJM Interconnection, L.L.C., Attachment E, ER18-1314-000 (“Keech Affidavit”), ¶ 14, 15. Capacity Reform Proposal, p. 33.

¹³ Capacity Reform Proposal, p. 19.

¹⁴ Keech Affidavit, ¶ 5.

¹⁵ *Id.*, ¶ 6.

disproportionately reduces the clearing prices paid to all resources.”¹⁶ According to Mr. Keech, adding less than 2% of zero-priced supply to the area outside MAAC reduces clearing prices in the RTO by 10%. Adding only 7% of zero-priced supply (i.e., about 2,000 MW) to EMAAC reduces EMAAC clearing prices by about one-third.¹⁷

Mr. Keech’s analysis is consistent with a similar analysis that was performed by the PJM Independent Market Monitor (“IMM”) regarding efforts by New Jersey to provide a subsidy to develop new natural gas plants in 2011. At the time, the IMM concluded that subsidizing 1,000 MWs of new natural gas generation would lead to “...a reduction in capacity market revenues to PJM suppliers of more than one billion dollars per year, including about 600 million dollars in EMAAC and about 400 million dollars in rest of MAAC.”¹⁸ This substantial reduction in capacity revenues to other market participants from a relatively small amount of subsidization reveals the massive corrosion of markets that will occur if out-of-market subsidies are not addressed.

P3 agrees with PJM that the time to address these out-of-market subsidies is now, given that subsidies have increased over the last several years and, in all likelihood, will continue to increase. As PJM’s expert witness, Dr. Anthony Giacomoni, states in his affidavit, state subsidy programs, whether ZECs or RPS/RECs “. . . provide subsidies to thousands of MWs of PJM Capacity Resources, and that number is scheduled to grow significantly under current law.”¹⁹

¹⁶ *Id.*, ¶ 7.

¹⁷ Capacity Reform Order, p. 28, citing Keech Affidavit, ¶ 6, 7 and 8.

¹⁸ *Impact on New Jersey Assembly Bill 3442 on PJM Capacity Market*, The Independent Market Monitor for PJM, dated January 6, 2011, p. 3. [The IMM’s numbers assumes the subsidized resources bid in at zero.] http://www.monitoringanalytics.com/reports/Reports/2011/NJ_Assembly_3442_Impact_on_PJM_Capacity_Market.pdf

¹⁹ Affidavit of Dr. Anthony Giacomoni on Behalf of PJM Interconnection, L.L.C., Docket No. ER18-1314-000 (“Giacomoni Affidavit”), ¶ 24.

Recent legislative activity in New Jersey offers a chilling glimpse of what the PJM's market could become if this problem is not addressed. Currently sitting on New Jersey Governor Phil Murphy's desk is legislation that, if signed into law, will consist of the largest collections of subsidies coming from RECs and ZECs in the PJM markets. Assembly Bill 3723, known as the "clean-energy legislation," will require 50% of the MWs consumed in New Jersey to be from a renewable resource by 2030. A separate bill, Senate Bill 2313, also referred to as the "nuclear subsidy bill," requires an additional 40% of the MWs, representing a cost of approximately \$300 million annually, consumed in New Jersey to be from a qualifying nuclear facility. As if these legislative interventions in the market were not enough, shortly after taking office in January of 2018, Governor Murphy signed Executive Order No. 8, directing the Board of Public Utilities, the Department of Environmental Protection, and all other state agencies to take "all necessary actions" to develop 3,500 MWs of off-shore wind by 2030, which includes setting up a subsidy for facilities that can help meet this goal.²⁰ Throughout the legislative and political process that produced these policies, an assumption prevailed that PJM and the FERC-regulated markets would be able to address reliability within a market-based construct while the policymakers of New Jersey decided what resources they would make economic.²¹

New Jersey restructured its electricity markets in 1999 because the state recognized that, "Electric power services are available in the wholesale market at prices substantially lower than the current cost of electric power generation and supply services provided to retail customers by

²⁰ New Jersey Executive Order 2018-8, "Promotes Offshore Wind Energy," dated February 5, 2018. <http://nj.gov/infobank/eo/056murphy/pdf/EO-8.pdf>

²¹ [Amid Arguments and Warnings, Nuclear Subsidy Bill Clears Committee, NJ Spotlight, April 6, 2018.](#)

this State's electric public utilities.”²² An entire system of rules and tariffs were developed by PJM and FERC to allow New Jersey and other states in the PJM region to benefit from access to these favorable wholesale market prices while preserving reliability. This market has driven power prices to historically low levels while preserving robust reserve margins. Forgetting this history of allowing competitive market forces to determine the resources that New Jersey residents chose for their power, New Jersey is now openly on a path that ignores market signals and requires their consumers to consume virtually all of their power from politically-favored, yet uneconomic resources. As New Jersey Senate President Stephen Sweeney emphatically declared during the legislative process, “The nuke plants in Salem provide 40 percent of the energy in the State of New Jersey, and it’s important that we find a way to keep them open, providing clean energy.”²³

Unfortunately, if states such as New Jersey are going to subsidize up to 90% of the delivered megawatts, the markets that New Jersey and 13 other states rely upon to provide capacity will collapse. As PJM states, “A market that does not fairly value the costs of meeting reliability needs will not continue to commit the resources needed for adequacy that compete only on their true net costs (allowing for wholesale market revenues), and not on those biased by subsidies. Thus, even if state policymakers choose to maintain their particular subsidy to their preferred resources, investment in needed resources in the region will become less sustainable

²² *The Electric Discount and Energy Competition Act*, N.J.S.A. 48.3-49, *et. seq.*, February 9, 1999. ftp://www.njleg.state.nj.us/19981999/S0500/7_II.PDF

²³ Committee Meeting of the Senate Environment and Energy Committee, Assembly Telecommunications and Utilities Committee, Senate Bill No. 3560, Assembly Bill No. 5330, “Establishes Nuclear Diversity Certificate program,” December 20, 2017, p. 2. <http://www.njleg.state.nj.us/legislativepub/pubhear/senatu12202017.pdf>

over time, because otherwise efficient, but unsubsidized, resources are more likely to be priced out by the subsidized clearing price.”²⁴

P3 agrees with PJM that an out-of-market subsidy of any kind has numerous, harmful effects to the capacity market, including the fact that:

- It undermines robust competition because other sellers cannot compete against a substantial subsidy available only to select capacity sellers;
- It distorts price signals needed to guide orderly entry and exit because the clearing price does not reflect the costs of the committed resources that, in reliance on the subsidy, offered well below their net costs of committing as capacity;
- It does not result in selecting least-cost resources that possess the attributes sought by the market, because those resources may be priced out by subsidized resources that are selected despite their higher costs;
- It undermines price transparency because the actual cost of providing capacity is not being transparently communicated since it is masked by the subsidy;
- It shifts risk from private capital to customers, because resource owners are insulated from the financial consequences of a resource that cannot, based on its economics, clear in a competitive auction, with customers (and other wholesale market participants . . .) bearing the costs of keeping the resource in operation; and
- It does not recognize or address any market power that may be involved in the submission of a below-cost offer.²⁵

Clearly, FERC must step in and rationalize the desire of some states to support certain in-state resources operating in interstate markets with the reality that the law encompassed in the Federal Power Act and the rules and regulations approved by this Commission require that wholesale market operations must occur in a non-discriminatory manner. Unfortunately, states have not made this task easy on the Commission as they strike positions such as the one

²⁴ *Id.*, p. 34.

²⁵ *Id.*, pp. 45-46, citing *ISO New England, Inc.*, 162 FERC ¶ 61,205 (2018) (“CASPR Order”), at P 21, citations eliminated.

articulated by the Organization of PJM States, Inc. ("OPSI") in February, 2018: "State policies are often designed to induce entry or assist in maintaining specific resources that possess desirable attributes while being unlikely to clear PJM's capacity auction. These types of state laws and policies legitimately represent state preferences, and should be respected by RTO processes."²⁶ How can the Commission be expected to develop policies that create just and reasonable wholesale rates when states are pursuing their "legitimate state preference" to develop policies to "induce entry" or "maintain specific resources" in the wholesale market? While there are 13 states and the District Columbia in the PJM footprint that have the ability to pursue legitimate state preferences, there is one and only one federally-sanctioned regulatory body that can develop wholesale market rates to "induce entry" or "maintain specific resources." Although perhaps politically uncomfortable, this Commission must perform its statutory duty as the sole guardian of wholesale market rates, lest 14 different pricing schemes to "induce entry" and "maintain specific resources" develop in the PJM footprint.

While P3 strongly believes that action must be taken and that PJM's existing tariff is unjust and unreasonable because it provides no mechanism to mitigate the impact of subsidies for existing facilities, both the PJM Capacity Repricing and the MOPR-Ex proposals contain significant material flaws that render them both inadequate. P3 strongly disagrees with PJM that "...concerns are addressed, and the capacity market's ability to honor the 'first principles is restored, by adopting either Capacity Repricing or MOPR-Ex."²⁷ The very problems that PJM's experts discuss in their affidavits – that of the problems with the *current, proposed and any new*

²⁶ OPSI letter to PJM Board of Managers, *Recommendation that the PJM Board of Directors not Approve PJM Staff's Repricing Proposal for Filing at FERC*, dated February 7, 2018 ("OPSI Letter"). <http://opsi.us/filings/2018/Repricing-Letter-to-PJM-2-7-18.pdf>

²⁷ Capacity Reform Proposal, p. 46.

subsidies – will continue to exist because neither Capacity Repricing nor the MOPR-Ex proposal fully address the problems inherent with the universe of subsidies stressing the PJM market. Said another way, according to PJM’s own analyses, even a small amount of subsidies are harmful to the market. Mr. Keech stated that based on the 2017 Base Residual Auction (“BRA”) alone, “PJM identified 698 MW from resources that could potentially be benefiting from RPS/REC programs and whose primary commercial function is electricity generation. PJM also identified a total of 981 MW of demand resources and price-responsive demand benefiting from certain specific state programs that subsidize, through general ratepayer revenues, the costs of providing demand curtailment.”²⁸ Both of PJM’s capacity market reform proposals exempt an inordinate number of known and material subsidies and, as a result, fail to address the underlying problem. As Mr. Keech stated, “. . . adding comparatively small quantities of subsidized offers disproportionately reduces the clearing prices paid to all resources.”²⁹

PJM’s Capacity Reform Proposal lays out the harms that current subsidies are creating, as well as the real threat of price suppression that will occur on an even greater scale given the growing instances of state-sponsored subsidy programs, thus providing ample evidence that its tariff must be revised. Yet neither of its proposals – Capacity Repricing or the MOPR-Ex – fully address the market impacts of existing and proposed subsidies.

PJM should be required to address the real threat of price suppression and discriminatory treatment of resources in the capacity market by affirmatively addressing the problem of *all* subsidies – existing, proposed and new, regardless of fuel type. Doing so would still enable all

²⁸ Keech Affidavit, ¶ 18.

²⁹ *Id.*, ¶ 7.

subsidized resources to be fairly committed as capacity based on a non-discriminatory MOPR tariff that mitigates *all* subsidies.

II. PROTEST

A. PJM's Capacity Repricing Proposal Should Be Rejected In Full.

While designed to be a means of protecting the wholesale market from the impact of state subsidization of generation resources, PJM's Capacity Repricing proposal will instead create a pathway to subsidization that will lead to the steady erosion of the benefits of competitive markets. There are no limits to the number of megawatts that could be subject to "repricing" under PJM's proposal, and states would have an unfettered ability to subsidize any form of capacity while leaning on the PJM markets to insure an adequate supply of resources to meet demand. Instead of being an accommodative approach to state policies, PJM's Capacity Repricing proposal is better thought of as an appeasement strategy for state subsidization that is unlikely to stand the test of time.

In the attached affidavit, Dr. Roy Shanker lends his voice to the numerous critics of PJM's Capacity Repricing Proposal. As Dr. Shanker observes, PJM's Capacity Repricing Proposal is fundamentally at odds with the Commission's articulated "first principles of capacity markets."³⁰ Under Capacity Repricing, competitive resources financed by at-risk capital face the prospect of being forced out of the market by (randomly-timed) out-of-market actions by individual states. Billions of dollars of at-risk capital have been invested in PJM to build new capacity. Many of these resources have been funded by investment that assumes uneconomic plants would retire consistent with market signals and rational economics. PJM admits that

³⁰ Shanker Affidavit, P 12, citing CASPR Order, P 21; *see also*, Shanker Affidavit, P 31.

repricing would allow a state to “save” a resource that the wholesale market cannot financially sustain.³¹ By definition, such an outcome is not economically rational.

Mechanically, the Capacity Repricing proposal is riddled with flaws. A unit that is economic and clears the second stage of the Base Residual Auction ("BRA") is at risk of not receiving a capacity commitment in the first BRA. PJM cautions against “otherwise efficient, but unsubsidized, resources”³² being priced out of the market, but that is exactly what repricing sanctions. Further, the two-stage auction process offers a strong incentive for parties to underbid their true costs in the first auction, directly distorting which units are chosen and which will retire from the market or fail to enter the market.³³

Likewise, the price of capacity could be set by a unit that did not receive a capacity commitment, creating potentially perverse market incentives. Consumer advocates are rightly concerned about any policy that would allow a market clearing price to be set and/or influenced by a unit that has no obligation to the market. Moreover, capacity repricing could logically lead to a greater submission of zero priced offers as subsidized resources grow, which has the potential to suppress prices even further. Either way, the impact of capacity repricing is very poorly understood at this juncture and the range of impacts could be significant.

Finally, PJM’s proposed definition of an "Actionable Subsidy" is riddled with exceptions that are arbitrary, unnecessary and would sanction significant price suppression. P3 submits that as PJM's expert has attested, "adding comparatively small quantities of subsidized offers

³¹ Capacity Reform Proposal, p. 56.

³² *Id.*, p. 34.

³³ Shanker Affidavit, P 29.

disproportionately reduces the clearing prices paid to all resources."³⁴ P3 understands this caveat to apply to both the size, origination or type of subsidy involved. Therefore, it is immaterial to make a distinction regarding the origination of the subsidy (state, federal or local), the size of the subsidy, the number or total capacity of subsidized resources within a resource class, the nature of the resource as generation or demand-side, and only screening existing resources for the presence of "Actionable Subsidies." PJM's Capacity Repricing proposal, unfortunately, makes all of these exemptions and distinctions.

The shortcomings of PJM's Capacity Repricing proposal are certainly reflected in its particularly poor stakeholder support (failing in a sector-weighted vote with only 1.07% in favor).³⁵ In addition to the stakeholder opposition to Capacity Repricing, OPSI, the guardians of the state policies that Capacity Repricing is designed to accommodate, urged the PJM Board to reject the proposal.³⁶ This broad opposition to Capacity Repricing is understandable given the numerous flaws associated with the proposal.

B. PJM's MOPR-Ex Proposal Represents an "Incomplete Improvement" to the Status Quo.

The MOPR has a long and complicated history in PJM. The MOPR originated in the 2006 settlement that established RPM. At the time, concerns were expressed that monopsony market power could be exercised by buy side interests seeking to suppress capacity clearing prices. The Commission, as well as the PJM stakeholders at that time, realized that out-of-

³⁴ Keech Affidavit, ¶ 7.

³⁵ PJM Markets and Reliability Committee, *Minutes*, PJM Interconnection, L.L.C.. Markets and Reliability Committee, *Minutes*, PJM Interconnection, L.L.C., (Jan. 25, 2018), <http://www.pjm.com/-/media/committeesgroups/committees/mrc/20180222/20180222-item-01-draft-minutes-mrc20180125.ashx> (Agenda item 5).

³⁶ OPSI Letter, *supra*.

market payments to selected generation facilities could inappropriately suppress clearing prices for other market participants.

Since its original approval by the Commission in 2006, the MOPR has evolved as the tool that the Commission has used to address concerns involving price suppression in the capacity market. The Commission issued an order on November 17, 2011, based upon P3's February 1, 2011, complaint urging the Commission to revise the MOPR, due to concerns about efforts in the PJM footprint to subsidize new market entry with out-of-market revenues.³⁷ P3 requested extensive changes to the MOPR, based in part on P3's concern that "uneconomic entry" into PJM pursuant to a recently enacted New Jersey capacity procurement statute was "imminent."³⁸ PJM generally agreed with the concerns raised by P3 (while expressing a slightly different means to address) and on April 12, 2011, the Commission approved a revised MOPR that would mitigate new natural gas units in PJM that did not qualify for a unit specific exemption. The Commission approved additional changes to the MOPR in 2013 and 2017 while keeping the focus of the PJM MOPR on the price suppressive effects of out-of-market payment streams to select resources.

PJM's current MOPR provides no protection against the price suppressive impacts of out-of-market revenue streams that are emerging in the PJM footprint, making PJM's existing MOPR unjust and unreasonable. PJM's MOPR only applies to new natural gas units in constrained LDAs, so any out-of-market payments at any level to existing natural gas plants,

³⁷ *Order on Compliance Filing, Rehearing, and Technical Conference*, PJM Interconnection, L.L.C.; PJM Power Providers Group v. PJM Interconnection, L.L.C., 137 FERC ¶ 61,145 (November 17, 2011) ("PJM 2011 MOPR Order").

³⁸ S. 2381, 214th Leg. (N.J. 2010).

nuclear, coal, hydro, solar, wind or landfill facilities would not be addressed by PJM's current MOPR. In fact, out-of-market payments to these resources could be multiples of PJM's current capacity clearing price and still not be mitigated. For example, in the recently approved order from the Maryland Public Service Commission, the renewable energy credit for offshore wind facilities is set at a levelized price of \$131/MWd with a 1% a year escalator.³⁹ Under the current MOPR and the proposed MOPR-Ex, the Maryland offshore wind subsidy would not be mitigated, even though that the same offshore wind resource would be required under Maryland law to participate in the PJM capacity market.⁴⁰

A market unprotected from the price destructive impacts of subsidized resources is not sustainable, as the Commission has recognized on many occasions.⁴¹ As a result of changes in the PJM market and the increased interest by PJM states in providing out-of-market revenue streams to certain resources, the status quo MOPR is not just and reasonable. With the current MOPR no longer effective and the Commission's express intent to "...use the MOPR to address the impacts of state policies on the wholesale capacity markets,"⁴² a revised and functionally effective MOPR is clearly needed in PJM.

³⁹ *In the Matter of the Applications of U.S. Wind, Inc., and Skipjack Offshore Energy, LLC, for a Proposed Offshore Wind Project(s) Pursuant to the Maryland Offshore Wind Energy Act of 2013*, Maryland Public Service Commission Order No. 88192, dated May 11, 2017, at p. 75. <http://energy.maryland.gov/Documents/PSC-Order-No-88192-CaseNo9431.pdf>

⁴⁰ "For each OREC [Offshore Wind Renewable Energy Credits] for which a qualified offshore wind project receives payment, a qualified offshore wind project shall: (I) sell all energy, capacity, and ancillary services associated with the creation of ORECs into the market operation by PJM Interconnection." Md. Code Ann., Public Utilities, §7.704(C)(3)(I)(2013).

⁴¹ FERC has found that "...uneconomic capacity suppresses prices, regardless of intent, and that such uneconomic entry can result in unjust and unreasonable capacity prices." *ISO New England Inc. and New England Power Pool Participants*, 158 FERC ¶ 61,138, dated February 3, 2017, at P 10.

⁴² CASPR Order, P 22.

Unfortunately, the MOPR-Ex, as presented, is too riddled with exceptions to be the complete or final answer. As Dr. Shanker offers, “Having spent at least 37 pages explaining the evils of subsidies, including extensive detail in two affidavits, on the scale of existing and potential subsidized units and their price suppression, PJM offers a new MOPR-Ex proposal that is riddled with problematic exceptions. Leaving virtually no one out of the MOPR-Ex, with its numerous exceptions, allows parties to effectively bid zero and depress prices, exactly what PJM agrees should be avoided.”⁴³ P3 cannot support the MOPR-Ex as presented because of the multiple and discriminatory exceptions that were included in order to gain stakeholder support, but serve to erode the effectiveness of the MOPR. Now more than ever, PJM needs an effective MOPR, even if it is not as politically popular as some alternatives.

As noted earlier, state RPS programs continue to proliferate in the PJM footprint. New Jersey Governor Murphy has expressed his desire to move to 100% renewable energy for his state by 2050, while bills have been introduced in Maryland and Pennsylvania to do the same.⁴⁴ While P3 respects the rights of states to promote renewable energy, the impact of REC payments on the wholesale market is material and can no longer be ignored by the Commission – particularly as RPS standards increase.⁴⁵

⁴³Shanker Affidavit, P 34.

⁴⁴ See, Pennsylvania House Bill 2132 and Senate Bill 1140 (both in 2017-2018 legislative session) and Maryland House Bill 878 (2018 session).

⁴⁵ Dr. Giacomoni also estimates that satisfying the current RPS obligations in the PJM Region would require nearly 5,000 MW of “‘around-the-clock’ capacity (located and metered in the PJM Region),” and that is scheduled under current law to grow to over 8,000 MW by 2025. Giacomoni Affidavit, ¶ 29.

PJM acknowledges that state RPS programs depress prices in the wholesale FERC-regulated PJM capacity markets.⁴⁶ Since the MOPR-Ex on its face does not address this price suppression, it cannot be considered just and reasonable. As Dr. Shanker observes, this is not merely a theoretical problem in PJM as legislatively-approved subsidies in New Jersey would increase the potential price suppression impacts on the PJM capacity market as high as \$10 billion.⁴⁷ Moreover, PJM rightly raises the concern that a RPS exemption could be considered discriminatory. P3 agrees with this concern and would urge the Commission to reject this proposed boundless RPS exemption.

Similarly, the blanket exemptions that MOPR-Ex provides to public power and self-supply resources is simply too broad to effectively protect PJM's markets. The Commission has affirmatively concluded that a net-short requirement for self-supply resources is an appropriate and necessary protection against prices suppression.⁴⁸ Yet, the MOPER-Ex, as proposed, would provide absolutely no protection against the actions of a self-supply entity seeking to inappropriately over supply the market and suppress prices. The Commission's view of such activity is unambiguous and the MOPR-Ex is inconsistent with that view.⁴⁹

While P3 greatly appreciates the tremendous stakeholder effort that led to the development of the MOPR-Ex proposal, and acknowledges that most P3 members supported the proposal at the stakeholder level as an incremental improvement to the status quo, P3 urges the

⁴⁶ Capacity Reform Proposal, p. 114.

⁴⁷ Shanker Affidavit, P 18.

⁴⁸ PJM 2011 MOPR Order, P 52-55.

⁴⁹ See, April 2011 MOPR Order, 135 FERC ¶ 61,022 at P 193. "To protect the integrity of PJM's wholesale capacity markets under RPM and to permit new self-supply, however, new self-supply seeking to participate in the RPM market must compete with other planned generation on the same competitive basis."

Commission to thoughtfully reflect on whether the MOPR-Ex, as presented, can effectively accomplish its stated purpose. Ultimately, MOPR-Ex should be viewed as an incomplete improvement to the status quo. The Commission can and should demand more protection for its markets.

C. The Commission Should Institute a New Proceeding to Develop a MOPR that Will Ensure Just and Reasonable Rates by Effectively Addressing the Problem of Price Suppression caused by State Interventions in the PJM Market.

As stated above, the Commission should avail itself of the opportunity to install in PJM a MOPR that will actually protect the market from subsidized resources that undermine competitive market signals. PJM has clearly articulated a problem; however, both MOPR-Ex and Capacity Repricing suffer from defects that prevent the market from being adequately protected. P3 proposes a different path forward.

In order for the MOPR to be effective, it needs to be broad enough to capture a range of actions while not unduly burdening the competitive market. In the past, the MOPR in PJM has been designed to protect against specific forms of price suppression. History reveals that the recipients of subsidies are hard to predict, the sources can vary, and the impact of any subsidy is material. An enduring MOPR should be flexible enough to protect the market from the threat of tomorrow, not just the threat of today or yesterday.

P3 urges the Commission to establish a separate proceeding with clear policy direction from the Commission for PJM to establish a MOPR that fully mitigates the impact of subsidized resources in the PJM market. In doing so, the Commission could accept PJM's proposed definition of a "material subsidy" and provide clear direction that any material subsidy be mitigated.⁵⁰ PJM's determination of the appropriate competitive price after mitigation provides a workable start for any subsequent proceeding. As Dr. Shanker concludes:

⁵⁰ P3 proposes that as a starting point for the next proceeding, the Commission adopt PJM's proposed definition of "material subsidy" (with one modification). Accordingly, "material subsidy" would be defined as "(1)

My recommendation would be that the Commission reject both proposals and take the appropriate actions to direct the implementation of a strong Minimum Offer Price Rule to apply to all new and existing units with Material Subsidies... This “no exception rule” should appropriately remove the various exemptions and mitigate all supply receiving a Material Subsidy.⁵¹

A “Clean MOPR,” as recommended by Dr. Shanker would be consistent with the Commission’s “first principles” of capacity markets. Such a MOPR would effectively address price distortions caused by out of market interventions in the market while ensuring that wholesale market rates are just and reasonable. Ultimately, a Clean MOPR would lead to “...the selection of the least-cost set of RTO resources that satisfy market needs without artificial price suppression.”⁵² The Commission should demand nothing less.

Dr. Shanker further observes that a “Clean MOPR,” free of the market-distorting exceptions contained in MOPR-Ex, would be easier for PJM to implement than MOPR-Ex. As Dr. Shanker notes,

“a Clean MOPR would be very easy to put into effect as it requires very little adjustment from the proposed MOPR-Ex process which PJM has deemed just and reasonable. Just like under MOPR-Ex, under a Clean MOPR approach, PJM would need to first determine if a capacity resource is receiving a material subsidy. The analysis would be exactly the same under MOPR-Ex and Clean

material payments, concessions, rebates, or subsidies directly or indirectly from any governmental entity connected to the construction, development, operation, or clearing in any RPM Auction, of the Capacity Resource, or (2) other material support or payments obtained in any state-sponsored or state-mandated processes, connected to the construction, development, operation, or clearing in any RPM Auction, of the Capacity Resource. A Material Subsidy shall not include (3) payments (including payments in lieu of taxes), concessions, rebates, subsidies, or incentives designed to incent, or participation in a program, contract or other arrangement that utilizes criteria designed to incent or promote, general industrial development in an area; (4) payments, concessions, rebates, subsidies or incentives designed to incent, or participation in a program, contract or other arrangements from a county or other local governmental authority using eligibility or selection criteria designed to incent, siting facilities in that county or locality rather than another county or locality.” P3 proposes to remove PJM’s proposed exclusion (5) dealing with federal production and investment tax credits, since Congress has affirmatively decided to phase these tax credits out.

⁵¹ Shanker Affidavit, P 47.

⁵² Shanker Affidavit, P 49.

MOPR. If a unit is deemed to have a material subsidy, then there would be no further need to determine whether the unit qualified for one of the MOPR-Ex exceptions and mitigation would apply. The approach is very straight-forward, easily understood and administratively simpler than MOPR-Ex”⁵³

Under such an approach, states would still have full control over the policy decision of whether they would like to rely upon an organized capacity market to price capacity. States would retain the ability to pursue Fixed Resource Requirement (“FRR”) treatment and compensate capacity through state-sponsored means should a state make the decision to do so. While states, under such an approach, would likely pay more for capacity than they currently do, such a decision would be entirely of the state’s initiative. Moreover, states like New Jersey have shown a willingness on multiple occasions to require consumers to pay more for capacity than market prices.

States made decisions to transfer responsibility for resource adequacy to the regional grid after careful reflection and with a full understanding of the consequences. The benefits of an interstate grid to these states over the past two decades have been enormous. If a state desires to re-acquire responsibility for resource adequacy and is prepared to pay the costs associated with such a decision, then the state has the right to pursue that option.⁵⁴ While P3 believes a state’s decision to procure capacity through non-market alternatives is unwise and will harm consumers, P3 recognizes states currently have that ability and is not suggesting that it be removed.

P3 concedes that this approach could lead to consumers paying subsidies to resources that do not clear an auction because their price-taker bids were mitigated to competitive levels. While such a result could be costly for consumers, state policymakers would need to accept that risk if those states are unwilling to assume responsibility for capacity

⁵³ Shanker Affidavit, P 48.

⁵⁴ The Commission has long recognized the FRR as a means to acquire capacity outside of the market. “The FRR option is the alternative for load serving entities that wish to secure their own capacity resources outside of a competitive market, whether as directed by state-authorized integrated resource plans, or pursuant to other considerations.” April 2011 MOPR Order, 135 FERC ¶ 61,022 at P 193.

procurement.⁵⁵ Ultimately, it would be a state’s decision to make – just like the decision to enter into an organized market with capacity procured on a regional basis through a market-based construct.

III. CONCLUSION

Since the introduction of RPM in PJM, billions of dollars have flowed into the PJM market in the name of reliability and with the expectation that capacity would be priced based on market signals. When those market dynamics are eroded by state policy actions that seek to replace PJM market signals and “induce entry of” or “maintain” politically-favored resources, the PJM capacity market becomes unsustainable. The Commission, as the Congressionally sanctioned regulator of interstate whole power markets, must assume its place as the regional regulator and bring order to this growing chaos.

In doing so, it is important that the Commission step in and squarely address the problem, rather than attempt to apply a series of band-aids that may forestall some bleeding but will not treat the underlying wound. The Commission has an opportunity, and sufficient time, between now and the 2019 BRA to address the problem in the appropriate manner. Some issues are simply not suitable for negotiated compromises or stakeholder consensus driven solutions. This is one of those issues. Commission leadership and regulatory fortitude are required in order to

⁵⁵ It is worth noting that the Standard Offer Capacity Agreement contracts that the New Jersey Board of Public Utilities approved on April 26, 2011, to provide additional capacity payments to support the construction of new natural gas plants in New Jersey contained capacity prices that were dramatically above market prices. For example, the contract price for capacity approved in the SOCA contract for CPV Shore in 2018 was \$303.45/MWd (as compared to the market clearing price in EMAAC of \$120/MWd). If the SOCA contracts had not been judicially invalidated due to the unconstitutionality of the underlying Long-Term Capacity Agreement Pilot Program Act (LCAPP), New Jersey ratepayers would have paid \$48.5 million more this year than the market price for the 725 MWs of capacity associated with the facility. See, Letter from Ralph LaRossa, PSEG, President and Chief Operating Officer, to Kristi Izzo, Secretary to the New Jersey Board of Public Utilities, RE: Executed Standard Offer Capacity Agreement, April 26, 2011.

fix the vexing problem of state subsidized resources that are undermining wholesale market price signals.

P3 firmly believes that there is a better path forward than presented in PJM's Option A and Option B. A MOPR-based approach that removes many of the exemptions contained in the MOPR-Ex proposal represents the most effective path forward if PJM's capacity markets are going to remain viable. The Commission has an opportunity to ensure just and reasonable rates by commencing a new proceeding with appropriate parameters to put such a MOPR in place by the 2019 BRA, while preserving the ability of states to satisfy their own capacity obligations thought the FRR should a state desire to meet its commitments in that manner.

The clock is ticking, but there is sufficient time to do it right. P3 urges the Commission to act with urgency, fortitude and vision.

Respectfully submitted,

On behalf of the PJM Power Providers Group

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May 7, 2018

CERTIFICATE OF SERVICE

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

Respectfully submitted,

On behalf of the PJM Power Providers Group

By: /s/ Laura Chappelle

Laura Chappelle

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May 7, 2018

Attachment A

Affidavit of Roy J. Shanker, Ph.D.

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

PJM Interconnection, L.L.C.)	Docket No. ER18-1314-000
)	Docket No. ER18-1314-001
)	

**Affidavit
Of
Roy J. Shanker, Ph.D.**

On Behalf of

The PJM Power Providers Group

Submitted May 7, 2018

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

Docket No. ER18-1314-000

Docket No. ER18-1314-001

Affidavit of Roy J. Shanker, Ph.D.

1. My name is Roy J. Shanker. My address is P. O. Box 1480, Pebble Beach, California, 93953. I have been retained by the PJM Power Providers Group (“P3”) to review the PJM Interconnection, L.L.C.’s (“PJM”) April 9, 2018, filing entitled, “Capacity Repricing or in the Alternative Expanded Minimum Offer Price Rule (MOPR-Ex) Proposal: Tariff Revisions to Address Impacts of State Public Policies on the PJM Capacity Market (“Capacity Reform Proposal”),¹ submitted pursuant to Section 205 of the Federal Power Act (“FPA”).”² Specifically, I was asked to consider the provisions of the Repricing and MOPR-Ex proposals in the context of achieving the stated objective of insulating the Federal Energy Regulatory Commission (“FERC” or “Commission”) jurisdictional PJM Capacity Market (“capacity market”) from price distortions caused by external, non-jurisdictional subsidies (e.g. state sponsored programs targeting specific types of generation).

Qualifications and Experience

2. My resume, attached as Exhibit RJS-1, summarizes my experience in numerous regulatory proceedings before state commissions and the Commission. As detailed therein, I have over 40 years of experience covering a broad range of issues in the electric utility industry, and I have worked as an independent consultant for the past 37 years. I have worked extensively in the PJM and NYISO markets during their initial development, and most relevant to this proceeding, directly participated in the related stakeholder processes that initiated and evolved these Regional Transmission

¹ PJM Interconnection, L.L.C., *Capacity Repricing or in the Alternative MOPR-Ex Proposal: PJM Tariff Revisions to Address Impacts of State Public Policies on the PJM Capacity Market*, Docket No. ER18-1314-000, filed April 9, 2018 (“Capacity Reform Proposal”).

² 16 U.S.C. § 824d (2012).

Organizations (“RTOs”) procedures for addressing the broad issue of mitigation of subsidized units in capacity markets, and related topics such as mitigation of buyer-side market power and related price suppression. Specifically, I have offered testimony on this subject in Docket No. AD17-11 (invited speaker) and filed technical conference comments and post conference comments in Dockets No. ER13-535; No. ER11-2875; No. EL11-20; and No. EL15-64-000. I also appeared before the New Jersey General Assembly in 2011, addressing related issues in discussions of Assembly Bill 3442 and Senate Bill 2381, related to the impacts of state-directed and subsidized capacity procurement for new natural gas units. In ISO-NE, I testified in Dockets No. ER10-787-000, No. EL10-50-000, and No. EL10-57-000 addressing a similar mitigation issue. I participated in multiple stakeholder processes in PJM and NYISO that discussed these issues, including the most recent ones in PJM that evaluated the two alternatives that PJM submitted in this proceeding (Capacity Repricing and MOPR-Ex), along with other mitigation strategies.

3. I have been involved, and continue to be involved, in virtually all areas of market design and development, and I participate actively in stakeholder activities in several markets (this participation varies from time-to-time, reflecting the evolution of issues in each market).

4. I have a bachelor’s degree from Swarthmore College and both a master’s and doctorate degree from Carnegie-Mellon University.

Conclusions and Recommendations

5. In its filing, PJM proposes two alternatives to address the problem of wholesale market distortions from state policy initiatives and other potential subsidies: i) a modified auction process that attempts to mitigate price suppression via a subsequent repricing of the unmitigated auction results (“capacity repricing”), or ii) a revision of PJM’s current Minimum Offer Price Rule (“MOPR”) to include additional resource types while limiting the application of MOPR to other resources.

6. I have two principal conclusions. First, there is a very material level of existing and planned out-of-market subsidies in PJM with attendant material price distortions that

will do serious harm to the market if not addressed. In its filing, PJM itself identifies thousands of megawatts of subsidized units with market impacts that have been estimated to be in the billions of dollars per year.

7. My second conclusion is that neither of the two mitigation alternatives presented by PJM is acceptable. After making such an excellent case for why mitigation is needed, PJM fails to put forth a solution that will actually fix the problem. Both options presented consciously allow for material exceptions and include other flaws or compromises that leave the market design vulnerable. Other than some generic notion that compromise or accommodation is “good,” these exceptions are not justified and sanction price suppression to the detriment of all market participants.

8. My recommendation would be that the Commission reject both proposals and take the appropriate actions to direct the implementation of a strong Minimum Offer Price Rule to apply to all new and existing units with Material Subsidies.³ This “no exception rule” should appropriately remove the various exemptions and mitigate all supply receiving a Material Subsidy. As advised by counsel, this would appropriately take place in a subsequent proceeding established at the Commission’s initiative.⁴ The complementary observation to this recommendation is that states must make a fundamental choice about facing the consequences of their preferences, which can

³ From the PJM Tariff definitions as defined in the Capacity Reform Proposal (PJM Tariff §1, Definition L-M-N (Option A): “Material Subsidy” shall mean: (1) material payments, concessions, rebates, or subsidies directly or indirectly from any governmental entity connected to the construction, development, operation, or clearing in any RPM Auction, of the Capacity Resource, or (2) other material support or payments obtained in any state-sponsored or state-mandated processes, connected to the construction, development, operation, or clearing in any RPM Auction, of the Capacity Resource. A Material Subsidy shall not include (3) payments (including payments in lieu of taxes), concessions, rebates, subsidies, or incentives designed to incent, or participation in a program, contract or other arrangement that utilizes criteria designed to incent or promote, general industrial development in an area; (4) payments, concessions, rebates, subsidies or incentives designed to incent, or participation in a program, contract or other arrangements from a county or other local governmental authority using eligibility or selection criteria designed to incent, siting facilities in that county or locality rather than another county or locality; or (5) federal government production tax credits, investment tax credits, and similar tax advantages or incentives that are available to generators without regard to the geographic location of the generation.

⁴ In its protest, P3 notes that existing federal subsidies (item 5 in the definition of Material Subsidy) will be expiring for wind and solar, and recommends that going forward, this exclusion from mitigation be eliminated. Certainly, within the context of a capacity market mitigation, this is reasonable given these subsidies are most material in production of energy, which is not addressed in this proceeding.

include increased costs for such preferences, versus distorting prices and destroying the capital of merchant competitors. For those states that wish to retain their subsidies and not deal with the reality of such actions in a market context, there always remains the ability to insulate their preferences from impacting the rest of the market via choices like fixed resource requirements (“FRR”) under the current PJM market design.⁵

9. Because my recommendation implies a forward-looking direction from the Commission for PJM to make these types of adjustments, I have not added specific implementation proposals. However, such implementation is not that difficult a task and, in fact, simpler than PJM’s proposed MOPR-Ex. As would be expected, PJM’s subsequent, Commission-directed filing would be accompanied by specific details. Given the enormous focus of the PJM stakeholder community on MOPR-related issues over the last year (including the development of specific tariff language for MOPR-Ex), I believe that producing a revised, exception-free MOPR could be filed with the Commission in approximately two months, leaving ample time for implementation prior to the May 2019 Base Residual Auction (“BRA”).

Background

10. In many respects, this proceeding is “déjà vu all over again.”⁶ The problem of market distortion from state subsidies in various forms and purposes has been before the Commission repeatedly. The context differs from case to case, addressing topics like discriminatory procurement (e.g. New Jersey and Maryland); simple uneconomic procurement by any party (NYISO); integrating public policy concerns and the operation of RTO markets (AD-17-11 and ER18-619);⁷ and buyer-side market power (PJM,

⁵ See generally, <https://www.pjm.com/-/media/committees-groups/task-forces/ccppstf/20170817/20170817-fixed-resource-requirement-overview.ashx>

⁶ Attributed to Yogi Berra.

⁷ See for example, Post Technical Conference Comments of Roy J. Shanker. AD17-11, filed June 22, 2017. *State Policies and Wholesale Markets Operated by ISO New England Inc., New York Independent System Operator, Inc., and PJM Interconnection, L.L.C.*, Notice of Technical Conference, Docket No. AD17-11-000 (Mar. 3, 2017) (“Notice of Technical Conference”).

NYISO and NE).⁸ Almost uniformly, the conclusions have been the same: out-of-market subsidies in any of these contexts are bad; they distort prices and interfere with the efficient entry and exit of generation. PJM itself summarized the most recent Commission pronouncement of this conclusion in its recent ISO-NE Order.⁹

Last month, addressing similar concerns in ISO New England, Inc., the Commission drew from its prior precedent several “first principles” of capacity markets, explaining that the ultimate goal of such markets “is to produce a level of investor confidence that is sufficient to ensure resource adequacy at just and reasonable rates.” The Commission strongly affirmed that where “participation of resources receiving out-of-market state revenues undermines those principles,” it is the Commission’s “duty under the FPA to take actions necessary to assure just and reasonable rates.”¹⁰

In a separate proceeding, the Commission has also offered:

We disagree and continue to find that mitigation of resources that have the incentive and ability to reduce capacity prices through uneconomic entry is appropriate and necessary to ensure just and reasonable rates. In contrast, a resource that can show that it does not have an incentive to exercise buyer-side market power should not be subject to market power mitigation. As we have stated previously, subjecting state sponsored resources to the MOPR does not prevent the states from pursuing their own public policy requirements. Rather, it is intended to ensure that whatever subsidy is received does not discriminatorily affect the outcome of the PJM auction.¹¹

11. The Commission’s conclusions have been based on several common building blocks. First, there is a concern that uneconomic subsidized entry has the potential to allow the exercise of market power by buyers, or collectively by agent(s) of the state, to

⁸ See, collectively, Dockets No. ER13-535; No. ER11-2875; No. EL11-20-000; No. ER10-787-000; No. EL10-50-000; and No. EL10-57-000.

⁹ *ISO New England, Inc.*, 162 FERC ¶ 61,205, at P 21 (2018) (“CASPR Order”).

¹⁰ See also, Capacity Reform Proposal, pp. 1-2.

¹¹ *PJM Interconnection, L.L.C.*, 143 FERC ¶ 61,090 at P 34 (2013) (the “ER13-353 Order”) (footnote omitted), *on reh’g*, 153 FERC ¶ 61,066 (2015), (Issued October 15, 2015), *vacated in part sub nom. NRG*, 862 F.3d 108.

suppress prices. Such a subsidy is often accompanied by discriminatory “new only” procurement or a procurement of a specific technology. Second, in pursuit of other objectives, e.g. “public policy,” state subsidies can distort and depress prices in a discriminatory manner independent of any direct objective to exercise a form of market power. Third, the Commission has, at times, voiced a concern about uneconomic investment in any form, even if independent of a direct subsidy. A common theme of the Commission’s decision-making is the interference with economic entry and exit decisions.¹²

12. Seen from the positive side, as PJM notes, the Commission recently stated in the affirmative the properties which a capacity market should have, that in turn make clear that price distortion by subsidies and the ensuing disruption of rational market entry and exit are unacceptable. As noted above, in the CASPR Order, the Commission identified several “first principles of capacity markets,” i.e., that capacity markets like those of ISO New England and PJM should:

- facilitate robust competition for capacity supply obligations,
- provide price signals that guide the orderly entry and exit of capacity resources,
- result in the selection of the least-cost set of resources that possess the attributes sought by the markets,
- provide price transparency,
- shift risk as appropriate from customers to private capital, and
- mitigate market power.¹³

13. PJM confirms that a targeted subsidy, independent of the underlying state rationale, violates these principles.

But regardless of the state’s specific policy motivation, retaining or compelling the entry of resources that the market *does not* regard as economic, suppresses prices for resources the market *does* regard as economic. This in turn suppresses revenues for resources that depend on these prices to support their continued operation or their economic new

¹² CASPR Order, P 21, citations omitted.

¹³ *Id.*

entry. Eventually, unless these resources too are given a subsidy or (if they are essential to preserving reliability) a Reliability Must Run (“RMR”) arrangement, they will be crowded out.¹⁴

14. In fact, the first 37 pages of PJM’s Capacity Reform Proposal is an homage to the proposition that subsidies are bad and the associated Commission recognition of this fact. In this regard, PJM concludes:

As the foregoing review makes clear, Commission action is needed now. The circumstances are similar to those that confronted the Commission in 2011 when it eliminated the blanket MOPR exemption for state-supported new entry: the “prospect of thousands of megawatts of . . . generation, [offered] under arrangements that would explicitly subsidize the resources regardless of Auction price, potentially being offered into the [PJM] [m]arket at a zero bid [brings] into focus the distortive effect . . . that the state [programs] could have on market prices for all capacity.” The principle applies equally here; the only difference is that in 2011, the concern was new entry, natural gas projects; today the concern arises from state programs to maintain and support existing resources and (to a lesser degree) induce entry of alternate energy resources. In such circumstances, where “participation of resources receiving out-of-market state revenues undermines [the first] principles” of capacity markets, the Commission has a “duty under the FPA to take actions necessary to assure just and reasonable rates.” (Commission CASPR order)

Some may argue that no action is needed at this time because capacity commitments in PJM are well above the installed reserve margin, and because the PJM Region continues to see new entry. This argument ignores the current drivers of new entry in PJM (see discussion of private equity models and gas turbine efficiency above, section I); and falsely suggests that there are times during the business cycle when it is appropriate to distort markets.

Moreover, being long on capacity does not justify setting subsidized clearing prices. A properly designed competitive market will address excess or shortage positions over time through the actions of competitive market participants. Excesses are not addressed by departing from competitive design principles (such as by allowing subsidies a significant role in setting clearing prices) until a surplus clears, and then trying to re-institute a competitive market design. The selected design must work in equilibrium, shortage, and surplus conditions. ***Subsidies will undermine competitive market design at any stage of the business cycle.***¹⁵

¹⁴ Capacity Reform Proposal, p. 14.

¹⁵ Capacity Reform Proposal, pp. 36-37 (emphasis added; footnotes omitted).

Even Small Subsidies Distort Markets

15. Aside from the abstract notions of the harms of out-of-market payments, PJM also offered some of its own estimates of the materiality of impacts. PJM witness, Mr. Adam J. Keech, comments on the scale of the impacts, *representing a lower bound* on changes that would be expected in four scenarios of additional subsidized entry (the scenarios are a lower bound because no existing subsidized generation is accounted for or mitigated):

7. As can be seen, adding comparatively small quantities of subsidized offers disproportionately reduces the clearing prices paid to all resources. For example, for the 2020/2021 Delivery Year, the “3000 MW Outside MAAC” scenario adds zero-priced supply of less than 2%, but decreases clearing prices in the RTO unconstrained pricing area by roughly 10%. The “6000 MW Outside MAAC” adds zero-priced supply of less than 4%, but decreases clearing prices in the RTO by 21%. See Attachment 1 at 3.

8. For the same Delivery Year, the “3000 MW Inside MAAC” scenario, which assumes about 1,000 MW of the added zero-priced supply is offered in the EMAAC LDA (which represents about 4% of supply in EMAAC), reduces clearing prices in that LDA by nearly 20%. **EMAAC clearing prices are reduced by about one-third in the second MAAC scenario**, which assumes about 2,000 MW of the 6,000 MW of added zero-priced supply (representing about 7% of supply in EMAAC) is offered in EMAAC. See Attachment 1 at 3.

9. Notably, these post-BRA sensitivity analyses do not test for how the clearing results would change if the subsidized offers that actually cleared in the subject BRA had submitted offers reflecting their competitive net costs. The sensitivities show only what would happen if additional subsidized offers were submitted in the BRA. **Therefore, the clearing price reductions—relative to what would happen if sellers with subsidies that offered below cost instead offered at a level sufficient to cover the net costs they need from the capacity market—would be even greater than shown here.**

10. PJM also has simulated capacity auctions that reprice—to zero—only two plants that cannot currently clear at competitive offers that recover their costs. As stated by Exelon in a public announcement, both the Quad Cities plant and Three Mile Island nuclear generating stations failed to clear PJM’s May 2017 BRA.¹ As shown in Attachment 2, allowing just these two plants to offer into the capacity auction at a subsidized price of zero would reduce the capacity revenues received by every seller in the unconstrained portion of the RTO by 2%. That 2% revenue reduction,

experienced by every cleared seller in the unconstrained part of the RTO, is more significant than it sounds. A seller that clears a resource with 1,000 MW of unforced capacity, for example, would see a \$547,500 reduction in its annual capacity market revenues for that Delivery Year—due solely to the subsidy.

11. Sellers in the ComEd LDA would see their capacity revenues cut by nearly 10% due solely to allowing the subsidized offer. This would result in a reduction in annual capacity market revenues of \$6.75 million for that same 1,000 MW resource.

12. In the MAAC LDA, the clearing price would drop by \$1/MW-day, as a result of the zero offer from Three Mile Island in that LDA. While this too does not sound very significant, it represents a reduction of \$365,000 in annual capacity market revenues for a resource with 1,000 MW of unforced capacity, and a reduction in total capacity market revenues for the MAAC region of approximately \$24 million.

13. This analysis highlights an important point. Sellers are rational. Sellers that need to cover their costs submit offers at the level necessary to cover their costs. Cost-recovery offers for Quad Cities and Three Mile Island were submitted in the 2017 BRA—as we know because their offers proved too high to clear. Simply because these resources are operated at a high capacity factor, or are existing resources, does not mean that they have zero costs of committing as capacity or that all of their costs are recovered through energy market revenues. This example is instructive as a reminder of the fundamental economic principles that govern whether or not a rational, unsubsidized seller will submit a zero-price offer.¹⁶

16. While Mr. Keech’s results were primarily scaled at the generator level impact, the potential impacts become huge if they are viewed at an overall RTO level. PJM’s Independent Market Monitor (“IMM”), Dr. Joseph Bowring, conducted an analysis of the capacity auction impacts of adding 1000 MWs of subsidized power in 2011 (in the context of the debate over Maryland and New Jersey discriminatory procurement

¹⁶ Affidavit of Adam J. Keech on Behalf of PJM Interconnection, L.L.C., Attachment E, ER18-1314-000 (“Keech Affidavit”), ¶7-13 (emphasis added).

initiatives). His findings were that such subsidized entry would depress overall market prices by \$1 billion dollars.¹⁷

17. The IMM, as well as PJM, continue to look at sensitivity studies every year after each BRA. These studies give a sense of scale to the potential dollar impacts. I looked for something comparable in scale (on the very conservative side) to show the consistency of these types of impacts with relatively small MW adjustments. The closest metric I found was a series of data from the IMM addressing load (not generator) reductions associated with the Short-Term Resource Procurement, a since-removed tariff provision that suppressed auction load by 2.5% each year. While not totally symmetric, because it is a demand shift and not a shift of the supply curve, it gives a very conservative lower bound on the type of subsidy impacts within the same scale as some of the actions Mr. Keech addresses. This is particularly of concern because none of these shifts exceeded approximately 3,800 MW, while the PJM “tolerance” under its repricing proposal is 5,000 MW. The results for a series of five years are in the following table:¹⁸

Year	2.5% STRP(1)	Dollar Impact (Reduced Payment To Generators)	MW Clearing Reduction
2013-14	2.50%	\$2,055,353,485	3388
2014-15	2.50%	\$1,236,157,884	3384
2015-16	2.50%	\$2,652,194,734	3046
2016-17	2.50%	\$1,381,039,855	2579
2017-18	2.50%	\$2,435,099,909	3358

(1) Short Term Resource Procurement (2.5% reduction in load)

¹⁷ *Impact on New Jersey Assembly Bill 3442 on PJM Capacity Market*, The Independent Market Monitor for PJM, dated January 6, 2011, p. 3. [The IMM’s numbers assumes the subsidized resources bid in at zero.]
http://www.monitoringanalytics.com/reports/Reports/2011/NJ_Assembly_3442_Impact_on_PJM_Capacity_Market.pdf

¹⁸ “Monitoring Analytics Report”:
http://www.monitoringanalytics.com/reports/Reports/2017/IMM_BRA_Scenario_Results_Summary_2017_0124.pdf

As Market Subsidies Grow, So too will the Problem

18. Additionally, Mr. Keech's and the IMM's scenarios are not extreme. Mr. Keech estimated an existing 3019 MW of non-exempted existing subsidized generation, approximately in scale with the IMM impacts above. But his evaluation is quite conservative, as it ignores the recent New Jersey proposals that would target subsidies for both an extensive RPS program and nuclear generation that could represent 50% of load being met by subsidized renewable energy (AB 3723) and additional subsidies to approximately 4000 MW of nuclear generation (SB 2313). Beyond that, a third bill (SB 1217) seeks subsidies for 1100 MW of offshore wind and 2000 MW of storage.¹⁹ These enormous market interventions swamp the type of sensitivity cases I presented above. When combined with Mr. Keech's estimate of existing impacts, this could approach approximately 10-12,000 MW. Looking at the IMM sensitivities for the five-year period above, shifts of supply in this range were captured in several years by excluding demand response and energy efficiency resources that were in the range of 10,000 MW. The scale of impacts here, which represent the removal of limited products, comports with the potential scale of the combined impacts of just one state's proposed programs combined with existing subsidized resources, as estimated by Mr. Keech.²⁰ Again, this isn't exactly a one to one comparison because of how the detailed representation is made in the actual modeling. But in this case for two years, it represents the impact of removing 8-10,000 MW of supply, comparable, but not exactly the same, as the notion of having an additional 10,000 MW of price-taking subsidized offers, or another 10,000 of unmitigated supply bidding at zero.

¹⁹ [Amid Arguments and Warnings, Nuclear Subsidy Bill Clears Committee, NJ Spotlight, April 6, 2018.](#)

²⁰ Marketing Analytics Report.

IMM Sensitivities on Removing Supply

Year	Dollar Impact Reduced Payment To Generators	MW Impact Clearing MW Decrease
2015-16	\$12,723,209,998.00	8179
2016-17	\$10,117,362,008.00	10413

These numbers show dramatically what the longer-term impacts are of these potential shifts in the supply curve when all of the facilities with Material Subsidies enter the market as price takers for the sale of capacity. The Commission cannot reasonably conclude that a market distorted to this degree is sustainable, just and reasonable.

19. The affidavit of PJM witness Dr. Anthony Giacomoni adds additional detail to the future exposures to subsidized new entry in PJM. He gives a state-by-state review of nuclear subsidies, offshore wind and aggregate renewable portfolio standards with mandatory compliance provisions. PJM clearly understands its capacity markets are a melting iceberg under siege from the warming seas of state policy interventions. He demonstrates PJM’s 5,000 MW threshold would be met this year:

25. As noted above, the Illinois ZEC program provides payments to Exelon for both Unit 1 and Unit 2 of Quad Cities, which Mr. Keech notes have a PJM Region capacity of approximately 1,400 MWs. If the New Jersey legislation endorsed by the state appropriation and budget committees in April 2018 is adopted and both the Salem and Hope Creek plants are found eligible, then that program would subsidize approximately 3360 MWs of PJM Region capacity.

26. As also explained above, the Maryland program authorized by the Maryland Offshore Wind Energy Act of 2013 contemplates up to 250 MW of offshore wind, while the New Jersey program authorized by the New Jersey Offshore Wind Economic Development Act of 2010 contemplates up to 1,100 MW of offshore wind as an initial phase.

27. State RPS programs also provide subsidies to thousands of MWs of capacity. As shown above, RPS states are mostly meeting their RPS percentage requirements. If they continue to meet those requirements, the RPS percentages prescribed by state law provide a good basis for estimating the MWs of capacity that will receive subsidies under these

programs. To estimate these MWs, PJM prepared the analysis reflected in Attachment 1 to this affidavit...

....

29. As can be seen on the last line of Attachment 1, PJM estimates that 4,969 MWs of “around-the-clock” capacity (located and metered in the PJM Region) are needed in 2018 to generate the RPS requirements for energy in the PJM Region. The “around-the-clock” assumption ignores differing capacity factors of RPS resources and assumes all capacity needed to meet RPS needs will operate at 100 % capacity factor— meaning the assumption is very conservative, and actual capacity to meet RPS requirements would be higher. PJM estimates that the RPS “around-the-clock” capacity requirement will exceed 8,000 MWs by 2025; and will increase to 8,866 MWs by the end of the analysis period in 2033.²¹

Level of Subsidies Versus Market Prices.

20. Dr. Giacomoni also adds some very valuable information regarding the scale of the subsidies versus recent BRA results. His analysis emphasizes the expected resulting behavior absent appropriate mitigation. The higher the subsidy, the more incentive to clear in the PJM markets via a zero or extremely low offer. The following table summarizes his results.

Summary of Giacomoni Results²²

Example	Level of Subsidy in \$/MWD
NJ Solar	\$2,575.00
NJ Nuclear	\$265.00
NJ Wind	\$250.00
Ohio Solar	\$59.00
Ohio Wind	\$202.00
DC Solar	\$4,751.00
DC Wind	\$134.00
DE Wind	\$253.00
MD Solar	\$128.00
MD WIND	\$243.00

²¹ Affidavit of Dr. Anthony Giacomoni on Behalf of PJM Interconnection, L.L.C., Docket No. ER18-1314-000 (“Giacomoni Affidavit”), ¶ 25-27; 29 (emphasis added).

²² Giacomoni Affidavit, p. 2.

21. By comparison, in the most recent auction for the 2020-21 delivery year, which required all resources to be annual Capacity Performance resources, the payments in dollars per MW day were:

Location	CP Price \$/MWD 2020-21 Delivery Year
RTO	\$76.53
MAAC	\$86.04
EMAAC	\$187.87
COM ED	\$188.12
DEOK	\$130

The scale of subsidies, as determined by Dr. Giacomoni, is overwhelming versus current market pricing for a capacity product. As the Commission-approved market construct for addressing resource adequacy in PJM, capacity market signals that are significantly dwarfed by out-of-market payment should provide the Commission great pause.

What to Do: PJM’s Proposals

22. PJM clearly understands the problem, the perniciousness of subsidies, and the need for action:

Longer term, the state load potentially faces a more costly system, because efficient new entry was turned aside as a result of the subsidy. The state otherwise expects to rely on the competitive market to meet its load’s long-term reliability needs at an efficient cost. But subsidizing one uneconomic plant is not enough to ensure long-term reliability, because the competitive mechanism (on which the state otherwise depends) has been thwarted. Other potential new entrants that need a market that values their capacity based only on their project’s cost efficiencies may be deterred from offering into a market whose results are significantly affected by selective state subsidies.

The real world is more complicated than this simple example, but it serves to illustrate a critical point: the state subsidy program is being underwritten by other participants in the wholesale market. The question of state subsidy programs is not just a matter of respecting a state policy choice within its domain, it also imposes important and detrimental consequences on the federally regulated wholesale market. Advancing

state policy by offering a subsidy tied to revenues received by a resource in PJM's markets effectively forces other participants in the wholesale market to pay for that objective. *Therefore, this is not merely a case of discrimination between one party that enjoys a subsidy and one that does not. It is worse than that, because other wholesale market participants, excluded from the subsidy, are also effectively required to help pay for the favored party's subsidy. That forced enlistment of other wholesale market actors to help the state achieve its objective necessitates a response by the federal regulator of the wholesale market.*²³

23. In the face of such overwhelming numbers and impacts, PJM appropriately concluded that it needs to take action and that “doing nothing” is not an option. There is no doubt that there is agreement on materiality and the need to act:

As the U.S. Supreme Court recently recognized, states rightly may pursue “various . . . measures . . . to encourage development of new or clean generation” or other vital public policy goals. (Cite to *Hughes v. Talen Energy Mktg., LLC*, 136 S. Ct. 1288, 1299 (2016)) Thus, the question raised by PJM's filing in this case is not whether states have the right to act but instead how the wholesale market should respond to such actions so that the goal of ensuring just and reasonable rates is not frustrated by an individual state's actions. To be clear, this filing does not seek any action by the Commission in preempting any state from making whatever policy choices it wishes. Rather, consistent with *Hughes* and the District Court's decision in *Village of Old Mill □Creek v. Star*, **the sole issue is how PJM and the Commission can ensure that the market can address these actions by states in a manner that does not undermine the fundamental purpose of the wholesale market.**²⁴

24. PJM offers two alternatives to the Commission, referred to as “Capacity Repricing” and “MOPR-Ex.” The first alternative, Capacity Repricing, is PJM's preferred alternative, although it acknowledges that it considers both alternatives to be just and reasonable. The Capacity Repricing proposal works via an initial auction for determining “who clears” that permits fully subsidized units to bid and clear with \$0/MWh bids. “Winners” of the first auction receive a formal supply obligation for the

²³ Capacity Reform Proposal, pp. 32-33, (emphasis added).

²⁴ *Id.*, p. 4 (footnotes removed, emphasis added).

designated delivery year that includes a payment commitment. The clearing price for the unsubsidized winners is then set by a second auction. In the second auction, a subset of the units with a Material Subsidy (e.g. those designated as having an Actionable Subsidy) are then mitigated to a proxy price that is determined to be more representative of a competitive offer (this applies to both new entry and existing units). The pricing derived from this second auction is then applied to the winners of the first auction. *Being a winner or clearing in the second auction has no bearing on who receives BRA-based capacity payments. Capacity obligations are solely determined by the first auction results reflecting the impact of subsidized offers.*

25. The second alternative is referred to as an expanded MOPR or MOPR-Ex. The general logic of a Minimum Offer Price Rule is to mitigate subsidized units prior to the auction. Offer prices for units (new and existing) receiving Actionable Subsidies²⁵ are mitigated and the mitigated values used in the only auction to determine pricing for all cleared resources. Cleared resources will have a capacity supply obligation in the designated delivery year at the clearing price(s). The key reforms in the MOPR-Ex as compared to the existing MOPR are an expansion of the type of resources covered (versus only CT and CC units today) and the addition of four, very material categorical exemptions (self-supply, competitive entry, RPS and public entity exemptions²⁶):

Given that the purpose of the MOPR-Ex is to address the price suppressive effects of material state subsidies on RPM Auction clearing prices, PJM is proposing to exclude from the definition of Capacity Resource with Actionable Subsidy the types of resources that are not likely to raise price suppression concerns. PJM proposes to accomplish such exclusion by establishing (or in some cases re-establishing) categorical exemptions to provide an objective, transparent process for sellers of resources that receive a Material Subsidy to demonstrate that Sell Offers for such resources do not raise price suppression concerns based on the characteristics of the seller or the applicable Material Subsidy. Specifically, PJM is re-proposing the Self-Supply and Competitive Entry

²⁵ See, in particular, Capacity Reform Proposal, pp. 61-78.

²⁶ Note that the RPS and public entity exemptions have never been included in the PJM MOPR, while the competitive entry and self-supply exemptions were previously included in the PJM MOPR but no longer exist in the current MOPR.

Exemptions that were initially approved in Docket No. ER13-535 and were in place for seven years of RPM Auctions. In addition, PJM is proposing two new categorical exemptions: the Public Entity Exemption and the RPS Exemption.²⁷

Flaws in PJM's Proposals – Capacity Repricing

26. PJM refers to the capacity repricing approach as a form of accommodation of the various state subsidies. That is, its basic function is to assure that all existing subsidized units can offer their capacity into the RPM/BRA at a price reflective of their subsidies. Once the pool of units is selected, including those being subsidized, pricing is set in the second auction. Thus, who wins (the quantity of capacity) and what they are paid (the price) are separate determinations. There are several fundamental problems with this approach that result in distorted pricing and interference with efficient entry of new generation and exit of existing generation. This approach has been considered before in ISO-NE and, though better than the status quo, it is clearly second best due to the resulting distortions.

27. First and most importantly, the Capacity Repricing proposal virtually assures all subsidized units of clearing the auction. Allowing the subsidized units to clear based on subsidized offers almost forces this result. As PJM concedes, repricing is designed to accommodate state policies.

28. This accommodation approach, while ignoring the underlying issues associated with subsidies, causes other problems to occur. Repricing can result in units without capacity obligations setting the clearing price and it is fully expected that units without capacity obligations will be infra-marginal (clear) in the price setting auction. The subsidized resource suppresses price in auction 1, but a more accurate picture of the true competitive environment is displayed in the prices obtained in auction 2, the repricing auction. As PJM explicitly states, units that fail to clear auction 1 but are relied on for pricing purposes in the more market representative auction 2 do not receive any capacity

²⁷ Capacity Reform Proposal, p. 102.

award.²⁸ It would be expected that these otherwise economic units would either retire or if they were new entrants, not proceed to construction and operation. Further, one would expect these otherwise competitive offers to “disappear” in the future, influencing the shape of the supply curve and amplifying price distortions. In these situations, it is the state subsidy that is determining the resource that receives the capacity obligation and not the PJM capacity market.

29. The third basic problem is the incentive to not bid marginal cost due to the price distortions. By segmenting who is a winner from what they get paid, parties will rationally bid in a fashion to try and clear in auction 1 by offering lower than marginal cost and hoping to recoup their costs (and more) in the higher priced second auction. Thus, one of the fundamental benefits of competitive clearing markets and the “law of one price” are forgone. Capacity suppliers will no longer have an incentive to represent their true prices in the first auction, and presumably with this first auction bias to under bid, it makes the new entry inefficiency discussed in the last paragraph even worse. PJM naively dismisses this concern without any substantiation.²⁹ Material changes in behavior will always occur as market payments and incentives change, sometimes with a market “disappearing” virtually overnight (e.g. when UTC bids were made subject to possible refund).³⁰ It would be irrational for an offeror not to consider the implications of failing to clear the first auction and subsequently adjust its behavior. This underpricing for the

²⁸ See, generally, Capacity Reform Proposal, pp. 61-67. Should the resources enter in any event, they would be eligible for CP bonus payments, but empirically those have been zero for three years, and will likely remain near zero as more and more units are subsidized and the incentive to retire is removed.

²⁹ Per PJM, “Indeed, accommodating state resource decisions by allowing the auction to clear resources with below-cost, subsidized offers will unavoidably displace resources at the higher cost end of the supply stack. Thus, the fact that the Capacity Market Clearing Price may be determined by a resource that did not clear the auction or receive a capacity commitment (see column H in Figure 4 above) does not undermine the validity of the BRA clearing results or the clearing price. Rather, it reflects the policy decision to accommodate state resource decisions and benefit load by allowing load to only pay for capacity once—through the capacity market, rather than paying once through the market and a second time through state payment to resources that did not clear the market.” Capacity Reform Proposal, p. 65.

³⁰ See generally, <http://www.pjm.com/~media/committees-groups/committees/mc/20141027-webinar/20141027-item-04-utc-reduction-impacts.ashx>.

first auction is likely to be even more pronounced with a CP design, as the potential for any bonus payments diminishes due to the extreme market surplus.³¹

30. The Capacity Repricing proposal also carries a fourth material problem. The overall problem of the “middle units” that clear the second auction but not the first is likely to be met with the same type of lobbying for subsidies as we have seen from other generation sources. These units will surely point out that they are more economic than subsidized units and seek some form of compensation. This is what the IMM has referred to as subsidies being “contagious.”³²

31. A simple litmus test of the Capacity Repricing proposal is to compare its behavior to the Commission’s CASPR “checklist”:

- Repricing does not facilitate robust competition for capacity supply obligations, it distorts prices, discourages certain new entry and promotes continued price discrimination for favored types of supply.
- Repricing does not provide price signals that guide the orderly entry and exit of capacity resources, it encourages potentially uneconomic facilities to underbid to capture the benefit of the second auction pricing, while disqualifying units that transparently are economic in the second auction but for the preferred subsidized units seen in the first auction.
- Repricing does not result in the selection of the least-cost set of resources that possess the attributes sought by the markets for all the above reasons and fosters discrimination in the type of supply as well as cost increases. Patently excessive prices are encouraged as their owners are buoyed by subsidies. (See table in paragraph 20 above regarding PJM’s own calculation of subsidy levels).
- Clearly the 2-stage process fails to provide price transparency by separating the determination of quantity and price.
- Capacity repricing does not shift risk as appropriate from customers to private capital, it does just the opposite by burdening customers with non-bypassable charges for the subsidies regardless of the efficiency or cost of

³¹ Capacity Reform Proposal, p. 11, referring to 23% margins in the current market.

³² Statement of Joseph Bowring, Technical Conference, May 1-2, 2017 AD17-11.
<https://www.ferc.gov/CalendarFiles/20170426150935-Bowring,%20Monitoring%20Analytics.pdf>

competitors. Cumulative price suppression will also be anticipated to raise total costs in the future based on adjustment of new entry offers.

- Capacity repricing does not mitigate all market power. At the most macro-level it rewards those participants that are most effective in garnering political support and subsidies, not those who offer innovation and competition.

32. I have been informed by P3 that the Electric Power Supply Association (“EPSA”) is sponsoring a more in-depth analyses of the Capacity Repricing proposal. I have reviewed the EPSA-sponsored analysis and agree with its general assessment.³³

Flaws in PJM’s Proposals – MOPR-Ex

33. In the abstract, the Minimum Offer Price Rule concept is a simple, very directed, and relatively easy to implement mitigation procedure to address uneconomic participation stemming from Material Subsidies. The offer for a subsidized participant is set at where a rational bidder would offer in the context of the PJM market design regardless of the level of subsidies. The same would apply to an existing facility where mitigated prices would reflect going forward costs, consistent with something similar to the Avoided Cost Rate now defined in the PJM Tariff.³⁴ Price mitigation like this would address all of the Commission’s and PJM’s principles.

34. MOPR-Ex, while addressing some of the flaws of the current market, fails to completely address the problems. Having spent at least 37 pages explaining the evils of subsidies, including extensive detail in two affidavits, on the scale of existing and potential subsidized units and their price suppression, PJM offers a new MOPR-Ex proposal that is riddled with problematic exceptions. Leaving virtually no one out the MOPR-Ex, with its numerous exceptions, allows parties to effectively bid zero and depress prices, exactly what PJM agrees should be avoided.

³³ Affidavit of David W. Deramus, Ph.D., and Collin Cain, M.SC., Protest of the Electric Power Supply Association, ER18-1314-000, dated May 7, 2018.

³⁴ PJM Tariff, Attachment DD §5.14(h).

35. Proposed Tariff revision Attachment DD, section 5.14(h)(6), retains the unit-specific exemption. This essentially allows any new entrant or existing units to offer into the RPM auction based on demonstrated actual costs. Though seemingly rational, this exemption has proved very problematic in the past to implement. Indeed, one of the drivers of the compromise offered to the Commission in 2013 was the lack of specific or sufficiently objective procedures in the unit specific exemption process as virtually any unit could successfully claim such an exemption.

36. The second exemption in the proposed Tariff revision for MOPR-Ex is the expanded self-supply exemption in Attachment DD, section 5.14(h)(7). This exemption has been, and remains, a very troubling element of PJM's efforts to address subsidized generation. This exemption, in my opinion, has always been a political compromise to accommodate certain parties who wish to retain their "historic business models." But consideration shows this is simply a self-serving statement. Where in their historic business model was there an automatically available market to sell these parties' surplus generation? Why join an RTO and enjoy all the benefits/efficiencies of centralized commitment and dispatch and then seek to retain the right to incur costs on a captive or cost of service basis and then subsequently "lean" on the rest of the market to support your capital investments until you actually need them? While PJM has tried to address these issues on a limited basis in the past by providing net short and net long restrictions, PJM has never dealt head on with the simple reality: if the energy market is efficient in balancing net short or long positions by substituting purchases or sales in the RTO market, why isn't the same true for capacity? The answer is obvious, these parties seek to "have their cake and eat it too."

37. This asymmetry is emphasized when one recognizes that these entities, intent on maintaining their traditional business models, are totally free to do so under the current Tariff by simply choosing the FRR option.³⁵ Under FRR, self-supply entities are free to build what they want and meet their own needs via appropriate demonstrations to PJM. But their ability to buy and sell to level excess or shortage in their capacity portfolios

³⁵ RAA, Schedule 8.1.

through the central market is limited (not limited enough in my opinion as I have testified in the past).

38. The simple consideration for the Commission with respect to this Exemption is to ask the question “why?” If the historic business models are so valuable, why do participants seek to only preserve a part of it via exemption, while exploiting the rest of the advantages of the RTO to their benefit? Presumably the exemption is desirable because it allows them to achieve a benefit not otherwise attainable. But at what cost to the market as a whole? In many ways, this is similar to a zero-sum game. If self-supply benefits some parties, then it is harming others, particularly competitive suppliers, by continually helping to drive the market long. Those seeking self-supply are insulated from these depressed prices, yet automatically find compensation for their surplus as a benefit. This benefit is not available to unsubsidized competitors who do not enjoy assured revenue streams. This simple observation explains much about what is wrong with the status quo, and by incorporation MOPR-Ex, as filed by PJM.

39. Alternatively, if there is not a discriminatory benefit, parties should be willing to forgo the exemption or be indifferent to choosing a FRR-type arrangement. History tells us this has been one of the most contested and sought-after exemptions within the stakeholder process. The answer to these rhetorical questions is clear: the self-supply exemption is desired because it has a differential and discriminatory benefit to those claiming the exemption.

40. PJM has argued that such an exemption has minimal impact, noting that “only” 4,152 MW have entered the market under the self-supply exemption since the 2016-17 delivery year.³⁶ But PJM’s analyses soundly rebut its own assertion. This amount of capacity sits right between the *conservative analyses* Mr. Keech stated should result in price reductions of 10%-21%. This level of impact was associated with additions between 3-6,000 MWs of new price taking supply assuming it was all located outside of MAAC (i.e. RTO).³⁷ If this range of additional price taking supply were located inside of

³⁶ Capacity Reform Proposal, p. 77.

³⁷ Keech Affidavit, ¶ 7.

MAAC, the impacts would be price suppression of 20%-33%.³⁸ PJM's own results are a vivid reminder of what a "little" compromise does to competition.

41. The third exemption in the revision is for Competitive Entry, proposed Tariff revision Attachment DD, section 5.14(h)(8). Effectively, if a new or existing entrant can satisfactorily demonstrate that they do not receive a Material Subsidy, they would be exempt from MOPR-Ex. As I have testified in the past, this is a rational exemption. I have facetiously referred to this as the "stupid money" problem, alluding to the idea that regardless of whether an investment is deemed "economic" by others, so long as it is supported by at-risk capital without an out-of-market subsidy, such an investment is welcomed to compete free of mitigation. While this may indeed harm incumbent participants, this is a basic competitive risk, and no different in concept than an incumbent facility remaining in the market when it is uneconomic and would be financially better off (to third party observers) retiring.

42. The fourth exemption in the MOPR revision is Attachment DD, section 5.14(h)(9) for Public Entities. This exemption is not well differentiated from the general self-supply exemption and has the same problems. For smaller entities, this exemption essentially allows them to build up to 600 MWs of additional capacity over and above their own requirements without mitigation. In the presence of a 150,000 MW-plus market and balancing opportunities that are very liquid, public entities would be expected to delay material capital investments until justified by market prices. Instead, the public entities exemptions allows such an entity to over-build by up to 600 MWs and lay the surplus off on the market at the expense of other suppliers. Since these public entities are indifferent to the price suppression and receive assured returns and earnings, the public entities exemption contained in the proposed MOPR-Ex provides an affirmative incentive to overbuild.

43. Again, the Commission should ask themselves why a public entities exemption is necessary. What are the benefits to the market, not just to these participants, that justify this? While I can think of externalities for the exempted parties (e.g. the psychological

³⁸ *Id.* ¶ 8.

benefit of building a big toy), as well as the ability to lean on the RTO for surplus balancing, I never have heard a reasonable explanation for such an exemption over the past decade beyond the statement that “this is our historic business model.” Somewhere there is a failure to communicate about the implications of Orders 888, 2000, 1000, EPACT 2005 etc. The idea was to change the market to a competitive footing, not preserve “historic business models” at the expense of those willing to take on the risks and benefits of competition.

44. The fifth exemption in the MOPR tariff revision is Attachment DD, section 5.14(h)(10) for Renewable Portfolio Standards or RPS. This exemption is very broad and any new facility would be exempt if “the Capacity Resource complies with the requirements of a state-mandated renewable portfolio standard or voluntary renewable portfolio standard”³⁹ While there are other potential criteria, this condition is all inclusive and would allow fully discriminatory procurement by resource type and any other criteria presented in a RPS.

45. When it comes to credibility of the MOPR-Ex alternative, the RPS exemption clearly sinks the ship. Dr. Giacomoni’s entire affidavit is devoted to the exposure that the PJM capacity market has to the growing phenomenon of subsidized generation. I discuss this fully above and Dr. Giacomoni’s affidavit offers full details. In the context of Mr. Keech’s affidavit, we are exempting many thousands of MWs with the attendant price suppression. This is not simply an exemption, it is surrender.

The Only Realistic Fix That Works: A “Clean” MOPR

46. All of the above brings us to my recommendation. As the Commission has concluded on numerous occasions, a MOPR-based approach is the correct one. A properly designed MOPR prevents quantity and price distortions before they can harm the market. The missing element is making it “strong” enough, via the elimination of clearly inappropriate exemptions. My recommendation is to do just that and create a new option: a “Clean MOPR.”

47. Given the flaws of the Repricing and MOPR-Ex proposals, and the need to correct an unjust and unreasonable market design tariff, I propose a market construct based on a

³⁹ Capacity Reform Proposal, p. 355. Attachment DD, section 5.14(h)(10), redline.

simple proposition: units that have been identified with a Material Subsidy should be mitigated. The only exception would be Competitive Entry, which presumably can be addressed by a clarification of the definition of Material Subsidy (if not already deemed to apply to such unit) and the allowance of mitigation to a unit specific cost.⁴⁰ All other new entrants and existing facilities would be mitigated to appropriate reference prices if necessary.

48. From an implementation stand point, a Clean MOPR would be very easy to put into effect, as it requires very little adjustment from the proposed MOPR-Ex process which PJM has deemed just and reasonable. Just like under MOPR-Ex, under a Clean MOPR approach, PJM would need to first determine if a capacity resource is receiving a material subsidy. The analysis would be exactly the same under MOPR-Ex and Clean MOPR. If a unit is deemed to have a material subsidy, then there would be no further need to determine whether the unit qualified for one of the MOPR-Ex exceptions and mitigation would apply. The approach is very straight-forward, easily understood and administratively simpler than MOPR-Ex.

49. The benefits of this simple solution become obvious when compared to the Commission's fundamental principles from their CASPR Order.

- A Clean MOPR facilitates robust competition for capacity supply obligations, all units are on an equal footing in the Commission's jurisdictional markets.
- A Clean MOPR doesn't impede or distort price signals, risks reside on those who wish to support out of mark subsidies, not on others. In turn it provides price signals that guide the orderly entry and exit of capacity resources.
- A Clean MOPR results in the selection of the least-cost set of RTO resources that satisfy market needs without artificial price suppression.

⁴⁰ One of the questions that could be addressed in the subsequent proceeding that P3 calls for in its pleading is whether there is a need for an explicit competitive entry exemption if the PJM definition of material subsidy is adopted. At this point, it is not clear to me whether the definition of material subsidy effectively eliminates the need for an explicit exemption for unsubsidized new entry. PJM stakeholder input on this question could be beneficial.

There is no price distortion. Subsidies can exist, but at the risk of the sponsor should a mitigated subsidized unit fail to clear the RPM market.

- A Clean MOPR provides price transparency, there would be no subsidies to distort the auction process. An implementation issue would be assuring the accuracy of mitigated and unit specific offers.
- A Clean MOPR shifts risk as appropriate from customers to private capital or the political entities sponsoring or mandating the subsidies. There is open choice for those who propose the subsidy to either face the risk of not clearing in the auction or to potentially elect to remove themselves from the general capacity markets and accept FRR status. The decision is that of the states, and the associated costs are not foisted on the rest of the market.
- A Clean MOPR helps mitigate market power. No rule per se eliminates market power, but it can make it more transparent and easier to identify then mitigate. In the absence of price distortions, the Clean MOPR accomplishes just these objectives.

50. If such an alternative were implemented, states or others offering subsidies would be presented with a clear alternative, either forgo the subsidy and associated local objectives or face the potential consequences of their “favored” alternatives not receiving a capacity payment. As PJM notes, this would expose them to potential additional costs. But those costs would be an explicit risk that the sponsor of the subsidy agrees to take on, rather than involuntarily imposing those costs and risks on others.

51. I recognize that such a recommendation is outside of the scope of this Section 205 filing and thus, again, urge the Commission to reject PJM’s two alternatives and initiate an appropriate proceeding to institute a proper and effective Minimum Offer Price Rule in accordance with my above findings and conclusions.

52. As I stated earlier, I would expect that the actual details of implementation, many elements of which are already in the existing and proposed tariffs, would be guided by direction from the Commission. This is not a difficult task, but unnecessary to address here in the context of determining whether either of PJM’s two proposals are just and reasonable. With Commission direction, I would think a new filing comporting with my

recommendation could be prepared within several months at most, well before any deadlines for the 2019 BRA.

53. This concludes my affidavit.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.

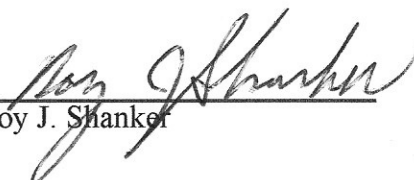
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Docket No. ER18-1314-000

AFFIDAVIT

I, Roy J. Shanker, do hereby swear and affirm under penalty of law that the statements in the foregoing Affidavit of Roy J. Shanker, Ph. D. are true to the best of my knowledge, information and belief.

Executed this 7th day of May, 2018.



Roy J. Shanker

**QUALIFICATIONS
AND
EXPERIENCE OF
DR. ROY J. SHANKER**

EDUCATION:

Swarthmore College, Swarthmore, PA
A.B., Physics, 1970

Carnegie-Mellon University, Pittsburgh, PA
Graduate School of Industrial Administration
MSIA Industrial Administration, 1972
Ph.D., Industrial Administration, 1975

Doctoral research in the development of new non-parametric multivariate techniques for data analysis, with applications in business, marketing and finance.

EXPERIENCE:

1981 - Independent Consultant
Present P.O. Box 1480
Pebble Beach, CA 93953

Providing management and economic consulting services in natural resource-related industries, primarily electric and natural gas utilities.

1979-81 Hagler, Bailly & Company
2301 M Street, N.W.
Washington, D.C.

Principal and a founding partner of the firm; director of electric utility practice area. The firm conducted economic, financial, and technical management consulting analyses in the natural resource area.

1976-79 Resource Planning Associates, Inc.
1901 L Street, N.W.

Washington, D.C.

Principal of the firm; management consultant on resource problems, director of the Washington, D.C. utility practice. Direct supervisor of approximately 20 people.

1973-76 Institute for Defense Analysis
Professional Staff
400 Army-Navy Drive
Arlington, VA

Member of 25 person doctoral level research staff conducting economic and operations research analyses of military and resource problems.

RELEVANT EXPERIENCE:

2018

244—On behalf of Joint Commentors. Federal Energy Regulatory Commission Docket EL18-34. Participation in the preparation of comments addressing PJM's proposed fast start pricing modifications and related price formation issues.

243—On behalf of the PJM Power Providers Group. Federal Energy Regulatory Commission Dockets EL17-32 and EL17-36. Pre-Technical Conference Comments and participant technical conference regarding seasonal products and specific related reliability and forecasting questions from Commission Staff.

2017

242—On behalf of the PSEG Companies. Federal Energy Regulatory Commission Docket No. ER13-535-000. Affidavit regarding implementation of Court of Appeals remand to FERC of the PJM capacity market Minimum Offer Price Rule.

241-- In the United States Court of Appeals for the Second Circuit. Case No. 17-2654. Co-writer/sponsor of the Brief of Energy Economists as Amici Curiae in Support of Plaintiffs-Appealants-Reversal. Comments regarding the impacts of subsidies on the operation of organized electric markets.

240—In the United States Court of Appeals for the Seventh Circuit. No. 17-2433. Co-writer/sponsor of the Brief of Energy Economists as Amici

Cucrae in Support of Plaintiffs-Appealants. Comments regarding the impacts of subsidies on the operation of organized electric markets.

239—Invited speaker Federal Energy Regulatory Commission technical session, Docket AD17-11. Comments on the appropriate incorporation of state policies in wholesale electric markets. Submission of post technical session comments.

238—On behalf of PJM Power Providers. Federal Energy Regulatory Commission Dockets EL17-36 and EL17-32 addressing the current Capacity Performance design and criticisms related to the exclusion of an inferior seasonal product. Explanation of how PJM establishes its adequacy targets and whether or not the asserted criticisms were valid.

2016

237- On behalf of DC Energy, Vitol, Intertia Power, Saracen Energy East. Federal Energy Regulatory Commission Dockets EL16-6, ER16-121. Submission of post technical session statement regarding PJM FTR market “netting” proposal.

236-On behalf of DC Energy, Vitol, Intertia Power, Saracen Energy East. Federal Energy Regulatory Commission Dockets EL16-6, ER16-121. Participant in two Technical Session Panels addressing PJM FTR market design and deficiency in the pending proposal to remove netting in the market settlement.

2015

235- On behalf of the Electric Power Supply Association. Federal Energy Regulatory Commission Dockets EL15-70, 71, 72, 82. Affidavit regarding MISO capacity market design and also addressing use of opportunity costs in offers.

234-On behalf of the Electric Power Supply Association. Federal Energy Regulatory Commission Dockets EL15-70, 71, 72, 82. Discussant in technical session addressing the establishment of opportunity costs as the basis for capacity reference pricing in the MISO Planning Resource Auctions.

233-On behalf of Dominion Virginia Power. Federal Energy Regulatory Commission Docket ER15-1966. Affidavit regarding changing economic incentives for suppliers associated with the modification of PJM’s calculation of Lost Opportunity Costs.

232-On behalf of “Indicated Suppliers” Federal Energy Regulatory Commission Docket No. EL15-64-000. Testimony addressing the appropriateness of proposed changes to the NYISO buyer side mitigation exemptions.

231-On behalf of Hydro Quebec, Energy Services U.S. Federal Energy Regulatory Commission Docket No. ER15-623. Affidavit addressing the consistent treatment of energy imports under PJM’s Capacity Performance proposal.

230-Before the Supreme Court of the United States, No. 14-995, On Petition for a Writ of Certiorari to the United States Court of Appeals for the Third Circuit. Brief of electrical engineers, scientists and economists as amici curiae in support of petitioners. Metropolitan Edison et. al. versus Pennsylvania Public Utility Commission et. al.
http://www.americanbar.org/content/dam/aba/publications/supreme_court_preview/briefs_2015_2016/14-840_Borlick_et_al.pdf

2014

229-On behalf of Benton County Wind Farm. United States District Court Southern District of Indiana, Indianapolis Division, Civil Action No. 1:13-cv-1984-SEB-TAB. Expert Reports addressing custom and practice in electric power purchase agreements.

228-On behalf of FirstEnergy Services. FERC Docket EL14-55. Affidavit related to the appropriate characterization of Demand Response in Capacity Markets reflecting performance as the reduction of retail energy consumption.

227)-Federal Energy Regulatory Commission. Docket RM10-17. On my own behalf, a statement regarding the ability of the PJM capacity and energy markets to clear in the transition from any determination that demand response would be excluded jurisdictionally from wholesale markets. This could in turn result in a more appropriate representation of retail demand response.

226) Illinois Commerce Commission. Matter: No. 13-0657. On behalf of Commonwealth Edison Company. Testimony regarding the operation of the PJM regional transmission expansion planning process in general and particularly with regards to the preservation of long-term transmission rights (Stage 1A Auction Revenue Rights), and the consequences that occur when such mandated rights are infeasible.

225-Federal Energy Regulatory Commission. Docket ER14-1579. On behalf of H-P Energy. Affidavit explaining importance of property rights and associated contracts within the PJM transmission planning process, particularly as they pertain to Upgrade Construction Service Agreements.

2013

224-Federal Energy Regulatory Commission. Docket No. ER14-456. On behalf of NextEra Energy to analyze a proposed modification to the PJM Tariff allowing for “easily resolved constraints” to be address by transmission upgrades without any analyses of benefits.

223-Federal Energy Regulatory Commission. Docket No. ER14-504. Affidavit on behalf of PJM Power Producers addressing the interaction between the PJM adequacy planning processes and the formulation of saturation constraints on Limited and Extended Summer Demand Response products.

222-Federal Energy Regulatory Commission. Docket AD13-7. Invited speaker on the Commission’s technical session regarding capacity markets in RTO’s. Comments addressed basic principles of market design, market features, and consequences of market failures and deviations from design principles.

221-Federal Energy Regulatory Commission. Docket No. EL13-62 on behalf of TC Ravenswood LLC. Two affidavits addressing the treatment of reliability support services agreements and associated capacity in the NYISO capacity market design.

2012

220-Federal Energy Regulatory Commission. Docket No. ER12-715-003. On behalf of First Energy Services Company. An affidavit and testimony addressing the appropriateness of the application of a proposed new MISO tariff provision after the fact to a withdrawing MISO member.

219-Federal Energy Regulatory Commission. Docket ER13-335. On behalf of Hydro Quebec U.S. Affidavit addressing appropriate application of ISO-NE Market Rule 1/ Tariff with respect to the qualification of new external capacity to participate in the Forward Capacity Market.

218-Federal Energy Regulatory Commission. Docket IN12-4. On behalf of Deutsche Bank Energy Trading. Affidavit regarding a review of specific transactions, related congestion revenue rights, and deficiencies in

CAISO tariff implementation during periods when market software produces multiple feasible pricing solutions.

217-Federal Energy Regulatory Commission. Docket No. ER12-715-003. On behalf of FirstEnergy Services Company. Affidavit regarding implementation of the MISO Tariff with respect to the determination of appropriate exit fees and charges related to certain transmission facilities.

216-Federal Energy Regulatory Commission. Docket No. IN12-11. On behalf of Rumford Paper Company. Affidavit regarding free riding behavior in the design of demand response programs, and its relationship to accusations of market manipulation.

215-Federal Energy Regulatory Commission. Docket No. IN12-10. On behalf of Lincoln Paper and Tissue LLC. Affidavit regarding relationship of demand response behavior and value established in Order 745 to claimed market impacts associated with accusations of market manipulation.

214-Federal Energy Regulatory Commission. Docket No. AD12-16-000. On behalf of PJM Power Providers, testimony regarding deliverability of capacity between the MISO and PJM RTO's and associated basic adequacy planning concepts.

213-United States Court Of Appeals, District of Columbia Circuit. Electric Power Supply Association, et al (Petitioners) v. Federal Energy Regulatory Commission et al (Respondents) Nos. 11-1486. Amici Curiae brief regarding the appropriate pricing of demand reduction services in wholesale markets vis a vis the FERC determinations in Order 745.

212-United States Supreme Court. Metropolitan Edison Company and Pennsylvania electric Company (Petitioners), Pennsylvania Public Utility Commission (Respondent) (No. 12-4) Amici Curiae brief regarding the nature of physical losses in electric transmission and relationship to proper marginal cost pricing of electric power and the marginal cost of transmission service.

2011

211-Federal Energy Regulatory Commission Docket No. ER12-513-000. On behalf of PJM Power Providers, testimony regarding the establishment of system wide values for the net cost of new entry related to modifications of the Reliability Planning Model.

210-Federal Energy Regulatory Commission Docket No. EL11-56-000, on behalf of First Energy Services. Affidavit regarding the appropriateness of proposed transmission cost allocation of Multi-Value Projects to an exiting member of the Midwest Independent System Operator.

209-Federal Energy Regulatory Commission Docket No. ER11-4081-000, on behalf of “Capacity Suppliers”. Affidavit addressing correct market design elements for Midwest Independent System Operator proposed resource adequacy market.

208-Public Utility Commission of Ohio, Case Nos. 11-346-EL-SSO,11-348-EL-SSO,Nos. 11-349-EL-AAM, 11-350-EL-AAM, on behalf of First Energy Services. Testimony regarding the interaction between the capacity default rates for retail access under the PJM Fixed Resource Requirement and the PJM Reliability Planning Model valuations.

207-Federal Energy Regulatory Commission Dockets No. ER11-2875, EL11-20, Staff Technical Conference on behalf of PJM Power Providers, addressing self supply and the Fixed Resource Requirement elements of PJM’s capacity market design.

206-New Jersey Board of Public Utilities, Docket Number EO11050309 on behalf of PSEG Companies. Affidavit addressing the implications of markets and market design elements, and regulatory actions on the relative risk and trade-offs between capital versus energy intensive generation investments.

205-Federal Energy Regulatory Commission Docket No. ER11-2875. Affidavit and supplemental statement on behalf of PJM Power Providers addressing flaws in the PJM tariff’s Minimum Offer Price Rule regarding new capacity entry and recommendations for tariff revisions.

204-Federal Energy Regulatory Commission Docket No. EL11-20. Affidavit on behalf of PJM Power Providers addressing flaws in the PJM tariff’s Minimum Offer Price Rule regarding new capacity entry.

203-Federal Energy Regulatory Commission Docket Nos. ER04-449. Affidavit and supplemental statement on behalf of New York Suppliers addressing the appropriate criteria for the establishment of a new capacity zone in the NYISO markets.

2010

202-New Jersey State Assembly and Senate. Statements on behalf of the Competitive Supplier Coalition addressing market power and reliability impacts of proposed legislation, Assembly Bill 3442 and Senate Bill 2381.

201-Federal Energy Regulatory Commission. Docket ER11-2183. Affidavit on behalf of First Energy Services Company addressing default capacity charges for Fixed Resource Requirement participants in the PJM Reliability Pricing Model capacity market design.

200-Federal Energy Regulatory Commission. Docket ER11-2059 Affidavit on behalf of First Energy Services Company addressing deficiencies and computational problems in the proposed “exit charges” for transmission owners leaving the MISO RTO related to long term transmission rights.

199-Federal Energy Regulatory Commission Docket RM10-17. Invited panelist addressing metrics for cost effectiveness of demand response and associated cost allocations and implications for monopsony power.

198-Federal Energy Regulatory Commission Consolidated Dockets ER10-787-000, EL10-50-000, and EL10-57-000. Two affidavits on behalf of the New England Power Generators Association regarding ISO-NE modified proposals for alternative price rule mitigation and zonal definitions/functions of locational capacity markets.

197-Federal Energy Regulatory Commission Docket No. ER10-2220-000. Affidavit on behalf of the Independent Energy Producers of New York. Addressing rest of state mitigation thresholds and procedures for adjusting thresholds for frequently mitigated units and reliability must run units.

196-Federal Energy Regulatory Commission Docket PA10-1. Affidavit on behalf of Entergy Services related to development of security constrained unit commitment software and its performance.

195-Federal Energy Regulatory Commission Docket No. ER09-1063-004. Testimony on behalf of the PJM Power Providers Group (P3) regarding the proposed shortage pricing mechanism to be implemented in the PJM energy market. Reply comments related to a similar proposal by the independent market monitor.

194-PJM RTO. Statement regarding the impact of the exercise of buyer market power in the PJM RPM/Capacity market. Panel discussant on the issue at the associated Long Term Capacity Market Issues Symposium.

193-Federal Energy Regulatory Commission Docket No. ER10-787-000. Affidavit on behalf of New England Power Generators Association addressing proper design of the alternative price rules (APR) for the ISO-NE Forward Capacity Auctions. Second affidavit offered in reply. Supplemental affidavit also submitted

192-Federal Energy Regulatory Commission Docket No. RM10-17-000. Affidavit on behalf of New England Power Generators Association addressing proper pricing for demand response compensation in organized wholesale regional transmission organizations.

191-Federal Energy Regulatory Commission Docket No. RM10-17-000, Affidavit on my on behalf regarding inconsistent representations made between filings in this docket and contemporaneous materials presented in the PJM stakeholder process.

2009

190-Federal Energy Regulatory Commission Docket No. ER09-1682. Two affidavits on behalf of an un-named party regarding confidential treatment of market data coupled with specific market participant bidding, and associated issues.

189-American Arbitration Association, Case No. 75-198-Y-00042-09 JMLE, on behalf of Rathdrum Power LLC. Report on the operation of specific pricing provision of a tolling power purchase agreement.

188-Federal Energy Regulatory Commission. Docket No. IN06-3-003. Analyses on behalf of Energy Transfer Partners L.P. regarding trading activity in physical and financial natural gas markets.

187-Federal Energy Regulatory Commission. Docket No. ER08-1281-000. Analyses on behalf of Fortis Energy Trading related to the impacts of loop flow on trading activities and pricing.

186-American Arbitration Association. Report on behalf of PEPCO Energy Services regarding several trading transactions related to the purchase and sale of Installed Capacity under the PJM Reliability Pricing Model.

185-Federal Energy Regulatory Commission Docket No. EL-0-47. Analyses on behalf of HQ Energy services (U.S.) regarding pricing and sale of energy associated with capacity imports into ISO-NE.

184-Federal Energy Regulatory Commission Docket No. ER04-449 019, Affidavit on behalf of HQ Energy Services (U.S.) regarding the implementation of the consensus deliverability plan for the NYISO, and associated reliability impacts of imports.

183-Federal Energy Regulatory Commission Docket ER09-412-000, ER05-1410-010, EL05-148-010. Affidavit and Reply Affidavit on behalf

of PSEG Companies addressing proposed changes to the PJM Reliability Pricing Model and rebuttal related to other parties' filings.

2008

182-Pennsylvania Public Service Commission. *En Banc* Public Hearing on "Current and Future Wholesale Electricity Markets", comments regarding the design of PJM wholesale market pricing and state restructuring.

181-Maine Public Utility Commission. Docket No. 2008-156. Testimony on behalf of a consortium of energy producers and suppliers addressing the potential withdrawal of Maine from ISO New England and associated market and supplier response.

180-Federal Energy Regulatory Commission. Docket No. EL08-67-000. Affidavit on behalf of Duke Energy Ohio and Reliant Energy regarding criticisms of the PJM reliability pricing model (RPM) transitional auctions.

179-Federal Energy Regulatory Commission. Docket AD08-4, on behalf of the PJM Power Providers. Statement and participation in technical session regarding the design and operation of capacity markets, the status of the PJM RPM market and comments regarding additional market design proposals.

178-Federal Energy Regulatory Commission. Docket ER06-456-006, Testimony on behalf of East Coast Power and Long Island Power Authority regarding appropriate cost allocation procedures for merchant transmission facilities within PJM.

2007

177-FERC Docket No. EL07-39-000. Testimony on behalf of Mirant Companies and Entergy Nuclear Power Marketing regarding the operation of the NYISO In-City Capacity market and the associated rules and proposed rule modifications.

176-FERC Dockets: RM07-19-000 and AD07-7-000, filing on behalf of the PJM Power Providers addressing conservation and scarcity pricing issues identified in the Commission's ANOPR on Competition.

175-FERC Docket No. EL07-67-000. Testimony and reply comments on behalf of Hydro Quebec U.S. regarding the operation of the NYISO TCC

market and appropriate bidding and competitive practices in the TCC and Energy markets.

174-FERC Docket Nos. EL06-45-003. Testimony on behalf of El Paso Electric regarding the appropriate interpretation of a bilateral transmission and exchange agreement.

2006

173-United States Bankruptcy Court for the Southern District of New York. Case No. 01-16034 (AJG). Report on Behalf of EPMI regarding the properties and operation of a power purchase agreement.

172-FERC Docket No. EL05-148-000. Testimony regarding the proposed Reliability Pricing Model settlement submitted for the PJM RTO.

171-FERC Docket No. ER06-1474-000, FERC. Testimony on behalf of the PSEG Companies regarding the PJM proposed new policy for including “market efficiency” transmission upgrades in the regional transmission expansion plan.

170-FERC Docket No. EL05-148-000, FERC. Participation in Commission technical sessions regarding the PJM proposed Reliability Pricing Model.

169-FERC Docket No. EL05-148-000, FERC. Comments filed on behalf of six PJM market participants concerning the proposed rules for participation in the PJM Reliability Pricing Model Installed Capacity market, and related rules for opting out of the RPM market.

168-FERC Docket No. ER06-407-000. Testimony on behalf of GSG, regarding interconnection issues for new wind generation facilities within PJM.

2005

167-FERC Docket No. EL05-121-000, Testimony on behalf of several PJM Transmission Owners (Responsible Pricing Alliance) regarding alternative regional rate designs for transmission service and associated market design issues.

166-FERC Technical Conference of June 16, 2005. (Docket Nos. PL05-7-000, EL03-236-000, ER04-539-000). Invited participant. Statement regarding the operation of the PJM Capacity market and the proposed new Reliability Pricing Model Market design.

165-American Arbitration Association Nos. 16-198-00206-03 16-198-002070. On behalf of PG&E Energy Trading. Analyses related to the

operation and interpretation of power purchase and sale/tolling agreements and electrical interconnection requirements.

164-Arbitration on behalf of Black Hills Power, Inc. Expert testimony related to a power purchase and sale and energy exchange agreement, as well as FERC criteria related to the applicable code and standards of conduct.

2004

163-Federal Energy Regulatory Commission. Docket No. Docket No. EL03-236-003 Testimony on behalf of Mirant companies relating to PJM proposal for compensation of frequently mitigated generation facilities.

162-Federal Energy Regulatory Commission. Docket No. ER03-563-030. Testimony on behalf of Calpine Energy Services regarding the development of a locational Installed Capacity market and associated generator service obligations for ISO-NE. Supplemental testimony filed 2005.

161-Federal Energy Regulatory Commission. Docket No. EL04-135-000. Testimony on behalf on the Unified Plan Supporters regarding implications of using a flow based rate design to allocate embedded costs.

160-Federal Energy Regulatory Commission. Docket No. ER04-1229-000. Testimony on behalf of EME Companies regarding the allocation and recovery of administrative charges in the NYISO markets.

159-Federal Energy Regulatory Commission. Dockets No. EL01-19-000, No. EL01-19-001, No. EL02-16-000, EL02-16-000. Testimony on behalf of PSE&G Energy Resources and Trade regarding pricing in the New York Independent System Operator energy markets.

158-Federal Energy Regulatory Commission. Invited panelist regarding performance based regulation (PBR) and wholesale market design. Comments related to the potential role of PBR in transmission expansion, and its interaction with market mechanisms for new transmission.

157-Federal Energy Regulatory Commission. Docket No. ER04-539-000 Testimony on behalf of EME Companies regarding proposed market mitigation in the energy and capacity markets of the Northern Illinois Control Area.

156-Federal Energy Regulatory Commission. Standardization of Generator Interconnection Agreements and Procedures Docket No. RM02-1-001, Order 2003-A, Affidavit on Behalf of PSEG Companies

regarding the modifications on rehearing to interconnection crediting procedures.

155-Federal Energy Regulatory Commission. Dockets ER03-236-000,ER04-364-000,ER04-367-000,ER04-375-000. Testimony on behalf of the EME Companies regarding proposed market mitigation measures in the Northern Illinois Control Area of PJM.

154-Federal Energy Regulatory Commission. Dockets PL04-2-000, EL03-236-000. Invited panelist, testimony related to local market power and the appropriate levels of compensation for reliability must run resources.

2003

153-American Arbitration Association. 16 Y 198 00204 03. Report on behalf of Trigen-Cineregy Solutions regarding an energy services agreement related to a cogeneration facility.

152-Federal Energy Regulatory Commission. Docket No. EL03-236-000. Testimony on behalf of EME Companies regarding the PJM proposed tariff changes addressing mitigation of local market power and the implementation of a related auction process.

151-Federal Energy Regulatory Commission. Docket No. PA03-12-000. Testimony on behalf of Pepco Holdings Incorporated regarding transmission congestion and related issues in market design in general, and specifically addressing congestion on the Delmarva Peninsula.

150-Federal Energy Regulatory Commission. Docket Nos. ER03-262-007, Affidavit on behalf of EME Companies regarding the cost benefit analysis of the operation of an expanded PJM including Commonwealth Edison.

149-Supreme Court of the State of New York, Index No. 601505/01. Report on behalf of Trigen-Syracuse Energy Corporation regarding energy trading and sales agreements and the operation of the New York Independent System Operator.

148-Federal Energy Regulatory Commission. Docket No. ER03-262-000. Affidavit on behalf of the EME Companies regarding the issues associated with the integration of the Commonwealth Edison Company into PJM.

147-Federal Energy Regulatory Commission. Docket No. ER03-690-000. Affidavit on behalf of Hydro Quebec US regarding New York ISO market rules at external generator proxy buses when such buses are deemed non-competitive.

146-Federal Energy Regulatory Commission. Docket RT01-2-006,007. Affidavit on behalf of the PSEG Companies regarding the PJM Regional Transmission Expansion Planning Protocol, and proper incentives and structure for merchant transmission expansion.

145-Federal Energy Regulatory Commission. Docket No. ER03-406-000. Affidavit on behalf of seven PJM Stakeholders addressing the appropriateness of the proposed new Auction Revenue Rights/Financial Transmission Rights process to be implemented by the PJM ISO.

144-Federal Energy Regulatory Commission. Docket No. ER01-2998-002. Testimony on behalf of Pacific Gas and Electric Company related to the cause and allocation of transmission congestion charges.

143-Federal Energy Regulatory Commission. Docket No. RM01-12-000. On behalf of six different companies including both independent generators, integrated utilities and distribution companies comments on the proposed resource adequacy requirements of the Standard Market Design.

142-United States Bankruptcy Court, Northern District of California, San Francisco Division, Case No. 01-30923 DM. On behalf of Pacific Gas and Electric Dr. Shanker presented testimony addressing issues related to transmission congestion, and the proposed FERC SMD and California MD02 market design proposals.

2002

141-Arbitration. Testimony on behalf of AES Ironwood regarding the operation of a tolling agreement and its interaction with PJM market rules.

140-Federal Energy Regulatory Commission. Docket No. RM01-12-000. Dr. Shanker was asked by the three Northeast ISO's to present a summary of his resource adequacy proposal developed in the Joint Capacity Adequacy Group. This was part of the Standard Market Design NOPR process.

139-Federal Energy Regulatory Commission. Docket No. ER02-456-000. Testimony on behalf of Electric Gen LLC addressing comparability of a contract among affiliates with respect to non-price terms and conditions.

138-Circuit Court for Baltimore City. Case 24-C-01-000234. Testimony on behalf of Baltimore Refuse Energy Systems Company regarding the appropriate implementation and pricing of a power purchase agreement and related Installed Capacity credits.

2001

137-Federal Energy Regulatory Commission. Docket No. RM01-12-000. Comments on the characteristics of capacity adequacy markets and alternative market design systems for implementing capacity adequacy markets.

136-Federal Energy Regulatory Commission. Docket ER02-456-000. Testimony on behalf of Electric Gen LLC regarding the terms and conditions of a power sales agreement between PG&E and Electric Generating Company LLC.

135-Delaware Public Service Commission. Docket 01-194. On behalf of Conectiv et al. Testimony relating to the proper calculation of Locational Marginal Prices in the PJM market design, and the function of Fixed Transmission Rights.

134-Federal Energy Regulatory Commission. Docket No. IN01-7-000 On behalf of Exelon Corporation . Testimony relating to the function of Fixed Transmission Rights, and associated business strategies in the PJM market system.

133-Federal Energy Regulatory Commission. Docket No. RM01-12-000. Comments on the basic elements of RTO market design and the required market elements.

132-Federal Energy Regulatory Commission. Docket No. RT01-99-000. On behalf of the One RTO Coalition. Affidavit on the computational feasibility of large scale regional transmission organizations and related issues in the PJM and NYISO market design.

131-Arbitration. On behalf of Hydro Quebec. Testimony related to the eligibility of power sales to qualify as Installed Capacity within the New York Independent system operator.

130-Virginia State Corporation Commission. Case No. PUE000584. On behalf of the Virginia Independent Power Producers. Testimony related to the proposed restructuring of Dominion Power and its impact on private power contracts.

129-United States District Court, Northern District of Ohio, Eastern Division, Case: 1:00CV1729. On behalf of Federal Energy Sales, Inc. Testimony related to damages in disputed electric energy trading transactions.

128-Federal Energy Regulatory Commission. Docket Number ER01-2076-000. Testimony on behalf of Aquila Energy Marketing Corp and

Edison Mission Marketing and Trading, Inc. relating to the implementation of an Automated Mitigation Procedure by the New York ISO.

2000

127-New York Independent System Operator Board. Statement on behalf of Hydro Quebec, U.S. regarding the implications and impacts of the imposition of a price cap on an operating market system.

126-Federal Energy Regulatory Administration. Docket No. EL00-24-000. Testimony on behalf of Dayton Power and Light Company regarding the proper characterization and computation of regulation and imbalance charges.

125-American Arbitration Association File 71-198-00309-99. Report on behalf of Orange and Rockland Utilities, Inc. regarding the estimation of damages associated with the termination of a power marketing agreement.

124-Circuit Court, 15th Judicial Circuit, Palm Beach County, Florida. On behalf of Okeelanta and Osceola Power Limited Partnerships et. al. Analyses related to commercial operation provisions of a power purchase agreement.

1999

123-Federal Energy Regulatory Commission. Docket No. ER00-1-000. Testimony on behalf of TransEnergie U.S. related to market power associated with merchant transmission facilities. Also related analyses regarding market based tariff design for merchant transmission facilities.

122-Federal Energy Regulatory Commission. Docket RM99-2-000. Analyses on behalf of Edison Mission Energy relating to the Regional Transmission Organization Notice of Proposed Rulemaking.

121-Federal Energy Regulatory Commission. Docket No. ER99-3508-000. On behalf of PG&E Energy Trading, analyses associated with the proposed implementation and cutover plan for the New York Independent System Operator.

120-Federal Energy Regulatory Commission. Docket No. EL99-46-000. Comments on behalf of the Electric Power Supply Association relating to the Capacity Benefit Margin.

119-New York Public Service Commission, Case 97-F-1563. Testimony on behalf of Athens Generating Company describing the impacts on pricing and transmission of a new generation facility within the New York Power Pool under the new proposed ISO tariff.

118-JAMS Arbitration Case No. 1220019318 On behalf of Fellows Generation Company. Testimony related to the development of the independent power and qualifying facility industry and related industry practices with respect to transactions between cogeneration facilities and thermal hosts.

117-Court of Common Pleas, Philadelphia County, Pennsylvania. Analyses on behalf of Chase Manhattan Bank and Grays Ferry Cogeneration Partnership related to power purchase agreements and electric utility restructuring.

1998

116-Virginia State Corporation Commission. Case No. PUE 980463. Testimony on behalf of Appomattax Cogeneration related to the proper implementation of avoided cost methodology.

115-Virginia State Corporation Commission. Case No. PUE980462 Testimony on behalf of Virginia Independent Power Producers related to an applicaton for a certificate for new generation facilities.

114-Federal Energy Regulatory Commission. Analyses related to a number of dockets reflecting amendments to the PJM ISO tariff and Reliability Assurance Agreement.

113-U.S. District Court, Western Oklahoma. CIV96-1595-L. Testimony related to anti-competitive elements of utility rate design and promotional actions.

112-Federal Energy Regulatory Commission Dockets No. EL94-45-001 and QF88-84-006. Analyses related to historic measurement of spot prices for as available energy.

111-Circuit Court, Fourth Judicial Circuit, Duval County, Florida. Analyses related to the proper implementation of a power purchase agreement and associated calculations of capacity payments. (Testimony 1999)

1997

110-United States District Court for the Eastern District of Virginia, CA No. 3:97CV 231. Analyses of the business and market behavior of Virginia Power with respect to the implementation of wholesale electric power purchase agreements.

109-United States District Court, Southern District of Florida, Case No. 96-594-CIV, Analyses related to anti-competitive practices by an electric utility and related contract matters regarding the appropriate calculation of energy payments.

108-Virginia State Corporation Commission. Case No. PUE960296. Testimony related to the restructuring proposal of Virginia Power and associated stranded cost issues.

107-Federal Energy Regulatory Commission. Dockets No. ER97-1523-000 and OA97-470-000, Analyses related to the restructuring of the New York Power Pool and the implementation of locational marginal cost pricing.

106-Federal Energy Regulatory Commission Dockets No. OA97-261-000 and ER97-1082-000 Analyses and testimony related to the restructuring of the PJM Power Pool and the implementation of locational marginal cost pricing.

105-Missouri Public Service Commission. Case No. ET-97-113. Testimony related to the proper definition and rate design for standby, supplemental and maintenance service for Qualifying facilities.

104-American Arbitration Association. Case 79 Y 199 00070 95. Testimony and analyses related to the proper conditions necessary for the curtailment of Qualifying Facilities and the associated calculations of negative avoided costs.

103-Virginia State Corporation Commission. Case Number PUE960117 Testimony related to proper implementation of the differential revenue requirements methodology for the calculation of avoided costs.

102-New York Public Service Commission. Case 96-E-0897, Analyses related to the restructuring of Consolidated Edison Company of New York and New York Power Pool proposed Independent System Operator and related transmission tariffs.

1996

101-Florida Public Service Commission. Docket No. 950110-EI. Testimony related to the correct calculation of avoided costs using the Value of Deferral methodology and its implementation.

100-Federal Energy Regulatory Commission Dockets No. EL94-45-001 and QF88-84-006. Testimony and Analyses related to the estimation of historic market rates for electricity in the Virginia Power service territory.

99-Circuit Court of the City of Richmond Case No. LA-2266-4. Analyses related to the incurrence of actual and estimated damages associated with the outages of an electric generation facility.

98-New Hampshire Public Utility Commission, Docket No. DR96-149. Analyses related to the requirements of light loading for the curtailment of Qualifying Facilities, and the compliance of a utility with such requirements.

97-State of New York Supreme Court, Index No. 94-1125. Testimony related to system planning criteria and their relationship to contract performance specifications for a purchased power facility.

96-United States District Court for the Western District of Pennsylvania, Civil Action No. 95-0658. Analyses related to anti-competitive actions of an electric utility with respect to a power purchase agreement.

95-United States District Court for the Northern District of Alabama, Southern Division. Civil Action Number CV-96-PT 0097-S. Affidavit on behalf of TVA and LG&E Power regarding displacement in wholesale power transactions.

1995

94-American Arbitration Association. Arbitration No. 14 198 012795 H/K. Report concerning the correct measurement of savings resulting from a commercial building cogeneration system and associated contract compensation issues.

93-Circuit Court City of Richmond. Law No. LX-2859-1. Analyses related to IPP contract structure and interpretation regarding plant compensation under different operating conditions.

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