UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Grid Reliability and Resilience Pricing	)	Docket No. RM18-1-000

REPLY COMMENTS OF THE INDEPENDENT MARKET MONITOR FOR PJM

Pursuant to notice issued October 2, 2017, in the above referenced proceeding, Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor ("Market Monitor") for PJM Interconnection L.L.C. ("PJM"), submits these reply comments. The Commission notice responds to the release by the Secretary of Energy, pursuant to section 403 of the Department of Energy Organization Act, 42 U.S.C. § 7173 (2012), of a proposed rule on September 28, 2017, for final action ("DOE Proposal") by the Commission.[1] PJM, Exelon, FirstEnergy, and PSEG advise the Commission to take action to direct PJM develop rules to modify energy market prices and/or create out of market payments to address the concerns raised by the DOE with potential nuclear and coal resource retirements. The Market Monitor disagrees. Any market intervention designed to placate the potential losers in the market will undermine the competitive market. The Market Monitor recommends rejection of the DOE Proposal.

A. PJM Market Resource Retirement Signals are Competitive and Reasonable.

Commenters argue that the PJM market signals premature retirement of baseload resources. The Market Monitor disagrees. PJM has managed significant resource

[1] *Grid Resiliency Pricing Rule*, Docket No. RM18-1, 82 Fed. Reg. 46940 (October 10, 2017) ("DOE Proposal").

retirements in recent history. Retired resources are characteristically old and inefficient. The PJM market does not signal retirement for the majority of nuclear resources.

As shown in Table 1, 32,150.7 MW of generation have been, or are planned to be, retired between 2011 and 2020. Of that, 6,427.3 MW are planned to retire after the first nine months of 2017. In the first nine months of 2017, 2,072.8 MW were retired. Of the 6,427.3 MW pending retirement, 4,125.0 MW are coal units. The coal unit retirements were a result of low gas prices, low capacity prices and the investments required for compliance with the EPA's Mercury and Air Toxics Standards (MATS) for some units.

Table 1 Summary of PJM unit retirements by fuel (MW): 2011 through 2020

	Battery	Coal	Diesel	Heavy Oil	Hydro	Kerosene	Landfill Gas	Light Oil	Natural Gas	Nuclear	Waste Coal	Wind	Wood Waste	Total
Retirements 2011	0.0	543.0	0.0	0.0	0.0	0.0	0.0	131.0	522.5	0.0	0.0	0.0	0.0	1,196.5
Retirements 2012	0.0	5,907.9	0.0	0.0	0.0	0.0	0.0	788.0	250.0	0.0	0.0	0.0	16.0	6,961.9
Retirements 2013	0.0	2,558.9	2.9	166.0	0.0	0.0	7.0	3.0	82.0	0.0	31.0	0.0	8.0	2,858.8
Retirements 2014	0.0	2,239.0	50.0	0.0	0.0	184.0	15.3	188.0	294.0	0.0	0.0	0.0	0.0	2,970.3
Retirements 2015	0.0	7,064.8	0.0	0.0	0.0	644.2	2.0	222.3	1,319.0	0.0	0.0	10.4	0.0	9,262.7
Retirements 2016	0.0	243.0	51.0	0.0	0.5	0.0	9.9	22.0	74.0	0.0	0.0	0.0	0.0	400.4
Retirements 2017 (Jan-Sep)	0.0	2,038.0	0.0	0.0	0.0	0.0	0.8	0.0	34.0	0.0	0.0	0.0	0.0	2,072.8
Planned Retirements (Oct 2017 and later)	40.0	4,125.0	2.4	148.0	0.0	0.0	0.0	30.6	661.8	1,419.5	0.0	0.0	0.0	6,427.3
Total	40.0	24,719.6	106.3	314.0	0.5	828.2	35.0	1,384.9	3,237.3	1,419.5	31.0	10.4	24.0	32,150.7

Table 2 shows the capacity, average size, and average age of units retiring in PJM, from 2011 through 2020. The majority, 76.9 percent, of all MW retiring during this period are coal fired steam units. These coal fired steam units have an average age of 54.4 years and an average size of 172.9 MW. Over half of the retiring coal fired steam units, 55.7 percent, are located in either Ohio or Pennsylvania. Retirements have generally consisted of smaller subcritical coal fired steam units and those without adequate environmental controls to remain viable beyond 2017.

Table 2 PJM retirements by fuel type: 2011 through 2020

Fuel	Number of Units	Avg. Size (MW)	Avg. Age at Retirement (Years)	Total MW	Percent
Battery	1	40.0	4.3	40.0	0.1%
Coal	143	172.9	54.4	24,719.6	76.9%
Diesel	5	21.3	39.8	106.3	0.3%
Heavy Oil	2	157.0	49.5	314.0	1.0%
Hydro	1	0.5	113.8	0.5	0.0%
Kerosene	20	41.4	45.5	828.2	2.6%
Landfill Gas	9	3.9	14.0	35.0	0.1%
Light Oil	30	46.2	43.2	1,384.9	4.3%
Natural Gas	55	58.9	47.3	3,237.3	10.1%
Nuclear	2	709.8	47.8	1,419.5	4.4%
Waste Coal	1	31.0	20.3	31.0	0.1%
Wind	1	10.4	15.6	10.4	0.0%
Wood Waste	2	12.0	23.2	24.0	0.1%
Total	272	118.2	48.9	32,150.7	100.0%

In addition to retirements, there have been significant coal plant sales and acquisitions in the last five years. Over 16,600 MW of PJM coal capacity, previously owned by investor owned utilities, were sold from 2013 through the third quarter of 2017. Private equity firms purchased 46 percent of that capacity. Dynegy and NRG, both publicly traded companies, purchased the other 54 percent. While investor owned utilities face pressure to maintain consistent quarterly and annual positive earnings targets, private equity firms and other merchant generating companies have different views of risk and long term value. Their purchase of coal plants indicates that short term losses in the PJM markets do not always signal retirement and that some investors assign market value based on optionality or other attributes.

The PJM market does not signal retirement for most nuclear resources. Table 3 shows the Market Monitor's most recent results for avoidable cost recovery for nuclear

resources from PJM energy and ancillary services markets.[2] The results have been updated using publicly available nuclear plant operating costs of $25.83 per MWh for single unit sites and $18.73 per MWh for multiunit sites as avoidable costs.[3] For the 12 months ended September 30, 2017, fewer than a quarter of nuclear units did not recover avoidable costs from energy and capacity revenues. The average DA LMP increase of 5.3 percent between the 12 months ended September 30, 2017, and 2016, resulted in all nuclear plants recovering more than 90 percent of avoidable costs for the 12 months ended September 30, 2017.

Table 3 Nuclear resource avoidable cost recovery by quartile

		Recovery of avoidable costs from energy and ancillary net revenue			Recovery of avoidable costs from all markets		
Technology	Total Installed Capacity (ICAP)	First quartile	Median	Third quartile	First quartile	Median	Third quartile
Nuclear (2016)	31,661	61%	88%	105%	91%	119%	135%
Nuclear (October 2016 through September 2017)	31,661	84%	97%	111%	109%	126%	143%

Capital expenditures are generally sunk costs and appropriately excluded from this analysis. To the extent that there are annual avoidable capital expenditures, the results could be affected. As a sensitivity analysis, the results were calculated with one third of the NEI publicly available capital expenditures added to the avoidable costs. For the 12 months ended September 30, 2017, approximately a quarter of nuclear units in PJM did not recover the sum of avoidable costs plus one third of the NEI capital expenditures.

Depending on the unit specific facts, there are some nuclear power plants in PJM that are not economic at recent levels of LMP and capacity market clearing prices. The decision on how to proceed belongs to the owners of those plants. The fact that some plants are uneconomic does not call into question the fundamentals of PJM markets. Many

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2 Contrary to assertions by PSEG in their reply comments at 4, in Docket No. AD17-11, "*State Policies and Wholesale Markets Operated by ISO New England Inc., New York Independent System Operator, Inc., and PJM Interconnection, L.L.C.*", the Market Monitor's calculations of net revenues do account for fuel costs.

3 The Market Monitor uses publicly available data provided by the Nuclear Energy Institute and publicly available LMP data in order to avoid using confidential data and to permit anyone to replicate the results.

generating plants have retired in PJM since the introduction of markets and many generating plants have been built since the introduction of markets.

B. Reply to PJM Comments.[4]

1. The Market Monitor Agrees with PJM that the Lack of Basis for the DOE Proposal Supports Not Implementing the Proposal.

Like the Market Monitor, PJM argues that the facts and sources cited by the DOE Proposal, such as the PJM generation outages during the 2014 Polar Vortex, do not support the DOE's findings that the prices in PJM are unjust and unreasonable. The facts do not support the DOE's proposal to provide cost of service rates to nuclear and coal generation.[5] The Market Monitor agrees with PJM that the DOE Proposal would undermine competitive markets.[6] For these reasons, the Commission should reject the DOE Proposal. The DOE Proposal suggests no market reforms that warrant further consideration by the Commission.

2. A Commission Directive Is Not Warranted or Advisable for PJM Price Formation Reform.

PJM requests the Commission to direct it to provide price formation reforms within a Commission directed timeframe. PJM falls short of requesting the Commission to declare its Locational Marginal Prices ("LMP") to be unjust and unreasonable through a Section 206 proceeding. The appropriate forum for PJM price formation reform is through PJM's stakeholder process, leading to a Section 205 filing. A Commission directed timeframe would unnecessarily truncate the PJM stakeholder process.

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[4] Initial Comments of PJM Interconnection, L.L.C. on the United States Department of Energy Proposed Rule, Docket RM18-1-000 (October 23, 2017). ("PJM").

[5] PJM at 5.

[6] PJM at 27.

PJM does not have a sufficiently developed proposal to warrant an expedited filing before the Commission. PJM is apparently requesting approval, without a full stakeholder process, of a significant change to LMP pricing without having thought through exactly what the problem is or what the solution to that problem might be. PJM has not articulated a problem sufficient to issue a formal Problem Statement to PJM stakeholders.[7] In fact, the problem articulated in the June 2017 PJM Report is the same as the problem articulated in the DOE Proposal, that low energy prices threaten the retirement of uneconomic coal and nuclear resources, an argument which PJM declares unsupported in reference to the DOE Proposal.[8] [9] PJM has not provided details for the extended LMP or scarcity pricing changes that it suggests in its comments, both of which constitute significant market design reforms.[10] Changes to the PJM energy market should follow the usual course of development for market design changes. That is particularly true for the type of fundamental change to PJM market design proposed by PJM.

The stakeholder process for major changes to the current market design could require a year or more of work based on the treatment of similar issues. That timeframe is consistent with thorough treatment of significant market design changes. As PJM states, "the evidence and events that the DOE NOPR cites do not support its assertion of a resilience crisis or its rationale for degrading competitive markets in the name of fuel resilience."[11] No crisis exists, and LMP produces just and reasonable prices. The

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7 PJM, Manual 34: Stakeholder Process, Rev. 07 (May 19, 2016) at 31.

8 PJM Report at 1.

9 PJM at 9–10.

10 PJM at 43–48.

11 PJM at 14.

Commission has no grounds for directing PJM to propose or implement expedited treatment of significant market reforms.

3. Extended LMP Sacrifices Short Run Market Efficiency to Reduce Uplift and Raise Energy Market Revenues.

To date, the PJM market has been designed to create accurate marginal cost prices and strong incentives for participants to follow those price signals to achieve efficient market results. LMP reflects the marginal impact of the next single MW on all active transmission constraints through its congestion component. LMP reflects the marginal impact of the next single MW on system transmission losses. Market power mitigation ensures that local market power does not lead to LMP exceeding short run marginal cost. A broad adoption of extended LMP would undermine the PJM market's fundamental focus on achieving the competitive market result of marginal cost pricing.

PJM's proposal to change the calculation of LMP would undercut the potential benefits of five minute pricing before the evidence is in. PJM will implement five minute pricing and settlements on February 1, 2018. Market settlements will occur using the LMP and generator output for every five minute interval to provide stronger market incentives for generators to follow PJM's dispatch instruction.

Efficient market outcomes are achievable with LMP based strictly on short run marginal cost. It is well understood that uplift is required for generators with nonconvex costs to participate. Uplift is also an outcome under extended LMP. Energy market revenue, combined with uplift, ancillary services revenue, and capacity market revenue, lead to net revenues that indicate a competitive long run rate of return to generation in PJM. Extended LMP consciously forgoes the efficient competitive market outcomes achievable only with marginal cost pricing in pursuit of other goals, like reducing uplift or raising the share of revenues from the energy market versus the capacity market.

A 2016 IEEE analysis of convex hull pricing, another term for the extended LMP concept, summarizes the economic tradeoffs of the market design change:

> *Weak Economic Justification [for Convex Hull Pricing]:*

> Marginal cost pricing is a well-known economic concept that, in convex markets, induces a partial competitive equilibrium. Even though electricity markets do not satisfy this convexity assumption, the potential for a partial competitive equilibrium provides a reasonable defense for marginal cost pricing. Convex Hull Pricing, on the other hand, does not have an accepted economic justification. Although reducing uplift (and thereby increasing transparency) is generally viewed as positive, it is unclear whether it should be the overarching goal of a pricing method. Furthermore, short-term and long-term investment incentives remain unknown for Convex Hull Pricing.
>
> *Property 6*: Convex Hull Pricing is not a widely accepted economic concept.[12]

The result that marginal cost pricing constitutes efficient market design does not depend on fuel mix, supply curve shape, or magnitude of energy market revenues, as asserted by PJM.[13] Marginal cost pricing is the outcome in competitive markets with convex costs. Such markets are efficient without regulatory intervention. The same efficiency properties are achievable through market design interventions in markets with market power and nonconvex costs. It is not necessary to end the pursuit of those efficiencies.

The Commission should reject PJM's claim, for which PJM has provided no evidence, that the PJM market is "eligible for prompt remedy" of a price formation problem and should make no ruling directing PJM to pursue extended LMP.

4. Extended LMP Applies Only to Market Committed Resources.

In the theoretical models and current RTO implementations of extended LMP or fast start pricing, the set of qualifying resources is restricted to those economically started by the market with sufficiently short start times. ISO New England, MISO, and NYISO have each

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[12] Schiro, Dane A, Tongxin Zheng, Feng Zhao, and Eugene Litvinov. "Convex Hull Pricing in Electricity Markets: Formulation, Analysis, and Implementation Challenges," *IEEE Transactions on Power Systems*, Vol. 31, No. 5 (September 2016).

[13] PJM at 37-39.

defined, or proposed, qualifying time frames no greater than one hour.[14] The rationale is that the cost of starting the resource may be marginal in the short run time frame of the market. In a full implementation of extended LMP, which no RTO has adopted, all resources in the economic unit commitment can set the price. The start time required for including commitment costs in prices in the full implementation would be that the resource can start between the execution time of the market unit commitment process and the operating hour. The criteria for price setting in all applications are fuel neutral, but only a subset of generation technologies meets them.

PJM suggests that "it needs to enhance price formation as it relates to all resource types."[15] If PJM moves forward as it suggests, PJM should make clear that it does not intend to violate the economic principles supporting the extended LMP market design by allowing resources that do not receive an economic commitment by the market to set price as if the PJM market has the option to economically turn the resource on or off. To do so would violate an underlying assumption of extended LMP. This applies to self scheduled resources and resources with multi-day minimum run times that extend their commitments into future operating days beyond the timeframe of the economic unit commitment process in the Day-Ahead Energy Market. At current self commitment levels in the PJM market, less than half of energy output would qualify.[16]

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[14] *See* Comments of the Midcontinent Independent System Operator, Inc., FERC Docket RM17-3-000 (February 28, 2017) at 5-6; Comments of ISO New England, Inc., FERC Docket RM17-3-000 (February 28, 2017) at 3; and Comments of the New York Independent System Operator, Inc., FERC Docket RM17-3-000 (February 28, 2017) at 2.

[15] PJM at 41-42.

[16] Comments of the Independent Market Monitor for PJM, Docket RM28-1-000 (October 23, 2017) at 40.

An "integer relaxation" model, as discussed by Dr. Hogan, has the property that the commitment of the resource is part of the market clearing process[17] The variable representing the commitment of the resource has an integer value of zero or one in the mathematical model. To achieve a convex approximation of the market supply curve, the integer may be relaxed to a value between zero and one for price calculations, representing a partial commitment of the resource. The integer relaxation applies to resources subject to economic commitment. In a 2016 presentation, Dr. Hogan states:

> A sufficient condition for real-time price consistency in ELMP is that all commitment and dispatch variables that are in the economic dispatch or are assigned an uplift payment from the market-clearing solution be included in the pricing model.[18]

The Market Monitor asserts that this sufficient condition is only met when extended LMP applies to only and all of the subset of resources making offers subject to economic commitment and dispatch by the market. The subset is not all online resources, and the subset generally excludes large baseload generators.

The extended LMP approach unnecessarily sacrifices market efficiency to reduce uplift. The Market Monitor recognizes that some economists support allowing energy prices to reflect the commitment costs of a subset of resources, as is the case with extended LMP. Any PJM implementation must, at least, be consistent with the requirements of the established economic models developed by Dr. Hogan and others. The Market Monitor also agrees with Dr. Hogan's assertion that reforms to scarcity pricing would provide more benefits to the efficiency of the PJM Energy Market than extended LMP.[19] The

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17 PJM at Appendix B.

18 "Electricity Market Design: Optimization and Market Equilibrium," William W. Hogan presentation to the Workshop on Optimization and Equilibrium in Energy Economics, Institute for Pure and Applied Mathematics at the University of California Los Angeles (January 13, 2016) <https://sites.hks.harvard.edu/fs/whogan/Hogan_UCLA_011316.pdf>.

19 PJM at Appendix B.

implementation of extended LMP will be complex and expensive. The implementation of extended LMP will have opportunity costs, one of which will likely be a detailed reformulation of scarcity pricing in PJM.

5. Shortage Pricing Reform Is an Appropriate Market Remedy to Better Reflect the Value of PJM Resources.

The Market Monitor agrees with PJM that reforms to shortage pricing would benefit price formation and support operational reliability.[20] PJM and its stakeholders should examine the level and the shape of the operational reserve demand curves. The Market Monitor suggests expansion of the scope of potential reform to include locational scarcity, as reflected in congestion pricing, as well as the definition of reserve products.

PJM states at 4:

> Assuming there is a shortcoming in capacity and energy markets, the first response should be to fix such a shortcoming, which is to say, evaluate structural market changes that better define and value resources' operational and reliability attributes *within the market rather than upending market principles in their entirety*.

Value in a market derives from the demand side of the market. If PJM seeks to reflect value, it should seek out market design reforms that ensure that marginal value is reflected accurately in the demand for energy during shortages, for energy to relieve constraints, and for reserves. Better defining value in the market does not imply changing the computation of LMP. An unprecedented adoption of extended LMP would constitute "upending market principles." Instead, PJM should follow its own suggestion to focus on defining value. Value in the PJM market would be more strongly, correctly, and transparently emphasized by revisions to demand curves, particularly the operational reserve demand curve. The Commission should laud PJM's efforts in this area.

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[20] PJM at 47.

C. Reply to Exelon's Comments[21]

1. No Change in the Markets Alters the Efficiency, Justness, or Reasonableness of LMP.

Exelon actually does request that the Commission issue a 206 order declaring LMP to be unjust and unreasonable. Exelon does not provide a correspondingly sweeping or well justified case to support this dramatic request. Exelon's only support for its argument that the Commission should declare LMP to be unjust and unreasonable is a series of examples or anecdotes demonstrating cases where Exelon finds prices to be counterintuitive. All of Exelon's examples are well known results of LMP that are not unique to PJM. LMP falls below the per MWh cost of a resource producing energy at its minimum output level because the LMP reflects the cost imposed on the market by the inflexibility of the resource. The market must reduce the output of a lower cost resource to accommodate the inflexibility of the higher cost resource. This is a well known, just and reasonable result of marginal cost pricing.

The Commission's Fast Start NOPR did not reach any conclusion that would justify allowing baseload resources operating at their minimum output level to determine LMP. In fact, the Fast Start NOPR addressed resources that start in less than 10 minutes and that may shutdown in an hour or less. The Commission did not issue an order reaching any conclusion about allowing fast start resources or any other resources with inflexible output ranges to determine the LMP as if they were the marginal resource.

Exelon continues to tout the benefits of PJM's suggested price formation reforms to its investors. On November 2, 2017, Exelon CEO Chris Crane stated:

> Given our size of our PJM fleet, each dollar or megawatt hour of distortion caused by a [flawed] market design undermines the Genco's economics by approximately $135 million per year on an unhedged basis. We believe that DOE's focus on price formation

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[21] Comments of Exelon Corporation, Docket No. RM18-1-000 (October 23, 2017). ("Exelon")

> will lead to a successful process at FERC that will eliminate these distortions by the summer of 2018. We have not reflected the value of these reforms in our forecast that we're showing you today, but we do believe they could be a significant positive for us starting in 2018.[22]

Exelon's pursuit of changing the PJM LMP to benefit its bottom line calls for a degree of skepticism about its arguments. Exelon openly exhibits rent seeking behavior in seeking subsidies and market design changes. PJM itself has made no commitment to pursuing a particular application of extended LMP that would generally allow baseload resources to set price, as suggested by Exelon.

Exelon appears to fail to consider the possibility that the prices in PJM are consistent with market fundamentals and that some of its plants are uneconomic as a result.

Exelon's request for a 206 order declaring LMP unjust and unreasonable is a collateral attack on prior Commission orders. PECO, an Exelon company, filed an alternative pricing method to LMP 20 years ago.[23] The Commission disagreed with PECO and found LMP to be just and reasonable, stating that "energy will be supplied consistent with the desire to minimize generating costs given available transmission."[24] The Commission's rationale for pricing consistent with cost minimization still holds.

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22 Exelon's (EXC) CEO Chris Crane on Q3 2017 Results – Earnings Call Transcript, Seeking Alpha (November 2, 2017), <https://seekingalpha.com/article/4119801-exelons-exc-ceo-chris-crane-q3-2017-results-earnings-call-transcript?page=2> .

23 *See, e.g., Elec. Storage Participation*, 157 FERC ¶ 61,121 (2016); *Offer Caps in Mkt. Operated by Reg'l Transmission Organizations & Indep. Sys. Operators*, 154 FERC ¶ 61,038 at P 45 (2016) ("An LMP that is less than the marginal cost of production may not be just and reasonable because it sends an inaccurate signal to load about the actual cost of producing the electricity, and to resources about the value of the next increment of supply."); *Nev. Power Co.*, 153 FERC ¶ 61,306 at P 3 (2015), citing 151 FERC ¶ 61,131 at P 174; *Pennsylvania-New Jersey-Maryland Interconnection, et al.*, 81 FERC ¶ 61,257, 62,253 (1997).

24 *Id.* at 65,253–65,255.

2. The Commission Should Make No Preemptive Ruling Concerning the Mitigation of Capacity Market Offers of Subsidized Resources.

Exelon requests the Commission to make a preemptive ruling against potential changes currently under consideration in the PJM stakeholder process. Exelon states (at 6):

> [T]he Commission should issue a policy statement declaring that units benefitting from state programs designed to preserve the operation of resilient nuclear resources by compensating them for their emissions-free attributes—such as the New York and Illinois Zero Emissions Credit programs—will not have their offers mitigated in FERC's markets.[25]

PJM and its stakeholders have spent months weighing the arguments of Exelon along with those of other stakeholders. The Commission should disregard Exelon's request for support of a minority position that would allow subsidies to alter the economic clearing of the PJM capacity market.

Exelon not only supports federal subsidies but wants to ensure that state subsidies for its nuclear plants in PJM are protected. But the state subsidies for selected nuclear plants infringe on the Commission's authority to regulate wholesale power markets. Such subsidies should not be provided blanket protection to interfere with competitive wholesale power markets. The Market Monitor opposes state subsidies that are explicitly designed to undermine the outcomes of competitive wholesale power markets.[26] The Market Monitor supports a simple and straightforward approach to ensuring that the impact of such subsidies on markets is limited and the impact on other states is limited. The Market Monitor's proposed Extended Minimum Offer Price Rule (MOPR-Ex) would limit the

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[25] Exelon at 6.

[26] *See*, *e.g.*, Amicus Brief of the Independent Market Monitor for PJM in Support of Plaintiffs-Appellants, Case No. 17-2445 (7th Cir September 11 2017); Amicus Brief of the Independent Market Monitor for PJM in Support of Plaintiffs-Appellants, Case No. 17-2654 (2nd Cir October 26, 2017).

impact of state subsidies and provide a disincentive for such subsidies.[27] The MOPR-Ex exempts competitive entry and would have a very limited impact. The existing MOPR rule which applies solely to new entry has significant exemptions that have applied to all new entrant combustion turbine and combined cycle resources. MOPR-Ex, with exemptions for self supply by cost of service utilities, for competitive entry, for self supply by public power entities and for competitive RPS programs is a practical approach to protecting competitive wholesale power markets that is fully consistent with the ruling of the U.S. Supreme Court in *Hughes v. Talen Energy Marketing*.[28]

Exelon references comparative analyses of subsidies to various fuel types in arguing that capacity market offers for units benefitting from the New York and Illinois Zero-Emissions Credit programs ("ZECs") should not be mitigated.[29] Almost all energy sources benefit from current or historic subsidization. The many current and historic subsidies benefitting the electricity industry include the building of infrastructure, research and development, financial assistance, and limits on liability.[30] Historic subsidies have tended to support the building and development of new technologies. Direct, unit specific subsidies intended to forestall the retirement of specific resources, such as ZECs, are unprecedented. The history of federal subsidies supporting various generation technologies does not justify the DOE's proposal. Exelon would confuse the issue by equating all subsidies with those that are designed to reverse the outcome of competitive markets to preserve specific resources.

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27 "MOPR-Ex: IMM Proposal for the CCPPSTF," (November 3, 2017) <http://www.monitoringanalytics.com/reports/Presentations/2017/IMM_CCPPSTF_Proposal_Summary_Revised_20171103.pdf> .

28 136 S. Ct. 1288 (2016).

29 Exelon at 27.

30 *See* Kammen, Daniel M. and Sergio Pacca. "Assessing the Costs of Electricity," *Annual Review of Environment and Resources*, Volume 29, 2004.

3. Some Changes to Markets to Reflect the Reliability and Environmental Value of Resources are Consistent with Competitive Markets.

Exelon also discusses some market design changes that have the potential to appropriately capture currently unpriced reliability and environmental value of resources in the market.[31] These include evaluating whether PJM's current reserve products reflect the demand for reliability required in PJM operations, expanding reserve products to include natural gas pipeline contingencies, and carbon pricing.

The Market Monitor does not support out of market payments to purchase fuel or otherwise support the operation of generators, as suggested by Exelon.[32]

4. Evaluation of Vulnerabilities of the Bulk Power System Should Not Focus on One Particular Fuel Source.

Exelon suggests that the Commission should perform a rigorous analysis to detail the vulnerabilities of the grid.[33] Exelon's testimony, provided by Dr. Stockton, focuses on vulnerabilities related to natural gas infrastructure. Threats to the bulk power system vary. If RTOs are to evaluate vulnerabilities, their analysis should not be limited to the vulnerabilities associated with only one particular fuel source. Having the electricity market operator focus on problems with only one fuel source would be discriminatory. But incorporating reliability analysis related to fuel availability across fuel types and potential impacts on constraint pricing is worth exploring in detail.

For example, as part of ensuring that a grid that is more reliant on gas fired resources continues to be reliable, PJM should continue to evolve its approaches to evaluating reliability and extend those to gas infrastructure. Use of transmission planning and reliability concepts should be applied to the gas infrastructure. If warranted by

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31 Exelon at 29-31.

32 Exelon at 32.

33 Exelon at 32-33.

reliability concerns, the use by the Commission of an ISO construct in the gas market to enhance planning for reliability across gas pipelines, to enhance interoperability of pipelines with power generators and to enhance interoperability across gas pipelines should be explored.

As part of ensuring that a grid that relies on gas, coal and nuclear for very similar shares of energy, PJM should continue to evolve its approaches to evaluating reliability and extend those to the coal infrastructure and the nuclear infrastructure. Use of transmission planning and reliability concepts should be applied to the coal infrastructure and the nuclear infrastructure. Risks associated with coal deliverability and availability to produce energy and risks associated with nuclear common mode issues could all be part of this evaluation.

D. Reply to FirstEnergy[34]

FirstEnergy argues that the RTO markets are "hybrid market/cost-based creatures of government policy," which, it argues, justifies nonmarket cost of service payment interventions.[35] The Market Monitor disagrees. It should come as no surprise that wholesale power markets continue to be subject to regulation. Most markets are subject to regulation. The wholesale power markets are regulated, but the Commission relies directly on competition to ensure just and reasonable results. Government policy has focused on competition.

FirstEnergy has an established track record of seeking subsidies in order to support uneconomic resources.[36] FirstEnergy has consistently attempted to shift the costs of

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34 Comments of the FirstEnergy Service Company et al. in Support of the Grid Reliability and Resilience Pricing Notice of Proposed Rulemaking, Docket No. RM18-1-000 (October 23, 2017). ("FirstEnergy")

35 FirstEnergy at 7.

36 See Ohio Public Utility Commission, Docket No. 14-1297-EL-SSO; Public Service Commission of West Virginia, Case No. 17-0296-E-PC.

uneconomic resources from its shareholders to its customers. FirstEnergy has received a clear signal from the market; the signal is not a hybrid or from the government. It is exactly this clear market signal that FirstEnergy wants to avoid, first by seeking state level subsidies and now by seeking federal subsidies.

FirstEnergy proposes a 15 year cost of service contact between the RTO and the generating company for a subset of uneconomic resources and provides qualifications for the resources that would receive payments. FirstEnergy's proposal would provide unjustified payments that exceed a market rate of return for the services those resources provide. In fact, FirstEnergy proposes to increase the allowable rate of return on the asset from market values to "preimpairment asset values." Allowing the higher rate would constitute a stranded cost payment that would pay for the sunk cost of capital, invested when FirstEnergy operated the units under cost of service regulation, exceeding the current asset value of the resources allegedly based on the impairment of asset values caused by the operation of the competitive wholesale power markets.[37] The payments would mask the competitive market signal for resource retirement and suppress efficient entry of new generation.

1. Regulation Through Competition is Not Consistent with Cost of Service Payment to Uneconomic Generators.

In the PJM region, states chose regulation through competition as an explicit alternative to cost of service regulation. Competition in electricity markets requires regulatory interventions to overcome market coordination problems created by transmission congestion and losses, nonconvexity of generator costs, transmission planning, reliability, and market power. PJM exists to provide that coordination with regulatory oversight and cost-based payments to support its operations. The regulatory regime around the market facilitates competition. As the Commission states:

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[37] FirstEnergy at 48.

> National policy for many years has been, and continues to be, to foster competition in wholesale power markets. In each major energy bill over the last few decades, Congress has acted to open up the wholesale electric power market by facilitating entry of new generators to compete with traditional utilities. As the third major federal law enacted in the last 30 years to embrace wholesale competition, the Energy Policy Act of 2005 strengthened the legal framework for continuing wholesale competition as federal policy for this country. The Commission has acted quickly and strongly over the years to implement this national policy.
>
> The Commission's core responsibility is to "guard the consumer from exploitation by non-competitive electric power companies."[38]

The existence of the Commission's regulatory oversight of the wholesale power markets does not justify undermining competition by forcing consumers to subsidize uneconomic units and to reverse the benefits of competition.

E. Reply to PSEG Companies[39]

PSEG supports both cost of service payments for baseload units, as proposed by FirstEnergy, and price formation changes, as proposed by Exelon. PSEG suggests the cost of service payments as an interim measure, recognizing that cost of service payments are not consistent with "the long-term efficiency of competitive markets."[40] PSEG does not explain why it is appropriate to make payments that are not consistent with efficient, competitive markets. PSEG states that the PJM proposal should also be evaluated.[41] PSEG describes several market design changes. Some of PSEG's suggested changes have the potential to

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38 See FERC Website, Electric Competition (accessed November 6, 2017) <https://www.ferc.gov/industries/electric/indus-act/competition.asp>.

39 Comments of the PSEG Companies, Docket No. RM18-1-000 (October 23, 2017). ("PSEG")

40 PSEG at 3.

41 PSEG at 4.

enhance competitive markets, while others would explicitly choose winners and losers in the markets and undermine competition.

PSEG has not explained why any of its generating plants require subsidies or whether it favors subsidies for nuclear and coal plants. PSEG has not attempted to assert that its nuclear assets are receiving retirement signals from the markets. PSEG has not proposed that the subsidies be returned to customers if prices increase and the profitability of the plants increases.

PSEG argues that the existence of cost of service regulated entities in the PJM market indicates that markets can perform competitively with cost of service subsidies. PSEG states:

> Finally, it should be noted, that about 30% of the units in PJM are currently under cost of-service regulation and that the PJM Independent Market Monitor deems both the energy and capacity markets to be competitive. It would thus be disingenuous to suggest that competition in the PJM market is incompatible with cost-of-service treatment for generators. If it were, the fact that almost 30% of the suppliers operate under a cost-of-service regime could not be reconciled with competitive operations. There is no apparent reason why competition would be extinguished if some set of additional resources also received cost-of-service support.

PSEG fails to recognize an important distinction between cost of service subsidies intended to alter the market and cost of service regulated entities that have been incorporated in the market using rules that minimize the competitive impacts.

The market paradigm and the quasi-market, cost of service, paradigm are mutually exclusive. Once the decision is made that market outcomes must be fundamentally modified, it will be virtually impossible to return to markets. While there are entities in the PJM markets that continue to operate under the quasi-market paradigm, those entities have made a long term decision on a regulatory model and the PJM rules generally limit any associated, potential negative impacts on markets. That consistent approach to the regulatory model is very different from current attempts to subsidize specific market assets that are uneconomic as a result of competition. Subsidies are an effort to reverse market

outcomes with no commitment to a regulatory model and no attempt to mitigate negative impacts on competition. The subsidy model is inconsistent with the PJM market design and inconsistent with the market paradigm and constitutes a significant threat to both.

Like PSEG, the Market Monitor supports reforms to increase the transparency of uplift payments and to improve shortage pricing. Reforms to shortage pricing have the potential to provide stronger price signals to resources to produce energy when the system needs it most. Correct triggering of both system level shortage pricing and local shortage pricing during congestion events would eliminate many of the counterintuitive results that occur when PJM commits resources out of merit for reliability. Transparency in the uplift payments to resources that operators call on in anticipation of shortage and congestion events would aid PJM and its stakeholders in correctly identifying reserve products and would enhance competition.

The Market Monitor does not support adding constraints to the capacity market to require the clearing of resources by fuel type or technology. Although characterized as constraints in the market, these are simply a way to require the clearing of selected units or technologies and are not consistent with competitive market outcomes. Such constraints would constitute a biased clearing of the market to pick winners and losers instead of allowing competition to determine market outcomes.

II. CONCLUSION

The Market Monitor respectfully requests that the Commission afford due consideration to this pleading as the Commission resolves the issues raised in this proceeding.

Respectfully submitted,

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