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Barcy F. McNeal  
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180 Broad Street  
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*RE: In the Matter of the Application of Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company for Authority to Provide for a Standard Service Offer Pursuant to R.C. §4928.143 in the Form of an Electric Security Plan, Case No. 14-1297-EL-SSO, et seq.*

To the Public Utilities Commission of Ohio:

Pursuant to Section V. C. 2 of the Third Supplemental Stipulation and Recommendation approved by the Commission on March 31, 2016, Ohio Edison Company, The Cleveland Electric Illuminating Company and The Toledo Edison Company ("Companies") hereby file their quarterly update to the Commission on the state of the wholesale electricity markets from the Companies' perspective.

Very truly yours,

*/s/ Carrie M. Dunn-Lucco*

Carrie M. Dunn-Lucco

# FirstEnergy's Perspective on PJM's Wholesale Electricity Markets: 2017

## 1 EXECUTIVE SUMMARY

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This report is required by section V.C.2 of the Third Supplemental Stipulation approved with modifications by the Commission on March 31, 2016 ("the Stipulation"). Each September 1, FirstEnergy files a detailed report, and the addendum is updated the other three quarters. This report does not replace the information in the report filed September 1, 2016, and is instead meant to build upon it.

The PJM wholesale markets are currently experiencing high supply, as evidenced by a high reserve margin, and low prices. This has resulted in lower customer bills in the short term, but could have unintended consequences for customers in the long term. PJM continues to state that the markets are working, but there are serious problems that the markets simply are not designed to solve. FirstEnergy believes that the existing model, which is built to only consider short-term cost and reliability, is not producing market outcomes that are in customers' best interests over the long term. Fuel diversity, fuel security, resilience, local economics, long term price stability, and environmental impacts are all essential considerations which are not addressed in PJM's current market design.

To complicate matters further, the grid is changing. Demand response and distributed energy resources are playing a much larger role than anticipated when the grid was designed. There has been a dramatic shift in the fuel mix, with significant increases in natural gas generation and renewables, and decreases in baseload coal and nuclear generation. FirstEnergy strongly believes that a diverse resource mix is the best way to ensure that the system can adapt to changing conditions and recover rapidly from disruptions; diversity enables resilience.

Market participants spent a considerable amount of time over the last year discussing whether and how public policy could be integrated into wholesale markets. As baseload units have retired (or contemplated retirement) prematurely in the face of economic struggles, states have taken public policy actions including supporting zero emitting nuclear units. FirstEnergy believes these legitimate state actions should be preserved and are a symptom of broader market issues. In May 2017, FERC held a technical conference with the goal of establishing a record on integrating markets and public policy, but it seems unlikely that a timely solution is forthcoming, as FERC's quorum has only been restored in the past month and there is significant stakeholder disagreement on the issue.

In FirstEnergy's view, there are several paths to address the issue of premature baseload retirement. These three paths are running in parallel and are not necessarily mutually exclusive. First, Ohio could approve legislation implementing zero emissions nuclear credit programs similar to those adopted in New York and Illinois. Second, actions could be taken resulting from the Department of Energy's Staff Report on Electricity Markets and Reliability.<sup>1</sup> Finally, PJM could implement one or more of their

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<sup>1</sup> <https://energy.gov/downloads/download-staff-report-secretary-electricity-markets-and-reliability>

proposals regarding capacity market repricing, a carbon adder, or energy price formation. However, FirstEnergy believes that any FERC or PJM solution will not likely be implemented in time to address the immediate concerns of Ohio's nuclear power plants and for customers to continue to enjoy the many benefits these plants bring to Ohio.

## 2 BACKGROUND

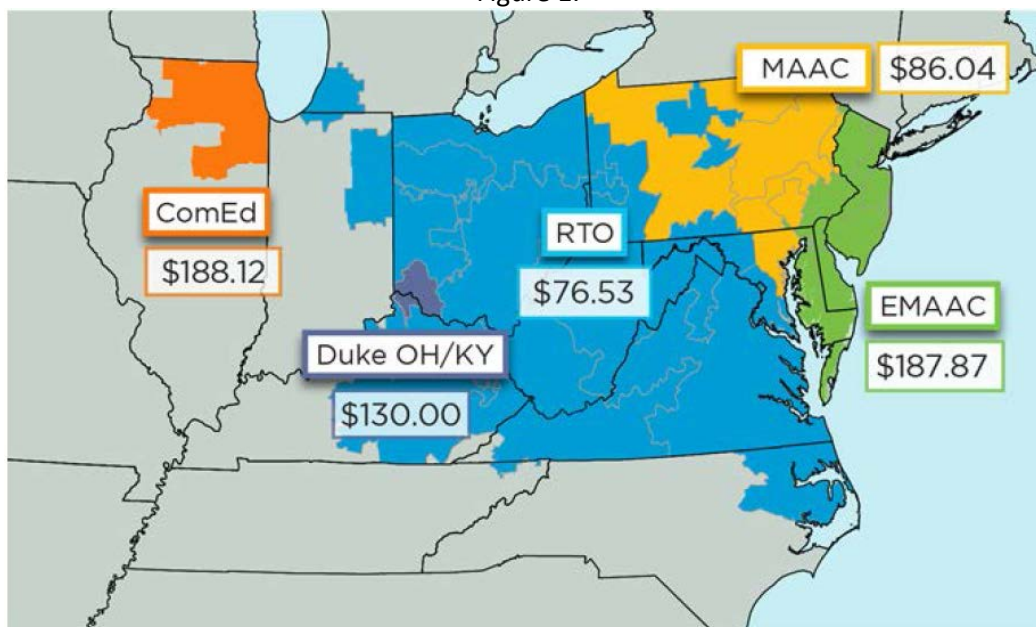
*The purpose of this section is to provide a brief overview of PJM markets including pricing trends, the changing grid, a discussion of diversity and resilience, and integrating markets and public policy.*

PJM has responsibility for organizing and administering the capacity, energy, ancillary services and Financial Transmission Rights (FTR) markets, and managing the reliability of the transmission grid. PJM provides open access to the transmission grid and ensures performance via long-term planning.

### Market Prices<sup>2</sup>

Capacity: The May 2017 Base Residual Auction ("BRA") was the first auction in which PJM procured 100% capacity performance ("CP") resources since the product was first introduced. As shown in Figure 1 below, RTO prices for the 2020/2021 delivery year cleared at \$76.53/MW-day for CP resources, compared to \$100.00/MW-day for 2019/2020 and \$164.77/MW-day for 2018/2019.<sup>3</sup>

Figure 1.



This downward trend in pricing indicates to FirstEnergy that the risk of non-performance is not being appropriately valued in pricing. This is likely because there have been no performance assessment hours since capacity performance was first implemented. Sustained low capacity pricing combined with

<sup>2</sup> See "FirstEnergy's Perspective on PJM's Wholesale Electricity Markets: 2016" filed September 1, 2016 in 14-1297-EL-SSO for a discussion on historical PJM pricing.

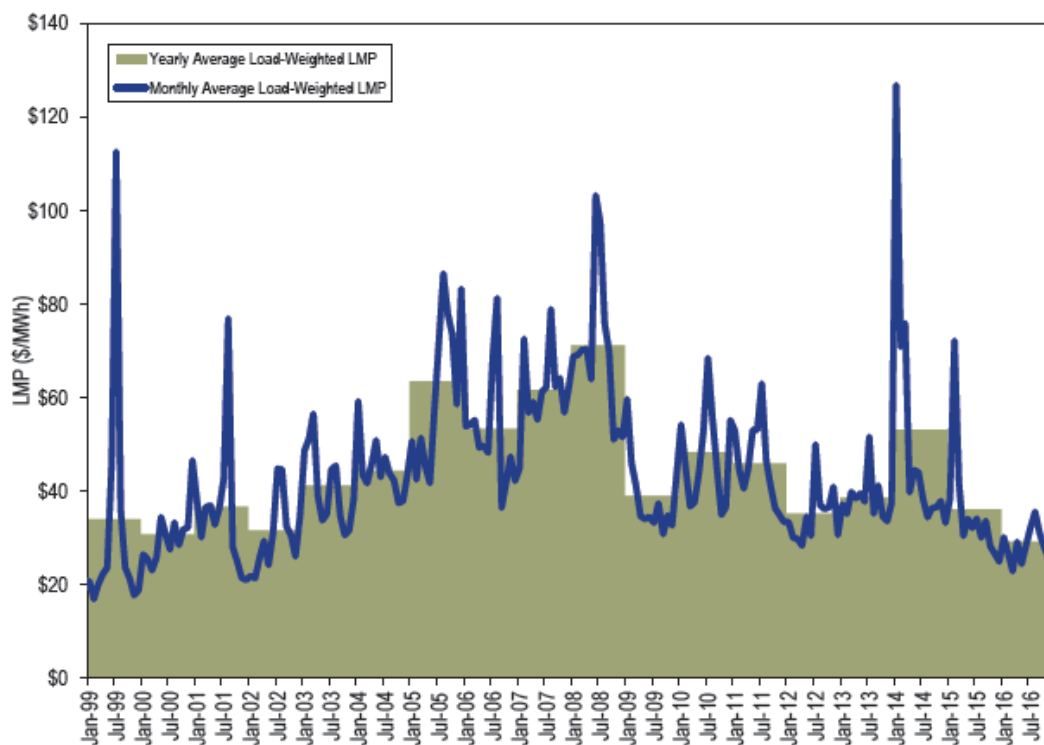
<sup>3</sup> <http://pjm.com/-/media/committees-groups/committees/mrc/20170525/20170525-2020-21-bra-results.ashx>

the fact that only 20% of natural gas-fired generators have firm fuel arrangements in place indicate that natural gas owners are simply willing to take on this large financial risk and deal with any consequences later.

Further, the extremely low price of \$76.53/MW-day for 2020/2021 begs the question as to whether the markets will continue to be sustainable for new natural gas entry. It is important to note that the most recent auction attracted 2,350 MW of new combined cycle natural gas resources<sup>4</sup> compared to just over 5,000 MW the year before.<sup>5</sup> This was the lowest level of new entry in six years.

Energy: Current energy market prices remain low compared to historical prices. Figure 2 below shows the volatile history of PJM's real-time load-weighted Locational Marginal Prices (LMP) for 2000 through 2016, as reported by Monitoring Analytics, the PJM Independent Market Monitor (Market Monitor).<sup>6</sup>

Figure 2.



<sup>4</sup> <http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/2020-2021-base-residual-auction-report.ashx>

<sup>5</sup> <http://www.pjm.com/~media/markets-ops/rpm/rpm-auction-info/2019-2020-base-residual-auction-report.ashx>

<sup>6</sup> Monitoring Analytics, LLC, *2016 State of the Market Report* 157 (2016), available at [http://monitoringanalytics.com/reports/PJM\\_State\\_of\\_the\\_Market/2016/2016-som-pjm-sec3.pdf](http://monitoringanalytics.com/reports/PJM_State_of_the_Market/2016/2016-som-pjm-sec3.pdf) ("2016 State of the Market Report").

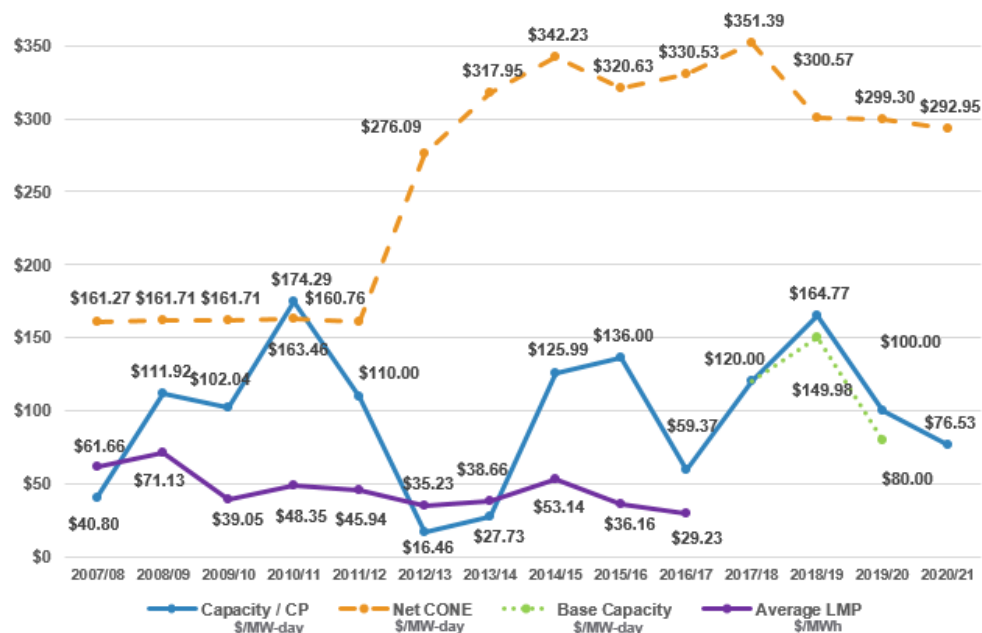
Figure 3 shows the year-over-year change in these LMPs, demonstrating a significant amount of volatility in prices.<sup>7</sup> Prices have swung more than 20% in nearly half of the years examined, with a 37.4% increase in 2014 followed by a 31.9% decline in 2015.

Figure 3.

|      | Real-Time, Load-Weighted,<br>Average LMP |         |                       | Year-to-Year Change |         |                       |
|------|------------------------------------------|---------|-----------------------|---------------------|---------|-----------------------|
|      | Average                                  | Median  | Standard<br>Deviation | Average             | Median  | Standard<br>Deviation |
| 1998 | \$24.16                                  | \$17.60 | \$39.29               | NA                  | NA      | NA                    |
| 1999 | \$34.07                                  | \$19.02 | \$91.49               | 41.0%               | 8.1%    | 132.8%                |
| 2000 | \$30.72                                  | \$20.51 | \$28.38               | (9.8%)              | 7.9%    | (69.0%)               |
| 2001 | \$36.65                                  | \$25.08 | \$57.26               | 19.3%               | 22.3%   | 101.8%                |
| 2002 | \$31.60                                  | \$23.40 | \$26.75               | (13.8%)             | (6.7%)  | (53.3%)               |
| 2003 | \$41.23                                  | \$34.96 | \$25.40               | 30.5%               | 49.4%   | (5.0%)                |
| 2004 | \$44.34                                  | \$40.16 | \$21.25               | 7.5%                | 14.9%   | (16.3%)               |
| 2005 | \$63.46                                  | \$52.93 | \$38.10               | 43.1%               | 31.8%   | 79.3%                 |
| 2006 | \$53.35                                  | \$44.40 | \$37.81               | (15.9%)             | (16.1%) | (0.7%)                |
| 2007 | \$61.66                                  | \$54.66 | \$36.94               | 15.6%               | 23.1%   | (2.3%)                |
| 2008 | \$71.13                                  | \$59.54 | \$40.97               | 15.4%               | 8.9%    | 10.9%                 |
| 2009 | \$39.05                                  | \$34.23 | \$18.21               | (45.1%)             | (42.5%) | (55.6%)               |
| 2010 | \$48.35                                  | \$39.13 | \$28.90               | 23.8%               | 14.3%   | 58.7%                 |
| 2011 | \$45.94                                  | \$36.54 | \$33.47               | (5.0%)              | (6.6%)  | 15.8%                 |
| 2012 | \$35.23                                  | \$30.43 | \$23.66               | (23.3%)             | (16.7%) | (29.3%)               |
| 2013 | \$38.66                                  | \$33.25 | \$23.78               | 9.7%                | 9.3%    | 0.5%                  |
| 2014 | \$53.14                                  | \$36.20 | \$76.20               | 37.4%               | 8.9%    | 220.4%                |
| 2015 | \$36.16                                  | \$27.66 | \$31.06               | (31.9%)             | (23.6%) | (59.2%)               |
| 2016 | \$29.23                                  | \$25.01 | \$16.12               | (19.2%)             | (9.6%)  | (48.1%)               |

In summary, as shown in Figure 4 below, capacity prices remain well below Net CONE, and average energy prices continue to be suppressed.

Figure 4.<sup>8</sup>



<sup>7</sup> *Id.*, p. 156.

<sup>8</sup> Chart developed using PJM Base Residual Auction reports for 2007/2008–2020/2021 and data from Figure 3.

## The Changing Grid

Demand response and distributed energy resources are playing a much larger role than anticipated when the grid was designed. Behind-the-meter technology has the potential to change the dynamics of markets and grid operations. This issue should be closely monitored as new technologies emerge and the grid continues to evolve.

In a recent whitepaper, PJM laid out its strategy for demand response, which makes up about 5% of the committed capacity today.<sup>9</sup> PJM indicated a desire to preserve its Curtailment Service Provider model and demand response's supply side role in capacity and ancillary services markets, but noted that the long-term goal should be demand response capability participation on the demand side of the energy market.

Twelve percent of demand response comes from distributed energy resources (DER), predominately behind the meter generation, and PJM does not differentiate based on how the load will be reduced.<sup>10</sup> PJM is holding a stakeholder process to evaluate rule changes which will further enable small generation resources on the distribution system to participate within wholesale markets. To accomplish this, PJM is exploring the aggregation of generation resources to achieve the 100 kW minimum threshold. FirstEnergy has been actively advocating for the need to recognize state and electric distribution company rights with a specific emphasis on the need for situational awareness and control to manage local safety and enable operational reliability. PJM is anticipating rule modifications by the end of the year. Several elements of this effort overlap with the outstanding FERC Notice of Proposed Rulemaking related to storage and distributed energy resource aggregation.<sup>11</sup>

FirstEnergy has developed the following principals when thinking about DER:

1. **General Requirements** – Market rules must acknowledge and consider the distribution system and state/local jurisdictional agency standards and protocol to ensure safety, reliability and equitable treatment across all customers seeking use of the system.
2. **Aggregation** - DER<sup>12</sup> seeking to expand participation in the wholesale markets through an aggregator is a concept which should be investigated thoroughly to understand the impacts to the system from a safety, reliability, and resilience standpoint.
3. **Services & Operational Principles** – The Distribution System Operator (DSO) shall maintain access to the Bulk Electric System (BES) through good utility practices. Operations must meet applicable reliability standards, good utility practice, conditions set forth in the Distribution System (DS) Impact Study/Facility Study and applicable local, state and federal laws and regulations. In addition, the DSO should preserve priority over the operations of all DER resources on its system and those respective resources must follow the DSO's operational and

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<sup>9</sup> <http://www.pjm.com/~media/library/reports-notice/demand-response/20170628-pjm-demand-response-strategy.ashx>

<sup>10</sup> Id.

<sup>11</sup> See FERC RM16-23, issued November 17, 2016.

<sup>12</sup> The term distributed energy resources includes but is not limited to solar, wind and other renewables, distribution system level synchronous generators, and energy storage resources at distribution voltages.

emergency instructions to preserve local safety and reliability regardless of commitments or dispatch signals between the RTO and the DER. DS power quality must be maintained within established guidelines regardless of commitments or dispatch signals between the RTO and the DER.

4. **Situational Awareness** – Metering and telemetry requirements may vary based on technology, commercial intent and configuration to ensure sufficient information for safety, reliability and settlements/accounting. Situational awareness must remain a top priority to preserve safety and reliability, and it cannot be compromised to ease participation in PJM markets. Management of safety includes, but is not limited to, distribution equipment, distribution personnel, customers, first responders and the general public.
5. **Information & Coordination** - The DS and RTOs/ISOs will require sufficient information to reliably operate their systems. Information sharing should align with the DS requirements and provide the necessary level of detail to maintain local and bulk reliability. Cost associated with this coordination should be borne by the DER resources initiating the requirement. Any application for aggregation must include a complete and detailed list of all the participating resources. The details must include the specific project location and the full range of technical capabilities of each resource. Finally, as a protection for the DER, steps must be taken to ensure the appropriate communication and dissemination of sensitive retail customer information.
6. **Cost Causation** – DER customers should be wholly responsible for the costs of any facilities that must be constructed, modified or purchased to accommodate the interconnection of the facility to the DS and for access to the BES as approved by state/local jurisdiction agency. Any charges levied by the DS operator to deliver the DER service to the interface between the DS and the RTO should be the responsibility of the DER as established by the DS operator and its state/local jurisdictional agency. Charges may include both on-going operational charges, penalties for non-compliance with rules or reliability directives or capital costs for facilities needed to provide BES access to the DER.
7. **Supporting Customers** – The design must include the ability to understand and meet emerging customer needs/expectations, and have informed customer service representatives able to engage customers implementing DER in meaningful ways. Utilities should support customers end to end, from meter installations, use of meter data for billings, and use of meter data for RTO coordination, and should partner with customers participating in DER to ensure intended outcomes are achieved.

Overall, FirstEnergy has advocated for PJM to take a holistic approach related to market rule changes around DER to avoid unintended interference with state/local jurisdictional requirements, distribution system operations, and settlements. A quality work product requires the development of rules by a multi-disciplined stakeholder group including robust participation from electric distribution companies and state regulators.

FirstEnergy anticipates PJM will appropriately raise the issue to a higher-level and expand the scope of the initiative. FirstEnergy hopes that the PUCO will remain engaged at the PJM/FERC level in these

discussions. This is a good opportunity for FirstEnergy and the PUCO to partner together on this key issue affecting customers.

FirstEnergy has also been engaged in PowerForward efforts, which is the PUCO's review of technological innovations and regulatory policies that could serve to enhance the consumer electricity experience through distribution grid modernization.

PowerForward is being conducted in three phases: Phase 1, held in April 2017, reviewed what the customer electricity experience of the future will look like. FirstEnergy presented at Phase 1 and used a video to visually depict our vision of the future to the Commission. Phase II, held in July 2017, consisted of a deeper dive into technologies that can be used to modernize the grid. FirstEnergy's presentation highlighted that our current reliability results are strong, but additional investment is needed to meet customers' evolving expectations and to integrate new emerging technologies. Phase III, which will be conducted in the first quarter of 2018, will focus on the regulations and ratemaking associated with grid modernization.

By mid-2018, the PUCO plans to conclude the PowerForward proceeding by issuing a vision document on the future of grid modernization in Ohio. FirstEnergy remains focused on this proceeding and potential grid modernization investments in Ohio.

Additionally, as described in FirstEnergy's September 2016 report on PJM markets, there has been a dramatic shift in PJM's fuel mix, with significant increases in natural gas generation and renewables, and decreases in baseload coal and nuclear generation. Notably, as shown in Figures 5 and 6,<sup>13</sup> nuclear plant closures have been announced at an unprecedented rate in the United States, and with a higher concentration in restructured states. Nuclear plants do not emit carbon and offer numerous other benefits, including contributions to fuel diversity, fuel security, resilience, and impacts on local economies. Legislation is pending in Ohio to compensate nuclear resources for these attributes as they are not currently considered under PJM's market construct.

FirstEnergy strongly believes that a diverse resource mix, including baseload generation, is the best way to ensure that customers are protected by a resilient system.

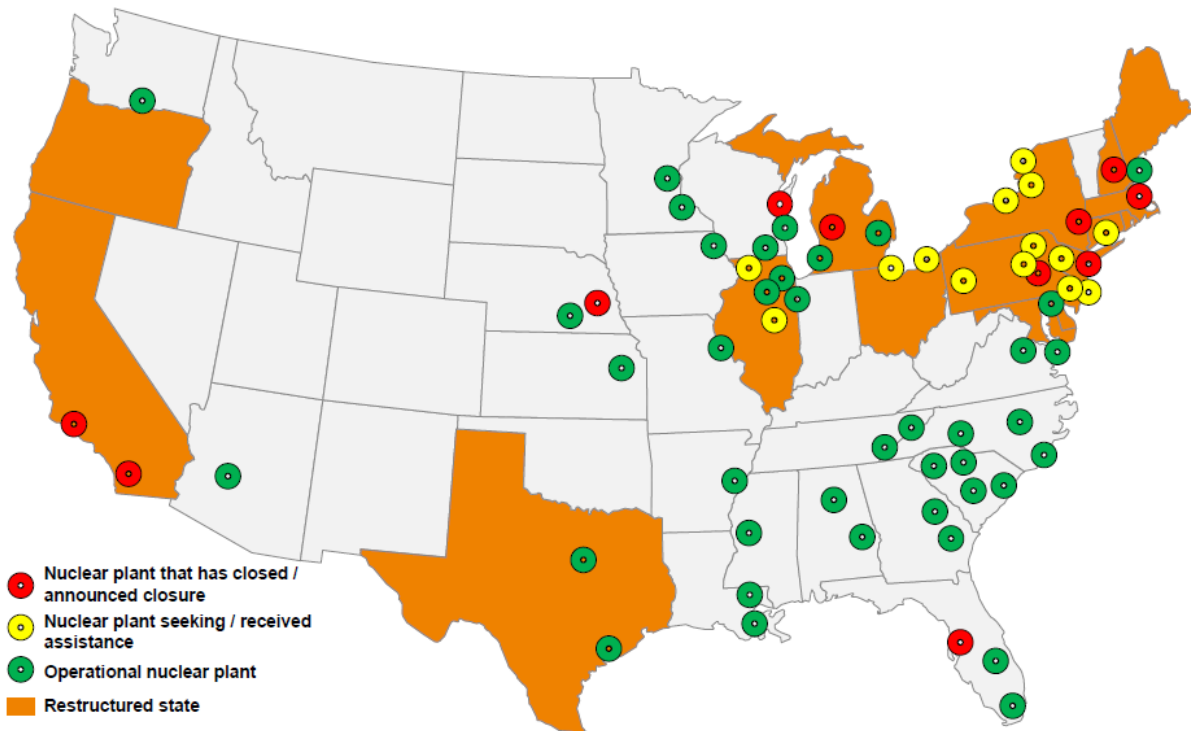
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<sup>13</sup> "U.S. Nuclear Plant Closures, Power Magazine, June 25, 2016; "Palisades Nuclear Plant Closing Shocks Many in South Haven Area", Mlive, December 9, 2016; "Ginna Nuclear Power Plant Gets a Lifeline", Power Magazine, February 18, 2015; Entergy Press Release, January 9, 2017; FirstEnergy Third Quarter 2016 Earnings Call, November 4, 2016; Exelon Press Release, May 30, 2017.

Figure 5.

| Plant             | Location               | MW    | Operating License Expiration        | Premature Closing Date | Reason for Closure                                                                                                                                                                                                         |
|-------------------|------------------------|-------|-------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kewaunee          | Wisconsin (MISO)       | 556   | 2033                                | 2013                   | PPA ended, low energy and capacity prices                                                                                                                                                                                  |
| Vermont Yankee    | Vermont (ISO-NE)       | 620   | 2032                                | 2014                   | Low energy and capacity prices                                                                                                                                                                                             |
| Fort Calhoun      | Nebraska               | 478   | 2033                                | December 2016          | Cheaper to purchase elsewhere                                                                                                                                                                                              |
| FitzPatrick       | New York (NYISO)       | 838   | 2034                                | February 2017*         | Low energy and capacity prices                                                                                                                                                                                             |
| Ginna             | New York (NYISO)       | 610   | 2029                                | March 2017 *           | Low energy and capacity prices                                                                                                                                                                                             |
| Clinton           | Illinois (MISO)        | 1,098 | 2026                                | May 2017**             | Low energy and capacity prices                                                                                                                                                                                             |
| Quad Cities       | Illinois (PJM)         | 1,880 | 2032                                | May 2018**             | Low energy and capacity prices                                                                                                                                                                                             |
| Palisades         | Michigan (MISO)        | 800   | 2031                                | October 2018           | PPA terminated early; cheaper to purchase elsewhere                                                                                                                                                                        |
| Pilgrim           | Massachusetts (ISO-NE) | 690   | 2032                                | May 2019               | Low energy and capacity prices                                                                                                                                                                                             |
| Oyster Creek      | New Jersey (PJM)       | 636   | 2029                                | May 2019               | Settlement to close early in return for no cooling tower install                                                                                                                                                           |
| Indian Point      | New York (NYISO)       | 2,080 | 2035 (renewal pending)              | April 2021             | Low energy prices, public opposition                                                                                                                                                                                       |
| Perry             | Ohio (PJM)             | 1,260 | 2026 (eligible for license renewal) | TBD                    | FirstEnergy publicly stated its intention in Nov. 2016 to be a fully regulated company; all of its competitive generation including the nuclear plants will either be placed in a regulated-like construct, sold or closed |
| Davis-Besse       | Ohio (PJM)             | 900   | 2037                                | TBD                    |                                                                                                                                                                                                                            |
| Beaver Valley     | Pennsylvania (PJM)     | 1,800 | 2036 / 2047                         | TBD                    |                                                                                                                                                                                                                            |
| Three Mile Island | Pennsylvania (PJM)     | 837   | 2034                                | September 2019         | Low energy and capacity prices                                                                                                                                                                                             |

Figure 6.



## Diversity and Resilience

On March 30, 2017, PJM released a whitepaper titled “PJM’s Evolving Resource Mix and System Reliability”.<sup>14</sup> The whitepaper analyzed potential future resource portfolios based on two components of reliability: resource adequacy (the amount of capacity needed to serve a forecasted peak load while meeting the required Loss of Load Expectation criterion) and operational reliability (the grid’s day-to-day operational needs, as measured by a portfolio’s capability to provide key generator reliability attributes).

PJM found, among other things, that the expected near-term resource portfolio is well equipped to provide the generator reliability attributes. As the potential future resource mix moves in the direction of less coal and nuclear generation, generator reliability attributes of frequency response, reactive capability and fuel assurance decrease, but flexibility and ramping attributes increase. Portfolios composed of up to 86 percent natural gas-fired resources maintained operational reliability, but of the 98 “desirable” portfolios, only 34 remained reliable during polar vortex conditions. Resource mixes with greater than 30% renewable penetration were not found to be reliable. The study did not evaluate economic impacts, and assumed that natural gas resources had fuel firm arrangements in place. At the April 19, 2017 Grid 20/20 session, PJM’s Mike Bryson acknowledged that an astounding 80% of natural gas resources do not have firm fuel arrangements in place.<sup>15</sup>

PJM notes that heavy reliance on one resource type raises questions about system resilience,<sup>16</sup> which is beyond the scope of this paper, and suggests that stakeholders continue to review criteria for resilience, whether the evolving resource mix will result in continued reliable operations, and how PJM’s business practice could include resilience. PJM has since released a draft Resilience Roadmap, laying out PJM’s plan to address this critical issue.<sup>17</sup>

On April 14, 2017, Secretary of Energy Rick Perry directed his Chief of Staff to initiate a study examining electricity markets and reliability.<sup>18</sup> Perry directed the Department of Energy to study “whether wholesale energy and capacity markets are adequately compensating attributes such as on-site fuel supply and other factors that strengthen grid resilience, and, if not, the extent to which this could affect grid reliability and resilience in the future.”

On Aug. 23, the Department of Energy released the “Staff Report to the Secretary on Electricity Markets and Reliability.” The Department of Energy study says what many, including FirstEnergy, have long contended: baseload power plants like coal and nuclear play an invaluable role in the long-term

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<sup>14</sup> <http://pjm.com/-/media/library/reports-notice/special-reports/20170330-pjms-evolving-resource-mix-and-system-reliability.ashx?la=en>

<sup>15</sup> <http://pjm.com/committees-and-groups/stakeholder-meetings/symposiums-forums/grid-2020-focus-on-resilience-part-1-fuel-mix-diversity-and-security.aspx>

<sup>16</sup> Presidential Policy Directive 21, issued February 12, 2013, states: “The term ‘resilience’ means the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents.”

<sup>17</sup> <http://pjm.com/~media/committees-groups/committees/mc/20170619-webinar/20170619-item-02-resilience-roadmap.ashx>

<sup>18</sup> <https://www.bloomberg.com/news/articles/2017-04-15/electric-grid-study-ordered-by-u-s-energy-chief-to-boost-coal>

resiliency of a well-functioning electric grid, and we must ensure these resources continue to provide customers with clean, reliable and affordable supplies of electricity.

The report addressed:

1. How the evolution of markets is changing the original policy assumptions that shaped creation of wholesale electricity markets
2. Whether wholesale energy and capacity markets are adequately compensating attributes such as on-site fuel supply and other factors that strengthen grid resilience, and if not, the extent to which this could impact grid reliability and resilience in the future
3. The extent to which continued regulatory burdens, as well as mandates and tax and subsidy policies, are responsible for forcing the premature retirement of baseload power plants

The report includes the following policy recommendations:

- Wholesale Markets: FERC should expedite efforts to improve wholesale energy price formation
- Valuation of Essential Reliability Service: FERC should study and make recommendations regarding efforts to require valuation of essential reliability services
- Bulk Power System Resilience: DOE should support efforts to enhance system resilience
- Promote R&D of next generation grid reliability and resilience tools: Focus R&D on improving renewable integration through grid modernization technologies that can increase grid flexibility and reliability
- Support Federal and regional approaches to electricity workforce development and transition assistance
- Energy Dominance: Continue to prioritize energy dominance and implement the Executive Order broadly and quickly
- Infrastructure Development: Accelerate and reduces costs for licensing, relicensing and permitting of grid infrastructure
- Electric and Gas Coordination: Support increased coordination between the electric and natural gas industries to address potential reliability and resilience concerns

FirstEnergy appreciates the DOE's careful and thorough study and is encouraged by the recommendations that identify the need for additional action. FirstEnergy looks forward to working with the Administration, FERC and others to implement in timely fashion the steps required to help keep fuel-secure baseload power plants a strong part of our energy future.

While the study's findings are clearly a positive development for coal and nuclear plants, it is too soon to tell the extent to which the federal government's actions will result in appropriate solutions to the market issues identified in this report.

### **Integrating markets and public policy**

On May 1-2, 2017 FERC hosted a technical conference on incorporating public policy into markets. States and stakeholders were given the opportunity to provide perspective on the interplay between policy and markets in ISO-NE, NYISO, and PJM, any potential wholesale market and resource adequacy implications from attempts to reconcile the two, and potential solutions. Commissioner Honorable

(who has since departed FERC) indicated that FERC is merely trying to build a record in absence of a quorum, and Chairman LaFleur (who is no longer Chair) asked how FERC can assist the RTO/ISOs, implying that a directive from FERC is not likely. PJM's Stu Bresler asked for deadlines and guidance from FERC, but indicated that PJM intends to work through the stakeholder process on these matters rather than looking to FERC for a solution.

In its notice requesting a post-technical conference, FERC laid out five possible paths:<sup>19</sup>

- Path 1 – Limited or No Minimum Offer Price Rule: an approach that would either not apply the minimum offer price rule to state-supported resources, or limit application of the minimum offer price rule to only state-supported resources where federal law preempts the state action providing that support.
- Path 2 – Accommodation of State Actions: an approach that would accommodate state policies that provide out-of-market support with the operation of the wholesale markets by allowing state-supported resources to participate in those markets and, when relevant, obtain capacity supply obligations, subject to adjustments necessary to maintain certain wholesale market prices consistent with the market results that would have been produced had those resources not been state-supported.
- Path 3 – Status Quo: an approach that would rely on existing tariff provisions applying the minimum offer price rule to some state-supported resources, and continuing case-by-case litigation over the specific line to be drawn between categories of state actions that may, or may not, result in a state-supported resource being subject to the minimum offer price rule.
- Path 4 – Pricing State Policy Choices: an approach in which state policies, to the extent possible, would value the attributes (e.g., resilience) or externalities (e.g., carbon emissions) that states are targeting in a manner that can be readily integrated into the wholesale markets in a resource-neutral way. For those state policies that cannot be readily valued and integrated into the wholesale markets, Path 4 would also require consideration of what, if anything, the Commission should do to address the market impacts of these state policies. For instance, other approaches for these state policies may include accommodation, application of the minimum offer price rule, or an exemption from the minimum offer price rule.
- Path 5 – Expanded Minimum Offer Price Rule: an approach that would minimize the impact of state-supported resources on wholesale market prices by expanding the existing scope of the minimum offer price rule to apply to both new and existing capacity resources that participate in the capacity market and receive state support.

Stakeholder response was diverse, with every path being supported by at least one party, and some parties suggesting pursuing multiple paths in parallel. FirstEnergy does not expect PJM stakeholders to come to consensus on this clearly divisive issue.

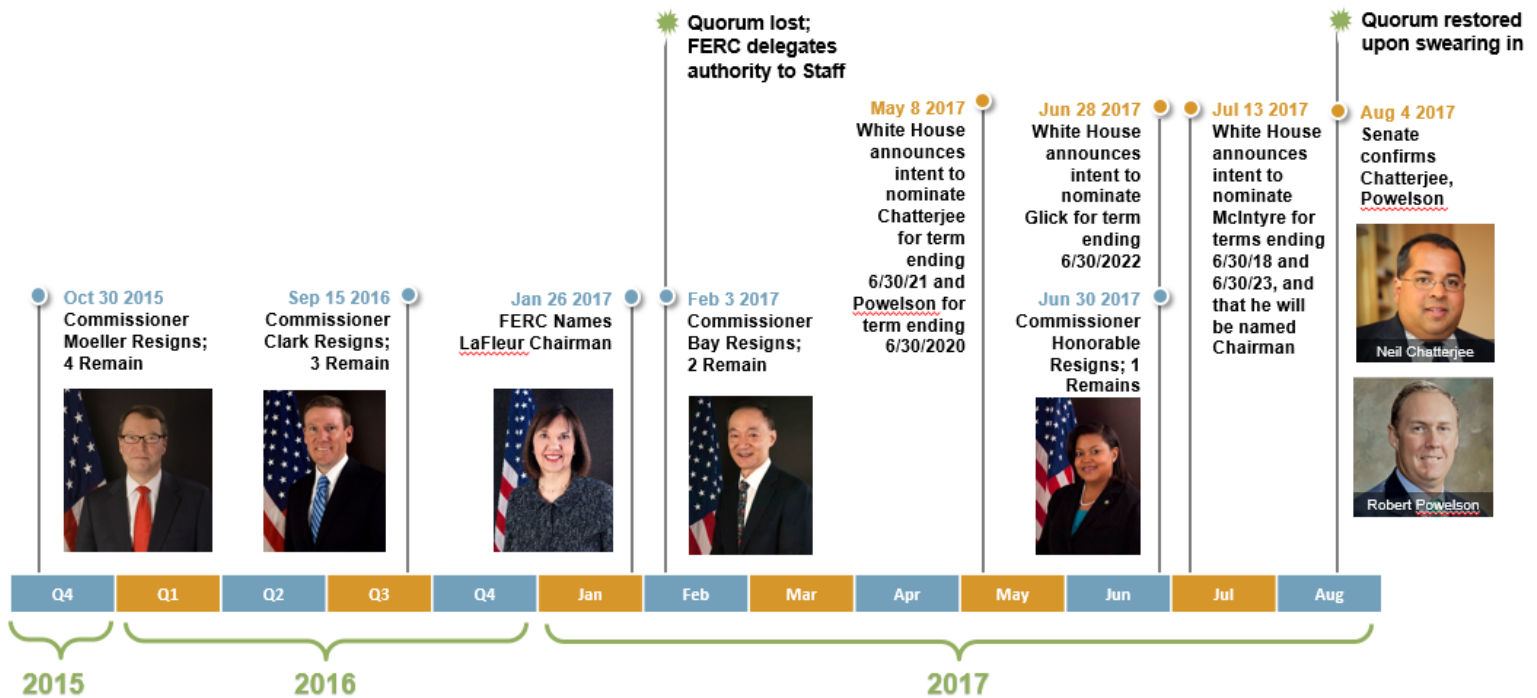
With FERC lacking a quorum from February through August of 2017 (see Figure 8), it is unclear how long it will take FERC to act on this important issue. Commissioner LaFleur has noted that FERC's backlog

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<sup>19</sup> FERC Docket AD17-11

increases by 100 orders per month for each month FERC lacks a quorum. With over 600 orders awaiting the newly sworn in Commissioners, it's unlikely that timely relief will come for baseload units.

Figure 8.



### PJM's proposals

In response to the FERC technical conference on integrating markets and public policy, PJM released a paper titled "Context for PJM Market Design Proposals Responding to State Public Policy Initiatives."<sup>20</sup> The paper links to three working papers:

Working Paper 1: Advancing Zero Emissions Objectives through PJM's Energy Markets (May 2, 2017)<sup>21</sup>

Working Paper 2: Capacity Market Repricing Proposal (June 12, 2017)<sup>22</sup>

Working Paper 3: Energy Market Price Formation (June 15, 2017)<sup>23</sup>

The first working paper, Advancing Zero Emissions Objective through PJM's Energy Markets, is essentially a state opt-in program that prices carbon (a carbon tax) into the energy market and clears separately from the rest of the market that does not opt-in. PJM's idea is not unlike those that have

<sup>20</sup> <http://www.pjm.com/~media/library/reports-notice/special-reports/20170612-context-for-pjm-market-design-proposals-responding-to-state-public-policy-initiatives.ashx>

<sup>21</sup> <http://pjm.com/~media/library/reports-notice/special-reports/20170502-advancing-zero-emission-objectives-through-pjms-energy-markets.ashx>

<sup>22</sup> <http://pjm.com/~media/library/reports-notice/special-reports/20170502-capacity-market-repricing-proposal.ashx>

<sup>23</sup> <http://www.pjm.com/~media/library/reports-notice/special-reports/20170615-energy-market-price-formation.ashx>

been discussed in New England for the past year, without resolution.<sup>24</sup> Since this proposal requires state action, and in most cases state legislation will need to be passed, the timing of implementation will not likely be in 2018. Many issues, including carbon tax pricing and rules that prevent border leakage, will need to be addressed. PJM has not identified how many states are required to implement this initiative, but does suggest that state policies would need to be the same.

The second working paper, PJM's Capacity Market Repricing Proposal is essentially the same idea PJM proposed last summer with the objective to minimize suppressed pricing impacts of certain "subsidized" resources. This proposal clears the market in two steps: 1) resource adequacy unit commitment and then 2) price, using a proxy value for a "subsidized" resource. The "subsidized" resource will need to pass a materiality test by PJM and the state can decide if the "subsidized" resource should be paid less than the cleared capacity price (in an effort to keep cost down for customers in states that have passed subsidy laws). This proposal is being discussed in stakeholder sessions and it is expected to be implemented mid-2018.

The final working paper, Energy Price Formation and Valuing Flexibility, addresses the following issues:

- 1) Pricing Reform - Ensuring LMP Reflects Resources Needed to Serve Load: PJM believes FERC's fast start pricing NOPR should be expanded such that all units whose output is needed to serve load or control transmission constraints in a given interval are eligible to set price, not just flexible and fast start resources. Inflexible and parameter-limited units would be included in the expanded eligibility.
- 2) Developing a Complementary Load-Following Product to Value Flexibility: A load following product should be developed, which would compensate flexible resources forced to ramp up or down economically to meet demand when a larger, inflexible resources must operate at its minimum output level.
- 3) Addressing Impacts of Negative Offers: The Production Tax Credit (PTC) has enabled wind to submit negative energy market offers, which distorts price signals and reduces revenue streams. PJM intends to raise this issue with stakeholders and regulators to develop a solution.

FirstEnergy supports PJM and FERC efforts on price formation. However, based on discussions FirstEnergy has had with PJM, we estimate that these price formation efforts will have minimal value for generators.

### 3 DISCUSSION

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*The purpose of this section is to discuss FirstEnergy's observations based on the background information provided above and FirstEnergy's experience as a PJM market participant. This section also includes an overview of key advocacy efforts for 2017.*

It is clear to FirstEnergy that it is imperative that States' rights should be preserved.<sup>25</sup> States' actions are clearly symptoms of a much broader market design problem, and PJM's proposals described in the previous section do not adequately address the broader, long-term problems.

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<sup>24</sup> See <http://www.nepool.com/IMAPP.php>; note that New England recently announced stakeholder discussions are on hold until 2018.

<sup>25</sup> FirstEnergy believes that mitigation frustrates state objectives. See initial and reply comments in FERC Docket AD17-11

Generators must rely on wholesale energy and capacity prices, which are not covering costs of operation, notwithstanding capital costs. Wholesale market revenues have fallen so low they essentially support investment in one resource type (at best) – natural gas-fired resources.<sup>26</sup> This phenomenon has been observed by PJM’s market monitor for the past few years.<sup>27</sup> A “perfect storm” of several factors in recent years has collectively produced this result, including: (i) the “fracking” boom which has provided an abundant supply of low cost natural gas; (ii) very low to no load growth; and (iii) federal and state mandates/subsidies limited to date to renewable resources, demand response, and other social programs. As noted previously, competitive baseload power plants are closing in large numbers.

FERC, PJM, and market participants need to take a step back. Rather than rushing into any of the fixes which merely treat the symptom rather than the disease, we need to ask ourselves “what is the correct problem for the markets to solve?” If we are merely trying to have a system that is reliable in the short-term at the lowest short-term cost, PJM’s job is done. If we have deeper concerns, there is more work to do.

There are several key problems with PJM’s model. First, the holistic cost of transmission and generation are not part of the planning process. Second, fuel security and fuel diversity are being deemphasized. PJM keeps saying that the system is “more diverse than ever”, but that will not be the case if coal and nuclear plants continue to retire. Finally, system resilience is not considered. We are on track for natural gas to make up a significant part of the resource mix. While PJM’s resource diversity whitepaper noted that the system will continue to be reliable with high penetrations of natural gas-fired resources, it did not answer the fundamental question of whether it’s a good idea to have a system almost entirely comprised of a single fuel source. Overreliance on natural gas is a national security issue.

FirstEnergy believes that the best way to ensure resilience is to have a diverse generation mix. To maintain diversity, PJM should value resilience and other related attributes as an important part of price formation. PJM should also ensure that operational characteristics match baseload needs. Engineers should evaluate generation and load characteristics, and PJM should perform integrated resource planning based on this data.

Lastly, extreme care needs to be taken to address customers’ desires to introduce technologies to the grid and participate in wholesale markets. The need to adhere to standards and protocols related to access to the transmission *and* state-regulated distribution systems is extremely important.

## 4 CONCLUSION

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Wholesale electric markets are at a crossroads, with several key decision points for FERC and PJM ahead. Namely, which attributes should be valued in PJM’s market design, and how PJM can best

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<sup>26</sup> In fact, the evidence from certain markets, e.g., California and Texas, is that the markets can no longer support even natural gas-fired generators. (See Nichola Groom, Unlikely Casualty in California’s Renewable Energy Boom: Natural Gas, Reuters, <http://www.reuters.com/article/us-california-energy-analysis-idUSKCN0YVOBX>).

<sup>27</sup> Monitoring Analytics, LLC, State of the Market Report for PJM – 2016 at Vol. 1, pg. 44 - 45 (March 9, 2017). Monitoring Analytics noted that while new combustion turbines and combined cycle gas plants receive enough net revenue to cover levelized total costs in the majority of zones, there are no zones in which this would be the case for a new coal plant or nuclear plant.

ensure a resilient system. There is no need to pursue short term fixes, which are too little, too late to save the baseload generation resources that need it the most. Instead, PJM and FERC should be focused on addressing the broader market design issues and preserving a diverse fuel mix to ensure a long-term resilient system. In determining the appropriate solution, PJM should consult with engineers to supplement discussions with economists, for a sound approach founded on strong engineering principles.

The current market design is simply not sustainable, and states need to be allowed to pursue legitimate public policy programs without FERC or PJM interference. Urgent action is needed to determine the role of baseload resources, how states can accomplish goals in a market structure, and how to avoid a national security disaster.

## ADDENDUM: Q3 2017 ISSUES

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*This section will be updated on a quarterly basis (December 1, March 1, June 1, and September 1), whereas the main body of the report will be updated annually on September 1. The purpose of this section is to provide an overview of key FERC and PJM initiatives active in each quarter.*

### Capacity Market Initiatives

[Capacity Market Repricing Proposal \(AD17-11\)](#): On May 2, 2017, PJM submitted for reference in a FERC technical conference docket a proposal PJM is evaluating that could allow states to achieve their policy goals in a way that would ensure that out-of-market subsidies don't impact the overall competitiveness of its markets. Under this proposal certain subsidies (as defined by PJM) would trigger repricing. This proposal was updated June 12, 2017 to include discussion of the PJM Capacity Construct and Public Policy Senior Task Force, remove the option in which the subsidized resource would be removed from stage 1 of the capacity auction, and includes four new pages on how subsidies should be handled.

[Capacity Construct/Public Policy Senior Task Force \(CCPPSTF\)](#): The CCPPSTF was created to assess the Reliability Pricing Model (RPM) to ensure potential state public policy initiatives and RPM objectives are not at odds. The group will identify both the characteristics of a well-functioning capacity construct, as well as potential public policy initiatives states could take regarding resource adequacy, fuel diversity, public, and environmental policies. Based on the identified factors, the group will discuss whether modifications are required to RPM. PJM continued working on capacity market reforms during a two-day session of the Capacity Construct Public Policy Senior Task Force (CCPPSTF) August 2 & 3. During this session, proposal sponsors reviewed and fielded questions regarding their proposal. PJM's goal is to have such changes effective for the upcoming 2018 BRA for 2021/2022 Planning Year.

- One group of proposals deals with repricing PJM capacity auctions to establish a final clearing price that would have been but for the subsidized resources participation in the auction.
- Another proposal applies a partial FRR to subsidized resources as well as mandating that all vertically regulated utilities utilize the FRR option.
- AMP proposes a bilateral market with a residual auction and penalties applied to those who don't satisfy their reliability requirement bilaterally.
- The IMM proposes to apply an extended Minimum Offer Price Rule (MOPR) to certain classes of state subsidized resources while allowing exemptions to other (federal & other) subsidized resources.
- A final proposal is to hold seasonal auctions.

[Incremental Auction Senior Task Force \(IASTF\)](#): The IASTF was created to focus on reviewing the current PJM RPM Incremental Auction process and structure with specific focus on circumstances where PJM is a capacity seller. This group will review excess capacity sale and Incremental Auction practices and discuss whether modifications are required to the PJM Incremental Auction processes. This group met five times this quarter and is currently discussing solution packages.

### Energy Market Issues

[Advancing Zero Emissions Objectives through PJM's Energy Markets \(AD17-11\)](#): On May 2, 2017, PJM submitted for reference in a FERC technical conference docket a proposal that would allow states to

have the option of establishing a cost per ton to carbon-emitting suppliers which would be reflected in generator offers and therefore in wholesale market prices. While PJM has stated a preference for a regional solution, a subset of PJM member states could form a sub-region if the region as a whole does not agree. An internal border adjustment would be needed to prevent “leakage” when one region within PJM participates and its neighbor does not. PJM would facilitate states coming together and agreeing on a common set of rules pricing carbon as a separate framework outside of its FERC approved tariff and operating agreement. PJM updated its May 2 document on August 23 with further detail.

[Energy Market Price Formation](#): On June 15, PJM released a working paper entitled “Energy Price Formation and Valuing Flexibility”. See main body of report for further detail.

[Hourly Offers](#): On July 31, PJM submitted amended language to its March 6 Compliance Filing to more accurately describe 1) how PJM intends to implement hourly offers, and 2) the calculation of its proposed penalty for Market Sellers that do not follow the applicable provisions of the Operating Agreement and PJM-approved Fuel Cost Policies.

### **Ancillary Services Market Initiatives**

[Primary Frequency Response Senior Task Force \(PFRSTF\)](#): The PFRSTF was created on May 25, 2017 to evaluate primary frequency response within PJM, evaluate if additional language is needed to the Operating Agreement, Open Access Transmission Tariff and manuals for requirement of frequency response capabilities and discuss any potential compensation mechanisms associated with providing primary frequency response capability. The group met one time this quarter to discuss the charter and work plan.

### **Other**

[Seams/Pseudo-Ties](#): On August 1, PJM submitted proposed revisions to the PJM-MISO Joint Operating Agreement to improve the administration and coordination of Pseudo-Ties between Midcontinent Independent System Operator, Inc. (MISO) and PJM by incorporating into the JOA standard definitions, rules, and responsibilities between the MISO and PJM. PJM requested an effective date of October 1 for these proposed revisions.

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Summary: Notice of Filing of Quarterly Report Pursuant to Section V.C.2 of the Third Supplemental Stipulation electronically filed by Ms. Carrie M Dunn-Lucco on behalf of The Cleveland Electric Illuminating Company and The Toledo Edison Company and Ohio Edison Company