Monitoring Analytics

State of Electricity Markets

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The Independent Market Monitor for PJM

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I am the Independent Market Monitor for the PJM wholesale power markets. I do not speak for PJM. The role of the independent market monitor, as defined by FERC and included in the PJM tariff, is to help ensure that the PJM markets are competitive by proposing market rules that incent competition, by monitoring for the exercise of market power and by reporting on the markets to regulators and customers. The IMM prepares annual and quarterly state of the market reports, in addition to reports on specific market topics, which are available on our web site.

The PJM Interconnection, L.L.C. (PJM) operates a centrally dispatched, competitive wholesale electric power market that, as of June 30, 2017, had installed generating capacity of 183,089 megawatts (MW) and 1,007 members including market buyers, sellers and traders of electricity in a region including more than 65 million people in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia.

While I am on a panel of consumer advocates, the role of the market monitor is not to be a consumer advocate. I am an advocate for efficient, competitive wholesale power markets which bring clear benefits to customers as well as to suppliers of power.

The goal of competition in the wholesale power markets is to provide customers wholesale power at the lowest possible price, but no lower. The PJM markets work. The PJM markets bring customers the benefits of competition. The results of the PJM energy market and the results of the PJM capacity market are competitive and reliable. But the PJM markets, and wholesale power markets in the U.S., face new challenges that potentially threaten the viability of competitive markets.

One of the benefits of competitive power markets is that changes in input prices and changes in the balance of supply and demand are reflected immediately in energy prices. The PJM load-weighted average real-time locational marginal price (LMP) was 19.2 percent lower in 2016 than in 2015, $29.23 per MWh versus $36.16 per MWh. PJM real-time load-weighted energy market prices were lower in 2016 than at any time in PJM history since the beginning of the competitive wholesale market on April 1, 1999. Energy prices were lower as a direct result of lower fuel prices and the resultant increased role of gas as the marginal fuel.

Another benefit of competitive power markets is that they are dynamic, flexible and resilient. The PJM market has resulted in a reliable system despite significant changes in underlying market forces. Technological innovation and significantly lower gas costs have been key market forces. In PJM, there have been substantial unit retirements as a result of market forces and there has been substantial new market entry as a result of market forces. The PJM market design has worked flexibly to address both market exit and entry without preferences for any technologies.

Particularly in times of stress on markets and when some flaws in markets are revealed, nonmarket solutions may appear attractive. Top down, integrated resource planning

approaches are tempting because it is easy to think that experts know exactly the right mix and location of generation resources and the appropriate definition of resource diversity and the appropriate definition of reliability and therefore which technologies should be favored through exceptions to market rules. The provision of subsidies to favored technologies, whether solar, wind, coal, batteries, demand side or nuclear, is tempting for those who would benefit, but subsidies are a form of integrated resource planning that is not consistent with markets. Subsidies to existing units are no different in concept than subsidies to planned units and are equally inconsistent with markets. Proposals for fuel diversity are generally proposals to subsidize an existing, uneconomic technology. Subsidies are tempting because they maintain existing resources and provide increased revenues to asset owners in uncertain markets. Cost of service regulation is tempting because cost of service regulation incorporates integrated resource planning and because guaranteed rates of return and fixed prices may look attractive to asset owners in uncertain markets.

It is essential that any approach to the PJM markets incorporate a consistent view of how the preferred market design is expected to work to provide competitive results in a sustainable market design over the long run. A sustainable market design means a market design that results in appropriate incentives to retire units and to invest in new units over time such that reliability is ensured as a result of the functioning of the market. There are at least two broad paradigms that could result in such an outcome. The market paradigm includes a full set of markets, most importantly the energy market and capacity market, which together ensure that there are adequate revenues to incent new generation when it is needed and to incent retirement of units when appropriate. In the market paradigm, investors absorb the risks associated with investment in and ownership of generation assets. In the market paradigm there is a market clearing price to incent investment in existing units or new units. The market paradigm will result in long term reliability at the lowest possible cost.

The quasi-market paradigm includes an energy market based on LMP but addresses the need for investment incentives via the long term contract model or the cost of service model. In the quasi-market paradigm, competition to build capacity is limited and does not include the entire PJM footprint. In the quasi-market paradigm, customers absorb the risks associated with investment in and ownership of generation assets through guaranteed payments under either guaranteed long term contracts or the cost of service approach. In the quasi-market paradigm, there is no market clearing price to incent investment in existing units or new units. In the quasi-market paradigm, there is no incentive for entities without cost of service treatment to enter and thus competition is effectively eliminated.

The market paradigm and the quasi-market 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 uneconomic market assets using various planning concepts as a rationale. The subsidy model is inconsistent with the PJM market design and inconsistent with the market paradigm and constitutes a significant threat to both.

The issue of external subsidies continued to evolve in 2017. These subsidies are not directly part of the PJM market design but nonetheless threaten the foundations of the PJM capacity market and the PJM energy market as well as the competitiveness of PJM markets overall.

The Ohio subsidy proceedings and the Illinois ZEC subsidy proceeding all originated from the fact that competitive markets result in the exit of uneconomic and uncompetitive generating units. Regardless of the specific rationales offered by unit owners, the proposed solution for all such generating units has been to provide out of market subsidies in order to retain such units. These subsidies are not accurately characterized as state subsidies. These subsidies were all requested by the owners of specific uneconomic generating units in order to improve the profitability of those specific units. These subsidies were not requested to accomplish broader social goals. Broader social goals can all be met with market based mechanisms available to all market participants on a competitive basis and without discrimination.

The recent Department of Energy Notice of Proposed Rulemaking (NOPR) proposes a much broader market intervention through cost of service regulation for selected technologies that would have a correspondingly large and negative impact on PJM's competitive wholesale power markets.

The proponents of subsidies and of the concomitant significant alterations to the PJM capacity market and energy market designs have not demonstrated that there is a systematic problem rather than an uneconomic unit specific problem. Proponents have not demonstrated that the technologies in question are uniformly uneconomic without subsidies. For example, over the 12 months ended in June 2017, fewer than a quarter of nuclear units in PJM did not recover avoidable costs from energy and capacity revenues despite low energy market prices. All PJM nuclear plants recovered more than 90 percent of avoidable costs for the 12 months ended June 30, 2017, despite the fact that some units were on refueling outages. Assertions about the impact of negative prices are also not supported. Negative LMPs reduced nuclear plant net revenues by an average of 0.3 percent and a maximum of 2.6 percent in 2016.

The proposed subsidy solutions in all cases ignore the opportunity cost of subsidizing uneconomic units, which is the displacement of resources and technologies that would otherwise be economic. A decision to subsidize uneconomic units that are a significant source of energy and capacity has direct and significant impacts on other sources of energy; the opportunity costs of subsidies are substantial. Such subsidies suppress energy and capacity market prices and therefore suppress incentives for investments in

new, higher efficiency thermal plants but also suppress investment incentives for innovation in the next generation of energy supply technologies and energy efficiency technologies. These impacts are large and long lasting but difficult to quantify precisely.

Subsidies are contagious. Competition in the markets could be replaced by competition to receive subsidies. PJM markets have no protection against this emergent threat. Accurate signals for entry and exit are necessary for well functioning and competitive markets. Competitive investors rely on accurate signals to make decisions.

The PJM wholesale power markets are not perfect. To the extent that market outcomes are subject to legitimate criticism, it is because the markets have, in some cases, not been permitted to reveal the underlying supply and demand fundamentals in prices. Before market outcomes are rejected in favor of nonmarket choices, markets should be permitted to work. It is more critical than ever to get capacity market prices correct and to get energy market prices correct. A number of capacity market design elements resulted in a significant suppression of capacity market prices for multiple years. PJM has addressed the fundamental issues of the capacity market design in its Capacity Performance design, including price formation, product definition and performance incentives.

Some are also proposing changes to the PJM market design to increase revenues to specific technologies under the rubric of energy market price formation. Within the market paradigm, the temptation to modify other elements of the PJM energy and capacity market design in order to address asserted issues related to the level of prices or the shape of the supply curve should also be resisted. Prices in PJM are not too low. The PJM supply curve is not too flat. One of the lessons of the history of PJM capacity market design is that design changes based on short term, nonmarket considerations can have long term, significant, negative unintended consequences. The basic logic of LMP should not be modified in order to increase prices, or off peak prices or revenues. The shape of the supply curve does not affect the basic logic of LMP and it should not be arbitrarily modified in order to meet a goal not related to the logic of LMP. The energy market design should not be modified in order to introduce elements of integrated resource planning to favor specific technologies. Improvements to the market design should be made when consistent with the basic market design logic, including better pricing when transmission constraints are violated and better and more locational scarcity pricing and improved incentives for flexible units by ending the practice of paying uplift to units based on inflexible operating parameters.

To the extent that there are shared broader goals related to PJM markets, they should also be addressed. If society determines that carbon is a pollutant, a market approach to carbon is preferred to a technology or unit specific subsidy approach. Implementation of a carbon price for the entire market is a market approach which would let market participants respond in efficient and innovative ways to the price signal rather than relying on planners to identify specific technologies or resources to be subsidized. If a

shared goal is increased renewables in addition to their carbon attributes, a market based solution to renewable energy credits (RECs) should be implemented.

Fuel diversity has also been mentioned as an issue. Current fuel diversity is higher than ever in PJM. If there is an issue, the real issue is fuel security and not fuel diversity. Before any significant actions are taken to undo markets in the name of security or resilience, careful analysis is required. PJM markets are secure and resilient and would be significantly harmed by interventions to broadly subsidize preferred technologies. If fuel reliability for gas is a concern, a careful evaluation would include the reliability of gas pipelines, the compatibility of the gas pipeline regulated business model with the merchant generator market business model, the degree to which electric generators have truly firm gas service and the need for a gas RTO to help ensure reliability. If the reliability of coal is a concern, a careful evaluation would include the quality and reliability of coal deliveries under a range of circumstances and the reliability of secondary fuel deliveries. If the reliability of nuclear is a concern, a careful evaluation would include the impact of natural disasters and common mode issues. A careful evaluation of overall market reliability would include the transmission system and the interaction among all elements of the markets in contingency analyses.

There is no reason to intervene in the markets in order to provide reliability and resilience. The reliability and resilience of PJM markets have continued to evolve through improvements in market design including changes to reserve markets and capacity markets. If PJM or FERC or DOE identify a need for greater reliability, it can be addressed using market mechanisms.

Competitive markets were introduced as an alternative form of regulation to ensure that wholesale power is provided at the lowest possible price. The PJM markets are working to provide competitive, reliable and resilient outcomes and should be permitted to continue to work.