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# Technical Conference on Environmental Regulations and Electric Reliability, Wholesale Electricity Markets, and Energy Infrastructure

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PJM is pleased to provide these initial comments in response to the Commission's inquiry on the "Potential Implications for Commission-Jurisdictional Markets" of the US EPA's Clean Power Plan.

I serve as the Executive Vice President of Operations for PJM. In this role, I oversee all aspects of PJM's operations and planning responsibilities. Because in PJM our dispatch is based on cleared bids for capacity, energy and ancillary services, my work extends to ensuring the compatibility of our market rules with PJM's operations and planning functions. I have overseen PJM's response to the Mercury and Air Toxics Rule (MATS) as well as our work in modeling the impacts of the proposed Clean Power Plan rule.

I appreciate the Commission's focus on available tools to address issues which arise as both PJM markets and operations adapt to the impact of the Clean Power Plan. In a nutshell, the market is a tool which can be utilized to ensure efficient competitive outcomes in response to a particular set of state or federal policies. The markets do not drive policy outcomes but have proven resilient enough to respond to different policy initiatives. In that sense, they have proven successful in producing a diverse and competitively priced set of resources that are compliant with that policy. Whether it is the Sulfur Dioxide Trading Program of the 1990's, the MATS rule or individual state RPS initiatives, the markets have been able to send the appropriate price signals that produce competitive outcomes.1

In some ways, the Clean Power Plan can be seen as another policy choice to which the markets will react. Just as with the MATS rule and state RPS rules, the EPA Clean Power Plan will adjust the type of resources that bid into the market but will not require wholescale market redesign. In this way, the markets provide an important role in revealing the least cost compliance options while also facilitating innovation by allowing new ideas to be tested and monetized if successful (or replaced if unsuccessful).

The markets are also able to quickly internalize the costs of compliance and respond to any implicit or explicit price on carbon dioxide emissions. Whether a cap and trade system is developed on a regional basis or units simply have to bid their individual compliance costs, the market provides a sorting function that allows the least cost solutions to emerge. Finally, the market provides a source of transparency, independence and neutrality in revealing the true cost of compliance. By providing the sort function referenced above, the market reveals the least cost compliance plan that is consistent with the Clean Power Plan and all reliability requirements. For all these reasons, the markets that this Commission has helped craft since at least the inception of RTOs, represents a valuable tool that can absorb and respond to the changes brought about by the Clean Power Plan without any wholesale revisions needed.

Nevertheless, the Clean Power Plan does create some unique challenges given its very structure and the legal foundation of the rule itself:

[1] In those cases where they have provided less than optimal results, we at PJM have not been shy about amending our rules governing the eligibility inputs into the market to ensure that the resources eligible to participate in the market can meet our reliability needs.

For one, section 111(d) requires the development of individual state plans, each of which must meet the compliance goal set by the EPA, and while the EPA encourages coordination between the states, it is not required.

Second, the rule requires individual states, as part of their compliance plans, to identify units and emissions reductions allocable to that state even if the state is part of a larger regional dispatch. The states also have flexibility to: (a) opt-in new gas-fired resources subject to section 111(b) New Source Performance Standards, or; (b) bring into their plans low utilization combustions turbines (defined in the rule as those operating at less than a 33% capacity factor) that are not otherwise required to be a part of a section 111(d) compliance plans. However, there is no requirement for consistency of these actions among the states participating in a single dispatch leading to an array of different treatments of new and low-utilization units based solely on the state in which they are located and that state's particular treatment of these units.

Third the state plan requires the balancing of a mix of resources some of which are within the markets and dispatch (such as renewable generation) and others which are not such as energy efficiency, building code improvements and "inside the fence" plant improvements.

Clearly if there were an explicit price on carbon dioxide or another regional parameter that would be reflected in the dispatch, the market can produce efficient results inclusive of that constraint. It is even possible for PJM to manage dispatch operations with multiple individual state prices on carbon dioxide as the explicit price can still be seamlessly incorporated into dispatch, although market outcomes may be less efficient than having a single regional price on carbon dioxide. Moreover, the interactions of one state's price on another may make compliance more of a moving target. The more problematic issue arises if individual states adapt different compliance approaches which lead to different implicit carbon dioxide prices either at the state or by individual generating unit. That being said, individual states could effectuate their plans by placing state-directed run-time limitations on individual units just as they do today for Title V air permits or local ozone and NOx rules in non-attainment areas. These limitations to individual units within a state would be respected in the dispatch but potentially would lead to a less optimal result than if all plants were subject to a uniform constraint. Furthermore, there would need to be a reliability safety valve that would provide for the ability to violate these constraints if an RTO found itself in a situation where the unit was need for reliability but did not have any "run-time" left. Absent an explicit price, it is unclear how an RTO would be able to allocate available run hours of units to when they are needed most.

In addition, non-price externalities such as environmental constraints that affect the dispatch and therefore potentially affect energy market price formation could have unintended consequences on Locational Prices and uplift. Moreover, unit specific environmental constraints could decrease price formation transparency as well as lead to congestion being transferred into uplift for which hedging is not possible. As a result, the value of Financial Transmission Rights (FTRs) and Auction Revenue Rights (ARRs) as a hedging tool against congestion may be diminished and, more importantly, the development of a region-wide product like FTRs or ARRs that could incorporate all of these diverse constraints would prove especially challenging. This is not to say that state by state approaches are impossible to implement, just that a lot of consultation and coordination will be needed to ensure that

such state by state approaches do not cause unintended consequences to market results and ultimately to the ratepayers.

PJM has begun this coordination process by engaging state commissions, state environmental regulators responsible for implementing the Clean Power Plan, and EPA starting last year. Recently, PJM has undertaken detailed analyses of scenarios and alternatives that were provided to us by OPSI. Those results have been reviewed with our members and with the states and are posted on our website at http://www.pjm.com/~/media/committees-groups/committees/mc/20150120-webinar/20150120-item-05-carbon-rule-analysis.ashx. Needless to say, the results show a wide range of economic impacts and costs as implementation strategies are especially sensitive to the price of natural gas and the degree to which a state focuses its compliance through building block four (energy efficiency) vs. more dispatch-related activities, especially those in building block two (increased use of natural gas) and three (increased use of renewables). We are using these results to model reliability impacts of the various scenarios. Here too, I expect no single answer but instead a wide range of impacts which will require qualitative analysis as to the feasibility of constructing transmission solutions to address the reliability impacts in the time allotted.

In short, we see this effort as part of a long and continuing dialogue with the Commission and the states. Although many like simple answers, when dealing with an issue as complex as the Clean Power Plan, there are no simple answers but many interdependent variables that can affect the ultimate cost of compliance. It is for this reason that we see this conference and our discussions with the states and with EPA as the first step in what could be a decade-long process of review, study and adjustment to address the many interdependent and in some cases, unknowable variables that will arise. We stand ready to work with the Commission, stakeholders, states and the EPA in that process.