



Organization of PJM States, Inc. (OPSI)

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October 16, 2015
(Via E-mail only)

PJM Board of Managers
PJM Interconnection LLC
955 Jefferson Avenue
Norristown, PA 19403

Re: Modeling Economic Impacts of Final 111(d) carbon regulations

Dear PJM Board of Managers,

At the request of PJM Interconnection, LLC ("PJM"), the Organization of PJM States, Inc. ("OPSI"), has evaluated PJM Staff's preliminary plans for modeling economic impacts associated with the final 111(d) carbon regulation ("111(d)") issued by the Environmental Protection Agency ("EPA"). OPSI recognizes that PJM's modeling of the potential impacts of this complex rule requires many assumptions, the determination of which will significantly impact modeling results. In this regard, OPSI appreciates PJM's request for OPSI's input on such assumptions and recommends the following assumptions and refinements to the modeling approach that PJM will use in its economic evaluation of the final 111(d) rule.

Base Case/Business as Usual: A base case should examine outcomes assuming no 111(d) regulation, with PJM presenting a "business as usual" scenario for each year for which PJM models compliance cases and sensitivity cases. However, PJM should model the continued participation of Maryland and Delaware in the RGGI program as part of the business as usual case; both new and existing affected units located in Maryland and Delaware should be included in this analysis. Although OPSI understands that PJM generally plans to use the variable values and input assumptions from PJM's market efficiency analysis, the "business as usual" case for purposes of as-

sessing the final 111(d) rule should not assume that all generation that has executed a Facilities Study Agreement or Interconnection Service Agreement will ultimately be constructed. Rather, PJM should, at a minimum, discount the level of queued generation to reflect the historic rate at which generators at these stages of the queue have actually been constructed. Additionally, generation modeled to enter or exit the market should first be evaluated to ensure such entry or exit is economically rational without 111(d); PJM should apply the 111(b) performance standards to any proposed market entry. Finally, new nuclear generation (other than planned uprates) that has not received both an operating license from the Nuclear Regulatory Commission and applicable state permits to construct such a facility should not be included in the "business as usual" case.

Compliance Years and Cases: PJM should, if possible, provide modeling results for 2023, 2026, 2028, and 2030. The compliance case years should be the same as those studied in the base case and any sensitivity cases with consideration of final 111(d) rule limits on carbon. Consistent with the base case, generation modeled to enter or exit the market in the compliance cases and sensitivity cases should first be evaluated to ensure such entry or exit is economically rational. The economics of entry and exit of generating units may vary between the base case and compliance cases and any such differences should be reflected in PJM's modeling.

Forecast Fuel Prices: PJM should follow through on its plan to use updated forecasts for natural gas, coal, and other relevant commodity prices. However a sensitivity assuming higher natural gas prices should be conducted as part of PJM's analysis.

Energy Efficiency: Although energy efficiency was excluded from the BSER determination in EPA's final 111(d) rule, it remains a potential compliance tool. Therefore, PJM should model at least three sensitivities involving energy efficiency. In the first sensitivity, energy efficiency resources should be included at a level no greater than supported by historic trends for mass-based modeling and historic trends of energy efficiency that can generate Emission Reduction Credits (ERCs) in rate based modeling. In the second sensitivity, PJM should assume that all states participate in the Clean Energy Incentive Program in years 2020 and 2021 and in doing so procure a pro rata share of the 300,000,000 short tons federal matching set-aside. The third sensitivity should reflect a higher level of energy efficiency than modeled in the first two scenarios.

Rate-Based vs. Mass-Based: PJM should run scenarios intended to compare rate-based approaches to mass-based approaches under various scenario assumptions. OPSI shares PJM's understanding that new combined cycle generators would not be available for compliance with, nor their emissions subject to, a rate-based approach under the final 111(d) rule. OPSI recognizes the challenge presented by the final 111(d) rule's limitations on the compatibility of rate-based states with mass-based states. PJM should run a scenario in which the states (with the exception of Maryland and Delaware) opt for a rate-based compliance pathway. If possible, two sensitivities should be run to ascertain rate-based compliance on a single-state basis, and also assuming a trad-

ing ready rate-based approach. In this scenario and accompanying sensitivities, Maryland and Delaware should continue to be analyzed through the lens of a mass-based trading program applicable to both new and existing units. At a minimum, PJM should run models simulating compliance with the proposed rate-based model rule for the remaining states. Any rate-based PRO-MOD analysis in addition to modeling the proposed rate-based model rule, should include 2 model runs for the state by state rate based compliance option (pathway 5 on US EPA's CPP presentation slide 24). One model run should reflect rates as an individual state rate for each state within PJM (as found in Table 12 of the final EPA rule) and another as a multistate rate within PJM (excluding RGGI states) for comparison.

PJM should also run mass-based scenarios, which OPSI acknowledges will be more complicated given the requirement that states account for leakage to new natural gas combined cycle units when opting for mass-based compliance pathways. At a minimum, PJM should run two scenarios: one scenario in which all PJM states are assumed to pursue a mass-based trading ready approach that attempts to address leakage through set-asides described in the proposed federal plan. In the second scenario, PJM should assume that all PJM states pursue a mass-based trading ready approach that addresses leakage by adopting the mass budgets that include the new source complement.

OPSI appreciates PJM's continuing efforts and dialogue on the potential impacts of EPA's final 111(d) rule. OPSI recognizes and requests that PJM include with its modeling response a statement that, to the extent PJM's modeling focuses only on PJM's energy markets, without consideration of capacity, energy efficiency, or infrastructure costs that may be required for compliance, such modeling will not produce or represent total estimated costs of complying with 111(d). However, PJM's modeling will provide states with additional information to consider in each state's important evaluation of potential implementation plans. OPSI appreciates PJM's efforts to provide timely information on this important issue.

Sincerely Yours,

s/ Gregory V. Carmean

Gregory V. Carmean
Executive Director OPSI

cc: OPSI Board of Directors