

PJM Interconnection Economic Analysis of the EPA Clean Power Plan Proposal

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Executive Summary

At the request of the Organization of PJM States, Inc., PJM Interconnection has analyzed potential economic impacts on electric power generation in the PJM footprint resulting from the U.S. Environmental Protection Agency's Clean Power Plan. The plan, proposed by EPA in June 2014, seeks a 30-percent reduction in carbon dioxide emissions from the electricity sector by 2030 (compared to 2005 levels). PJM does not take positions for or against pending regulations but does provide independent expert analysis on the potential economic and reliability impacts of proposed regulatory rules and legislation.

The Organization of PJM States, which represents state utility regulators in the region served by PJM, requested analyses of several scenarios including a comparison of regional compliance versus state-by-state compliance. PJM included additional scenarios with different assumptions in the analysis to provide modeled results covering a wide range of possible outcomes. In total PJM analyzed 17 distinct scenarios – each was evaluated with and without the implementation of the Clean Power Plan. The scenarios covered varying combinations and levels of renewable resources, energy efficiency, natural gas prices, nuclear generation and new entry of natural gas combined-cycle resources.

This report is the first of two PJM evaluations of the proposed Clean Power Plan. It presents an analysis of the Clean Power Plan's potential economic impacts, including the identification of fossil-fueled steam generation capacity thought to be “at risk” for retirement based only upon energy market simulation results. PJM has not attempted to simulate capacity market outcomes in conjunction with the energy market simulations. PJM will use the results of the economic analysis to conduct a reliability analysis to determine transmission needs resulting from potential generator retirements.

The results of PJM's analyses are not predictions of future outcomes; rather, they are assessments of possible impacts based on specific assumptions and tempered by uncertainties. Those uncertainties include future market conditions, the form of the final EPA rule and the manner in which states choose to comply. PJM's analyses offer insights into the complex interactions between wholesale electricity prices, generation at risk for retirement, changes in natural gas prices, energy efficiency, renewable resources, nuclear generation and compliance costs associated with the Clean Power Plan. This analysis attempts only to quantify the change in production costs as a cost of compliance with the Clean Power Plan. PJM did not attempt to quantify the capital costs of renewable resources, energy efficiency, or new combined-cycle generation that may be associated with complying with the Clean Power Plan because such decisions may be due to existing state policies or to otherwise-economic decisions for new entry independent of the Clean Power Plan.

High-level insights from the economic analysis include:

- Fossil steam unit retirements (coal, oil and gas) probably will occur gradually. As the CO₂ emission limits decline over time, the financial positions of high-emitting resources should become increasingly less favorable, with lower-emitting resources displacing them more often in the competitive energy market.
- Electricity production costs are likely to increase with compliance because larger amounts of higher-cost, cleaner generation will be used to meet emissions targets.
- The price of natural gas likely will be a primary driver of the cost of reducing CO₂ emissions if natural gas combined-cycle units become a significant source of replacement generation for coal and other fossil steam units.
- Adding more energy efficiency and renewable energy and retaining more nuclear generation would likely lead to lower CO₂ prices; this could result in fewer megawatts of fossil steam resources at risk of retirement because lower CO₂ prices may reduce the financial stress on fossil steam resources under this scenario.
- State-by-state compliance options, compared to regional compliance options, likely would result in higher compliance costs for most PJM states. This is because there are fewer low-cost options available within state boundaries than across the entire region. However, results will vary by state given differing state targets and generation mixes. PJM modeled regional versus individual state compliance only under a mass-based approach.
- State-by-state compliance options would increase the amount of capacity at risk for retirement because some states likely would face higher CO₂ prices in an individual compliance approach.

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