

The Environmental Protection Agency's Clean Power Plan could increase wholesale power prices by up to 40% in MISO by the year 2020



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On June 2, 2014, the US Environmental Protection Agency ("EPA") proposed regulations to curb carbon emissions from existing power plants. London Economics International LLC ("LEI") examined the impact of the EPA's proposed Clean Power Plan ("CPP") on the electricity markets in the US using its network simulation model, POOLMod. Initial modeling results indicate that optimal carbon allowance prices required to achieve the proposed target reductions could be as high as \$25/ton in coal-dominated regions¹ such as MISO, and are likely to stay under \$10/ton in gas-dominated markets such as ERCOT. The impact of the proposed regulations on power prices is expected to be variable across regional markets. Under LEI's simulation of energy markets in 2020, wholesale energy prices could increase between 25% and 40% in a market like MISO, and rally up between 9% and 13% in a market like ERCOT. The diverse impact of the proposed carbon regulation on regional power markets is primarily due to three elements: regional supply mix, the carbon footprint of the price-setting resource (which dictates the sensitivity of the system to carbon allowance prices), as well as legacy trends (for example, how a region's carbon emission profile has changed since 2005).

Introduction

On June 2, 2014, the EPA issued the CPP, a proposal on carbon pollution guidelines for existing power plants. The CPP proposes to reduce carbon dioxide ("CO₂") emissions from existing fossil fuel-fired power plants in the US by 30% from 2005 levels by 2030. The CPP suggests that states can achieve this goal in one of two ways:

- **Option 1** has a compliance timeframe of 2030 to achieve a 30% reduction below 2005 levels with an interim target of 26-27% by 2020;
- **Option 2** has a more gradual emissions cap trajectory but reduces the compliance timeframe by 5 years to 2025 for achieving 30% reduction, with an interim target of 23% by 2020.

LEI's Analytical Approach

LEI conducted an impact analysis of the proposed carbon regulations on US regional markets. The analysis used simulation modeling techniques that represent the economic dispatch of resources in a regional market to meet electrical load. LEI used its proprietary network simulation model, POOLMod, to forecast future market outcomes under a "business as usual"

¹ We looked at regional markets assuming that states will choose to collaborate with each other on multi-state approaches that reflect the regional structure of existing electricity operating systems; rather than choosing state-specific compliance strategy.

scenario. Next, LEI used the simulation model with an assumed market-based allocation of carbon allowances to determine the “optimal” local carbon allowance price that would allow a region to achieve target emissions reduction on a least cost basis. In LEI’s analysis, carbon allowances would be bought by resources that would value them the most (and need them the most). LEI’s analysis explicitly recognized that there would be shifts in the merit order and dispatch, as generators re-position their assets based on their perceived short run marginal costs of production with a carbon allowance requirement.

As a result of the modeling, and through the comparison with market outcomes under the “business as usual” scenario, LEI was able to forecast the impact of CPP on energy prices. Key inputs to LEI’s simulation modeling included assumptions on market fundamentals (such as supply and demand factors) and data on carbon emissions (by plant), as well as EPA’s target emissions reductions pursuant to the CPP.

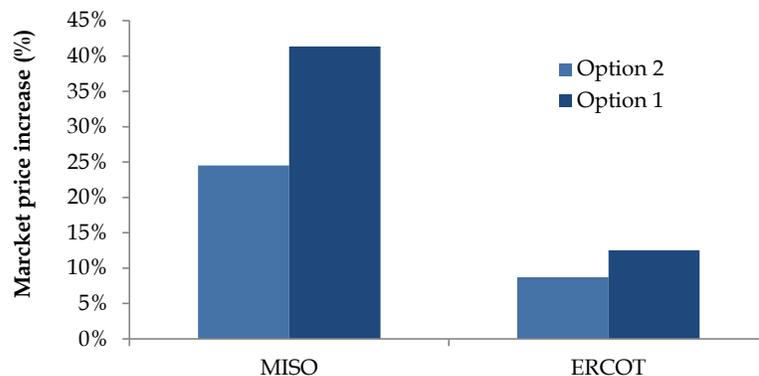
Modeling Results

LEI’s modeling results show that under EPA’s CPP, the optimal local carbon allowance price will vary significantly by location (state or region). In effect, a state-by-state or region-by-region compliance approach may forego the opportunities to reduce the overall compliance costs for the nation as a result of trading.

LEI’s forecasts for 2020 suggest an optimal carbon allowance price of \$5/ton in a gas-dominated market such as ERCOT (which is currently operating at emissions levels that are 15% below 2005 levels) to as much as \$25/ton in a coal-dominated market such as MISO (where carbon emissions on a regional basis are only 11% below 2005 levels).

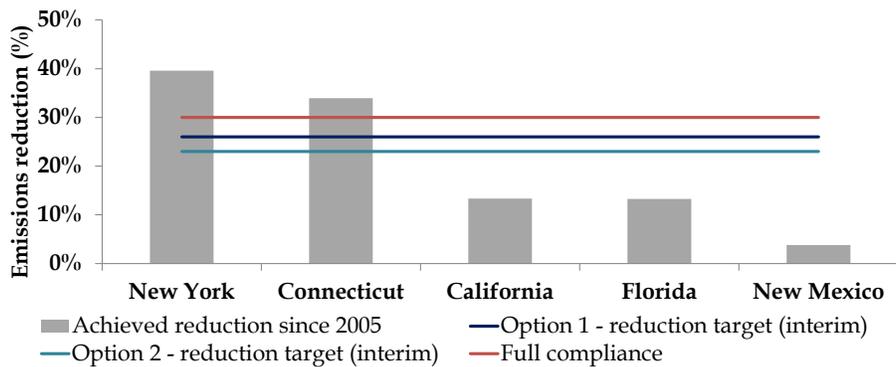
Not surprisingly, the impacts of such carbon reduction costs on energy market prices also vary significantly depending on the option choice. For example, energy prices in 2020 for MISO could increase by 25% to 40% (for local carbon allowance prices of \$17/ton and \$25/ton under Option 1 and Option 2 respectively). On the other hand, a region such as ERCOT is projected to see energy prices increase in the range of 9% to 13% (for local carbon allowance price of \$5/ton and \$7/ton under Option 1 and Option 2 respectively). Figure 1 summarizes the results of the simulation modeling for the ERCOT and MISO markets in the year 2020.

Figure 1. Projected impact of EPA’s proposed carbon regulation on MISO and ERCOT power markets in 2020



The CPP's impact on energy market prices varies on a regional basis due to a combination of factors including the supply diversity, the future opportunity cost for power plants to reduce output (and forego energy revenues) in order to reduce carbon emissions, and emissions reduction achieved since 2005 (the baseline year selected by the EPA). A region that is already close to achieving the target reductions will likely see much more modest market price impacts, minimal change in market operations, and less substantial compliance costs. As illustrated in Figure 2, certain states, such as New York and Connecticut, have achieved emissions reductions well beyond the EPA's targets, whereas other states, such as New Mexico, have a long way to go to meet the CPP's requirements.

Figure 2. Sample of states' achieved emissions reductions (2011 emissions levels as compared to 2005 emissions levels)



Sources: EPA and LEI

Compliance affordability will be a key element in the decision of states as they choose between the two options in the CPP, along with the legacy position of the state (e.g., current emissions relative to the baseline year). Although Option 1 features a tighter level of emissions reduction target (26% below 2005 levels) for the interim year 2020, full compliance (30% below 2005 levels) is only required by 2030; whereas, Option 2 proposes a more lenient interim goal (23% below 2005 levels) in exchange for a shorter compliance period (30% reduction below 2005 levels by 2025).

LEI publishes bi-annual market reviews of all US and Canadian regional power markets in which it provides a forecast of future wholesale market prices and considers the impact of major policy changes such as the EPA's proposed carbon regulation.

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