



Climate Change and the Clean Power Plan

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The United States is currently taking a large regulatory step to reduce greenhouse gas emissions nationwide. Given Ohio's heavy reliance on coal-based electricity and our large transportation sector, both of which are large contributors to greenhouse gas emissions, these programs will have important implications for Ohioans and businesses located in the state. It is important for Ohioans to better understand how these regulations will affect them.

The rationale for imposing regulations on the US economy to reduce carbon emissions is that carbon emissions are causing climate change. There is obviously debate about climate change, but numerous economic studies suggest that climate change may cause significant damage to society. Economic estimates of these damages range from \$12-\$40 per ton of CO₂ emitted. That means that the damages from driving our cars ranges from \$0.01 to \$0.04 per gallon of gasoline we purchase, and the damages from lighting our homes ranges from \$1 to \$4 per year. It is important to keep these damages in perspective, however, since each ton of CO₂ emitted in Ohio produces around \$2300 in economic benefits to people in the state.

The current regulations on carbon dioxide are based on a US Supreme Court ruling in 2007, which gave the US Environmental Protection Agency the authority to use the Clean Air Act to regulate greenhouse gas emissions. Since that ruling, the US Environmental Protection Agency (EPA) has been working to develop regulations on two key sectors: transportation and electricity generation.

Regulations on transportation have been in place for several years now. Most of us don't see these regulations directly because they only affect us when we buy a car. Basically, they require an increase in the fuel efficiency of automobiles sold in the United States. The so-called Corporate Auto Fuel Efficiency (CAFE) standard is set to rise from around 35 miles per gallon today to 54.5 miles per gallon by 2025. This means that by 2025 the average fuel efficiency of all new cars sold in the US will be at least 54.5 miles per gallon. Because it is unlikely that the average gasoline powered car will achieve this high level of fuel efficiency, this regulation means that many new hybrid and electric cars will enter the market in the next decade.

This past year President Obama rolled out his Clean Power Plan, which imposes new regulations on the electricity generation sector to reduce greenhouse gases. The rules have been implemented nationwide, but the extent of the regulations differ by state because the mix of energy in each state is different. Ohio's electricity sector currently generates about 103 million tons of CO₂ per year, and is required to emit less than 75 million tons of CO₂ by 2030 under the new regulations. To do this, Ohio will have to reduce overall consumption (that is engage in energy efficiency improvements), substitute natural gas for coal in electricity production, increase renewables, and/or increase nuclear power.

There are many pathways to meet this target. Given what is currently known about the costs of various activities, the cheapest options are substituting natural gas for coal, improving energy efficiency (and thus reducing overall consumption), and using more renewable wind power. Ohio is already undergoing a shift from coal to natural gas, such that about 60% of the reduction in coal use since 2009 has been made up with use of natural gas. Renewables have also been instrumental in reducing coal consumption, making up about 7% of the reduction in coal since 2009. Natural gas prices typically would be expected to increase with such a large increase in demand, but they have actually fallen over this period as Ohio and other eastern states have tapped into shale gas reserves.

The experience of the past 5 years suggests that Ohio may not face exorbitant costs for implementing the clean power plan. Natural gas and wind power both are now cheaper than traditional coal, and thus increasing their use should not cost rate payers significantly. The uncertainty of course lies with natural gas prices. If natural gas prices remain low, meeting the Clean Power Plan will be fairly painless and low cost. Given the likely widespread increase in natural gas demand as all states across the country face similar pressures as Ohio, however, natural gas prices are likely to rise. Fortunately, the relatively low cost of wind power puts an overall cap on the price of electricity.

One important uncertainty in Ohio lies with the renewable energy standards, which the legislature froze in 2014. The study committee recommends maintaining this freeze, and appears to favor eliminating the standards altogether. From the perspective of the Clean Power Plan, however, freezing or eliminating these standards may be a poor public policy choice given the important role that wind power may play in limiting electricity price increases for consumers. Obviously wind power cannot provide capacity (e.g., energy on hot summer days), but wind power is not susceptible to price shocks in the natural gas market. As a bit of insurance against high natural gas prices, the state legislature should consider allowing the renewable energy standards to be implemented so that more wind power enters the grid.

A final issue is that Ohio and 23 other states have sued US EPA over the Clean Power Plan. The suit will undoubtedly take a number of years to resolve. In the meantime, Ohio will file an extension for implementing the rule, and will study the implications of the rule on Ohio.