The Effects of Carbon Regulation: Section 111d of the Clean Air Act and Similar Regulations on the Energy Industry in Wyoming and Washington

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Abstract

The EPA, under President Obama's administration, issued a regulatory action in June 2014, through section 111d of the Clean Air Act which mandates that carbon dioxide levels from power plants must be cut by 30% by 2030 from 2012 levels. This action could take the United States a step further in combating climate change. The 30% goal is a national one; each state has its own goals. The state-by-state goals are based on three factors: existing natural gas capacity,current efficiency of energy generating units, and potential for renewable energy generation.

This research focused on two states: Wyoming and Washington in an attempt to look at how these goals can be achieved and possible economic impact of the goal. These states were chosen because they are very different in concerns of energy production and consumption. Comparing and contrasting these states help provide an understanding of the type of effects this regulatory action may have on the nation. How do these regulations affect coal usage, future expectations for individual state economies, and the potential energy mix within the states? All these aspects paint a picture of how society will move forward with these regulations.

Regulatory Approach

In times of divided government the president will shift his attention towards implementing actions through regulatory means when his objectives cannot be reached through the legislative process. This means he is trying to interpret existing legislation to fit his policy agenda. In this case President Obama is using the Clean Air Act in attempt to limit carbon dioxide emissions in existing energy generating units. There have been other regulations or laws implemented limiting the emissions on pollution sources that have proven to be damaging to the public good. With carbon dioxide, the perceived short term costs are not worth the potential costs of cleaning up the source. The reason the free market is not recognizing these costs are is due to the negative externalities of increased healthcare costs and increased risk of global warming in which the costs are very difficult to quantify.

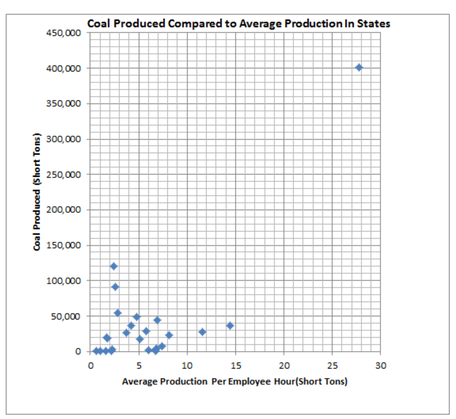

Figure 1. The graph above shows the relation between average coal production per hour and the total amount of coal produced by certain states. The state in the top right corner is Wyoming.

When dealing with energy production, analyzing the extraction of energy resources is key to understand why states use their energy resources. When it comes to a fossil fuel like coal, states extract different amounts of coal at different efficiency levels. So when the EPA imposes regulations that will limit the use of fossil fuels you are not only having to change the complicated energy mix of utilities, you are also lowering the demand for mining companies to sell their coal to utilities domestically. This is why states like Wyoming who are heavy coal producers and consumers are so adamant against these emission reduction regulations.

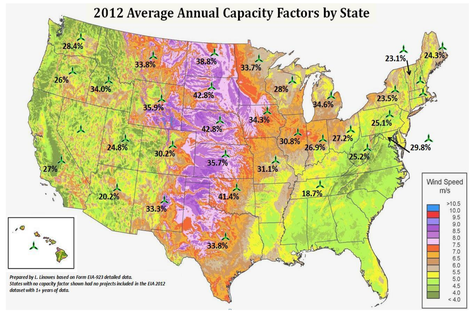

Figure 2. The graph above shows the average annual capacity factors coupled with average wind speed per state.

This chart shows how wind speeds help determine the capacity factors for states. This chart is an example of a system that the EPA uses to determine what reduction to the certain states pounds per megawatt hour can be. States in the purple, have the best wind speeds in the country. These states will be encouraged in the increase their wind power production which is part of the third block; however, since the expiration of the Production Tax Credit, wind developers are unsure about developing projects in the future. Wind energy production in the central region of the country will be crucial to meeting the proposed goals.

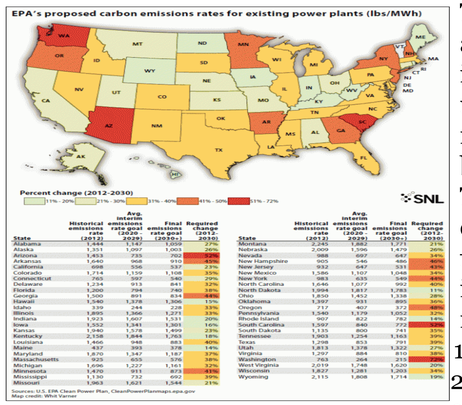

Figure 3. This map shows the proposed standards set by the EPA for the Clean Power Plan.

To reduce emissions the EPA composed 4 routes or ways of achieving carbon reductions. The first block is done through improving heat rate efficiency in existing energy generating units (EGUs). The second option is increase utilization rates of natural gas EGUs and lower coal utilization rates. The third block is using low carbon or zero energy producing options. The last block is making the end using of electricity more efficient. All of these methods are used by some states to lower the emissions outputs and invest in sustainable low cost energy in the future. The numbers below show the lbs/MWh reductions associated with each block.

1. 63.7756 lbs/MWh
2. 160.2653 lbs/MWh
3. 110.7755 lbs/MWh
4. 116.6531 lbs/MWh

Results and Discussion

The true effects of this main piece of regulatory action cannot currently be quantified, but based on this research this regulatory action can be successful. The possibility for creating a less carbon intense future is possible if certain political interests or short term economic outlooks are subdued. Preexisting regulatory action and public perception will allow this regulation to take hold; however, economic effects of supply and demand may push these carbon intensive products outside the U.S.

Acknowledgements & Reference

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