GREEN PARADOX – THE CASE OF THE CLEAN POWER PLAN

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Overview

It is estimated that about 40% of carbon emissions in the United States comes from the electric power industry. In an effort to reduce these emissions, the United States Environmental Protection Agency (EPA) proposed the Clean Power Plan (CPP) in June 2014 under the mandate of the Clean Air Act. The CPP aims to reduce carbon emissions from the electricity industry by 32% below 2005 levels by 2030. Under the CPP, each state is assigned an emission target to meet by 2030. The target for each state was determined through EPA's Best System of Emission Reduction (BSER) formula. The BSER is based on four building blocks:

i. Improving the heat rate of coal-powered plant
ii. Switching from coal to Natural Gas Combined Cycle technology
iii. Switching from fossil-based (carbon-intensive) generation technologies to renewable generation technology
iv. Demand management.

With the announcement of CPP, states are required to develop a feasible plan toward achieving their target (to be approved by the EPA in 2018) or forced to go by the Federal government plan. Thus, the CPP will be fully implemented in 2018.

Strand (2007) Sinn (2008), Hoel (2008), Gerlagh & Liski (2008) Di Maria, Smulders and Werf (2008) demonstrate that environmental policies aimed at reducing carbon emissions could rather lead to increased emissions (Green Paradox). The mechanism of this paradox is based on supply side reaction to such policies. Owners (Producers) of carbon intensive resources anticipate decrease in demand for their resource and thus, adjust the extraction path of the resource. That is, the green policy cause fossil resource owners to shorten their extraction path, thereby increasing the immediate term supply; decreasing price and thus increasing demand (emissions) in the immediate time period.

In the case of the CPP, the interim period between the announcement of the proposal (in June 2014) and 2018 when the policy will be fully implemented provides a room for such supply side reaction in anticipation of the full implementation of the CPP. This study set out to find evidence of the Green Paradox following the announcement of the CPP.

An evidence of the green paradox in the case of the CPP speaks to the effectiveness of the CPP (and its implementation strategy) in achieving its objective in 2030.

The structure of the paper is as follows: section two reviews the literature on the green paradox and the Clean Power Plan. We present the econometric model and results in the subsequent sections.

METHODS

The paper is developed on the premise that the physical quantity of coal used to generate electricity may have increased after the announcement of the Clean Power Plan (CPP) in June 2014. Thus, I use Difference-in-Difference estimation technique to measure the impact of the announcement of the CPP on the use of coal in electricity generation. I also test three hypotheses as a demonstration of the evidence of the green paradox. I show that the average sulphur content and ash content of coal used to generate electricity increased after the announcement of the proposal. I also demonstrate the paradox through the price of coal on the Spot market. I use states that have Renewable Portfolio Standard as a control group for the Difference-in-Difference estimation.

Results

I find evidence of green paradox in all the four hypothesis. Figures 1 show the evidence of the green paradox. The result show that not only is more coal being used to generate electricity but also the more dirty coal (high sulphur content) is driving out the less dirty coal (less sulphur content) after the announcement of the proposal.

Conclusions

This work shows that there is evidence of the green paradox in the case of the CPP (announcement).

The CPP has created an uncertainty in electricity generation market. Coal owners reacted to the announcement of the CPP by increasing extraction thereby reducing prices on the spot market and as a result, more coal has been used to generate electricity after the announcement of the CPP.

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Figure 1.: Quantity of Coal for Electricity Generation.