

Electric Utilities' Prolonged Reliance on Coal: The Impact of Marketable Coal Combustion Byproducts on Fuel Switching

Qingxin He and Jonathan M. Lee¹

03/31/2016

Abstract

Beginning in 1970, Title I of the U.S. Clean Air Act established plans to reduce emissions of criteria air pollutants (e.g. ozone, particulate matter, carbon monoxide, and sulfur dioxide) in counties designated as nonattainment by the Environmental Protection Agency (EPA). Over time the number of criteria pollutants and the degree of regulatory stringency has expanded thereby increasing the desirability of cleaner burning fuels among electric utilities. Natural gas and petroleum are generally recognized as cleaner alternatives to coal across most of the relevant criteria air pollutants. Nonetheless, coal remains the predominant fuel used in the U.S. electricity generating sector. This study estimates the impact of marketable coal combustion byproducts (CCBs) on fuel switching decisions, and results suggest that electric plants with contracts to sell CCBs increase their share of coal use by 5.9 percentage points in comparison to their non-selling counterparts. The shift from cleaner burning fuels towards coal combustion results in a roughly 2.0% increase in CO₂ emissions among CCB sellers. From a second best standpoint these results suggest that the marketability of CCBs may result in an inefficient overuse of coal in electricity generation in the presence of unregulated pollution such as carbon dioxide (CO₂). Indeed, forecasts from our model suggest that the share of coal usage among CCB sellers would decline by roughly 7.2 percentage points if CO₂ emissions were priced at the current estimated social cost of carbon used by the EPA.

¹ He: Winston-Salem State University, 106 R.J. Reynolds, 601 S. Martin Luther King Jr. Dr., Winston-Salem, NC 27110 (email: heq@wssu.edu). Lee (*corresponding author*): East Carolina University, A-439 Brewster, Tenth St., Greenville, NC 27858 (email: leejo@ecu.edu).