

New study reveals the power of railroads to buffer coal plants from a carbon emissions tax

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A new study by University of Maryland economist Louis Preonas provides empirical evidence that railroads are likely to cut transportation prices to prop up coal-fired plants if U.S. climate policies further disadvantage coal in favor of less carbon-intensive energy sources.

One strategy being considered to help reduce the country's contribution

to [global climate change](#) is a tax or fee on greenhouse gas emissions by [coal](#)-burning power plants. The hope is that such fees will reduce competitiveness of coal-fired energy and consumers will chose lower-emission options at a competitive cost. The [new study](#), published in *The Review of Economic Studies*, shows that [rail](#) transportation companies could reduce the effectiveness of those fees.

"These findings underscore the importance of looking at the whole fossil fuel supply chain," said Preonas, an assistant professor in the Department of Agricultural and Resource Economics. "If policymakers ignore real distortions in the market, like monopoly power in rail shipping, their climate policy efforts may not achieve the intended results."

For his study, Preonas used the drop in [natural gas prices](#) over the past decade as a natural experiment for understanding how market pressures effect the price of coal-fired power generation. By analyzing data on coal deliveries, rail carrier use of the U.S. rail network and hourly energy generation from power plants, Preonas showed that as competition from [natural gas](#) forced coal fired plants to reduce electricity prices, railroad companies reduced their coal transportation fees. By absorbing some of the cost difference between coal and natural gas, the railroads propped up the coal market to avoid losing business.

Preonas calculated that without the railroad's propping up of the [coal industry](#), natural gas use would have increased even more, reducing [greenhouse gas emissions](#) by an additional 10% over current levels.

According to the study, the rail industry's response to price competition in the coal market indicates that they are likely to absorb a significant portion of any carbon tax or fee that may be applied to coal-burning plants. This would ultimately benefit the coal industry at the expense of the railroads and their shareholders.

Preonas also showed that railroads can only absorb a carbon tax for certain power plants. About 44% of U.S. coal-burning plants are served by a single railroad. Those plants are most reliant on their rail carrier, which means those carriers have higher profit margins and are better positioned to reduce costs to keep a coal plant operational. Where plants are served by multiple railroads or able to receive shipments by water such as a nearby river or lake, rail companies face more competition and may have less room for price cuts.

The study underscores the need for future research to explore the long-term implications of market power among rail transportation companies, including their potential impact on coal-fired plant retirements and the fiscal health of coal mining communities.

Preonas said that this work also serves as a broader call to incorporate market power distortions into climate policy projects for other carbon-intensive industries such as petroleum refining and aluminum production.

Data used for the study included Energy Information Administration data on coal deliveries to [power plants](#) and [power](#) plant characteristics in the United States; hourly generation data from the Environmental Protection Agency's Continuous Emissions Monitoring System, which determines how much coal each plant consumes based on the relative prices of coal and natural gas; and data from the Bureau of Transportation Statistics which provides detailed information about the U.S. rail network, including the rail carriers operating on each track segment.

More information: Louis Preonas, Market Power in Coal Shipping and Implications for U.S. Climate Policy, *Review of Economic Studies* (2023). [DOI: 10.1093/restud/rdad090](https://doi.org/10.1093/restud/rdad090)

Provided by University of Maryland

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