

# Carbon regulation burden heaviest on poor

March 3 2014, by Clifton B. Parker



New research finds the heaviest burden for climate change regulation falls on the poor, for whom basic necessities take up a bigger chunk of the budget.

The heaviest burden for climate change regulation costs falls on people – especially lower income groups – and not corporations, according to new Stanford research.

The reason is that companies ultimately pass on those costs to people. For the poor, basic necessities take up a bigger chunk of the budget than for the rich.

"Households in the lowest income group pay, as a percent of income, more than twice what households in the highest 10 percent of the income distribution pay," wrote economist Charles Kolstad, a senior fellow at the Stanford Institute for Economic Policy Research and the Precourt Institute for Energy.

The research gives impetus to adopting a fairer approach to carbon regulation costs, Kolstad said.

"This regressivity can be addressed through transfer payments, if and when the U.S. decides to regulate greenhouse gases leading to [climate change](#)," said Kolstad, who researches environmental economics, regulation and climate change. As an example, he suggests reducing the payroll tax for lower income groups as a way to make a carbon tax more fair.

The study examined Bureau of Economic Analysis data and used a \$15 per metric ton carbon "tax" as a scenario. In other words, every person or organization (such as a company) that emits carbon into the atmosphere would pay a tax on the total amount emitted multiplied by \$15 per metric ton of carbon. The researchers looked at how such a hypothetical tax would hit individual income groups, industries and different regions.

Kolstad said that price and substitution effects may somewhat dampen the regressive nature of such costs. For example, when prices change, people change what they do. If the price of heating oil goes up, people may use more electricity or natural gas to warm their homes.

The paper was published as a SIEPR policy brief and is based on detailed analysis by Kolstad and Corbett Grainger of the University of Wisconsin-Madison.

## **Fairness issue**

Their research points out that carbon regulation involves the question of who pays the most and the least – an issue with political and social consequences. Analyzing greenhouse cost burdens is important due to the urgency of coping with global warming, which may lead to sea-level rise, local temperature and precipitation changes, and increased frequency of extreme weather.

Kolstad said, "One of the most significant problems associated with passing any sort of legislation is perceived fairness. Although there are other issues, fairness in paying for the legislation and fairness in the benefits that the legislation generates can be key to passage. This work helps understand the extent to which paying for carbon legislation can be perceived as fair or unfair, with obvious remedies for correcting any unfairness."

The poorest households spend a higher percentage of their income on fuels for heating and transportation, while higher income individuals spend proportionately a greater amount on services, which usually have lower than average carbon emissions per unit of output.

"Emissions increase more slowly as income increases. Thus, one would expect some regressivity in a carbon tax," the study stated.

Kolstad expected the regressive nature of carbon regulations to be even more dramatic.

"I thought that a carbon regulation would be far more regressive, falling on the shoulders of the poor more than it does," he said.

This expectation, he said, was based on the fact that lower income Americans often drive older, less fuel-efficient cars and frequently commute long distances to work to access lower cost housing. "Although that mental model may be correct, transportation fuel is only part of the

picture," he said.

## **Impacts on industry**

While the costs of greenhouse gas regulations are broadly spread over the entire economy, some industries are hit harder, according to the study's hypothetical carbon tax. These would include electric power, fertilizer, cement and coal-related industries like mining and transportation. Lime, a key ingredient in the manufacture of cement, would see the highest cost increase at 15 percent.

"The extent to which these industries are ultimately disadvantaged depends on the extent to which they are able to pass costs on to customers," the research noted.

Still, these most highly affected industries contributed only 1 percent to the total gross output of the U.S. economy in 2011, according to the study.

"This suggests that the adverse incidence of such a tax can be ameliorated through highly targeted financial assistance, without reducing the incentive benefits of a carbon tax," the paper stated.

Another question is which regions bear the most or least cost of [carbon](#) regulations. This is a bit more complicated to examine, as the coal mining companies operating in Wyoming may have owners in San Francisco or New York, Kolstad said.

Research shows that while the total out-of-the-pocket [carbon tax](#) costs may be similar across U.S. regions, the price of electricity may vary considerably. Thus, one could expect higher electrical costs in coal-dependent states like Kentucky, Tennessee, Mississippi and Alabama.

As for whether the United States adopts greenhouse gas regulations, he is pessimistic in the short run – but optimistic in the long run.

"Policy windows happen in which the conditions are right for congressional action. We are not in one now, but I am confident these will arise at some point in the future," Kolstad said.

**More information:** The policy brief is available online:  
[siepr.stanford.edu/?q=/system/ ... Brief\\_Kolstad\\_v4.pdf](https://siepr.stanford.edu/?q=/system/.../Brief_Kolstad_v4.pdf)

Provided by Stanford University

Citation: Carbon regulation burden heaviest on poor (2014, March 3) retrieved 2 May 2024 from  
<https://phys.org/news/2014-03-carbon-burden-heaviest-poor.html>

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