



Designing a
FAIR CARBON TAX

*Drawing from more than 20 years of economic study, **Daniel F. Morris** and **Clayton Munnings** argue that the regressive impacts of a carbon tax can be addressed by well-crafted policy.*

In some circles, a tax on carbon dioxide emissions is presented as a bogeyman that will make poor people even poorer. As quiet discussions continue about the viability of carbon taxes to help address the nation's fiscal issues, the potential impacts to low-income groups from higher energy prices will no doubt be used to fight against progress. Economic research from the past few years, however, suggests the negative effects of carbon taxes on these groups are not as extensive as politicians would tell us.

Although putting a price on carbon may possibly have regressive impacts, economic estimates can overstate these impacts by using short-term or nonrepresentative income measures. In fact, some research suggests that a carbon tax may even be progressive in certain cases. Moreover, it would not be difficult to craft market-based control policies that protect vulnerable classes of citizens while reducing the country's greenhouse gas emissions.

In a recent RFF issue brief, we underscore both these points. We surveyed more than 20 years of economic study to determine how households are impacted by carbon taxes and how to limit or offset income losses to low-income populations. The results provide some useful guidelines for designing carbon taxes in the United States. Critical findings include the following:

- » Carbon taxes are probably not as regressive as they are often characterized, and they appear even less regressive when using measurements based on annual household consumption or accounting for tax effects for producers. In some cases, they may be slightly progressive.

- » Regional differences in the effects of a carbon tax are small.

- » Government programs that index to inflation may contribute to a more progressive tax.

- » Low-income households can be compensated for increased prices with carbon tax revenue. If it is returned through direct rebates, the results will be progressive and reach more households, but targeted tax swaps may have similar effects.

Impacts to Households

What do economists currently think the consequences of carbon pricing are for low-income populations? Some studies suggest the income burden from pricing carbon may be as high as 3.5 percent for low-income households, but less than 1 percent for high-income households. If accurate, then a carbon tax is clearly regressive. These studies, however, may overestimate regressivity due to three simplified but important assumptions.

The first assumption is that producers can pass 100 percent of increased carbon charges through to consumers in the form of higher prices. Second, some researchers characterize impacts to households by measuring the tax burden as a portion of annual income instead of annual consumption. Finally, some studies assume that social safety net programs do not dampen the impact of pricing carbon on low-income households.

Cost Pass-Through

The first step to measure the effects of carbon taxes on low-income groups is to understand how carbon taxes reverberate through the economy to impact consumers—often called the tax incidence. The three most important pathways through which environmental taxes can be felt are increased costs to consumers, lower production or increased costs for businesses, and the value of tax revenue. If one makes the assumption that 100 percent of the tax will be passed through to households, then the tax could be quite regressive. Many studies

do assume that producers can completely pass increased costs on in the form of higher energy prices. They also assume that consumers would not reduce their energy consumption, despite higher prices, which means that a carbon tax would not impact producers whatsoever.

In reality, producers will bear some proportion of the costs, which may result in reduced returns on investment and lowered wages. The burden of these impacts would fall on richer households that draw a disproportionate share of income from investing in—and working for—producers. Allowing producers to change their labor, capital, and emissions profile and consumers to change their energy consumption in economic models will generate more realistic results and give a more complete picture of the impacts to households.

Annual Income versus Consumption

The conventional argument is that carbon taxes are regressive like sales taxes are regressive: richer households purchase more goods and therefore pay more sales tax in absolute terms, but sales tax payments constitute a larger fraction of low-income households' annual income. When using the impact of a consumption tax on households as a portion of annual income as the metric, the burden falls disproportionately onto low-income households.

But annual income does not necessarily give an accurate representation of a household's well-being. Measuring household impacts in terms of annual income may overstate regressivity for two reasons. First, households' annual income can vary drastically from year to year; temporarily unemployed workers are a good example. Second, households' annual income generally increases over time. The income of a fourth-year PhD candidate likely will increase substantially after graduation—

reducing the proportion of income that goes to taxes. Both examples demand a concept of income that appropriately accounts for long-term trends.

Economists could accurately characterize household impacts by comparing tax burdens to lifetime income, but that estimation is difficult and speculative. Economists therefore use a work-around that contends annual consumption is a reasonable proxy for lifetime income. Measuring incidence as a portion of annual consumption instead of annual income results in quite different findings. A 2010 study conducted by economists Corbett Grainger and Charles Kolstad finds that a carbon price appears two to three times more regressive when measured in terms of annual income rather than annual consumption. In fact, the authors find that a carbon price has an almost neutral impact on households when measured in terms of annual consumption.

Social Safety Nets

Until recently, most researchers neglected the role that inflation indexing plays in protecting low-income households from the impacts of pricing carbon. A tax on carbon would increase energy prices and possibly boost inflation, which could actually benefit low-income households in a number of ways. Many government assistance programs are indexed to inflation so that low-income participants are not unduly affected. Thus, as inflation increases, transfer payments such as Social Security, workers' compensation, and veterans' benefits also increase. Inflation indexing has progressive effects because transfer payments constitute a disproportionate amount of income for low-income households. Additionally, the government adjusts income tax brackets in response to changes in inflation rates, which may result in some households dropping down to a bracket

with lower tax rates. Lastly, increased inflation can expand eligibility for and increase payments from the Earned Income Tax Credit—payments that disproportionately accrue to low-income households. Neglecting these benefits tends to lead to an exaggerated regressive estimate of carbon pricing impacts.

A 2012 study conducted by RFF researchers Joshua Blonz, Dallas Burtraw, and Margaret Walls accounts for each of these benefits and confirms their progressive effect. According to the findings—which were for a cap-and-trade system—the three lowest income quintiles benefit substantially from inflation indexing, while the top two income quintiles experience a minor increase in costs. The effect of transfer indexing is strong enough to turn an estimated 0.25 percent burden from the tax into a 0.13 percent gain for households in the lowest income quintile.

power. But those regions that are more reliant on fossil fuel currently pay less in electricity prices, so research suggests that a carbon tax will result in a price flattening across the nation.

Although this is the case for electricity prices, a carbon tax may affect the price of other types of energy—such as gasoline and home heating oil—differently across the country. Despite that, it may have similar effects on household income in different regions. A 2012 study conducted by RFF researchers Karen Palmer, Anthony Paul, and Matthew Woerman finds that the tax burden for average households clusters around 1.5 percent of annual income, despite the fact that regions consume energy differently. For example, Appalachia spends more on gasoline than New England, where households spend more on heating oil. This suggests that although energy consumption of specific fuels varies by region,

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Regional Effects

Just as carbon tax impacts will be felt differently across income groups, regions of the country will face different impacts. Although existing economic models cannot deliver reliable estimates about household impacts in specific cities or congressional districts, clear regional patterns arise from a national carbon price.

The electricity sector will most prominently exhibit regional disparities in price increases. Areas of the country that depend more on fossil fuel for electricity production will see greater price increases than areas that use renewable sources or nuclear

overall energy consumption is such that the carbon tax does not significantly disadvantage households in any specific region.

In general, economists tend to find modestly regressive to slightly progressive impacts of carbon pricing when making assumptions that accurately reflect reality. The recent research confirming these results marks an evolution in academic thinking and a departure from the view that carbon taxes are just like a sales tax.

Offsetting Tax Burdens

Although a carbon tax may be less regressive than it appears at first blush, it still is

potentially more burdensome to low-income households than to wealthier households. The direct and indirect burdens of the tax, however, are only part of the story. The carbon tax discussion is incomplete with-

be more economically efficient than targeted low-income assistance programs.

Researchers at RFF recently developed a new model of the US economy designed to help policymakers navigate this complex

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out including the use of revenues generated from the tax. The government can make the tax fully neutral or even progressive by directing some amount of revenues to low-income households, through either direct rebates or swaps to reduce other, more distortionary taxes.

The direct-rebate route is straightforward: the government would simply send checks to all eligible households. Although all households would benefit from the rebate, the lowest 20 percent would likely see the greatest gains. This approach was a key component to the proposed Cantwell–Collins cap-and-trade bill in the 111th Congress, and the direct rebate has remained popular in some circles because of its administrative ease.

Direct rebates are not the only solution. Tax revenue swaps have gained bipartisan support over the past year as a way to reduce distortionary taxes and begin to get the country's financial house in order. For households, this approach would consist of reducing income or payroll taxes (or both) by the same proportion of income that goes to the carbon tax. Depending on the distortionary tax being offset, the swaps could enhance economic efficiency, though possibly to the detriment of equity concerns. For instance, swapping carbon tax revenue to reduce income or corporate taxes may have a more regressive outcome than reducing payroll taxes, but they may

array of options. The model can be used to analyze the economic, distributional, and environmental impacts of a federal carbon tax for current and future generations across the country. The model also examines the most efficient uses of revenue from a carbon tax—for example, to support revenue-neutral tax reform, reduce the deficit, or provide rebates to consumers.

While there is still much to learn about how a carbon tax might work within the US economy, worries about detrimental effects to low-income populations should not be used as a barrier to implementation. A carbon tax is a policy that can gird vulnerable populations against both environmental degradation and economic hardship. ●

FURTHER READING

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