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## **Offsetting a Carbon Tax's Costs on Low-Income Households**

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# Abstract

Imposing a tax on carbon dioxide emissions would reduce the damage from climate change but would also impose a larger burden, relative to income, on low-income households than on high-income households. This paper evaluates two broad groupings of options for reducing the regressive effects of a carbon tax; one group of options would affect large segments of the economy, for example by reducing payroll taxes, and the other group of options would be targeted at low-income households, for example by providing an additional payment to households currently receiving electronic transfer benefits. Each option is evaluated based on the percent of low-income households that it would affect, whether it would provide comparatively larger benefits for lower-income households, its administrative costs, and its implications for economic efficiency, specifically whether it would increase incentives to work and invest and whether it would preserve the incentives to reduce emissions that the carbon tax would create. The broad based options could potentially provide support for a relatively large share of low-income households, but some of those options would provide relatively small benefits to those households. Options specifically targeting low-income households could be most effective in reaching households that do not file income taxes or that do not have earnings. Three of the seven options considered would increase the incentive to work or invest and all but one of the options would preserve the incentive to reduce emissions of carbon dioxide.

# Offsetting a Carbon Tax's Costs on Low-Income Households

## Introduction

Taxing the carbon content of fossil fuels offers an efficient method of reducing emissions of carbon dioxide (CO<sub>2</sub>), the most prevalent greenhouse gas. The effectiveness of the tax stems from the fact that it would increase the prices of goods and services based on the amount of CO<sub>2</sub> emissions associated with the production and use of them: Goods that lead to relatively high emissions, such as coal-fired electricity, would see larger price increases than goods that have relatively low emissions, such as services. Those changes in relative prices are essential to the success of the program because they provide incentives for businesses to produce goods in a manner that result in lower emissions and for households to reduce consumption of energy-intensive goods that cause high emissions. At the same time, those price increases would impose a burden on low-income households. Policymakers could consider several policies for offsetting tax-induced costs borne by low-income households.

This paper examines the potential effects of a carbon tax on households in various income categories, absent any compensation. It then describes the extent to which low-income households might be protected from the effects of the carbon tax by automatic compensation they would receive from indexing of transfer payments and the income tax system. Next the paper examines the extent to which low-income households might receive additional protection under compensation options that policymakers might consider, including both broad-based policies and policies that explicitly target households at the lower end of the income distribution. The effects of alternative policy options are each evaluated using a consistent set of criteria. The paper concludes with a discussion of the portion of the revenue generated by a carbon tax that might be needed to offset the costs incurred by low-income households.

## Effects of a Carbon Tax on Low-Income Households Absent Compensation

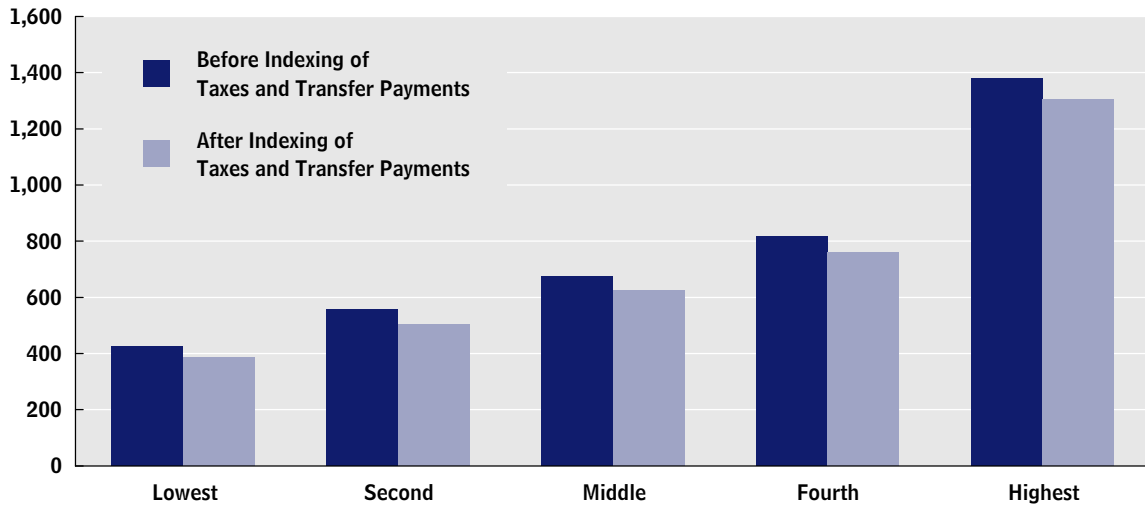
Several studies have examined how setting a price on carbon—either by taxing it or by implementing a cap-and-trade program—would affect households at different points in the income distribution. Most studies have found that such policies would be regressive, imposing larger burdens (relative to income or to other metrics) on low-income households than on their higher income counterparts. For example, the Congressional Budget Office (CBO) found that a policy that set a price of \$28 per metric ton on CO<sub>2</sub> emissions (roughly \$103 per ton of carbon) would impose a cost of \$425 dollars per year on the average household in the lowest income quintile and a cost of \$1,380 per year on the average household in the highest income quintile (see Figure 1; note that those annual costs were measured based on the size of the economy in 2010). That cost would account for 2.5 percent of after-tax income for the average household in the lowest income quintile, compared with less than 1 percent of after-tax income for the average household in the highest quintile (see Figure 2).<sup>1</sup> That difference occurs for two reasons: Lower-income

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<sup>1</sup> Congressional Budget Office (2009).

**Figure 1.**  
**Estimated Cost of a \$28 Tax per Ton of Carbon Dioxide, by Income Quintile**

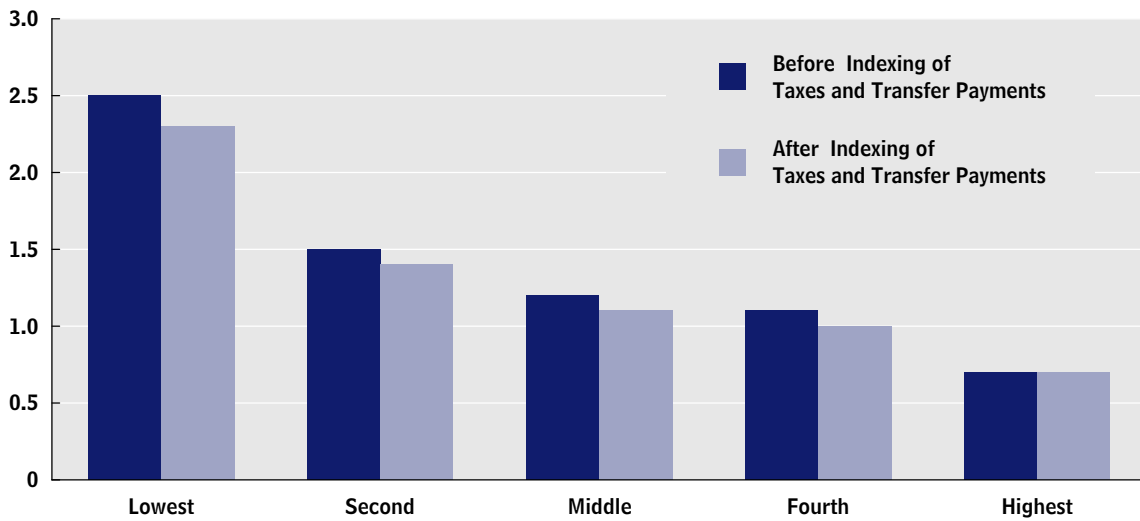
(2009 dollars)



Source: Congressional Budget Office.

**Figure 2.**  
**Estimated Cost of a \$28 Tax per Ton of Carbon Dioxide, by Income Quintile**

(Percentage of after-tax income)



Source: Congressional Budget Office.

**Table 1.**  
**Average Annual Household Expenditures on Energy-Intensive Items, by Income Quintile, 2007**

(Dollars)

	Quintile					All Households
	Lowest	Second	Middle	Fourth	Highest	
Utility Expenditures	1,203	1,596	1,840	2,181	2,847	1,934
Gasoline Expenditures	1,046	1,768	2,418	2,988	3,696	2,384
Total spending on energy-intensive items	2,249	3,364	4,258	5,169	6,543	4,318
Total as a percentage of income	21.4	12.2	9.2	7.1	4.1	6.8

Source: Congressional Budget Office based on data from Bureau of Labor Statistics, Consumer Expenditure Survey, 2007 ([www.bls.gov/cex/2007/Standard/sage.pdf](http://www.bls.gov/cex/2007/Standard/sage.pdf)).

Note: Energy-intensive items include natural gas, electricity, fuel oil, other heating fuels, gasoline and motor oil.

households spend a larger fraction of their income and, because energy-intensive goods are necessities, they make up a larger share of lower-income households' expenditures (see Table 1).

The degree to which a carbon tax is found to disproportionately burden low-income households varies across studies, based on the metrics against which analysts measure costs. Measuring a household's tax-induced costs relative to its income would overestimate the regressivity of a carbon tax if that household's annual income understates its ability to bear the higher costs. For example, households with retired members may have low current incomes even though they have substantial wealth. Some studies have addressed that concern by comparing households' costs under a carbon tax to their annual consumption rather than to their annual income (under the assumption that consumption is a better indicator of households' income over an extended period of time). Such studies find that a carbon tax would still be regressive, but less so than if costs were compared to annual income.<sup>2</sup>

Estimates of the degree of regressivity of a carbon tax also vary based on analysts' assumptions about the extent to which the cost of the tax would be passed forward to consumers in the form of higher prices for final goods and services or passed backward to workers and investors in the form of lower wages and lower returns on their investments. To the extent that a carbon tax is passed backward, the tax would be less regressive, potentially even becoming progressive.<sup>3</sup> The sensitivity of the incidence of the tax to analysts' assumptions about whether the tax is passed forward or backward is related to the measurement issues described above. If analysts account for the reduction in the real value of households' net savings caused by higher prices, the incidence of the tax would be similar regardless of whether it was assumed to be passed forward or backward.<sup>4</sup>

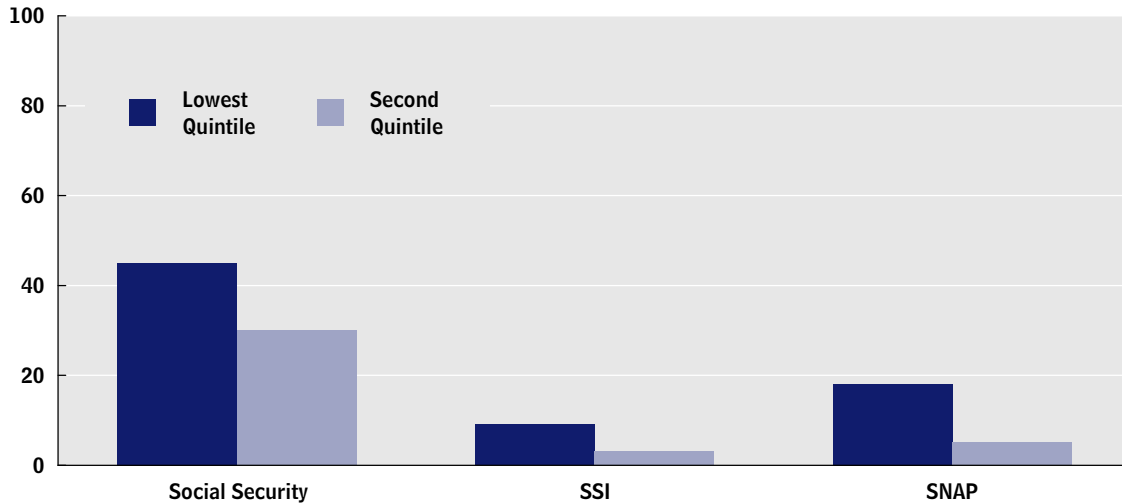
<sup>2</sup> For example, see Hassett (2009).

<sup>3</sup> For example, see Rausch et al. (2010) and Fullerton (2010).

<sup>4</sup> This is less true if households have unexplained consumption (not financed through savings or earnings), which typically occurs for low-income households.

**Figure 3.**  
**Low-Income Households That Would Benefit from Automatic Indexing of Transfer Programs**

(Percentage of Households)



Sources: Congressional Budget Office tabulations based on data from the March 2005 Current Population Survey; 2006 Statistics of Income Public Use File.

Notes: SSI = Supplemental Security Income; SNAP = Supplemental Nutrition Assistance Program.

## Compensation Associated with Indexing of Government Transfer Payments and Federal Income Taxes

Some households would receive automatic increases in government payments if a carbon tax caused the overall price level to rise.<sup>5</sup>

- Social Security payments and Supplemental Security Income (SSI) payments are pegged to the consumer price index (CPI), so they would automatically increase as the price level rose.
- Supplemental Nutrition Action Payments (SNAP, formerly named Food Stamps), help low-income households purchase food. Those payments are pegged to food prices, so they would increase to the extent that a carbon tax increased grocery bills.

Based on 2006 data, cost-of-living increases for Social Security would offer some compensation for more than 40 percent of households in the lowest 20 percent of the income distribution and for roughly 30 percent of households in the second-lowest income quintile (see Figure 3). In addition, 9 percent of

<sup>5</sup> For the purposes of this paper, it is assumed that the overall price level will rise as a result of the tax. If the Federal Reserve were to take action to prevent that from happening, the overall price level would stay constant but the relative price of carbon-intensive goods and services would still rise. Either way, the change in relative prices would disproportionately affect low-income households to the extent that carbon-intensive goods and services, such as gasoline and electricity, constitute a relatively large share of their consumption.

**Table 2.**  
**Average Annual Household Expenditures on Energy-Intensive Items, by Age, 2007**

	Under Age 65	Age 64 and Over	All Households
Utility Expenditures	1,947	1,880	1,934
Gasoline Expenditures	2,607	1,461	2,384
Total spending on energy-intensive items	4,554	3,341	4,318
Total as a percentage of income	6.6	8.3	6.8

Source: Congressional Budget Office based on data from Bureau of Labor Statistics, Consumer Expenditure Survey, 2007 ([www.bls.gov/cex/2007/Standard/sage.pdf](http://www.bls.gov/cex/2007/Standard/sage.pdf)).

Note: Energy-intensive items include natural gas, electricity, fuel oil, other heating fuels, gasoline, and motor oil.

households in the lowest quintile and 3 percent of the households in the second-lowest quintile would receive automatic compensation in the form of higher SSI payments.<sup>6</sup>

Cost-of-living increases for Social Security and SSI would only partially protect households receiving those benefits—to the extent that income from those sources covers only part of their total expenditures. That effect would be exacerbated because expenditures on energy-intensive items are a higher share of total expenditures both for low-income households (see Table 1) and for the elderly (see Table 2).

In addition, the rise in the price level would reduce households' tax burden. Because the federal income tax system is largely indexed to the consumer price index (for example, an increase in the price index would reduce the income level at which a 15 percent tax bracket applies), an increase in consumer prices with no increase in nominal incomes would reduce federal income taxes.

On average, the automatic indexing of transfer payments and the tax system would reduce the cost that the carbon tax would impose on households in the lowest income quintile from \$425 to \$385 (see Figure 1) or from 2.5 percent to 2.3 percent of their after-tax income (see Figure 2). The average cost borne by households in the second-lowest quintile would fall from \$555 to \$505 (from 1.5 percent to 1.4 percent of after tax income).

## Options for Further Offsetting Costs for Low-Income Households

This paper compares two types of options for further offsetting the costs that low-income households would bear under a carbon tax.

The first type includes options that would direct some carbon tax revenue back to households in a manner that would benefit households in all income brackets, not just those at the lower end of the income distribution. Such possibilities include using carbon tax revenue to:

<sup>6</sup> For additional discussion of the effects of indexing and policy options for offsetting costs that households would incur under policies that set a price on carbon dioxide emissions, see Congressional Budget Office (2008), Dinan (2009), and Elmendorf (2009).

- Reduce income tax rates,
- Provide income tax rebates,
- Provide payroll tax rebates, and
- Increase incentives for energy-saving investments.

The second type includes options that would specifically target low-income households. Those options include using carbon tax revenue to:

- Increase Earned Income Tax Credit (EITC) payments,
- Provide an additional fixed payment to households that are eligible for SNAP payments, and
- Increase payments made to households through the existing Low Income Home Energy Assistance Program (LIHEAP).

## Criteria Used for Comparing Policy Options

When choosing among policies that could offset the cost increase that low-income households would incur under a carbon tax, policymakers might consider multiple criteria, including:

- *Targeting:*
  - What fraction of low-income households would the policy cover?
  - Would it provide more compensation (relative to their income) for low-income households than for high-income households?
- *Administration:* Could the compensation strategy rely largely on an existing administrative structure and thereby avoid creating new institutional structures or adding new compliance costs?
- *Economic Efficiency:*
  - Would the policy preserve incentives for households to reduce consumption of energy-intensive goods and services?
  - Would it increase incentives for households to work and to invest?

This paper evaluates each option on the basis of those criteria. The question of whether the compensation policy would increase incentives for households to work and invest is relevant because the price increases triggered by a carbon tax decrease such incentives. Higher prices would lower households' real (inflation-adjusted) wages, potentially causing some workers to reduce their hours worked or to drop out of the work force. For example, two-income households may choose to have one member stay home and care for children if the lower real wage no longer justifies his or her labor outside the home. The decreased incentive to work caused by the drop in real wages could be somewhat offset by the "income effect"—lower real wages would reduce household incomes, causing an increase in incentives to work—however, empirical evidence indicates that the magnitude of this income effect would be comparatively small. Higher prices would also lower the real return on investments, thus discouraging saving and investing.



## Results

No single option performs best according to all of the criteria; trade-offs are inevitable. For example, some researchers find that the economy-wide cost of a carbon tax would be considerably lower if the revenue were used to reduce marginal tax rates on labor, capital, or personal income than if it were used to offset costs imposed on low-income households. Reductions in marginal tax rates would help offset the disincentives to work and to invest that a carbon tax would otherwise create; however, they would provide larger relief (measured as a share of income) to higher income households than to lower income households. In general, options that would most effectively provide direct compensation to low-income households tend to be less effective at increasing households' incentives to work and to invest. Policymakers would not, of course, be limited to one form of compensation but could combine different options.

### Broad-Based Compensation Options

Policymakers could choose to supplement automatic compensation that households would receive by enacting measures that would distribute some of the carbon tax revenue to households across the full income distribution. Several such broad-based compensation measures were considered in the context of cap-and-trade programs for carbon dioxide emissions—programs that, like a carbon tax, would lead to higher prices for energy-intensive goods.

**Reduction in Income Tax Rates.** A proportional reduction in all individual income tax rates would provide the largest percentage increase in after-tax income and the largest dollar amount of tax reductions for taxpayers in the highest income tax brackets of the policies considered in this paper; taxpayers in the 10 percent or 15 percent tax brackets, who constitute roughly two-thirds of taxpayers with taxable income, would receive minimal benefits.<sup>7</sup> Limiting the rate reductions to the two lowest income tax brackets would cause all taxpayers with income exceeding those brackets to receive the same dollar benefit. For taxpayers whose taxable income fully falls within those brackets, taxpayers whose income put them near the top of the 15 percent bracket (\$44,050 for a single taxpayer and \$88,100 for a couple in 2012) would benefit the most. Reductions in income tax rates would not help low-income households that do not have sufficient income to owe income taxes. Only 30 percent of households in the lowest income quintile and 64 percent of households in the second-lowest income quintile would benefit from a reduction in income taxes (see Figure 4).

A reduction in corporate income tax rates would benefit owners of corporate stock in the short run, with most of the benefits going to higher-income households. As capital markets adjusted over the longer term, however, the economic gain from reducing the tax would spread across all types of capital. Over time, at least some of the economic gains could also be shifted to wage earners, although the degree of such shifting is uncertain. Nevertheless, any gains by low- and moderate-income households from a reduction in corporate taxes would be modest—even over the longer term—and insufficient to offset their increased energy costs.

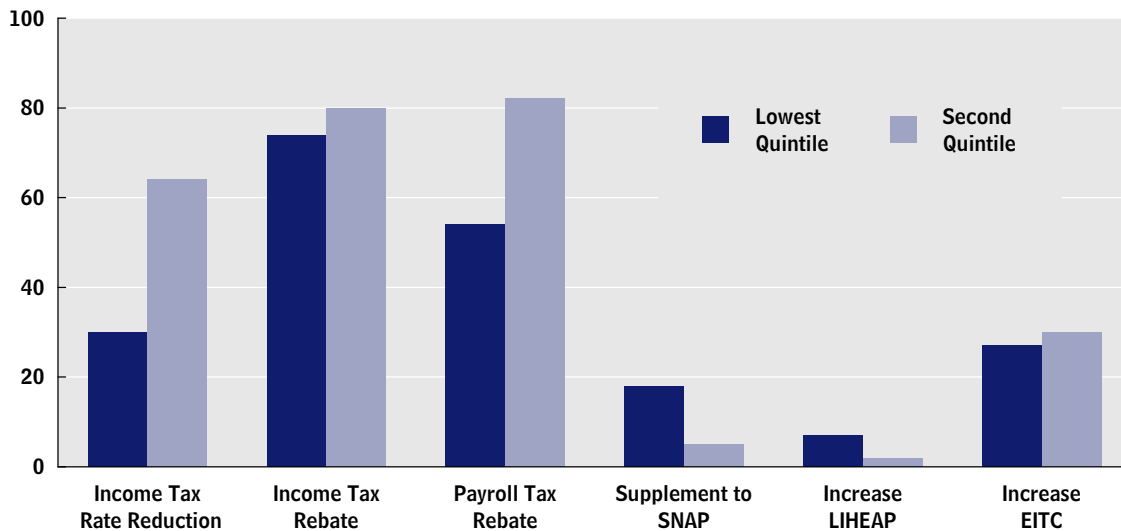
Although a reduction in income tax rates would fail to provide compensation for many low-income households, it would be straight forward to administer (requiring no additional administrative costs) and would provide some efficiency advantages:

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<sup>7</sup> The 10 percent bracket expires after 2012 under current law.

**Figure 4.**  
**Low-Income Households That Would Benefit from Various Compensation Options Based on Data on Taxes, Income, and Benefits**

(Percentage of Households)



Sources: Congressional Budget Office tabulations based on data from the March 2005 Current Population Survey; 2006 Statistics of Income Public Use File.

Notes: SSI = Supplemental Security Income; SNAP = Supplemental Nutrition Assistance Program; LIHEAP = Low Income Household Energy Assistance Program; EITC = Earned Income Tax Credit.

- Because lower rates would not be tied to households’ consumption of energy-intensive goods, they would not offset the carbon tax-induced incentives to consume less of those goods.
- Further, a reduction in income tax rates would provide households with an added incentive to work and to save and invest because lower tax rates boost the after tax return that households receive from working and investing.

Several researchers have found that using carbon tax revenue to reduce income tax rates could significantly lower the overall cost that a carbon tax would impose on the economy.<sup>8</sup> An income tax rate reduction is the only policy option considered here which would increase most households’ incentives to work, save and invest.

**Income Tax Rebate.** Unless an income tax rebate was refundable (that is, payable in excess of the amount of income tax owed), it would be of little or no value to taxpayers who filed income tax returns but owed no income tax—which was the case for approximately 30 million of the 106 million households that filed returns in 2006. Making a rebate refundable would expand the number of eligible households, but would raise administrative complications: Households that do not typically file income taxes would need to file in order to receive the rebate. For example, in 2006, an estimated 10 million households did not file a return. Households with very low income and those headed by elderly people account for most of the households that do not file a return.

<sup>8</sup> For example, see Parry (2000) and Rausch and Reilly (2012).

The rebates available under the Economic Stimulus Act of 2008 might provide an indication of the number of eligible households likely to file an income tax return in order to claim a rebate. The IRS received approximately 156 million individual income tax returns during the 2008 filing season, the first year in which filers could claim the recovery rebate. That total represents an increase of 16 million returns (11.5 percent) over the number received in the previous year.<sup>9</sup> Much of that increase probably represents those filing solely to claim the rebate—the annual increases in returns received during the 2006 and 2007 filing seasons were just 1.6 percent and 3.0 percent, respectively. Although many households appear to have filed a return just to claim the rebate, the number that did so was a bit below expectation. When the Economic Stimulus Act of 2008 was enacted, the Joint Committee on Taxation estimated that \$106.7 billion in stimulus payments would be paid in fiscal year 2008. A total of \$94.1 billion was actually distributed in that year, although it is difficult to determine how much of the shortfall was attributable to eligible people failing to claim the rebate. The economic stimulus rebates were temporary. The percentage of eligible households that would file under a permanent program would probably be higher.

A refundable tax rebate of a fixed dollar amount would be progressive, providing greater relief as a percentage of income to low-income households. Rebates can be adjusted for differences in family size. They can also be targeted to lower-income taxpayers by reducing (phasing out) the amount of the rebate at higher incomes. For example, the individual income tax rebates that were part of the economic stimulus package enacted in 2008 were reduced by 5 percent of income in excess of \$75,000 for individuals and \$150,000 for couples. Phasing out a rebate reduces its budgetary cost but adds complexity to the calculation of tax liability and makes the true tax on additional income (the marginal tax rate) less transparent. Based on the \$28 tax per ton of carbon dioxide used in Figure 1, a rebate of \$385 would be sufficient (on average) to offset the cost that the tax would impose on households in the lowest income-quintile (after accounting for indexing of federal income tax rates and transfer payments).

As seen in the experience with stimulus payments, the IRS would need to undertake substantial educational efforts to ensure that many wage earners and others who otherwise would not file income tax returns (because their incomes fall below the statutory requirements for filing) would file returns to obtain the rebate. The increase in administrative costs would be greatest if the rebates were paid to all households, rather than only to those that met certain income requirements. The recent economic stimulus rebates were payable to households without income tax liability if their combined income from earnings, Social Security, and veterans' disability payments was at least \$3,000. Allowing households that made less than that amount to claim a refundable income tax rebate would increase administrative costs.

A fixed rebate (not dependent on earnings) would preserve households' incentives to reduce their consumption of energy-intensive goods, but would not provide households with any additional incentives to work or save and thus would not offset any of the overall economic costs associated with a carbon tax program. In contrast, the fixed rebate would boost households' incomes, thus creating a disincentive to work. The magnitude of that effect, however, is likely to be quite small.

**Payroll Tax Rebate.** One proposal would issue a payroll tax rebate for Social Security and Medicare taxes as means of offsetting the higher costs that households would face as a result of a carbon tax. Under that proposal, the rebate would apply to the tax on the first \$3,660 of earnings. With a combined

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<sup>9</sup> The significant gap between the number of returns filed in 2007 (140 million) and the number of households filing returns in 2006 (106 million) is explained by the fact that some households file multiple returns.

employee and employer tax rate of 15.3 percent, the maximum energy credit per worker would be \$560.<sup>10</sup> Based on the \$28 tax per ton of carbon dioxide used in Figure 1, that rebate would more than offset the average cost that the tax would impose on households in the two lowest income quintiles. However, many low-income households do not have earnings and, therefore, would not receive the rebate.

A payroll tax rebate would reach the approximately 159 million workers who are covered under the Social Security and Medicare programs, but would not benefit households without covered earnings.<sup>11</sup> Many of those noncovered households have low income or include retirees. Data from the 2008 Current Population Survey, produced by the U.S. Census Bureau, indicate that, although about 80 percent of all households would be eligible for a payroll tax rebate, only slightly more than half (54 percent) of the households in the lowest fifth of the income distribution would qualify. About three-quarters of the households in that quintile that would not qualify for a payroll tax rebate receive Social Security benefits and thus would be partially protected from higher energy costs by cost-of-living adjustments.

A payroll tax rebate (like any fixed-dollar rebate) would be progressive over most of the income distribution, providing benefits that were a larger percentage of income for lower-income households except for those with the very lowest income and little or no earnings. (However, because the rebate amount would depend upon the number of workers within each household, the rebate would not necessarily be equal for households with the same income.)

Administering a payroll tax rebate would be complicated by a number of issues. Adjusting payroll tax withholding would impose some administrative burden on employers, who also would lack the necessary information to adjust withholding for workers with more than one job. An alternative to adjusting payroll tax withholding would be to pay the rebate through the income tax system when workers file returns. Although that approach would be easier to administer, the timing of the rebate would not coincide with the timing of individuals' increased expenditures. Furthermore, because some workers who pay payroll taxes do not currently file income tax returns, some additional administrative costs would be incurred to process more returns.

A payroll tax rebate would preserve incentives to reduce carbon dioxide emissions and, by increasing workers' take-home pay, would provide modest incentives for greater participation in the labor force. It would not offer new work incentives for people already in the labor force with earnings high enough to qualify for the maximum rebate.

**Incentives for Energy Saving Investments.** Using revenue from a carbon tax to subsidize household investments that reduce carbon dioxide emissions would help mitigate households' costs of adapting to higher energy prices. For example, subsidizing weatherization improvements would enable households to use less energy for heating and cooling. Tax incentives for energy savings investments typically favor higher-income households over lower-income households. Data on the utilization of federal residential energy credits for 2006 indicate that both participation and average benefits increased with income (see Table 3). That pattern occurs for two reasons: Higher-income households are more likely to have the savings necessary to make the investments, and higher-income households face higher tax rates, and

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<sup>10</sup> Metcalf (2007). For 2012, the employee tax rate for social security was temporarily reduced by two percentage points; therefore the combined employee and employer tax rate was 13.3 percent.

<sup>11</sup> Such rebate would not have to affect the financial status of Social Security and Medicare or the future retirement benefits of workers. Workers would receive credit for their full covered earnings, and the Social Security and Medicare trust funds could be credited for the full amount of the payroll tax. See [www.ssa.gov/pressoffice/basicfact.htm](http://www.ssa.gov/pressoffice/basicfact.htm).

**Table 3.**  
**Utilization of Federal Residential Energy Credits, 2006**

Adjusted Gross Income	Number of Tax Returns (Thousands)	Percentage of Total	Percentage Claiming Residential Energy Expenses	Average Usable Residential Energy Credit (Dollars)
Under \$15,000	37,614	27.2	0.1	111
\$15,000 to \$30,000	29,649	21.4	1	197
\$30,000 to \$50,000	24,907	18	3.2	208
\$50,000 to \$100,000	30,053	21.7	6.6	223
\$100,000 to \$200,000	12,110	8.7	8.9	252
\$200,000 and Above	4,088	3	6.9	305
Total	138,420	100	3.2	230

Source: Congressional Budget Office based on Internal Revenue Service, “Individual Income Tax Returns, Preliminary Data, 2006,” *Statistics of Income Bulletin* (Spring 2008), Table 1, pp. 6–17.

therefore benefit more from incentives offered in the form of tax deductions (but not from tax credits which do not depend on marginal tax rates).

Moreover, such incentives could increase the total costs (both public and private) of reducing U.S. emissions of carbon dioxide because they would encourage households to choose certain alternatives over others when adjusting to higher energy prices. For example, a tax credit for solar heating would encourage the use of that technology even if it were not the most cost-efficient alternative in the absence of the credit. Creating a tax incentive system without distorting technology choices is difficult.

### Options Specifically Targeting Low-Income Households

Policymakers could choose to use some of the carbon tax revenue to fund programs that would specifically target low-income households. Those programs could be considered in lieu of, or in addition to, some of the broad-based options described above.

**Fixed Payment for Households Eligible for SNAP.** A fixed payment based on the same eligibility rules as those for the Supplemental Nutrition Assistance Program (SNAP, formerly known as the Food Stamp program) would be a way to target benefits to low-income households. To be eligible for SNAP in 2012, an applicant’s monthly income must be at or below 130 percent of the poverty guideline (\$2,422 for a family four) and countable assets must be less than \$2,000 (\$3,325 for households with elderly or disabled members). In 2011 participation in SNAP was the highest it had ever been, with nearly 45 million people (or one in seven U.S. residents) receiving SNAP benefits each month.<sup>12</sup> In fiscal year 2010, the most recent year for which detailed demographic data are available, 85 percent of households receiving SNAP benefits had income (excluding SNAP benefits) below the federal poverty guideline and about three quarters of households receiving SNAP benefits included a child, a person age 60 or older, or a disabled person. Participation was exceptionally high in recent years due to the downturn in the economy. In 2006, SNAP recipients included 18 percent of households in the lowest income quintile and 5 percent of those in the second quintile (see Figure 4).

<sup>12</sup> Congressional Budget Office (2012).

The fixed payment could be distributed to households through the same system as SNAP benefits, which are paid through an electronic benefit transfer system. Those SNAP benefits are deposited electronically in individual accounts each month, and recipients use a card to debit their account when paying for groceries.

A fixed payment to SNAP recipients would not undermine incentives for households to reduce their consumption of energy-intensive goods. However, it would not offset any of the economic efficiency costs of higher energy prices because it would not provide households with additional incentives to work or to save and invest.

**Increased Funding for LIHEAP.** The Low Income Home Energy Assistance Program (LIHEAP) currently helps some low-income households pay their energy bills. Federal rules restrict LIHEAP assistance to households with income up to 150 percent of the federal poverty guideline (or 60 percent of state median income, if greater). States, however, can choose to set lower income limits, and as a result, eligibility requirements vary from state to state. In 2009, an estimated 7.4 million households received assistance through LIHEAP—about 16 percent of federally eligible households.

Providing assistance for carbon-tax-induced increases in energy bills to all low- and moderate-income households would require a major expansion of the program, a substantial increase in administrative costs, and possibly a major overhaul of the program. The current program is funded as a block grant from the federal government to the states and other entities, leaving wide latitude in the types of assistance provided.

Increasing LIHEAP subsidies could raise the overall cost of achieving any given level of emission reductions, because it would somewhat offset the price signals necessary to motivate households to undertake low-cost reductions.<sup>13</sup> Further, LIHEAP subsidies would not provide any additional incentives for households to work and invest.

**Increase EITC Payments.** An option based on the current tax system, and targeted specifically toward low-income households, would be to expand the Earned Income Tax Credit. The EITC is a refundable credit (that is, households receive a payment if the credit exceeds their income tax liability before applying the credit), payable to low-income families with earnings. In 2011, single parents with one child and income up to \$36,052 (\$41,132 for a married couple) were eligible for the credit. Single parents with two or more children could qualify with income up to \$40,964 (\$46,044 for a married couple). Childless workers between the ages of 25 and 65 were eligible for a much smaller credit but must have had income less than \$13,660 (\$18,740 for a married couple) to qualify.<sup>14</sup>

In 2009, taxpayers filed for the EITC on 27 million tax returns. The total amount of the credit was \$59.2 billion, of which \$54 billion (91 percent) was refundable. Forty-six percent of EITC recipients (accounting for 22 percent of total payments) were families whose income was less than \$15,000.<sup>15</sup>

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<sup>13</sup> Under LIHEAP, states are directed to provide the highest level of assistance to households with the highest energy bills, relative to their income, thus, households with higher energy bills tend to receive higher payments; see 42 U.S.C. 8624(b)(5).

<sup>14</sup> See <http://www.irs.gov/Individuals/EITC-Income-Limits,-Maximum-Credit--Amounts-and-Tax-Law-Updates>.

<sup>15</sup> See [http://www.irs.gov/uac/SOI-Tax-Stats---Individual-Income-Tax>Returns-Publication-1304-%28Complete-Report%29#\\_sec1](http://www.irs.gov/uac/SOI-Tax-Stats---Individual-Income-Tax>Returns-Publication-1304-%28Complete-Report%29#_sec1).

Increasing the EITC payments would be straightforward for the IRS to administer. If the increase was proportional to the existing credit, most of the benefits would go to low-income families with children and very few to childless workers. Increasing the EITC would not provide any benefits to households without earnings, however.

An expansion of the EITC could also yield economic benefits. For example, studies have found that increases in the EITC have had a positive effect on the participation of low-income single women in the labor force—because individuals need earnings to qualify for payments, the EITC encourages individuals to enter the workforce.<sup>16</sup> Although increasing the EITC would raise marginal tax rates for some workers, there appears to be little adverse effect on the number of hours worked by people who are already working.

## **Revenue Needed to Keep Low-Income Households Whole**

Based on earlier CBO work, fully offsetting the additional cost that a carbon tax would impose on households in the lowest income quintile would take roughly 12 percent of the gross revenue collected by a carbon tax. Offsetting the cost for the second quintile would take an additional 15 percent of gross revenue.<sup>17</sup> Those calculations do not account for the extent to which a carbon tax might increase the federal government's own costs (for example, because of the increase in transfer payments and because of the federal government's own higher energy costs if the burden of the tax is passed forward to consumers in the form of higher prices) or might decrease other tax collections (for example, because of lower wages and profits if the burden of the tax is passed backward on the factors of production). Accounting for those effects would mean that the net increase in tax revenue available as a result of the carbon tax would be less than gross tax receipts; thus, the shares of net additional revenue required to protect households in the lowest two quintiles would somewhat higher than the percentages described above.

## **Conclusions**

Choosing among options for offsetting costs that low-income households might incur under a carbon tax would involve a trade-off between various criteria. For example, some options that specifically target low-income households, such as providing a supplement for all households eligible for SNAP payments, would not increase households' incentive to work and invest, but would direct relief at the most vulnerable households. In contrast, a proportional reduction in personal income tax rates would provide such an incentive but would direct larger benefits toward higher-income households (see Table 4).

Policies can be designed to achieve a mixture of outcomes. For example, lowering payroll tax rates on a portion of earnings or reducing the rate at which the EITC phases out would target more relief to lower-

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<sup>16</sup> See Meyer (2007) and Eissa and Hoynes (2006).

<sup>17</sup> Those calculations are based on CBO's analysis of the cost that low-income households would incur under the cap-and-trade program that would have been established under H.R. 2454. The gross cost borne by all households—based on the \$28 price on emissions that CBO estimated for 2020, but measured in the context of the 2010 economy—totaled \$109.6 billion. The market value of allowances and the value of domestic and international offsets represent the gross revenue that would be collected under an equivalent tax and totaled \$104.7 billion. Households in the lowest and second-lowest income quintiles incurred 11 percent and 14 percent of the total gross cost, respectively, accounting for 12 percent and 15 percent of the gross revenue. See Congressional Budget Office (2009).

**Table 4.**  
**Evaluation of Policy Options with Respect to Three Criteria**

	Targeting		Larger Proportional Benefits to Lower-Income Households?	Administration	Economic Efficiency		
	Percent of Households Covered <sup>a</sup>			Requires Significant Increase in Administrative Costs?	Increase Incentives to Work?	Increase Incentives to Invest?	Preserve Incentives to Reduce Emissions?
	Lowest Quintile	Second Quintile					
Broad Based Measures							
Income tax rate reduction	30	64	No	No	Yes	Yes	Yes
Income tax rebate	74	80	Yes	Yes, if fully refundable	No	No	Yes
Payroll tax rebate	54 <sup>b</sup>	82 <sup>b</sup>	Yes	No <sup>c</sup>	Small increase	No	Yes
Energy saving investment tax credit	n.a.	n.a.	No	No	No	No	Yes
Targeted Measures							
Fixed payments for SNAP-eligible households	18	5	Yes	No	No	No	Yes
LIHEAP	7	2	Yes	No, if current recipients <sup>d</sup>	No	No	No
Expand EITC	27	30	Yes	No	Small increase	No	Yes

Source: Congressional Budget Office.

Notes: n.a. = not available; LIHEAP = Low Income Household Energy Assistance Program; EITC = Earned Income Tax Credit.

- Indicates the percentage of households receiving income or benefits in 2006 from the program that the policy option would use for delivering compensation.
- Indicates share of households with earnings that would make them eligible for the payroll tax rebate.
- Administering a payroll tax credit could be straightforward, but preventing individuals with more than one job from receiving multiple rebates would raise complications.
- Providing additional payments to all households that are eligible for LIHEAP could entail a significant increase in administrative costs because only 16 percent of eligible households receive benefits.

income families than would a reduction in corporate tax rates, while offsetting some of the adverse economic effects of the program.

An important consideration in using revenues to provide assistance to households is the amount of new administrative or compliance costs. Using existing transfer programs or providing rebates through the income tax system would avoid creating new institutional structures for administering payments. Existing systems that already collect information on household income also are well suited to targeting assistance based on need. However, no single existing system would reach all households. Not everyone—especially



members of low-income households and retirees—pays payroll taxes or files an income tax return. But people would need to file a return to participate in a rebate program based on the income tax system.

In theory, delivering rebates through a combination of the existing tax system and the existing transfer programs would better reach affected households than would relying on either approach by itself and would not require a new program. For example, data from the Current Population Survey indicate that about 95 percent of households would qualify for a payroll tax rebate (assuming that it was provided to individuals with earnings) or for an automatic cost-of-living increase in Social Security benefits, including 85 percent to 90 percent of households in the lowest income quintile. It is not easy, however, to coordinate rebates with existing programs to avoid overlap and to ensure that economically equivalent households receive roughly the same benefit.

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