June 19, 2009

Honorable Dave Camp
Ranking Member
Committee on Ways and Means
U.S. House of Representatives
Washington, DC 20515

Dear Congressman:

At the request of your staff, the Congressional Budget Office (CBO) has analyzed the potential effects on households of the cap-and-trade program that would be implemented pursuant to H.R. 2454, the American Clean Energy and Security Act of 2009, as reported by the House Committee on Energy and Commerce on May 21.

The attached report summarizes the results of that analysis, indicating both the net overall cost per household nationwide and the net costs or benefits that would be realized by households in various income quintiles. CBO has estimated those amounts for the bill as it would be implemented in 2020 (but shown in 2010 dollars). This analysis does not address other provisions of the bill, nor does it encompass the potential benefits associated with any changes in the climate that would be avoided as a result of the legislation.

I hope this information is helpful to you. The CBO staff contacts are Frank Sammartino and Terry Dinan.

Sincerely,

Douglas W. Elmendorf

Douglas W. Elmendorf

Attachment

cc: Honorable Charles B. Rangel
       Chairman

       Honorable Henry A. Waxman
       Chairman
       Committee on Energy and Commerce

       Honorable Joe Barton
       Ranking Member

Congressional Budget Office

The Estimated Costs to Households From the
Cap-and-Trade Provisions of H.R. 2454

June 19, 2009

Global climate change is one of the nation's most significant long-term policy challenges: Reducing emissions of greenhouse gases (GHGs) would moderate the damage associated with climate change and, especially, the risk of significant damage, but doing so would also impose costs on the economy. In the case of carbon dioxide (CO_2)—which accounts for 85 percent of U.S. GHG emissions— higher costs would stem from the fact that most economic activity is based on fossil fuels, which contain carbon and, when burned, release it in the form of that gas.

H.R. 2454, the American Clean Energy and Security Act of 2009, as reported by the House Committee on Energy and Commerce on May 21, 2009, would create a cap-and-trade program for GHG emissions, an incentive-based approach for regulating the quantity of emissions. (The bill would also make a number of other significant changes in climate and energy policy.) The legislation would set a limit (the cap) on total emissions over the 2012–2050 period and would require regulated entities to hold rights, or allowances, to emit greenhouse gases. After allowances were initially distributed, entities would be free to buy and sell them (the trade part of the program).

This analysis examines the average cost per household that would result from implementing the GHG cap-and-trade program under H.R. 2454, as well as how that cost would be spread among households with different levels of income.[1] The analysis does not include the effects of other aspects of the bill, such as federal efforts to speed the development of new technologies and to increase energy efficiency by specifying standards or subsidizing energy-saving investments.

Reducing emissions to the level required by the cap would be accomplished mainly by stemming demand for carbon-based energy by increasing its price. Those higher prices, in turn, would reduce households' purchasing power. At the same time, the distribution of emission allowances would improve households' financial situation. The net financial impact of the program on households in different income brackets would depend in large part on how many allowances

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[1] For information about the projected budgetary impact of the bill, see Congressional Budget Office, cost estimate for H.R. 2454, the American Clean Energy and Security Act of 2009 (June 5, 2009).

were sold (versus given away), how the free allowances were allocated, and how any proceeds from selling allowances were used. That net impact would reflect both the added costs that households experienced because of higher prices and the share of the allowance value that they received in the form of benefit payments, rebates, tax decreases or credits, wages, and returns on their investments.

The incidence of the gains and losses associated with the cap-and-trade program in H.R. 2454 would vary from year to year because the distribution of the allowance value would change over the life of the program. In the initial years of the program, the bulk of allowances would be distributed at no cost to various entities that would be affected by the constraint on emissions. Most of those free allocations would be phased out over time, and by 2035, roughly 70 percent of the allowances would be sold by the federal government, with a large share of revenues returned to households on a per capita basis. This analysis focuses on the effect of the legislation in the year 2020, a point at which the cap would have been in effect for eight years (giving the economy time to adjust) and at which the allocation of allowances would be representative of the situation prior to the phase-down of free allowances. The incidence of gains and losses would be considerably different once the free allocation of allowances had mostly ended. Although the analysis examines the effects of the bill as it would apply in 2020, those effects are described in the context of the current economy—that is, the costs that would result if the policies set for 2020 were in effect in 2010.

On that basis, the Congressional Budget Office (CBO) estimates that the net annual economywide cost of the cap-and-trade program in 2020 would be $22 billion—or about $175 per household. That figure includes the cost of restructuring the production and use of energy and of payments made to foreign entities under the program, but it does not include the economic benefits and other benefits of the reduction in GHG emissions and the associated slowing of climate change. CBO could not determine the incidence of certain pieces (including both costs and benefits) that represent, on net, about 8 percent of the total. For the remaining portion of the net cost, households in the lowest income quintile would see an average *net benefit* of about $40 in 2020, while households in the highest income quintile would see a *net cost* of $245. Added costs for households in the second lowest quintile would be about $40 that year; in the middle quintile, about $235; and in the fourth quintile, about $340. Overall net costs would average 0.2 percent of households' after-tax income.

How the GHG Cap-and-Trade Program Established Under H.R. 2454 Would Work

H.R. 2454 would establish two cap-and-trade programs, one for six GHGs (mostly CO_2) and one for a seventh GHG, hydrofluorocarbons (HFCs). The first program, the focus of this analysis, is generally referred to as the GHG cap-and-trade program.

H.R. 2454 would set limits on GHG emissions for each year. Regulated entities could comply with the policy in some combination of three ways:

■ By reducing their emissions,

■ By holding an allowance for each ton of GHGs that they emitted, or

■ By acquiring an "offset credit" for their emissions.

Offset credits would be generated by firms that were not covered by the cap but that reduced their emissions or took actions to store emissions in trees and soil, using methods that would be approved by the Environmental Protection Agency. The bill would allow firms to use a significant quantity of offset credits—generated in the United States and overseas, with a maximum quantity for each specified in the legislation—toward compliance with the cap. Most of those offset credits would be generated by changes in agricultural and forestry practices. To the extent that acquiring offset credits was cheaper than undertaking more emission reductions, allowing firms to comply with offset credits would lower compliance costs overall.

CBO estimates that the price of an allowance, which would permit one ton of GHG emissions measured in CO_2 equivalents, in 2020 would be \$28.[2] H.R. 2454 would require the federal government to sell a portion of the allowances and distribute the remainder to specified entities at no cost. The portions of allowances that were sold and distributed for free would vary from year to year. This analysis focuses on the year 2020, when 17 percent of the allowances would be sold by the government and the remaining 83 percent would be given away. Entities that received allowances could sell them or use them to meet their compliance obligations.

Estimated Costs per Household

The GHG cap-and-trade program established under H.R. 2454 would impose costs on U.S. households and provide some financial benefits, as well as the benefits associated with any changes in the climate that would be avoided as a result of the legislation. (This analysis addresses only those financial benefits.) The costs would be incurred through higher prices for the goods and services that households consumed, and the incidence of those costs would be determined primarily by households' consumption patterns. In the aggregate, most of those costs would be offset by income or other benefits provided to households as a result of the distribution of the value of the emission allowances. The legislation

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[2] That price accounts for the effects of banking emission allowances as well as the ability of firms to comply with the cap by purchasing domestic and international offset credits. For more detail on how CBO estimated allowance prices, see the agency's cost estimate for H.R. 2454.

would influence how much of that value was conveyed to various households by specifying how to allocate the allowances. For example, H.R. 2454 would direct some of that value to low-income households by specifying that 15 percent of the allowance value be used to provide energy rebates and tax credits for such households.

Gross Compliance Costs
Gross compliance costs would consist of the cost of emission allowances, the cost of both domestic and international offset credits, and the resource costs incurred in order to reduce the use of fossil fuels:

■ *The cost of the allowances.* The cost of acquiring allowances would become a cost of doing business. In most cases, the firms required to hold the allowances would not bear that cost; rather, they would pass it onto their customers in the form of higher prices.

■ *The cost of both domestic and international offset credits.* Like the cost for allowances, the cost of acquiring offset credits would be passed on by firms to their customers in the form of higher prices.

■ *The resource costs associated with reducing emissions.* The resource costs would include the value of the additional resources (including nonmonetized resources, such as time) required to reduce emissions—for example, by generating electricity from natural gas rather than from coal, by making improvements in energy efficiency, or by changing behavior to save energy (by carpooling, for example).[3]

According to CBO's estimates, the gross cost of complying with the GHG cap-and-trade program delineated in H.R. 2454 would be about \$110 billion in 2020 (measured in terms of 2010 levels of consumption and income), or about \$890 per household (see Table 1). Of that gross cost, 96 percent would be the cost of acquiring allowances or offset credits. The reminder would be the resource costs associated with reducing emissions.

As noted, firms would generally pass the cost of reducing their emissions—or of acquiring offset credits or emission allowances—on to their customers, and their customers' customers. (Indeed, assuming that higher costs are passed into prices is customary in distributional analyses.) Households and governments would bear those costs through their consumption of goods and services. Because households account for the bulk of spending, they would bear most of the costs. The federal

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[3] The resource cost does not indicate the potential decrease in gross domestic product (GDP) that could result from the cap. The reduction in GDP would also include indirect general equilibrium effects, such as changes in the labor supply resulting from reductions in real wages and potential reductions in the productivity of capital and labor.

government and state and local governments would bear the remainder (an estimated 13 percent) through their spending on goods and services.

The distribution of the gross cost of complying with the policy would be quite different if the price level did not increase as a result of the cap—if, for example, the Federal Reserve adjusted monetary policy to prevent such an increase. In that case, the compliance costs would fall on workers and investors in the form of lower wages and profits. Under that alternative assumption, the gross cost of the program would fall more heavily on high-income households than is indicated in this analysis because the distribution of wages and profits is more tilted toward higher-income households than is the distribution of expenditures.

The Disposition of Allowance Value
Although households and governments would pay for the cost of the allowances—generally in the form of higher prices—those allowances would have value and would be a source of income. The ultimate effects of the cap-and-trade program on U.S. households would depend crucially on policymakers' decisions about how to allocate that value. Under H.R. 2454, allowances would be allocated among businesses, households, and governments, and the value of most of those allowances would ultimately be conveyed to households in various ways.

Under H.R. 2454, about 30 percent of the allowance value—$28 billion—would be allocated in a fairly direct manner to U.S. households to compensate them for their increased expenditures. That relief to households would include the 15 percent of the allowance value set aside for a low-income energy rebate and a tax credit for households receiving benefits through the Supplemental Nutrition Assistance Program or through the Medicare Part D low-income subsidy, and for households not participating in those programs but with income below certain thresholds. It would also include about $14 billion in allowances given to companies that distribute electricity and natural gas, with instructions to pass those benefits on to residential customers.

Roughly 50 percent of the allowance value—$47 billion—would be directed to U.S. businesses to offset their increased costs. That amount includes about $14 billion provided to what are termed emission-intensive trade-exposed industries (which would be less able to pass their compliance costs on to their customers than would other industries facing less international competition) and oil refiners. It also includes $27 billion worth of allowances that would be given to local distributers of electricity and natural gas, with instructions to pass those savings on to commercial and industrial customers (as distinct from the amount passed on to residential customers noted in the previous paragraph). The value of the allowances received by businesses would ultimately accrue to households in the form of increased returns on their investments.[4]

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[4] The cost of obtaining allowances would be passed into prices in most cases because that cost would raise firms' variable production costs (that is, the costs to produce additional units of

About 10 percent of the allowance value would be allocated to the federal government and to state governments to spend within the United States (not accounting for the amount used to fund the energy rebate and tax credit). For example, the bill would direct a portion of the allowance value to be spent encouraging the development of particular technologies (such as electricity generation that includes carbon capture and storage) and improvements in energy efficiency. The value of those allowances allocated to governments would ultimately be passed on to households in the form of higher wages, increased returns on their investments, or lower energy costs.

Finally, H.R. 2454 would direct the federal government to spend 7 percent of the allowance value overseas, funding efforts to prevent deforestation in developing countries, to encourage the adoption of more efficient technologies, and to assist developing countries in adapting to climate change. The value the allowances spent overseas would impose a net cost on U.S. households: They would bear the cost of the allowances but would not receive the value (apart from the benefits of slowing climate change). In contrast, the other allowance allocations would not impose a net cost on U.S. households taken as a whole: Households would bear costs but ultimately would receive equivalent benefits.

Additional Benefits and Costs
Some additional transfers of income and additional costs would result from the GHG cap-and-trade program under H.R. 2454 but are not reflected in the gross compliance costs and the disposition of the allowance value discussed above. Those additional transfers would total about $14 billion, but they would also add close to $12 billion to the government's costs, which ultimately would be borne by households through higher taxes or reduced government spending. They would include the following:

■ *The value of the rebates and tax credits for low-income households that exceeded the 15 percent of the allowance value that the bill would set aside to pay for them.* The cost of the rebates and credits would exceed that allowance value by $2.8 billion, CBO and the Joint Committee on Taxation (JCT) estimate. That amount would add to the sums received by households but would also increase the cost to the government.

■ *Increases in government benefit payments that are pegged to the consumer price index, such as Social Security benefits.* Under the assumption that the

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output). In contrast, the receipt of allowances that is not linked to the quantity of output would represent a reduction in firms' fixed production costs. Businesses generally do not change prices in response to changes in fixed costs as they do in response to changes in variable costs. Therefore, the value of the allowances received would generally accrue to shareholders (or perhaps workers in some cases).

costs of compliance are passed through to consumers in higher prices and that the Federal Reserve does not take action to offset those price increases, the rise in the consumer price index would trigger increased cost-of-living benefits in indexed programs.[5] The increase in those transfer payments would help offset the increased expenditures for the households that received them. At the same time, increasing those payments would impose a cost on the federal government.

■ *Reduced federal income taxes.* Because the federal income tax system is largely indexed to the consumer price index, an increase in consumer prices with no increase in nominal incomes would also reduce federal income taxes. That effect would increase households' after-tax income but would also add to the federal deficit. In combination, the effect of price changes on the government's indexed benefit payments and income tax receipts would convey an estimated $8.7 billion to households.

■ *The net income received by providers of domestic offset credits.* Covered entities would spend an estimated $5.5 billion purchasing domestic offset credits to comply with the cap. Suppliers of offset credits would receive that amount in gross income but would incur costs to generate them. The additional net income of suppliers of domestic offset credits would be an estimated $2.7 billion.

Net Economywide Cost
Taking into the account the gross cost associated with complying with the cap ($110 billion); the allowance value that would flow back to U.S. households ($85 billion), both in the form of direct relief and indirectly through allocations to businesses and governments (all of which would eventually benefit households in people's various roles as consumers, workers, shareholders, and taxpayers); and the additional transfers and costs discussed above (providing net benefits of $2.7 billion), the net economywide cost of the GHG cap-and-trade program would be about $22 billion—or about $175 per household. Four factors account for that net cost:

■ The purchase of international offset credits (about $8 billion),

■ The cost of producing domestic offset credits (about $3 billion),

■ The resource costs associated with reducing emissions (about $5 billion), and

■ The allowance value that would be directed overseas (about $6 billion).

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[5] CBO estimates that, if the relative price increases triggered by the cap-and-trade program were passed through to customers and not offset by actions by the Federal Reserve, the price level would be 0.7 percent higher in 2020 than it would otherwise be.

Each of those components represents costs that would be incurred by U.S. households as a result of the cap-and-trade program but would not be offset by income resulting from the value of the allowances or from additional payments (such as increases in Social Security benefits) that would be triggered by the program.

Transitional Costs
The measure of costs described above reflects the costs that would occur once the economy had adjusted to the change in the relative prices of goods and services. It does not include the costs that some current investors and workers in sectors of the economy that produce energy and energy-intensive goods and services would incur as the economy moved away from the use of fossil fuels. To be sure, increased production of energy from non-fossil-fuel sources (such as wind or solar) and a shift to more energy-efficient production processes would create jobs and profit opportunities as well. However, those jobs might be in different regions of the country or require different skills than the jobs being lost, and the profit opportunities might arise from different types of capital; their availability would mute but not eliminate the costs of the transition. Thus, investors would see the value of some stocks decline, and workers would face higher risk of unemployment as jobs in some sectors were eliminated. Stock losses would tend to be widely dispersed among investors because shareholders typically diversify their portfolios. In contrast, the costs of unemployment would probably be concentrated among relatively few households and, by extension, their communities. The magnitude of those transitional costs would depend on the pace of emission reductions, with more rapid reductions leading to larger costs.

The magnitude of transitional costs would also be affected by international trade, especially for goods or services that embody large amounts of GHG emissions. The cost of producing such goods in the United States would rise under the cap-and-trade program, thereby disadvantaging producers of those goods relative to foreign competitors that did not face a similarly stringent program for reducing emissions. Although large segments of the U.S. economy either do not face significant foreign competition (for example, the electricity and transportation sectors) or involve trade with countries that have a cap-and-trade program (the European Union, for example), some important manufacturing industries, such as steel, face competition from countries that do not face the costs of such a system.

At the same time, as already noted, the prices of stocks in industries that would be expanding under a cap-and-trade program—such as renewable energy—could rise, as would job openings in those industries. CBO expects total employment to be only modestly affected by a cap-and-trade program to reduce GHG emissions. Except during cyclical downturns such as the current recession, most individuals who seek employment are able to find jobs, and a cap-and-trade program would not greatly diminish that ability. Some regions and industries would experience substantially higher rates of unemployment and job turnover as the program

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became increasingly stringent. That transition could be particularly difficult for individuals employed in those industries (such as the coal industry) or living in those regions (such as Appalachia). However, any aggregate change in unemployment would be small compared with the normal rate of job turnover in the economy.

Distribution of Costs Across Households in Different Income Brackets

Estimates of the average net cost to households under H.R. 2454 do not reveal the wide range of effects that the cap-and-trade program would have on households in different income brackets, different sectors of the economy, and different regions of the country. In order to provide greater insight into some of those variations, CBO estimated the effect of the GHG cap-and-trade program on the average household in each fifth (quintile) of the population arrayed by income.[6]

Net Costs and Benefits

Taking account of households' share of the gross compliance cost and resource costs and the relief that would flow to households either through direct rebates and transfers or indirectly through the allocation of allowances, CBO estimates that households in the lowest income quintile would see an average *net benefit* of about $40, while households in the highest income quintile would see a *net cost* of approximately $245 (see Table 2). Households in the second lowest quintile would see added costs of about $40 on average, those in the middle quintile would see an increase in costs of about $235, and those in the fourth quintile would pay about an additional $340 per year. Overall, costs for households would average 0.2 percent of their average after-tax income.

Data and Methodology

The database for the analysis was constructed by statistically matching income information from the Statistics of Income data from the Internal Revenue Service, households' characteristics from the Current Population Survey reported by the Bureau of the Census, and data on households' expenditures from the Consumer Expenditure Survey by the Bureau of Labor Statistics. The data are from 2006, the latest year for which information from all three sources was available, and thus reflect the patterns of income and consumption in that year. The data were adjusted to 2010 levels by the estimated overall growth in population and income.

The estimated price increases for specific goods and services come from a model of the U.S. economy that relates final prices of goods to the costs of production

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[6] CBO ranks households on the basis of household income adjusted for differences in household size. Each quintile contains an equal number of people.

inputs. Gross costs have been distributed to households on the basis of their consumption of those goods and services.[7]

CBO allocated households to quintiles on the basis of a comprehensive measure of household income that accounts for cash and noncash income and adjusts for household size. After-tax household income reflects the impact of federal income, payroll, and excise taxes.

As discussed below, for this analysis, CBO did not allocate to households in various income categories $7.2 billion of net costs incurred by federal, state, and local governments and $5.5 billion of the value of allowances allocated to businesses because there is no clear basis for identifying which households would either bear those costs or benefit from the value of those allowances. With those items excluded, the gross cost would come to approximately $770 per household, compared with the total gross cost of $890 per household (as reported in Table 1); the net cost used in this distributional analysis would come to $165 per household, compared with the overall net cost of $175 (as reported in Table 1).

The Distribution of Gross Compliance Costs
The largest part of the gross cost of the program would stem from holding allowances and purchasing offsets. Those costs would become a cost of additional production for firms subject to the cap on emissions, which they would generally pass on to their customers in the form of higher prices. The prices of goods and services throughout the economy would rise on the basis of the CO_2 emissions associated with their production and consumption. Goods and services resulting in greater emissions would have larger price increases; for example, the price of electricity would increase more than the price of food.

Another portion of the gross cost is the resource costs of implementing the legislation. Those resource costs would include expenditures that firms and households made to reduce their emissions (for example, by generating electricity from natural gas rather than from coal or by installing insulation) as well as inconvenience costs (from driving less, for instance). CBO reports all of those costs in dollar values and has assumed that households would bear those costs in proportion to their consumption of goods and services that result in CO_2 emissions. Thus, households that consumed relatively large shares of fossil-fuel-intensive goods and services prior to the policy would bear the cost of either reducing those emissions or purchasing allowances and offset credits. The

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[7] For the purposes of this analysis, CBO allocated the cost of reducing all of the gases covered in the GHG cap-and-trade program across households and governments on the basis of their contributions to carbon dioxide emissions, which constitute more than 85 percent of those gases.

average resource cost accounts for only about $35 of the average gross cost increase of $770 per household.[8]

The gross cost would be largest in absolute terms for the average household in the highest income quintile. High-income households consume more goods and services than do lower-income households; consequently, they would experience a greater increase in expenditures as those prices rose as a result of the cap on emissions. In total, households in the highest income quintile would bear an estimated 36 percent of the gross cost associated with the cap, and their annual expenditures would increase by about $1,380, on average. In contrast, expenditures would increase by an estimated $425 for households in the bottom quintile, without any offsetting cost decreases or income transfers taken into account.

Although the increase in out-of-pocket expenditures because of the higher prices would be substantially larger for high-income households than for low-income households, they would impose a larger burden—measured as a share of income—on low-income households. That increased cost would account for 2.5 percent of after-tax income for the average household in the lowest income quintile, compared with 0.7 percent of after-tax income for the average household in the highest quintile. That difference occurs for two reasons: Lower-income households consume a larger fraction of their income, and energy-intensive goods and services make up a larger share of lower-income households' expenditures.

The Distribution of Direct Relief to Households
About 31 percent of the allowance value would be allocated in a fairly direct manner to U. S. households to compensate them for their increased expenditures (see Table 1). Some of that relief is expected to be allocated across most households in the form of a rebate on their bills for heating and cooling their homes. Other relief would be directed at low-income households in the form of an energy rebate or a tax credit. By CBO's estimates, 25 percent of the direct relief to households would go to households in the lowest income quintile and 50 percent to households in the two lowest quintiles combined. On average, the amount of direct relief would offset 94 percent of the additional expenses that households in the lowest quintile incurred. In contrast, the direct relief received by households in the highest quintile would offset only 18 percent of their added costs.

The Distribution of Allowance Value to Households via Businesses
H.R. 2454 would direct about 51 percent of the allowance value to businesses. In addition, net income would accrue to producers of domestic offsets. CBO

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[8] That $35 figure is the household portion of the $40 average resource cost for the economy as a whole, shown in Table 1. The remaining $5 is the government portion of the resource cost (discussed later).

assumes that transfers to businesses (either in the form of allowances or cash) would lead to higher profits.[9] That result would be likely to occur in cases in which the transfers reduced the fixed costs associated with producing a good or providing a service. In general, businesses change prices in response to changes in their variable production costs (costs that increase in proportion to the quantity of goods or services provided) but not in response to changes in their fixed costs. That assumption was also used by CBO and JCT in estimating of the amount of the energy rebate and tax credit that would be provided to low-income households.[10] Increased profits, net of taxes, were allocated to households according to their holdings of equities, which were estimated from the Federal Reserve's Survey of Consumer Finances. Those holdings include equity held through mutual funds and private pension accounts.

CBO estimates that about 63 percent of the allowance value conveyed to businesses would ultimately flow to households in the highest income quintile.[11] On average, that relief would offset $885 of the additional expenses of those households resulting from the higher prices. In contrast, households in the lowest income quintile would receive only an estimated 5 percent of the relief targeted to businesses—an average of $65 per household.

The Costs and Allowance Value Not Included in CBO's Distributional Analysis
In total, federal, state and local governments account for roughly 14 percent of CO_2 emissions through the goods and services that they purchase. As a result, governments would incur roughly 14 percent of the gross compliance costs (the costs of purchasing allowances and offsets and of reducing emissions), amounting to about $15 billion. The federal government would also incur additional costs of about $12 billion to pay for the rebate for low-income households and the energy tax credit in excess of the allowance value allocated for those benefits, and to

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[9]Trade-exposed industries might not be able to increase their prices to reflect the higher costs that they would face as a result of the cap. As a result, the cost of the cap might fall on workers and shareholders in those industries rather than on their customers. Correspondingly, the relief aimed at those industries (which would be linked to their level of production) would tend to offset costs that workers and shareholders in those industries would otherwise incur. CBO assumed for this analysis that the cost of complying with the cap would lead to price increases for those industries. Correspondingly, CBO reflected the value of allowances allocated to those industries as offsetting price decreases.

[10] CBO assumed that allowances that were given to local distributers of electricity and natural gas would be passed on to commercial and industrial customers as a fixed rebate on their bill. As a result, that rebate would be retained as profits by the businesses that received them. An alternative assumption would alter the distributional results, in part, by altering the estimated size of the energy rebate and tax credit that low-income households received.

[11] Under an alternative assumption that transfers to businesses result in lower prices, a larger share of the benefits would flow to households in other income quintiles.

account for the costs of higher benefits and lower taxes because of increases in the consumer price index. The incidence of these costs would depend on the manner in which governments chose to cover them. For example, if governments chose to increase taxes, the cost would fall on households on the basis of their share of federal, state, and local taxes. In contrast, if governments chose to cover the additional expenses by cutting back on the services that they provide, the cost would fall on households that no longer received those services. As a result of the uncertainty about the incidence of governments' gross compliance costs and certain other costs, CBO did not distribute those costs across households.

On the other side of the ledger are a nearly equivalent amount of allowances and other benefits that were not allocated to households in this analysis. Those include about 11 percent of the allowance value that is directed to be spent by federal and state governments in a manner that does not have a clear incidence. For example, $5 billion would be given to state governments to fund increases in energy efficiency and the use of renewable energy. The federal government would also receive additional taxes from the allowances allocated to businesses and the income received by producers of domestic offsets. Because there is no clear basis for estimating how that value would ultimately be distributed across households in different income quintiles, CBO did not allocate those additional government receipts for this analysis. CBO also did not allocate the estimated $5.5 billion of the allowance value provided to businesses through subsidies for capturing and storing CO_2 emissions from electricity generation and developing advanced auto technologies because of similar uncertainty about the incidence of those benefits across households.

Altogether, CBO did not distribute across household income quintiles costs and benefits with a net contribution of $1.7 billion of the total $22 billion net economywide cost of the cap-and-trade program (as reported in Table 1). The undistributed costs and benefits account for about $10 of the total per-household net cost of $175 (as reported in Table 1).

While the net cost that CBO did not distribute was relatively small, the distributional effects of the omitted costs and benefits could be significant. For example, if most of the omitted costs were to fall on lower-income households while most of the omitted benefits were to fall on higher-income households, the distributional outcomes could be significantly different than those reported in Table 2.

Table 1. Total Cost and Average Cost of the Greenhouse-Gas Cap-and-Trade Program in H.R. 2454

`	Total Cost (Billions of dollars)	Share of Allowance Value (Percent)	Average Cost per Household (Dollars)
Gross Costs of Complying with the Cap			
Cost of Allowances and Offsets			
Market Value of Allowances	91.4	100.0	740
Domestic and International Offsets	13.3	n.a.	110
Resource Costs	4.9	n.a.	40
Total Gross Cost	109.6	n.a.	890
Disposition of Allowance Value to Domestic Entities			
Allocation of Allowances to Households			
Low-income rebate and tax credit	-13.7	15.0	-110
LDC residential customers	-14.5	15.8	-115
Allocation of Allowances to Businesses			
Trade-exposed industries	-14.1	15.4	-115
LDC nonresidential customers	-27.1	29.7	-220
Other	-5.5	6.0	-45
Allocation of Allowances to Government			
Deficit reduction	-1.0	1.1	-10
Energy efficiency and clean energy technology	-6.9	7.5	-55
Other public purposes	-2.3	2.5	-20
Total	-85.0	93.0	-690
Other Transfers			
Low-Income Rebate and Tax Credit Not Covered by Allowance Allocation	-2.8	n.a.	-25
Automatic Indexing of Taxes and Transfers	-8.7	n.a.	-70
Net Income to Providers of Domestic Offsets	-2.7	n.a.	-20
Total	-14.3	n.a.	-115
Additional Government Costs			
Low-Income Rebate and Tax Credit Not Covered by Allowance Allocation	2.8	n.a.	25
Automatic Indexing of Taxes and Transfers	8.7	n.a.	70
Total	11.6	n.a.	95
Net Economywide Cost	21.9		175
Memorandum: Source of Net Economywide Cost			
International offsets	7.8	n.a.	65
Production cost of domestic offsets	2.7	n.a.	20
Resource costs	4.9	n.a.	40
Allowance value going overseas	6.4	7.0	50
Total	21.9	n.a.	175

Source: Congressional Budget Office.

Notes: n.a. = not applicable; LDC = local distribution companies.
The figures in the table show the effects of the program in 2020 applied to levels of income in 2010.

Table 2. Distribution of the Costs and Financial Benefits of the Greenhouse-Gas Cap-and-Trade Program in H.R. 2454 Among Households, by Level of Income

	Gross Costs	Direct Relief to Households	Allocation to Businesses and Net Income to Domestic Offset Producers[a]	Net Cost
Average Dollar Cost per Household				
Lowest Quintile	425	-400	-65	-40
Second Quintile	555	-420	-90	40
Middle Quintile	675	-300	-140	235
Fourth Quintile	815	-245	-230	340
Highest Quintile	1,380	-250	-885	245
All Households	770	-320	-285	165
Cost as a Percentage of After-Tax Income				
Lowest Quintile	2.5	-2.3	-0.4	-0.2
Second Quintile	1.5	-1.1	-0.2	0.1
Middle Quintile	1.2	-0.6	-0.3	0.4
Fourth Quintile	1.1	-0.3	-0.3	0.4
Highest Quintile	0.7	-0.1	-0.5	0.1
All Households	1.0	-0.4	-0.4	0.2
Percentage Shares of Costs and Value				
Lowest Quintile	11	25	5	-5
Second Quintile	14	25	6	5
Middle Quintile	17	19	10	28
Fourth Quintile	21	15	16	41
Highest Quintile	36	16	63	31
All Households	100	100	100	100

Source: Congressional Budget Office.

Notes: The figures are 2010 levels based on 2006 distribution of income and expenditures.
Households are ranked by adjusted household income. Each quintile contains an equal number of people.
Households with negative income are excluded from the bottom quintile but included in the total.

a. Includes allowance allocations for nonresidential customers of local distribution companies and trade-exposed industries.