July 9, 2009

Honorable James M. Inhofe
Ranking Member
Committee on Environment and Public Works
United States Senate
Washington, DC 20510

Dear Senator:

I am writing in response to your request for information about the costs that would be imposed on households in different regions of the country by H.R. 2454, the American Clean Energy and Security Act of 2009.

As you know, the Congressional Budget Office (CBO) recently analyzed the effects that the cap-and-trade program for greenhouse-gas (GHG) emissions specified by H.R. 2454 (as reported by the House Committee on Energy and Commerce) would have on households at various income levels.[1] That bill would set a limit on total emissions for each year and would require regulated entities to hold rights, or allowances, to emit greenhouse gases. CBO's analysis accounts for the effects on households in different income groups of both the increases in prices of goods and services that would result from the cap-and-trade program (the gross cost of the program) and the distribution of the value of emission allowances (which, in the aggregate, would offset most of the gross cost). The price increases would be a direct effect of the cap-and-trade program: Combustion of fossil fuels releases carbon dioxide (CO_2), which accounts for over 80 percent of all GHG emissions in the United States. By increasing the prices of fossil fuels in proportion to their CO_2 emissions, a cap-and-trade program would increase the prices of goods and services in proportion to the CO_2 emissions associated with their production and consumption.

But those increases in prices would not be the only effect on households because, under H.R. 2454, much of the value of the allowances would be distributed among households, either directly or indirectly. For example, in the initial years of the cap-and-trade program, roughly 35 percent of the allowance value would be directed to

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1. Congressional Budget Office, "The Estimated Costs to Households From the Cap-and-Trade Provisions of H.R. 2454," letter to the Honorable Dave Camp (June 19, 2009).

residential, commercial, and industrial consumers of electricity. In total, about 80 percent of the gross cost of the program would be offset by the distribution of allowances; however, because the gross cost and the allowance value would not flow in the same proportions to each household, the program would tend to impose higher costs on some households than on others.

To facilitate a comparison with households' current income, CBO analyzed the cap-and-trade program under H.R. 2454 as it would be implemented in 2020 but scaled those costs to the size of the current economy.[2] Using that approach, CBO estimated that the gross annual cost per household would be $890 and the net annual cost (accounting for both the gross cost and the distribution of allowance value) would be $175.[3] The net annual cost per household would range from a $40 gain in income for households in the lowest one-fifth of the income distribution to a $340 loss for households in the second highest quintile.[4] As CBO stated in its analysis, those figures reflect costs associated with producing and consuming goods in a manner that results in lower GHG emissions, but they do not include the transition costs of moving to a less carbon-intensive economy, such as those that could occur because of job losses or business closings.

Because of differences in consumption patterns and electricity prices, the gross cost of a cap-and-trade program is likely to vary from one part of the country to another. CBO has not analyzed regional differences in that cost, but recent studies suggest that such differences would be relatively small. In particular, two teams of experts—one affiliated with the National Bureau of Economic Research (NBER) and one affiliated

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2. CBO projects that GDP in 2010 will be about one-third less than the level projected for 2020; therefore, the agency reduced the 2020 costs and the allowance value by about one-third so that the amounts relative to the size of the economy remained the same.

3. The net cost per household is composed of the cost of producing domestic "offsets," which are primarily changes in agricultural or forestry practices that either reduce or sequester emissions; the purchase of offsets from foreign entities; the value of emission allowances that are sent overseas; and the direct resource costs associated with reducing emissions. Those resource costs include the cost of producing goods and services in ways that lead to lower emissions (the cost of investing in producing electricity from renewable sources, for example) as well as the inconvenience costs associated with consuming less energy (by turning down thermostats, for example). Direct resource costs differ from estimates of the reduction in gross domestic product (GDP). Direct resource costs include costs not measured in GDP, such as inconvenience costs, but exclude costs that are reflected in GDP, such as any reductions in the use or productivity of capital and labor that result from the policy.

4. CBO could not determine the incidence of some portion of both the gross cost and the value of allowances, so the distributional analysis focused on the remainder of both (which constitutes 92 percent of the total net cost). The gross cost would be highest for households in the top quintile, but because of the amount of allowance value that those households would receive, their net cost would be lower than that of households in the fourth quintile.

with Resources for the Future (RFF)—have estimated regional differences in the effects of policies that would increase the prices of fossil fuels in rough proportion to the CO_2 emitted when they are combusted, as would occur under a cap-and-trade program.[5]

Like CBO's analysis of H.R. 2454, the analyses by NBER and RFF both assume that prices imposed on emissions ultimately would be borne by households in the form of higher prices for the goods and services that they consume, even if suppliers or intermediate users of fossil fuels initially pay the amounts involved. NBER's and RFF's analyses focus on the costs incurred once emissions are priced, and (like CBO's analysis) they do not address the transition costs of imposing such a price. Although the analyses by CBO, NBER, and RFF consider different CO_2 emission prices and examine policies in different years, the qualitative effects on households with different levels of income are similar in the studies; each finds that, measured as a share of annual income, the price increases would impose a larger burden on low-income households than on high-income households.

In contrast to CBO's analysis, NBER's and RFF's analyses are not specific to H.R. 2454: Most important, they examine methods of returning the allowance value (or tax revenues) to households that differ from those specified in the legislation. This letter, therefore, addresses only their results concerning the price increases for households at various income levels (that is, the regional analysis of the gross annual cost per household, which CBO estimated to be $890 in its analysis):

■ The NBER study finds only small regional differences. In particular, the increase in households' spending would range from 1.9 percent of annual income in the East South Central region to 1.5 percent in the West North Central region.

■ The RFF study also finds only small regional differences, although the differences are somewhat larger for low-income households. Specifically, the increase in households' spending would range from 1.6 percent of annual income in the Ohio Valley to 1.3 percent in California, New York, and the Northwest. Effects on households in the bottom decile of the income distribution would range from 5.5 percent in the Ohio Valley to 4.0 percent in California.

The attachment to this letter provides further details about NBER's and RFF's analyses. It should be noted that the distribution of allowance value under H.R. 2454
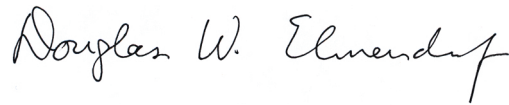
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5. See Kevin Hassett, Aparna Mathur, and Gilbert Metcalf, *The Incidence of a U.S. Carbon Tax: A Lifetime and Regional Analysis,* Working Paper 14023 (Cambridge, Mass.: National Bureau of Economic Research, January 31, 2008); and Dallas Burtraw, Richard Sweeny and Margaret Walls, *The Incidence of U.S. Climate Policy: Alternative Uses of the Revenue from a Cap-and-Trade Program,* Discussion Paper 09-17-Rev (Washington, D.C.: Resources for the Future, June 2009).

would offset most of those costs in the aggregate, and to the extent that the allocation of that value under the bill would differ from region to region, the net geographic impact might differ from those identified in the two studies. Also, a great deal of uncertainty surrounds the potential overall impact of a cap-and-trade program, and its effects on particular geographic areas are even more uncertain.

I hope you find this discussion helpful, and I would be happy to answer any further questions you might have. CBO's staff contact for this analysis is Terry Dinan.

Sincerely,

Douglas W. Elmendorf

Director

Attachment

cc: Honorable Barbara Boxer
     Chairman
     Senate Committee on Environment and Public Works

     Honorable Henry A. Waxman
     Chairman
     House Committee on Energy and Commerce

     Honorable Joe Barton
     Ranking Member
     House Committee on Energy and Commerce

     Honorable Charles B. Rangel
     Chairman
     House Committee on Ways and Means

     Honorable Dave Camp
     Ranking Member
     House Committee on Ways and Means

Two Recent Studies of Regional Differences in the Effects of Policies That Would Price Carbon Dioxide Emissions

July 9, 2009

Two teams of experts—one affiliated with the National Bureau of Economic Research (NBER) and one affiliated with Resources for the Future (RFF)—have estimated regional differences in the effects of policies that would increase the prices of fossil fuels in rough proportion to the carbon dioxide (CO_2) emitted when they are combusted, as would occur under a cap-and-trade program.

An Analysis by the National Bureau of Economic Research

An analysis by NBER examines the effects of a hypothetical tax of $15 per metric ton of CO_2 imposed in 2003.[1] The study accounts for differences in the bundles of goods and services consumed by households in different parts of the country—for example, higher gasoline consumption by households in the West. However, the analysis does not account for regional differences in the price increases that would probably result from the tax (or from other policies to impose a price on greenhouse-gas emissions). Most prominently, increases in electricity prices could vary: Regions that rely on coal-fired electricity generation would tend to experience larger price increases than regions that rely on electricity generated from nuclear power, for example. Unlike prices for most other goods and services, prices for electricity can vary significantly among different regions because of the difficulty in transmitting electricity long distances.

NBER's analysis finds relatively small differences in the effect on households across regions of the country (see Figure 1). In the analysis, increased expenditures account for the largest share of average household income (1.9 percent) in the East South Central region and the smallest share (1.5 percent) in the West North Central region. Most of the regional differences stem from differences in the amount of energy that households consume directly (such as gasoline, electricity, natural gas, and home heating oil) rather than indirectly (such as fossil fuels used in the production of food, clothing, and other items).

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1. See Kevin Hassett, Kevin, Aparna Mathur, and Gilbert Metcalf, *The Incidence of a U.S. Carbon Tax: A Lifetime and Regional Analysis,* Working Paper 14023 (Cambridge, Mass.: National Bureau of Economic Research (January 31, 2008). NBER's analysis also includes scenarios in which the tax on CO_2 emissions was imposed in 1987 and 1997.

An Analysis by Resources for the Future

An analysis by RFF examines the effects of an emission price of $20.91 per metric ton of CO_2 using households' expenditure patterns and income levels in 2006.[2] The analysis accounts for both regional variation in the consumption of goods and services and regional differences in the amount by which electricity prices would increase as a consequence of the policy. Using a model that incorporates changes in the supply of and demand for electricity, RFF estimates that the price of electricity would increase by as little as 7 percent in California and by as much as 27 percent in the Ohio Valley.

Yet, even after accounting for regional differences in increases in electricity prices, RFF's analysis indicates relatively small regional effects (see Figure 2 and Table 1). In the analysis, households in regions with larger increases in electricity prices tend to experience smaller increases in the costs of other goods and services that they consume. Increases in total expenditures range from 1.6 percent of households' income in the Ohio Valley region to 1.3 percent (19 percent lower) in several other places, such as California, New York, and the Northwest. For the different deciles of income, the regional differences that RFF shows are only slightly larger than for households on average. For households in the lowest 10th of the income distribution, increases in total expenditures range from a high of 5.5 percent of households' income in the Ohio Valley to a low of 4.0 percent (27 percent lower) in California.

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2. See Dallas Burtraw, Dallas, Richard Sweeny and Margaret Walls, *The Incidence of U.S. Climate Policy: Alternative Uses of the Revenue from a Cap-and-Trade Program,* Discussion Paper 09-17-Rev (Washington, D.C.: Resources for the Future, June 2009).

Figure 1.

NBER's Estimates of a Cap-and-Trade Program's Average Costs per Household as a Share of Income, by Region
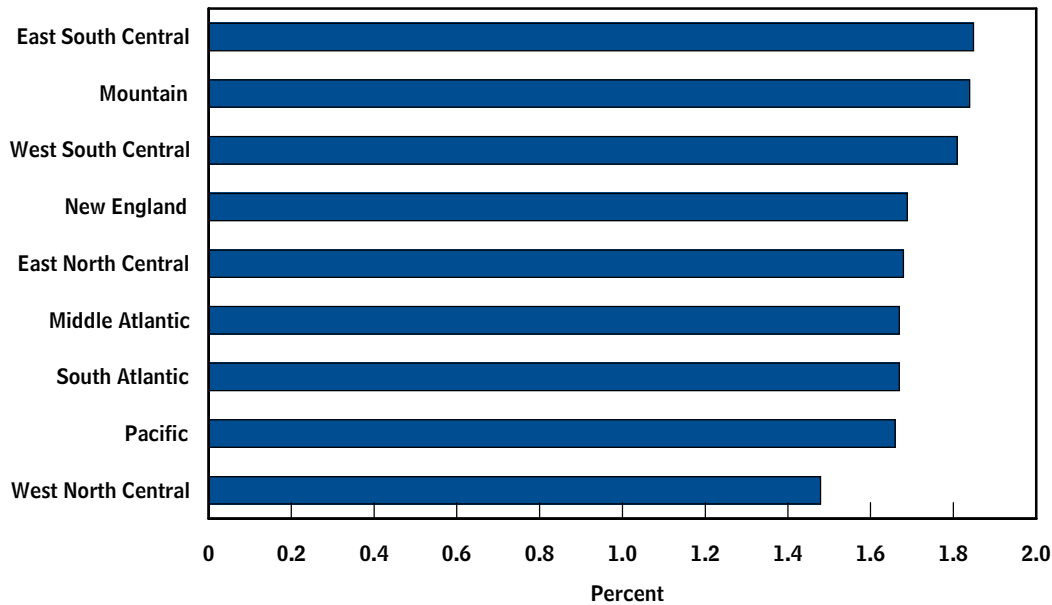
Source: Kevin Hassett, Aparna Mathur, and Gilbert Metcalf, *The Incidence of a U.S. Carbon Tax: A Lifetime and Regional Analysis,* Working Paper 14023 (Cambridge, Mass.: National Bureau of Economic Research, January 31, 2008).
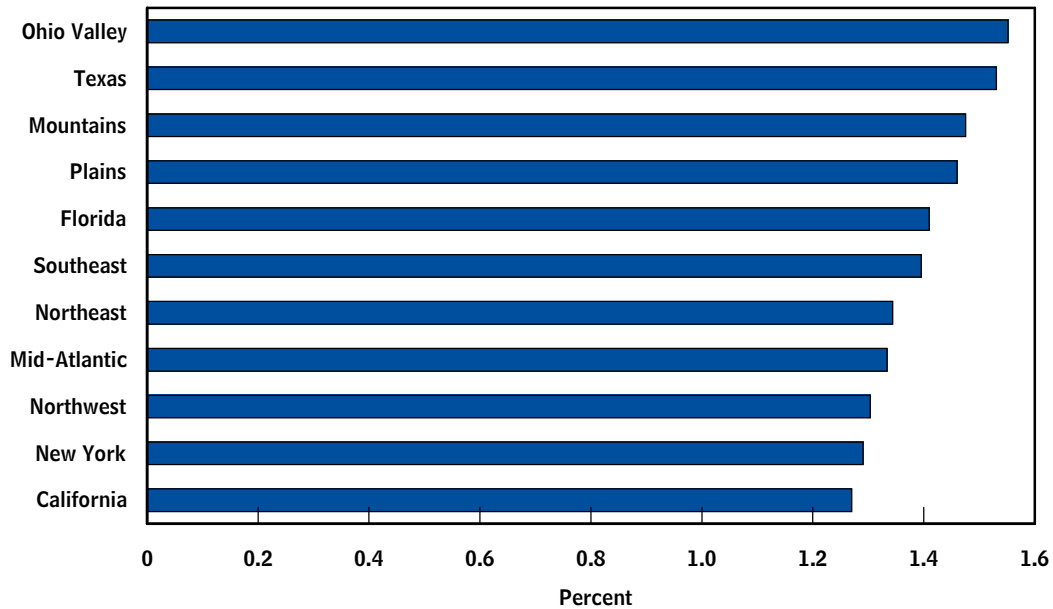
Notes: NBER = National Bureau of Economic Research.

Regions are defined as follows:

- East South Central—Alabama, Kentucky, Mississippi, Tennessee;
- Mountain—Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming;
- West South Central—Arkansas, Louisiana, Oklahoma, Texas;
- New England—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont;
- East North Central—Indiana, Illinois, Michigan, Ohio, Wisconsin;
- Middle Atlantic—New Jersey, New York, Pennsylvania;
- South Atlantic—Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia;
- Pacific—Alaska, California, Hawaii, Oregon, Washington; and
- West North Central—Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota.

Figure 2.

RFF's Estimates of a Cap-and-Trade Program's Average Costs per Household as a Share of Income, by Region

Source: Dallas Burtraw, Richard Sweeny and Margaret Walls, *The Incidence of U.S. Climate Policy: Alternative Uses of the Revenue from a Cap-and-Trade Program,* Discussion Paper 09-17-Rev (Washington, D.C.: Resources for the Future, June 2009).

Notes: RFF = Resources for the Future.

RFF's analysis includes selected states and regions; regions are defined as follows:

- Ohio Valley—Illinois, Indiana, Kentucky, Michigan, Missouri, Ohio, West Virginia, Wisconsin;
- Mountains—Arizona, Colorado, Nevada;
- Plains—Kansas, Minnesota, Nebraska, Oklahoma, South Dakota;
- Southeast—Alabama, Arkansas, District of Columbia, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia;
- Northeast—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island;
- Mid-Atlantic—Delaware, Maryland, New Jersey, Pennsylvania; and
- Northwest—Idaho, Montana, Oregon, Utah, Washington.

Table 1.

RFF's Estimates of a Cap-and-Trade Program's Average Costs per Household as a Share of Income, by Region and Income Decile

| | Percentage of Annual Income, by Income Decile | | | | | | | | | | |
	1	2	3	4	5	6	7	8	9	10	Average
Ohio Valley	5.5	3.2	2.6	2.3	2.0	1.8	1.7	1.5	1.3	1.0	1.6
Texas	5.0	3.0	2.5	2.2	2.0	1.8	1.6	1.4	1.4	1.0	1.5
Mountains	5.3	3.1	2.4	2.1	1.8	1.7	1.6	1.4	1.3	0.9	1.5
Plains	4.7	2.6	2.3	1.9	1.9	1.7	1.6	1.4	1.2	1.1	1.5
Florida	4.7	2.8	2.3	2.0	1.7	1.6	1.4	1.3	1.2	0.8	1.4
Southeast	4.8	3.0	2.4	2.0	1.8	1.6	1.5	1.3	1.2	0.8	1.4
Northeast	5.4	3.3	2.4	2.1	1.8	1.5	1.5	1.4	1.2	0.9	1.3
Mid-Atlantic	5.2	2.9	2.4	2.1	1.8	1.6	1.5	1.3	1.1	0.9	1.3
Northwest	4.5	2.6	2.1	1.8	1.8	1.5	1.4	1.3	1.1	0.9	1.3
New York	4.9	2.9	2.0	2.0	1.9	1.6	1.5	1.3	1.2	0.8	1.3
California	4.0	2.6	2.1	2.0	1.6	1.5	1.4	1.3	1.2	0.9	1.3
National	4.4	2.8	2.3	2.1	1.8	1.6	1.5	1.4	1.2	0.9	1.4

Source: Dallas Burtraw, Richard Sweeny and Margaret Walls, *The Incidence of U.S. Climate Policy: Alternative Uses of the Revenue from a Cap-and-Trade Program,* Discussion Paper 09-17-Rev (Washington, D.C.: Resources for the Future, June 2009).

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- Northeast—Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island;
- Mid-Atlantic—Delaware, Maryland, New Jersey, Pennsylvania; and
- Northwest—Idaho, Montana, Oregon, Utah, Washington.

Decile 1 includes those households in the lowest 10th of the income distribution; decile 10, those in the highest 10th.