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Who Gets the Money? Distributional Implications of Carbon Revenue Recycling

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- The U.S. can reduce CO₂ emissions and generate a substantial amount of revenue from imposing a charge on carbon.
- The incidence of a carbon charge will be regressive: the resulting increase in prices will fall more heavily on low-income households.
- However, if the government redistributes the revenues from the carbon charge on an equal per capita basis, the impact will be progressive: low-income households will be net “winners,” and middle-income households will be “kept whole.”

Sooner or later the United States will join the other nations of the world in instituting policies to curb CO₂ emissions. One way to do this is to raise the price of fossil fuels by levying charges based on their carbon content – in effect, making users pay for access to the limited carbon reabsorption capacities of the biosphere.

Carbon charges will mean a lot of money. How much depends on how high the charge is set (or equivalently, how low the carbon-emission cap is set) and on the price elasticity of demand for carbon. Based on the U.S. emissions target in the Kyoto Protocol and ‘middle-range’ assumptions on the price elasticity, Barnes and Breslow (2003: 143) calculate that carbon charges would yield roughly \$240 billion annually (in 1999 dollars) in 2010. Because demand for fossil fuels is price-inelastic, a more ambitious cap – like the 50% emissions reduction by the year 2050 proposed by the Europeans – would generate even larger revenues.

This prospect raises the question: Who gets the money?

The net distributional impact of carbon charges depends on (i) the incidence of the charges themselves and (ii) how the resulting revenue is recycled into the economy. In the U.S., the incidence of carbon charges will be regressive: as a percentage of income, the resulting

¹ Economics for Equity and the Environment Network (E3) is a nationwide network of economists developing arguments for environmental protection with a social equity focus. For more information, please contact Kristen Sheeran, Director, at ksheeran@e3network.org. E3 is a program of Ecotrust.



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price increases will hit the poor harder than the rich. Yet, in absolute terms, the rich will pay more, as shown in the “cost” column of the following table:

Distributional Incidence of Carbon Charges and Equal Per Capita Revenue Recycling

Income Decile	Mean Household Income (\$)	Costs from Higher Prices (\$)	Benefits from Recycling (\$)	Net Effect (\$)	Net Effect as % of Income
1	6,884	1,158	1,512	+354	+5.1%
2	13,127	1,418	1,777	+359	+2.7%
3	20,453	1,800	2,034	+234	+1.1%
4	28,107	2,085	2,358	+272	+1.0%
5	35,900	2,089	2,393	+304	+0.8%
6	44,406	2,303	2,429	+126	+0.3%
7	53,613	2,719	2,549	-170	-0.3%
8	66,179	2,800	2,902	+102	+0.2%
9	87,480	3,144	2,916	-228	-0.3%
10	161,801	4,119	2,740	-1,378	-0.9%

Source: Barnes and Breslow (2003: 144) based on ‘middle-range’ scenario. Units are 1999 dollars.

If carbon revenues are recycled on an equal per capita basis, the net impact is progressive. (Equal per capita payouts are shown in the “benefits” column of the table; differences across deciles are due to variations in household size.) In purely pocketbook terms – without counting the environmental benefits of curbing fossil fuel emissions – low-income households would be net “winners” while upper-income households would be net “losers.”

The last column in the table depicts the net effect: the richest decile incurs a net cost equivalent to 0.9% of household income; the poorest decile reaps a net benefit equivalent to 5.1% of household income. A doubling of total carbon revenue (as a result of tighter caps or a lower price elasticity of demand) would double these net effects.

These numbers are rough estimates, but other studies have produced similar results (for example, CBO 2000, 2001; Boyce and Riddle 2007). The numbers could be further refined by allowing price elasticities of demand to vary across deciles and by including impacts on the producer side of fossil-fuel markets. If carbon charges are partly absorbed by reduced profit margins – rather than passed 100% to consumers as assumed in most calculations – the net distributional impact would be more strongly progressive because corporate stock ownership is more unequal than income distribution.



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One way to recycle carbon revenues on an equal per capita basis is via a “sky trust” that makes payments to every woman, man, and child in the country – an arrangement analogous to the Alaska Permanent Fund’s annual dividends from oil-extraction revenues. Alternatively, part or all of the carbon revenues could be recycled via provision of public goods such as national health care. If these public goods benefit all persons equally, the net distributional impact is the same.² To offset employment impacts in carbon-intensive sectors (like coal mining and trucking), some fraction of the revenues must also be earmarked for transitional adjustment assistance.

Politically, an egalitarian answer to the question of “Who gets the money?” is appealing for two reasons. First, due to skewed income distribution, the winners from such a “cap-and-dividend” policy will outnumber the losers: as the table indicates, roughly 70% of people end up with more money in their pockets. Public attitudes to higher prices at the gas pump would be transformed radically if consumers knew that the extra money was going to them rather than to oil companies or the government.

Second, the egalitarian distribution of revenues – and the newly created property rights that underlie those revenues – would affirm the ethical principle that the gifts of creation are held in common and equally by all. People vote their values, as well as their interests. An egalitarian answer would reflect moral values that are deeply held and widely shared.

By framing a policy that is grounded in interests and values supportive of both environmental protection and the egalitarian distribution of carbon revenues, we can help to ensure that the U.S. crafts a politically sustainable path to reducing its CO₂ emissions.

² Another option is tax shifting, for example using carbon taxes to replace payroll taxes as advocated by Al Gore (2006). This, too, would yield an overall progressive net impact, but it would fail to benefit non-workers including the old, the young, the disabled, and the unemployed; moreover, it would tie the future of Social Security to what ultimately will be a diminishing revenue source.



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References

Barnes, Peter and Marc Breslow (2003) 'The Sky Trust: The Battle for Atmospheric Scarcity Rent.' In James K. Boyce and Barry G. Shelley, eds., *Natural Assets: Democratizing Environmental Ownership*. Washington, DC: Island Press.

Boyce, James K. and Matthew E. Riddle (2007) *Cap and Dividend: How to Curb Global Warming While Protecting the Incomes of American Families*. Political Economy Research Institute, Working Paper No. 150.

Congressional Budget Office (CBO) (2000) *Who Gains and Who Pays Under Carbon-Allowance Trading? The Distributional Effects of Alternative Policy Designs*.

CBO (2001) *An Evaluation of Cap-and-Trade Programs for Reducing U.S. Carbon Emissions*.

Gore, Al (2006) "Solving the Climate Crisis." Speech at New York University, 18 September. Available at <http://www.nyu.edu/community/gore.html>.