PRIMING THE PUMP

How Pollution Charges Combined with Revenue Recycling Help the U.S. Economy and Citizens

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by Paige Brown

The atmosphere is a valuable common asset that regulates Earth's climate and keeps it habitable. Many scientists believe that the buildup of greenhouse gases in the atmosphere will disrupt the global climate, and may already be doing so. As a result, Congress has been debating policies and actions to reduce the risk of climate change. Our political representatives should be committed to policies that are in the best interests of all Americans. Yet, the proposals to date would give a few private interests free emissions rights, in part because freely distributing emissions rights would reduce industry opposition to greenhouse gas restrictions, thus speeding action on climate change.

Americans and the U.S. economy will lose if politicians allow private interests free use of the atmosphere. Instead, policymakers should charge greenhouse gas emitters, such as by taxing emissions or auctioning emissions permits, and return the revenue to the economy (a process referred to here as "revenue recycling"). Revenue recycling would help the U.S. economy, offset the cost to individuals of fossil fuel price increases, and protect the most vulnerable members of society.

This paper elaborates on part of the set of arguments for charging polluters and recycling the revenue summarized in "Fair and Low-Cost Climate Protection" (Redefining Progress 1999).[1] The author expands on the discussion of options for revenue recycling and describes factors that influence how much revenue could be generated. More important, this paper outlines how charging polluters and recycling the revenue can avoid climate change while protecting individuals and the U.S. economy as a whole.

WHY REVENUE RECYCLING IS IMPORTANT TO THE U.S. ECONOMY AND CITIZENS

It may seem counterintuitive that charging for greenhouse gas emissions would cost society less than giving away emissions permits. However, with few exceptions, whether polluters are charged or not, policies that substantially limit carbon emissions will necessarily cause fossil fuel prices to rise (Cramton and Kerr 1999).[2] If the government gave away pollution rights, the extra money spent by consumers and most businesses would stay in the pocket of the select few corporations that were granted free emissions rights. But why should the buck stop there? Instead, charging polluters and recycling the revenue can mitigate the effect of fossil fuel price increases on both the economy and on individuals.

Fossil fuel price increases will slow investment and consumer spending because the prices of many goods and production inputs will rise. Because consumer spending and investment will decrease, studies predict that the economy, as measured by the gross domestic product (GDP), will experience a lower level of growth than it otherwise would (Energy Information Administration [EIA] 1998). Raising revenue through pollution charges, then returning the revenue to investors and/or consumers through tax cuts, would increase investment and/or consumer spending, thus "priming the pump" of the economy and lessening the impact on the GDP. In fact, under some revenue recycling plans, the GDP could grow *more* than it would have without greenhouse gas reductions (Repetto and Austin 1997).

Mitigating the impact of climate policies on the economy is important. It is equally important to protect individuals. Increased fossil fuel prices cause people to lose some purchasing power because they must pay more for the same goods. Decreasing taxes or directly rebating the revenue replaces some of this lost purchasing power thereby offsetting part of the fossil fuel price increase. Also, as people respond to these price changes by buying more energy-efficient products, the price per unit of energy may be higher, but the total amount they pay could be lower than before greenhouse gas restrictions were put in place.[3]

It will also be important to help those individuals, businesses, workers, and low-income consumers that are particularly vulnerable to price increases because they are more dependent on fossil fuels or are unable to pay higher energy prices. For example, it is likely that some workers in the coal industry will lose their jobs because their employer will sell less coal as utilities switch to cleaner fuels. Pollution charges can provide a dedicated revenue source to minimize the hardship for these groups.

OPTIONS FOR RECYCLING THE REVENUE FROM POLLUTION CHARGES

Tax reductions or direct rebates are the two most likely means of recycling the revenue from greenhouse gas emissions charges. While the temptation would be great to use revenue from pollution charges to fund unrelated government programs, a majority of the revenue must be returned to citizens or investors to achieve the full benefits of revenue-raising policies.

Direct Rebates to Individuals

One approach is to rebate the revenue raised from pollution charges directly to individuals. The amount is determined by dividing the total revenue by the eligible population, so that each person receives an equal share. Direct rebates could create a broad political constituency for action to slow global warming, as the yearly rebate would be tangible evidence that the atmosphere is a common asset that is being managed for the benefit of all citizens.

One specific proposal, the Sky Trust Initiative, recommends creating an independent trust that would collect the revenue from auctioned emissions permits, then send annual rebates to all U.S. citizens—men, women, and children (Barnes 1999). The Initiative seeks to establish a U.S. Sky Trust, modeled after the Alaska Permanent Fund, which places part of the state's oil revenue into a trust and distributes the proceeds equally to all Alaskans. The Sky Trust would similarly sell carbon emissions permits and divide the income equitably among all U.S. citizens.[4] Because the Sky Trust would not be a government agency, but a private trustee, the Trust would operate outside the federal budget and thus would not affect taxes or public expenditures.

Under a second proposal by Resources for the Future (RFF), Credible Early Action, the government would auction emissions permits and rebate 75 percent of the revenue directly to people.[5] RFF addresses vulnerable groups by distributing the remaining 25 percent to states based on energy use by low-income households and the vulnerability of industry (both owners and workers) to increased energy costs (Kopp et al. 1999).

Cutting Taxes on Investment or Wages

The tax system could potentially be made more environmentally friendly and economically efficient by changing what is taxed.[6] Reducing taxes on things we want more of, such as savings, investment, and labor, and replacing them with taxes on things we want less of, such as pollution, could yield both economic and environmental benefits. This is known as environmental tax shifting. Personal, corporate, or investment taxes could be reduced and replaced with pollution charges.[7] The dual benefit would arise from lowering taxes on—and thus encouraging—employment and investment, while raising taxes on—and thus discouraging—pollution.

Reducing taxes on wages can benefit the economy as well as workers. Taxes on wages, such as payroll taxes, mean that firms pay more for labor than the wage received by employees. Because overall labor costs are higher for firms than they would be with no tax, firms pay lower wages and hire fewer workers, which slows down the U.S. economy. Some economists argue that because decreasing labor taxes would lower the overall costs of hiring additional employees, employment would increase, thus benefiting the U.S. economy as a whole. One recent study found that it is possible that under certain circumstances,

even lacking clear evidence that carbon emissions should be reduced, the U.S. economy would be better off swapping some existing labor taxes for revenue raised from auctioned emissions permits or modest carbon taxes (Parry and Bento 1999).

Reducing investment taxes can benefit the economy and is a more equitable approach among businesses than a permit giveaway. For example, firms in high technology, chemical, and pulp and paper industries are not primary energy producers and so are unlikely to receive emissions permits, but they will still face higher energy prices. Higher energy prices causes investment to decrease, thus slowing economic output. However, if the pollution charges were gradually phased in and some of the revenue used to offer businesses an investment tax credit, then it would be possible to avoid the decrease in output among all businesses (Hassett and Gale 2000). Freely distributing greenhouse gas emissions permits, in contrast, would only compensate those few businesses that receive permits, leaving the rest to face higher costs, thus making the U.S. economy and the entire business sector worse off.

Combining the Approaches to Revenue Recycling

Single revenue recycling schemes can be too much of one good thing, and not enough of another, as there are tradeoffs among the choices. For example, corporate tax cuts are the best revenue recycling option if the only goal is greater GDP growth, but this option would do little to help consumers or low-income people (Repetto and Austin 1997). Hybrid options, on the other hand, can blend the best parts of several approaches. A mix of tax cuts, rebates, and transition assistance to people and businesses is likely preferable to choosing a single system. Different tax reductions, such as corporate and personal tax cuts, could be combined to benefit both workers and businesses.

In addition to returning the revenue through tax cuts or rebates, part of the revenue should also be targeted toward helping those most hurt by fossil fuel price increases resulting from emissions reductions, such as low- and middle-income consumers, and workers and businesses in fossil fuel–dependent industries. Some people and businesses will be able to absorb the price increases or make different energy choices relatively easily. Others will be more affected by increasing prices and will need to be helped. For example, those living in rural areas with little or no access to public transportation or low-income residents in areas with severe winters will be hit harder by energy price increases because it will be difficult for them to avoid the increased costs (Miller et al. forthcoming). Hybrid options can combine temporary assistance for vulnerable members of society through tax reductions or direct rebates. Both the Sky Trust Initiative and the Credible Early Action proposal contain temporary transition assistance combined with direct rebates.

What Revenue from Pollution Charges Could Mean for Individuals

Revenue recycling can offset part, or in some cases all, of the price increase faced by Americans. Table 1 illustrates what recycling pollution revenue would mean for the average citizen if greenhouse gas reductions were undertaken in 2002, at $25 per ton and at $125 per ton (Hamond et al. 1997).

TABLE 1: **WHAT RETURNING THE REVENUE COULD MEAN FOR INDIVIDUALS (HAMOND ET AL. 1997)**

Carbon Permit (price per ton)	Revenue (billions per year)	Cost to Average Household (per year)	Payroll Tax Refund per Worker (per year)	Rebate per Person (per year)	Rebate to Average Household (per year)
$25	$27.7	$196	$285	$101	$262
$125	$140	$888	$1,141	$511	$1328

A $25 per ton carbon charge could raise about $27.7 billion (Hamond et al. 1997). Such a fee would cost the average household about an extra $196 dollars a year, but if the revenue were directly rebated to citizens, each person would receive $101, or about $262 for the average family,[8] thus offsetting the increased costs. If instead the revenue were used to reduce payroll taxes, each worker would get about $285, which would more than cover added costs. However, reducing payroll taxes would pro-

vide narrower coverage than a rebate, because nonworking people, such as children, would not be eligible for the tax reduction.

Tighter emissions limits would make permits more scarce and valuable, thus resulting in higher permit and fossil fuel prices, *and* increased revenues, if the permits are sold. A $125 per ton permit price could raise $140 billion in the year 2002 (Hamond et al. 1997), and cost the average household $888. If the revenue were rebated, the average family would receive $1,328, thus offsetting the price increase. Individuals could receive a $511 per capita rebate, or workers could receive about $1,141 extra per year in payroll tax reductions.

In each case, many households could end up at least as well off as before greenhouse gas emissions limits. Further, more energy-efficient households would gain because they would have lower fossil fuel costs, but the same rebate.

WHAT FACTORS INFLUENCE HOW MUCH REVENUE WILL BE RAISED BY POLLUTION CHARGES?

Economic studies of the effects of reducing greenhouse gas emissions are often confusing because they tell contradictory stories regarding the economic costs and benefits. For example, estimates of the amount of revenue that could be raised from pollution charges range from $30 to $300 billion. Despite these disparate results, review of these studies reveals commonalities that underscore the importance of pursuing a policy of emissions charges and revenue recycling. The studies consistently agree that the more tightly the United States limits emissions, the higher the price of one ton of carbon will rise to reflect this increased scarcity.

Figure 1 summarizes three studies' estimates of prices per ton of carbon in 2010 for various greenhouse gas emissions limits. The carbon price difference within each study is largely determined by the amount of greenhouse gas reductions.[9] Price differences between the studies re-

FIGURE 1: **CARBON PRICE ESTIMATES IN 2010**

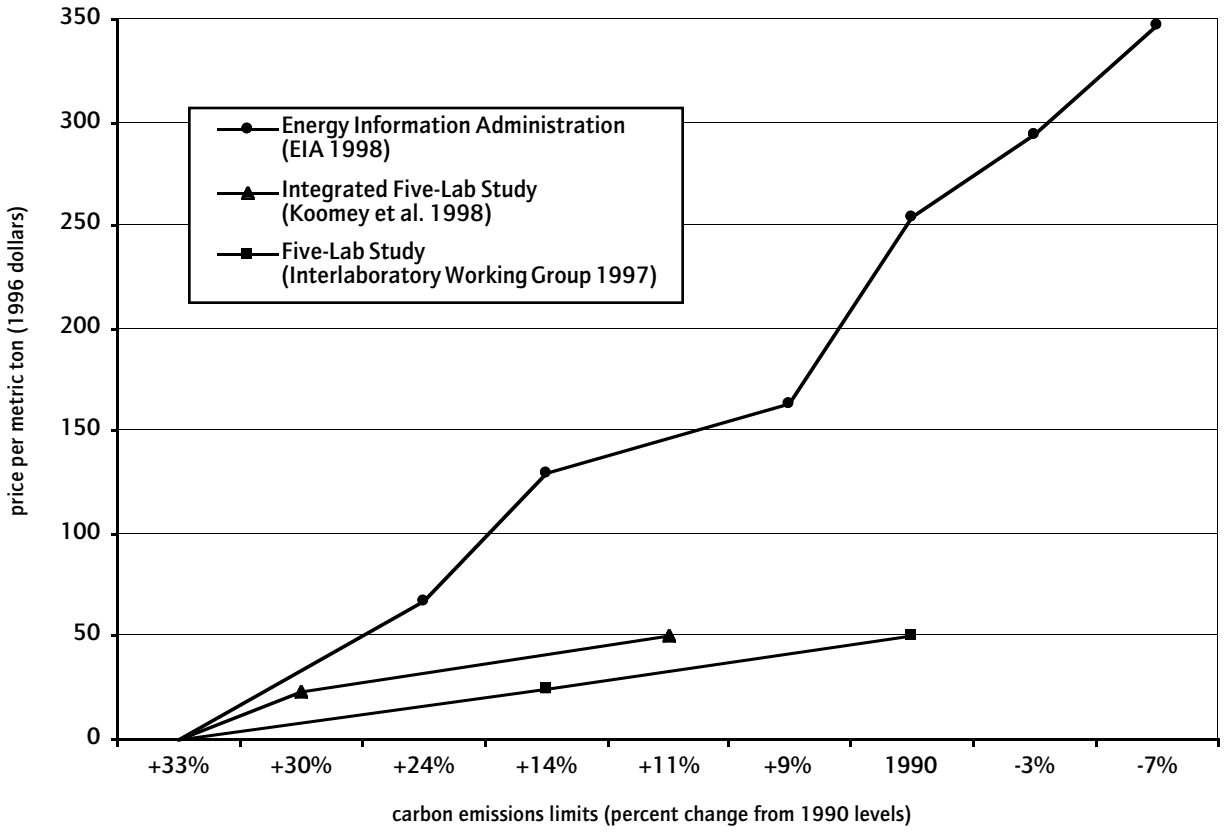
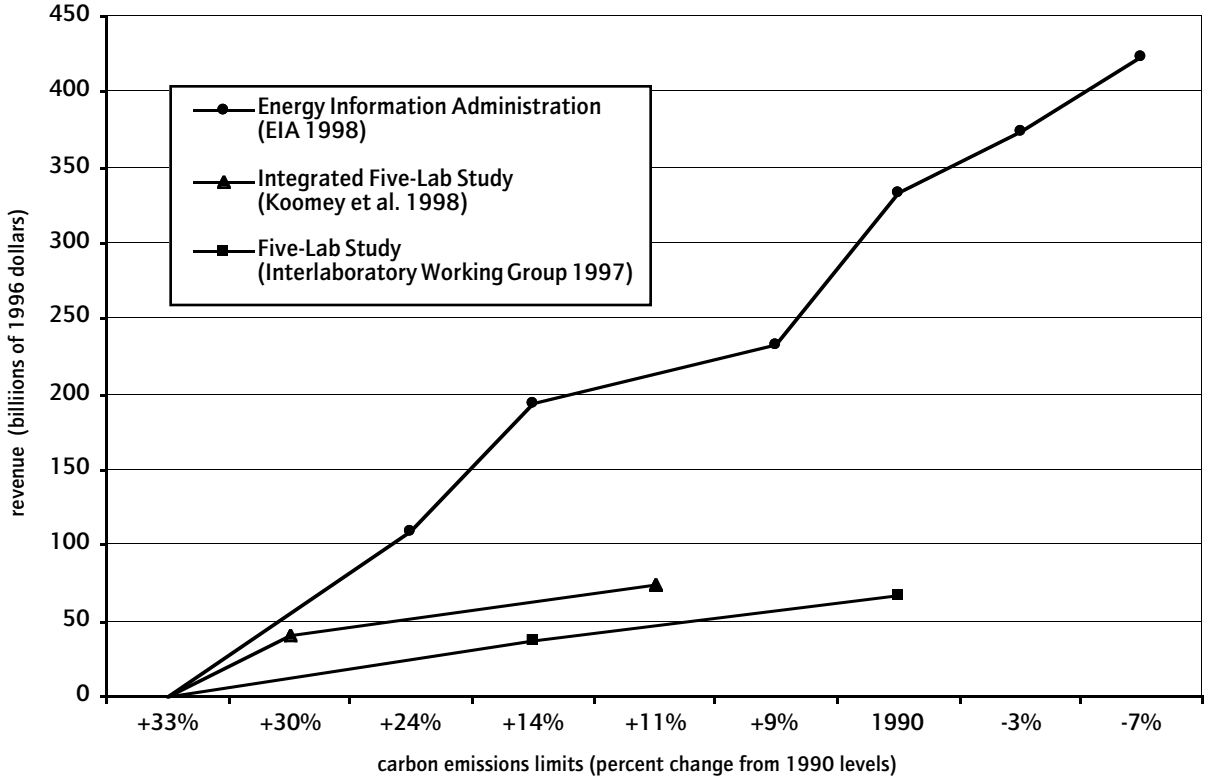


FIGURE 2: **TOTAL REVENUE ESTIMATES IN 2010**



sult from different assumptions concerning the speed of technological innovation, the level of future economic growth, and speed of energy-efficiency improvements, among other differences.[10] None of the three results illustrated in figure 1, however, include international trading. Studies that assume international greenhouse gas trading will not be used to reduce emissions yield much higher cost estimates. This is because international trading is anticipated to offer low-cost greenhouse gas reduction opportunities, which is one reason why it is included in the Kyoto Protocol. For example, studies by Pacific Northwest National Laboratory and Charles River Associates that do include trading estimate the price of carbon in 2010 to be approximately $100 (EIA 1998). The EIA study in figure 1, which does not include trading, estimates the cost to be about 3.5 times higher—$348 per ton.

Total Revenue Rises as Greenhouse Gas Emissions Fall

Figure 2 summarizes studies' estimates of total revenues from pollution charges (the vertical axis) based on the amount of greenhouse gas emissions allowed (the horizontal axis) in the year 2010. The total revenue is determined by multiplying the estimated price per ton of carbon by the estimated number of tons emitted. Figure 2 illustrates that as greenhouse gas emissions limits are tightened, the total amount of revenue raised will increase. This revenue can then be used to soften the impact of price increases on the economy and individuals.[11]

If the United States did nothing to limit its greenhouse gas emissions, by 2010 they would be 33 percent greater than they were in 1990, in which case there would be no revenue, as there would be no emissions reductions. As emissions restrictions gradually tighten from the "business as usual" 1990+33% scenario, the scarcity and therefore the price of a permit to emit one ton of carbon would increase. If these permits were sold, then the revenue would increase as well (EIA 1998).

The key point is that the more greenhouse gases are limited, the more scarce and valuable emissions permits become, leading to higher fossil fuel prices. If emitters are charged, more revenue is raised to offset these price increases. If emitters receive free emissions rights, prices still

rise, as shown in figure 1, but no revenue would be generated to offset higher fossil fuel prices.

CONCLUSION

Pollution charges combined with revenue recycling through tax reductions or direct rebates would slow global warming in a more equitable and economically efficient way compared with giving away the rights to pollute. While there are tradeoffs among the revenue recycling options between boosting the economy and reducing impacts equitably, choosing among these tradeoffs yields greater benefits overall than freely distributing pollution rights. Hybrid revenue recycling options, in particular, could ensure that the distribution of pollution revenue protects the U.S. economy and individuals. A mix of tax cuts or rebates, combined with transition assistance, could benefit workers, families, a broad range of businesses, low-income people, and the economy as a whole.

Revenue raised from pollution charges offers the means of addressing climate change and ameliorating the interim impacts of these new policies on people and the economy. An enormous amount of revenue is at stake that could either enrich those few businesses that receive free emissions allocations or ease the transition to a clean-energy economy for individuals and all businesses, while protecting those most vulnerable to energy price changes.

NOTES

1. This is the second paper in a series highlighting why it is imperative that the United States require polluters to pay for their greenhouse gas emissions by auctioning emissions permits or taxing pollution. The first paper in this series, "Fair and Low-Cost Climate Protection," summarized why charging polluters and recycling the revenue is better for the economy, social equity, and the environment. A series of papers will follow that expands on individual arguments. Please direct comments, queries, or requests for additional information to Redefining Progress, One Kearny Street, Fourth Floor, San Francisco, CA 94108. Phone: 415-781-1191. Web site: <http://www.rprogress.org>.

2. Freely distributing emissions permits creates windfall profits for firms that receive them (Cramton and Kerr 1999). Some have proposed alternate free-distribution schemes that reduce windfall profits. One alternative distributes permits based on a firm's projected output of the good it produces. The permit allocation is then regularly updated. While the details can not be fully discussed here, this distribution system lowers price effects and decreases windfall profits (Lashof et al. 1997; Burtraw et al. 1999). However, because this approach bases distribution on a firm's output, it would become incredibly unwieldy for the private sector in general, which produces thousands of different products. It is likely feasible only for some large sectors with predominantly homogenous outputs, such as the electric utility sector. Also, output-based allocation fails to create revenue for transition assistance and loses economic efficiency compared with taxes or auctioned permits.

3. Reducing greenhouse gas emissions can also save individuals money. As fossil fuel prices increase, people will use less energy and buy more efficient equipment. Households could potentially save approximately $400 per year from reductions in the costs of energy and energy-using equipment (Bernow et al. 1999). Due to these savings, while energy prices may rise, it is possible that the total amount spent on energy could fall as a result of increased efficiency and the use of clean-energy alternatives (Tellus Institute and Stockholm Environment Institute 1998).

4. See <http://www.skytrust.cfed.org/> for more information on the Sky Trust Initiative.

5. See <http://www.weathervane.rff.org/features/feature060.html> for more information on the Credible Early Action Proposal.

6. This paper can only offer a brief outline of tax shifting; for a more thorough discussion, see Hamond et al. 1997 and Parry 1996.

7. Personal tax reductions may involve expanded earned income tax credit, increased exemptions, or payroll tax reductions. Corporate tax reductions could mean reducing the corporate tax rate, increasing the investment tax credit, or reducing the capital gains tax.

8. The average family used for this calculation is 2.6 persons. The data is from the U.S. Census Bureau Web site, accessed 30 November 1999: <http://www.census.gov/>.

9. The estimates represent projections of the necessary prices per ton of CO2 to achieve the desired reduction in 2010, in 1996 dollars (EIA 1998; Interlaboratory Working Group 1997; Koomey et al. 1998). This price is equivalent to the cost of a carbon permit.

10. Repetto and Austin offer a detailed discussion of how assumptions used in economic models determine the outcome, as well as a discussion of which assumptions more accurately reflect reality (EIA 1998; Repetto and Austin 1997).

11. This is not a perpetual system, as at some point greenhouse gas limits could become too strict, thus raising fossil fuel prices too high. Given the politics of greenhouse gas reductions, however, it appears unlikely that excessively strict limits will be put in place, and the limits could be relaxed should fossil fuel prices rise too steeply.

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