



GREEN TAXES AND CLIMATE CHANGE: THEORY AND REALITY

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The primary goal of tax systems is to raise revenue for government so that it can perform its public functions, but the various systems of taxation, which reach deeply into the intricate financial network of industrial, commercial and personal decision-making, can also simultaneously deliver substantive signals. Greening the tax code can allow government to harness its fiscal structure to help achieve its environmental goals. It can target the key pressure points where the tax system intersects with financially sensitive decisions that can significantly affect behavior. Although the concept of environmentally oriented tax instruments is not new (Irwin and Liroff 1974), today's focus on climate change has created new momentum for examining the ways that tax instruments can reduce greenhouse gas emissions.

Green tax theory

There are two sides to the proverbial coin of the green tax theory – tax increases that discourage activities or commodities that are environmentally damaging and tax decreases that encourage those that are environmentally beneficial. In both instances, the tax instruments should be based on traditional tax principles that consider issues of equity, economic effect and administrative feasibility, but they also are grounded on an additional principle – the environmental impact of the tax instrument.

A green tax increase can have an environmental impact in an economically efficient way under one of

several, sometimes overlapping theories. Early in the twentieth century, A.C. Pigou first presented the concept that taxes could capture the costs of private activities that otherwise would be borne by society and apply them to the activities generating the costs (Pigou 1920, 168). By internalizing those external costs (although Pigou did not use those terms), a tax could reflect the real environmental cost of the activity and build that cost into private-sector decision-making. A related theory is the polluter pays principle, which started primarily as a prohibition against government subsidies of pollution control measures (OECD 1972) but frequently is presented as something akin to the cost-internalization principle (OECD 1992). The concept of least-cost abatement provides another rationale: by avoiding the one-size-fits-all approach of some regulation, tax increases set to achieve the desired degree of aggregate pollution reduction can allow individual polluters to decide when it is economically efficient for them to abate pollution (Surrey 1973, 156). Finally, the double-dividend theory (Pearce 1991, 940), also known as ecological tax reform (von Weizsäcker and Jesinghaus 1992, 18), would use the revenue raised under any of these theories to reduce some existing tax burden, such as taxes on labor that may be dampening the economy. The environmental tax would produce the first – environmental – dividend, and the tax relief would produce the second – economic – dividend (Milne 2003, 10–12).

All these theories share, in general terms, the idea that adjusting the economic calculation can result in more environmentally beneficial and economically efficient results. Few green tax increases perfectly execute these theories, given challenges such as identifying and enacting the exact external cost for internalization, but the theories guide the design and certainly contribute heavily to the political rhetoric surrounding their enactment.

Green tax decreases have a more pragmatic foundation. By awarding a tax credit, deduction, exemption or reduced tax rate that otherwise would not be available, government finds a way to encourage an environmentally positive commodity or activity. The

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primary motivation is to achieve a given environmental benefit by subsidizing activities that otherwise would not occur, not to make the market more economically efficient or rational. If costs were fully internalized, the demand for these measures might decline.

Green tax decreases also have a very different fiscal effect than tax increases, obviously reducing the flow of revenues to the government rather than increasing it. This difference can have significant political consequences. Tax increases are often politically unpopular, unless accompanied by offsetting tax relief, while constituents may welcome tax cuts from which they can benefit. For politicians, tax cuts may also offer the opportunity to deliver benefits more quietly through the tax code than through the conspicuous scrutiny of the annual appropriations process. However, as Stanley Surrey explained when he coined the term “tax expenditure”, targeted tax incentives have the same fiscal impact as direct appropriations and, in fact, are government expenditures (Surrey 1973, 3–4).

Green tax increases in action

Both the European Union and the United States put their toes into the green tax waters in the early 1990s when they proposed broad-based energy taxes. Although they found the water too chilly, their proposals capture key political and policy issues involved in using green taxes to address climate change.

From an environmental perspective, the ideal green tax for climate change would be a tax on the carbon content of fossil fuels. When combusted, the carbon in the fuel produces the carbon dioxide that increases the greenhouse gases in the atmosphere. Taxing the carbon would help internalize external costs and cause the polluter to pay. The taxes that were proposed, however, did not follow the pure carbon tax model.

In 1992, the European Commission proposed a revenue-neutral tax based half on carbon content and half on energy value (European Commission 1992). Thus, it extended the tax to non-carbon fuel sources such as nuclear power and hydropower, recognizing in part the fact that a carbon tax alone would have disparate impacts on the competitive position of different member states (European Commission 1991).

It also provided some tax relief for energy-intensive industries, recognizing that competitiveness concerns had to somewhat temper the environmental goal. Even so, energy-intensive industries resisted the tax, as did some member states that were hesitant to accept a tax system that, for the first time, would have imposed rates unified at the Community level (Boeshertz and Rosenstock 2003, 152–53; European Commission 1992). As part of a deficit-reduction package in 1993, the Clinton Administration proposed a federal tax based solely on energy content, realizing the regional and economic difficulties of imposing a carbon tax on coal, but the tax still fell under political pressure from opponents (US Treasury 1993). As these accounts illustrate, the environmental principle underlying green taxes will not automatically trump the policy principle that looks at economic effect, and few taxes are immune from political considerations. Nevertheless, these taxes, if enacted, would have represented the first internationally significant steps toward using fiscal policy on a global scale to increase the cost of a broad range of fossil fuels, well beyond the longstanding taxes on transportation fuels.

Broad-based energy or carbon taxes need not occur only at the highest levels. In the early 1990s, Denmark, Finland, Norway and Sweden introduced carbon taxes, and recent studies of the effect of their carbon-energy taxes on the industrial sector have found that the taxes have reduced carbon dioxide emissions (Speck et al. 2006, 217–20). Other countries have acted as well. For example, Germany began phasing in a tax on energy products and electricity in 1999, and two years later the United Kingdom imposed a climate change levy on electricity and fossil fuels used outside the household sector as part of a larger program to reduce carbon dioxide emissions by 20 percent by 2010 (European Environment Agency 2005, 52–53).

Support continues to grow for the market-based approach. The Stern Review in late 2006 underscored the importance of attaching a price to carbon emissions, whether by tax, trading regime or regulation (Stern 2006, xviii), and in March 2007 the European Commission issued a Green Paper to launch a discussion on increasing the use of market-based instruments, including green taxes, in Europe. In line with the approach it proposed in 1992, the European Commission again has suggested that fuels should be taxed according to both their energy content and their greenhouse gas emissions

(European Commission 2007, 2 and 7). Although the United States has not taken any significant steps toward broad-based energy taxation since 1993, two members of Congress have introduced legislation proposing carbon taxes, and one presidential candidate has called for carbon tax.

This thumbnail sketch of history cannot do justice to the details, but it provides some evidence of the historical and continued interest in broad-based energy taxes. It would be a mistake, however, to think only of energy-based taxes when considering how green tax increases can reduce greenhouse gas emissions. For example, a tax on gas guzzler cars in the United States rises as high as USD 7,700 for cars with fuel economy of less than 12.5 miles per gallon, although its effectiveness has been constrained by a loophole for sport utility vehicles, which were not on the drawing boards when the tax was enacted. Norway imposes a tax on perfluorocarbons (PFCs) and hydrofluorocarbons (HFCs) based on their contribution to the greenhouse effect (European Environment Agency 2005, 59). The tax approach is fungible. It is only a matter of finding and defining a tax base that generates greenhouse gas emissions and then of imposing a tax on that base to internalize costs or achieve the desired change in behavior.

Green tax decreases in action

In the climate change arena, green tax decreases can send targeted, positive price signals that can increase the use of renewable energy and improve energy efficiency in an effort to reduce reliance on fossil fuels. These decreases can take the form of tax credits, deductions, exemptions or reduced tax rates that otherwise would not be available under neutral principles of taxation.

The United States in recent years has chosen to use tax expenditures rather than tax increases to pursue these ends. For example, since 1992, the producers of electricity from wind power have been able to claim an income tax credit (now USD 2.0 cents) for each kilowatt hour of electricity they sell. As a result of legislation enacted in 2005, purchasers of cars powered by alternative fuels may be eligible for an income tax credit; businesses that make energy efficiency improvements in their buildings can claim a tax deduction of up to USD 1.80 per square foot; manufacturers of energy-efficient refrigerators, dishwashers and clothes washers can claim an

income tax credit ranging from \$125 to \$175 per machine produced during 2006 and 2007, depending on the type of machine, degree of energy efficiency, and level of production beyond historical levels. Many of these incentives have limited life spans, targeting the transitional time for the new technology and reducing the long-term fiscal impact.

The United States is certainly not alone in the use of tax expenditures to address climate change. To cite just a few examples, the United Kingdom offers landlords an income tax deduction of up to GBP 1,500 per property for the installation of insulation in residential properties they lease, and the province of British Columbia in Canada exempts energy efficient furnaces from its sales tax (OECD 2007, 108 and 111). In the transportation sector, Sweden has offered tax benefits to employees whose compensation includes employer-provided vehicles using alternative fuels (European Environment Agency 2005, 109).

However, the United States has had greater freedom to use tax expenditures than the European member states, because it has nothing comparable to the European Union's state aid rules, which impose a formal discipline on the circumstances in which member states can provide tax subsidies for environmental protection (European Commission 2001). In addition, the federal budget rules in the United States requiring that tax bills must be revenue neutral lapsed from 2002 to 2007, allowing the federal government to enact green tax decreases without having to find offsetting revenues to pay for them. The Energy Policy Act of 2005 carried a five-year price tag of \$15 billion in tax expenditures for energy, some environmentally positive, and some environmentally negative (Joint Committee on Taxation 2005).

One should not leave the topic of tax expenditures without noting at least in passing that another way to green the tax system is to eliminate or reduce existing tax subsidies for fossil fuels and other commodities that contribute to greenhouse gas emissions. Removing those tax (and non-tax) subsidies can take one step toward correcting prices, even if one does not continue down the path toward fully internalizing external costs.

When to use green taxes for climate change

Tax instruments are just a means to an end, in this case reducing greenhouse gas emissions. There are no

absolute rules governing when and how to use green tax instruments, or whether to use the tax-increase or tax-expenditure side of the green tax coin, but perhaps in closing a few observations are in order. First, when green taxes are used in the climate change context, they often serve the dual motives of reducing greenhouse gas emissions and promoting energy security. Consequently, their policy and political foundations may not be limited to the environmental context and their design may reflect multiple goals. Their green may bear stripes in other colors as well.

Second, policymakers must consider carefully the choice between green tax instruments that send negative signals and those that send positive signals. As a general matter, pervasive, strong, negative signals, such as broad-based energy taxes, have the potential to induce long-term structural and attitudinal changes that over time will change the ways in which business and daily life are conducted. They can extend deep into the broad reaches of economic decisions. On the other hand, carefully targeted, positive signals of tax expenditures may be useful to help society over specific speed bumps of technological change in the short term, improving the economic viability or acceptance of new technologies until they can compete independently.

The choice, however, does not depend just on whether to use broad or targeted, negative or positive signals. It also rests on the fundamental question of who should pay. Should the polluter pay, as in the case of tax increases, or should the beneficiary (society) pay in the case of tax expenditures? And if using both is an option, if the negative signal is sufficiently strong, can it accomplish most or all of the desired result without the assistance of targeted tax expenditures, leaving the full cost on the polluter? This choice of who should pay will reflect fundamental policy, fiscal and political decisions.

Third, as other articles have illustrated, taxation is just one of numerous ways in which government can effect change, and a looming issue in the climate debate is the relationship between broad-based energy taxes and permit trading regimes. They are both market-based instruments; they both send price signals; and they may raise similar issues of equity and economic impact, particularly if the permits are auctioned, not grandfathered. But they also are different. Taxes on fossil fuels will carry a known price, set by the tax rate, whereas the price

of permits will fluctuate with the market. Taxes will not yield a pre-determined level of emissions' control, whereas a properly enforced trading scheme will achieve a known target. Taxes will carry a cost that is more visible to voters and consumers and therefore more politically volatile, while permit trading may be more politically opaque to the general public. Both policy and political calculations will govern the choice, but the choice need not be limited to one or the other. The two may operate in concert, for example, by using different instruments for different sectors or by using taxes in conjunction with permits that are not auctioned. Government can use more than one type of green coin in its purse of market-based options.

Finally, the question of who decides which coin to use – a question that has more novel implications in the case of tax instruments. Within many governments, tax matters are handled in the first instance by the tax writers and tax administrators and environmental matters by those involved primarily in environmental protection, but green taxation is built in the hybrid world that combines the disciplines of taxation, environmental protection, and economics. Tax specialists become environmental specialists; environmental regulators need to incorporate the role of taxation in their universe; and economists should inform the analysis. This broadening may require the development of enhanced expertise and different forms of collaboration, and the plot may thicken with jockeying for control over potential new revenue streams. It may also be constrained by institutional limits, such as the European Union's unanimity rule, which requires that all member states agree before a tax can be implemented at the Community level. The challenges of climate change demand new solutions and interdisciplinary expertise, and, as demonstrated by experience to date, the well-matched pervasiveness of greenhouse gas emissions and tax systems offers significant opportunities for the future.

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