

**ENVIRONMENTAL TAXES:
AN INTRODUCTORY PRIMER**

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Many people tend to think of taxation and the environment as two entirely different worlds -- two circles that do not intersect. Governments impose taxes in order to raise the revenues they need to operate; governments get involved in environmental matters to protect the public interest. The circles, however, do intersect more than people might think. Governments often have used tax policies to try to achieve environmental goals, and policymakers are increasingly considering whether taxes and other market-based approaches should play a larger role. This paper summarizes the ways in which the two circles can intersect -- what an environmental tax looks like, the theories involved, the key terminology and some of the basic issues.

WHAT IS ENVIRONMENTAL TAXATION?

Environmental taxes can come in various forms, but as a general matter, environmental tax measures tend either (1) to impose a tax cost on something that is environmentally disadvantageous, or at least less preferable than other alternatives, or (2) to give a tax break to something that is environmentally beneficial. For example, the federal government imposes a tax on ozone depleting chemicals, and it gives tax breaks to people who buy electric vehicles. In both instances, the "price" of the commodity in question -- the ozone depleting chemical or the electric car -- is altered by the tax or the tax break, respectively. In the first instance, the price goes up; in the second instance, it goes down. Each environmental tax measure will look different, because each will be tailored to suit the particular environmental issue it is addressing.

WHAT THEORIES DRIVE ENVIRONMENTAL TAXATION?

Several different, though not necessarily incompatible, theories exist about why governments should use environmental taxation. They are briefly discussed below.

The Behavioral Approach. Under one theory, environmental taxation is intended to influence people's decisions by slanting market prices. The tax breaks will make certain investments or activities look more financially attractive; the tax increases will make others look less attractive. As a result, the objective in designing the tax mechanism is to set the tax break or the tax cost at the level that will cause the desired number of people to change their behavior.¹ Proponents of this approach argue that allowing people to make these

¹The notion that tax systems will influence behavior is an accepted element of tax policy. Over the past year, for example, the country has debated the effects of reducing capital gains tax rates, just as it debated the merits of reducing marginal rates during the Reagan presidency. These debates revolve around theories about the behavioral effect of tax changes. Similarly,
(continued...)

choices is more cost-efficient to society as a whole than mandating that certain measures be taken through regulations.² Government sets the prices and lets the marketplace make the choices.

The Cost-Internalization Approach. Under another theory, environmental taxes should reflect the environmental costs to society of certain activities or purchases. In other words, environmental taxes "internalize" the environmental costs that otherwise are not reflected in the market price. For example, the price of fossil fuels does not reflect the environmental costs of carbon dioxide emissions that come from burning the fuel, but a tax based on the carbon content of the fuel could incorporate into the sales price the environmental cost to society.³ This theory applies primarily to environmental taxes that raise the cost, not those that subsidize actual cost through tax breaks. It is not wholly distinct from the "behavioral" tax increases described under the first theory because any tax that raises the cost probably will affect behavior.

The Revenue-Driven Approach. Finally, some kinds of taxes that impose a cost may be called environmental taxes primarily because they raise revenue that will be used to fund environmental programs. The commodity subject to tax usually bears some rough environmental relationship to the programs that will be funded. For example, the federal excise tax on certain chemicals has produced revenues dedicated to the Superfund for environmental cleanup of Superfund sites. This theory is related to the second (internalization) theory in that the price of the chemical reflects some of the costs to society, but in this case the revenues are dedicated to paying for some of those costs.

Why do these theories matter? Most environmental taxes that survive the political grist mill will not be theoretically pure in their final form, but the theoretical underpinnings for the tax approach will be part of the debate. In addition, the theory behind the tax may affect the way in which it is designed. For example, calculating a tax increase or tax break that will change behavior is very different from the process of calculating the amount of tax increase that government needs to fund a related program.

¹(...continued)

governments have chosen to give special tax treatment to donations to charity, recognizing the public interest in encouraging the gifts.

²See, e.g., Stanley Surrey, Pathways to Tax Reform: The Concept of Tax Expenditures, (Harvard University Press 1973), pp. 155-174.

³This theory builds on the more general theory of internalizing costs propounded in 1920 by Nicolas Pigou, an English economist, in his book, The Economics of Welfare.

THE CURRENT STATE OF PLAY

The federal tax code contains a number of environmental tax provisions (see Richard Westin's article, "Understanding Environmental Taxes," which is included in this notebook under "Other Relevant Materials"). In addition, the states have enacted a number of provisions in their own tax codes (see "Environmental Taxes in New England," also included in this notebook). The environmental tax measures enacted at the federal and state levels have used tax breaks quite extensively to encourage favored activities and they have experimented modestly with imposing tax costs on environmentally disadvantageous activities or products. Thus, they have largely played around the edges of tax systems to date, making changes which, while made at the margins, may have cognizable environmental benefits.

At the same time, however, a debate is starting that raises questions about whether governments should make more significant shifts in their tax systems. Policy makers in Europe for the past several years have been debating whether the tax burden should shift from labor and capital to environmental taxes (taxes on energy in particular).⁴ A similar debate may be starting in the United States, spurred by a report issued in February by the President's Council on Sustainable Development. The Council has recommended that the country "[b]egin the long term process of shifting to tax policies that -- without increasing overall tax burdens -- encourage employment and economic opportunity while discouraging environmentally damaging production and consumption decisions."⁵ It is still far too early to know the strength and tenor of this debate.

TAX INCENTIVES: WHO, WHAT, WHY, AND WHEN?

Who? The term "tax incentive" is merely the tax policy term for a tax break, perhaps taking away some of the aura of an unjustified benefit that one associates with a "tax break." A tax incentive will reduce the cost of some investment, purchase or activity of the taxpayer by allowing the taxpayer to pay less tax than otherwise would be due.

What Kinds? Tax incentives can operate within the various different types of tax systems -- the income tax, franchise tax, estate or inheritance tax, sales tax, or property tax. In each case, the tax incentive will reduce the amount of tax that otherwise would have to be paid under that tax system, but the tax incentive can provide this benefit in one of several

⁴See, e.g., Ernst U. von Weizsacker, Ecological Tax Reform: A Policy Proposal for Sustainable Development (Zed Books 1992).

⁵The President's Council on Sustainable Development, Sustainable America: A New Consensus for Prosperity, Opportunity and a Healthy Environment for the Future, February, 1996, p. 47. Excerpts of this report are provided in this notebook under "Other Relevant Materials."

ways, which are briefly outlined below.

1. *Tax Deduction.* A tax deduction is most often seen in the income tax context. It allows a taxpayer to reduce the taxable income that otherwise would be subject to tax by the amount of the tax deduction. Tax deductions act as an incentive when they reward expenditures that otherwise would not be deductible for income tax purposes or could not be deducted as quickly, such as the immediate deduction of a cost that otherwise would be spread over a number of years.
2. *Tax Credit.* A tax credit is an amount that the taxpayer can deduct from the tax that otherwise is due to be paid -- it is a credit against bottom line tax liability. Thus, a \$200 income tax credit for the cost of hiring a forester to develop a forestry management plan reduces the landowner's income tax bill by \$200. An \$200 income tax deduction, however, would only reduce taxable income (as opposed to tax liability) by \$200, resulting in a tax savings equal to the income tax rate times \$200.
3. *Tax Exemption.* A tax exemption means that some activity, income or value that otherwise would be subject to tax will not be included in the tax calculation. In other words, the exempt item is ignored for tax purposes. For example, a sales tax may exempt certain sales, such as sales of solar equipment, and certain types of property may be exempt from the property tax, such as van pool vehicles owned by employers. Many states effectively exempt part of the value of farmland and forestland from property tax by allowing the land to be assessed at its current use value rather than its development value.
4. *Rate Reduction.* A rate reduction gives favored tax treatment by applying a tax rate that is lower than the rate ordinarily applied. For example, a state may provide that some qualifying farmland cannot be taxed at more than "x" mills for property tax purposes.

How much of a tax benefit is required to achieve the desired environmental result in each instance will vary depending upon the particular environmental issue and the factors that affect people's decisions.

Why Use Incentives for Environmental Purposes? Tax incentives can act as environmental incentives in one of two basic ways. First, they can encourage taxpayers -- individuals or businesses -- to make an investment or take an action that they otherwise would not consider or would be less likely to consider. For example, solar equipment requires a greater initial capital investment than a traditional heating system, but its ongoing operational expenses will be much lower. The upfront cost, however, may discourage people from making the investment even though it may be in their long term financial interest. A tax incentive for the purchase -- such as a tax credit equal to some percent of the cost -- may help overcome the financial barrier to making the initial investment, and it may help overcome consumers' hesitations to try a less conventional technology.

Secondly, tax incentives can sometimes help people maintain their status quo, where the status quo is the preferred environmental position. For example, current use assessment of farmland or open space may help landowners from having to sell the land for development. Similarly, reduced valuations for estate tax purposes may avoid forced sales at time of death.

When Should Tax Incentives be Used? A number of factors or issues come into play when considering the appropriateness of using tax incentives. They are briefly outlined below.

The Cost Issue. By their very nature, tax incentives mean a loss in revenue to the government. The taxpayer will be paying less as a result of claiming the tax incentive, so the government will receive a smaller check. This cost, or "tax expenditure," means that government will have to look elsewhere to make up for the loss, either by raising a tax, eliminating another incentive or changing its spending levels. Although these tradeoffs are not always highly visible, they are part of the fiscal reality of government that policymakers and proponents must consider.

The Effectiveness/Cost Efficiency Issue. Because tax incentives act as rewards, one must think about whether the incentive is rewarding activity that would have occurred even without the incentive. In other words, is the tax break really acting as an incentive? This question is important both when evaluating the environmental effectiveness of the incentive and when evaluating whether the government is getting a cost-efficient return.

The Complexity Issue. Tax incentives can be effective because they offer a special status to special kinds of activities, but defining that status and those activities means creating byways that branch out from the highway of the tax system. Incentives are enacted to encourage people to choose the road less taken, but the road map becomes more complicated. Complexity can leave some people feeling as though the system is becoming more confusing and perhaps less fair. Tax incentives are hardly new to our tax systems, but each new incentive that is added must be measured against the prevailing standard of, or tolerance for, complexity.

The Administrative Feasibility Issue. Relatedly, a tax incentive will work best if it is administratively feasible from the point of view of both the taxpayer and the administering tax authorities -- if its implementation does not require, for example, unduly complex filings, ambiguous line-drawing or highly discretionary auditing judgments.

The Equity Issue. Tax incentives may have different value for different people, depending on their tax situation. For example, an income tax deduction is more valuable to someone in a high tax bracket to someone in a low tax bracket. This potential inequity is a built-in characteristic of some kinds of tax incentives, but not all. Equity issues can also arise in the context of the potential shift in tax burden that could accompany the enactment of a tax incentive: The incentive will cost money, so taxes may have to be raised elsewhere, leaving

policymakers with the question whether the net result is equitable.

The Direct Expenditure Issue. Finally, one must always consider whether, on balance, a tax incentive approach is better than having government make a direct expenditure, for example, through a grant program. Tax incentives, as "tax expenditures," cost the government real dollars, so why shouldn't the government act directly through a grant program rather than indirectly through a tax program? Tax incentive programs have the appeal of seeming to be less bureaucratic than grant programs from the perspective of the potential participant and the administering agency -- no applications to prepare or review in advance and no award decisions. They do not carry the baggage of government "handouts" that sometimes accompanies grant programs. On the other hand, tax incentives have an open-ended cost; anyone who qualifies will get the benefit, often without regard to need or motivation; and the tax programs are administered by the tax authorities, who may not have the environmental expertise.

TAX DISINCENTIVES: WHO, WHAT, WHY, AND WHEN?

Who? Environmental taxes that increase the cost of an activity or purchase can be called tax disincentives -- by increasing the cost, they encourage taxpayers to use less or use something else. By acting as a disincentive for the environmentally disadvantageous activity or product, they serve as an incentive for environmentally preferred behavior.

What Kinds? Tax disincentives most commonly take the form of excise taxes or sales taxes that add an extra layer of cost to a sale or purchase transaction, such as the federal excise tax on the manufacturer's sale of ozone depleting chemicals. Sometimes, however, they may take the form of the denial of a benefit that someone ordinarily would receive, such as the denial of reduction in the assessed value of property due to pollution when it has been polluted by the taxpayer. The following discussion focuses on the first category of disincentives.

Certain elements are always present in the design of environmental taxes that increase the cost by imposing a sales or excise tax:

The Tax Base. Some commodity has to be defined as the commodity that is subject to tax -- the tax base. In an environmental tax, the tax base should be tied as closely as possible to the environmental problem, because ordinarily one's objective is to tax the commodity that is causing the environmental problem. In the case of the stratospheric ozone depletion problem, for example, one would ideally tax the emissions of CFCs and other ozone depleting chemicals that actually rise up into the atmosphere, because those emissions trigger the adverse environmental effect. From an administrative perspective, however, it would be impossible to tax these emissions. Consequently, the chemicals that are sold in the market place are taxed as a surrogate. Thus, the tax base will be depend on the environmental problem being addressed in light of

administrative feasibility considerations.

The Tax Rate. The rate of tax that is applied to the tax base will vary depending on the theory behind the tax. If the purpose of the tax is to change behavior, the rate of tax will depend on complex economic analyses of the effect of different tax rates on behavioral patterns. These analyses will consider, in part, the extent to which taxpayers will reduce their usage to avoid the tax either because there are other, cheaper (and more environmentally advantageous) alternatives available or because they can use less. Ideally, the tax rate would be set at a level that would cause the desired percentage of people to reduce their purchases by the desired amount. If the purpose of the tax is to internalize the costs of environmental damage associated with the commodity, the tax rate in theory would be based on a calculation of those costs. Finally, if the tax is intended primarily to generate revenue for other programs, the rate would be determined by the amount of revenue the government needs.

The Taxpayer/Tax Collection Point. Someone must be identified as the person (or corporation) who will pay the tax. Someone must also be identified as the person (or corporation) responsible for transmitting the tax to the government. The taxpayer and the tax remitter may not always be the same person. For example, the consumer may pay a tax on motor vehicle tires that cause disposal problems, but the store selling the tire will remit the tax to the government. The choice of the point at which the tax is imposed, including who pays and who remits, is determined by three factors: administrative feasibility, environmental effectiveness, and political visibility.

From an administrative perspective, the government will want to collect the tax without having to deal directly with ungainly numbers of people. From an environmental perspective, it will want to ensure that the tax is imposed at the point where it will have the greatest behavioral effect if the tax is intended to influence behavior. Consequently, policymakers will need to consider whose decisions should be influenced and how placing the tax at different points will affect those decisions. For example, is a tax based on the carbon content of fuels more effective if it is imposed at the point where the fuel first enters the stream of commerce, encouraging utilities to switch to low-carbon fuels or renewable energy, or is the tax more effective if it is imposed on all end users, causing utility customers to conserve energy? From a political perspective, taxes that are highly visible to the end user -- the voter -- may be more problematic, but visibility may also be part of the calculation of environmental effectiveness.

Exemptions. Depending on the type of tax, some transactions should be exempt from the tax because taxing them will not further the environmental goal. For example, proposals to tax fossil fuels to improve air quality usually exempt fuels that are used as feedstocks, because the fuel used as a feedstock will not be burned and, therefore, will not contribute to the environmental problem.

Use of the Revenues. By their nature, tax disincentives will generate revenues for the government. Even though the tax serves as a disincentive, there will always be some people who will be willing to bear the increased cost, leaving government with the decision about how to use the revenues generated by the tax. Government has two basic choices: It can dedicate the tax revenues to the associated environmental problem, or it can put the revenues into the general fund. In either case, if the tax funds new spending, other taxes will not be affected. However, if the tax funds existing spending levels, the government may be able to reduce the burden of other taxes. The significance of this issue grows in proportion to the size of the revenues expected from the tax. The federal government has tried various approaches. It has chosen to dedicate some revenues, such as the Superfund tax on chemicals; it has used the tax on ozone depleting chemicals to offset the cost of various energy-related tax incentives; and it tried -- but failed -- to enact a general energy tax to reduce the federal deficit.

Why Use Tax Disincentives for Environmental Purposes? Tax disincentives can send important price signals in the marketplace. If governments have the political will to set tax rates high enough, they can significantly affect behavior or send a strong message about environmental costs. Even at lower levels, highly visible (but less painful) tax disincentives can make taxpayers stop and think about their choices, particularly if government clearly explains its reasons behind the tax. They can also generate much-needed revenues.

The environmental benefit from tax disincentives may be short term or long term, depending on the particular situation. In some instances, the environmental goal may be to cause some number of consumers to shift to another product that is already on the market or another method that is already available but perhaps a bit more costly. In other instances, the environmental goal may be to create a pressure point -- a price bottleneck -- that will encourage new innovation or long term shifts in investment patterns. In either case, the tax changes the cost of living or the cost of doing business and, accordingly, may reap positive environmental results.

When Should Tax Disincentive be Used? As in the case of tax incentives, a number of issues come into play. Some issues, such as *administrative feasibility*, have been discussed above in the context of defining the appropriate collection point for the tax. The issue of *complexity of the tax code* may be less pronounced in the case of tax disincentives than incentives if the disincentives build on existing sales or excise tax systems, but it always remains a consideration. Two issues that play a strong role in the tax disincentive context, however, are the issue of the economic effect of the tax disincentive and the issue of unintended environmental consequences.

The Economic Effect Issue. Environmental tax disincentives (an incentives) artificially adjust the pricing ground rules of the marketplace. This adjustment of economic forces that brings environmental benefits, however, may cause other economic ripple effects. For example, taxes on fossil fuels will have both environmental and economic effects that

reverberate throughout the economy because fossil fuels permeate the economy. Thus, policymakers must consider both sides of the coin. A more limited tax may affect fewer people, but the environmental and economic effect on those people is just as important. In order to reduce the economic effect of a tax, policymakers may be tempted to reduce the rate of the tax, but because the environmental effectiveness of a behavioral tax is linked to the way it alters costs, the economic and environmental effects of the tax must be considered together.

The Unintended Consequences Issue. A tax disincentive runs the risk of causing people to change their behavior in an environmentally disadvantageous way completed unintended by the tax. For example, high levels of tax based on the volume of waste water that leaves an industrial plant could be designed to reduce the volume of water that needs to be treated; on the other hand, the volume-based calculation may create an incentive to concentrate more waste in less volume, making it harder to treat. Thus, proponents of an environmental tax disincentive should think about ways in which to design the tax in order to minimize the adverse consequences.

ENVIRONMENTAL TAXES AT THE FEDERAL, STATE OR LOCAL LEVEL?

The American tax system is built in three layers -- federal taxes that set uniform rules throughout the country, state taxes that vary significantly in nature and degree of burden from state to state, and local taxes that also vary somewhat in nature and greatly in degree of burden. Environmental taxes can operate at each of these levels, but different considerations will shape their form.

Environmental taxes enacted as part of the federal tax code will ensure that the marketplace rules have been changed equally for all taxpayers in the country -- the same tax code applies to everyone. This approach may be particularly appropriate for environmental problems that are relatively common to all the states or have significant trans-boundary effects.

Establishing uniform, federal ground rules, however, does not necessarily mean that all taxpayers will be affected similarly. For example, a tax on fossil fuels would hit New England states harder than states in the Northwest, which rely heavily on non-fossil, hydroelectric power. These disparate regional effects may create obstacles to the enactment of the tax or cause the tax, through political compromise, to fall to the level of the lowest common denominator. As a result, states sometimes may have greater freedom to tailor tax measures to their environmental needs. The range of constituencies may be less wide or less varied at the state level than at the national level. In addition, the immediate awareness of the environmental problem -- and, therefore, the political will to act -- may be greater. The effectiveness of a state approach will depend, from an environmental perspective, on whether unilateral action by one state will adequately address the environmental problem and, from an economic perspective, on whether it creates the risk of putting the state at a competitive

disadvantage.

Local environmental tax measures usually revolve around the property tax system, because property taxes provide the major source of funding for municipalities. As creatures of the state, however, municipalities get their taxing authority from the state. As a result, environmental tax measures that operate on the local level usually are the product of state-wide legislation.

THE INTERPLAY OF ENVIRONMENTAL TAXES AND REGULATION

Finally, stepping back from the details of environmental taxes, it is useful to think about the role of environmental taxes in the addressing environmental problems. Taxation and regulation address environmental problems in two fundamentally different ways. Taxation tilts the price structures and lets taxpayers decide what they will do on the tilted field. Some percentage of the taxpayers will choose to follow the signals of the tax incentives or disincentives, but some will not. Regulation, on the other hand, tends to mandate that all the people who are affected follow the new set of rules, regardless whether the new rules are economically rational for all those people. Given this difference, regulation may be more appropriate than taxation in those instances where solving the environmental problem requires close to a complete change in behavior, where some continuation of old patterns cannot be tolerated. Environmental taxation and regulation vary in other respects as well -- the routes they take through legislatures, the agencies that are responsible for overseeing them, and the administrative steps that must be taken to implement them.

The choice between taxation and regulation, however, is often not an "either/or" choice. Taxation and regulation can also work hand-in-hand. For example, environmental taxes can help speed the transitions toward regulatory deadlines by encouraging voluntary changes in advance of the deadline. Tax incentives can help ease the financial burden of complying with regulatory requirements, acting in those instances less as a pure "incentive" and more as a tax version of cost-sharing. Tax disincentives can help pay for the costs of regulation, providing a means of funding the repair of the environmental damage, as frequently occurs with dedicated clean-up funds. While regulation controls the environmental side-effects of existing technologies, environmental taxes can help trigger technological innovation or help build consumer interest in new technologies.

ENVIRONMENTAL TAX DESIGN

