

Statement of
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NOTICE

This statement is not available
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Mr. Chairman, we are pleased to appear before the Committee this morning to discuss several environmental taxes that were cited in the Congressional Budget Office (CBO) report *Reducing the Deficit: Spending and Revenue Options*, which was released last month. These include excise taxes on air and water pollutants, excise taxes on carbon-based fuels, and a tax on agricultural chemicals. We will submit for the record the sections of the report covering these topics. These sections contain both a description of each tax and estimates of revenues that could be raised over the 1991-1995 period.

We would now like to address some of the key issues that arise in thinking about the use of these environmental taxes. These issues include:

- o How do taxes compare with current regulations in reducing pollution? The primary points of comparison are the certainty and the economic costs of achieving any given level of improvement in the environment;
- o How can taxes supplement current environmental regulations? Taxes can still play a role in improving the environment if they are used to supplement or augment existing regulations, rather than used in place of them;

- o How do pollution taxes compare with other taxes as a source of federal revenue? This question must be asked from the perspective of overall economic efficiency, and from the perspective of the distributional equity of the federal tax burden; and
- o Finally, what are the problems with pollution taxes? While they are generally appealing as an alternative to regulations, there are cases where regulations may be preferred because of **technical** problems of measuring emissions or of high administrative costs.

USING TAXES TO REDUCE ENVIRONMENTAL DAMAGES

Taxes on emissions of pollutants or on activities that generate pollution could become important instruments for achieving environmental protection, as well as being new sources of federal revenue. Direct regulation of polluters is now the principal method for controlling pollution in the United States. Direct regulatory controls include requiring that certain equipment to reduce pollution be installed and granting permits that limit emissions at certain facilities.

Economists and others have long supported the greater use of taxes or other price incentives in environmental protection programs. Pollution taxes could create incentives for firms or individuals to reduce pollution at the least cost or in an economically efficient manner. Ideally, a pollution tax would be set at a level that would balance the social benefits of incremental reductions in pollution--stemming from cleaner air or water, for **example--against** the incremental social costs of reducing the pollution.

A pollution tax that was set below this level would result in too much pollution in that the social damages of the last increment of pollution would exceed the social costs of eliminating that pollution. Conversely, a tax that was set above this level would cause too much reduction of pollution. In this second case, the benefits placed on the last increment of pollution reduction would be less than the costs that had to be incurred to reduce emissions by that amount.

Current regulatory means of controlling pollution can, like taxes, be more or less stringent than would be desired when all the benefits and costs of pollution and its control were considered. Finding and getting to this optimal level of pollution through either taxes or regulation is difficult, in large part because it is hard to measure the costs and, especially, the benefits of reducing pollution. Taxes and other price incentives do offer some advantages over regulations,

however, in achieving levels of pollution abatement that might be specified in current or future environmental legislation.

Properly designed taxes would provide incentives for individuals or firms to seek ways to reduce pollution at the lowest cost. Thus, whatever level of pollution reduction is attained would be achieved at the lowest cost to society. Such incentives may not be present under regulatory controls, which offer less flexibility to producers. A related advantage of taxes over some direct controls is that they create strong incentives for research and development of production processes or pollution control equipment that could make reducing pollution less expensive.

Pollution taxes are an appealing alternative to current controls in some respects, but they are not without their disadvantages. Their primary drawback is that the degree of emissions reduction that would result from any particular tax level may be less certain than the emissions reduction resulting from direct controls. The choice is often between the cost of control, where taxes have an advantage, and the certainty of control, where regulation may be preferred. Over a period of time, however, the process of collecting pollution taxes would generate useful information that would reduce this uncertainty, and taxes could be adjusted so that the desired level of pollution would be attained.

A second difficulty with pollution taxes is that they could carry substantial administrative and compliance costs. Pollution taxes would be new taxes and would add to the costs of administering the tax system. However, in some instances, much of the administrative and compliance costs have already been incurred as part of the regulatory process. Further, there could be technological difficulties in measuring the emissions. The more directly the emissions can be measured and taxed, the more efficiency the tax system would promote.

Pollution taxes could replace the current system of direct regulation. Perhaps more likely, they could be used to supplement current mechanisms to control pollution. If additional pollution abatement were desired over what was currently being achieved by direct regulation, a tax would allow the added improvement of the environment to be accomplished in an efficient way. For example, a tax would induce a polluter who could cut emissions at a relatively low cost to reduce them below levels that current standards dictate. Producers facing very high costs of reducing pollution beyond required levels, however, would simply pay the tax.

In this last case or, more generally, when pollution taxes are set at relatively low levels, a tax would be collected without achieving further pollution **abatement--at** least, in the short run. In this instance, pollution taxes should be judged primarily on whether they can raise revenue efficiently and fairly as compared with other taxes.

Over the longer term, however, such taxes would lower the profitability of activities that pollute. Doing so would make investing in these activities less attractive and, eventually, would raise the prices and lower the production of goods that pollute. Hence, even if taxes appear to be set too low to reduce pollution in the near term, they may do so over the longer term.

POLLUTION TAXES AS REVENUE SOURCES

Recently, economists and lawmakers have found the revenue-raising potential of environmental taxes to be of particular interest. Using pollution taxes as a source of federal revenue may benefit the economy, while other current **taxes--such** as taxes on **income--may** adversely affect incentives to work or save. In contrast, the behavioral effects of imposing taxes on pollution could be **positive--at** least, if they were set at rates that would bring about improvements in the environment. Thus, from the perspective of allocating resources, it might be preferable to raise revenue from pollution taxes rather than from current taxes.

The distributional consequences of using pollution taxes as a revenue source must also be considered. Some people would justify pollution taxes on the basis that polluters who are degrading the environment should pay--even if they are polluting within currently

permitted bounds. Society's environmental resources, in this view, belong to the public at large, and those who use the resources should pay for them.

However, the view that "polluters should pay" may not square with common conceptions of tax equity. Because pollution taxes would hit some industries and regions of the country harder than others, such taxes would impose different tax burdens on businesses and households with otherwise equal abilities to pay. Pollution taxes would also increase the prices of some consumption items--such as **electricity**--that would cause the tax system to be ultimately more regressive than if revenues were raised from other tax sources.

Although viewing pollution taxes as economic incentives for reducing pollution or as revenue sources are not necessarily inconsistent concepts, they do have different implications for the specific level of the tax. Relatively low charges per unit of pollution may provide little economic incentive to reduce pollution, but they might offer a reliable sources of revenue. For example, in the case of a tax that is set below the cost of reducing emissions, polluters would not cut their emissions; they would simply pay the tax. In contrast, a tax that exceeds the incremental per unit costs of controlling emissions beyond levels that might already be required by existing regulations could generate substantial reductions in pollution, thus reducing the

basis for the tax. The choice of a specific tax or fee level, therefore, depends on the primary motivation for the charge.

Some of the increased economic efficiency that taxes would provide can be realized through other means. For example, a system of marketable allowances for pollution, such as is currently being considered in the clean air legislation, provides economic incentives, similar to those provided by taxes, to reduce pollution in an efficient way. Firms that can cut pollution more cheaply than other firms would tend to do so and sell a portion of their pollution allowance to those that could only achieve reductions of emissions at a relatively high cost.

Unlike taxes, granting marketable pollution allowances to firms based on their historical rates of emissions would not generate revenue for the government. If increasing revenue were considered important, however, the government could sell these allowances to pollute rather than give them away.

EXAMPLES OF POLLUTION TAXES

A pollution tax is defined by its basis (on what the tax is levied) and its size (that is, how big the tax per unit of pollution is). Ideally, the basis of a pollution tax should be the actual emission or the polluting activity that causes the environmental damage. As illustrated below

in comments on options for pollution taxes examined by CBO, it is sometimes administratively impractical or too expensive to levy the tax directly on the source of the damage. In some of these cases, however, the information already obtained under current regulatory programs would make it possible to levy the tax on something close to actual emissions.

The size of the tax depends partly on the objective of the tax. A higher tax rate would tend to reduce pollution more than a lower rate. In addition, a higher rate could generate more or less revenue than a lower rate, depending on what it would cost firms to reduce pollution and avoid the tax. Distributional consequences may also affect the preferred size of the tax.

Stationary Sources of Air Pollutants--Sulfur Dioxide and Nitrogen Oxides

One option that CBO examined was to impose excise taxes on air pollutants. Taxes could be applied fairly directly to actual emissions in the case of pollution generated by large stationary sources, including industrial facilities such as coal-fired electric utilities. In that particular option, taxes of \$150 per ton of sulfur dioxide and \$250 per ton of nitrogen oxides were imposed on electric utilities and large manufacturing plants.

These taxes are assumed to **supplement**, rather than replace, current regulations on emissions of these pollutants. The tax rates assumed are believed to be of sufficient size to induce additional abatement of pollution. Existing regulatory programs require most facilities to have permits to emit these pollutants. Applying taxes to *actual* levels of emission would be preferred to applying them to *permitted* levels. To minimize administrative costs, however, CBO assumed that taxes would be levied on the permitted levels of discharge. Although polluters may not always emit up to their permitted levels, it would be in their interest to make their permit requests conform to actual emissions if such a tax were imposed. Allowing and encouraging changes in permitted levels would cause this tax to have an effect similar to a direct tax on levels of emissions.

These taxes would increase revenues by an estimated \$22 billion during the 1991-1995 period. The additional pollution abatement caused by these taxes would result from some polluters switching to cleaner fuels and, perhaps, adopting some less expensive methods to reduce emissions of nitrogen oxide. The taxes are not believed to be sufficiently large to induce widespread use of some available, but more expensive, technologies to control emissions of sulfur dioxide or nitrogen oxide. However, although current regulations do not encourage switching to lower sulfur content fuels, it is a relatively low cost means of improving the environment that even a low tax would promote.

Controlling Mobile Sources of Pollution

Motor vehicles pollute the air when being driven, but measuring actual emissions of any specific vehicle and applying a tax to those emissions would be impractical. Unless technologies for measuring pollution improve, taxing pollution from mobile sources, such as cars and trucks, must be done less directly.

Moreover, important decisions affecting how much pollution a car generates are made during its design. A tax on the estimated emissions of a new car would give manufacturers and consumers an incentive to bias their decisions in favor of vehicles with less built-in potential for pollution.

CBO estimated the added revenues from a tax on new cars and trucks that would average \$250 per vehicle. The tax on individual types of vehicles would be positively related to their estimated rates of pollution emissions. This tax would generate nearly \$13 billion in additional revenues over the 1991-1995 period. However, this particular tax is imperfect in that many other **factors--such** as how much the car is driven or how it is **maintained--play** important roles in how much pollution is generated. Yet, the tax would have no effect on these factors at all.

Older vehicles represent about 90 percent of the vehicles on the road and cause a larger percentage of problems from mobile source emissions. The tax option considered by CBO excludes older vehicles. Ideally, both old and new vehicles would be taxed. Taxing *all* vehicles would penalize all owners for the emissions from their vehicles. Taxing *new* vehicles would reduce emissions because it would create a financial incentive for consumers to purchase vehicles that emit less pollution, much as the gas guzzler tax creates an incentive to purchase more fuel efficient models.

Alternatively, taxing *old* vehicles would probably not reduce emissions from specific older **vehicles--that** is, unless the tax was set very **high--because** equipping vehicles with emission controls is quite expensive. However, taxing older vehicles would reduce the incentive to keep these older cars on the road just to avoid paying a pollution tax on a new car. An added consideration is that because **lower-income** people are more likely to own older vehicles than those with higher incomes, the tax would be regressive.

Carbon Charges to Delay or Avert Global Warming

Worry about serious effects of global warming has raised concern about emissions of carbon dioxide into the atmosphere. Carbon dioxide is one of several atmospheric trace gases that trap the **sun's** heat near the

earth; others are water vapor, methane, and the **chlorofluorocarbons**. Some scientists are concerned that rising concentrations of these atmospheric trace gases will cause temperatures to rise, which would affect climate, and possibly could have catastrophic consequences, though evidence supporting such dire predictions is far from conclusive.

Carbon dioxide is an important part of the human contribution to rising concentrations of these heat-trapping gases. Reducing carbon dioxide emissions, which essentially means reduced combustion of fossil fuels (coal, oil, and natural gas), could become part of a policy to avert or delay the effects of global warming. The use of carbon **charges--essentially** different taxes on fossil fuels based on their carbon **content--would** be a relatively efficient way of reducing their use and, consequently, reducing emissions of carbon dioxide.

In this instance, a tax could be levied on fossil fuels where they enter the **economy--at** the wellhead or mine-mouth, or point of import. Such a tax would be relatively easy to administer and, most important, would have essentially the same effect on emissions of carbon dioxide as if the tax were levied at the point of emission. The effect is the same because a clearly defined relationship exists between the amount of carbon in a fuel and the amount of carbon dioxide emitted during its combustion.

Unlike other air pollutants, such as sulfur oxides, there is no known technology for removing carbon dioxide from combustion gases. Until such a technology is created, a tax on extracting or importing fossil fuels would be as effective in controlling carbon dioxide emissions as a direct tax on the emissions themselves.

CBO has estimated added revenues from several different taxes on the carbon content of fossil fuels. A tax that might come close to eliminating growth in carbon dioxide emissions over the next decade could generate revenues of \$163 billion over the 1991-1995 period. Revenues are relatively large because the tax base is **large--fossil** fuels are an important part of production in the U.S. economy. Moreover, the tax must be relatively high to cut the use of fossil fuels enough to meet the objective of stabilizing emissions over this period. In this instance, the tax would equal about 40 percent of the **delivered** price of **coal--the** fuel with the greatest rate of carbon dioxide emission during **combustion--and** about 10 percent of the price of refined petroleum and natural gas.

A Tax on Agricultural Chemicals

A final environmental tax examined by CBO is a tax on sales of agricultural **chemicals--pesticides** and fertilizers. These agricultural chemicals are believed to create significant environmental hazards,

particularly as nonpoint sources of surface and **groundwater** pollution. Such chemicals, mostly through their improper disposal, can also be a significant point source of water pollution.

Taxing agricultural chemicals would tend to reduce their use by farmers and, consequently, reduce the environmental hazards associated with their application. The use of a tax to induce behavior that benefits the environment in this instance is quite different from the tax on fossil fuels. In the case of fossil fuels, there is a unique relationship between the rate of use of a particular fuel and the rate of emissions of carbon dioxide. Hence, simply discouraging use of the fuels through taxes would achieve the desired environmental outcome with relative efficiency.

With agricultural chemicals, however, a multitude of factors--some of which are within the control of the **farmer--determines** the environmental damage associated with using these substances. In this instance, taxes might be only part of a more comprehensive strategy to reduce environmental damages from these chemicals. Other policy actions could include education in the proper use of agricultural chemicals or research and development of chemicals that are less harmful to the environment.

In the option estimated by CBO, a 10 percent tax was imposed on sales of agricultural pesticides and fertilizers. This tax raised an estimated \$4 billion over the 1991-1995 period.

CONCLUSION

Existing environmental programs are typically based on specifying particular technological choices for polluters or putting limits on their emissions. These programs have improved the environment. An issue now facing the Congress is whether to go further and require more pollution abatement. But deciding this issue, in turn, entails determining how much flexibility to allow polluters and how to allocate the costs of the programs and controls.

The Congress may wish to pursue further abatement, and it may be willing to accept some uncertainty in the level of reduced emissions in exchange for lowering the cost of achieving whatever reductions occur. If so, then using pollution taxes would appear to be the preferred strategy. Even at lower levels, pollution taxes could fill gaps in the current regulatory program, inducing some cost effective actions to reduce pollution below current standards. In either case, they could also be an important new source of revenue.