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## *Tools for Restructuring the Economy*

In Chapter 1, I cited Øystein Dahle's warning that the failure of prices to tell the ecological truth could undermine capitalism, just as the failure of prices to tell the economic truth undermined socialism. The Chinese recognized this risk of prices not telling the ecological truth when they banned tree cutting in the Yangtze river basin following the near-record flooding in 1998. They said that a tree standing was worth three times as much as a tree cut. If they had included not only the flood control value of trees but also the value in recycling rainfall to the country's interior, a tree standing might easily be worth six times as much as a tree cut.<sup>1</sup>

The use of a highly valued resource such as a tree for a lowly valued purpose such as lumber imposes an economic cost on society. Similarly, since the price of a gallon of gasoline does not include the cost of climate change, it too imposes a cost on society. If losses such as these, now occurring on an ever larger scale, keep accumulating, the resulting economic stresses could bankrupt some countries.

The key to sustaining economic progress is getting prices to tell

the ecological truth. Ecologists and economists—working together—can calculate the ecological costs of various economic activities. These costs can then be incorporated into the market price of a product or service in the form of a tax. Additional taxes on goods and services can be offset by a reduction in income taxes. The issue in “tax shifting,” as the Europeans call it, is not the level of taxes but what they tax.

There are several policy instruments that can be used to restructure the economy, including fiscal policy, government regulation, eco-labeling, and tradable permits. But restructuring the tax system is the key to eliminating the crippling economic distortions. Tax policy is particularly effective because it is systemic in nature. If taxes raise the price of fossil fuels to reflect the full cost of their use, this will permeate the economy, affecting all energy-related economic decisions.

Today’s fiscal systems, a combination of subsidies and taxes, reflect the goals of another era—a time when it was in the interest of countries to exploit their natural resources as rapidly and competitively as possible. That age has ended. Now natural capital is the scarce resource. The goal is to restructure the fiscal system so that the prices reflect the truth, protecting the economy’s natural supports.

It is not easy to grasp the scale and urgency of the needed restructuring. Reestablishing a stable, sustainable relationship between the global economy and the earth’s ecosystem depends on restructuring the economy at a pace that historically has occurred only in wartime. When national security is threatened, governments take extreme measures, such as drafting able-bodied men into the armed forces, commandeering natural resources, and sometimes even taking over strategic industries. Although it may not yet be obvious to everyone, we may well be facing a threat that is comparable in scale and urgency to a world war.

### **The Fiscal Steering Wheel**

Fiscal policy is an ideal policy instrument for building an eco-economy because both taxes and subsidies are widely used and work through the market. By relying primarily on these two tools to build an eco-economy, we capitalize on the market’s strengths, including its inherent efficiency in allocating resources. The challenge is to use taxes and subsidies to help the market reflect not only the

direct costs and benefits of economic activities but the indirect ones as well. If we use fiscal policy to encourage environmentally constructive activities and to discourage destructive ones, we can steer the economy in a sustainable direction.

Some environmental goals—such as limiting the catch in a fishery or properly disposing of nuclear waste—can be achieved only by government regulation. Edwin Clark, former senior economist with the White House Council on Environmental Quality, observes that some of the other tools discussed here, such as tradable permits, “require establishing complex regulatory frameworks, defining the permits, establishing the rules for trades, and preventing people from acting without permits.” In some cases, it is simply more efficient to ban environmentally destructive activities than to try to tax them out of existence. While the advantage has shifted toward the use of tax policy in achieving environmental goals, there is still a role for regulation to play.<sup>2</sup>

A major weakness of the market is that while nature’s goods—lumber, fish, or grain—move through the market, many of nature’s services do not. Since there is no bill rendered for pollinating crops, controlling floods, or protecting soil from erosion, these services are often thought of as free. And because they have no apparent market value, they are often not protected. Fiscal policy can be used to compensate for this shortfall as well.

A market that tells the ecological truth will incorporate the value of ecosystem services. For example, if we buy furniture from a forest products corporation that engages in clearcutting, we pay the costs of logging and converting the logs into furniture, but not the costs of the flooding downstream. If we restructure the tax system and raise taxes on clearcutting timber so that its price reflects the cost to society of the resultant flooding, this method of harvesting timber likely would be eliminated.

Taxes designed to incorporate in their prices the environmental costs of producing goods or providing services enable the market to send the right signal. They discourage such activities as coal burning, the use of throwaway beverage containers, or cyanide gold mining. Subsidies can be used to encourage such activities as planting trees, using water more efficiently, and harnessing wind energy. Environmental taxes and subsidies also can be used to represent the interests of future generations in situations where traditional economics simply discounts the future.

The advantage of using fiscal policy to incorporate the indirect environmental cost is that economic decisions at all levels—from those made by political leaders and corporate planners to those made by individual consumers—are guided by the market. It has a pervasive influence. If it tells the ecological truth, it minimizes the information that individual decisionmakers need to make an environmentally responsible decision.

### **Tax Shifting**

Tax shifting involves changing the composition of taxes but not the level. It means reducing income taxes and offsetting them with taxes on environmentally destructive activities such as carbon emissions, the generation of toxic waste, the use of virgin raw materials, the use of nonrefillable beverage containers, mercury emissions, the generation of garbage, the use of pesticides, and the use of throw-away products. This is by no means a comprehensive list, but it does include the more important activities that should be discouraged by taxing. There is wide agreement among environmental scientists on the kinds of activities that need to be taxed more. The question now is how to generate public support for the wholesale tax shifting that is needed.

In this area, Europe is well ahead of the United States, largely because of the pioneering efforts of Ernst von Weizsäcker, formerly head of the Wuppertal Institute and now a member of the German Bundestag. He not only pioneered this concept, but has provided ongoing intellectual leadership on the issue.<sup>3</sup>

The way tax shifting works can be seen in the table compiled by Worldwatch researcher David Roodman. (See Table 11-1.) It looks at Europe, where most of the shifting has occurred, and gives a sense of how nine countries have reduced taxes on personal income or wages while increasing them on environmentally destructive activities. Sweden was the first country to begin this process, with a program to lower taxes on personal income while raising them on carbon and sulfur emissions to discourage the burning of fossil fuels, particularly those with high sulfur content. For several years, only the smaller countries of Europe, such as Denmark, the Netherlands, and Sweden, followed this path. But during the late 1990s, France, Germany, Italy, and the United Kingdom joined in.

Tax shifting has appeal in Europe in part because it creates jobs, an issue of concern in a region plagued with high unemployment.

Table 11–1. *Shifting Taxes from Income to Environmentally Destructive Activities*

Country, First Year in Effect	Taxes Cut on	Taxes Raised on	Revenue Shifted <sup>1</sup> (percent)
Sweden, 1991	personal income	carbon and sulfur emissions	1.9
Denmark, 1994	personal income	motor fuel, coal, electricity, and water sales; waste incineration and landfilling; motor vehicle ownership	2.5
Spain, 1995	wages	motor fuel sales	0.2
Denmark, 1996	wages, agricultural property	carbon emissions from industry; pesticide, chlorinated solvent, and battery sales	0.5
Netherlands, 1996	personal income and wages	natural gas and electricity sales	0.8
United Kingdom, 1996	wages	landfilling	0.1
Finland, 1996	personal income and wages	energy sales, landfilling	0.5
Germany, 1999	wages	energy sales	2.1
Italy, 1999	wages	fossil fuel sales	0.2
Netherlands, 1999	personal income	energy sales, landfilling, household water sales	0.9
France, 2000	wages	solid waste; air and water pollution	0.1

<sup>1</sup>Expressed relative to tax revenue raised by all levels of government.

Source: Adapted from David Malin Roodman, "Environmental Tax Shifts Multiplying," in Lester R. Brown et al., *Vital Signs 2000* (New York: W.W. Norton & Company, 2000), pp. 138–39.

Shifting from the use of virgin raw materials to recycled materials, for example, not only reduces environmental disruption, it also increases employment since recycling is more labor-intensive. This was one of the reasons Germany adopted a four-year plan of gradually reducing taxes on incomes while increasing those on energy use in 1999. When completed, this will shift 2.1 percent of total revenue generated; with an annual revenue budget of nearly \$1 trillion, it would shift \$20 billion a year. Denmark leads the way in the amount of taxes being shifted, with a total of 3 percent moved thus far by measures adopted in 1994 and 1996. The Danish government taxes the use of motor fuels, the burning of coal, the use of electricity, landfilling, and ownership of motor vehicles. The tax on the purchase of a new car in Denmark is typically higher than the price of the vehicle itself.<sup>4</sup>

The Netherlands, a country with an advanced industrial economy concentrated in a small land area, uses taxes to curb the release of heavy metals, including cadmium, copper, lead, mercury, and zinc. Between 1976 and the mid-1990s, the industrial discharge of these various elements fell 86–97 percent each. The Dutch firms that developed the pollution control equipment used to achieve these reductions gained an edge on firms in other countries, greatly expanding their export sales and earnings.<sup>5</sup>

The environmentally destructive activities now taxed in Europe include carbon emissions, sulfur emissions, coal mining, landfilling, electricity sales, and vehicle ownership. Countries elsewhere might tax other activities to reflect their particular circumstances. Among these might be taxes on excessive water use, the conversion of cropland to nonfarm uses, tree cutting, pesticide use, and the use of cyanide in gold mining. Over time, taxes on environmentally destructive activities could increase substantially, perhaps one day accounting for the lion's share of tax collection.

Governments typically take care to ensure that environmental taxes are not socially regressive. David Roodman describes how Portugal has avoided this with its tax on water, an increasingly scarce resource in this semiarid country. The town of Setúbal provides households with 25 cubic meters of water per month that is tax-free. It then “terraces” additional water taxes, raising the tax through three successively higher levels of consumption.<sup>6</sup>

The concept of taxing environmentally destructive activities received a major boost in the United States in November 1998 when

the U.S. tobacco industry agreed to reimburse state governments \$251 billion for past Medicare costs of treating smoking-related illnesses. This was, in effect, a retroactive tax on the billions of packs of cigarettes sold in the United States during the preceding decades. It was a staggering sum of money—nearly \$1,000 for every American. This was a tax on cigarette smoke, a pollutant that is so destructive to human health that it may cause more damage than all other pollutants combined.<sup>7</sup>

This “tax” that the industry is paying on past damage associated with smoking will be funded by raising the price of cigarettes. Between January 1998 and April 2001, the average U.S. wholesale price of cigarettes climbed from \$1.33 per pack to \$2.21, a 66-percent increase in two years. It is expected to climb further, helping to discourage cigarette smoking.<sup>8</sup>

Another value of environmental taxes is that they communicate information. When a government taxes a product because it is environmentally destructive, it tells the consumer that it is concerned about this. And restructuring the tax system has a systemic effect, steering millions of consumer decisions in an environmentally sustainable direction every day—ranging from how to get to work to what to order for lunch.

Tax shifting to achieve environmental goals has broad support. Polls taken in the late 1990s in both the United States and Europe show overwhelming support for the concept once it is explained. On both sides of the Atlantic, support of the electorate is 70 percent or greater. Tax shifting is also an attractive economic tool because it can be used to achieve so many environmental goals. Once it is used in one context, it can easily be applied in others.<sup>9</sup>

If the world is to restructure the economy before environmental destruction leads to economic decline, tax restructuring almost certainly will be at the center of the effort. No other set of policies can bring about the systemic changes needed quickly enough. In an article in *Fortune* magazine that argued for a 10-percent reduction in U.S. income taxes and a 50¢-per-gallon hike in the tax on gasoline, Harvard economist N. Gregory Mankiw summarized his thinking as follows: “Cutting income taxes while increasing gasoline taxes would lead to more rapid economic growth, less traffic congestion, safer roads, and reduced risk of global warming—all without jeopardizing long-term fiscal solvency. This may be the closest thing to a free lunch that economics has to offer.”<sup>10</sup>

### Subsidy Shifting

In 1997, the Earth Council published a study entitled *Subsidizing Unsustainable Development*. Its purpose was to identify and tabulate environmentally destructive governmental subsidies. It found an astonishing number of examples—at least \$700 billion worth per year. The authors noted, “There is something unbelievable about the world spending hundreds of billions of dollars annually to subsidize its own destruction.”<sup>11</sup>

In effect, governments were spending \$700 billion of taxpayers’ money a year to encourage the use of water, the burning of fossil fuels, the use of pesticides, fishing, and driving. The report documented countless examples of taxpayers subsidizing the use of water in countries where water tables are falling. Governments are spending billions of dollars each year to encourage the use of fossil fuels at a time when both atmospheric carbon dioxide levels and public concern about climate change are rising. Additional billions are being spent to expand the world fishing fleet when its capacity is already nearly double the sustainable catch.<sup>12</sup>

Just as we use taxes to discourage destructive activities, we can use subsidies to encourage environmentally constructive activities, financing them by shifting funds from environmentally destructive subsidies. If these subsidies of \$700 billion per year were shifted into funding environmentally *constructive* activities, such as investing in renewable energy, tree planting, family planning, and the education of young women in developing countries, our future could be far brighter.<sup>13</sup>

In his seminal work on fiscal restructuring for environmental purposes, *The Natural Wealth of Nations*, David Roodman observes: “Few public policies are as unpopular in theory and popular in practice as subsidies. The very word can make economists shudder and taxpayers fume, turn the poor into cynics, and enrage environmentalists.” Despite this common response, some of our greatest achievements—from ending the Dust Bowl to developing the Internet—were based on government subsidies.<sup>14</sup>

The principal activities worldwide that are subsidized are food production, automobile driving, and fossil fuel use. Within agriculture, governments subsidize the use of irrigation water, crop production, the use of fertilizers and pesticides, and the consumption of food itself. Almost all governments subsidize irrigation water, keeping the food produced with it artificially low in price. The

Punjab, India's breadbasket state, went a step further when the chief minister gave farmers free electricity in return for their political support. In a state where irrigation pumps are powered by electricity, this dramatically lowered the price of water, encouraging its use at a time when overpumping was already lowering the water table. By accelerating aquifer depletion, the time in which to adjust to the eventual decline in the groundwater supply is reduced. Expanding food production by overpumping creates a false sense of food security. In contrast to India, China's recent decision to phase in a water price increase in steps over the next five years is a giant step toward reducing the subsidization of water use.<sup>15</sup>

Some countries subsidize food consumption. Iran subsidizes bread consumption to the tune of \$4 billion a year, or \$63 per person. The government buys wheat from farmers at roughly 70¢ per kilogram, makes it into flour, and then sells it to bakeries at 2¢ per kilogram. This across-the-board subsidy, which encourages consumption by the affluent as well as the poor, is also an indirect subsidy to the use of irrigation water, one of the country's scarcest resources.<sup>16</sup>

Another subsector of the world food economy that is heavily subsidized is oceanic fishing. Originally, coastal countries subsidized fishing to develop this basic industry and take advantage of a locally available supply of animal protein. More recently, subsidies have been designed to ensure that each country maximized its share of the oceanic fish catch. Over the last two decades, this practice has spread, until today the capacity of the world fishing fleet is roughly double the sustainable yield of oceanic fisheries. This leads to overfishing and the destruction of the fisheries themselves, an excellent example of the law of unintended consequences.<sup>17</sup>

Extraction industries, particularly in mining and forestry, are another major recipient of subsidies. Coal mining, for example, is now heavily supported in some countries because the cost of extracting coal from an ever greater depth in old mines has increased. But coal mining is declining sharply in a number of countries, including the United Kingdom, where the Industrial Revolution began, and China, the world's largest user of coal. Belgium has phased out coal mining entirely.<sup>18</sup>

Germany, however, continues to subsidize coal mining. German subsidies, designed to protect the jobs of miners, have reached levels that defy belief. From 1983 to 1991, subsidies climbed per miner

from “a generous \$21,700 to a lavish \$85,800,” as Roodman put it. He notes that it would be cheaper for Germany simply to close the mines and pay the miners not to work.<sup>19</sup>

This contrasts sharply with the situation in China, which abruptly cut its coal subsidies from \$750 million in 1993 to \$240 million in 1995. In addition, China has introduced a tax on high sulfur coals. China’s largest cities—with some of the worst air pollution in the world, largely due to burning coal—are even banning coal use. Beijing, Shanghai, Lanzhou, Xi’an, and Shenyang are planning to phase out coal use entirely. The combination of bold subsidy reductions and the new tax on high sulfur coal cut China’s coal use by an estimated 14 percent between 1996 and 2000. (See Figure 11–1.) This provides an excellent example of the effective use of fiscal policy to reach the environmental goals of reducing local air pollution and global carbon emissions. In addition, China is subsidizing an ambitious plan to develop its wind resources, generating electricity to reduce further its reliance on coal. In effect, it is shifting subsidies from coal to wind.<sup>20</sup>

Tree cutting is also subsidized by governments for various reasons. For example, the government of the Australian state of Victoria pays logging companies \$170 million more each year to get timber out than the wood is worth. A similar situation used to exist in the United States, where for decades U.S. taxpayers financed the construction of roads into national forests to facilitate clearcutting by

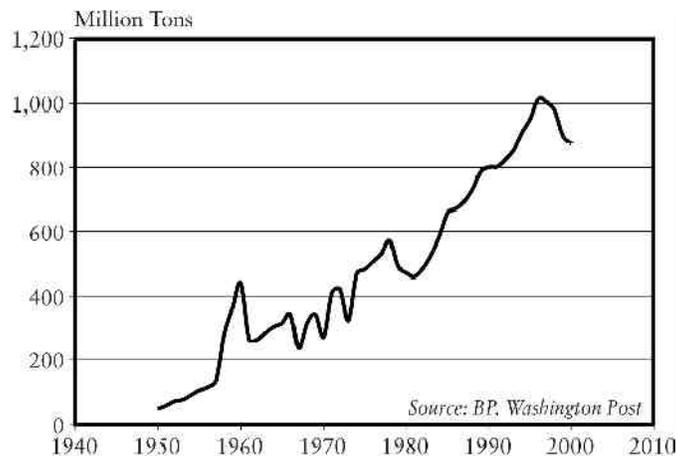


Figure 11–1. Coal Consumption in China, 1950–2000

timber companies. In 1999, the U.S. Forest Service, the government agency responsible for the management of national forests, announced a moratorium on the construction of new roads in national forests.<sup>21</sup>

A study by the World Resources Institute indicates that U.S. government subsidies of automobile use, including construction and maintenance of highways, highway patrols, and other supports to motorists, exceed the taxes paid on motor fuel, vehicle purchases, and license plates by \$111 billion per year. This means that automobile driving is being heavily subsidized by those who do not even own a car.<sup>22</sup>

The Earth Council's 1997 report observes, "The car has liberated individuals just as surely as it has enslaved societies. Every day vast reaches of prime agricultural land are paved and offered up as sacrifices. Every month the population equivalence of entire towns perish from road accidents and automobile pollution."<sup>23</sup>

These destructive subsidies are but a few of those that need to be eliminated. The challenge now is to shift subsidies from environmentally destructive activities to ones that will help build an eco-economy.

The use of subsidies for environmentally constructive purposes is not new. For example, in 1934 the U.S. Congress created the Soil Conservation Service, a nationwide agency with employees in every state whose responsibility was to protect the agricultural resource base for future generations. Farmers were paid to plant windbreaks, to strip-crop, and to adopt other cropping practices that would protect their soils from wind erosion. This reduced soil erosion, helping to bring the disastrous Dust Bowl era to an end.<sup>24</sup>

A more recent example of subsidies playing a strategic environmental role is tax credits for investment in wind electricity generation two decades ago. On the heels of the energy crisis of the 1970s, the U.S. government provided tax incentives for those investing in renewable sources of energy, such as wind. At the same time, California adopted a strong tax incentive for wind power. Together these led to a large investment in wind in California and the creation of a new industry, one that used advanced technologies to convert wind energy into electricity.<sup>25</sup>

When these two tax incentives were discontinued, progress on wind power in the United States came to a near standstill. Meanwhile, the large but short-lived U.S. market led Europeans to start

investing in wind energy, including in a wind turbine manufacturing industry. The Danes, who had also introduced wind energy subsidies, continued to develop the technology and to expand their capacity. Ironically, the principal beneficiary of the California tax incentive was Denmark, which now leads the world in wind energy generation per person and in manufacturing wind turbines. It is an excellent example of how a modest subsidy can launch a new industry.<sup>26</sup>

In recent years, a new U.S. wind production tax credit has encouraged heavy investment in wind farms in Colorado, Iowa, Kansas, Minnesota, Oregon, Pennsylvania, Texas, Washington, Wyoming, and other states. Strong fiscal incentives to invest in wind energy encouraged the private development of more-efficient wind turbines. The resulting precipitous drop in costs of wind electric generation explains the 24-percent annual worldwide growth in wind electric generation from 1990 to 2000 and the projected 60-percent growth in the United States in 2001. As the industry has evolved and grown, it has reached the point where some investments in wind power are now being made without subsidies.<sup>27</sup>

Tax credits were also used to subsidize investments in energy efficiency beginning in the late 1970s. This, too, paid large dividends, but as a policy instrument it was neglected after oil prices dropped from their highs of the late 1970s and early 1980s. With the rise in oil prices during the last half of 2000, public attention is again shifting to efficiency and renewables.

The potential for building an environmentally sustainable economy by restructuring subsidies is enormous. The economics of shifting from destructive subsidies to constructive ones is as attractive as the logic is compelling. Today we should be subsidizing not mining but recycling, not fossil fuels but climate-benign energy sources, and not urban automobile dependency but state-of-the-art urban rail systems.

### **Ecolabeling: Voting with Our Wallets**

Labeling products that are produced with environmentally sound practices lets consumers vote with their wallets. Ecolabeling is now used in many sectors of the economy, including to identify energy-efficient household appliances, forest products from sustainably managed forests, fishery products from sustainably managed fisheries, and “green” electricity from environmentally friendly renew-

able sources.

Among the youngest of the ecolabels is that awarded by the Marine Stewardship Council (MSC) for seafood. In March 2000, the MSC launched its fisheries certification program when it approved the Western Australia Rock Lobster. Also earning approval that day was the West Thames Herring Fishery. Among the key players in the seafood processing and retail sectors supporting the MSC initiative were Unilever, Youngs-Bluecrest, and Sainsbury's.<sup>28</sup>

In September 2000, the Alaska salmon fishery received its certification, the first American fishery to do so. Brendan May, chief executive of the MSC, in referring to the Alaska salmon fishery, said, "With its high profile and international market penetration, it is the perfect product to carry our ecolabel, telling consumers that it is the best environmental choice in seafood. This is a triple victory for Alaska, for the marine environment, and for seafood consumers everywhere."<sup>29</sup>

To be certified, a fishery must demonstrate that it is being managed sustainably. Specifically, according to the MSC: "First, the fishery must be conducted in a way that does not take more fish than can be replenished naturally or kills other species through harmful fishing practices. Secondly, the fishery must operate in a manner that ensures the health and diversity of the marine ecosystem on which it depends. Finally, the fishery must respect local, national, and international laws and regulations for responsible and sustainable fishing."<sup>30</sup>

The MSC's counterpart for forest products is the Forest Stewardship Council (FSC), which was founded in 1993 by the World Wide Fund for Nature (WWF) and other groups. Its role is to provide information on forest management practices within the forest products industry. Some of the world's forests are managed to sustain a steady harvest in perpetuity; others are clearcut, decimated overnight in the quest for quick profits. The FSC distinguishes between these two forms of management in its labels for forest products, whether it be lumber sold at a hardware store, furniture in a furniture store, or paper in a stationery store.<sup>31</sup>

Headquartered in Oaxaca, Mexico, the FSC in effect accredits national organizations that verify that forests are being sustainably managed. In addition to this on-the-ground monitoring, the accredited organizations must also be able to trace the raw product through the various stages of processing to the consumer. The FSC

sets the standards and provides the FSC label, the stamp of approval, but the actual work is done by national organizations.<sup>32</sup>

The FSC has established nine principles that must be satisfied if forests are to qualify for its label. Those managing the forests must have a written plan that describes the objectives and the means of achieving them. The management plan must respect the rights of indigenous peoples who live in the forests or have the responsibility for the forested land. There are numerous other principles, but the central one is that the forest is managed in a way that ensures that its yield can be sustained indefinitely. This means careful selective cutting, in effect mimicking nature's management of a forest by removing the more mature, older trees over time. Simply stated, the management preserves the capacity of the forest to provide both products and services.<sup>33</sup>

WWF describes the certification system as a way of "identifying wood and wood products that come from well managed sources anywhere in the world backed up by a label that would be clear, unambiguous, and easily recognized." This provides consumers with the information they need to support good forestry through their purchases of forest products. By identifying timber companies and retailers that are participating in the certification program, socially minded investors also have the information they need for responsible investing.<sup>34</sup>

In March 1996, the first certified wood products were introduced into the United Kingdom. Since then, the certification process has grown worldwide. As of June 2001, some 24 million hectares of forests had been certified under the auspices of the FSC. This area included more than 300 forests in 45 countries.<sup>35</sup>

To support this certification program, forest and trade networks have been set up in Austria, Brazil, Canada, France, Germany, the Nordic countries, Russia, Spain, Switzerland, the United Kingdom, and the United States. These networks, whose combined corporate membership may reach 1,000 by the end of 2001, are part of the vast support group of companies that adhere to the FSC standards in their marketing. Among the world's five largest wood buyers, the top three—Home Base, Home Depot, and Ikea—buy only FSC-certified wood.<sup>36</sup>

In June 2001, the Natural Resources Ministry in Moscow announced that it was introducing national mandatory certification of wood. Although a small portion of its timber harvest is already

certified, buyers' discrimination against the rest of the harvest costs Russia \$1 billion in export revenues. The ministry estimates that its uncertified wood sells for 20–30 percent less than certified wood from competing countries.<sup>37</sup>

Another commodity that is getting an environmental label is electricity. In the United States, many state utility commissions are requiring utilities to offer consumers a green power option. This is defined as power from renewable sources other than hydroelectric, and it includes wind power, solar cells, solar thermal energy, geothermal energy, and biomass. Utilities simply enclose a return card with the monthly bill, giving consumers the option of checking a box if they would prefer to get green power. The offer specifies the additional cost of the green power, which typically is from 3 to 15 percent.<sup>38</sup>

Utility officials are often surprised by how many consumers sign up for green power. Many people are apparently prepared to pay more for their electricity in order to help ensure a stable climate for future generations. Local governments, including, for example, those in Santa Monica and Oakland in California, have signed up to use green power exclusively. This includes the power they use for municipal buildings as well as that required to operate various municipal services, such as street lights and traffic signals.<sup>39</sup>

Many corporations are signing up as well. Toyota's North American marketing headquarters in California, with some 7,000 employees, has opted for green power. Literally scores of companies in California—some larger, like Kinko's and Patagonia, and many smaller ones—are subscribing. Even colleges and universities are getting in on the act. In April 2000, as an Earth Day project, students at the University of Colorado sponsored a referendum that committed themselves to an increase in student fees of \$1 per semester in exchange for the university's purchase of green power. The measure was approved by an overwhelming 85 percent of the voters. In the San Francisco Bay area, some 30 churches are also subscribing to green power. Within the Episcopal church, a group called Episcopal Power and Light has launched a nationwide effort to get not only churches to buy green power, but their members as well.<sup>40</sup>

The net effect of these growing numbers of green power proponents is a tidal wave of demand that is forcing many utilities to scramble in their search for an adequate supply of green electricity.

One reason wind farms are springing up in so many states is that this is one of the fastest ways of bringing new green power online. While green power marketing appears to be more advanced in the United States, it will likely spread to other countries soon.

Other types of ecolabeling include the efficiency labels put on household appliances that achieve a certain standard in the use of electricity or other forms of energy. These have been in effect in many countries since the energy crisis of the late 1970s. There are also green labels provided by environmental or governmental groups at the national level. Among the better known environmental seal of approval programs are Germany's Blue Angel, Canada's Environmental Choice, and the U.S. Environmental Protection Agency's Energy Star.<sup>41</sup>

### **Tradable Permits**

Environmental taxes and tradable permits are both economic instruments that can be used to reach environmental goals. The principal difference between the two is that with permits, governments set the amount of a given activity that is allowed, such as the harvest from a fishery, and let the market set the price of the permits as they are auctioned off. With environmental taxes, in contrast, the price of the environmentally destructive activity is set by government in the tax rate, and the market determines the amount of the activity that will occur at that price. Both economic instruments can be used to discourage environmentally irresponsible behavior.<sup>42</sup>

The decision of when to use taxes as opposed to permits is not always a clearcut one. When it is desirable to keep an environmentally destructive activity below a certain level, permits are more precise than taxes, which have a less certain effect. Once permits are set at the desirable level, the market decides what they are worth. When taxes are fixed at a certain level, the market decides how best to minimize their effect by reducing the undesirable environmental activity. Governments have much more experience with environmental taxes. It is also clear that environmental taxes work under a wide range of conditions. Still, permits have been used successfully in two widely differing situations: restricting the catch in an Australian fishery and reducing sulfur emissions in the United States.

Concerned about the threat of overfishing to its lobster fishery, the government of Australia estimated the sustainable yield of the

fishery and then issued permits totaling that amount. Fishers could then bid for these permits. In effect, the government decided how many lobsters could be taken each year and let the market decide how much the permits were worth. Since the permit trading system was adopted in 1986, the fisheries have stabilized and appear to be operating on a sustainable basis.<sup>43</sup>

Perhaps the most ambitious effort to date to use tradable permits was the U.S. effort to reduce sulfur emissions by half from 1990 to 2000. Permits were assigned to some 263 of the more sulfur-dioxide-intensive electrical generating units operated by 61 electric utilities. These were mostly coal-fired power plants east of the Mississippi River. The result was that sulfur emissions were cut in half between 1990 and 1995, well ahead of schedule. Although this approach has occasional hitches, the sulfur reduction effort is widely seen as successful, an approach that minimized the costs of achieving an environmental goal.<sup>44</sup>

Trading permits had been proposed by the U.S. government as a way to reach the carbon reduction goals of the Kyoto Protocol. Permits are desirable when there is a specific goal, but if the purpose is to stimulate a long-term trend, then graduated taxes over time may be preferable. If the goal is to reduce carbon emissions worldwide, with higher goals for industrial countries who burn disproportionately large amounts of fossil fuels, then governments can set taxes at a level appropriate to each country's situation.<sup>45</sup>

### **Support for Fiscal Restructuring**

Taxes and subsidies designed specifically to reach environmental goals are not yet widespread. As noted earlier, there has been some tax shifting in Europe, but it is still in the early stages, not exceeding more than 3 percent of the official revenue of any country. Governments have used environmental taxes to reduce the discharge of heavy metals into the environment in the Netherlands or the use of leaded gasoline in countries such as Malaysia, Thailand, and Turkey. But they have not yet been used effectively on big-ticket items. For example, no government has seriously discussed adopting a carbon tax that would phase out fossil fuel use.

As mentioned, in both Europe and North America polls show that 70 percent of voters on both sides of the Atlantic think it is a good idea. The challenge is to translate this approval into support. There has been little political leadership on the issue, especially

from the United States, the country the world looks to for leadership on major issues. The focus in the United States is almost exclusively on whether taxes are being raised or lowered, not on restructuring the system.<sup>46</sup>

With subsidies, there is little public knowledge of the scale of subsidies. Many are hidden, some carefully disguised to reduce their public visibility. As the Earth Council report concluded, many governments of industrial countries have no way of knowing how much they subsidize fossil fuel use with various direct and indirect subsidies. For example, the U.S. oil depletion allowance, though it is not highly visible or regularly debated in Congress, is a powerful subsidy for oil use.<sup>47</sup>

David Roodman notes in *The Natural Wealth of Nations* that there is little organized support within the environmental community for tax shifting. Among the major environmental membership organizations in the United States, not one has a full-time staff person working on these issues. There are now two small U.S. groups working on fiscal shifting. The first is Taxpayers for Common Sense, a group established in 1995 that has 1,000 members. The second is Green Scissors, a group that works specifically to eliminate environmentally destructive subsidies from the federal government's annual budget.<sup>48</sup>

Among economists, there is strong support for tax restructuring. This was evident in 1997 when some 2,500 leading economists worldwide, including eight Nobel laureates, endorsed the idea of a carbon tax. The actions of this group made it clear that it is not the wisdom of restructuring our fiscal system that is the question, but whether we can overcome political inertia and the obstacles posed by the interests vested in the status quo.<sup>49</sup>

MIT economist Paul Krugman writes in the *New York Times* about the distortions in our economy that result from the failure of the market to reflect the full costs of many products and services. He observes, "you don't have to be an elitist to think that the nation has lately been making some bad choices about energy use, and about lifestyles more generally. Why? Because the choices we make don't reflect the true costs of our actions." Starting with the estimated annual \$2.6 billion cost of traffic congestion in Atlanta in 1999, Krugman calculates that the decision by one person to commute by car in Atlanta now imposes on others an additional congestion cost of \$3,500 per year—or \$14 per workday. This is

each driver's part of the indirect or social costs per person of traffic congestion in Atlanta. As Krugman and other prominent economists focus on these issues, it will help to raise public understanding of the need to incorporate indirect costs in the market prices that shape our decisions.<sup>50</sup>

Some key organizations are beginning to support the idea. A report on the environmental outlook in the 30 members of the Organisation for Economic Co-operation and Development (OECD) recommended a broad-based tax restructuring to deal with environmental threats. Since the OECD represents nearly all the leading industrial countries, its recommendations are certain to garner public attention.<sup>51</sup>

During 2001, *The Economist*—traditionally not a leader on environmental issues—has become an outspoken advocate of fiscal restructuring. The editors recommend that governments not attempt to pick “the winners” among new energy technologies but instead “they would do better to provide a level playing field by scrapping the huge and usually hidden subsidies for fossil fuels, and by introducing measures such as carbon taxes so that the price of fossil fuels reflects the costs they impose on the environment and human health.”<sup>52</sup>

The potential benefits of fiscal restructuring are obvious. Fiscal policy, including the shifting of both taxes and subsidies, is the key to our success in building an eco-economy because it is systemic. Reducing mining subsidies not only makes metals produced from virgin ore more costly, for example, but it also indirectly encourages the recycling of metals. Similarly, raising the price of gasoline with a carbon tax that reflects the full cost to society of burning this fuel will permeate the entire economy, sending signals through the market that will lead to more environmentally responsible behavior.