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# Jean Monnet Chair Papers

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## Markets Versus Environment?

RICHARD B. STEWART



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The Robert Schuman Centre at the  
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**Stewart: *Markets Versus Environment?***



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**RICHARD B. STEWART**

**1995**

**The Robert Schuman Centre at the  
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## **Biographical Note**

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After practicing law in Washington, D.C., Stewart joined the Harvard Law School faculty in 1971, becoming Byrne Professor of Law. He was also a member of the Kennedy School of Government faculty at Harvard. From 1989 to 1991 he served as Assistant Attorney General for Environment and Natural Resources in the U.S. Department of Justice, with responsibility for representation of the United States in all civil and criminal litigation involving environmental issues. He has been a visiting professor of law at the University of Chicago, the University of California at Berkeley, the European University Institute, Florence, and Georgetown University. In 1974 he served as Special Counsel to the Senate Watergate Committee. He is a graduate of Yale, Harvard Law School, and Oxford, where he was a Rhodes Scholar. Professor Stewart is a member of the American Law Institute and the American Academy of Arts and Sciences, and received an honorary doctorate from the Erasmus University, Rotterdam.



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## Markets versus Environment?

Ever since the beginning of the contemporary environmental movement 30 years ago, market competition has been attacked as an engine of environmental destruction. Notwithstanding the spectacular environmental as well as economic failures of centrally planned economies, the OECD nations with market-based economies have adopted a far reaching system of central planning – command and control regulation – in order to provide a clean and healthy environment. The dysfunctions and limitations of this central planning system are increasingly apparent. This essay argues for far greater use of market-based incentives to more effectively protect the environment while also promoting economic goals and democratic accountability.

The relation between markets and environmental protection assumes a more complex character in the case of trade among states. In this context, there have been growing demands for adoption of uniform regulatory standards to govern economic activity throughout the common market. Uniform standards have been widely adopted in the United States and the European Union. The demand for uniform standards is now being debated in the context of international trade. Uniformity is assertedly necessary in order to protect the environment from the side-effects of competition in the extended market, and to protect the market itself from the side-effects of different regulatory standards in different states.

This essay argues that uniformity of environmental regulation throughout a common market is neither necessary nor desirable. While approximation of environmental measures may be desirable in some instances, differences are often appropriate, on both environmental and economic grounds. There is also wide opportunity for use of market-based incentives for environmental protection in the multistate context. Such incentives can go far towards reconciling environmental and economic goals while accommodating diversity and flexibility. The lock-step strategy of ever-widening command regulation must re-examined, and greater use made of alternatives better suited to the needs of the earth in an era of accelerating economic integration and political pluralism.

## I. Markets, Regulation, and Economic Incentives

This part of the essay addresses the relation between markets and environmental protection in the context of a single state. Part II addresses the relation in the context of trade among states.

### A. The Failures of the Market and of Private Law to Protect the Environment

The ethical character of market organization of economic activity has been debated since the eighteenth century and is still a matter of deep controversy. But the failings of state socialism in the former Soviet Union, in Eastern Europe, and in many developing countries has stimulated renewed appreciation of the economic and political virtues of competitive markets in harnessing the efforts of managers to the demands of consumers, promoting efficiency in resource allocation, stimulating innovation, and avoiding undue concentration of political power. As a result, there have been many steps taken by nations throughout the world during the past fifteen years to abandon central planning, privatize state-owned enterprises, and scale back government regulation of economic activity.

Simultaneously with this development, however, there has also been a widespread trend toward the adoption of centrally planned regulation in order to control air and water pollution, deal with toxic wastes, and confront other environmental problems. Seemingly oblivious to the inherent and well-documented failures of *Grosplan*, these systems seek to produce environmental quality by issuing orders to thousands of individual facilities, prescribing the conduct of their operations in specific detail. What explains this seeming paradox?

The very success of the market system of competition in providing goods and services demanded by consumers tends to produce excessive amounts of pollution and wastes. This occurs because the market system fails to include prices for these side-effects of production and consumption. As a result, firms fail to bear the costs to society of pollution, wastes, and other environmental externalities which firms generate in competing for consumer favor. Similarly, consumers do not bear the environmental costs associated with consumptive activities, such as driving automobiles which pollute the air.<sup>1</sup>

<sup>1</sup> See P. Menell and R. Stewart, *Environmental Law and Policy*, Ch. 3 (1994).



In theory, private law could solve this market failure by making firms or consumers pay compensation to those injured by these externalities. For a variety of reasons, however, private litigation is institutionally ill-suited to accomplish this task. For example, air pollution from a particular factory may potentially affect millions of individuals throughout an air basin. While each may suffer some increased risk of harm as a result of exposure, it is virtually impossible to show that such exposure caused a particular individual's illness or property damage. Moreover, pollution is often created by dozens or hundreds of sources, making the problem of establishing causal responsibility even more difficult. Litigation is costly, and the individual plaintiff's stake is often small. Case-by-case court litigation is also a poor means for resolving recurring scientific, economic, and engineering issues presented in environmental controversies. Damage remedies are often inadequate because of the difficulties in tracing causation and quantifying injury. And, perhaps most important, the public demands protective measures to prevent harm from occurring in the first place. The threat of private damage liability is too uncertain or weak to provide such protection.<sup>2</sup>

These failures of private law have become more pronounced and obvious in the past several decades in the face of mounting environmental problems attributable to economic growth, technological advance, and population pressures, and rising public concern over environmental problems. There are a variety of policy instruments which government might select to deal with the failures of the market and private law and protect the environment. For example, government could impose a tax or fee on pollution. The government could issue a limited number of pollution rights and allow them to be bought and sold in the market. Government could subsidize measures to reduce pollution. It could impose a tax or deposit fee on wastes, containers, or packaging and provide a credit or refund for proper disposal. It could disseminate information regarding the environmental performance of products or firms to consumers and investors who might use their market power to reward firms with superior performance. Government and industry could negotiate contracts calling for an overall reduction in pollution or wastes from a given facility or industry. These alternatives, however, have until recently played little or no role in environmental policy. In the United States, as elsewhere, the overwhelming instrument of choice has been command and control regulation. Pursuant to legislation, government agencies adopt specific prohibitions or requirements relating to pollution, wastes, resource management, land use, and development. These regulations are enforced against firms and individuals through licensing and permit requirements, enforcement actions, and sanctions for violations.

<sup>2</sup> See P. Menell and R. Stewart, *supra*, Ch. 4.

## B. The Drawbacks of Command and Control Regulation

Regulation appeals to lawmakers for several reasons. It responds to the public perception that environmental degradation is evil and should be prohibited. Regulation promises the public that effective action is being taken to prevent harm from occurring in the first place. Regulatory programs, at least in their initial phases, are relatively easy to design, implement, and enforce. For example, polluters can be required to install available technology for reducing pollution and sanctioned if they fail to do so. Regulation seems to “work”. Several decades of experience with regulation, however, has made clear important limitations in the command and control approach. Nonetheless, it remains the bedrock of environmental law in the United States, Europe, and elsewhere.

Command and control environmental regulation relies principally on controls on the amount and character of the pollution discharged and wastes generated by particular types of industrial processes and products. These requirements are generally based on the level of control achievable by installation of best available technology, or BAT. Many environmental regulatory schemes also have environmental quality standards that specify the maximum amount of pollution permitted in the air, water, or soil. These standards, however, can only be achieved by controls on the processes and products responsible for the pollution in question.<sup>3</sup>

Controls based on BAT reflect a simple premise: that industrial plants and products should incorporate available technologies to reduce pollution. Determining BAT for particular processes or products, however, requires government officials to consider complex engineering and economic factors.<sup>4</sup> Requirements are embodied in regulations or directives that generally apply uniformly to all plants or products of a given type. In the United States and elsewhere, this approach has proved relatively effective in achieving substantial initial reductions in pollution. But experience has revealed important shortcomings, particularly in the context of a dynamic market economy:<sup>5</sup>

1. Uniform command and control requirements are economically quite wasteful because they ignore variations among facilities in the cost of reducing pollution, and also ignore geographic variations in pollution effects. A more

<sup>3</sup> See Richard Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 Calif. L. Rev. 1259 (1981).

<sup>4</sup> See Robert Crandall, *Controlling Industrial Pollution* (1983).

<sup>5</sup> This discussion is adapted from Bruce Ackerman and Richard Stewart, *Reforming Environmental Law*, 37 Stanford Law Review 1333 (1985).



cost-effective strategy of risk reduction could free enormous resources for additional pollution reduction or other societal purposes.

2. Command and control approaches tend to impose disproportionate burdens on new products and processes. Regulators typically impose far more stringent and costly controls on new sources because there is no risk of shut-down and unemployment. Also, new plants and products must run the gauntlet of regulatory proceedings to win approval; the resulting uncertainty and delay discourage new investment. BAT standards also impose disproportionate burdens on more productive and profitable industries because these industries can “afford” more stringent controls. This “soak the rich” approach penalizes growth and international competitiveness.

3. BAT controls can ensure that established control technologies are installed. But they do not provide strong incentives for the development of new, environmentally superior strategies, and may actually discourage their development by locking. Moreover, BAT controls often focus on “end of pipe” technologies that can be widely applied, rather than processes changes and other pollution prevention strategies, which tend to be specific to particular facilities.

4. BAT involves the centralized determination of complex scientific, engineering, and economic issues regarding the feasibility of controls on hundreds or thousands of pollution sources. Such determinations impose massive information-gathering and decision-making burdens on administrators, and tend to produce rigid, uniform requirements that are excessively costly or otherwise inappropriate as applied to particular facilities or products.

5. A BAT strategy is inconsistent with intelligent priority setting. Simply regulating to the hilt whatever pollutants happen to get on the regulatory agenda often results in large expenditures to address relatively minor problems, and may preclude the government from dealing adequately with more serious problems that come to scientific attention later. BAT also tends to reinforce regulatory inertia.

These criticisms are not theoretical. They reflect the results of detailed empirical study. For example, of twelve U.S. studies of the costs of regulating various air pollutants, seven indicated that traditional command and control regulation was more than 400% more expensive than the least-cost solution; four revealed that it was about 75% more expensive; one suggested a modest cost-overrun on 7%.<sup>6</sup> Even if a reformed system could cut costs by “only”

<sup>6</sup> See Ackerman and Stewart, *supra*, at 175-176. Other studies showed similar inefficiencies in the BAT system of water pollution control regulation. See *id.* at 176-177.

one-third, it could save more than \$14 billion a year on air pollution control expenditures in the United States alone.<sup>7</sup> The scope of potential savings is reflected in the United States in the fact that annual expenditures alone to comply with federal pollution control laws were estimated by EPA at \$115 billion in 1990, rising to \$185 billion by 2000.<sup>8</sup> While such expenditures are greater, in absolute amounts, in the United States than in any other single nation, and while the legal system and regulatory culture of the United States exacerbates the defects of command regulation, the gains from more efficient approaches to environmental protection in other nations would also be great.

The dynamic failings of the command and control system are also notable. If we are going to maintain, much less improve, environmental quality in the face of continued economic growth, it is imperative to develop new, environment-friendly means of meeting consumer demands. Central planning directives that assign pollution control quotas to individual facilities and prescribe in detail how they must be achieved stifle diversity and innovation, and fail to provide positive incentives for the development of environmentally superior processes and products. Instead, we should strive to harness the energies and incentives of the market system to protection of the environment in order to ensure that environmental goals are met more efficiently, reward managers who devise new and better ways of meeting economic and environmental objectives, and dismantle the environmental central planning bureaucracy. We cannot perpetuate an ever-expanding, ever, and ultimately incoherent array of procrustean orders.

A final, critical failing of the central planning approach to environmental protection is that it undermines democratic accountability. Decisions about what environmental problems should be addressed and the level of resources that should be directed at solving them are made through a remote bureaucratic process. The process consists of a myriad of separate and often uncoordinated standard-setting exercises involving archane engineering and economic issues. The decision making process is driven by bureaucratic objectives and routines and by interest group "insiders" with the specialized knowledge and resources to monitor and influence decisions of concern to their constituencies. Environmental policy is the aggregate of these myriad decisions, which are very difficult for the public political process to monitor or control.

<sup>7</sup> See Portney, *Air Pollution Policy*, in Portney (ed.), *Public Policies for Environmental Protection* 65 (1990) (reporting projected cumulative expenditures on air pollution control for 1979-1988 at \$427.71 billion).

<sup>8</sup> U.S. EPA, *Environmental Investments, The Cost of A Clean Environment* (1990).



### C. The Advantages of Market-Based Incentives Systems for Environmental Protection

The most powerful market-based incentives are taxes and tradeable permit systems. These two systems share important advantages over command and control central planning. Both place a price on pollution and waste. Taxes do so directly, tradeable permit systems indirectly by limiting the total number of marketable permits and thereby imposing an opportunity cost on their use. Both systems also decentralize to facility managers the decision as to how much to reduce pollution or waste and how to accomplish it. These managers have strong incentives to achieve continuing reductions in pollution or waste; in doing so they will increase their profits, either by paying less in taxes to the government or selling to other firms pollution permits that they no longer need. Moreover, they have the flexibility to achieve these reductions by whatever means they can devise, as compared to the lock-step regulatory approach in which all facilities within a given category must meet the same standard. Under a tax or tradeable permit system, those facilities with relatively low pollution reduction costs will find it profitable to achieve large reductions and thereby avoid paying so much in taxes or for permits. On the other hand, firms with relatively high costs will do relatively less in the way of reductions, finding it relatively cheaper to pay taxes or buy permits for their extra discharges. The resulting redistribution of the overall abatement burden from high-cost to low-cost abaters will ensure far more cost-effective achievement of overall environmental protection goals than under the lock-step command-and-control system.

In addition, economic incentives would encourage source reduction, shifts in economic activity among sectors, and structural changes; the Commission Task Force on the Environment and the Internal Market found that such changes would be needed to achieve environmental quality goals in the face of the pressures unleashed by the internal market and that traditional regulatory controls would not be able to achieve such changes.<sup>9</sup>

The market-based systems also reduce costs by encouraging and rewarding experimentation and innovation. In addition, the penalty imposed by the BAT system on new products or facilities and on more profitable industries will be eliminated; all emitters of the same pollutant or generators of the same waste must pay the same fee or permit price. The need for a large central planning bureaucracy to write detailed regulations will be eliminated. The government must select the level of the pollution tax, or determine the total amount of

<sup>9</sup> Task Force on the Environment and the Internal Market, "1992," *the Environmental Dimension* at 208-10 (cited in note 58).



pollution allowed and permits issued. But the decisions as to how each facility will limit pollution will be made by individual firms.<sup>10</sup>

The fact that the decisions made by government are much more limited in character promotes democratic accountability. Decisions on the overall level of pollution taxes or the overall amount of pollution to be allowed are much easier for the public to understand and the political process to control than a shifting array of highly technical BAT standards. For the same reason, these market based approaches make it easier to monitor and adjust overall priority setting.

The advantages of using information-based strategies to encourage consumer and investor demand for environmental quality are similar, although in this case the government no longer controls the overall level of demand for environmental quality. The demand is set directly by the public.

Deposit and return systems, which can include toxic and other wastes as well as containers and packaging, have a hybrid character. In order to obtain a refund, a waste generator or consumer must meet specified regulatory requirements, such as treating and safely disposing of toxic wastes or returning a beverage container to a collection center. However, the requirement of paying an initial fee is a form of tax that creates incentives to reduce the generation of waste or the use of excess packaging, or non-recyclable containers. In addition, the prospect of a refund provides a strong incentive for compliance with treatment and disposal requirements, and can make "midnight dumping" unprofitable. The level of the fee is a politically visible decision that the public can easily review and assess.

Environmental covenants or contracts consist of negotiated agreements between government authorities and industry on comprehensive targets and timetables for reductions of pollution or other risks in lieu of piecemeal regulatory requirements for specific types of pollution from particular facilities or plant units. Such agreements allow firms flexibility and a substantial amount of time to achieve designated reductions in overall pollution or risks in the most cost-effective way. The government which contracts for environmental quality on behalf of the public, achieves a greater level of reduction than would be attained by otherwise applicable command and control requirements. The contract can be set either on an industry-by-industry basis, or facility-by-facility. In the former case, democratic accountability can be maximized if the overall level of reductions demanded of different industries is coordinated as part of a national environmental plan that sets overall reduction goals and then

<sup>10</sup> See Project 88: *Harnessing Market Forces To Protect Our Environment* (1988); Project 88, *Round II* (1990).



allocates needed reductions among different industry sectors. This is the approach to environmental contracting taken by the Dutch.<sup>11</sup> Alternatively, if reductions are negotiated on a facility-by-facility basis, the community in which a given facility is located can effectively monitor and influence the decision.

There are, of course, various problems that must be addressed in the design and implementation of market-based incentive systems. For example, both tax and transferrable permit system require accurate monitoring of emissions or waste generation, and sanctions on those who fail to pay their taxes or who exceed their permit limits. Under a tradeable permit system the government must also keep track of permit ownership and record transfers. But monitoring and enforcement are also required under command and control systems. Indeed, the government will have a stronger interest in enforcing a tax system or a system of auctioned pollution rights because its own revenues are at stake. Fee systems may, however, be inappropriate if it is necessary to achieve a precise level of overall discharges, because it may be difficult for the government to select the fee level that will induce firms in the aggregate to just achieve that level. The advantages of both fee and transferrable permit systems is greatest if there are large numbers of sources generating pollution in the same airshed or water body. In such a situation, however, these systems may generate "hot spot" problems if polluting facilities utilize the flexibility which the systems afford to locate in the same vicinity. These systems can nonetheless be adjusted to restrict clustering of pollution sources, as some loss in efficiency. In general, there are no grounds for supposing that market-based systems will be more administratively difficult than the prevailing regulatory approach, and good reasons for concluding that they will in many respects be much simpler to implement.<sup>12</sup>

Environmentalists have objected to fees and transferrable permits as a "license to pollute" that allows the rich to degrade the environment with impunity. This criticism is misplaced on several grounds. It is the command and control regulatory scheme which confers a "license to pollute". The residual pollution allowed by regulatory requirements is free to the polluter. By contrast, under a tax or tradeable permit system, a source must pay or bear a cost for each and every unit of pollution to the commons. Imposing a price on residual emissions is not only more equitable, but also more efficient because it provides a continuing incentive for firms to devise ways to achieve further pollution reductions. Also, in a competitive market even a wealthy firm will

11 See Jan M. van Dunne, *Environmental Contracts and Covenants: New Instruments in a Realistic Environmental Policy?* (1993).

12 See Ackerman and Stewart, *supra*, at 178-188.

not continue to pollute if it can increase its profits by reducing pollution and thereby reduce its taxes or free up pollution rights for sale to others.

#### D. Applications of Market-Based Incentive Systems

The use of market-based instruments for environmental protection is not just the stuff of theory; it is already a reality in practical application in the United States and elsewhere. In several areas of environmental policy, market-based instruments are in place and operating with general and often great success.

*Trading Air Pollution Control Requirements.* The United States has used transferrable permit systems to deal with a variety of air pollution problems. The Environmental Protection Agency pioneered the use of trading systems that allow a plant to reallocate regulatory limitations on emissions of the same pollutant among different locations in the same plant and also different plants to reallocate control burdens.<sup>13</sup> The resulting flexibility has allowed firms to achieve large savings without sacrifice of environmental quality.

*The U.S. Acid Rain Program.* 1990 Amendments to the U.S. Clean Air Act adopted a trading system as an integral part of an ambitious program to deal with acid precipitation by reducing total sulfur emissions in the U.S. by 50% over ten years.<sup>14</sup> The foundation of this program is a system of SO<sub>2</sub> emissions allowances. Each allowance enables the holder to emit one ton of SO<sub>2</sub> in a particular year, or a subsequent year. The allowances may be freely bought and sold and used anywhere in the continental United States. EPA is to issue allowances to existing sources, in proportion to their energy output; this allocation rewards sources that have already reduced their emissions. New sources must obtain allowances from existing sources. Allowances are ratched down in a two-phase process in order to achieve the 50% reduction.

The Act allows facilities total flexibility in deciding how to reduce emissions and how much to reduce emissions. Firms can, for example, seek to reduce pollution by installing five gas desulfurization scrubbers or lower-pollution combustion technologies such as fluidized bed processes. They may switch to cleaner fuels, such oil, natural gas, or low sulfur or washed coal. They may reallocate capacity utilization from high-polluting to low-polluting units. They

<sup>13</sup> For a review of EPA trading programs, see R. Liroff, *Reforming Air Pollution Regulation: The Toil and Trouble of EPA's Bubble* (1986); Hahn & Hester, *Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Programs*, 16 Yale J. Reg. 109 (1989); Dudek & Palmisano, *Emissions Trading: Why is This Thoroughbred Hobbled?*, 13 Colum. J. Envtl. L. 217 (1988).

<sup>14</sup> Clean Air Act, §§ 401-416, 42 USC §§ 7651-7651o.



can shut down existing units and build new, less-polluting facilities. They may adopt renewable energy technologies. Or they may seek to reduce emissions by lowering consumption of energy through demand management techniques such as energy pricing schemes to reduce peak demand or assisting customers, through interest-free loans and information services, to adopt conservation measures such as insulation, low flow shower heads, and energy efficient lighting technologies. The flexibility thus afforded to firms is expected to reduce the cost of achieving the 50% reduction in SO<sub>2</sub> emissions from \$5 billion a year to \$4 billion or less.

Allowances are issued for each year. However, units can trade allowances for future years. In addition, the Act appears to contemplate "banking" of allowances. For example, if a facility doesn't use all of its 1998 allowances, it can save or "bank" the unused allowances for its own use in later years, or sell the unused allowance to others for their future use. EPA must establish a central accounting system to keep track of allowance transfers. Sources must install continuous emissions monitoring systems to monitor SO<sub>2</sub> emissions and report the results to EPA. There have been a number of trades in allowance futures thus far, and the Chicago Board of Trade has petitioned EPA for permission to set up a futures market in SO<sub>2</sub> allowances.<sup>15</sup>

*The Southern California RECLAIM Program.* Non-attainment of ozone (smog) standards in urban areas has become the most serious compliance problem under the Clean Air Act. The South Coast Air Quality Management District in California, which encompasses greater Los Angeles, has concluded that the traditional command and control regulatory system has reached its limits. In lieu of traditional regulation, the District was adopted a marketable permits program for emission of hydrocarbons (HC) and oxides of nitrogen (NO<sub>x</sub>), which interact in the atmosphere to produce ozone smog. Allowances for each pollutant will be issued to existing sources. The initial markets will include about 400 HC and NO<sub>x</sub> emitting facilities. Each covered facility is subject to a cap on facility-wide emissions, aggregated under the "bubble" principle. The emissions cap for each facility will then be reduced annually, by percentages geared to compliance with the "reasonable further progress" requirements for non-attainment areas established by the 1990 Clean Air Act Amendments. Sources may, however, freely trade emission rights with each

<sup>15</sup> For discussion of the sulfur trading program, see Van Dyke, *Emissions Trading to Reduce Acid Deposition*, 100 Yale L.J. 2707 (1992); Bartels, Marron & Lipsky, *Clean Air, Clear Market: Making Emissions Trading Work: The Role of a Computer-Assisted Auction*, 131 Pub. Util. Fortnightly, June 15, 1993, 14. Recent Developments, *The Clean Air Act Amendments of 1990 and the Use of Market Forces to Control Sulfur Dioxide Emissions*, 28 Harv. J. Legis. 235 (1991); Dennis, *Smoke for Sale: Paradoxes and Problems of the Emissions Trading Program of the Clean Air Act Amendments of 1990*, 40 U.C.L.A. L. Rev. 1101 (1993).

other. At present, there will be separate markets for SO<sub>2</sub> and NO<sub>x</sub>, although the possibility of interpollutant trading is being studied. Trading areas are zoned to avoid creation of "hot-spots" as a result of emissions bunching. There is an elaborate system of monitoring requirements to ensure current tracking of emissions. It is estimated that the trading system will reduce compliance costs by hundreds of millions of dollars annually and save thousands of jobs that would otherwise be lost.<sup>16</sup> States in the northeastern United States are considering the development of an interstate trading system to combat their regional ozone pollution problem.

*The Lead Phase-down Program.* During the 1980s EPA issued regulations reducing, on a phased basis, the allowable lead content of gasoline. The agency simultaneously authorized trading, within and among refiners, of the remaining allowed content of lead in their gasoline, and permitted firms who achieved extra reductions ahead of schedule to sell lead credits to others for whom refinery modifications were more difficult or costly. To provide leaded gasoline producers and importers with additional flexibility in complying with the new limits, the agency issued regulations permitting producers and importers whose gasoline in 1985 contained less lead per gallon than the applicable standard to "bank" lead content credits and apply them to future requirements or sell them to others.

Banking and trading were active and resulted in cost savings on the order of hundreds of millions of dollars over the few years of the program, as well as lessening opposition from small refineries facing high costs for reducing lead in gasoline. The program successfully reduced the lead content in gasoline by ninety percent.<sup>17</sup>

*Chlorofluorocarbon Reduction.* The U.S. is using trading and taxes as tools in the effort to phase out chlorofluorocarbons (CFCs) in order to protect the stratospheric ozone layer. To implement the 1987 Montreal Protocol and the national legislation following from it, the EPA has issued regulations requiring a phase-out of CFC production and consumption by the year 2000. It is implementing the phase-out by issuing depreciating allowances to each producer and importer of CFCs. CFC producers, importers, and other interested parties may trade these allowances. In addition to issuing CFC allowances, the United States has imposed a tax on CFC production and importation. Like the

<sup>16</sup> Dwyer, *The Use of Market Incentives in Controlling Air Pollution: California's Marketable Permits Program*, 20 Ecol. L. Quarterly 103 (1993).

<sup>17</sup> For discussion, see Barry D. Nussbaum, *Unleaded Gasoline Transition in the U.S.: The Use of Mandates and Incentives* (U.S. E.P.A., 1991).



allowance trading system, this tax provides a market for the development and use of substitutes for CFCs.<sup>18</sup>

*Environmental Contracting and Covenants.* The Netherlands has recently begun to use environmental contracts on an industry-wide basis as a means of achieving the ambitious pollution reduction goals contained in its National Environmental Policy Plan. This plan sets comprehensive, multi-media national targets for pollution reduction and environmental improvement over the next twenty years, with interim benchmarks.<sup>19</sup> Each industry is allocated a designated share of the required reductions and improvements. The responsible government authorities and a number of industry groups, such as the basic metals industry, have signed or are currently negotiating contracts in which the industry agrees to achieve the overall targets assigned to it. In return, the government agrees to substitute the contractual arrangements for the pollutant-by-pollutant regulations otherwise applicable, and to restrict charges in requirements during the period of the contract. The plan's purpose is to give industry flexibility to achieve overall reductions in a more cost-effective fashion and to provide it with relative certainty regarding requirements over an extended period of time in exchange for greater reductions than would otherwise be required or achieved. If industry facilities fail to meet their commitments, they face penalties and reinstatement of the traditional regulatory requirements. Similar agreements are being negotiated in Germany, Belgium, and Denmark.<sup>20</sup> Japan has followed an approach under which local municipalities negotiate agreements of varying degrees of comprehensiveness with individual industrial facilities.<sup>21</sup>

The U.S. has had limited experience with the contractual approach. Congress adopted an ambitious program of technology-based controls for 191 specified toxic pollutants in section 112 of the 1990 Clean Air Act,<sup>22</sup> but section 112 also authorizes an alternative "early reduction" program. Industries that achieve a 90% reduction in toxic pollutants before the EPA promulgates regulations imposing technology-based regulatory controls are exempt from compliance with the new regulations for five years after they come into effect.<sup>23</sup> In this provision, the government is essentially offering a unilateral contract, promising sources flexibility and assurance against future modifica-

18 See S. Seidel and D. Blank, *Closing an Ozone Loophole*, *Env'tl Forum*, Nov.-Dec. 1990, at 18, 20.

19 Jan Van Dunne, *supra*.

20 See *id.*

21 See Julian Gresser, *et al.*, *Environmental Law in Japan*, at 229-79; Bruce E. Aronson, *Review Essay, Environmental Law in Japan*, 7 *Harv. Int'l L. Rev.* 135, 143-47.

22 Clean Air Act, §112(h), 42 USC §7412(h).

23 Clean Air Act, §112(i)(5), 42 USC §7412(i)(5).

tion of requirements for a limited time. In exchange, the government receives substantial reductions earlier than it could through the cumbersome system of command-and-control regulation, which requires years of rule making proceedings and other steps to implement new controls.

*Other Market-based Incentive Programs.* Many states in the U.S. have adopted deposit/refund programs for beverage containers. Some municipalities have instituted charges for deposit of household waste based on its weight and content, charging more, for example, for wastes containing non-recyclable material. The European Union and several of its member states have adopted ecolabel programs for consumer products. The U.S. Securities and Exchange Commission requires companies whose stock is listed on stock exchanges to disclose to investors environmental requirements and liabilities that are financially material. Germany, and the Netherlands have imposed taxes on water or on pollution. In most instances, however, these charges are designed to raise revenues to cover the administrative costs of environmental regulators or the costs of joint treatment of effluent, rather than to provide incentives for limiting pollution.

## E. Conclusion

There is enormous scope for expanded use of market-based incentives systems in order to better promote economic and environmental objectives and enhance the democratic accountability of government decisions on environmental protection priorities and resource commitments. Market-based incentive system are not a panacea, and are not appropriate for every type of environmental problem. But the single-minded attachment to central planning that has dominated environmental law and policy must be abandoned in favor of a broader array of approaches that will far better serve society's needs and aspirations.



## II. Environmental Protection in a Regime of Trade Among States

The relation between environmental protection and markets become more complex in a plural system of many states bound by a common free trade market. The United States, the European Union, and international trade among nations are different versions of such a system. This part of the essay first summarize the rationale for free trade. It then considers the arguments for and against uniformity of environmental regulation throughout a given free trade regime. The relation between trade and environmental protection is then examined in the specific context of three different types of environmental problems:

*Products.* Examples of environmental problems posed by products include automobile air pollution, pesticide residues on foods, and the release of ozone-depleting chemicals from refrigeration units.

*Processes,* including industrial and product manufacturing processes, and forestry, mining, agriculture, fishing and other resource extraction and management processes for production of products. Environmental problems posed by processes include air pollution, water pollution, soil contamination, and habitat destruction.

*Wastes.* Examples of environmental problems caused by wastes include toxic and radioactive contamination.

This Part also examines the relation between environment and trade in the context of the different political and institutional structures of the USA, the European Union, and the international community. It concludes with an examination of the contribution which market-based incentives might make toward promoting environmental and economic objectives in these settings.

### A. The Free Trade Regime and the Rise of Environmental Regulation

The cornerstone of the case for free trade is the mutual economic benefit resulting from trade among nations with differences in comparative advantage in producing goods and services. This concept has been characterized by Paul Samuelson as "the sole proposition in the social Sciences which is both true and non-trivial".<sup>24</sup> In the classic Ricardian conception, comparative advantage was

<sup>24</sup> David Robertson, *Trade and the Environment: Harmonization and Technical Standards*, in *International Trade and the Environment* 309, 311 n.6 (Patrick Low ed., 1992).

based on relative differences in physical factor endowments – such as the character of agricultural land, climate, timber, and mineral resources – among nations.<sup>25</sup> But an enlarged conception of comparative advantage has come to include differences in human capital and industrial and technological infrastructure. No reason exists in principle why comparative advantage should not also encompass differences in the ability of ecosystems and populations to assimilate pollution, and also differences in national economic, social, and regulatory policies and legal and administrative systems.

There are additional reasons, beyond comparative advantage, why free trade enhances the welfare of all nations engaging in trade. A wider market enhances the opportunity to realize economies of scale. It also promotes specialization, with attendant gains in productivity. A greater array of suppliers stiffens the efficiency-promoting discipline of competition. The wider network of contacts accelerates the diffusion of knowledge and technological innovation.

Experience confirms the economic benefits of a free trade regime (FTR). Empirical studies show a strong correlation between the degree of trade liberalization and economic growth rates among different nations and a similar correlation between changes in trade policy and growth in individual nations.<sup>26</sup>

The economic benefits from a common market and the perceived detriments from trade rivalry among the American states under the Articles of Confederation were an important impetus for the ratification and adoption of the United States Constitution.<sup>27</sup> Moreover, the expected gains from the creation of a common market and common currency were not purely economic; it was thought that economic integration would advance political integration and mutual security. Similar considerations propelled the creation and subsequent strengthening of the European Union. Economic rivalry was thought to breed political conflict and to have contributed to the outbreak of three large-scale wars in Europe within seventy-five years. Europeans believed that economic integration would ameliorate the causes of political and military conflict.

Economic integration was seen as a global imperative after World War II. Many western leaders thought that restrictive trade policies by major nations

25 David Ricardo, *Principles of Political Economic and Taxation* 113-17 (London, George Bell & Sons 1891).

26 See Anne O. Krueger, *Perspectives on Trade and Development* 57-62 (1990); Anne O. Krueger, *Trade Policy as an Input to Development*, 70 Am. Econ. Rev. 288 (1980).

27 See Merrill Jensen, *The New Nation: A History of the United States During the Confederation 1781-89* (1950).



in response to the Great Depression were a major cause of the continued economic stagnation of the 1930s. The development of a coordinated international monetary policy at Bretton Woods and the promotion of trade liberalization through the General Agreement on Tariffs and Trade (GATT) were cornerstones of global prosperity. The post-war creation of a global FTR was a major factor behind the spectacular growth of the global economy in the following three decades.<sup>28</sup>

The rise of environmental regulation has created a threat of conflict between trade and environmental objectives. On the one hand, free traders have feared that states' environmental regulations represent a serious non-tariff barrier to trade. On the other hand, environmentalists fear that the FTR will undermine national efforts to adopt more protective environmental controls and drive environmental regulation towards the lowest common denominator.

Both the United States and the European Union have experienced internal controversy over the legality of state environmental regulations that assertedly threaten free trade. In the international context, environmentalists' fears concerning the trade regime were ignited by the Gatt panel decision in the Tuna Dolphin case, invalidating, as contrary to GATT, U.S. legislation banning imports of tuna caught by Mexican fishing boats on the high seas because of their failure to comply with U.S. regulations on the incidental take of dolphin while fishing for tuna.<sup>29</sup> The asserted conflict between environmental regulation and free trade was a major issue in the negotiation of the North American Free Trade Agreement (NAFTA) and was also a topic of concern in the conclusion of the GATT Uruguay Round and the creation of a World Trade Organization. It is thus important to understand the relation between environmental regulation and trade in order to clarify the debate and find new institutional means for reconciling economic and environmental goals.

## **B. Arguments for and Against Uniformity in Environmental Regulation Among Trading States**

Because of dominant reliance on command and control regulation to deal with environmental problems, the trade-environment debate has been framed around the following questions: Should states be free to adopt whatever level of environmental regulation they wish? Should uniform standards be adopted? If uniform standards are adopted, should individual states be precluded from adopting more stringent standards?

<sup>28</sup> See Jagdish Bhagwati, *Protectionism* (1988).

<sup>29</sup> GATT: *Dispute Settlement Panel Report on United States Restrictions on Imports of Tuna*, 30 I.L.M. 1594 (1991); DS29/R (June, 1994).

Environmentalists tend to favor adoption of uniform standards at a high level of protection, but maintain that states should be free to adopt more stringent standards. Free traders tend to favor allowing each state to adopt its own standards for regulation processes within its borders; allowing each state to adopt non-discriminatory standards with respect to waste shipment and disposal; and the adoption of common standards for products, precluding the ability of individual states to adopt more stringent standards. The resolution of this debate turns on consideration of several different factors.<sup>30</sup>

*Threats to Free Trade Posed by Different State Environmental Standards.* Differences in environmental regulatory standards among states linked by free trade may threaten free trade and diminish the benefits that it provides. As developed more fully below, this threat is potentially significant in the context of product regulation, where differences in state regulatory standards can create trade barriers and excessive transaction costs. Differences in the regulatory standards applicable to wastes, however, are unlikely to have similar adverse results, so long as a state applies the same standards to out-of-state wastes as it applies to its own states. The trade-based argument for uniformity does not apply at all to differences in process standards. The fact, for example, that state A has more or less stringent air pollution control regulations for manufacturing plants than state B does not in any way obstruct trade between them.

*Differences among States in Assimilative Capacity.* Different states may appropriately adopt different environmental regulatory standards in order to reflect differences in environmental, economic, and social circumstances. Geographic, ecological, and demographic variations among nations affect the ability of different nations to assimilate pollution and other forms of natural resource exploitation. A nation with fast-running, short rivers, can assimilate a higher level of water pollution with less environmental harm than nations with long, slow-running rivers. A British official is reported to have said: "Italy economically benefits from the amount of sunshine that it receives each year. Why should not our industry be able to take similar advantage or our long coastline ... and rapidly flowing rivers?"<sup>31</sup> Nations with soils that are low in buffering capacity suffer greater damage from acid deposition than those with high buffering capacity. A large, sparsely-populated country will suffer fewer adverse health and environmental effects from a given level of pollution emissions than will a small, densely populated country. Nations also differ in their existing levels of pollution and other forms of environmental resource

<sup>30</sup> For further discussion of these factors, see Richard Stewart, *Environmental Regulation and International Competitiveness*, 102 Yale L.J. 2039 (1993).

<sup>31</sup> See David Vogel, *Environmental Protection and the Creation of a Single European Market* 7 (1992) (unpublished paper presented at 1992 Annual Meeting of American Political Science Ass'n, on file with author).



use. For example, those with lower levels, other things being equal, will be better able to accommodate additional pollution than nations that already have high levels of pollution.<sup>32</sup>

Social, cultural, and historical factors may lead different societies to attach more or less importance to environmental protection as opposed to expanding the supply of public and private goods and services. For example, even within Western European nations at comparable stages of economic development, there are striking differences in environmental orientation between nations such as Germany, Denmark, and the Netherlands on the one hand and France, Great Britain and Italy on the other.

There are also differences in wealth among nations. Experience shows that societies treat environmental quality as a "luxury"; they demand relatively more of it as income rises and needs for housing, food and other "basics" are satisfied. Wealthier societies also tend to be better educated and therefore more cognizant of the importance of environmental protection. Thus, wealthier nations are more likely to choose to devote a higher percentage of their resources to environmental protection. Wealth and associated educational levels also affect nations' abilities to develop strong, capable administrative authorities to devise, implement, and enforce effective environmental protection measures.<sup>33</sup>

Finally, nations differ in their stage of economic development, which affects not only their wealth but also the composition of their productive output. While there is no "iron law" that produces a fixed, uniform pattern of economic development, most contemporary nations have moved from economies that are based primarily on agriculture, to a stage of intensive industrialization, and then to patterns in which service industries are increasingly important.<sup>34</sup> Nations at the intermediate stage of intensive industrialization are likely to produce proportionately more pollution and other forms of environmental

32 This conclusion must, however, be qualified by noting that nations with relatively pristine environments may have a strong interest in preserving them; in such a nation, the marginal harm of an additional increment of pollution may be greater than in a nation already moderately polluted.

33 One measure of enforcement levels is the funding for enforcement efforts. In 1991, the U.S. per capita budget of the Environmental Protection Agency was \$24.40; the Mexican per capita budget of the Mexican environmental agency (formerly SEDUE, now SEDESOL), was \$.48. The Mexican figure in 1989, however, was only \$.08. See Juanita Darlin *et al.*, *Can Mexico Clean Up its Act?*, L.A. Times, Nov. 17, 1991, at A1 (citing Congressional Research Service data).

34 See Colin Clark, *The Conditions of Economic Progress* 492 (3d ed. 1957) (pointing out that as economies develop, employment declines in agriculture then in manufacturing); Ronald K. Shelp, *Beyond Industrialization: Ascendancy of the Global Service Economy* 80-81 (1981) (citing exceptions to general pattern of development).

degradation in relation to GDP than nations whose economies depend primarily either on agriculture or services.<sup>35</sup> It will accordingly be relatively more costly for such nations to achieve a given level of environmental quality than those in which industry constitutes a smaller percentage of output.

These several variables will mean that different nations will vary in their capacity to assimilate pollution and other adverse environmental effects of resource use. They will also differ in the extent to which citizens are willing to forgo other public and private goods and services to prevent environmental degradation. Accordingly, the governments of different nations, each responsive to the welfare of its citizens, could justifiably adopt environmental requirements of quite different stringency. These requirements would appropriately reflect the effective assimilative capacity of the environment in each country.<sup>36</sup>

Investment in polluting industry should flow to nations with lower standards and greater assimilative capacity. This flow of investment benefits the residents of these nations, who place a higher priority on expanding the output of public and private goods and services or can assimilate pollution with less environmental damage. It also benefits residents of nations with higher standards and lower assimilative capacity, who would suffer greater welfare loss if polluting industries were located in their country. This beneficial flow of investment is driven by variations in relative competitive advantage attributable to the differences in national standards.<sup>37</sup>

On this analysis, adoption of uniform standards would lead to inappropriately high standards in nations with higher assimilative capacity, forcing them to devote too few resources to non-environmental goods and services which they would otherwise prefer. It might also lead to inappropriately low standards in other nations. Uniform measures would thus reduce welfare by restraining trade without producing compensating benefits.

*Competitive Rivalry and the "Race to the Bottom".* Despite the economic argument for different environmental standards in different states, it has been

35 Robert E.B., Lucas et al., *Economic Development, Environmental Regulation and the International Migration of Toxic Industrial Pollution: 1960-88*, in P. Low, ed., *supra* note 24, at 67, 67-69.

36 See Judith M. Dean, *Trade and the Environment: A Survey of the Literature*, in P. Low, ed., *supra* note 24, at 15, 15-16; see also James E. Krier, *The Irrational National Air Quality Standards: Macro- and Micro-Mistakes*, 22 UCLA L. Rev. 323, 324-330 (1974) (criticizing uniform air quality standards in the United States for ignoring variations in costs and benefits of pollution control among states).

37 See Martin C. McGuire, *Regulation, Factor Rewards, and International Trade*, 17 J. PUB. ECON. 335, 336 (1982).



argued that a system which allows states to adopt different standards might lead to competition among states to adopt less burdensome and costly requirements in order to favor its own industry in international competition, producing a Prisoner's Dilemma<sup>38</sup> that results in a "race to the bottom" in standards. According to the argument, each nation, acting independently, fears that other nations will adopt lax environmental requirements, and that it will therefore suffer serious competitive disadvantage if it adopts the more stringent requirements that it prefers. Since each nation reasons in the same way, all adopt less stringent requirements than they would prefer individually. This argument is often accompanied by the expressed fear that industry will attempt to play one state off another and engage in "blackmail."

This argument is most frequently voiced in the context of process regulations, where a state's imposition of costly requirements will increase its industry's manufacturing costs and thereby disadvantage it in trade competition. It is also potentially applicable to product regulation. If state A's manufacturers have to meet stringent and costly regulatory requirements for products sold in the domestic market, they will either have to sell the same product abroad or manufacture a separate export product line. In either event, they are likely to incur higher costs than competitors in states with lower standards. The race to the bottom argument is also potentially applicable to waste disposal and treatment regulation, but few nations seem eager to compete in the waste handling business by adopting lax standards. The implication of the "race to the bottom" argument is that uniform minimum standards should be adopted in order to forestall destructive competition.

The response to the "race to the bottom" argument is that there is no reason to suppose that international competition for comparative advantage will lead nations to adopt inappropriately low environmental standards. In a purely domestic context, a government must weigh the benefits of environmental protection against the cost of forgoing other goods and services that could be produced by the resources devoted to environmental protection. In the international context, those costs may also include reduced competitiveness in the world market, a cost set by the existing levels of environmental requirements throughout the world. Each nation will weigh this cost against the benefits of enhanced environmental protection, which are a function of its assimilative capacity. Each nation will achieve its own balance between cost and benefit. On this analysis, there is no Prisoner's Dilemma and no race to the bottom.<sup>39</sup>

38 See R. Duncan Luce & Howard Raiffa, *Games and Decisions: Introduction and Critical Survey* 94-97 (1957).

39 See Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the "Race to the Bottom" Rationale for Federal Environmental Regulation*, 68 N.Y.U. L. Rev. (1994). (discussing the issue in context of competition for industry among states in the U.S.).



There may nonetheless be ways in which a "race to the bottom" might occur. One possibility is that national political systems are myopic. The government of nation A may lower its standards in order to gain competitive advantage, not foreseeing that B will reduce its standards in response. When B matches its reduction, A may reduce its standards still further in the false expectation of securing a permanent advantage. Such extreme myopia, which might produce a never-ending downward spiral in standards, seems highly implausible. A more realistic possibility is that A is uncertain about the exact value that B's political system places on environmental protection and how B's government will respond to A's choice of standard, and vice-versa. If each nation's choice of standards depends on those chosen by other nations, if each is uncertain as to what choices others will make, and if each is unsure how others will respond to its choices, it is possible that all nation might indeed adopt lower standards than they would otherwise prefer.

But, if nations compete for mobile capital by lowering their environmental standards, harmonizing standards at a relatively high level will not eliminate such competition altogether. Rather, it will simply shift the competition into other forms, such as lower occupational health and safety standards or lower taxes for funding social programs.<sup>40</sup> If so, one must justify giving priority to eliminating competition in environmental standards, or advocate worldwide uniformity in all government regulations affecting the cost of producing goods and services.

*Environmental Externalities.* Externalities can both cause and result from inadequate process standards.<sup>41</sup> Environmental process standards are likely to be less stringent than otherwise when some of the adverse environmental effects of a process are imposed on other nations, for example through trans-boundary pollution. The state in which the processes are located is likely to pay little or no attention to the interests of other states, and accordingly, it will fail to adopt adequate requirements. For many years Britain did not control sulfur emissions from its power plants because most of the adverse effects were experienced in Scandinavia and elsewhere.<sup>42</sup> Environmental externalities are not limited to physical spillovers of pollution or wastes. Many individuals

Put in somewhat different terms, it may be conceded that the decisions of one nation about environmental standards create externalities for other nations by reducing or enhancing competitive effects. These externalities, however, are pecuniary ones and therefore should not produce market failures.

<sup>40</sup> See Revesz, *supra*.

<sup>41</sup> Environmental externalities can also be associated with product standards. Consider, for example, an upwind state that adopts relatively lax standards for air pollution from automobiles, much of which is carried to downward states.

<sup>42</sup> See, e.g., Richard Wallis, *Sweden Criticizes Britain Over Acid Rain Pollution*, Reuters N. Eur. Service, Mar. 4, 1985.



care deeply about the preservation of rare or environmentally significant resources in other nations, or even about localized pollution. Some nations may allow destruction of their tropical rain forests because most of their own citizens do not care greatly about preserving them, even though many people in other countries are extremely distressed by the disappearance of rare species and ecosystems.<sup>43</sup> Regardless of the form of environmental externality, nations will often fail to adopt appropriate environmental standards because the costs of more stringent standards will be borne by the nation adopting them, whereas a significant portion of the benefits will accrue to those in other nations.

A somewhat different form of incentive problem is present in the case of the global commons, such as the atmosphere, the oceans, or Antarctica. Biological diversity might also be regarded as a form of global commons, even though many biological resources are located within natural boundaries. All nations may benefit if each acted to protect the commons from despoliation, but it may be that no nation has an adequate incentive to take such action. Each nation may, for example, benefit from measures to eliminate emissions of chlorofluorocarbons (CFCs) that destroy upper atmospheric ozone, causing an increase in cancer-causing ultraviolet radiation at the earth's surface.<sup>44</sup> Similarly, it may be in the mutual interest of all nations to limit whaling in order to prevent the extinction of whales.<sup>45</sup> From the viewpoint of any one nation it may not, however, be rational to unilaterally limit CFC emissions or whaling because most of the benefits of such action would accrue to others, while it would bear all of the costs. If this is true for each nation, no nation will adopt restrictions, even though all nations would be better off if each did. Under this "tragedy of the commons" scenario, no one will prevent the despoliation of the commons.<sup>46</sup> On the other hand, a few nations, who may be economically developed and deeply committed to environmental protection, may find the benefits to them of preserving the commons sufficient to justify unilateral protective measures. Nonetheless, other nations may choose to "free ride" on their efforts, enjoying the benefits while contributing nothing of their own. Finally, states may also adopt lax standards for other reasons, such as the quest for competitive advantage. These standards can cause environmental degradation or psychic loss in other countries because of environmental externalities.

43 See, e.g., David Adamson, *Defending the World: The Politics and Diplomacy of the Environment* 90-104 (1990).

44 See, e.g., Robert W. Hahn and Albert M. McGartland, *The Political Economy of Instrument Choice: An Examination of the U.S. Role in Implementing the Montreal Protocol*, 83 Nw. U.L. Rev. 592, 595 (1989).

45 See, e.g., Anthony D'Amato & Sudhir K. Chopra, *Whales: Their Emerging Right to Life*, 85 Am. J. Int'l L. 21, 22 (1991).

46 See Garret Hardin, *The Tragedy of the Commons*, 162 Science 1243, 1244 (1968).



The importance to be accorded to environmental externalities depends critically on their extent. Many environmentalists believe that everything is connected to everything else, and that the regional and global environmental externalities generated by local activities are pervasive and powerfully destructive. If this is the case, far-reaching regional or international agreements or authorities would be necessary to deal with such systematic and compelling externalities. Such externalities would also reduce the importance of, and therefore the need to accommodate, national differences in ecological conditions and values that would otherwise justify substantial differences in standards among states. Thus far, however, science has established relatively few acute physical environmental externalities of broad scope; these include stratospheric ozone depletion, atmospheric buildup of greenhouse gases, loss of biodiversity, and instances of regional air or water pollution problems. Concerns based on externalities should therefore be focussed on these problems.

*Ecological Imperatives and Democratic Values.* The considerations discussed above are largely utilitarian in character. They involve factors that must be considered in how best to promote overall welfare. But the debate over trade and the environment also involves important moral and political values that transcend welfare maximization.

Many environmentalists maintain that environmental protection is an ecologically-based ethical imperative. They invoke a variety of justifications for this position. Some hold that a safe and healthy environment is a basic human right. Others stress obligations to future generations to preserve the earth's resources, including the diversity and beauty of those resources. Still others assert that humans have duties to other species or to nature herself.<sup>47</sup> The common implication of these positions is that environmental policy should not be based solely on welfare-maximizing factors such as assimilative capacity. Rather it must be based on global ethical and ecological imperatives. A further implication is that there is no virtue in allowing each state to choose whatever level of environmental protection it believe appropriate for its circumstances. Rather, all nations and their citizens have a common obligation to protect the earth's environment at levels necessary to protect human health, preserve the resource base, and preserve non-human species and the ecosystems which sustain life. Accordingly, all states should adopt a common, high level of environmental protection. Considerations of trade, economic welfare, and state autonomy should be subordinated to this common goal. This position is reinforced by the view, noted above, that environmental externalities are systemic and important. If environmental externalities are indeed pervasive, states may not ignore the adverse impact of their environmental policies on citizens of

<sup>47</sup> See Edwin M. Smith, *The Endangered Species Act and Biological Conservation*, 57 S. Cal. L. Rev. 374 (1984) (discussing various ethical theories).



other states, on future generations, and the biosphere itself. They are obliged to join in common protective measures.

A quite different normative position with directly opposed implications is based on the important political virtues in the ability of a state or other political unit to choose its own environmental policies, based on its assessment of its own needs and priorities. In a democratic state, the virtues of self-determination extend to the people as a whole, and their ability to shape their own community and its destiny. Decisions about the use of common resources, including the air and water, are central to a political community's self-governance. This view finds especially strong support in the developing countries, who often regard efforts by environmentalists and developed nations to foster their adoption of environmentally protective measures as a new form of colonialism. The developing countries often claim that scientific uncertainty is too great to justify large economic sacrifices for potential threats such as climate change, and that in any event the burden of any sacrifice should fall on the rich countries who have built up their economic base by despoiling the earth.

### **C. The Relation Between Trade/Environment Issues and Different Types of Environmental Problems**

The arguments for and against uniformity of environmental regulation among states trading in a common market are quite different, depending on whether the regulation in question concerns products, processes, or wastes.

*Product Regulation.* Different state product regulations pose an obvious and immediate threat to the realization of a common market. The threat stems from the strong strategic position of states importing products manufactured elsewhere. A state that is downwind of an air pollution source in another state cannot block the pollution. Nor can it block lax environmental regulation in another state that may give industry a competitive advantage in world markets. In the case of products, however, self-help is readily available. A state that adopts comparatively stringent and costly product regulations can prevent noncomplying imports from harming its industry by excluding or prohibiting their sale. This form of self help, however, can be used for protectionist purposes. If followed by many states, it can also lead to a tangle of conflicting or cumulatively burdensome requirements preventing full realization of the benefits of the common market.

A basic requirement of common market or trade law is that state regulation must be facially nondiscriminatory. But states seeking competitive advantage may comply with this requirement and still seek to use product regulation to

benefit domestic manufacturers. Facially nondiscriminatory product regulations are often designed in such a way as to give a competitive advantage to local firms. For example, the U.S. banned imports of Canadian lobsters that did not meet the minimum size requirements imposed by the U.S. on lobsters harvested in the U.S., despite evidence that Canadian lobsters are naturally smaller because Canadian waters are colder.<sup>48</sup> The disputes between the U.S. and the European Union (EU) over the U.S. ban on EU wine containing trace residues of pesticides and the EU ban on U.S. beef from cattle that had received bovine growth hormones are also illustrations of environmental and health measures that have been attacked as disguised trade restrictions.<sup>49</sup> Moreover, manufacturers in a state with more stringent or otherwise distinctive standards are likely to enjoy scale economies in complying with such requirements and thus obtain a competitive advantage over importers. For example, German producers have complained that Danish container recycling requirements undercut their ability to compete with Danish brewers in the Danish market.<sup>50</sup> Domestic producers are also likely to be more familiar with the domestic regulatory and legal system and therefore better able to deal with it.

Quite apart from these discriminatory effects, differences in standards among states impair trade by forcing manufacturers to learn about and respond to different regulations in different states, thus increasing transaction costs and undercutting the economies of scale achievable in a common market with uniform standards.

All nations and producers have a basic common interest in harmonizing their product regulations in order to reduce transaction costs, efforts at disguised protectionism, and other trade barriers resulting from differences in national standards. Harmonization promotes the advantages of a more extensive product market: specialization, scale economies, and increased competition. The importance of these factors is reflected in the proposed North American Free Trade Agreement (NAFTA), which has extensive provisions

48 See *Lobsters from Canada*, 1990 WL 299945 (U.S. Can. F.T.A. Binat. Panel, May 25, 1990) (upholding U.S. ban).

49 See *Ban on Some European Wines May End*, N.Y. Times, Feb. 2, 1991, at A10; *Don't Let Hormones Start a Trade War*, N.Y. Times, Dec. 28, 1988, at A26.

50 The European Court of Justice upheld most aspects of the Danish law against a claim by the European Commission that the law unlawfully interfered with the common market. See Case 302/86, *Commission v. Denmark (Re Disposable Beer Cans)*, 1988 E.C.R. 4607, 1 CMLR 619 (1989) (upholding deposit-and-return system on containers, but striking down requirement that only certain approved containers could be used as violation of Article 30 EEC).



designed to promote harmonization of product standards.<sup>51</sup> To be sure, it is not always easy to agree on common standards. Differences in environmental, social, and economic conditions among nations may make different product standards appropriate. Environmental groups fear that harmonization will weaken standards in the U.S. and other nations with the most stringent standards, while producers in developing nations complain that they cannot afford to comply with more stringent requirements.<sup>52</sup> Moreover, the impairment to free trade resulting from different standards is a matter of degree. The legitimate interests of states in having different environmental standards may justify variations in product standards among different states.

*Process Regulation.* The potential conflicts between trade, competitiveness, and process regulation and liability rules are different, more serious, and more intractable. Producers in states with more stringent regulatory requirements and expansive liability rules will incur higher costs in complying with regulatory requirements and avoiding liability. These higher costs will, other things being equal, disadvantage such producers competing in both domestic and international markets. Moreover, states are generally have little in no ability to prevent environmental degradation within their borders resulting from pollution spillovers from nations with lax standards. They also can not directly enforce pollution control or resource preservation requirements within the territory of other states.

In order to deal with the competitive and environmental impacts of lower standards in other states, states with higher standards might seek to exclude or impose special duties on products imported from states with lower standards. Such measures, however, are generally illegal under international trade law,<sup>53</sup> and cannot in any event insulate domestic producers from the competitive disadvantage they face in third markets. Nor can nations with more stringent standards prevent multinationals from moving operations to nations with laxer environmental requirements. Litigation is, as a practical matter, of little assistance in the case of most pollution spillovers, and affords no remedy for competitive disadvantages or for preservation losses in other states.

In these circumstances states disadvantaged as a result of lower standards in other states can only obtain relief through federal or supranational legislation

51 See North American Free Trade Agreement, Chs. 7B (Sanitary and phytosanitary measures), 9 (general standards-related measures).

52 See Matthew Hunter Hurlock, Note, *The GATT, U.S. Law, and the Environment: A Proposal to Amend the GATT in Light of the Tuna/Dolphin Decision*, 92 Colum. L. Rev. 2098, 2131-33 (1992); John Burgess, *Competing in a Diverse Market; U.S. Firms Seek Unity on Product Standards in Europe*, Wash. Post, Dec. 2, 1991, at A1.

53 See the GATT Panel Tuna-Dolphin decisions, note 29, *supra*.



or agreements among states. The result generally sought is adoption of uniform minimum standards, allowing individual states to adopt and enforce more stringent process standards if they choose. However, the common interest in harmonizing process standards is typically much weaker than the common interest in harmonizing product standards, where harmonization can increase the economic welfare of all nations by removing trade barriers. Differences in process measures by themselves do not create trade barriers. Despite evidence that the competitive significance of differences in environmental process regulatory standards is modest,<sup>54</sup> states that have adopted less stringent standards presumably wish to retain whatever economic benefits, including competitive advantages, that such standards confer, as do industries located in those states. Industries in states with more stringent standards would prefer to see their competitors subject to the same standards, but the interests of their competitors is diametrically opposed. Finally, it is far more difficult to monitor and enforce compliance with common process measures than it is compliance with product standards.

The potential competitiveness consequences of different process standards has excited deep political controversy, as illustrated by the U.S. debates over ratification of the NAFTA. For example, environmental and union groups asserted that if trade with Mexico were liberalized, Mexico's weaker environmental requirements would lead U.S. industry to relocate there.<sup>55</sup> The "Reagan-Bush" version of "free trade" was attacked as producing a situation where "the lowest common denominator prevails" in environmental regulation.<sup>56</sup> Politicians, invoking the concept of "fair trade", denounced "pollution havens," and voiced concern that competition among nations in regulation will result in a "race to the bottom", substantially weakening U.S. regulatory standards.<sup>57</sup> President Clinton asserted that Mexico should tighten its environmen-

54 See Richard Stewart, *Environmental Regulation and International Competitiveness*, 102 Yale L.J. 2039, 2061-2084 (1993) (reviewing and evaluating empirical studies).

55 See *Environmentalists, Labor, Others Join in Conference on International Trade*, *Int'l Env't Daily* (BNA), Aug. 27, 1992; Stephen L. Kass and Michael B. Gerrard, *The North American Free Trade Agreement*, N.Y.L.J., Nov. 2, 1992, at 3.

56 Peter DeFazio, *The Environmental Cost of Free Trade*, 7 J. Env'tl. L. & Litig. 9 (1992). The author is a Member of Congress from Oregon.

57 See NAFTA: *Hearings Before the Subcomm. on Int'l Trade of the Senate Comm. on Finance*, 102d Cong., 2d Ses. (1992); *Baucus Says NAFTA Still Needs to Bridge Gap on Mexican Environmental Enforcement*, 1992 Daily Rep. for Executives (BNA) No. 130, at D-14 (July 7, 1992), available in LEXIS, Nexis Library, DREXEC File; *NAFTA: No Direct Sanctions Allowed if Mexico Lax in Environmental Enforcement*, *Reilly Says*, *Int'l Trade Daily* (BNA), Sept. 17, 1992, available in LEXIS, Nexis Library, BNAITD File.



tal standards "so we don't have people running down there so they can evade all the Clean Air Act" requirements.<sup>58</sup>

The attention given to the competitiveness impact of different environmental process standards seems analytically and factually misplaced. The debate ignores the benefits of environmental protection. If U.S. citizens prefer high levels of environmental quality, then the costs – including the costs associated with reduced international competitiveness – of efficiently achieving those quality levels are appropriate. Of course, there may be a questions whether the quality levels chosen are excessive, or the legal and policy instruments used to achieve those levels are inefficient, resulting in unnecessary costs. In these circumstances, however, competitiveness per se should not be the central concern. Rather, the concern should be the overall performance of the economy, including the environmental benefits as well as the economic costs generated by government regulatory programs and liability rules. U.S. environmental policies and regulatory instruments may unjustifiably retard U.S. productivity and growth, quite apart from their effects on international competitiveness, because they are often misdirected and are excessively costly in relation to the environmental benefits that they provide.<sup>59</sup> Also, when plant closings and relocations can be attributed to weakened U.S. competitiveness, the issue focuses public and political attention in a way that charts and numbers illustrating lagging U.S. productivity or regulatory inefficiency do not.

Second, the available empirical studies fail to establish that differences in environmental process standards have a major impact on competitiveness, whether competitiveness is defined in terms of productivity growth, import/export patterns, or industrial location. Differences in the level and type of environmental regulation do affect productivity growth and trade patterns and may have influenced the location of a few industries, such as basic chemicals. But even in the most heavily regulated industries, environmental compliance costs represent only a small percentage of manufacturing costs.<sup>60</sup> Nonetheless, there are limitations to the empirical studies, which fail to address a number of potential effects of environmental measures on investment and innovation. Moreover, industry may have an incentive to highlight the potential competitiveness impacts of environmental regulation as a reason against adoption by a state of new and more costly regulatory requirements. Also, as

<sup>58</sup> *Clinton Endorses NAFTA But Says Pact Needs to be Strengthened*, Int'l Trade Daily (BNA), Feb. 22, 1993.

<sup>59</sup> See Stephen Breyer, *Analyzing Regulatory Failure: Mismatches, Less Restrictive Alternatives, and Reform*, 92 Harv. L. Rev. 547, 553-59 (1979); Richard B. Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 Cal. L. Rev. 1256, 1263-76 (1981).

<sup>60</sup> See Richard Stewart, *supra* note 52.

illustrated by the NAFTA debate, environmentalists emphasize potential competitiveness effects in order to support initiatives to require nations with lower standards to raise them to the levels in nations with higher standards.

When uniform process standards are adopted, the emphasis on competitiveness concerns influences the type of standards adopted. Such standards tend to be based on adoption by all facilities in a given industry of BAT standards on pollution or waste generation, as opposed to environmental quality standards that would allow different facilities to generate different amounts of pollution or waste depending on the character of their receiving environments. The latter are more appropriate from a welfare economic perspective. The BAT approach, however, tends to narrow the differences in compliance costs among facilities compared to the ambient approach. This approach is favored – in the name of avoiding “competitive distortions” – by those firms that would otherwise face relatively more costly requirements, as well as by environmentalists.

*Regulation of Wastes.* Waste can be regarded as a negative product that commands a negative price; generators have to pay others to store and dispose of their wastes. Free trade in wastes should promote joint welfare for reasons similar to those that justify free trade in ordinary goods and services: economies of scale in disposal techniques, comparative advantage based on geology and transportation access, and innovation through specialization. If a waste commands a positive price because of the potential for recycling, it can be regarded as a product or resource with potentially hazardous characteristics. A regime of free trade in wastes assumes that the recipient of the wastes commands and is paid a market price for disposing of them. Prohibiting illegal cross-border dumping of wastes is entirely consistent with and indeed necessary to support a FTR.

States in the United States have enacted legislation banning or imposing special restrictions on the import and disposal within the state of out-of-state wastes. However, the public in many states acutely fears the hazards associated with toxic and radiological wastes, and is often adverse to assuming responsibility for wastes of any sort generated in other states. Many states have therefore attempted to impose bans or other restrictions on imports of out-of-state wastes. Unlike discriminatory product import restrictions, such measures benefit local “consumers” by reducing their exposure to waste hazards, as well as benefitting local producers of waste by foreclosing access by others to local disposal facilities.<sup>61</sup> Also, many nations have acceded to arguments that it is

<sup>61</sup> In addition, supporters of such legislation have asserted that a ban on out-of-state wastes is necessary to create adequate incentives for minimizing waste generation and providing adequate disposal capacity. But this argument generally fails to address the question of



improper to export wastes to less developed nations, and have joined in bans on such exports.

## D. The Relation Between Trade and Environment in Different Multi-State Institutional Settings

### 1. The United States and the European Union

Although political integration has proceeded appreciably further in the United States than the European Union, there are broad similarities in many aspects of environmental regulation in these two systems of plural states linked by a common market.

With respect to product regulation, the initial responsibility for dealing with differing state standards has fallen to the high court which exercises the negative sanction of invalidating state measures that discriminate against other states or otherwise unduly frustrate the workings of the common market. In the United States, the Supreme Court invokes the negative commerce clause doctrine.<sup>62</sup> In the Community, the European Court of Justice (ECJ) utilizes Articles 30, 34, and 36 of the Rome Treaty, prohibiting Member State measures that have the effect of restricting or hindering trade, unless they are justified as promoting "the protection of health and life of humans, animals, or plants" and do not represent a "means of arbitrary discrimination or a disguised restriction on trade".

From *Rewe-Zentrale-AG v. Bundesmonopolverwaltung für Branntwein* ("Cassis de Dijon")<sup>63</sup> to the Danish returnable bottle case<sup>64</sup>, to the Walloon wastes decision,<sup>65</sup> the ECJ has sought to balance the interests in a common market and economic integration with the interests of a member state in environmental, health and safety protection, through techniques quite similar to those employed by the United States Supreme Court. The common judicial techniques include a prohibition on overtly discriminatory measures, an assessment of other trade-burdening measures by examining the proportionality between the benefits secured and burdens imposed, the availability of less re-

why a disposal fee adequate to cover the full social costs of waste disposal could not provide the appropriate incentives.

62 U.S. Const. Art. I, §8, cl 3. See, for example, *Pike v. Bruce Church, Inc.*, 397 US 137 (1970); *Dean Milk Co. v. City of Madison*, 340 US 349 (1951); *Minnesota v. Clover Leaf Creamery Co.*, 449 US 456 (1981).

63 Case 120/78, *Rewe-Zentrale-AG v. Bundesmonopolverwaltung für Branntwein*, 1979 ECR 649, 1979:3 CMLR 494.

64 Case 302/86, *supra* note 50.

65 Case C-2/90, *Commission v. Belgium* (July 9, 1992).

strictive alternative measures, and other evidence of discriminatory purpose.<sup>66</sup> The Danish bottle case, which bears a striking resemblance to a U.S. decision upholding an Oregon recycling measure,<sup>67</sup> shows that courts in both systems are prepared up to a point, to uphold Member State environmental measures despite their adverse impact on trade and potentially protectionist motives.

The second technique for dealing with differing state product standards is legislation imposing uniform standards. Both the United States and the European Union have adopted uniform standards for the most environmentally significant categories of products, including motor vehicles, fuels, detergents, pesticides, and other chemical products.<sup>68</sup> In the European Union, product legislation is more systematic than process legislation because of the mutual interest of all states in avoiding barriers to the free flow of products throughout the internal market.<sup>69</sup> There is no great problem in enforcing Community product legislation, because member states can effectively prohibit the sale or use of non-complying products within their borders.

When legislation adoption uniform standards has been adopted, a key remaining question is whether states may establish and enforce standards more stringent those adopted through Community legislation. To the extent that they can, the threat to the internal market remains. The federal courts in the United States regularly confront this issue under the rubric of preemption, asking whether Congress meant to exclude more stringent state regulation. Sometimes statutes clearly answer the question one way or another, but often, because of political stalemate among states nationally-organized and interest groups, statutes are silent or ambiguous. The decisions of the Supreme Court on this subject do not provide much illumination for the ECJ, which must consider similar issues in a different constitutional context.

- 66 The Walloon Wastes decision, however, upheld a discriminatory ban on solid waste imports.
- 67 *American Can Co. v. Oregon Liquor Control Comm'n*, 15 Or App 618, 517 P2d 691 (1974).
- 68 For United States legislation, see, for example, Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), 7 USC §§ 136-136; Clean Air Act, 42 USC §§ 7401-7671 (1983 & Supp 1991); Toxic Substances Control Act, 15 USC §§ 2601-2671 (1982 & Supp 1992). For Community legislation, see, for example, Council Dir 91/441, 1991 OJ L242 (amending Council Dir 70/220 on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emission from motor vehicles); Council Dir 86/94, 1986 OJ L80:51 (amending for second time Directive 73/404/EEC on the approximation of the laws of the Member States relating to detergents).
- 69 See Eckard Reh binder and Richard Stewart, *Legal Integration in Federal Systems: European Community Environmental Law*, 33 Am. J. Comp. L. 371, 393-98 (1985).



Article 100A of the Treaty authorizes legislation, approved by a qualified majority, for the harmonization of member state measures in order to promote the establishment or functioning of the internal market. Article 100A(4) provides that if a member state wishes to adopt different national provisions "on grounds of major needs referred to in Article 36, or relating to protection of the environment or the working environment", it shall so notify the Commission. "The Commission shall confirm the provisions involved after having verified that they are not a means of arbitrary discrimination or a disguised restriction on trade between member states."

Case-by-case court invalidation of particular state standards is not a viable means of dealing with assertedly inadequate state process regulation. The selective sanction of nullity cannot solve problems due to pollution spillovers, potential competitiveness concerns, or normative demands for stronger control measures. In order to deal with these problems, the U.S. Congress and the European Union have widely adopted legislation imposing controls on process-generated air pollution and water pollution, and toxic wastes, central command and control regulatory legislation imposing uniform minimum standards on all states and on all sources within given industrial categories. States are typically left free to adopt more stringent requirements.

The determination of the appropriate stringency of regulatory standards, which legislation in the United States but not in the Community has generally left to administrators, must inevitably strike a balance between environmental considerations, economic considerations and the different interests of states and industry groups. From the viewpoint of trade and competitiveness, the structure of standards is often as important as the level set because adoption of common standards does not mean that all firms in a given industry will be faced with the same compliance costs. For example, uniform environmental quality standards – specifying the maximum permissible concentration of pollutants in the air or water – give a relative advantage to those states whose air, or water is relatively unpolluted because they can accommodate new industry and additional pollution without violating the standards. By contrast, uniform technology-based standards deny such states competitive advantage, although different facilities will face different compliance costs depending on their circumstances (including such things as the facility's age or processes) and precisely how the standards are framed. Different states and businesses will also be affected differently by a system that imposes more demanding standards on new sources than on existing sources as compared to a system that imposes the same controls on both. Most legislation in both the United States and the European Union employs a combination of both types of standards.



Process regulation in the United States is comprehensive, and enforcement is vigorous. The federal government, or in some cases the states by delegation turn the federal government, ensure permits to facilities incorporating regulatory requirements. Regulated facilities must file regular compliance monitoring reports with the government. The federal government brings administrative, civil and criminal enforcement actions directly against firms that violate requirements. The states also have broad enforcement powers. The major federal environmental regulatory statutes contain "citizen suit" provisions authorizing "any person" to bring civil enforcement activities against violators.<sup>70</sup>

The amount of legislation dealing with pollution by industrial processes that the Community has enacted despite conflicts of interest among member states and a difficult legislative process that has required agreement by all member states or by a qualified majority of such states is remarkable. However, there remain major gaps, most notably in the areas of hazardous air and water pollution and toxic waste cleanup.<sup>71</sup> In addition, there have been very serious problems in implementing and enforcing the extensive legislation which the European Union has adopted.<sup>72</sup> Process regulations must be enforced by the states against their own industries. States that place a higher priority on industrial development or are concerned about the relative competitive position of their industry will be tempted to delay and compromise the execution of Community legislation. The absence of direct Community enforcement authority and the lack of strong sanctions for Member State recalcitrance invite such footdragging. Ironically, the record of Community legislation may be as extensive as it is precisely because member states do not expect to be held to full and prompt compliance with the requirements adopted.

The completion of an internal market comprising an "area without internal frontiers in which the free movement of goods, persons, services and capital is ensured",<sup>73</sup> and the development of a common currency are expected to stimulate a higher level of economic development, which threatens to create commensurate increases in pollution and other forms of environmental degradation. A Commission report predicts that these increases will outstrip current Community regulatory efforts to reduce air pollution to safe levels, and will

<sup>70</sup> See, e.g., Clean Air Act §304, 42 USC §7604.

<sup>71</sup> This pattern may reflect the fact that such hazards are less likely to result in extensive transboundary problems than conventional air and water pollutants. The pollution of the Rhine by toxic releases is a notable exception to this generalization. See Jan M. van Dunne, ed, *Transboundary Pollution and Liability: The Case of the River Rhine* (Lelystad: Vermande, 1991).

<sup>72</sup> See Rolf Wägenbaur, *The European Community's Policy on Implementation of Environmental Directives*, 14 *Fordham Int'l L.J.* 455 (1990-91).

<sup>73</sup> Single European Act, Art. 13.



exacerbate transboundary hazardous waste problems.<sup>74</sup> Moreover, the completion of an internal market will increase the importance of competitive concerns, potentially increasing the unwillingness of some member states to enforce community legislation vigorously.

Regional differences and conflicts have played an important role in some aspects of U.S. environmental policy. Environmentalists and representatives of the more heavily polluted northeastern and midwestern states helped enact legislation imposing special limits on additional pollution in areas with cleaner air in the south and the west.<sup>75</sup> Competitiveness concerns also lead representatives of such states to insist on the adoption of nationally uniform technology-based standards for identical sources of water pollution. Regional conflicts between midwestern states, where major sources of sulfur-emitting coal combusting electric generating plants are located, and northeastern states suffering acid deposition from such sources blocked federal legislation to deal with the problem for over a decade.

Differences among the member states in the European Union are far greater than the differences among states in the U.S. Particularly significant is the contrast between the highly economically developed case and the less developed periphery. The Community has sought to accommodate the interests of its less industrially developed members in two ways.<sup>76</sup> First, the EU has, in one instance, adopted different levels of control for different Member States. The 1988 directive on large combustion plants establishes ceilings on total loadings of SO<sub>2</sub>, NO<sub>x</sub>, and total suspended particulates through a differential formula that allows some of the industrializing member states to increase their existing emissions while forcing already industrialized states to achieve significant reductions. This compromise emerged only after a long political struggle. The other technique for dealing with the situation of the industrializing Member States is financial transfers. The EU has used its European Regional Development Fund to finance environmental protection measures in less afflu-

<sup>74</sup> See European Commission Task Force on the Environment and the Internal Market, "1992", *The Environmental Dimension*.

<sup>75</sup> See Clean Air Act §§160-169B, 42 USC §§7470-7479, 7491-7492.

<sup>76</sup> Fewer differences in industrial development exist among states in the United States than in the EU, but they still play an important role in the development of environmental policy. For example, states in the West that are less developed and have relatively clean air have opposed stringent national emission limitations on new sources and prevention-of-significant-deterioration restrictions on increases in pollution loadings. These measures have been favored by the industrialized states in the Midwest and Northeast, who fear a shift in development to the West. See generally Bruce A. Ackerman and William T. Hassler, *Clean/Dirty Air: or How the Clean Air Act Became a Multibillion-Dollar Bail-Out for High-Sulfur Coal Producers and What Should be Done About It* (1981); B. Peter Pashigian, *Environmental Regulation: Whose Self-Interests Are Being Protected?*, 23 *Economic Inquiry* 551 (1985).



ent regions. Maastricht endorsed a greatly expanded program of Community aid to industrializing regions and those with especially severe environmental problems in order to cushion the burden of complying with Community legislation. But the member states are already beginning to resist paying the \$75 billion cost of this and other Maastricht initiatives.

Transboundary pollution from industrial, commercial, and agricultural processes presents special problems that are likely to become more apparent as the EU's environmental regulation matures.<sup>77</sup> The EU, like the U.S., has sought to deal with transboundary spillovers by the adoption of common measures to reduce pollution from all Member States. The U.S. experience suggests, however, that this will not be a wholly adequate long-run strategy. As controls become more stringent and more expensive, downward states will seek to shift more of the costs of control to upward states. Moreover, in both the U.S. and the E.C., many transboundary pollution will require differing regional structures in lieu of the present system of uniform regulation. Congress recognized the need for regional differences in 1990 when it created the Ozone Transport Commission to develop a coordinated strategy for dealing with ozone pollution in the northeastern states,<sup>78</sup> and also adopted five different sets of compliance timetables and requirements for achieving the ozone standards in different urban areas with ozone pollution problems of differing severity.<sup>79</sup> There is also increasing recognition in the U.S. of the need for regional approaches to water pollution control.<sup>80</sup> Thus, there is emerging recognition that the "one-size fits all" logic of BAT command and control regulation is ecologically unsound.

Special problems are presented by interstate shipments of waste, which can be viewed as a negative product. There is strong public opposition in most states to accepting for disposal wastes generated in other states. This opposition is especially strong in the case of hazardous and radioactive waste. On the other hand, some states wish to export wastes, either because they lack suitable disposal capacity or because disposal is cheaper elsewhere. The United States Supreme Court has held that waste is a proper article of commerce and has in-

77 For general discussion of transboundary pollution issues in the EU context, see Note, *The Environmental Policy of the European Economic Community to Control Transnational Pollution – Time to Make Critical Choices*, 12 Loyola LA Int'l & Comp. L.J. 579 (1990). The magnitude of transboundary pollution problems in the EU is illustrated by the fact that in eight out of the twelve Member States, pollution originating outside the Member State accounts for between one-third and three-fourths of acid deposition within the state. See Note, *EC Regulation of Sulfur Dioxide Levels: Directive 89/427*, 14 BC Intl & Comp L Rev 369, 375 n.54, chart A (1991).

78 Clean Air Act §184, 42 USC §7511c.

79 Clean Air Act §181, 42 USC §7511.

80 See Peter Menell and Richard Stewart, *Environmental Law and Policy* 512-517 (1994).



validated discriminatory state legislation prohibiting disposal of waste originating from other states.<sup>81</sup> The recent decision by the ECJ in *Commission v Belgium*,<sup>82</sup> agreed that wastes were “goods” protected by the free trade principles of Article 30. Nonetheless, the ECJ upheld legislation by the Wallonia region of Belgium imposing a ban on wastes imported from outside the region for disposal, insofar as it was applied to bar imports of non-hazardous solid waste from the Netherlands. The ECJ validated this facially discriminatory measure by characterizing waste as a special case because of its environmental effects, referring to a waste disposal “emergency” in Wallonia, and invoking the principles of “self-sufficiency” and “proximity” for waste disposal set forth in Article 130R of the Treaty.

Both the United States and the European Union have comprehensive legislation regulating the treatment and disposal of hazardous waste.<sup>83</sup> In addition, the U.S. has a far-reaching system of liability for remediating hazardous substance contamination.<sup>84</sup> But none of this legislation directly addresses the question of a state’s ability to restrict waste imports from other states. In the Wallonia wastes case, the ECJ, nonetheless held that Wallonia’s ban on imports of hazardous waste was impliedly preempted by EU legislation insofar as it was applied to bar imports of hazardous wastes from the Netherlands hazardous waste legislation because EU requires an exporting state to notify the receiving state of shipments and relies on the latter to police compliance with Community requirements regarding treatment and disposal.<sup>85</sup> The ECJ’s decision upholding Wallonia’s ban on non-hazardous waste but invalidating its ban on hazardous waste has stimulated efforts to adopt EU legislation addressing the controversial issue of interstate waste shipments. Such legislation is also under consideration in the U.S. has caused controversy and confusion.

81 *City of Philadelphia v. New Jersey*, 437 US 617 (1978). Notwithstanding this decision, strong local opposition to disposal of out-of-state wastes have led states, such as Alabama, with substantial disposal capacity to find various ways to exclude out-of-state wastes. The Supreme Court has invalidated such discriminatory measures. See *Chemical Waste Management, Inc. v. Hunt*, 112 Ct 2009 (1992).

82 Case 2/90, *Commission v. Belgium* (July 9, 1992).

83 Resource Conservation and Recovery Act, 42 USC §§6921-6939e; Directive 78/319/EEC of 20 March 1978 on toxic and dangerous waste, OJ L84, 31 March 1978, p.43.

84 Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC §§9601-9675.

85 Council Dir 84/631, 1984 OJ L326:31 (on the supervision and control within the European Community of the transfrontier shipment of hazardous waste).

## 2. *International Trade and the Environment*

The natural, economic, and institutional features of the international setting give trade and environment issues a quite different character than those in a federal-type system such as the United States and the European Community.

Some resources are beyond the territorial jurisdiction of any state. The most notable examples are Antarctica, the oceans, and the living resources which they contain. The global atmosphere is likewise outside the jurisdiction of any nation, although this feature does not distinguish it from airsheds shared by states in a federal-type system. Within the global atmosphere there from regional airsheds is more or less uniform mixing of certain pollutants, such as Greenhouse gases (GHGs) and chloroflourocarbons (CFCs), creating a situation in which each nation is both a polluter and is also exposed to the adverse effects of pollution. The amount of pollution emitted, however, varies greatly among nations. The adverse environmental effects of stratospheric ozone depletion and global warming are also not uniform across nations.

There are many more nations in the world than the number of states in the United States, or member states in the European Union. Moreover, far greater disparities exist among nations – in terms of natural resources, economic development, wealth, education, and governmental systems – than are found in federal-type systems. Even the North/South division that has figured so prominently in discussions of international environmental law and policy ignores many differences among the “North” and the “South” nations. For example, the Organization of Petroleum Exporting Countries (OPEC) nations, the “Asian Tigers”, the nations of subsaharan Africa, and the Latin American countries have quite divergent interests.

There is no international legislative authority with power to enact statutes that bind nations. The World Court exercises adjudicatory authority only with respect to controversies between nations as such, when such nations have voluntarily consented to the Court’s jurisdiction. That jurisdiction is limited and rarely invoked. The adjudicatory authority of GATT dispute resolution panels and other tribunals created by bilateral or regional trade or environmental agreements such as the United States-Canada Free Trade Agreement (FTA) has been used only intermittently. The underdeveloped state of international institutions has made it far more difficult to develop either a FTR or an effective system of environmental protection among nations than among the states in a federal-type system like the United States or the European Community. It likewise greatly complicate the problem of reconciling free trade and environmental protection.



The GATT is a world FTR regime created by consensus among the participating nations. Some of its basic ground rules, such as the requirement of national treatment and provisions recognizing, within, limits the authority of nations to exclude products that present risks to health or the environment, are consistent with those developed by the United States Constitution and the United States Supreme Court, and by the Treaty of Rome and the European Court of Justice. There are special provisions, however, such as those recognizing the nations' interest in avoiding balance-of-payments problems, that are unique to an international system of independent nations. The GATT also provides for dispute-resolution institutions – panel tribunals with a right of appeal to a council composed of representatives of all nations that are parties to the GATT – to make the inevitably contextual judgments involved in application of these broad principles in particular cases. The procedure for appeal of GATT panel decisions to an essentially political process of negotiation among participating nations in the council again reminds us that the GATT is an association of independent nations and not a federal-type system that establishes sovereign supranational authority. The GATT does not specifically address environmental issues as such. A working group on trade and environmental issues, authorized in 1971, had never met until recently, and environmental groups have come to regard the GATT as at best indifferent and often hostile to environmental concerns.<sup>86</sup> Environmental issues, however, acquired greater saliency at the end of the Uruguay Round, in large part as a result of the NAFTA debate, and institutional commitments have been made for greater consideration of environmental issues by the new World Trade Organization. As illustrated by the CFC-related trade restrictions in the Montreal Protocol, international environmental agreements must increasingly address trade issues. At the same time, the GATT and regional trade agreements must increasingly address environmental concerns.<sup>87</sup>

International environmental protection has theoretical roots in customary international law, which has articulated a general obligation of nations not to act in ways that inflict injury on the territory of another nation. But the precise nature and content of this obligation remains quite unclear because virtually no relevant decisions have been made by the World Court or other international tribunals. Most international environmental law has grown out of bilateral or multilateral treaties. The negotiation of these agreements is a slow and cumbersome process, and each sovereign nation may decide whether to adhere to them. The great differences among nations produce acute conflicts

<sup>86</sup> See, e.g., Alex Hittle, *Trade and the Environment at an Impasse*, ENVTL. F., July-Aug. 1992, 26.

<sup>87</sup> See John H. Jackson, *World Trade Rules and Environmental Policies-Congruence or Conflict?*, 49 Wash. & Lee L. Rev. 1227, 1255-59 (1992); Stewart, *supra* note 10, at 1349-50.

of interest that impede agreement. Substantial progress has nonetheless been made in reaching or developing multilateral agreements dealing with endangered species,<sup>88</sup> chemical testing and labelling,<sup>89</sup> the development of Antarctica,<sup>90</sup> hazardous waste treatment,<sup>91</sup> depletion of stratospheric ozone due to emissions of CFCs and other chemicals,<sup>92</sup> global warming,<sup>93</sup> and biological diversity.<sup>94</sup> It is noteworthy that these agreements have not been focused on one particular type of externality, such as product risks, but encompass many different types of environmental problems. In addition, the North American Free Trade Agreement (NAFTA) has set an important precedent by specifically addressing environmental issues in the context of a regional trade liberalization agreement.

Even when international agreements have been reached, there remains the problem of nonsignatories who seek to free-ride on others' efforts to preserve common resources or reduce pollution spillovers. Monitoring, implementation, and enforcement are also very serious problems, as environmental groups have pointed out in the debate over the environmental aspects of the NAFTA pact.<sup>95</sup> There is no supranational environmental police or regulatory authority. Reliance must generally be placed on information disclosure, scientific and public opinion, moral suasion, and the implicit or explicit threat that sanctions, such as trade restrictions, will be imposed, or side benefits, such as aid, will be withheld from those who do not comply.<sup>96</sup>

In the area of product regulation, harmonization of national standards would benefit consumers in all nations by eliminating the barriers imposed by

88 See, e.g., Convention on International Trade in Endangered Species of Wild Fauna and Flora, Mar. 3, 1973, 27 U.S.T. 1087, U.N.T.S. 243 [hereinafter CITES].

89 See, e.g., OCED, *Principles of Good Laboratory Practice*, OECD Doc. ENV/CHEM/HLM/80.1 (Apr. 11, 1980), reprinted in 19 I.L.M. 1057.

90 See, e.g., Convention on the Regulation of Antarctic Mineral Resource Activities, June 2, 1988, 27 I.L.M. 868.

91 See, e.g., Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 28 I.L.M. 657 [hereinafter Basel Convention].

92 See, e.g., Montreal Protocol on Substances that Deplete The Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1550, amended and adjusted 30 I.L.M. 539 (1991) [hereinafter Montreal Protocol].

93 See, e.g., United Nations Conference on Environment and Development: Framework Convention on Climate Change, May 9, 1992, 31 I.L.M. 899.

94 See, e.g., Convention on Biological Diversity, May 22, 1992, 31 I.L.M. 822.

95 See J. Ward, *Environmental Enforcement: Unfinished Business in North American Trade*, Testimony of the Natural Resources Defense Council before the Senate Finance Committee Subcommittee on International Trade (Sept. 16, 1992).

96 See generally Barry E. Carter, *International Economic Sanctions: Improving the Haphazard U.S. Legal Regime* (1988).



different standards to realization of the full benefits of international trade. But differences among nations in assimilative capacity and the social value placed on environmental protection create impediments to common standards. Work to harmonize regulatory and labelling standards for chemicals is proceeding under the auspices of the GATT, the OECD, and international environmental and health organizations. Understandably, it has been much more difficult to harmonize environmental standards for other types of products, such as automobiles, where differences in assimilative capacity are often much more important. It makes little sense to have the same automotive emission controls in Mali as in Japan. Harmonization has also been impeded by the insistence of nations, such as the U.S., that others adopt their relatively stringent standards ("harmonization up") or that they retain the right to set standards more stringent than those adopted by international agreement.

Differing national requirements for resource exploitation and manufacturing processes present other considerations. Harmonization of process measures cannot be justified on the ground that it promotes consumer welfare by removing impediments to trade. Indeed, to the extent that existing variations in national standards appropriately reflect national differences in assimilative capacity and social values, eliminating those differences would reduce consumer welfare. Existing standards are often too low, however, because of two types of externality problems. In the first type of problem, exemplified by transboundary pollution and the destruction within a given country of rare ecosystems and endangered species, part of the costs of environmental degradation are borne by those in other jurisdictions. In the second type of problem, exemplified by stratospheric ozone depletion, climate changes threatened by greenhouse gas emissions, and over-exploitation of the ocean's resources, all nations face a potential tragedy of the commons. Some form of collective agreement is necessary to deal with these externalities and to prevent environmental degradation that reduces total welfare.

Negotiation of international agreements to harmonize environment process standards is no easy task. The number of countries is large, their interests are quite diverse and often sharply conflicting, and international institutions are underdeveloped and highly imperfect. Because of their more urgent need for economic development, citizens of developing countries often place a lower value on reducing environmental externalities than citizens of developed countries. The joint economic benefits of common process standards are often far less than those of common product standards. Competitiveness concerns are also highly important. Rather than providing a solution to international competitiveness concerns, international negotiations may become a new battleground of economic rivalry as each country or group of countries seeks to "tilt" the structure and content of proposed agreements to its competitive



advantage.<sup>97</sup> Implementation and enforcement also presents very serious problems. One must rely on the signatory parties to enforce agreed-upon standards against their own industries. Many signatories may lack either the capacity or the will to do so effectively, particularly where international competitiveness concerns play a political role.

Given the difficulties in achieving agreement on common measures and the obstacles to effective implementation and enforcement, international environmental law with respect to processes should focus on the problems of the commons and other externalities where the case for joint action is greatest and considerations of natural self interest tend to favor such action.

Process-based externalities would exist in the absence of trade, although the economic development fostered by the trade may increase the magnitude of such externalities. Trade measures are, however, a potential means of enforcing process standards, whether national or international. The United States has gone the farthest in imposing unilateral trade sanctions against other nations who do not adhere to what the U.S. regards as appropriate measures to protect common resources, including whales and fish. Recently, concerns over competitiveness sparked by the NAFTA debate have led to proposals in the U.S. for general tariffs that would impose duties supposedly equal to the cost advantage enjoyed by firms in other countries with environmental process standards less stringent than those in the U.S.

<sup>97</sup> For example, in the global climate negotiations the EU sought agreement on specific targets and timetables for limiting fossil fuel CO<sub>2</sub> emissions. Leading EU nations, such as Germany, had already concluded that such limitations were desirable for purely economic reasons relating to plant modernization and productivity. Others, such as France, were committed to expanding their already formidable nuclear generating capacity. The U.S. has abundant fossil fuel resources, especially coal, which emits higher amounts of CO<sub>2</sub> per energy yield than other fossil fuels. An agreement restricting fossil fuel CO<sub>2</sub> emissions would therefore disadvantage U.S. industry relative to industry in the EU. The U.S. opposed limitations on fossil fuel CO<sub>2</sub> alone, arguing for a comprehensive approach which would include all greenhouse gases (GHGs), their sources, and their sinks. OPEC nations, including Saudi Arabia, also opposed fossil fuel CO<sub>2</sub> limitations. On the other hand, developing countries like Brazil were concerned about the potential extension of any agreement to include non-fossil CO<sub>2</sub> and methane emissions resulting from deforestation. In the end, no binding limitations were agreed to. The Climate Convention is a framework convention; agreements on specific limitations of GHG emissions must await future protocols.

The EU has debated a proposed energy fuel tax based in part on carbon content of fuel, but at the insistence of European industry the proposal would become effective only if Japan and the U.S. adopted CO<sub>2</sub> limiting measures that impose comparable financial burdens on their industries. Proposal for a Council Directive Introducing a Tax on Carbon Dioxide Emissions and Energy, COM(92) 266 final at 46-47.



The U.S. has been the leader in imposing unilateral restrictions, although it could well become a target if, for example, the EC imposed an energy/carbon tax to curtail CO<sub>2</sub> emissions and imposed countervailing duties on imports from the U.S. if it failed to adopt a similar tax. Such measures could be justified as internalizing the external costs of environmental degradation and establishing a level playing field for competition.<sup>98</sup> The difficulty with these justifications is that the costs of environmental degradation are a function of societal values and other elements of assimilative capacity which vary from nation to nation. There is no objective or uniform "cost" of pollution. Given the serious potential for protectionist abuses of unilateral measures based solely on different standards in other countries, the GATT appropriately views such measures as violating international trade law.

The U.S. ban on imports of Mexican tuna caught on the high seas with an incidental take of dolphins in excess of U.S. regulatory standards was invalidated by two GATT panels.<sup>99</sup> The panels drew a sharp distinction between trade restrictions on products that present a risk of harm to health on the environment, which the panels indicated would generally be upheld against challenge under GATT if based on standards that are also applied in a non-discriminating fashion to imported and domestically produced products alike, and trade restrictions aimed at the environmental effects of processes outside the importing nation's borders, which the panels indicated are generally unlawful under GATT.

The panels' rationale would essentially make all process-based trade restrictions GATT illegal. The rationale seems too broad, for it fails to address the special problem of effectively protecting resources in the commons, outside any nations' jurisdiction, and also fails to consider whether multilateral trade restrictions involved in aid of international environmental agreements should be treated differently under GATT than unilateral measures. Pursuant to the CITES convention, states have regularly enforced bans on imports of animals or products of animals that are protected as endangered under the Convention. The Montreal Protocol to the Vienna Convention, which provides for substantial reductions in the manufacture and use of ozone-depleting chemicals by the signatories, which include the developed nations and many developing nations provides for bans of imports from non-signatories of products manufactured by use of such chemicals as well as products imports from non-signatures of the chemicals themselves or products containing them. These provisions are

<sup>98</sup> See Frederic L. Kirgis, *Environment and Trade Measures After the Tuna/Dolphin Decision*, 49 Wash. & Lee L. Rev. 1219, 1224 (1992); David A. Wirth, *The International Trade Regime and the Municipal Law of Federal States; How Close a Fit?*, 49 Wash. & Lee L. Rev. 1389, 1399-1401 (1992).

<sup>99</sup> See note 29, *supra*.

designed to provide incentives for countries to join the convention, as well as to protect signatories from trade competition by free-riders. Substantial arguments can be made that such measures should be upheld under GATT.<sup>100</sup> An alternative, followed in the NAFTA, would be specific agreement among GATT members to validate or grant a waiver for specific multilateral trade restrictions in specific international environmental agreements. The use of trade sanctions to enforce international agreements on environmental standards for processes is a topic that will be at the center of future international law and policy.

International trade and transport of wastes is a politically charged issue because of the reluctance of many states to accept others' waste the inability of many developing countries to ensure appropriate treatment and disposal of hazardous wastes, and the widely-held view that it is immoral for the developed countries to ship their wastes to developing countries. The Basel Convention adopted a closely-regulated system of trade in hazardous wastes that requires notice to and consent by the importing country to specific shipments. The Basel signatories have recently agreed, however, to a ban on exports of hazardous wastes from developed to developing countries. Also, the Bamako Convention bans exports to and imports of hazardous wastes to African nations. Powerful arguments can nonetheless be made in favor of some forms of trade in hazardous wastes. Economies of scale in treatment and disposal and the differing environmental suitability of potential disposal sites may make it inappropriate to require each state to dispose of all its own waste. In addition, absolute bans on trade encourage illegal traffic in wastes, as many examples of unlawful disposal in developing nations attest.

<sup>100</sup> See Richard B. Stewart, *International Trade and Environment: Lessons from the Federal Experience*, 49 Wash. & Lee L. Rev. 1329, 1361-1368 (1992).



## E. The Use of Economic Incentives to Protect the Environment in a Multi-State Context

As explained in Part I, market-based incentives have a number of important advantages over traditional command and control regulation. These include achieving environmental objectives at less cost; providing both the flexibility and the incentives for development and adoption of innovative, less-polluting, more resource-efficient products and processes; eliminating the need for a large and cumbersome central planning bureaucracy; and promoting democratic accountability. Market-based systems retain all of these advantages when applied in a multi-state setting as opposed to a single state. Moreover, several aspects of market-based incentives make them especially well-suited for dealing with environmental problems in the context of trade among several states. Economic incentives harness the power of the expanded common market to the service of environmental protection. At the same time, they place fewer demands on the limited capabilities of international institutions than command and control regulation. This section discusses these and other advantages of economic incentives in the multi-state context and gives examples of actual or potential applications or market-based incentives in the United States, the European Community, and internationally.

Use of market-based incentives is most advanced in the United States.<sup>101</sup> A panel of experts convened by the European Commission has recommended use of economic incentives in Community environmental legislation,<sup>102</sup> as has the European Parliament Committee on Environment, Public Health, and Consumer Protection.<sup>103</sup> The EU Council has sought, albeit unsuccessfully, to negotiate a tax on carbon/energy in fossil fuels to reduce emissions of CO<sub>2</sub>.<sup>104</sup> The use of market-based incentives is just emerging as a subject of interest in international environmental law, particularly in the context of implementing the Climate Change Convention.

The potentially most powerful applications of market-based incentives in the multi-state context are the use of taxes, tradeable permits, and other contractual approaches to deal with process pollution and wastes. The following discussion first examines these applications, and then briefly considers the poten-

<sup>101</sup> See Richard B. Stewart, *Controlling Environmental Risks Through Economic Incentives*, 13 Colum. J. Envtl. L. 153 (1988).

<sup>102</sup> *Report of the Working Group of Experts from the Member States on the Use of Economic and Fiscal Instruments in European Community Environmental Policy* (1990).

<sup>103</sup> See *Committee's Report on Economic and Fiscal Instruments on Environmental Policy*, Eur. Parl. Sess. Doc. A3-01301/91 (May 13, 1991).

<sup>104</sup> See *Proposal for a Council Directive Introducing a Tax on Carbon Dioxide Emissions and Energy*, 25:5 Bull. EEC 46-47 (1992).

tial application of these and other market-based tools to other environmental problems.

Taxes and various forms of contracting, including tradeable emission reduction credits, use the comparative advantage and scale economies of the multistate Free Trade Regime (FTR) in order to achieve environmental objectives at a substantially lower cost than if each state adopts its own regulatory program. Just as states benefit economically by participating in an expanded common market, they also benefit environmentally because resources are channelled to facilities that use resources more efficiently, reducing pollution and waste. The use of economic incentives in the FTR also widens the competition for innovation in environmentally superior technologies and promotes the rapid diffusion of successful innovations. Such incentives also promote structural shifts in the output of goods and services to emerging "green" sectors of the wider economy. One example of these benefits is the U.S. program for a nationwide market for tradeable permits for sulfur emissions. It is projected for use of this market will reduce the costs of achieving a 50% reduction in sulfur emissions by over \$1 billion annually compared to costs under a command and control approach.

Moreover, by reducing the costs of achieving environmental objectives, economic incentives make it easier for states to agree on common measures. The conflicts of interest that are inevitable in multi-state agreements can be significantly moderated if the costs of complying with commonly agreed-upon measures are significantly reduced. The U.S. sulfur trading program again provides an example of this benefit. Midwestern states and the Bush administration would not have agreed to the 50% sulfur reduction program without the significant cost savings to be obtained from the trading program.

In addition, economic incentives provide diversity and flexibility in implementation, thus accommodating differences in circumstances among the various states in a multi-state system. The decentralization inherent in economic incentives also serves interests in state autonomy. For example, under a tradeable permits approach each state could be given an allocation of permits and given the freedom to decide how such permits should be initially allocated. Command and control regulation generally follows a uniform "one size fits all" approach, creating obstacles to agreement among states with different circumstances. As illustrated by the history of the EU directive on reduction of sulfur emissions, in which different standards were applied to the industrialized and industrializing states; departures from uniformity to accommodate differences among states are contentious and politically difficult to achieve.



Economic incentives reduce the need for an extensive central bureaucracy and promotes democratic accountability by reducing the number of decisions that government must make. This consideration is especially important in multi-state systems where political and legal integration is incomplete, as in the European Union, or weak, as in the international community. For example, command and control regulation aggravates the EU's "democracy deficit" by requiring that Brussels bureaucrats devise and seek to enforce through the Member States a uniform requirements for environmental protection. Taxes or tradeable permits ease this deficit by making the basic policy choice - the overall amount of tax incentive or permitted pollution - more transparent, and by eliminating the need for detailed central commands, thereby promoting the subsidiary principle.

In the international context, institutions are currently too weak to support a worldwide environmental regulatory bureaucracy capable of functioning like the U.S. Environmental Protection Agency. Creation of such a bureaucracy would in any event not be desirable. By contrast, the level of economic incentives can be agreed upon through a convention or subsequent protocols, and the agreed-upon incentive levels can be implemented by each nation. Because nations can obtain revenues through the use of taxes or auctioned permits, implementation and enforcement problems are likely to be less severe than under a command and control approach.

As noted earlier, the application of tax, tradeable permit, or other contractual systems relies upon collection of accurate and complete information about emissions and wastes. Gathering information about total emissions and wastes may pose substantial technical, institutional and political problems. Accurate monitoring of some pollutants, such as the greenhouse gas methane, may be particularly difficult, although proxy measures for actual emissions can be developed. Professional and administrative capabilities in many nations are quite limited. Such information, is, however, necessary to ensure proper implementation and enforcement of regulatory programs. Moreover, the focus the environmental "bottom line" of overall pollution or waste levels, which is inherent in the use of taxes, tradeable permits, or pollution reduction contracts, will provide accountability, enlist the resources of science, and help mobilize public and political opinion against those states who fail to honor their undertakings. These advantages are especially significant in the international context, where supra-national methods of direct enforcement are generally not available. It is very important to build monitoring and reporting capacity; use of economic incentives will favor this effort.

Economic incentive systems also provide an effective and economically efficient means of transferring fiscal and technological resources to developing



nations. Assisting these nations to take environmentally sound paths to development will be critical to future protection of the earth's environment, particularly in the case of global commons problems, including climate change and stratospheric ozone depletion, and the conservation of biodiversity. Without the necessary technological and fiscal resources, developing nations will be tempted to pursue development through technologies that may be cheaper in the short run but environmentally destructive and wasteful of resources over the longer run. Also, the developing countries often have very limited administrative and technical resources. Both developed and developing nations would benefit from the protection of ecologically valuable resources, such as tropical rain forests, that are located in developing countries, and reduction of global externalities such as emissions of greenhouse gases and ozone-depleting chemicals. Developed nations might also benefit from the creation of markets for exports of environmentally superior technologies. The developing countries have some responsibility to deal with loss of biodiversity and pollution externalities, but only in relation to standards appropriate to their own assimilative capacities as well as to their proportionate contribution to common environmental problems. In these circumstances, it would be in the mutual interest of the developed and developing nations contractually agile for the developing countries to undertake environmentally protective measures in exchange for the transfer of appropriate resources from the developed nations.<sup>105</sup>

The Montreal Protocol to the Vienna Convention is an example of such a contract. It provides for financial assistance from the developed nations to the developing countries to cover the costs of changing production processes to accommodate chlorofluorocarbon (CFC) substitutes and reduce use of CFCs.<sup>106</sup> This arrangement was vital in securing the assent of the Protocol. The Montreal Protocol also set an important precedent by explicitly<sup>107</sup> including in the agreement both "sticks", in the form of trade sanctions against nonsignatories, and "carrots", in the form of payments from the more developed to the less developed countries to help finance the costs of phasing out the use of CFC's.<sup>108</sup> Such inducements were motivated by the urgency and seriousness of the environmental problem in question – stratospheric ozone depletion – and the need for common measures to deal with it. Carrots may be necessary in order to secure the cooperation of developing countries. Sticks may be necessary to overcome free-riding by nonsignatories, who benefit

<sup>105</sup> For argument that such agreements can secure more economically efficient use of resources, see Ronald Coase, *The Problem of Social Cost*, 3 J.L. Law & Econ. 1 (1960).

<sup>106</sup> Montreal Protocol, *supra* note 92, at 1555-56.

<sup>107</sup> See Karl Göran Mäler, *International Environmental Problems*, 6 Oxford Review of Economic Policy 80 (1991).

<sup>108</sup> See Montreal Protocol, *supra* note 92, Arts. 4 & 5, S. Treaty Doc. No. 10 at 5-6, 26 I.L.M. at 1554-56.



from the signatories' environmental protection efforts and simultaneously enjoy a cost advantage in international competition, and to meet potential ethical objections to relying solely on financial payments to induce nations to cease activities that harm the global commons.

The fact that both CFCs and their substitutes were developed and marketed by developed country firms provides a potential distinction to limit the precedential effect of the financial transfer provision in the Montreal Protocol. But the Climate Change Convention and the Biodiversity Convention also condition agreements by the developing countries to undertake environmentally protective measures on provision of financial and technological assistance by the developed countries, extending the contractual approach to the conservation of biodiversity and prevention of spillovers from agricultural and silvicultural as well as industrial, externalities. The Climate Change Convention provides that the developed countries that are parties to the Convention "shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties" to meet their obligations under the Convention.<sup>109</sup> The Convention also establishes a fund to help provide such assistance.<sup>110</sup>

Nevertheless, the extent of bilateral or multilateral fiscal transfers by the developed countries, and the willingness to relax intellectual property rights with respect to technologies in favor of the developing countries is likely to be sural in relation to the magnitude of the resources required to promote environmentally protective development in the developing countries. The total amount of assistance being provided under the Montreal Protocol is in the region of a billion dollars. The amounts required to finance significant restrictions on GHG emissions from developing countries in the next several decades would run from hundreds to thousands of billions. Practical political factors would preclude direct transfers from the developed countries of anywhere near such amounts.

A system of tradeable permits is another form of contracting that furnishes an effective and politically palatable way of transferring capital and pollution-reducing technologies from the more industrialized to the less industrialized states. Such a trading system could be used to deal with regional air pollution problems such as sulfur emissions or emissions of ozone gases, or global problems, such as greenhouse gas emissions. Less developed states can be given relatively more allowances in recognition of their need for industrial development. Firms in the industrialized regions facing relatively high costs for reducing pollution could invest in pollution reductions in the industrializ-

<sup>109</sup> Climate Change Convention, *supra* note 93, Art. 4, para. 3.

<sup>110</sup> *Id.*, Art. 11.



ing regions, where costs would likely be lower. These investments would include the use of sophisticated, environmentally superior technologies in new plants. Private investment, driven by competitive market forces, would encourage technological innovation and probably prove more effective and less costly than expenditures by public authorities for the same purpose, making an "ecological market economy" out of the FTR by creating property rights out of what would otherwise be common resources, and therefore overused.

Still another approach to contracting is to develop a system of property rights in natural resources. An innovative, market-based approach to preserving biodiversity which could set a broad precedent is an agreement between a major U.S. pharmaceutical company and the Government of Costa Rica in which the company agreed to finance preservation of tropical forest in return for preferential access to the forest's genetic resources. A significant question is the extent to which such property rights should be subject to governmental ownership and control. The Biodiversity Convention recognizes property rights in the nation in which natural resources are located, and contains other language which could qualify private intellectual property rights, potentially undermining the efficiency of private market arrangements. On the other hand, giving nations a proprietary interest in genetic resources may be an important step towards more effective protection of biodiversity.

While pollution fees or taxes share all the basic economic advantages of the trading approach to contract, they lack some of the political and administrative advantages of trading. For example, they do not allow states flexibility in the allocation of pollution allowances, and do not harness market forces to transfer capital and technology to the industrializing states in order to promote development that is environment-friendly.<sup>111</sup> In the case of some environmental problems, such as GHG emissions, quite high fees or taxes would be needed in order to induce significant changes in polluting activities. There is often strong political opposition to such taxes, especially from industry with concerns over competitiveness, as illustrated by the demise of the European Commission's proposal for an energy/carbon tax. Industry opposition to a trading system is likely to be less intense because they would probably not have to pay for their permits. Under a trading system the government could auction off permits, but in practice permits have been given to existing firms in proportion to the allowed emissions under preexisting regulatory requirements. In these circumstances, firms may be able to make a profit by reducing their pollution and selling their excess permits. Transfers of financial resources to developing states could be accomplished by earmarking a portion of developed country

<sup>111</sup> Part of the proceeds of a pollution fee or tax could be earmarked for investment in environmental protection in the industrializing regions, but investment decisions would be made by public authorities.



tax revenues for that purpose, the remainder being retained to offset, on a revenue-neutral basis, existing taxes on capital and labor. But the developed countries would be reluctant to entrust international bureaucracies with authority over vast revenues. There is also a tension between the revenue and incentive aspects of a pollution tax or fee. Finance ministers want a dependable fiscal base. Also, earmarking a portion of fee revenues for transfers to other states does not ensure efficient transfer of appropriate technologies to reduce pollution and waste in the most cost-effective manner.

While new forms of property rights, contract, and taxes of fees to deal with process pollution and wastes offer the greatest promise for progress, other forms and applications of economic incentives also have promise in the multi-state market context. For example, the imposition of fees on pollution from automobiles and other environmentally undesirable product attributes could potentially provide more flexibility and fewer impediments to trade than command and control regulation. A system which imposed a fee on the generation of hazardous wastes and refunded that fee upon a demonstration that the wastes had been properly treated and disposed of would ameliorate the problem by making improper disposal unprofitable and providing the private sector with incentives to accurately track such wastes. The recently developed EU program of eco-labelling<sup>112</sup> would harness consumer demand by stimulating a common market for environment-friendly products.

The global climate policy debate vividly illustrates the contribution that economic incentives can make to solving environmental problems in the context of a FTR among states. The costs of achieving significant limitations on GHGs are enormous. The use of internationally agreed command-and-control requirement to limit the many different GHG sources and sinks would be extraordinarily cumbersome. It is also doubtful that sufficient transfers of technology and other assistance from the developed to the less developed countries can be achieved through bilateral or multilateral assistance mechanisms. Most developed countries' industries are reluctant to accept costly new GHG limitation requirements that would disadvantage them in international competition. At the same time, some of these industries' firms could enjoy rich market opportunities for sales of resource-efficient, technologies to developing countries. These several factors suggest the desirability of using a tradeable permit system might be to limit GHG emissions.<sup>113</sup> Participating nations would agree to restrict net emissions of GHGs from their territory according to an agreed-upon schedule. Such an agreement would in effect establish a net GHG emis-

<sup>112</sup> See Wägenbaur, 1992 U. Chi. Legal F. at 30 (cited in note 72).

<sup>113</sup> See Richard B. Stewart & Jonathan Wiener, *The Comprehensive Approach to Global Climate Policy: Issues of Design and Practicality*, 9 Ariz. J. Int'l L. & Comp. L. 83 (1992).



sions allowance for each participating nation. Nations that did not need to use their entire allotment could sell their excess allowances to others. Such sales could either be made between nations, or between private firms that had been allocated allowances by their respective nations. The Climate Change Convention allows parties to the Convention to adopt "joint implementation" measures for dealing with GHGs.<sup>114</sup> This provision could be interpreted to allow broad development of trading systems.

In order to win their assent to limitations, developing nations could be given relatively more allowances than developed nations. This would represent a transfer of valuable in-kind assets to the developing countries, but in a form less likely to excite political opposition than would outright cash grants. International market transfers of such allowances would be a quite effective way of transferring capital and appropriate technology to developing countries. For example, firms in developed countries would provide capital and know-how, including technology protected by intellectual property rights, to foreign nations or firms to enable them to undertake economically productive activities in a more energy-efficient and environmentally beneficial fashion. The firms in the developed countries would be compensated for these investments in part by transfers from the developing countries of net GHG emission allowances that would no longer be needed because of the energy savings obtained as a result of the investment. The developed country firms could use such allowances themselves, or, more likely, sell them to other firms anywhere in the world. The development of an international "green" currency, in the form of net GHG allowances, would channel technology and resources to wherever in the world net GHG emissions could be reduced at the lowest cost. In addition to promoting transfers of capital and technology from developed to developing countries, economic incentive systems would, for reasons already explained, significantly reduce the costs of achieving reductions and avoid the need to create an elaborate international command-and-control regulatory authority.<sup>115</sup> Both of these features would promote the likelihood of agreement on targets and timetables for GHG limitations. This decentralized, market-based system could be supplemented by bilateral or multilateral governmental grants, but it would likely be far more effective in ensuring appropriate, cost-effective technology transfer than exclusive reliance on national and international government bureaucracies.

<sup>114</sup> Climate Change Convention Act 4 §2(a).

<sup>115</sup> There would have to be international agreement on the allocation of allowances. Once such an allocation was established, market transactions and nation-to-nation agreements would determine the extent of controls of different GHGs for particular sources and the extent of preservation and enhancement of particular sinks. Under a command-and-control approach, each of these thousands of particularized decisions would have to be made through some authoritative international process.



### III. Conclusion

Harmonizing the many-sided relation between competitive markets and environmental protection is a central challenge for future domestic and international law and policy. Command and control regulation is poorly suited to meet this challenge. Central planning approaches tend to create a false conflict between economic and environmental goals. Market-based approaches to environmental conflict can erase this conflict by harnessing the enormous power of competition and the price system to capture resource externalities. The virtues of market-based approaches are especially apt in the context of trade among states. Reconciling free trade and environmental protection in situations where political integration is limited and supra national institutions are relatively weak requires approaches that economizing on government. Market-based incentives meet this need, and turn economic integration to ecological advantage, making environmentalists of Adam Smith and David Ricardo.













