Chapter 4

Effects of Environmental Regulations on Trade and Competitiveness

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The previous chapter discussed ways in which trade affects the environment, and the circumstances under which trade restrictions might be appropriate to reach environmental goals. This chapter considers how environmental regulations can affect trade and manufacturing competitiveness.

In some cases, domestic environmental regulations, particularly on products or product disposal, can act as ontariff trade barriers. Such measures are sometimes needed to achieve environmental goals. However, some fear that de-facto trade barriers will be erected under the guise of environmental protection. Sorting out the impacts of these measures on both trade and the environment can be difficult. The effects of environmental provisions on trade are not well understood.

At the same time, domestic environmental regulations, particularly on industrial processes, can put domestic firms at a disadvantage in international competition. (Regulations on products' inherent characteristics, use, and recycling or disposal would be less likely to have competitive impacts since these types of regulation would apply equally to imported and domestic goods.) A disadvantage might occur if competitors in a foreign country face weaker regulations and/or enforcement (and thus lower compliance costs). Domestic firms could also be disadvantaged if foreign firms face similar regulations but receive more government help in meeting them. This chapter considers the extent to which U.S. manufacturing firms suffer a competitive disadvantage, and possible responses to such disadvantage.

Over the years, many studies have examined the competitive impacts of environmental regulations for manufacturing. (This literature is reviewed in appendix E.) These studies are difficult to summarize and offer somewhat mixed conclusions. Some studies have not found a relationship between environmental regulation and trade and investment. Others judged the overall effect to be "small" or "insignificant," though there is no agreed notion of what those terms mean in this context. However, in certain sectors facing high environmental control costs, the effects on trade performance were larger. Serious problems with both the data and methodology of these studies make anything but limited and/or tentative conclusions problematic. Also, caution should be taken in applying these results to the present competitive and environmental climate. Much of this research involves data from the 1970s, when fewer U.S. industrial sectors were under as great competitive challenge from abroad. What were modest impacts 10 or 15 years ago might well be more troubling today when competition as a whole-arising from many nonenvironmental reasons-is more intense, and U.S. environmental regulation is more strict.

This chapter also discusses whether countervailing duties or other trade measures are likely to bean effective response when U.S. firms face possible competitive disadvantages from lax environmental standards in other countries. While such measures merit consideration, their effectiveness in remedying competitive impacts is limited. Other alternatives, such as negotiating with other countries to raise their standards, domestic support for research and development, and technical assistance to industry, may need equal or greater consideration in a strategy to maintain U.S. manufacturing competitiveness.

ENVIRONMENTAL REGULATIONS AS TRADE BARRIERS

As has been mentioned, governments use various means to regulate environmental conduct within their borders. They may regulate manufacturing processes, for example, by requiring permits for the release of pollutants. Countries also may regulate which products may be produced and sold, and how they may be used and disposed of. For example, a country might require cars to meet specified emissions standards; products not to contain banned compounds (such as polychlorinated biphenyls (PCBs)); and manufacturers to take back empty beverage containers for refilling and reuse.

To be effective, a country's system of regulations to some extent must cover imported products. A

country's internal regulations seldom extend to the process by which imported products are made.[1] But the regulations likely would subject imported products to the same standards as domestic products regarding the nature of the product (PCB-free equipment), its use (catalytic converters must operate effectively for a specified number of miles), and its disposal (reuse of beverage bottles).

Differences in internal regulations can impede trade: products made for use in one country might not meet another country's standards.[2] When standards can be harmonized, or made similar, trade can be more open, and trade disputes rarer. Thus, as recognized by the Organisation for Economic Cooperation and Development's (OECD) 'harmonization principle' (see ch. 2), harmonization can be a worthwhile goal. However, as OECD recognized, harmonization is not always appropriate or feasible; sometimes it makes sense for countries to have different standards (see ch. 3 and box 3-A).

The most comprehensive effort to harmonize environmental standards has been taken within the European Community (EC) (see box 2-A in ch. 2). EC's supra-national government facilitates harmonization. Outside the EC, standards harmonization has focused on nonenvironmental areas, such as technical compatibility of products, and has been achieved largely by the private sector. Harmonization of environmental standards requires governmental action.

The basic General Agreement on Tariffs and Trade (GATT) normally permits differences in internal regulations. Internal regulations need not be justified; GATT only requires that domestic goods and imported goods from all countries be treated in the same way (see the annex to ch. 2). Moreover, these regulations may be enforced against imported goods at the border: nations that ban, tax, or otherwise regulate certain domestic goods may ban, tax, or regulate the importation of those same goods.[3] The GATT Standards Code (which applies only among countries that have signed onto the Code) goes somewhat further, providing procedures and principles designed to minimize the trade effects of domestic standards (see the annex to ch. 2). The Standards Code also provides for challenges to domestic regulations as unduly restricting trade, although no such cases have been adjudicated. However, the Standards Code, like the basic GATT agreement, does not call for second-guessing a country's environmental policy or weighing the environmental benefit of a regulation against its disruption of trade. Rather, a country's environmental goals are taken as given, and trade effects of regulations are accepted as long as the regulations conform to GATT's requirements (e.g., no discrimination against foreign goods). This approach, while allowing countries flexibility in achieving environmental goals, also has the potential to permit protectionist regulations taken in the name of environment.

Quite apart from GATT's particular rules, it can be a complex task to judge the appropriateness of specific environmental measures with trade effects. A recent dispute between the United States and Canada over lobsters illustrates some of the difficulties (see app. A for further details). This dispute was decided by a binational panel under the terms of the U.S.-Canada Free Trade Agreement; however, under the terms of that agreement, the panel applied GATT law. Both U.S. and Canadian regulations prescribed a minimum size for harvested lobsters, to ensure that lobsters reached reproductive maturity before they were caught. Canada's minimum size was smaller because lobsters in Canadian waters reached reproductive maturity at a smaller size. However, the United States banned imports of live Canadian lobsters below the U.S. minimum. Canada saw this as an unfair trade barrier, holding that the ban was not necessary to protect lobster stocks. The United States argued it could not effectively enforce its domestic lobster conservation program if foreign lobsters under the U.S. minimum size were permitted in the U.S. market, because it was too difficult to determine lobsters' origin. The majority of the binational panel deciding the case did not evaluate what conservation benefit the U.S. regulation had, or

[1] Attempts to influence processes used abroad often take a more indirect form, such as threatened or actual trade restrictions. As discussed in ch. 3, such trade restrictions have greater potential to conflict with the rules of the General Agreement on Tariffs and Trade (GATT) rules than do the domestic environmental measures considered here.

[2] In this paper, "regulation" and "standard" are, unless otherwise specified, used interchangeably to denote requirements imposed by governments rather than actions taken voluntarily by firms.

[3] This is clearly so for regulations based on the product itself, but more doubtful for regulations based on the process by which a product was made. (See annex to ch. 2.)

weigh that benefit against trade disruption. Rather, it found the regulation proper because U.S. and Canadian lobsters were subject to the same specific requirements as U.S. lobsters.

As has been mentioned, GATT cases are not now decided by balancing environmental benefit against possible distortion to trade. Such a balancing has occurred in a dispute within the EC, where EC trade rules apply. This occurred in a case[4] involving a 1981 Danish regulation providing that gaseous mineral waters, lemonade, soft drinks, and beer could only be marketed in returnable containers, defined as containers for which there was a system of collection and refilling under which a large proportion of containers used would be refilled. Furthermore, except for some limited circumstances, manufacturers could only use containers the Danish Government had approved. Foreign companies perceived these requirements as unfair because returning containers for refilling would be much more costly for them than for local producers. Also, they were afraid the Danish Government might limit its approval to a few standard bottle shapes, thus prohibiting foreign companies from using distinctive bottles carrying brand recognition. The Danish regulation was also viewed with suspicion because it did not apply to milk and wine, two products for which Danish producers had little foreign competition.

The European Commission brought a complaint against Denmark, asserting the Danish regulation unduly restricted the free movement of goods among EC member countries. The Danish Government argued its measure was justified by environmental concerns. With regard to the deposit-and-return system for empty containers, the European Court of Justice (the EC's highest court) agreed with Denmark. It noted that protection of the environment is one of the EC's essential objectives, and therefore may justify certain limitations on the free movement of goods. Regarding the Commission's argument that there were less restrictive options available to the Danish Government, the court found that the trade burden of the Danish requirement for returnable containers was not disproportionate to its environmental benefits.

However, the court did find that the burden of requiring foreign manufacturers to use only government-approved containers was disproportionate to the benefit. It noted that a system for returning nonapproved containers was capable of protecting the environment, and observed that the volume of bottles at issue would be small in any case owing to the deposit-and-return system's substantial restrictive effect on imports.

This decision is an example of how a court or other dispute settlement panel could apply a proportionality test to balance competing objectives of free trade and environmental protection. Some critics argue that the court was too accepting of the Danish regulations, thus leaving the door open to protectionist use of environmental legislation.[5] Perhaps encouraged by this case, Germany has fashioned a tough law on recycling of packaging that also could put imported products at a disadvantage.[6]

Ultimately, both the EC and GATT face the same tough problem: how to leave leeway for legitimate domestic regulations for health, safety, environment, and similar matters, while at the same time preventing the use of regulations for protectionist ends. This can at times be a delicate balancing act; attempts to more fully satisfy one of these goals can frustrate the other.

The difficulties in striking this balance are apparent in the GATT Uruguay Round negotiations that focus on minimizing trade barriers. This negotiating goal was endorsed by Congress, which in 1988 listed "the reduction or elimination of barriers and other trade-distorting policies and practices" as one of three overall trade negotiating objectives, and also singled out "unjust~led phytosanitary and sanitary standards.

The "Dunkel draft" of proposed GATT Amendments under consideration in early 1992 would address this objective through a revised Agreement

4 The case is discussed in more detail in app. A.

5 It is worth noting that Denmark has had a highly concentrated beer industry. In the mid-1980s Carlsberg and Tuborg, both controlled by United Breweries, together had 70 percent of the Danish market for beer. See 'The Danish Bottles Case," an unpublished case study prepared by Ph.D. candidate John Clark under the supervision of Professor Scott Barrett, the London Business School, and supported by the Management Institute for Environment and Business, Washington, DC, 1991.

6 *Verpackungsverordnung* (Ordinance on the Avoidance of Packaging Waste), June 12, 1991.

7 Omnibus Trade and Competitiveness Act of 1988, Public Law 100-418, sec. 1101(a)(2), 1101(b)(7)(C).

on Technical Barriers to Trade (commonly called the Standards Code), and a proposed new Decision on Sanitary and Phytosanitary Standards (commonly called the SPS Code).* The draft would make the Standards Code a part of the basic GATT agreement,[9] at the same time strengthening some of its language. The Standards Code now states:

> Parties shall ensure that technical regulations and standards are not prepared, adopted or applied with a view to creating obstacles to international trade.[10]

The Dunkel draft would change the last part of the sentence to "with a view to *or the effect* of creating *unnecessary* obstacles to international trade. "[11] Thus, even if innocently intended, standards could be considered improper based on their actual effect. As to when an obstacle to trade is "unnecessary," the Dunkel draft adds:

> For this purpose, technical regulations shall not be more trade-restrictive than necessary to fulfill a legitimate objective, taking account of the risks non-fulfillment would create.[12]

The draft explains in a footnote that:

> This provision is intended to ensure proportionality between regulations and the risks non-fulfillment of legitimate objectives would create.[13]

In principle, there is nothing wrong with judging regulations on their effects as well as their intentions; a trade barrier does not become less harmful because it is unintended. It is also in principle proper to judge adverse trade effects by whether they are necessary to achieve an environmental goal, and whether a less trade-restrictive means could be found. It would be beneficial for those making environmental policy to anticipate possible trade effects, and to craft regulations to minimize them. In particular, just as environmental impact assessment is sometimes proposed to evaluate changes in trade laws, so might a trade impact assessment be appropriate for major changes proposed in environmental laws.

However, depending on how these proposed Standards Code provisions are interpreted, their practical effect might be to make it harder for nations to maintain legitimate environmental regulations. Such regulations could be subject to second-guessing: in hindsight, it might be easy to think of an alternative approach that would have had less effect on trade.[14] The requirement to use the least trade-restrictive means might be interpreted to mandate the use of more flexible (but seldom tested) forms of regulation (e.g., tradable over nontradable permits, or taxes instead of quantity limits), on the theory they pose less of an obstacle to trade, unless strong evidence showed the less restrictive form of regulation would not meet the environmental goal. Also, it could be difficult for a panel to determine whether certain less trade-restrictive measures could address environmental concerns effectively and in a timely manner.

Another amendment proposed in the Dunkel draft, the SPS Code, would cover regulations concerning the life or health of plants and animals, the diseases spread by them, and health and the healthfulness of foods derived from them.[15] This Code too would be made part of the basic GATT agreement. The proposed SPS Code requires standards to be "based on scientific principles and [not be] maintained against available scientific evidence.' '[16] While '[sanitary or phytosanitary measures which conform to international standards, guidelines or recommendations shall be deemed" to comply, stricter measures must have "a scientific

*The Dunkel draft, named for GATT's Secretary-General (see ch. 2), is set out in Multilateral Trade Negotiations, the Uruguay Round, Trade Negotiations Committee, "Draft Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations," Dec. 20, 1991, GATT Document MTN.TNC/W/FA.
Ch. 2 discusses certain other proposed changes found in the Dunkel draft, such as strengthened dispute resolution procedures.

9 The current status of GATT Codes is described in the annex to ch. 2.

10 GATT Standards Code, paragraph 2.1.

11 Dunkel draft, p. G.2, paragraph 2.2 (emphasis denotes words added).

12 Dunkel draft, pp. G.2-G.3, paragraph 2.2.

13 Ibid., p. G.3, footnote 1.

14 In interpreting GATT Article XX, some panels have found that alternative, less trade-restrictive approaches should have been tried. This occurred with the United States' case against Thailand concerning cigarette import licensing (see app. A), and in Mexico's case against the United States in the tuna/dolphin dispute (see chs. 2 and 3).

15 The complete definition of sanitary and phytosanitary measures is given in the Dunkel draft, p. L.45, paragraph 1.

16 Dunkel draft, p. L.36, paragraph 6.

17 Dunkel draft, p. L.37, paragraphs 10,11.

justification.' '[17] These provisions, like the proposed amendments to the Standards Code, are for a worthwhile purpose. If the scientific evidence behind regulations is never scrutinized, the door is opened to trade barriers. A case often cited in this regard is an unadjudicated dispute between the United States and the EC. The EC banned the import of beef from cattle fed certain hormones, even though the United States maintained there was no scientific evidence of a health risk. (See app. A.)

On the other hand, the proposed SPS Code could be interpreted so as to discourage legitimate SPS-related environmental regulations. How much scientific evidence will be required for "a scientific justification?' Scientific certainty is rare; usually scientists can at best agree on a range of outcomes, with estimates as to their probabilities. There is typically uncertainty regarding the severity of the effects likely to arise from particular forms of environmental problems. Would the SPS Code require, if not a scientific certainty, at least a scientific consensus that an outcome is probable? What if there is no scientific consensus? Would regulations be permitted in order to avoid a potentially catastrophic outcome that scientists agreed was possible but very unlikely, or that only a small minority of scientists thought possible? It is not clear how the SPS Code would be interpreted. At issue is who has what burden of proof. Some environmentalists hold that the term 'sound science" implies that those in favor of a regulation could have the burden of proving that it is justified. They would urge a "precautionary principle" that puts the burden of proof on those who challenge the regulation.[18] Since often neither side can actually prove its case, the allocation of the burden of proof is important. And whatever the scientific burden of proof is, it is not clear dispute resolution panels can reliably determine whether it is met; that task could be difficult even for international scientific organizations.

Even if there were no scientific uncertainty, it would still be unclear what constitutes 'a scientific justification.' While science can evaluate environmental risks, it cannot in the end determine how society should trade off environmental concerns against economic and other concerns. How much expense is justified in order to avoid a particular form of environmental damage or a particular health effect, or the risk of such effects? This cannot be answered in the abstract, nor can it be answered by scientists alone; it is a societal question, one that normally would be resolved at least in rough measure by a political process. It is not clear how GATT panels could judge for society what regulations are justified.

While the proposed SPS Code could result in GATT panels making the judgments described above, it would not necessarily be interpreted in that way. The staff of the U.S. Trade Representative (USTR) commented to OTA that the text (which refers to *'a"* scientific justification) and the negotiating history make it clear that: 1) when the scientific community is divided into two or more scientific positions, each country would be free to choose which of those scientific positions to adopt; and 2) each country would be free to make its own tradeoffs between environmental risk and other concerns.[19]

Also, some environmentalists are concerned the SPS Code recognizes the Codex Alimentarius Commission (CAC) as a source of international standards for food safety .20 CAC, which now sets voluntary industry guidelines for food safety, is jointly sponsored by two agencies of the United Nations, the Food and Agriculture Organization and the World Health Organization. U.S. delegations to CAC have had heavy industry representation and much less representation of environmental and consumer

18 The precautionary principle is aimed at ensuring that ''a Substance or **activity posing a threat to the environment is prevented** from *=-tie **environment, even if tbere is no conclusive scientific proof linking tbat particular substance or activity to environmental damage." James Cameron and Juli Abouchar,** "The Precautionary Principle: A Fundamental Principle of **Law and Policy for the** Protection of the Global **Environment,''** *Boston College International and Comparative Law Review,* **vol.** XIV, No. 1, 1991, p. 2.

19 **Personal communication with USTR staff, Mar. 27, 1992.**

20 **Dunkel draft, p. L.46, paragraph 3.**

groups; it is claimed that the same is true for other countries.[21]

The proposed Standards and SPS Codes also could call on GATT' members to make more effort than now required to get state and local governments to follow the Codes' rules. These proposed Codes provide that counties "shall formulate and implement positive measures and mechanisms in support of the observance of" the Codes' provisions by "other than central government bodies. '[22] In principle, it makes sense to require subnational governments to follow GATT's rules regarding technical regulations; indeed, subnational regulations, because they can vary from region to region within a country, have even greater potential than national regulations to disrupt trade. However, depending on how the Codes' other provisions are interpreted (including those discussed above), state and local governments might find it harder to maintain even legitimate environmental regulations, and a national government might find it harder to let them. Where a state's regulation was stricter than international norms, the state might face a heavy burden of justifying its deviation. In the United States, states and localities sometimes impose stricter standards or requirements than Federal Law.[23] Some states and localities have established their own materials and waste policies including deposit-refund and redemption value systems for beverage containers, minimum recycled fiber content for newsprint, and bans on particular materials (e.g., aseptic drink containers and polystyrene fast-food packaging).

In sum, the trade disputes and the proposed amendments just discussed highlight some issues likely to arise when the objective is to both promote liberal trade and foster environmental protection. Such a goal will likely require both informed scientific judgment on environmental risks and possible responses, and choices on how such risks should be balanced against other societal concerns. These judgments are not ones GATT dispute resolution panels, as now constituted, would seem well-suited to make; possible procedural modifications and institutional alternatives are considered in chapter 5.

EFFECTS OF LAX FOREIGN REGULATIONS ON MANUFACTURING TRADE AND COMPETITIVENESS

In examining whether lower environmental standards abroad should be met by trade measures to counteract possible adverse impacts on U.S. manufacturing firms, several complex questions need to be considered. One question is how standards compare. Standards are not *always* lower abroad. A few other leading industrial countries, such as Germany and Japan, have standards that are, at least on balance, roughly comparable to the United States. In some areas the United States may have higher standards; in other cases, Japan or Germany. (See

21 Dapne Wysham, "The Codex Connection, Big Business Hijacks GATT," *The* Nation, Dec. 17, 1990, pp. 770-773; Tom Hillard, *Trade Advisory Committees: Privileged Access for Polluter,* Public Citizen's Congress Watch, December 1991, pp. 27-28 (citing sources including *Report of the Nineteenth Session of the Joint FAO/WHO Codex Alimentarius Commission* (Rome, Italy: Food and Agriculture Organization of the United Nations and World Health Organization July 1991)); Charles Arden-Clarke, WWF International, *The General Agreement on Tariffs and Trade, Environmental Protection and Sustainable Development,* revised November 1991, p. 28. If an institution such as CAC has insufficient environmental representation, the institution might be made serviceable by changing the representation. In 1991, for the fiit time, the U.S. delegation to CAC included some representation from consumer groups. Tom Hillard, op. cit.

22 Dunkel draft, p. G.5, paragraph 3.5, and p. L.43, paragraph 45. The current Standards Code includes a similar duty, but uses weaker language, requiring that parties "shall take such reasonable measures as may be available to them to ensure that local government bodies within their territories comply." GATT Article XXIV, paragraph 12, contains similar language. However, the effective difference between the current and proposed language may be small. As this paper was going to press, The GATT Council adopted and released a decision interpreting the Article XXIV language to require that the national government make a "serious, persistent and convincing effort" to secure compliance by the local government with GATT's rules. "Canada-Irnport, Distribution and Sale of Certain Alcoholic Drinks by Provincial Marketing Agencies," Report of the Panel, Oct. 16, 1991, GATT Document DS17/R, paragraphs 5.35 through 5.39. That case concerned a U.S. complaint against alcohol regulation by Canadian provinces. The Article XXIV language is also pertinent to another very recent dispute, this one brought by Canada concerning state alcohol regulations within the United States. The panel's report in this case was given in mid-March 1992, to GATT's member countries, and at that time was thought likely to be considered at the April 30 GATT Council meeting. *Inside U.S. Trade, Mar. 20, 1992,* Special Report, p. S-1 (article prints sections 5 and 6 of the panel's report). The panel stated that the qualifications on the duty to make state and local regulations conform to GATT 'grants a special right to federal states without giving an offsetting privilege to unitary states, and has to be construed narrowly to as to avoid undue imbalances in rights and obligations between contracting parties with unitary and federal constitutions." Ibid., p. S-13, paragraph 5.79. The panel expressed the opinion that failure to force compliance is justified only when a country's "constitutional distribution of powers" prevents the national government from controlling measures by regional and local authorities. Ibid.

23 See, for example, 33 U.S.C.A.1370 in the Federal Water pollution ControlAct, and 42 U.S.C.A.7412(r)(11) (accident prevention provisions) and 42 U.S.C.A. 7429(h)(1) (solid waste incineration) in the Clean Air Act.

app. E.) However, some other OECD countries do have lower standards. Standards in developing countries are generally even lower. The case of greatest current interest is Mexico because of its common border with the United States and the possibility of a North American Free Trade Agreement (NAFTA) (see ch. 2). Another OTA study, expected to be issued in the summer of 1992, is examining the implications of U.S.-Mexico trade, technology, and investment in detail.

Newly industrializing countries such as South Korea and Taiwan, with substantial manufacturing capacity but weaker environmental standards, probably present the greatest potential difficulty. Taiwan is in the early stages of implementing environmental reforms; South Korea lags behind. Legal standards alone are an imprecise gauge of competitive impact; implementation and enforcement have to be taken into account. There may be more likelihood that environmental standards will be enforced and implemented in a country, like the United States, with open political processes and substantial opportunities for citizen action, than in countries with less open systems. Even when standards and enforcement are roughly comparable, governments can differ in the form of regulation, the level and kind of support (e.g., tax incentives, technical assistance) to help their industries comply with environmental regulations, and the nature of the relationship between government and industry. This subject will be addressed more fully in the final report in this assessment.

Another question to be considered is the degree to which regulations affect competitiveness. Although higher U.S. standards, when they are present, can constitute a competitive disadvantage for U.S. manufacturing in some sectors, there are many complicating factors. Some firms have implemented strict U.S. regulations in ways that reduce any competitive disadvantage or even create a competitive advantage. This can happen in two ways, only mentioned here but to be treated more fully in OTA's final report. First, compliance with higher standards can sometimes lead to process improvements that increase manufacturing efficiency.[24] Second, higher U.S. standards can put U.S. firms in the lead for technology to meet those standards. Being first with the technology could give U.S. firms an edge in countries that subsequently adopt similar standards. Higher standards can also give U.S. companies an edge in the market for environmental goods and services. Germany, the United States, and Japan are the largest producers and exporters of environmental equipment and services because of their relatively strict environmental standards. (See app. D.)

Various responses (including both trade and domestic measures) could be taken in cases where lower standards abroad do put U.S. firms at a disadvantage. A possible trade response would be to treat weaker foreign regulations as a subsidy, and to levy countervailing duties.[25] This approach has an appealing logic. According to economic theory, environmental regulations are supposed to "internalize' the costs of pollution to society; that is, to make the polluter pay those costs. When costs are internalized, the market operates more efficiently, producing private behavior that in theory maximizes social welfare. Compared to this situation, a failure to internalize costs of pollution amounts to a kind of market-distorting subsidy to the polluter. Under U.S. law, subsidized imports can sometimes be subject to countervailing duties. These are extra import tariffs designed to neutralize the effect of the subsidy, thus in principle counteracting a market distortion and removing U.S. firms competitive disadvantage.

Whether it would be appropriate to apply such duties to imports to adjust for lax (or nonexistent) foreign environmental regulations would depend on many factors. Some economists point out that more permissive regulations abroad do not necessarily represent a major distortion of the free, cost-internalized market.[26] Factors such as industrial makeup, population density, and social priorities (this latter influenced by the country's degree of wealth) enter into the calculation (see ch. 3). Nevertheless, regulations in other countries, especially in developing countries, are often less strict than would best serve that country's interest—especially in the longer term (ch. 3); in such cases, the absent or lax regulation distorts the market. Moreover, a country's regulations will not normally take into account harm done abroad by domestic

24 U.S. Congress, Office of Technology Assessment, *Serious* **Reduction** *of Hazardous Waste: For Pollution Prevention and Industrial Efficiency,* OTA-ITE-317 (Washington DC: U.S. Government Printing Office, September 1986), pp. 6,20,77.

25 See app. B for discussion of some countervailing duty legislation proposed in the 102d Congress.

26 For example, see Judith M. Dean, *Trade and the Environment: A Survey of the Literature,* paper prepared for the World Bank, 1991.

activities that produce transborder or global environmental degradation; from the point of view of the world as a whole, this is another market distortion, which countervailing duties could address.

In particular, when transborder or global environmental degradation affects the United States, the environmental damage suffered in the United States might outweigh whatever bargain the price of the goods represents. In that case, countervailing duties could be appropriate to stop a transaction that hurts the United States. In a case of what seems to be purely local pollution, the goods' mode of production might not have an adverse environmental effect on the United States—but could have a competitive impact, depending on the industry.

Even when weak foreign regulations act as a market-distorting subsidy, it is not always in the United States' own economic interest to levy countervailing duties. This is true for subsidies in general, not just those in the form of lax environmental standards.[27] Also, levying countervailing duties based on the level of environmental standards could spark resentment, especially from developing countries. Some developing countries see protectionism as the motive underlying developed countries' efforts to raise developing countries' environmental standards (see ch. 3). Finally, countervailing duties on lax environmental regulations probably would be deemed to violate GATT. if challenged.[28] (It is unlikely GATT's members would agree to change this.) A unilateral U.S. decision to apply them could provoke rounds of retaliation and counter-retaliation.

Another concern is whether countervailing duties would be effective. The threat of trade measures such as countervailing duties sometimes can in itself prompt change in a foreign country's policies. However, OTA's previous studies on trade show the present countervailing duty laws are not very effective in counteracting foreign advantages. Reasons include: delay before duties can be applied; difficulty of discovering and proving subsidies; cost of legal proceedings as a disincentive to seeking relief; difficulty in quantifying subsidies; and difficulty of satisfying the injury requirement.[29] To some extent, these problems could be ameliorated. For example, the government could pursue cases on its own, without waiting for industry (as is now permitted under U.S. law but very rarely done), and the injury test might possibly be made easier to satisfy under U.S. law. Even with these changes, questions about effectiveness would remain. The use of countervailing duties as a response to inadequate environmental standards would probably suffer many of these same problems.

Treating weaker foreign regulations as subsidies would raise new issues in the administration of countervailing duty laws. To quantify the subsidies would require computing the hypothetical extra costs foreign firms would incur if they had to meet U.S. standards. It could be difficult to determine precisely what a foreign firm would have to do in this case, and how much it would cost (including time spent as well as money paid). Moreover, it is not clear what it would mean for a foreign country to have comparable standards as the United States. For example, a country that imposes less strict air pollution emission requirements on industry than the

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27 Countervailing duties will often be beneficial to the country imposing them when foreign subsidies involve a key industry, one that contributes disproportionately to a country's wealth because of factors such as increasing returns to scale, increasing returns to learning, and technology spillovers to other industries. When a domestic industry experiences a sudden surge in competition from imports, countervailing duties can help to avoid sudden displacement of workers and facilities, and to permit orderly restructuring and downsizing to improve competitiveness. However, in both cases, domestic measures to aid the industry are normally preferable to trade measures. In general, whether countervailing duties are desirable is hard to say; it depends on many factors including the condition of downstream industries that use the imported item. U.S. Congress, Office of Technology Assessment, *Competing Economies: America, Europe, and the Pacific Rim,* OTA-ITE-498 (Washington, DC: U.S. Government Printing Office, October 1991), pp. 55, 122-124, 153-154.

28 While GATT does not precisely define the concept of subsidy and the matter is not free from doubt, a GATT ruling that countervailing duties are a permitted response to lax environmental regulations is unlikely. If countervailing duties were permitted to address how a firm benefits from lax environmental regulation, they might also appear justified to address benefits from lax governmental regulations in other areas such as labor, and worker health and safety laws. This would be quite an extension of the currently understood scope of permitted application of countervailing duties under GATT.

29 U.S. Congress, Office of Technology Assessment, *Competing Economies: America, Europe, and the Pacific Rim,* OTA-ITE-498 (Washington, DC: U.S. Government Printing Office, October 1991), pp. 138-154. The injury requirement is the requirement to show that the domestic injury suffering or threatened with material injury. GATT normally permits countervailing duties only if this showing is made. As interpreted by the International Trade Commission and the courts, this requirement has often been difficult to satisfy, especially for industries promising growth and high reward. However, since countervailing duties based on low foreign environmental standards are probably to begin with inconsistent with GATT, there might be no compelling reason for U.S. law to include the injury requirement in this context.

United States might still achieve the same or abetter level of ambient air quality. The other country might have less industry, or might have topographic features that discourage atmospheric inversions. Other problems could arise. Standards can vary from state to state within the United States. Also, different countries might frame regulations in ways that make comparisons difficult.[30]

A possible alternative to countervailing duties would be some form of border tax adjustment (defined below). Border tax adjustments could only be applied when domestic environmental requirements take the form of a tax on a product. Since this is seldom the case now, the immediate opportunities would be limited. There could be different ways to apply a border tax adjustment, each with different strengths and weaknesses as to GATT consistency, administrative workability, and achievement of environmental objectives. No approach is fully satisfactory.

If a nation taxes a domestic product, GATT, as it has been interpreted, permits the nation to levy an equivalent tax (a "border tax adjustment") on the same product when it is imported, regardless of how that product is taxed abroad. When the taxed product is incorporated into a downstream product, GATT has also been interpreted to permit an equivalent tax on the import of that downstream product (again, a "border tax adjustment' '), based on the quantity of the first product present. These interpretations were made in a dispute concerning U.S. taxes under the 1986 Superfund Amendments and Reauthorization Act, in which the United States taxed domestic and imported petroleum, certain domestic and imported feedstock chemicals, and imported products derived from those chemicals.[31] While there is no guarantee, it appears probable that GATT in the future would be interpreted along the same lines.

A border tax adjustment might be applied to neutralize the foreign advantage of more permissive environmental regulation of manufacturing processes. However, to do so, domestic regulations would need to be changed so as not to regulate a polluting process as such, but instead to tax a product. (There could for example be an excise tax levied when the product is first sold.)

One approach would be to tax a product that happens to be the end product of a polluting process. This would be easy to do administratively, and would probably be deemed GATT-consistent. This approach might reach the economic objective of preventing competitive disadvantage; however, an end-product tax could have perverse results from an environmental standpoint. If the taxis on the product as such, it would not depend on what production process was used; there would thus be no incentive for domestic or foreign manufacturers to reduce pollution, and no incentive for foreign countries to adopt regulations limiting that pollution.

An alternative approach would be to adjust the end-product tax depending on the process used both at home and abroad. This would restore incentives to minimize environmental degradation. However, GATT would likely prohibit such taxes if they were challenged.[32] Also, such a tax would face some of the same formidable administrative problems that the countervailing duty approach would entail. The government would need to investigate the process by which foreign and domestic goods are made, and periodically update that information. Separate investigations would be needed for each product from each country, and perhaps broken down by companies within a given country. Only then would the government know enough to apply the tax.

Another approach would be to tax not an end product but a raw material to a polluting process,

30 The countervailing duty approach aims t. remove the competitive disadvantage to U.S. firms only in the U.S. market. It has been proposed that the competitive disadvantage facing U.S. exports could be addressed by an export subsidy. When a good is sent to a country where that good is cheaper to make because of less strict environmental standards, the U.S. Government could pay a subsidy to makeup that difference. Most export subsidies would violate GATT; export subsidies also would present the same practical and conceptual problems discussed above in identifying and quantifying the cost differences due to different environmental regulations. The export subsidies would also cost the government money.

31 The case is described in app. A. The taxes on imports were found to be permitted under GATT so long as imports were taxed at the same rate as domestic goods. The U.S. law in some cases taxed imports at a higher rate; that feature was found to violate GATT.

GATT also permits the taxes to be rebated when products are exported, regardless of how the products are taxed in the destination country. See GATT Subsidies Code, Annex (Illustrative List of Export Subsidies), items (g), (h).

32 The decision in the Superfund case did not make it explicitly clear that GATT would prohibit such taxes. However, a tax that depends on the manufacturing process used seems outside the purview of the border tax adjustment doctrine as set out in that case; and such a tax would likely be deemed to violate the most-favored-mtion and national treatment requirements because they treat physically identical products differently based on their origin (see annex to ch. 2).

such as fossil fuel.[33] This could encourage pollution prevention and resource conservation by domestic manufacturers, since the more fuel or material a manufacturer consumes, the more tax it would pay. Imports of products could be taxed based on the fossil fuel or material used to produce the product, again providing an incentive for conservation. This approach would likely be deemed consistent with GATT, at least under some circumstances.[34] However, it would have the administrative problem of determining amounts of the raw material used in processes at home and abroad.[35]

Despite the cautions raised above, trade measures such as countervailing duties or border tax adjustments might still be considered as part of a strategy to safeguard U.S. competitiveness. In this regard, several alternative approaches might be considered either separately or in tandem with trade measures. One approach would be to use negotiations or other means to encourage other countries to adopt similarly strict regulatory approaches. The 1990 amendments to the Clean Air Act, for example, call on the President to report to Congress with an evaluation of competitive impacts and a strategy for addressing impacts through trade consultations and negotiations (see ch. 2 and app. E). In the NAFTA negotiations and parallel-track environmental discussions, the attraction of increased access to the U.S. market has become an incentive for Mexico to strengthen its environmental regime. In other circumstances where new trade agreements with developing countries are anticipated, it might be appropriate to begin discussions on environmental matters well before trade discussions begin. The United States very likely would need to offer technical and/or other assistance to help these countries develop and implement higher standards (see ch. 3). While current budgetary constraints limit options, initial steps might include technical assistance to developing countries for planning, institution building, and pilot projects on the environment.

Also, as discussed below, domestic policies could play an important role in ensuring U.S. competitiveness. Strategic use of domestic policies may make trade responses to lax foreign regulations unnecessary.

GOVERNMENT ENVIRONMENTAL ASSISTANCE TO MANUFACTURING FIRMS

The discussion up to now has focused on trade measures as a response to a competitive disadvantage due to variations among countries' *regulatory strictness.* Trade measures are also urged by some as a response to a competitive disadvantage due to national variations in *government assistance with regulatory compliance.* For example, it is possible some countries that have standards roughly comparable to the United States may offer their firms more help (e.g., research and development support, technical assistance or other industrial services, tax incentives, and/or favorable financing) in meeting the standards. (Variations among national approaches will be more fully addressed in the final report of this assessment.)

Under current U.S. law, the government could in some cases levy countervailing duties on imported goods produced with the aid of subsidies. This would in principle be consistent with GATT, though amendments under consideration in the Uruguay Round would exempt some R&D assistance from countervailing duties.[36] However, in addition to the limitations discussed above, countervailing duties have very limited effectiveness in counteracting the effects of government subsidies that promote the development and application of new technology. Such subsidies can have an effect that grows with

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33 The EC is thinking of such a "carbon tax" along these lines, though it is not yet considering applying the tax to imports Of downstream products. (See box 2-A.)

34 The border tax adjustment based on raw materials used in the foreign production would appear to fall within the border tax adjustment doctrine of the Superfund case. However, the reach of tbat doctrine is not clear. It is possible, for example, that GATT would approve of the border tax adjustment if the taxis on feedstock chemicals, whose molecules are physically incorporated into the downstream product (as was so in the Superfund case), but not if it is on fuel, whose molecules are not physically incorporated into the downstream product. Also, on a practical level, verifying the amount of fuel used in a process could be harder to do than verifying the amount olfeedstock chemicals used.

35 A product tax and border adjustment could also make environmental sense, and would be easy to apply, when concerned with the product's use or disposal. For example, a tax on products to represent their disposal costs would provide an incentive to minimize production and consumption of such products. However, in this case a *product tax* would not be needed to prevent a competitive disadvantage, since a tax on the *disposal* of end-products would have the same competitive impact on imported and domestic products.

36 Dunkel &@ pp. I.9, I.10. The Dunkel draft would also exempt certain subsidies for disadvantaged regions, which could include subsidies fOr environmental compliance. Earlier drafts of proposed amendments included a broader exemption for environmental compliance subsidies.

time, rather than dissipating with time as countervailing law assumes.[37]

Apart from questions of effectiveness and GATT consistency, it is worth considering whether it is appropriate for governments to respond with countervailing duties when other governments' provide environmental assistance. The answer depends in part on the type of government help. Some subsidies (such as permanent operating subsidies) can perpetuate inefficient activity. Other forms of assistance, such as support for the development and application of new technology, can produce broad societal benefits. Because firms cannot capture all the benefits their R&D brings to society, and sometimes cannot take the risks inherent in ambitious R&D programs, the free market acting alone will likely induce less R&D than would be best for society. Government policies thus have an important role in encouraging R&D, including environmental R&D.

Given the broad benefits of R&D, it is not surprising the Uruguay Round proposals would exempt R&D support from imposition of countervailing duties. This proposed change is in essence a recognition that R&D should be encouraged rather than discouraged. Similarly, OECD's Polluter Pays Principle, which states that firms should bear the costs of complying with environmental regulations, allows for a possible exception for government aid to promote development of new pollution control technologies and equipment (ch. 2).

Some other forms of government assistance, while not directly developing technology, can do so indirectly. An example: incentives to aid manufacturers or other customers purchase equipment embodying new technology. Japan gave an important boost to its computer industry by subsidizing and facilitating computer leasing.[38] Today Japan is supporting its fuel cell industry through anew policy of subsidizing fuel cell purchases;[39] it is also requiring utilities to reimburse fuel cell cogenerators of electricity. (Although an energy technology, fuel cells have environmental benefits over many traditional forms of energy generation.)

Given foreign governments' industrial promotion, and the limited effectiveness of countervailing duties, other possibilities might be considered as part of a strategy to help ensure that strict U.S. regulations do not disadvantage U.S. fins. Examples include government incentives for development of U.S. environmental technology and technical assistance to help firms adopt pollution prevention approaches. Previous OTA studies have discussed a broad range of domestic policy options to enhance manufacturing competitiveness in general.[40] The final report in this assessment will consider what domestic policies might be appropriate for competitiveness concerns arising specifically from environmental compliance.

Possible policies might be considered in the broader context of the emerging global opportunities in environmental technologies and services. As environmental concerns increase and environmental costs become a greater fraction of total manufacturing costs, access to improved environmental technology could be helpful to a wide range of industries. Increasingly, such technology will entail process and equipment changes that meet environmental objectives while improving the efficiency of manufacturing.

There is a growing global competition in the provision of environmental technology and services, a competition that will be discussed in detail in the final report of this assessment. Many U.S. environmental firms have focused on the U.S. market, which is by far the largest market for such goods and services. (See app. D.) Japan, which has used support for technology development and diffusion to promote many industries, including automobiles, semiconductors, and computers,[41] has began to use similar means to promote its environmental industry, through R&D support, export promotion, and foreign aid programs. Germany and several other European Community countries are also actively promoting their environmental industries, as is the EC itself.

37 See OTA, *Competing Economies*, op. cit., pp. 152-153 and footnote 162.

38 OTA, **Competing** *Economies*, **op. cit.,** pp. 261-262.

39 "MITI To Offer Subsidies to Energy Savers," *The Nikkei Weekly*, Oct. 12, 1991. Such institutions as hospitals, hotels, and schools were eligible for the subsidies, which were scheduled to begin in April 1992.

40 U.S. Congress, office of Technology Assessment, *Making Things Better: Competing in Manufacturing*, OTA-ITE-443 (Washington, DC: U.S. Government Printing Office, February 1990) and *Competing Economies*, op. cit.

41 OTA, **Competing** *Economies*, **op. cit.,** ch. 6.