## Appendix E

# Assessing Trade and Competitiveness Impacts of Environmental Regulations on U.S. Manufacturing

There have been attempts to assess the competitive impacts of environmental regulation on U.S. manufacturing at least since the early 1970s. A number of studies were done in the early to mid-1970s; after a period of reduced interest, the topic appears to be gaining scholarly and government attention today.[1] The U.S. Government was involved early and continues to work in this area.

The majority of studies dealing with this question have concluded that environmental regulation does increase the costs for U.S. producers, but that these increases are relatively small. Some studies have failed to find a relationship between environmental regulation and trade and investment. However, other studies have found an effect, but have judged the overall effect to be small. In certain sectors facing high environmental control costs, the effects on trade performance were larger.

However, serious problems with both the data and the methodology make anything but limited and/or tentative conclusions problematic. Limitations of the research methodologies make valid assessments difficult. Many of these studies may underestimate the total costs of environmental regulation, particularly for some industries; at the same time, they may neglect the benefits of regulation, such as increased energy and materials efficiency and increased public health.

Moreover, it is important to note that much of the research dates from the 1970s, and thus many of the conclusions about the effect of environmental regulation on trade come from a time when U.S. industry was just beginning to feel the competitive pressures that have so greatly intensified in recent years. As a result, what were modest impacts on a competitively strong industry then could be more significant today when competition as a whole is more intense. Thus, while the studies generally concluded that the effects were small, this does not mean that these effects are currently insignificant and should not be addressed.[2] This is particularly true given the new and stricter environmental regulations which will go into effect in the 1990s. In an era of heightened competition, increased environmental costs can diminish trade performance, and when combined with other effects (e.g., cost of capital, foreign industrial policies, etc.) may contribute to significant competitiveness difficulties. But, as other OTA reports have shown, factors such as capital availability, a well-trained workforce, and strong development and diffusion of commercially oriented technologies remain important determinants of competitiveness.[3]

### *The Impact on Trade*

Economic theory suggests that the increased environmental control costs borne by U.S. producers would reduce their competitive advantage in global markets as they face increased competition from producers in nations with lower environmental control costs. Many of the empirical models of the effect of environmental regulation on trade hypothesize that increased environmental control costs will worsen U.S. trade performance.

While studies have been done on the relation between environmental regulation and economic growth, only a few have assessed the cost of environmental regulation and examined its impact on international trade and investment.[4] Overall, the studies are difficult to summarize and offer somewhat mixed conclusions.

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1 The studies on the relationship between environmental regulation and trade are distinct from those examining the impact of regulation on overall economic growth. This report limits its focus to the trade impacts of environmental regulation. Other material has examined the effect of environmental policies on overall U.S. economic growth (e.g., GNP, investment, jobs). (See, e.g., Dale W. Jorgenson and Peter J. Wilcoxen, "The Impact of Environmental Legislation on U.S. Economic Growth, Investment, and Capital Costs,' paper presented at the U.S. Environmental Policy and Economic Growth conference, sponsored by the American Council for Capital Formation, Washington DC, Sept. 12, 1991.)

2 For example, in a study of the steel industry, OTA concluded, "In a world industry in which profits are low or absent, environmental costs can be significant even though they may account to only a small percentage of costs." See U.S. Congress, Office of Technology Assessment, *Technology and Steel Industry Competitiveness* (Washington, DC: U.S. Government Printing Office, June 1980), p. 83.

3 See 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); also *Competing Economies: America, Europe, and the Pacific Rim, OTA-ITE-498 (Washington* DC: U.S. Government Printing Office, October 1991).

4 Ugelow reviewed earlier studies done in the 1970s, while Dean surveyed studies done through 1990. Judith L. Ugelow, "A Survey of Recent Studies on Costs of Pollution Control and the Effects of Trade,' in Seymour J. Rubin and Thomas R. Graham (eds.), *Environment and Trade* (London: Frances Pinter Ltd., 1982); Judith Dean, "Trade and the Environment: A Survey of the Literature," Background Paper, *WorldDevelopmentReport, 1992,* World Bank, April 1991; see also Charles S. Pearson and Robert Repetto, "Reconciling Trade and the Environment: The Next Steps, " prepared for the Trade and Environment Committee of the EPA, December 1991.

Virtually all studies agree that environmental regulation increases the cost structure of firms producing in the United States.[5] For example, the U.S. Bureau of the Census reports that in 1988 the average cost of environmental regulation for 445 manufacturing industries was 1.1 percent of value added.[6] Some other estimates are higher.[7] For example, world business leaders surveyed by Organisation for Economic Co-operation and Development (OECD) report that environmental costs average 2.4 percent of sales income and are anticipated to rise to 4.3 percent by the end of the decade.[8]

While relatively small overall, the costs of environmental regulation are higher for certain industies. For example, 14 percent of 445 industries have environmental regulation costs of more than 2 percent of value added.[9] Copper smelting or refining, petroleum refining, steel, and cement all have relatively high costs from environmental regulation. Dow Chemical estimates a 2.5 to 3 percent price increase because of environmental capital investments.[10] When compared to the trade shielding effects of tariffs, environmental regulation costs are by no means trivial.[11]

Even though environmental regulation imposes expenses on U.S. producers, it is another matter to show whether these costs negatively affect trade performance. To do this, economists usually rely on economic models that include a number of variables, including the cost of environmental regulation, to either measure or predict trade performance and overseas investment.

Some studies find that it is impossible to isolate the effect of environmental regulation on trade, particularly because other variables, such as the cost of capital and exchange rate fluctuations, overshadow the effects of increased environmental regulation costs. For example, in 1979 the U.S. Department of Commerce concluded that its studies "have disclosed no evidence of either significant out-migration of U.S. industries to 'pollution havens' or of trade pattern dislocations directly attributable to pollution control costs."[12] They expected any cost differentials to be masked by other factors affecting the state of the economy.[13] Similarly, a later study, looking at net exports in five pollution-intensive industries, found no trade impact from environmental control costs.[14]

However, other studies have found more evidence of impacts-albeit small. A 1978 OECD study concluded that the general increase in prices due to environmental regulation is not highly significant, "but is nevertheless sufficient to trigger some reduction in private consumption and in exports. "[15] Another study found that "pollution abatement regulations have a negative and fairly significant effect on trade performance (in the 1970s)."[16] A third study found that a 1 percent increase in cost due to environmental regulation would result in a net reduc-

[5] This background paper focuses on the impact on trade of process regulations that limit pollution from industrial facilities. It does not examine the impact of other types of environmental regulation, including product regulations (e.g., automobile emission standards), regulations on product reuse (e.g., recycling laws), or other types of regulations.

[6] The main source for data on pollution control costs for industry is from the Bureau of the Census, *Manufacturer's Pollution Abatement Capital Expenditures and Operating Costs*, published annually.

[7] There are two different ways to express environmental control costs. The first uses the share of environment control costs paid directly by the firm as a ratio of value added. A second measure, relying on an input-output model, includes both the direct costs to the firm plus the indirect costs of environmental controls embedded in the firm's inputs and supplies. These cows are higher but they are divided by the total firm costs, not the lower value added. However, using only direct environmental control costs as a share of total costs, rather than value added, as is sometimes done, results in estimates that understate the true cost of environmental regulation. See Joseph P. Kalt, "The Impact of Domestic Environmental Regulatory Policies on U.S. International Competitiveness, " in A. Michael Spence and Heather A. Hazard (eds.), *International Competitiveness* (Cambridge, MA: Ballinger Publishing Co., 1988).

[8] Preliminary information from OECD, 1991.

[9] U.S. Trade Representative, "Review of U.S.-Mexico Environmental Issues," February 1992.

[10] Charles J. Hahn, Comment on "International Comparisons of Environmental Regulation," Raymond J. Kopp, Paul R. Portney, and Diane E. Dewitt, in *Environmental Policy and the Cost of Capital*, American Council for Capital Formation, September 1990, Washington, DC.

[11] By 1979 the average tariff for nonprimary products (products other than ores, timber, and the like) imported into industrialized countries was down to 4.7 percent. (John Jackson, *The World Trading System: Law and Policy of International Relations* (Cambridge, MA: MIT Press, 1989), p. 53.) Given that environmental control costs in the most affected industries are above 2 percent of value added, their magnitude in comparison to tariffs can be significant. See also Ingo Walter, "International Economic Repercussions of Environmental Policy: An Economist's Perspective," in Rubin and Graham, op. cit.

[12] U.S. Department of *commerce*, "U.S. Pollution Control Costs and International Trade Effects-1979 Status Report" (mimeo), September 1979, p. 3.

[13] Cited in Ugelow, Op. Cit.

[14] J. Tobey, "The Effects of Domestic Environmental Policies on Patterns of World Trade: An Empirical Test," *Kyklos*, vol. *43, No. 2*, 1990, *pp. 191-209.*

[15] Organisation for Economic *Co-operation* and Development, Macroeconomics *Evaluation of Environmental Programmes*, 1978, p. 11. cited in Ugelow, op. cit. Pasurkaalsofound small impacts of environmental regulation see Carl Pasurka, "Environmental Control Costs and U.S. Effective Rates of Protection" *Public Finance Quarterly*, vol. 13, No. 2, April 1985, pp. 161-182.

[16] Kalt, op. cit.

tion of the U.S. balance of trade of $6.5 billion in 1982.[17] While the study concludes that this is a small effect, if the impact was the same in 1990, it would result in an $8.6 billion worsening of the U.S. merchandise trade deficit of $101 billion. Yet another study found that a pollution tax imposed on Mexico equal to the value of environmental control costs of the counterpart U.S. industries would lead to a 1.2 to 2.6 percent reduction in Mexican exports to the United States.[18] This would reduce U.S. imports from Mexico by approximately $375 million a year.

While assessments generally conclude that the economy-wide effects are minor or nonexistent, some studies suggest that sectoral effects are more significant. For example, the Commerce Department concluded that while it could find no relationship between environmental control costs and overall trade patterns, environmental regulation in 1979 did add $7.30 more per ton to the costs of U.S. bleached kraft pulp (paper) over that of Sweden or Canada for a 5.8 to 8 percent increase.[19] Because U.S. producers already held a competitive cost advantage, the study concluded that the impacts on trade would be minimal. Similarly, the Commerce Department found that environmental control costs averaged 6.6 cents per pound in the U.S. copper industry, but only 2.7 cents in Canada, and 0.5 cents in Peru and Chile. The report predicted that U.S. copper imports would rise from 167,000 tons in 1974 to 661,000 tons in 1987, and that 16 percent of this increase (79,000 tons) would be attributable to additional environmental regulatory controls on U.S. copper producers.[20] The Department classified these impacts as small. By contrast, in 1988, OTA concluded that the cost to the U.S. copper industry, particularly copper smelting, of environmental regulation "has been large, with substantial negative impacts on competitiveness and capacity."[21] Another study estimated that water pollution control expenditures would lead to differential trade impacts, for example, an increase of shoe imports of less than 1 percent, but an increase in steel imports of 6 percent.[22] Because the products of many industries with high control costs tend to be highly standardized intermediate goods purchased by other industries (e.g., chemicals, petroleum, minerals) with high price elasticity of demand, small changes in price may cause larger changes in sales.[23]

Finally, one study found that between 1973 to 1982 the United States increased its net imports of goods more from industries with higher environmental control costs than from those in which such costs were lower.[24] In other words, as a ratio of imports to exports, the United States increasingly imported goods in industries that had high environmental control costs. However, the ratio did not change for imports from Canada, a country whose environmental regulations are similar to those of the United States.

## *The Impact on Investment and Relocation*

*In* addition to affecting trade directly, some argue that uneven regulation may induce U.S. firms to migrate to countries with lower levels of regulation-the so-called pollution haven effect. Studies of the location impacts of environmental regulation are inconclusive, but suggest that the effect is modest. There are reasons to suggest that the migratory effect of environmental regulation is likely to be less than the trade effect.

Unlike decisions to buy discrete items, U.S. overseas investment decisions are often driven by such considerations as foreign market access or savings in areas such as wages. For relocation decisions driven by cost considerations, the savings have to be large enough to overwhelm

17 H. David Robison, "Industrial Pollution Abatement: the Impact on Balance Of Trade," *Canadian Journal of Economics*, vol. 21, No. 1, February 1988.

18 Patrick Low, "Trade Measures and Environmental Quality: Implications for Mexico's Exports," paper presented at the Symposium on International Trade and the Environment, sponsored by the World Bank, Washington, DC, Nov. 21-22, 1991.

19 Us. Department of Commerce, 1979, Op. Cit., p. 12.

20 U.S. Department of Commerce, 1979, op cit., app. 2, p. 4. The Congressional Budget Office estimated that environmental regulation also contributed to significant declines in the zinc smelting industry. (U.S. Congress, Congressional Budget Office, *Environmenta/Regulation and Economic Efficiency*, March 1985.)

21 U.S. Congress, Office of Technology Assessment, *Copper: Technology and Competitiveness*, OTA-E-367 (Washington, DC: U.S. Government Printing Office, September 1988).

22 Public Research Institute, Th. *Effects of Effluent Discharge Limitations on Foreign Trade in* Selected Industries, Report to the U.S. National Commission on Water Quality (Arlington, VA: February 1976).

23 General Agreement on Tariffs and Trade (GATT), "Trade and the Environment" Feb. 12, 1992, p. 20.

24 Robison, op. cit.

the costs of opening up a new plant (which can be substantial).[25] Many firm location decisions are not driven by low cost, as access to markets, skilled labor, and quality infrastructure may be more important. And usually savings from lax environmental regulations will be relatively modest compared to the savings from other factors, such as low wages. However, many countries with low labor costs also have low levels of environmental and worker health and safety regulations, which when combined, can result in even lower costs.

Most economy-wide studies suggest a low impact on investment from differing environmental regulation.[26] Leonard found no significant effects on investment of differential environmental regulation.[27] A study of U.S. "maquiladoras" plants (plants locating in Mexico near the U.S. border through a special Border Industrialization Program) found no relationship between the level of low Mexican regulations and U.S. investment.[28]

While economy-wide studies find no investment effect, anecdotal evidence, case studies, and surveys of firms suggest that lower environmental regulation does play a role. For example, one study found that 26 percent of maquiladora operators in Mexicali cited Mexico's lax environmental enforcement as an important reason for their relocation there.[29] The U.S. General Accounting Office found that between 11 and 28 wood furniture manufacturers in the Los Angeles area relocated to Mexico between 1988 and 1990, taking with them 960 to 2,547 jobs.[30] About 80 percent of the firms cited stringent air pollution standards as well as lower labor costs as major factors in their location decision. In Mexico, these firms faced no air pollution standards for the application of paint coatings and solvents.[31]

Case studies may find impacts because environmental regulation affects some industries more than others. For example, U.S. operations that moved to Mexico were either relatively labor-intensive light manufacturing operations and generally not highly polluting, or producers of hazardous waste such as asbestos.[32] A few industries more likely to relocate due to environmental regulation include some mineral processing, toxic products, and intermediate organic chemicals.[33] This is consistent with a finding that environmental regulation does not affect industry location in the United States overall, but that it may have some effect on the location of highly polluting industries.[34] For the subset of industry that is labor cost sensitive, is relatively footloose or is making new investment decisions, and has high environmental compliance costs, low environmental regulation can add to the cost advantage gained by low labor costs.

## *Limitations of the Studies*

These studies do not provide definitive conclusions. Studies relying on economic models are limited by several factors. First, it is difficult to separate the effects of environmental regulation from other variables, such as wages and exchange rates, on overall trade patterns. OECD concluded that in relation to differing environmental costs among OECD nations, the fact that there have been no evident changes in competitive status does not suggest that environmental costs have not affected competitiveness, but that the totality of influences on competitiveness is such as to disguise any effect.[35]

Second, data limitations relating to the costs and benefits of environmental regulation make it difficult to accurately assess the competitiveness impact. Some of these limitations would suggest that the actual impacts are even lower than currently measured, but others would lead in the opposite direction, to suggest larger impacts.

None of the models include the benefits from environmental regulation and as a result may overstate the impact on trade. Firms may indeed accrue benefits from environ-

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25 However, the savings from lax environmental regulations maybe a more important determinant for new investment decisions than for relocations.

26 For example, see Ingo Walter, "Environmentally Induced Industrial Relocation to Developing Countries," in Rubin and Graham, op. cit.

27 H. Jeffrey Leonard, *Pollution and the Struggle for the World Product (New* York NY: Cambridge University Press, 1988).

28 Gene M. Grossman and Alan B. Krueger, "Environmental Impacts of a North American Free Trade Agreement," paper presented at the conference on the U.S.-Mexico Free Trade Agreement sponsored by the Mexican Secretary of Commerce and Industrial Development, Oct. 8, 1991.

29 Thirteen percent of the firms said that weaker environmental legislation was a major factor in selecting Mexico, while another 13 percent said it was an important factor. (Roberto Sanchez, "Health and Environmental Risks of the Maquiladora in Mexicali," *Natural Resources Journal, vol. 30,* winter 1990.) One economic development official for the Mexican state of Sonora suggests, "The red tape and expense of American environmental law is a powerful incentive for some companies to locate in Mexico. I've had a couple ocompanies come down solely for that reason." (Quoted in Sandy Tolan, "Hope and Heartbreak," *The New York Times Magazine,* Best of Business Quarterly, winter 1990-91.)

30 us. Congress, U.S. General Accounting Office, "U.S.-Mexico Trade: Some U.S. Wood Furniture Firms Relocated From Los Angeles Area to Mexico," April 1991.

31 Ibid.

32 Leonard, op. cit.

33 Ibid.

34 Tim Bartik, "The Effects of Environmental Regulation on Business Location in the United States," *Growth and Change,* summer 1988.

35 Preliminary information from OECD, 1991.

mental regulation. For example, OTA found that environmental regulations accelerated steel industry modernization.[36] Pollution prevention efforts may increase competitiveness, if they result in firms paying closer attention to energy and materials efficiency and continuous process improvement.[37] Lower pollution costs may also be reflected in lower health care costs, increased agricultural productivity, and lower costs in other pints of the economy from reduced pollution.[38] Companies can benefit from these both directly and indirectly (cheaper supplies and inputs). Further, as other nations develop stricter environmental regulation, U.S. firms may receive some first-mover benefits as firms in other nations spend money to catch up. Finally, the United States may run a trade surplus in environmental protection products and services that acts to offset to some extent negative trade effects from environmental regulation-induced cost differentials (see app. D).

Third, it is not clear that the models accurately measure cost, either in the United States or other nations. Most of the studies rely on data on pollution abatement expenditures from a survey by the Bureau of the Census. However, there is some evidence that these surveys underreport environmental control costs.[39] For example, in the copper industry, Census data indicate that environmental control costs added 4 cents per pound to the price of copper in 1985.[40] However, at least four other sources, based on actual examination of copper smelting firms, found that the expenses were much higher, ranging from 7.5 cents per pound to 15 cents per pound.[41] The Census surveys may underreport true costs if the respondents do not have complete knowledge of all expenditures. Chapman found that survey results of the copper mining and smelting industry may not have included costs such as monitoring and planning activities, environmental activities that are part of the production process, interest expense on equipment, and productivity loss.[42]

Moreover, costs may be underestimated if other expenses are not calculated, including: administrative and legal fees and fines (these can be sizable in the Resource Conservation Recovery Act (RCRA) and Superfund proceedings);[43] costs of having to substitute new materials or processes; costs associated with bans on certain products or on production of certain hazardous products (e.g., zinc smelting, arsenic, benzidine-dye); increased costs of the effects of environmentally related industrial zoning; costs related to workplace health and safety protection; fees and taxes for permits; administration and recordkeeping; and research and development (R&D) for environmental controls.[44] In addition, some argue that the environment, particularly hazardous waste issues, occupies a significant portion of time for some top executives. Finally, even though costs may not be all that high now, new and stricter environmental regulations put in place in the 1990s may change this picture, particularly for some industries. This all suggests that current estimates of U.S. environmental costs, based on surveys, may in fact be too low, which would lead to impacts that are underestimated.

Another limitation of the studies is that few include foreign costs of environmental regulation in the models, which leads to an overestimation of the impact of environmental regulation on trade and investment. The United States has among the most advanced environmental regulations in the world, although some other nations (Canada, Japan, Denmark, and Germany) have

36 U.S. Congress, Office of Technology Assessment, *Technology and Steel Industry Competitiveness*, op. cit., p. 83.

37 See *us*. 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); also Michael Porter, "America's Green Strategy," *Scientific American*, April 1991, p. 168.

38 See Organisation for Economic Co-operation and Development *Environmental Policy Benefits: Monetary Valuation* (Paris: OECD, 1989).

39 For e-pie, as discussed above, Tobey (op. cit) concluded that environmental control costs had no impact on trade. However, his cost estimates appear too low. For example, he calculated that environmental control costs accounted for only 2.05 percent of the copper smelting industry total costs. In contrast, as discussed below, the true costs appear to be at least three to five times greater.

40 Data from the Bureau of the Census, based on the *Manufacturer' sPollution Abatement Capital Expenditures and Operating Costs*, 1987.

41 See U.S. Congress, Office of Technology Assessment, *Copper: Technology and Competitiveness*, op. cit.—lo to 15 cents per pound; National Research Council, *Competitiveness of the U.S. Minerals and Metals Industry* (Washington, DC: National Academy Press, 1990)-9 to 15 cents per pound; "Counting the Cost of Clean Air," *E&MJ*, January 1990-7.5 cents per pound; Duane Chapman, "Environmental Standards and International Trade in Automobiles and Copper: The Case for a Social Tariff," *Natural Resources Journal*, vol. 31, winter, 1991, pp. 449-461—10 to 15 cents per pound. Total U.S. copper production costs averaged 65 cents per pound.

42 Chapman, op. cit.

43 For example, Portney estimates that costs of litigation and other non-cleanup related expenses could exceed 20 percent of total Superfund cleanup costs. (Paul Portney, "The Economics of Hazardous Waste Regulation" paper presented at U.S. Waste Management Policies: Impacts on Economic Growth and Investment Strategies, sponsored by the American Council for Capital Formation, Washington, DC, Nov. 7, 1991.)

44 Chapman, op. cit.

also developed strict and comprehensive approaches.[45] Other OECD nations, including France, United Kingdom, Switzerland, Spain, and Italy, have less strict standards, and non-OECD nations have even lower standards.[46] In addition, even among countries with similar levels of environmental regulation, there is wide variation in enforcement.[47] Moreover, countries differ in the forms of regulation employed and the relationship between government and industry in forming environmental policy. Some forms of regulation (e.g., tradeable permits) may result in lower overall costs to industry while still achieving a stated environmental goal.

As a percent of gross domestic product (GDP), the United States spends more than any other nation (1.5 percent of GDP and $78 billion) on environmental goods and services.[48] Japan spends about half the U.S. rate (0.7 percent), northern European nations spend slightly more than half (0.9 percent), and southern European nations only one-third (0.5 percent) .49 The costs of regulation in less developed countries, including the newly industrializing countries (NICs), is significantly lower than in OECD nations. Table E-1 compares costs for different regions.

Even though many less developed countries have low or no regulations, this situation appears to be changing. Many countries, especially the NICs, are putting in place stricter environmental regulations.[50] Moreover, some argue that even though many less developed countries have minimal or no regulations, some multinational corporations (MNCs) may apply their high home country standards to their plants in less developed nations.[51] However, little systematic evidence has been presented to substantiate this claim. Thus, it is unclear the extent to which MNCs do this, particularly smaller firms that relocate to less developed nations. For example, while U.S. maquiladoras suppliers say that they don't illegally pollute, others dispute this claim and argue that sewage and other runoff from the area is often highly polluted with industrial wastes.[52] Even if the MNCs abide by home country standards, they may receive a cost advantage if local suppliers are unregulated.

Finally, the impact on U.S. firms can be even more significant because favorable tax treatments and subsidies in other nations for their firms can help offset these costs, and change the cost structure between nations.[53] Not all nations are as committed to the polluter pays principle (an OECD principle that says that polluters should bear the cost of complying with environmental regulations) as the United States.

**Table E-l—Estimated Per Capita Expenditures on Environmental Goods and Services**

| Regions | costs ($) |
|---|---|
| United States | 313 |
| Canada | 270 |
| Japan | 197 |
| Northern Europe | 194 |
| Southern Europe | 84 |
| OECD average | 214 |
| Rest of world | 8 |

SOURCE: Preliminary information from OECD, 1991.

## *U.S. Government Efforts*

Congressional concern about the competitive and trade impacts of U.S. environmental regulations is not new. Congress has on different occasions called on the executive branch to assess the impact of U.S. environmental standards on the competitiveness of American

45 Preliminary information from OECD, 1991; Kopp, Portney, and Dewitt argue that OECD air and water pollution control policies were generally the same, and that any cost differential the United States bears is likely to be small, but that hazardous waste policies were different. In particular, Resource Conservation Recovery Act (RCRA) and Superfund imposed more stringent requirements on U.S. manufacturers than on overseas. (International Comparisons of Environmental Regulation Raymond J. Kopp, Paul R. Portney, and Diane E. Dewitt, in *Environmental Policy and the Cost of Capital, American* Council for Capital Formation, September 1990, Washington, DC.)

46 Preliminary information from OECD, 1991.

47 Ibid.

48 A recent report by the Environmental Protection Agency (EPA) estimated higher costs for the United States of protecting and restoring the environment—$115 billion annually, or about 2 percent of U.S. gross national product. However, EPA estimates include all costs associated with municipal and private solid waste collection (approximately $20 billion) as well as costs of pollution control equipment on automobiles and other mobile sources (approximately $8 billion). Without these, the EPA estimate is $87 billion, closer to the OECD estimate. U.S. Environmental Protection Agency, *Environmental Investments: The Costs of a Clean Environment, EPA-230-90-084* (Washington DC: December 1990).

49 Preliminary information from OECD, 1991.

50 Paul Cullen Beately, "The Benefits of a Global Environmental Compliance Strategy, " *Corporate Management,* vol. 158, No. 3, pp. 14-19, June 1989.

51 USTR, op. cit.

52 For example, see Joseph La Dou, "Deadly Migration: Hazardous Industries' Flight to the Third World," *Technology Review,* vol. 94, No. 5, July 1991; Sanford Lewis et al., "BorderTrouble: Rivers in Peril. A Report on Water Pollution Due to Industrial Development in Northern Mexico," National Toxics Campaign Fund, May 1991; Diane M. Perry, Roberto Sanchez, William H. Glaze, and Marisa Mazari, "Binational Management of Hazardous Waste: The Maquiladora Industry at the U.S.-Mexico Border, *Environmental Management,* vol. 14, No. 4,1990, pp. 441-450; and Sandy Tolan, "Hope and Heartbreak," *The New York Times Magazine,* reprinted in *Best of Business Quarterly,* winter 1990-91.

53 For example, the Japanese give industrial grant aid to help reduce cost of compliance.

industry. It has also called on the executive branch to prompt other countries to raise their environmental standards.

### Water Pollution Control Act Amendments of 1972

The Federal Water Pollution Control Act Amendments of 1972 directed the Secretary of Commerce to periodically study and report to Congress on the international trade impacts of the law. The Secretary, among other things, was asked to make a determination of the "probable competitive advantage" for foreign goods produced in countries without pollution control standards, or with lesser standards, or with subsidies or reimbursements for manufacturers' environmental costs.[54] In succeeding years the Secretary released four studies.[55] The last report focused on an industrial sector-aluminum—that is among the most sensitive to environmental controls because of its high electricity demands. Why the reports were discontinued is not clear. A fifth report[56] was written in 1977 but not released because it was judged inconclusive.[57] The report compared pollution abatement expenditures and exports and imports for 47 manufacturing sectors between 1973 and 1976. According to its author, the study could not determine to what extent pollution control expenditures affected trade.

A 1979 Commerce Department status report on the congressionally mandated studies summarized the overall findings as having disclosed "no evidence of either significant out-migration of U.S. industries to 'pollution havens' or of trade pattern dislocations directly attributable to pollution control costs."[58] The summaries of two sector-specific reports (pulp and paper, and copper) were less optimistic, stating that foreign imports may be slightly advantaged.

The amendments to the Water Pollution Control Act also directed the President, as a means of heading off competitive disadvantages, to negotiate "international agreements to apply uniform standards of performance for the control of discharge and emission of pollutants from new sources, uniform controls over the discharge and emission of toxic pollutants, and uniform controls over the discharge of pollutants into the ocean."[59] According to one analyst, President Carter unsuccessfully tried to implement this policy.[60]

### 1990 Amendments to the Clean Air Act

Competitiveness concerns were prominent in the debate about the 1990 Amendments to the Clean Air Act.[61] This law, the first major revision of Federal air pollution control requirements since 1977, significantly strengthened U.S. clean air requirements. Much of the burden of meeting the law's requirements will fall on U.S. business. Congress recognized this in section 811 of the 1990 Amendments, which noted (among other things) that U.S. business would need to make significant air quality investments and could incur additional costs in implementing the law's requirements.[62] Congress also expressed concern that complying with the act might make it difficult for American jobs, production, processes, and products to compete with countries with less demanding environmental requirements. Congress also found that mechanisms 'should be sought through which the United States and its trading partners can agree to eliminate or reduce competitive disadvantages. '

The law called on the President to report back to Congress within 18 months (May 15, 1992) with an evaluation of competitive impacts and a strategy for addressing such impacts through 'trade consultations and negotiations. The strategy is to include options that might be employed to deal with competitive disadvantages caused by differences in standards among U.S. major trading partners. Examples of such options stated in the law were harmonization of standards and trade adjustment measures. A number of bills and proposals currently before the 102d Congress seek to promote foreign environmental standards through trade negotiations or measures (see app. B).

To respond to section 811, the EPA Office of Air and Radiation assembled an interagency team including EPA,

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54 Public Law 92-500, section 6.

55 U.S. Department of Commerce, *The Effects of Pollution Abatement on International Trade* (Washington, DC: U.S. Department Of Commerce, 1973). Also for years 1974 and 1975; U.S. Department of Commerce, *Environmental Standards and Comparative Costs of Production in the Aluminum Industry* (Washington, DC: November 1976).

56 Loren E. Casement, Effects *of Pollution Abatement Costs on Exports and Imports by Selected SIC's* (Washington, DC: U.S. Department of Commerce, 1977).

57 Loren Casement, U.S. Department of Commerce, personal communication, Jan. 28, 1992.

58 U.S. Department of Commerce, "U.S. Pollution Control Costs and International Trade Effects-1979 Status Report," internal document, September 1979, p. 3.

59 Public Law 92-500.

60 Jeffrey Leonard, *Environmental Regulations Driving U.S. Industry* Overseas? (Washington, DC: The Conservation Foundation 1984), p. 31.

61 Public Law 101-549.

62 Based on the Administration's original Clean Air Act proposal, the act would add roughly $14.6 billion in costs per year by the year 2000, resulting in total annual air costs to $45 billion. (U.S. Environmental Protection Agency, Office of Policy, Planning, and Evaluation, *Environmental Investments: The Cost of a Clean Environment* (Washington, DC: December 1990).

Department of Commerce, U.S. Trade Representative, and the State Department that is preparing a two-part study. The first phase, which as of March 1 has been completed in draft form, compares air quality controls of United States with those of Canada, Germany, Japan, Korea, and Mexico. The report examines not only the different air pollution standards and regulations in each nation, but also the degree to which regulations are actually achieved and enforced. The second phase, which is underway, will identify and assess the economic effects of the Clean Air Act on four U.S. industries and calculate the likely effect on trade of the price increases. The reports are expected to be delivered to Congress on or before May 15, 1992. As of March 1992, evaluation of means to address the competitive impacts of the act through trade consultations or negotiations had not begun.