

Appendix D

Trade in Environmental Goods, Services, and Technologies

The global market for environmental goods and services (EGS) is large and growing fast. The United States is the world's biggest producer and consumer of EGS thanks to its size and relatively strict environmental laws. It is also the second largest net exporter of environmental goods after Germany; Japan is the third. Several other industrial countries are competitive exporters of some types of EGS.

There is expanding worldwide interest in "cleaner production" technologies that prevent, rather than control and treat, pollution and waste. Although not usually included in EGS market estimates, demand for cleaner industrial, energy, and agricultural technologies, as well as for "green" products, seems likely to increase as concerns about global climate change, toxic substances, and more familiar soot and sewage⁷ problems continue to mount.

The Organisation for Economic Co-operation and Development (OECD) estimates that the worldwide environmental market was \$200 billion in 1990 and will grow at a 5.5 percent annual rate to \$300 billion by 2000.¹ OECD defines the environmental industry to include end-of-pipe pollution abatement equipment—e.g., water and wastewater treatment, stack gas scrubbers, solid waste handling—plus engineering, management, and consulting environmental services. Thus, OECD considers pollution prevention consulting services in its definition of environmental industry. However, it excludes both technologies incorporated into processes for pollution prevention and "green" consumer products—those that are more energy efficient, made with less toxic components, contain recycled materials, etc.

The U.S. EGS market is 42 percent of the global market; OECD nations together account for 82 percent.² EGS markets in newly industrialized and developing country markets are expected to expand. There will be greater opportunities for international trade in EGS as environmental standards and demands grow in stringency

in both developed and developing nations. For instance, Mexico's environmental market is projected to increase 15 percent annually during the early 1990s.³ Some projections have Taiwan spending \$105 billion over the next 10 years for environmental protection, with imports of pollution control equipment expected to grow at 20 percent annually.⁴ Environment is a concern in Eastern Europe and the former Soviet republics. Those European Community (EC) countries with less developed environmental infrastructures and regulations must upgrade to meet EC standards. The Clean Air Act Amendments of 1990 in the United States⁵ and stronger waste minimization and recycling incentives in Germany and France⁶ are among initiatives in the industrial nations that will likely add billions of dollars to the world EGS market, and thus to trade opportunities.

As the largest net exporters of environmental products, Germany, the United States, and Japan earn estimated trade surpluses of \$10 billion, \$4 billion, and \$3 billion, respectively.⁷ The United Kingdom, France, the Netherlands, and Sweden are also net environmental goods exporters. About 10 percent of U.S. environmental production is exported, while import penetration has grown in the waste and air sectors, accounting for 26 percent in the case of industrial air pollution control equipment. Japan exports 6 percent of environmental equipment production, importing under 3 percent of its consumption. Germany exports 40 percent of its product, about half of that within Europe, but imports only 5 percent of demand.

These figures do not include trade in so-called cleaner production—processes that prevent pollution and waste. Cleaner production encompasses a wide range of technologies, from solar power and "clean coal" burning to less polluting steelmaking processes, chlorofluorocarbon (CFC)-free integrated circuit production, and chromium-free leather tanning. In contrast to end-of-pipe or remedial cleanup technologies, these environmentally preferable

¹ Organisation for Economic Co-operation and Development (OECD), *The OECD Environment Industry: Situation, Prospects and Government Policies*, OCDE/GD (92)1 (Paris: OECD, 1992).

² These percentages were derived from data in OECD, *ibid.*

³ U.S. Department of Commerce, International Trade Administration, "Market Research Summary: 1991-The Mexican Market for Pollution Instruments Equipment and Services."

⁴ "Taiwan Firms To Buy Waste Treatment Equipment," *NewsACTION* (published by International Business Development, Northwestern University), vol. 6, No. 1, spring 1991.

⁵ ICF Resources Inc. and Smith Barney, Harris Upham and Co., Inc., "Business Opportunities of the New Clean Air Act: The Impact of the CAAA of 1990 on the Air Pollution Control Industry," draft report prepared for the Office of Air and Radiation, U.S. Environmental Protection Agency, January 1992.

⁶ "Green Germany Drags Brussels Into Environmental Arena," *Financial Times*, Jan. 24, 1992, p. 2.; "France Launches Attack On Waste," *Financial Times*, Jan. 24, 1992, pp. 1, 14.

⁷ OECD, *op. cit.*, is the source for all data in this paragraph.

technologies are integral to production processes.⁸ Markets and trade in cleaner products and processes are therefore very difficult to define and quantify. Should scrap-using electric arc steel mini-mills be considered in this market because they have fewer environmental impacts than integrated steel production that starts with iron? Should all industrial monitoring and control instruments be included because, in addition to contributing to productivity and product quality, they can diminish materials and energy waste? Probably not. As an analog, one probably would not count apples and running shoes as health expenditures. Regardless of these taxonomic difficulties, demand for cleaner production seems likely to accelerate. Trade opportunities arise from industrialization of developing countries, reconstruction of Eastern European and former Soviet economies, and from demand for new and replacement capital stock within OECD.

Trade in environmental technologies—both end-of-pipe and cleaner production—is not greatly impeded by tariffs and explicit nontariff barriers (e.g., local content requirements). For instance, tariffs imposed on U.S. air pollution control equipment by major foreign markets are typically under 5 percent, although there are some exceptions—South Korean and Canadian tariffs are being phased down from higher levels (in 1990, 20 percent and 9.2 percent, respectively).⁹ Preliminary research by OECD on transfer of seven commercially available clean technologies to developing countries suggests that trade-related policies (e.g., tariffs, local content requirements, patents, and currency restrictions), while sometimes an issue, are not major obstacles to environmental technology trade.

Trade and transfer of environmental technologies to developing countries can be expected to increase if those countries have greater resources to implement environmental regulations and finance technology acquisition. Without regulation, industry has little incentive to invest in pollution control or to adopt clean technologies that offer no cost advantage. (Some pollution preventing processes do offer cost advantages, however, even in the absence of environmental control costs.) Inadequate financial resources are a major constraint in expanding environmental trade to developing countries, Eastern Europe, and former Soviet republics. Credit and foreign exchange are often lacking. Poor cash flow can even keep firms from purchasing pollution preventing processes that offer lower operating costs and improved productivity.¹⁰ (See box 3-B in ch. 3, “Financing Environmental

Measures in Developing Countries,” for further discussion.)

Differing standards further complicate efficient market entry and reduce economies of scale by requiring companies to alter their products and procedures for each country. These inconsistencies can offer advantages to home country firms. The problem of differential regulation across different jurisdictions is not limited to the international arena. In the United States, disparate State and local standards and procedures present similar problems to domestic producers of environmental technologies.

The U.S. Government has taken some steps that encourage trade in EGS and the transfer of environmental technologies. For instance, the United States Environmental Training Institute was recently established as a joint venture between the U.S. Government and the private sector to train developing country public- and private-sector participants. The Institute may familiarize foreign trainees with U.S. equipment, procedures, and expertise, creating brand loyalty for U.S. products while strengthening developing countries’ capabilities to manage their environment.

The U.S. Agency for International Development (AID) has a variety of programs for developing country technical assistance and project financial support that can benefit U.S. environmental industries. The U.S. Environmental Protection Agency (EPA) engages in foreign technical assistance that may promote use of U.S. brand equipment. EPA, AID, and the Department of Commerce cooperate on trade missions and other export promotion activities. The Department of Commerce is trying to advance U.S. firms’ awareness of foreign environmental market opportunities. The Department of Energy leads the interagency Committee on Renewable Energy Commerce and Trade (CORECT) that seeks to promote renewable energy related commerce.

The Overseas Private Investment Corporation (OPIC) is a Federal agency that supports U.S. business ventures in developing and Eastern European countries (and soon former Soviet republics) through information, investment missions, project financing, and insurance programs. OPIC’s Environment Investment Fund, as well as general and specialized regional funds for Asia and Africa, can promote U.S. environmental exports and investments. The Trade and Development Program’s financial support for project feasibility studies, Export-Import Bank credit and insurance programs for U.S. exports, and the Small

⁸ 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).

⁹ U.S. Department of Commerce, International Trade Administration, “b. Competitive Assessment of the U.S. Industrial Air Pollution Control Equipment Industry,” August 1990, table 20, p. 40.

¹⁰ *Ibid.*

Business Administration are other sources of help for U.S. environmental companies seeking to compete overseas.

There are special U.S. Government-sponsored regional efforts to promote foreign environmental capability which can benefit the U.S. EGS industry. The United States-Asia Environmental Partnership (US-AEP) was recently established by the Administration to promote the use of U.S. expertise and technology to solve Asian environmental challenges. US-AEP involves over 20 Federal agencies. Assistance for Eastern Europe, including the Support for Eastern Democracy Act, first passed by Congress in October 1989, contains environmental components. For the U.S.-Mexico border region, the Administration has proposed environmental spending

of \$203 million for fiscal year 1993. This will be in addition to \$460 million over 3 years announced by the Mexican Government for environmental purposes in the border region.¹¹

Opening foreign market channels will not, by itself, assure a strong, internationally competitive U.S. environmental industry. The United States faces stiff competition from other nations, notably Japan and Germany, whose governments are actively promoting the development and deployment of new environmental technology. These efforts, as well as U.S. effort and options, will be analyzed in the final report of this assessment, to be delivered in 1993.

¹¹ Jan Gilbreath Rich, "Financing Environmental and Infrastructure Costs Under a North American Free Trade Agreement With Emphasis On the Texas-Mexico Border," draft presented to the Institute of the Americas conference "Latin American Environment and Technological Cooperation," La Jolla CA, Nov. 17-19, 1991.