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As more countries begin to address environmental problems, new markets for environmental technologies and services are emerging in the developing world. Developing countries often need technologies and expertise from developed countries in addressing their many serious environmental problems. The potential for exports of U.S. environmental technologies and services to developing (and other) countries is attracting increased attention from policymakers. One issue is whether the U.S. government should do more to promote environmental exports. A related issue is whether the Federal government should use foreign assistance to encourage environmental exports, either as a specific focus for action, or as part of a broader strategy to link aid and export policies more closely.

Developing countries vary greatly in their ability and/or willingness to pay for the costs of environmental protection. Most poorer developing countries have not chosen to use their scarce financial resources to address environmental issues without financial assistance from developed countries. The more prosperous developing countries have more resources; several fast-growing developing country economies in Southeast Asia and Latin America plan multi-billion dollar investments in environmental infrastructure in the next few years. However, some still receive bilateral aid to address global environmental problems that might not otherwise be among their priorities.

Several laws passed in the 102d Congress call for closer coordination of U.S. aid and export promotion efforts, including environmental exports. Additional export promotion measures have been proposed in the 103d Congress. (See box 1-A for discussion of recent laws and Executive Branch initiatives;

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Box I-A-Recent U.S. Initiatives on Environmental Export Promotion and Development Assistance

Enactments in the 102d Congress:

- The Export Enhancement Act of 1992 (Public Law 102-429) directs the President to set up an "environmental trade working group" under the interagency Trade Promotion Coordinating Committee (TPCC) which was given statutory status. The working group-which includes, among others, the Commerce Department, the U.S. Agency for International Development (USAID), the Environmental Protection Agency (EPA), the State Department, the Department of Energy, the Trade and Development Agency (TDA), the Overseas Private Investment Corporation and the U.S. Export-Import Bank (Eximbank)-is to develop a government strategy for expanding exports of environmental technologies, goods, and services. The working group is to assess how its activities advance the goals of Agenda 21, the guiding policy and implementation document for the U.N. Conference on Environment and Development. President Clinton recently announced that he was directing the Commerce Department, the Department of Energy, and the Environmental Protection Agency to develop a strategic plan for environmental trade development, promotion and technical assistance.

The law also authorizes placement of environmental commercial officers in countries that are promising markets for exports or competitors for U.S. environmental technologies and services. Another provision in the law directs Eximbank to use its programs to support "the export of goods and services that have beneficial effects on the environment or mitigate potential adverse environmental effects." in addition, the law authorizes a major expansion of the Eximbank "War Chest" a fund designed to match tied aid credits offered by foreign governments (see ch. 4).

- The Aid, Trade and Competitiveness Act of 1992 (Title III of Public Law 102-549), among other things, establishes an office of capital projects in USAID. One function will be to develop a program of "developmentally sound" capital projects for basic infrastructure to deviate poverty impacts or promote environmental safety and sustainability at the community level, taking account of host country development needs and export opportunities for U.S. goods and services. Such projects include basic sanitation, water supply and treatment systems, and pollution control. Projects should have measurable, positive effects for indicators of human and environmental health. The program is to be coordinated with other agencies, using TPCC. Congress urged the President to spend \$650 million of the USAID appropriation in fiscal year 1993 and \$700 million in fiscal year 1994 to implement the capital projects program

Continued

pertinent U.S. programs are described in more detail in chapter 5 and appendix B.)

This background paper, part of a larger OTA assessment of American industry and the environment,¹ provides information that maybe useful as

Congress examines linkages between aid and environmental export promotion. It discusses:

- estimates of the size of the market for environmental goods and services (EGS) in developing

¹ The final report in this assessment, to be completed later in 1993, will discuss the market opportunities and competitive position of U.S. firms that sell environmental technologies and services, and related export promotion issues. The final report will also discuss connections among environmental technology, environmental regulations, and manufacturing industry competitiveness.

This background paper draws in part on a contract report prepared for OTA, entitled "Environmental Export Promotion and Official Development Assistance," by Madeleine Costanza.

Another background paper prepared for this assessment examined trade and environment issues, including the developing country context; see U.S. Congress, Office of Technology Assessment *Trade and Environment: Conflicts and Opportunities*, OTA-BP-ITE-94 (Washington, DC: U.S. Government Printing Office), May 1992.

Box I-A-Recent U.S. initiatives on Environmental Export Promotion and Development Assistance--Continued

- The *Foreign Operations and Export Financing Appropriations Act for Fiscal Year 1993* (Public Law 102-391) earmarks \$650 million of USAID's fiscal year 1993 appropriation to environment or energy activities related to global warming. The law also urges USAID to aim \$10 million in assistance at activities related to the Committee on Renewable Energy Commerce and Trade (CORECT), the Environmental Technology Export council (ETEC), and the International Fund for Renewable Energy and Efficiency. CORECT and ETEC are bodies that attempt to coordinate government export activities with private companies and trade associations (see app. B).
- Several provisions in the *National Energy Policy Act of 1992* (Public Law 102-486) emphasize energy-related environmental technology transfer to developing countries, in part to boost U.S. exports. The law directs the Secretary of Energy, through USAID, to undertake programs of technology transfer to developing countries for renewable energy technologies, clean coal technologies, and innovative environmental technologies associated with reduced greenhouse gas emissions. Each program is authorized at a level of \$100 million per year for several years. The law also authorizes funds for interagency working groups on renewable energy and energy efficiency, as well as training for developing country officials, at an annual level of \$10 million for fiscal years 1993 and 1994. Funds have yet to be appropriated for any of these initiatives.

Executive Branch Initiatives

Numerous programs and projects undertaken by one or more Federal agencies fund activities pertinent to environmental assistance or energy and environmental exports. Two of the larger initiatives (discussed further in app. B) are:

- *The United States-Asia Environmental Partnership*. This public-private partnership seeks to help Asian countries address environmental needs using U.S. technology, and participation of U.S. firms. Seed money for the partnership has been provided by USAID; other Federal, state, and nongovernmental agencies also are involved.
- * *The United States Environmental Training Institute*. This nonprofit organization arranges for training of developing country public and private officials in the United States by U.S. firms and agencies. Companies, which have the opportunity to demonstrate their technologies to the officials, pay for operating costs and sponsor courses. EPA, USAID, and TDA provided some startup funds for the institute.

countries and in the newly industrializing countries;

- estimates of environmental aid as a component of development assistance;
- how the aid programs of several major donors may affect environmental exports. The discus-

sion focuses on official development assistance (ODA)² provided by Japan, and to a lesser extent Germany, and some other European countries which are members of the Development Assistance Committee (DAC) of the Organisation for Economic Cooperation and

²"ODA" is a term used by the Organisation for Economic Cooperation and Development (OECD) to identify one type of foreign assistance. As used here and by OECD, it refers to aid given by a government chiefly to promote the recipient country's economic development and welfare that has a "grant element" of at least 25 percent. (A pure grant would have a grant element of 100 percent; a pure commercial loan, 0 percent). The term "aid," as used in this paper, may denote either ODA or some broader category of foreign assistance depending on context.

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Development (OECD).³ While there is some discussion of U.S. aid practices, the discussion is illustrative rather than a comparison.

The background paper is not intended to be a comprehensive analysis of the many ways in which a donor's aid could promote exports, or the degree to which such export promotion is compatible with meeting recipients' environmental and development goals.⁴ The export promoting effects of aid depend on many factors, including (among others) the geographic emphasis; the kinds of projects supported (whether power plants and sewage treatment plants or technical assistance for land management and training); the way in which projects are planned and approved; and whether formal policies or informal practices make it likely the aid will be spent in the donor country.

Whether export promotion is compatible with recipients' environmental and development goals depends as well on additional considerations. These include, among others, the extent to which a country's aid follows environmentally and developmentally sound criteria; whether a recipient country has the technical information and resources needed to make an appropriate choice among alternative technologies and approaches; and whether adequate provision is made for training, operation and maintenance after equipment is installed or projects are completed.

The complex administrative structure of aid and variations in aid missions further complicates

analysis. For example, a single development project may be supported by several bilateral and multilateral agencies and sources. Japan's aid system involves four major policy-making agencies and two implementing agencies. Development assistance is only one of several missions for U.S. foreign assistance, and many specific objectives vie for the limited development assistance project budget of the U.S. Agency for International Development (USAID), the primary U.S. ODA agency.

Major findings and conclusions from subsequent chapters are summarized below.

AID FOR THE ENVIRONMENT

(SEE CH. 2)

While precise estimates do not exist, developing countries could need to invest amounts exceeding 1 percent of their gross domestic products (or over \$50 billion annually by the end of this decade at projected growth rates) to factor environmental objectives into their development requirements.⁵ Most of these investments would need to come from developing country sources, or from private investment and trade. But, as was brought out at the 1992 United Nations Conference on Environment and Development (UNCED), developed country governments could catalyze developing country environmental efforts by providing technical assistance and help with project financing. Additional aid could help

³OECD members account for about 90 percent of ODA; several Arab countries account for most of the rest. The DAC, established in 1961, provides a forum for OECD donors to discuss and coordinate their bilateral aid policies. Unless otherwise stated, statistics on ODA in this paper are from the Organisation for Economic Cooperation and Development *Development Cooperation 1992 Report* (Paris:OECD, December 1992).

⁴ *I*ro, environmental and energy aid and exports to Eastern Europe and the former Soviet Union are not addressed in detail in this paper. Another OTA assessment on these subjects is in progress; its first report is U.S. Congress, Office of Technology Assessment, *Energy-Efficiency Technologies for Central and Eastern Europe*, OTA-E-562 (Washington, DC: U.S. Government Printing Office, May 1993). Environmental export issues with Mexico associated with the proposed North American Free Trade Agreement also are not addressed. For discussion of U.S.-Mexican trade issues, see U.S. Congress, Office of Technology Assessment, *U.S.-Mexico Trade: Pulling Together or Pulling Apart?*, OTA-ITE-545 (Washington, DC: U.S. Government Printing Office, 1992).

⁵Such a level of investment would be roughly comparable as a portion of GDP to investments made by several advanced industrial nations for environmental protection during the 1970s.

developing countries address global issues such as stratospheric ozone depletion, greenhouse gas emissions, and loss of biodiversity—issues not necessarily perceived by developing countries as requiring their independent action.⁶

Preliminary information suggests that donors provided over \$2 billion in bilateral aid in 1991 for environmental projects or projects with an environmental component as defined by the donor. (Total aid in 1991 was \$57 billion.) Environmentally-related aid and loans from multilateral sources exceeded \$3 billion, so that the total in bilateral and multilateral assistance exceeded \$5 billion in 1991.

The two largest aid donors—Japan and the United States—probably provided over \$600 million each in bilateral aid for environmental projects or for projects with an environmental component; Germany provided about \$500 million in direct environmental aid.⁷ Because common definitions and baseline data from other years are not available, it is difficult to know how much of the donors' environmental aid relabels or replaces pre-existing programs or constitutes "new and additional resources."

Much of the environmental aid assists in developing human resources and institutional capacities for addressing environmental concerns. Such environmental capacity building includes technical and financial help for country studies and strategies; for training, education, and public awareness campaigns; for environmental monitoring; and for developing ways to devise and enforce regulations.⁸

Several donors help developing countries finance infrastructure, including infrastructure that can contribute to environmental objectives. Examples are basic infrastructure for public health and environmental quality (e.g., water supply and wastewater treatment systems, sanitary landfills) and pollution control equipment for factories and power plants. The United States devotes only a small share of its bilateral aid to such capital projects (whether environmental or otherwise).

To date, donors have focused little aid on helping developing countries adopt pollution prevention approaches and cleaner production processes or technologies. Even when they have greater front-end costs than conventional pollution control technologies, cleaner technologies can be less costly in the long term because they use materials and energy more efficiently and produce less waste for treatment. Pollution prevention has yet to receive much attention from development agencies, although some United Nations activities are underway and a few bilateral technical assistance projects have recently been initiated (including a major new project by USAID).

ENVIRONMENTAL MARKETS

(SEE CH. 2 AND APP. A)

The world market for environmental goods and services was estimated by OECD to be \$200 billion in 1990. Developing countries now account for only a small part of this market. However, several fast-growing developing countries in Asia and Latin America may become

⁶ Some multilateral aid for addressing global environmental issues is provided through the Global Environment Facility (GEF), administered by the World Bank, the United Nations Environment Program, and the United Nations Development Programme. The GEF is not discussed in detail in this paper.

⁷ The estimates for the United States, Japan, and Germany are subject to change. As is discussed in chapter 2, these donors were not among the nine DAC countries that had reported estimates of environmental aid to OECD by April 1993.

⁸ For a review of DAC member activities up to 1990, see *Development Cooperation 1990 Report*, op. cit., pp. 71-82.

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important markets for environmental goods and services. This has happened in some newly industrializing countries which were themselves considered developing countries a few years ago.

Partly fueled by aid, environmental business opportunities in the developing world are growing. The six ASEAN nations currently represent an environmental market of about \$1.8 billion per year.¹⁰ The 1992 environmental market in six Latin American countries is estimated to be \$2.4 billion.¹¹ Some lower income countries, including India and China, are increasing their investments in environmental protection and pollution control. China plans to spend \$15 billion on environmental protection or projects that include related environmental improvements in its current five-year plan that ends in 1995.

Difficulties in obtaining financing could limit growth of developing country environmental markets. In many developing countries, government funding for environmental protection will likely remain sparse. Private or mixed public-private funding sources will be key to the growth of environmental markets. Financial packages—drawing on private funds, official assistance, and innovative approaches for project financing—can be the determining factor in contract awards. The opening of various developing country economies to greater foreign investment and the loosening of state controls on energy, transport, and manufacturing industries—including privatization—provide growing possibilities for environmentally favorable investment.

ENVIRONMENTAL AID IN COMPETITIVE CONTEXT

(SEE CHS. 3-5)

While a few U.S. environmental firms operate worldwide, most are inexperienced in doing business outside the United States. Many are small or medium-size businesses that have focused exclusively on the U.S. market, the largest in the world. Some other aid donors—including Japan, Germany, and several other European countries—have large environmental industries that are actively seeking export opportunities.

Environmental aid, like aid in general, can help donor country firms sell goods and services abroad, adding to their domestic employment. Aid to help developing countries with environmental monitoring, standard setting and enforcement, and training can bring commercial benefits to donor country firms while building developing country capabilities. Moreover, such technical cooperation for projects can develop into lasting business relationships that lead to future sales by donor country firms after aid ends.

Donor country consultants or citizens often conduct project feasibility studies and engineering studies. Industrialized country engineering and construction firms are often involved in project design and management, and may use personnel and engineering services headquartered in donor countries. Some environmental projects (such as wastewater treatment facilities and stack gas scrubbers) are very expensive to build. Although local materials (e.g., concrete, sheetmetal, pipes) and labor comprise a substan-

⁹ Examples of the magnitude of the NIC environmental markets include about \$11 billion of environmental projects in Taiwan's current Six-Year Development Plan and over \$10 billion in South Korea's 1991-95 investment plans. See American Institute in Taiwan, "Listing of Taiwan's Six-Year Development Plan Projects (partial List) & Status Report on Selected Major Projects," August 1991, and Republic of Korea Ministry of Environment *White Paper 1990*, 1991, as cited in Tal Woo Lee, "Perspective of Environmental Industry in Korea," paper presented at GLOBE '92, Vancouver, B.C., Canada, Mar. 16-20, 1992.

¹⁰ Jonathan Menes, Acting Assistant Secretary for Trade Development, U.S. Department Of Commerce, Testimony Before the "Committee on Merchant Marine and Fisheries, Subcommittee on Environment and Natural Resources, Feb. 25, 1993. ASEAN is the Association of South East Asian Nations, consisting of Brunei, Indonesia, Malaysia, Philippines, Singapore, and Thailand.

¹¹ USAID, *Environmental Market Conditions and Business Opportunities in Key Latin American Countries*, Business Focus Series, October 1992. The six countries are Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela.

tial portion of the project costs, environmental and energy infrastructure projects may use imported equipment and technology transferred from developed countries, with some return of project monies to the donor country.

Most donor countries (including the United States) seek benefits from their aid for their domestic economies and firms. Many U.S. consultants and contractors benefit from U.S. project aid, such as grants and technical assistance for institution building, education, and training. However, the United States spends a high portion of its aid on debt relief and "program assistance" (aid not linked to particular projects), which as discussed in chapter 4 have limited potential to increase exports. Moreover, since the 1970s, relatively little U.S. bilateral aid has gone to large capital projects.¹² Large capital projects often require imports of engineering services, equipment and technology, and can be conducive to building long-term business relationships. Much of the bilateral aid provided by Japan and Germany supports such capital projects.

To varying degrees, donors formally or informally "tie" the aid so that funds from the donor are used to purchase its goods and services (box I-B). Tying of aid tends to increase exports, though it is difficult to say by how much; in some cases, the recipient country would have spent the money in the donor country anyway.

Tied aid is sometimes offered not as a pure grant but with a loan component; assuming the loan is paid back, such "tied aid credits" enable more exports for a given amount of net aid expenditure. While tied aid credits can be a powerful export promotion tool, they can skew aid in ways that promote donor country commerc-

ial interests at the expense of recipient country development and environmental interests. The United States, which has used tied aid credits less than several other major donors, for many years negotiated for tougher OECD rules to lessen commercial advantage from their use. The latest OECD rules, as amended by the Helsinki Package adopted in December 1991, show promise in limiting the commercial effect of tied aid credits; however, even these rules are likely to permit substantial use of tied aid credits for commercial advantage. Some environmental projects may fall in this category (see ch. 4).

Questions are arising about how and when donors should cooperate on the environment and how and when they should act to foster business opportunities for their domestic firms. These issues are especially conspicuous in the ongoing debates about the respective trade, aid, and environmental policies of Japan and the United States—the largest donors of aid in general and environmental aid in particular. More cooperation between Japan and the United States on environmental issues could be a promising area of common interest as the two countries begin to consider possible new frameworks for restructuring their economic relationship.¹³ The commercial ramifications of such cooperation for environmental firms is not clear.

Environmental aid has emerged as a key focus for Japan's aid in the 1990s. Japan has announced plans for major increases in its environmental aid in the next few years. The major Japanese aid agencies provide support for environmental research, training, and technical cooperation with developing countries and financing for environmental infrastructure. In addition, Japan's Minis-

¹² As is discussed in chapter 5, U.S. aid at one time placed major emphasis on capital projects. This changed during the 1970s, in part because of concern that some large development projects supported by U.S. loans had not made a contribution to development goals (such as alleviation of poverty) commensurate with their size and had potential to contribute to corruption. For discussion of this history, see Curt Tarnoff and Larry Q. Newels, "Foreign Assistance and Commercial Interests: The Aid for Trade Debate," *CRS Report to Congress*, May 24, 1993, p. 17, pp. 22-26.

¹³ Such a possibility was raised at the April 1993 meeting in Washington between President Clinton and Japanese Prime Minister Kiichi Miyazawa. See *Weekly Compilation of Presidential Documents*, Apr. 16, 1993, p. 598. For discussion of some of the issues, see Pat Murdo, "Cooperation, Conflict in U.S.-Japan Environmental Relations," *JEI Report*, Japan Economic Institute, Washington DC, May 28, 1993.

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Box I-B-Aid Practices that Can Enhance Exports

Aid that is formally "tied," that is, conditioned on the funds being used to purchase goods and services from a donor country, has received a great deal of attention over the years. However, even if aid is not formally tied, many practices used by donors make it more likely that funds will be spent in the donor country. For example, donors might choose to fund projects in sectors where their firms enjoy a competitive presence.

Numerous other practices, sometimes called "informal" tying, can increase the export-enhancement effects of bilateral ODA. Recipients may come to a tacit understanding that tomorrow's aid depends on spending a good part of today's aid in the donor country. Donors may ascertain procurement intentions before aid is offered. Several countries, including the United States, at times make grants to developing country governments to fund preliminary studies (such as feasibility studies) by donor country firms. While funds for subsequent stages of the project may not be tied, the firm doing the study will tend to recommend familiar home country technologies and services. Firms doing the studies may have an advantage in bidding for the main project. In the same vein, some countries have at times untied most of a construction project but tied to some extent the engineering management component; a donor country management firm could steer other components of the project to donor country firms.

Donor country governments may work with their national firms to identify potential aid projects and areas with promising export opportunities, and to parlay particular grants of aid (including grants for training or for research and development) into long-term business relationships. Most donors use such approaches to some extent. The U.S.-Asia Environmental Partnership and the U.S. Trade and Development Agency discussed in box I-A and appendix B are examples of American efforts to use aid to build business relations. Box 2-B gives examples from Europe and Japan.

In addition to directly promoting exports, bilateral aid can indirectly promote exports by assisting national firms in winning contracts from untied multilateral development aid. Multilateral aid is an important source of environmental assistance, involving over \$3 billion in loans in 1992. Countries monitor the programs of the World Bank and the regional development banks; some have standing grant facilities for the banks to draw upon to pay for preliminary studies for multilateral projects. These grants are sometimes earmarked for hiring donor country firms or citizens, who again are likely to recommend home-country technologies and services.

Donors also directly contribute funds to some multilateral projects (called cofinancing), and fund related but separate projects (canal parallel financing). While not directly influencing who wins contracts for multilateral projects; these practices could make a recipient country government more receptive to a national firm's bid (in the case of cofinancing) or help familiarize national firms about the multilateral project (in the case of parallel financing).

While most multilateral funds per se are untied, there is an important exception. European Community countries offer some multilateral aid (about \$3 billion worth in 1992) through a common fund that is largely tied to purchases from firms in EC countries. About 10 percent of the EC multilateral funds—or \$300 million—is environmental aid.

try of International Trade and Industry (MITI) provides its own "green aid" and has launched programs for environmental technology development to address global environmental issues.

It is hard to determine the degree to which commercial considerations underlie Japan's environmental aid. The Japanese government has a history of successful promotion of exports, including use of aid to promote exports of manufac-

tured goods. It has successfully targeted industries it considers strategic, such as automobiles and computers, substantially accelerating their growth and increasing their exports. Some see MITI's green aid and R&D measures as an early indicator that the environment could become a strategic focus for Japanese industrial policies. MITI's activities are in their early stages and are expected to grow substantially.

However, Japan's overall aid program is evolving. Japan has, at least officially, been taking steps to open up more of its ODA to participation by non-Japanese firms. A recent U.S. Executive Branch report to Congress, coordinated by the State Department, expressed cautious optimism that U.S. (and other foreign) firms "will be able to increase their participation in Japan's ODA contracts over the next few years."¹⁴

Whether "cautious optimism" is in order in the case of environmental aid remains to be seen. Japan appears to be using its environmental aid both as a showcase and as a testing ground for new aid approaches. Japan's stated interest in international environmental cooperation may suggest receptivity to participation by U.S. firms. To benefit from opportunities arising from Japanese aid, U.S. firms normally would have to establish a sustained presence in Japan and make persistent efforts to understand Japan's ODA system; few U.S. firms to date have made such efforts. Some U.S. environmental firms could be in a position to benefit by focusing on areas where they provide superior goods or services pertinent to Japanese aid objectives.

Even if some U.S. firms might benefit from Japan's aid, the greater commercial benefits flowing to Japanese firms could have long-term ramifications for the competitiveness of U.S. environmental firms. Japan's environmental aid, like its aid overall, is focused on East Asia--a region with promising potential to emerge as an important environmental market independent of aid. Japanese firms are already more established in East Asian developing countries than the firms of any other industrialized country. With its

emphasis on capital projects, Japan's ODA can help build long-term commercial ties and relationships for its firms that may last after aid ends. While some recent U.S. initiatives such as the U.S.-Asia Environmental Partnership (see box I-A) could help, U.S. firms seeking to compete in the East Asian market may face an uphill battle.

CURRENT POLICY CONTEXT

(SEE CH. 5 AND APP. B)

The appropriate role of U.S. aid in encouraging exports of U.S. goods and services has been a subject of continuing debate.¹⁵ Promotion of exports of U.S. manufactured goods has not been a primary thrust of U.S. development aid. The U.S. Department of Commerce and several other government agencies administer a number of programs to promote and finance U.S. exports; these programs (discussed in appendix B) are limited in scope, especially for manufactured goods. Through enactment of several 1992 laws, such as the Export Enhancement Act, the National Energy Policy Act, and the Aid, Trade and Competitiveness Act, Congress authorized Federal agencies to place more emphasis on export promotion (including environmental export promotion).¹⁶ The degree of emphasis will depend, of course, on funding and commitment to implementation. These and other actions, such as the United States-Asia Environmental Partnership launched by the Bush Administration in January 1992, are discussed in box I-A.

Some of these measures authorize a greater USAID role in fostering U.S. exports, especially for environmental and renewable energy or energy-efficiency technologies. Whether U.S. aid should

¹⁴ U.S. Department of State in coordination with other executive branch agencies and departments in response to a request by the United States Senate, "Japan's Foreign Aid: Program Trends and U.S. Business Opportunities," Feb. 18, 1993, mimeo., p. 6.

¹⁵ For a more detailed discussion of issues and legislative proposals, see Curt Tarnoff and Larry Q. Newels, "Foreign Assistance and Commercial Interests: The Aid for Trade Debate," *CRS Report for Congress*, U.S. Library of Congress Congressional Research Service, May 24, 1993.

¹⁶ Additional export promotion measures have been introduced in the 103d Congress. Proposals that focus specifically on environmental exports include H.R. 1830, the proposed Global Environmental Cleanup Act; H.R. 2112, the proposed National Environmental Trade Development Act, introduced on May 12, 1993; S. 978, the proposed National Environmental Technology Act; and S. 979, the proposed Greentech Jobs Initiative Act.

take on a more commercial orientation continues to be debated in the development community. As a practical matter, the efficacy of using aid projects to promote exports is ultimately limited by aid budgets. While the United States in some years may still be the largest overall aid donor, its ODA budget has declined as a portion of GNP over time, and is now well below the DAC average. Moreover, development assistance that part of the aid budget most relevant to direct promotion of environmental exports—counts for only part of the total U.S. foreign assistance budget.

Some question whether there is any need for direct government action to promote exports through aid. For example, a 1992 policy review by USAID states that since 1985 U.S. exports to developing countries have grown faster than that of major competitors.¹⁷ (Data for particular sectors may differ; the USAID policy review did not discuss whether environmental exports shared in this strong growth in exports to developing countries.) Instead of direct action to promote exports, the USAID review saw continuing efforts to encourage developing countries to open markets and make other policy reforms as a better way to encourage exports, albeit indirectly.

Of course, market-opening approaches would not necessarily promote U.S. exports more than exports from other industrialized countries. And, despite the recent progress noted by USAID, the United States was still behind the EC and far behind Japan in 1990 merchandise exports to developing countries as a percentage of GNP.¹⁸ There is also no guarantee that the United States will maintain its current market shares if other countries pursue aid practices that promote ex-

ports to a greater extent than the United States. While the precise export promotion effect is hard to determine, such practices are widely used by other major donors, many of which also provide substantial non-aid-related export promotion for manufactured goods.¹⁹ In principle, it might be preferable for all donors to agree to change these practices—for example, to forgo tying their aid, letting development priorities and the market determine where aid money is spent. However, such an agreement is not likely to be achieved any time soon; and for the United States alone to forgo use of such practices could mean U.S. exports would suffer in time.

Opinions are divided about whether orienting U.S. aid more toward direct promotion of environmental exports would compromise or further environmental protection and development goals. There is a similar division of opinion about the aid practices of other countries.

Supporters of closer links might hold that a focus on exports could further the goals of economic development and environmental protection. Promotion of exports may create a stronger constituency for aid in donor countries, making continuation of aid more likely. Linkages between aid and exports also might encourage continuing business relationships between donor country firms and developing countries—relationships that could be conducive for transfer of environmental technology and practices. Also, involvement of donor country firms in aid planning might help screen out some projects that are ill-founded from a business sense. The prospect of exports to developing country markets may encourage donors to support research and development to adapt environmental technologies more

¹⁷ The USAID research is discussed in “Aid, Trade and Development: Implications of the Background Papers for the Trade Policy Working Group,” mimeo., June 1992.

¹⁸ The percentages are: United States, 2.4; EC, 2.8; and Japan, 3.9. These figures are derived from USAID, “U.S. Trade Trends and Issues,” mimeo., June 1992, p. 11, table 2 (presenting data on 1985 and 1990 merchandise exports to developing countries), and U.S. Department of Commerce, *Statistical Abstract of the United States 1992*, p. 830, table 1370 (1990 GNP data).

¹⁹ For example, as is discussed in app. B and will be addressed more fully in the final report for this assessment, U.S. government-assisted export financing appears more limited than that in Japan and several European countries; private export financing by U.S. banks is also very limited.

specifically to developing country needs, and to support training. It also could encourage more effort to evaluate the performance of environmental technologies, either by individual countries or possibly through evaluation activities undertaken with multilateral support.

Others contend that the use of aid for export promotion can compromise both environmental and developmental goals. They point to increased costs for purchases restricted to bidding only among donor country firms. This increases the costs of capital projects and reduces the amount of real aid.²⁰ A capital projects orientation could diminish direct aid for basic human needs, such as food, medicine, or reducing poverty. At least for some environmental projects, the division between capital projects and basic human needs is not clear; for example, capital projects may be needed to assure safe drinking water and to treat waste in order to protect against health threats. However, overemphasis on export promotion could bias projects toward overly expensive infrastructure, with more sophisticated technology than needed to meet basic human needs. Such technology can be inappropriate to a country's level of development, draining resources from more pressing problems, and can create dependency on developed countries. Furthermore, expensive capital projects paid by soft loans could aggravate developing country debt burdens or balance of payments problems. These financial difficulties could reduce a country's capacity to buy environmental goods and services without aid, and could encourage mismanagement of the environment.²¹

While use of development assistance to promote exports might in some cases hamper environmental or developmental goals, this result is not inevitable. It would be possible to pursue

export promotion with safeguards to prevent compromise of environmental or developmental goals. Under such an approach, projects, however desirable from an export promotion standpoint, would still need to meet rigorous environmental and developmental standards. Some export opportunities might be lost, but it should be possible to find fully satisfactory projects.

Several steps could be taken to screen projects for adverse effects, such as might result from use of inappropriate technology, whether or not export promotion is the goal. Some of these procedures have begun to be used by donors. Among those pertinent to the environment:

1. *Environmental studies to identify real needs and priorities:* Donors increasingly fund developing country environmental studies, environmental profiles, and conservation strategies. DAC has noted a need for coordination and use of "good practices" in these assessments. USAID's approach is worthy of note: increasingly, developing country organizations undertake the studies, thus building local capabilities for environmental analysis. Additional measures could be taken to assure opportunity for public review and input from nongovernmental organizations in developing and donor countries.

2. *Use of guidelines in project reviews:* Conscientious efforts by donors to see that guidelines are applied could reduce transfers of inappropriate technology. Germany, for example, makes special efforts to assure that developing countries have trained personnel available before capital projects are funded. Public export financing agencies in the United States and in several other donor countries are developing and in some cases implementing environmental guidelines for decisionmakers. So are multilateral lending institu-

²⁰ One survey of recent empirical studies concludes that "an average of 15 to 30 percent' increased costs is the "best aggregate estimate." Catrinus J. Jepma, *The Tying of Aid* (Paris: OECD, 1992), p. 58.

²¹ Developing countries with heavy burdens on their balance of payments and substantial foreign debt are more likely to overuse (rather than sustainably manage) their natural resource base to gain foreign exchange. Overharvesting of otherwise renewable resources such as timber and fisheries are two examples.

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tions. Some private lending institutions also are developing environmental criteria.

3. *Evaluation of technologies:* Better information about the performance of environmental technologies could help donors assess how projects with export potential would mesh with recipient countries' needs. It also could help recipient countries evaluate alternatives. Some evaluation programs to serve domestic objectives in donor countries exist, including several small programs administered by the U.S. Environmental Protection Agency.²² Such evaluation programs are likely to provide more objective information than would be available from firms with an interest in selling their own technology. Technology evaluations might be undertaken multilaterally, under the auspices of an agency such as the United Nations Environment Programme or the United Nations Development Programme.

In many cases, developing countries will find it preferable to use locally available technology, or to adapt developed country technologies to local needs. Some donors are working to customize developed country environmental technology to the specific needs of developing countries (see discussion of Japan's Green Aid Plan *ibid.* 5). Regional centers in developing countries might be tapped to facilitate such adaptations, as well as to address training needs.²³

4. *Provision for operation and maintenance:* Donors might also screen projects with export potential to assure that adequate provision is made for operation and maintenance of environ-

mental infrastructure once construction is over. Projects often fall into disrepair because of inadequate budgeting for maintenance or spare parts procurement. Skimping on training for developing country personnel is often a shortcoming in development contracts. The more complex the technology, the greater the need for highly trained personnel to operate or maintain the equipment. Use of aid to support education and training can serve the environmental and developmental needs of developing countries and export promotion objectives.

Through such measures, donor countries could help strengthen developing country decisionmaking capabilities, while at the same time providing opportunities for their firms to develop commercial relationships. With stronger technical capabilities and better information, decisionmakers in developing countries will be better able to make informed choices about available options. Additional steps by donors, such as effective implementation of the environmental guidelines that are slowly being incorporated into the policies of national and multilateral lending institutions, also could help provide an appropriate balance between export promotion and environmental or developmental goals. Such efforts may in time result in more congruence among aid policies, environmental objectives, and development objectives while contributing to improved economic conditions in developing countries that will be essential for healthy long-term trading relationships.

²² These include the Superfund Innovative Technology Evaluation Program, the Waste Reduction innovative Technologies Evaluation Program and the Municipal Innovative Technology Evaluation Programs. An EPA-sponsored organization the National Environmental Technologies Application Corporation, has evaluated bioremediation agents related to oil spills.

²³ For discussion of potential roles of regional centers for energy-efficient technology, see "Relatively Advanced Developing Country Focus for Technology Cooperation Related to Global Climate Change," Conference Statement, Bellagio, Italy, Oct. 28-Nov. 1, 1991 (mimeo., Energy and Climate Program of the World Wildlife Fund, Washington, DC).