United States
Environmental Protection
Agency

Task Force On
Technology Cooperation
And Export Assistance

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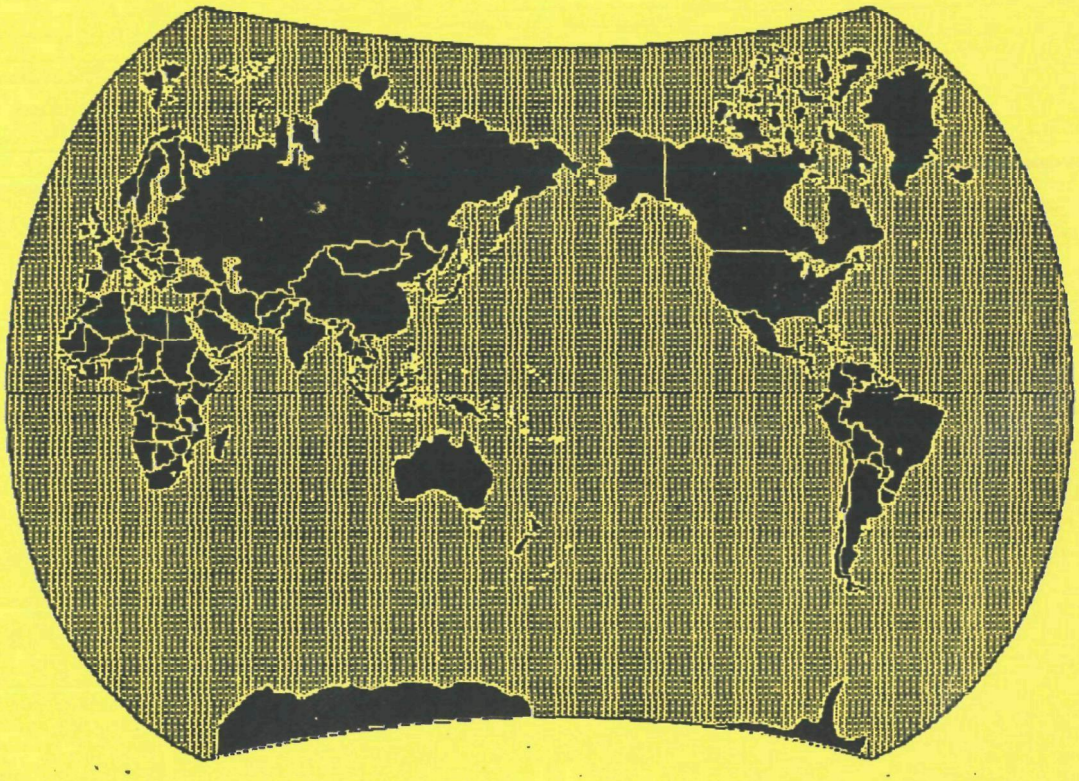
EPA

Global Markets For Environmental Technologies

Defining A More Active Role For EPA Within A Broader U.S. Government Strategy



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EXECUTIVE SUMMARY

Currently estimated at $200 billion a year, the global market for environmental technologies and services is projected to reach nearly $300 billion by the year 2000. New market opportunities are expected to accompany industry's increased use of cleaner production processes, as well as the adoption of more stringent environmental standards by governments throughout the world. America has long been a leader in providing environmental protection products and services at home. Maturing markets overseas now offer U.S. firms an unprecedented opportunity to meet the new and burgeoning needs of the international client.

In July 1992, EPA established an intra-agency Task Force on Technology Cooperation and Export Assistance to develop recommendations on the Agency's role in U.S. environmental export assistance efforts. The Task Force was particularly interested in determining if and how enhancing U.S. technology and services exports could help EPA achieve its environmental objectives.

The Task Force completed an extensive inventory of U.S. and international export assistance programs. The results of this exercise are contained in the body of this report and in the appendices. In examining EPA's activities, the Task Force found that the Agency already plays a critical -- though largely indirect and unrecognized -- role in facilitating U.S. environmental exports through its work in two key areas:

(1) **Demonstration of innovative solutions to environmental problems throughout the world:** EPA is engaged in a comprehensive effort to strengthen and build environmental infrastructures throughout Eastern Europe, the former Soviet Union, and the developing world. These programs help create the demand for environmental technologies, goods and services worldwide, thereby creating potential commercial opportunities for U.S. business and industry; and

(2) **Technology innovation, development, and diffusion:** EPA is a national and international leader in the research and development of new environmental technologies. Such programs stimulate the development of innovative technologies that enhance the competitive position of U.S. suppliers.

Building on these activities and consistent with a number of legal and policy considerations, the Task Force concluded that EPA can and should play a more active role within overall U.S. environmental export assistance programs. The Task Force determined that a carefully targeted and integrated U.S. program, involving the active participation of all Federal agencies including EPA, would not only maximize the full resources of the U.S. government; it would also help enlist the expertise, creativity, and financial resources of the U.S. private

sector in solving environmental problems around the globe. Specific recommendations directed at EPA include:

(1) **Expand cooperative programs with the Department of Commerce and other public and private sector organizations:** EPA and Commerce should use their recently-concluded Memorandum of Understanding to expand cooperative programs in a number of areas, including: (a) co-chairmanship of the environmental sub-group to the Trade Promotion Coordinating Committee; (b) environmental training for U.S. and Foreign Commercial Service personnel; and (c) cooperation in setting up environmental and agricultural business centers in Russia and the Newly Independent States. EPA should also cement its cooperative ties with other Federal and State programs and with business organizations, environmental groups, and other outside organizations.

(2) **Establish an inter-agency initiative on "U.S. Technology for International Environmental Solutions" (U.S. TIES):** Led by EPA and directed at improving the international competitiveness of U.S. environmental technologies, U.S. TIES would foster the development and international dissemination of credible data and information on U.S. pollution prevention and end-of-pipe technologies.

(3) **Establish central coordinating body within EPA to oversee management of the Agency's export assistance activities:** Managed out of the Office of International Activities and involving the participation of all relevant EPA offices and regions, this centralized coordinating body would provide strategic oversight, improve the internal management of existing and planned activities, and communicate with interested outside organizations and individuals.

As EPA's environmental export assistance program becomes further clarified, additional issues, such as the adequacy of existing Agency legal authority, might need to be addressed.

INTRODUCTION

EPA Task Force on Technology Cooperation and Export Assistance

In July 1992, EPA formed an intra-agency Task Force on Technology Cooperation and Export Assistance to develop recommendations on the Agency's role in U.S. environmental export assistance programs. Co-chaired by Alan Hecht of the Office of International Activities (OIA) and Dan Esty of the Office of Policy, Planning and Evaluation (OPPE), the Task Force included the participation of all relevant offices within EPA, including the Office of Research and Development (ORD), Office of General Counsel (OGC), Office of Congressional and Legislative Affairs (OCLA), Office of Air and Radiation (OAR), Office of Solid Waste and Emergency Response (OSWER), Office of Water (OW), and Office of Prevention, Pesticides, and Toxic Substances (OPPTS). A full list of Task Force members is provided in Appendix A.

The Task Force has met formally three times since July, and Task Force members have consulted informally with other public and private sector organizations. The Task Force has also completed a comprehensive fact-finding exercise on environmental export assistance activities currently underway within the U.S. Government, the U.S. private sector, and throughout the international community.

The Task Force coordinated its activities closely with EPA's Innovative Technology Council, co-chaired by Walter Kovalick of OSWER and Alfred Lindsey of ORD. While the Innovative Technology Council has focused on U.S. efforts to assist the private sector in developing and commercializing new technologies domestically, the Task Force on Technology Cooperation and Export Assistance has focused on the introduction of these technologies and expertise into the international marketplace. The Task Force has also benefitted considerably from the work of the National Advisory Council for Environmental Policy and Technology.

Purpose of this Report

The purpose of this report is to summarize the results of the Task Force's work since July 1992. The report describes the current global market for environmental goods and services; summarizes the export-related programs underway at EPA, at other U.S. public and private sector organizations, and throughout the international community; and describes EPA unique capabilities and the legal and policy considerations involved in taking a more active role. The report concludes with the Task Force's specific recommendations on: (1) expanding cooperation with the Department of Commerce and other public and private sector organizations; (2) establishing an inter-agency initiative called "U.S. Technology for International Environmental Solutions (U.S. TIES); and (3) establishing a centralized coordinating body within EPA to oversee management of the Agency's environmental export assistance activities.

THE GLOBAL MARKET FOR ENVIRONMENTAL GOODS AND SERVICES

In the most widely cited estimate, the Organization for Economic Cooperation and Development (OECD) has appraised the current global market for environmental technologies and services at over $200 billion a year and has projected this market to reach nearly $300 billion by the turn of the century. Table 1 shows how the market is expected to be divided.

TABLE 1
Forecasts of World Market Trends for the Environment Industry
(in billions US$)

Environmental Sector	1990	2000	Growth Rate
EQUIPMENT	$ 152	$ 220	5.0%
Water Treatment	60	83	4.0
Waste Management	40	63	6.4
Air Quality Control	30	42	4.4
Other	22	32	5.1
SERVICES	48	80	7.4
Total	200	300	5.5

Source: OECD, "The OECD Environment Industry: Situation, Prospects, and Government Policies," (Paris: OECD, 1992).

The growth in the environmental market is largely believed to result from the enactment of more stringent environmental regulations around the world and the commitment of the resources necessary to enforce them. Industrialized nations, developing countries, and countries with economies in transition are all looking to reduce the risks and the costs that pollution imposes. In addition, non-governmental organizations and multilateral lending and development institutions have made protection of the environment integral to their assistance activities. Moreover, companies themselves are recognizing that cleaner manufacturing processes not only mitigate waste but heighten cost-savings and competitiveness. We are thus seeing greater adoption of cleaner technologies on a voluntary basis.

TABLE 2
Forecasts of Market Trends for the Environment Industry by Region

Region	1990 (US $bil)	2000 (US $bil)	Estimated Growth Rate (%)
NORTH AMERICA	**$ 84.0**	**$ 125.0**	**5.4**
United States	78.0	113.0	5.0
Canada	7.0	12.0	7.9
EUROPE	**54.0**	**78.0**	**4.9**
Germany	17.0	23.0	4.0
France	10.0	15.0	5.5
United Kingdom	7.0	11.0	6.3
Netherlands	2.7	3.7	4.1
Italy	5.0	7.7	6.0
Denmark	1.0	1.2	2.2
Greece	.3	.5	7.4
Portugal	.4	.7	8.3
Spain	1.8	3.0	7.4
Belgium	1.4	2.3	6.4
Ireland	.3	.5	6.5
Austria	1.3	1.8	4.3
Switzerland	1.9	2.5	3.5
Sweden	1.5	2.0	3.7
Finland	1.0	1.3	3.3
Norway	.7	1.0	4.4
ASIA-PACIFIC	**26.2**	**42.0**	**6.2**
Japan	24.0	39.0	6.7
Australia	2.0	2.8	4.4
New Zealand	.0	.3	5.5
NON-OECD	**36.0**	**55.0**	**5.9**
Eastern Europe/ former Soviet Union	15.0	21.0	4.0
Other	21.0	34.0	6.8
TOTAL	**200.0**	**300.0**	**5.5**

Source: OECD, "The OECD Environment Industry: Situation, Prospects, and Government Policies."

The 1990 figures above reflect a present market that is dominated by demand for end-of-pipe pollution control equipment. While the OECD projects the markets for both equipment and services to increase through the end of the century, the services market is expected to grow faster as pollution control technologies are more fully integrated into industrial products and processes. Demand for environmental equipment is projected to grow 5% per annum, with the highest demand being for waste management and land reclamation equipment. But the prospects for services, such as environmental consulting, engineering, design, risk management, and product testing, look particularly promising. In response to these bright prospects, the United States and a number of other countries have begun to position themselves to take advantage of lucrative business opportunities in the environmental sector.

EXISTING EXPORT-RELATED PROGRAMS

To ascertain how countries are making a place for their industries in this market, the Task Force identified existing export-related programs inside the United States, beginning with those of EPA, and throughout the international community.

Existing EPA Programs Related to Export Assistance

While environmental export promotion has not been a traditional goal or concern of EPA, the Agency is already involved in a number of technology cooperation and export-related programs which collectively promote capacity-building and markets for environmental technologies. First, EPA has already begun to implement the three recommendations on export assistance contained in the Agency's report to President Bush following up on his January 1992 directive on a 90-day review of government-wide regulations. These recommendations included:

(1) Launching the U.S. Environmental Training Institute;

(2) Increasing international access to EPA's Environmental and Energy Efficient Technology Transfer Clearinghouse; and

(3) Organizing "reverse" trade missions and a number of other concrete activities.

The inaugural course of the U.S. Environment Training Institute (USETI), held in May 1992, was enthusiastically received by the U.S. business community and by government and industry representatives abroad (See Box 1). As a result, EPA has scheduled four new courses for 1993 and more than a dozen in 1994, including courses on Singapore and Puerto Rico.

THE U.S. ENVIRONMENTAL TRAINING INSTITUTE

EPA, together with the U.S. Agency for International Development (AID) and the Trade and Development Agency (TDA), established the non-profit U.S. Environmental Training Institute (USETI) as a public-private initiative to build environmental management capacity in developing countries. Through ETI, major U.S. corporations currently working in key environmental fields conduct focused training courses at laboratories, training facilities, and factories in the U.S. for overseas public- and private-sector executives to give these key decision makers quality training in technologies and approaches that can be incorporated into their local industries and governments.

ETI's May 1992 course brought decision makers from nine countries to Washington, D.C. and Chicago to learn about landfill management techniques. ETI is currently scheduled to hold three more courses this year and one course a month throughout 1993. Future classes will address issues such as pollution prevention, nuclear waste clean-up, energy efficiency, and NOx reductions. Also in 1993, ETI will bring specialized courses to Southeast Asia and to the Caribbean.

Box 1

The Environmental and Energy Efficient Technology Transfer Clearinghouse is also successfully underway, and EPA has arranged for the World Environment Center, a non-profit business organization based in New York City, to devote the necessary management resources to ensure its commercialization and expansion. The Clearinghouse is co-sponsored by EPA, the U.S. Agency for International Development (AID), and the U.S. Department of Energy (DOE), and is an on-line, computer-based information service that links a network of 500 government and commercial data bases to provide users with vendor and technical information for pollution control, renewable energy, and energy efficient technologies. In the true sense, it is a "one-stop shop" for information on energy efficient and environmental technologies, vendors, regulations, and related considerations. Clearinghouse stations currently operate in four Mexico City locations, in Vienna at UNIDO, and in Washington at EPA and at the Inter-American Development Bank. The World Environment Center and the Environmental Resource Group are also creating a stand-alone system for use in Asia and elsewhere. Future plans hope to introduce the Clearinghouse in Eastern Europe, the Caribbean, Ukraine, Southeast Asia, and Latin America.

EPA has also tentatively scheduled a "reverse" trade mission for early next year for Brazilian officials to meet with public and private sector officials in the United States on the

clean-up of Brazil's Tiete River. Among other things, this project will allow Brazilian industrial and political leaders to visit U.S. cities that have enacted similar river clean-ups, will showcase U.S. technologies, and will lay the foundations for future prevention, restoration and planning work, and cooperative research.

THE VENDOR INFORMATION SYSTEM FOR INNOVATIVE TREATMENT TECHNOLOGIES (VISITT):
A Unique EPA Data Base

EPA also offers the Vendor Information System for Innovative Treatment Technologies (VISITT), a data base containing information on innovative technologies that can be used to treat contaminated groundwater, soils, sludges, and sediments. The VISITT data base informs users about the technical aspects of various clean-up technologies and the contaminant or waste they treat, provides the names and contact points of vendors, and oftentimes gives a summary of performance data, reference projects, and pricing information. VISITT identifies technologies at all stages of development; however, roughly 40% of those described are commercially available and ready for use.

Although it was originally designed for domestic use, VISITT has recently been publicized at exhibits that receive international attention, and the international community is becoming a fast-growing new generation of users. VISITT's current version references 154 U.S. suppliers of innovative treatment technologies. EPA plans to introduce an updated version in January 1993.

Box 2

In addition to these newer programs, EPA for many years has conducted a spectrum of activities which indirectly help U.S. environmental businesses work overseas. Such programs include EPA-conducted training workshops and conferences; technology testing; data bases, clearinghouses, and information centers that provide technical and source information; and cooperative agreements between EPA and bilateral and multilateral organizations. The Superfund Innovation Technology Evaluation (SITE) Program, now in its sixth year, is a good example of training and demonstration. The U.S. Federal Technology Transfer Act (FTTA) vested EPA with considerable authority to cooperate with industries and universities in developing new and innovative environmental technologies, and through the SITE program, EPA promotes the development and use of alternative clean-up methods for hazardous waste sites. EPA now participates in over 30 cooperative research and development and licensing agreements.

EPA also participates in four Energy Efficiency Centers established, in coordination with other Federal agencies, the World Wildlife Federation, and the Conservation Foundation, in Warsaw and Katowice, Poland; Prague, Czechoslovakia; and Moscow. These Centers serve the region with technical training and demonstration, technology transfer, information services, policy analysis and development, and help link domestic and foreign partners for joint ventures -- all capacity building activities that lead to economic development and environmental protection, but that also provide a role for the U.S. private sector.

Two other regional centers, the Caribbean Environment and Development Institute and the Regional Environment Center for Central and Eastern Europe, also receive EPA support. The Caribbean Institute offers the Caribbean region a centralized source of environmental expertise, coordinates existing programs and fosters new partnerships that build capacity, technical cooperation, and environmental training. The Regional Environment Center for Central and Eastern Europe offers a centralized source of information for that region on Eastern European and NIS environmental laws, policies, and issues, as well as on education and training programs, assistance programs, and environmental institutions operating in Eastern Europe.

EPA also participates actively in the U.S.-Asia Environmental Partnership (AEP), the first comprehensive regional partnership program designed to bring together U.S. and Asian businesses, non-governmental organizations (NGOs), and governments in order to enhance Asia's environment and promote economic progress. A joint public-private initiative, the AEP focuses on creating programs to advance environmental training, technology transfer, and environmental infrastructure projects in the region. EPA expects the program to create significant possibilities for partnerships that will expand cooperation between the U.S. and Asia. So while the Agency does not aggressively pursue and promote trade opportunities, many current EPA programs do provide the opportunity for U.S. vendors of environmental goods and services to identify and fill environmental needs across to globe. Simultaneously, these programs benefit nations which look to EPA for sound environmental advice and assistance.

In summary, through a variety of programs, EPA is in a key position to showcase U.S. technology and know-how to address environmental problems.

Other U.S. Public Sector Programs

While EPA itself is a less established actor in export assistance, other agencies have clear-cut mandates to conduct programs and activities that promote U.S. exports: the U.S. Departments of Commerce and Energy, the U.S. Agency for International Development (AID), Small Business Administration (SBA), Trade Development Agency (TDA), Overseas Private Investment Corporation (OPIC), and the Export-Import Bank (Exim Bank). Inter-agency

committees, such as the Commerce-led Trade Promotion Coordination Committee (TPCC) and the Energy-run Committee on Renewable Energy Commerce and Trade (CORECT), have emerged to coordinate efforts across government. Trade promotion programs broadly range from more passive services (e.g., maintaining data bases or other repositories of information on market opportunities, vendors, and technical data) to active assistance (e.g., conducting market analyses, trade fairs, and trade missions, facilitating joint ventures and partnerships, providing direct technical assistance, and providing or coordinating the financial means to export) [See Appendices B and C]. Many of these programs relate directly or indirectly to trade in environmental goods and services.

The Department of Commerce, for example, sponsors several Washington-based regional business centers that, to varying extents, offer counseling and information on business opportunities in specific regions. The environment industry is one of the sectors served. Commerce also sponsors 20 to 30 industry-targeted overseas trade missions annually. These open doors to host-country government and business leaders and help U.S. firms identify local agents, representatives, and distributors. The customary cost to participants is between $2,000 and $5,000 a piece. Since 1988, Commerce has maintained the National Trade Data Bank (NTDB), a data base of market research reports, country-specific data, export and import statistics, and international economic information. A number of NTDB documents address foreign environmental sectors. The Department of Commerce has also announced the establishment of the National Environmental Technologies Trade Initiative (NETTI), which will use bilateral conferences throughout the developing world to enhance U.S. environmental exports.

Focusing on energy exports, the Department of Energy (DOE) leads the Committee on Renewable Energy Commerce and Trade (CORECT), a public-private work group to promote U.S. renewable energy products and services internationally. CORECT sponsors pilot and demonstration programs and conducts fact-gathering activities, trade missions, education, training, and financial assistance programs to develop regional markets. CORECT does not provide direct funding, but it provides extensive support services and help that major development banks either do not or cannot offer. Currently, CORECT has activities underway in the Caribbean, the Pacific Rim, and in Eastern Europe. DOE also holds trade fairs, trade missions, and conferences to promote the energy sector, and works to eliminate trade barriers, identify financing options, and coordinate other federal activities involving energy goods exports.

The Trade Development Agency (TDA), formerly the Trade Development Program, funds "scoping" missions, feasibility studies, orientation visits and reverse trade missions, technical symposia, training, information dissemination, and procurement promotion for major

development projects in developing and middle-income countries. TDA places a priority on the environment and in 1990 allocated over one-fifth of its grants to environmental projects.

The U.S. Agency for International Development (AID) also has a number of export-related programs, often joining technical assistance with export promotion. For example, AID is the organizing force behind the multi-agency U.S.-Asia Environmental Partnership (AEP), mentioned earlier, which is seen as a long-term effort to evolve a multi-billion dollar market for environmental technologies and services in Asia. Another program, the Project in Development and the Environment, works to foster economic growth in developing countries through technology transfer, training, and environmental education programs that will create strong indigenous environmental sectors. AID also, in cooperation with Commerce, funds U.S. business project development in Central and Eastern Europe, and one of the focal industries is environmental equipment.

The Overseas Private Investment Corporation (OPIC) and the Export-Import Bank (Exim Bank) provide investment insurance coverage and loans for export activities, and both have placed increasing priority on environmental projects. OPIC's Energy Insurance Program, for instance, insures up to 90% of most overseas investments in energy exploration, development, and production against political risks. Its Environmental Investment Fund supports business enterprises in developing countries that use natural resources sustainably or otherwise practice sound environmental management. Exim Bank offers an Export Credit Insurance program to protect U.S. exporters and offers loans and guarantees for U.S. goods and services, encouraging trade in environmental technologies and services.

In the recent tighter economic times, many state development agencies have also established active export assistance programs to promote local goods and services. According to the most recent survey of the National Association of State Development Agencies (NASDA), States held over 1,500 international trade seminars in 1990, and many States provide subsidies to participate in international trade shows and facilitate export financing.

While this is only a sample of the numerous publicly-sponsored programs, the private sector has found that government programs tend to be too obscure or inaccessible and the information firms are able to get from the government -- when they know to access it -- is often outdated or too general to be of use. Another problem is that projects with developing countries and countries whose economies are in transition tend to carry more costs and risks than small- and medium-sized firms and for-profit investors are able or willing to bear, and government programs generally fail to address this.

U.S. Private Sector Programs

The private sector has attempted to remedy some of these shortcomings of public programs through a number of private and quasi-private environmental export assistance groups [See Appendix D]. Most of these organizations are still relatively young, reflecting the fact that the market for environmental goods and services has only recently come to be viewed by American business as profitable. The Environmental Technology Export Council (ETEC), for example, is a new organization of over 50 corporations, trade associations, and government laboratories formed specifically to expand the export position of U.S. environmental firms. ETEC plans to play an active role in environmental trade assistance, but at the moment it is still working to define itself as a link among industry, government, and market interests.

Another group, the Environmental Business Council, is an association of 180 New England-based environmental and energy firms that is slightly over a year old. In the past year EBC has hosted trade and environment missions from China, Germany, and Czechoslovakia, speakers from France, Belgium, and Mexico, has sponsored trade missions to and conferences in Mexico, and has established a "Plan of Co-operation" with the Mexican national chamber of commerce, CONCAMIN. EBC is looking to establish similar relationships in Europe and Asia.

A third group, the U.S.-ASEAN Council for Business and Technology, represents the interests of over 60 U.S. and Asian companies in and to the Association of Southeast Asian Nations (ASEAN). The Council works to strengthen U.S. government trade and investment promotion programs, provide information, and facilitate industry-specific contacts by conducting targeted programs to develop new commercial opportunities in the ASEAN region. For the last two years the Council has led missions on environmental market opportunities.

Taking a different approach, the National Environmental Technology Applications Corporation (NETAC), a non-profit organization created by EPA and the University of Pittsburgh Applied Research Center, works to accelerate the movement of environmental technologies into the marketplace by providing technical assistance, technology demonstration and evaluation, conducting surveys of domestic and foreign markets, and helping innovators commercialize their technologies. NETAC has cooperative partnerships with Poland, Hungary, and Russia, and other countries to provide technology transfer, assistance, and training programs. NETAC also works with two universities in Germany under joint research cooperative agreements. NETAC is more "best-technology-oriented" than U.S.-trade-oriented, and so it does not exclusively represent U.S. firms.

There are also a number of private sector funds which help firms secure the financial means necessary to successfully export. The Environmental Enterprises Assistance Fund

(EEAF), for example, provides financial assistance for projects under $2 million that promote commercially viable environmental technologies in developing countries. While this particular fund was established with AID backing, a number of purely private venture capital firms also view the environment as a choice market for investment.

Finally, the World Resources Institute is examining whether a new type of organization is needed to act as a funding and services intermediary to provide timely, targeted technical and market information, assemble external sources of technical know-how, and mobilize pre-investment and subsequent financing. Such an organization would operate as a fee-for-services, for-profit organization, and would provide the kinds of key intermediate, firm-tailored services that European companies have access to and that Canadian firms can tap into.

Foreign Programs

Europe, Canada, and more recently Japan, have taken a longer term view toward the opportunities that pollution remediation, prevention, and cleaner process design offer industry and national competitiveness. These are countries that historically have had a greater emphasis on exporting than has the U.S. (See Table 2). Given their early initiatives, it is not surprising, especially with the high values estimated for the environment market, to see these countries offer export assistance programs that target this sector. For example, nearly all the Western European countries, Japan, and Canada publish state-produced compendia of nationally-produced environmental goods and services to distribute to prospective clients at trade events, for example. More assertively, nearly all of these countries have created export assistance programs that are cross-agency, targeted, and firm-focused.

Canada sponsors an industrial development strategy called the Environmental Industries Sector Initiative (EISI) that is designed to improve the competitiveness of Canadian environmental goods and services industries promoting the development and use of new, cleaner, more efficient technologies. The Nordic countries promote their environmental industries through the coordinated efforts of government, universities, and private or semi-private trade councils and business associations. Denmark, Norway, and Sweden, for example, fund an "export manager-for-hire" program for smaller firms where a hired professional spends 20-40% of his time with the firm establishing export capacity and skills. In Sweden, this service is offered through the Swedish Trade Council, a publicly-chartered organization run jointly by industry and government. The Council helps firms locate overseas representatives, establish subsidiaries and acquire companies, negotiate joint ventures, recruit personnel, and it offers help with the legal and financial mechanics of exporting. The independent Swedish Institute of Export Training also offers company-tailored training, marketing information, and information

on financing, language and culture, and market- or product-specific exporting. In fact, Denmark, Norway, and Sweden all offer programs specialized to individual firms.

The French manage most aspects of export promotion through one Federal ministry, which itself relies on a public sector trade insurance company to subsidize firms' market development and exploration costs, provide insurance for market research, and assist with

TABLE 3
Export Intensity of Western Europe and the United States
(Exports as a Percentage of GNP)

Countries with Exports 0-19% of GNP		Countries with Exports 20-39% of GNP		Countries with Exports 40-59% of GNP		Countries with Exports 60-79% of GNP	
France	18.7%	Norway	30.4%	Netherlands	48.3%	Ireland	69.9%
UK	18.3	Germany	28.3			Belgium	64.4
Italy	16.4	Iceland	28.1				
Greece	14.1	Sweden	27.7				
Spain	11.7	Switzerland	27.6				
		Denmark	27.6				
under 10%:		Portugal	27.5				
U.S.	6.9%	Austria	25.8				
		Finland	20.1				

From William E. Nothdurft, Going Global, (Washington, D.C.: The Brookings Institution, September 1992).

financing. These national programs work closely with a network of government-subsidized export consultancies and local and overseas Chambers of Commerce.

While Germany asserts that it has no formal national export strategy and that export assistance officially is the territory of the private sector, the German government does offer a great deal of assistance. The Ministry of Industry, for example, funds Chambers of Industry and Commerce and Chambers of Commerce Abroad for firm-tailored market research. A state-run credit institute provides centralized approval for financial assistance applications, while the state-run Office of Foreign Trade Information gathers and disseminates information through a

worldwide network of trained trade "correspondents." State and regional governments co-fund firms' costs to participate in trade fairs and to hire export consultants.

In Italy, a loosely coordinated system of public, private, national, and local organizations serve exporters' interests. The Italian Institute of Foreign Trade (ICE), for example, has over 110 domestic and overseas offices, to carry out promotion programs, provide advanced training for export professionals, and subsidize firms' participation in trade fairs. The Confederation of Italian Industries and the domestic and overseas Chambers of Commerce, both government-subsidized, offer targeted assistance and also co-fund promotion and trade costs. Regional centers also provide firm-focused sectoral and market assistance. Italy additionally runs a number of export service organizations that combine government backing and fees-for-services.

The British Overseas Trade Board (BOTB) sponsors most of Britain's State export assistance programs, providing consulting services, funding subsidies, training, and information through several regional and overseas offices, in cooperation with the Foreign and Commonwealth Office. Britain also has a very active state-subsidized Chamber of Commerce system. As in France and Germany, the British government requires firms to join their local Chambers.

Finally, Japan has recently introduced a complex and ambitious program known as "New Earth 21" that seeks to remedy the environmental damage done to the Earth since the start of the industrial revolution through development and use of cutting-edge Japanese environmental technologies. The program, structured to span one hundred-years, is administered by the Ministry of International Trade and Industry (MITI), but also involves the newly-established Research Institute of Innovative Technology for the Earth (RITE), which is guided by the New Energy and Industrial Technology Development Organization (NEDO), the International Center for Environmental Technology Transfer (ICETT), which is administered by the Ministry of Foreign Affairs, and other domestic and foreign organizations. Through its overseas development assistance programs, Japan plans to promote worldwide diffusion of the new technologies through expert advisors, training, transfer, and research exchange, and thus create a comprehensive infrastructure to promote its environmental market interests. (Appendix E gives a more detailed description of foreign programs.)

There are several common threads to these programs. First, the countries cited here, as well as many not mentioned, have begun to regard environmental policy as an aspect of economic policy, recognizing the financial opportunities that come with stricter environmental

EXPORTING LESSONS FROM EUROPE

- **Differentiate Between Export Promotion and Export Assistance**
  Export promotion programs offer supply-side services, e.g., export incentives and trade shows, but they do not help companies identify and penetrate new markets and do not link promotion efforts to sales. *Export assistance programs* work to develop markets by identifying, anticipating, creating, and responding to emerging overseas markets for both existing and future products. These programs offer demand-driven services that build long-term export capacity.

- **Target Assistance to the Export-Willing**
  Focus available resources on those firms that want to export. Train those firms, or create intermediary bodies to handle exporting for them.

- **Focus Assistance by Sector and Market**
  Export assistance works best when it is regionally and sectorally targeted. The more successful programs customize assistance to the needs of individual firms. Most current programs are too general to be effective.

- **Revise and Improve Assistance Programs**
  Constantly revise established programs and invent new ones to respond to changes both in the global marketplace and in firms' needs. Remember that small firms are essential to competitiveness.

- **Utilize the Private Sector**
  Export assistance works best when it is delivered by private or quasi-private providers, with government playing an enabling role.

- **Charge for Services**
  Exporting is worthwhile only if it is profitable, and if it is profitable, assistance should be paid for. Develop services that firms will pay for.

Box 3 *Summarized from William E. Nothdurft's* ***Going Global,*** *(Washington, D.C.: The Brookings Institution, September 1992).*

regulation and processes that do not produce costly wastes. As a result, these countries have created sophisticated programs to help their environmental goods and services firms develop and export.

Second, these countries have found that the more directed their assistance, geographically and sectorally, the better the results for exporters. Moreover, these countries have found it

more profitable to focus resources on firms that want to export, rather than trying to persuade reluctant firms to export. Many countries have found that private or quasi-private organizations deliver the most effective export assistance programs, and a growing trend is for these organizations to act on a company's behalf in export transactions. Additionally, Europe is beginning to favor fee-for-service programs, indirect subsidies, soft loans, and matching fund schemes over direct financial subsidies: "Virtually all of the services offered by the best export assistance programs, private and public, are now fee-based" (Nothdurft, *Going Global*).

European programs also recognize the key role of the public sector. Other governments tend to devote more money and staff -- particularly overseas -- to assist exporting than does the U.S., and tend to offer exporters greater financial incentives to participate in export events than does the U.S. Europeans governments also place fewer restrictions on and barriers to export financing. Countries decide which exports they want to assist and ensure that sufficient funds are available to promote those exports.

Lastly, the more successful foreign programs differentiate between export promotion and export assistance. Export promotion programs offer supply-side services such as incentives to export and trade shows, but do not help companies identify and penetrate new markets and do not clearly link promotion to sales. Export assistance programs, on the other hand, develop markets and offer demand-driven services that lead to long-term export capacity. Such programs identify, anticipate, create, and respond to emerging overseas markets or market niches for both existing and future products. Export assistance, with a small amount of export promotion services, is what the successful foreign programs try to provide. Box 3 summarizes some of these key lessons.

DEFINING EPA'S ROLE

EPA's Comparative Advantage

The Task Force does not recommend that EPA undertake the types of public sector and foreign export assistance activities described above. Traditional export promotion activities -- such as trade lead and market data services -- are clearly the responsibility of the Department of Commerce and other Federal agencies. Nevertheless, the Task Force concluded that EPA's national and international leadership in two key areas position the Agency to play a more active role in overall U.S. government export assistance activities:

(1) **Demonstration of innovative solutions to environmental problems around the world:** EPA is engaged in a comprehensive effort to strengthen and build

environmental infrastructures throughout Eastern Europe, the former Soviet Union, and the developing world. EPA is, for example, working with governments in setting environmental standards and conducting policy analysis, in developing monitoring and enforcement capabilities, and in applying pollution prevention, risk management, and other environmental management techniques. All of these programs help create the demand for environmental technologies, goods, and services worldwide, thereby creating potential commercial opportunities for U.S. business and industry; and

(2) **Technology innovation, development, and diffusion:** EPA is a national and international leader in the research and development of new environmental technologies. Such programs stimulate the development of innovative technologies that enhance the competitive position of U.S. suppliers.

Legal and Policy Considerations

The Task Force discussed a number of legal and policy considerations related to a more active role for EPA in environmental export assistance. With respect to legal considerations, 5 C.F.R. Section 2635.703 (c) Subpart G precludes an EPA employee from promoting or endorsing any product, service, or enterprise in the absence of specific statutory authority to perform this role. Available authorities supports cooperation and assistance with respect to the Departments of Commerce and State, as well as dissemination of information that may enhance foreign trade opportunities. Although EPA's statutory mission does not include export promotion as such, the Agency's informational role properly complements the export promotion activities of other agencies. As EPA's environmental export assistance program becomes further clarified, questions of whether additional statutory authority might be needed will be addressed. EPA will also need to assure coordination with ongoing regulatory and enforcement programs, as well as consistency with EPA's duty to protect confidential business information and to guard against conflicts of interest.

The Task Force also examined a number of policy considerations. States, local governments, international organizations, and countries throughout the world, for example, look to EPA for guidance on setting environmental standards and regulations, developing policy and management guidelines, and establishing the scientific and technical underpinnings for environmental programs. The Task Force strongly encourages that EPA do nothing to jeopardize its international credibility and reputation for objectivity.

RECOMMENDATIONS

Consistent with the above legal and policy considerations, the Task Force concluded that EPA can and should play a more active role within overall U.S. government export assistance activities. Specifically, drawing on the two leadership roles described above, the Task Force calls on the Agency to expand cooperative programs with the Department of Commerce and other public and private sector organizations; establish a new program entitled, "U.S. Technology for International Environmental Solutions" to enhance the international competitiveness of U.S. environmental technologies and services; and establish a central coordinating body within EPA to improve strategic oversight and internal management of these programs and to communicate with outside organizations and individuals.

A targeted and integrated program will not only help maximize the full resources of the U.S. government; it will also help enlist the expertise, creativity, and financial resources of the U.S. private sector in solving environmental problems around the globe. Carefully coordinated with other Federal agencies and focusing on the dissemination of relevant information, such a program will facilitate contacts between those who possess the technologies and expertise and those who need them.

RECOMMENDATION #1: Expand cooperative programs with the Department of Commerce and other public and private sector organizations

The Department of Commerce has lead Federal responsibility for export and trade related activities, including environmental export assistance. In October 1992, EPA Administrator William Reilly and Commerce Secretary Barbara Franklin signed a Memorandum of Understanding (MOU) committing both agencies to work together on "all mutually-agreeable activities related to the development of environmental technologies and commercialization by U.S. industry." The MOU provides for the conclusion of inter-agency agreements on joint undertakings involving the transfer of funds to pay for services, the use of facilities, and the expertise of personnel.

The Task Force recommends that EPA and Commerce use the MOU to cooperate in five areas:

(1) **Co-chairmanship of the Environmental Sub-Group under the Trade Promotion Coordinating Committee (TPCC):** EPA is already an active participant on all TPCC working groups, particularly the TPCC Working Group on Environment, Energy and Infrastructure (EEI). The Export-Import Bank and OPIC Reauthorization bills of 1992 both authorize the establishment of an

environmental sub-group to the EEI workgroup and call for EPA to play an active role. EPA and Commerce should consider co-chairing this sub-group.

(2) **Environmental training for U.S. and Foreign Commercial Service (U.S.&FCS) personnel:** EPA and Commerce have informally discussed training of U.S.&FCS personnel in the Asian Region under the U.S.-Asian Environmental Partnership. This cooperation should be broadened to all regions of the world in an effort to raise U.S.&FCS environmental consciousness and familiarity with EPA's environmental programs. A educational program for U.S.&FCS personnel in March 1993 could be the ideal opportunity for initiating this training.

(3) **Cooperation in setting up environmental and agricultural business centers in Russia and the Newly Independent States (NIS):** Congress has authorized a $12 million appropriation for the Department of Commerce to establish ten environmental and agricultural business centers throughout the former Soviet Union. Building on EPA's cooperative programs in this region, EPA should provide advice, technical expertise, and other support to Commerce in setting up these centers. EPA will also receive funds under the Freedom Support Act to provide technical assistance to NIS.

(4) **Improved sharing of information:** EPA currently produces three kinds of information relevant to the global environmental market: (a) information on environmental needs and conditions worldwide, (b) information of current and emerging technologies, policies, and services, and (c) information on U.S. experience in applying these technologies. EPA should work through Commerce to make non-proprietary information more widely available to both foreign and domestic parties, thereby helping to facilitate contacts between those who possess the technologies and expertise and those who need them. EPA should also continue its work with Commerce to develop an environmental supplement and stand-alone version to the Export Yellow Pages that lists U.S. suppliers of environmental goods and services.

(5) **Participation in environmental trade missions and trade fairs:** EPA should continue its successful participation in environmental trade missions abroad, "reverse" trade missions to the United States, and organization of environmental trade fairs.

The Agency should also improve its cooperative ties with other public and private sector organizations along the following lines:

(1) **Cooperation with the Department of Energy on Climate Change:** EPA and DOE should lead U.S. participation in an energy efficiency carbon dioxide reduction effort as part of the U.S. contribution to the climate convention adopted in Rio. This cooperation will have spin-offs for U.S. energy exports.

(2) **Eximbank, OPIC, TDA, and other Federal Agencies:** EPA should cement its relationship with other Federal agencies that have programs related to environmental export assistance. Considering the primary importance of financing as a basic requirement to environmental export programs, EPA should continue to promote environmental awareness at financial institutions such as OPIC, TDA, and the Export-Import Bank. Specifically, EPA should help these organizations ensure that projects under consideration are environmentally sound.

(3) **State Export Programs:** EPA should work more closely through its regional offices to coordinate with State export promotion offices. Most, if not all, States have constructed their own export promotion programs in recent years. State-level programs have the advantages of being flexible, working closely with local industries, and having a more manageable-sized clientele to work with than federal programs do. Many State programs have a component on the environmental sector, and there is substantial room for EPA to support these programs through information sharing, assistance, and training.

(4) **Cooperation with business organizations, environmental groups and other outside organizations:** EPA should work with trade associations and other business groups through the Department of Commerce and directly to raise awareness of environmental problems and associated commercial opportunities throughout the world.

(5) **Establishment of CORECT-like Body on Environmental Export Promotion:** To promote greater interaction between the U.S. public and private sectors, EPA should consider the establishment of an EPA- and Commerce-led government-industry coordinating committee charged with promoting U.S. environmental exports. Undertaken as part of, or in coordination with, the TPCC environmental sub-group described earlier, such a committee (perhaps called "Greentech") could parallel the highly effective Department of Energy-led Committee on Renewable Energy and Trade (CORECT).

RECOMMENDATION #2: Establish an inter-Agency initiative on "U.S. Technology for International Environmental Solutions" (U.S. TIES)

In order to promote the greater use of U.S. environmental technologies and expertise in solving international environmental problems, the Task Force recommends the establishment of an inter-agency technology innovation and development initiative called "U.S. Technology for International Environmental Solutions" (U.S. TIES). Led by the EPA's Office of Research and Development, in cooperation with the Agency's Innovative Technology Council, U.S. TIES would involve the active participation of other Federal agencies, national laboratories and universities, and other private sector groups in assessing and solving international environmental problems through enhanced technical assistance, exchange of information, and training.

Focusing on both pollution prevention and end-of-pipe technologies, U.S. TIES would foster the development and international dissemination of credible data and information on the performance, costs, potential applications, and environmental impacts of competitive U.S. technologies. Elements of the program, currently under discussion with industry, academia, and non-governmental organizations, would include:

(1) **Technology or Product Testing:** EPA would conduct field and laboratory testing of new and innovative technologies at pilot or full scale, where vendors would supply and operate the technologies and EPA would evaluate their performance. One mode of operation might be to have non-EPA panels set up by professional societies or other non-governmental organizations (NGOs) screen and recommend "representative" technologies for evaluation. Initially, priorities might be set for different technology areas (e.g., NOx reduction, packaged drinking water treatment for small communities) based on priority international environmental needs. The model for this effort is the Superfund Innovative Technology Evaluation (SITE) program.

(2) **Protocols for Product Testing:** EPA (working with industry and academia) would develop testing protocols and a peer review process to obtain technology performance data that would then be provided to Federal, State, university, or industry testing organizations. Although protocols and peer review are a necessary adjunct to the proposed EPA testing program, such a program could also stand alone. The model for this effort is the series of product evaluation protocols for oil spill bioremediation being developed by the EPA Bioremediation Action Committee.

(3) **Environmental Technology Profiles:** In conjunction with professional societies, academia, and other government experts, EPA would produce consensus-based monographs of technological approaches to address particular international environmental programs (e.g., reduction of metal finishing effluents). The monographs would identify current and emerging U.S. approaches and describe known performance cost, benefits, limitations, and design criteria. Case examples of "success stories" might be included as well. The model for this is the series of innovative waste treatment technology consensus monographs being developed by EPA through the American Academy of Environmental Engineers, in cooperation with professional societies and the Departments of Defense and Energy.

(4) **Demonstrations:** Technology demonstration is an important tool for showing foreign companies and governments that given technologies will work. EPA would help establish U.S. teams of experts from professional societies, academia, and government to oversee demonstrations using EPA-developed evaluation protocols. Demonstrations would flow directly from specific technical assistance projects (e.g., through United Nations Environment Program, the United Nations Industrial Development Organization, or the many bilateral efforts of the United States). Alternatively, EPA could work with individual countries to identify and jointly carry out a limited number of demonstrations in high priority areas. Conduct of demonstrations could be the responsibility of the technology vendor. A more aggressive program could involve U.S. financial support for demonstration conduct.

(5) **Research and Development:** Some international environmental problems will require new technological approaches. Innovative approaches that may be better, faster, or cheaper will be needed to improve environmental quality and also to help maintain the competitive position of the United States. EPA would conduct research to develop solutions to these problems in conjunction with industry, academia, and other government agencies. The Federal Technology Transfer Act would be used to ensure rapid commercialization. Priority areas would be jointly identified and consortia would be established to conduct the research and development. This program is critical to long-term competitiveness because of the support other countries with strong government/industry cooperative programs currently provide such research.

RECOMMENDATION #3: Establish a central coordinating body within EPA to oversee management of the Agency's export assistance activities

In organizing training programs, workshops, and conferences and developing centralized clearinghouses and databases throughout the Agency, EPA is already engaged in a number of export-related programs. To date, however, many of these programs have been carried out in isolation from one another without central coordination or a clear understanding of how these programs fit into a larger agency-wide strategy. Moreover, many outside entities interested in learning more about EPA's export assistance programs have been confused by the lack of a central contact point within the Agency for further information.

The Task Force recommends that EPA establish a centralized coordinating body within the Agency to provide strategic oversight, improve internal management of existing programs, and communicate with outside organizations and individuals. Managed out of the Office of International Activities and involving the active participation of all relevant EPA offices and regions, the centralized body would not assume responsibility for implementing programs already underway or planned throughout the Agency. Implementation and lead for these programs clearly fall within the statutory responsibilities and expertise of the relevant program offices.

The centralized body would, however, focus on integrating existing and planned activities into a larger agency-wide strategy. For outside organizations and individuals, the body would serve as an initial contact point, acting as a "one-stop shop" for information on EPA's export assistance programs. Specific responsibilities would include:

(1) Continuous evaluation and review of EPA's existing and planned environmental export-related activities;

(2) Support for cross-agency strategic planning and budgetary initiatives, including the development of concrete goals, objectives, and measures of success;

(3) Liaison with the Department of Commerce, TDA, OPIC, and other Federal agencies on joint undertakings, including EPA participation in environmental trade missions and trade fairs, identification and listing of U.S. environmental suppliers, and environmental review of U.S. funded projects;

(4) Continuous review of foreign public and private sector programs;

(5) Preparation of public information and other outreach materials.

APPENDICES

APPENDIX A
MEMBERS OF THE TASK FORCE
ON TECHNOLOGY COOPERATION AND EXPORT ASSISTANCE

DAN ESTY	*DEPUTY ASSISTANT ADMINISTRATOR, OPPE (CO-CHAIR)*
ALAN HECHT	*DEPUTY ASSISTANT ADMINISTRATOR, OIA (CO-CHAIR)*
Michael Adler	*Climate Change Division, OPPE*
John Beale	*Deputy Director, Office of Policy Analysis and Review, OAR*
Ruth Bell	*International Activities Division, OGC*
Scott Bidner	*Economics and Technology Team, OIA*
Robert Brenner	*Director, Office of Policy Analysis and Review, OAR*
Sally Cole	*Deputy Chief of Staff, Office of the Administrator*
Gordon Davidson	*Director, Office of Federal Facilities Enforcement, OE*
Mark Goldman	*Special Assistant to the Deputy Administrator*
Alan Fox	*Associate Assistant Administrator, OW*
Julia Gallagher	*Economics and Technology Team, OIA*
Tom Kean	*Special Assistant, OPPTS*
Peggy Knight	*Director, Public Liaison Division, Office of Communication, Education, & Public Affairs*
Jamison Koehler	*Chief, Economics and Technology Branch, OIA*
Walter Kovalick	*Director, Technology Innovation Office, OSWER*
Alfred Lindsey	*Director, Office of Environmental Engineering and Technology Demonstration, ORD*
Stephen Lingle	*Deputy Director, Office of Environmental Engineering and Technology Demonstration, ORD*
Ray Ludwiszewski	*Acting General Counsel, OGC*
Michael Moore	*Director, Technology Transfer Staff, ORD*
Abby Pirnie	*Director, Office of Cooperative Environmental Management, OA*
William Pistor	*Deputy Director, Congressional Liason Div., OCLA*
Mike Shapiro	*Deputy Assistant Administrator, OAR*
Carol Singer	*Acting Deputy Director, Public Liaison Division, Office of Communication, Education, & Public Affairs (AACEPA)*
Ellen Spitalnik	*Special Assistant for International Waste Policy, OSWER*
Edgar Thornton	*Special Assistant, OPPE*
Bowdoin Train	*Deputy Assistant Administrator, OSWER*
Douglas Turner	*Special Assistant, OPPE*

APPENDIX B
SURVEY OF THE EXPORT-RELATED ACTIVITIES OF EPA PROGRAM OFFICES

OFFICE OF AIR AND RADIATION (OAR)

Training, Workshops, and Conferences

Program: Workshops on NSR Permitting - Canada
Contact: Office of Air Quality Planning and Standards, (919) 541-5433
Held two workshops for Canada in June and September 1992 on national PSD/NSR permitting.

Program: Work Group on Emissions Inventory Techniques - Canada
Contact: David Mobley, Technical Support Division, (919) 541-4676
Participated in work group on air emissions inventory techniques under U.S.-Canada Air Quality Agreement.

Program: Seminars on Intercalibration of Radon Monitoring Equipment - China
Contact: Office of Radiation Programs, (202) 233-9320
Will hold seminars and advise China on radon monitoring equipment and environmental monitoring.

Program: Workshop on Emission Measurement Techniques - China
Contact: Technical Support Division, (919) 541-5536
Participated in workshop with China on emissions measurement techniques.

Program: Conference in Finland on Air Toxicants - Finland
Contact: B. Hassett-Sipple, Office of Air Quality Planning and Standards, (919) 541-5616
Will present a paper in the risk assessment session on ambient air exposure to butadiene and styrene in Finland, April 1993.

Program: Conference on Photochemical Ozone Problems and Control - Germany
Contact: David Mobley, Technical Support Division, (919) 541-4676
Participated in July 1992 U.S.-German conference on photochemical ozone problems and control.

Program: UN Economic Commission for Europe Workshop on Air Pollution Control Technology Exchange - Hungary
Contact: Office of Air Quality Planning and Standards, (919) 541-5616
Provided technological expertise at UN Economic Commission for Europe, Convention on Long-Range Transboundary Air Pollution in June 1992 Workshop on Air Pollution Control Technology Exchange in Budapest.

Program: Environmental Radioactivity Measurement Training - Indonesia
Contact: Office of Radiation Programs, (202) 233-9320
Will provide consultant in establishment of environmental radiation measurement programs in Indonesia.

Program: **Training and Guidance on Radon Chamber and Measurement - Japan**
Contact: **Office of Radiation Programs, (202) 233-9320**
Will provide Japan training and guidance on construction of radon chamber and training on radon measurements.

Program: **Conference in Japan on Toxics Risk Assessment and Management - Japan**
Contact: **B. Kellam, Office of Air Quality Planning and Standards, (919) 541-5616**
Presented model, provided user's manuals, and distributed follow-up information requests at conference on toxics risk assessment and management in Japan, February 1992.

Program: **Training on Environmental Radioactivity Measurements - Korea**
Contact: **Office of Radiation Programs, (702) 798-2476**
Will provide Korea with radon measurement and analysis training and laboratory development advice and will help establish environmental radiation measurement program.

Program: **Provide Training to Mexican Radon Program - Mexico**
Contact: **Office of Radiation Programs, (702) 798-2476**
Provide training in radon detection systems, laboratory design, and data analysis to Mexican radon program.

Program: **Air Pollution-Related Training - Mexico**
Contact: **Ron Townsend, Office of Air Quality Planning and Standards, (919) 541-2498**
Providing training to upgrade air pollution professional staff in Mexico City and Monterrey, Mexico.

Program: **Chiller Workshops - Mexico**
Contact: **Office of Atmospheric and Indoor Air Programs, (202) 233-9140**
Conducted two July 1992 workshops in Mexico City on chiller servicing practices that reduce emissions of ozone-depleting chemicals. Attendees included representatives from Argentina, Brazil, Venezuela, and Uruguay, as well as ten U.S. manufacturers, several of whom established Mexican distributorship arrangements.

Program: **Workshop on Environmental Health along U.S.-Mexico Border**
Contact: **B. Hassett-Sipple, Office of Air Quality Planning and Standards, (919) 541-5616**
Participated in 2-day workshop exploring plans to evaluate environmental health issues along the U.S.-Mexico border, February 1992.

Program: **Air Pollution Modelling, Instrumentation, & Measurement Work Group - NIS**
Contact: **William Hunt, Technical Support Division, (919) 541-5559**
Participated in U.S.-USSR work groups dealing with exchange of information and technical papers on air monitoring and modeling.

Program: **Workshop on CFC-Safe Solvent Substitutes - Thailand**
Contact:
With Governments of Japan and Thailand, hosted a workshop in Thailand on CFC-safe solvent substitutes.

Program: **Conference in UK on Product Labeling - UK**
Contact: **T. Mohin, Office of Air Quality Planning and Standards, (919) 541-5616**
Participated in confederation of British industry conference on new EC product labelling law as part of UK and OECD Life Cycle Assessment Methodology activities. Have also provided support to special committee to address life cycle assessment issues which OECD is also considering.

Program: **Air Toxics Risk Assessment Course**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Will offer a risk assessment course on air toxics for domestic and international entities.

Program: **Workshop to Explore Business and Export Opportunities from Clean Air Act**
Contact:
Hosted April 1992 workshop to explore business and export opportunities created by the 1990 reauthorization of the Clean Air Act. Compiled export promotion projects to result from Clean Air Act implementation.

Program: **International Workshop on Indoor Radon Remedial Action**
Contact: **Office of Radiation Programs, (202) 233-9370**
Offer expertise at international workshop on indoor radon remedial action.

Program: **Workshop and Technical Assistance on Air Modeling**
Contact: **William Hunt, Technical Support Division, (919) 541-5559**
Participated in OECD project workshops on air quality indicators and indices.

Program: **Workshop on Air Quality Model Harmonization**
Contact: **Technical Support Division, (919) 541-5536**
Participated in workshop on air quality model harmonization within the EC, providing assistance to European Research Community on flow turbulence and combustion.

Program: **Regional Halon-1211 Training Workshops**
Contact: **Office of Atmospheric and Indoor Air Programs, (202) 233-9140**
Conducted two regional halon-1211 training workshops for fire protection experts from Southeast Asia and Latin America. Follow-up activities will include provision of U.S.-manufactured recycling equipment to workshop participants.

Program: **UN Economic Commission for Europe Working Group on Technology**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Provided technological expertise at meeting of UN Economic Commission for Europe Convention on Long-Range Transboundary Air Pollution Working Group on Technology, June 1992.

Program: **Work Group on Global Emissions Inventory**
Contact: **David Mobley, Technical Support Division, (919) 541-4676**
Participated in international global atmospheric chemistry project to inventory global emissions.

Program: **Meeting on Uranium Fuel Cycle Wastes**
Contact: **Office of Radiation Programs, (702) 798-2476**
Provided expertise on uranium fuel cycle wastes at South African Council for Nuclear Safety meeting.

Clearinghouses and Data Bases

Program: **Provide Information to for NATICH Data Base**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Provide information for NATICH data base. Relevant to technology transfer efforts with Thailand, the UK, Australia, and Canada.

Program: **International Radon Data Bank**
Contact: **Office of Radiation Programs, (202) 233-9320**
Maintain data base for analysis of radon measurement summaries from contributing countries. Will be used in planning future radon studies.

Activities Which Directly Promote U.S. Know-How

Program: **Advised about Municipal Waste Combustors and Controls - Canada**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Advised Canada about municipal waste combustors and controls.

Program: **Advised on Performance Standards for Chemical Plants - Canada**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5674**
Advised Canada on new source performance standards for chemical plants.

Program: **Conferred about Sterilization of Medical Wastes - Canada**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with Canada about sterilization of medical wastes by irradiation.

Program: **Corresponded about Secondary Lead Manufacturing - Canada**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Corresponded with Canada about secondary lead manufacturing.

Program: **Conferred about Hot Mix Asphalt - Canada, UK**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with Canada and England and provided technical information about hot mix asphalt production.

Program: **Conferred about Wood-Fired Boiler Emissions and Emission Controls - Canada, UK**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with Canada and England about wood-fired boiler emissions and emission controls.

Program: **Advised on Cement Kiln Emissions Controls - Canada, UK**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Advised Canada and England on cement kiln emissions controls.

Program: **Advised on Kraft Pulp Mills - Canada, UK**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with England and Canada about technical issues relating to Kraft pulp mills.

Program: **Technical Assistance in Use of Air Quality Indices - China**
Contact: **William Hunt, Technical Support Division, (919) 541-5559**
Provided assistance to Chinese Institute of Environmental Health Monitoring in use of air quality indices.

Program: **Energy Efficiency Centers - Eastern Europe, NIS**
Contact: **Laura Williams, Battelle Labs, (202) 646-5257**
With Department of Energy (DOE), Conservation Foundation, and World Wildlife Federation, established Centers in Warsaw and Katowice, Poland; Prague, Czechoslovakia; and Moscow, Russia to achieve economic development and environmental protection by promoting energy efficiency. Centers emphasize identifying private sector business opportunities, investment opportunities, and possible joint venture partners; technical training and demonstration projects; policy analysis and development; and public information services.

Program: **Conferred about Combustion Sources and Associated Pollutants - France**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with France about combustion sources and associated pollutants.

Program: **Corresponded about Incineration - France, UK**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Corresponded with England and France about incineration.

Program: **Corresponded about Manganese Production - Greece**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Corresponded with Greece about manganese production.

Program: **Development of Radiation Monitoring Program - Greece**
Contact: **Office of Radiation Programs, (202) 233-9320**
Assist Greece in planning and developing a radiation monitoring program.

Program: **Provided Technical Information on Emissions Related to Cement, Plastics, and Roofing Materials - Honduras**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Provided Honduras technical information on emissions and emissions controls related to cement, plastics, and roofing materials.

Program: **Advised on Power Plant Emissions Controls - Hong Kong**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Advised Hong Kong on power plant emissions controls.

Program: **Conferred about Small Boilers - Hong Kong**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with Hong Kong about small boilers.

Program: **Corresponded about Cupolas - Israel**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Corresponded with Israel about cupolas.

Program: **Set Up Air Monitoring Program - Kuwait, Saudi Arabia**
Contact: **William Hunt, Technical Support Division, (919) 541-5559**
Helped establish air monitoring program in Kuwait and Saudi Arabia at close of Gulf War.

Program: **Developed Emissions Inventory Capabilities - Mexico**
Contact: **Technical Support Division, (919) 541-5536**
Assisted Mexican scientists in developing emissions inventory capabilities.

Program: **Facility Visits and VOC Inventorying Assistance - Mexico**
Contact: **Fred Dimmick, Office of Air Quality Planning and Standards, (919) 541-5616**
Toured several types of facilities in Mexico as part of a cooperative exercise in emission inventorying of VOC emissions in September 1992.

Program: **Advised on Controls for Printing, Wood Furniture Coatings, and Electronic Coating Industries - Mexico**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5674**
Advised Mexico on controls for printing, wood furniture coatings, and electronic coating industries.

Program: **Air Pollution Regulatory Modeling Assistance to World Bank - NIS**
Contact: **Technical Support Division, (919) 541-5536**
Assisted World Bank in assessing air pollution control regulatory modeling program in Belarus.

Program: **Water Supply System Assessment - NIS**
Contact: **Office of Radiation Programs, (202) 233-9340**
Evaluate and assess the impacts of the Chernobyl accident on the Kiev water supply system.

Program: **Natural Gas Recovery - Eastern Europe, NIS**
Contact: **Office of Atmospheric and Indoor Air Programs, Global Change Division, (202) 233-9190**
Advise Poland, Czechoslovakia, Russia, and Ukraine on promoting greater recovery of natural gas from coal mining and reducing methane emissions via technology clearinghouse, U.S.-Poland technical working group, technical exchanges, and focused assessments.

Program: **Assistance in Clean-up of Chernobyl Contamination - NIS**
Contact: **Office of Radiation Programs, (202) 233-9340**
Cooperation in cleanup of Chernobyl contamination in Belarus. Also will provide information and advice regarding chernobyl effects to Russian Institute TYPHOON.

Program: **Radioactive & Hazardous Constituents Cleanup Demonstration - Poland, NIS**
Contact: **Office of Radiation Programs, (202) 233-9340**
Demonstrate specific clean-up technologies for areas in Ukraine and Poland contaminated with radioactive and hazardous constituents. Technology transfer.

Program: **Technical Assistance on Air Modeling Network Design - Poland**
Contact: **Technical Support Division, (919) 541-5536**
Provided technical assistance to Krakow, Poland on air monitoring network design.

Program: **Installation and Training for Emissions Monitoring System - Poland**
Contact: **Technical Support Division, (919) 541-5536**
Helped install a continuous emissions monitoring system and trained operators at power plant in Krakow, Poland.

Program: **Advised about Emissions from Coal Combustion in Residential Heaters and Small Boilers - Poland**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Advised Poland about emissions from coal combustion in residential heaters and small boilers.

Program: **Cooperation with Swedish EPA - Sweden**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Provided technological expertise at meetings with Swedish representative to discuss iron and steel plants and chemical manufacturing plants.

Program: **Conferred about Ferrous and Non-Ferrous Metals - Sweden**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with Sweden about ferrous and non-ferrous metals.

Program: **Cooperative Studies and Exchange - Taiwan**
Contact: **Office of Radiation Programs, (202) 233-9320**
Will host two visiting scientists from Taiwan for analysis of EPA environmental data and radiochemical methods development. Will also visit Taiwan to provide information on radon measurement methods.

Program: **Conferred about Utility Boilers - UK**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with England about utility boilers.

Program: **Advised on Environmental Aspects of Brick Manufacturing - UK**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with England about environmental issues relating to brick making.

Program: **Corresponded about Steel Foundries Emissions - UK**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Corresponded with England about steel foundries emissions.

Program: **Technical Assistance on Air Monitoring Networks - Uruguay**
Contact: **William Hunt, Technical Support Division, (919) 541-5559**
Providing technical assistance to Uruguay, through the OAS, with training and siting and selection of monitoring equipment.

Program: **Mobile Air Conditioning Recycling - Venezuela**
Contact: **Office of Atmospheric and Indoor Air Programs, (202) 233-9140**
Provide financial and technical support to the Venezuelan government to develop a demonstration project to use refrigerant recycling equipment to minimize emissions of ozone-depleting refrigerants when servicing automotive air conditioners. Follow-up will include provision of U.S.-manufactured equipment.

Program: **Technical Advice on Medical Waste Incineration - multi**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Provided technical advice on medical waste incineration to Canada, Japan, England, Korea, and Saudi Arabia.

Program: **Conferred about Primary Aluminum Production Processes, Emissions, and Emissions Controls - multi**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with China, Canada, France, Thailand, Iceland, Bahrain, and Russia about primary aluminum production processes, emissions, and emissions controls.

Program: **Conferred about Industrial Boiler Emissions and Emission Controls - multi**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Conferred with Canada, England, and Israel about industrial boiler emissions and emission controls.

Program: **Financial and Technical Assistance to Developing Countries through Montreal Protocol Multilateral Fund - multi**
Contact: **Office of Global Change, Technology Transfer Group, (202) 233-9190**
As part of the U.S. contribution to the Multilateral Fund under the Montreal Protocol, provide financial and technical assistance to developing countries (through 1992: China, Ecuador, Mexico, and Venezuela) on phasing-out ozone-depleting chemicals. Assistance often leads to developing countries' receiving Fund financing to purchase U.S. equipment.

Activities Which Indirectly Promote U.S. Know-How

Program: **Cooperative Exchange on Radon Metrology - Germany**
Contact: **Office of Radiation Programs, (202) 233-9320**
Will develop an ongoing relationship with Germany to allow periodic comparison and exchange of ideas on radon metrology.

Program: **Solvents Phase-Out Project - Mexico, Thailand**
Contact: **Office of Atmospheric and Indoor Air Programs, (202) 233-9140**
Organized cooperative government-industry initiatives in early 1992 to assist Mexican and Thai electronics industries in reducing use of ozone-depleting solvents.

Program: **Cooperative Agreement with Atomic Energy Research Institute - Japan**
Contact: **Office of Radiation Programs, (202) 233-9340**
Cooperative program will include information exchange with JAERI and arrangements for visiting scientists regarding residual radioactivity, radioactive waste disposal, radiation protection standards, and emergency planning and response.

Program: **Briefed Japanese Businessmen on CAA Amendments - Japan**
Contact: **Fred Dimmick, Office of Air Quality Planning and Standards, (919) 541-5616**
Briefed a group of Japanese businessmen on Title III of the Clean Air Act amendments.

Program: **Global Environmental Radiation Monitoring - NIS**
Contact: **Office of Radiation Programs, (202) 233-9320**
Established after Chernobyl to coordinate environmental radiation monitoring and data interpretation.

Program: **Workshops on Emissions Inventories - EC**
Contact: **David Mobley, Technical Support Division, (919) 541-4676**
Provided assistance to Economic Commission of Europe at workshops on emissions inventories, summer 1992.

Program: **Work with Int'l Atomic Energy Agency (IAEA)**
Contact: **Office of Radiation Programs, (202) 233-9290**
Provide IAEA assistance in formulation of international recommendations and policy on radiation protection matters.

Program: **Provide Environmental Radiation Remediation Assistance - IAEA**
Contact: **Office of Radiation Programs, (202) 233-9340**
Initiative with the IAEA to strengthen environmental radiation protection program at the IAEA Division of Nuclear Safety, with a focus on providing environmental radiation remediation and risk management assistance to Eastern Europe and the former Soviet Union.

Program: **Climatic Test Program for Integrating Radon Detectors - IAEA**
Contact: **Office of Radiation Programs, (702) 798-2476**
Co-authoring publication with IAEA on integrating radon detectors for international publication.

Program: **International Radon Intercalibration - IAEA**
Contact: **Office of Radiation Programs, (202) 233-9320**
Used OAR radon chambers to expose detectors from 24 countries and IAEA for a comparison of passive detectors. A final report will provide information on measurement comparability.

Program: **Transport Models for High-Level Waste - INTRAVAL**
Contact: **Office of Radiation Programs, (202) 233-9290**
Provide information and advice to the international group INTRAVAL on transport models for high-level waste repositories.

Program: **Established & Harmonized Motor Vehicle Noise Emissions Standards - UN**
Contact: **Office of Policy Analysis and Review, (202) 260-5580**
Established and harmonized motor vehicle noise emissions standards as part of UN/ECE Inland Transport Committee's Group of Experts on Noise.

Program: **Provide Information to WHO Technology Transfer Effort - WHO**
Contact: **Office of Air Quality Planning and Standards, (919) 541-5616**
Provide information to the WHO Technology Transfer effort, Geneva.

Program: **Technical Assistance in Air Monitoring - WHO**
Contact: **Technical Support Division, (919) 541-5536**
Providing technical assistance to WHO on air monitoring and data analysis.

Program: **Technical Advice on Air Quality - World Bank**
Contact: **Tom Pace, Office of Air Quality Planning and Standards, (919) 541-5556**
Advising World Bank on technical and policy issues related to air quality management in Belarus and Ukraine, NIS.

Program: **Harmonization of Automobile Emissions, Fuel, and Vehicle Inspection Standards - multi**
Contact: **Office of Mobile Sources, (202) 260-7645**
On-going activities to provide advice on harmonizing automobile emissions standards and to transfer information on fuels regulations and vehicle inspection programs to the UN, European Communities, the Stockholm Group, Japan, Taiwan, Canada, and Mexico. Could lead to demand for U.S. goods and services.

Program: **Green Technology Programs - general**
Contact: **Jonathan Hoffman, (202) 233-9190**
Sponsor voluntary programs that encourage corporations to adopt energy-efficient technologies. Corporation signs a memorandum of understanding (MOU) with EPA, committing to survey corporate facilities and undertake retrofits as appropriate.

Program: **Refrigeration Technology - general**
Contact: **Office of Atmospheric and Indoor Air Programs, Global Change Division, (202) 233-9190**
Participate in joint project to evaluate available alternatives to ozone depleting refrigerants and blowing agents in household refrigerators and freezers and to determine replacements or changes necessary to reduce use of these substances and increase refrigerator performance.

Task Force Members
Mike Shapiro, Deputy Assistant Administrator
Rob Brenner, Director, Office of Policy Analysis and Review
John Beale, Deputy Director, Office of Policy Analysis and Review

OFFICE OF INTERNATIONAL ACTIVITIES (OIA)

Training, Workshops, and Conferences

Program: **U.S. Environmental Training Institute (USETI)**
Contact: **Mark Kasman, (202) 260-0424**
EPA, AID, and TDA together have established the non-profit U.S. Environmental Training Institute (USETI), a public-private initiative to build environmental management capacity in developing countries. Through USETI, U.S. companies teach topical courses, developed by EPA and industry, to policy leaders and potential clients from developing countries. USETI provides scholarships for most attendees and offers firms an opportunity to showcase their technologies. USETI was provided $300,000 in federal start-up funds; industry is responsible for program

costs. USETI also gets federal, and in particular EPA, in-kind support; considering this, government support exceeds $1 million.

Clearinghouses and Data Bases

Program: Green Pages (section of Export Yellow Pages)
Contact: Scott Bidner, (202) 260-2087
Directory that gives names, addresses, phone numbers, and describes over 7,000 U.S. vendors of pollution control, renewable energy, and energy efficient technologies, services, and equipment. Accessed through the Environmental and Energy Efficient Technology Transfer Clearinghouse. Also published in hard copy.

Program: Environmental and Energy Efficient Technology Transfer Clearinghouse
Contact: John Diamante, (202) 260-4877
Co-sponsor with AID and DOE "one-stop shop" data base on energy efficient and environmental technologies, vendors, regulations, other data bases, and related environmental information. Information currently supplied by industry; EPA and DOE information systems will be added. Operates in four Mexico City locations, in Vienna at UNIDO, and in Washington at EPA and the Inter-American Development Bank, and soon in Puerto Rico to serve EPA's Wider Caribbean and Latin American program.

Program: Technical Information Packages (TIPs)
Contact: Mark Kasman, (202) 260-0424
Provide information on pollution control technologies for all media. Packages include documents and articles relating to specific technologies, directory of EPA experts, list of electronic data bases, and information on training opportunities in the field.

Program: Brochure, "Environmental Technology - Matching Solutions to Problems"
Contact: Scott Bidner, (202) 260-2087
Describes EPA program offices and INFOTERRA international activities related to environmental technology transfer. Information on EPA publications, electronic information sources and contact information also included.

Activities Which Directly Promote U.S. Know-How

Program: U.S.-Asia Environmental Partnership (US-AEP) - Asia
Contact: Pat Koshel, (202) 260-0797
Participates in AID-coordinated U.S.-Asia Environmental Partnership (US-AEP), a public-private program focused on developing environmental training, technology transfer, and environmental infrastructure programs in Asia. Expected to create significant opportunities for partnerships that will expand environmental exports to Asia.

Program: Participation in AID-Commerce Southeast Asia Environmental Initiative - Asia
Contact: Mark Kasman, (202) 260-0424
Will place a staff person in Singapore to, among other things, explore market opportunities for U.S. environmental goods and services.

Program: **Activities with U.S.-ASEAN Council for Business and Technology - Asia**
Contact: **Mark Kasman, (202) 260-0424**
With representatives from AID and the Department of Commerce, accompanied U.S.-ASEAN (Association of Southeast Asian Nations) Council members in 1991 on environmental market trade mission to Thailand, Indonesia, and Singapore. Another mission planned for October 1992. Several future initiatives also planned to develop environmental export opportunities in region.

Program: **Tiete River Study - Brazil**
Contact: **Scott Bidner, (202) 260-2087 or Cam Hill, (202) 260-6009**
With other agencies, submitted a proposal to TDA to conduct a study of and recommend solutions for cleaning up heavily polluted Tiete River in Brazil. Would allow industrial and political leaders to visit U.S. cities that have enacted similar clean-up; showcase U.S. clean-up technologies; and lay foundations for future prevention, restoration and planning work, and cooperative research.

Program: **Caribbean Environment and Development Institute - Caribbean**
Contact: **Martha Shimkin, (202) 260-8502**
Assists in development of environmental network in Region for sharing expertise, technology, and information, developing partnerships, and for coordinating existing programs that emphasize capacity building, technical cooperation, and training.

Program: **Regional Environmental Center - Central and Eastern Europe**
Contact: **Lew Pasarew, (202) 260-6154, and Ann Vernardos, W.E.C, (212) 683-4700**
Created in September 1990 as hub for networking environmental data, information, education, and training, and promoting environmental institutions in the region. Center maintains information on local environmental laws and regulations, environmental policies and issues, and regional assistance programs. Private sector information service available since Spring 1992.

Program: **ECO-BRAZIL '92 Exhibition of U.S. Environmental Technologies - UN**
Contact: **Scott Bidner, (202) 260-2087**
Lead in organizing first U.S. government exhibit on environmental technology in June 1992; in connection with the June 1992 UNCED conference in Sao Paulo, Brazil.

Program: **Trade Promotion Coordinating Committee (TPCC) - general**
Contact: **Scott Bidner, (202) 260-2087**
Participates in multi-agency committee to mobilize U.S. export and trade opportunities in several areas, including environment. Subgroups include subcommittee on Energy, Environment, and Infrastructure, and forthcoming working group on Environment Trade.

Activities Which Indirectly Promote U.S. Know-How

Program: **Work with Department of Commerce (DOC)**
Contact: **Scott Bidner, (202) 260-2087**
Sit on various DOC committees which promote U.S. exports and assists with a U.S.-Mexico Business Committee on Environmental Technology Transfer which DOC and Mexican ministry of commerce, SECOFI, launched in late 1991.

Program: **Work with the Export-Import (Exim) Bank**
Contact: **Jamison Koehler, (202) 260-4894**
Produced a brochure for Exim Bank on opportunities for Exim assistance in exporting U.S. environmental goods and services.

Program: **Work with the Trade Development Agency (TDA)**
Contact: **Jamison Koehler, (202) 260-4894**
Negotiated with TDA to produce directories on U.S. environmental goods and services suppliers.

Program: **Activities with Environmental Business Council (EBC)**
Contact: **Jamison Koehler, (202) 260-4894**
Exploring activities with association of "envirotech" firms. EBC has sponsored trade missions to Mexico and Asia, "reverse" trade missions, and plans future missions to Eastern and Western Europe. Has established "Plan of Co-operation" mith Mexico's CONCAMIN to coordinate education and technology transfer and joint business ventures. EBC has office in Mexico.

Program: **Activities with Environmental Technology Export Council (ETEC)**
Contact: **Jill Gallagher, (202) 260-0769**
Exploring activities with new association of environmental technology firms to expand environmental exports through trade and "reverse" trade missions; market studies; analysis of financing and insurance mechanisms; international projects data base; and training programs for overseas decision makers.

Task Force Members
Alan Hecht (Co-Chair), Deputy Assistant Administrator
Jamison Koehler, Acting Director, International Issues Division
Scott Bidner, Economics and Technology Team
Julia Gallagher, Economics and Technology Team

OFFICE OF POLICY, PLANNING, AND EVALUATION (OPPE)

Training, Workshops and Conferences

Program: **Mexico-U.S. Environmental Statistics Conference**
Contact: **Environmental Statistics and Information Division, (202) 260-2680**
Participated in an October 1991 OMB organized conference attended by U.S. and Mexican federal statistics agencies to develop frameworks for bilateral cooperation on environmental statistics.

Program: **Business Workshops on Opportunities for Exporting Alternative Energy Technologies**
Contact: **Climate Change Division, (202) 260-8825**
Funding workshops with selected industries on opportunities for exporting alternative and renewable energy technologies.

Program: **Business Conference on Energy Export and Investment Opportunities in a Greenhouse World**
Contact: **Climate Change Division, (202) 260-8825**
Co-sponsoring a May 1993 conference on export and investment opportunities in several Latin American countries.

Program: **Energy Efficiency Technology Trade Show**
Contact: **Climate Change Division, (202) 260-8825**
Developed a traveling exhibit on energy efficient technologies which will be set up at several conferences on energy, climate change and the environment in 1993.

Program: **OECD Indicators Workshops**
Contact: **Environmental Statistics and Information Division, (202) 260-2680**
Planning to participate in a series of indicator workshops during 1993 designed to develop a core set of indicators to be used in the OECD Country Reviews for assessing individual country progress towards national environmental goals. Workshops will be held in Canada, France, U.S. and The Netherlands.

Clearinghouses and Data Bases

Program: **International Fund for Renewable Energy and Efficiency (IFREE)**
Contact: **Climate Change Division, (202) 260-8825**
Supporting the development of a technical assistance program which will help incorporate alternative energy investments into lending programs and alerts businesses to new sources for financing.

Program: **International Information Project**
Contact: **Environmental Statistics and Information Division, (202) 260-2680**
Initiated development of a system which will allow the comparing of selected international environmental agreements, laws, regulations and standards, enforcement and institutional infrastructures, intervention policies, and data on wastes, ambient conditions and environmental indicators in 24 nations.

Activities Which Directly Promote U.S. Know-How

Program: **Country Studies**
Contact: **Climate Change Division, (202) 260-8825**
Supporting studies in developing and Eastern European countries to assess energy and forestry-related sources of greenhouse gas emissions and options for reducing these emissions.

Program: **Project Identification**
Contact: **Climate Change Division, (202) 260-8825**
Developing innovative approaches for identifying new climate mitigation projects. This activity will generate new projects that can be fed into the project pipeline at the World Bank, GEF, and other international donors and lenders. Concepts developed could help keep U.S. business informed about new climate change business opportunities.

Activities Which Directly Promote U.S. Know-How

Program: **Trilateral NAFTA Environmental Statistics Workshop**
Contact: **Environmental Statistics and Information Division, (202) 260-2680**
Conferring with Mexico and Canada on the holding of a trilateral workshop to discuss production of a North American state of the environment report and the coordination and harmonization of environmental statistics. Conference may be held in mid-summer 1993.

Task Force Members
Dan Esty (Co-Chair), Deputy Assistant Administrator
Doug Turner, Special Assistant
Edgar Thornton, Special Assistant
Mike Adler, Climate Change Division

OFFICE OF RESEARCH AND DEVELOPMENT (ORD)

Training, Workshops, and Conferences

Program: **Workshops for Promoting Pollution Prevention in Latvia**
Contact: **Timothy Oppelt, Director OEETD/RREL, (513) 569-7418**
Planning is arranging a number of workshops on the identification of P2 technologies and the promotion of their implementation in industry for Latvia and the Baltics. Resources to be determined. Plan to strike cooperative effort with technical institutes and trade organizations.

Program: **Subsurface Restoration Conference, 3rd International Conference on Ground Water Quality Research, Dallas, Texas, June 21-24, 1992**
Contact: **Clinton Hall, Director OEPER/RSKERL, (405) 332-8800**
An estimated 600 attendees heard 35 invited platform speakers from 5 different countries addressing subsurface restoration topics such as regulatory strategy, basic science required for decision making, site characterization, technologies for contaminant immobilization and containment, technologies for contaminant removal, and technologies for contaminant destruction. There were 50 people from Canada, China, England, Denmark, France, Sweden, Germany, and Puerto Rico in attendance. This series of presentations will be developed into a book by a major book publisher. In addition to the platform presentations, about 80 poster presentations highlighted the work of other researchers on a wide variety of subsurface restoration issues. $50,000 (EPA Resources).

Program: **USSR (former)-USA Chlorinated Organic Chemicals Pollution Prevention Workshop, Moscow and Sterlitamak, Russia, November 11-18, 1990**
Contact: **Timothy Oppelt, Director OEETD/RREL, (513) 569-7418**
EPA organized a Chlorinated Organic Chemicals Pollution Prevention Workshop in response to the Soviet Union's request to expand the provisions of the Bilateral agreement between the USSR and the USA to include a new program related to the "Prevention of Pollution and Treatment of Toxic Waste." The American delegation presented technical papers, toured chemical plants, and participated in related meetings in Moscow and Sterlitamak. The goals of the Soviet Union include exchanging technical information related to low-waste organic chemical production as well as pollution prevention and waste treatment techniques. Their principal goal related to

establishing joint economic ventures between American and Soviet chemical companies. The initial technical discussions and exchanges focused on chlorine producing and consuming chemical processes (e.g., chloralkali, vinyl chloride monomers, polymers, etc.) and utilization and recovery of chlorinated organic solvents. General discussions focused on the structure of federal, state, and city environmental agencies; our legal basis and mechanisms for developing regulations; methods for determining compliance; and enforcement actions. Also general discussions related to the operation of a market economy, management of chemical plants in a market economy, and the necessity of generating profits for an ongoing manufacturing plant. $2,100 (EPA Resources).

Program: Pacific Basin Consortium for Hazardous Waste Research
Contact: Alfred Lindsey, Director OEETD/Headquarters
The Pacific Basin Consortium for Hazardous Waste Research (PBCHWR) is currently composed of 61 member organizations from 15 countries around the Pacific. The PBCHWR held several technical conferences in various locations in the Pacific Basin. Argonne National Laboratory (ANL) is one of the founding members of the PBCHWR. This agreement will support three tasks that will be conducted by EPA, ANL and PBCHWR: (1) organize the technical program for the 1992 Pacific Basin Conference on Hazardous Waste; (2) arrange for the preparation of special reviews of hazardous waste topics that are of special interest in the region, and (3) prepare the proceeding of the conference for general distribution.

Program: Pacific Basin Consortium (1988-1991) on Hazardous Waste Research
Contact: John Skinner, OEETD/Headquarters
Under this program (1988-1991), the following was accomplished: (1) attended first meeting in February 1988 on hazardous waste research in the developing countries of the Pacific Basin, (2) consortium developed three training manuals/courses, (3) presented several case studies at a September 1989 meeting, (4) presented a lecture on the use of calcining kilns for hazardous waste disposal at a conference in Singapore in 1989, and (5) prepared the final report "Hazardous Waste in the Pacific Basin - the Need for International Collaborative Research." For FY88, FY89, and FY90, S&E were $0, $3,500, and $0, respectively; R&D was $26,000, $25,000, and $0, respectively (EPA Resources).

Program: Stationary Source Sampling and Analysis Workshop, Beijing, China, April 15-20, 1992
Contract: Gary Foley, Director OMMSQA/AREAL, (919) 541-2106
Planned and conducted a workshop with the participation of the China National Environmental Protection Agency and five U.S. equipment manufacturers to promote U.S.-made pollution monitoring equipment in China. As a result of the workshop, $40,000 worth of equipment was sold with additional orders planned.

Program: Photochemical Air Pollution
Contact: Basil Dimitriades, OMMSQA/AREAL
The goal of this project (1975-1990) with the Japanese Environmental Agency, Air Quality Bureau was to exchange information, data, and viewpoints on scientific issues pertaining to photochemical air pollution and its abatement through periodical panel meetings in the US and Japan, visitations, and correspondence. Accomplishments included 1-2 day visits from Japanese scientists on 5 occasions and panel meetings and exchange of information on atmospheric chemistry and modeling in ozone, aerosol, acid name, and HAP. (EPA Resources).

Program: Air Pollution Related Meteorology
Contact: Frank Schiermeier, OMMSQA/AREAL
This project (indefinite) is with the Japan Meteorological Agency. Every 1 or 2 years, a joint meeting of the US-Japan Air Pollution Meteorology Panel is conducted, rotating between Japan and the US. Only 1 or 2 US scientists travel to the meetings in Japan. At these meetings, papers are presented and field study data bases and dispersion models are exchanged for the mutual benefit of both countries. Accomplishments also included conducting the 9th joint meeting in Tokyo in February 1986, hosting the 10th Joint Meeting of the US-Japan Air Pollution Meteorological Panels in March 1988 in RTP, and US attendance at the 11th joint meeting in Tokyo in the Spring of 1990. For FY88, FY89, and FY90, R&D was $1,000, $300, and $0, respectively (EPA Resources).

Program: Solid Waste Management
Contact: John Skinner, OEETD/Headquarters
Seven US/Japan Solid Waste Conferences were held and proceedings widely distributed. For FY88 and FY89, R&D was $10,000 annually (EPA Resources).

Program: Stationary Source Pollution Control Technology
Contact: Michael Maxwell, OEETD/AEERL
This project (1975-1990) with Japan's Ministry of International Trade & Industry, Agency of Industrial Science & Technology provided a conduit for exchanging results of research, development, and commercial activities in the following areas: flue gas treatment technology for NOx control, combustion modification technology for NOx control, FGD technology for Sox control, and particulate control technology for combustion and industrial sources. Reports on Nox and SOx in Japan were produced. Accomplishments included symposia on stationary sources SOx control applications (November 1986, October 1988), symposia on particulate control technology (March 1988), symposium on stationary source NOx control technology (March 1989), visits to Japan (August-September 1987) to discuss advanced stationary source NOx control techniques such as combustion modification and reburning, an international conference on municipal waste combustion (April 1989), and a symposium on SO_2 control technology (May 1990). (EPA Resources).

Program: International Conferences on Healthy Buildings
Contact: Frank Princiotta, Director OEETD/AEERL
The objective of the Healthy Buildings Conferences is to develop recommendations on materials and systems that should be used in buildings to ensure good air quality, thermal comfort, and energy efficiency. Every three years this conference brings together researchers and practitioners to review knowledge and experiences. Recommendations from each conference are compiled in a post-conference publication that is made available to conference attendees and other interested scientists, architects, building owners, manufacturers of materials, etc. For FY88, FY89, FY90, and FY91, S&E were $0, $4,000, $2,000, and $5,000, respectively; R&D was $0, $0, $0, and $15,000, respectively. (EPA Resources).

Program: International Conference on Municipal Waste Combustion
Contact: Theodore Brna, OEETD/AEERL
Under this project (May 1988-May 1989), EPA and Environment Canada jointly sponsored an International Conference on Municipal Waste Combustion, held April 11-14, 1989 in Hollywood, FL. Other organizations participating in the conference included the American Society of

Mechanical Engineers, the Air Pollution Control Association, and the World Health Organization. For FY89 and FY90, S&E were $1,000 and $2,500, respectively; and R&D was $20,000 and $0, respectively; Canadian funds were received under reimbursable IAG RW-CN-932641 (EPA Resources).

Program: **Annual Incineration Conference**
Contact: **Timothy Oppelt, Director OEETD/RREL, (513) 569-7418**
RREL is a major co-sponsor of the annual international symposium on thermal treatment technologies for the management of radio-active, hazardous, mixed, Superfund and medical wastes. The 1992 Conference was held in Albuquerque, New Mexico. It was attended by 658 individuals. Approximately 15% of these attendees were from eleven foreign countries. The 1993 Conference (the twelfth) will be held in Knoxville, Tennessee. In-house support plus $4,000 travel (EPA Resources).

Program: **International Oil Spills Conference**
Contact: **Jack Farlow, OEETD/RREL**
This conference is held biannually and is sponsored jointly by EPA, USCG, and the American Petroleum Institute. The 1991 Conference had participation from about 30 countries. Its purpose was to exchange information on all aspects of oil spill prevention, control, and cleanup. $0 (EPA Resources).

Program: **Third International Conference on Waste Management in the Chemical and Petrochemical Industries, Salvador, Brazil, October 20-23, 1992**
Contact: **Timothy Oppelt, Director OEETD/RREL, (513) 569-7418**
EPA/RREL co-sponsored for the planning, development, and conduct of this international conference for new technologies and practices for waste minimization. The purpose of this conference was to promote collective efforts towards the development of new technologies for waste minimization by providing a forum for exchange of experience among international professionals and researchers concerned with as many significant aspects as possible. Emphasis was given to the practices of waste reduction and minimization by the chemical and petrochemical industries. This conference was sponsored by CETREL S.A. and the International Association on Water Pollution Research and Control (IAWPRC). RREL supported the first conference which targeted incineration and control technologies. In parallel with the conference RREL will conduct a one-day specialty course on waste reduction. $0 (EPA Resources). Funded through registration fees and industry sponsorship.

Program: **The Asia-Pacific Cleaner Production Conference - Melbourne, Australia, February 24-27, 1992**
Contact: **Timothy Oppelt, Director OEETD/RREL, (513) 569-7418**
This UNEP Conference is a result of UNEP's Cleaner Production Program that was formally launched in Canterbury, UK, in September 1990, and agreed upon a program of activities that focussed on awareness-raising and information exchange throughout the world. This conference is of regional priority for the South-East Asian Region. RREL participated in the authorship and presentation of two papers: "International Legislative Trends" and "Cooperative Approaches in Minimizing Hazardous Waste," as well as workshop activities. Limited technical hours (EPA Resources).

Program: First EPA/ICI Environmental Workshop - Australia, March 2-3, 1992
Contact: Timothy Oppelt, Director OEETD/RREL (513) 569-7418

A RREL-led team of four scientists/engineers from EPA, CMA, and AIPP conducted a two-day seminar entitled "Cleaner Production - Recent U.S. Experience" to a group of scientists and engineers in Sydney, Australia. This seminar was sponsored by ICI Australia and Environment Protection Authority - Victoria. After presentations of cleaner production trends in the U.S., Australia cleaner production initiatives and problems were discussed. This seminar enhanced an ongoing relationship between RREL and pollution prevention organizations in Australia, particularly multinational companies such as ICI. Limited technical assistance hours.

Program: Sewage Treatment Technology
Contact: Carl Brunner, OEETD/RREL

Under this project (1988-1991) with the Japanese Department of Sewerage and Sewage Purification, the 10th, 11th, and 12th US-Japan conferences on sewage treatment technology (1985, 1987, 1989) were held and a small number of Japanese engineers and scientists were hosted for technology exchange. Funding in FY88, FY89, FY90, and FY91 was S&E $0, $20,000, $5,000, and $2,500; and R&D $0, $23,000, $0, and $0. In addition, ¥ 3.8 billion supported a visiting Japanese research engineer from December 1989-1990 (EPA Resources).

Program: EPA - Environment Canada Hazardous Waste Research Workshop
Contact: Robert Mournighan, OEETD/RREL

The annual workshops under this project (1981-1992) provide a forum for sharing information, technology transfer, and coordination of basic research programs, including incineration of hazardous and municipal waste. For FY88, FY89, and FY90, S&E were $1,000, $2,000, and $2,000, respectively (EPA Resources).

Program: Air and Waste Management Association's Spring Conference - Canada & U.S.
Contact: Ila Cote, Office of Health Research, Health Effects Research Laboratory, (919) 541-2281

Participation in AWMA's annual conferences to present and discuss regulatory, technical, social, and economic issues affecting industry in Canada and the U.S.

Program: U.S.-Canada Pollution Prevention Initiative - Canada
Contact: Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418

Participate in annual joint meetings on joint pollution prevention assessments at industries along joint border, including comparison of procedures and methodologies for pollution prevention assessments.

Program: International Symposium on Environmental Contamination - Central and Eastern Europe
Contact: Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418

October 1992 symposium in Budapest will be forum for technology transfer of hazardous waste treatment and remediation technologies. Numerous U.S. technology vendors will participate. Goal is to show U.S. vendors problems and technology needs in Central and Eastern Europe.

Program: International Workshop on Remediation Technologies for Heavy Metal Contamination of Soils - France
Contact: Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418
Provided technology transfer at September 1992 French workshop on remediation technologies for heavy metal contamination of soils.

Program: Int'l Symposium on Using Waste Residues in Construction - Netherlands
Contact: Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418
Participated in 1991 and will participate in 1993 fora for technology transfer and exchange regarding using waste residues in construction.

Program: Workshop for Waste Minimization Technical Assistance - Philippines
Contact: Gary Foley, Office of Modelling, Monitoring Systems & Quality Assurance Atmospheric Research and Exposure Lab, (919) 541-2106
Workshop providing in-depth review of waste minimization and pollution prevention for Philippines Dept.s of Environmental and Natural Resources, Trade and Industry, Environmental Management Bureau, and industry.

Program: Waste Minimization Technical Assistance Project
Contact: Timothy Oppelt, Director OEETD/RREL, (513) 569-7418
A representative from EPA/RREL and a workshop leader from industry co-led a 3-1/2 day workshop in October 1992 that provided an in-depth treatment of the various aspects of waste minimization and pollution prevention for representatives from the Philippines Department of Environment and Natural Resources, Department of Trade and Industry, Environmental Management Bureau, and the industry sector. Funded through a cooperative agreement between USAID and World Environment Center.

Program: UNEP Conference/Seminar on Clean Production
Contact: Gary Foley, Office of Modelling, Monitoring Systems & Quality Assurance Atmospheric Research and Exposure Lab, (919) 541-2106
Presented paper at UNEP conference and participated in September 1990 working group.

Program: International Workshop on Regulation of Sludge and Organic Waste Application to Soil
Contact: Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418
Assist in international workshop on regulation of sludge and organic waste application to soil.

Program: International Ash Working Group
Contact: Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418
Participate in multi-national public and private effort to document sources, characteristics, and use of residues from combustion of municipal solid waste.

Clearinghouses and Data Bases

Program: **International Cleaning Production Information Clearinghouse (ICPIC)**
Contact: **Myles Morse, OEETD, (202) 260-3161, and**
Director of Industry and Environment Office, Paris, 33-1-40-58-88-50
ICPIC is a computerized information exchange system of the UNEP/IEO Cleaner Production Program, based on the US EPA's Pollution Prevention Information Exchange System. It aims to transfer technical policy, program, legislative, and financial expertise on cleaner production. The program helps countries to establish projects and programs, identify technical process options for cleaner production, show procedures to reduce wastes and liabilities and thus save money. The system provides cleaner production information, including location of documents and experts on cleaner production, to industries and governments. $50,000 (EPA Resources).

Program: **Pollution Prevention Information Clearinghouse (PPIC)**
Contact: **Myles Morse, OEETD, (202) 260-3161**
Information network on multi-media source reduction and recycling. Helps government and industry establish pollution prevention programs; identify technical processes, upcoming trade fairs, seminars etc., and project funding. Pollution Prevention Information Exchange System (PIES) within PPIC is interactive, PC-based system providing instant access to information on experts, events, publications, case studies, program summaries. PPIC is available in information packets and through a technical support hotline.

Program: **Control Technology Center**
Contact: **Bob Blaszczak, ESD/OAQPS, and Chuck Darvin, AEERL/ORD**
Jointly run by ORD and OAR, the Control Technology Center provides information and assistance on air emissions prevention and control techniques.

Program: **RREL Treatability Data Base, Version 4.0**
Contact: **Timothy Oppelt, Director OEETD/RREL, (513) 569-7418**
The objective of the database is to provide a thorough review of the effectiveness of proven treatment technologies in the removal/destruction of chemicals in various types of media including, but not limited to, municipal and industrial wastewater, drinking water, groundwater, soil, debris, sludge, and sediment. The database contains 1166 chemical compounds and over 9200 sets of treatability data. The chemicals contained in the database are often those regulated under the Clean Water Act, Safe Drinking Water Act, Resource Conservation and Recovery Act, Toxic Substances Control Act, Superfund Amendments and Reauthorization Act, and other environmental laws enacted by Congress. For each chemical, the database includes: physical/chemical properties, aqueous and solid treatability data, Freundlich isotherm data, other environmental database information sources, and data references including a reference abstract. The physical/chemical properties included are those most routinely used, such as molecular weight, boiling point, melting point, etc. The treatability data summarize the treatment technologies used to treat the specific chemical; the type of waste/wastewater treated; the size of the study/plant; and the treatment efficiency achieved. $1,000 to cover postage (EPA Resources).

Program: **CIERRA**
Contact: **Darwin Wright, OEETD/Headquarters**
EPA-ORD helped establish CIERA. It is a coalition of university, industry, government, and environmental organizations that can provide environmental and energy expert technical assistance

on research teams to prevent or solve global environmental problems. CIERA provides a database of environmental research personnel and projects, manages an environmental pollution prevention program for USAID, and assesses current and future energy and environmental technologies, technology transfer programs and technology trade programs. CIERA has developed working arrangements with government and university professionals in Poland and Hungary to support development of environmental programs in East European countries. $25,000 (EPA Resources).

Program: Alternative Treatment Technology Information Center (ATTIC)
Contact: Ben Blaney
Data base of alternative treatment data.

Activities Which Directly Promote U.S. Know-How

Program: Temporary Advisor to Government of India on treatment of tannery wastes.
Contact: Bala Krishnan, OEETD/Headquarters
Provided service as a temporary advisor to Regional Office for South East Asia, New Delhi, India for two months on treatment of tannery wastes with special reference to chromium recovery and management of salt liquor. No cost to EPA. Funded under UN-WHO program.

Program: Environmental Model for Water Quality of Indian Coal Mines Including Cost Effective Treatment Technology
Contact: Bala Krishnan, OEETD/Headquarters
Developing cost effective treatment technologies for dealing with mine water of Indian local field having special physio-chemical characteristics to render them suitable for potable use. $75,000 funded under U.S. India Rupee Fund.

Program: Technical Assistance to Waste Minimization Program in Poland
Contact: Timothy Oppelt, Director OEETD/RREL, (513) 569-7418
This project will involve demonstration of measurable environmental and economic benefits resulting from waste minimization activities at selected chemical plants and subsequently, introducing these practices throughout the industry. (EPA Resources). Sponsored by the World Environment Center.

Program: USAID Project Assistance - Waste Minimization in Indonesian Metal
Contact: Timothy Oppelt, Director OEETD/RREL, (513) 569-7418
In May 1992, an RREL environmental engineer conducted waste minimization assessments at three metal finishing companies in the Jakarta area. In a one day workshop ending their two week assignment, ORD presented results to company personnel, Indonesian government officials, and USAID staff. A report entitled, "Trip Report on Metal Finishing Waste Minimization Project, Jakarta, Indonesia," documents the team's findings. ORD personnel time (EPA Resources)

Program: Pollution Prevention Strategies for Sustainable Development
Contact: Timothy Oppelt, Director OEETD/RREL, (513) 569-7418
The U.S. is a Pilot Study Directorate for this NATO/CCMS project. The project is a three-year project with 17 cooperating countries. The project's purpose is to facilitate the transfer of

information on pollution prevention activities underway in the participating countries. $50K in FY 91 and $35K in FY 92.

Program: Instituting a Program for Technology Transfer for Ground Water
Contact: Clinton Hall, Director OEPER/RSKERL, (405) 332-8800
Made initial visits for discussions and preparation with Hungarian Institute for Environmental Management for instituting a program for technology transfer for ground water remediation. $5,200 (EPA Resources).

Program: Biofilm Formation and Drinking Water Quality
Contact: Benjamin Lykins, OEETD/RREL
This project (October 1989 - October 1991) with the NAN CIE, facilitated the study of the distribution effects, such as biofilm formation and microbiological control, that may be associated with the use of ozone in drinking water treatment. Investigators in France constructed large pipe loops that allowed for direct observation of biofilm formation in distribution systems. Pilot plants were constructed that fed ozone-treated water into pipe loops; treatment configuration was similar to the types of treatment that may be adopted in the US to meet anticipated disinfection by product regulations. Results of the first phase were presented at the American Water Works Association Annual Conference in June 1990. For FY89, FY90 and FY91, S&E were $20,000 annually, and R&D was $50,000 annually (EPA Resources).

Program: Implementing Industrial Pollution Prevention in the NIS
Contact: Darwin Wright, OEETD/Headquarters
The objective of this project is to promote pollution prevention, waste minimization, and cleaner production technologies through international technology cooperation (industry to industry) in selected Republics of the former Soviet Union. CIERA will provide teams of industry, government and academic pollution prevention experts to provide technology assessments, technology options and pollution prevention training at industrial sites in the NIS to transfer United States pollution prevention successes to both individual factories and industrial sections in the NIS. This exchange of information on existing and innovative pollution prevention practices and technologies will support environmentally beneficial protection activities in the NIS. The OIA and ORD will provide joint technical support for this project; OIA has the primary responsibility for coordinating and ORD has the responsibility for managing pollution prevention research, technical assistance and technology transfer programs.

Program: US-German Bilateral Agreement on Hazardous Waste Cleanup Projects
Contact: Alfred Lindsey, Director OEETD/Headquarters
By leveraging existing resources and programs within the bilateral agreement each agency will enhance the potential impact of these activities to the overall hazardous waste site problems within their respective countries. The goals of this bilateral agreement are to: (1) facilitate understanding of each side's approach to the remediation of contaminated sites; (2) demonstrate innovative remedial technologies; (3) compare quality assurance programs; and (4) facilitate technology transfer. The two lead agencies are the United States Environmental Protection Agency (EPA), Office of Research and Development (ORD), and the Federal Republic of Germany (FRG), Federal Ministry for Research and Technology (BMFT).

Program: Prevention of Water Pollution from Industrial and Municipal Sources
Contact: Alfred Lindsey, OEETD/Headquarters

This project with the VNII VODGEO of the USSR was completed in 1990. It investigated treatment and disposal technology for municipal and industrial effluents. In past years Soviet/American cooperation in the field largely focused on exchange of information on various research, development, and demonstration projects conducted in each country and site visits to innovative and advanced treatment installations. However, in 1986 the two sides agreed to conduct a more focused research program consisting of complementary projects in two general areas: (1) evaluation of biological treatment of wastewaters containing toxic substances and (2) improvement of anaerobic and aerobic digestion processes for wastewaters and sludges. Several reciprocal visits resulted in successful transfer of technical information and ideas. Reports chronicled the state of Soviet water technology and USSR projects. For FY88 and FY89, R&D was $30,000 and $25,000, respectively (EPA Resources).

Program: Stationary Source Air Pollution Control
Contact: Frank Princiota, Director OEETD/AEERL

The main objective of this 8-year project (1985-1992) with the NIOOGAZ of the USSR is to analyze emissions and develop control technology, especially gaseous emissions technology and particulate abatement technology. Accomplishments include publication of an English-Russian/Russian-English glossary of coal cleaning terms in 1987 and exchange of a large number of research articles and reports on FGD, reburning, fabric filter, ESPs, flares, multi-stage combustion design for NOx control, multi-stage burners, and isokinetic sampling. Meetings of group co-chairmen have been held in September 1985, November 1988, January 1990, and 1991 along with workshops on reburning, FGD, VOCs, municipal waste incineration, and other topics. For FY88, FY89, FY90, and FY91, S&E were $15,000, $12,000, and $5,000 respectively. R&D was $100,000, $111,000, $15,000, and $0, respectively. Other resources were $900,000 in FY90 (EPA Resources).

Program: Gaseous Emission Abatement Technology
Contact: Michael Maxwell, OEETD/AEERL

This project (1987-1991) with the NIOOGAZ of the USSR coordinates the following activities: (1) limestone scrubbing; (2) magnesia scrubbing; (3) double alkali method; (4) spray dryer flue gas desulfurization; (5) removal and suppression of the oxides of nitrogen from stationary sources; and (6) gaseous organic emissions abatement from stationary sources. Accomplishments include 9 U.S. reports and 5 Soviet reports presented at a workshop held in the United States in 1987, boiler design drawings received from the Soviets in March 1988 in preparation for the reburning project, working drawings for the Ladyzhinskaya Power Station presented to the U.S. side during the November 1988 visiting in continuation of the Joint Reburning Demonstration in the USSR, 8 U.S. papers and 12 Soviet papers presented in the USSR in November 1988, a reburning project meeting held June 22-29, 1989, 7 U.S. papers and 8 Soviet papers presented in the U.S. in January 1990, reciprocal reburning project meetings in 1990, a reburning demonstration with resulting data and continued exchange of papers and reports in 1991. For FY88, FY89, FY90, and FY91, S&E were $15,000, $12,000, $0, and $15,000, respectively, and R&D was $100,000, $10,000, $0, and $12,000 respectively (EPA Resources).

Program: Particulate Abatement Technology
Contact: James Kilgroe, OEETD/AEERL
This project with the NLLOGAZ of the USSR included: (1) particulate control technology; (2) sampling and analytical procedures for characterizing aerosols; and (3) pollution abatement from municipal waste incineration. Accomplishments included 3 U.S. papers and 2 Soviet papers presented at a workshop in 1987, 8 U.S. papers and 12 Soviet papers presented in the USSR in 1988, papers presented on U.S. activities at a U.S. workshop in January 1990, a tour of the Mid-Connecticut Refuse Derived Fuel facility in Hartford, Connecticut and the mass burn facility in Bridgeport, CT, and exchange of sampling and analysis procedures for testing at municipal waste combustion facilities in 1991. For FY88, FY89, FY90, and FY91, S&E were $4,000 annually (EPA Resources).

Program: Desulfurization Technology for Air Pollution Control
Contact: Charles Sedman, OEETD/AEERL
Under this project (1987-1990) the Engineering Institute of Sarajevo conducted a 3 year study to develop dry lime injection process for SO_2 removal. A Yugoslav principal investigator visited RTP in July 1987 and submitted a project work plan in May 1988. Research at bench level was completed in December 1988. A pilot reactor completed in December 1989 was evaluated in the following year with focus on development of a dry reactor, similar to the Lurgi circulating bed. For FY88, FY89, and FY90, S&E were $0, $7,000, and $0, respectively (EPA Resources).

Program: Bilateral Agreement with Central and Eastern European Countries
Contact: Alfred Lindsey, Director OEETD/Headquarters
Under this project, ORD's activities in Central and Eastern Europe include cooperative research and technical assistance. Cooperative research efforts include a comparative risk project in Czechoslovakia and Poland to help establish priorities for mitigation activities and environmental investments. Targeted technical assistance projects include the Northern Bohemia Air Quality Project. The initial focus of this project is air monitoring for pollutants: later efforts will involve assisting the Czechs in finding and utilizing cost-effective air pollution control technologies to reduce risks. ORD also developed and set up an air monitoring system in Krakow Poland and is currently assisting the Poles in improvement in their water and wastewater treatment systems. Through this project, ORD provided air monitoring equipment, analytical equipment, and water and wastewater treatment equipment.

Program: International Technology Exchange Program
Contact: Alfred Lindsey, Director OEETD/Headquarters
Through an IAG with DOE's Office of Technology Development, and a cooperative agreement with the Coalition for International Environmental Research and Assistance (CIERA) and Ohio University at Athens, we are providing financial assistance to help develop environmental technology international programs, including ENVIROTRADE. $100,000 (EPA Resources).

Program: Pollution Prevention Assistance in the NIS
Contact: Alfred Lindsey, Director OEETD/Headquarters
Through an IAG with AID (Jim Gallup), and a cooperative agreement (CR-817557) with the Coalition for International Environmental Research and Assistance (CIERA) and Ohio University at Athens we are continuing to provide financial assistance to help develop environmental technology international programs and to provide technical assistance on pollution prevention in the NIS, primarily Russia and Kazakhstan. $50,000 (EPA Resources).

Program: **USAID, Environmental Pollution Prevention Project**
Contact: **Greg Ondich, OEETD/Headquarters**
The EP3 objectives are to: (1) provide technical assistance, (2) strengthen in-country technical expertise, including establishing national centers, (3) promote the sources of financing for U.S. pollution prevention technology, (4) assist in improving national environmental polices, and (5) promote U.S./foreign country cooperative activities. Several geographic regions are targeted including: Asia (Sir Lanka, Thailand); East Europe/Africa (former Soviet Republics, Egypt); Central/South America (Chili, Mexico, Dominican Republic, El Salvador, etc.); and South Asia (India, Indonesia). EP3 is a global AID project with an authorized core (AID) funding of $20 million over five years (FY93-97). $500,000 annually, (reimbursable funds-in) IAG with EPA Office of International Activities as project office (supporting offices include ORD, OPPT, and OA), and the AID Bureau for Research & Development, Office of Environment and Natural Resources (EPA Resources).

Program: **Bilateral Agreement Between U.S. and India**
Contact: **Bala Krishnan, OEETD/Headquarters**
Coordinating research efforts with Government of India officials in the prioritized areas of research such as pollution prevention, clean technologies, and remedial technologies. $300,000 under U.S. India Rupee Fund.

Program: **U.S.-Australia Cooperative Pollution Prevention Program - Australia**
Contact: **Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418**
Participate in information exchanges with Australian industries and government, also pilot seminars. On-going pollution prevention technology transfer program.

Program: **Independent Panel on Intractable Waste - Australia**
Contact: **Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418**
Assist Australian Independent Panel on Intractable Waste in assessing technologies for treating and disposing of intractable waste.

Program: **Advisor to Center of Toxic Waste Management - UK**
Contact: **Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418**
Provide technical direction to Center in England and technology transfer on U.S. practices in hazardous waste management.

Program: **EPA and Industrial Tox Research Center - India**
Contact: **Gary Hatch, Office of Health Research, Health Effects Research Laboratory, (919) 541-2281**
Collaborate with Industrial Tox Research Center in Delhi, India.

Program: **Netherlands Pollution Prevention Exchange Program**
Contact: **Timothy Oppelt, Director OEETD/RREL, (513) 569-7418**
ORD worked several months in 1991 with the Netherlands Organization for Technology Assessment after being invited by the Dutch government to collaborate on efforts to apply four EPA industry-specific pollution prevention guidance manuals to industry within the Netherlands.

Two RREL engineers worked in the following areas: (1) facility assessments and technology evaluations, (2) life-cycle of products, (3) transfer of pollution prevention concepts and technologies, (4) biotechnology for cleaner production. Through contacts made during this assignment, continuing pollution prevention information transfer is occurring with a number of European countries. (EPA Resources).

Program: **Bilateral Agreement - Spain**
Contact: **Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418**
Participate in water quality modeling in streams and reservoirs.

Program: **NATO/CCMS Pilot Study on Demonstration of Remedial Action Technologies for Contaminated Land and Groundwater - multi**
Contact: **Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418**
Provided extensive technology transfer in Phase I of two phase study to NATO countries through presentations and field trips. Phase II will emphasize tech transfer to Central & Eastern Europe.

Activities Which Indirectly Promote U.S. Know-How

Program: **The Superfund Innovative Technology Evaluation (SITE) Program**
Contact: **Alfred Lindsey, Director OEETD/Headquarters**
The SITE Program, now in its sixth year, encourages the development and use of innovative treatment technologies for hazardous waste site remediation and monitoring and measurement technologies for evaluating the nature and extent of hazardous waste site contamination. Through cooperative agreements with innovators, SITE provides funding of up to $300,000 over two years to develop and evaluate the performance of these new technologies under field conditions. SITE was budgeted for $16.7 million in FY92 and $16.8 million in FY93.

Program: **The Municipal Innovative Technology Evaluation (MITE) Program**
Contact: **Alfred Lindsey, Director OEETD/Headquarters**
Like the SITE program, MITE promotes the development and evaluation of alternative clean-up technologies for municipal waste recycling and control. Testing and evaluation occurs at over 15 EPA-supported university research centers and several EPA-permitted facilities elsewhere. MITE was budgeted for $1.1 million in FY92 and $1.4 million in FY93.

Program: **Control of Major Precursor Air Pollutants (Including Mobile Source and Oxidant Modeling)**
Contact: **Alfred Galli, OEETD/Headquarters**
This project with the OECD/Environment Committee has 4 goals: (1) to build on the major elements of local/urban control strategies for episodes of high ozone concentration. Work will also be undertaken with a view to integrating control measures for short-term photochemical oxidant episodes with long-term acid deposition control strategies. (2) Work on motor vehicles will be performed with the elaboration of cost-effective measures: to reduce emissions from diesel and heavy duty vehicles (Germany lead); and to reduce atmospheric emissions from evaporative losses (Canada lead). (3) In addition to many countries' programs on conventional pollutants (SO_2, NOx, ozone, etc.) there is a growing emphasis on problems caused by hazardous air pollutants. The Air Management Policy Group (AMPG) will prepare control oriented reports

on many hazardous air pollutants of concern to member countries. (4) The AMPG will also initiate work on municipal waste combustion emphasizing emission characterization, combustion practices, controls, and ash handling, disposal, or utilization. Accomplishments include research reports, journal articles, and proceedings of meetings. For FY88, FY89, and FY90, S&E were $4,000 annually (EPA Resources).

Program: **Volatile Organic Compounds (VOC) Task Force**
Contact: **Carols Nunez, OEETD/AEERL**
This project (1988-1990) is with the Economic Commission for Europe (ECE) Task Force on Volatile Organic Compounds (VOC) Control to examine the sources, effects, and means of controlling/reducing VOC emissions to the ambient environment. Successful implementation of the Task Force's goals will result in the international sharing of information related to: (1) technology development and application; (2) regulatory approaches; and (3) environmental impacts. The shared information benefits the areas of: (1) ozone non-attainment; (2) stratospheric ozone depletion; (3) global climate change; (4) indoor air pollution; and (5) air toxics. Contributions include providing US reports relating to VOC control programs/approaches for Task Force use (areas covered will include solvent use, refineries, gasoline distribution, and others); two EPA engineers attending VOC control approaches meeting in Paris in November 1988; and proceedings showing VOC emission sources and control approaches in participating countries. For FY88, FY89, and FY90, S&E were $0, $2,000, and $2,000 (EPA Resources).

Program: **Environment Canada**
Contact: **Timothy Oppelt, Director OEETD/RREL, (513) 569-7418**
In 1985, ORD established a MOU with Environment Canada for research and development cooperation in science and technology. The MOU has been retained in force and has been actively supported by both sides since its inception. Activities have included, and will continue to include, information exchange and joint participation in projects—many of which have been co-funded. Although the MOU was initially developed primarily to support cooperative research, the coverage is broad and the MOU has been used by other Agency offices as well. Annual meetings for planning and review of related activities are called for in the MOU and have been held in alternating countries. Meetings review current or recently completed high-priority mutually-beneficial cooperative projects. Travel funds (EPA Resources).

Program: **Demonstration of Remedial Action Technologies for Contaminated Land and Groundwater**
Contact: **Donald Sanning, OEETD/RREL**
This project (November 1986 - November 1991) with the NATO/CCMS dealt with the problems of contamination resulting from the handling of hazardous materials/hazardous wastes. The need for cost-effective remedial technologies to apply at these sites has resulted in the application of new technologies and/or new applications of existing technologies. The desire to build a knowledge base so that emerging remedial technologies may be identified was the impetus to the NATO/CCMWS Pilot Study on Demonstration of Remedial Action Technologies for Contaminated Land and Groundwater. This knowledge base program is to include "lessons learned," i.e., both the successes and failures of limitations of the various technologies. Over 400 International Scientists from 13 countries have been involved in the study. Activities resulted in numerous publications in many international conferences and journals, and exchange of programmatic information between executive level EPA personnel and their foreign counterparts in the Federal Republic of Germany, the Netherlands and Denmark. For FY88, FY89, and

FY90, annually; R&D was $30,000, $30,000, and $35,000, respectively; and other resources were $10,000 annually in FY87 and FY88 from the US Air Force and $35,000 from OSWER in FY89 (EPA Resources).

Program: Follow-Up to Completed NATO/CCMS Study on Flue Gas Desulfurization
Contact: Frank Princiotta, Director OEETD/RREL

This project with NATO/CCMS has provided valuable information on European and Canadian state of the art air pollution control technology. Reports summarize EPA's research/development of air pollution from coal combustion and the yearly meeting. The flue gas desulfurization pilot study that began in 1976 involved information and technology transfer. The project has been in follow-up status since 1981. The focus has expanded to include information and technology transfer on all current and emerging air control technology relating to the combustion of coal. Interest remains high for the member countries because of acid rain, forestry damage, and other ecological and health impacts associated with coal combustion. The US acknowledges active participation by the following countries/organizations: Belgium, Canada, Federal Republic of Germany, OECD's International Energy Agency, Italy, the Netherlands, Norway, and the United Kingdom. Austria and Sweden have been observers. For FY88, FY89, FY90, and FY91, S&E were $1,000, $3,000, $4,000, and $4,000 respectively; and R&D was $12,000, $12,000, $20,000, and $20,000 (EPA Resources).

Program: Pollution Prevention Strategies for Sustainable Development - NATO
Contact: Gary Foley, Office of Modelling, Monitoring Systems & Quality Assurance Atmospheric Research and Exposure Lab, (919) 541-2106

Pilot Study Directorate for this three-year NATO/CCMS project with 17 cooperating countries. To facilitate information transfer on pollution prevention activities in participating countries.

Program: Cooperative Research and Development Agreements (CRADA) for Certified Reference Materials
Contact: Tom Clark, Director OMMSQA/EMSL-Cincinnati

Certified reference materials (calibration standards and quality control samples) for all EPA-regulated chemicals are developed and distributed world-wide by cooperation of EPA and independent cooperator firms. Data on materials are reviewed and verified by EPA to meet stringent technical specifications before they are EPA Certified. American Association of Laboratory Accreditation (A2LA) certifies other manufacturers of reference materials to be A2LA Certified to the same stringent technical specifications as the EPA CRADA products. No direct funding. EPA oversight role supported as part of ORD's base QA/QC Program and other EPA Programs.

Program: Safe Disposal of Hazardous Wastes with Special Emphasis on the Problems and Needs of Developing Countries
Contact: James Smith, OTTRS/CERI

This project (1985-1991) with the World Health Organization (WHO), the United Nations Environment Programme (UNEP), and the World Bank produced technical reports, manuals, and workshops on the management of common community hazardous wastes. Accomplishments included the report "The Safe Disposal of Hazardous Wastes - The Special Needs and Problems of Developing Countries," booklets for handling of common community, hazardous wastes, industry-specific and multi-media guidance, and workshops for the treatment and disposal of hazardous wastes. These reports are intended for administrative and technical staff and convey

needed information for planning and designing a hazardous waste treatment system. The user is provided with: (1) an understanding of significant human and environmental health concerns; (2) a program to determine what hazardous wastes are being produced in a country or region; and (3) procedures for designing a hazardous waste treatment system which will minimize, reduce, and reuse these wastes and arrange for their safe disposal. For FY88, FY89, FY90, and FY91, S&E were $17,000, $0, $8,000, and $17,000, respectively; R&D was $0, $0, $20,000, and $30,000, respectively; and other resources were $3,000, $0, $0, and $3,000. WHO paid travel (EPA Resources).

Program: Joint Research on Municipal Waste Combustion Technology
Contact: James Kilgroe, OEETD/AEERL

Under this project (June 1987-May 1990), Environment Canada and EPA agreed to exchange information on municipal incineration/combustion programs. Activities included: (1) the characterization of emissions and residues from MWC processes; (2) the assessment and development of technology for controlling pollution from MWC; (3) the development of guidelines and regulations; and (4) the performance of risk assessment studies. Accomplishments included: participation in the development of Canadian guidelines for the control of pollution from incinerators; completion of field test in Maine, Massachusetts, and at the Mid-Connecticut resource recovery facilities; and evaluation of residue samples from the Montgomery County South incinerators. For FY88, FY89, FY90, and FY91, S&E were $123,000, $123,000, $76,000 and $0, respectively; R&D was $800,000, $800,000, $235,200, and $75,000, respectively (EPA Resources).

Program: Use of Electro-Kinetics in the Treatment of Waste
Contact: Jonathan Herrmann, OEETD/RREL

This project (1988-1992) is with the Poltegor (Mining Institute of Poland). The first phase involved the thorough review of the literature with respect to improving the injection of grouts and cleanup chemicals for use with wastes and soil-water systems. Based on the literature obtained and the results of laboratory-scale testing, a feasibility evaluation of the concept of using an electric field to improve injection was developed. The second phase involved the pilot-scale testing of injection of grouts and cleanup chemicals into wastes and soil-water systems. Pilot-scale testing focused on the evaluation of intermediate scale devices and systems that can be tested in the field. The third phase involved the field-scale testing of injection of grouts and cleanup chemicals into wastes and soil-water systems. Testing focused on the testing of full-sized equipment or multiple arrays of electro-kinetic systems or devices. As with the laboratory and pilot-scale tests, emphasis was placed on the improvement of injection of grouts or chemicals into wastes or soil-water systems that are contaminated with heavy metals. For FY88, FY89, FY90, and FY91, other (no S&E or R&D) was $0, $45,000, $6,700, and $15,100, respectively (EPA Resources).

Program: Composting to Treat Organic Contaminated Soils
Contact: Ronald Hill, OEETD/RREL

This project (1990-1993) is with the Technical University of Wroclaw, Poland. The first phase involves the review of the literature on the land treatment/composting of organic hazardous waste. Based on this literature review, a laboratory-scale testing program will be designed, constructed, and implemented to evaluate the destruction of organic hazardous waste in a soil matrix. The organisms to be used should be naturally occurring either from soils or sewage sludges, or should be commercially available. The organic contaminants should include some recalcitrant

compounds. The evaluation should include the use of sewage sludge as a source of nutrients and organic compounds to determine the rate and extent of degradation. Mass balances should be determined with careful attention to determine the amount of loss to the atmosphere due to volatilization or leaching from the soil. Based on the results of the laboratory testing, a field study will be determined. After approval of field study experimental plan by all parties, the plan will be implemented. Replicate field plots exposed to natural conditions of weather will be constructed in the field. Mass balances will be determined to establish the loss of contaminants to air losses, leachate, and degradation. The field study should be for approximately 1 year followed by a 6-month period of final report preparation and approval. For FY88, FY89, and FY90, resources (excluding S&E and R&D) in FY90 were $25,300 (EPA Resources).

Program: Ground Water Research
Contact: Lowell Leach, OEPER/RSKERL
The goal of this project (1985-1988) with the Beijing Municipal Research Institute of Environmental Protection was to provide technology transfer and training on the design of land treatment systems for municipal wastewater including ground water impact evaluation. Accomplishments included a journal article on the rapid infiltration experiment that demonstrated the utility of the system for wastewater treatment and groundwater recharge in China, eight land treatment demonstration projects evaluated by the PRC, a wetland wastewater treatment design workshop in Beijing, June 25-27,1990, an internal bilateral research report on "Land Treatment of Brewery Wastewater by Overland Flow" in 1990, and a 4-day land treatment design seminar in Beijing. Land treatment technology was endorsed by the PRC for full-scale implementation throughout China. For FY88, FY89, FY90, and FY91 S&E were $105,000 annually, and R&D was $20,000 annually (EPA Resources).

Program: International Solid Waste and Public Cleaning Association (ISWA)
Contact: Bala Krishnan, OEETD/Headquarters
The International Solid Waste and Public Cleansing Association (ISWA), an international organization representing 25 countries from across the world, promotes adoption of acceptable systems of solid waste management through technological development and improvement of practices for protection of the environment and conservation of materials and energy resources. There are 4 working groups that focus on: hazardous waste management, sanitary landfills, municipal incineration, and waste collection and transport. The main objectives are (1) to provide reports that summarize solid/hazardous waste research finding from around the world, and (2) to provide a mechanism, such as conferences and workshops, for the face to face exchange of solid/hazardous waste research information between American and foreign experts. Accomplishments include the following. Chairman of the Work Group for Hazardous Waste Subcommittee. Completed the 1984-1987 work plan with publications by Academic Press. Completed ISWA-Japan waste Management Association's "Symposium on Hazardous Waste Management." Completed the 1984-1987 work plan with publications by Academic Press. Completed ISWA-Japan Waste Management Association's "Symposium on Hazardous Waste Management." Attended the ISWA Quadrennial Congress in September 1988 in Copenhagen. Chaired the Working Group on Hazardous Waste in September 1988. The Working Group on Hazardous Waste held a conference in Geneva in May 1989. The ISWA Working Group on Hazardous Waste and the Pacific Basin Consortium on Hazardous Waste Research held a joint meeting in Honolulu in September 1989. ISWA Executive Committee met in Amsterdam in January 1989, Geneva in June 1989, and Sardinia in October 1989. Working Group on Hazardous Waste produced the book "International Perspectives on Hazardous Waste

Management." For FY88, FY89, and FY90, R&D was $50,000, $50,000, and $0. Other resources included reimbursable/membership dues (cost share) 11,000 Swiss francs ($8,460 US) paid by the American Public Works Association.

Program: **Organization Internationale De Metrologie Legale (OIML)**
Contact: **Christopher DeRosa, Director OMMSQA/EMSL-Cincinnati**
The United States is a member of OIML by treaty along with over 100 other countries. OIML is concerned with the development and maintenance of legal measurement standards in many areas including measurement of pollution. The National Institute for Standards and Technology (NIST) is the lead Agency for U.S. OIML activities. William L. Budde, Director, Chemistry Research Division, Environmental Monitoring Systems Laboratory - Cincinnati, is the designated scientific advisor to the U.S. National Working Group for OIML in the area of measurement of pollution. The work group includes members from instrumentation companies that export pollution measurement equipment to other countries. $25,000 (EPA Resources).

Program: **UNEP Conference/Seminar on Clean Production**
Contact: **Timothy Oppelt, Director OEETD/RREL, (513) 569-7418**
EPA staff presented a paper at the UNEP conference and participated in work groups in Canterbury, England, September 1990, "Encouraging Clean Technologies: The U.S. Environmental Pollution Prevention Program." $1,500 (EPA Resources).

Program: **Western Lake Superior Region Resource & Management Cooperation - Canada**
Contact: **Gary Glass, Office of Environmental Processes and Effects Research, Environmental Research Lab (Duluth), (218) 720-5550**
MOU with 15 government agencies and universities including Canadian university, to coordinate research exchange and outreach and education support in programs to achieve full benefits of Lake Superior regional waters, air, fish, wildlife forests, and wildlands, and associated resources.

Program: **Emerging Technology Projects - Canada, UK**
Contact: **Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418**
Participate in development of various emerging technologies with labs in England and Canada.

Program: **Cooperation Plan - WHO**
Contact: **Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418**
Participate in on-going activities to promote use of worldwide data bases related to water monitoring, provide technical assistance and facilitate wider use of U.S. standards in developing nations. Preparing water supply guideline documents which emphasize developing countries.

Program: **Small Business Innovation Research Program**
Contact: **Donald Carey, (202) 260-7473**
Provide grants of up to $50,000 for feasibility research on new, higher-risk technologies; $150,000 for principal research; and non-federal support for product commercialization.

Program: **EPA Directed Model Development**
Contact: **Gary Foley, Office of Modelling, Monitoring Systems & Quality Assurance Atmospheric Research and Exposure Lab, (919) 541-2106**
Developing process to catalyze private sector-DOE cost-sharing in order to accelerate innovative environmental technologies development. Will strengthen U.S. industry's competitiveness in world markets.

Program: **Development of Innovative Environmental Technologies**
Contact: **Timothy Oppelt, Office of Environmental Engineering and Technology Demonstration, Risk Reduction Engineering Lab, (513) 569-7418**
Directing development of process to catalyze private sector investment in cost sharing arrangements with DOE to accelerate development of innovative environmental technologies, which will strengthen U.S. industry's ability to compete in world markets.

Task Force Members
Fred Lindsey, Director, Off. of Environmental Engineering & Technology Demonstration
Steve Lingle, Deputy Dir., Off. of Environmental Engineering & Technology Demonstration
Michael Moore, Director, Technology Transfer Staff

OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE (OSWER)

Training, Workshops, and Conferences

Program: **International Symposium on Environmental Contamination - Central and Eastern Europe**
Contact: **Technology Innovation Office, (703) 308-8800**
Participating in International Symposium on Environmental Contamination in Central and Eastern Europe.

Program: **Hazardous Waste Characterization Training - Hungary, Poland**
Contact: **Office of Emergency and Remedial Response, Hazardous Site Evaluation Division, (703) 603-8860, and Technology Innovation Office**
Developing hazardous waste characterization training course for Hungary (1992) and Poland (1993) covering principles of national site characterization and ranking and providing information on international programs.

Program: **Emergency Response Training - Kuwait**
Contact: **Office of Emergency and Remedial Response, (703) 603-8700**
Supplies on-scene training to other nations, such as with oil fires in Kuwait.

Program: **Hazardous Waste Characterization Training - Philippines**
Contact: **Office of Emergency and Remedial Response, (703) 603-8700**
Participated in forum on proposed hazardous waste rules for Philippines.

Program: Technical Participation at International Conferences
Contact: Office of Emergency and Remedial Response, (703) 603-8700
Participates in roughly eight international conferences annually related to sharing expertise on groundwater issues, risk assessment, and other clean up issues.

Program: Forum on Domestic and International Innovative Hazardous Waste Treatment Technologies
Contact: Technology Innovation Office, (703) 308-8800
With ORD, co-sponsoring November 1992 4th annual forum on domestic and international innovative hazardous waste treatment technologies.

Program: Conferences on Worker Health and Safety
Contact: Office of Emergency and Remedial Response, (703) 603-8700
Participate in conferences and research regarding worker health and safety guidelines, regulations, and training.

Program: International Exhibition on Environmental Information and Communication
Contact: David Bennett, Office of Emergency and Remedial Response, Hazardous Site Evaluation Division, (703) 603-8880
Will provide information on reclamation experiences at International Congress and Exhibition on Environmental Information and Communication – ECO-INFORMA '92.

Clearinghouses and Data Bases

Program: Vendor Information System for Innovative Treatment Technologies (VISITT)
Contact: Linda Fiedler, Technology Innovation Office, (703) 308-8799
Data base providing available information on 154 U.S. remediation technologies and suppliers; next version scheduled for January 1993. Publicized at many exhibits which receive international attention; international community comprises small portion of system users.

Activities Which Directly Promote U.S. Know-How

Program: Technical Assistance on Border Environment and Enforcement - Mexico
Contact: Office of Waste Programs Enforcement, (202) 260-4814
Provide technology assistance, staff exchanges, training, and cooperative enforcement material to instruct Mexican environmental inspectors.

Program: Joint Contingency and Emergency Response Planning - Mexico
Contact: Chemical Emergency Preparedness Office, Joint Response Team, (202) 260-8600
Conduct activities with Mexico on border "sister city" contingency planning and emergency response. Activities will include gathering information on sister cities, assessing current programs, and promoting joint U.S.-Mexico contingency planning for hazardous materials emergency response through workshops and other exercises.

Program: Technical Assistance on Accident Prevention - Mexico
Contact: Chemical Emergency Preparedness Office, (202) 260-8600
Provided technical assistance and accident prevention training following April 1992 sewer explosion in Guadalajara, Mexico.

Program: Technical Assistance on Waste Management - multi
Contact: Office of Solid Waste, Waste Management Division, (703) 308-8414
Conducted short-term mission to Chile to inspect and advise on sanitary landfills. Presented briefings on U.S. waste regulations and waste management experience. Similar activities have been conducted in Russia, Peru, Chile, Australia, and China.

Activities Which Indirectly Promote U.S. Know-How

Program: Hazardous Waste Legislation Assistance - China, World Bank
Contact: Technology Innovation Office, (703) 308-8800
Assists World Bank and China in developing comprehensive legislation on hazardous waste.

Program: Meetings with International Maritime Organization (IMO)
Contact: Office of Emergency and Remedial Response, (703) 603-8700
Work with IMO on spill response protocols for international treaties.

Program: Public-Private Partnership Program
Contact: Meg Kelly, Technology Innovation Office, (703) 308-8800
Run public-private program utilizing federal facilities to develop new technologies for cleaning hazardous waste sites. EPA, private firms, and federal facility work together to diagnose site and test new clean-up technologies.

Program: "Rio" and "Parallel Track" Initiatives
Contact: OSWER, (202) 260-4610
Planned initiatives under "Rio" and "Parallel Track" for technical assistance, information exchange, and training. Will likely enhance information about opportunities in developing countries and provide those countries with U.S. expertise.

Task Force Members
Bowdoin Train, Deputy Assistant Administrator
Walter Kovalick, Director, Technology Innovation Office
Ellen Spitalnick, Special Assistant for International Waste Policy

OFFICE OF WATER (OW)

Activities Which Directly Promote U.S. Know-How

Program: Krakow Presidential Initiative - Poland
Contact: Ed Gross, (202) 260-7370
Managed a $4 million project to provide drinking water and wastewater treatment equipment to the city of Krakow, Poland.

Program: **Recycle and Reuse of Wastewater - Israel**
Contact: **Bob Bastian, (202) 260-5859**
Provided technical support to Israel in organizing and participating in a delegation of experts on recycling and reuse. As part of this program, a team of Israelis also visited the U.S. to study wastewater treatment.

Program: **Caribbean/South American Sewage Treatment Support**
Contact: **Charles Vanderlyn, (202) 260-7277**
Offered technical expertise on the use of innovative and alternative sewage treatment in the Caribbean and South America.

Activities Which Indirectly Promote U.S. Know-How

Program: **Participation in Development of International Border Environmental Plan (IBEP) - Mexico**
Contact: **Eliot Tucker, (202) 260-5842**
Contributed to the IBEP between EPA and the Mexican environmental agency.

Program: **North American Free Trade Agreement (NAFTA) Support - Canada, Mexico**
Contact: **Eliot Tucker, (202) 260-5842**
Prepared the Water section of EPA's environmental analysis in support of NAFTA. Also coordinated identification of possible water-related environmental activities in the interior of Mexico as part of the Parallel Track Initiative.

Program: **Constructed Wetlands - Hungary**
Contact: **Paul Baltay, (202) 260-5859**
Prepared a study plan for the reconstructed wetlands project at Lake Tata, Hungary.

Task Force Members
Alan Fox, Associate Assistant Administrator

OFFICE OF THE ADMINISTRATOR (OA)

Program: **National Advisory Council for Environmental Policy and Technology (NACEPT)**
Contact:
EPA participates in and is advised by the activities and recommendations of the Trade and Environment and the Technology Innovation and Economics Committees of the National Advisory Council for Environmental Policy and Technology (NACEPT).

APPENDIX C
SURVEY OF U.S. GOVERNMENT PROGRAMS TO PROMOTE THE EXPORT OF ENVIRONMENTAL GOODS AND SERVICES (EXCLUDES EPA)

-- Not Comprehensive --

DEPARTMENT OF COMMERCE (DOC)

Program: Business Information Service for the Newly Independent States (BISNIS)
Contact: (202) 482-4655
BISNIS offers information on potential trade partners, investment regulations and incentives, upcoming seminars, conferences, and trade promotion events, and on various U.S. government programs that support private enterprise, trade, and investment. In addition, BISNIS maintains a reference library for the U.S. business community that carries directories, newsletters and other publications on doing business in the former Soviet Union. Established in June 1992, BISNIS is the most recent DOC regional business center.

Program: Eastern European Business Information Center (EEBIC)
Contact: (202) 482-2645
Established in 1992, EEBIC provides services similar to those of BISNIS: trade partner information, Eastern European investment regulations, incentives, upcoming trade events, etc. Since opening, EEBIC has handled over 60,000 inquiries. Much of EEBIC's information pertains directly to the environmental sector. EEBIC also publishes the Eastern Europe Business Bulletin, a bimonthly newsletter. Jointly with U.S. Agency for International Development (AID), DOC is trying to increase the involvement of small- and medium-sized U.S. companies in Eastern Europe through EEBIC.

Program: Eastern European Environmental Business Consortium (EEEBC); Part of the Consortia of American Business in Eastern Europe (CABEE)
Contact: Conrad Kleveno, Director, (703) 684-2424
Created in October 1991, the EEEBC promotes trade in U.S. environmental technologies and services in Poland, Hungary, and Czechoslovakia. It works mainly with small- and medium size firms and requires a membership fee. An AID matching-funds grant of $500,000 will provide funding through September 1994; after that time, the Consortium will be self-sufficient. Among its responsibilities, EEEBC facilitates joint ventures, cooperative agreements and partnerships; identifies financial assistance both within and outside the consortium; facilitates technology transfer, technical assistance, and professional and information exchanges; and ensures integration of Eastern European knowledge and skills into the total consortium process. EEEBC is currently located in Warsaw, Poland and has plans for future offices in Hungary and Czechoslovakia.

Program: Foreign Trade Missions
Contact: Anita Blackman, (202) 482-4908
The DOC annually sponsors 20 to 30 overseas trade missions that target specific industries or service sectors. Led by the appropriate Trade Development industry officer, trade missions open doors to host-country government and business leaders, help U.S. firms

identify local agents, representatives, and distributors. DOC provides pre-trip marketing information, advance planning, publicity, and logistical support, and interpreter services as appropriate. Trade missions involve about 175 U.S. companies each year. Participation fees run between $2,000 and $5,000.

Program: Latin America/Caribbean Business Development Center
Contact: (202) 482-0841
This joint DOC-AID Center offers business counseling, matches U.S. firms with foreign contacts, and sponsors workshops, symposia, conferences, and business development and reverse trade missions for industry. The Center also offers numerous publications, including the monthly LA/C Business Bulletin. Similar to the EEBIC, the Center does not limit itself to one industry or service sector; however, a large portion of its information directly addresses the environmental industry.

Program: National Trade Data Bank (NTDB)
Contact: (202) 482-1986
Established by the Omnibus Trade and Competitiveness Act of 1988, the NTDB contains over 105,000 documents relating to international trade (e.g., market research reports, country-specific data, export and import statistics, and international economic information) available from 15 federal agencies. A number of documents explicitly address foreign environmental sectors. 700 Federal Depository Libraries in the U.S. carry the NTDB, as do the 67 district offices and 68 country offices of the International Trade Administration. NTDB can also be purchased at nominal cost on CD-ROM.

Program: Trade Development Industry Desk Officers
Contact: Loretta Jonkers, Pollution Control Equipment, (202) 482-0564
Industry desk officers identify trade, finance, and investment opportunities for U.S. business; develop trade policies and initiatives to increase sectoral exports and to reduce or remove barriers that affect industrial competitiveness; initiate trade promotion strategies that help U.S. companies act on international opportunities; and work with their subject industries and trade associations on international marketing. Pollution Control Equipment Desk Officers represent the environment sector.

DEPARTMENT OF ENERGY (DOE)

Program: Coal and Technology Export Program
Contact: Jean Lerch, (202) 586-7297
The Coal and Technology Export Program, as part of DOE's Office of Fossil Energy, acts as information clearinghouse and federal liaison to industry in promoting exports of U.S. clean coal products and services. Joining the interests of the coal industry, technology firms, and trade associations, the Program holds public meetings, conferences, and seminars, and publishes the *Directory of U.S. Coal and Coal Technology Export Resources* and the *Guide to Federal Export Assistance Activities Applicable to the U.S. Coal and Coal Technologies Industry*. The Program has also facilitated Technology Cooperation Arrangements for Deployment of Clean Coal Technologies with Costa Rica and Chile, which will foster information exchange and promote increased public awareness of clean coal technologies.

Program: Committee on Energy Efficient Commerce and Trade - Proposed (COEECT)
Contact: Tom Hall, (202) 586-8302
In the vein of CORECT (see below), COEECT is a proposed committee that would promote international trade in U.S. energy efficient products and services and coordinate federal programs to promote energy efficient technologies. Capitol Hill is mulling this one over, but its prospects look promising.

Program: Committee on Renewable Energy Commerce and Trade (CORECT)
Contact: Tom Hall, (202) 586-8302
CORECT was formed by Congress in 1984 as a work group of federal agencies and renewable energy industry representatives, led by DOE, that would "facilitate the cost-effective use of U.S. renewable energy products and services around the world." CORECT sponsors technology pilot and demonstration programs and conducts activities (e.g., fact-gathering and trade missions, education, training, support programs, and financing assistance programs) to develop regional markets. CORECT has also created a one-stop multi-agency loan application for firms to solicit federal financial assistance. While CORECT does not provide direct funding, it does provide extensive support services and help that major development banks either do not or cannot provide. Currently, CORECT has activities underway in the Caribbean, the Pacific Rim, and in Eastern Europe. To identify projects, CORECT works closely with major industry associations to ascertain what market areas and types of work firms are most interested in pursuing.

Program: Export Initiative Program
Contact: Kate Thompson, (202) 586-7997
The Export Initiative Program, sponsored by DOE's Office of International Affairs, works to boost exports of U.S. energy-related goods and services by identifying international business opportunities and aiding companies to pursue these opportunities by holding trade fairs, trade missions, conferences, etc.; working to eliminate discriminatory foreign trade barriers and trade-restrictive U.S. regulations; identifying financing options; and coordinating other federal initiatives involving energy goods exports.

Program: U.S. Federal International Energy Trade and Development Opportunities Program (FIETOP)
Contact: Peter Cover, (202) 586-7297
Collaboratively sponsored by DOE, AID's Office of Energy, and the Trade Development Program (TDA), the FIETOP program works simultaneously to foster overseas economic development and to develop trade opportunities for U.S. energy goods suppliers by providing U.S. firms with the necessary financial support to conduct pre-feasibility studies of promising energy-related projects.

EXPORT-IMPORT BANK OF THE UNITED STATES (EXIM BANK)

Program: Direct Loans
Contact: James Sharpe, (202) 566-8187
Exim Bank supports U.S. goods and services exports through loans to foreign purchasers who otherwise would not be able to buy specific U.S. goods and services or would purchase them from another country. Exim Bank loans up to 85% of the transaction cost and requires 15% down from the purchaser. Loan durations generally do not exceed 10 years and carry a fixed

interest rate. The program places priority on environmental technologies and services.

Program: Export Credit Insurance
Contact: James Sharpe, (202) 566-8187
Exim's Export Credit Insurance program protects U.S. exporters in the event that a foreign buyer fails to meet payment obligations.

Program: Loan Guarantees
Contact: Bruce Hunt, (202) 566-8997
Exim provides loan guarantees to U.S. and foreign financial institutions for repayment of medium- and long-term loans made to foreign buyers of U.S. goods and services. As with direct loans, Exim requires a 15% cash payment to the U.S. exporter. Most guarantees provide coverage for political and commercial risks.

OVERSEAS PRIVATE INVESTMENT CORPORATION (OPIC)

Program: Energy Insurance Program
Contact: B. Thomas Mansbach, (202) 336-8588
Through the Energy Insurance Program, OPIC provides insurance for most types of overseas investment in energy exploration, development, and production, insuring up to 90% of investments, which cannot exceed $100 million. Coverage provides against inconvertibility, expropriation, political violence and operations interference due to political violence. Alternative energy projects can be insured for up to 20 years, while oil and gas projects are covered for a maximum of 12 years. OPIC will not insure projects in OPEC countries that involve the exploration, development, or production of oil and gas.

Program: International Environmental Investment Fund
Contact: Frederick Medero, (202) 463-4414
The Environmental Investment Fund supports new or expanding business enterprises in developing countries that use natural resources on a sustainable basis or otherwise practice sound environmental management. The Fund aims to show the financial viability of investing in developing country environment projects and to thus stimulate financial initiatives by other private-sector oriented development groups. With initial capital of over $60 million, the fund offers up to 49% equity and equity-related financing to projects in five sectors: sustainable agriculture, forest management, ecotourism, renewable and alternative energy, and pollution prevention and abatement technologies. OPIC has recently authorized the fund at $100 million. Foreign enterprises in which the Fund invests must have a business connection (e.g., ownership in the company, management of the company, participation in licensing agreements, marketing agreements, or the supply of equipment and services) with one or more U.S. firms.

SMALL BUSINESS ADMINISTRATION (SBA)

Program: Loan Guarantee Program
Contact: Kathryn Parker, (202) 653-7794
SBA's Loan Guarantee Program provides financial institutions repayment protection for loans made to small businesses seeking to expand overseas. The Program guarantees up to $750,000 and covers 70-100% of eligible loans.

Program: Small Business Development Centers' International Trade Centers
Contact:
SBA has designated about 20 of its 700 Small Business Development Centers as international trade centers, specializing in giving small businesses counseling and training in exporting.

Program: Service Corps of Retired Executives
Contact:
SBA provides some export assistance through its Service Corps of Retired Executives.

Program: Small Business Institute
Contact:
SBA also provides export assistance through its Small Business Institute.

TRADE AND DEVELOPMENT AGENCY (TDA)

Program: Trade and Development Agency (TDA)
Contact: Jill Jones, (703) 875-4357
TDA funds definitional missions (DM), feasibility studies, orientation visits or reverse trade missions, technical symposia, trade-related training, and information dissemination/procurement promotion for major development projects in State Department-defined "friendly" developing and middle-income countries. TDA places a priority on environmental projects, and in FY1990 over one-fifth of TDA's grants went to environmental projects. TDA receives project leads through foreign governments and private firms, U.S. embassies and industry, and international lending institutions such as the World Bank, although official requests for assistance must be made by foreign clients directly to TDA or to TDA through a U.S. embassy or Consulate. TDA only funds projects which have the potential to generate 50 to 75 times the provided funding in increased U.S. exports.

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT (AID)

Program: American Business Initiative (ABI)
Contact: Bill Craddock, (202) 647-7805
Funded with $50 million, this cooperative AID and DOC effort offers feasibility and project development funding to U.S. businesses in Central and Eastern Europe, and has provided information and business services to thousands of small U.S. businesses in these regions. One of the few industries ABI focuses on is environmental equipment. Includes the Capital Development Initiative, which focuses on project opportunity definition, promotion of investment and trade, and joint ventures.

Program: U.S.-Eastern European Utility Partnership Program (UPP)
Contact:
Begun in 1991, this cooperative program with the U.S. Energy Association, brings together electric utilities in the U.S., Poland, Hungary, and Czechoslovakia for management and technical advisory missions, focused regional seminars, and information dissemination.

Program: Biomass Energy Systems and Technology, Office of Energy and Infrastructure, Bureau for Research and Development (BEST)
Contact: Frank Tugwell, Winrock International, (703) 522-5928
Created in 1989 and scheduled to continue until 1996, BEST is designed to identify and reduce the technical, economic, financial, and institutional risks associated with implementing modern biomass energy systems in developing countries. BEST is composed of three components: the Biomass Energy Project Development and Implementation component, which supports on-site projects of U.S. and developing country private sector companies by helping commercially viable projects secure financing and assisting with pre-investment studies; the Technology Adaptation and Transfer component, which supports new innovative technologies and demonstrations of commercially viable biomass energy systems; and the Biomass Energy Program Support component, which promotes worldwide efforts in biomass energy development through entrepreneurial networking, data management and dissemination, and communications. In 1992, BEST began collaborating with the Biomass Users Network (BUN), a private developing country organization dedicated to biomass energy development. BUN will be responsible for administering small grants for BEST.

Program: Bureau for Science and Technology
Contact: Bradshaw Langmaid, (202) 647-4322
The Bureau identifies opportunities for U.S. technology transfer to developing countries, and although not its exclusive focus, it emphasizes technologies that can improve these countries' environmental quality. AID determines the nature and amount of support case-by-case.

Program: Emergency Energy Program
Contact: Ross Pumfrey, (703) 875-4072
AID's Emergency Energy Program has conducted energy audits and installed or retrofitted no- and low-cost technologies in 48 East European factories. Audits have recommended several additional, more expensive measures; however, a lack of funds has stalled implementation. The Program recently was extended to the Baltic States, and the Commonwealth Republics will be added in 1993.

Program: Energy Conservation Services Project (ECSP), Office of Energy and Infrastructure, Bureau for Research and Development
Contact: John Armstrong, RCG/Hagler, Bailly, Inc., (703) 351-0300
Under the umbrella of the Energy Policy Development and Conservation Program (EPDAC), ECSP aims to improve - and to a degree finance - energy efficiency in the utility, manufacturing, transportation, and building sectors. The Project targets specific industries and companies and has resulted in many client countries developing their own national energy conservation plans. The Project was funded for $1.1 million in 1992, its last year of operation. It will be replaced with the Energy Efficiency Project (See Energy Efficiency Project, below).

Program: Energy Efficiency Project (EEP)
Contact: David Jhirad, (703) 875-4072
EEP is a program that addresses concerns about global climate change by enhancing host country capacity for energy efficient and clean energy technology; it is intended to replace the Energy Conservation Services Project at the end of 1992. The Project focuses on three sectors for conservation and demand management: power systems, industry, and the building

and transportation sectors. EEP provides technical assistance to AID missions and regional bureaus; helps developing countries design their own energy efficiency programs; offers energy efficient technology transfer and technology training services, market assessments, and study tours, conferences, and workshops. EEP's technical assistance emphasizes more problem identification and strategic planning. EEP was funded for $3.1 million in 1992 and is projected for $2.2 in 1993; the project is scheduled to be completed in the year 2000.

Program: Energy Planning and Policy Development (EPPD)
Contact: David Jhirad, (703) 875-4072
Also part of the Energy Policy Development and Conservation Program (EPDAC), the EPPD supports institutional capacity building, improved planning, and creation of innovative financing via four project avenues: strategic assessments and policy development to promote integrated resource planning; project development and technology cooperation to promote commercialization ventures between U.S. and developing country firms; environmental impact assessment and mitigation to develop host country capabilities; and information dissemination, training, and reverse trade missions to link U.S. and developing country entities and abet commercialization and transfer of infrastructure-scale technology. 1992 funding was $1.3 million; this is the last year for the program.

Program: Energy Project Development Fund, Office of Energy and Infrastructure
Contact: Rolf Anderson, (703) 875-4203
With a budget of $2.5 million, this Fund provides money for pre-feasibility and feasibility studies for clean energy projects in developing countries. The Fund also makes money available to scout out sustainable and environmentally acceptable economic development projects that promote U.S. trade and investment. Funding for private sector projects has been available since 1990 and public sector projects since 1992, and only U.S. companies, developing country public utilities, and private sector entities that work with U.S. companies are eligible to apply.

Program: Energy Technology Innovation Project (ETIP)
Contact: Ernie Lam, Bechtel, Inc., (703) 528-4488
ETIP provides technical assistance for developing and implementing innovative clean energy and environmental technologies through trade missions and reverse trade missions, technical assessments and feasibility studies, and technology implementation. Initiated in 1990, and scheduled to continue through 1999, ETIP was funded for $3.8 million in 1992 and expects funding of $2 million in 1993.

Program: Energy Training Project (ETP)
Contact: Samuel Schweitzer, (703) 875-4072
Created in 1987, ETP is a ten year project designed to build institutional capacity in developing countries through targeted energy-related training programs for government and private firms. Courses cover a wide range of topics (e.g., energy policy, planning analysis and financing, management of energy enterprises, fossil-fuel exploration and utilization, electric utility operations and development, energy conservation and efficiency, and global warming). The Project also enables graduate-level education at U.S. institutions for a small number of the participants, as well as corporate internships, and internships with U.S. universities and federal agencies.

Program: Entrepreneurs International
Contact: Office of International Training, (703) 875-4147
Entrepreneurs International brings business people and students from developing nations to the U.S. for 4 to 8 weeks of on-the-job training at U.S. companies. EI pays all administrative expenses and U.S. companies offer the training at no cost. The goal is to strengthen business, professional, and personal ties between the U.S. and developing countries and to foster connections that will yield effective trade relationships. The energy efficient technology sector is targeted by this program.

Program: Environmental Credit Program
Contact: Daniel Roberts, (202) 647-9842
AID's $5 million Environmental Credit program provides loans and loan guarantees to selected developing-country commercial ventures that can yield positive environmental impacts and can result in exports of U.S. environmental technology.

Program: Environmental Enterprises Assistance Fund (EEAF)
Contact: Franklin Tugwell, Winrock International, (703) 525-9430
Created in 1990 by AID ($2.4 million), Winrock International, and the Rockefeller Foundation, EEAF is a non-profit international development organization that offers direct loans and equity placements for promoting and disseminating commercially-viable renewable energy and other environmental technologies in developing countries.

Program: Global Energy and Environmental Management (GLEEM)
Contact: David Jhirad, (703) 875-4072
This new program, expected to begin in 1993, will promote sustainable economic growth and increased productivity of energy and environmental sector investments through technical assistance to developing countries. It is expected to result in improved energy and environmental investment decision-making; least-cost planning and environmental management; policy and institutional improvements; and clean energy and environmental technology development and commercialization. GLEEM has a projected first year budget of $2 million.

Program: India's Program for Acceleration of Commercial Energy Research (PACER)
Contact:
Established in 1987 as a six-year, $20 million U.S.-India collaboration, the PACER program provides co-financing grants to Indian manufacturers and research groups to stimulate technological innovation in India's energy sector. Since inception, PACER has supported over 26 projects and studies. Although most of the money is devoted to internal development, several U.S. firms have joint-ventured with Indian companies with PACER funding. AID expects that development of an Indian energy infrastructure will open market opportunities for U.S. firms. AID plans to expand PACER to other parts of Asia.

Program: Private Sector Energy Development Program (PSED)
Contact: Jose Trujillo, Kim Engineering, (703) 524-4400
PSED was created in 1989 to encourage private sector solutions to energy problems in AID-assisted countries. Project activities are designed to build institutional capacity, promote clean energy technology, and stimulate innovative finance. Toward this end, the Program sponsors country assessments that identify needs which U.S. companies can meet, conferences,

workshops, study tours, and funds feasibility studies and technical assistance projects. Projected to continue through 1999, PSED was funded for $2.2 million in 1992, and for $2.4 million in 1993.

Program: Project in Development and the Environment (PRIDE)
Contact: Curt Nissly, (202) 663-2493
AID created the PRIDE program to foster sustainable and economic growth, improve living standards, and minimize environmental, health, and economic risks in developing countries. Promoting a strong environmental technology and services sector is seen as fundamental in realizing these goals. PRIDE uses strategic planning techniques to identify and solve critical environmental and natural resource problems; increase public awareness through information diffusion, technology transfer, training, and environmental education programs; leverage external resources; and conduct practical field demonstrations. PRIDE is a five year project and was established in August of 1991.

Program: Regional Bureaus for Environmental Programs
Contact: Molly Kux, Bureau for Asia, (202) 647-9841
Lydia La Ferla, Bureau for Europe, (202) 647-7270
James Hester, Bureau for Latin America and the Caribbean, (202) 647-8093
AID's regional bureaus oversee, but do not necessarily implement, the AID-sponsored environmental programs in their respective regions.

Program: Renewable Energy Applications and Training Program (REAT)
Contact: Ross Pumfrey, (703) 875-4072
REAT is designed to identify and promote sustainable investments in renewable energy technologies that will meet rural and urban needs for reliable, environmentally sound energy. Within REAT there are four project elements: strategic assessment; project development and technology commercialization support; information dissemination, training, and reverse trade missions; and environmental impact assessment and mitigation. REAT coordinates participating U.S. renewable energy industries joint ventures and investments. Established in 1985 and expected to continue through 1995, REAT was funded for $3.3 million in 1992 and is projected to receive $2 million in 1993.

Program: US-Asia Environmental Partnership (US-AEP)
Contact: Timothy Titus, (202) 835-0366
The fledgling US-AEP was established in January 1992 to foster trading ties among U.S. and Asian government agencies, industries, professional associations, and other potential partners with the aim of facilitating environmental trade and improving environmental quality in Asia. Funded for an initial five years at $100 million by AID, US-AEP divides its work among four programs: Environmental Fellowships, Exchange, and Training; Technology Cooperation; Environmental and Energy Infrastructure; and the Regional Biodiversity Conservation Network. US-AEP is viewed as a long-term effort to create US-Asian partnerships and evolve a multi-billion dollar market for environmental technologies and services in the region.

Program: Water Resources Development (Oman)
Contact: Ken Randolph, 968-703000 (in Oman)
With $42.5 million in funding, AID established the Water Resources Development project to improve the planning, management, and development of water resources in Oman. Project

loans are used to fund the design and construction of a water management system. Grants are used for technical assistance, training, and water resources planning and management. The program has resulted in contracts for U.S. firms.

APPENDIX D
SURVEY OF U.S. PRIVATE SECTOR PROGRAMS TO PROMOTE THE EXPORT OF ENVIRONMENTAL GOODS AND SERVICES

THE ALLIANCE TO SAVE ENERGY
1725 K Street, N.W., Suite 509, Washington, D.C. 20006

Program: **"World Export Program"**
Contact: **(202) 857-0666**
The Alliance is a 1500 member organization that has traditionally focused on domestic energy policy. However, under its World Export Program, which is funded by government, corporate, and foundation contributions, the Alliance plans to help U.S. business identify and explore new world markets for energy efficient products and services. Activities include workshops, trade missions, and publications. In 1991 the Alliance and the International Institute for Energy Conservation (IIEC) co-organized participation of U.S. manufacturers of energy efficient products in a Trade Development Program-sponsored mission to Thailand. In 1991 the Alliance and U.S. AID co-sponsored a workshop on Eastern European markets for energy efficient products and published a follow-up report that outlined each country's market. The Alliance and U.S. AID have worked together on pilot studies for the U.S.-Asia Environmental Partnership (US-AEP) as well. In June 1992 the Alliance initiated a multi-year effort to promote the diffusion of energy efficient technologies by sponsoring a forum entitled, "Global Warming and the Earth Summit: Energy Opportunities for U.S. Business," which highlighted new business opportunities coming out of the climate convention and other UNCED agreements. The Alliance also publishes "A Resource Guide for Exploring Energy Efficient Products," which informs manufacturers about government programs that can help them increase exports.

ENVIRONMENTAL BUSINESS COUNCIL, INC.
53 State Street, Suite 3400, Boston, MA 02109

Program: **International environmental trade development and promotion**
Contact: **Diana Coates, Executive Director, (617) 367-0282**
Slightly over one year old and representing 180 members, the EBC is an association of New England-based environmental and energy ("envirotech") firms which has undertaken to identify and expand domestic and international market opportunities for its members. EBC is very active in networking members with foreign government representatives and potential clients. In the past year, EBC has hosted trade and environment missions from China, Germany, and Czechoslovakia, and speakers from France, Belgium, and Mexico. EBC has also sponsored trade missions to and conferences in Mexico and has established a "Plan of Co-operation" with the Mexican national chamber of commerce, CONCAMIN. EBC has recently completed a scouting mission to Asia and is planning future missions to Eastern and Western Europe to determine possibilities for building trade models with European and Asian partners that are similar to the EBC-Mexico arrangement.

ENVIRONMENTAL ENTERPRISES ASSISTANCE FUND
1622 N. Kent St., Suite 202, Arlington, VA 22209

Program: **Environmental technology promotion through financial support**
Contact: **Frank Tugwell, (703) 522-5928**
The Environmental Enterprises Assistance Fund is an international development non-profit organization established in 1990 by Winrock International and USAID to provide financial support for the promotion and spread of commercially viable renewable energy and other environmental technologies in developing countries. EEAF provides financial assistance for projects of less than $2 million in scope.

ENVIRONMENTAL TECHNOLOGY EXPORT COUNCIL (ETEC)
777 North Capitol Street, NE, Suite 805, Washington, DC 20002

Program: **International environmental export promotion**
Contact: **Denise Pado-Sullivan, (202) 962-3290**
ETEC was established to represent America's leading environmental technology firms and trade associations and help them to capture a larger share of the world pollution control market. Some of the Council's planned activities include a study of U.S. competitiveness in world environmental technology markets, an analysis of available financing and insurance mechanisms, an on-line data base of worldwide project opportunities, training programs in new technologies for members and overseas decision makers, and a translation service on overseas government regulations. ETEC also hopes to sponsor trade missions for U.S. firms and "reverse" trade missions for foreign buyers to visit U.S. businesses. ETEC's first regional priority is to sponsor market studies for Asia.

INDUSTRY COOPERATIVE FOR OZONE LAYER PROTECTION (ICOLP)
2000 L Street, NW, Suite 710, Washington, DC 20036

Program: **Promotion of CFC-alternative technologies**
Contact: **Andrew Mastrandonas, (202) 737-1419**
ICOLP was created in 1989 to aid in the worldwide exchange of information on alternative technologies, substances, and processes for industrial CFC solvents. Through OZONET, an electronic database that provides detailed technical information on CFC alternatives and business contacts, ICOLP is able to transfer a plethora of information inexpensively enough to allow small businesses and even individuals worldwide to tap in. ICOLP's current membership consists of 15 foreign and domestic member companies.

INTERNATIONAL INSTITUTE FOR ENERGY CONSERVATION (IIEC)
420 C Street, NE, Washington, DC 20002

Program: **Activities to promote energy efficient technologies and practices**
Contact: **(202) 546-3388**
The IIEC was established as a non-profit in 1984 to promote energy efficiency and conservation worldwide, and to link U.S. businesses with overseas energy efficiency opportunities. As part of its Model Country Programs, IIEC is currently working with Asian utilities on demand side management (DSM) plans, is exploring energy conservation opportunities in ASEAN, and is working with Latin American industries to initiate energy efficiency programs and develop local

markets for energy efficient technologies and products. In 1991, IIEC and the Alliance to Save Energy conducted an energy efficiency trade mission to Thailand. IIEC has published several reports on energy efficiency programs, including a directory of energy-saving technologies for industrial, commercial, agricultural, and residential use, and is advisor to several development banks.

Program: **"Global Energy Efficiency Initiative (GEEI)," the U.S. Working Group**
Contact: **(202) 546-3388**
The GEEI was launched in 1990 to foster worldwide cooperation on incorporating energy efficiency improvements into developing and Eastern European countries' development strategies. Through its U.S. Working Group on Global Energy Efficiency, the GEEI has efforts underway to promote trade in energy efficient and solar technologies. In 1992, the group plans to target five countries for the development of energy efficiency project proposals and to launch training initiatives in Indonesia and Mexico.

INTERNATIONAL BUSINESS DEVELOPMENT PROGRAM
Northwestern University, Evanston, IL 60208

Program: **International Business Development Environmental Program**
Contact: **Jeffrey Strauss, (708) 491-5617**
IBD program activities range from environmental technology development to providing practical assistance to companies marketing environmental equipment and services. IBD has brought several pollution control equipment buying missions, primarily from Taiwan and Korea, to the U.S. to meet with U.S. suppliers. Follow-up activities have generated an estimated $330 million in environmental exports. IBD also organizes seminars and has developed an inventory of public and private sector environmental technology transfer programs. IBD supports efforts of the Trade Development Program, UNIDO, and the OECD as well. IBD regularly receives requests from foreign firms to identify environmental equipment suppliers.

INTERNATIONAL TRADE COUNCIL
1900 Mt. Vernon Ave., PO Box 2478, Alexandria, VA 22301-0478

Program: **Export analyses for environmental technologies**
Contact: **(703) 548-1234**
The ITC, which works in conjunction with its sister organization, the International Development Institute, has a membership of 850 importing and exporting companies in fields that include energy, water, and sanitation. The Council offers analyses of business opportunities and risks and tracks various international regulations and initiatives. The ITC has identified environmental technologies as a new priority area.

NATIONAL ENVIRONMENTAL TECHNOLOGY APPLICATIONS CORP. (NETAC)
Univ. of Pittsburgh Applied Research Ctr., 615 William Pitt Way, Pittsburgh, PA 15238

Program: **Promotion of international trade in innovative environmental technologies**
Contact: **Ivy Schram, (412) 826-5552**
NETAC is a non-profit organization created in 1988 by EPA and the University of Pittsburgh Applied Research Center to nurture the development of environmental technologies and accelerate their movement into the marketplace. While NETAC does not advocate particular technologies,

it does provide technical assistance, technology demonstration, and evaluation, conduct surveys of domestic and foreign markets, and help innovators to commercialize their technologies. NETAC also publishes "Environmental Technology and Product Profiles" of state-of-the-art technologies and products. NETAC actively promotes its services, and because it is more "best-technology-oriented" than U.S. trade-oriented, NETAC does not exclusively represent U.S. firms. Promotion of international trade in innovative technologies is conducted by the International Services Department, which manages NETAC's cooperative partnerships with foreign entities -- for example, Poland, Hungary, and Russia have agreements with NETAC for technology transfer, assistance, and training programs, and two universities in Germany work under cooperative agreement on joint research. NETAC has also led a delegation of American companies to the former Soviet republics to discuss Soviet environmental technology needs. In the U.S., NETAC consults to technology innovators on foreign environmental needs, infrastructures, and changing economies. The organization also works with international clients to identify market niches and competitive products in the U.S. Particularly, NETAC has targeted Europe, Venezuela, and Canada for training and technology transfer programs.

U.S.-ASEAN COUNCIL FOR BUSINESS AND TECHNOLOGY, INC.
1400 L Street, NW, Suite 650, Washington, DC 20005

Program: **Facilitates environmental business and technology trade**
Contact: **Levi Richardson, (202) 289-1911**

The U.S.-ASEAN Council, with a membership of over 60 U.S. and Asian companies, represents the interests of the private sector in and to the Association of Southeast Asian Nations (ASEAN). The Council's main initiatives emphasize strengthening U.S. government trade and investment promotion programs, promoting business-government cooperation, providing trade and investment information, and facilitating industry-specific contacts. The Council conducts focused, industry-specific trade and investment programs for businesses to develop new commercial opportunities in these countries, and in late 1991 led a mission to Thailand, Indonesia, and Singapore on environmental market opportunities. Prior to that, U.S.-ASEAN held a seminar in Washington on environmental technologies trade and investment opportunities, and in May 1992 sponsored a business development mission to Thailand and Malaysia on waste water and hazardous waste technologies, and environmental services and consulting. In June 1992, the Council led an environmental technologies development mission to the Philippines and Malaysia, and a mission to Indonesia and Thailand on clean coal technology and market development. The Council has planned further environmental business missions to Indonesia, Singapore, Thailand, and Malaysia.

U.S. ENVIRONMENTAL TRAINING INSTITUTE
3000 K Street, NW, Suite 690, Washington, DC 20007

Program: **U.S. Environmental Training Institute (USETI)**
Contact: **Edith Cecil, (202) 338-3400**

EPA, AID, and TDA together have established the non-profit U.S. Environmental Training Institute (USETI), a public-private initiative to build environmental management capacity in developing countries. Through USETI, U.S. companies teach topical courses, developed by EPA and industry, to policy leaders and potential clients from developing countries. USETI provides scholarships for most attendees and offers firms an opportunity to showcase their technologies. USETI was provided $300,000 in federal start-up funds; industry is responsible for program

costs. USETI also gets federal, and in particular EPA, in-kind support; considering this, government support exceeds $1 million.

WORLD TRADE CENTERS ASSOCIATION, INC.
One World Trade Center, Suite 7701, New York, NY 10048

Program: **Facilitates general international business and trade**
Contact: **(212) 432-2626**
The WTCA is a non-profit organization founded in 1968 that represents over 150 regional World Trade Centers worldwide. Regional WTCs (there are 64 in the U.S.) provide a central focal point for regional trade and conduct activities to coordinate regional business and government agencies involved in international trade. WTCs offer a variety of services, including international office and exhibit space, trade research and information, and trade mission programs, and can focus their efforts on industry-specific opportunities. The Pittsburgh WTC, for example, has developed a targeted program to educate its members on opportunities in the international environmental goods market.

USEFUL PUBLICATIONS

Business and the Environment
Cutter Information Corp.
(617) 648-8700

Business Opportunities in Eastern Europe
Atlantic Information Services, Inc.
(202) —

Eastern European Energy Report
A Strategic Marketing Inc. Co.
(212) —

Ecology and Economics
Ecologize for Profit
(708) 359-6391

Energy, Economics and Climate Change
Cutter Information Corp.
(617) 648-8700

Environmental Business Journal
Environmental Business Publishing, Inc.
(800) 446-4325

Environment Watch: East Europe, Russia, and Eurasia
Cutter Information Corp.
(617) 648-8700

International Business and Sustainable Development
International Environmental Bureau of the International Chamber of Commerce
P.O. Box 301
N-1324 Lysaker, NORWAY
(47 2) 58 18 00 - telephone
(47 2) 58 18 75 - fax

International Environment Reporter
The Bureau of National Affairs, Inc.
(202) 452-4200

International Trade and Technology NewsACTION
International Business Development Program, Northwestern University
(708) 491-5617

OTHER RESOURCES

Chamber of Commerce of the United States
1615 H Street, NW, Washington, DC 20062
(202) 659-6000

U.S. Export Council for Renewable Energy
777 North Capitol Street, NE, Suite 805, Washington, DC 20002
Contact: (202) 408-0660
ECRE is comprised of nine member associations that represent over 800 companies in the renewable energy field. ECRE heads the Industry/Trade Activities Service Group of the inter-agency Committee on Renewable Energy Commerce and Trade (CORECT).

World Environment Center (WEC)
419 Park Avenue South, Suite 1800, New York, NY 10016
(212) 683-4700

APPENDIX E
SURVEY OF INTERNATIONAL PROGRAMS TO PROMOTE THE EXPORT OF ENVIRONMENTAL GOODS AND SERVICES

AUSTRIA

Program: **Austrian Trade Commission**
Contact: **Bernhard Zimberg, Austrian Embassy, (202) 895-6717**

The Austrian government provides promotional assistance to its environment industries through state Trade Commission representation at trade fairs and international events. The Austrian Federal Economic Chamber also publishes catalogs of select firms that offer state-of-the-art environmental and engineering technologies. The promoted firms primarily address air, water, and soil media, and, to a lesser extent, alternative energy, recycling, and noise.

Source Documents:
Austrian Foreign Trade Office, "Austrian Economic Guide: Environment and Technology."

Austrian Federal Economic Chamber, "Austrian Environmental Technologies All Over the World," 1992.

Austrian Federal Economic Chamber, "Austria Export: Environmental Engineering."

Austrian Trade Commission, "Austrian Economic Guide: Environment and Energy."

CANADA

Program: **Environmental Industries Sector Initiative (EISI)**
Contact: **Richard Slowikowski, Environmental Industries Directorate, Industry, Science and Technology Canada, (613) 954-2989**

Industry, Science and Technology Canada (ISTC) has positioned itself to be "an agent of change in the 1990s" by undertaking programs to promote the development and application of new, cleaner, more efficient technologies, and the science needed to underpin such developments. In April 1989, ISTC launched the Environmental Industries Sector Initiative (EISI), an industrial development strategy to improve the competitiveness of Canadian industries which produce environmental goods and services. Through EISI, ISTC hopes to promote the development of "a world class environmental industry in Canada." Phase I of EISI, completed in March 1992, established a consultation network among federal and provincial governments and industry that will be used to collect, synthesize, and disseminate information on environmental industries, identify business opportunities. Phase II, 1992-1997, will focus on ways that Canada can capitalize on these opportunities to make its environment sector internationally competitive. Intrinsic to this effort is the establishment of an initially government-sponsored national association of environmental companies.

Program: **Technology for Environmental Solutions**
Contact: **Peter Drabble, Canadian Embassy, (202) 682-1740 x 7740**

The Technology for Environmental Solutions program, combining the Science and Environment Ministries, was established in 1991. The program administers technology demonstration and transfer components and an information network and allocates a budget of $100 million.

Program: **Catalogs Products and Services**
Contact: **Peter Drabble, Canadian Embassy, (202) 682-1740 x 7740**
External Affairs and International Trade Canada publishes three extensive directories of firms that specialize in various environmental services or manufacture environmental products.

Program: **Other Publications**
Contact: **Conference Board of Canada, (613) 526-3280**
In 1989, the Conference Board, in conjunction with Industry, Science and Technology Canada and the Environmental Industries Sector Initiative, established the Business and Environment Research Program, which has produced two reports, "Business and the Environment: Economic Benefits from Environmental Improvements" and "Business and the Environment: Strengthening Canadian Environmental Companies." The reports are intended to assist the growth of environment companies in Canada and enhance their international competitiveness by helping them take advantage of expanded business opportunities throughout the world.

Program: **Cross-certification of technologies (conceptual)**
Contact: **Peter Drabble, Canadian Embassy, (202) 682-1740 x 7740**
Drabble is spearheading a project to look into whether the U.S. and Canada might work out an arrangement whereby EPA would certify successfully-demonstrated Canadian environmental technologies -- much like Canada's current arrangement with FDA for pharmaceuticals. The program he describes sounds similar to one that ORD's Technology Transfer Staff is considering, only here, technologies would be tested on Canadian sites and the U.S. would affirm whether the technologies successfully accomplish their objective. Such an arrangement might be compatible with ORD's initiative, because Canada could provide project funding, which is the primary obstacle for EPA, as well as sites. If we pursue this, we should look into whether joint technology ventures, joint patenting, or cooperative rights assignment could be arranged, akin to the U.S. National Technology Initiative of the FTTA.

Program: **British Columbia, Catalogs of Products and Services**
Contact: **Peter MacLean, Government of British Columbia Canada, (714) 852-0201**
The Government of British Columbia, Canada, has published a targeted compendium of British Columbia firms which offer proven, marketable technologies appropriate for export. Firms promoted specialize in water and wastewater treatment, waste management, environmental information systems, and to a lesser extent, water and marine monitoring, air pollution control, alternative fuel, and oil spill cleanup technologies.

Source Documents:
British Columbia Trade and Tourism, "Environmental Technology," 1992.

Environment Canada, "Canada's Green Plan," 1990.

Environment Canada, "Technology for Environmental Solutions," in connection with Canada's Green Plan.

External Affairs and International Trade Canada, "Canada... A World Leader in Environment Products and Services," catalog.

External Affairs and International Trade Canada, "Industry and the Environment: Directory of Canadian Environmental Services and Firms," catalog.

External Affairs and International Trade Canada, "Industry and the Environment: Directory of Manufacturers of Environmental Products," catalog.

Industry, Science and Technology Canada, "The Environmental Industries Sector Initiative: An Overview and Progress Report for 1989-1990," June 1990.

Industry, Science and Technology Canada, "Toward Sustainable Development: Challenges and Opportunities," June 1991.

Organisation for Economic Cooperation and Development, "The OECD Environment Industry: Situation, Prospects and Government Policies," Paris 1992.

The Conference Board of Canada and Industry, Science and Technology Canada, "Business and the Environment: Economic Benefits from Environmental Improvements," March 1991.

The Conference Board of Canada and Industry, Science and Technology Canada, "Business and the Environment: Strengthening Canadian Environmental Companies," March 1991.

World Resources Institute, "Backs to the Future: U.S. Government Policy Toward Environmentally Critical Technology," June 1992.

DENMARK

Program: **Danish Technology Institute (DTI)**
Contact: **Danish Embassy, (202) 234-4300**
Acts as a research and technology deployment center.

Program: **International Company Development Project**
Contact: **Danish Embassy, (202) 234-4300**
Develops 2- to 5-year business plans for internationalizing and upgrading technical and managerial sophistication of firms. The program allows firms from outside Denmark to participate, and thus creates trade networks among the countries involved. Funding is received from the government, the EC Social Fund, and governments of participant countries. Past projects have been conducted with the Irish Productivity Center and the Dutch Institute for Small and Medium Craft Businesses, and future projects are planned with Spain, Portugal, Italy, France, and Eastern Europe.

Program: **Ministry of Industry**
Contact: **Danish Embassy, (202) 234-4300**
In 1990, the Ministry concluded a comprehensive Export Market Development Program that provided government soft loans for 40-60% of the costs to research a targeted market. If successful, loan were to be repaid, otherwise not. That concluded program was superseded by the Export Network Development Initiative, which is aimed at fostering local and regional producer networks. Networks are composed of groups of private firms, which are brokered by private consultants, and are overseen by the Danish Technology Institute with funding from

private industry. Government provided the start-up funds, but the program is expected to be self-supporting shortly. Under the Ministry, the National Agency for Industry and Trade also runs a "Premarket Diagnosis" program to assess the export-readiness of small firms without prior experience and to provide loans (repayable if successful, otherwise not) to cover 70% of the costs of hiring a private consultant to develop an exporting strategy. Denmark also runs a program similar to Sweden's "Export-Manager-for-Hire" that provides funding to firms to hire a professional who will spend 20-40% of his time with the firm establishing export capacity and skills.

Program: **National Union of Clerks**
Contact: **Danish Embassy, (202) 234-4300**
Offers an export assistant curriculum with the Federation of Danish Employers and the Aarhus School of Commerce that provides training and arranges internships.

Source Documents:
Confederation of Danish Ministries, "Danish Pollution Control: Equipment and Technical Know-How," 1992.

Danish Ministry of the Environment, National Environmental Protection Agency, "Cleaner Technology Action Plan: 1990-1992," June 1990.

Danish Ministry of the Environment, National Environmental Protection Agency, "Research and Development Projects in the Fields of Waste Water Treatment and Aquatic Environment Technology in Denmark, 1988-1991," June 1989.

GAO, "Export Promotion: A Comparison of Programs in Five Industrialized Nations," June 1992.

William Nothdurft, "Going Global," (Washington, DC: Brookings Institution, September 1992).

Organisation for Economic Cooperation and Development, "The OECD Environment Industry: Situation, Prospects and Government Policies," Paris 1992.

Danish Ministry of Foreign Affairs, "Danish Know-How," from the Export Directory of Denmark 1988/89.

Danish National Environmental Protection Agency, "Report on Cleaner Technology 1990-1992," on which the above Action Plan is based.

Danish Ministry of the Environment, "Government Action Plan on Environment and Development."

EUROPEAN COMMUNITY (EC)

Program: **EC-Established Independent Trade Association**
Contact: **Helen Donahue, European Delegation, (202) 862-9500**
The Network for Environmental Technology Transfer (NETT), established as an independent association by the EC in 1989, provides networking services to coordinate industry with users

of clean technologies. NETT offers consulting services, on-line databases, advice on R&D services, and seminars, workshops, trade fairs, etc.

Program: European Information Centres
Contact: European Delegation, (202) 862-9500
Centres offer market opportunity data and connect would-be exporters with potential buyers and trading partners. Charge nominal fees-for-service.

Program: Business Cooperation Network (BC-NET)
Contact: European Delegation, (202) 862-9500
Offers market opportunity data and contacts, similar to Information Centres.

Source Documents:
Conversation with Sebastian Remoy [research analyst on OTA report, "Trade and Environment: Conflicts and Opportunities"], U.S. Congress Office of Technology Assessment, July 6, 1992.

Commission of the European Communities, "EC Research Funding: 3rd Framework Programme 1990-1994," 3rd Edition, January 1992.

Commission of the European Communities, "EC Research Funding," 2nd Edition, May 1990.

"Checklist for the Negotiation and Drafting of an International R&D Cooperation Agreement in the Framework of a EUREKA Project," 1988.

"EUREKA Annual Progress Report 1991."

"EUREKA 1989 Project Progress Report."

"EUREKA News: Opening Europe to SMEs," May 19, 1992.

GAO, "Export Promotion: A Comparison of Programs in Five Industrialized Nations," June 1992.

"Medium Term Plan for EUREKA 1989-92"

William Nothdurft, "Going Global," (Washington, DC: Brookings Institution, September 1992).

"Guidelines for the Protection of Technological Information: EUREKA"

"OPETs: Organisations for the Promotion of Energy Technology," Energy in Europe, June 30, 1991.

"Specific Actions for Vigorous Energy Efficiency" Energy in Europe, June 30, 1991.

FINLAND

Program: Catalog of products and services, market intelligence
Contact: Joseph Reini, Embassy of Finland, (202) 363-2430
The Finnish Foreign Trade Association (FFTA) has a section for environmental technology which

provides export promotion and advisory services. The FFTA publishes magazines, catalogs, and reference materials for prospective clients, and the Finnish Ministry of the Environment, Ministry of Trade and Industry, and Foreign Trade Association collectively publish a textbook-like hardcover, "Environmental High-Technology From Finland," that technically explains state-of-the-art innovations and gives company contacts. FFTA focuses promotional activity on European markets and sponsors a Euro-Info-Centre that provides firms with Euro-market intelligence. However, developing country markets are becoming an increasing priority. In 1991 the Finnish government and the World Bank co-sponsored a seminar on "Finland's Approach to Environmental Issues" which aggressively promoted Finnish environmental companies to development specialists.

Source Documents:
Embassy of Finland and the World Bank, compendium for "Seminar on Finland's Approach to Environmental Issues" 1991.

Finnish Foreign Trade Association, "Finnish Energy Technology: Peat and Bioenergy, Power Generation, Electrification," 1989.

Finnish Foreign Trade Association, "Finnish Trade Review: Energy," August 1990.

Finnish Foreign Trade Association, "Finnish Trade Review: Energy and Environment," May-June 1991.

Ministry of the Environment, "Environmental High-Technology from Finland," Helsinki 1987.

Organisation for Economic Co-Operation and Development, "The OECD Environment Industry: Situation, Prospects and Government Policies," Paris 1992.

FRANCE

Program: Programs Under the Ministry of Economic Affairs, Finance, and Budget
Contact: French Embassy, (202) 944-6300
Formulates trade policy and manages overseas trade promotion in general. Under the Ministry, the Direction des Relations Economiques Exterieures (DREE) is the main policy making agency for export promotion and credit activities. DREE's Centre Francais du Commerce Exterieur (CFCE) *(Center for Foreign Commerce)* is the primary contact point domesticly for export promotion services, with a network of 24 regional offices, and an office in Paris, that counsel exporters, organize overseas trade events, distribute trade information, and offer seminars with chambers of commerce on foreign market or sector opportunities. The CFCE is a fee-for-service organization. DREE's Poste d'Expansion Economique is the main contact point overseas for export promotion services. Its 180 posts in 80 countries disseminate market and opportunities information, locate agents and distributors, support participation in trade events, and counsel visiting French firms. The French Committee for External Economic Events (CFME), also under DREE, sponsors or helps organize more than 200 general and country-specific trade events annually and assists exhibitors with booths; exhibitors pay all costs of participation, but COFACE insurance reduces the risks and guarantees 50-60% of costs.

Program: **Agency for International Promotion of SMEs (API-PME)**
Contact: **French Embassy, (202) 944-6300**
The Agency for International Promotion of SMEs (API-PME), a spin-off of "the General Federation of SMEs" lobbying organization, provides 2-3 years' assistance to SMEs to test and enter new export markets through its 17 offices (often shared with French Trade Commission) in 15 countries, conducts firm audits and test marketing of products, identifies potential importers and distributors, joint venture partners, and subsidiaries. Overseas branches identify market sector opportunities and bring these to firms' attention.

Program: **Compagnie Francaise d'Assurance pour le Commerce Exterieur (COFACE)**
Contact: **French Embassy, (202) 944-6300**
The Compagnie Francaise d'Assurance pour le Commerce Exterieur (COFACE) *(French Insurance Company for Foreign Trade)* is an export insurance and guarantee agency with a network of 22 regional offices that offers specialized insurance for market research and export financing assistance in cooperation with commercial banks. COFACE reimburses 50% of costs for two market development missions and guarantees 50-60% of market exploration costs and other costs if market R&D proves unsuccessful. For SMEs producing innovative products with export potential, COFACE guarantees up to 75% of market studies costs through the National Agency for Research and Expansion (ANVAR). And COFACE runs an "assurance prospection" program for large firms, guaranteeing up to 75% of fixed costs to investigate overseas markets.

Program: **Regional Assistance and Consultancy Fund (FRAC-Export)**
Contact: **French Embassy, (202) 944-6300**
Government-subsidized (50%) market research consultancy fund through which regional governments or chambers of commerce assist firms in hiring marketing consultants to prepare a customized study of a target export market.

Program: **Essone's "Objective Europe" Program**
Contact: **French Embassy, (202) 944-6300**
A joint public-private program to broker joint ventures between Essone's firms and potential partners for trade, production, and technology-sharing agreements.

Program: **Regional Mission for the Coordination of International Trade with Brittany (MIRCEB)**
Contact: **French Embassy, (202) 944-6300**
A public-private partnership that grew out of dissatisfaction with the limitations of conventional support. Offers tailored assistance to small firms (e.g., foreign market studies, trade fair assistance, strategic counseling, searches for overseas representatives, and facilitates joint ventures) on a fee-for-service basis. Draws up customized contracts with individual firms to penetrate specific markets and subsidizes 30% of export-related costs. Offices in U.S., Asia, Europe, and France.

Program: **Chambers of Commerce**
Contact: **French Embassy, (202) 944-6300**
Organize foreign trade missions and sponsor information centers, data banks, and training courses; receive some government funding and additional subsidies for certain trade events. Membership in local and regional Chambers is mandatory for some firms. Overseas Chambers provide information, facilities, commercial assistance.

Program: Federation of Small and Medium-Sized Industries
Contact: French Embassy, (202) 944-6300
Targets medium-sized companies to establish foreign subsidiaries; receives government support.

Source Documents:
Discussion with the U.S.-ASEAN Business Council staff, June 17, 1992.

GAO, "Export Promotion: A Comparison of Programs in Five Industrialized Nations," June 1992.

William Nothdurft, "Going Global," (Washington, DC: Brookings Institution, September 1992).

GERMANY

Program: Ministry for Economic Affairs (BMWi)
Contact: German Embassy, (202) 298-4000
The Ministry for Economic Affairs *(The Bundesministerium fur Wirtschaft, BMWi)* is responsible for overall government export promotion activities. Under BMWi, the Federal Office for Foreign Trade Information *(Bundesstelle fur Aussenhandelsinformation, BfAi)* is the key agency that gathers and disseminates export assistance information via worldwide network of trained "correspondents."

Program: Ministry of Industry
Contact: German Embassy, (202) 298-4000
Provides funding to Chambers of Industry and Commerce (IHK) and Chambers of Commerce Abroad (AHK) for firm-tailored market research.

Program: German Diplomatic Corps
Contact: German Embassy, (202) 298-4000
Provides BfAi with economic-related information and reports.

Program: Export Credit Institute (AKA)
Contact: German Embassy, (202) 298-4000
Centrally approves firms' applications for medium- and long-term export-related financing made through any of 54 commercial banks.

Program: State of Rhine-Westphalia
Contact: German Embassy, (202) 298-4000
Provides support for trade fairs (60-65% of its export promotion budget) and covers 50% of booth set-up and staffing costs. Also offers a "Partner Search" program.

Program: North Rhine-Westphalia Foreign Trade Institute
Contact: German Embassy, (202) 298-4000
A joint venture of State Chambers of Commerce and Craft and State government that covers 40-50% of private consultant costs (up to $13,000) to review local firms' export readiness.

Program: Chambers of Commerce
Contact: German Embassy, (202) 298-4000
National umbrella network of overseas and domestic chambers receive, sort, and distribute

foreign trade information to affiliate chambers in Germany and abroad. The Chambers are central to the informal network of semi-private and private organizations. The Association of Chambers of Industry and Commerce (IHK) plays a primary role in assisting exporters domestically, and linking exporters, government organizations, and overseas chambers; providing advice, information or consulting referrals, and sponsoring specialized seminars on exporting procedures and transactions, sometimes in cooperation with state governments; offering market analyses conducted by AHK for government-subsidized cost. The IHK are self-supporting, but domestic chamber membership is mandatory. The 43 Chambers of Commerce Abroad (AHK) effectively act as Foreign Commercial Service, with bilateral operations that provide a full range of export services, particularly market and marketing advice and assistance in locating agents and distributors; funded by membership dues, fees for services, and the government.

Program: German Industry Council for Exhibitions and Trade Fairs
Contact: German Embassy, (202) 298-4000

The Council *(Die Austellungs und Messe-Ausschuss der Deutchen Wirtschaft, AUMA)* is a private "umbrella" organization that brings together government, and several dozen private sector fair organizers, chambers of commerce, and trade associations in coordinating domestic and overseas trade events; screens trade fairs held abroad and oversees German participation; helps organize and oversee 100+ fairs held annually in Germany. The Council is considered the de facto trade fair expert for the European Community. The German government subsidizes 30% of firms' participation costs in trade fairs and provides funds to AUMA for special projects such as research.

Source Documents:

GAO, "Export Promotion: A Comparison of Programs in Five Industrialized Nations," June 1992.

German Federal Minister for Research and Technology, "Environmental Research and Technology Programme 1989-1994," 1989.

German Federal Ministry for the Environment, "Environmental Protection in Germany, Summary," June 1992.

German Federal Ministry for the Environment, "Environmental Report 1990, Summary," May 1990.

German Federal Ministry for the Environment, "Umweltpolitik: Outline of the Fourth Immission Control Report of the Federal Government," July 1988.

German Federal Ministry for Research and Technology, "Global Change: Our World in Transition," March 1991.

William Nothdurft, "Going Global," (Washington, DC: Brookings Institution, September 1992).

Organisation for Economic Cooperation and Development, "The OECD Environment Industry: Situation, Prospects and Government Policies," Paris 1992.

U.S. Embassy London, Summary of ACOST Report, "Environmental Research Programs."

World Resources Institute, "Backs to the Future: U.S. Government Policy Toward Environmentally Critical Technology," June 1992.

ITALY

Program: **Ministry of Trade**
Contact: **Italian Embassy, (202) 328-4750**
The Italian Ministry of Trade *(Ministero del Commercio con l'Estero)* is responsible for foreign trade and export promotion policy. Technically under the Ministry, the Institute of Foreign Trade *(Instituto Nazionale per il Commercio Estero, ICE)* obtains policy direction and funding from Ministry, but tends to function as an autonomous public corporation, carrying out export promotion programs and providing advanced training for export professionals. ICE also subsidizes trade fair participation costs with firms. ICE has 38 domestic offices, 75 foreign offices, and 5 overseas trade centers which operate independently from the embassies. There are plans to establish specialized overseas service centers that focus on specific market sectors.

Program: **Ministry of Foreign Affairs**
Contact: **Italian Embassy, (202) 328-4750**
The Ministry *(Ministero degli Affari Esteri)* provides support through embassies and consulates.

Program: **Confederation of Italian Industries**
Contact: **Italian Embassy, (202) 328-4750**
The Confederation *(Confindustria)* is the main association that represents and supports 130,000 industrial enterprises. Firms are sub-grouped into industry consortia with more targeted promotion services. The R.O.M.E. Consortium, for example, funds 70% of firms' trade fair expenses.

Program: **Chambers of Commerce**
Contact: **Italian Embassy, (202) 328-4750**
Offer a range of export-related services though network of domestic and overseas offices. Domestic Chambers are privately supported and activities are generally independent from those of other organizations. Domestic Chambers provide seminars on export procedures and transactions. Overseas Chambers provide trade fair support.

Program: **ERVET**
Contact: **Italian Embassy, (202) 328-4750**
ERVET, an export service organization, is a quasi-public economic development corporation that maintains several regional service centers providing sophisticated business services to networks of manufacturing firms that are too small to afford their own. The Service Center for Export Development of Emilia-Romagna Firms (SVEX), created by ERVET in cooperation with regional chambers of commerce and production associations, identifies untapped but potentially important markets and works to establish long-term trade relationships. SVEX is currently funded by ERVET, but is expected to become self-supporting through fees. RESFOR, another center located in Emilia-Romagna, acts as a subcontractor network by maintaining a continuously-updated data base of member firms' production capabilities to provide technical profiles of firms to large manufacturers worldwide looking to subcontract. RESFOR provides members with profiles on large companies seeking subcontractors, and also represents firms at trade fairs and

provides information on emerging markets. RESFOR is funded by low membership fees and ERVET, but is expected to be self-supporting by 1995.

Program: **Environment Ministry**
Contact: **Italian Embassy, (202) 328-4750**
The Environment Ministry currently has plans for a more market-oriented approach to environmental protection and will shift some activities to the private sector.

Source Documents:
GAO, "Export Promotion: A Comparison of Programs in Five Industrialized Nations," June 1992.

William Nothdurft, "Going Global," (Washington, DC: Brookings Institution, September 1992).

World Resources Institute, "Backs to the Future: U.S. Government Policy Toward Environmentally Critical Technology," June 1992.

JAPAN

Program: **New Earth 21**
Contact: **Japanese Embassy, Economics Section, 939-6700**
New Earth 21 is a one hundred-year project under the administration of the Ministry of International Trade and Industry (MITI) which is aimed at repairing the damage done to the earth since the industrial revolution began. The program emphasizes suppressing and reversing damage done by greenhouse gases and targets five "new earth" initiatives: energy efficiency and conservation, clean energy sources, environment-oriented technology development, CO_2 sinks enhancement, and future generation energy-related technologies. All of these initiatives were begun in 1990, but they will mature at staggered ten-year intervals. Japan will pursue New Earth 21 through its newly-established Research Institute of Innovative Technology for the Earth (RITE) which is guided by NEDO, the International Center for Environmental Technology Transfer (ICETT) which is administered by the Ministry of Foreign Affairs, and through other domestic and foreign organizations. Japan plans to promote worldwide diffusion of the new technologies through expert advisors, training, transfer, and research exchange. In 1990, MITI budgeted a total of ¥ 6 billion for environmental technology R&D – of which ¥ 2 billion was slated to support private sector research.

Program: **Research Institute of Innovative Technology for the Earth (RITE)**
Contact: **Japanese Embassy, Economics Section, (202) 939-6700 and**
Mr. Fukumizu, NEDO/Japanese Embassy, (202) 822-9298
The Research Institute of Innovative Technology for the Earth (RITE), which receives most of its funding through the New Energy and Industrial Technology Development Organization (NEDO) under MITI, was established in July 1990 as the research institute leg of Japan's New Earth 21 initiative. However, Japan plans to use RITE to provide opportunities for international scientific exchange, to construct an international network to promote environmental technology, to collect and distribute information on environment-related technology, to establish a technologies reference data base system, and to promote the adoption of systems that use new industrial technologies.

Program: **International Center for Environmental Technology Transfer (ICETT)**
Contact: **Mr. Fukumizu, NEDO/Japanese Embassy, (202) 822-9298**
The International Center for Environmental Technology Transfer (ICETT) was established in 1990 to carry out technology transfer under New Earth 21. ICETT, administered by the Ministry of Foreign Affairs, had a starting FY 1990 budget of ¥ 2 billion. In addition to transfer activities, ICETT works closely with Japanese research institutions such as RITE, maintains its own R&D facilities, and hosts foreign researchers and research exchange. In 1990, ICETT commissioned four private Japanese companies to develop CO_2-fixing, industrial pollution control, and energy efficiency technologies that are intended to be transferred to developing and Eastern European countries.

Program: **Action Program to Arrest Global Warming**
Contact: **Japanese Embassy, Economics Section, (202) 939-6700**
The Action Program to Arrest Global Warming was established in 1990 to pursue Japan's 1990-2010 priority of stabilizing global per capita and total CO_2 emissions; arrest methene and other gas emissions as 1990 levels; and conserve and develop forest "sinks." To do this, Japan is looking at reforming urban structures and improving transportation systems, energy supply systems, manufacturing processes, and life style behavior. RITE is central to the effort.

Source Documents:
Conversation with Sebastian Remoy [research analyst on OTA report, "Trade and Environment: Conflicts and Opportunities"], U.S. Congress Office of Technology Assessment, July 6, 1992.

Embassy of Japan, various memos.

"Environmental Technology Transfer Center Commissions Four Firms to Develop Environmental Technologies," Chemicals & Materials, Sept. 26, 1990.

Government of Japan, Ministry of International Trade and Industry, "The Global Environmental Challenge: Japanese Initiative for Technological Breakthrough," February 1990.

Kazuo Matsushita, Japan Environment Agency, "Sharing Responsibility for Global Development and Environmental Sustainability: A Japan Perspective," February 1990.

Ministry of Foreign Affairs, "Economic Development and the Environment: The Japanese Experience," April 1992.

Ministry of Foreign Affairs, "Japan's Environmental Endeavors," April 1992.

Ministry of International Trade and Industry, "International Center for Environmental Technology Transfer (ICETT)."

Research Institute of Innovative Technology for the Earth (RITE) booklet describing RITE functions and goals, Sansei City, Japan.

Research Institute of Innovative Technology for the Earth (RITE), "Joint Research Programs for Global Environment-Related Technologies: Invitation for FY 1991," 1991.

U.S. Embassy Tokyo, unclassified memorandum transmitting MITI "New Earth 21" documents, March 1990.

World Resources Institute, "Backs to the Future: U.S. Government Policy Toward Environmentally Critical Technology," June 1992.

Yasuhiro Shimazu, Environmental Attache to the Embassy of Japan, "Japan's Policy on Global Warming," December 1990.

Yasuhiro Shimazu, Environmental Attache to the Embassy of Japan, "The New Earth 21 - Action Program for the 21st Century," presentation at Johns Hopkins School of Advanced International Studies, Spring 1992.

KOREA (SOUTH)

Program: Export Promotion Program
Contact: Alan Walker, Korea Free Trade Association, (202) 828-4400
South Korea recently unveiled a 10-year plan to spend more than $1 billion (75% public and 25% private monies) to develop an environmental technologies R&D program that includes constructing an export platform for Korean environmental products. The government has also proposed establishing a regional institution for cooperation on environmental issues.

Source Documents:

"Korea's Environment Plan," Wall Street Journal, May 26, 1992, p. A12.

"ROK Announces New Environmental Initiatives," KOREAupdate, June 29, 1992, p. 4.

U.S. Embassy Seoul, unclassified cables, July 1992.

NORDIC COUNCIL OF MINISTERS: DENMARK, FINLAND, ICELAND, NORWAY, and SWEDEN

Program: Nordic Environment Finance Corporation (NEFCO) for Export Financing
Contact: Harro Pitkanen, NEFCO, Helsinki, 358-0-1800229
The Nordic Environment Finance Corporation (NEFCO) was established in 1990 by the Nordic country governments to provide risk capital for joint ventures between Nordic and local partners in Central and Eastern Europe and the former USSR. NEFCO supports long-term collaborative efforts to produce environmental technology and equipment, upgrade industrial processes, and supply consulting services in the environmental sector, and emphasizes establishing strong environmental manufacturing and services sectors in these partner countries.

Program: Nordic Investment Bank (NIB)
Contact: Monica Lofgren, Nordic Investment Bank, Helsinki, 358-0-18001
The Nordic Investment Bank (NIB), which jointly owned by the governments of Denmark, Finland, Iceland, Norway, and Sweden and operates NEFCO, provides financing for investment projects within and outside the Nordic region. NIB encourages environmental improvement investments in the Nordic countries and surrounding regions.

Source Documents:
Organisation for Economic Co-Operation and Development, "The OECD Environment Industry: Situation, Prospects and Government Policies," Paris 1992.

Stephan Schmidheiny, "Changing Course: A Global Perspective on Development and the Environment," MIT Press, 1992.

William Delphos, "Environment Money: The International Business Executive's Guide to Government Resources," Venture Publishing, 1990.

NORWAY

Program: Program Similar to Sweden's "Export-Manager-for-Hire"
Contact: Embassy of Norway, (202) 333-6000
Norway runs a program similar to Sweden's "Export-Manager-for-Hire" that provides money to firms lacking the internal capacity to begin exporting to hire a consultant that will spend 20-40% of his time working within the firm to establish export capacity and skills.

Source Documents:
GAO, "Export Promotion: A Comparison of Programs in Five Industrialized Nations," June 1992.

William Nothdurft, "Going Global," (Washington, DC: Brookings Institution, September 1992).

Organisation for Economic Co-Operation and Development, "The OECD Environment Industry: Situation, Prospects and Government Policies," Paris 1992.

Export Council of Norway, "Norway Exports '90: Environmental Technology and Services," 1990.

SWEDEN

Program: Ministry of Industry
Contact: Swedish Embassy, (202) 337-5170
Under the Ministry of Industry, the Swedish National Industrial Board delivers export development and other services to SMEs through Regional Development Funds, regional planning, and development agencies administered by county councils. Regional Development Funds (RDFs) are funds established in each of Sweden's 24 counties with the support of the County Councils and the National Industrial Board to help small businesses develop market-oriented direct export operations. Assistance is focused at regional/local level, and actual business services are provided by private consultants and the quasi-private Swedish Trade Council, which considers RDFs to be its "eyes and ears" at the local level. Now-completed "Export Pulse" program which ran several years helped small firms with export potential develop their capacity through strategic development and market research; 450 firms attribute their transition to successful exporters to this program.

Program: Swedish Trade Council
Contact: Swedish Embassy, (202) 337-5170
The Trade Council is a publicly chartered independent organization supported equally and run

jointly by industry and government with a staff of 200 trade specialists in Stockholm and 200 additional in embassies and trade offices abroad. Over a 4 year period, provides 60% of the cost of hiring an "export manager-for-hire" to develop a strategic market penetration plan for firms that lack the internal capacity to begin exporting. The hired professional spends 20-40% of his time with the firm establishing export capacity and skills and offers help locating overseas representatives, establishing subsidiaries, acquiring companies, securing licenses, negotiating joint ventures, recruiting personnel. The Trade Council also helps firms with export standards, liability and trade laws, shipping and payment terms. The Council's Institute of Export Training offers export-willing firms company-tailored training and marketing information, and information on financing, language and culture, and on market- or product-specific exporting mechanics.

Source Documents:
GAO, "Export Promotion: A Comparison of Programs in Five Industrialized Nations," June 1992.

William Nothdurft, "Going Global," (Washington, DC: Brookings Institution, September 1992).

"Swedish Know-How for Environment Protection: A Tool in Development Cooperation," June 1990.

SWITZERLAND

Program: Catalog of Environmental Products and Services
Contact: Christopher von Arb, Swiss Embassy, (202) 745-7900
The Swiss Association of Machinery Manufacturers (VSM) publishes a registry of companies which offer a broad representation of state-of-the-art environmental technologies and consulting services and describes Switzerland's standards for the environmental media each technology addresses.

Source Documents:
Swiss Association of Machinery Manufacturers, "Environmental Technology from Switzerland," Zurich, 1990.

Swiss Federal Office of Environment, Forest and Landscape, "The State of the Environment in Switzerland: 1990 Report on the Environment," 1990.

Swiss Office for Trade Promotion, "Switzerland Your Partner: Environment Conservation."

TAIWAN

Program: Industrial Technology and Research Institute (ITRI)
Contact: Taiwanese Diplomatic Representation Economics Section, (202) 686-6400
The Industrial Technology Research Institute (ITRI) is a government-industry sponsored organization whose mission is to re-direct Taiwan's industrial focus toward environmental protection. This is done under ITRI's Pollution Control Technology Program and is coordinated by the Center for Pollution Control Technology. The Center works with three national laboratories, and diffuses ITRI's technologies and provides technical services to private sector industries. ITRI is currently studying Taiwan's pollution abatement industry.

Source Documents:
Industrial Technology Research Institute, "Pollution Control Technology Program in ITRI," ITRI Office at 195 Chung-Hsin Rd., Section 4, Chu-tung Chien, Hsin Chu, TAIWAN.

UNITED KINGDOM

Program: British Department of Trade and Industry (DTI)
Contact: British Embassy, (202) 898-4346
DTI has the overall responsibility for Britain's export promotion programs, and under DTI, the British Overseas Trade Board (BOTB) executes the policy, financing, and overseas projects. BOTB prepares an annual 3-year plan integrating domestic and overseas promotional resources and targeting where to spend funds. In 1992, BOTB targeted Asia and the Pacific Rim, Japan, North America, and Western Europe. BOTB also launched "Opportunity Japan" in 1988 and will launch "Opportunity U.S." in 1993 to increase market share and long term market presence. BOTB subsidizes firm participation in trade events up to 50% of costs for first three events in a particular market per specified period -- provides greater support for events related to U.S. and Japanese markets; also provides 50-75% of foreign buyers' expenses to participate in reverse trade missions sponsored by industry, chambers and trade associations. A joint directorate combines key export promotion functions of the BOTB and Foreign and Commonwealth Office. BOTB also offers several specialized services. The Export Market Research Scheme (EMRS) is a marketing research program, managed by the Association of British Chambers, that helps firms with fewer than 200 employees obtain narrowly targeted intelligence on markets outside the EC. EMRS provides free marketing advice and subsidizes the cost of hired consultants, in-house research expenses, and purchasing public research. The New Products from Britain Program subsidizes the cost of publicizing specific products in target markets. And BOTB's Export Services Card is a charge card (with terms like American Express') that allows firms to order export assistance services by phone. BOTB also offers a Quality Management System which measures service effectiveness and customer satisfaction. BOTB operates through 11 regional offices, which work with Foreign and Commonwealth Office, and with 17 Area Advisory industry groups.

Program: Foreign and Commonwealth Office
Contact: British Embassy, (202) 898-4346
Through its 185 posts abroad, the Foreign and Commonwealth Office identifies and screens potential overseas representatives for new exporters.

Program: Simpler Trade Procedures (SITPRO) Board
Contact: British Embassy, (202) 898-4346
Helps firms with export documentation.

Program: Export Credits Guarantee Department (ECGD)
Contact: British Embassy, (202) 898-4346
Provides risk insurance coverage.

Program: Association of British Chambers of Commerce (ABCC)
Contact: British Embassy, (202) 898-4346
Most Chambers have international trade and export departments and offer a comprehensive range of services. With DTI support, ABCC is developing a strategy to enhance the representation of

British business and provide broader range of services. ABCC organizes trade events with trade associations, maintains a network of 34 export development advisors to provide market research to local chambers. ABCC sponsors a 3-year "export audit" program to identify export-ready firms where government provides 100% funding to chambers the first year, 75% the second, 50% the third, and no funding after that. Chambers also connect exporters to banks, shipping companies, and private export consultants. Some chambers organize export clubs where seasoned exporters informally advise new exporters. The London Chamber of Commerce provides many services in conjunction with the government, and provides a free Confidential Export Audit program to ascertain the level of an interested firm's commitment to exporting. Chambers are supported by membership and receives no government funds.

Program: Confederation of British Industries
Contact: British Embassy, (202) 898-4346
Responsible for organizing trade events with Chambers and also provides other services.

Source Documents:
Centre for Exploitation of Science and Technology, "Annual Review 1990/91."

Confederation of British Industry and KPMG Management Consulting, "Environmental Technology: Competing in a Growing Market," July 1991.

Department of the Environment (UK), Environmental Protection Technology (EPT) Scheme, "Clean Technology," November 1989.

GAO, "Export Promotion: A Comparison of Programs in Five Industrialized Nations," June 1992.

William Nothdurft, "Going Global," (Washington, DC: Brookings Institution, September 1992).

RESOURCE, "Environmental Technology," 1992.

RESOURCE, "Technical Collaboration Worldwide," 1992.

U.S. Embassy London cable summarizing British Advisory Council on Science and Technology (ACOST) report, "Environmental Research Programs," 1992.

APPENDIX F

MEMORANDUM OF UNDERSTANDING

between

THE UNITED STATES DEPARTMENT OF COMMERCE

and

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

on

GENERAL COOPERATION

WHEREAS, it is the mission of the United States Department of Commerce to focus on economic opportunities that challenge the initiative of U.S. business and industry, to enhance the international competitiveness of business and industry, to encourage the development, transfer and commercialization of new technologies by industry, to promote the participation of industry in international trade, to collect and analyze data of an economic and statistical nature concerning business and industry and to carry out selected programs in public health, safety and environmental improvement.

WHEREAS, it is the mission of the United States Environmental Protection agency to exercise regulatory responsibility for the prevention, control, and abatement of pollution in areas of air, water, soils, solid wastes, pesticides, noise, radiation and toxic substances, to set and enforce environmental standards, to conduct research on the processes, effects, risks, and measures of control of environmental problems, to assist state and local entities, and to promote environmental science literacy.

IN ADDITION, the Department of Commerce contributes to improved environmental quality through the promotion of efficient production practices which reduce industrial waste and the Environmental Protection Agency contributes to U.S. competitiveness through the commercialization of environmental technologies and the utilization of federally-funded research and development at its laboratories and university-based research centers;

THEREFORE the United States Environmental Protection Agency and the United States Department of Commerce agree to work cooperatively, through this memorandum of understanding, to ensure that the United States Government both meets the environmental challenges facing our society and helps U.S. industry harness the competitive strengths resulting from this effort.

OBJECTIVE

The objective of this Memorandum of Understanding (MOU) is to establish a mechanism for cooperation and coordination between the United States Environmental Protection Agency (EPA) and the United States Department of Commerce (DOC) in all mutually-agreeable activities related to the development of environmental technologies and commercialization by U.S. industry.

EPA and DOC both recognize the critical connection between enhancing the health of our environment and enhancing the competitiveness of U.S. industry. DOC and EPA will work together in a number of different areas to ensure that both of these interrelated goals are met.

AUTHORITIES

The roles, functions, and legal mandates of the EPA and the DOC, including the Technology Administration and the International Trade Administration, are not altered by this Agreement. This MOU is intended to facilitate cooperative efforts by both agencies in the conduct of their programmatic activities. This MOU does not supersede or void existing understandings or agreements between EPA and DOC. The actions carried out under this agreement will strengthen coordination, increase understanding and action on issues concerning U.S. competitiveness and the environment, and reduce duplication of effort.

PROVISIONS

To achieve the objectives of this MOU, specific interagency agreements (IAGs) between EPA and DOC and their component organizations may be developed pursuant to this MOU to define specific undertakings. Such agreements may provide for the transfer of funds to pay for services, the use of facilities, the expertise of personnel, and the development of cooperative projects, and will be subject to the laws and regulations pertaining to the respective agencies. Among the activities which EPA and DOC both may undertake in specific IAGs are:

On the part of DOC

To assist EPA in the transfer and commercialization of environmentally acceptable technologies which enhance the competitiveness of U.S. industry and promote the international trade of U.S. environmental technologies and services;

To provide technical expertise for review, advice, research, or consultation in selected areas of environmental technology;

To promote the export of U.S. manufactured goods and

nonagricultural commodities and services based on environmentally friendly technologies;

To conduct economic evaluations of the effect of environmental technologies and policies on U.S. business and industry with EPA's technical support.

On the part of EPA

To provide expertise on environment-related technology and technology innovation by providing DOC with technical reviews, advice, consultation, and technical assistance in the planning and reviewing of program, training, research, and demonstrations in areas of mutual interest;

To help establish processes which guide and facilitate the rapid transfer of technology between EPA and DOC laboratories and facilities, and coordinate, as appropriate, environmental science education and outreach activities;

To assist DOC in the identification of environmental technologies which promote waste reduction and pollution prevention of U.S. industry.

On the part of EPA and DOC

To provide opportunities for personnel to better learn the policies and activities of both agencies and to efficiently use the mechanisms and expertise of the other agency;

To the extent possible, support each other on policy and especially research matters related to the implementation of this agreement;

To reference this MOU in any supplemental agreements, amendments, or IAGs prepared to document details of cooperative efforts carried out by the two organizations.

DURATION OF AGREEMENT

This agreement becomes effective on the date of signature by both parties and continues for a period of five years. This agreement may be modified by mutual consent or terminated by either party with ninety days advance notice.

This memorandum of understanding entered into on on the ____ day of _____ in the year _____.

Barbara Hackman Franklin	William K. Reilly
Secretary	Administrator
Department of Commerce	Environmental Protection Agency