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PROJECT PAPER EXCERPT

ENVIRONMENTAL POLLUTION PREVENTION PROJECT
(EP3)

Project Number 936-5559

PROJECT PAPER

Research and Development Bureau
U S. Agency for International Development

April 1992

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I. SUMMARY

I A Goal and Purpose

The goal of EP3 is reduction in environmental pollution associated with urbanization and industrialization.

Traditionally, efforts at urban and industrial pollution management, where they have existed at all, have concentrated on "end-of-pipe" pollution treatment. Pollution treatment is ultimately unsustainable as the principal means of urban and industrial pollution management. This is especially so in developing countries, where effective pollution treatment would divert ever larger amounts of scarce resources from pressing economic development uses. Experience in the U.S. and other developed countries in recent years has confirmed that pollution prevention through waste minimization and cleaner production technologies is an alternative that is less expensive, more cost-effective, and sustainable over the long run. Applied as a means of pollution management in developing countries, pollution prevention promises to improve plant efficiency, rapidly enhance the quality and quantity of natural resources for production, and make it possible for more financial resources to be directed to economic development investments.

The purpose of EP3 is to create the necessary conditions for decision makers in the public and private sectors to undertake proper urban and industrial pollution management in A.I.D.-assisted countries. The necessary conditions are (a) knowledge of the means for pollution prevention and control, (b) familiarity with the advantages of cleaner production methods, and (c) assistance for introducing industrial process and equipment innovations that minimize waste generation.

EP3 will promote pollution prevention and cleaner production primarily by.

- (a) providing a broad range of technical assistance, training, and information services for environmental awareness and pollution prevention at the plant, industry category, and national levels;
- (b) strengthening and expanding in-country sources of technical expertise for pollution prevention, including establishing national programs of pollution prevention training, information, and technical assistance;
- (c) identifying, promoting, and expanding sources of financing for pollution prevention technology and creating linkages between firms and agencies in EP3-assisted countries and U.S. suppliers of pollution prevention expertise and equipment;

- (d) helping to improve national environmental policies, laws, regulations, and their implementing institutions so as to expand incentives for cleaner production,
- (e) promoting and serving as a catalyst for international cooperation activities to encourage, coordinate, and combine the pollution prevention efforts of A.I.D and other U S and donor agencies with the aim of achieving maximum pollution prevention benefit from their respective resources and comparative advantages.

EP3 is not seen as the ultimate vehicle for achieving substantial progress in national urban and industrial pollution prevention in any country. Rather, through its Country Support Program described below, it is seen as a potent instrument for setting in motion long-term concerted efforts within a country, and as an instrument for promoting, supporting, integrating, and laying the groundwork for a variety of Mission activities; and through that, for maximizing the environmental and pollution prevention benefits of limited Mission resources.

During its 5-year Life Of Project, EP3 will operate on three closely linked tracks: (a) EP3 operations at the A.I.D./Washington level; (b) EP3 Country Support Programs in selected A.I.D.-assisted countries; and (c) short-term training and technical assistance available for all A.I.D.-assisted countries.

I.B. EP3 Operations at the A I.D /Washington Level

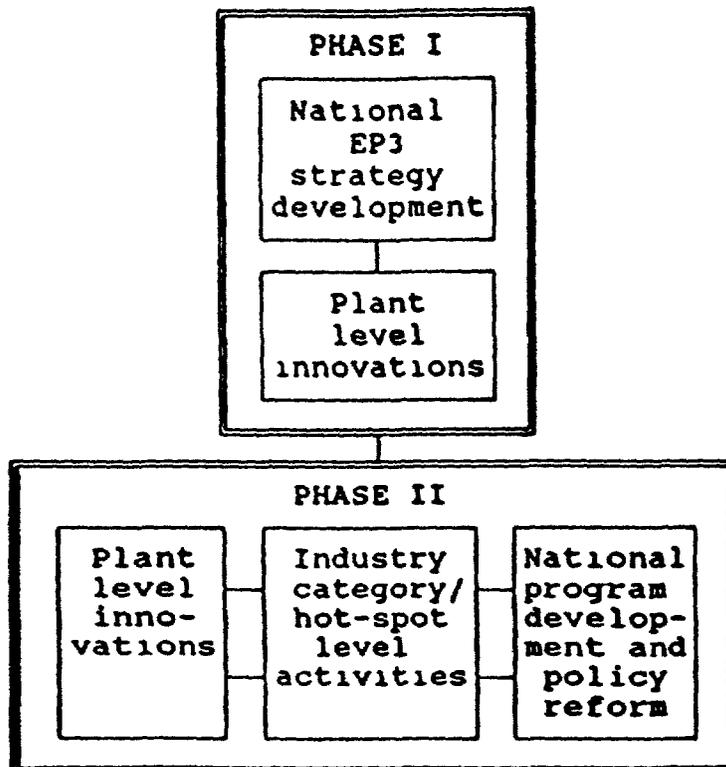
The EP3 project design includes three major operating elements at the A.I.D./W level:

- (a) an early project learning system designed to enhance learning from the pioneering experience of EP3 "emphasis countries" in the first three years, and to utilize what has been learned to run simultaneous programs more cost-effectively in many more countries during the remaining project years;
- (b) an EP3 clearinghouse that will prepare training materials and conduct pollution prevention related training, will maintain databases on a wide range of topics related to pollution prevention, and will disseminate information through a variety of media aimed at both broad and highly targeted audiences;
- (c) International cooperation activities that encourage, coordinate, and combine the pollution prevention efforts of U.S. agencies and multilateral and bilateral development assistance organizations worldwide, resulting in more efficient leveraging of the resources of other entities to finance EP3 pollution prevention innovations.

EP3 Country Support Programs encompass over 25 possible discrete types of activities designed systematically to improve knowledge of the means for pollution prevention and control and of the advantages of cleaner production methods, to introduce industrial pollution prevention innovations, and to create the conditions -- including the policy, regulatory, and institutional framework -- necessary for expanding and accelerating industrial process and equipment changes that minimize waste generation.

The following describes a model Country Support Program that incorporates all the possible types of EP3 activities. Each EP3 Country Support Program will be tailored to the priorities and circumstances of the country, however, and may include fewer discrete activities sequenced and timed in a somewhat different way and therefore of a lesser or greater duration than the three years suggested by the Country Support Program model presented below. EP3 Country Support Programs will be USAID initiatives that are likely to result in a demand for additional and expanded pollution prevention and control initiatives arising from heightened awareness and demonstrated benefits of pollution prevention and improved environmental quality. Accordingly, they will be designed in collaboration with USAIDs, and the designs will require Mission approval.

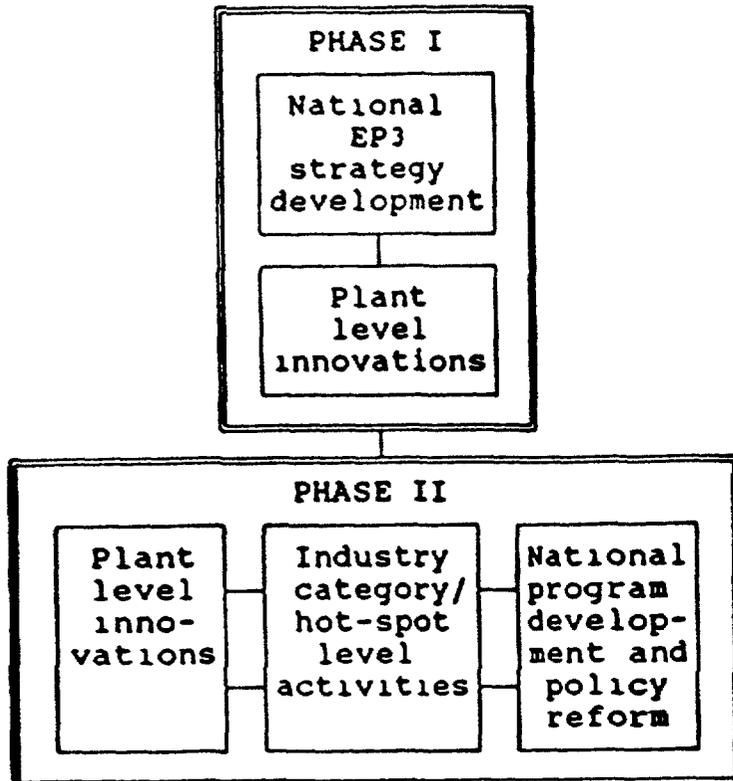
EP3 Country Support Program



The many specific activities that may be encompassed by an EP3 Country Support Program are organized under five broad components introduced in two phases. The pace of progress and character of response to activities in Phase I will determine the specific activities possible in Phase II in each country. Before Phase II is formally launched, an agreement will be concluded among the host country, USAID, and EP3 management regarding timing, intensity, and precise characters of Phase II activities, and the division of functional and funding responsibilities for carrying them out.

In Phase I of EP3 Country Support Programs, first, under the heading of "national EP3 strategy development," several activities are undertaken that lead to the detailed plan for the EP3 Country Support Program tailored to local needs and circumstances. Development of the strategy is followed immediately by activities aimed at introducing no/low capital cost pollution prevention innovations at designated initial target plants, these activities, under the heading of Phase I "plant level innovations," represent the first steps in implementing the national EP3 strategy. Phase I is expected to take between three and six months.

EP3 Country Support Program



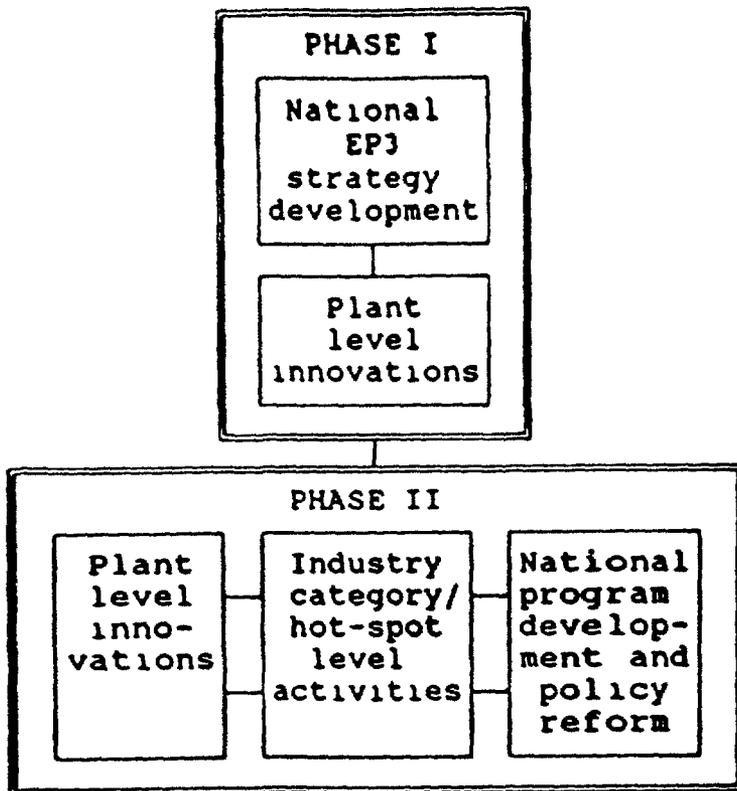
Phase II encompasses three components that may be initiated sequentially or simultaneously, but for the most part are carried out simultaneously and interactively. Phase II "plant level innovations" include activities connected with introducing more capital-intensive pollution prevention and control measures at plants that have successfully carried out no/low capital cost innovations. "Industry category/hot-spot level activities" are designed to spread the proven innovations throughout the initial target industry category. In some cases, instead of a target industry category there will be a target "hot-spot". This term refers to a zone where a large

number of heavily polluting plants are concentrated; the plants may or may not be in the same industry category. "National program development and policy reform" activities provide assistance for extending the EP3 effort to other industries and hot-spots; for building in-country capacity to deal with the full gamut of pollution concerns; and for program, policy, and regulatory reform in support of pollution prevention. Phase II continues for two and a half years, during which EP3 assistance is systematically phased out as in-country capacity is strengthened.

Specific EP3-assisted activities potentially encompassed by individual Country Support Programs are summarized in the following paragraphs.

Phase I National EP3 Strategy Development Rapid assessment of the national pollution prevention and control policy and regulatory environment, identification of in-country pollution prevention and control experts, identification of sources of

EP3 Country Support Program



financing for pollution prevention equipment; selection of the initial target industry category or hot-spot and initial target plants; preparation of a national EP3 strategy that is finalized and endorsed at a Pollution Prevention Roundtable.

Phase I Plant Level Innovations (in each of the initial target plants) Training of plant personnel to participate in pollution audits and assessments; conduct of pollution audits and assessments; formulation and execution of programs of no/low capital cost pollution prevention innovations; evaluation of pollution prevention performance; development, for

individual target plants, of Phase II action plans for introducing more capital-intensive pollution prevention innovations.

Between Phases I and II a Leadership Conference on Pollution Prevention is conducted as a means of consolidating and publicizing high level commitment to industrial pollution prevention, and to Phase II of the EP3 Country Support Program specifically. The Leadership Conference represents a decision and commitment benchmark, and follows the conclusion of agreements among the host country government, USAID, and EP3 management regarding timing, intensity, and precise characters of Phase II activities, and the division of functional and funding responsibilities for carrying them out. Other donor agencies may also be parties to the detailed workplan and implementation commitments for Phase II. A number of measures can be taken to minimize or eliminate the effects of potential delays resulting from negotiating these commitments and bringing the associated resources on line, so as to avoid a loss of momentum in the overall EP3 Country Support Program.

Phase II Plant Level Innovations (in each of the initial target plants that have successfully introduced no/low capital cost

pollution prevention measures). Technical and economic appraisals for capital-intensive pollution prevention and control technology; assessment of information from suppliers of pollution prevention equipment and development of loan applications for financing the equipment, installation of pollution prevention equipment. In addition, EP3 will work with other projects and donors to provide limited financial support for pollution prevention equipment in initial target plants in cases where

- the equipment would have widespread application in the industry category;
- the recipient plant agrees to serve as a demonstration site for others; and
- a small amount of leverage financing will substantially expedite acquisition of full financing from other sources, and thus facilitate rapid installation of the equipment.

Phase II Industry Category/Hot-Spot Level Activities. Training for plant managers and personnel, including industry- or hot-spot-wide training related to pollution prevention and waste minimization, on-site training in individual plants, and demonstration-based training utilizing innovations introduced in initial target plants; identification and resolution of pollution prevention and control problems that can only be dealt with, or can readily be dealt with, on an industry- or hot-spot-wide basis; establishment of linkages with in-country and U.S. suppliers of pollution prevention expertise and technology.

Phase II National Program Development and Policy Reform. Development of a national program of pollution prevention training, information, and technical assistance that is linked into pollution prevention databases worldwide; studies in support of policy, regulatory, and enforcement/incentive reforms; strengthening the capacity of institutions with pollution prevention responsibilities; mounting of pollution prevention awareness programs; carrying out special programs for specific target groups; and designing, conducting, and evaluating related USAID initiatives.

As Phases I and II progress in a number of countries, effective demand for pollution prevention expertise and equipment will be generated, while links are established with U.S. suppliers of this expertise and equipment.

Since EP3 Country Support Programs are essentially Mission initiatives, selection of countries for them will necessarily be made in close consultation with USAID Missions. The selection process will be based on analysis of explicit preference factors related to the type and severity of urban and industrial pollution problems in the country, the likelihood of success and significant beneficial impact of an EP3 Country Support Program, and the level of demonstrated institutional interest in and commitment to pollution prevention efforts.

In addition to operations in Washington, D C and highly coordinated multifaceted Country Support Programs in designated countries, EP3 will maintain a short-term training and technical assistance service operated largely, but not exclusively, on a buy-in basis. The phrase "short-term" is meant to distinguish this technical assistance from that provided in connection with EP3 Country Support Programs, and not to suggest that it is available only for efforts of very short duration. EP3 short-term training and technical assistance services will be available directly to USAID Missions, or through them to host-country national and local governments, universities, trade organizations, or other NGOs. These services will be available to all A I D - assisted countries.

EP3 short-term training and technical assistance services will be available covering the entire range of activities and subjects discussed under EP3 Country Support Programs, above. In addition, training and technical assistance will be available through EP3 to respond to any need associated with the larger context of urban environmental issues, pollution control and treatment, and general environmental quality management. The EP3 implementation mechanism and the EP3 clearinghouse assure access to a broad range of training materials and a wide array of U.S. urban and industrial pollution prevention and control expertise on a quick response basis.

Thus, in addition to the activities and subjects mentioned above, training and technical assistance will be available through EP3 to respond to any need associated with the larger context of urban environmental issues, pollution control and treatment, and general environmental quality management. EP3 technical assistance will also be available to help Missions with design, conduct, and evaluation of environmental initiatives; with environmental resource management aspects of their CDSSs, Action Plans, and other planning documents; with project environmental impact assessments; with methodologies for determining values for PRISM indicators that are directly and indirectly related to environmental resource management; and for related types of activities.

I.E. Implementation

The EP3 Project will be carried out by the Office of Environment and Natural Resources, Bureau for Research and Development (R&D/ENR) with shared technical management and oversight from the Office of Energy and Infrastructure (R&D/EI).

The EP3 responsibilities of each office are summarized as follows:

- R&D/ENR provides primary technical oversight over environmental pollution prevention and control policy development, advisory services, training and education,

environmental quality planning and risk assessment, regulatory analysis and reform, and institution building

- R&D/EI provides primary technical oversight for engineering assistance, pollution prevention audits and assessments at industrial facilities, technology cooperation and commercialization, and environmental trade and investment promotion

The EP3 Project Officer will be in R&D/ENR and will be the principal coordination point for EP3 interactions with the contractors, USAID Missions and Regional Bureaus, U.S. agencies and international organizations. The Project Officer will work under the technical direction of the Director, R&D/ENR, for EP3 activities for which R&D/ENR has primary oversight responsibility and for the Director, R&D/EI, for EP3 activities for which R&D/EI has primary oversight responsibilities. There will be monthly coordination meetings of the Project Officer and the Directors of R&D/ENR and R&D/EI to insure consistent technical guidance, policy and management direction

The Project Officer will be advised by an industrial and urban pollution committee initiated by the R&D Bureau, but incorporating input and membership from throughout the Agency. EPA, DOE, Peace Corps, commerce and other agencies will be invited to participate on an "as interested" basis. The Project Office from R&D/ENR and a member of the Office of Energy and Infrastructure will initiate the first three meetings, after which a chairman will be chosen for future meetings. This committee shall work closely with the Environmental Forum established by the Policy Directorate.

The EP3 Project is part of an integrated environmental quality program in the Bureau for Research and Development that links project activities with coordinated management oversight from several R&D Offices. R&D/EI has existing environmental activities and will design projects such as Global Energy and Environmental Management (GLEEM) and Project in Environmental Engineering and Technology (PEET) that may involve coordinated oversight between R&D/EI and R&D/ENR. The Office of Health (R&D/H) is also developing an environmental health project where advisory boards will facilitate coordination among R&D Offices.

The primary implementation mechanism for EP3 will be a core contract and complementary requirements contract for buy-ins. It is anticipated that the primary contractor will develop and administer cooperative agreements with a small number of environmental NGO professional associations for expeditious access to a wide array of pollution prevention, environmental, and industrial process experts on both a paid and voluntary pro bono basis. Examples of these organizations may include industry trade associations and member companies, education foundations and universities, independent consultants and environmental equipment manufacturers, and EPA and state and local government

environmental experts

EP3 joins the growing family of A I D./W environmental initiatives such as ETP, EPAT, EHP, PRIDE, GREENCOM, and the PRE/H Urban Environmental Strategy. Its implementation will be closely coordinated with these other initiatives to ensure maximum cost-effectiveness and complementarity. In addition, it is expected that the EP3 project will buy-in to other A I D./Washington projects. In particular, it is likely that EP3 will execute buy-ins to EPAT and the proposed Environmental Health Project for activities encompassed by those projects.

Implementation of EP3 will utilize the special resources, capabilities, and comparative advantages of the U S Environmental Protection Agency. Close coordination will be maintained with these agencies through the EP3 Project Officer overall, and through the contractor for routine operational details.

Technical assistance teams fielded for EP3 Country Support Programs will be assembled from a variety of sources, depending on the specific needs of a particular country and the available sources of needed expertise. EP3 expects to utilize the primary implementation mechanism to strengthen the international pollution prevention support activities of a few U.S. environmental NGO professional associations to deliver their professional members to help implement EP3 country support programs on a *pro bono* basis. EP3 will supplement these experts through agreements with other participating organizations and individuals. Expertise will often be provided on a volunteer *pro bono* basis, but provision is also made in EP3 for paid services. A special effort will be made to identify experts from counterpart type and size U.S. plants to provide technical advice to industries in EP3 country support programs. In-country experts will participate in the technical assistance teams as a means of expanding their knowledge and experience.

EP3 operations in Washington, D.C. will be primarily (but not exclusively) core funded. EP3 short-term training and technical assistance will be primarily (but not exclusively) buy-in funded. EP3 Country Support Programs will be financed through a combination of EP3 core funds and USAID Mission buy-ins. Owing to Mission programming and budgetary cycles, it is anticipated that Phase I Country Support Program activities will be largely core funded, while Phase II activities will be largely buy-in funded. In addition, host country governments, trade organizations, and other NGOs will contribute personnel time, support services and facilities, and expertise. Pollution prevention equipment will be financed principally by commercial sources and/or programs of other development assistance agencies and host-country governments.

I F Anticipated Project Accomplishments

Accomplishments over the 5-year life of EP3 are expected to include

- At least 5 EP3 Country Support Programs, including, in each country, an assessment of the national pollution prevention policy and regulatory environment; over fifty trained pollution prevention experts in individual plants, trade associations and other NGOs, private firms, research institutions, and national and local government agencies, directly completed programs of no/low capital cost pollution prevention innovations in 6-8 factories, and also indirectly in other factories as a result of efforts to spread proven innovations, capital-intensive pollution prevention innovations introduced directly in at least 2 factories, and also in other factories as a result of efforts to spread proven innovations, established lines of financing for pollution prevention innovations, trade linkages with U.S. suppliers of pollution prevention expertise and technology; pollution prevention awareness and targeted special programs; an ongoing national pollution prevention program based on public/private cooperation; policy and regulatory reforms undertaken or under consideration to promote pollution prevention; and a national program for pollution prevention training, information, and technical assistance. Sri Lanka and Chile have already expressed strong and concrete interest in becoming focus countries for EP3 Country Support Programs.
- At least 40 short-term training and technical assistance missions addressing a broad array of urban environmental, pollution prevention and control, and general environmental quality management concerns.
- Development of an EP3 clearinghouse to disseminate general and highly targeted pollution prevention information. All or part of the clearinghouse may be implemented through agreements with EPA that strengthen existing EPA pollution prevention clearinghouses and training programs. The training modules and databases developed as part of EP3 operations will continue to serve pollution prevention activities for many years.
- International cooperation activities to operate and serve the pollution prevention activities of A.I.D. and other U.S. agencies and development assistance organizations worldwide.

II PROJECT BACKGROUND AND RATIONALE

II.A Relationship to A I D Policy

EP3 arises from A.I.D.'s initiative on the environment, and responds directly to the urban and industrial pollution subsector of that initiative. The project approach is based on the demonstrated greater efficiency and sustainability of preventing industrial pollution at its source rather than concentrating on pollution cleanup (treatment) as the fundamental long-term pollution management strategy. In its focus on pollution prevention, EP3 represents a new dimension in A I.D.'s approach to environmental concerns. In fact, it is the first project of its kind to be mounted by any development assistance agency, and thus places A.I.D. in the leadership in an area that will unquestionably be a major locus of environmental activity in the coming decades.

By fostering urban and industrial pollution management through waste minimization and cleaner production processes, EP3 will spur more efficient production, broader availability of natural resources for economic production, and a reduction in subsidies to manufacturing in the form of publicly borne effects of pollution and publicly financed pollution cleanup. In this way, EP3 also promotes the A.I.D. policy of support for free markets and broad-based economic growth. Moreover, EP3 will seek to share recent advances in U.S. pollution prevention expertise and technology by stimulating demand for that expertise and technology in developing countries while creating trade linkages with U.S. suppliers.

II.B. Urban and Industrial Pollution: A Brief Survey

Dramatic growth in rates of urbanization and industrialization in developing countries in the past three decades has resulted in severe environmental pollution. Rapid industrialization has accompanied urban growth and has led to sharp increases in the volume and toxicity of industrial wastewater discharges, emissions into the air, and solid waste materials dumped in urban areas. The close proximity of growing urban populations to industrial facilities means that enormous and growing numbers of people have decreasing access to clean air and potable water, and are regularly exposed to a wide variety of dangerous chemicals. While the extent and character of industrial pollution differs from region to region, it has become a severe problem in East Europe and the republics of the former Soviet Union, Asia and the Pacific, Latin America, and to a somewhat lesser extent the Near East and Africa.

East Europe and the former Soviet Union

In East Europe and the republics of the former Soviet Union the emphasis on rapid industrialization, especially since World War

II, has imposed a heavy cost in terms of urban and industrial pollution. With regard to air pollution, for example, in industrial regions of what was formerly East Germany, average annual sulfur dioxide levels are five times the U.S. standard, and average annual particulate levels are 13 times the U.S. standard. In Hungary, nearly half the population lives in areas with heavily polluted air. In Czechoslovakia and Poland, sulfur dioxide deposition averages almost half an ounce per square yard every month. Toxic elements, including lead and arsenic released from power plants that burn high sulfur coal, accumulate in the soil and contaminate food. Based on data from a wide variety of sources, The Worldwatch Institute recently produced the following rough estimates of annual nitrogen oxide and sulfur dioxide emissions

Nitrogen Oxide and Sulfur Dioxide Emissions, 1988

	Emissions (thousand tons)		Emissions Per Capita (Kilograms)		Emissions Per Dollar of GNP (grams)	
	Nit. Ox.	Sulf. Diox.	Nit. Ox.	Sulf. Diox.	Nit. Ox.	Sulf. Diox.
East Europe*	4,007	16,286	203	152	30	22
Soviet Union (European part only)	4,190	10,124	15	35	2	5
United States	19,800	20,700	80	84	4	4

* Excludes Yugoslavia, Albania, and all parts of the former Soviet Union

The situation with regard to water pollution is no better. Industrial discharges, combined with untreated sewage and agricultural runoff, have contaminated most rivers, lakes, and seashores in East Europe and the Soviet Union. Seventy percent of Czechoslovakian rivers are badly polluted. About a third of those in Bohemia and half those in Slovakia can no longer support aquatic life. A third of the rivers and 9,000 lakes in former East German territory are biologically dead. Eighty percent of Romania's river water is so badly polluted that it cannot be sufficiently treated cost-effectively to raise it to potable quality.

Solid waste generation, particularly industrial waste, has been very high in this region, as indicated in the following table. The estimates in the table have been compiled by the World Resources Institute from various OECD and UNEP sources. Moreover, though reliable data are scarce, hazardous wastes appear to have been indiscriminately dumped on land throughout the region. To illustrate, some 15,000 hazardous dump sites are awaiting

evaluation in former East German territory, in Czechoslovakia, illegal waste dumps are being discovered throughout the country, drinking water in and around the towns of Jachymov and Nedjek in north-western Bohemia have reportedly been contaminated for years from nearby mines, in Prague, city planners cannot account for 80 percent of an estimated 40,000 tons of hazardous waste produced annually in the city.

Annual Industrial Waste Generation

	Year of Estimate	Total (thousand tons)	Per Unit Area (tons/Km ²)
Czechoslovakia	1982	80,910	645.3
Hungary	1985	21,146	229 0
Poland	1985	274,885	902 8
Soviet Union	1985	306,311	13.8
United States	1985	628,000	68.5

Asia and the Pacific

In Asia and the Pacific major cities and towns are growing at the rate of 4-7 percent per year. This means a doubling of the urban population every 10-17 years resulting in massive pressures on the urban environment. The Asian Development Bank expects regional air and water pollution to grow by 5-10 times its current levels over the next 15 years, based in part on an estimated 150-200 percent increase in industrial and mining activity.

While it is a serious problem in all major cities of the region, air pollution is particularly severe in Shanghai and in China's other industrial areas, resulting primarily from the widespread combustion of low-grade coal. Ten years ago, coal combustion in China was releasing each year 120 million tons of ash, 20 million tons of fly ash, and 12 million tons of SO₂, according to a 1983 report of the U.N. Economic and Social Commission for Asia and the Pacific (ESCAP). In India, extremely high levels of suspended particulates have been recorded in New Delhi, Hyderabad, and Kanpur, and of sulfur dioxide concentrations in Ahmedabad and Bombay. Malaysia, The Philippines, and Thailand face similar air pollution situations as a result of growing numbers of automobiles, thermal power plants, lead smelters, chemical processing plants, and metallurgical operations. The dust concentration in some metropolitan cities of the region is four to nine times the international standard. The following figures compiled by The Worldwatch Institute from UNEP data illustrate. The figures represent averages of readings at various monitoring sites from 1980-1984 in each city shown in the table.

Number of Days Annually Above WHO Standard

<u>City</u>	<u>Sulfur Dioxide</u>	<u>Particulates</u>
Bangkok	0	97
Beijing	68	272
Kuala Lumpur	0	37
New Delhi	6	294
Seoul	87	NA
Shenyang	146	219
Xian	71	273
New York	8	0

Similarly, water pollution has become an increasing problem in many parts of Asia. In China, all major rivers are seriously polluted in the stretches downstream of large cities. In India, the Sabarmati, the Ganges, the Mahi, the Narmada, and the Tapi are all seriously polluted in stretches. In Malaysia, the Klang valley is polluted due to discharge of industrial wastewater and solid waste; food processing industries such as pineapple canneries, sugar refineries, and fish processing plants produce large amounts of organic waste, especially on the west coast. In Pakistan, major rivers like the Kabul, the Rabi, the Leh, and the Lyari are polluted when passing through the dense areas of Karachi, Rawalpindi, and other cities. Severe water pollution is common throughout Thailand, waste from sewage, and from sugar and distillery units, mining activities, synthetic fabric factories, and other industrial activity contribute to the pollution. In the early 1980s ESCAP surveyed countries in its region and found that 75% of them considered water pollution to be severe, either on a widespread basis or in certain defined areas within their territory; the situation is known to have deteriorated considerably over the past decade, and as noted earlier, the Asian Development Bank expects the rate of deterioration to accelerate in the coming decade and a half.

Latin America

Urbanization and industrialization has also exacted a heavy toll in air and water pollution in most Latin American cities. The air pollution in Mexico City and the surrounding valley, for example, is considered by many experts to be the most dangerous in the world. Lima, Buenos Aires, São Paulo, and Santiago also have very high levels of carbon monoxide, sulfur dioxide, and other airborne pollutants. While crowded urban populations with inadequate sanitation contribute to water pollution, industry is a major culprit as well. Argentina, for example, has suffered severe water pollution in the River Plate as a result of the dumping of highly toxic chemical waste by the tanning industry. In Brazil,

Guanabara Bay, the 400-square kilometer natural harbor, has become heavily polluted as a result of industrial discharges and dumping. Cartagena Bay in Colombia has suffered the same fate.

Near East

In the Near East, water pollution is commonly cited as the primary environmental concern. In the areas north of Cairo, for example, salinized drainage water from irrigated areas, agricultural pesticides, industrial effluents, sewage disposal, and overpumping of aquifers has resulted in highly polluted water. In this delta region it has been estimated that water pollution accounts for an 85 percent drop in the fish catch in some of the major lakes in recent years. In Yemen, contamination of drinking water is a serious problem in urban areas like Sana'a, where inadequate sewage systems pollute aquifers beneath the city. In 1972, the U.N. Conference on the Human Environment declared water pollution to be Syria's worst environmental problem, and the problem has become worse since then. Lack of sanitary sewage disposal systems exacerbated by increased dumping of industrial wastes has caused significant ecosystem damage to the Euphrates, Oronte, and Barrada rivers. In Jordan, the concentration of industry in the Amman-Zarqua region has created severe water pollution there. In both Israel and Turkey, pollution caused by seepage of industrial wastes into aquifers has contaminated the water supply in certain areas.

Although air pollution is a lesser problem in the region, it is far from inconsequential in many cities. In Cairo, for example, insufficient paving and combustion-based processes combine to produce high particulate and chemical concentrations. Haifa is the recipient of heavy loads of airborne pollutants from cement factories, oil refining industries, a power plant, and other manufacturing facilities concentrated around two sides of the city.

Africa

Environmental pollution has received limited attention in sub-Saharan African countries both because of their relatively low levels of industrialization and because of the staggering nature of other problems, such as drought, declining agricultural production, loss of biodiversity, soil erosion, and deforestation. Air pollution is becoming a serious problem, however, in the more industrialized cities of Africa like Abidjan and Lagos, where, according to a UNEP report, carbon dioxide levels were among the highest in the developing world in 1989/90. Moreover, evidence indicates that water contamination is becoming more widespread throughout the continent due to pollution from both agricultural chemicals and urban and industrial waste.

Until recently, environmental pollution was generally ignored in developing countries, as it was in western countries until the 1960s. In a manner similar to most western countries until very recently, developing country efforts at urban and industrial pollution management, where they existed at all, concentrated on "end-of-pipe" pollution treatment. Accumulated experience in both western and developing countries has revealed what in retrospect seems obvious: pollution treatment is ultimately unsustainable as the principal means of urban and industrial pollution management.

This is the case because as production grows, so expenditures on pollution treatment must grow. When these expenditures are made by the private sector, they represent substantial additional capital and operating costs, which both reduce competitiveness and add to consumer prices. When pollution treatment expenditures are made by the public sector, they constitute a subsidy that removes incentives for cleaner production. In either case, the pollution cleanup approach means growing volumes of pollutants and concomitant growing volumes of expenditures for treating them: a growing proportion of GNP in effect is spent on efforts to maintain rather than improve productivity and the quality of life.

In the absence of a better approach, developing countries are faced with the alternatives of ignoring environmental pollution, with the result that pollution soon begins to impede economic development, or engaging in pollution treatment, with the result that ever-increasing amounts of resources need to be diverted from economic development investment. In the long -- and probably not so long -- run, the absence of a better approach condemns developing countries to economic stagnation at best.

Experience in the U.S. and other western countries in recent years has demonstrated that pollution prevention, primarily through waste minimization and cleaner production technologies, is an alternative that is less costly, more cost-effective, and sustainable over the long run. The relative costs of pollution treatment and pollution prevention of course vary widely among different types of manufacturing processes, pollutants, pollution standards, and geographic circumstances. With that in mind, the table below illustrates the advantages of pollution prevention using composite data from paper manufacturing in the U.S. The table shows the relative costs of production per unit of paper product under different approaches to fiber recovery and different discharge standards. To facilitate comparison, all the figures in the table are expressed as indexes against a base of 100, which is the production cost per unit with no fiber recovery.

The table shows that pollution treatment adds 14 to 19 percent to production costs over the range of 75 to 90 percent recovery of fiber. Pollution prevention, by contrast, actually results in lower net production costs over the same range of fiber recovery, although the net savings diminish as pollution standards are

raised Owing to its cost-reducing effects, pollution prevention cost performance is significantly better than for pollution treatment throughout the entire range of pollution standards, and even when a combination of preventing and treating pollution is used there are net savings over the 75 through 85 percent recovery range. Indeed, studies by the U S Environmental Protection Agency, North Carolina's Pollution Prevention Program, and others have shown that the cost of preventing industrial pollution through waste-avoiding process designs and use of pollution prevention technology is always much less than the cost of cleaning up the same pollution, in some cases by a factor of 1,000.

Relative Net Costs for Fiber Recovery in Paper Manufacture

	<u>Percent of Fiber Recovery</u>			
	<u>75</u>	<u>80</u>	<u>85</u>	<u>90</u>
Treatment (clarifier & flocculation)	114	115	116	119
Prevention (drum filter save-all)	80	82	87	97
Prevention + Treatment (drum filter & clarifier)	93	94	96	103

Source "The Economics of Pollution Prevention, Annex A: Calculation of Net Costs of Nonproduct Recovery in Paper Manufacture," Blair T. Bower, unpublished manuscript, November, 1991.

The following table summarizes the findings of nine U.S. industrial pollution prevention case studies from over 2,000 reported in the literature or presented at professional meetings in the last few years. The cases in the table were selected to show a wide range of capital costs, but otherwise were chosen randomly from among those for which there was complete comparable information.

Apart from the clear "bottom line" benefits of pollution prevention, the table shows payback periods generally less than two years. It also shows that a high proportion of annual savings is typically related purely to improvement in production efficiency, not to the cost savings of pollution prevention as compared with pollution treatment to meet the same pollution standards. This is particularly important in developing countries, where there may be no pollution standards.

Hence, an emphasis on pollution prevention, the focus of EP3, holds great promise for developing countries. It can reduce urban and industrial pollution significantly and rapidly, thereby quickly enhancing the quality of life and the quality and quantity of natural resources available for production to large numbers of

people It can greatly improve the operating efficiency of manufacturing enterprises, making them more competitive and sustainable and reducing costs to consumers And it can reduce public and private expenditures on pollution treatment, releasing significant amounts of capital for urgently needed investments in true economic growth

Summary of Nine U.S Industrial Case Studies in Pollution Prevention

Industry Category of the Plant	Process Change	Capital Cost (to nearest \$500)	Annual Savings (to nearest \$500)	% of Savings from Improved Efficiency
Fine Chemicals	Heat recovery	\$7,500	\$5,000	50%
Chemical Mfg.	Vapor loss reduction	\$5,000	\$275,000	100%
Food Canning	Steam recapture	\$15,000	\$45,000	100%
Brewing	Waste as fertilizer	\$88,000	\$88,000	0%
Textile Mfg.	Effluent heat reduction	\$100,000	\$50,000	100%
Furniture Mfg.	Hazardous waste reuse	\$1,500,000	\$905,000	0%
Textile Printing	Solvent recovery	\$7,500	\$90,000	100%
Metal Finishing	Spray paint loss reduction	\$874,000	\$642,000	33%
Small Appliance Mfg.	Solvent recycling & substitution	\$3,000	\$20,500	85%

Source: Michael Overcash, original research for this Project Paper, November, 1991.

Additional information on environmental and economic benefits of pollution prevention innovations in manufacturing plants can be found in Annex C (Technical Analysis) and Annex D (Financial and Economic Analysis) of this Project Paper.

The reasons why pollution preventing production processes and technologies are not widespread in developing countries are many. First, of course, throughout the developing world there remains insufficient awareness of pollution as a problem, accompanied by resistance to redirecting resources from economic growth to improving environmental quality. Where there is receptivity to investing in improving environmental quality, there is commonly inadequate technical capacity to anticipate or analyze the severity and constituent components of pollution problems, and therefore to make good judgements about the most cost-effective approaches to pollution management. In any case, as mentioned earlier, developing country efforts at pollution management have followed the earlier pattern of the industrialized countries and concentrated on end-of-pipe treatment. Moreover, developing countries generally lack both the institutional effectiveness and the policy and regulatory environments necessary for encouraging pollution prevention.

As a result, at the plant level there are few apparent incentives for pollution prevention measures and often little interest on the part of plant managers in knowing about cleaner production processes and technologies. As a result also, commercial financing institutions have not perceived a profitable market in financing pollution prevention innovations and have not undertaken to encourage such a market.

Information, awareness, technical capacity, the policy and regulatory environment, sources of financing, and the priorities of plant managers are interrelated. That is why its Country Support Programs are the centerpiece of EP3. EP3 Country Support Programs aim at establishing an initial base of pollution prevention information, know-how, training, beneficial experience, and financing; and then upon that base building momentum for pollution prevention innovations, expanding institutional capacity, and reformed policies and regulations. That is also why EP3 Country Support Programs, while tailored by USAIDs to the needs and circumstances of each individual country, will, as much as possible, be structured around the following principles:

- (a) initiating operations on the basis of a realistic assessment of the national context of environmental policies, laws, regulations, enforcement/compliance procedures, institutional capacity, technical expertise, financing mechanisms for pollution prevention innovations, priority urban and industrial pollution concerns, and priority economic development concerns;
- (b) beginning modestly, with a single target industry category (or "hot-spot" agglomeration of polluting facilities) and a few initial target plants, and with no/low capital cost innovations that are easy to introduce and dramatically demonstrate the bottom-line benefits of pollution prevention;

- (c) providing a wide array of technical assistance to help initial target plants introduce pollution prevention innovations,
- (d) offering further technical assistance to target plants for acquiring and installing more capital-intensive pollution prevention innovations, including help with evaluating equipment options, identifying sources of financing, and preparing loan applications for new equipment;
- (e) taking steps to publicize experience with the bottom-line benefits of pollution prevention innovations in target plants, and to encourage adoption of similar innovations widely in the initial target industry category;
- (f) providing technical assistance for national pollution prevention policy and regulatory reform, and for national pollution prevention programs that will address additional industry categories;
- (g) providing assistance for building in-country pollution prevention technical expertise, for designing public awareness programs and special programs aimed at particular target groups; and for establishing national programs for pollution prevention training, information, and technical assistance;
- (h) establishing trade links with U.S. suppliers of pollution prevention expertise and technology as a means of sharing the advances in pollution prevention and control in the U.S. in recent years.

II.E. EP3 Short-Term Training and Technical Assistance

EP3 Country Support Programs will be available in countries selected on the basis of preference factors indicating, among other things, a high likelihood of program success and significant beneficial impact of an EP3 Country Support Program. Many countries will not qualify for EP3 Country Support Programs. In any case, the number of Country Support Programs that can be handled responsibly and effectively under a single project obviously has its limits. Yet, the need is vast and the opportunities for contributing to reducing urban and industrial pollution in developing countries is virtually limitless.

For this reason, in addition to its Country Support Programs, EP3 will provide a short-term training and technical assistance service available to all A.I.D.-assisted countries. This service will be available primarily, but not exclusively, on a buy-in basis. EP3 short-term training and technical assistance will respond to any need associated with industrial pollution prevention and control, other urban environmental issues, and general environmental quality management. This includes Mission needs for help with environmental resource management aspects of

CDSs, Action Plans, PRIS^m indicators, or other planning and reporting documents, and with environmental project design, implementation, and evaluation

Thus, through its short-term training and technical assistance activities, EP3 will be able to address a broader range of issues on a discrete basis in a broader array of countries and to transfer experience-based knowledge among countries with and without EP3 Country Support Programs. In countries without EP3 Country Support Programs, short-term training and technical assistance activities may enable EP3 to identify targets of opportunity that can serve as entry points for future EP3 Country Support Programs

III PROJECT DESCRIPTION

III A Project Goal, Purpose, and Key Features

The goal of EP3 is reduction in environmental pollution associated with urbanization and industrialization.

The purpose of EP3 is to create the necessary conditions for decision makers in the public and private sectors to undertake proper urban and industrial pollution management in A.I.D.-assisted countries. The necessary conditions are (a) knowledge of the means for pollution prevention and control, (b) familiarity with the advantages of cleaner production methods, and (c) assistance for introducing process and equipment innovations that minimize waste generation. EP3 will promote pollution prevention and cleaner production primarily by:

- (a) providing a broad range of technical assistance, training, and information services for environmental awareness and pollution prevention at the plant, industry category, and national levels;
- (b) strengthening and expanding in-country sources of technical expertise for pollution prevention, including establishing national programs for pollution prevention training, information, and technical assistance;
- (c) identifying, promoting, and expanding sources of financing for pollution prevention technology and creating linkages between firms and agencies in EP3-assisted countries and U.S. suppliers of pollution prevention expertise and equipment;
- (d) helping to improve national environmental policies, laws, regulations, and their implementing institutions so as to expand incentives for cleaner production;
- (e) promoting and serving as a catalyst for international cooperation activities that encourage, coordinate, and combine the pollution prevention efforts of A.I.D. and other U.S. and donor agencies with the aim of achieving maximum benefit from their respective resources and comparative advantages.

During its 5-year Life Of Project, EP3 will operate on three closely linked tracks: (a) EP3 operations at the A I.D./Washington level; (b) EP3 Country Support Programs in selected A.I.D.-assisted countries; and (c) short-term training and technical assistance available for all A.I.D.-assisted countries.

III B EP3 Operations at the A I D /Washington Level

III B 1 Early Project Learning

EP3 represents a pioneering effort in that it addresses environmental concerns primarily through pollution prevention rather than end-of-pipe pollution treatment. While each individual component of EP3 has been researched, and the overall project design draws on experience with similar project approaches in other subject areas, there has nevertheless been no true project precedent on which to build. For that reason, the project design includes an early learning feature to work as follows:

- (a) in collaboration with USAID Missions, an initial group of countries for EP3 Country Support Programs will be identified in the first weeks of project activity, and Country Support Programs will be launched in them immediately;
- (b) after four to six months, comparative progress and performance in these countries will be carefully evaluated in consultation with local USAIDs, and a small number of "emphasis countries" will be designated with the aim of completing all Country Support Program components in them during the following two and a half years (an effort will be made to designate emphasis countries in different A.I.D. regions);
- (c) at the end of the third project year, in association with a scheduled major EP3 evaluation and in consultation with relevant USAIDs, a thorough review and analysis of experience in the emphasis countries will be conducted; the lessons learned will provide the basis for mid-course corrections in elements of the EP3 operational approach.

This early learning feature will enable EP3 to operate with maximal efficiency and effectiveness, and to run more Country Support Programs in more countries simultaneously, for the remaining project years. Further detail on the early learning feature of EP3 appears in Section VI.

III.B.2. EP3 Clearinghouse

The EP3 Clearinghouse in Washington, D.C. will draw in part on existing EPA pollution prevention information clearinghouse and training facilities and the information and training resources of other A.I.D. projects. The clearinghouse will be an important resource both for EP3 Country Support Programs and for short-term training and technical assistance activities, and will also respond to information inquiries regarding urban and industrial pollution prevention from A.I.D.-assisted countries and others.

The clearinghouse will include statistical databases and other information associated with EP3 Country Support Programs and short-term training and technical assistance activities. Industry-specific data, including results of technical and economic appraisals at individual factories, will be available through the clearinghouse to similar industries throughout the world. The clearinghouse will link into relevant existing databases such as EPA's Pollution Prevention Information Exchange System and UNEP/IEO's International Cleaner Production Information Clearinghouse. It will also maintain a database of pollution prevention programs worldwide, including information on current activities and funding, procedures for requesting assistance, eligibility requirements, and key contacts.

Principal activities of the EP3 clearinghouse include the following

- (a) **Information Dissemination.** Establishing and maintaining a pollution prevention resource library of commercial publications, newsletters and reports, and information on U.S. suppliers of cleaner production and pollution prevention expertise and equipment; linking into, establishing, and maintaining a variety of pollution prevention databases as described above; publishing a regular pollution prevention newsletter for global distribution and customized bulletins and special reports for particular countries, industry categories, or other target audiences; responding to information inquiries, particularly in support of EP3 implementation and evaluation activities.
- (b) **Training.** Preparing training modules and course materials for use in EP3 Country Support Programs and in training programs conducted regionally or at A.I.D./Washington. These training packages will be coordinated with training activities of others, including UNIDO, UNEP, EPA, and A.I.D. environmental training programs such as those associated with GREENCOM, ETP, and EPAT. EP3 training modules will draw on case studies derived from EP3 field activities and from its library and databases, and will be available to Missions, A.I.D. environmental projects, and others.

Additional information on the EP3 clearinghouse will be found in Section V.

III.B.3. International Cooperation

EP3 will maintain continuous interaction with Regional Bureaus and USAIDs through periodic meetings, newsletters, and reports. EP3 will also promote and serve as a catalyst for international donor cooperation activities that encourage, coordinate and combine the pollution prevention efforts of A.I.D. and other international organizations concerned with industrial pollution in developing countries.

Examples of initial activities include cooperation with United Nations Agencies including UNIDO, the Industry and Environment Office of UNEP, the Asian and Pacific Centre for Transfer of Technology (ESCAP), and United Nations Economic and Social Commission for Western Asia (ESCWA). EP3 Country Support Program activities will be coordinated closely with the UNEP/IEO cleaner production databases and industry teams and the UNIDO industry-specific expertise and local program officers in developing countries. APCTT and ESCWA are interested in sharing information networks with the EP3 clearinghouse and international cooperation on EP3 Country Support Programs through technical assistance and training. Other international organizations will be invited to participate, including the U.S. Export-Import Bank, the International Finance Corporation, the World Bank, the regional development banks, bilateral development assistance agencies, and possibly PVOs.

International cooperation activities will combine the specialized expertise and resources of member organizations to transfer pollution prevention techniques and know-how and cleaner production technologies more effectively, and to build national programs for cleaner production and pollution prevention training, information, and technical assistance in developing countries. Representatives will meet twice during the first year to coordinate activities, set priorities and review joint efforts to develop national pollution prevention programs in 5-10 developing countries.

International cooperation between the Cleaner Production Programs of Industry and Environment Office of UNEP and UNIDO has already been initiated. At a meeting of A.I.D., UNIDO and UNEP on April 13, 1992 there was expressed interest in collaboration with EP3 to help establish and strengthen national programs for cleaner production and pollution prevention in developing countries. The specialized experience and expertise of each organization will be utilized to provide technical assistance, information, training, industrial evaluation projects, and sufficient support to build sustainable institutions. These collaborative efforts, like EP3 Country Support Programs and where possible in cooperation with EP3 Country Support Programs, will focus on target industry categories and environmental problems and use combined resources to transfer industrial pollution prevention and cleaner production technologies.

The international technology cooperation approach is based on the understanding that ultimately solutions to industrial pollution problems are interdisciplinary (involving, for example, management, technology, economics, and environmental sciences), inter-institutional (engaging private industry, consultants, universities, and government), and international in scope. International cooperation will build capacity and know-how in individual developing countries by:

- (a) drawing on the specialized technical assistance, economic analysis, training, management and administrative expertise of each participating institution and combining the special capabilities of international organizations with the skills and needs of industrial pollution experts in individual developing countries,
- (b) linking EP3 and other participants in an international information network that keeps donors abreast of current pollution prevention activities, needs, and opportunities;
- (c) coordinating environmental standards being developed for most industrial categories to permit similar emission and discharge criteria, including pollution prevention and cleaner production incentives, to be used by World Bank, Asia Development Bank, Inter-American Development Bank, U.N. Agencies and bilateral donors;
- (d) using EP3 and other grant resources to identify pollution prevention and cleaner production technologies that are cost effective, to demonstrate economic and environmental benefits and short pay-back periods, and to facilitate expeditious access to loan financing to complete the transfer of capital-intensive cleaner production technologies.

Another example of international cooperation is the industrial and urban pollution committee initiated by the R&D Bureau. This advisory committee will incorporate input and membership from throughout the Agency. EPA, DOE, Peace Corps, commerce and other agencies will be invited to participate on an "as interested" basis. The Project Office from R&D/ENR and a member of the Office of Energy and Infrastructure will initiate the first three meetings, after which a chairman will be chosen for future meetings. This committee shall work closely with the Environmental Forum established by the Policy Directorate.

Specifically for EP3 international cooperation, the committee will review and advise on:

- potential linkages between EP3 and other donor-assisted projects in urban and industrial pollution.
- International cooperation components of the EP3 Country Support Program approach and other major EP3 elements;
- effectiveness of EP3 efforts to collaborate with and draw on the expertise of other A.I.D. projects; and
- contractor long-term technical assistance and training development plans that have implications to support international cooperation;
- International cooperation components of EP3 annual workplans and progress reports;

Additional information on international cooperation activities will be found in Section V.

III.C EP3 Country Support Programs

III C 1 Selection of Countries for EP3 Country Support Programs

EP3 Country Support Programs may encompass the full range of over 25 discrete EP3 activities, tailored to the needs and circumstances of each individual country. EP3 Country Support Program activities are designed to establish a base of in-plant pollution prevention experience that provides a foundation for achieving information and technology transfer, greatly expanding in-country availability of pollution prevention expertise, and assisting with reforms leading to a policy and regulatory environment that encourages cleaner industrial production. Country Support Programs may extend to approximately three years, at the end of which pollution prevention momentum should be firmly established and EP3 assistance can be replaced with national and local programs.

Since EP3 Country Support Programs are essentially Mission initiatives, selection of countries for them will necessarily be made in close collaboration with USAID Missions. The following preference factors will be employed in the selection process:

- (a) the type and severity of urban and industrial pollution problems in the country, and the extent to which these problems are found in medium and smaller scale factories;
- (b) the likelihood of success and significant beneficial impact of an EP3 Country Support Program, including the presence of a "target of opportunity" high visibility industrial pollution concern that can serve as an entry point for the program;
- (c) the level of support for an EP3 Country Support Program on the part of the government, private sector, NGOs, USAID Mission, and other donors that work in the country, as demonstrated by the resources they are willing to commit to it;
- (d) the extent to which environmental policies, laws, regulations, incentives, and their implementing institutions support pollution prevention.

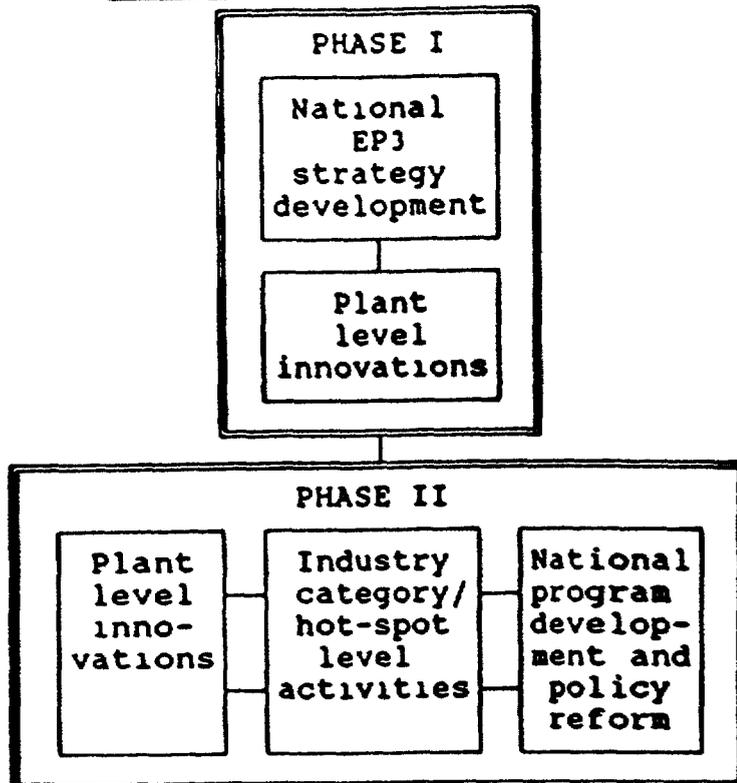
III.C.2. Overview of EP3's Two-Phase Country Support Programs

EP3 Country Support Programs will be USAID initiatives that are likely to result in a demand for additional and expanded pollution prevention and control initiatives arising from heightened awareness and demonstrated benefits of pollution prevention and improved environmental quality. Accordingly, they will be designed in collaboration with USAIDs, and the designs will

require Mission approval. The following describes a model Country Support Program that incorporates all the possible types of EP3 activities, and thus reflects the fullest scale of EP3 Country Support Program. Each EP3 Country Support Program will be tailored to the priorities and circumstances of the country and Mission, however, and may include fewer discrete activities sequenced and timed in a somewhat different way and therefore of a lesser or greater duration than the three years suggested by the Country Support Program model presented below.

EP3 Country Support Programs are structured in two phases. Work begins on the basis of an overall project plan negotiated with the

EP3 Country Support Program



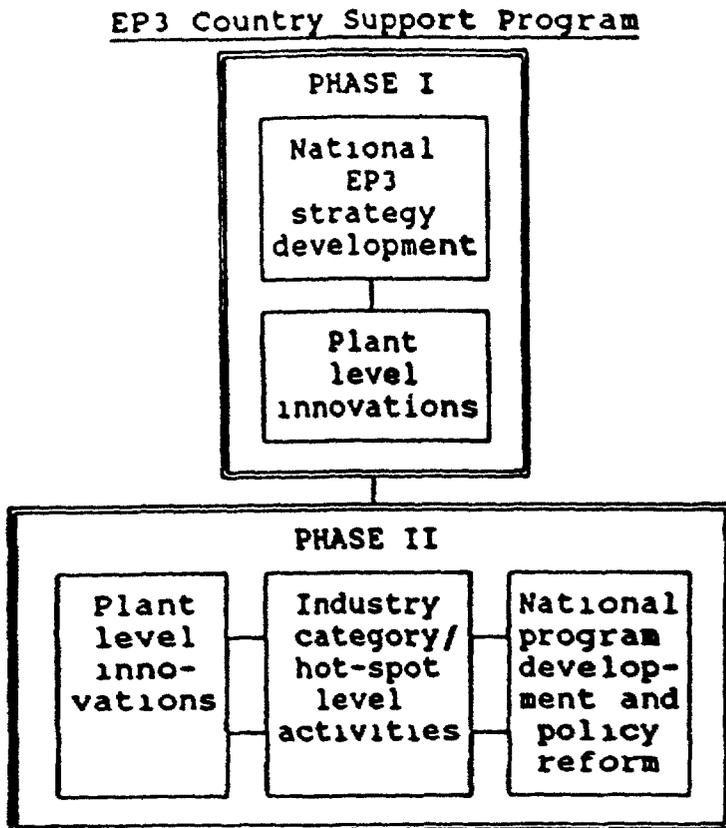
Mission with the understanding that this plan will be refined early in Phase I, and again prior to Phase II. The pace of progress and character of response to activities in Phase I determines the specific activities possible in Phase II. Before Phase II is formally launched, an agreement is concluded among the host country, USAID, and EP3 management regarding timing, intensity, and precise natures of Phase II activities, and the division of functional and funding responsibilities for carrying them out.

In Phase I of EP3 Country Support Programs, first, under the heading of "national EP3 strategy

development," several activities are undertaken that lead to a workplan for the EP3 Country Support Program tailored to local needs and circumstances. As part of the work connected with developing the national EP3 strategy, local pollution prevention experts are identified and the process of inventorying possible sources of financing for pollution prevention innovations is initiated. Phase I, which extends for approximately six months, also includes activities related to introducing no/low capital cost pollution prevention innovations at initial target plants. These activities, under the heading of Phase I "plant level innovations," represent the first steps in implementing the EP3 strategy.

Between Phases I and II a Leadership Conference on Pollution

Prevention is conducted as a means of consolidating and publicizing high level commitment to industrial pollution prevention, and to Phase II of the EP3 Country Support Program specifically. The Leadership Conference represents a decision and commitment benchmark, and follows the conclusion of agreements among the host country government, USAID, and EP3 management regarding timing, intensity, and precise characters of Phase II activities, and the division of functional and funding responsibilities for carrying them out. Other donor agencies may also be parties to the detailed workplan and implementation commitments for Phase II. A number of measures can be taken to minimize or eliminate the effects of potential delays resulting from negotiating these commitments and bringing the associated resources on line, so as to avoid a loss of momentum in the overall EP3 Country Support Program.



Phase II encompasses three broad categories of activities that may be initiated either sequentially or simultaneously, but for the most part are carried out simultaneously and interactively at the plant, industry category, and national program/policy levels. (In the diagram, the horizontal alignment of Phase II components and the double lines connecting them are meant to reflect their simultaneous and interactive natures.) Phase II "plant level innovations" cover activities connected with introducing more capital-intensive pollution prevention and control

measures at plants that have successfully carried out no/low capital cost innovations. "Industry category/hot-spot level activities" are designed to spread the proven innovations -- both no/low capital cost and capital-intensive innovations -- throughout the initial target industry category. In some cases, instead of an initial target industry category there will be an initial target "hot-spot". This term refers to a zone where a large number of heavily polluting plants are concentrated; the plants may or may not be in the same industry category.

"National program development and policy reform" activities provide assistance for extending the EP3 effort to other industry

categories and hot-spots, for a wide variety of training and awareness efforts, for building technical and institutional capacity to deal with the gamut of pollution concerns from policy to technology, and for program, policy, and regulatory reform in support of pollution prevention. Phase II continues for up to approximately two and a half years, during which EP3 assistance is systematically phased out as in-country capacity is strengthened in each country.

As Phases I and II progress in a number of countries, effective demand for pollution prevention expertise and equipment will be generated, while links are established with U.S. suppliers of this expertise and equipment. Establishing these trade linkages will complement EP3 direct technical assistance as means of sharing U.S. advances in pollution prevention and control with A.I.D. - assisted countries.

EP3 Country Support Programs will be financed primarily through a combination of EP3 core funds and USAID Mission buy-ins. Owing to Mission programming and budgetary cycles, it is anticipated that Phase I Country Support Program activities will be largely core funded, while Phase II activities will be largely buy-in funded. In addition, host country governments, trade organizations, and other NGOs will contribute personnel time, support services and facilities, and expertise. Pollution prevention equipment will be financed principally by commercial sources and/or programs of other development assistance agencies and host country governments.

Technical assistance teams fielded for EP3 Country Support Programs will be assembled from a variety of sources. These sources include professional environmental associations; industry trade associations and member companies; education foundations and universities, independent consultants and consulting companies; environmental NGOs; equipment manufacturers; and EPA and state and local government environmental professionals. Expertise will be provided on a volunteer pro-bono basis where possible, but sufficient provision is also made in EP3 to carry out assignments utilizing paid services. A special effort will be made to identify experts from counterpart type and size U.S. plants to provide technical advice to plants in EP3 countries. Local experts will be linked to teams of U.S. experts as a means of expanding their knowledge and experience.

One technical expert from the EP3 home office staff will be assigned to each Country Support Program from its inception to its conclusion in order to provide a fixed point of contact and to ensure continuity, consistency, responsiveness, and coordination. Members of various technical teams that may be fielded during the course of a Country Support Program are likely to change as the Country Support Program progresses and the outside expertise needed changes accordingly.

The specific activities encompassed by Phase I and Phase II are described in the following subsections. Based on experience with other projects, the carefully considered estimates of the EP3 project design team are, as noted earlier, that Phase I will extend for approximately 6 months and Phase II will extend for up to two and a half years. There may, however, be a brief lull in on-the-ground activity between the two phases, so that the entire EP3 Country Support Program may continue for somewhat longer than the three year maximum overall time frame suggested in the following subsections. There are specific measures, mentioned below, that can be taken to minimize the lull or avoid it altogether. Moreover, in some countries elements of an EP3 Country Support Program, such as a national industrial pollution prevention program, public-private cooperation on pollution prevention, or plant level pollution prevention innovations in the target industry category, may already be in place, and in these countries, EP3 Country Support Programs may extend for considerably less than three years.

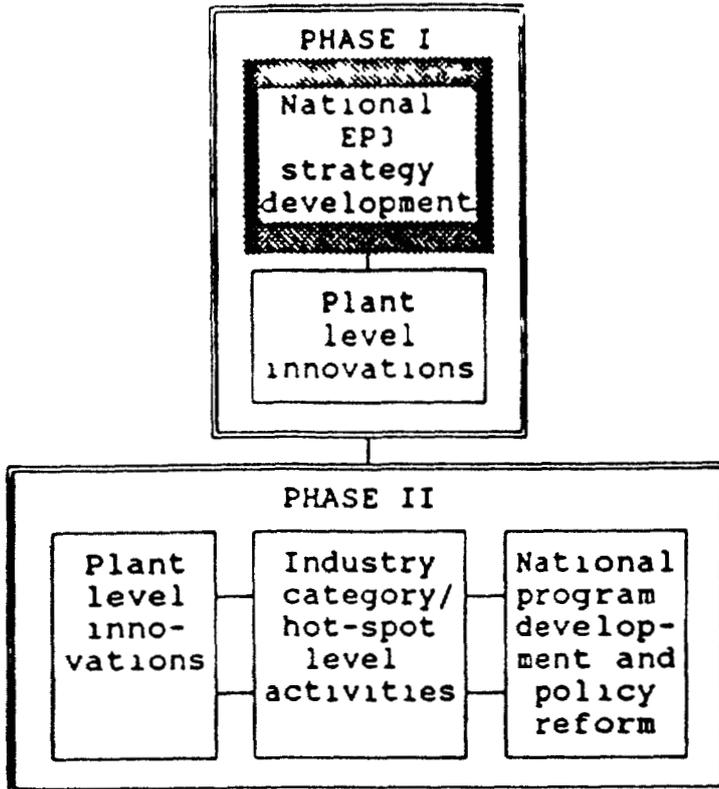
In any case, as also mentioned earlier, the activities described below should be thought of as elements of a general and full-scale model. The actual form an EP3 Country Support Program takes, and its duration, will be determined in collaboration with, and be approved by, the USAID whose initiative it represents.

III.C.3. Phase I National EP3 Strategy Development

The Phase I national EP3 strategy development component of EP3 Country Support Programs is expected to take 1-3 months, depending upon information availability and other circumstances in the country. The EP3 team for this component will include 3-5 U.S. specialists with experience in industrial pollution prevention that together cover expertise in policy analysis, institutional analysis, industrial processes, industrial or related applied economics, and assessment of industrial pollution problems. Through advance collaboration with the local USAID, two in-country counterparts will also have been identified to be on the team, and a local institution will have been identified to house the EP3 effort. All aspects of the work of the EP3 team will be characterized by continuing consultations with the Mission and with government, industry, and NGO leaders. Following are the activities included in this component of EP3 Country Support Programs.

- (a) **Rapidly assessing the national policy and regulatory environment.** Rapid assessments include review and analysis of (1) existing data and reports related to pollution problems in the country, and (ii) environmental policies, laws, regulations, incentives, and their implementing institutions. Findings are presented in a **Policy and Pollution Report** describing (1) the national policy and regulatory environment and its relationship to current pollution problems and pollution prevention, and (ii) recommended

EP3 Country Support Program



detailed studies that might be carried out in Phase II of the EP3 Country Support Program toward policy reform

- (b) Identifying in-country pollution prevention and control experts. This is the first step in establishing a database of in-country pollution prevention expertise, including experts in various types of manufacturing processes. The database will be expanded on a continuing basis, and in Phase II will be taken over and maintained by a national program for pollution prevention

training, information, and technical assistance. Some of the local experts identified will be utilized in Phase I plant level activities and in Phase II activities at all three levels, both as experts in their own right and in order to strengthen their expertise.

- (c) Identifying in-country, regional, and other sources of financing for industrial pollution prevention equipment. EP3 funds will not be used to finance major capital investments. Although the need for such financing will not come about until Phase II of the EP3 Country Support Program, the process of identifying and examining potential financing sources begins in Phase I. This will prevent the search for capital financing, which may take some time, from later impeding Country Support Program momentum.
- (d) Selecting the initial target industry category or hot-spot and initial target plants. EP3 Country Support Programs will identify and concentrate on an initial target industry category, such as metal finishing, textile dyeing, leather tanning, food processing, or pulp and paper manufacture, which are commonly among the most highly polluting operations in developing countries. As mentioned earlier, in some countries it will be more productive instead to concentrate initially on a hot-spot concentration of heavily polluting plants that may or may not be in the same industry category.

Within the target industry category or hot-spot, 6-8 initial target plants will be identified

The initial target industry category or hot-spot and the initial target plants will represent a major industrial pollution problem and meet the following criteria

- I a relatively large number of medium size or smaller plants contribute to the pollution,
- II a high priority interest in reducing the pollution is expressed by the government;
- III a relatively large number of people are affected by the pollution and there is a high level of interest among the public at large and NGOs in reducing the pollution.

The initial target industry category or hot-spot and the initial target plants will be identified in part through research based on existing data and studies, and in part through consultations with the local USAID, government agencies, and representatives of various industry categories and plants. The research and consultations will explore factors in addition to the basic criteria above that indicate a high potential for successful, significant, and well-received pollution prevention innovations. These additional factors will be ones pointing to the preferred industry categories and plants from among those meeting the basic criteria

These preference factors may include indications of interest on the part of plant managers in reducing pollution and minimizing waste in their industry categories, the apparent practicability of introducing both no/low capital cost and more capital-intensive pollution prevention innovations, a high likelihood that such innovations will result in significantly cleaner production and a significant positive effect on environmental quality, and a high likelihood that in the absence of EP3 assistance the pollution problem would continue to grow. The EP3 team will have to determine that for the target industry category or hot-spot there is a reasonable array of pollution prevention options that can be brought to bear, as documented in U.S. and northern European experience.

- (e) **Preparing a national EP3 strategy and convening a Pollution Prevention Roundtable.** A proposed-for-discussion national EP3 strategy that lays out all the activities to follow in the EP3 Country Support Program will be prepared on the basis of the initial project plan for the EP3 Country Support Program, EP3 work done and working experience so far, and consultations with government, industry, and NGO leaders. The proposal will contain operational detail for the remainder of Phase I, and will identify anticipated

activities, scheduling, and responsibilities for Phase II. The proposal will be finalized in close collaboration with the local USAID, in whose name it will be proposed. Among other things, this will ensure consistency with Mission priorities and planning documents such as CDSSs and Mission Environmental Action Plans, and also with a National Environmental Action Plan or similar document that may exist.

Once the proposed strategy is completed the Mission will participate in convening a 1-2 day Pollution Prevention Roundtable for government, industry, and NGO leaders. This Roundtable will discuss, agree upon, and adopt the national EP3 strategy in its final form, with the understanding that the strategy for Phase II and beyond will be reconsidered, refined, and further detailed on the basis of experience with Phase I of the EP3 Country Support Program. The Pollution Prevention Roundtable is meant to:

- create an opportunity to discuss the state of the environment, obstacles and opportunities for employing pollution prevention, and the challenge for action, based in part on the work of the EP3 team,
- ensure that the EP3 strategy conforms to local leadership perceptions, priorities, and views of what is most practicable;
- formalize government, industry, and NGO collaboration to address industrial pollution prevention; and
- obtain public endorsement of the strategy, among other things as a means of encouraging enthusiastic participation on the part of the initial target plants.

If appropriate and possible, the Pollution Prevention Roundtable will be helped to become in effect a permanent pollution prevention council that reconvenes regularly. Its primary continuing functions would be to review progress and consider revisions in the national EP3 strategy, to publicize pollution prevention successes, and in other ways to promote pollution prevention and pollution prevention awareness.

III.C.4. Phase I Plant Level Innovations

The Phase I plant level innovations component of EP3 Country Support Programs will result in pollution prevention innovation successes in the 6-8 initial target plants, and the beginnings of a national network of experienced industrial pollution prevention professionals and advocates. The activities in this component will be carried out in each plant by a team comprising:

- one or two U.S. pollution assessment and prevention experts, at least one of which will be experienced in similar factories in the U.S.;
- one or two university-based or other in-country pollution

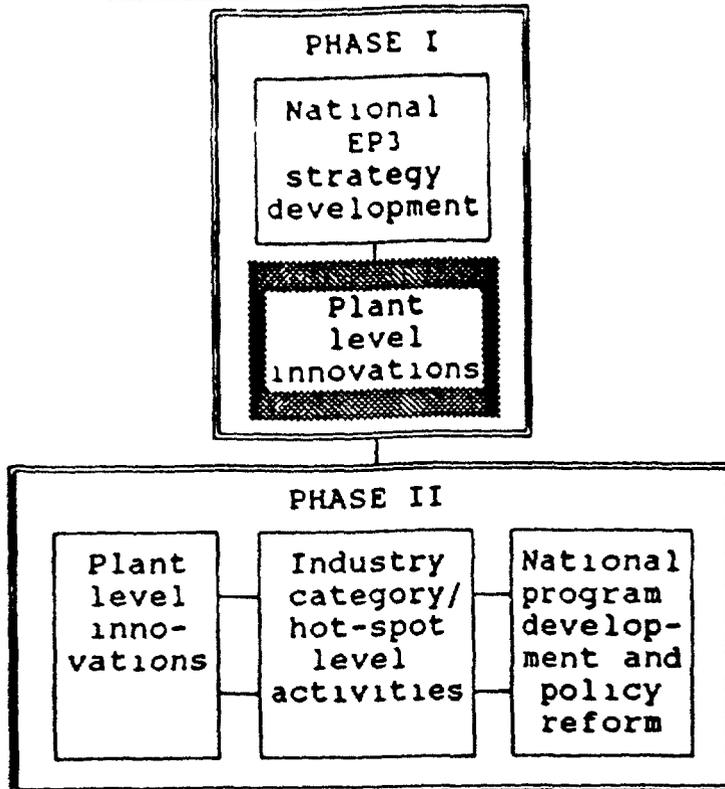
prevention specialists,

- two or three plant personnel, including mid- and upper-level managers, and if possible, a representative of workers

The teams will be equipped with their own pollution monitoring devices. Activities under Phase I plant level innovations are expected to take 2-3 months, depending on the complexity of the situations in initial target plants and the natures of the innovations introduced. This component includes the activities described below

- (a) **Laying the groundwork for plant level pollution prevention activities.** Before beginning work in any of the target plants, a preparatory 1-2 day seminar will be conducted. This seminar will be for in-country pollution prevention specialists and all plant personnel that will participate in the team work in individual plants. The seminar will focus on pollution prevention awareness in general and with respect to the initial target industry category (or hot-spot) and plants. Known pollution problems at the plants and the general procedures for conducting pollution prevention audits and assessments will be discussed. After the seminar, personnel from the target plants will begin the process of making observations and collecting needed data at their factories in preparation for the audits and assessments. The first day of work by the full team in each plant will be devoted to intensive training for in-plant team members and developing a detailed plan for conducting the audit and assessment in that plant.
- (b) **Conducting pollution prevention audits and assessments in the initial target plants.** Pollution prevention audits and assessments conducted at target plants will have the aim of identifying measures for reducing pollution generated by the facilities. There is considerable built-in incentive for plant operators to participate enthusiastically in the pollution prevention audits and assessments. The incentive is in the fact that these studies will necessarily address issues important for overall production efficiency at target plants, and the recommendations that result will help minimize waste and reduce production costs. Indeed, this, not pollution

EP3 Country Support Program



prevention, is likely to be the main interest of plant operators in the audits and assessments

The audits and assessments entail several visits to each target plant by EP3 personnel over a two-week period. Before and during this period in-plant team members may be making observations and collecting data continuously. A standard EP3 pollution prevention audit/assessment protocol will be developed to serve as the basis for all plant level audits and assessments.

This will ensure

relatively comparable data that can be fed into the databases at the EP3 clearinghouse in Washington, D C and used for a variety of analyses

Of the pollution prevention measures identified during the audits and assessments, those that involve no/low capital cost actions that can be carried out immediately, and their expected benefits, will be fully detailed. These would include measures such as improved housekeeping, recycling, better inventory management, more efficient overall process management, minor equipment changes, improved maintenance, and so on.

Less detailed recommendations will also be made regarding more capital-intensive process changes and cleaner production equipment that will both enhance profitability and reduce polluting discharges. Additional assistance related to these more capital-intensive innovations will be provided later in Phase I and in Phase II of the EP3 Country Support Program, after the plant has successfully carried out the no/low capital cost innovations.

- (c) Formulating and carrying out a program of no/low capital cost pollution prevention innovations in the initial target plants. After consultations with the plant operator, the audit and assessment team will present its findings and

recommendations at a meeting of upper level plant managers and, if possible, representatives of workers. A program for carrying out the agreed no/low capital cost pollution prevention innovations expeditiously will be formulated, based on proposals by the audit and assessment team. This program, which will be assisted by EP3, may include:

- obtaining additional information on experience with the innovations elsewhere,
- technical assistance for carrying out the innovations,
- training for plant personnel in pollution prevention awareness, modifying production processes, operating modified equipment, and waste minimizing procedures,
- up to \$5,000 in EP3 funds for acquiring off-the-shelf hardware that expedites the innovations

The audit and assessment findings, planned innovations, estimated pollution prevention and cost reduction benefits of the no/low capital cost innovations, and program for carrying out the no/low capital cost innovations will be summarized in a **Pollution Prevention Report** for the plant. The report will be formally presented at a ceremony that introduces all levels of plant personnel to the pollution prevention effort and officially launches the program.

(d) **Evaluating performance in the initial target plants and developing individual Phase II pollution prevention action plans for each of them.** Plant level teams will document the processes of putting in place the no/low capital cost innovations and will monitor their pollution prevention and economic benefits. Meanwhile, plants where agreed upon innovations have been undertaken in good faith and as quickly as practicable will be "rewarded" with further technical assistance to develop a cooperative detailed action plan for pursuing the more capital-intensive innovations identified earlier. The action plan will be developed as soon as the no/low capital cost innovations have been put in place. It will include

- relatively detailed specifications for more capital-intensive pollution prevention innovations at the plant;
 - estimated pollution prevention and cost-saving benefits,
 - a workplan of coordinated actions by plant personnel and EP3 technical specialists for installing the innovations in Phase II of the EP3 Country Support Program, including conducting technical and economic appraisals of the proposed capital-intensive innovations, evaluating information from equipment suppliers, arranging financing, training workers, setting up pollution and economic monitoring systems, and the like
- Implementation of the action plan will begin immediately.

Once the no/low capital cost innovations have been in place long enough to monitor and assess performance under routine operating conditions, a **Pollution Prevention Progress Report** will be prepared for the plant. This report will summarize

the innovations introduced and the basic steps in introducing them, lessons learned from the experience, the estimated reductions in pollution discharges and production costs resulting from the innovations, and the action plan for pursuing more capital-intensive pollution prevention innovations. The report will be formally presented at a second pollution prevention ceremony at the plant. Information in the report will be transmitted to Washington, D.C. and entered into the database of the EP3 clearinghouse.

III C 5 Leadership Conference on Pollution Prevention - Decision and Commitment Benchmark

When Pollution Prevention Progress Reports are available from all initial target plants that successfully introduced no/low capital cost innovations, information from them will be gathered into a single document. The document will summarize selected information on national pollution problems from the Policy and Pollution Report, present key information about innovations at the initial target plants, their pollution prevention and economic consequences, and plans for more capital-intensive innovations, and provide a summary of the national EP3 strategy. The document will be prepared as a brief, easily readable, and attractive booklet suitable for a broad audience. It will serve as the focal point for a Leadership Conference on Pollution Prevention, convened with USAID participation.

The Leadership Conference on Pollution Prevention is a highly publicized one-day meeting of key industrial, government, and possibly NGO leaders, and also representatives of other development assistance agencies. Presentations and discussions are conducted on pollution problems in the country, the pollution prevention approach, including examples from elsewhere emphasizing cost and waste minimization as well as pollution prevention benefits, experiences of the initial target plants and their plans for more capital-intensive innovations; the national EP3 strategy to be carried out over the next two and a half years, and the roles different organizations represented at the conference will and could play in pollution prevention in general and Phase II of the EP3 Country Support Program in particular. The conference will open and close with remarks by the highest possible government official. The purpose of this conference is to.

- create awareness, within the highest levels of decision-making, of the environmental and economic development benefits of pollution prevention;
- establish a highly-publicized senior level commitment to pollution prevention in general, and to Phase II of the EP3 Country Support Program specifically;
- encourage active support for and involvement in Phase II of the EP3 Country Support Program on the part of host

government agencies, business, NGOs, and other development assistance agencies,

- provide recognition for the efforts of the initial target plants and encouragement for their continued efforts in Phase II

The Leadership Conference on Pollution Prevention is meant also as a clear decision and commitment benchmark for the host country government, the local USAID, and EP3 project management. Prior to the conference, representatives of these entities and the Pollution Prevention Roundtable will assess experience in Phase I and agree on the modifications, refinements, and detailed Phase II workplan for the national EP3 strategy. The Phase II workplan will spell out the timing and precise natures of Phase II activities, and the functional and funding responsibilities of different organizations for carrying them out. Developing the Phase II workplan will require negotiating firm commitments for Phase II implementation from USAID, EP3, and the host country government, and also NGOs, private firms, other in-country entities, and possibly other development assistance agencies. The Leadership Conference on Pollution Prevention therefore marks not only a national leadership commitment in principle to pollution prevention, but also acceptance of concrete commitments necessary for a successful Phase II from the institutions directly involved in implementing the EP3 Country Support Program.

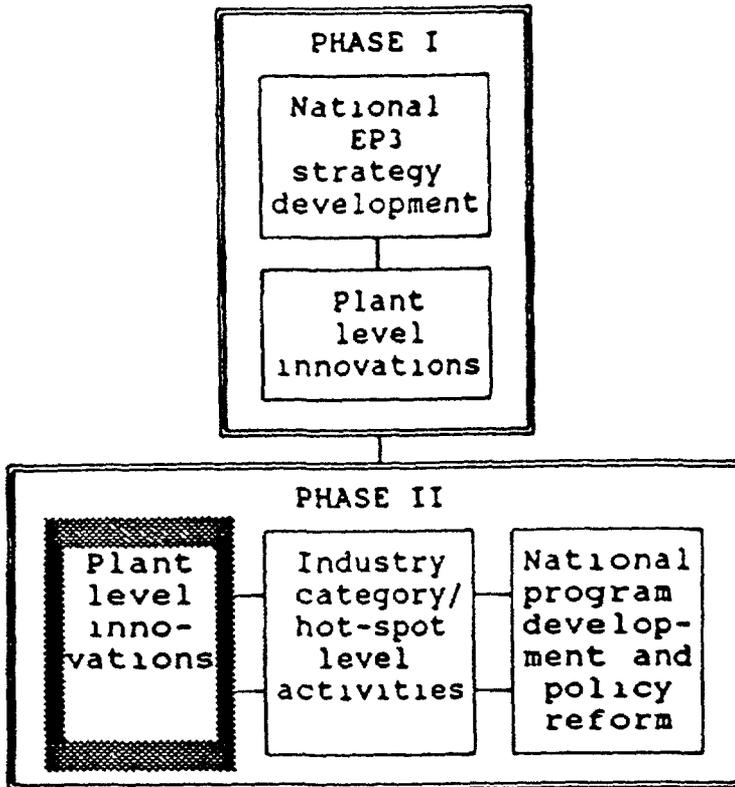
Despite the fact that much of the groundwork for these commitments will have been laid during Phase I, negotiating them in their final explicit forms, and especially bringing them on line, may take some time. For example, A.I.D. funding for Phase I is likely necessarily to be largely from EP3 core funds, owing to the nature of Mission program planning and budgetary cycles. Phase II will be much more heavily dependent on Mission buy-in funding. Yet, in many cases planning and budgetary cycles will also make it impossible for Missions to provide Phase II buy-in funding as soon as desirable. Even greater delays may be associated with the funding commitments of the host country government or other donor agencies, some of which may undertake Phase II commitments only as an outcome of the Leadership Conference. There may, therefore, be a brief lull in EP3 activity on the ground prior to the Leadership Conference on Pollution Prevention, and there is the potential for an actual hiatus in EP3 Country Support Program activity before full implementation of Phase II.

It will be important to maintain momentum of the EP3 Country Support Program, especially in the initial target plants. There are several ways the effects of potential delays can be avoided or minimized, depending on the specific situation in each country. One approach may be to fund initial Phase II activities as short-term technical assistance buy-ins to EP3 for which Mission funding is available in the current FY. Another may be to front-load Phase II with EP3 core-funded activities until substantial Mission buy-in funds can be brought on line. Still another may be to

utilize the resources and capabilities of other A I D /W or Mission environmental projects for the initial activities of Phase II. In addition, it may be possible to utilize the resources of other development assistance agencies operating in the country for the initial activities of Phase II. And of course, some combination of these is possible. In any case, commitments necessary for sustaining EP3 momentum while Phase II activities are brought on line will be an important component of the detailed workplan negotiated for Phase II and publicly announced at the Leadership Conference on Pollution Prevention.

III C 6 Phase II Plant Level Innovations

EP3 Country Support Program



The Phase II plant level innovations component of EP3 Country Support Programs may extend from several months to a limit of two and a half years. At first it will concentrate on working cooperatively with initial target plants to help them introduce more capital-intensive pollution prevention measures. However, in due course plant level activities will be fully interactive with the other components of Phase II. This will come about as industry level activities extend EP3 to additional plants in the initial target industry category or hot-spot, as in-country pollution prevention expertise is expanded, and as national program development

efforts extend EP3 to plants in additional industry categories. Following are the types of EP3 Phase II assistance that will be provided, in collaboration with the local USAID, to initial target plants that have successfully introduced no/low capital cost pollution prevention measures.

- (a) Support for technical and economic appraisals for capital-intensive pollution prevention and control technology. These studies will include comparative analyses of equipment, supplier, and financing alternatives; quantified estimates of anticipated reductions in polluting discharges; analysis of the relevant aspects of competition, regulation, and incentives; and the usual financial, rate of return, and

technical feasibility and planning analyses. Information developed in the course of these studies will be entered into the database of the EP3 clearinghouse in Washington, D C and employed in the other Phase II components of the Country Support Program

- (b) **Technical assistance to help assess information from suppliers of pollution prevention equipment and to develop loan applications for financing the equipment.** The EP3 home office will coordinate closely with field personnel to expedite development of trade information and linkages, and thus help expedite acquisition and installation of pollution prevention equipment in the target plants. Since the beginning of the EP3 Country Support Program there will have been underway efforts to identify, evaluate, and establish working relationships with sources of financing for industrial pollution prevention equipment, including programs of national governments and other foreign assistance agencies. EP3 technical assistance teams will help target plants apply to the most advantageous appropriate sources for financing, data from the technical and economic appraisals will be used in applications for financing.

It is expected that in many cases U S. suppliers will be the most advantageous sources of pollution prevention technology and associated installation expertise. EP3 will utilize the services of the U S Trade and Development Program, the various facilities of the U.S. Department of Commerce, the Overseas Private Investment Corporation, the Foreign Commercial Service, and the Export-Import Bank to identify and establish linkages with U S suppliers and help finance transactions

- (c) **Technical assistance associated with installing pollution prevention equipment.** EP3 may provide specialists to advise on production process modifications and conduct personnel training to maximize the pollution prevention effectiveness and rate of return of capital-intensive innovations in target plants. In addition, EP3 will make available experts to help establish systems for monitoring pollution prevention and cost saving benefits of the innovations.

- (d) **Limited financial support for selected installations.** While EP3 will not provide financing for installation of pollution prevention capital equipment and technology, EP3 may collaborate with other A.I D. projects or other donors to provide limited leverage financing. These will be cases in which

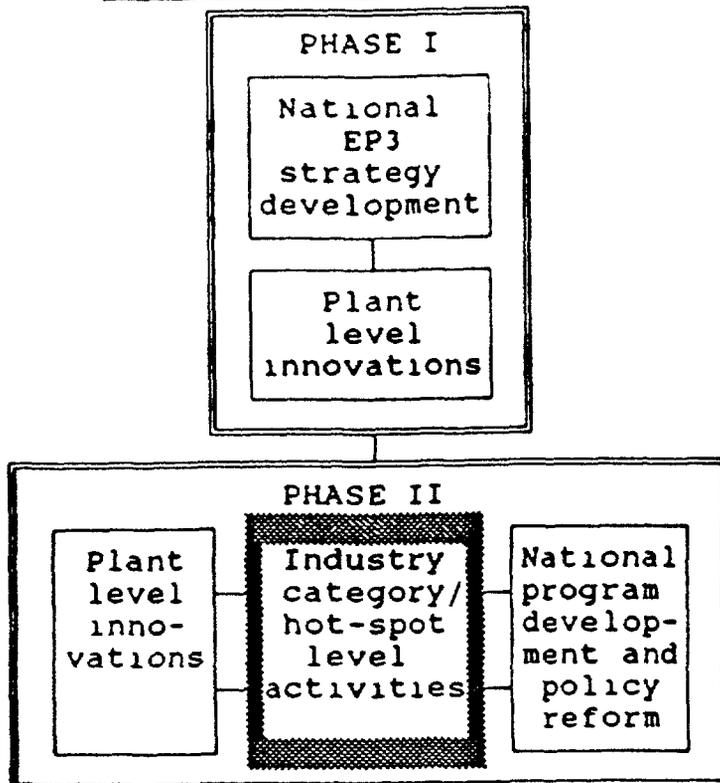
- the equipment would have widespread application in the industry category and the recipient plant agrees to serve as a demonstration site for others, and
- a small amount of leverage financing will substantially expedite acquisition of full financing from other

sources and thus facilitate rapid installation of the equipment

III C 7 Phase II Industry Category/Hot-Spot Level Activities

The Phase II industry category hot-spot level component of EP3 Country Support Programs at first encompasses activities designed to extend plant level pollution prevention innovations throughout the initial target industry category or hot-spot. However, as

EP3 Country Support Program



with Phase II plant level activities, in due course this component is fully interactive -- indeed, integrated -- with the other components of Phase II. With regard to additional plants in the initial target industry category or hot-spot, in this component of the Country Support Program EP3 will provide the types of assistance described below in collaboration with the local USAID

- (a) **Training for plant managers and other personnel.** Types of training provided will depend upon industry category or hot-spot needs and circumstances. Generally, it is expected to

encompass industry-wide training related to pollution prevention and waste minimization in the industry category, on-site training in individual plants, and demonstration-based training utilizing innovations introduced in initial target plants.

- (b) **Technical assistance to address pollution problems throughout the industry category or hot-spot and develop industry-wide pollution prevention measures.** Working with industry organizations and other NGOs, EP3 technical assistance specialists will help identify and address pollution prevention and control problems that can only be dealt with, or can readily be dealt with, on an industry- or hot-spot-wide basis. For example, a target industry category might be helped to identify and introduce a cleaner, less hazardous, more fully consumed, or more readily recoverable chemical to

substitute for a highly polluting one now used in the production process throughout the industry category

- (c) Assistance for establishing linkages with in-country and U.S. suppliers of pollution prevention expertise and technology. Using the database of in-country pollution prevention and control expertise, databases at the EP3 Cleaner Production Resource Bank in Washington, D C , and the services of various U S government agencies, EP3 will provide plants in the initial target industry category or hot-spot with information on suppliers of pollution prevention and cleaner production expertise and technology. The effort will target suppliers with the capacity to respond to specific requirements, and will assist to establish linkages with them that may lead to commercial transactions

III C 8 Phase II National Program Development and Policy Reform

The Phase II national program development and policy reform component of EP3 Country Support Programs will build on the experience of the other components, and in turn will reinforce them. It is through the activities of this component that the foundation for nation-wide continuing and self-sustaining improvement in pollution prevention and control will be established, and the groundwork laid for phasing out EP3 assistance. Following are the activities assisted by EP3 in this component of the Country Support Program

- (a) Developing a national program for pollution prevention training, information, and technical assistance. Working closely with the local USAID, EP3 will provide technical, financial, and training support for developing a national pollution prevention program, and for helping it to become firmly established and efficiently and effectively operating during the period of EP3 Country Support Program assistance. In addition, EP3 will provide information resource assistance to these programs by linking them with the EP3 clearinghouse in Washington, D C and helping to link them with other pollution prevention databases. Building on EP3 Country Support Program experience, these national programs will concentrate initially on manufacturing-related pollution prevention, but in due course they are expected to extend their concerns to other sectors, to urban pollution prevention generally, and to pollution control and treatment in their countries

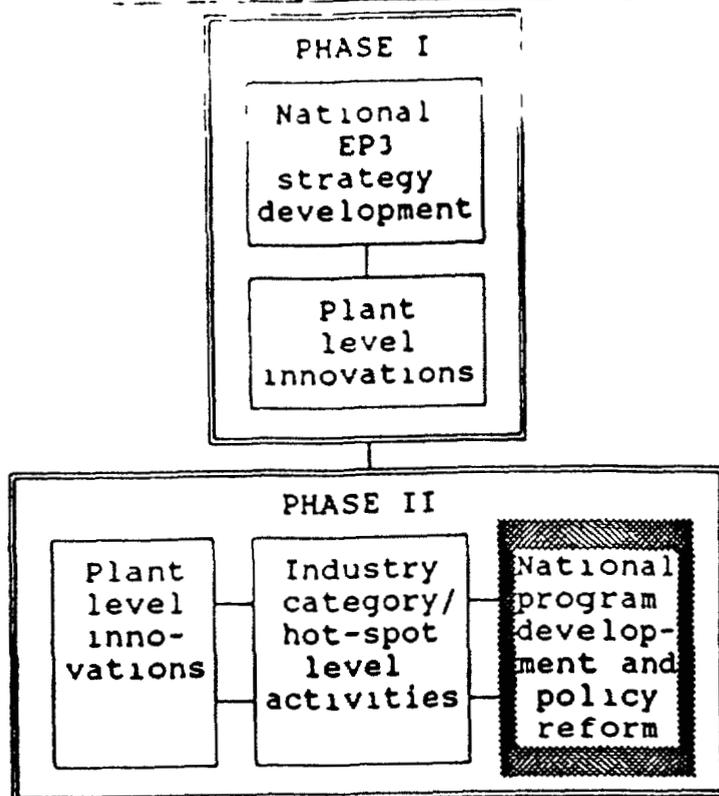
The national pollution prevention programs will serve government and the business community by collecting and disseminating pollution prevention information, providing a range of training programs, providing limited pollution prevention technical assistance services, and developing and maintaining databases of suppliers of pollution prevention expertise and technology for referral purposes. In addition to their routine functions, examples of special activities

that could be undertaken by national pollution prevention programs include

- providing technical assistance to government and industry to design and carry out a national industrial pollution prevention program, based in part on experience with the EP3 Country Support Program,
- maintaining special measuring and testing equipment and expertise for technical assistance in designing and evaluating alternative pollution prevention innovations in individual plants,
- taking organizational responsibility for expanding the structure, functions, and membership of the Pollution Prevention Roundtable,
- hosting regular meeting of industry and government officials to address specific pollution problems,
- training "pollution prevention managers" from large numbers of plants in specific industry categories or hot-spots who can train others in their plants and work with technical experts to conduct pollution prevention audits and assessments,
- running programs in additional industry categories and hot-spots that encompass elements of the Phase I plant level innovations, Phase II plant level innovations, and Phase II industry category/hot-spot level activities of the EP3 Country Support Program;
- continuing other Phase II activities of the EP3 Country Support Program, including providing technical assistance for policy and regulatory reform studies and for strengthening pollution prevention institutions, mounting special programs for target groups of national and local government officials, legislators, industry representatives, and planners; and supplying expertise for USAID environmental initiatives in the country.

The national programs for pollution prevention training, information, and technical assistance will be user-driven. Each will be an outgrowth of the work of the Pollution Prevention Roundtable and the network of factory, industry category, technical expert, NGO, and government people concerned with pollution prevention that will have been built and encouraged by the local USAID in part through EP3 Country Support Program activities. Tangible support for the program will be required from members of the community of pollution prevention concern. In each country, therefore, the national pollution prevention program will have a unique and evolving character reflective of the priority concerns and circumstances of its constituency.

EP3 Country Support Program



An important function of these national programs will be to promote confidence and positive working relationships on pollution problems between government and industry. Accordingly, the programs will be located in universities, industry associations or other NGOs, or other well-established nongovernmental entities.

- (b) Carrying out studies in support of policy, regulatory, and enforcement/incentive reforms. Technical experts will be provided by

EP3 to help teams composed primarily of in-country experts conduct policy and regulatory reform studies called for in the national EP3 strategy. The studies will

- include detailed analyses of the policy and regulatory environments related to urban and industrial pollution;
- propose and justify reforms,
- provide estimates of environmental, financial, and economic impacts of proposed reforms, including incidences of benefits and costs,
- recommend procedures for implementing the proposed reforms.

These analyses will build on the Phase I rapid assessment of the national pollution policy and regulatory environment and will benefit from the extensive knowledge developed through EP3 Country Support Program activities since then. If requested, EP3 technical experts will extend their assistance to helping draft and implement the reforms.

- (c) Strengthening the institutional base for pollution prevention and control. In collaboration with the local USAID, EP3 will offer assistance to host-country governments in their efforts to establish or strengthen institutions developing and implementing environmental policies, laws, regulations, and incentives that support pollution prevention. EP3 technical

assistance will also be available to help strengthen broader environmental agencies, especially with respect to their programs that influence pollution prevention and control. Assistance will be offered as well to other institutions, such as universities and NGOs (including trade associations), to strengthen their technical and organizational capacity to help identify and resolve current or anticipated pollution problems.

- (d) **Conducting pollution prevention awareness programs.** EP3 will offer the assistance of specialists to help design and prepare materials for general public, government, and industry pollution prevention awareness programs. Design of these programs will benefit substantially from experience in other EP3 Country Support Program activities. Two important objectives of the awareness programs will be:
- to expand public demand for cleaner production methods, and through this to create or significantly strengthen vital social acceptability incentives for plant managers to introduce pollution prevention innovations,
 - to create or enhance recognition of the community of interest among government, industry, and the general public for pollution prevention through cleaner production and waste minimization.
- (e) **Mounting special programs for specific target groups.** In collaboration with USAID Missions and host-country governments, EP3 will help to design and mount a variety of special programs aimed at specific target groups. These programs will include information dissemination, training programs, seminars, workshops, in-country trade fairs or trade missions, and study tours. Target groups may include managers and engineers from particular industry categories, national and local government leaders and environmental officials, urban planners and public works engineers, industry and trade association representatives, local pollution prevention consultants, NGO representatives, and others. Precise objectives of each special program will vary with the needs and circumstances of each group, but one aim throughout will be to heighten awareness of U.S. know-how and suppliers of pollution prevention expertise and equipment.
- (f) **Designing, conducting, and evaluating USAID initiatives.** Because EP3 Country Support Programs will be carried out as Mission initiatives, inherent in their activities is EP3-related technical assistance provided directly to USAID Missions. In addition, EP3 technical specialists will be available to help Missions design, adjust, conduct, and evaluate existing projects in their portfolios that are or could be related to pollution prevention and control. This of course includes assistance with environmental projects, but it may also include assistance with projects that have no explicit environmental component.

For example, EP3 technical specialists will help Missions to design new initiatives coordinated with and intended to reinforce or continue pollution prevention activities and momentum generated by the EP3 Country Support Program. But they will also assist Missions to incorporate pollution prevention and environmental trade elements into existing initiatives that could benefit from them, such as private enterprise, industrial promotion, health and sanitation, housing and urban development, and agri-business projects.

III D Mission and Host Country Involvement in EP3 Country Support Programs

Two points mentioned earlier need to be reemphasized here. First, EP3 Country Support Programs are conceived as Mission initiatives. These initiatives are heavily supported by central EP3 resources in the form of overall Country Support Program design, implementation, and monitoring assistance, EP3's global experience, the training and information facilities of the EP3 clearinghouse, the coordinated focussing of resources of many assistance agencies through international cooperation activities, in-country coordination and continuity through an EP3 technical specialist permanently assigned to that country's EP3 Country Support Program, rapid access to a wide range of technical expertise through the EP3 home office, EP3 core funding to some extent, and more -- but they nevertheless remain Mission initiatives. Second, the foregoing described an EP3 Country Support Program of the fullest scale possible, one that encompasses all the types of Country Support Program activities offered by EP3. Any specific EP3 Country Support Program, however, may well include fewer discrete activities packaged in a somewhat different way than described.

EP3 Country Support Programs are not seen as the ultimate vehicles for achieving substantial progress in national urban and industrial pollution prevention. As an A I D. project, the resources EP3 can bring to bear in any country are relatively modest in comparison to the complexity and magnitude of the problem it addresses. EP3 Country Support Programs are seen as instruments for setting in motion long-term concerted efforts within countries to achieve cleaner production and waste minimization, and they are seen as instruments for promoting, supporting, integrating, and laying the groundwork for a variety of Mission activities, and through that for maximizing the environmental and pollution prevention benefits of limited Mission resources. That is why EP3 Country Support Programs must arise from and be carefully adapted to prevailing priorities and circumstances of each country and Mission.

This requires that Missions and host country institutions be deeply involved in the design and implementation of EP3 Country Support Programs. The central role of Missions in EP3 country selection and the EP3 early learning exercise was described earlier. Missions will identify lead in-country institutions for

EP3 Country Support Programs and negotiate the necessary working arrangements with them. They will be responsible for involving these institutions in developing the original overall EP3 project plan for the country and in all subsequent project decision making, management, and oversight activities, such as those mentioned in the following paragraph, as appropriate in their view.

Missions will determine precise scopes and schedules of individual Country Support Program activities, approve proposed technical specialist personnel, negotiate in-country support; determine the nature of working partnerships between EP3 technical specialists and host country public and private institutions and individual counterparts, review and approve all reports arising from the work of EP3 technical specialists, such as the Policy and Pollution Report, propose and approve selection of the initial target industry category or hot spot and initial target plants, be instrumental in developing the proposed-for-discussion national EP3 strategy, participate in planning, convening, and conducting all roundtables, workshops, conferences, seminars, and training activities, collaborate in developing and carrying out programs for introducing pollution prevention innovations in target plants, be instrumental in developing, and approve, the detailed workplan for Phase II, take the lead in developing national programs for pollution prevention training, information, and technical assistance, determine or approve special programs mounted for specific target groups, be the overall point of EP3 contact for the host country, exercise general oversight of EP3 Country Support Program progress, and, to the extent possible, directly participate at the working level in all EP3 Country Support Program activities. In this way, EP3 Country Support Programs are Mission initiatives undertaken collaboratively with host country governments and other institutions, and supported by the expertise, personnel, and facilities of the global EP3 project.

All this can imply demands on Mission personnel resources not unlike those normally associated with other Mission initiatives of a similar scale. Especially in the cases of smaller Missions, however, it may not be possible to meet these demands. In these situations, EP3 personnel can play a larger operational role, with Mission personnel perhaps concentrating on review, approval, general oversight, and liaison with host country officials. Owing to the flexibility built into the EP3 implementation mechanism (see Section V of this Project Paper), the roles and specific responsibilities taken on by Mission and EP3 personnel respectively are readily adaptable to Mission circumstances and desires. Agreements concerning these roles and responsibilities will be incorporated into the original EP3 project plan and subsequently the detailed Phase II workplan negotiated with the Mission. Whatever the arrangements concluded between the Mission and EP3 management, the essential fact and appearance of the EP3 Country Support Program as a Mission initiative will not be compromised.

III E EP3 Short-Term Training and Technical Assistance

In addition to operations in Washington, D C and coordinated multifaceted Country Support Programs in designated countries will maintain a short-term training and technical assistance service operated largely on a buy-in basis. The phrase "short-term" is meant to distinguish this technical assistance from that provided in connection with EP3 Country Support Programs, and not to suggest that it is available only for efforts of very short duration. EP3 short-term training and technical assistance services will be available directly to USAID Missions, or through them to host-country national and local governments, universities, trade organizations, or other NGOs. These services will be available to all A I D -assisted countries.

Training and technical assistance services will be available covering the entire range of activities and subjects discussed under EP3 Country Support Programs: assessments of national pollution prevention policy and regulatory environments, building a database of in-country pollution prevention expertise, identifying sources of pollution prevention technology and financing, identifying priority pollution problems and polluting industry categories, hot-spots, and plants; organizing pollution prevention roundtables, conducting pollution prevention audits and assessments, introducing no/low capital cost and more capital-intensive pollution prevention innovations at specific sites; establishing programs of pollution monitoring, technical and economic appraisals of proposed pollution prevention innovations; establishing trade linkages with U S suppliers of pollution prevention expertise and technology, pollution prevention training of many types, developing national pollution prevention programs, carrying out studies in support of pollution prevention policy, regulatory, and enforcement/incentive reforms, strengthening the institutional base for pollution prevention and control; conducting pollution prevention awareness programs; mounting special programs for specific target groups, designing, conducting, and evaluating USAID initiatives, and more.

The EP3 implementation mechanism and the EP3 clearinghouse assure access to a broad range of training materials and U S. urban and industrial pollution prevention and control expertise on a quick response basis. Therefore, in addition to the activities mentioned above, training and technical assistance will be available through EP3 to respond to any need associated with the larger context of urban environmental issues, pollution control and treatment, and general environmental quality management. EP3 technical assistance will also be available to help Missions with environmental resource management aspects of their CDSSs, Action Plans, Mission Environmental Action Plans, and other strategic planning exercises and documents; with project environmental assessments; economic analysis of alternative proposals; with methodologies for determining values for PRISM indicators that are directly and indirectly related to environmental resource management, and for related activities.

IV. SUMMARY OF PROJECT ANALYSES

IV.A. Introduction

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IV B Mission and Bureau Interest and Country Need

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IV C. Technical Analysis

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IV.D. Financial and Economic Analysis

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IV.F. Social Soundness and Gender Analysis

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IV.G Administrative Analysis

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V IMPLEMENTATION PLAN

V A Primary Implementation Mechanism

A primary implementation mechanism was sought for EP3 that would strengthen international cooperation by:

- obtaining a substantial involvement of A.I.D. and USAIDs on a partnership basis in setting objectives, priorities and detailing implementation activities of the project;
- limiting the number of organizations and agencies with which A I.D. would need to manage or sign contracts or agreements;
- strengthening the international capabilities of U S domestic environmental professional associations by expanding their rosters of international pollution experts and screening their members providing EP3 *pro bono* technical assistance;
- providing flexibility for making mid-course adjustments to take advantage of the early learning feature of the project.

With this in mind, R&D/ENR has determined that the most appropriate primary implementation mechanism is a competitive core contract and a complementary requirements contract executed simultaneously with the award of the core contract.

R&D/ENR considered both a contract and a cooperative agreement as the primary implementation mechanism for EP3 R&D/ENR considered the distinction between a cooperative agreement as an assistance instrument where A I D supports the program of the cooperator with provision for substantial A I D involvement in program implementation versus the contract that is used when the principal purpose is to acquire specific goods or services of direct benefit or use to an A.I.D program

Although strengthening the capabilities of U.S. environmental NGO professional associations is an important part of this project, EP3 will accomplish its goals by providing a broad range of technical assistance, training and information services. The acquisition and delivery of these assistance and training services is most appropriate through a contract mechanism.

The contractor will also be expected to develop and administer subcontracts or cooperative agreements, as appropriate, with a small number of environmental NGO professional associations to ensure expeditious access to a wide array of pollution prevention, environmental, and industrial process experts on both a paid and voluntary *pro bono* basis. Some of these organizations may access industry trade associations and member companies, education foundations and universities, independent consultants and environmental equipment manufacturers, and EPA and state and local government environmental professionals.

EP3 will assist the primary environmental NGO professional associations implement EP3 by expanding their international networks of environmental experts, preparing rosters with experts identified by country and industry expertise, specialized skills and languages and experience by environmental problem area; carefully screening and preparing experts for missions to developing countries; providing help with reports, follow-up information, or related needs; linking experts with similar experience; and documenting progress, problems and experiences as EP3 country support programs are implemented

R&D/ENR considered A I D developed, executed and administered cooperative agreements to the U.S. environmental NGO professional associations, but determined that subcontracts or cooperative agreements developed and administered by the contractor with A.I D. execution of the agreements were more appropriate. The Country Support Programs are three year implementation activities led by an in-country contractor expert and supported by contractor staff, local experts and U.S. expert volunteers identified by the environmental NGO professional associations. These programs require close coordination between A I D. and host government officials, local industry and local experts, the contractor and pro bono experts. The contractor will be present throughout program implementation and will know precise needs and can recommend how to effectively integrate pro bono experts into the overall program There will be numerous environmental experts that will come and go during implementation of the three year Country Support Programs and they will need to work closely with the contractor. It will be necessary to keep the associations and their pro bono experts focussed on the Country Support Programs and avoid overlaps or problems between competing objectives, overlapping program goals and membership issues

A direct management relationship between the contractor and the environmental NGO professional associations will also reduce the administrative and fiscal accounting burden of the U.S associations who have limited experience working with A.I.D. and USAIDs. There will also be a single point of contact between EP3 and A I.D contracts when there are questions about salaries or need to request official procedural approvals This arrangement will also be most efficient for R&D/ENR as it will reduce the administrative and management burden for EP3 management staff. For these reasons, R&D/ENR has determined that subcontracts or cooperative agreements with U S environmental associations should be developed and administered by the contractor.

The contractor will be responsible for overall management of the activities funded under the core contract and complementary requirements contract, including early learning activities; implementing the EP3 clearinghouse; supporting international cooperation activities; establishing and maintaining contacts with USAID Missions and host country government institutions, including ensuring full Mission and host country involvement in EP3 Country Support Programs as described in Section III, subsection III.D.,

"Mission and Host Country Involvement in EP3 Country Support Programs," of this Project Paper; coordinating activities of sub-grantees/subcontractors; preparing annual work plans and scopes of work for specific team activities; coordinating efforts of field teams; procuring materials and equipment; and monitoring and reporting on progress of EP3 overall, EP3 Country Support Programs, and EP3 Short-Term Training and Technical Assistance.

During the Project Paper design, the issue of organizational conflict of interest was raised regarding the pro bono environmental experts. The U.S. environmental NGO professional associations are independent, not-for-profit and non-advocacy organizations whose mission is to contribute to sustainable development by strengthening urban and industrial health, safety and environmental management practices worldwide. Although volunteers will not be asked to assist where there may be an issue of potential organizational conflict of interest, associations will be expected to develop selection criteria and written procedures to insure pro bono experts provide unbiased advice and derive no unfair competitive advantage from missions.

In many cases private industrial companies are expected to be the best source of practical experience in pollution prevention. Experience with the World Environment Center, International Executive Service Corps, TVA Bicentennial Volunteers, Inc. and the Industry Council for Development all indicate that there is a solid foundation of interest among industrial companies to support international activities such as EP3. In the course of EP3 project design discussions were held with five organizations explicitly for the purpose of exploring the degree of likely EP3 access to pro bono technical assistance expertise. The five organizations were representative of the range of those from which EP3 would expect draw pro bono expertise, and included the Air and Waste Management Association, Coalition for International Environmental Research and Assistance (CIERA), National Solid Waste Management Association, Water Pollution Control Federation, and World Environment Center (WEC). Of these only one, the National Solid Waste Management Association, said they could not play any role in seeking pro bono services from their members; budgetary limitations was given as the reason. Two of the organizations, CIERA and WEC, as a matter of course arrange for pro bono technical assistance overseas through their memberships, networks, and databases. The remaining two associations expressed willingness to canvass their memberships in response to specific requests, pointing out that availability of pro bono expertise would be a function of timing and terms of specific assignments.

The conclusions drawn by the EP3 design team from its investigations into this matter are that: (a) on the whole, it will be possible to access a substantial amount of pro bono technical expertise, (b) there is a sizeable number of associations ready to assist in identifying needed pro bono experts through their memberships, networks, and databases; (c) ultimately, there can be no *a priori* sweeping guarantees about the

availability of quantities and types of *pro bono* technical assistance for specific countries, regions, or time periods; and that (d) private firms will often be willing to contribute experts from their staffs *pro bono* if expenses are paid and the non-monetary benefits, such as marketing leads, public recognition and professional development are perceived as sufficient. Thus, the technical expertise required for services provided through EP3, and especially through its Country Support Programs, should indeed be available to a significant degree on a *pro bono* basis. This will, however, need to be supplemented by technical experts paid at standard A I D. rates. In a few isolated cases, obtaining the needed specialists may require A.I.D. salary waivers

EP3 will periodically use international pollution prevention experts for advice on the design, phasing, and conduct of core pollution prevention, environmental quality management, environmental policy, institutional development, and training programs and activities. Advisors will be selected for their demonstrated capabilities in international pollution prevention, their familiarity with current thinking in the field, and their commitment to advancing the state of knowledge. Advisors may include high level experts from EPA, associations not directly involved in implementing EP3, and other international assistance organizations such as the World Bank, IFC, and others. The advisors may also include project directors from other A.I.D. pollution projects to help assist EP3 and R&D/ENR develop appropriate linkages with other projects and activities and help address overall urban and industrial pollution in developing countries.

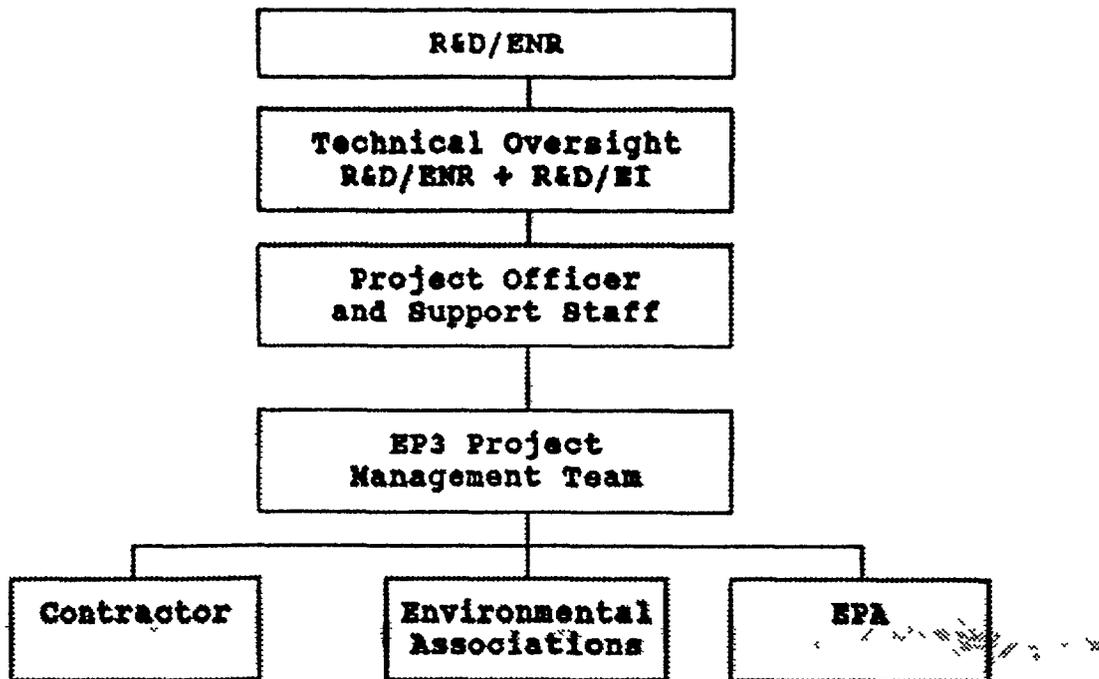
V.B. A I.D. Project Management

The EP3 Project will be carried out by the Office of Environment and Natural Resources, Bureau for Research and Development (R&D/ENR), with jointly shared technical management and oversight from the Office of Energy and Infrastructure (R&D/EI). The EP3 responsibilities of each office are summarized as follows.

- R&D/ENR provides primary technical oversight over environmental pollution prevention and control policy development, advisory services, training and education, environmental quality planning and risk assessment, regulatory analysis and reform, and institution building.
- R&D/EI provides primary technical oversight over engineering assistance, pollution prevention audits and assessments at industrial facilities, technology cooperation and commercialization, and environmental trade and investment promotion.

The EP3 Project Officer will be in R&D/ENR and will be the principal coordination point for EP3 interactions with project contractors, USAID Missions and Regional Bureaus, U.S. agencies, and international organizations. The Project Officer will work

EP3 MANAGEMENT ORGANIZATIONAL DIAGRAM



- reviewing and approving the project's core information dissemination and training programs;
- overseeing contractor collaborative work planning, and reviewing and approving the EP3 annual workplan and any revisions in project component activities,
- maintaining close programmatic collaboration with EPA,
- supervising operations of the EP3 clearinghouse;
- taking the lead in activities related to international cooperation,
- receiving, reviewing, and approving all requests from the field and A I.D./W for EP3 services and obtaining field mission clearance for travel of project personnel;
- overseeing technical review of all project outputs before they are distributed within and outside A.I.D.;
- approving any proposed changes in key project personnel;
- reviewing and approving consultants proposed by the implementation contractor;
- obtaining Mission or appropriate A.I.D./W office evaluations of all buy-in funded activities under the project;
- scheduling and coordinating EP3 advisory activities, internal management reviews, and external project evaluations.

The support staff, in addition to carrying out Project Officer responsibilities under delegations of authority, will provide administrative support including

- using a computer information system to track project core and country-specific training and technical assistance activities and to monitor the progress of project buy-in requests;
- providing a manual information system to store and track project reports, published materials, and other printed outputs,
- providing administrative support for preparation of budgets and other documents necessary to execute buy-ins to other projects or PASAs/RSSAs to access services of U S Government agencies,
- maintaining close administrative collaboration with EPA,
- project monitoring,
- general project administration.

The Project Officer will be advised by an industrial and urban pollution committee initiated by the R&D Bureau, but incorporating input and membership from throughout the Agency. EPA, DOE, Peace Corps, commerce and other agencies will be invited to participate on an "as interested" basis. The Project Office from R&D/ENR and a member of the Office of Energy and Infrastructure will initiate the first three meetings, after which a chairman will be chosen for future meetings. This committee shall work closely with the Environmental Forum established by the Policy Directorate

Specifically for EP3, the committee will review and advise on:

- contractor long-term technical assistance and training development plans,
- EP3 annual workplans and progress reports,
- efficacy of the EP3 Country Support Program approach and other major EP3 elements;
- effectiveness of EP3 efforts to collaborate with and draw on the expertise of other A.I D projects, and
- potential linkages between EP3 and other donor-assisted projects in urban and industrial pollution.

The U.S. Environmental Protection Agency and A.I.D. are currently implementing programs of international cooperation to provide technical assistance and information to support global environmental management. Some of these programs cover economics and environmental policy, environmental agency capacity building,

environmentally sound energy use, global climate change, pesticide use and disposal, emergency preparedness and response, and urban and industrial pollution. In the 1990s, EPA anticipates an increasing emphasis on environmental problems in developing countries, particularly on urban pollution, institution strengthening, and environmental quality management.

Through a collaborative effort with A I D , EPA can expand its technical assistance and information activities to meet the needs of Missions and developing countries. Under the existing Memorandum of Understanding (MOU) between A I D and EPA, a RSSA will be signed that obligates funding for EPA specifically for the following EP3 activities:

- providing assistance to Missions and developing countries for establishing and implementing appropriate environmental regulations and policies, carrying out studies to support reforms or incentives, and strengthening host country environmental agencies at the national and local level;
- providing sound technical advice, field support, monitoring and analytical services, and environmental quality information and methods to assess improvement in host country environmental quality,
- providing environmental training materials and conducting seminars and study tours on urban and industrial pollution prevention, risk assessment, environmental policy development and implementation, and environmental quality management in developing countries, including exchanges and short-term assignments to developing countries;
- disseminating EPA publications and other environmental information and reports to Missions and developing countries to support EP3 and international cooperation activities,
- maintaining an international support network to identify and access environmental experts in EPA, state and local governments, and universities;
- providing overall management assistance support to EP3 and specific technical assistance activities that link EPA governmental roles with those of the host-country,
- providing assistance in design of urban and industrial pollution prevention projects or integrating environmental quality elements into private sector or other Mission initiatives.

Sri Lanka and Chile have expressed strong and concrete interest in becoming focus countries for EP3 Country Support Programs. Sri Lanka is discussing an EP3 buy-in of _____ to _____ under its Natural Resources and Environmental Policy Project and Chile is considering increasing its FY93 funding level of its buy-in by postponing the start-up of other activities.

India is currently designing the Trade in Environmental Services and Technologies Project (TEST) Although USAID/India did not respond to the EP3 fax query, it is currently discussing with ENR the possibility of achieving the objectives of TEST through simultaneous coordinated implementation of TEST and EP3, utilizing the comparative advantages of each. In addition, letters expressing strong and concrete interest in implementing EP3 Country Support Programs have been received from USAID Missions in the Dominican Republic and Ecuador

All this strongly indicates a high level of Mission interest in buy-ins to EP3, both for Country Support Programs and for short-term training and technical assistance activities

In addition, discussions with project officers of other A.I.D./W projects suggest a high likelihood of buy-ins to EP3 from those projects (as well as buy-ins from EP3 to those projects) The most promising opportunities for this are likely to arise in connection with the work of MTAP, WASH, Environmental Health, EPAT, and GREENCOM. More information on likely buy-ins associated with inter-project collaboration appears in the following subsection. Asia Bureau has also suggested that it is likely to buy in to EP3 for a variety of services to augment the activities of its ASEAN Environmental Improvement Project

Summary of Mission Rankings of Levels of Interest in EP3

Country	Mission Interest in EP3 Overall	Mission Interest in EP3 Country Support Program	Mission Interest in EP3 ST Trning & Tech. Assist.	Host Country Government Interest in EP3	Business Interest in EP3
ASIA					
Sri Lanka	5	5	5	5	5
Thailand	5	5	5	5	3
Indonesia	4	4	4	3	3
Nepal	3	3	4	2	3
Philippines	3	2	2	3	3
LATIN AMERICA					
Chile	5	5	5	5	4
Ecuador	5	4	4	4	4
Dominican Republic	5	5	5	5	5
Honduras	4	4	4	4	3
Bolivia	4	4	4	3-4	3-4
Belize	3	3	4	4	4
El Salvador	4	1	2	3	4
Costa Rica	3	3	4	3	4
Barbados	4	3	3	3	3
Peru	2	2	1	2	1
NEAR EAST/AFRICA					
Jordan	4	3	4	3	4
Yemen	3	3	3	3	1-2
Oman	3	n/a	n/a	3	2
Morocco	1.4	2	3.1	n/a	n/a
Cameroon	1-2	1-2	1-2	1-2	1-2
Zimbabwe	1	1	2	2	1

Two factors are likely to have a substantial influence on the level of EP3 buy-in demand. The first is the quality and responsiveness of EP3 teams. Other R&D projects have had a high level of buy-in demand in part because they have responded quickly to Mission needs and have established a reputation for fielding highly competent teams and tightly managing those teams. Projects in R&D and elsewhere that the Missions do not perceive as having these attributes have not approached their buy-in projections. This seems to be the case particularly where projects emphasize research, and technical assistance is not their primary mission.

The second is ease of buy-ins. A major determinant of response time is not just the contractor but A I D itself. Mission and Regional Bureau officers interviewed stressed that buy-ins will be higher if the buy-in process itself is administered rapidly and efficiently by R&D/ENR and the grants/contracts office supporting R&D/ENR. Also, since there are a number of projects with environmental quality and training components in R&D/ENR, R&D/EI, R&D/Health, and other R&D offices, a Mission with a given need may find itself uncertain which of these projects is most appropriate as a source of assistance. A number of Missions have expressed to the EP3 design team the importance to them of availability of assistance for rapidly determining the appropriate project for a buy-in in a particular situation. The twin needs for rapid A.I.D /W response and for assistance in routing buy-in requests imply a need for substantial AID/Washington administrative support.

V.F. Relationships to Other Projects and Agencies

A.I.D /W is currently implementing or designing a number of environmental projects that should reinforce and be reinforced by EP3. An integral part of the plan for implementing EP3 entails close coordination and cooperation with these other projects so as to achieve the maximum collective benefit with respect to A I.D 's initiative on the environment overall. The details of coordination will, of course, have to be worked out through USAIDs in the case of each country in which both EP3 and other projects are or could be operating. Nevertheless, the following table shows ways it is planned broadly to pursue coordinated implementation of EP3 and other A.I.D /W environmental projects. In a number of cases, coordinating implementation may involve EP3 buy-ins to other projects or buy-ins by other projects into EP3. Relationships between EP3 and each project shown in the table are discussed briefly in the paragraphs following the table.

Environmental Policy and Training Project (EPAT). EPAT is intended to encourage and support host country adoption of economic policies that promote sustainable use of natural resources and enhancement of environmental quality as a means fostering lasting development. Both EPAT and EP3 have important training components. With coordination, in any country EPAT could support training efforts on broader environmental policy and regulation issues, while EP3 concentrates on complementary

training related specifically to urban and industrial pollution prevention policy and associated policy analysis. EPAT's information dissemination activities can draw on the databases of the EP3 clearinghouse in Washington, D.C. In general, the environmental policies on which EP3 will aim to concentrate will tend to emphasize incentive systems, and these primarily in relation to encouraging pollution prevention and cleaner production. It can be expected, however, that in many cases it will be impossible, if not inappropriate, to address issues related to such policies outside the broader environmental policy context that is the main concern of EPAT. In the case of any country in which EPAT is working, it is expected that the EP3 project may buy-in to EPAT.

**AREAS OF INTENDED COLLABORATION BETWEEN
EP3 AND OTHER A I.D /WASHINGTON ENVIRONMENTAL PROJECTS**

	Train- ing	Informa- tion Dis- semina- tion	Environ- mental Policy Planning	Tech- nology Transfer and Trade Develop- ment	Envi- ron- mental Educa- tion	Pri- vate Sector Devel- opment
EPAT	■	■	■			
PRIDE			■			■
GREEN- COM		■			■	
EHP	■	■	■	■	■	■
LAMP	■				■	
ETP	■					
GLEEM			■	■		■
PRE/H	■		■			

Project in Development and the Environment (PRIDE). PRIDE is meant to provide Europe and Near East Missions with technical, analytical, and informational support to promote sound environment and natural resource use for long-term sustainable economic growth in host countries. An important element of PRIDE is strategic planning, which can be supported with respect to urban and industrial pollution prevention concerns through EP3 pollution prevention strategy development activities. In addition, both PRIDE and EP3 have strong private sector development components that can be mutually supporting. In the case of PRIDE the emphasis is on developing private sector capacity to address a wide range of environmental management concerns, in the case of EP3 the emphasis is on strengthening private sector capability to provide pollution prevention expertise, equipment brokering, and

financing services to manufacturing establishments, and to encourage waste minimizing and cleaner production processes among those establishments.

Environmental Education and Communications Project (GREENCOM).

GREENCOM is essentially an environmental information dissemination, education, and participation project that will adapt itself to environmental priorities of host countries. The project paper for GREENCOM is currently under development. Nevertheless, it seems clear that whatever the final project design there should be ample opportunity for cooperation with EP3 leading to greater efficiency in the areas of environmental information dissemination and education, and possibly also in fostering more effective participation of NGOs in urban and industrial pollution prevention

Environmental Health Project (EHP). EHP is the proposed successor to Water and Sanitation for Health. EHP takes a health perspective in providing services to the water and sanitation sectors for institutional development and training; hygiene education; finance; community participation; policy development; engineering technical assistance; and solid waste and wastewater management. In a number of countries EHP and EP3 are likely to share concerns: EHP from the health perspective and EP3 from the complementary pollution prevention perspective. There are certain to be opportunities to collaborate and cooperate, both off and on budget, over a wide range of pollution prevention activities.

Local Accident Mitigation and Prevention (LAMP). LAMP is a program being launched by A.I.D.'s Office of Foreign Disaster Assistance. The program builds on a UNEP program called Awareness and Preparedness for Emergencies at the Local Level (APELL). This program aims to increase awareness of the consequences of water and airborne pollution among local authorities, industry, and local community and interest groups. It is quite possible that in a number of countries, particularly where EP3 Country Support Programs are focussed on "hot-spot" concentrations of heavily polluting plants, LAMP and EP3 will need to work with the same entities regarding the same central concerns. In these cases, close coordination will be needed, and cooperation on specific activities is likely to be most fruitful in the areas of training and environmental education.

Environmental Training Program (ETP). ETP offers Agency personnel at all levels the information, tools, and intellectual resources they need to integrate environmental concerns into their jobs effectively. For Mission Environmental Officers and Project Officers, ETP offers Environmental Impact Analysis workshops. For A.I.D. economists ETP offers basic training in environmental issues. For general staff, it provides a wide variety of technical workshops. For front line decision makers, ETP offers sessions at periodic conferences. There are several opportunities for cooperation in training between ETP and EP3. EP3 can provide data and case studies from its databases for use in ETP pollution

prevention training; EP3 can also provide ETP with pollution prevention training materials and teachers. EP3, on the other hand, will certainly want to incorporate ETP training materials on a number of environmental subjects into its training library, and possibly cooperate with ETP with regard to training for specific Missions

Global Energy and Environment Management (GLEEM). GLEEM concentrates on the linkages between energy, environment, and sustainable development. It seeks simultaneously to expand energy availability while reducing adverse environmental impacts of energy delivery and use. It includes elements dealing with capital mobilization for the energy sector, power sector institutional performance, integrated resource planning and policy formulation, energy efficiency, new energy supply options, technology cooperation, and increased private sector participation in delivery of energy services. There is an obvious relationship between energy development and use on the one hand, and urban and industrial development on the other. Accordingly, the opportunities for mutually supportive cooperation between GLEEM and EP3 would appear to be many, particularly in the areas of environmental policy reform, technology transfer and trade development, and private sector development related to environmental quality and quality issues

Urban Environmental Strategy of the Office of Housing and Urban Programs (PRE/H). PRE/H's Urban Environmental strategy seeks (1) to integrate urban environmental concerns into program design, (2) to test new private sector approaches to providing environmental services that are typically municipally financed, and (3) to help improve urban environmental analytical capability of donors and host countries. The strategy is being pursued through a variety of existing and proposed programs and research activities that have direct or indirect relationships to the urban and industrial pollution prevention concerns of EP3. In particular, PRE/H environmentally related activities are often concerned with improving the effectiveness and efficiency of municipal administration in a way that stands to complement and support the improved industrial pollution prevention performance upon which much of the attention is focussed in EP3 Country Support Programs Areas for close cooperation would include training, municipal policy development, and possibly others such as municipal institutional development.

In addition to other A I D /W environmental projects, and apart from connections with the U S. Environmental Protection Agency discussed elsewhere in this Project Paper, there is another A I.D. program and a number of programs of other U.S. Agencies that have or could have relationships to the concerns of EP3. Coordination between EP3 and these other programs will be important in order to maximize the effectiveness and complementarity of these publicly funded U.S. initiatives. Coordination will also be important because the functions of these other programs can be utilized directly for EP3 implementation, as summarized in the following

table Relationships between EP3 and the programs shown in the table are discussed briefly in the paragraphs following the table.

A.I.D. Private Sector Revolving Fund (AID/PSRF). A I D.'s Bureau for Private Enterprise will consider loans or guarantees for projects in developing countries that have a substantial developmental impact by promoting sound environmental development, generating net employment opportunities, earning net foreign exchange, developing managerial and technical skills, or transferring technologies Many of the capital-intensive pollution prevention innovations introduced through EP3 Country Support Programs are expected to meet all of these criteria simultaneously, and therefore be eligible in principle for assistance under this program

**FUNCTIONS OF U.S AGENCY PROGRAMS
THAT COULD BE USEFUL IN EP3 IMPLEMENTATION**

	Trade Links	Feasibility Studies	Technical Assistance	Financing: Grants, Loans, and Equity
AID/PSRF				■
DOC/ITA	■			
TDP		■	■	■
Eximbank				■
OPIC	■			■
FCS	■			

Department of Commerce International Trade Administration (DOC/ITA). DOC/ITA helps U.S. businesses with export counseling, market and trade lead information, and financial and technical assistance. Its programs include the National Trade Data Bank, the Agent Distributer Service, the Gold Key trade visit assistance service, the Trade Opportunities Program, U S. business information dissemination programs, the Center for International Business Research, and a staff of trade development officers in seven major industrial categories. EP3 will both feed information into these programs to ensure that U.S firms can access information on pollution prevention trade opportunities, and direct U.S firms to the assistance provided as trade links are established with potential buyers through EP3 Country Support Programs.

The Trade and Development Program (TDP). TDP is a component of the U.S. International Development Cooperation Agency. It promotes economic development in developing countries by funding feasibility studies, consultancies, training programs, and other project planning services in a wide range of sectors. Within

these sectors, TDP-funded technical assistance must utilize the expertise of U.S. nationals or be related to activities potentially offering significant opportunities for U.S. exports. Much of the technical assistance associated with EP3 will meet TDP funding criteria precisely, and therefore should be able to take advantage of TDP funding.

Export-Import Bank (Eximbank). Eximbank helps facilitate the sale of U.S. goods and services to foreign buyers by making it easier for overseas buyers to purchase U.S. goods and services on credit. It provides loans directly to foreign buyers and also encourages U.S. banks to extend credit to foreign buyers by providing risk protection. Eximbank will facilitate the sale of U.S. goods or services to a creditworthy foreign buyer when the buyer cannot find a commercial lender, providing the product or service is at least 50% U.S. content, the transaction is deemed economically viable, the transaction does not adversely affect the U.S. economy, and there is a reasonable assurance of repayment. Many of the capital-intensive pollution prevention innovations introduced through EP3 Country Support Programs are expected to create opportunities for U.S. suppliers and otherwise meet Eximbank criteria. Eximbank will therefore be taken into account as a potential last-resort financing source in the course of EP3 Phase II plant level innovations activities.

Overseas Private Insurance Corporation (OPIC). OPIC promotes economic growth in developing countries by encouraging U.S. private investment in them. OPIC assists U.S. firms investing in developing countries by insuring investments against certain political risks and by providing direct loans and/or loan guaranties. OPIC is currently developing a privately-owned and managed investment fund called the OPIC Environmental Investment Fund that will identify, invest in, and support new or expanding business enterprises in developing countries that use natural resources on a sustainable basis or otherwise practice sound environmental management. During EP3 implementation OPIC programs can be utilized both to help develop trade links with U.S. firms and to help finance U.S. investment in expansions associated with cleaner production processes.

Foreign Commercial Service (FCS). FCS utilizes its worldwide network of trade specialists and offices to provide U.S. firms with information and counseling on business opportunities and barriers in foreign markets, agent/distributor services, financing, and related matters, with the aim of promoting U.S. business abroad. As with DOC/ITA, EP3 will feed information into FCS to ensure that U.S. firms can access information on pollution prevention trade opportunities, and will also direct U.S. firms to the assistance provided by FCS as trade links are established with potential buyers through EP3 Country Support Programs.

Finally, there are programs of other development assistance agencies, both multilateral and bilateral, with which EP3 will be closely coordinated in order to ensure the most effective and

efficient use of pollution prevention institutional comparative advantages and resources. Examples of these programs include the Metropolitan Improvement Project (World Bank); the Global Environmental Facility (World Bank); the Cleaner Production Program (UNEP); UNIDO; environment related programs of UNCHS; environmental programs of the Asian Development Bank; and environmental programs of the Canadian, Danish, Dutch, German, Japanese, and U K. bilateral assistance agencies. The principal mechanism for coordination with programs of other foreign assistance agencies will be international cooperation, described in III.C 3 , earlier in this Project Paper.

V.G EP3 Clearinghouse Linkages

The EP3 clearinghouse will join a growing family of environmental clearinghouses, information and training centers, and databases worldwide. The EP3 clearinghouse will benefit from linkages with existing and planned facilities established by others that can serve the concerns of EP3, and will also link in with other facilities so that their users can access information developed through EP3. Following are some examples to illustrate these linkages.

The Environment and Natural Resources Information Center (ENRIC) is an information facility serving A I D 's programming and reporting needs in the fields of natural resources and the environment. Its centerpiece is a database that tracks environmental and natural resources activities supported by A.I.D. through both project and non-project assistance. This database builds on A I.D.'s existing project databases and adds technical information on environmental components, their costs, who implements them, and more. Through electronic linking with ENRIC, the EP3 clearinghouse will make EP3 project information immediately available to ENRIC on the one hand, and will give EP3 expeditious access to information on related A I.D. projects. Information generated by other A.I D projects will serve EP3 beneficiaries directly, and will also facilitate collaboration between EP3 and other A I.D. activities.

The Pollution Prevention Information Clearinghouse (PPIC), dedicated to reducing industrial pollutants through technology transfer, education, and public awareness, is operated by EPA's Office of Environmental Engineering and Technology Demonstration and Office of Pollution Prevention. PPIC helps to establish government and industry pollution programs; locate and order documents, identify upcoming events, conferences, training sessions, seminars, and workshops; uncover grant and other project funding opportunities; and identify pertinent environmental legislation. PPIC contains four information exchange mechanisms: a hard copy reference library on pollution prevention; a computerized conduit to databases and document-ordering accessible to modem-equipped PCs; a telephone service for users without access to a PC; and information packets containing general and industry-specific materials on pollution prevention for use both

independently and in the context of training programs. Electronic linkage and print-based forms of cooperation between the EP3 clearinghouse and PPIC will provide both with access to a broader array of relevant current information and training resources at less cost.

Moreover, being wired to PPIC will link the EP3 clearinghouse access to the **International Cleaner Production Information Clearinghouse (ICPIC)**. ICPIC, which is electronically accessible to PPIC, is a computerized information exchange system of the United Nations Environment Program's Industry and Environment Office (UNEP/IEO). ICPIC serves as a cleaner production information exchange facility that provides information developed by UNEP/IEO's working groups, including pollution prevention data on a growing list of specific industry categories such as leather tanning, electroplating, textiles, halogenated solvents, and more; descriptions of government policies and strategies to promote and transfer cleaner production processes and products; summaries of activities of UNEP/IEO's data harmonization working group intended to standardize clean technology data systems from member nations, summaries of research in progress related to innovative technologies, manufacturing options, product longevity, agricultural practices, transportation alternatives, and energy consumption, and clean technology activities of specific countries. UNEP is planning to network ICPIC through electronic linkages to regional nodes concentrating on cleaner production information and activities for countries in individual global regions.

There are also several relevant information and training facilities established or planned in connection with A I D global and regional projects, such as the **Water and Sanitation for Health (WASH) Information Center**. Obviously, electronic or other exchange mechanisms will be established between these facilities and the EP3 clearinghouse to maximize information and training resource access and cost-effectiveness of A I D 's overall initiative on the environment.

Because other environmental information and training resource centers exist and are under development, the EP3 design team gave careful consideration to the option of "buying-in" to others rather than creating one of its own. None of those existing or planned, however, are designed to provide the full array of training and information resources needed for EP3, and as a practical matter none could be modified to do so. This is especially true with regard to information that is highly EP3-specific, such as that needed for project monitoring and evaluation. Fragmentation of the various functions intended for the EP3 clearinghouse among the facilities of different institutions is obviously not a viable approach to ensuring proper training and information resources for EP3. Moreover, it is imperative that EP3 needs be served expeditiously, efficiently, and on a priority basis by training and information resources in which EP3 has invested. It was determined, therefore, that there

was no satisfactory alternative to developing an EP3 clearinghouse, housing it in the EP3 home office under direct management of the EP3 contractor, and linking it with existing training and information resource facilities where practical

This raises the question of the disposition of the databases, libraries, and training resources of the EP3 clearinghouse at the conclusion of EP3. Several options were considered for this as well. Examples include turning these over to EPA's PPIC in Washington, D C or the planned joint EPA/A.I.D. regional centers, to UNEP's ICPIIC or its planned regional nodes, to UNIDO, to the World Bank; to a PVO such as WEC, or to another A I D. project. While any or a combination of these may be appropriate, there really is no way of determining at this time what the most appropriate disposition will be. The field of pollution prevention will experience considerable growth in the coming years. As it matures, the current proliferation of global training and information resource centers is likely to be superseded by consolidation at global and regional levels and a growing role for such centers at national levels. Indeed, there is a high likelihood that environmental information and training facilities within A.I.D. will be consolidated in the coming years.

VI. MONITORING AND EVALUATION PLAN

VI A. Internal Monitoring and Evaluation

Routine ongoing monitoring and evaluation by A.I.D.'s EP3 management will be based on close continuing working relationships with relevant USAID Missions and Bureaus, EP3 implementation contractors and EPA, and on the objectively verifiable indicators and means of verification detailed in the Logical Framework Matrix (Annex A).

Detailed monitoring of pollution prevention innovations will be conducted using the databases of the EP3 clearinghouse. Information developed in connection with planning, implementing, and evaluating innovations arising from EP3 Country Support Programs will be recorded in the databases and be available to A I D and EP3 management immediately. This will include information on:

- pre-implementation environmental impact assessments (see Annex E);
- anticipated costs and pollution reduction effects, including specific chemicals, process, technical options, and economic costs and benefits;
- actual costs and pollution reduction effects, including specific chemicals, process, technical options, and economic costs and benefits,,
- installation requirements to minimize cost and maximize effectiveness,
- special financing requirements or advantages;
- payback periods;
- time from decision to implementation,
- related matters.

The EP3 early learning feature calls for particularly close monitoring of progress in the initial group of countries selected for EP3 Country Support Programs during the first four to six months of project activity. This monitoring will be designed to enable careful evaluation of comparative progress and performance at the end of that period. On the basis of the evaluation, a small number of "emphasis countries" will be designated from among the initial group. Emphasis countries will receive priority in allocation of EP3 resources, and will continue to be monitored especially closely through the first three years of project activity. The first three years of project activity will cover

completion of EP3 Country Support Programs in the emphasis countries.

At the end of three years, a thorough review and analysis of experience in the emphasis countries will be conducted, and the lessons learned will provide the basis for mid-course corrections in elements of the EP3 operational approach. All phases of this activity will be carried out in close collaboration with relevant USAID Missions, including.

- selecting the initial group of countries for EP3 Country Support Programs,
- establishing monitoring variables and procedures and evaluation criteria for the initial group of countries;
- designating emphasis countries,
- establishing monitoring variables and procedures for emphasis countries in general and with respect to each Country Support Program activity specifically;
- evaluating the appropriate mix of in-country and expatriate specialists for each phase of the Country Support Programs;
- determining special criteria for evaluating performance and sustainability of the national centers of pollution prevention training, information, and technical assistance;
- analyzing emphasis country experience at the end of three years

This internal monitoring and evaluation activity will be coordinated with an external evaluation also scheduled for the end of the third project year

Additional monitoring will come about through the operations of the EP3 clearinghouse. The clearinghouse will be an important EP3 mechanism for assembling and disseminating information about sustainable pollution prevention techniques and appropriate technologies emerging from EP3 experience. It will collect and process monitoring-related information associated with:

- pollution prevention innovations arising from EP3 Country Support Programs, as described above;
- EP3 short-term training and technical assistance activities, including in-country expertise, consultants, and the EP3 individuals participating in specific project tasks;
- urban and industrial pollution prevention commercial publications, newsletters, research reports, and reports on related activities of other projects;

- developments and experience with pollution preventing processes and technologies worldwide;
- U S suppliers of pollution prevention expertise and equipment;
- suppliers of pollution prevention expertise and equipment and of installations with demonstration value in each of the A.I.D. regions;
- urban and industrial pollution prevention programs of U S agencies and of other donor agencies worldwide, including funding, current activity, requirements for eligibility, procedures for requesting assistance, and key contacts

VI B External Monitoring and Evaluation

Objectively verifiable indicators and means of verification for the EP3 goal, purpose, outputs, and inputs that will serve as one focal point of EP3 external monitoring and evaluation are detailed in the EP3 Logical Framework Matrix (Annex A).

External evaluations of all aspects of EP3 will take place on the following schedule

- | | |
|---------------|---|
| August 1993 | desk evaluation by R&D A.I.D personnel. |
| August 1995 | desk evaluation by R&D A.I.D personnel. This evaluation will emphasize the Early Project Learning component of EP3 and recommended mid-course corrections |
| November 1996 | full desk and field evaluation, employing outside technical and program experts This evaluation will cover all aspects of EP3 project operations and impacts, and will provide independent judgement on the mid-course corrections proposed for the remaining project years. This evaluation will also place special emphasis on long-term benefits and sustainability of plant, industry category, and national level innovations introduced by EP3, and on EP3's overall contribution to focussing attention on pollution prevention worldwide. |

These evaluations will be conducted following the guidelines provided in the A I D Evaluation Handbook. A I D Program Design and Evaluation Methodology Report No. 7" (1987) (Supplement to: Chapter 12 A.I.D. Handbook 3, "Project Assistance") and the AA/R&D Administrative Procedures for Conducting Evaluations" Memorandum dated March 22, 1990 Additional guidance for preparing and presenting the evaluation reports will be obtained from the A.I.D. "Publications Style Guide" (1988). This will assure that information obtained via the schedule of external evaluations

yields data pertinent to project relevance, effectiveness, efficiency, impact, and sustainability useful to management.

The EP3 Project Officer will be responsible for ensuring sufficient coverage of the findings and presentations of the results. Dissemination of the evaluation report and evaluation summary will be coordinated by R&D/PO. The EP3 Project Officer and the R&D/PO Evaluation Officer will assure that evaluation documents are concise and accurate.

As part of the EP3 evaluation process there will be biannual financial audits. Funds have been provided for these audits in the EP3 budget for years 2 and 4. Audits will be conducted in accordance with audit requirements current when the audits are conducted.