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FINAL REPORT
FOR THE USAID/WEC
COOPERATIVE AGREEMENT IN SUPPORT
OF THE US - ASIA ENVIRONMENTAL
PARTNERSHIP

November 1, 1995



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TO: Melissa Dann
US-AEP

November 2, 1995

FAX NO: (202) 835-0366

of Pages(including cover): 2

FROM: Lisa Raudelunas *LR*

CC:

SENT BY:

RE: WEC EBE By Country Expenditure

Please find attached a Table that summarizes WEC's expenditures by country for our US-AEP cooperative agreement. This summary is for the period of April 1992 - September 1995.

The following information has been used to provide the summary:

- Total cooperative agreement expenses to September 30, 1995 (estimate) = \$3,894,978
(Direct: \$3,242,934 + Salary: \$652,044)
- Total EBEs = 402
- Cost share has been based upon estimates of actual cost share expenses identified.
- WEC has calculated our In-Kind Contribution using \$800 per day for industry representatives and \$500 per day for government representatives. In-kind contributions by senior level Asian professionals participating in the EBE program have been accounted for using the same rates.
- Due to the very wide variations of each EBE, the average EBE was determined to be the total cooperative agreement expenses divided by the number of EBEs.

EBE Cost = \$9,689 (Direct: \$8,067 + Salary: \$1,622)

It can be assumed that the average EBE duration is 2 weeks.

If you have any questions or comments, please contact me at (212) 683-4700.

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World Environment Center/US-Asia Environmental Partnership Environmental Business Exchange Program Summary
April 1992 - September 1995

Country	EBEs from U.S.	EBEs to U.S.	EBEs Asia to Asia	EBEs Total	Direct Cost (\$)	Salary (\$)	Total (\$)	Cost Share \$	Cost Share EBEs	WEC In-Kind (\$)
Bangladesh	2	0	0	2	16,134	3,244	19,378	0	0	
Hong Kong	4	11	0	15	121,005	24,330	145,335	29,107	12	
India	43	65	0	108	871,236	175,176	1,046,412	120,774	46	
Indonesia	23	25	0	48	387,216	77,856	465,072	11,000	5	
Korea	4	18	0	22	177,474	35,684	213,158	39,427	22	
Malaysia	3	0	0	3	24,201	4,866	29,067	4,867	1	
Nepal	1	4	0	5	40,335	8,110	48,445	0	0	
Philippines	5	28	0	33	266,211	53,526	319,737	13,200	6	
Singapore	0	5	0	5	40,335	8,110	48,445	24,335	5	
Sri Lanka	9	2	1	12	96,804	19,464	116,268	0	0	
Taiwan	9	28	0	37	298,479	60,014	358,493	165,719	35	
Thailand	38	42	0	80	645,360	123,760	775,120	43,535	6	
Multi-country	5	27	0	32	258,144	51,904	310,048	0	0	
TOTAL	146	255	1	402	3,242,934	652,044	3,894,978	451,964	138	4,956,083

EBE Cost (with overhead)

Direct \$8,067
Salary \$1,622
 \$9,689

11/2/95

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B	List of Trip Reports Prepared Under the US-Asia Environmental Partnership Cooperative Agreement, November 1, 1995
C	Bi-weekly and Quarterly Reports
D	Monthly Reports
E	Six-Month Reports
F	Work Plan
G	Annual Reports
H	Final Report: Evaluation of WEC Activities Under the US-AEP Cooperative Agreement, November 4, 1994
I	Reporting Requirement Approval

1.0 Introduction

This Final Report was prepared in conformance with the section 1E.2.1 (f) of the World Environment Center's (WEC) cooperative agreement [(CA) AEP-0015-A-00-2055-00], with the U.S. Agency for International Development (USAID) to provide support for the U.S.-Asia Environmental Partnership (US-AEP).

As required by the CA, this report summarizes the accomplishments achieved under the CA, the methods used, and recommendations regarding unfinished work or continuation of the program. It covers the entire period of the CA (September, 1992 through August, 1995), and includes all information requested under sections 1E.2.1(a) through 1E.2.1(d) of the CA.

The following two sections are included in this report.

- 2.0 Summary of Accomplishments Achieved Under the CA , the Methods Used, and Recommendations for Continuation of the Program
- 3.0 Program Performance Planning and Reporting

2.0 Summary of Accomplishments Achieved under the CA, Methods Used, and Recommendations for Continuation of the Program

2.1 Accomplishments Achieved and Methods Used

At the beginning of the cooperative agreement, US-AEP was a new centrally funded program seeking acceptance by USAID missions, and recognition on a broader scale as the overarching USG environmental program in Asia. While working to meet environmental needs in Asia, the US-AEP also served U.S. companies by facilitating business contacts, sales, and hopefully long term partnerships. As described below, WEC's activities under this cooperative agreement supported and contributed to the achievement of each of these objectives.

The cooperative agreement established as a goal the completion of 200 short-term technical assistance (STTA) and short-term professional development (STPD) activities. The STTAs and STPDs became known in the US-AEP as Environmental Business Exchanges, or EBEs.

Achievement: The goal of 200 exchanges was greatly exceeded, with 402 exchanges having been completed. Table 1 presents the EBE numerical summary.

2.1.1 Soliciting and Creating Project Demand

Each USAID mission and each US-AEP Technology Representative had their own priorities, and their own approach to communication and project planning. Frequent communications by fax, by phone, and less frequently visits in person, were vital to WEC's ability to meet the many and varied demands. WEC used each of these approaches to identify priority issues and on-going needs that might be the appropriate focus of exchanges. In addition to activities generated in the field, the US-AEP secretariat also requested specific EBEs.

WEC's standard operating procedure was to ensure that all requests were field driven. This approach ensured that the need for goods or services was expressed by an Asian entity or organization, and also served to distinguish the program from other US-AEP components, such as the National Association of State Development Agencies (NASDA) grants, that were driven more by supply than demand.

WEC worked with each of the US-AEP clients (i.e., USAID missions, US-AEP technology representatives, and the U.S. private sector) to identify environmental needs. While advance planning was more the norm, on numerous occasions exchanges requested by the field were implemented on less than a week's notice.

Achievement: WEC's program staff provided repeated quick-response support to US-AEP clients in Asia and the U.S. This ability contributed to the perception of US-AEP as a highly responsive USG program.

Table 1

Numerical Summary of Environmental Business Exchanges

Country	U.S. to Asia	Asia to U.S.	Asia to Asia	Total
India	43	65	0	108
Thailand	38	42	0	80
Indonesia	23	25	0	48
Taiwan	9	28	0	37
Philippines	5	28	0	33
Multi-country	5	27	0	32
Korea	4	18	0	22
Hong Kong	4	11	0	15
Sri Lanka	9	2	1	12
Nepal	1	4	0	5
Singapore	0	5	0	5
Malaysia	3	0	0	3
Bangladesh	2	0	0	2
Total:	146 EBEs	255 EBEs	1 EBE	402 EBEs

A simple description of the EBE program including the approval process is presented at the beginning of WEC's Annual Report for 1993, (included as part of this Final Report), and is not repeated here. The following discussion of methods used provide a context for the discussion of accomplishments, and leads quite logically to recommendations for the future of the program in section 2.2.



2.1.2 Designing Exchanges

WEC provided two technical managers (chemical engineering, and environmental engineering) for this project who reviewed correspondence, held meetings with staff, and engaged US-AEP clients to ensure that there was technical clarity and logic in the requests being received, and the exchanges offered. This key capability kept the efforts focused, efficient, and responsive to client needs, and ensured that all exchanges were appropriately designed in meeting participant needs.

Achievement: All exchanges conducted under this CA were appropriately focused and responsive to participant needs.

In designing exchanges, WEC drew upon an existing network of contacts developed through many years of designing *pro bono* exchange activities throughout the world. This existing resource and in depth institutional experience allowed WEC to identify a large number of appropriate U.S. experts for a variety of exchanges.

Individual exchanges were designed to minimize the cost (to US-AEP) per exchange through leveraging and cost containment measures. In addition to negotiating with program participants to obtain the most favorable cost sharing arrangement, WEC developed working partnerships with the World Bank's Metropolitan Environmental Improvement Project (MEIP) in Sri Lanka, and the Bank's Urban Air Pollution (URBAIR) project in India, the Philippines, Indonesia, and Nepal. Within USAID, activities and costs were shared with USAID/India's Trade in Environmental Services and Technology (TEST) contract.

WEC designed and implemented a multi-country exchange of Thai and Indonesian medical officials interested in U.S. medical waste management practices. Working with a relatively large group of individuals, all of whom had a shared interest (medical waste management), allowed for streamlined and efficient design and implementation activities

Achievement: WEC reduced the USAID cost per exchange under this CA by leveraging resources, cost sharing, and efficient program design. These efforts had a direct and positive impact on the total number of exchanges completed under the CA.

2.1.3 Implementing Exchanges

Implementing exchanges required differing levels of effort on WEC's part depending on whether the exchange activity went from the U.S. to Asia, or vice versa. In general WEC effort was greater for visits to the U.S., as these activities required US-AEP/WEC to be the host. Support provided depended on the extent of logistical assistance necessary, the support provided by other groups or institutions, and the size of the delegation. Logistical arrangements provided by WEC, either through U.S.-based, or Thailand or Indonesia-based, WEC staff were frequently praised for their efficiency and helpfulness.

WEC staff sometimes had the opportunity to meet with Asian exchangees and discuss their needs. These discussions were always helpful in understanding the Asian perspective, and on occasion allowed for fine tuning of the U.S.-based itinerary.

While the outcome of the exchanges were often difficult to quantify, an independent evaluation of WEC activities (*Final Report: Evaluation of WEC Activities Under the US-AEP Cooperative Agreement, - ITRI, 1994*) that included a survey of participants, indicated that fully one-fourth of the Asian participants intended to enter into licensing agreements, distributorships or other business relationships involving U.S. environmental technology within 1 - 3 years.

Achievement: WEC activities under this CA were effective in promoting an awareness of U.S. environmental goods and services. Fully one fourth of Asian exchange participants expected to pursue business relationships involving U.S. environmental firms.

2.2 Recommendations for Continuation of the Program

The following recommendations are based on WEC experience under this CA, and made to assist US-AEP management with the successful continuation of the exchange program.

1. Identify clear and measurable program goals. Make these goals known to all organizations participating in the US-AEP and include them in contracts or cooperative agreements.
2. Develop a planned series of technical environmental activities involving representatives from several Asian countries, instead of just one. Widely announce this technical series to project program continuity and allow for advance planning.
3. Provide clear and public recognition of the US-AEP Technology Representatives as a main engine driving program demand in Asia. Give them measurable goals and the resources to achieve the goals.
4. Encourage more frequent, shorter trips to Asia by US-AEP partners that cover fewer topics in more depth.
5. Transition US-AEP publications from a program "sales pitch" to providing useful information. Technical publications and case studies might be considered.
6. Invite more input for the future of US-AEP from Asian and U.S. industry and government. They are the "clients", and possibly the program's future.

3.0 Program Performance Planning and Reporting

Under this cooperative agreement WEC was required to submit:

- quarterly reports
- annual work plans
- 6-month progress reports
- annual reports
- final report
- copies of any special reports

During the course of the CA, requests were made for WEC to prepare biweekly reports and monthly reports. WEC complied with these requests. WEC also prepared a monthly rolling summary of Environmental Business Exchange activities and participants (a copy of the final summary follows). WEC was informed that this report was welcomed as it was useful reference for both internal and external distribution.

As the informational needs of the US-AEP Secretariat became clearer, WEC routinely provided monthly reports, quarterly reports, annual reports. A letter between WEC and the Lewis P. Reade, US-AEP Director General, follows that documents the agreement regarding the reporting requirements.

WEC was required to develop annual work plans for this CA. An initial work plan was submitted to US-AEP November 5, 1995. After much discussion, and interim draft work plans, a Work Plan dated April 15, 1993 was approved. At the request of US-AEP, this document covered a two-year period.

Recognizing that the evolution of reporting requirements might cause some confusion, copies of reports are presented in the Appendices. Appendices A through I contain the following information:

- A Summary of Environmental Business Exchanges Under the US-Asia Environmental Partnership, August 15, 1995
- B. List of Trip Reports Prepared Under the US-Asia Environmental Partnership Cooperative Agreement, November 1, 1995
- C. Bi-weekly and Quarterly Reports
- D. Monthly Reports
- E. Six-Month Reports

- F. Work Plan
- G. Annual Reports
- H. Final Report: Evaluation of WEC Activities Under the US-AEP Cooperative Agreement, November 4, 1994
- I. Reporting Requirement Approval

Appendix A

**Summary of Environmental Business Exchange Trip Reports Under the US-
Asia Environmental Partnership, August 15, 1995**



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August 15, 1995

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SUMMARY OF ENVIRONMENTAL BUSINESS EXCHANGES UNDER THE US-ASIA ENVIRONMENTAL PARTNERSHIP

BANGLADESH

BANG-1. Factory Assessment of the Tannery Industry -- USAID/Dhaka requested WEC assistance in performing pollution prevention assessments of tannery facilities in the Hazaribagh areas of Dhaka. Project dates: September 26 to October 7, 1994.

2 EBE from U.S. to Bangladesh: Lawrence Barber, Director of Manufacturing (Rtrd.), A. C. Lawrence Leather Company

Mark Pfefferle, Environmental Economist, Science Applications International Corporation

HONG KONG

HONG-1. Environmental Technology Transfer Program -- WEC facilitated a technology transfer business exchange for Coleman Energy and Environmental Systems. Vastford Industrial Ltd., of Hong Kong was particularly interested in Coleman's ground penetrating radar, time domain electromagnetic buried object detector, and wireless remote surveillance/monitoring system. Project initiation: October 23 to November 9, 1994.

2 EBEs from U.S. to Hong Kong: Bradley Kabanuk, Manager; and Frank Jesse, International Corporate Counsel, Coleman Energy & Environmental Systems

HONG-2. China Light and Power Electric Vehicle Exchange -- China Light and Power (CLP) of Hong Kong was interested in exploring opportunities for using U.S. technology in expanding their push in electric vehicles. Under this exchange two officials from CLP conducted follow up meetings with past contacts including: G.M. Hughes; Westinghouse; and Delco. They also viewed the latest developments in electric vehicle technology at the EVS12 conference. Project dates: December 4 to 8, 1994.

2 EBEs from Hong Kong to U.S.: W.L. Brown; and Liang Fleming, Special Projects Manager, China Light and Power

HONG-3. Hong Kong Productivity Council (HKPC) Electroplating Wastewater Recycling Tour -- The HKPC was interested in exploring U.S. technologies for recycling of wastewaters from plating operations. Under this exchange they visited facilities using equipment or operated by DeWallace, U.S. Filter, and

EMCAT. Project dates: December 12 to 16, 1994.

2 EBEs from Hong Kong to US: Rudolph Wan; and William Chan, Consultants, Hong Kong Productivity Council

HONG-4. Solid Waste Landfill Exchange -- Canonie Environmental, an engineering design and geological services company has been in contact with several Hong Kong firms including: Gammon Engineering; Chun Wo Construction and Engineering; Enviro-Chern; and Square Construction Co., all interested in finding partners to pursue Hong Kong landfill projects that they claim will total \$137 million. Project dates: March 13 to 17, 1995.

2 EBEs from U.S. to Hong Kong: Neno Duplancic, P.E., Vice President; and Brad Kordic, Business Development Manager, Canonie Environmental

HONG-5. Bleaching and Dyeing Industry Exchange -- The Hong Kong Productivity Council participated in this exchange to evaluate U.S. clean technologies for the bleaching and dyeing (B&D) industry, focusing on dyes and chemicals, low volume waste generating processes and equipment, and recovery systems for water, caustics, dyes, and heat. The group visited: Gaston County Dyeing Machine Co.; Cotton, Inc.; Scholl America; Galey & Lord; and Burlington Chemical. In addition, the group participated in an orientation program at the North Carolina State University College of Textiles. The ultimate goal of this exchange is to provide a basis for the creation and installation of a number of demonstration plants into existing B&D facilities in Hong Kong utilizing this kind of technology. Project dates: May 18 to 26, 1995.

7 EBEs from Hong Kong to U.S. Dr. Ellen Chan, Principal Environmental Officer, Environmental Protection Department, Government of Hong Kong

Raymond Leung, Senior Environmental Officer, Management Division; and Linus Wu, Associate Consultant, Textile and Apparel Division, Hong Kong Productivity Council

Wong Chi Wing, Supervisor, Repair and Maintenance Department, Satisfactory Printing and Dyeing Ltd.

K.K. Chan, Factory Manager, China Dyeing Holdings Ltd.

Chow Ming Cheung, Project Manager, Hing Fung Printing and Dyeing Co.

Leung Hing Ki, Plant Engineering Manager, Gold Wheat Investments, Ltd.

INDIA

INDI-1. TEST Program Cooperation -- WEC is continuing cooperation with Sanders International in identifying opportunities for leveraging activities under the USAID mission's Trade in Environmental Services and Technology (TEST) program that are consistent with the US-AEP mandate. Activities being undertaken as part of this collaborative effort are listed below. The TEST program cost shared some portion of activities for project 1a and subsequent projects under INDI-1, below.

1a Evaluation of Incinerator Technology -- WEC arranged a tour of U.S. facilities for an Indian

industry official interested in evaluating incinerator technology for hazardous waste treatment. Project dates: October 2 to 21, 1993.

1 EBE from India to U.S.: B. Ravi, Managing Director, Pure Tech Engineering

1b. Diesel Emissions Control Technology -- Supporting technology transfer efforts, WEC supported Fluid Power Incorporated (FPI) in demonstrating a real-pressure control valve for use in diesel engine emissions systems to reduce particulate emissions. Project dates: October 8 to 19, 1993.

4 EBEs from U.S. to India: Jim Silvers, President/CEO; Ram Rathi, Executive Vice President; Louis Harms, Vice President Engineering; and Glenn Dunmire, Director, International Development, FPI

1c. Air Filter Technology Evaluation -- WEC supported a technology evaluation program by INALSA, an Indian manufacturer of air filters. INALSA sought to identify cost effective technologies and options that might be introduced in India. U.S. manufacturers included in the tour were: Pneumafil Corporation; Donaldson Northland Supercell; Dorr-Oliver; Air Cleaning Specialists of California; and Room Cleaning Engineering. Project dates: October 5 to 22, 1993.

1 EBE from India to U.S.: D. Chatterjee, Manager, INALSA

1d. Diesel Fuel Conditioner Demonstration/Technology Transfer -- WEC supported this technology transfer project by facilitating a demonstration of Hammerdown diesel fuel conditioner, which reduces emissions to the atmosphere, at the Automotive Center in Pune. Meetings were held with Auroworld World, a private sector corporation, on the commercialization of the product in India. Project dates: April 8 to 17, 1994.

1 EBE from U.S. to India: Ben Motion, Chief Engineer, LV Petro

1e. Auto Exhaust Emissions Control Demonstration/Technology Transfer -- WEC facilitated demonstration of technology for retro-fitting non-catalytic converter-equipped vehicles with exhaust emissions control systems that promise to significantly reduce emissions. Officials of Lean Power Corporation met with: Lucas-TVS; Lucas Indian Service; Mahindra and Mahindra; Maruti Udyog Ltd.; Premier Automobiles; Hindustan Motors; Tata Engineering and Locomotive; Telco; and the Automotive Research Association of India. Project dates: January 2 to 14, 1994.

3 EBEs from U.S. to India: Dr. Stephen Bryen, President; Charles Hamilton, Vice President; and Michael Leshner, Chief Scientist, Lean Power Corporation

1f. Demonstration of "Linductor" Oil Recovery System -- Under this exchange Yankee Environmental Services met with a number of firms to introduce their new technology for vacuuming spilled oil to the Indian market. Meetings were conducted with: Mahindra and Mahindra; Madda Controls; and Ion Exchange. Project dates: November 6 to 21, 1993.

2 EBEs from U.S. to India: Christian Lint, President and Chairman, Yankee Engineering Services

Catherine Clerf, President, CAC International

1g. Demonstration of Real-Time Toxic Emissions Monitoring Systems -- K3 Corporation manufactures software systems to integrate environmental sensors, computers, and

telecommunications to provide effective industry analytical and management tools. Under this exchange, K3 met with: C.G. Hartmen and Braun; Blue Star Ltd.; and Assorted Instruments Manufacturing. Project dates: November 6 to 21, 1993.

1 EBE from U.S. to India: Kris Kudrnac, President, K3 Corporation

1h. Technology Transfer: Fluidized Bed Chemical Recovery System for Paper Mill Black Liquor - Enders Process Equipment uses a fluidized bed reactor system to recover pulping chemicals and destruction of organic pulping residue by thermal oxidation. Under this exchange Enders met with Indian companies interested in this technology: UP Straw and Agro Products, Ltd.; Grasm Industries, Harihar Polyfibers Ltd.; Shreyans Paper Mills, Ltd.; West Coast Paper Mills Ltd.; Shiva Paper Mills, Ltd.; ABC Paper Mills, Ltd.; and Zenith Papers. Project dates: November 7 to 23, 1993.

1 EBE from U.S. to India: Joseph Enders, President, Enders Process Equipment

1i. Oil Absorbent Demonstration -- Ab-Sorb manufactures a low-cost material for use in cleaning, and absorbing spilled oil and other substances. Potential applications range from shop floor use to major oil spill response activities. The company believes that there is greatest potential for recovery and reuse of spilled petroleum products using the Ab-sorb product. Under this exchange Ab-Sorb explored joint ventures with potential Indian partners. Project dates: November 7 to 23, 1993.

1 EBE from U.S. to India: Jack Wallace, President and CEO, Ab-Sorb

1j. Industrial Wastewater Treatment Technology Assessment Exchange -- Representatives of Ion Exchange traveled to the U.S. to evaluate wastewater treatment technologies relevant to the pulp and paper, tannery, and iron and steel industries. U.S. industries included in the tour were: Kinetic Recovery Corporation; Kinetic Engineered Systems, Inc.; Memtek Corporation; Osmonics Incorporated; Koch Membrane Systems; Green Bay Packaging; Black and Veatch; Zimpro Environmental; Krupp Wilputte Corp.; and Thetford Systems, Inc. Project dates: November 5 to 19, 1993.

3 EBEs from India to U.S.: Dr. Satish Chilekar, Senior General Manager; Ravi Vaidya, Manager - Effluent Treatment; and T. Chandran, Sales Manager, Ion Exchange

1k. Review of Incinerator Operations -- Pure Tech and its sister company, Cyano Clean Company are advancing plans to build a hazardous waste incinerator near Madras. Under this exchange technical representatives of Pure Tech visited the Sikes incinerator facility operated by International Technology (IT) Corp. Project dates: December 4 to 25, 1993.

2 EBEs from India to U.S.: A. Goldwin Joseph, Environmental Engineer; and R. Narashimhan, Chemical Engineer, Pure Tech Engineering.

1l. Corporate Environmental Mission -- Representatives of IT Corp. met with officials of India's chemical, fertilizer, and tannery industries, as well as Federal, state and regulatory personnel to discuss IT Corp.'s understanding and experience with pollution prevention and waste minimization. Indian corporate environmental programs were reviewed, and alternative approaches discussed. IT Corp. also met with representatives of Pure Tech Corp. interested in incinerator technology, and discussed the supply of a turn-key incineration system for the Madras area. Project dates: January 15 to February 1, 1994.

2 EBEs from U.S. to India: Prakash Acharya, Chemical Engineer; and Alan Baker, Business Development Manager, IT Corp.

1m. Shriram Industrial Enterprises Limited (SIEL) Environmental Management and Safety Systems Survey -- A representative of SIEL visited the U.S. to evaluate technology related to environmental management and safety techniques in the chemical and aquaculture industries and in industrial parks, and fly ash utilization in thermal power plants. SIEL evaluated the cost effectiveness of these various technologies and options for them to be utilized in India. U.S. facilities included in the tour were: Research Triangle Foundation; Southern Star Shrimp Farm; Harlingen Shrimp Farm; Texas A&M University Aquaculture Research Center; Aquaculture Management Association; Dow Chemical Company; Radian Corporation; Tellico West Industrial Properties; Big River Conversion Systems Inc.; Ferro Tech; and E.I. du Pont de Nemours & Company. Project dates: January 18 to February 6, 1994.

1 EBE from India to U.S.: Surendra Kumar, Asst General Manager, SIEL

1n. Nuchem Wastewater Treatment Evaluation -- Nuchem, Ltd. has been working in the field of wastewater and effluent treatment based on electro dialysis and membrane technologies using reverse osmosis. They expanded their understanding in the field of water and wastewater treatment through biological methods and traveled to the U.S. to have discussions with various U.S. organizations in the field of biological wastewater treatment and other remediation technologies. Project dates: February 11 to March 5, 1994.

1 EBE from India to U.S.: N. Shriram, Vice President, Nuchem, Ltd.

1o. Corporate Environmental Program -- WEC sponsored an exchange for Indian industry executives to visit with State development agencies in Washington, California, and Colorado. Project dates: March 24 to April 9, 1994.

5 EBEs from India to U.S.: Subir Gupta, Assistant Manager, Tata Risk Management Services

R.K. Banerji, Deputy Director, Shriram Institute for Industrial Research

Ashok Panjwani, Vice President, United Phosphorus Ltd.

A.V. Kane, Manager, Gujarat Alkali and Chemicals Ltd.

K. Harinathan, Manager, Industrial Credit and Investment Corporation of India

1p. Clean Technology for Paper Mills -- ThermoChem, Inc./Manufacturing and Technology Conversion International (MTCI) has developed a technology for eliminating water pollution from mini-paper mills and distilleries while simultaneously recovering chemicals and energy. This technology has been licensed to Esvin Advanced Technologies of India. Esvin requested technical assistance in applying the licensed technology to straw-black liquor. While in the U.S. Esvin officials visited a Mead pulp mill and a Weyerhaeuser pulp mill. Project dates: May 26 to June 3, 1994 & July 2 to August 2, 1994.

2 EBEs from India to U.S.: V.S. Venkataraman, Managing Director; and Dr. M. Mahalingam, General Manager, ESVIN TECH

1 EBE from U.S. to India: K. Durai-Swamy, Senior Vice President - Marketing, ThermoChem

1g. Assessment of "Green" Boiler Technology -- Delegates from the Indian Boilers Manufacturers' Association visited U.S. boiler manufacturers to study the latest in fuel-efficient and environmentally friendly boilers with the objective of importing and incorporating these technologies into the manufacture of boilers in India. While in the U.S. the delegation also attended the American Boiler Manufacturers' Association annual general meeting. U.S. firms included in the U.S. itinerary for the delegation included: John Zink Company; The International Boiler Works Company; American Schack Company; Industrial Boilers Company; Sellers Engineering Company; Mac Environmental; Eclipse Systems; Catalytic Systems Division; and Soil Purification, Inc. Project dates: June 17 to July 1, 1994.

7 EBEs from India to U.S.:

D.B. Baldawala, Director, Industrial Boilers, Ltd.

C.R. Engineer, Vice President - Marketing, Industrial Boilers, Ltd.

N.K. Desai, Chief Executive, Laxmi Boilers

M.S. Walla, Director, Walla Engineering Associates

B.P. Trivedi, Partner, Jayant Welding & Engineering Works

V.N.G. Rao, Managing Director, Ignifluid Boilers India, Ltd.

G. Trivedi, Director, Thermax Ltd.

1r. Evaluation of Biological Formulations for Industrial Wastestreams Treatment -- U.S. Biotech, Inc. of New Jersey, and Premier Ziba, Ltd. of New Delhi explored the transfer of biological formulations for use in treating industrial wastestreams in India. Under this exchange representatives of Premier Ziba visited U.S. Biotech Inc., facilities to further discussions and evaluations as a precursor to test marketing products to sugar processing, tannery and sewage treatment industries in India. Project dates: June 18 to 24, 1994.

3 EBEs from India to U.S.: Govind Srivastav; Lashman Srivastav; and Dr. Jaganathan, Premier Ziba

1s. Technology Assessment Exchange -- Representatives of Nuchem Ltd. visited U.S. experts in biological waste treatment, facility audits, and the use of agricultural wastes for constructing light weight construction materials. Project dates: October 2 to 21, 1994.

2 EBEs from India to U.S.: P. Bharm, Executive Director; and N. Shriram, Vice President of Technology and Operations, Nuchem Ltd.

1t. Catalytic Converter Exchange -- Dyna-K plans to manufacture metallic monoliths for catalytic converters. Under this exchange they will visit U.S. companies with an interest in the Indian market. Project dates: April 30 to May 15, 1995.

1 EBE from India to U.S.: C.F. Dias, Executive Director, Dyna-K Stampings

1u. Filter Exchange -- Uniixel Laser is a manufacturer of stainless steel filters for treating wastestreams from the organic chemical industry. They are interested in meeting with U.S. firms that might license welding technology for sintered stainless steel. U.S. partners may include: Texcel; and Alabama Technologies. Project dates: April 4 to 24, 1995.

1 EBE from India to U.S.: S. Nagaswami, Managing Director, Uniixel Laser

1v. Environmental Services Exchange -- Vimta Labs is interested in strengthening their capabilities for analysis of dioxins and furans, conducting environmental assessments, environmental auditing, and bioremediation. Participants in the tour will include: Harding Lawson; Law Engineering; and Tighe and Bond. Project dates: May 1 to 15, 1995.

2 EBEs from India to U.S.: Dr. S.P. Vasireddi, Chairman and Managing Director; and Dr. K.S.M. Rao, Director of Laboratory and Technical Manager, Vimta Labs

INDI-2. Textile Industry -- Review of Pollution Prevention/Control Technology -- WEC worked with AT International to bring a group of textile industry executives to the U.S. to review of pollution prevention and control technologies relevant to bleaching and dyeing operations. Project dates: April 23 to May 6, 1994.

8 EBEs from India to U.S.:

- G.M. Singhvi, Kiran Textiles
- Amrit Raj Dhariwal, Mangal Textiles
- Gautam Chopra, Munna Textiles
- M.I. Daga, M. Processing House
- Vikram Singh Rathore, Small Industries Development Bank of India.
- Chattaran Desai, Technical Director, Paradise Prints
- Girish R. Luthra, Technical Director, Luthra Dyeing and Printing Mills
- Bapu Deshapende, Senior Executive, Technical Service, Product Development, Bhavan Industries, Colourtex

INDI-3. Metropolitan Environmental Improvement Programme (MEIP) - URBAIR -- WEC, in support of the World Bank's MEIP program, provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans resulted of work group sessions and conferences among government and private sector officials, and set forth government priorities and budget allocations. Project dates: May 28 to June 9, 1994.

1 EBE from U.S. to India: Dr. Stanley Greenfield, Senior Vice President, Systems Applications International

INDI-4. Transfer of Carbon Disulfide Removal Technology -- WEC supported a Radian Corporation mission to India to demonstrate technology for safely removing carbon disulfide during the manufacture of rayon. Indian companies that met with Radian included: Bombay Dyeing; Century Rayon; South India Viscose and Rayon; and Sudarshan Chemical Industries, Ltd. Project dates: March 11 to 30, 1994.

1 EBE from U.S. to India: Avi N. Patkar, Senior Staff Engineer, Radian Corporation

INDI-5. Clean Coal Technology Evaluation -- The Indian coal industry can significantly benefit from U.S. coal washing operations that would reduce the amount of stone transported from mines, and thereby increase the BTU value per ton of coal shipped. Under this exchange principals of India's coal industry visited the U.S., attended Coal Prep '94, and met with experts at the Center for Applied Energy Research, Roberts and Schaeffer, and Pennsylvania Electric's Keystone coal preparation facility. Project dates: April 30 to May 10, 1994.

5 EBEs from India to U.S.: B.C. Misra, Director, Central Mine Planning and Design Institute

Amitav Banerjee, General Manager, Andrew Yule & Company

M. Rajagopal, Chief, Coal Preparation Division
Central Mine Planning and Design Institute

K.S. Rao, Sr. Joint President, Indo Gulf Fertilizers and Chemicals Corp.

M.W. Goklany, Executive Director, India Power Partners;
Managing Director, Desein Private, Ltd.

INDI-6. Assessment of Solar Photovoltaic Technology -- Suryashakti Systems, Pvt. Ltd., manufactures solar photovoltaic power components and other renewable energy devices. The purpose of this exchange was to review U.S. technology in photovoltaics with the goal of forming joint ventures with U.S. firms. U.S. companies tentatively identified for the visit included: Radoo Products; and BSAR Solar. Project dates: July 25 to August 4, 1994.

2 EBEs from India to U.S.: Upendra Kamdar, Managing Director; and Vijay Kamdar, Director, Suryashakti Systems

INDI-7. Waste to Energy Technology Assessment -- Under this exchange Western Pacques India Ltd. (WPIL), an Indian environmental engineering company, traveled to the U.S. to assess options for joint ventures and technology transfer. WPIL plans to build by 2010 an effluent and solid waste treatment plant to generate 2000 MW of power based on waste to energy technology. Project dates: February 2 to 25, 1995.

2 EBEs from India to U.S.: Shan J. Bhan, Vice President - Operations; and Surendra A. Patwardhan, Senior Manager, Western Pacques India Ltd.

INDI-8. Biomass Gasification Exchange -- Representatives of Ajinkyatara Cooperative Sugar traveled to the U.S. to review technologies for biomass gasification using bagasse from sugar plants and concentrated spent wash waters from distillery operations. The tour included: Thermo Chem Inc.; Cratech; Hawaii Natural Energy Institute; Institute of Gas Technology; Battelle Columbus; and Bioenergy Development Corp. Project initiation: November 8 to 20, 1994.

4 EBEs from India to U.S.: Vikramsinh H. Aparadh, Managing Director; and L. Prabhakar, Technical Advisor, Ajinkyatara Company Cooperative Sugar Factory Ltd

P. Venkataramen, Managing Director; and G. Ramanathan, General Manager, EASL.

INDI-9. Fly Ash Utilization Exchange -- Three U.S. companies interested in exploring the potential for establishing a facility in India to use up to 2000 tons of combustion products per day, resulting in commercial products that could be sold on the Indian market. This exchange included evaluation of alternative sites, determination of optimal plant size, selection of an Indian partner, and discussions of project financing. Project dates: August 21 to September 6, 1994.

3 EBEs from US to India: Jagdish Saluja, President, Viking Systems International
Howard Fitzgerald, Manager, ReUse Technology
Carl Bell, Partner, The Delta Group.

INDI-10. Coal Washery Exchange -- Under this exchange Norwest Mine Services Inc. met with a number of private sector companies to explore possibilities for joint business ventures in coal washery design, construction, and operation. Norwest also met with government agencies to assess the impact of regulations on the ability of Norwest to compete in the Indian market place. Project dates: October 9 to 23, 1994.

1 EBE from U.S. to India: Donovan Symonds, President, Norwest Mine Services Inc.

INDI-11. Evaluation of Oil Refining and Recycling Technologies -- Vijayant Autocrafts participated in this exchange to review U.S. technologies for developing a lubricating oil refining and blending plant. Synthetic lubricant oil manufacturing were also of interest. Project dates: November 9 to 23, 1994.

1 EBE from India to U.S.: Harshad Tolia, Chairman and Managing Director, Vijayant Autocrafts.

INDI-12. ICOLP Technology Cooperation Project -- The International Cooperative for Ozone Layer Protection (ICOLP) requested participation in the EBE program to fund the attendance of three experts to meet with Indian industry and government officials and discuss alternatives to the use of ozone depleting solvents (ODSs). ICOLP experts also instructed Indian industry on submitting project proposals to phase out the use of ODSs to the Multilateral Fund of the Montreal protocol. Project dates: December 2 to 12, 1994.

3 EBEs from U.S. to India: Ms. Urmi Ray, AT&T - Aqueous and Semi-Aqueous Alternatives Expert
Prathap Reddi, Ford Motor Company - No-Clean Technologies expert
Fano Basu Ray, ICOLP Project Coordinator.

INDI-13. Indian Cogeneration Exchange -- Econergy International Corporation (EIC) represents a consortium of Duke Engineering Services, Lockheed Martin, Niagara-Mohawk, and TransAlta Utilities Corp. EIC identified sites and sugar mills having potential for joint cogeneration projects using bagasse and other biomass fuels. Under this exchange EIC pursued negotiations which, if successful would result in 30 and 50 megawatt facilities. Project dates: December 2 to 17, 1994.

3 EBEs from U.S. to India: Frederick P. Renner, Consortium Project Manager; and

John Paul Moscarella, Cogeneration Expert, Econergy
Internation Corporation

Gene Minner, Engineer, NUS Haliburton

INDI-14. Remote Environmental Monitoring Exchange -- Under this exchange Environmental Risk and Insurance Management Services (ERIMS) visited Environmental Services Ltd. (ESL) of Anchorage, Alaska to assess ESL remote environmental monitoring equipment at use at U.S. installations. ERIMS also meet with International Solar Electric Technology regarding possible joint venture projects. Project dates: December 16 to 26, 1994.

2 EBEs from India to U.S.:

Dr. B.A. Giridhar, Deputy General Manager; and Santosh
Gupta, Jr. General Manager, Environmental Risk and
Insurance Management Services

INDI-15. Indian ESCO Exchange -- WEC was approached by RMA, the holder of the USAID EMCAT contract, and their subcontractor Kiona International, Inc. for assistance in sending U.S. ESCOs to India to meet with Indian companies (previously screened by Kiona) interested in pursuing joint ventures, and to attend the 11th Indian Engineering Trade Fair and ENCON 95. Project dates: February 9 21, 1995.

6 EBEs from U.S. to India:

Donald Smith, Chairman & CEO, Energy Masters
Corporation

Flynn Bucy, International Manager, Proven Alternatives,
Inc.

Michael Bobker, President, BEI Energy Corp.

James Crossman, President; and Chris Subbarao,
Engineer, Financial Energy Management

Thomas Dreessen, President, Energy Performance
Services

INDI-16. Demand Side Management Exchange -- Under this exchange the Ahmedabad Electricity Company of India and the Resources Development Foundation (RDF) are pursuing demand side management opportunities in India. RDF will provide the electric company with information on financing DSM and supply side activities, and on DSM planning and implementation. Project dates: February 10 to 23, 1995.

2 EBEs from U.S. to India:

Subash Chandra, Principal, Charter Oak Energy

Kevin Fitzgerald, RDF Consultant

INDI-17. Energy Conversion Devices Exchange -- Under this exchange Ovonic Battery Company, a subsidiary of Energy Conversion Devices, Inc., is holding discussions with interested parties on the design and construction of a fleet of two wheeled electric vehicles powered by proprietary nickel metal hydride rechargeable battery technology. Ovonics will hold meetings with government and industry representatives with the goal of forming joint ventures for the commercialization of the battery technology. Project dates: February, 6 to 20, 1995.

5 EBEs from U.S. to India:

Nancy M. Bacon, Senior Vice President, Energy
Conversion Devices, Inc

Subhash Dhar, President; Anthony Osgood, Engineer; and Ronald Himmler, Battery Engineer, Ovonic Battery Company

Subhendu Guha, Vice President - R&D, United Solar Systems Corporation

INDI-18 (MULT-7). Electric Vehicle Exchange -- Chaz Haba of Planet Electric visited India to pursue a joint venture with Bajaj Auto to produce electric vehicles. While in India, Mr. Haba also met with representatives of Ashok Leyland, a major Indian automotive manufacturer interested in developing electric vehicles. In addition to the meetings in India, Mr. Haba visited Bangkok, Thailand to provide a demonstration of electric vehicle technology to a delegation of the U.S.-Asia Environmental Partnership (US-AEP). Mr. Haba met with local Thai officials to promote the use of electric vehicle technology in Bangkok. Project dates: July 8 to 19, 1995.

1 EBE from U.S. to India: Chaz Haba, President & CEO, Planet Electric, Inc.

INDI-19. Delegation to Waste Expo '95 -- A delegation of Indian industry, municipal, and central government representatives will visit the Waste Expo '95 in Chicago. Project dates: April 23 to May 3, 1995.

6 EBEs from India to U.S. Surjit K. Chaudhary, Municipal Commissioner, Madras Municipal Corporation

Dr. S.R. Maley, Vice President, Biotech Exel Industries Ltd.

Kunit Oza, Chairperson, Clean Bombay Foundation

C.M. Vij, Director & Chief Engineer, Municipal Corporation of Delhi

Tarun Khatwani, Manager - Project Development, Industrial Plants and Waste Treatment;

Asim Barman, Calcutta Municipal Corporation

INDI-20. Energy Efficiency Services Exchange -- SRC undertook a feasibility study of energy services companies (ESCOs) in India in 1992. This study underscored the importance of ESCOs in India and the opportunities for joint venture partnerships between U.S. and Indian energy service companies. Under this exchange SRC is providing training on the financial, regulatory, and technological requirements for establishing ESCOs. Project dates: March 23 to April 8, 1994.

1 EBE from U.S. to India: Dilip Limaye, President, SRC International

INDI-21. Industrial Boilers Exchange -- As a follow up to an earlier exchange, a representative of the Indian company, Industrial Boilers Ltd., will visit the U.S. to finalize a Memorandum of Understanding with Combustion Association, Inc. Project dates: May 14 to June 3, 1995.

1 EBE from India to U.S.: R.R. Engineer, Vice President (Technical), Industrial Boilers Ltd.

INDI-22. Photovoltaic Technology -- The J.S. Group participated in the exchange program to review

U.S. technologies and identify companies that might be interested in collaboration in India. The delegation visited: Spire; United Solar Systems Corporation; ISET; and Global Photovoltaic. Project dates: May 22 to 31, 1995.

2 EBEs from India to U.S.:

Brig. (Retd.) N.N. Sharma, Senior Advisor; and R. Sainath, General Manager, J.S. Group

INDONESIA

INDO-1. Megacities on the Pacific Rim and the Burden of Air Pollution -- WEC worked with the Mansfield Center for Pacific Affairs and RCG/Hagler, Bailly in organizing this conference which brought together policy makers from Bangkok, Jakarta, Kuala Lumpur, Los Angeles, Manila, Mexico City, Singapore, and Taipei. The conference included representatives of private industries, governments, NGOs, academia, scientific communities, and the media. The specific goals of the conference were to: (1) provide participants with a clear picture of problems and problem solving techniques specific to air pollution problems of the region; (2) provide familiarity with data sources and their use; (3) offer a forum for the joint discussion and development of strategies to reduce air pollution; and (4) provide a means to develop and maintain contacts among professionals and communities in the region to work together on solution to air pollution problems. Project dates: February 13 to 19, 1993.

12 EBEs from U.S. to Indonesia:

Dr. Larry Berg, Director - Jessie M. Uruh Institute of Politics, University of Southern California

Jan Chatten-Brown, Esq., Attorney at Law

David Coel, Program Supervisor, South Coast Air Quality Management District

Joel Epstein, Vice President; Mary Harris, Vice President; and Fiona Mikkelson, RCG/Hagler, Bailly

Kernan Lipper, Esq., Staff Director - Natural Resources Committee, California State Assembly

Harold Martinez, President, ABLE Industrial Products

Marilyn Morton, Government Relations, Parsons Corporation

Janice Perlman, Executive Director, Megacities Project

James Rochow, Esq., Attorney at Law

Michael Walsh, Consultant

INDO-2. Metropolitan Environmental Improvement Programme - URBAIR -- WEC worked with the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control strategies. National plans resulting from the work group sessions and conferences between government and private sector officials, set forth government priorities and budget allocations. Project dates: July 24 to August 4, 1993.

1 EBE from U.S. to Indonesia:

Michael Ruby, Director of Engineering, Envirometrics Inc.

INDO-3. Technology Assessment Mission: Pulp and Paper Industry -- As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC brought representatives of the Indonesian pulp and paper industry to tour U.S. industries and evaluate state-of-the-art techniques and technologies. U.S. institutions/facilities visited were: National Council of the Paper Industry for Air and Stream Improvement, Inc.; Willamette Industries, Inc.; Union Camp Corp.; Sonoco Paper Products; and Weyerhaeuser. Project dates: October 23 to November 5, 1993.

4 EBEs from Indonesia to U.S.:
Widya Tjahyana Lauwangsa, Engineer, PT Pakerin Pulp and Paper Products & Chemical Industries

Ir. Darono Wikanaji, Wastewater Treatment Facilities Engineer, PT Kertas Leces

Drs. Warih Supriadi, Paper Engineer - Quality Control Department. PT Surabaya Agung Industri Pulp & Kertas

Zulkifli Lubis, Vice Section Chief - Environmental Protection, PT Indah Kiat Pulp & Paper Corporation

INDO-4. Technology Assessment Mission: Metal Finishing Industry -- As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC brought representatives of the Indonesian metal finishing industry to tour U.S. industries to evaluate state-of-the-art techniques and technologies. Project dates: December 6 to 18, 1993.

4 EBEs from Indonesia to U.S.:
Ir. Dadang Sudrajat, Head of Quality Control, PT Suprarex Rays

Ir. Jaya Agung Prastowo, PT Y.K.K. Indonesian Zipper Co. Ltd.

Ir. Suryanur Syafei, Chief - Quality Control, PT Padli Komponen Corporation

Ir. Widya Wicaksana, Project Manager, PT Probengkei

INDO-5. Waste Minimization Technology Transfer: Textile Industry -- WEC provided an expert from U.S. textile industry to lead a training session for Indonesian industries on state-of-the-art waste minimization techniques. He conducted factory assessments at seven textile industries in the Jakarta area. Project dates: November 9 to 20, 1993.

1 EBE from U.S. to Indonesia: Dr. Andrew Foldi, Senior Research Chemist (Rtrd) - Textile Fibers, E.I. Du Pont

INDO-6. Environmental Management at Industrial Estates -- The Indonesian government recently passed strict new rules making the developers/managers of industrial estates responsible for emissions from resident industries. To assist developers in understanding and dealing with these new environmental requirements, WEC organized a tour of U.S. industrial parks in: Rhode Island; Cleveland, Ohio; Houston, Texas; and Kansas City, Missouri. In addition the Indonesian Developers were given a short course on basic considerations for environmental monitoring. Project dates: April 17 to 28, 1994.

8 EBEs from Indonesia to U.S.:
Sjukur Lawigena, Division Head - Operation and Property Management; and Wilyadi Adinoto, Project Manager for Industrial Estate, PT Bumi Serpong Damai

A.J. Kristiadi, Manager of Operation, PT Grahbuana Cikarang and PT Kawasan Industri Jababeka

Swastiono Donny Dewanto, Environmental Engineer; Elisabeth Dessy, Asst. Manager of Business Development; and Ade Irwn Dwiyana Machmudin, Development Assistant, PT Lippo City Development

Diding Muchidin, Director and Senior Environmental Engineer, PT Jaya Arkonin Engineering Manggala Pratama

Budi Sutjahjo, Deputy Director and Senior Environmental Engineer, PT Waseco Tirta

INDO-7. Sharing of GIS and Remote Sensing Expertise -- The AHT Group of Indonesia was interested in U.S. experience and expertise in geographic information systems (GIS) and remote sensing. More specifically, AHT was pursuing an Asian Development Bank funded project to develop the Marine and Coastal Information System, a component of the Marine Resources Evaluation and Planning Project, and has identified U.S. expertise as necessary to the project. Project dates: May 1 to 11, 1994.

1 EBE from U.S. to Indonesia: Fran Stetina, International Data Systems Office/Goddard Space Flight Center

INDO-8. Factory Assessments for the Plywood Industry -- USAID/Indonesia requested WEC assistance in providing factory assessments for the plywood industry. Under this exchange U.S. experts traveled to Indonesia and engage in up to five factory assessments and a brief workshop for industry and government officials. Project dates: September 18 to 28, 1994.

2 EBEs from U.S. to Indonesia: Dan Sjolseth, Corporate Director - Environmental Science & Technology, Weyerhaeuser

Albert Fellows (Rtrd.), Boise Cascade Corporation

INDO-9. Technology Assessment for Infrastructure Projects in Indonesia -- The US-AEP infrastructure representative in Jakarta requested participation in the EBE program by three Indonesian engineers involved in the development of Bumi Serpong Damai, a town being developed on the outskirts of Jakarta. The development plan includes establishment of water distribution and collection, and sewage treatment. The Indonesians who participated in this exchange were interested in mechanical/electrical equipment, pipe, and pumping station designs. Project dates: October 11 to 22, 1994.

3 EBEs from Indonesia to U.S.: Ir. Munawar Saleh, Urban Planning Manager; Ir. Rini Anggraini, Infrastructure Engineer; and Trinawati Basuki, Quality Survey Manager, P.T. Bumi Serpong Damai

INDO-10. U.S./Indonesia Joint Oil Spill Response Workshop -- The U.S. Minerals Management Service (MMS) in collaboration with the Indonesian Agency for Research and Assessment Technology (BPPT) are hosting a joint oil spill response workshop. Under this exchange, US-AEP is sponsoring members of the U.S. private sector to make technical presentations. Project dates: January 27 to February 5, 1995.

4 EBEs from U.S. to Indonesia Steve Blackburn, Marketing Director, MARCO Pollution Control

Bill Gorham, Senior Scientist/Program Manager, ENSR
Consulting & Engineering

Bob Dalton, Executive Vice President, Global Industries
Corporation

Atle Nordvic, Director, Applied Engineering Department,
Marine Spill Response Corporation

INDO-12 Ecotourism Exchange -- USAID/Jakarta requested the participation of Keith Sproule and Karen Ziffer of Private Agencies Collaborating Together (PACT) to assist in the development and presentation of an ecotourism workshop. The workshop, which ran from April 18 through 20 addressed awareness, knowledge, planning, and implementation of sound ecotourism initiatives. Project dates: April 10 to May 7, 1995.

2 EBEs from U.S. to Indonesia

Keith Sproule, Karen Ziffer, PACT

INDO-13. Oil Spill Response Vessel Exchange -- The Indonesian Government, as part of its effort to secure navigation safety and to prevent marine disasters in the Maalacca and Singapore Straits - two of the busiest and most important shipping lanes in the world, particularly for oil tankers - is seeking to improve its fleet of marine disaster prevention ships. Specifically, the Indonesian Sea Communication (the Indonesian Coast Guard) intends to procure three units of 500 gross tonnage type marine disaster prevention ships. To this end, representatives from the Indonesian Ministry of Sea Communications visited MARCO Pollution Control, a designer and builder of marine disaster prevention ships located in Seattle, Washington. The Indonesian representatives viewed MARCO facilities and equipment currently in use by the U.S. Coast Guard. Project dates: June 25 to July 1, 1995.

6 EBEs from Indonesia to the U.S.:

Ir. Drs. Abdul Razak Manan, MSI, Commissions for EIA,
Ministry of Communication

Ir. Tunjung Indrawan, Secretary of the Directorate
General of Sea Communication

C. Sutikno, Head of Subdirectorate on Ship Readiness,
Directorate Sea and Coast Guard, Sea Communications

Ir. Hari Budiharto, Directorate Port and Dredging,
Directorate General of Sea Communication

Ir. Saibun Pane, Research and Development Centre,
Ministry of Communication

Drs. Iman Hambali, Planning Division, Ministry of
Communication

KOREA

KORE-1. Flue Gas Desulfurization Technology Assessment -- In cooperation with Radian Corporation, WEC sponsored the participation of officials from Korea Electric Power Corporation (KEPCO) on a tour of U.S. flue gas desulfurization installations. Included on the tour were: Electric Power Research Institute's Hydrogen Sulphur Test Center; General Electric's Environmental Services Division; Babcock and Wilcox; and Combustion Engineers. Project dates: December 9 to 22, 1993.

2 EBEs from Korea to U.S.: Park Hun Kyung, Operation Engineer - Sechon Thermal Power Plant; and Jo Young Dae, Assistant Manager - Environmental Technology Section, Korea Electric Power Corporation

KORE-2. Review of Mercury Recovery and Hazardous Waste Treatment Technology -- Environmental Management Corporation (EMC) is planning to build six hazardous waste treatment facilities in the central part of Korea, and a mercury recovery facility. WEC arranged a tour of U.S. facilities that provided EMC with both an overview and specific details of U.S. technology in each of these areas, as well as on industrial wastewater treatment and public education efforts. Project dates: November 11 December 4, 1993.

1 EBE from Korea to U.S.: Shin-Born Lee, Executive Director - General Affairs, Environmental Management Corporation

KORE-3. Assessment of U.S. Water Treatment Technology -- The City of Pusan, Korea has embarked on an ambitious infrastructure building initiative that includes the construction of sewage treatment facilities. Under this exchange four officials from Pusan traveled to the U.S. and surveyed wastewater treatment facilities in several U.S. cities including: San Francisco, California; Denver, Colorado; and El Paso, Texas. CH2M Hill was the U.S. host for this visit. Project dates: June 6 to 29, 1994 & October 17 to 26, 1994.

4 EBEs from Korea to U.S.: Sang Hyoun Kim, Director General of Sewage Department, Construction Bureau; Ryu Jang-Soo, Director of the Construction Bureau; and Kim U-Bong, Section Chief, Sewage Treatment, Pusan City

Dr. Yoo Chan Jun, Senior Researcher, Research and Training Institute

KORE-4. Waste-to-Energy Incineration Exchange -- Basic Envirotech is a finalist in competition to provide an incinerator plant to the Han Kook Tire Company, Korea. Under this exchange officials from Basic met with Han Kook and explain the more salient features of their patented processes. Project dates: September 24 to 31, 1994.

2 EBEs from U.S. to Korea: John Basic, Jr., President; and Peter Hage, International Marketing Manager, Basic Envirotech.

KORE-5. Wastewater and Solid Waste Management Assessment -- UEDC officials visited the U.S. to meet with U.S. companies interested in participating in wastewater and solid waste management projects in Korea. Companies visited included: IT Corp; Re-Tech; Plasma Technology; WMX; and Foster Wheeler. Project dates: October 8 to 19, 1994.

4 EBEs from Korea to U.S.: Kim Nak-Kyung, President; Min Hoon-Ki, President; and Park Kwang-Jii, Administrative Manager, UEDC

Kim Hak-Myung, President, Con-Tech Corp.

KORE-6. Packaging Resin and Nylon Recycling Technology Transfer -- Environmental Technologies, USA (ET) manufactures loose-fill packaging materials using agricultural materials and food extrusion technology. They also utilize technologies capable of producing a 95% recycled nylon resin. Under this exchange representatives of ET traveled to Korea and met with Sun Hill Glucose Co. Ltd. to explore

business opportunities for collaboration in distributing products in Asia. Project dates: November 19 to 26, 1994.

2 EBEs from U.S. to Korea: Robert Young, President and CEO; and Ed Boehmer, Chief Engineer, Environmental Technologies.

KORE-7. Solid Waste Management Technology Exchange -- EMC is visiting the U.S. to view solid waste management technologies. EMC has plans for 6 new incineration facilities over the next five years. The tour will likely include: Molten Metal Technology in Connecticut; Freshkill Landfill in New York; IT Corp. in Louisiana; Wheelerbrator in Florida; and ReTec in California. Project dates: April 22 to May 5, 1995.

3 EBEs from Korea to U.S. Bok, Jin Poong, Chairman; Kang, Ho-Jik, Manager - Waste Treatment Division; and Lee, Jun-Heung, Assistant Manager, Environmental Management Corporation

KORE-8. Air Pollution Alert Exchange -- Four Korean government officials will visit USEPA Region 5 and the South Coast Air Quality Control Board to gain familiarity with U.S. technology and methods for monitoring air pollution and alerting the public about pollution levels. Project dates: February 27 to March 8, 1995.

4 EBEs from Korea to U.S.: Choi, Ryong-II, Director; He, Woo-Young, Assistant Director - Air Quality Policy Division; and Choi, Soo-Kun, Director - Han River Environmental Management Office, Ministry of the Environment

Youn, Hyeog-Sig, Assistant Director - Environmental Protection Division, Incheon Metropolitan City

MALAYSIA

MALA-1. SEASIS Electric Arc Furnace Dust Treatment Conference -- WEC provided two U.S. steel industry experts to speak on the management of electric arc furnace dust at the SEASIS conference in Malaysia. Project dates: September 3 to 8, 1993.

2 EBEs from U.S. to Malaysia: Alan Sarko, Director of Business Development, Inorganic Recycling Corporation

Kenneth L. Minnick, Environmental Compliance and Planning Manager (Rtrd.), Lukens Steel

MALA-2. Environmental Impact Assessment Technology Transfer -- Petroleum National Berhad (Petronas) sought U.S. expertise in performing impact assessments and developing monitoring programs of offshore oil drilling projects. Petronas embarked on several large assessment projects this year. Under this exchange, Continental Shelf Associates (CSA) met with Petronas to further explore business opportunities. Project dates: April 22 to 28, 1994.

1 EBE from U.S. to Malaysia: Dr. David Gettleson, President and Scientific Director, Continental Shelf Associates.

NEPAL

NEPA-1. Metropolitan Environmental Improvement Programme (MEIP) - URBAIR -- Joining US-AEP and MEIP resources, WEC provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans resulted from work group sessions and conferences among government and private sector officials and set forth government priorities and budget allocations. Project dates: November 27 to December 9, 1993.

1 EBE from U.S. to Nepal: Dr. Stanley Greenfield, Senior Vice President, Systems Applications International

NEPA-2. Electric Vehicle Technology Transfer -- As a follow-on to a successful National Association of State Development Agencies (NASDA) grant demonstrating electric vehicle technology in Kathmandu, WEC sponsored an exchange for four Nepali businessmen interested in learning about the state-of-the-art in electric vehicle technology. The exchange included meetings with representatives of Advanced Electric Car Technology and the Electric Power Research Institute, and included attendance at the Second National Conference on Electric Vehicle Infrastructure in Scottsdale, Arizona. Project dates: November 28 to December 9, 1993.

4 EBEs from Nepal to U.S.:

S. Raj Bhandari, CEO, Mercantile Computers

Pansak Siriruchatapong, Ph.D, Deputy Director, National Electronics and Computer Technology Center

K.B. Shrestha, Executive Director, South Asia Trading Company

Sushil Amatya, Executive Director, Consolidated Engineers

PHILIPPINES

PHIL-1. Philippine Business for the Environment (PBE) Conference, Manila -- WEC provided two speakers for the PBE conference "Corporate Environmental Policies and Programs". David Chittick, Vice President of Engineering for AT&T, and WEC Board member, spoke on corporate environmental policies, while Burt Hamner, with the Washington Department of Ecology, held a waste minimization workshop for government inspectors, and conducted a waste minimization opportunity assessment at a Manila department store. Project dates: March 19 to 27, 1993.

2 EBEs from U.S. to the Philippines: David Chittick, Vice President for Engineering, AT&T, WEC Board Member

Burt Hamner, Environmental Planner, Washington State Department of Ecology

PHIL-2. Metropolitan Environmental Improvement Programme (MEIP) - URBAIR -- WEC assisted the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans resulting from work group sessions and conferences among government and private sector officials, set forth government priorities and budget allocations. Project dates: July 24 to August 9, 1993.

1 EBE from U.S. to the Philippines: Michael Ruby, President & Director of Engineering,

Envirometrics Inc.

PHIL-3. Philippine Business for the Environment Conference, Cebu, Philippines -- Mr. Burt Hamner was invited by PBE for a repeat presentation (see PHIL-1, above) at Cebu, Philippines. Project dates: September 30 to October 9, 1993.

1 EBE from U.S. to the Philippines: Burt Hamner, Environmental Planner, Washington State Department of Ecology

PHIL-4. Technology Assessment Mission: Cement and Pulp & Paper Industries -- USAID/Philippines referred Mr. Guevara to WEC as a possible candidate for the Environmental Business Exchange Program. WEC arranged an exchange that emphasized plant site visits that demonstrated U.S. technology and visits to U.S. manufacturers of environmental control products relevant to the cement, and pulp and paper industries. Companies on the tour included: Mead Paper; Weyerhaeuser; Scott Paper Company; Simpson Tacoma Kraft; Medusa Cement; Holnam Cement; and 3M. Mr. Guevara also attended a course offered by USETI and an EPA conference. Project dates: September 30 to October 11, 1993.

1 EBE from Philippines to U.S.: Lauro Guevara, Vice President for Environment, Philippine Investment Management Co. (PHINMA)

PHIL-5. Integrated Approach to Waste Handling and Disposal -- WEC provided an expert from Energy Answers Corporation (EAC/Polydyne) to provide information to government officials on EAC's Integrated System approach (including combustion of waste for generation of electricity, composting, and recycling) for managing municipal solid waste. EAC/Polydyne also evaluated the need and possibility of successful implementation of such a system. Project dates: April 25 to May 7, 1993.

1 EBE from U.S. to Philippines: Gordon Sutin, Executive Vice President, Energy Answers Corporation/Polydyne, Inc.

PHIL-6. Technology Assessment Program - Smokey Mountain Project -- R-II Builders, Inc. was awarded the Smokey Mountain Development and Reclamation Project. In addition to cleaning up the dump site and providing housing for the 3,500 families living there, the project will also establish a modern, state-of-the-art incinerator complex with a through-put of 1,400 metric tons per day. This exchange allowed representatives of R-II Builders, Inc. to evaluate U.S. technology for flue gas conditioning. The exchange included visits to: Ogden Martin's Energy/Resource Recovery Facility; Wisconsin Electric's Port Washington Municipal Waste Incinerator; Post, Buckley, Schuh & Jernigan, Inc.; and NaTec Resources. Project dates: December 14 to 18, 1993.

4 EBEs from Philippines to U.S.: Reghis Romero, Chairman; Edmond Q. Sese, President; Raul A. Arellano, Jr.; Vice President - Equipment; and Atanasio Vercide, Vice President - Fabrication, R-II Builders, Inc.

PHIL-7. Technology Transfer - Solid Waste Baling Equipment -- Representatives of the Metro Manila Authority (MMA) traveled to the U.S. to evaluate the operation of Mosley solid waste baling equipment. MMA was seeking ways of extending the useful life of operating solid waste landfills. Project dates: May 26 to June 1, 1994.

3 EBEs from Philippines to U.S.: Prospero I. Oreta, Municipal Mayor of Malabon; Vice Chairman, Metro Manila Authority

Ofelia Monroy, Consultant, Urban Planning Section, Metro Manila Authority

Jose Paolo Sibal, Managing Director, Phoenix Environmental Protection systems.

PHIL-8. Philippine National Oil Company (PNOC) Technology Assessment -- A consortium led by the California Energy Company entered into a contract to assist PNOC in developing geothermal power. Hydrogen sulphide emissions are a major concern at geothermal sites and the government has recently passed stringent regulations regarding H₂S emissions. As part of this project, exchanges were designed to provide training of PNOC officials on the chemistry dependent nature of hydrogen sulphide control options, and also allow for a tour of US companies manufacturing alternative treatment systems. Project dates: September 26 to October 6, 1994.

5 EBEs from Philippines to U.S.: Herman Guillen, Engineering Design Manger; Hermes Ferrer, Geoscientific Manager; Dwight Maxino, production Manager, Romy Jabonillo, Process and Instrumentation Coordinator; and Frances Dolor, Planning Manager, Philippine National Oil Company

PHIL-9 Waste to Energy Technology Evaluation -- YSC has developed a waste to energy system suitable to the particular needs of Philippine waste management. The system will process high moisture content MSW through a hydrolysis and fermentation process that yields both a lignin-like material that can be burnt, and chemicals for sale. Under this exchange officials of MMA visited the U.S. to evaluate this technology. Project dates: October 2 to 16, 1994.

8 EBEs from Philippines to U.S.: Senator Ramon Revilla, Chairman Public Works Committee

Abelardo R. Topacio, Aid to Senator Revilla

Rudolfo Fuentes, Director - Environmental Management Bureau, Metro Manila Authority

Prospero I. Oreta, Municipal Mayor of Malabon; Vice Chairman, Metro Manila Authority

Ofelia P. Monroy, Technical Aide to Mayor Oreta

Natividad M. Sibal, Legal Advisor to Mayor Oreta

Jessie L. Todoc, Energy Regulation Officer, Department of the Environment

Dionisio C. Dela Serna, Chairman, Housing and Urban Development

PHIL-10 Pharmaceutical Waste Incineration Exchange -- Under this exchange Interphil Laboratories, a Philippine pharmaceuticals manufacturer met with U.S. incinerator manufacturers capable of treating pharmaceutical wastes. Project dates: November 26 to December 5, 1994.

1 EBE from Philippines to U.S.: Eduardo Cabrera, Vice President, Interphil Labs. Inc.

PHIL-11 Air Monitoring Technology Exchange - Norman Dela Cruz, President, First Signs, Incorporated, traveled to the U.S. to view particulate monitoring equipment. First Signs has been contracted by the Filipino Government to set up approximately 50 ambient air monitoring stations in and

around Manila, the first such study of its kind. In order to procure the best equipment possible, Mr. Dela Cruz met with numerous air monitoring manufacturers. Project dates: March 26 to April 13, 1995.

1 EBE from the Philippines to U.S. Norman Dela Cruz, President, First Signs, Inc.

PHIL-12. Iron and Steel Industry Exchange -- ASEAN EIP has requested that representatives of the Philippine iron and steel industry visit the U.S. to review current environmental practices and technologies. Facilities included on the tour included: Davy International, I/N Tek, Plasma Energy, Consteel, NUCOR, and ESL. Project dates: May 9 to 26, 1995.

5 EBEs from the Philippines to U.S.: Arther Florendo, Vice President, Bacnotan Steel Corporation

Felix Silva, Technical Consultant, Philippine Pipe and Foundry Corporation

Wilfredo Labayen, Executive Vice President, Phoenix Iron and Steel Corporation

Estefanio Gacad, Technical Services Manager, GST Philippines, Inc.

Lemuel E. Suan, Operations Engineer, Davao Steel Plant

SINGAPORE

SING-1. Evaluation of Wastewater Treatment Systems -- Under this exchange Pacific Vinitex Pte. Ltd, of Singapore met with Hoffman Environmental, Inc. and Blue Pacific Environmental Services, Inc. to learn more about chemical wastewater treatment systems and explore possible licensing and joint venture agreements. Project dates: August 11 to 19, 1994.

2 EBEs from Singapore to U.S.: Chua Boon Tat, Executive Director; and Lim Eng Chuan, Business Development Manager, Pacific Vinitex Pte. Ltd.

SING-2. Technology Transfer for Chemical Incineration -- Technochem Manufacturers Pte. Ltd. is interested in installing a waste oil recycling facility and chemical incinerator as part of a business expansion in industrial chemical waste management. Under this exchange, company officials visited the U.S. and toured manufacturers. Project dates: January 16 to 21, 1995.

3 EBEs from Singapore to U.S.: Ng Thin Teng, Director; Robert Lim, Operations Manager; and Ng We Wee, Chemist, Technochem Manufacturers Pte. Ltd.

SRI LANKA

SRIL-1. Technology Information Center -- Working in concert with the World Bank's Metropolitan Environmental Improvement Programme (MEIP), WEC identified the individuals responsible for the State of Minnesota's leading-edge institutions that disseminate and encourage industry's consideration and implementation of environmental protection measures. WEC sent delegates from: a Minnesota policy-making institution; the Office of Waste Management; an industry association/affiliation, WRITAR; and the government representative and "linking" institution, the Minnesota Trade Office. This delegation met with

Sri Lankan counterparts for a week-long session to develop the best Sri Lankan model for continued technical outreach and training for the private sector. Project dates: October 8 to 24, 1993.

3 EBEs from U.S. to Sri Lanka: Kevin McDonald, Senior Environmental Planner,
Minnesota Office of Waste Management
Terry Foecke, Director, Waste Reduction Institute
Karin Nelson, Environmental Technology and Services
Trade Representative, Minnesota Trade Office

SRIL-2. Factory Assessments -- Four industry sectors (metal finishing, canneries, paint, and leather tanning) were identified by USAID/Sri Lanka as needing U.S. expertise in optimizing production processes and in minimizing and treating the wastes generated. Experts identified by WEC performed factory assessments at two sites within each sector. The experts provided training for local consultants and also participated in an informal workshop. Project dates: May 1 to 11, 1994.

4 EBEs from U.S. to Sri Lanka: Terry Foecke, Director, Waste Reduction Institute
Calvin Henning, President, Frost Paint Co.
John Smith, Vice President for Environment, S.B. Foot
Tanning Company
Larry Ring, Plant Manager, Pillsbury, Green Giant
Division

SRIL-3. Plastics Recycling Technology Assessment -- Maharaja Organization Ltd. of Sri Lanka visited the U.S. to meet with experts in plastics recycling, with the goal of identifying joint venture partners for recycling facilities in Sri Lanka. Project dates: November 4 to 20, 1994.

2 EBEs from Sri Lanka to U.S.: N.S. Perera, Group Director; and B.S. Manukulasurlya,
Managing Director, Maharaja Organization Ltd.

SRIL-4. Moratuwa-Ratmalana Waste Minimization Project -- USAEP/WEC is assisting this project by providing industrial and institutional experts to assess opportunities for waste minimization and recommend facilities most appropriate for waste minimization grant/loan programs and participation in public outreach efforts. Project dates: February 18 to March 11, 1995.

2 EBEs from U.S. to Sri Lanka: Don Brosky, Pollution Prevention Specialist, 3M
Burt Hamner, Pollution Prevention Manager, Shapiro and
Associates

SRIL-5. Infrastructure Development Exchange -- Under this exchange Ms. Lalitha Jayaraman, Director, Environmental Infrastructure Unit of the Sri Lankan Secretariat for Infrastructure Development and Investment - a USAID sponsored activity to develop and facilitate BOO/BOT projects in Sri Lanka, will attend the International Law Institute (ILI) conference on Financing Urban Environmental Infrastructure in Bangkok. Project dates: February 25 to March 2.

1 EBE from Sri Lanka to Thailand. Ms. Lalitha Jayaraman, Director, Environmental
Infrastructure Unit, Secretariat for Development &
Investment

TAIWAN

TAIW-1. Electric Arc Furnace Dust Recycling -- Enviroscience, Inc. (ESI) has proprietary technology for the recycling electric arc furnace dust. E Chang Iron Steel Company of Taiwan is interested in acquiring ESI technology for recycling electric arc furnace dust, and initial discussions have been very promising. The exchange provided an opportunity for the principals of the companies to meet and discuss technical and financial aspects of technology transfer. Project dates: April 4 to 11, 1994.

3 EBEs from U.S. to Taiwan: C. Tom Philipp, President and Owner; Bob H. Sims, Manager of Engineering; and Don Warner, Manager - Contracts, Enviroscience, Inc.

TAIW-2. TEPA Review of U.S. Experiences in Wastewater and Harbor Management -- The AIT facilitated the visit to the U.S. of a delegation of Taiwan county environmental directors, primarily to view U.S. activities and achievements in harbor and wastewater management. The delegation traveled to Boston, Chicago, and Honolulu. U.S. companies hosting the delegation in each city were: CDM, Inc.; WMX; and CH2M Hill International, respectively. WEC assisted in arranging appropriate itineraries for the delegation and on-the-ground logistics. Project dates: July 6 to 19, 1994.

9 EBEs from Taiwan to U.S.:

- Li Kung-cheh, Commissioner, Environmental Protection Department, Taiwan Provincial Government
- Chu Liu-chao, Director, Bureau of Environmental Protection, Hua-lien County
- Huang Sheng-fa, Director, Bureau of Environmental Protection, Changhua County
- Wu Tien-chi, Director, Bureau of Environmental Protection, Chiayi County
- Hong Chin-tien, Director, Bureau of Environmental Protection, Kaoshiung County
- Kuo Kun-ming, National Institute of Environmental Training, EPA
- Huang Chi-lin, Taitung County Environmental Protection Director
- Wu Gin-son, Director, Bureau of Public Health and Environment, Kinmen
- Liu Cheng-ying, Director, Bureau of Public Health and the Environment, Lien-chieng County

TAIW-3. Evaluation of Emissions Control Technologies -- China Steel Corporation in Kaoshiung evaluated Reaction Engineering International (formerly Energy and Environmental Research Corporation) technology for controlling NOx and SOx emissions from their industrial furnaces and boilers. Project initiation: November 26 to December 15, 1994 & December 31 to January 10, 1995.

3 EBEs from U.S. to Taiwan: Michael Heap, President; Dr. Philip Smith, Vice President of Technology; and Stoney Chen, Director of Business

Development, Reaction Engineering International

5 EBEs from Taiwan to U.S.:

Sing-Tsu Tsai, Manager - Iron Making Process Development; Tsan-Ying Ho, Associate Engineer - Energy and Environment Section; Dr. Seng-Rung Wu, Group Leader - Combustion Technology; Kent C.T. Wu, Section Chief - Air Pollution Control; and H. J. Liu, Manager - Utility Department, China Steel Corporation.

TAIW-4. Descaling Technology Transfer -- Under this exchange Aqua-Flow, Inc. held meetings with Kailay Engineering, the largest environmental controls and mechanical company in Taiwan to discuss possible joint venture opportunities. Project dates: January 10 to 24, 1995.

1 EBE from U.S. to Taiwan:

Alden L. Coke, President, Aqua-Flow, Inc.

TAIW-5. Printing Industry Facility Assessments -- The Taiwan Industrial Development Bank has requested assistance from U.S. experts in assessing pollution prevention and waste minimization opportunities in the printing industry. Project dates: January 7 to 15, 1995.

2 EBEs from U.S. to Taiwan:

Jeffrey Adrian, Environmental Director, The John Roberts Company

Gary Jones, Manager Environmental Information Office, the Graphic Arts Technical Foundation

TAIW-6. NOx Control Technology Exchange -- The Chinese Petroleum Corporation (CPC) and the Industrial Technology Research Institute (ITRI) of Taiwan participated in the EBE program to identify appropriate technologies for meeting increasingly stringent NOx emission standards in Taiwan. While in the U.S., the delegation met with: Uncoal; Mobile; University of Utah's Combustion Laboratory; Reaction Engineering International; and Coen Company. Project dates: May 22 to 30, 1995.

4 EBEs from Taiwan to U.S.:

Dr. Hung-chung Shen, Industrial Materials Department; and Mr. Goa-shee Leu, Senior Engineer, Chinese Petroleum Corporation

Dr. Chien-chung Tsai, Combustion Technology Division; and Dr. Li-chaing Chen, Deputy Director, Industrial Research Institute

TAIW-7. Cement Industry Exchange -- WEC organized a technology demonstration exchange including representatives of the largest Taiwan cement manufacturing industries, officials from Taiwan EPA, and a leading advocate for emission standards. The group toured: Ash Grove Cement Facility; South Coast Air Quality Management District; and Calaveras Cement. Additional meetings were held with: PSM International; Nalco Fuel Tech.; U.S. Environmental Protection Agency; and the Global Environmental Fund. Project dates: May 6 to 15, 1995.

10 EBEs from Taiwan to U.S.:

Dr. Fu-tien Jeng, Professor, Graduate Institute of Environmental Engineering, National Taiwan University

Jen-ta Pan, Engineering Department, Taiwan Cement Corporation

Cheng-hsin Huang, Purchasing Manager, Universal

Cement Corporation

Shih-Song Ho, Chief, Environmental Department, Hsin Hsin Cement Corporation

Mon-lee Tan, Chief of Operations and Engineering, Asia Cement Corporation

Tsu-hsu Lai, Environmental Engineer, Industrial Pollution Control Corporation

Su-Jeen Gau, Section Chief, Industrial Development Bureau

Ching-Shi Yang, Director, Air Quality Bureau, Environmental Protection Administration

Kuang-ming Hsien, Manager, China Technical Consultants, Inc.

Yung-Tsai Yuan, Chief of Environmental Department, Chien Tai Cement Co., Ltd.

THAILAND

THAI-1. Demand-Side Management (DSM) Joint Venture -- At the request of USAID/Thailand, WEC facilitated the exchange of staff between RCG/Hagler Bailly and TEAM Consulting of Thailand. Through this program RCG/Hagler trained TEAM staff in DSM and evaluate the potential for forming a joint venture. Project dates: October 23 to 31, 1993 & April 7 to 14, 1994.

3 EBEs from U.S. to Thailand: Frank Stern, Senior Associate; Tig Tuntivate, Senior Associate; and Jean Clinton, Principal Consultant, RCG/Hagler, Bailly

2 EBEs from Thailand to U.S.: Suree Yantapanit, Deputy Managing Director, Padernm Chaiyasingh, Senior Electrical Engineer, TEAM Consultants

THAI-2. CHEMTREC Training -- Following a request from Thai Ministry of Science Technology and the Environment (MOSTE), and with the support of USAID/Thailand, WEC worked with the Chemical Manufacturer's Association to provide a CHEMTREC expert to evaluate Thai needs and the feasibility of installing a similar system for MOSTE, and make presentations on the workings of CHEMTREC. Project dates: October 21 to November 4, 1993.

1 EBE from U.S. to Thailand: Alma Howard (Retd.), Emergency Response Planning & Training, Chemical Manufacturer's Association

THAI-3. Study of Air Monitoring Network Needs -- EGAT was in the process of evaluating alternative systems for a national air quality monitoring network. Radian Corporation provided an expert to explore technical options with EGAT officials; traveling to Taiwan to observe the Taiwan EPA system, and evaluate the advantages and disadvantages of various monitoring configurations and software systems. Support for this mission was provided by WEC/Thailand. Project dates: June 16 to July 30, 1993.

1 EBE from U.S. to Thailand: Scott Jenkins, Senior Program Manager, Radian Corporation

THAI-4. Technology Evaluation of Electric Tuk-Tuks -- Pholasith Tuk-Tuk Company Ltd. of Bangkok expressed interest in developing electric tuk-tuks. WEC followed-up on the pairing (by R.J. Gurley of USAID/Thailand) of Pholasith Tuk-Tuk Company with the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT). A tuk-tuk and an extra engine and transmission were sent to AECT who performed the conversion and prepared a conversion kit for use in demonstrations in Bangkok. Project initiation: October 23 to 28, 1993 & February 19 to 25, 1994.

4 EBEs from U.S. to Thailand: David Porter, Manager - International Technology Transfer; and Ed Riddell, Program Manager - International Technology Transfer, EPRI

Richard Mayer, Vice President of Operations and Director of Engineering; and Chaz Haba, Chairman and CEO, AECT, Inc.

4 EBEs from Thailand to U.S.: Dr. Chulapongs Chullakesa, Governor, Provincial Electric Authority

Dr. Pansak Siriruchatapong, Deputy Governor, National Electronics and Computer Technology Center

Anan Supatarvich, Managing Director; and Ms. Theeraporn Manawakul, Assistant Managing Director, Pholasith Tuk Tuk Company

THAI-5. Thailand Reforestation Project -- USAID/Thailand funded the planting of 750,000 trees in Khao Yai National Park (the Royal Thai Government seeks to plant 500,000,000 trees to commemorate the 50th anniversary of His Majesty). In support of this effort, and seeking to bring U.S. expertise to bear, representatives of the Oregon Forest Resources Coalition (a confederation of private sector forestry and nursery companies, science, education, and government, interested in the sustainable development and management of forest resources) worked with the Royal Forestry Department for two weeks. The exchanges established a relationship between the Coalition and the Royal Thai Government and the Thai private sector. They also provided the coalition opportunities to identify and assess the potential for business opportunities, and provide the scientific data necessary for negotiating a carbon dioxide offset for a U.S. utility company. As a result of this exchange, officials from the RTG are visiting Oregon to pursue business opportunities. Project dates: September 12 to 24, 1993.

3 EBEs from U.S. to Thailand: Rick Herson, President, Oregon Woods, Inc.

Dr. Robin Rose, Associate Professor, Department of Forestry, Oregon State University

Jim Peters, International Training Coordinator, Office of International Research and Development, Oregon State University

(Jim Peters' EBE was leveraged by his ongoing efforts in Thailand, researching Thailand and Oregon's resource dependant communities).

THAI-6. COPEC Mission to Design Carbon Offset Projects -- COPEC met with the Thailand

Environmental Institute and the Royal Thai Forestry Department to explore and define carbon "offsets". This mission was designed to provide an entree for U.S. firms into Thai energy service and forestry management markets. Project dates: November 26 to December 9, 1993.

1 EBE from U.S. to Thailand: Marc Stuart, Senior Analyst, COPEC

THAI-7. Development of Thai Environment and Safety Certification Program -- The Thai Ministry of Industry and the Ministry of Science, Technology and Environment are interested in encouraging the development of private, commercial environmental and safety certification programs. Under this exchange the sharing of U.S. expertise in environment and safety was explored by HSB Professional Loss Control, with SEECCO, a Thai company. Project dates: October 27 to November 11, 1993.

1 EBE from U.S. to Thailand: James Dewey, P.E., Vice President, HSB Professional Loss Control

THAI-8. Development of Sustainable Linkages Between Thai Utilities and the U.S. Power Industry - The Electric Generating Authority of Thailand (EGAT) participated the Environmental Exchange program to hold discussions with the Electric Power Research Institute (EPRI) about becoming an affiliate member. This relationship between EGAT and EPRI would establish a long-term, self-sustaining linkage between the Thai utilities and the U.S. power industry. Project dates: February 19 to 25, 1994.

5 EBEs from Thailand to U.S.: Somvonk Poshyananda, Deputy Director General; Siriwadh Sribhibhach, Assistant General Manager; and Duandas Srisomwong, Assistant Director - R&D, EGAT

Wannawit Thanwanich, Deputy Governor; and Kasem Imkasorn, Director of Research and Development, Municipal Electric Authority

THAI-9. Collaboration between Federation of Thai Industries (FTI) and the Industrial Environmental Organization (IEA) -- The FTI invited the IEA to explore long-term, sustainable linkages between U.S. and Thai industrial organizations. The participants from IEA addressed two issues: formalizing the relationship between FTI and IEA; and initiating planning for the Industrial Environmental Conference and Exposition. Project dates: February 14 to 17, 1994.

4 EBEs from U.S. to Thailand: Larry Aker, President, Pacific Treatment de Mexico

Jack Flynn, Conference Director; and Marlene Flynn, Program Director, IEA

Bill Snyder, Executive Director, Oregon Environmental Technology Association

THAI-10. Urban Air Quality Monitoring Systems-- The Anti-Air Pollution Association and the Chulabhorn Research Institute's Center for Urban Environment invited several representatives from BG Technologies to discuss and demonstrate technologies to obtain real time data for use in traffic control. The two representatives obtained air quality data using a portable, multi-parameter system. They also met with several government and industry officials including: Industrial Estate Authority of Thailand, Board of Investment; the Federation of Thai Industries; and the Industrial Works Department. They also meet with Thai companies to identify a suitable Thai partner to work with in future operations in the country. Project dates: February 15 to March 5, 1994.

2 EBEs from U.S. to Thailand: Dr. Anders F. Jepsen, President; and Edward Wetherell, Project Engineer, BG Technologies

THAI-11. The Eastern Water Resources Development and Management Company, Ltd -- Eastern Water was established by the Provincial Waterworks Authority (PWA) and charged with the management of scarce water resources on the Eastern Seaboard. This U.S. tour provided these individuals with exposure to water supply and distribution equipment, GIS, metering, and meter reading equipment; institutions with expertise in sound water resources management, pricing policies, and water reclamation and conservation. A second leg of the exchange would provide for two representatives of U.S. companies to visit Thailand to provide follow-up assistance. Project dates: April 13 to 21, 1994 & April 29 to May 15, 1995.

4 EBEs from Thailand to U.S.: Dr. Wanchai Ghooprasert, President and CEO; Wanchai Lawatanatrakul, Vice President; Phirawat Buasap, Vice President; Pairoj Sattayasansakul, Senior Engineer, The Eastern Water Resources Development and Management Company, Ltd

1 EBEs to U.S. from Thailand: Dr. Wanchai Ghooprasert, President and CEO, The Eastern Water Resources Development and Management Company, Ltd

THAI-12. Orlando, Florida/Songkhla, Thailand, Twinning Exchange -- RHUDO, USAID/Thailand requested US-AEP support for developing a twinning relationship between the cities of Orlando, Florida, and Songkhla, Thailand. Under this exchange public works officials from the two cities discussed common problems and shared possible solutions. The twinning was conducted in two phases. Project dates: August 9 to 19, 1994 & October 3 to 15, 1994.

4 EBEs from U.S. to Thailand: Octavio Serrano, Director of Solid Waste; and David Metzker, Director of Public Works, City of Orlando, Florida

Claude Swindell, Vice President, Ecotech Consultants, Inc.

Richard Oldham, City Attorney

7 EBEs from Thailand to U.S.: Prachopti Agouru, Mayor, Wilai Saisuntorn, City Manager; Vira Intarakul, Director of Sanitary Engineering; Banjit Panrangsie, Chief of Solid Waste Collection; Boonsanguan Vilairatana, Director of Finance; Amornluck Intasay, Chief of Public Relations; and Sukhon Lapitison, Director of Health and the Environment.

4 exchangees sponsored by the City of Songkhla

THAI-13. Pacific Adobe Technology Transfer Exchange -- Pacific Adobe, a leader in the earth building industry, manufactures a variety of earth press machines suitable for transportation to rural and remote areas. The company has a demonstration development established in Chiang Mai, Thailand. Under this exchange Pacific Adobe met with Mahaphant Fibre-Cement Co., a Thai consortium that is a likely distributor, and Sahakol, a consortium that is interested in manufacturing the equipment in Thailand. Project dates: July 5 to August 10, 1994.

2 EBEs from U.S. to Thailand: Forest Sprague, President, Pacific Adobe, Inc.

Joe Simpson, President/Wwner, TECFAR Manufacturing

THAI-14. Chiang Mai Solid Waste Management Exchange -- McGill Environmental Systems (MES) has been studying solid waste management problems in Chiang Mai, and have proposed solid waste management support services, including the construction of a transfer station that would include composting and sorting facilities. McGill S&P International, a U.S.-Thai partnership, has been formed to construct and operate the transfer station should the project be successful. Under this exchange McGill completed engineering and budgeting activities, and continued negotiations with Chiang Mai officials. Project dates: September 17 to 26, 1994.

2 EBEs from U.S. to Thailand: James McGill, President; and M. Noel Lyons, Vice President & General Manager, McGill Environmental Systems

THAI-15. Thailand Department of Teacher Education Exchange -- The DTE is in the process of setting up 13 new environmental science centers, each of which will have a modern environmental chemistry laboratory. Under this exchange representatives of the DTE visited U.S. manufacturers of laboratory instruments and universities to help develop specifications for the needed purchases. Project dates: September 28 to October 11, 1994.

7 EBEs from Thailand to U.S. Sutep Pongsriwat, President, Chiangrai Teachers College, Assistant Professor of Biology

Dr. Saroj Theerailb, Assistant Professor of Chemistry, Ayudhaya Teachers College

Praluab Sooksomsoon, Assistant Professor of Chemistry, Loei Teachers College

Visharn Kongtawong, Associate Professor of Physics and Electronics, Piboonsongkram Teachers College

Neet Julabat, Instructor of Physics and Electronics, Petchaburi Teachers College

Boonsong Sapvethakarnkit, Instructor of Biology, Buriram Teachers College

Puangnoi Tavornyutitam, Finance Officer, DTE

THAI-16. Pattana Group Review of U.S. Environmental Technologies -- Under this exchange the Pattana Group, a Thai environmental engineering company, visited environmental companies in the Portland, Oregon area to review oil recycling technologies. A second phase of the exchange took representatives of Cascade Earth Sciences, Hydrokinetics Systems, and Northstar Environmental to Thailand to pursue specific project opportunities. Project dates: October 8 to 25, 1994; December 8 to 22, 1994; & May 12 to June 2, 1995.

2 EBEs from Thailand to U.S.: Dr. Hansa Sanguanoi; and Dr. Payow Boonprakob, Pattana Group

2 EBEs from U.S. to Thailand: Terry Rahe, President, Cascade Earth Systems; and Jack Mahoney, Vice President, Northstar Environmental

2 EBEs from U.S. to Thailand: Bill Snyder, Executive Director, Oregon Environmental Technology Association

Joe McDonnell, President, Beta Control Systems

THAI-17. MACRO Sanitary Landfill Design Exchange -- MACRO is a small Thai engineering design firm that has been recognized for their solid waste management expertise. The company wants to work with Public Works Department (PWD) officials in incorporating environmentally sound criteria for Thailand's municipal/solid waste treatment and disposal. Under this exchange MACRO met with: SCS Engineers; CH2M Hill; and Post, Buckley, Schuh & Jernigan to assess their interest and capabilities in assisting in the development of the Prachathisat Sanitary District municipal landfill and, based on this collaboration, pursue a strategic alliance. Project dates: November 25 to December 8, 1994.

5 EBEs from Thailand to U.S.: Supote Lohwacharin, Managing Director; Sompong Burintrathikul, Chief-Environmental Engineering Section; and Wilairat Saifon, Senior Environmental Engineer, MACRO

Pranee Limtheansa, Environmental Engineer; and Tammanoon Nuntasomboon, Environmental Engineer, PWD

THAI-18. Hotel Energy Audit Exchange -- Under this exchange Saangsan Consultants Ltd., Thailand met with Dorgan Associates, Inc. of Madison, Wisconsin to share U.S. expertise in energy auditing procedures, the use of energy efficient technologies and storage systems, and other methods for reducing energy consumption. Potential projects have been identified in the hotel industry. Project dates: January 23 to February 4, 1995.

5 EBEs from Thailand to U.S.: Monthon Kumpengsath, Managing Director; and Thosaporn Predapun, Energy Audit Program Manager, Saangsan Consultants, Inc.

Dr. Chiraphol Sintunawa, Director, Association for Development of Environmental Quality

Jumpoon Chavasiri, Director of Human Resources Management, Dusit Thani Group

Sawang Phoompong, Executive Assistant Manager, Royal Orchid Sheraton

THAI-19. Financing Urban Environmental Infrastructure -- The International Law Institute is holding a conference in Bangkok on Financing Urban Environmental Infrastructure. The conference is designed to bring together U.S. firms with Thai municipal authorities, ministry officials, law firms, and commercial banks to explore the benefits of private sector financing. Project dates: February 25 to March 2, 1995.

4 EBEs from U.S. to Thailand: Howard Fry, Attorney, Blank, Rome, Comisky and McCauley

Dr. Ghon Rhee, Pacific-Basin Capital Markets Research Center, University of Rhode Island

Rebecca Merrell, International Law Institute

Michael Curley, Attorney

THAI-20. Electric Vehicle Exchange -- U.S. Electricar, Inc. is participating in the exchange program to hold meetings with the CEO Club of Thailand aimed at forming a joint venture. The company will also be exhibiting a bus, scooter, and industrial vehicles at the Board of Investment Fair. Project dates: February 14 to 22, 1995.

2 EBEs from U.S. to Thailand: Carl Perry, President; and Paul Kohlman, Field Engineer, Electrical Systems, U.S. Electricar.

MULTIPLE COUNTRY EXCHANGES

MULT-1. Medical Waste Technology Assessment -- Business representatives from Indonesia and Thailand expressed interest in EBEs that address U.S. medical waste treatment technologies. WEC is conducting a 13 person exchange program for industry, hospital and government officials from each of these countries. The exchange included visits to facilities that employ and manufacture: medical waste incinerators; autoclaves; radiation equipment; and sharps containers. Project dates: August 23 to September 2, 1994.

9 EBEs from Indonesia to U.S.: Dr. H. Ahmad Sanoesi Tambunan, Director, Rumah Sakit Islam, Jakarta

Dr. Noegroho Hadi Poerwowidago, Director, Rumah Sakit Bethesda, Jogjakarta

Dr. Junawati Gunawan, Director, Sakit Mitra Keluarga, Bekasi

Dr. Hadjat Santosa Digdowirogo, Deputy Director, Rumah Sakit Harapan Kita

Dr. Sofyan Mukti, Head, Directorate of Environmental Sanitation, Department of Health, Republic of Indonesia

Dr. Rajimun Muslihudin, Senior Staff, Directorate of Toxic and Hazardous Waste, Environmental Impact Management Agency (BAPEDAL)

Albertus Arief Jusni, Assistant Project Manager, Lippo Village Hospital

Hartono Mangunsentana, President Director, PT Harimas Pratama

Dr. Sismadi Partodimulyo, Director, Sismadi Group

4 EBEs from Thailand to U.S.: Akdej Homsesthi, Director of Garbage Disposal Division, Department of Public Cleansing, Bangkok Metropolitan Administration

Nitaya Mahabhol, Extra-Ordinary Specialist in Public Health Engineering, Ministry of Public Health

Dr. Anant Kiatfuengfoo, Managing Director, Thai Board of Orthopedics, Samrong Hospital, Samutprakarn

Wirote Watcharakiatisk, Head, Environmental Engineering Section, Department of Environmental Health, Ministry of Public Health

* Sponsored by Waste Management International

MULT-2. Industry/NGO Linking Exchange -- Environmental Careers Organization (ECO) is a Boston-based NGO which provides NGOs with sufficient technical expertise to work with the private sector and government agencies to promote pollution prevention and toxics use reduction. Under this exchange ECO met with NGOs in Asia to determine the level of interest in setting up parallel organizations that might build linkages between the NGO and industrial communities. Countries visited under this exchange included India, Taiwan, Hong Kong, and the Philippines. Project dates: November 29 to December 20, 1994.

2 EBEs from U.S. to Asia: Diane Mailey, Program Manager; and Tim Greiner, Technical Specialist, ECO

MULT-3. CITES Tour with U.S. Fish and Wild Life Service (USFWS) -- Nominees from the governments of the Philippines, Bangladesh, India, Indonesia, and Nepal participated in a U.S. Fish and Wildlife Service tour of customs facilities and procedures employed in Los Angeles and San Francisco, and visited the USFWS forensics laboratory in Ashland, Oregon. Project dates: January 28 to February 4, 1995.

2 EBEs from Indonesia to U.S.: Ir. Dwiatmo Siswomartono, Director of Nature Reserve Management and Flora Fauna Conservation

Drs. I.G.N.N. Sutedja, Head of Species Traffic Section

2 EBEs from Bangladesh to U.S.: Syed Salamat Ali, Deputy Chief Conservator of Forests; and A.H.M. Monzurul Karim, Conservator of Forests

2 EBEs from Philippines to U.S.: Wilburt Dee, IPAS Director and Concurrent Officer-in-Charge, Wildlife Resources Division, PAWS Chairman, Inter-Agency Wildlife Management Committee

Mary Jean Caleda, Officer-in-Charge Wildlife Resources Division, Vice Chairman, InterAgency Wildlife Management Committee, DENR Ninoy Aquino International Airport Wildlife Monitoring Team

2 EBEs from Nepal to U.S.: Hum Prasad Adhikari; and Thir Bahadur, G.C., National Parks and Wildlife Conservation

2 EBEs from India to U.S.: S.K. Das, Deputy Director of Wildlife Preservation, Eastern Zone, Calcutta; and Surindra Kumar, Deputy Director of Wildlife Preservation, Northern Region Delhi.

MULT-4. Conservation Program Exchange -- In cooperation with the Smithsonian Institution, US-AEP is undertaking this exchange to conduct an initial survey to identify American and Asian areas and institutions, their capabilities, needs, and expressions of interest to participate in a Conservation Exchange Program (CEP). The survey is focusing on national parks, zoos, aquariums, botanical gardens, natural history museums, and other appropriate areas to identify opportunities for "US to Asia" and "Asia to US" exchanges of fellowships, research, education, outreach and awareness programs, and training in fund raising efforts. Project dates: January 29 to March 31, 1995.

1 EBE from U.S. to Thailand/
Malaysia/Indonesia/Philippines

Dr. Michael Stuewe, Consultant

MUTLI-5. GEMI CONFERENCE -- The Global Management Initiative (GEMI) is an organization dedicated to promoting environmental excellence by the business community. Six individuals attended the GEMI annual conference under the US-AEP's Environmental Business Exchange program. During the conference, the US-AEP exchangees participated in a Total Quality Environmental Management (TQEM) workshop and sat in on many panel discussions and presentations by corporate environmental officials. The participants gained valuable insight as to how the U.S. business community handles environmental issues. Project dates: March 20 to 25, 1995.

1 EBE from Singapore to U.S.

Jarayam Menon, Director - Manufacturing Services,
Singapore Manufacturer's Association

1 EBE from Indonesia to U.S.

Ismid Hadad, President and Director, Resource
Development Consultants

1 EBE from Malaysia to U.S.

Wong Soo Kan, Safety and Quality Audit Manager,
Malaysian Oxygen Bhd.

1 EBE from the Philippines to U.S.

Arnold P. Salvador, Executive Director, Management
Association of the Philippines

MULT-6. Total Quality Environmental Management Exchange -- The Gauntlett Group, Inc. participated in the EBE program to assess the receptiveness of Asian industry for training in TQEM methods. Under this exchange they focused on Asian suppliers of a U.S. multinational company. The participants met with representatives of DHE-Demag in Singapore, Petroleam Nasional Bearhad in Kuala Lumpur, Malaysia and in Seoul, Korea, Dow Chemical, Samsung, Daewoo Electronics, and Daewoo Car Manufacturers. Project dates: May 5 to 31, 1995.

2 EBEs from U.S. to Korea,
Singapore and Malaysia:

Suwanna Gauntlett, President, Gauntlett Group, Inc.

Norman Eader, Vice President, Office of Public Affairs,
Oregon Graduate Institute of Science and Technology.

MULT-7 (INDI-18). Electric Vehicle Exchange -- Chaz Haba of Planet Electric visited India to pursue a joint venture with Bajaj Auto to produce electric vehicles. While in India, Mr. Haba also met with representatives of Ashok Leyland, a major Indian automotive manufacturer interested in developing electric vehicles. In addition to the meetings in India, Mr. Haba visited Bangkok, Thailand to provide a demonstration of electric vehicle technology to a delegation of the U.S.-Asia Environmental Partnership (US-AEP). Mr. Haba met with local Thai officials to promote the use of electric vehicle technology in Bangkok. Project dates: July 8 to 19, 1995.

1 EBE from U.S. to India:

Chaz Haba, President & CEO, Planet Electric, Inc.

Appendix B

**List of Trip Reports Prepared Under the US-AEP Cooperative Agreement,
November 1, 1995**

**World Environment Center / U.S.-Asia Environmental Partnership****Environmental Business Exchange (EBE) Trip Reports****November 1995**

Trip Reports as per Cooperative Agreement (CA) AEP-0015-A-00-2055-00 in Support of the U.S.-Asia Environmental Partnership

EBE ID# EBE DATES TITLE OF TRIP REPORT**BANGLADESH**

BANG-1	9/26 - 10/7/94	Identification of Opportunities Incorporating Economic Incentives into Proposed Environmental Legislation for the People's Republic of Bangladesh
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HONG KONG

HONG-1	10/23 - 11/9/94	Coleman Energy and Environmental Systems Technology Transfer
HONG-2	12/4 - 7/94	China Light & Power Electric Vehicle Exchange
HONG-3	12/12 - 16/94	Hong Kong Productivity Council Electroplating Wastewater Recycling Tour No Report Necessary
HONG-4	3/13 - 17/95	Hong Kong Landfill Restoration Projects
HONG-5	5/18 - 26/95	Bleaching and Dyeing Clean Technology Exchange

INDIA

INDI-1a	10/2 - 21/93	Evaluation of Incinerator Technology
INDI-1b	10/8 - 19/93	Diesel Emissions Control Technology

INDI-1c	10/5 - 2/93	Air Filter Technology Evaluation
INDI-1d	4/8 - 17/94	Diesel Fuel Conditioner Demonstration
INDI-1e	1/2 - 14/94	Auto Exhaust Emissions Control Demonstration Technology
INDI-1f	11/6 - 21/93	No Report
INDI-1g	11/6 - 21/93	Demonstration of Real-Time Toxic Emissions Monitoring Systems
INDI-1h	11/7 - 23/93	Technology Transfer: Fluidized Bed Chemical Recovery for Paper Mill Black Liquor
INDI-1i	11/7 - 23/93	Oil Absorbent Demonstration
INDI-1j	12/7 - 16/93	Industrial Wastewater Treatment Technology Assessment Exchange
INDI-1k	12/6 - 29/93	Review of Incinerator Operations, Indian Thermal and Cyano Clean
INDI-1l	1/17 - 2/23/94	Corporate Environmental Mission (IT Corporation Exchange)
INDI-1m	1/15 - 2/9/94	Shriram Industrial Enterprise Ltd. (SIEL) Environmental Management and Safety Systems Survey
INDI-1n	2/12 - 3/5-94	Evaluation of U.S. Waste Management and Efficient Control Technologies
INDI-1o	3/27 - 4/9/94	Corporate Environmental Program
INDI-1p (1&2)	5/26 - 6/3/94 7/2 - 8/2/94	Clean Technology for Paper Mills - Esvin Tech - Parts 1&2
INDI-1q	6/18 - 7/1/94	Indian Boilers Manufacturers' Association Trade Mission
INDI-1r	6/18 - 30/94	Evaluation of Biological Formulations for Industrial Wastestreams Treatment (Premier Ziba)

INDI-1s	10/2 - 19/94	Technology Transfer Exchange
INDI-1t	4/30 - 5/15/95	Catalytic Converter Exchange
INDI-1u	5/9 - 26/95	Filter Exchange
INDI-1v	5/1 - 15/95	Vimta Labs, Ltd. Environmental Testing Exchange
INDI-2	4/23 - 5/6/94	Review of Pollution Prevention Control Technology in the Textile Industry
INDI-3 (Same as NEPA-1)	5/8-6/9/94	MEIP - URBAIR
INDI-4	3/11 - 30/94	Evaluation of CS ₂ Recovery in Rayon Mills
INDI-5	4/30 - 5/10/94	Clean Coal Technology Evaluation
INDI-6	7/7 - 8/10/94	Assessment of Solar Photovoltaic Technology
INDI-7	2/4 - 26/95	Wastewater Treatment and Waste Management Technology Assessment
INDI-8	11/8 - 20/94	Biomass Gasification Exchange
INDI-9	8/21 - 9/6/94	Coal Ash Utilization Assessment
INDI-10	10/9 - 23/94	Coal Washery Exchange
INDI-11	11/11 - 23/94	Evaluation of Oil Refining and Recycling Technologies
INDI-12	12/5 - 10/94	International Cooperative for Ozone Layer Protection (ICOLP) Technology Cooperation Exchange
INDI-13	12/2 - 17/94	India Bagasse-Based Cogeneration Exchange
INDI-14	12/19 - 22/94	Remote Environmental Monitoring Exchange

INDI-15	2/9 - 21/95	Indian ESCO Exchange: Exploration of Energy Efficiency Performance Contracting Joint Venture Opportunities in India
INDI-16	2/10 - 23/95	Development of Demand-Side Management and Energy Efficiency Program at Ahmedabad Electricity Company
INDI-17	2/6 - 20/95	Ovonic Battery Company/Energy Conversion Devices Inc. Environmental Business Exchange
INDI-18	7/8 - 19/95 (Same as MULT-7)	Electric Vehicle Exchange
INDI-19	4/23 - 5/3/95	Delegation to Waste Expo '95
INDI-20	3/23 - 4/8/95	Energy Efficiency Services Exchange
INDI-21	5/14 - 6/3/95	Industrial Boilers Limited Exchange
INDI-22	5/22 - 31/95	Photovoltaic Technology

INDONESIA

INDO-1	2/13-19/93	Megacities on the Pacific Rim and the Burden of Air Pollution
INDO-2	7/24 - 8/4/93 (Same as PHIL-2)	MEIP - URBAIR
INDO-3	10/24 - 11/5/93	Pulp and Paper Study Tour
INDO-4	12/6 - 16/93	Metal Finishing Tour
INDO-5	11/9 - 20/93	Factory Assessments at Seven Textile Industries in the Jakarta Area
INDO-6	4/16 - 30/94	Environmental Management of Industrial Estates
INDO-7	5/4 - 11/94	Sharing of GIS and Remote Sensing Expertise

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INDO-8	9/18 - 28/94	Facility Waste Minimization Assessment and Efficiency Assessment for the Indonesian Plywood Industry
INDO-9	10/11 - 20/94	Technology Assessment for Infrastructure Projects
INDO-10	1/31 - 2/2/95	U.S./Indonesia Joint Oil Spill Response Workshop
INDO-12	4/10 - 5/12/95	Ecotourism Exchange
INDO-13	6/25 - 7/1/95	Oil Spill Response Vessel Exchange
KOREA		
KORE-1	12/9 - 22/93	Fuel Gas Desulfurization Technology Assessment (KEPCO)
KORE-2	11/22 - 12/4/93	Review of Mercury Recovery and Hazardous Waste Treatment Technology
KORE-3	6/13 - 24/94 10/18 - 25/94	Assessment of U.S. Water Treatment Technology
KORE-4	9/24 - 30/94	Waste to Energy Incinerator Technology Exchange
KORE-5	10/8 - 19/94	Wastewater and Solid Waste Management Assessment
KORE-6	11/19 - 26/94	Packaging Resin and Nylon Recycling Technology Transfer
KORE-7	4/22 - 5/8/95	Solid Waste Management Technology Exchange
KORE-8	2/25 - 3/9/95	Air Pollution Alert Systems Exchange

MALAYSIA

MALA-1	9/6 - 7/93	The South East Asian Iron and Steel Institute (SEASI) Electric Arc Furnace Dust and Slag Treatment Workshop (2 Volumes)
MALA-2	4/22 - 28/94	Environmental Impact Assessment Technology Transfer to the Malaysia Offshore Oil and Gas Sector
MALA-3	4/22 - 28/94	Environmental Impact Assessment Technology Transfer to the Malaysia Offshore Oil and Gas Sector

NEPAL

NEPA-1	11/27 - 12/9/93 (Same as INDI-3)	Metropolitan Environmental Improvement Programme (MEIP) - URBAIR
NEPA-2	11/28 - 12/9/93	Electric Vehicle Technology Transfer

PHILIPPINES

PHIL-1	3/19 - 27/93	Philippine Business for the Environment Conference
PHIL-2	7/24 - 8/9/93 (Same as INDO-2)	MEIP - URBAIR
PHIL-3	9/30 - 10/9/93	Philippine Business for the Environment Conference
PHIL-4	10/28 - 11/11/93	Philippine Investment-Management Consultants, Inc. (PHINMA) Technology Assessment Mission: Cement and Paper Pulp Exchange
PHIL-5	4/23 - 5/7/93	Integrated System Approach
PHIL-6	12/14 - 18/93	Technology Assessment Program: Smokey Mountain Project
PHIL-7	5/26 - 6/1/94	No Report

PHIL-8	9/27 - 10/6/94	Technical Assistance on H ₂ S Gas Abatement Systems (PNOC)
PHIL-9	10/2 - 13/94	Waste-To-Energy Technology Evaluation
PHIL-10	11/26 - 12/13/94	Pharmaceutical Incineration Exchange
PHIL-11	3/26 - 4/13/95	Air Monitoring Technology Exchange
PHIL-12	4/2 - 26/95	Iron and Steel Industry Exchange

SINGAPORE

SING-1	8/12 - 20/94	Pacific Vinitex Evaluation of Wastewater Treatment Technology
SING-2	1/16 - 21/95	Technology Transfer for Chemical Incineration and Waste Oil Recycling

SRI LANKA

SRIL-1	10/8 - 24/93	Sri Lanka - Minnesota Scoping Mission on Institution Building for Waste Minimization
SRIL-2A	10/11 - 20/93	Leather Tanning Factory Assessment
SRIL-2B	11/7 - 11/93	Paints and Coatings Industry Factory Assessment Report
SRIL-3	11/4 - 20/94	Plastics Recycling Technology Assessment
SRIL-4A	2/18 - 3/4/95	Evaluation of Waste Minimization Opportunities at Five Industrial Facilities in the Moratuwa-Ratmalana Region of Sri Lanka
SRIL-4B	2/25 - 3/11/95	Strategies for the Promotion and Sustainability of the U.S. Agency for International Development's Waste Minimization Program in Sri Lanka
SRIL-5 (& THAI-19)	2/27 - 28/95	Financing Urban Environmental Infrastructure

TAIWAN

TAIW-1	4/5 - 9/94	Enviroscience, Inc. (ESI) Electric Arc Furnace Dust Recycling Technology Assessment
TAIW-2	7/6 - 19/94	Taiwan Environmental Protection Agency Review of U.S. Expertise in Wastewater and Harbor Management
TAIW-3A	11/26 - 12/12/94	Evaluation of Emission Control Technologies
TAIW-3B	12/31/94 - 1/10/95	Evaluation of Emissions Control Technologies
TAIW-4	1/10 - 16/95	Descaling Technology Transfer Exchange
TAIW-5	1/9 - 17/95	Printing Industry Facility Assessments
TAIW-6	5/22 - 30/95	NOx Control Technology Exchange
TAIW-7	5/6 - 16/95	Taiwan Cement Industry NOx Reduction Demonstration Mission

THAILAND

THAI-1A	10/23 - 31/93	Demand Side Management Joint Venture
THAI-1B	4/11 - 15/94	Electrical Demand Side Management in Thailand, Phase Two
THAI-2	10/21 - 11/4/93	CHEMTREC Training
THAI-3	6/16 - 7/30/93	Study of Air Monitoring Network Needs
THAI-4A	10/23 - 28/93	Technology Evaluation of Electric Tuk-Tuks
THAI-5	9/9 - 21/93	Thailand Reforestation Project
THAI-6	11/26 - 12/9/93	COPEC Mission to Design Carbon Offset Projects
THAI-7	10/27 - 11/11/93	Development of Thai Environment and Safety Certification Program - Fire Safety Review

THAI-8	2/19 - 25/94	No Report
THAI-9	2/14 - 17/94	Collaboration Between Federation of Thai Industries and the Industrial Environmental Organization
THAI-10	2/15 - 3/5/94	Urban Air Quality Monitoring Systems
THAI-11A	4/13 - 21/94	The Eastern Water Resources Development and Management Company, Ltd.
THAI-11B	4/29 - 5/14/95	The Eastern Water Resources Development and Management Company, Ltd.
THAI-12A (& THAI-12B)	8/9 - 19/94 10/3 - 14/94	Orlando, Florida/Songkhla, Thailand Twinning Exchange
THAI-13	7/16 - 8/9/94	Pacific Adobe, Inc. Technology Transfer Exchange
THAI-14	9/18 - 24/94	McGill Environmental Systems, Inc., Chiang Mai Solid Waste Management
THAI-15	9/28 - 10/11/94	No Report
THAI-16A	10/10 - 24/94	Pattana Group Company Limited Review of U.S. Environmental Technology, Part One
THAI-16B	12/8 - 22/94	Pattana Group Company Limited/Oregon Pacific Group Environmental Technologies Exchange, Part Two
THAI-16C	5/12 - 6/2/95	Oregon Pacific Group Technology Assessment
THAI-17	11/26 - 12/9/94	MACRO Sanitary Landfill Design Exchange
THAI-18	1/23 - 2/4/95	Hotel Energy Audit Exchange
THAI-19 (& SRIL-5)	2/27 - 28/95	Financing Urban Environmental Infrastructure
THAI-20	2/14 - 26/95	Electric Vehicle Exchange

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MULTIPLE COUNTRY EXCHANGES

MULT-1	8/23 - 9/2/94	Medical Waste Technology Assessment
MULT-2	11/29 - 12/21/94	Industry/NGO Linking Exchange
MULT-3	1/28 - 2/4/95	CITES Tour with U.S. Fish and Wild Life Service (USFWS)
MULT-4	1/29 - 3/15/95	Conservation Exchange Program Survey
MULT-5	3/20 - 25/95	Global Environment Management Initiative (GEMI) Conference
MULT-6	5/5 - 31/95	Environmental Study of Singapore, Malaysia and Korea
MULT - 7	7/8 - 7/19/95 (Same as INDI-18)	Electric Vehicle Exchange

Follow-up Projects with Trip Reports incorporated into the first phase:

THAI - 4B1	Electric Vehicles
THAI - 4B2	Electric Vehicles
INDI - 1p2	Esvin
THAI - 12B	Songkla/Orlando
KORE - 3B	CH2M Hill (Pusan City)

Appendix C

Bi-weekly and Quarterly Reports

MEMO

TO: US-AEP Secretariat
From: World Environment Center
Re: Biweekly Report (January 1 - January 15, 1993)
Date: January 21, 1993

1.0 CURRENT ACTIVITY STATUS

General

Tony Marcil, Larry Lai and Natalie Kraft of WEC attended the U.S.- AEP partnership cooperative agreement signing ceremony on Friday, January 15th.

Discussions were held with Susan Ware of NOAA regarding their interests in the Pacific Islands and the potential for a U.S.- AEP role. Ms. Ware has previously indicated an interest in exploring WEC assistance in solid waste management issues in the Pacific. Ms. Ware indicated that she will be meeting with her staff to formulate ideas/projects.

While in Thailand, Will Knowland and Nancy Benioff were briefed by the Mission Director, Tom Reese and RHUDO staff about their plans for environmental management twinning arrangements with U.S. and Thai municipalities. WEC staff provided a briefing on our discussions with the State of Minnesota, and agreed to follow-up with the International City Management Association. The meeting also resulted in a confirmation of interest on the part of the Ministry of Science, Technology and Environment, Permanent Secretary Kasem Snidvongs and his Minister to visit Florida in April.

While in Indonesia, Will Knowland and Nancy Benioff met with a RHUDO Team from Research Triangle Institute working on design of a U.S.-AEP HG - supported environmental infrastructure loans in Indonesia and Philippines. Discussions will continue regarding potential TA for training activities to compliment their U.S. - AEP funded program.

Subproject activities:

- **National/Local Responsible Care and Corporate Environmental Initiative Programs**

- Made follow-up telephone calls to CMA to identify appropriate documents for distribution at AEP workshops or other events.

Philippines -- Confirmed David Chittick, Vice President, Engineering, AT&T to be the U.S. speaker and participant in the Conference-Workshop on Corporate Policies and Programs, co-sponsored with the Philippines Business for the Environment in Manila, March 22-23.

- **Industrial Environmental Auditing**

India -- Spoke with Sharmila Ribeiro of ATI regarding the status of a potential textile industry pollution prevention audit in Jodhpur. She is of the mind that a combination audit/workshop format would be the most useful. ATI staff have just returned from India and a meeting is planned to finalize the structure of the project, suggest dates, and identify an appropriate volunteer.

Exchanged faxes with Dr. U N. Bhraney of Bhilai Engineering Corporation (BEC). Dr. Bhraney is seeking assistance to reduce emissions from the BEC steel mill, and ideas for reuse/processing of fruit wastes.

Sri Lanka -- Continued attempts to follow-up with Coopers Lybrand to determine the status of the environmental audit at the tire manufacturing facility.

Discussed, with Greg Votaw, the possibility of coordinating AEP activities with the World Bank's MEIP. Met with Steven Stern, Communications Consultant to MEIP, at the Partnership Signing ceremony. MEIP and U.S.-AEP activities were discussed and commitments made to explore opportunities to cooperate within the next few weeks.

Nepal -- Met with Tobey Pierce, and Holly Welles of USAID, Asia Bureau, and Melissa Dann, US-AEP Secretariat, to discuss potential projects in Nepal. Decision made to investigate possible projects with AID/Nepal, focusing on low resource projects that would have short-term benefits. Spoke with Sher Plunkett AID/Nepal regarding US-AEP interest and exchanged faxes. Plunkett will consult with his staff for potential project ideas.

Singapore -- Communications initiated with Robert Kwan, Chairman, National Council on the Environment, Singapore.

Indonesia -- Briefed with Embassy Science Counsellor and Foreign Commercial staff on WEC and US-AEP activities; they both noted their highly favorable impression of WEC's recent waste minimization audits in the paper industry and encouraged WEC to do more.

- **Industrial Disaster Preparedness Strategies**

A. Kernburn

- **Electric Power Demand Side Management Strategies**

- Attended a meeting of the U.S. Working Group on Global Energy Efficiency at the International Institute for Energy Conservation

*- Terry O'Brien with Governor's office Philippines for Terry @ IIEC
'Del. pres', 'contacted' Shari of Limalaya at IIEC - possible contact*

- **National Environmental Action Plans/National Environmental Funds**

*in a part
WEC / B...
organization*

Thailand -- Met with the Permanent Secretary of the Ministry of Science Technology and the Environment, and senior staff of the Office of Environmental Policy and Planning to discuss the current status of, and delays in their master plan (now that 1993 annual planning has been completed it appears that they may be moving ahead).

- **Management and Implementation of Environmental Assessments**

- David Green's interested in hosting 2-3 fellows

- **Offices of Technical Assistance (OTA)**

Thailand, Indonesia -- Briefed USAID and government environmental department s regarding potential work for the OTAs; confirmed arrangements for North Carolina OTA staff person to work with Asian Development Bank industry waste minimization team in Thailand at the end of January.

- M. Muli

- **Constructed Wetland Wastewater Treatment Technologies**

India -- Discussions with Ted McDonald of US EPA's Office of International Activities (OIA) revealed concerns regarding the constructed wetlands project proposed by US EPA employee Subijoy Dutta, P.E. WEC is cooperating with OIA in their efforts to ensure that proper agency clearances are received. Subsequent conversations with Mr. Dutta have indicated that the New Delhi Water Board will be approached within the next week to be the official lead for the project, and that they would request technical assistance from WEC under the US-AEP. Dutta foresaw no problems in this transition.

*Summary of EPA
'Biodiversity
Action'*

Thailand -- Currently awaiting detailed status and financial report from Bicentennial Volunteers Inc., regarding status of current wetlands projects.

*Talked to
...*

6

- **Certified Laboratory Systems**

- Spoke with Fred Grunder, CIH, of the American Institute of Industrial Hygienists. Fred was very receptive to the idea of expanding the number of certified industrial hygiene laboratories in Asia. He indicated that AHIA had certified a few laboratories overseas (only 2 or 3 in Asia) and that there is a need to expand the program. Information on WEC, U.S.-AEP and possible ideas for certification projects have been provided to Grunder for review and possible consideration by appropriate AIHA committees.

Thailand -- Obtained an endorsement of the Office of Environmental Policy and Planning for initiating certified laboratory related work in Thailand.

- **Regional Environmental Forum: Mega-cities on the Pacific Rim**

(- Continued preparations for the Jakarta Mega-cities conference on air pollution.

1.1 SUCCESSES

A total of seven exchanges have occurred under the cooperative agreement to date. This number is expected to increase significantly as sub-projects are initiated.

The final member of WEC's Washington U.S.-AEP staff, Ms. Swarupa Ganguli, will be on staff as of January 19th. Ms. Ganguli was previously with IRG, an international consulting firm. She holds a B.A. in Economics, and a B.S. in Business Administration/Finance from the Wharton School, University of Pennsylvania, and a M.A. in Economics and International Relations from Johns Hopkins.

1.2 CONCERNS

The terms of WEC's Cooperative Agreement specify only exchanges for US experts going to Asia (STTAs), and for Asians coming to the United States (STPDs). There are no provisions for recognizing the valuable contributions accomplished to the US-AEP's mission by supporting travel within the U.S., and within Asia. Two examples of this are the recent attendance of state OTA experts at the workshop on pollution prevention in Washington, and the up-coming attendance of country delegates at the Mega-Cities Forum in Indonesia. This issue needs to be reviewed so that opportunities for constructive dialog, bridge building, and information sharing are not ignored. A possible means for addressing this issue would be a revision to the work plan to allow such travel to be counted.

2.0 UPCOMING ACTIVITIES

- Continued follow-up with CMA regarding Responsible Care
- Follow-up on various potential environmental auditing projects throughout the region
- Follow-up contacts with World Bank staff on MEIP, and the potential for leveraging project efforts
- Follow-up New Delhi Water Board constructed wetlands project
- Meeting with Fred Grunnder of AIHA to explore possible collaboration on certified laboratories
- Continued preparation for Regional Environmental Forum: Mega-cities on the Pacific Rim conference in mid-February.

cc:

U.S. EPA
Asia Foundation
USETI
WEC/BAN
WEC/JAK
WEC/NY



Bi-weekly Report (January 18-February 5, 1993)

1.0 Current Activity Status

Subproject activities

- ▶ **National/Local Responsible Care and Corporate Environmental Initiative Programs**
 - Finalized meeting with CMA on 2/8/93 to identify appropriate documents for distribution at AEP workshops and other events.
 - Arranged meetings with K.V. Venkatesh of the National Organic Chemical Industries and Ajay Kishore Rohatgi of the Indian CMA in Bombay on February 24 and 25, 1993.
- ▶ **Industrial Environmental Auditing**
 - Met with Sharmila Riberio and S.K. Gupta of ATI to finalize arrangements for a visit to a textile factory in Jodhpur regarding a request for a pollution prevention audit/workshop. Larry Lai and Swarupa Ganguli will go to Jodhpur on March 2, 1993.
- ▶ **Industrial Disaster Preparedness Strategies**
 - Swarupa Ganguli, Larry Lai, and Richard Williams will meet with the Indian CMA and National Safety Council on February 24 and February 25, 1993.
- ▶ **Electric Power Demand Side Management Strategies**
 - Held conversations with Terry Oliver of IIEC to discuss a large DSM project in the Philippines.
 - Contacted Sharon Limaye at the Strategic Resources Corporation regarding possible participation in a DSM conference in April, 1993.
- ▶ **Management and Implementation of Environmental Assessments**
 - Met with David Evans and Associates on February 3, 1993 to discuss the possibility of two Asian exchanges.
- ▶ **Constructed Wetland Wastewater Treatment Technologies**
 - Met with Subjoy Dutta of the USEPA regarding a constructed wetlands project. Larry Lai and Swarupa Ganguli will visit the Delhi Water Board to follow up on a possible exchange.
- ▶ **Regional Environmental Forum**
 - Continued preparations for the Jakarta Mega-Cities conference on air pollution.

1.1 Successes

- A total of four exchanges are being finalized. Burt Hamner and David Chittick will speak at the Philippine Business for the Environment, and two Filipino Fellows will work with the Massachusetts OTA and the Environmental Protection Agency.

2.0 Upcoming Activities

- Larry Lai and Swarupa Ganguli will be travelling to India and Sri Lanka from February 20-March 15, 1993. Will Knowland will be travelling to Indonesia and the Philippines from February 16 to February 25, 1993.

WORLD ENVIRONMENT CENTER
Bi-weekly Report (February 1-February 12, 1993)

1.0 Current Activity Status

Subproject activities

- ▶ **National/Local Responsible Care and Corporate Environmental Initiative Programs**
 - Arranged meetings with K.V. Venkatesh of the National Organic Chemical Industries and Ajay Kishore Rohatgi of the Indian CMA in Bombay on February 24/25
- ▶ **Industrial Environmental Auditing**
 - Met with Sharmila Riberio and S.K. Gupta of ATI to finalize arrangements for a visit to a textile factory in Jodhpur regarding a request for a pollution prevention audit/workshop. Meeting in Jodhpur on March 2
- ▶ **Industrial Disaster Preparedness Strategies**
 - Arranged to meet with the Indian CMA and National Safety Council on February 24/25
 - Attended briefing by EPA team on the Mae Moh, Thailand power plant disaster; follow-up meeting with US-ASEAN Council
 - Briefed by EPA team to the Ma Ta Phut and Rayong Industrial Estates in Thailand concerning emergency response systems at these estates
- ▶ **Electric Power Demand Side Management Strategies**
 - Discussed a large DSM project in the Philippines with Terry Oliver of IIBC.
 - Contacted Strategic Resources Corporation regarding participation in a DSM conference
- ▶ **Management and Implementation of Environmental Assessments**
 - Met with David Evans and Associates to discuss the possibility of two Asian exchanges.
- ▶ **Constructed Wetland Wastewater Treatment Technologies**
 - Met with Subhjoy Dutta of the USEPA regarding a constructed wetlands project. Will meet with the Delhi Water Board to discuss a possible exchange.
- ▶ **Offices of Technical Assistance**
 - Continued with arrangements for bringing two Filipino fellows to Massachusetts.
- ▶ **Regional Environmental Forum**
 - Continued preparations for the Jakarta Megr-Cities conference on air pollution.

1.1 Successes

• A total of four exchanges are being finalized. David Chittick, Vice President at AT&T and Burt Hamner, Washington State Dept. of Ecology will speak at the Philippine Business for the Environment conference, "Corporate Environmental Policies and Programs." Pending funding approval, Lydia Ablana of the Philippine Industrial Technology Development Institute will work with the Massachusetts OTA and an officer from the Philippine Environment Management Bureau will work with the Massachusetts DEP and possibly EPA Region I.

2.0 Upcoming Activities

• Larry Lal and Swarupa Ganguli will be in India and Sri Lanka February 20-March 15. Will Knowland will be in Indonesia and the Philippines February 16-25.
• Planning an international session for the National Roundtable of the State Pollution Prevention Programs



Bi-weekly Report (January 18-February 5, 1993)

1.0 Current Activity Status

Subproject activities

- ▶ **National/Local Responsible Care and Corporate Environmental Initiative Programs**
 - Finalized meeting with CMA on 2/8/93 to identify appropriate documents for distribution at AEP workshops and other events.
 - Arranged meetings with K.V. Venkatesh of the National Organic Chemical Industries and Ajay Kishore Rohatgi of the Indian CMA in Bombay on February 24 and 25, 1993.
- ▶ **Industrial Environmental Auditing**
 - Met with Sharmila Riberio and S.K. Gupta of ATI to finalize arrangements for a visit to a textile factory in Jodhpur regarding a request for a pollution prevention audit/workshop. Larry Lai and Swarupa Ganguli will go to Jodhpur on March 2, 1993.
- ▶ **Industrial Disaster Preparedness Strategies**
 - Swarupa Ganguli, Larry Lai, and Richard Williams will meet with the Indian CMA and National Safety Council on February 24 and February 25, 1993.
- ▶ **Electric Power Demand Side Management Strategies**
 - Held conversations with Terry Oliver of IIEC to discuss a large DSM project in the Philippines.
 - Contacted Sharon Limaye at the Strategic Resources Corporation regarding possible participation in a DSM conference in April, 1993.
- ▶ **Management and Implementation of Environmental Assessments**
 - Met with David Evans and Associates on February 3, 1993 to discuss the possibility of two Asian exchanges.
- ▶ **Constructed Wetland Wastewater Treatment Technologies**
 - Met with Subojoy Dutta of the USEPA regarding a constructed wetlands project. Larry Lai and Swarupa Ganguli will visit the Delhi Water Board to follow up on a possible exchange.
- ▶ **Regional Environmental Forum**
 - Continued preparations for the Jakarta Mega-Cities conference on air pollution.

1.1 Successes

·A total of four exchanges are being finalized. Burt Hamner and David Chittick will speak at the Philippine Business for the Environment, and two Filipino Fellows will work with the Massachusetts OTA and the Environmental Protection Agency.

2.0 Upcoming Activities

·Larry Lai and Swarupa Ganguli will be travelling to India and Sri Lanka from February 20-March 15, 1993. Will Knowland will be travelling to Indonesia and the Philippines from February 16 to February 25, 1993.



Bi-weekly Report (January 18-February 5, 1993)

1.0 Current Activity Status

Subproject activities

- ▶ **National/Local Responsible Care and Corporate Environmental Initiative Programs**
 - Finalized meeting with CMA on 2/8/93 to identify appropriate documents for distribution at AEP workshops and other events.
 - Arranged meetings with K.V. Venkatesh of the National Organic Chemical Industries and Ajay Kishore Rohatgi of the Indian CMA in Bombay on February 24 and 25, 1993.
- ▶ **Industrial Environmental Auditing**
 - Met with Sharmila Riberio and S.K. Gupta of ATI to finalize arrangements for a visit to a textile factory in Jodhpur regarding a request for a pollution prevention audit/workshop. Larry Lai and Swarupa Ganguli will go to Jodhpur on March 2, 1993.
- ▶ **Industrial Disaster Preparedness Strategies**
 - Swarupa Ganguli, Larry Lai, and Richard Williams will meet with the Indian CMA and National Safety Council on February 24 and February 25, 1993.
- ▶ **Electric Power Demand Side Management Strategies**
 - Held conversations with Terry Oliver of IIEC to discuss a large DSM project in the Philippines.
 - Contacted Sharon Limaye at the Strategic Resources Corporation regarding possible participation in a DSM conference in April, 1993.
- ▶ **Management and Implementation of Environmental Assessments**
 - Met with David Evans and Associates on February 3, 1993 to discuss the possibility of two Asian exchanges.
- ▶ **Constructed Wetland Wastewater Treatment Technologies**
 - Met with Subojoy Dutta of the USEPA regarding a constructed wetlands project. Larry Lai and Swarupa Ganguli will visit the Delhi Water Board to follow up on a possible exchange.
- ▶ **Regional Environmental Forum**
 - Continued preparations for the Jakarta Mega-Cities conference on air pollution.

1.1 Successes

·A total of four exchanges are being finalized. Burt Hamner and David Chittick will speak at the Philippine Business for the Environment, and two Filipino Fellows will work with the Massachusetts OTA and the Environmental Protection Agency.

2.0 Upcoming Activities

·Larry Lai and Swarupa Ganguli will be travelling to India and Sri Lanka from February 20-March 15, 1993. Will Knowland will be travelling to Indonesia and the Philippines from February 16 to February 25, 1993.

Bi-weekly Report (February 15-February 26, 1993)**1.0 Current Activity Status****► National/Local Responsible Care and Corporate Environmental Initiative Programs**

- Received request from the Indian Chemical Manufacturers Association in Bombay for five industry experts to address a May 1993 conference on Responsible Care
- Met with Zerxes Lashkari, VP Polyolefins Industries in Bombay to discuss environment-related trade links and cleaner production possibilities.
- WEC will sponsor two experts to speak at the Philippines Business for the Environment Conference, "Corporate Environmental Policies and Programs," March 22-23.

► Industrial Environmental Auditing

- Identified pollution prevention assessment possibility for chemical and textile industries in Gujarat, India and leather industries in Agra and Kanpur.
- Discussed the idea of WEC volunteers serving as industry experts for the Indian Institute of Technology courses on environmental audits

► Constructed Wetland Wastewater Treatment Technologies

- Met with the International City Managers Association to discuss a "twinning" project between selected cities in Thailand and the U.S. focused on wastewater treatment (this work may be funded directly by USAID)
- Investigating the possibility of a constructed wetlands expert from Research Triangle Institute, NC to speak at a mid-April conference in Thailand

► Offices of Technical Assistance

- Continued with arrangements for a Filipino Industrial Technology Development Institute engineer to work on waste minimization technologies in Massachusetts.

► Regional Environmental Forum

- Supported 16 delegates to the Jakarta Mega-Cities conference on air pollution with AEP funding (co-sponsored with USAID/Jakarta, USAID/Manila, EIP and Governments of Indonesia and Taiwan).

► Other

- Met with John Wood, Commercial Consul in Bombay about arrangement for a country coordinator in India
- Met with Darius DeGuzaman, Polydyne Inc., to discuss assistance to the Philippine government in waste-to-energy technology.
- Environmental agencies and consulting companies in Indonesia, Philippines, and Thailand agreed to identify exchange opportunities with U.S. environmental consulting firms.
- Met with Rebecca Ranich of Michael Baker Engineering Group to discuss ways Baker can participate in WEC-USAEP business exchanges

1.1 Completed

The Jakarta Mega-Cities conference on air pollution brought together delegations from five Asean countries, Taiwan, Mexico and the U.S. for an intensive workshop on strategies and technologies. The delegation leaders, following the conference, agreed to continue a dialogue on air pollution. WEC also agreed to produce a newsletter covering air quality issues in the region and make the Energy Efficient and Environmental Technology Clearinghouse available



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Bi-weekly Report (March 1 - March 12, 1993)

1.0 Current Activity Status

- ▶ **National/Local Responsible Care and Corporate Environmental Initiative Programs**
 - Working to identify appropriate speakers for the Indian Chemical Manufacturers Association's May 1993 conference on Responsible Care (pending AEP approval)
- ▶ **Electric Power Demand Side Management Strategies**
 - Discussed DSM and alternative energy sources with Avanthi Jayatilake, Project Management Specialist at USAID/Sri Lanka
- ▶ **Constructed Wetland Wastewater Treatment Technologies**
 - Finalized arrangements for the senior engineer from the Delhi Water Supply and Sewerage Undertaking to visit the U.S. to observe operating wetlands and finalize design plans for the Yamuna River constructed wetland in New Delhi.
 - Met with the Delhi Water and Sewerage Undertaking concerning the constructed wetlands project for the Yamuna River area and visited the proposed site
- ▶ **Management and Implementation of Environmental Assessment**
 - Met with Dr. Devanesan Neelah, Ministry of Environment and Parliamentary Affairs, Sri Lanka to discuss Sri Lanka's need for a cadre of people trained in Environmental Impact Assessment.
 - Met with G.K. Amarantunga, Chairman Central Environmental Authority, Sri Lanka to discuss specific industries to target for pollution prevention measures. Identified rubber manufacturing, food processing, leather tanning, pesticides and plastic bag manufacturing.
 - Met with the Small Industries Development Bank, the Rajasthan Pollution Control Board and two companies in the textile industry to discuss WEC involvement in pollution prevention measures
- ▶ **Regional Environmental Forum**
 - Coordinating follow-up activities from the Jakarta air quality conference
- ▶ **Other**
 - Began preliminary discussions with Triangle Laboratories, specialists in dioxin testing and analysis, regarding an upcoming environmental conference for the pulp and paper industry in Thailand regarding dioxin emissions.
 - Continued preparations for Polydyne Inc. work with the Philippine government in waste-to-energy technology.
 - Working with the US-AEP Secretariat to determine appropriate work plan

2.0. Upcoming Activities

- WEC will sponsor two experts to speak at the Philippines Business for the Environment Conference, "Corporate Environmental Policies and Programs," March 22-23.



Tri-weekly Report (April 12 to April 30, 1993)

1. Current Activity Status

In light of WEC's new workplan, the US-AEP Secretariat and WEC have sent cables to major USAID missions in priority AEP countries to request their participation in designing field-oriented AEP activities. Over the next sixteen months, the Secretariat and WEC have agreed to allocate 30 exchanges to India, 15 exchanges to Thailand, 10 exchanges to Indonesia, 10 exchanges to the Philippines, and 10 exchanges to Sri Lanka. WEC/USAID Mission interaction pursuant to these cables are outlined below.

1.1 Subproject activities

- ▶ WEC held discussions with USAID/Indonesia to identify potential environmental business exchanges to Indonesia. The exchanges will take place in the areas of industrial waste minimization, municipal environmental infrastructure, and clean energy.
- ▶ USAID/Thailand has initiated discussions with WEC regarding allocating exchanges over the next sixteen months. The correspondence with USAID/Thailand indicates that some of the exchanges will be used for the Eastern Seaboard Environmental Initiative (ESEI).
- ▶ WEC has received a request from a subsidiary of BHP Chemical, Environmental Technologies International, to host Indonesian interns in the area of environmental impact assessment.
- ▶ WEC is in correspondence with the Foreign Commercial Service and the New York Department of Environmental Conservation to identify potential plants for a Korean delegation consisting of representatives from an engineering firm and local government officials. The delegation will visit sludge/dewatering facilities at U.S. wastewater treatment plants.

2. Successes

- ▶ Gordon Sutin of Energy Answers Corporation, in conjunction with Polydyne, Inc., has left for the Philippines to conduct both a pre-feasibility study on developing a waste-to-energy facility in Metro Manila and a seminar on integrated waste management.



Bi-weekly Report (March 29-April 2, 1993)

WEC has been working closely with the US-AEP Secretariat to revise the existing workplan. The new workplan focuses on promoting environmental business exchanges between senior Asian and American professionals. Eligible candidates under the new WEC/US-AEP workplan will be comprised primarily of private sector candidates interested in information and technology transfer. Consistent with this new approach, many of the sub-project activities discussed in previous bi-weekly reports may need to be eliminated or moved over to other WEC cooperative agreements. This report summarizes the projects described in previous bi-weekly reports in light of these new developments.

1. **Current Activity Status**

Subproject activities

- ▶ **National/Local Responsible Care and Corporate Environmental Initiative Programs**
·Submitted request for approval for providing experts to a conference on Responsible Care hosted by the Indian Chemical Manufacturer's Association. This activity is on hold pending approval from USAID/India.
- ▶ **Constructed Wetland Wastewater Treatment Technologies**
·This activity will no longer be funded by the US-AEP
- ▶ **Demand Side Management**
·This activity will no longer be funded by the US-AEP
- ▶ **Industrial Environmental Auditing**
·Awaiting expression of interest/leadership from USAID/Sri Lanka to assist the World-Bank initiated Metropolitan Environmental Improvement Project (MEIP) in helping local industry develop auditing capabilities for undertaking pollution prevention measures.
- ▶ **Certified Laboratory Systems**
·Finalized arrangement for Dr. Tondeur (dioxin testing and analysis specialist) to deliver a paper to a conference on environmental issues being sponsored for industry and government officials. WEC has also arranged for Dr. Tondeur to present a paper on the improved management of chemical analysis for environmental laboratories and quality assurance in chemical measurements by working with the Environmental Research and Training Center. This activity will no longer be funded by the US-AEP; associated costs will be picked up under another WEC cooperative agreement.
- ▶ **Regional Environmental Forum**
· Finished proceedings from the very successful Megacities conference in Jakarta. Currently following-up implementation of projects identified from the Conference. This activity will no longer be funded by US-AEP, and will be funded by an alternative WEC cooperative agreement.
- ▶ **Other**
·Held discussions with the World Bank to work on the urban air quality management strategy and action plan (URBAIR) for Asia.
·Held discussions with USETI to allow two WEC staff to attend an USETI course. WEC is exploring ways of complementing the USETI program without duplication.

2. **Successes**

WEC has finalized and received approval from the US-AEP Secretariat to proceed with its new workplan. As discussed above, this workplan will focus on industry-to-industry exchanges and will be field-driven, taking into account the priorities of the USAID Mission strategies.



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Bi-weekly Report (March 15-March 26, 1993)

1. Current Activity Status

Subproject activities

- ▶ **National/Local Responsible Care and Corporate Environmental Initiative Programs**
 - Working to identify speakers for the Indian Chemical Manufacturer's Association for the May, 1993 conference on Responsible Care.
 - Received a draft proposal from the Philippine Business for the Environment (PBE) to assist local industry in developing capabilities in environmental impact assessment and waste management diagnostics.
 - ▶ **Industrial Environmental Auditing**
 - Received a draft proposal from the Metropolitan Environmental Improvement Project (MEIP) in Sri Lanka to assist them in helping local industry develop auditing capabilities for undertaking pollution prevention measures.
 - ▶ **Management and Implementation of Environmental Assessments**
 - Conducting discussions with several U.S. environmental consulting groups regarding placement with an Asia/Pacific environmental protection agency, engineering associations or national consulting firms to develop in-country training and management programs for conducting environmental assessments.
 - ▶ **Certified Laboratory Systems**
 - Finalizing the schedule for Dr. Tondour (dioxin testing and analysis specialist) to deliver a paper to a conference on environmental issues being sponsored for industry and government officials. WEC has also arranged for Dr. Tondour to work with the Environmental Research and Training Center to discuss their certified laboratory, do sampling dioxin work at a number of Thai pulp and paper companies, and present a paper on the improved management of chemical analysis for environmental laboratories and quality assurance in chemical measurements.
 - ▶ **Regional Environmental Forum**
 - Convened a steering committee meeting to discuss follow-up activities and exchanges resulting from the Jakarta Megacities Conference in February. This committee will facilitate the implementation of projects identified from the Conference.
 - ▶ **Other**
 - Received concurrence from USAID/Philippines to proceed with bringing Gordon Sutin of Energy Answers Corporation to Manila to conduct a waste/energy workshop, and engage in research, discussion, and identification of waste-to-energy technologies appropriate to the Philippines.
- #### 2. Successes
- Sent two WEC volunteer experts to speak at a conference in the Philippines for the PBE. The Conference was met with positive responses from the Mission, and WEC has been asked to replicate it in Cebu this following September.
- #### 3. Upcoming Activities
- WEC has been working closely with the US-AEP Secretariat to revise its workplan to reflect industry-to-industry exchanges as well as activities that are under the USAID Mission's strategies.

**U.S.- ASIA ENVIRONMENTAL PARTNERSHIP
WEC QUARTERLY PROGRESS REPORT NO. 1
(Period ending December 31, 1992)**

A. ACTIVITIES COMPLETED THIS QUARTER

WEC's US-AEP staff in Washington increased to five during this quarter with the additions of Nancy Benioff, Sarah Gober, Natalie Kraft, and Larry Lai. Office administrative systems supporting US-AEP have been established.

WEC's work plan for the Cooperative Agreement (CA) was submitted to the US-AEP Secretariat. Revisions were made to respond to Secretariat and Working Group comments. Approval of the work plan is pending.

Specific activities conducted under the CA are presented below under the ten subproject areas initially identified in the work plan.

1. National/Local Responsible Care and Corporate Environmental Initiative Programs

- Met with Garrity Baker, Director of International Affairs, with the Chemical Manufacturer's Association (CMA) to obtain an update of CMA's international Responsible Care activities. Baker indicated that they had no active efforts in Asia, with the focus of their developing country activities being in Venezuela and Mexico. Baker indicated (1) a willingness to provide CMA materials to WEC for promoting responsible care, (2) that CMA wanted to be kept informed of progress that we are making, and (3) that he would entertain the idea of adding the CMA name to any handbook that might further Responsible Care activities in developing countries.

2. Industrial Environmental Auditing

- Made initial contacts to explore potential candidates for auditing activities India, Sri Lanka and Nepal.

- India: Met with Sharmila Ribeiro, Program Development Officer, Appropriate Technologies International (ATI) to discuss potential involvement in a demonstration project for the textile industry in Jodhpur. ATI's efforts have two parts, the construction of a centralized wastewater treatment plant, and encouraging pollution prevention activities.

- Sri Lanka: Contacted Dennis Smythe and Flora Painter at Coopers and Lybrand to determine the status of a request for assistance in performing an environmental audit for a tire factory in Sri Lanka. The audit would be performed as part of the requirements for privatizing the facility. The project is currently being discussed by USAID and the mission. Follow-up contacts will occur in January.

- Nepal: Initial discussions are underway with Pravin Rana of SAIC to identify target industries (cement, tanning, or textiles) in Nepal as possible candidates for exchanges.

3. Industrial Disaster Preparedness Strategies

- Became familiar with WEC-USAID Local Accident and Management and Prevention Program activities in India. Travelled to Bombay and New Delhi.

- India: Joined APELL workshops in Bombay and Delhi. Met a wide range of industry, government agency (including Environment and Labour, and Emergency Preparedness and International Affairs Office) officials. Also held meetings with various NGOs, including the Ford Foundation; representatives of trade associations, including K.P. Nyati, Environmental advisor to the Confederation of Indian Industries, and consulting groups. Held meetings at the Embassy with Jim Ehrman, the Labor Attache; Clarke Pierce, the newly arrived Science Attache; Dr. Peter Heydemenn, Science Counselor, and Deputy Mission Director Steve Mintz. Also met with John Grayzel, Amitabh Ray of the TDE Office, AID.

Participated in the opening ceremony of WEC/AID cosponsored Industrial Safety Video Production studio at the Central Labour Institute which has received training, technical assistance, and equipment support under WEC's Asia Bureau CA. Possible future activities were discussed with Joint Secretary Battarachaya, CLI Director Mushawetty, and CLI staff.

4. Electric Power Demand Side Management Strategies

- Held preliminary project scoping discussions with the International Institute for Energy Conservation.

5. National Environmental Action Plans/National Environmental Funds

- Preliminary project scoping discussions held with the Science Attache, Royal Thai Embassy and with the WEC Bangkok Office.

6. Management and Implementation of Environmental Assessments

- Held preliminary meetings with Jentai Yang of U.S. EPA's Office of International Activities to discuss Agency training initiatives relating to environmental assessments in Taiwan

7. Offices of Technical Assistance (OTA)

- Co-sponsored (with AID, Asia) a pollution prevention workshop which featured speakers from the US-AEP Secretariat, USAID, pollution prevention programs from California, Illinois, Minnesota, North Carolina, and Massachusetts, and WEC. Among those also present were state representatives from trade development agencies, and the trade development coordinator for USAID's EIP project. In addition the Chairman of the National Pollution Prevention Programs provided an overview of the Roundtable's history and functions. Potential opportunities for exchanges were discussed, and a broad understanding achieved of the capabilities of state pollution prevention programs. A summary report, including suggestions for future activities was distributed to all workshop participants.

- Philippines: Tim Greiner of the Massachusetts Office of Technical Assistance performed an assessment of the institutional, informational and technical needs of Philippine industry, government and NGOs to determine whether a program similar to Massachusetts's would be applicable for the Philippines.

Greiner concluded that Philippine industry and government had little waste minimization experience, lacked a shared definition for waste minimization, and only had limited access to waste minimization information; he recommended that government and industry pursue a high profile education and awareness campaign. The establishment of a waste minimization technical assistance office appeared to be premature, however a non-regulatory waste minimization pilot project might be feasible to explore (demonstrate) the advantages of waste minimization.

- Preliminary identification of several candidates from the Philippines to participate in on-the-job training at the Massachusetts Office of Technical Assistance and/or the Massachusetts Department of Environmental Protection.

8. Constructed Wetland Wastewater Treatment Technologies

- India: Met with Subijoy Dutta, P.E., of the U.S. EPA to discuss WEC involvement in a demonstration wetlands construction project in New Delhi on the Yamuna River. Support under the US-AEP would be used to leverage assistance provided by the World Bank (which is providing 40 percent of the funding), and pro bono services of two consulting firms. Preliminary consideration is being given to providing travel costs for two US experts to visit the site, and the purchase of a dissolved oxygen meter for monitoring.

9. Certified Laboratory Systems

Contacted Fernando Padilla, CIH with SAIC, and Fred Svaldi, CIH with the National Loss Control Company to identify possible U.S. contacts interested in promoting the development of industrial hygiene laboratories in Asia. Both

suggested contacting Fred Grunder - American Industrial Hygiene Association after January 1, 1993, to discuss the Association's lab accreditation program.

10. Regional Environmental Forum: Mega-cities on the Pacific Rim

- From August 9-22, 1992 senior level air quality experts representing 7 major urban centers in the Pacific Rim met in Los Angeles, California at the South Coast Air Quality Management District to develop a Case Study on vehicular sources of air pollution. The delegates exchanged information and ideas regarding air quality programs in the region.

The case study, entitled: Megacity strategies to reduce emissions from vehicles will be presented at the February 14, 1993 conference Megacities on the Pacific Rim and the Burden of Air Pollution. The two volume report focuses on vehicular air quality issues in Bangkok, Jakarta, Kuala Lumpur, Los Angeles, Manila, Mexico City, Singapore and Taipei. The study contains city profiles, a overview of each city's strategies for reducing emissions from vehicles, experiences gained from implementing various strategies, and a series of practical recommendations for coping with air pollution in each city. Specific areas investigated are: cleaner vehicles, cleaner fuels and alternative fuel sources, traffic management and control, mass transit and public awareness programs.

- Continued preparation for the Jakarta megacities air pollution conference.

B. EXCHANGES ACCOMPLISHED

Exchanges this reporting period:

- Tim Greiner of the Massachusetts Office of Technical Assistance assessment in the Philippines.
- Nadia Widjaja, Director of Air and Marine Pollution Control, BADEPAL; Mhd. Izzuddin Abdul Ghani, Head of Mobile Source Emission Control, Ministry of Science Technology and the Environment in Kuala Lumpur; Erlinda Gonzales, Chief of Environmental Quality Division, Philippine Environmental Management Bureau; Joseph Hui, Chief Engineer, Strategic Planning and Research Department, Singapore; Phyllis Ferng, Bureau of Air Quality Protection and Noise Control, TEPA; and Dr. Supat Wangwongwatana, Air Quality and Noise Management Division, Office of Environmental Policy and Planning, participated in the Los Angeles Mega-cities on the Pacific Rim Workshop.

Total Exchanges This Period: 1 STTAs 6 STPDs
Total Exchanges under CA: 1 STTAs 6 STPDs

C. ISSUES ARISING THIS QUARTER

The terms of WEC's Cooperative Agreement specify only exchanges for US experts going to Asia (STTAs), and for Asians coming to the United States (STPDs). There are no provisions for recognizing the valuable contributions accomplished to the US-AEP's mission by supporting travel within the U.S., and within Asia. Two examples of this are the recent attendance of state OTA experts at the workshop on pollution prevention in Washington, and the up-coming attendance of country delegates at the Mega-Cities Forum in Indonesia. This issue needs to be reviewed so that opportunities for constructive dialog, bridge building, and information sharing are not ignored. A possible means for addressing this issue would be a revision to the work plan to allow such travel to be counted.

D. ACTIVITIES PLANNED FOR NEXT QUARTER

1. National/Local Responsible Care and Corporate Environmental Initiative Programs
 - Following-up with CMA to identify appropriate documents for distribution at AEP workshops or other events.
 - Follow-up with the Bombay CMA to determine the status of their responsible care activities and possible assistance that might be appropriate.
 - Work through WEC's International Environmental Forum CMA members to investigate possible avenues for promoting country Responsible Care programs.
2. Industrial Environmental Auditing
 - India -- Develop a better project definition for the pollution prevention training for textile industries, and identify a STTA candidate for the activity.
 - Sri Lanka -- Continue follow-up with Coopers Lybrand to determine the status of the environmental audit at the tire manufacturing facility.
 - Nepal -- Follow-up contacts with Pravin Rana to develop a specific project for consideration under the IEDS program. Also follow-up with Toby Pierce of USAID on possible air pollution related project.
3. Industrial Disaster Preparedness Strategies
4. Electric Power Demand Side Management Strategies

5. National Environmental Action Plans/National Environmental Funds
6. Management and Implementation of Environmental Assessments
7. Offices of Technical Assistance (OTA)
 - Attend waste minimization workshop in Manilla, January 18-20, and identify candidates for STPD with the Massachusetts OTA/DEP.
 - Facilitate the STPD with Massachusetts OTA/DEP.
 - Follow-up on the establishment of an international session for the National Pollution Prevention Roundtable in April.
 - Meet with the Roundtable's new executive director to explore cooperative activities.
 - Explore possibility of developing a WEC volunteer data base for the use of roundtable participants.
8. Constructed Wetland Wastewater Treatment Technologies
 - Finalize arrangements with Subijoy Dutta for cosponsorship of the Yamuna River constructed wetlands project.
9. Certified Laboratory Systems
 - Follow-up contacts with AIHA lab certification program.
10. Regional Environmental Forum: Mega-cities on the Pacific Rim
 - Complete preparations and conduct the Jakarta Megacities conference on air pollution.

QUARTERLY REPORT:

(March 31 - June 30, 1993)

FOR THE AID/WEC COOPERATIVE AGREEMENT

IN SUPPORT OF

THE U.S.-ASIA ENVIRONMENTAL PARTNERSHIP

June 30, 1993



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**Quarterly Report - WEC Cooperative Agreement (CA)
in Support of the U.S. Asia Environmental Partnership
(April 1, 1993 through June 30, 1993)**

1. Status of work under the CA

1.1 Current EBE Status

During this reporting period World Environment Center (WEC) received approval of its April 15, 1993 work plan for activities to be carried out in support of the US-AEP. This work plan reflected a significant shift from the previous draft work plan. Most notably, it narrowed the focus of WEC's activities to industry-based Environmental Business Exchanges (EBEs), and gave primary consideration to mission-driven environmental programs. With this shift in direction, WEC terminated previous activities in progress. A total of 54 exchanges had been in various stages of planning; 14 exchanges had been completed.

WEC, in cooperation with the US-AEP, sent a series of faxes to USAID missions announcing the new mission-driven, industry focus of the EBE program and solicited feedback on mission priority programs that should be supported under the CA.

As of the end of this reporting period, only a few requests from missions have been received as delineated in Table 1.

Table 1

Project	Expert	Status
1. Philippines/Waste-to-Energy	G. Sutin/EAC	Report drafted
2. Philippines/PHNMA	L. D. Guevara	Planning on-going
3. Philippines/URBAIR	M. Ruby	Planning on-going
4. Indonesia/URBAIR	M. Ruby	Planning on-going
5. Thailand/Air Monitoring	S. Jenkins/Radian	In progress
6. Thailand/DSM	(6 EBEs)	Planning on-going
7. Thailand/CAT system	-- /Sargent & Lundy	Planning on-going
8. Thailand/Chemtec	CMA	Planning on-going
9. S. Korea/Sludge dewatering	(6 EBEs)	Cancelled
10. India/URBAIR	--	Planning on-going

Total Active EBEs = 14

Note: In addition to these fourteen EBEs, an URBAIR-related EBE has been approved for Nepal.

The following figures summarize the current EBE status.

- ▶ Total exchanges completed: 15
- ▶ Total exchanges in progress: 1
- ▶ Total exchanges currently planned: 13
- ▶ Grand total: 29 EBEs

1.2 Areas of agreed upon action between WEC and US-AEP

Overall, the level of response from the missions has been somewhat disappointing. In an effort to advance the US-AEP agenda, and accelerate the EBE program, WEC met with US-AEP. The following areas where action would be taken were agreed upon:

1.2.1 More aggressive program to market EBEs in countries without USAID missions.

This activity has already begun with the drafting of original marketing materials on three WEC programs: Factory Assessment Programs, Corporate Environmental Programs, and Technology Assessment Programs. These documents have been designed to allow for easy incorporation of local contact names.

1.2.2 Complementing existing Mission initiatives in priority one countries.

Specific activities discussed included:

India

- ▶ Work with the Confederation of Indian Industries (CII). The CII has proposed the organization of a binational business coalition to promote environmental technology cooperation. The purpose of this coalition will be to promote broad-based technology cooperation between India and the United States. One of the initiatives the CII will take to launch this effort will be to send five representatives of Indian industries to the United States. In this case, WEC's role would be to provide support for the initial exchange and eventually become CII's counterpart for a coalition with CII.

- ▶ Work with the Trade in Environmental Services and Technology (TEST) contractor, when selected, to develop appropriate exchanges with them.

- ▶ Work with commercial consul offices in Bangalore, Bombay, Calcutta, and Madras to link business exchanges to their trade and technology cooperation initiatives.

Sri Lanka

- ▶ Assist the existing NAREPP (Natural Resources and Environmental Planning Project) in developing their environmental assessment and audit programs.

- ▶ Assist the Technology Initiative in the Private Sector (TIPS) program in advancing the adoption of pollution prevention measures and encourage industry investment in pollution prevention technologies.

Indonesia

- ▶ Continue to assist the Mission on its programs.
- ▶ Collaborate with the HIGs program.

Philippines

- ▶ Work with Urban Air (URBAIR), a project initiated by the World Bank's Metropolitan Environmental Improvement Program (MEIP) to provide one air pollution control technology expert.

Thailand

- ▶ Continue to assist Tom Reese in implementing the USAID/Thailand Mission's aggressive program.

1.2.3 Regional Asian programs

- ▶ Consider development of a consultant assistance program which would identify U.S. environmental consulting firms interested in doing business in Asia to inform them of opportunities that exist in the region, and educate them regarding the various types of assistance available to them. The outcome of this program will be a better educated and informed U.S. consulting community with improved competitiveness in the Asian market place.

- ▶ Attend the upcoming July conference in Hong Kong to make appropriate contacts to initiate activities for the Priority 2 countries (Hong Kong, Malaysia, Singapore, South Korea, and Taiwan.)

2. Comparison of accomplishments with established goals

WEC had projected completion of 19 EBEs this quarter. By way of comparison, only one EBE was completed and one EBE is in progress.

3. Reasons why goals were not met

Two reasons explain the lack of progress in achieving the projected number of exchanges.

▶ The response from USAID missions (other than USAID/Thailand) in establishing exchanges has been minimal.

▶ Six EBEs associated with a delegation from South Korea failed to materialize due to a last minute cancellation.

Note: Actions already underway, and planned [see (1.1) above] should accelerate the rate of exchanges.

4. Status of finances and expenditures

4.1 Status

Third quarter (April to June, 1993)

Total expenses April to May 1993	\$ 103,217
Estimated expenses (June, 1993)	\$ 3,443
Total estimated expenses as of June 30, 1993	\$ 106,660

Originally projected 3rd quarter expenses	\$ 346,226
Variance	\$ 239,566

Totals

Budget	\$3,471,130
Cumulative expenses as of 6/30/93	\$ 528,0121
Balance	\$2,943,119

4.2 Analysis of variance

The third quarter expenses fell \$239,566 short of the projected expenses that WEC had given to the US-AEP Secretariat on April 29, 1993. The causes for this variance were:

- ▶ The lack of EBE activity resulted in lower direct costs and salaries for this quarter.
- ▶ The activities [see (1.1 above)] currently in the planning stages will not occur until the fourth quarter and will be reflected in the fourth quarter financial status report.

**Three Month Report - WEC Cooperative Agreement (CA)
in Support of the US - Asia Environmental Partnership
(US-AEP)**

(October 1, 1993 through December 31, 1993)

1. Status of work under the CA

1.1 Environmental Business Exchange Activity Status

This quarter marked the highest level of activity yet achieved under this Cooperative Agreement. The reasons for this increased level of activity were three fold: the fruition of planning activities conducted during the previous quarter, close cooperation with USAID/India's TEST project, and successful marketing of USAID missions in Sri Lanka and Nepal.

WEC's role as a partner under the CA continues to evolve, as evidenced by discussions with MSI in goal-setting sessions. These sessions have suggested that WEC focus primarily, if not solely, on executing exchanges that raise the awareness of US technologies, capabilities and experience in Asia; and not focus on increasing the awareness of US companies about environmentally related business opportunities in Asia. If this shift in mandate is formalized, the adjustment by WEC may temporarily reduce efficiency as efforts are refocused.

1.2 EBE Status (October 1, - December 31, 1993)

A total of 57 exchanges were initiated during this period. The following are brief descriptions of the completed activities.

Demand-Side Management (DSM) Joint Venture -- At the request of U.S.AID/Thailand, WEC is facilitating the exchange of staff between RCG/Hagler, Bailly, and TEAM Consulting of Thailand. Through this program RCG/Hagler will train TEAM staff in DSM and evaluate the potential for forming a joint venture. 3 exchanges completed: October, 1993.

CHEMTREC Training -- Following a request from Thai Ministry of Science Technology and the Environment (MOSTE), and with the support of U.S.AID/Thailand, WEC worked with the Chemical Manufacturer's Association, to provide a CHEMTREC expert to evaluate Thai needs and the feasibility of installing a similar system for MOSTE, and make presentations on the workings CHEMTREC. 1 exchange completed: October, 1993.

Technology Evaluation of Electric Tuk-Tuks -- Pholasith Tuk-Tuk Company Ltd. of Bangkok expressed interest in developing electric tuk-tuks. WEC followed-up on the pairing (by R.J. Gurley of U.S.AID/Thailand) of Pholasith Tuk-Tuk Company with the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT). A tuk-tuk and an extra engine and transmission were sent to AECT who performed the conversion and prepared a conversion kit for use in demonstrations in Bangkok. As a result of this exchange a joint venture was agreed to, and Pholasith will begin production of electric vehicles in a new factory in 1994. 6 exchanges completed: November, 1993.

COPEC Mission to Design Carbon Offset Projects -- COPEC will meet with the Thailand Environmental Institute and the Royal Thai Forestry Department to explore and define carbon "offsets". This mission is designed to provide an entree for U.S. firms into Thai energy service and forestry management markets. 1 exchange completed: November, 1993.

Development of Thai Environment and Safety Certification Program - The Thai Ministry of Industry, and the Ministry of Science, Technology and Environment are interested in encouraging the development of private, commercial environmental and safety certification programs. Under this exchange the sharing of U.S. expertise in environment and safety was explored by HSB Professional Loss Control, with SECCO, a Thai company. 1 exchange completed: November 1993.

Philippine Business for the Environment Conference, Cebu, Philippines -- Mr. Burt Hamner was invited by PBE for a repeat presentation (see PHIL-1, above) at Cebu, Philippines. 1 exchange completed: October, 1993.

Technology Assessment Program - Smokey Mountain Project -- R-II Builders, Inc. was awarded the Smokey Mountain Development and Reclamation Project. In addition to cleaning up the dump site and providing housing for the 3,500 families living there, the project must also establish a modern, pollution-free and environmentally friendly incinerator complex with a through put of 1,400 metric tons per day. This exchange will allow representatives of R-II Builders, Inc. to evaluate U.S. technology for flue gas conditioning. The exchange will include visits to Ogden Martin's Energy/Resource Recovery Facility, Wisconsin Electric's Port Washington Municipal Waste Incinerator, and NaTec Resources. 4 exchanges completed: December, 1993.

Technology Information Center -- Working in concert with the World Bank's Metropolitan Environmental Improvement Project (MEIP), WEC

identified the individuals responsible for the State of Minnesota's leading-edge institutions that disseminate and encourage industry's consideration and implementation of environmental protection measures. WEC sent delegates from: a Minnesota policy-making institution, the Office of Waste Management; an industry association/affiliation, WRITAR; and the government representative and "linking" institution, the Minnesota Trade Office. This delegation met with Sri Lankan counterparts for a week-long session to develop the best Sri Lankan model for continued technical outreach and training for the private sector. 3 exchanges completed: October, 1993.

Factory Assessments -- Four industry sectors (metal finishing, canneries, paint, and leather tanning) were identified by the U.S.AID/Sri Lanka as needing U.S. expertise in optimizing their production processes and minimizing and treating the wastes generated. Experts identified by WEC performed factory assessments at two sites within each sector. The experts provided training for local consultants and also participated in an informal workshop. 4 exchanges completed: October, 1993.

Metropolitan Environmental Improvement Project (MEIP) - URBAIR -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. 1 exchange completed: December, 1993.

Electric Vehicle Technology Transfer -- As a follow-on to a successful NASDA grant demonstrating electric vehicle technology in Kathmandu, WEC sponsored an exchange for four Nepali businessmen interested in learning about the state-of-the-art in electric vehicle technology. The exchange included meetings with representatives of Advanced Electric Car Technology and the Electric Power Research Institute, and included attendance at the Second National Conference on Electric Vehicle Infrastructure in Scottsdale, Arizona. 4 exchanges completed: December, 1993.

Technology Assessment Mission: Pulp and Paper Industry -- As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC brought representatives of the Indonesian pulp and paper industry to tour U.S. industries and evaluate state-of-the-art techniques and technologies. U.S. institutions/facilities visited were: National Council of the Paper Industry for Air and Stream Improvement, Inc., Willamette Industries, Inc., Union Camp Corp., Sonoco Paper Products, and Weyerhaeuser. Follow-up activities will

occur with Sonoco for introduction of chemical recovery technologies. 4 exchanges completed: October, 1993.

Technology Assessment Mission: Metal Finishing Industry -- As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC is bringing representatives of the Indonesian metal finishing industry to tour U.S. industries to evaluate state-of-the-art techniques and technologies. 4 exchanges completed: December, 1993.

Waste Minimization Technology Transfer: Textile Industry -- WEC provided an expert from U.S. textile industry to lead a training session for Indonesian industries on state-of-the art waste minimization techniques. 1 exchange completed: October, 1994.

TEST Program Cooperation -- WEC is continuing cooperation with Sanders International in identifying opportunities for leveraging activities under the mission's TEST program that are consistent with the U.S.-AEP mandate. Activities being undertaken as part of this collaborative effort are listed below.

- Evaluation of Incinerator Technology -- WEC arranged a tour of U.S. facilities for an Indian industry official interested in evaluating incinerator technology for hazardous waste treatment. 1 exchange completed: October, 1993.
- Diesel Emissions Control Technology -- supporting technology transfer efforts, WEC supported FPI in demonstrating a real-pressure control valve for use in diesel engine emissions systems to reduce particulate emissions. 4 exchanges completed: October 8, 1993.
- Air Filter Technology Evaluation -- WEC supported a technology evaluation program by INALSA, an Indian manufacturer of air filters. INALSA is seeking to identify cost effective technologies and options that might be introduced in India. U.S. manufacturers included in the tour are Pneumatil Corporation, Donaldson Northland Supercell, Dorr-Oliver, Air Cleaning Specialists of California, and Room Cleaning Engineering. 1 exchange completed: October, 1993.
- Demonstration of "Linductor" Oil Recovery System -- Under this exchange Yankee Environmental Services met with a number of firms to introduce their new technology for vacuuming spilled oil to the Indian market. Meetings were conducted with Mahindra and Mahindra, Madda Controls, and Ion Exchange. 2 exchanges completed: November, 1993.
- Demonstration of Real-Time Toxic Emissions Monitoring Systems -- K3 Corporation manufactures software systems to integrate

environmental sensors, computers, and telecommunications to provide effective industry analytical and management tools. K3 met with C.G. Hartmen and Braun, Blue Star Ltd., and Assorted Instruments Manufacturing. 1 exchange completed: November, 1993.

- Technology Transfer: Fluidized Bed Chemical Recovery System for Paper Mill Black Liquor -- Enders Process Equipment uses a fluidized bed reactor system to recover pulping chemicals and provide for the pollution free destruction of organic pulping residue by thermal oxidation. Enders met with Indian companies interested in this technology: UP Straw and Agro Products, Ltd., Grasim Industries, Harihar Polyfibers Ltd., Shreyans Paper Mills, Ltd., West coast Paper Mills Ltd., Shiva Paper Mills, Ltd., ABC Paper Mills, Ltd., and Zenith Papers. 1 exchange completed: November, 1993.

- Oil Absorbent Demonstration -- Ab-Sorb manufactures a low-cost material for use in cleaning, and absorbing spilled oil and other substances. Potential applications range from shop floor use to major oil spill response activities. The company believes that there is greatest potential for recovery and reuse of spilled petroleum products using the Ab-sorb product. Under this exchange Ab-Sorb explored joint ventures with potential Indian partners. 1 exchange completed: November, 1993.

- Industrial Wastewater Treatment Technology Assessment Exchange -- Representatives of Ion Exchange will travel to the U.S. to evaluate wastewater treatment technologies associated with pulp and paper, tannery, and iron and steel industries. U.S. industries included in the tour are: Kinetic Recovery Corporation, Kinetico Engineered Systems, Inc., Memtek Corporation, Osmonics Incorporated, Koch Membrane Systems, Green Bay Packaging, Black and Veatch, Zimpro Environmental, Krupp Wilputte Corp., and Thetford Systems, Inc. 3 exchanges completed: December, 1993.

- Review of Incinerator Operations -- Pure Tech and it's sister company Cyno Clean Company, and advancing plans to build a hazardous waste incinerator near Madras. Under this exchange technical representatives of Pure Tech will visit the Sikes incinerator facility operated by IT Corp. 2 exchanges completed: December, 1993

Flue Gas Desulfurization Technology Assessment -- In cooperation with Radian Corporation, WEC sponsored the participation of officials from Korea Electric Power Corporation (KEPCO) on tour of U.S. flue gas desulfurization installations. Included on the tour were: Electric Power Research Institute's Hydrogen Sulphur Test Center, General Electric's Environmental Services Division, Babcock and Wilcox, and Combustion Engineers. 2 exchanges completed: December, 1993.

Review of Mercury Recovery and Hazardous Waste Treatment Technology

-- EMC is planning to build 6 hazardous waste treatment facilities in the central part of Korea, and a mercury recovery facility. WEC arranged a tour of US facilities that provided EMC with both an overview and specific details of US technology in each of these areas, as well as on industrial wastewater treatment, and public education efforts. 1 exchange completed: November, 1993.

2. Comparison of accomplishments with established goals

Agreements between the Project Officer, Lew Reade, and Tony Marcil, President and CEO of WEC, established a goal of 24 exchanges to Asia from the US and 24 from Asia to the US during the period July 6 and December 31, 1993. During this 6-month time frame both goals were exceeded: 42 exchanges occurred from the US to Asia, and 28 occurred from Asia to the US.

3. Status of finances and expenditures

Total Budget	\$3,271,130
Cumulative Expenses (11/30/93)	\$1,025,287
Balance	\$2,245,843

THREE MONTH PROGRESS REPORT:

(April - June 1994)

FOR THE AID/WEC COOPERATIVE AGREEMENT

IN SUPPORT OF

THE U.S.-ASIA ENVIRONMENTAL PARTNERSHIP

July 15, 1994



World Environment Center 419 Park Avenue South, Suite 1800, New York, NY 10016
1600 Wilson Blvd, Suite 500, Arlington, VA 22209

Abbreviations:

AID	Agency for International Development
CY	calendar year
EBE	Environmental Business Exchange
FY	fiscal year
IEDS	International Environmental Development Service
US-AEP	U.S.-Asia Environmental Partnership
USAID	U.S. Agency for International Development
WEC	World Environment Center

**Three Month Report-WEC Cooperative Agreement (CA)
in Support of the US-Asia Environmental Partnership (US-AEP)**

1.0 Status of work under the CA: Environmental Business Exchange (EBE) Activities

This quarter marked the US-AEP/WEC's highest period of activity to date. Sixty (60) exchanges were initiated and completed in this three month period, and approximately 30 additional exchanges were planned.

WEC also awarded a contract to Investment and Trade Resources International (ITRI) to perform an evaluation of the US-AEP program. The evaluation started in May, 1994, and it is scheduled for completion by July, 1994.

a. India

TEST Program Cooperation-- WEC is continuing cooperation with Sanders International in identifying opportunities for leveraging activities under the USAID Mission's Trade in Environmental Services and Technology (TEST) program that are consistent with the US-AEP mandate. During this quarter, WEC and Sanders International agreed to share costs of individual EBEs under the TEST program. Cost sharing arrangements per individual exchange are indicated below.

TEST-Diesel Fuel Conditioner Demonstration/Technology Transfer -- WEC supported this technology transfer project by facilitating a demonstration of Hammerdown diesel fuel conditioner, which reduces emissions to the atmosphere, at the Automotive Center in Pune. Meetings will be held with Auroworld World, a private sector corporation, on the commercialization of the product in India. Project initiation: April, 1994.

1 EBE from U.S. to India: Ben Motion, Chief Engineer, LV Petro

TEST-Corporate Environmental Program -- WEC sponsored an exchange for Indian industry executives to visit with State development agencies in Washington, California, and Colorado. Project initiation: April 1994.

5 EBEs from India to the U.S.: Subir Gupta, Assistant Manager,
Tata Risk Management Services

R.K. Banerji, Deputy Director, Shriram
Institute for Industrial Research

Ashok Panjwani, Vice President, United
Phosphorus Ltd.

(1)

A.V. Kane, Manager. Gujarat Alkali and Chemicals Ltd.

K. Harinathan, Manager, Industrial Credit and Investment Corporation of India

TEST-Clean Technology for Paper Mills -- ThermoChem, Inc./Manufacturing and Technology Conversion International (MTCI) has developed a technology for eliminating water pollution from mini-paper mills and distilleries while simultaneously recovering chemical and energy. This technology has been licensed to Esvin Advanced Technologies (Esvin) of India. Esvin has requested technical assistance in applying the licensed technology to straw-black liquor. While in the U.S., Esvin officials visited a Mead pulp mill, and a Weyerhaeuser pulp mill. The TEST program is cost sharing with US-AEP for implementation of this project. Project initiation: June, 1994

2 EBEs from India to the U.S.: V.S. Venkatraman, Managing Director,
Dr. M. Mahalingam, General Manager,
Esvin

1 EBE from U.S. to India: K. Durai-Swamy, Senior Vice President,
Marketing, ThermoChem

TEST-Assessment of "Green" Boiler Technology -- Delegates from the Indian Boilers Manufacturers' Association (IBMA) visited U.S. boiler manufacturers to study the latest in fuel-efficient and environmentally friendly boilers with the objective of importing and incorporating these technologies into the manufacture of boilers in India. While in the U.S., the delegation attended the American Boiler Manufacturers' Association Annual General Meeting. U.S. firms included in the U.S. itinerary for the delegation included: John Zink Company, American Schack Company, Sellers Engineering Company, Castone, Johnson Matthey, Beltran Associates, and Research Cottrell. The TEST program is cost sharing with US-AEP for implementation of this project. Project initiation: June, 1994.

6 EBEs from India to the U.S.: D.B. Baldawala, Director, Industrial Boilers, Ltd.

C.R. Engineer, Marketing Executive,
Industrial Boilers, Ltd.

M.S. Walia, Director, Walia Engineering Associates

B.P. Trivedi, Partner, Jayant Welding & Engineering Works

V.N.G. Rao, Managing Director, Ignifluid Boilers India, Ltd.

G. Trivedi, Director, Thermax Ltd.

TEST-Evaluation of Biological Formulations for Industrial Wastestreams Treatment

-- U.S. Biotech, Inc. of New Jersey and Premier Ziba, Ltd. of New Delhi are exploring the transfer of biological (bacterial) formulations for use in treating industrial wastestreams in India. Under this exchange, representatives of Premier Ziba visited U.S. Biotech Inc., facilities to further discussions and evaluations as a precursor to test marketing products to sugar processing, tannery, and sewage treatment industries in India. This exchange includes cost sharing with the TEST program. Project initiation: June, 1994.

3 EBEs from India to the U.S.: Govind Srivastav, Lakshman Srivastav and Dr. Jaganathan, Premier Ziba.

Review of Pollution Prevention/Control Technology -- WEC worked with AT International to bring a group of textile industry executives to the U.S. to review pollution prevention and control technologies relevant to bleaching and dyeing operations. Project initiation: April, 1994.

8 EBEs from India to U.S.:

- Kishenlal Garg, Digjam Fabrics
- Amrit Raj Dhariwal, Mangal Textiles
- Gautam Chopra, Munna Textiles
- M.I. Daga, M. Processing House
- Vikram Singh Rathore, Small Industries Development Bank of India.
- Chittaranjan Desai, Technical Director, Paradise Prints
- Girish R. Luthra, Technical Director, Luthra Dyeing and Printing Mills

Bapu Deshapande, Senior Executive,
Technical Service, Product Development,
Bhavan Industries, Colourtex

Metropolitan Environmental Improvement Project (MEIP) - URBAIR. WEC, in support of the World Bank's MEIP program, provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Project initiation: December, 1993 and May, 1994.

1 EBE from U.S. to India: Dr. Stanley Greenfield, Senior Vice
President, Systems Applications
International

Clean Coal Technology Evaluation -- The Indian coal industry can significantly benefit from U.S. coal washing operations that would reduce the amount of stone transported from mines, and thereby BTU value per ton of coal shipped. Under this exchange, principals of India's coal industry visited the U.S., attended Coal Prep 94, and met with experts at the Center for Applied Energy Research, Roberts and Schaeffer, and Pennsylvania Electric's Keystone coal preparation facility. Project initiation: May, 1994.

5 EBEs from India to U.S.:

B.C. Misra, Director, Central Mine Planning
and Design Institute

Amitav Banerjee, General Manager,
Andrew Yule & Company

M. Rajagopal, Chief, Coal Preparation
Division, Central Mine Planning and
Design Institute

K.S. Rao, Sr. Joint President, Indo Gulf
Fertilizers and Chemicals Corp.

M.W. Goklany, Executive Director, India
Power Partners, Managing Director,
Desein Private, Ltd.

b. Indonesia

Environmental Management at Industrial Estates -- The Indonesian government recently passed strict new rules making the developers/managers of industrial estates responsible for emissions from resident industries. To assist developers in understanding and dealing with these new environmental requirements, WEC organized a tour of U.S. industrial parks in Rhode Island, Cleveland, Ohio, Houston, Texas, and Kansas City, Missouri. In addition the Indonesian Developers will be given a short course on basic considerations for environmental monitoring. Project initiation: April, 1994.

8 EBEs from Indonesia to U.S.: Sjukur Lawigena, Division Head, Operation and Property Management

Wilyadi Adinoto, Project Manager for Industrial Estate, PT Bumi Serpong Damai

A.J. Kristiadi, Manager of Operation, PT Grahbuana Cikarang and PT Kawasan Industri Jababeka

Swastiono Donny Dewanto, Environmental Engineer,

Elisabeth Dessy, Asst. Manager of Business Development, Ade Irwn

Dwiyana Machmudin, Development Assistant, PT Lippo City Development

Diding Muchidin, Director and Senior Environmental Engineer, PT Jaya Arkonin Engineering Manggala Pratama

Budi Sutjahjo, Deputy Director and Senior Environmental Engineer, PT Waseco Tirta

Sharing of GIS and Remote Sensing Expertise -- The AHT Group of Indonesia is interested in U.S. experience and expertise in geographic information systems (GIS) and remote sensing. More specifically, AHT is pursuing an Asian Development Bank-funded project to develop the marine and Coastal Information Systems, a component of the Marine Resources Evaluation and Planning Project, and has identified U.S. expertise as necessary to the project. Project initiation: May, 1994

1 EBE from U.S. to Indonesia: Fran Stetina, International Data Systems Office/Goddard Space Flight Center

c. Korea

Assessment of U.S. Water Treatment Technology -- The City of Pusan, Korea has embarked on an ambitious infrastructure building initiative that includes the construction of sewage treatment facilities. Under this exchange, two officials from Pusan will travel to the U.S. and survey wastewater treatment facilities in several U.S. cities including: San Francisco, CA, Denver, CO, and El Paso, TX. CH2M Hill is the U.S. host for this visit. Project initiation: June, 1994.

2 EBEs from Korea to U.S.: Sang Hyoun Kim, Director General of Sewage Department, Construction Bureau,

Dr. Yoo Chan Jun, Senior Researcher, Research and Training Institute, Pusan City

d. Malaysia

Environmental Impact Assessment Technology Transfer -- Petroliam National Berhad (Petronas) is seeking U.S. expertise in performing impact assessments and developing monitoring programs of offshore oil drilling projects. Petronas will be embarking on several large assessment projects this year. Under this exchange, Continental Shelf Associates (CSA) will meet with Petronas to further explore business opportunities. Project initiation: April, 1994

1 EBE from U.S. to Malaysia: Dr. David Gettleson, President and Scientific Director, Continental Shelf Associates

e. Nepal

Metropolitan Environmental Improvement Project (MEIP) - URBAIR -- Joining US-AEP and MEIP resources, WEC provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials and will set forth government priorities and budget allocations. Project initiation: December, 1993 and May, 1994.

1 EBE from U.S. to Nepal: Dr. Stanley Greenfield, Senior Vice President, Systems Applications International

f. Philippines

Metropolitan Environmental Improvement Project (MEIP) - URBAIR -- WEC assisted the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials and will set forth government priorities and budget allocations. Project initiation: July, 1993 and May, 1994.

1 EBE from U.S. to the Philippines: Michael Ruby, Director of Engineering, Envirometrics Inc.

Technology Transfer - Solid Waste Baling Equipment -- Representatives of the Metro Manila Authority (MMA) traveled to the U.S. to evaluate the operation of Mosley solid waste baling equipment. MMA is seeking ways of extending the useful life of operating solid waste landfills. The addition of baling equipment would go a long way to achieving this end, as effective volume reduction through baling may be 50 percent. Project initiation: April, 1994.

3 EBEs from Philippines to U.S.: Prospero I. Oreta, MMA Vice Chairman Mayor

Ofelia Monroy, Consultant, Urban Planning Section MMA

Jose Paolo Sibal, Managing Director, Phoenix Environmental Protection systems.

g. Taiwan

Electric Arc Furnace Dust Recycling -- Enviroscience, Inc. (ESI) has proprietary technology for the recycling electric arc furnace dust. E Chang Iron Steel Company of Taiwan is interested in acquiring ESI technology for recycling electric arc furnace dust, and initial discussions have been very promising. The exchange provides an opportunity for the principals of the companies to meet and discuss technical and financial aspects of technology transfer. Project initiation April, 1994.

3 EBEs from U.S. to Taiwan: C. Tom Philipp, President and Owner,

 Bob H. Sims, Manager of Engineering,

 Don Warner, Manager, Contracts,
 Enviroscience, Inc.

TEPA review of U.S. experiences in wastewater and harbor management -- The AIT is facilitating the visit to the U.S. of a delegation of Taiwan county environmental directors, primarily to view U.S. activities and achievements in harbor and wastewater management. The delegation will visit Boston, Chicago, and Honolulu. U.S. companies hosting the delegation in each city are: CDM, Inc., WMX, and CH2M Hill International, respectively. WEC is assisting in arranging appropriate itineraries for the delegation and on-the-ground logistics. Project initiation: June, 1994.

7 EBEs from Taiwan to U.S.: Hsieh Jin-song, Deputy Director,
 Department of Environmental Protection,
 Taiwan Provincial Government

 Chu Liu-chao, Director, Bureau of
 Environmental Protection, Hua-lien
 County

 Huang Sheng-fa, Director, Bureau of
 Environmental Protection, Changhua
 County

 Wu Tien-chi, Director, Bureau of
 Environmental Protection, Chiayi County

Hung Chin-tien, Director, Bureau of
Environmental Protection, Kaoshiung
County

Kuo Kun-ming, National Institute of
Environmental Training, EPA

h. Thailand

The Eastern Water Resources Development and Management Company, Ltd --
Eastern Water was established by the Provincial Waterworks Authority (PWA) and
charged with the management of scarce water resources on the Eastern
Seaboard. A U.S. tour was planned to provide these individuals with exposure
to water supply and distribution equipment, GIS, metering, and meter reading
equipment; institutions with expertise in sound water resources management,
pricing policies, and water reclamation and conservation. A second leg of the
exchange provided for two representatives of U.S. companies to visit Thailand to
provide follow-up assistance. Project initiation: April, 1994.

4 EBEs from Thailand to U.S.: Dr. Wanchai Ghooprasert, President and
CEO

Wanchai Lawatanatrakul, Vice President

Phirawat Buasap, Vice President

Pairoj Sattayasansakul, Senior Engineer

2 EBEs from U.S. to Thailand: TBA

1.1 Comparison of Accomplishments with Established Goals

Although no numerical targets had been established, WEC had anticipated that
16 exchanges would have to be completed every month from January to
September to reach its total quota of 200 exchanges by the end of September,
1994. By comparison, WEC completed approximately 20 exchanges every month
from April through June, 1994 with a total of sixty exchanges for the three month
period.

2.0 Status of Finances and Expenditures

Total Budget	\$3,271,130
Cumulative Expenses 6/6/94	\$1,930,810
Estimated Pipeline Costs	\$ 110,000
Balance	\$1,230,320

Appendix D

Monthly Reports

May, 1993 - June, 1995



Monthly Report
May 1993

1. Current Activity Status

The new US-AEP/WEC workplan, which was approved in April, will respond to specific USAID/Mission requests in arranging Environmental Business Exchanges. To date, WEC has received four requests from USAID/Thailand and one request from USAID/Philippines

1.1 Subproject activities

- ▶ WEC is identifying an expert familiar with the Chemical Manufacturer's Association's Chemtrec system. The expert would conduct a study to determine the feasibility of establishing a system similar to Chemtrec in Thailand.
 - ▶ WEC is facilitating the exchange of staff between TEAM, a Thai engineering firm, and RCG/Hagler Bailly to pursue Demand Side Management (DSM) business in Thailand. The purpose of this exchange would be to send RCG/Hagler Bailly experts to Thailand to work with TEAM, and subsequently send TEAM engineers to work with RCG/Hagler Bailly on real DSM projects. Based on the success of this exchange, the companies would form a business partnership in Thailand.
 - ▶ WEC is arranging a business exchange where two experts from the Radian Corporation would follow up on the Thai Ministry of Environment's interest in a country-wide air quality system. The Royal Thai Government's (RTG) Pollution Control Department has requested Radian assistance to review RTG progress on its plans for implementing a nationwide air quality monitoring network.
 - ▶ WEC is preparing an exchange for experts from Sargent and Lundy, an architecture and engineering firm, to demonstrate their unique energy software to the Electricity Generating Authority of Thailand (EGAT). The suggested timing for this exchange is in June for two-three weeks.
 - ▶ A business exchange trip is being organized for Lauro Guevara, Vice President for Environment, PHINMA, to allow him to become more acquainted with environmental technology and management in the U.S., specifically in the cement and pulp and paper industry.
 - ▶ WEC was in the process of arranging a trip for a delegation of Korean officials from Yooshin, a consulting firm, and the city of Wonju to visit the U.S. to evaluate the operation and effectiveness of sludge dewatering equipment. This trip was, however, cancelled by the Korean government.
- 2. Successes**
- ▶ Dr. Gordon Sutin of Energy Answers Corporation, in conjunction with Polydyne, Inc., assessed the potential for an integrated waste management system, including a waste-to-

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energy facility, in Metro Manila. The expert confirmed the need for such a system, and recommended a pre-feasibility and waste characterization study be undertaken before the government pursues any specific proposals.



Memorandum

To: Jacquie Farrell
From: Swarupa Ganguli
Subject: Monthly Report
Date: July 30, 1993
Fax: (202) 835-0366

Monthly Report (July, 1993)

As a part of its new agreement with the Secretariat, WEC has agreed to complete 48 Environmental Business Exchanges (EBEs) through December 31, 1993. Twenty-four of these exchanges will be from the U.S. to Asia; twenty-four will be from Asia to the U.S. The EBEs will revolve around three programs: Corporate Environmental Initiatives, Factory Assessment Programs, and Technology Assessment Programs. To launch this new set of EBEs, Larry Lai travelled to Hong Kong, Singapore, and Sri Lanka this month. In Hong Kong and Singapore, he met with business representatives and officers from several Asian Foreign Commercial Services (FCS) offices. In Sri Lanka, he met with USAID/Sri Lanka and representatives of the World Bank-initiated Metropolitan Environment Improvement Project (MEIP) to develop scopes of work for several EBEs to support both Mission and MEIP priority activities.

1. Current Activity Status

Subproject activities

- ▶ **Hagler Bailly-TEAM Exchange.** The objective of this program is to facilitate an exchange between TEAM, a Thai consulting firm, and RCG/Hagler Bailly, Inc. to work on Demand Side Management (DSM) projects. It is expected that this exchange will lead to longer term business prospects for these two consulting firms.
- ▶ **Hong Kong Waste Treatment Exchanges.** The objective of these exchanges will be to address Hong Kong's waste treatment problems. WEC is currently recruiting volunteer experts to develop solutions for treatment of biomedical waste, low-level radioactive waste, and construction waste.
- ▶ **India Textile Industry Technology Demonstration Program.** The objective of this program is to bring three or four Indians from the textile industry to the U.S. to visit major textile operations and learn about new manufacturing equipment, process control, and pollution control technologies. US-AEP/WEC is working with

AT International and the Small Industries Development Bank of India (SIDBI) to identify the appropriate candidates.

- ▶ **Philippine Investment-Management Consultants, Inc. (PHINMA) Exchange.** WEC is coordinating an exchange for the visit of Mr. Lauro D. Guevara, Vice President and Director for Environment, PHINMA, to the U.S. The objective of this technology assessment program is to introduce Mr. Guevara to several U.S. cement and pulp and paper plants, to visit the vendors of pollution control technology, and to attend several training courses at the United States Environmental Training Institute (USETI).
- ▶ **South East Asia Iron and Steel Institute (SEAISI) Electric Arc Furnace Dust Treatment Workshop, Malaysia.** The objective of this exchange is to identify and support two speakers for their regional workshop on "Electric Arc Furnace Dust Treatment" to be held in Kuala Lumpur, Malaysia, September 6 to 7, 1993. This request originated from the USAID/Philippines.
- ▶ **Sri Lanka Factory Assessments.** The objective of this project is to conduct factory assessments in six industry sectors of Sri Lanka. The industries include leather tanning, textiles, paint, metal finishing, latex processing, and canning. The assessments will address process optimization, process control, waste minimization, and waste treatment. The results of these assessments will be incorporated into a more formal demonstration program with the assistance of local trade associations and the MEIP program. US-AEP/WEC has been working with USAID/Sri Lanka to facilitate this exchange. It is expected that the exchanges will occur in October and will be two weeks in duration per industry sector.
- ▶ **Sri Lanka Leather Tanning Environmental Impact Assessments.** The objective of this exchange is to respond to USAID/Sri Lanka's request for conducting EIAs for a new tannery complex. To facilitate this exchange, WEC will provide three volunteers; one from the U.S. tanning industry and two experts in environmental impact management.
- ▶ **Sri Lanka-Minnesota Exchange.** WEC is sending a mission from Minnesota to Sri Lanka. The objective of this mission, which would be coordinated by the Minnesota Trade Office, is to: a) gain first-hand knowledge of the Sri Lankan industrial, economic, and environmental situation; b) share Minnesota's experience in institution building; c) develop alternative approaches to building an industry-sponsored, environmental technology dissemination institution; and d) lay the ground work for a potential long-term "environmental twinning" arrangement that would benefit Sri Lankan and Minnesotan industries and institutions.

- ▶ **URBAIR Air Quality Exchange.** The objective of this exchange is to send an air quality expert to the Philippines and to Indonesia to interact with air quality assessment and economic valuation groups, participate in industry and government visits, and take part in an action plan workshop as a part of the MEIP's, URBAIR (Urban Air) program. An air quality expert, Dr. Michael Ruby, is travelling in the Philippines and in Indonesia from July 24 to August 6, 1993 to participate in URBAIR workshops. URBAIR assists governments and the private sector develop tools (policy, monitoring, and management) to identify immediate and long-term actions and investments to restore air quality in Asian cities.

2. Successes

WEC sent officials from Radian Corporation to assist the Royal Thai Government in demonstrating its national air quality monitoring systems. This mission, which took place from June 16 to June 30, 1993, resulted in one EBE.

3. Upcoming Activities

Will Knowland is in Bangkok and is holding conversations with the Federation of Thai Industries (FTI) and the Foreign Commercial Service (FCS) to market EBEs in Thailand. Lisa Raudelunas is travelling in Indonesia to develop EBEs targeting waste minimization problems. WEC is also holding conversations with the Tata Energy and Research Institute (TERI) to develop technology assessment EBEs. These would entail bringing over high-level Indian industry officials on technology tours to the U.S.

To: Joyce Coffee
From: Swarupa Ganguli
Date: October 1, 1993
Subject: Monthly Report, September, 1993
Fax: (202) 835-0366

1. CURRENT ACTIVITY STATUS

WEC's Environmental Business Exchange (EBE) program continued to gain momentum in September, 1993. During this month, preparations for initiating approximately 15 exchanges were underway, and it is expected the ensuing months will result in several more exchanges.

Subproject activities

Thailand

● **Demand-Side Management (DSM) Joint Venture** -- At the request of USAID/Thailand, WEC is facilitating the exchange of staff between RCG/Hagler, Bailly, and TEAM Consulting of Thailand. Through this program RCG/Hagler will train TEAM staff in Demand Side Management (DSM) projects and evaluate the potential for forming a joint venture. Status: WEC is continuing preparation for this project which is expected to be initiated October, 1993.

4 EBEs from US to Thailand: David Walcott, RCG/Hagler, Bailly
Tig Tuntivate, RCG/Hagler, Bailly
Jean Clinton, RCG/Hagler, Bailly

4 EBEs from Thailand to US: TBA

● **CHEMTREC Training** -- Following a request from Thai Ministry of Science Technology and the Environment (MOSTE), and with the support of USAID/Thailand, WEC met with the Chemical Manufacturer's Association (CMA) and identified a CHEMTREC expert who can evaluate Thai needs, and the feasibility of installing a similar system for MOSTE. Status: The project is expected to be initiated from October 21 to November 4, 1993.

1 EBE from US to Thailand: Alma Howard, Chemical Manufacturer's Association

● **Technology Evaluation of Electric Tuk-Tuks** -- Pholasith Tuk-Tuk Company Ltd. of Bangkok expressed interest in developing electric tuk-tuks. WEC is following-up on the pairing (by R.J. Gurley of USAID/Thailand) of Pholasith with the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT). A tuk-tuk and an extra engine and transmission have been sent to AECT who will both perform the conversion and prepare a conversion kit for use in demonstrations in Bangkok. Status: The tuk-tuk and the engine have arrived in the U.S. This project, which was initiated in August, 1993, appears to have potential for a joint venture.

4 EBEs from U.S. to Thailand: David Porter, Manager, International Technology Transfer, and Ed Riddell, Program Manager, EPRI

Richard Mayer, Vice President of Operations and Director of Engineering, and Chaz Haba, Chairman and CEO, AECT, Inc.

Philippines

●Philippine Business for the Environment Conference (PBE), Cebu, Philippines --

Mr. Burt Hamner was invited by the PBE for a repeat presentation at Cebu, Philippines. This will be a follow up to the Philippine Business for the Environment (PBE) Conference on "Corporate Environmental Policies" held in Manila in March, 1993. Status: This project is expected to be initiated in October, 1993.

1 EBE from U.S. to the Philippines: Burt Hamner, Environmental Planner, Washington State Department of Ecology

●Technology Assessment Mission: Cement and Pulp & Paper Industries --

USAID/Philippines referred Mr. Guevara to WEC as a possible candidate for the Environmental Business Exchange Program. WEC arranged a six-week exchange that emphasizes plant site visits to demonstrate U.S. technology and visits to U.S. manufacturers of environmental control products relevant to the cement and pulp & paper industry. Companies on the tour include: Mead Paper, Weyerhaeuser, Scott Paper Company, Simpson Tacoma Kraft, International Paper, Medusa Cement, Holman Cement, and 3M. Mr. Guevara will also attend a course offered by USETI and an EPA conference. Status: Mr. Guevara arrived in the U.S. in October, and he is currently touring the U.S. under the EBE program.

1 EBE from Philippines to U.S.: Lauro Guevara, Vice President for Environment, Philippine Investment Management Co. (PHINMA)

Malaysia

●SEASIS Electric Arc Furnace Dust Treatment Conference -- WEC is providing two U.S. steel industry experts to speak on the management of electric arc furnace dust at the SEASIS conference in Malaysia. Status: The two experts attended the conference in Kuala Lumpur from September 3 to September 8, 1993. WEC is expecting the final trip report.

2 EBEs from U.S. to Malaysia: Alan Sarko, Inorganic Recycling Corp.

Kenneth L. Minnick, Environmental Compliance and Planning Manager (Rtrd.), Lukens Steel

Sri Lanka

●Technology Information Center -- WEC is working in concert with the World Bank's Metropolitan Environmental Improvement Project (MEIP) and has identified the individuals responsible for the State of Minnesota's leading-edge institutions that disseminate and encourage industry's consideration and implementation of environmental protection measures. WEC met with the Minnesota delegation and the Sri Lankan Chamber of Commerce to develop a consultant strategy for the exchange. Status: This project will be initiated in October, 1993.

3 EBEs from U.S. to Sri Lanka:

Kevin McDonald, Senior Planner, Minnesota Office of Waste Management

Terry Foecke, Director, Waste Reduction Institute (WRITAR)

Karin Nelson, Environmental Technology and Services Representative, Minnesota Trade Office

● **Factory Assessments** -- Four industry sectors (metal finishing, canneries, paint, and leather tanning) were identified by the USAID/Sri Lanka as needing U.S. expertise in optimizing their production processes and minimizing and treating the wastes generated. WEC met with the volunteers and provided a briefing on the exchange and USAID/US-AEP needs and requirements. This project is expected to be initiated in October, 1993.

4 EBEs from U.S. to Sri Lanka:

Terry Foecke, Director, WRITAR

Calvin Henning, President, Frost Paint Co.

John Smith, Vice President for Environment, S.B. Foot Tanning Company

Larry Ring, Plant Manager, Green Giant Co.

Nepal

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Status: The project is expected to be initiated in December, 1993.

1 EBE from U.S. to Nepal:

Dr. Stanley Greenfield, Senior Vice President, Systems Applications International

Indonesia

● **Metropolitan Environmental Improvement Project - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control strategies. These national plans will be the result of work group sessions and conferences among government, and private sector officials and set forth government priorities and budget allocations. Status: The first phase of the project was initiated in July, 1993, and the second phase will take place in February, 1993.

1 EBE from U.S. to Indonesia: Michael Ruby, Director of Engineering, Envirometrics Inc.

●**Technology Assessment Mission: Pulp and Paper Industry**- -- As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC is bringing representatives of the Indonesian pulp and paper industry to tour U.S. industries to evaluate state-of-the-art techniques and technologies. Status: This project is expected to be initiated November, 1993.

4 EBEs from Indonesia to the U.S. TBA

●**Waste Minimization Technology Transfer: Textile Industry**- --WEC is providing two experts from the US textile industry to provide training to Indonesian industries on state-of-the-art waste minimization techniques. Status: This project is expected to be initiated in November, 1993.

2 EBEs from U.S. to Indonesia TBA

India

● **Trade in Environmental Services and Technology Program** - -- WEC is cooperating with Sanders International in identifying opportunities for leveraging activities under the India Mission's TEST program that are consistent with the US-AEP mandate. Currently, WEC is arranging for two industry officials from India to visit the U.S. to evaluate inincerator and air filter technology respectively.

2 EBEs from India to U.S. Mr. B. Ravi, Pure Tech Engineering
Mr. D. Chatterji, INALSA

● **Diesel Engine Emissions Systems Technology Demonstration**- -- WEC is sending four representatives from Fluid Power Industries (FPI) to India. FPI will be discussing a technology they have developed-real pressure control valves for use in diesel emissions-with local Indian companies including Voltas, Telco, Larsen & Toubro, Neptune, and Bharat Forge. Status: This FPI team will be in India from October 8 to October 15, 1993.

4 EBEs to from U.S. to India Jim Silvers, President and CEO, FPI
Ram Rathi, Executive Vice President, FPI
Louis Harms, Vice President, Engineering,FPI
Glenn Dunmire, Director, Int'l Development

●**Textile Industries Exchange** -- WEC is working with AT International to bring a group of textile industry executives to the U.S. for a review of pollution prevention technologies involved with color removal. Status: This project is expected to be initiated in November, 1993.

4 EBEs from India to U.S.: TBA

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Status: The project is expected to be initiated on February, 1993.

1 EBE from U.S. to India:

Stanley Greenfield, Senior Vice President, Systems Applications International

2. SUCCESSES

In the month of September, WEC successfully completed five Environmental Business Exchanges from U.S. to Asia and started one exchange from Asia to the U.S.

3. UPCOMING ACTIVITIES

WEC is continuing preparations for approximately 15 exchanges to be initiated in October. Larry Lai, Senior Program Manager, is travelling to Hong Kong and Nepal in early October to generate additional exchanges in those countries.



To: Jacquie Farrell
From: Swarupa Ganguli
Date: September 3, 1993
Subject: Monthly Report, August, 1993

1. CURRENT ACTIVITY STATUS

WEC's Environmental Business Exchange (EBE) program has gained increasing momentum in August, 1993. During this month, preparations for initiating approximately 45 exchanges were underway, and it is expected the ensuing months will result in several more exchanges. WEC is currently holding talks with several other organizations to leverage their resources and initiate further EBEs. In this regard, WEC has met with US-AEP Business Representatives during an AEP orientation workshop. WEC has also met with Ken Langer of TR&D to explore cooperation with the US-AEP Clean Energy Initiative in Thailand.

Subproject activities

Thailand

● **Demand-Side Management (DSM) Joint Venture** -- At the request of USAID/Thailand, WEC is facilitating the exchange of staff between RCG/Hagler, Bailly, and TEAM Consulting of Thailand. Through this program RCG/Hagler will train TEAM staff in Demand Side Management (DSM) projects and evaluate the potential for forming a joint venture. WEC is continuing preparation for this project which is expected to be initiated in September, 1993.

4 EBEs from US to Thailand: David Walcott, RCG/Hagler, Bailly
Tig Tuntivate, RCG/Hagler, Bailly
Jean Clinton, RCG/Hagler, Bailly

4 EBEs from Thailand to US: TBA

● **CHEMTREC Training** -- Following a request from Thai Ministry of Science Technology and the Environment (MOSTE), and with the support of USAID/Thailand, WEC met with the Chemical Manufacturer's Association (CMA) and identified a CHEMTREC expert who can evaluate Thai needs, and the feasibility of installing a similar system for MOSTE. The project is expected to be initiated in October, 1993.

1 EBE from US to Thailand: Alma Howard, Chemical Manufacturer's Association

● **Study of Air Monitoring Network Needs** -- The Electric Generating Authority of Thailand (EGAT) is evaluating alternative systems for a national air quality monitoring network. Radian Corporation provided an expert to explore options with EGAT officials, to travel to Taiwan and observe the Taiwan EPA system, and to examine the advantages and disadvantages of various configurations and software systems. Support for this mission was provided by WEC/Thailand. The trip was completed in July, 1993, and WEC is currently awaiting the draft report.

1 EBE from US to Thailand: Scott Jenkins, Senior Program Manager, Radian Corporation

●**Technology Evaluation of Electric Tuk-Tuks** -- Pholasith Tuk-Tuk Company Ltd. of Bangkok expressed interest in developing electric tuk-tuks. WEC is following-up on the pairing (by R.J. Gurley of USAID/Thailand) of Pholasith with the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT). A tuk-tuk and an extra engine and transmission have been sent to AECT who will both perform the conversion and prepare a conversion kit for use in demonstrations in Bangkok. The tuk-tuk and the engine have arrived in the U.S. This project, which was initiated in August, 1993, appears to have potential for a joint venture.

4 EBEs from U.S. to Thailand: David Porter, Manager, International Technology Transfer, and Ed Riddell, Program Manager, EPRI

Richard Mayer, Vice President of Operations and Director of Engineering, and Chaz Haba, Chairman and CEO, AECT, Inc.

●**Thailand Reforestation Project** -- USAID/Thailand is funding the planting of 750,000 trees in Khao Yai National Park (the Royal Thai Government seeks to plant 500,000,000 trees to commemorate the 50th anniversary of His Majesty). In supporting this effort, and seeking to bring U.S. expertise to bear, representatives of the Oregon Forest Resources Coalition (a confederation of private sector forestry and nursery companies, science, education, and government, interested in the sustainable development and management of forest resources) will work with the Royal Forestry Department for two weeks. These exchanges will establish a relationship between the Coalition and the Royal Thai Government and the Thai private sector. It will also provide the coalition opportunities to identify and assess the potential for business opportunities, and provide the scientific data necessary for negotiating a carbon dioxide offset for a U.S. utility company. This project was initiated in August, 1993.

3 EBEs from U.S. to Thailand: Rick Herson, President, Oregon Woods, Inc.

Dr. Robin Rose, Associate Professor, Department of Forestry, Oregon State University

Jim Peters, International Training Coordinator, Office of International Research and Development, Oregon State University

Philippines

●**Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. The project was completed in July/August, 1993. Currently, the draft report from the trip is in preparation.

1 EBE from U.S. to the Philippines: Michael Ruby, Director of Engineering, Envirometrics Inc.

●Philippine Business for the Environment Conference (PBE), Cebu, Philippines --

Mr. Burt Hamner was invited by the PBE for a repeat presentation at Cebu, Philippines. This will be a follow up to the Philippine Business for the Environment (PBE) Conference on "Corporate Environmental Policies" held in Manila in March, 1993. This project is expected to be initiated in October, 1993.

1 EBE from U.S. to the Philippines: Burt Hamner, Environmental Planner, Washington State Department of Ecology

●Technology Assessment Mission: Cement and Pulp & Paper Industries --

USAID/Philippines referred Mr. Guevara to WEC as a possible candidate for the Environmental Business Exchange Program. WEC is continuing preparations to arrange a six-week exchange that emphasizes plant site visits to demonstrate U.S. technology and visits to U.S. manufacturers of environmental control products relevant to the cement and pulp & paper industry. Companies on the tour include: Mead Paper, Weyerhaeuser, Scott Paper Company, Simpson Tacoma Kraft, International Paper, Medusa Cement, Holman Cement, and 3M. Mr. Guevara will also attend a course offered by USETI and an EPA conference. The project is expected to be initiated in September, 1993.

1 EBE from Philippines to U.S.: Lauro Guevara, Vice President for Environment, Philippine Investment Management Co. (PHINMA)

Malaysia

●SEASIS Electric Arc Furnace Dust Treatment Conference -- WEC is providing two U.S. steel industry experts to speak on the management of electric arc furnace dust at the SEASIS conference in Malaysia. The project is expected to be initiated in September, 1993.

2 EBEs from U.S. to Malaysia: Alan Sarko, Inorganic Recycling Corp.
Kenneth L. Minnick, Environmental Compliance and Planning Manager (Rtrd.), Lukens Steel

Sri Lanka

●Technology Information Center -- WEC is working in concert with the World Bank's Metropolitan Environmental Improvement Project (MEIP) and has identified the individuals responsible for the State of Minnesota's leading-edge institutions that disseminate and encourage industry's consideration and implementation of environmental protection measures. WEC met with the Minnesota delegation and the Sri Lankan Chamber of Commerce to develop a consultant strategy for the exchange.

3 EBEs from U.S. to Sri Lanka: Kevin McDonald, Senior Planner, Minnesota Office of Waste Management
Terry Foecke, Director, Waste Reduction Institute (WRITAR)

Karin Nelson, Environmental Technology and
Services Representative, Minnesota Trade Office

●**Factory Assessments** -- Six industry sectors (metal finishing, canneries, paint, latex processing, paint, and leather tanning) were identified by the USAID/Sri Lanka as needing U.S. expertise in optimizing their production processes and minimizing and treating the wastes generated. WEC met with the volunteers and provided a briefing on the exchange and USAID/US-AEP needs and requirements. This project is expected to be initiated in October, 1993.

6 EBEs from U.S. to Sri Lanka:

Terry Foeke, Director, WRITAR

Calvin Henning, President, Frost Paint Co.

John Smith, Vice President for Environment, S.B.
Foot Tanning Company

Larry Ring, Plant Manager, Green Giant Co.

Dr. Hans Friedli, Chemist/Engineer (Rtrd), Dow
Chemical

1 TBA

Nepal

●**Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. The project is expected to be initiated in December, 1993.

1 EBE from U.S. to Nepal:

Dr. Stanley Greenfield, Senior Vice President, Systems
Applications International

Indonesia

●**Metropolitan Environmental Improvement Project - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control strategies. These national plans will be the result of work group sessions and conferences among government, and private sector officials and set forth government priorities and budget allocations. The first phase of the project was initiated in July, 1993, and the second phase will take place in February, 1993.

1 EBE from U.S. to Indonesia:

Michael Ruby, Director of Engineering,
Envirometrics Inc.

India

● **TEST Program Cooperation** -- WEC is working with Sanders International to identify opportunities for leveraging environmental business opportunities surfaced under the USAID/India T program. WEC is working with AT International to bring a group of textile industry executives to the U.S. for a review of pollution prevention technologies involved with color removal. This project is expected to be initiated in October, 1993.

4 EBEs from India to U.S.: TBA

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. The project is expected to be initiated on February, 1993.

1 EBE from U.S. to India: Stanley Greenfield, Senior Vice President, Systems Applications International

2. SUCCESSES

In the month of August, WEC successfully completed two Environmental Business Exchanges. In the first exchange, Mr. Scott Jenkins, a Senior Program Manager at Radian Corporation, provided technical assistance to EGAT for evaluating alternative systems for a developing a national air quality monitoring network. The trip resulted in several tangible business opportunities for Radian. These included:

- a proposal to the Management of Natural Resources and Environment for Sustainable Development (MANRES) project to perform a health effects study of sulfur compounds released at Mah Moh;
- a proposal to the mobile sources consultancy portion of the MANRES project; and
- a proposal to the World Bank for a larger mobile source workshop in Bangkok.

In the second exchange, Dr. Michael Ruby of Envirometrics, provided technical assistance to the Urban Air (URBAIR) workshop designed to develop national air pollution control plans. The trip also resulted in the identification of market opportunities for U.S. firms in the Philippines and in Indonesia for pollution control equipment. The principal markets identified were for particulate control equipment and gas control equipment for toxic gases.



To: Joyce Coffee
From: Swarupa Ganguli
Date: November 1, 1993
Subject: Monthly Report, October, 1993
Fax: (202) 835-0366

1. CURRENT ACTIVITY STATUS

October was a busy month for US-AEP activities. WEC completed 13 Environmental Business Exchanges (EBEs), initiated nine EBEs, and designed and received requests for approximately 22 EBEs.

Subproject activities

Thailand

● **Demand-Side Management (DSM) Joint Venture** -- At the request of USAID/Thailand, WEC is facilitating the exchange of staff between RCG/Hagler, Bailly, and TEAM Consulting of Thailand. Through this program RCG/Hagler will train TEAM staff in Demand Side Management (DSM) projects and evaluate the potential for forming a joint venture. Status: WEC sent three EBEs to Thailand from October 24 to October 30, 1993. The EBEs from Thailand to the U.S. are currently in the process of being identified.

3 EBEs from US to Thailand: David Walcott, RCG/Hagler, Bailly
Tig Tuntivate, RCG/Hagler, Bailly
Jean Clinton, RCG/Hagler, Bailly

4 EBEs from Thailand to US: TBA

● **CHEMTREC Training** -- Following a request from the Thai Ministry of Science Technology and the Environment (MOSTE), and with the support of USAID/Thailand, WEC met with the Chemical Manufacturer's Association (CMA) and identified a CHEMTREC expert who can evaluate Thai needs, and the feasibility of installing a similar system for MOSTE. Status: WEC sent one EBE from the U.S. to Thailand on October 21, 1993. The expert is expected to return on November 4, 1993.

1 EBE from US to Thailand: Alma Howard, Chemical Manufacturer's Association

● **Technology Evaluation of Electric Tuk-Tuks** -- Pholasith Tuk-Tuk Company Ltd. of Bangkok expressed interest in developing electric tuk-tuks. WEC is following-up on the pairing (by R.J. Gurley of USAID/Thailand) of Pholasith with the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT). A tuk-tuk and an extra engine and transmission have been sent to AECT who will both perform the conversion and prepare a conversion kit for use in demonstrations in Bangkok. Status: The tuk-tuk and the engine have arrived in the U.S. This project, which was initiated in August, 1993, appears to have potential for a joint venture.

4 EBEs from U.S. to Thailand: David Porter, Manager, International Technology

Transfer, and Ed Riddell, Program Manager, EPRI
Richard Mayer, Vice President of Operations and
Director of Engineering, and Chaz Haba, Chairman
and CEO, AECT, Inc.

● **Thailand Reforestation Project**-- USAID/Thailand is funding the planting of 750,000 trees in Khao Yai National Park (the Royal Thai Government seeks to plant 500,000,000 trees to commemorate the 50th anniversary of His Majesty). In supporting this effort, and in seeking to bring U.S. expertise to bear, representatives of the Oregon Forest Resources Coalition will work with the Royal Forestry Department for two weeks. These exchanges will establish a relationship between the Coalition and the Royal Thai Government and the Thai private sector. It will also provide the coalition opportunities to identify and assess the potential for business opportunities, and provide the scientific data necessary for negotiating a carbon dioxide offset for a U.S. utility company. Status: WEC sent three EBEs from the U.S. to Thailand in October, 1993.

3 EBEs from U.S. to Thailand:

Rick Herson, President, Oregon Woods, Inc.
Robin Rose, Associate Professor, Department of
Forestry, Oregon State University
Jim Peters, International Training Coordinator, Office
of International Research and Development, Oregon
State University

● **Weather Forecasting Technology Project** -- The Thailand Meteorological Department is planning to use its existing system of radar and satellite data receiving stations to perform numerical weather forecasting. Through the EBE program, WEC is facilitating the training of government officials during a trip to Cray Research Systems, General Sciences Corporation, and the National Oceanic and Atmospheric Administration. Status: This project is expected to be initiated in January, 1994.

4 EBEs from Thailand to U.S.:

Sombut Uthaisang, Director General, Kraisor
Pornsuttee, Deputy Director General, Dr. Sombat
Chareonwong, Head, Weather Forecasting Division,
Thailand Meteorological Department, Pritchit
Asvaplunghroh, Managing Director, Thai
Equipment

● **COPEC Mission to Design Carbon Offset Projects**-- COPEC will meet with the Thailand Environmental Institute and the Royal Thai Forestry Department to explore and define carbon "offsets". The mission is designed to provide an entree for U.S. firms into Thai energy service and forestry management markets. Status: This project is expected to be initiated in November, 1993.

1 EBE from U.S. to Thailand:

Marc Stuart, Senior Analyst, COPEC

● **Development of Thai Environmental and Safety Certification Program**-- The Thai Ministry of Industry and Ministry of Science, Technology, and Environment are interested in encouraging the development of private, commercial environmental and safety certification programs. Under this exchange, the sharing of U.S. expertise in environment and safety will be explored by HSB Professional Loss Control, with SEECCO, a Thai company. The possibility exists that a joint

venture may result from these discussions. This project is expected to be initiated in November, 1993.

1 EBE from U.S. to Thailand: James Dewey, P.E., Vice President, HSB Professional Loss Control

Philippines

● Philippine Business for the Environment Conference (PBE), Cebu, Philippines --

Mr. Burt Hamner was invited by the PBE for a repeat presentation at Cebu, Philippines. This will be a follow up to the Philippine Business for the Environment (PBE) Conference on "Corporate Environmental Policies" held in Manila in March, 1993. Status: This project was initiated from October 4 to October 9, 1993. Mr. Hamner also conducted waste minimization workshops in conjunction with the Cebu Chamber of Commerce and Industry for industry officials.

1 EBE from U.S. to the Philippines: Burt Hamner, Environmental Planner, Washington State Department of Ecology

● Technology Assessment Mission: Cement and Pulp & Paper Industries --

USAID/Philippines referred Mr. Guevara to WEC as a possible candidate for the Environmental Business Exchange Program. WEC arranged a six-week exchange that emphasizes plant site visits to demonstrate U.S. technology and visits to U.S. manufacturers of environmental control products relevant to the cement and pulp & paper industry. Companies on the tour include: Mead Paper, Weyerhaeuser, Scott Paper Company, Simpson Tacoma Kraft, International Paper, Medusa Cement, Holman Cement, and 3M. Mr. Guevara will also attend a course offered by USETI and an EPA conference. Status: Mr. Guevara arrived in the U.S. in October, and he is currently touring the U.S. under the EBE program.

1 EBE from Philippines to U.S.: Lauro Guevara, Vice President for Environment, Philippine Investment Management Co. (PHINMA)

Sri Lanka

● Technology Information Center -- WEC is working in concert with the World Bank's Metropolitan Environmental Improvement Project (MEIP) and has identified the individuals responsible for the State of Minnesota's leading-edge institutions that disseminate and encourage industry's consideration and implementation of environmental protection measures. WEC met with the Minnesota delegation and the Sri Lankan Chamber of Commerce to develop a consultant strategy for the exchange. Status: This project was initiated in October, 1993.

3 EBEs from U.S. to Sri Lanka: Kevin McDonald, Senior Planner, Minnesota Office of Waste Management
Terry Foecke, Director, Waste Reduction Institute (WRITAR)

Karin Nelson, Environmental Technology and Services Representative, Minnesota Trade Office

● **Factory Assessments** -- Four industry sectors (metal finishing, canneries, paint, and leather tanning) were identified by the USAID/Sri Lanka as needing U.S. expertise in optimizing their production processes and minimizing and treating the wastes generated. WEC met with the volunteers and provided a briefing on the exchange and USAID/US-AEP needs and requirements. Status: This project was initiated in October, 1993.

4 EBEs from U.S. to Sri Lanka:

Terry Foeke, Director, WRITAR
Calvin Henning, President, Frost Paint Co.
John Smith, Vice President for Environment, S.B.
Foot Tanning Company
Larry Ring, Plant Manager, Green Giant Co.

Nepal

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Status: The project is expected to be initiated in December, 1993.

1 EBE from U.S. to Nepal:

Dr. Stanley Greenfield, Senior Vice President,
Systems Applications International

● **Electric Vehicle Technology Transfer** -- As a follow-on to a successful National Association of State Development Agencies (NASDA) grant demonstrating electric vehicle technology in Kathmandu, WEC is supporting an exchange for four Nepali businessmen interested in learning about the state-of-the-art electric vehicle technology. The exchange will include meetings with representatives of Advanced Electric Car Technology and the Electric Power Research Institute, and will include attendance at the Second National Conference on Electric Vehicle Infrastructure in Scottsdale, Arizona. Status: This project is expected to be initiated in December, 1993.

4 EBEs from Nepal:

S.R. Bhandari, CEO of Mercantile Computer
G.Kharel
K.B. Shresthea, Owner, South Asia Trading Co.
Shisul Kumar Amatya

Indonesia

● **Metropolitan Environmental Improvement Project - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control strategies. These national plans will be the result of work group sessions and conferences among government, and private sector officials and set forth government priorities and budget allocations. Status: The first phase of the project was initiated in July, 1993, and the second phase will take place in February, 1993.

1 EBE from U.S. to Indonesia: Michael Ruby, Director of Engineering,
Envirometrics Inc.

●**Technology Assessment Mission: Pulp and Paper Industry-** -- As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC is bringing representatives of the Indonesian pulp and paper industry to tour U.S. industries to evaluate state-of-the-art techniques and technologies. Status: This project is expected to be initiated November, 1993.

4 EBEs from Indonesia to the U.S.: Widya Tjahyana Lauwangsa, PT Pakerin
Ir. Darono Wikanaji, PT Kertas Leces
Warih Supriadi, PT Surabaya Agung Industri Pulp & Kertas
Zulkifli Lubis, PT Indah Kiat Pulp & Paper Corporation

●**Waste Minimization Technology Transfer: Textile Industry-** --WEC is providing two experts from the US textile industry to provide training to Indonesian industries on state-of-the-art waste minimization techniques. Status: This project is expected to be initiated in November, 1993.

4 EBEs from U.S. to Indonesia: TBA

India

● **Trade in Environmental Services and Technology Program -** -- WEC is cooperating with Sanders International in identifying opportunities for leveraging activities under the India Mission's TEST program that are consistent with the US-AEP mandate. Status: In October, two industry officials from India visited the U.S. to evaluate incinerator and air filter technology respectively.

2 EBEs from India to U.S.: Mr. B. Ravi, Pure Tech Engineering
Mr. D. Chatterji, INALSA

● **Diesel Engine Emissions Systems Technology Demonstration-** -- WEC is sending four representatives from Fluid Power Industries (FPI) to India. FPI will be discussing a technology they have developed-real pressure control valves for use in diesel emissions-with local Indian companies including Voltas, Telco, Larsen & Toubro, Neptune, and Bharat Forge. Status: This FPI team was in India from October 8 to October 15, 1993.

4 EBEs to from U.S. to India: Jim Silvers, President and CEO, FPI
Ram Rathi, Executive Vice President, FPI

Louis Harms, Vice President, Engineering, FPI
Glenn Dunmire, Director, Int'l Development

● **Diesel Fuel Conditioner Demonstration/Technology Transfer**-- WEC is supporting this technology transfer project, by facilitating a demonstration of Hammerdown diesel fuel conditioner, which reduces emissions to the atmosphere, at the Automotive Center in Pune. Meetings will also be held with Auroworld, a private sector corporation, on the commercialization of the product in India. Status: This project is expected to be initiated in November, 1993.

1 EBE from U.S. to India

Ben Motion, Chief Engineer, LV Petro

● **Auto Exhaust Emissions Control Demonstration/ Technology Transfer** -- WEC is facilitating a demonstration of technology for retrofitting non-catalytic convertor-equipped vehicles with exhaust emissions control systems that promise to significantly reduce emissions. Officials of Lean Power Corporation will meet with Lucas-TVS, Lucas Indian Service, Mahindra and Mahindra, Maruti Udyog Ltd., Premier Automobiles, Hindustan Motors, Tata Engineering and Locomotive, Telco, and the Automotive Research Association of India. Status: This project is expected to be initiated in December, 1993.

4 EBEs from U.S. to India

Stephen Bryen, President, Michael Lesher, Chief Scientist; Charles Hamilton, Vice President; Lean Power Corporation

● **Demonstration of "Linductor" Oil Recovery System**-- Under this exchange, Yankee Environmental Services will meet with a number of Indian firms to introduce this new technology for vacuuming spilled oil to the Indian market. Currently, planned meetings include Mahindra and Mahindra, Mazda Controls, and Ion Exchange. Status: This project is expected to be initiated from November 8 to November 23, 1993.

2 EBEs from U.S. to India

Christian Lint, President and Chairman, Yankee Engineering Services
Catherine Clerf, President, CAC International

● **Demonstration of Real Time Toxic Emissions Monitoring Systems**-- K3 Corporation manufactures software systems to integrate environmental sensors, computers, and telecommunications to provide effective industry analytical and management tools. K3 will be meeting with C.G. Hartman and Braun, Blue Star Ltd., and Assorted Instruments Manufacturing. Status: This project is expected to be initiated in November, 1993.

1 EBE from U.S. to India:

Kris Kudrnac, President and CEO, K3 Corporation

● **Technology Transfer: Fluidized Bed Chemical Recovery System for Paper Mill Black Liquor**-- Enders Process Equipment uses a fluidized bed reactor system to recover pulping chemicals and provide for the pollution free destruction of organic pulping residue by thermal oxidation. Several Indian companies have expressed interest in this technology. These companies include: UP Straw and Agro Products, Ltd., Grasim Industries, Harihar Polyfibers Ltd., Sheryan Paper Mills, Ltd., West Coast Paper Mills Ltd., Shiva Paper Mills, Ltd., ABC Paper Mills, and Zenith Papers. Status: This project is expected to be initiated in November, 1993.

1 EBE from U.S. to India

Joseph Enders, President, Enders Process Equipment

● **Oil Absorbent Demonstration** -- Ab-Sorb manufactures a low-cost material for use in cleaning and absorbing spilled oil and other substances. Potential applications range from shop floor use to major oil spill response activities. The company believes that there is greatest potential for recovery and reuse of spilled petroleum products using the Ab-sorb product. Under this exchange, Ab-Sorb will explore joint ventures with potential Indian partners. Status: This project will be initiated in November, 1993.

1 EBE from U.S. to India

Jack Wallace, President and CEO, Ab-Sorb

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Status: The project is expected to be initiated on February, 1993.

1 EBE from U.S. to India:

Stanley Greenfield, Senior Vice President, Systems Applications International

Korea

Flue Gas Desulfurization Technology Assessment -- In cooperation with Radian Corporation, WEC is sponsoring participation of officials from Korea Electric Power Corporation (KEPCO) on tour of U.S. flue gas desulfurization installations. Included in this tour are: Electric Power Research Institute's Hydrogen Sulphur Test Center, General Electric's Environmental Services Division, and Wahlco's Process Systems Group. Status: This project is expected to be initiated in January, 1994.

2 EBEs from Korea to U.S.:

Jo Young Dae, Assistant Manager, Environmental Technology Section, Korea Electric Power Corporation (KEPCO)

1 TBA

2. SUCCESSES

In the month of October, WEC successfully completed 13 EBEs and initiated nine EBEs.

3. UPCOMING ACTIVITIES

WEC is continuing preparations for approximately 22 exchanges to be initiated in November and December. Swarupa Ganguli, Deputy Project Manager, is travelling to India from November 8 to November 16 to generate additional exchanges for the remainder of 1993 and design new exchanges for 1994.



To: Joyce Coffee
From: Swarupa Ganguli
Date: December 1, 1993
Subject: Monthly Report, November, 1993
Fax: (202) 835-0366

1. CURRENT ACTIVITY STATUS

In the month of November, 1993, WEC completed approximately 14 exchanges and made preparations for initiating 30 exchanges in the months of December, 1993 and January, 1994.

Subproject activities

Thailand

● **Demand-Side Management (DSM) Joint Venture** -- At the request of USAID/Thailand, WEC is facilitating the exchange of staff between RCG/Hagler, Bailly, and TEAM Consulting of Thailand. Through this program RCG/Hagler will train TEAM staff in Demand Side Management (DSM) projects and evaluate the potential for forming a joint venture. Status: WEC sent three EBEs to Thailand from October 24 to October 30, 1993. The EBEs from Thailand to the U.S. are currently in the process of being identified.

3 EBEs from US to Thailand: David Walcott, RCG/Hagler, Bailly
Tig Tuntivate, RCG/Hagler, Bailly
Jean Clinton, RCG/Hagler, Bailly

2 EBEs from Thailand to US: TBA

● **CHEMTREC Training** -- Following a request from the Thai Ministry of Science Technology and the Environment (MOSTE), and with the support of USAID/Thailand, WEC met with the Chemical Manufacturer's Association (CMA) and identified a CHEMTREC expert who can evaluate Thai needs, and the feasibility of installing a similar system for MOSTE. Status: WEC sent one EBE from the U.S. to Thailand on October 21, 1993. This exchange was completed by November 4, 1993.

1 EBE from US to Thailand: Alma Howard, Chemical Manufacturer's Association

● **Technology Evaluation of Electric Tuk-Tuks** -- Pholasith Tuk-Tuk Company Ltd. of Bangkok expressed interest in developing electric tuk-tuks. WEC is following-up on the pairing (by R.J. Gurley of USAID/Thailand) of Pholasith with the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT). A tuk-tuk and an extra engine and transmission have been sent to AECT who will both perform the conversion and prepare a conversion kit for use in demonstrations in Bangkok. Status: The tuk-tuk and the engine have arrived in the U.S. This project, which was initiated in August, 1993, resulted in a joint venture. Pholasith will begin production of electric vehicles in a new factory in 1994.

4 EBEs from U.S. to Thailand: David Porter, Manager, International Technology

Transfer, and Ed Riddell, Program Manager, EPRI
Richard Mayer, Vice President of Operations and
Director of Engineering, and Chaz Haba, Chairman
and CEO, AECT, Inc.

2 EBEs from Thailand to U.S.:

Dr. Chulapongs, Governor, Provincial Electric
Authority
Dr. Pansak, Deputy Governor, National Electronics
and Computer Technology Center

• **Thailand Reforestation Project**-- USAID/Thailand is funding the planting of 750,000 trees in Khao Yai National Park (the Royal Thai Government seeks to plant 500,000,000 trees to commemorate the 50th anniversary of His Majesty). In supporting this effort, and in seeking to bring U.S. expertise to bear, representatives of the Oregon Forest Resources Coalition will work with the Royal Forestry Department for two weeks. These exchanges will establish a relationship between the Coalition and the Royal Thai Government and the Thai private sector. It will also provide the coalition opportunities to identify and assess the potential for business opportunities, and provide the scientific data necessary for negotiating a carbon dioxide offset for a U.S. utility company. Status: WEC sent three EBEs from the U.S. to Thailand in October, 1993. As a result of this exchange, officials from the RTG are visiting Oregon to pursue business opportunities .

3 EBEs from U.S. to Thailand:

Rick Herson, President, Oregon Woods, Inc.
Robin Rose, Associate Professor, Department of
Forestry, Oregon State University
Jim Peters, International Training Coordinator, Office
of International Research and Development, Oregon
State University

• **Weather Forecasting Technology Project** -- The Thailand Meteorological Department is planning to use its existing system of radar and satellite data receiving stations to perform numerical weather forecasting. Through the EBE program, WEC is facilitating the training of government officials during a trip to Cray Research Systems, General Sciences Corporation, and the National Oceanic and Atmospheric Administration. Status: This project is expected to be initiated in January, 1994.

4 EBEs from Thailand to U.S.:

Sombut Uthaisang, Director General, Kraisor
Pornsutee, Deputy Director General, Dr. Sombat
Chareonwong, Head, Weather Forecasting Division,
Thailand Meteorological Department, Pritchit
Asvaplungprohm, Managing Director, Thai
Equipment

• **COPEC Mission to Design Carbon Offset Projects**-- COPEC will meet with the Thailand Environmental Institute and the Royal Thai Forestry Department to explore and define carbon "offsets". The mission is designed to provide an entree for U.S. firms into Thai energy service and forestry management markets. Status: This project was initiated in November, 1993.

1 EBE from U.S. to Thailand:

Marc Stuart, Senior Analyst, COPEC

● **Development of Thai Environmental and Safety Certification Program**-- The Thai Ministry of Industry and Ministry of Science, Technology, and Environment are interested in encouraging the development of private, commercial environmental and safety certification programs. Under this exchange, the sharing of U.S. expertise in environment and safety will be explored by HSB Professional Loss Control, with SEECCO, a Thai company. The possibility exists that a joint venture may result from these discussions. This project was initiated in November, 1993.

1 EBE from U.S. to Thailand: James Dewey, P.E., Vice President, HSB Professional Loss Control

Philippines

● **Technology Assessment Mission: Cement and Pulp & Paper Industries** -- USAID/Philippines referred Mr. Guevara to WEC as a possible candidate for the Environmental Business Exchange Program. WEC arranged a six-week exchange that emphasizes plant site visits to demonstrate U.S. technology and visits to U.S. manufacturers of environmental control products relevant to the cement and pulp & paper industry. Companies on the tour include: Mead Paper, Weyerhaeuser, Scott Paper Company, Simpson Tacoma Kraft, International Paper, Medusa Cement, Holman Cement, and 3M. Mr. Guevara will also attend a course offered by USETI and an EPA conference. Status: This exchange was completed by November, 1993.

1 EBE from Philippines to U.S.: Lauro Guevara, Vice President for Environment, Philippine Investment Management Co. (PHINMA)

● **Technology Assessment Program-Smokey Mountain Project**--R-11 Builders, Inc. was awarded the Smokey Mountain Development and Reclamation Project. In addition to cleaning up the dump site and providing housing for the 3500 families living there, the project must also establish a modern, pollution-free and environmentally friendly incinerator complex with a through put of 1,400 metric tons per day. This exchange will allow representatives of R-11 Builders, Inc. to evaluate U.S. technology for flue gas conditioning. It will also include visits to General Electric's Environmental Services Division, NaTec Resources, Haldor Porsoe, Inc., and Wahlco's Process System's Group. This project is expected to be initiated in December, 1993.

4 EBEs from Philippines to U.S.: Edmond W. Sese, President,
Leopoldo T. Sanchez, Senior Vice President
Victor S. Songco, Vice President
Raul A. Arellano, Jr. Consultant
R-11 Builders

Nepal

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group

sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Status: The project is expected to be initiated in December, 1993.

1 EBE from U.S. to Nepal:

Dr. Stanley Greenfield, Senior Vice President,
Systems Applications International

● **Electric Vehicle Technology Transfer** -- As a follow-on to a successful National Association of State Development Agencies (NASDA) grant demonstrating electric vehicle technology in Kathmandu, WEC is supporting an exchange for four Nepali businessmen interested in learning about the state-of-the-art electric vehicle technology. The exchange will include meetings with representatives of Advanced Electric Car Technology and the Electric Power Research Institute, and will include attendance at the Second National Conference on Electric Vehicle Infrastructure in Scottsdale, Arizona. Status: This project is expected to be initiated in December, 1993.

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G.Kharel
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Kertas
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Corporation

● **Waste Minimization Technology Transfer: Textile Industry**--WEC is providing two experts from the US textile industry to provide training to Indonesian industries on state-of-the-art waste minimization techniques. Status: This project is expected to be initiated in February, 1994.

4 EBEs from Indonesia to U.S.: TBA

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India

● **Diesel Fuel Conditioner Demonstration/Technology Transfer**-- WEC is supporting this technology transfer project, by facilitating a demonstration of Hammerdown diesel fuel conditioner, which reduces emissions to the atmosphere, at the Automotive Center in Pune. Meetings will also be held with Auroworld, a private sector corporation, on the commercialization of the product in India. Status: This project is expected to be initiated in January, 1993.

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2 EBEs from U.S. to India

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Catherine Clerf, President, CAC International

• **Demonstration of Real Time Toxic Emissions Monitoring Systems**-- K3 Corporation manufactures software systems to integrate environmental sensors, computers, and telecommunications to provide effective industry analytical and management tools. K3 will be meeting with C.G. Hartman and Braun, Blue Star Ltd., and Assorted Instruments Manufacturing. Status: This project was completed in November, 1993.

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Kris Kudrnac, President and CEO, K3 Corporation

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1 EBE from U.S. to India:

Stanley Greenfield, Senior Vice President, Systems Applications International

• **Industrial Wastewater Treatment Technology Assessment Exchange**-- Representatives of Ion Exchange will travel to the U.S. to evaluate wastewater treatment technologies associated with pulp and paper, tanneries, and iron and steel industries. U.S. industries included in the tour are: Kinetic Recovery Corporation, Kinetico Engineered Systems, Inc., Memtek Corporation, Osmonics Incorporated, Koch Membrane Systems, Green Bay Packaging, Black and Veatch, Zimpro Environmental, Krupp Wilputte Corp., and Thetford Systems, Inc. Status: This project will

be initiated in December, 1993.

3 EBEs from India to U.S.:

Satish Chilekar, Sr. General Manager
Ravi Vaidya, Effluent Treatment Manager
T. Chandran, Sales Manager
Ion Exchange

• **Review of Incinerator Operations**-- Pure Tech and its sister company, Cyno Clean, are advancing plans to build a hazardous waste incinerator near Madras. Under this exchange, technical representatives from Pure Tech will visit the Sikes incinerator facility operated by IT Corp. Status: This project is expected to be initiated in December, 1993.

2 EBEs from India to U.S.:

A. Goldwyn Joseph, Environmental Engineer
Mr. Narasimhan, Chemical Engineer
Pure Tech Engineering

Korea

• **Flue Gas Desulfurization Technology Assessment** -- In cooperation with Radian Corporation, WEC is sponsoring participation of officials from Korea Electric Power Corporation (KEPCO) on tour of U.S. flue gas desulfurization installations. Included in this tour are: Electric Power Research Institute's Hydrogen Sulphur Test Center, General Electric's Environmental Services Division, and Wahlco's Process Systems Group. Status: This project is expected to be initiated in December, 1993.

2 EBEs from Korea to U.S.:

Park Hun Kyung
Jo Young Dae, Assistant Manager, Environmental
Technology Section, Korea Electric Power
Corporation (KEPCO)

• **Review of Mercury Recovery and Hazardous Waste Treatment Technology**--EMC is planning to build six hazardous waste treatment facilities in the central part of Korea, and a wastewater treatment facility in Chongju City. WEC is arranging a tour of U.S. facilities that will provide EMC with both an overview and specific details of U.S. technology in each of these areas, as well as mercury recovery systems. Status: This project was initiated in November, 1993.

1 EBE from Korea to U.S.:

Lee Shin-Bom, Executive Director, EMC

2. SUCCESSES

• As a result of the Technology Evaluation of Electric Tuk Tuk exchange, a joint venture was formed between a U.S. and a Thai company. The Thai company, Pholasith Tuk-Tuk Company, Ltd., will begin the production of electric vehicles in a new factory in 1994.

• WEC sent a group of U.S. experts from Oregon to work with Thailand's Royal Forestry Department for two weeks. As a result of this exchange, officials from the Royal Thai Government are visiting Oregon to pursue business opportunities.

3. UPCOMING ACTIVITIES

- WEC is continuing preparations for approximately 24 exchanges to be initiated in December, 1993 five exchanges in January, 1994 and six exchanges in February, 1994. Additional exchanges are also in the process of being identified and conceptualized for 1994.

- Swarupa Ganguli, Deputy Project Manager travelled to India from November 8 to November 16 to generate additional exchanges for the remainder of 1993 and design new exchanges for 1994.



To: Joyce Coffee
From: Swarupa Ganguli
Date: January 7, 1994
Subject: Monthly Report, December, 1993
Fax: (202) 835-0366

1. CURRENT ACTIVITY STATUS

Subproject activities

Thailand

● **Demand-Side Management (DSM) Joint Venture** -- At the request of USAID/Thailand, WEC facilitated the exchange of staff between RCG/Hagler, Bailly, and TEAM Consulting of Thailand. Through this program RCG/Hagler trained TEAM staff in Demand Side Management (DSM) projects and evaluate the potential for forming a joint venture. Status: WEC sent three EBEs to Thailand from October 24 to October 30, 1993. The EBEs from Thailand to the U.S. are currently in the process of being identified and will take place in January, 1994.

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Tig Tuntivate, RCG/Hagler, Bailly
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Edmond Q. Sese, President
Raul A. Arellano, Jr. Vice President, Equipment
Atanasio Vercide, Vice President, Fabrication

Nepal

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4 EBEs from U.S. to India Stephen Bryen, President, Michael Leshner, Chief Scientist; Charles Hamilton, Vice President; Lean Power Corporation

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Status: The project is expected to be initiated on February, 1994.

1 EBE from U.S. to India: Stanley Greenfield, Senior Vice President, Systems Applications International

● **Industrial Wastewater Treatment Technology Assessment Exchange**-- Representatives of Ion Exchange will travel to the U.S. to evaluate wastewater treatment technologies associated with pulp and paper, tanneries, and iron and steel industries. U.S. industries included in the tour are: Kinetic Recovery Corporation, Kinetico Engineered Systems, Inc., Memtek Corporation, Osmonics Incorporated, Koch Membrane Systems, Green Bay Packaging, Black and Veatch, Zimpro Environmental, Krupp Wilputte Corp., and Thetford Systems, Inc. Status: This project was initiated in December, 1993.

3 EBEs from India to U.S.: Satish Chilekar, Sr. General Manager
Ravi Vaidya, Effluent Treatment Manager
T. Chandran, Sales Manager
Ion Exchange

● **Review of Incinerator Operations**-- Pure Tech and its sister company, Cyno Clean, are advancing plans to build a hazardous waste incinerator near Madras. Under this exchange, technical representatives from Pure Tech will visit the Sikes incinerator facility operated by IT Corp. Status: This project was initiated in December, 1993.

2 EBEs from India to U.S.: A. Goldwyn Joseph, Environmental Engineer
Mr. Narasimhan, Chemical Engineer
Pure Tech Engineering

Korea

● **Flue Gas Desulfurization Technology Assessment** -- In cooperation with Radian Corporation, WEC is sponsoring participation of officials from Korea Electric Power Corporation (KEPCO) on tour of U.S. flue gas desulfurization installations. Included in this tour are: Electric Power Research Institute's Hydrogen Sulphur Test Center, General Electric's Environmental Services Division, and Wahlco's Process Systems Group. Status: This project was initiated in December, 1993.

2 EBEs from Korea to U.S.: Park Hun Kyung
Jo Young Dae, Assistant Manager, Environmental Technology Section, Korea Electric Power Corporation (KEPCO)

• **Review of Mercury Recovery and Hazardous Waste Treatment Technology**—EMC is planning to build six hazardous waste treatment facilities in the central part of Korea, and a wastewater treatment facility in Chongju City. WEC is arranging a tour of U.S. facilities that will provide EMC with both an overview and specific details of U.S. technology in each of these areas, as well as mercury recovery systems. Status: This project was initiated in November, 1993.

1 EBE from Korea to U.S.:

Lee Shin-Bom, Executive Director, EMC

2. SUCCESSES

The month of December, 1993 ended a quarter of the highest level of activities achieved under this Cooperative Agreement. A total of 57 exchanges were completed during this period, with approximately 23 exchanges completed in this month.

3. UPCOMING ACTIVITIES

Larry Lai, Senior Program Manager, will travel to Asia, starting January 15, for approximately three and a half weeks to develop and design EBEs in the following countries: Philippines, Indonesia, Sri Lanka, Singapore, and South Korea.



To: Joyce Coffee
From: Swarupa Ganguli
Date: March 4, 1994
Subject: Monthly Report, February, 1994
Fax: (202) 835-0366

1. CURRENT ACTIVITY STATUS

India

• **Diesel Fuel Conditioner Demonstration/Technology Transfer** -- WEC will support this technology transfer project by facilitating a demonstration of Hammerdown diesel fuel conditioner, which reduces emissions to the atmosphere, at the Automotive Center in Pune. Meetings will be held with Auroworld World, a private sector corporation, on the commercialization of the product in India. Project initiation: April, 1994.

1 EBE from U.S. to India: Ben Motion, Chief Engineer, LV Petro

• **Nuchem Wastewater Treatment Evaluation**-- Nuchem, Ltd. has been working in the field of wastewater and effluent treatment based on electro dialysis and membrane technologies using reverse osmosis. They are expanding their understanding in the field of water and wastewater treatment through biological methods and will be coming to the U.S. to have discussions with various U.S. organizations in the field of biological wastewater treatment and other remediation technologies. Project initiation: February, 1994.

1 EBE from India to US N. Shriram, Vice President, Nuchem, Ltd.

• **Vam Organic Chemicals Limited Bio-gas Technology Evaluation** -- A representative of Vam Organic will visit the U.S. to evaluate bio-gas technology for distillery effluent treatment and technology related to secondary treatment of distillery effluent, utilization of distillery effluent in irrigation, and use of bio-gas for power generation. Vam Organic will evaluate the cost effectiveness of these technologies and options for them to be utilized by India. Project initiation: April, 1994.

1 EBE from India to US Shyam Bang, President, Project Division, Vam Organic Chemicals Ltd.

• **Textile Industry Technology Evaluation** -- Review of Pollution Prevention/Control Technology - WEC is working with AT International to bring a group of textile industry executives to the U.S. to review of pollution prevention and control technologies relevant to bleaching and dyeing operations. Project initiation: April, 1994.

5 EBEs from India to U.S.:
Mr. Kishenlal Garg, Digjam Fabrics
Mr. A.R. Dhariwal, Mangal Textiles
Mr. Gautam Chopra, Munna Textiles
Mr. M.I. Daga, M. Processing House

Mr. V.S. Rathore, Small Industries Development
Bank of India

●**Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC, in support of the World Bank's MEIP program, provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Project initiation: The first phase of this project was initiated in December, 1993, and the second phase will take place in May, 1994.

1 EBE from U.S. to India: Dr. Stanley Greenfield, Senior Vice President,
Systems Applications International

Indonesia

●**Metropolitan Environmental Improvement Project - URBAIR** -- WEC worked with the World Bank's MEIP program by providing an U.S. air pollution and planning expert to assist in the development of national air pollution control strategies. National plans result from the work group sessions and conferences between government and private sector officials, and set forth government priorities and budget allocations. Project initiation: The first part of this project was initiated in July, 1993, and the second part will take place in May, 1994.

1 EBE from U.S. to Indonesia: Michael Ruby, Director of Engineering,
Envirometrics Inc.

●**Technology Assessment Mission: Textile Industry** -- As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC is bringing representatives of the Indonesian textile industry to tour U.S. industries to evaluate state-of-the-art techniques and technologies. Project initiation: May, 1994.

4 EBEs from Indonesia to U.S.: TBA

Malaysia

●**Tenaga Nasional Berhad (TNB) Power Generation Flue Gas Conditioning** -- WEC will bring six representatives from TNB, one of Malaysia's largest power generating companies, to assess U.S. technologies for flue gas conditioning equipment. Project initiation: April, 1994.

6 EBEs from Malaysia to U.S.: TBA

Nepal

●**Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- Joining US-AEP and MEIP resources, WEC provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials and will set forth government priorities and budget allocations. Project initiation: The first part of this exchange

was initiated in December, 1993, and the second part will take place in August, 1994.

1 EBE from U.S. to Nepal:

Dr. Stanley Greenfield, Senior Vice President,
Systems Applications International

Philippines

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC assisted the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Project initiation: The first part of this exchange was initiated in July, 1993, and the second part will take place in May, 1994.

1 EBE from U.S. to the Philippines:

Michael Ruby, Director of Engineering,
Envirometrics Inc.

Thailand

● **Demand-Side Management (DSM) Joint Venture** -- At the request of U.S.AID/Thailand, WEC is facilitating the exchange of staff between RCG/Hagler Bailly and TEAM Consulting of Thailand. Through this program RCG/Hagler will train TEAM staff in DSM and evaluate the potential for forming a joint venture. Project initiation: The first part of this exchange took place in October, 1993, and it is expected the second part will take place in April, 1994.

4 EBEs from U.S. to Thailand:

Frank Stern, RCG/Hagler, Bailly
Tig Tuntivate, RCG/Hagler, Bailly
Jean Clinton, RCG/Hagler, Bailly

3 EBEs from Thailand to U.S.:

TBA

● **Technology Evaluation of Electric Tuk-Tuks** -- Pholasith Tuk-Tuk Company Ltd. of Bangkok expressed interest in developing electric tuk-tuks. WEC followed-up on the pairing (by R.J. Gurley of U.S.AID/Thailand) of Pholasith Tuk-Tuk Company with the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT). A tuk-tuk and an extra engine and transmission were sent to AECT who performed the conversion and prepared a conversion kit for use in demonstrations in Bangkok. As a result of this exchange, a joint venture has been established and will begin production of electric vehicles in a new factory in 1994. Project initiation: The first part of this exchange was initiated in November, 1993, and it is expected the second part will take place in April, 1994.

4 EBEs from U.S. to Thailand:

David Porter, Manager, International Technology
Transfer, and Ed Riddell, Program Manager, EPRI

Richard Mayer, Vice President of Operations and
Director of Engineering, and Chaz Haba, Chairman

and CEO, AECT, Inc.

2 EBEs from Thailand to U.S.:

Dr. Chulapongs, Governor, Provincial Electric Authority; Dr. Pansak, Deputy Governor, National Electronics and Computer Technology Center

●Weather Forecasting Technology Project -- The Thailand Meteorological Department is planning to use its existing system of radar and satellite data receiving stations to perform numerical weather forecasting. Through the EBE program, WEC will facilitate the training of government officials during a trip to Cray Research Systems, General Sciences Corporation, NCR, and the National Oceanic and Atmospheric Administration. Project initiation: March, 1994.

4 EBEs from Thailand to U.S.:

Sombut Uthaisang, Director General, Thailand Meteorological Department

Kraisorn Pornsutee, Deputy Director General, Thailand Meteorological Department

Dr. Sombat Chareonwong, Head, Weather Forecasting Division, Thailand Meteorological Department

Prichit Asvaplungprohm, Managing Director, Thai Equipment

●Transfer of US Training and Engineering Skills to Thailand -- Certified Environmental Consulting, Inc. (CEC), a subsidiary of Yellowstone Environmental Services is engaging in discussions with ERM Thailand, and a memorandum of understanding has been prepared between the two companies. Under this exchange, CEC will consummate a joint venture and secure a terms of reference to provide training and engineering know-how, and transfer U.S. technology for use in the Thai market. Project initiation: April, 1994.

2 EBEs from US to Thailand:

Dr. Gary Rogers, Environmental Engineer, CEC

Dr. Stanley Klemetson, Executive Vice President, CEC

●Development of Sustainable Linkages Between Thai Utilities and the U.S. Power Industry--

The Electric Generating Authority of Thailand (EGAT) has requested to participate in WEC's Environmental Business Exchange program. The delegation will have discussions with the Electric Power Research Institute (EPRI) about becoming an affiliate member. This relationship between EGAT and EPRI would establish a long-term, self sustaining linkage between the Thai utilities and the U.S. power industry. Project initiation: February, 1994.

5 EBEs from Thailand to U.S:

Somvonk Poshyananda, Dy. Director General, EGAT

Siriwadh Sribhibhach, Asst. Gen. Manager, EGAT

Duandas Srisomwong, Asst. Director, R&D, EGAT

Wannawit Thanwanich, Deputy Governor, Municipal
Electric Authority, (MEA)

Kasem Imkasorn, Director of Research and
Development, MEA

●Collaboration between Federation of Thai Industries (FTI) and the Industrial Environmental Organization (IEA)-- The FTI has invited IEA to explore long-term, sustainable linkages between U.S. and Thai industrial organizations. The participants from IEA will address two issues: formalizing the relationship between FTI and IEA; and initiating planning for the Industrial Environmental Conference and Exposition. Project initiation: February, 1994.

4 EBEs from U.S. to Thailand:

Larry Aker, President, Pacific Treatment de Mexico

Jack Flynn, Conference Director, IEA

Marlene Flynn, Program Director, IEA

Bill Snyder, Executive Director, Oregon
Environmental Technology Association

●Urban Air Quality Monitoring Systems--The Anti-Air Pollution Association and the Chulabhorn Research Institute's Center for Urban Environment have invited several representatives from BG Technologies to discuss and demonstrate technologies to obtain real time data for use in traffic control. The two representatives will obtain air quality data using a portable, multi-parameter system. They will also meet with several government and industry officials including: Industrial Estate Authority of Thailand, Board of Investment, The Federation of Thai Industries, and Industrial Works Department. They will also meet with several Thai companies to identify a suitable Thai partner to work with in future operations in the country. Project initiation: February, 1994.

2 EBEs from U.S. to Thailand:

Dr. Anders F. Jepsen, President, BG Technologies

Edward Wetherell, Project Engineer, BG
Technologies

2. SUCCESSES

In November, 1993, WEC sent Jack Wallace, President, Ab.Sorb, Inc. to India to explore the market for the recovery and reuse of spilled petroleum products using a low-cost material for use in cleaning and absorbing spilled oil and other substances, manufactured by Ab.Sorb, Inc. As a result of this exchange, Ab.Sorb, Inc. signed a Memorandum of Understanding (MOU) with an Indian Corporation, met during the India visit, to begin feasibility and market studies to bring its environmental technology to India.



To: Joyce Coffee
From: Swarupa Ganguli
Date: April 4, 1994
Subject: Monthly Report, March, 1994
Fax: (202) 835-0366

1. CURRENT ACTIVITY STATUS

India

• **Diesel Fuel Conditioner Demonstration/Technology Transfer** -- WEC will support this technology transfer project by facilitating a demonstration of Hammerdown diesel fuel conditioner, which reduces emissions to the atmosphere, at the Automotive Center in Pune. Meetings will be held with Auroworld World, a private sector corporation, on the commercialization of the product in India. Project initiation: April, 1994.

1 EBE from U.S. to India: Ben Motion, Chief Engineer, LV Petro

• **Energy Efficiency Training Course** -- WEC is sending an expert to conduct a one-week training course on energy efficiency services. The course is being organized by the United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP), in cooperation with the National Productivity Council (NPC) of India. The training program will guide and encourage consulting engineers to engage in commercial energy services and familiarize them with energy service concepts as well as financial, regulatory, and technical requirements for establishing energy service companies (ESCOs). The training program will use U.S. ESCOs as case studies.

1 EBE from U.S. to India: Dilip Limaye, President, SRC International

• **Vam Organic Chemicals Limited Bio-gas Technology Evaluation** -- A representative of Vam Organic will visit the U.S. to evaluate bio-gas technology for distillery effluent treatment and technology related to secondary treatment of distillery effluent, utilization of distillery effluent in irrigation, and use of bio-gas for power generation. Vam Organic will evaluate the cost effectiveness of these technologies and options for them to be utilized by India. Project initiation: April, 1994. /

1 EBE from India to US: Shyam Bang, President, Project Division, Vam Organic Chemicals Ltd.

• **Textile Industry Technology Evaluation** -- Review of Pollution Prevention/Control Technology - WEC is working with AT International to bring a group of textile industry executives to the U.S. to review of pollution prevention and control technologies relevant to bleaching and dyeing operations. Project initiation: April, 1994.

8 EBEs from India to U.S.:

Kishenlal Garg, Digjam Fabrics
A.R. Dhariwal, Mangal Textiles
Gautam Chopra, Munna Textiles
M.I. Daga, M. Processing House
V.S. Rathore, Small Industries Development Bank of India
Chittaranjan Desai, Paradise Prints
Girish Luthra, Luthra Dyeing & Printing
Bapu Deshpande, Bhavin Textiles

●**Transfer of Carbon Disulphide Removal Technology** -- WEC is supporting a Radian Corporation mission to India to demonstrate technology for safely removing carbon disulphide during the manufacture of rayon. Indian companies that will meet with Radian include: Bombay Dyeing, Century Rayon, South India Viscose and Rayon, and Sudarshan Chemical Industries. Project initiation: March 11, 1994.

1 EBE from U.S. to India:

Avi N. Patkar, Senior Staff Engineer, Radian Corporation

●**Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC, in support of the World Bank's MEIP program, provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Project initiation: The first phase of this project was initiated in December, 1993, and the second phase will take place in May, 1994.

1 EBE from U.S. to India:

Dr. Stanley Greenfield, Senior Vice President, Systems Applications International

Indonesia

●**Metropolitan Environmental Improvement Project - URBAIR** -- WEC worked with the World Bank's MEIP program by providing an U.S. air pollution and planning expert to assist in the development of national air pollution control strategies. National plans will result from the work group sessions and conferences between government and private sector officials, and set forth government priorities and budget allocations. Project initiation: The first part of this project was initiated in July, 1993, and the second part will take place in May, 1994.

1 EBE from U.S. to Indonesia:

Dr. Michael Ruby, Director of Engineering, Envirometrics Inc.

●**Technology Assessment Mission: Textile Industry** -- As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC is bringing representatives of the Indonesian textile industry to tour U.S. industries to evaluate state-of-the-art techniques and technologies. Project initiation: May, 1994.

4 EBEs from Indonesia to U.S.:

TBA

Nepal

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- Joining US-AEP and MEIP resources, WEC provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials and will set forth government priorities and budget allocations. Project initiation: The first part of this exchange was initiated in December, 1993, and the second part will take place in August, 1994.

1 EBE from U.S. to Nepal: Dr. Stanley Greenfield, Senior Vice President,
Systems Applications International

Philippines

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC assisted the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Project initiation: The first part of this exchange was initiated in July, 1993, and the second part will take place in May, 1994.

1 EBE from U.S. to Philippines: Dr. Michael Ruby, Director of Engineering,
Envirometrics Inc.

Taiwan

● **Electric Arc Furnace Dust Recycling**--Enviroscience, Inc. (ESI) has proprietary technology for recycling electric arc furnace dust. E. Chang Iron Steel Company of Taiwan is interested in acquiring ESI technology for recycling electric arc furnace dust, and initial discussions have been very promising. The exchange provides an opportunity for the principals of the companies to meet and discuss technical and financial aspects of technology transfer. Project initiation: April, 1994.

3 EBEs from U.S. to Taiwan: C. Tom Philipp, President and Owner
Bob H. Sims, Manager of Engineering
Don Warner, Manager, Contracts, Enviroscience,
Inc.

Thailand

● **Eastern Water Resources Development and Management Company, Ltd.** The Eastern Water Resources Development and Management Company, Ltd. , slated to become Thailand's first private water utility company, is interested in visiting the U.S. to meet with privately-owned U.S. water companies. The objective of this tour will be to discuss water supply and distribution equipment, innovative water management technologies including GIS and meter reading, and issues related to sound water management, pricing policies, and water reclamation and conservation.

4 EBEs from U.S. to Thailand:

Dr. Wanchai Ghooprasert, President and CEO
Wanchai Lawatanarakul, Vice President
Phirawat Buasap, Vice President
Pairoj Sattayasansakul, Senior Engineer,
Eastern Water

● **Demand-Side Management (DSM) Joint Venture** -- At the request of U.S.AID/Thailand, WEC is facilitating the exchange of staff between RCG/Hagler Bailly and TEAM Consulting of Thailand. Through this program, RCG/Hagler will train TEAM staff in DSM and evaluate the potential for forming a joint venture. Project initiation: The first part of this exchange took place in October, 1993, and the second part will take place in April, 1994.

4 EBEs from U.S. to Thailand:

Frank Stern, RCG/Hagler, Bailly
Tig Tuntivate, RCG/Hagler, Bailly
Jean Clinton, RCG/Hagler, Bailly

2 EBEs from Thailand to U.S.:

Suree Yantapanit, Dy. Managing Director,
Padern Chaiyasingsh, Senior Electrical Engineer,
TEAM Consultants

● **Technology Evaluation of Electric Tuk-Tuks** -- Pholasith Tuk-Tuk Company Ltd. of Bangkok expressed interest in developing electric tuk-tuks. WEC followed-up on the pairing (by R.J. Gurley of U.S.AID/Thailand) of Pholasith Tuk-Tuk Company with the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT). A tuk-tuk and an extra engine and transmission were sent to AECT who performed the conversion and prepared a conversion kit for use in demonstrations in Bangkok. As a result of this exchange, a joint venture has been established and will begin production of electric vehicles in a new factory in 1994. Project initiation: The first part of this exchange was initiated in November, 1993, and the second part took place in March, 1994.

4 EBEs from U.S. to Thailand:

David Porter, Manager, International Technology Transfer, and Ed Riddell, Program Manager, EPRI
Richard Mayer, Vice President of Operations and Director of Engineering, and Chaz Haba, Chairman and CEO, AECT, Inc.

2 EBEs from Thailand to U.S.:

Dr. Chulapongs, Governor, Provincial Electric Authority; Dr. Pansak, Deputy Governor, National Electronics and Computer Technology Center

● **Transfer of US Training and Engineering Skills to Thailand** -- Certified Environmental Consulting, Inc. (CEC), a subsidiary of Yellowstone Environmental Services is engaging in discussions with ERM Thailand, and a memorandum of understanding has been prepared between the two companies. Under this exchange, CEC will consummate a joint venture and secure a terms of reference to provide training and engineering know-how, and transfer U.S. technology for use in the Thai market. Project initiation: May, 1994.

2 EBEs from US to Thailand:

Dr. Gary Rogers, Environmental Engineer, CEC
Dr. Stanley Klemetson, Executive Vice President,
CEC

2. SUCCESSES

WEC published an Annual Report for 1993. This report, which was circulated to US-AEP, POD Implementing Organizations, USAID Missions, US&FCS offices, and volunteer experts, has been received favorably.



To: Joyce Coffee
From: Swarupa Ganguli
Date: June 6, 1994
Subject: Monthly Report, May, 1994
Fax: (202) 835-0366

1. CURRENT ACTIVITY STATUS

India

● **Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC, in support of the World Bank's MEIP program, provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Project initiation: The first phase of this project was initiated in December, 1993, and the second phase was initiated in May, 1994.

1 EBE from U.S. to India:

Dr. Stanley Greenfield, Senior Vice President, Systems Applications International

● **Clean Technology for Paper Mills**--ThermoChem, Inc./Manufacturing and Technology Conversion International (MTCI) has developed a technology for eliminating water pollution from mini-paper mills and distilleries while simultaneously recovering chemicals and energy. This technology has been licensed to Esvin Technologies (Esvin Tech) of India. Esvin Tech has requested technical assistance in applying the licensed technology to straw-based black liquor. While in the U.S., Esvin officials will visit a Mead pulp mill and a Weyerhaeuser pulp mill. The TEST program is cost sharing with US-AEP for implementation of this project. Project initiation: May, 1994

2 EBEs from India to the U.S.:

V.S. Venkataraman, Managing Director, Dr. M. Mahalingam, General Manager, Esvin Tech

1 EBE from U.S. to India:

K. Durai-Swamy, Senior Vice President, Marketing, ThermoChem

● **Assessment of "Green" Boiler Technology** --Delegates from the Indian Boilers Manufacturer's Association (IBMA) will visit U.S. boiler manufacturers to study the latest in fuel-efficient and environmentally-friendly boilers with the objective of importing and incorporating these technologies into the manufacture of boilers in India. While in the U.S., the delegation will also attend the American Boiler Manufacturers' Association Annual General Meeting. U.S. firms tentatively included in the itinerary for the delegation include: John Zink Company; The International Boiler Works Company; American Schack Company; Industrial Boilers Company; Sellers Engineering Company; Mac Environmental; Eclipse Systems; Catalytic Systems Division; and Soil Purification, Inc. The TEST program is cost sharing with US-AEP for implementation of this project. Project initiation: June, 1994.

8 EBEs from India to the U.S.

D.B. Baldawala, Director, Industrial Boilers, Ltd.

R.T. Arasu, Jt. Managing Director, Cethar Vessals Ltd.

N.K. Desai, Chief Executive, Laxmi Boilers

M.S. Walla, Director, Walla Engineering Associates

B.P. Trivedi, Partner, Jayant Welding and Engineering Works

V.N.G. Rao, Managing Director, Ingifluid Boilers, India, Ltd.

E.M. George, General Manager, Thermax, Ltd.

Indonesia

● **Sharing of GIS and Remote Sensing Expertise** -- The AHT Group of Indonesia is interested in U.S. experience and expertise in geographic information systems (GIS) and remote sensing. More specifically, AHT is pursuing an Asian Development Bank-funded project to develop the marine and Coastal Information System, a component of the Marine Resources Evaluation and Planning Project and has identified U.S. expertise as necessary to the project. Project initiation: May, 1994

● **Metropolitan Environmental Improvement Project - URBAIR** -- WEC worked with the World Bank's MEIP program by providing an U.S. air pollution and planning expert to assist in the development of national air pollution control strategies. National plans will result from the work group sessions and conferences between government and private sector officials, and set forth government priorities and budget allocations. Project initiation: The first part of this project was initiated in July, 1993, and the second part was initiated in May, 1994.

1 EBE from U.S. to Indonesia:

Dr. Michael Ruby, Director of Engineering, Envirometrics Inc.

Malaysia

● **Waste Water Monitoring Technology Evaluation** -- HF Scientific is exploring technology transfer opportunities with Yomart Environmental Systems Sdn Bhd. of Malaysia. Yomart is interested in demonstrations of waste water monitoring equipment that might have wide application in the Malaysian marketplace. Project initiation: August, 1994.

1 EBE from U.S. to Malaysia:

Robert J. Maley, President, HF Scientific

● **Environmental Impact Assessment Technology Transfer** -- Petroliam National Berhad (Petronas) is seeking U.S. expertise in performing impact assessments and developing monitoring programs of offshore oil drilling projects. Petronas will be embarking on several large

assessment projects this year. Under this exchange, Continental Shelf Associates (CSA) will meet with Petronas to further explore business opportunities. Project initiation: May, 1994

1 EBE from U.S. to Malaysia:

Dr. David Gettleton, President and Scientific Director, Continental Shelf Associates.

Philippines

●**Metropolitan Environmental Improvement Project (MEIP) - URBAIR** -- WEC assisted the World Bank's MEIP program by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Project initiation: The first part of this exchange was initiated in July, 1993, and the second part took place in May, 1994.

1 EBE from U.S. to Philippines:

Dr. Michael Ruby, Director of Engineering, Envirometrics Inc.

●**Technology Transfer - Solid Waste Baling Equipment** -- Representatives of the Metro Manila Authority (MMA) will travel to the U.S. to evaluate the operation of Mosley solid waste baling equipment. MMA is seeking ways of extending the useful life of operating solid waste landfills. The addition of baling equipment would go a long way to achieving this end, as effective volume reduction through baling may be 50 percent. Project initiation: May, 1994.

3 EBEs from Philippines to U.S.:

Prospero I. Orcta, MMA Vice Chairman Mayor
Robert C. Nacienceno, MMA General Manager
Jose Paolo Sibal, Managing Director, Phoenix Environmental Protection systems.

●**Philippine National Oil Company (PNOC) Technology Assessment** -- A consortium led by the California Energy Company have entered into a contract to assist PNOC in developing geothermal power. Hydrogen sulphide emissions are a major concern at geothermal sites, and the government has recently passed stringent regulations regarding H₂S emissions. As part of this project, exchanges have been designed that will allow for the training of PNOC officials on the chemistry dependent nature of hydrogen sulphide control options, and also allow for a tour of US companies manufacturing alternative treatment systems. Project initiation: August, 1994

3 EBEs from Philippines to U.S.:

Rafael Bernardo, Senior Engineer;
Samson Javellana, Manager, Geothermal Division;
Mike De Jesus, Engineer, PNOC

Thailand

●**Orlando, Florida/Songkhla, Thailand, Twinning Exchange** -- RHUDO, USAID/Thailand requested US-AEP support for developing a twinning relationship between the cities of Orlando, Florida, and Songkhla, Thailand. Under this exchange public works officials from the two cities would discuss common problems and share possible solutions. The proposed twinning would be conducted in two phases. Individuals who would be participating in this exchange from Thailand are: the Songkhla Director of Engineering, the City Manager, and either the Mayor or Deputy Mayor. A second phase of the program would send two officials from Orlando, and one private sector representative to Thailand. Project initiation: June, 1994.

3 EBEs from Thailand to the U.S.: TBA

3 EBEs from U.S. to Thailand: TBA

2. SUCCESSES

●WEC awarded a contract to Investment and Trade Resources International (ITRI) to perform an evaluation of its Cooperative Agreement (CA) of the US-AEP program. The evaluation was initiated in May, 1994.

●Brian Streiffer joined the WEC staff to work on the US-AEP program. Brian replaced Sarah Gober, who left WEC to return to graduate school, as a project assistant



To: Joyce Coffee
From: Swarupa Ganguli
Date: July 7, 1994
Subject: Monthly Report, June, 1994
Fax: (202) 835-0366

1. CURRENT ACTIVITY STATUS

India

● **Clean Technology for Paper Mills**--ThermoChem, Inc./Manufacturing and Technology Conversion International (MTCI) has developed a technology for eliminating water pollution from mini-paper mills and distilleries while simultaneously recovering chemicals and energy. This technology has been licensed to Esvin Technologies (Esvin Tech) of India. Esvin Tech has requested technical assistance in applying the licensed technology to straw-based black liquor. While in the U.S., Esvin officials will visit a Mead pulp mill and a Weyerhaeuser pulp mill. The TEST program is cost sharing with US-AEP for implementation of this project. Project initiation: May, 1994

2 EBEs from India to the U.S.:

V.S. Venkataraman, Managing Director, Dr. M. Mahalingam, General Manager, Esvin Tech

1 EBE from U.S. to India:

K. Durai-Swamy, Senior Vice President, Marketing, ThermoChem

● **Assessment of "Green" Boiler Technology** --Delegates from the Indian Boilers Manufacturer's Association (IBMA) will visit U.S. boiler manufacturers to study the latest in fuel-efficient and environmentally-friendly boilers with the objective of importing and incorporating these technologies into the manufacture of boilers in India. While in the U.S., the delegation will also attend the American Boiler Manufacturers' Association Annual General Meeting. U.S. firms tentatively included in the itinerary for the delegation include: John Zink Company; The International Boiler Works Company; American Schack Company; Industrial Boilers Company; Sellers Engineering Company; Mac Environmental; Eclipse Systems; Catalytic Systems Division; and Soil Purification, Inc. The TEST program is cost sharing with US-AEP for implementation of this project. Project initiation: June, 1994.

6 EBEs from India to the U.S.

D.B. Baldawala, Director, Industrial Boilers, Ltd.
C.M. Engineer, Vice President, Industrial Boilers, Ltd.
M.S. Walia, Director, Walia Engineering Associates
B.P. Trivedi, Partner, Jayant Welding and Engineering Works
V.N.G. Rao, Managing Director,

Ingifluid Boilers, India, Ltd.
G. Trivedi, Corporate Planning,
Thermax, Ltd.

● **Evaluation of Biological Formulations for Industrial Wastestreams Treatment**-- U.S. Biotech Inc. of New Jersey and Premier Ziba, Ltd. of New Delhi are exploring the transfer of biological (bacterial) formulations for use in treating industrial wastestreams in India. Under this exchange, representatives of Premier Ziba will visit U.S. Biotech, Inc. facilities for further discussions and evaluations as a precursor to test marketing products to sugar processing, tannery, and sewage treatment industries in India. This exchange includes cost sharing with the TEST program. Project initiation: June, 1994.

3 EBEs from India to the U.S.:

Govind Srivastav, Lakshman
Srivastav, and Dr. Jaganathan,
Premier Ziba

● **Evaluation of Solar Photovoltaic Technology**-- Suryashakti Systems, Pvt. Ltd., manufacturers solar photovoltaic power components and other renewable energy devices. The purpose of this exchange is to review U.S. technology in photovoltaics with the goal of forming joint ventures with U.S. firms. U.S. companies tentatively identified for the visit include: Radoo Products, Texas Instruments, BSAR Solar. Project initiation: July, 1994.

2 EBEs from India to the U.S.:

Upendra Kamdar, Managing Director,
Vinay Kamdar, Director, Suryashakti
Systems

Indonesia

● **Sharing of GIS and Remote Sensing Expertise** -- The AHT Group of Indonesia is interested in U.S. experience and expertise in geographic information systems (GIS) and remote sensing. More specifically, AHT is pursuing an Asian Development Bank-funded project to develop the marine and Coastal Information System, a component of the Marine Resources Evaluation and Planning Project and has identified U.S. expertise as necessary to the project. Project initiation: May, 1994.

1 EBE from U.S. to Indonesia:

Fran Stetina, International Data
Systems, Office/Goddard Flight
Center

Korea

● **Assessment of U.S. Water Treatment Technology**-- The City of Pusan, Korea has embarked on an ambitious infrastructure building initiative that includes the construction of sewage treatment facilities. Under this exchange, two officials from Pusan will travel to the U.S. and survey wastewater treatment facilities in several U.S. cities including: San Francisco, CA, Denver, CO, and El Paso, TX. CH2M Hill is the U.S. host for this visit. Project initiation: June, 1994

2 EBEs from Korea to U.S.:

Sang Hyoun Kim, Director General of

Sewage Department, Construction Bureau
and Dr. Yoo Chan Jun, Senior Researcher,
Research and Training Institute, Pusan City

Malaysia

● Waste Water Monitoring Technology Evaluation -- HF Scientific is exploring technology transfer opportunities with Yomart Environmental Systems Sdn Bhd. of Malaysia. Yomart is interested in demonstrations of waste water monitoring equipment that might have wide application in the Malaysian marketplace. Project initiation: September, 1994.

1 EBE from U.S. to Malaysia:

Robert J. Maley, President, HF
Scientific

Philippines

● Philippine National Oil Company (PNOC) Technology Assessment -- A consortium led by the California Energy Company have entered into a contract to assist PNOC in developing geothermal power. Hydrogen sulphide emissions are a major concern at geothermal sites, and the government has recently passed stringent regulations regarding H₂S emissions. As part of this project, exchanges have been designed that will allow for the training of PNOC officials on the chemistry dependent nature of hydrogen sulphide control options, and also allow for a tour of US companies manufacturing alternative treatment systems. Project initiation: August, 1994

3 EBEs from Philippines to U.S.:

Rafael Bernardo, Senior Engineer;
Samson Javellana, Manager,
Geothermal Division; Mike De Jesus,
Engineer, PNOC

Thailand

● Orlando, Florida/Songkhla, Thailand, Twinning Exchange -- RHUDO, USAID/Thailand requested US-AEP support for developing a twinning relationship between the cities of Orlando, Florida, and Songkhla, Thailand. Under this exchange public works officials from the two cities would discuss common problems and share possible solutions. The proposed twinning would be conducted in two phases. Individuals who would be participating in this exchange from Thailand are: the Songkhla Director of Engineering, the City Manager, and either the Mayor or Deputy Mayor. A second phase of the program would send two officials from Orlando, and one private sector representative to Thailand. Project initiation: June, 1994.

3 EBEs from Thailand to the U.S.:

TBA

3 EBEs from U.S. to Thailand:

TBA



To: Joyce Coffee
From: Swarupa Ganguli
Date: August 8, 1994
Subject: Monthly Report, July, 1994
Fax: (202) 835-0366

1. CURRENT ACTIVITY STATUS

India

● **Evaluation of Solar Photovoltaic Technology**-- Suryashakti Systems, Pvt. Ltd., manufacturers solar photovoltaic power components and other renewable energy devices. The purpose of this exchange is to review U.S. technology in photovoltaics with the goal of forming joint ventures with U.S. firms. U.S. companies tentatively identified for the visit include: Radoo Products, Texas Instruments, BSAR Solar. Project initiation: July, 1994.

2 EBEs from India to the U.S.: Upendra Kamdar, Managing Director,
Vinay Kamdar, Director, Suryashakti
Systems

● **Waste-to-Energy Technology Assessment** --Under this exchange, Western Paques India Ltd. (WPIL), an Indian environmental engineering company, will travel to the U.S. to assess options for joint ventures and technology transfer. WPIL plans to build an effluent and solid waste treatment plant to generate 2000 MW by 2010 based on waste-to-energy technology. Project initiation: September, 1994.

2 EBEs from India to the U.S.: A.D.Jalagokar, Senior Vice President;
Dilip Kulkarni, General Manager,
Western Paques, Ltd. (WPIL)

Indonesia

● **Factory Assessments for the Plywood Industry** --USAID/Indonesia requested WEC assistance in providing factory assessments for the plywood industry. Under this exchange, U.S. experts will travel to Indonesia and engage in up to five factory assessments and a brief workshop for industry and government officials. Project initiation: September, 1994.

2 EBEs from U.S. to Indonesia: Dan Sjolseth, Weyerhaeuser
Albert Fellows, Boise Cascade Corp.
(rtrd.)

● **Technology Assessment for Infrastructure Projects in Indonesia**-- The US-AEP infrastructure representative in Jakarta has requested participation in the EBE program by 3-4 Indonesian engineers involved in the development of Bumi Serpong Damai, a town being developed on the outskirts of Jakarta. The development plan includes establishment of water distribution and collection and sewage treatment. The Indonesians who will participate in this exchange are interested in mechanical/electrical equipment, pipe, and pumping station designs. Project initiation: September, 1994.

3 EBEs from Indonesia to the U.S.:

TBA

Malaysia

● **Waste Water Monitoring Technology Evaluation** – HF Scientific is exploring technology transfer opportunities with Yomart Environmental Systems Sdn Bhd. of Malaysia. Yomart is interested in demonstrations of waste water monitoring equipment that might have wide application in the Malaysian marketplace. Project initiation: September, 1994.

1 EBE from U.S. to Malaysia:

Robert J. Maley, President, HF Scientific

Philippines

● **Philippine National Oil Company (PNOC) Technology Assessment** -- A consortium led by the California Energy Company have entered into a contract to assist PNOC in developing geothermal power. Hydrogen sulphide emissions are a major concern at geothermal sites, and the government has recently passed stringent regulations regarding H₂S emissions. As part of this project, exchanges have been designed that will allow for the training of PNOC officials on the chemistry dependent nature of hydrogen sulphide control options, and also allow for a tour of US companies manufacturing alternative treatment systems. Project initiation: August, 1994

3 EBEs from Philippines to U.S.:

Rafael Bernardo, Senior Engineer;
Samson Javellana, Manager,
Geothermal Division; Mike De Jesus,
Engineer, PNOC

Taiwan

● **TEPA Review of U.S. experiences in Wastewater and Harbor Management**-- The AIT is facilitating the visit to the U.S. of a delegation of Taiwan county environmental directors, primarily to view U.S. activities and achievements in harbor and wastewater management. The delegation visit Boston, Chicago, and Honolulu. U.S. companies hosting the delegation in each city are: CDM, Inc., WMX, and CH2M Hill International. WEC is assisting in arranging appropriate itineraries for the delegation on-the-ground logistics. Project initiation: June, 1994.

9 EBEs from Taiwan to U.S.:

Li Kung-cheh, Commissioner, EP
Dept. of Taiwan Provincial
Government

Chu Liu-chao, Director, Bureau of
Environmental Protection, Hua-lien
County

Huang Sheng-fa, Director, Bureau of
Environmental Protection, Changhua
County

Wu Tien-chi, Director, Bureau of

Environmental Protection, Chiayi
County

Hong Chin-tien, Director, Bureau of
Environmental Protection, Kaoshiung
County

Kuo Kun-ming, National Institute of
Environmental Training, EPA

Huang Chi-lin, Taitung County EP
Director

Wu Gin-son Director, Bureau Public
Health and Environment, Kinmen

Liu Cheng-ying, Director, Bureau of
Public Health and the Environment,
Lien-chieng County

Thailand

● **Orlando, Florida/Songkhla, Thailand, Twinning Exchange** -- RHUDO, USAID/Thailand requested US-AEP support for developing a twinning relationship between the cities of Orlando, Florida, and Songkhla, Thailand. Under this exchange public works officials from the two cities would discuss common problems and share possible solutions. The proposed twinning would be conducted in two phases. Individuals who would be participating in this exchange from Thailand are: the Songkhla Director of Engineering, the City Manager, and either the Mayor or Deputy Mayor. A second phase of the program would send two officials from Orlando, and one private sector representative to Thailand. Project initiation: August, 1994.

3 EBEs from Thailand to the U.S.:

TBA

3 EBEs from U.S. to Thailand:

Octavio Serrano, Director of Solid
Waste, and David Metzker, Director
of Public Works, City of Orlando,
Florida

Chip Swindell, Vice President,
Ecotech Consultants

● **Pacific Adobe Technology Transfer Exchange** -- Pacific Adobe, a leader in the earth building industry, manufactures a variety of earth press machines suitable for transportation to rural and remote areas. The company has a demonstration development established in Chiang-Mai, Thailand. Under this exchange, Pacific Adobe will meet with Mahaphant Fibre-Cement Co., a Thai consortium that is a likely distributor, and Sahakol, that is interested in manufacturing the equipment in Thailand. Project initiation: July, 1994.

3 EBEs from U.S. to Thailand:

Forest Sprague, President, Pacific
Adobe

Joe Simpson, President/owner,
TECFAR

Ed Davis, Mechanical Design
Computer Specialist

Multi-Country Exchanges

• **Medical Waste Technology Assessment**-- Business representatives from Indonesia, Hong Kong, and Singapore have all expressed interest in EBEs that address U.S. medical waste treatment technologies. WEC is conducting a 15 person exchange program for industry, hospital, and government officials from all of these countries. The exchange will include visits to facilities that employ and manufacture medical waste incinerators, autoclaves, radiation equipment and sharps containers. Project initiation: August, 1994.

15 EBEs

TBA

2. SUCCESSES

ITRI completed the evaluation of WEC's Cooperative Agreement (CA) with the US-AEP program. This evaluation has been provided to the US-AEP Secretariat for comment.



To: Joyce Coffee
From: Swarupa Ganguli
Date: September 1, 1994
Subject: Monthly Report, August, 1994
Fax: (202) 835-0366

1. CURRENT ACTIVITY STATUS

Bangladesh

• **Factory Assessment of the Tannery Industry**-- USAID/Dhaka has requested WEC assistance in performing pollution prevention assessments of tannery facilities in the Hazaribagh areas of Dhaka. Project initiation: September, 1994

2 EBEs from U.S. to Bangladesh:

Lawrence Barber, Director of Manufacturing (Rtrd.), A.C. Lawrence Leather Company

Mark Pferffle, Environmental Economist, Science Applications International Corporation

Hong Kong

• **Environmental Technology Transfer Program**-- WEC is facilitating a technology transfer business exchange for Coleman Energy and Environmental Systems. Vasford Industrial, Ltd., of Hong Kong is particularly interested in Coleman's ground penetrating radar and time domain electromagnetic buried object detector and wireless remote surveillance/monitoring system. Project initiation: September, 1994.

3 EBEs from U.S. to Hong Kong:

Martin Yarborough, Vice President; Bradley Kabanuk, Manager; Frank Jesse, International Corporate Counsel; Coleman Energy & Environmental Systems

India

• **Fly Ash Utilization Technology Assessment** -- Representatives from Viking Systems International, International Business Development Corporation, and Re Use Technology are interested in traveling to India to evaluate the market for commercial applications of fly-ash utilization. While in India, they will meet with Unitech, India's foremost company in construction and real estate. Unitech has shown an interest in utilizing flyash in making concrete. They will also meet with other Indian companies with similar interests as potential partners for their projects.

3 EBEs from India to the U.S.:

Jack Saluja, President, Viking Systems International

Carl T. Bell, President, International
Business Development Corporation,
and Howard B. Fitzgerald, ReUse
Technology

● Waste-to-Energy Technology Assessment --Under this exchange, Western Paques India Ltd. (WPIL), an Indian environmental engineering company, will travel to the U.S. to assess options for joint ventures and technology transfer. WPIL plans to build an effluent and solid waste treatment plant to generate 2000 MW by 2010 based on waste-to-energy technology. Project initiation: September, 1994.

2 EBEs from India to the U.S.:

A.D. Jalagokar, Senior Vice President;
Dilip Kulkarni, General Manager,
Western Paques, Ltd. (WPIL)

Indonesia

● Factory Assessments for the Plywood Industry --USAID/Indonesia requested WEC assistance in providing factory assessments for the plywood industry. Under this exchange, U.S. experts will travel to Indonesia and engage in up to five factory assessments and a brief workshop for industry and government officials. Project initiation: September, 1994.

2 EBEs from U.S. to Indonesia:

Dan Sjolseth, Weyerhaeuser
Albert Fellows, Boise Cascade Corp.
(nrd.)

● Technology Assessment for Infrastructure Projects In Indonesia-- The US-AEP infrastructure representative in Jakarta has requested participation in the EBE program by 3-4 Indonesian engineers involved in the development of Bumi Serpong Damai, a town being developed on the outskirts of Jakarta. The development plan includes establishment of water distribution and collection and sewage treatment. The Indonesians who will participate in this exchange are interested in mechanical/electrical equipment, pipe, and pumping station designs. Project initiation: September, 1994.

3 EBEs from Indonesia to the U.S.:

TBA

Malaysia

● Waste Water Monitoring Technology Evaluation -- HF Scientific is exploring technology transfer opportunities with Yomart Environmental Systems Sdn Bhd. of Malaysia. Yomart is interested in demonstrations of waste water monitoring equipment that might have wide application in the Malaysian marketplace. Project initiation: September, 1994.

1 EBE from U.S. to Malaysia:

Robert J. Maley, President, HF
Scientific

Philippines

● **Philippine National Oil Company (PNOC) Technology Assessment** – A consortium led by the California Energy Company have entered into a contract to assist PNOC in developing geothermal power. Hydrogen sulphide emissions are a major concern at geothermal sites, and the government has recently passed stringent regulations regarding H₂S emissions. As part of this project, exchanges have been designed that will allow for the training of PNOC officials on the chemistry dependent nature of hydrogen sulphide control options, and also allow for a tour of US companies manufacturing alternative treatment systems. Project initiation: August, 1994

3 EBEs from Philippines to U.S.:

Rafael Bernardo, Senior Engineer;
Samson Javellana, Manager,
Geothermal Division; Mike De Jesus,
Engineer, PNOC

● **Waste-to-Energy Technology Evaluation**-- YSC has developed a waste-to-energy system suitable to the particular needs of Philippine waste management. The system will process high moisture content municipal solid waste (MSW) through a hydrolysis and fermentation process that yields both a lignin like material that can be burnt. Under this exchange, officials of MMA will visit the U.S. to evaluate this technology. Project initiation: September, 1994.

4 EBEs from Philippines to U.S.:

Mayor Jose Oreta, MMA, co-chair of
EXCOM
Senator Ramon Revilla, Chairman,
Public Works Committee
Mr. Griselda J.G. Bausa, Director,
Energy Resource Development
Bureau
Mr. Rodrigo Yu Fuentes, Director,
Environmental Management Bureau,
MMA

Singapore

● **Evaluation of Wastewater Treatment Systems**-- Under this exchange, Pacific Vinitex Pte. Ltd., of Singapore met with Hoffman Environmental, Inc. and Blue Pacific Environmental Services, Inc. to learn more about chemical wastewater treatment systems and explore possible licensing and joint venture agreements. Project initiation: August, 1994

2 EBEs from Singapore to the U.S.:

Chua Boon Tat, Executive Director,
and Lim Eng Chuan, Business
Development Manager, Pacific
Vinitex Pte., Ltd.

Taiwan

● **TEPA Review of U.S. experiences in Wastewater and Harbor Management**-- The AIT is facilitating the visit to the U.S. of a delegation of Taiwan county environmental directors, primarily

to view U.S. activities and achievements in harbor and wastewater management. The delegation visit Boston, Chicago, and Honolulu. U.S. companies hosting the delegation in each city are: CDM, Inc., WMX, and CH2M Hill International. WEC is assisting in arranging appropriate itineraries for the delegation on-the-ground logistics. Project initiation: June, 1994.

9 EBEs from Taiwan to U.S.:

Li Kung-cheh, Commissioner, EP
Dept. of Taiwan Provincial
Government

Chu Liu-chao, Director, Bureau of
Environmental Protection, Hua-lien
County

Huang Sheng-fa, Director, Bureau of
Environmental Protection, Changhua
County

Wu Tien-chi, Director, Bureau of
Environmental Protection, Chiayi
County

Hong Chin-tien, Director, Bureau of
Environmental Protection, Kaoshiung
County

Kuo Kun-ming, National Institute of
Environmental Training, EPA

Huang Chi-lin, Taitung County EP
Director

Wu Gin-son Director, Bureau Public
Health and Environment, Kinmen

Liu Cheng-ying, Director, Bureau of
Public Health and the Environment,
Lien-chiang County

Thailand

●Orlando, Florida/Songkhla, Thailand, Twinning Exchange -- RHUDO, USAID/Thailand requested US-AEP support for developing a twinning relationship between the cities of Orlando, Florida, and Songkhla, Thailand. Under this exchange, public works officials from the two cities would discuss common problems and share possible solutions. The proposed twinning would be conducted in two phases. Individuals who would be participating in this exchange from Thailand are: the Songkhla Director of Engineering, the City Manager, and either the Mayor or Deputy Mayor. A second phase of the program would send two officials from Orlando, and one private sector representative to Thailand. Project initiation: August, 1994.

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3 EBEs from Thailand to the U.S.:

TBA

3 EBEs from U.S. to Thailand:

Octavio Serrano, Director of Solid Waste, and David Metzker, Director of Public Works, City of Orlando, Florida

Chip Swindell, Vice President, Ecotech Consultants

● **Pacific Adobe Technology Transfer Exchange** -- Pacific Adobe, a leader in the earth building industry, manufactures a variety of earth press machines suitable for transportation to rural and remote areas. The company has a demonstration development established in Chiang-Mai, Thailand. Under this exchange, Pacific Adobe will meet with Mahaphant Fibre-Cement Co., a Thai consortium that is a likely distributor, and Sahakol, that is interested in manufacturing the equipment in Thailand. Project initiation: July, 1994.

3 EBEs from U.S. to Thailand:

Forest Sprague, President, Pacific Adobe

Joe Simpson, President/owner, TECFAR

Ed Davis, Mechanical Design Computer Specialist

Multi-Country Exchanges

● **Medical Waste Technology Assessment**-- Business representatives from Indonesia, Hong Kong, and Singapore have all expressed interest in EBEs that address U.S. medical waste treatment technologies. WEC is conducting a 15 person exchange program for industry, hospital, and government officials from all of these countries. The exchange will include visits to facilities that employ and manufacture medical waste incinerators, autoclaves, radiation equipment and sharps containers. Project initiation: August, 1994.

15 EBEs

TBA

Lisa R.



To: Joyce Coffee
US-AEP/TR&D
From: Larry C. Lai *Larry C. Lai*
WEC/MTL Group, Inc.
Date: September 27, 1994
Subject: September Monthly Report

BANGLADESH

- U.S. experts departed for Dhaka to conduct pollution prevention assessments at 4 tannery facilities, and to review proposed government regulations and provide suggestions for industry financial incentives to encourage environmental compliance. Project initiation: September, 1994.
- 2 EBE from U.S. to Bangladesh: Lawrence Barber, Director of Manufacturing (Rtrd.) A. C. Lawrence Leather Company
Mark Pfefferle, Environmental Economist, Science Applications International Corporation

HONG KONG

- Arrangements have been completed for Coleman Energy and Environmental Systems to meet with Vastford Industrial Ltd. of Hong Kong to discuss Coleman's ground penetrating radar, time domain electromagnetic buried object detector, and wireless remote surveillance/monitoring system. Project initiation: October, 1994.
- 3 EBEs from U.S. to Hong Kong: Martin Yarborough, Vice President; Bradley Kabanuk, Manager; Frank Jesse, International Corporate Counsel; Coleman Energy & Environmental Systems

INDIA

- With a shift in focus, planning continues for a waste-to-energy technology assessment mission for Western Pacques India Ltd. (WPIL). The Western Pacques exchange will now focus on technologies that derive energy from anaerobic digestion, rather than incineration of municipal wastes. This shift in focus has delayed the visit for approximately one month. Project initiation: October, 1994.
- 2 EBEs from India to the U.S.: A.D. Jaigaonkar, Senior Vice President; Dilp Kulkarni, General Manager; Western Pacques India Ltd. (WPIL)
- Discussions are continuing with the US-AEP technology representative in India to finalize the schedule for representatives of Ajinkyatara Cooperative Sugar to view U.S. technologies for biomass gasification using bagasse from sugar plants and concentrated spent washwaters from distillery operations. The tour will include: Thermo Chem Inc., Cratech, Hawaii Natural Energy Institute, Institute of Gas Technology, Battelle Columbus, and Bioenergy Development Corp. Project initiation:

~~September~~
October, 1994.

4 EBEs from India to the U.S.:

Abhaysinh Raje Bhonsle, Founder Chairman, Minister for Cooperation, Government of Maharashtra

Shivendrasinh Raje Bhonsle, Chairman, Vikramsinh H. Aparadh, Managing Director, L. Prabhakar, Technical Advisor, Ajinkyatara Company Cooperative Sugar Factory Ltd.

- Cooperating with the TEST program, plans have begun for representatives of Nuchem Ltd. to visit U.S. experts in biological waste treatment, facility audits, and the use of agricultural wastes for constructing light weight construction materials. Project initiation: October, 1994.

2 EBEs from India to U.S.:

P. Bham, Executive Director, and N. Sriram, Vice President of Technology and Operations, Nuchem Ltd.

INDONESIA

- The U.S. team performing factory assessments at plywood facilities arrived in Indonesia on schedule. However, because of forest fires the location and format of the assessments had to be changed. The experts showed flexibility and good humor in adapting to the situation. Project initiation: September, 1994.

2 EBEs from U.S. to Indonesia:

Dan Sjolseth, Weyerhaeuser

Albert Fellows, Boise Cascade Corp. (rtrd.)

- Planning has been completed for the arrival in the U.S. of Indonesian engineers involved in the development of Bumi Serpong Damai, a town being developed on the outskirts of Jakarta. The Indonesians will attend the WEF conference in Chicago and meet with representatives of U.S. companies, including Law International. Project initiation: October, 1994.

4 EBEs from Indonesia to the U.S.:

Ir. Thorlq Shohim, Planning Manager, Perusahaan Daerah Air Minton, Kabupaten Tangerang

Ir. Munawar Saleh, Urban Planning Manager, Ir. Rini Anggraini, Infrastructure Engineer, Trinawati Basuki, Quality Survey manager, P.T. Bumi Serpong Damal

KOREA

- Basic Envirotech meets with Han Kook Tire Company and explain the more salient features of their patented processes. Project initiation: September, 1994.

2 EBEs from U.S. to Korea:

John Basic, Jr., President, Peter Hage, International Marketing Manager, Basic Envirotech.

- Coordination activities continue with CH2M Hill to bring Pusan officials to the U.S. to view wastewater treatment technologies. Project initiation: October, 1994.

4 EBEs from Korea to U.S.: Sang Hyoun Kim, Director General of Sewage Department, Construction Bureau, and Dr. Yoo Chan Jun, Senior Researcher, Research and Training Institute; Ryu Jang-soo, Director of the Construction Bureau. Kim U-Bong, Section Chief, Sewage Treatment.

MALAYSIA

- Representatives of the Government of Malaysia were to have travelled to the U.S. during September to meet with the California Air Resources Board, the South Coast Air Monitoring District, as well as vendors of equipment. This experience was to have assisted the Malaysians in enacting their own vehicular emissions monitoring and enforcement program. However, due to a fire at the Kuala Lumpur International Airport, the visit has been postponed. Project initiation: October, 1994.

8 EBEs from Malaysia to the U.S.: Mohammed Supian, Assistant Commissioner of the Traffic Department

Alias Haji Sam, Superintendant of Police

Liew Siew Kim, Director, Haji Shamsuj Ariffin, Director of Enforcement, Land Transportation Department

4 TBA

- WEC is assisting a Malaysian consortium led by Namfa in identifying a U.S. partner with incineration capabilities, as they prepare to bid for a contract to privatize solid waste management services. Namfa is bearing all costs associated with this exchange. Project initiation: September, 1994.

3 EBEs from Malaysia to U.S.: Muhaimi Mustapha, Senior Vice President; Shamsuddin Hamid, Director of Operations; Robin Colquhoun, Project Manager, Namka Corp.

PHILIPPINES

- Representatives of the Philippine National Oil Company (PNOC) will visit California Energy Company in an exchange that will provide training for PNOC officials on the chemistry dependent nature of hydrogen sulphide control options, and include a tour of US companies manufacturing alternative treatment systems. Project initiation: September, 1994.

5 EBEs from Philippines to U.S.: Herman Guillen, Engineering Design Manger; Hermes Ferrer, Geoscientific Manager; Dwight Maxino, production manager, Romy Jabonillo, Process and Instrumentation Coordinator; Frances Dolor, Planning Manager, Philippine National Oil Company (PNOC)

- YSC has developed a waste to energy system suitable to the particular needs of Philippine waste management. The system will process high moisture content MSW through a hydrolysis and fermentation process that yields both a lignin like material that can be burned, and chemicals for sale. Under this exchange officials of MMA will visit the U.S. to evaluate this technology. Project initiation: October, 1994.

8 EBEs from Philippines to U.S.:

Senator Ramon Revilla, Chairman Public Works Committee

Rodrigo Yu Fuentes, Director, Environmental Management Bureau, MMA

Prospero I. Oreta, Mayor of Malabon

Jessie L. Todoc, Energy Regulation Officer, Department of the Environment

Ofelia P. Monroy, Technical Aide to Mayor Oreta

Natividad M. Sibal, Legal Advisor to Mayor Oreta

Abelardo R. Topacio, Aid to Senator Revilla

Dionisio Delaserna, Chairman, Housing and Urban Development.

- WEC is working with the Florida International Trade Development Office to arrange a visit for Jomar Ochoa of USAID/Philippines. Mr. Ochoa will visit a variety of Florida fruit and seafood businesses and institutions, with an emphasis on environmental controls, use of pesticides, and food collection and storage. He will also visit a citrus peel/solvent factory.

TAIWAN

- Planning continues for a visit to China Steel Corporation in Kaoshiung by Energy and Environmental Research Corporation (EER), who will be discussing their technology for controlling NOx and SOx emissions from their industrial furnaces and boilers. Project initiation: October 1994.

THAILAND

- McGill Environmental Systems (MES) travelled to Chiang Mai and completed engineering and budgeting activities, finalizing arrangement to establish a solid waste transfer station. Project initiation: September, 1994.

2 FBEs from U.S. to Thailand:

James McGill, President, and Styre Hanson, Engineer, McGill Environmental Systems

- Representatives of the Thailand Department of Teacher Education are visiting U.S. manufacturers of laboratory instruments, and universities to help develop specifications for the needed purchases. The delegation is also attending a laboratory instrumentation seminar in St. Louis. Project initiation: September, 1994.

7 FBEs from Thailand to U.S.

Sutep Pongsriwat, President, Chiangrai Teachers College, Assistant Professor of Biology

Dr. Saroj Theerailb, Assistant Professor of Chemistry, Ayudhaya Teachers College

Praluab Sooksomsoon, Assistant Professor of Chemistry,
Loei Teachers College

Visham Kongtawong, Associate Professor of Physics and
Electronics, Piboonsongkram Teachers College

Neet Julabat, Instructor of Physics and Electronics,
Petchaburi Teachers College

Boonsong Sapvethakarn'it, Instructor of Biology, Buriram
Teachers College

Puangnoi Tavomyutitam, Finance Officer, DTE

- Representatives of Thanburi Bus Body Company will visit Navistar International to explore the possibility of a joint venture to manufacture Navistar diesel engines for use in their buses. Project initiation: October, 1994.

3 EBEs from Thailand to the U.S.:

Kitti Khaorotham, Assistant Managing Director; Viravut Thongmitr, Engineering Manager; Narong Thongnim, Director, Thanburi Bus Body Company of Thailand



To: Joyce Coffee
US-AEP/TR&D

From: Larry C. Lai
WEC/MTL Group, Inc.

Date: October 28, 1994

Subject: October Monthly Report

BANGLADESH

- U.S. experts completed pollution prevention assessments at Dhaka tannery facilities, and provided suggestions for financial incentives to encourage environmental compliance.

2 EBE from U.S. to Bangladesh: Lawrence Barber, Director of Manufacturing (Rtrd.) A. C. Lawrence Leather Company

Mark Pfefferle, Environmental Economist, Science Applications International Corporation

HONG KONG

- Representatives of Coleman Energy and Environmental Systems met with Vastford Industrial Ltd., of Hong Kong to discuss Coleman's ground penetrating radar, time domain electromagnetic buried object detector, and wireless remote surveillance/monitoring system.

3 EBEs from U.S. to Hong Kong: Martin Yarborough, Vice President; Bradley Kabanuk, Manager; Frank Jesse, International Corporate Counsel; Coleman Energy & Environmental Systems

INDIA

- Planning continued for a waste-to-energy technology assessment mission for Western Pacques India Ltd. (WPIL). The Western Pacques exchange focuses on technologies that derive energy from anaerobic digestion. Project initiation: November, 1994.

2 EBEs from India to the U.S.: A.D. Jaigaonkar, Senior Vice President; Dilp Kulkarni, General Manager; Western Pacques India Ltd. (WPIL)

- After a temporary postponement, representatives of Ajinkyatara Cooperative Sugar will review technologies for biomass gasification using bagasse from sugar plants and concentrated spent washwaters from distillery operations. The tour will include: Thermo Chem Inc., Cratech, Hawaii Natural Energy Institute, Institute of Gas Technology, Battelle Columbus, and Bioenergy Development Corp. Project initiation: November, 1994.

4 EBEs from India to the U.S.: Abhavsini Rajee Bhonsle, Founder Chairman, Minister for Cooperation, Government of Maharashtra

Shivendrasinh Raje Bhonsle, Chairman, Vikramsinh H. Aparadh, Managing Director, L. Prabhakar, Technical Advisor, Ajinkyatara Company Cooperative Sugar Factory Ltd.

- Cooperating with the TEST program, representatives of Nuchem Ltd. visited U.S. experts in biological waste treatment, facility audits, and the use of agricultural wastes for constructing light weight construction materials. Project initiation: October, 1994.

2 EBEs from India to U.S.: P. Bharm, Executive Director, and N. Sriram, Vice President of Technology and Operations, Nuchem Ltd.

- Norwest Mine Services Inc. met with a number of private sector companies to explore possibilities for joint business ventures in Coal washery design, construction and operation. Norwest also met with government agencies to assess the impact of regulations on the ability of Norwest to compete in the Indian market place. Project initiation: October, 1994.

1 EBE from U.S. to India: Donovan Symonds, President, Norwest Mine Services Inc.

INDONESIA

- Indonesian engineers involved in the development of Bumi Serpong Damai, a town being developed on the outskirts of Jakarta, attended the WEF conference in Chicago and meet with representatives of U.S. companies, including Law International. Project initiation: October, 1994.

4 EBEs from Indonesia to the U.S.: Ir. Thoriq Shohim, Planning Manager, Perusahaan Daerah Air Minton, Kabupaten Tangerang

Ir. Munawar Saleh, Urban Planning Manager, Ir. Rini Angraini, Infrastructure Engineer, Trinawati Basuki, Quality Survey manager, P.T. Bumi Serpong Damai

KOREA

- Pusan City officials visited the U.S. to view wastewater treatment technologies. This visit was co-sponsored by CH2M Hill. Project initiation: October, 1994.

4 EBEs from Korea to U.S.: Sang Hyoun Kim, Director General of Sewage Department, Construction Bureau, and Dr. Yoo Chan Jun, Senior Researcher, Research and Training Institute; Ryu Jang-soo, Director of the Construction Bureau, Kim U-Bong, Section Chief, Sewage Treatment.

UEDC officials visited the U.S. to meet with U.S. companies interested in participating in wastewater and solid waste management projects in Korea. Companies visited included: IT Corp, Re-Tech, Plasma Technology, WMX, and Foster Wheeler. Project initiation: October, 1994.

4 EBEs from Korea to the U.S.: Kim Nak Kyung, President, Min Hoon-Ki, President, Park Kwang-Jii, Administrative Manager, UEDC

Kim Hak-Myung, President, Com-Tech Corp.

PHILIPPINES

- Officials of MMA visited YSC, Tennessee Valley Authority, and Black and Veatch and others, to learn more about YSC's technology for disposal of solid wastes. Project initiation: October, 1994.

8 EBEs from Philippines to U.S.:

Senator Ramon Revilla, Chairman Public Works Committee

Rodrigo Yu Fuentes, Director, Environmental Management Bureau, MMA

Prospero I. Oreta, Mayor of Malabon

Jessie L. Todoc, Energy Regulation Officer, Department of the Environment

Ofelia P. Monroy, Technical Aide to Mayor Oreta

Natividad M. Sibal, Legal Advisor to Mayor Oreta

Abelardo R. Topacio, Aid to Senator Revilla

Dionisio Delaserna, Chairman, Housing and Urban Development.

TAIWAN

- Planning continues for a visit to China Steel Corporation in Kaoshiung by Reaction Engineering International (formerly Energy and Environmental Research Corporation), who will be discussing their technology for controlling NOx and SOx emissions from their industrial furnaces and boilers. Project initiation: November, 1994.

THAILAND

- Representatives of Thanburi Bus Body Company were to have visited Navistar International to explore the possibility of a joint venture to manufacture Navistar diesel engines for use in their buses. USAID/Thailand decided to fund this project under the U.S. Thai Development Partnership rather than US-AEP.
- Public works officials from the Songkla, Thailand and Orlando, Florida discussed common problems facing their growing cities and share possible solutions. Project initiation: October, 1994.

8 EBEs from Thailand to the U.S.:

Prachopti Agouru, mayor, Wilai Slsuntorn, City Manager, Vera Intarakul, Director of Sanitary Engineering, Vesal Kiatpaiboon, Deputy mayor, Banjit Panrangsie, Chief of Solid Waste Collection, Boonsanguan Vilairatana, Director of Finance, Amornluck Intasay, Chief of Public Relations, Sukhon Tapitson, Director of Health and the Environment



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To	WEC/MTL	From	Larry C. Lai
Co.	WEC/MTL	Co.	
Dept.		Phone #	
Fax #		Fax #	

To: Joyce Coffee
US-AEP/TR&D

From: Larry C. Lai *Larry C. Lai*
WEC/MTL Group, Inc.

Date: December 6, 1994

Subject: November Monthly Report

INDIA

- Planning continued for a waste-to-energy technology assessment mission for Western Pacques India Ltd. (WPIL). The Western Pacques exchange focuses on technologies that derive energy from anaerobic digestion. Project initiation: December, 1994.

2 EBEs from India to the U.S.: A.D. Jaigaonkar, Senior Vice President; Dilp Kulkarni, General Manager; Western Pacques India Ltd. (WPIL)

- Representatives of Ajinkyatara Cooperative Sugar reviewed technologies for biomass gasification using bagasse from sugar plants and concentrated spent washwaters from distillery operations. The tour included: Thermo Chem Inc., Cratech, Hawaii Natural Energy Institute, Institute of Gas Technology, Battelle Columbus, and Bioenergy Development Corp. Project initiation: November, 1994.

4 EBEs from India to the U.S.: Vikramsinh H. Aparadh, Managing Director, L. Prabhakar, Technical Advisor, Ajinkyatara Company Cooperative Sugar Factory Ltd

P. Venkataramen, Managing Director, G. Ramanathan, General Manager, EASL.

- Vijayant Autocrafts is interested in reviewing U.S. technologies to develop a lubricating oil refining and blending plant. Synthetic lubricant oil manufacturing is also of interest. Project initiation: November, 1994.

1 EBEs from India to the U.S.: Harshad Tolia, Chairman and Managing Director, Vijayant Autocrafts.

INDONESIA

- WEC followed up with USAID/Indonesia regarding mission expressed interest in a follow on to the successful plywood waste minimization exchange completed in September 1994.

KOREA

- Environmental Technologies, USA (ET) meet with Sun Hill Glucose Co. Ltd. to explore business opportunities for collaboration in distributing products in Asia. Project initiation: November, 1994.

2 EBEs from U.S. to Korea:

Robin Young, President and CEO, Ed Boehmer, Chief Engineer, Environmental Technologies.

PHILIPPINES

- Interphil Laboratories, a Philippine pharmaceuticals manufacturer will meet with U.S. incinerator manufacturers capable of treating pharmaceutical wastes. Project initiation: November, 1994.

1 EBE from Philippines to U.S.:

Eduardo Cabrera, Vice President, Interphil Labs. Inc.

SRI LANKA

Maharaja Organization Ltd. of Sri Lanka visited the U.S. to meet with experts in plastics recycling, to identifying joint venture partners for recycling facilities in Sri Lanka. Project initiation: November, 1994.

2 EBEs from Sri Lanka to U.S.:

N.S. Perera, B.S. Manukulasuriya, Maharaja Organization Ltd.

TAIWAN

- Reaction Engineering International (formerly Energy and Environmental Research Corporation), met with China Steel to discuss REI technology for controlling NOx and SOx emissions from their industrial furnaces and boilers. Project initiation: November, 1994.

2 EBEs from the U.S. to Taiwan:

Michael Heap, President, Stoney Chen, Director of Business Development, Reaction Engineering International

THAILAND

- MACRO is a small Thai engineering design firm met with SCS Engineers, CH2M Hill, and Post, Buckley, Schuh & Jernigan, to assess their interest and capabilities in assisting in the development of the Prachathisat Sanitary District municipal landfill, and based on this collaboration pursue a strategic alliance. Project initiation: November, 1994

5 EBEs from Thailand to U.S.:

Supote Lohwacharin, Managing Director, Sompong Burintrathikul, Chief, Environmental Engineering Section, Wilairat Saifon, Senior Environmental Engineer, MACRO

Pranee Limtheansa, Environmental Engineer, Tammanoon Nuntasomboon, Environmental Engineer, PWD

MULTI-COUNTRY EXCHANGE

- Environmental Careers Organization (ECO) will meet with NGOs in Asia to determine the level of interest in setting up parallel organizations that might build linkages between the NGO and industrial communities. Countries visited under this exchange include India, Taiwan, Hong Kong, and the Philippines. Project initiation: November, 1994

2 EBEs from U.S. to Asia:

Diane Mailey, Program Manager, Tim Greinert, Technical Specialist, ECO



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To Lisa Anderson	From LARRY LAI
Co. IBM NY	Co.
Dept.	Phone #
Fax #	Fax #

To: Joyce Coffee
 US-AEP/TR&D

From: Larry C. Lai
 WEC/MTL Group, Inc.

Date: January 9, 1995

Subject: December 1994 Monthly Report

HONG KONG

China Light and Power Electric Vehicle Exchange -- China Light and Power (CLP) of Hong Kong explored opportunities for using U.S. technology in expanding their push in electric vehicles. Two officials from CLP followed up on past contacts with G.M. Hughes, Westinghouse, and Delco. They also viewed the latest technological developments at the EVS12 conference. Project initiation: December, 1994.

2 EBEs from Hong Kong to the U.S.: W.L. Brown, Liang Fleming, Special Projects Manager, China Light and Power

Hong Kong Productivity Council (HKPC) Electroplating Wastewater Recycling Tour -- The HKPC is interested in exploring U.S. technologies for recycling of wastewaters from plating operations. Under this exchange HKPC officials visited facilities using equipment or operated by DeWallace, U.S. Filter, and EMCAT. Project initiation: December, 1994.

2 EBEs from Hong Kong to US: Rudolph Wan, William Chan, Hong Kong Productivity Council

INDIA

ICOLP Technology Cooperation Project -- The International Cooperative for Ozone Layer Protection (ICOLP) participated in the EBE program to allow three experts to meet with Indian industry and government officials and discuss alternatives to the use of ozone depleting solvents (ODSs). ICOLP experts also provided council to Indian industry on submitting project proposals to phase out the use of ODSs to the Multilateral Fund of the Montreal protocol. Project initiation: December, 1994.

3 EBEs from U.S. to India: Urmi Ray, AT&T - Aqueous and semi-

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aqueous alternatives expert

Pratahp Reddi, Ford Motor Company -
No-Clean Technologies expert

Rano Basu Ray, ICOLP Project
Coordinator.

Indian Cogeneration Exchange -- Econergy International Corporation (EIC) represents a consortium of Duke Engineering Services, Lockheed Martin, Niagara-mohawk, and TransAlta Utilities Corp. Through previous activities EIC identified sites and sugar mills having potential for joint cogeneration projects using bagasse and other biomass fuels. Under this exchange EIC pursued negotiations which, if successful would result in 30 and 50 megawatt facilities. Project initiation: December 1994.

3 EBEs from U.S. to India:

Frederick P. Renner, Consortium Project
Manager, John Paul Moscarella,
Cogeneration Expert, EIC

Gene Minner, Engineer, NUS
Haliburton

Remote Environmental Monitoring Exchange -- Under this exchange Environmental Risk and Insurance Management Services (ERIMS) visited with Environmental Services Ltd. (ESL) of Anchorage, Alaska to assess ESL remote environmental monitoring equipment at use at U.S. installations. ERIMS also meet with International Solar Electric Technology regarding possible joint venture projects. Project initiation: December, 1994.

2 EBEs from India to the U.S.:

A.N. Kha, Vice President, Dr. B.A.
Giridhar, Deputy General Manager,
Environmental Risk and Insurance
Management Services

TAIWAN

Evaluation of Emissions Control Technologies -- China Steel Corporation in Kaoshiung evaluated Reaction Engineering International (formerly Energy and Environmental Research Corporation) technology for controlling NOx and SOx emissions from their industrial furnaces and boilers. Project initiation: November/December, 1994.

2 EBEs from U.S. to Taiwan:

Michael Heap, President, Dr. Philip
Smith, VP of Technology, Stoney Chen,
Director of Business Development,
Reaction Engineering International

5 EBEs from Taiwan to U.S.:

Sing-Tsu Tsai, Tsan-Ying Ho, Dr. Seng

Rung Wu, Kent C. T. Wu, H. J. Liu,
China Steel Corporation.

THAILAND

Pattana Group Review of U.S. Environmental Technologies -- Under this exchange, the Pattana Group, a Thai environmental engineering company, visited environmental companies in the Portland, Oregon area to review oil recycling technologies. A second leg of the exchange took representatives of Cascade Earth Sciences, Hydrokinetics Systems, and Northstar Environmental to Thailand to define specific project opportunities. Project initiation: October/December, 1994.

2 EBEs from Thailand to the US: Dr. Hansa Sanguanno, Dr. Payow Boonprakob, Pattana Group.

3 EBEs from U.S. to Thailand: Terry Rahe, President Cascade Earth Sciences

Ken Dunder, President, Hydrokinetic Systems

Jack Mahoney, Vice President, Northstar Environmental



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To	USA Landscapes	From	LARRY LAI
Co.	WEC/MTL	Co.	
Dept.		Phone #	
Fax #		Fax #	

To: Joyce Coffee
 US-AEP/TR&D

From: Larry C. Lai *Larry C. Lai*
 WEC/MTL Group, Inc.

Date: February 9, 1995

Subject: January 1995 Monthly Report

The following exchanges occurred during January 1995.

INDONESIA

U.S./Indonesia Joint Oil Spill Response Workshop -- The U.S. Minerals Management Service (MMS) in collaboration with the Indonesian Agency for Research and Assessment Technology (BPPT) hosted a joint oil spill response workshop. Under this exchange, US-AEP sponsored members of the U.S. private sector to make technical presentations.

- 4 EBEs from U.S. to Indonesia:
- Steve Blackburn, Marketing Director, MARCO
 - Bill Gourham, Senior Scientist/Program Manager, ENSR Consulting & Engineering
 - Terry Taylor, CEO, Global Industries Corporation
 - Rainer Engelhardt, Vice President of Research and Development, Marine Spill Response Corporation

SINGAPORE

Technology Transfer for Chemical Incineration -- Technochem Manufacturers Pte. Ltd. is interested in installing a waste oil recycling facility and chemical incinerator as part of a business expansion in industrial chemical waste management. Under this exchange, company officials visited the U.S. and tour U.S. manufacturers for a two-week period.

- 3 EBEs from Singapore to U.S.:
- Mr. Ng, Director; Robert Lim, Operations Manager; Ng We Wee, Chemist, Technochem Manufacturers Pte. Ltd.

TAIWAN

Descaling Technology Transfer -- Under this exchange Aqua-flo, Inc. held meetings with Kailay Engineering, the largest environmental controls and mechanical company in Taiwan to discuss possible joint venture opportunities.

- 1 EBE from U.S. to Taiwan:
- Alden L. Coke, President, Aqua-flo, Inc.

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Printing Industry Facility Assessments -- The Taiwan Industrial Development Bank requested assistance from U.S. experts in assessing pollution prevention and waste minimization opportunities in the printing industry.

2 EBEs from U.S. to Taiwan: Jeffrey Adrian, Environmental Director, The John Roberts Company
Gary Jones, Manager Environmental Information Office, the Graphic Arts Technical Foundation

THAILAND

Hotel Energy Audit Exchange -- Under this exchange Saangsan Consultants Ltd. Thailand met with Dorgan Associates, Inc., of Madison, Wisconsin, to share U.S. expertise in energy auditing procedures, the use of energy efficient technologies and storage systems, and other methods for reducing energy consumption. Potential projects have been identified in the hotel industry.

5 EBEs from Thailand to U.S.: Monthon Kumpengsath, Managing Director, Tossaporn Preedaphan, energy Audit Program Manager, Saangsan Consultants, Inc.
Dr. Chiraphol Sintunawa, Director, Association for Development of Environmental Quality
Bart Duykers, General Manager, The Boathouse Hotel
Wichit Na Ranong, President, Thai Hotel Association

MULTI-COUNTRY EXCHANGE

CITES Tour with U.S. Fish and Wild Life Service (USEWS) -- Nominees from the governments of the Philippines, Bangladesh, India, Indonesia, and Nepal participated in a U.S. Fish and Wildlife Service tour of customs facilities and procedures employed in Los Angeles and San Francisco, and also visit the USFWS forensics laboratory in Ashland, Oregon.

2 EBEs from Indonesia to U.S.: Ir. Dwiatmo Siswomartono, Director of Nature Reserve Management and Flora Fauna Conservation
Drs. IGNN. Sutadja, Head of Species Traffic Section

2 EBEs from Bangladesh to U.S.: Syed Salamat Ali, Deputy Chief Conservator of Forests, A.H.M. Monzurul Karim, Conservator of Forests

2 EBEs from Philippines to U.S.: Wilbur Dee, IPAS Director and concurrent Officer-in-Charge, Wildlife Resources Division, PAWS Chairman, Inter-Agency Wildlife Management Committee
Mary Jean Calenda, Officer-in-Charge Wildlife Resources Division, Vice Chairman, InterAgency Wildlife Management Committee, DENR Ninoy Aquino International Airport Wildlife Monitoring Team

2 EBEs from Nepal to U.S.: Hum Prasad Adhikari, and Thir Bahadur, G.C., National Parks and Wildlife Conservation

2 EBEs from India to U.S.:

S.K. Das, Deputy Director of Wildlife Preservation, Eastern Zone,
Calcutta, Surendra Kumar, Deputy Director of Wildlife
Preservation, Northern Region Delhi.B:mo

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To: Joyce Coffee
 US-AEP/TR&D

From: Larry C. Lai *Larry C. Lai*
 WEC/MTL Group, Inc.

Date: April 3, 1995

Subject: March 1995 Monthly Report

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To	<i>Lisa L</i>	From	<i>Larry Lai</i>
Co.	<i>wec/ny</i>	Co.	
Dept.		Phone #	
Fax #		Fax #	

The following exchanges occurred during March 1995.

HONG KONG

Solid Waste Landfill Exchange -- Canonic Environmental, an engineering design and geological services company has been in contact with several Hong Kong firms including: Garmon Engineering, Chun Wo Construction and Engineering, Enviro-Chem, and Square Construction Co., all interested in finding partners to pursue Hong Kong landfill projects that may total \$137 million.

2 EBEs from U.S. to Hong Kong: Neno Duplancic, P.E., Vice President and Brad Kordic, Business Development Manager, Canonic Environmental.

INDIA

Filter Exchange -- Uniixel Laser is a manufacturer of stainless steel filters for treating wastestreams from the organic chemical industry. They are interested in meeting with U.S. firms that might license welding technology for sintered stainless steel. U.S. partners may include: Applied Energy Systems, Texcel and Alabama Technologies.

1 EBEs from India to U.S.: S. Nagarwami, Managing Director, Uniixel Laser

Environmental Services Exchange -- Vimta Labs is interested in strengthening their capabilities for analysis of dioxins and furans, conducting environmental assessments, environmental auditing, and bioremediation. Participants in the tour will include: Harding Lawson, Law Engineering, and Tighe and Bond.

2 EBEs from India to U.S.: Dr. S.P. Vasireddi, Chairman and Managing Director, Vimta Labs
 Dr. K.S.M. Rao, Director of Laboratory and Technical manager

KOREA

Solid Waste Management Technology Exchange -- EMC is visiting the U.S. to view solid waste management technologies. EMC has plans for 6 new incineration facilities over the next five years. The tour will likely include: Molten Metal Technology in Connecticut, the Freshkill Landfill in New York, IT Corp. in Louisiana, Wheelerbrator in Florida, and ReTec in California. Project imitation: March, 1995.

3 EBEs from Korea to U.S. Bok Jin Poong, Chairman, Kang, Ho-Jik, Manager/Waste Treatment Division, Lee, Jun-Heung, Assistant Manager EMC

MULTI-COUNTRY EXCHANGE

GEMI Conference -- The Global Environmental Management Initiative (GEMI) is an organization dedicated to promoting environmental excellence by the business community. ASEAN EIP proposed 4 candidates to

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attend the GEMI annual conference under the US-AEP's Environmental Business Exchange Program.

- 1 EBE from Singapore to U.S.: Jayaram Mennon, Director Manufacturing Services, Singapore Manufacturer's Association
- 1 EBE from Indonesia to U.S.: Ismid Hadad, President and Director, Resource Development Consultants
- 1 EBE from Malaysia to U.S.: Wong Soo Kan, Safety and Quality Audit Manager, Malaysian Oxygen Bhd.
- 1 EBE from the Philippines to U.S.: Arnold Salvador, Executive Director, Management Association of the Philippines



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US

March 3, 1995

To: Joyce Coffee
US-AEP/TR&D

From: Larry C. Lai *Larry C. Lai*
WEC/MTL Group, Inc.

Subject: February 1995 Monthly Report

The following exchanges occurred during February, 1995.

INDIA

Catalytic Converter Exchange -- Dyna-K plans to manufacture metallic monoliths for catalytic converters. Under this exchange they visited U.S. companies with an interest in the Indian market. Project initiation: February, 1995.

1 EBE from India to U.S.: C.F. Dias, Executive Director, Dyna-K Stampings

Demand Side Management Exchange -- Under this exchange the Ahmedabad Electricity Company of India and the Resources Development Foundation (RDF) pursued demand side management opportunities in India. RDF provided the electric company with information on financing DSM and supply-side activities and on DSM planning and implementation. Project initiation: February, 1995.

2 EBEs from U.S. to India: Subash Chandra, Principal, Charter Oak Energy
Kevin Fitzgerald, RDF consultant.

Energy Conversion Devices Exchange -- Under this exchange Ovonic Battery Company, a subsidiary of Energy Conversion Devices, Inc., held discussions with interested parties on the design and construct a fleet of two wheeled electric vehicles powered by proprietary nickel metal hydride rechargeable battery technology. Ovonic held meeting with government and industry representatives with the goal of forming joint ventures for the commercialization of the battery technology. Project initiation: February, 1995.

5 EBEs from U.S. to India: Nancy M. Bacon, Senior Vice President, Energy Conversion Devices, Inc
Subhash Dhar, President, Anthony Osgood, Engineer, Raymond Himmler, Battery Engineer, Ovonic Battery Company
Subhendu Cruhn, Vice President, United Solar Systems Corporation.

KOREA

Air Pollution Alert Exchange -- Four Korean government officials visited USEPA Region 5 and the South Coast Air Quality Control Board to gain familiarity with U.S. technology and methods for monitoring air

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pollution and alerting the public about pollution levels. Project initiation: February, 1995.

4 EBEs from Korea to U.S.:

Choi Ryong-II, Director, Hoo Woo-Young, Assistant Director, Air Quality Policy Division, Ministry of the Environment

Choi Soo-Kun, Director, Han River Environmental Management Office, Ministry of the Environment

Youn Hyeog-Sig, Assistant Director, Environmental Protection Division, Incheon Metropolitan City

SRI LANKA

Moratuwa-Ratmalana Waste Minimization Project -- USAEP/WEC is assisting this project by providing industrial and institutional experts to assess opportunities for waste minimization and recommend facilities most appropriate for waste minimizations grant/loan programs and participation in public outreach efforts. Project initiation: February, 1995.

2 EBEs from U.S. to Sri Lanka:

Don Brosky, Pollution Prevention Specialist, 3M

Burt Hamner, Pollution Prevention Manager, Shapiro and Associates

Infrastructure Development Exchange -- Under this exchange Lalitha Jayaraman, Director, Environmental Infrastructure Unit, Secretariat for Infrastructure Development and Investment - a USAID sponsored activity to develop and facilitate BOO/BOT projects in Sri Lanka, will attend the International Law Institute (ILI) conference on Financing Urban Environmental Infrastructure in Bangkok. Project initiation: February, 1995.

1 EBE from Sri Lanka to Thailand:

Lalitha Jayaramanam, Director, Environmental Infrastructure Unit, Secretariat for Infrastructure Development and Investment

THAILAND

Financing Urban Environmental Infrastructure -- The International Law Institute held a conference in Bangkok on Financing Urban Environmental Infrastructure. The conference was designed to bring together U.S. firms with Thai municipal authorities, ministry officials, law firms, and commercial banks to explore the benefits of private sector financing. Project initiation: February, 1995.

5 EBEs from U.S. to Thailand:

Howard Fry, Attorney, Blank, Rome, Comisky and McCauley

Dr. Ghon Rhee, Pacific-Basin Capital Markets Research Center, University of Rhode Island

George Peterson, The Urban Institute

Rebecca Merrell, International Law Institute

Michael Carley, Attorney

Electric Vehicle Exchange - U.S. Electricar, Inc. participated in the exchange program to hold meetings with the CEO Club of Thailand aimed at forming a joint venture. The company also exhibited a bus, scooter, and industrial vehicles at the Board of Investment Fair. Project initiation: February, 1995

2 EBEs from U.S. to Thailand:

Tom Hakel, President, Paul Kohlman, Field Engineer,
Electrical Systems, U.S. Electricar.

MULTI-COUNTRY

Conservation Program Exchange -- In cooperation with the Smithsonian Institution, US-AEP is undertaking this exchange to conduct an initial survey to identify American and Asian areas and institutions, their capabilities, needs, and expressions of interest to participate in a Conservation Exchange Program (CEP). The survey is focusing on national parks, zoos, aquariums, botanical gardens, natural history museums, and other appropriate areas to identify opportunities for "US to Asia" and "Asia to US" exchanges of fellowships, research, education, outreach and awareness programs, and training in fund raising efforts. Project initiation: February, 1995.

1 EBE from U.S. to Thailand/
Malaysia/Indonesia/Philippines

Dr. Michael Stuewe, Consultant

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To: Joyce Coffee
US-AEP/TR&D

From: Larry C. Lai *Larry C. Lai*
WEC/MTL Group, Inc.

Date: May 15, 1995

Subject: Monthly Report for April 1995

The following exchanges occurred during April 1995.

Delegation to Waste Expo '95 -- A delegation of Indian industry, municipal and central government visited the Waste Expo '95 in Chicago.

8 EBEs from India to U.S.

Surjit K. Chaudhary, Municipal Commissioner Madras Municipal Corporation

Dr. S.R. Maley, Vice President, Biotech Exel Industries Ltd.

Kunti Oza, Chairperson. Clean Bombay Foundation

C.M. Vij, Director and Chief Engineer, Municipal Corporation of Delhi

Tarun Khatwani, Manager, Project Development, Industrial Plants and Waste Treatment

Asim Barman, Calcutta Municipal Corporation

Dr. Saroj Nagpal and Dr. A.B. Akolkar, Central Pollution Control Board, Ministry of Environment and Forestry

Catalytic Converter Exchange -- Dyna-K plans to manufacture metallic monoliths for catalytic converters. Currently, fabricating these elements are expensive as imports and are not manufactured by the Indian company. Under this exchange they visited U.S. companies with an interest in the Indian market.

1 EBE from India to U.S.:

C.F. Dias, Executive Director, Dyna-K Stampings

The Eastern Water Resources Development and Management Company, Ltd -- Eastern Water was established by the Provincial Waterworks Authority (PWA) and charged with the management of scarce water resources on the Eastern Seaboard. This U.S. tour provided the President and CEO with exposure to water supply and distribution equipment, and institutions with expertise in sound water resources management, pricing policies, and water reclamation and conservation. Meetings were held with: Global Environment Fund, American Clean Water Foundation, LAW International, Ecotech Consultants, Water Resources Research Institute, Water Management District of Southern California, and the California Water Resources Control Board.

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1 EBE from Thailand to the U.S.: Dr. Wanchai Ghooprasert, President and CEO, Provincial Water Works Authority

Ecotourism Exchange -- USAID/Jakarta requested participation in the EBE program by Keith Sproule and Karen Ziffer of Private Agencies Collaborating Together (PACT), to assist in the development and presentation of an ecotourism workshop. The workshop, planned for April 18 through 20th, addressed awareness, knowledge, planning, and implementation of sound ecotourism initiatives.

2 EBEs from U.S. to Indonesia: Keith Sproule, Karen Ziffer, PACT

Air Monitoring Technology Exchange -- Norman dela Cruz, President of First Signs participated in the EBE program and viewed U.S. particulate monitoring (EM10) equipment. Vendors included on this exchange were: Thermo Environmental Instruments, CB Corporation, Graebby/Nutech, Wetting and Associates, Clean Air Engineering, Napp Inc., and Econ America Ltd.

1 EBE from the Philippines to U.S.: Norman dela Cruz, President, First Signs



To: Joyce Coffee
US-AEP/TR&D

From: Larry C. Lai *Larry C. Lai*
WEC/MTL Group, Inc.

Date: June 8, 1995

Subject: Monthly Report for May, 1995

The following exchanges occurred during May, 1995.

Bleaching and Dyeing Industry Exchange -- The Hong Kong Productivity Council participated in this exchange to evaluate U.S. clean technologies for the bleaching and dyeing industry, focusing on dyes and chemicals, low volume waste generating processes and equipment, and recovery systems for water, caustics, dyes, and heat. The group will visit: Gaston County Dye Manufacturing, Ciba Geigy, The Gap, Cotton, Inc., Scholl America, and North Carolina State University College of Textiles. Project initiation: May, 1995.

7 EBEs from Hong Kong to U.S.: Dr. Ellen Chan, Principal Environmental Protection Officer, Environmental Protection Department, Hong Kong Government

Raymond Leung, Senior Environmental Consultant, Management Division, Linus Wu, Associate Consultant, Textile and Apparel Division, Hong Kong Productivity Council

Wong Chi Wing, Supervisor, Repair and Maintenance Department, Satisfactory Printing and Dyeng Ltd.

K.K. Chan, Dep. Factory Manager, China Dyeing Holdings Ltd.

Chow Ming Cheung, Project Manager, Hing Fung Printing and Dyeing Co.

Leung Hing Ki, Plant Engineering Manager, Gold Wheat Investments Ltd.

Industrial Boiler Exchange -- As a follow up to a earlier exchange, a representative of the Indian company, Industrial Boilers Ltd. will visit the U.S. to finalize a Memorandum of Understanding with Combustion Association, Inc.

1 EBE from India to U.S.: R. R. Engineer, Vice President, Industrial Boilers Ltd.

Photovoltaic Technology -- The J.S. Group participated in the exchange program to review U.S. technologies and identify companies that might be interested in collaboration in India. The delegation visited: Spire, United Solar Systems Corporation, ISET, and Global Photovoltaic.

2 EBEs from India to the U.S.: Brig. N. N. Sharma, Senior Advisor, and R. Sainath, General

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Manager, J.S. Group.

Iron and Steel Industry Exchange -- ASEAN EIP has requested that representatives of the Philippine iron and steel industry visit the U.S. to review current environmental practices and technologies. Facilities included on the U.S. tour include: Davy International, I/N Tek, Plasma Energy, Consteel, NUCOR, and ESL.

5 EBEs from the Philippines to U.S.: Arther Florendo, Vice President, Bacnotan Steel Corp.
Felix Silva, Technical Consultant, Philippine Pipe and Foundry Corp.
Wilfredo Labayen, Executive Vice President, Phoenix Iron and Steel Corp.
Estefanio Gacad, Technical Services Manager, GST Philippines, Inc.
Lemuel E. Suan, Operations Engineer, Davao Steel Plant.

NOx Control Technology Exchange -- The Chinese Petroleum Corporation (CPC) and the Industrial Technology Research Institute (ITRI) of Taiwan are participating in the EBE program to identify appropriate technologies for meeting increasing stringent NOx emission standards. While in the U.S. the delegation will meet with Unocal, Arco, the University of Utah's Combustion Laboratory, Reaction Engineering International, and the Coen Company.

4 EBEs from Taiwan to the U.S.: Dr. Hung-chung Shen, Industrial Materials Department, Mr. Goashee Leu, Senior Engineer, CPC
Dr. Chien-chung Tsai, Combustion Technology Division, Dr. Li-chiang Chen, Deputy Director, ITRI

Cement Industry Exchange -- WEC organized a technology demonstration exchange including representatives of the largest Taiwan cement manufacturing industries, officials from Taiwan EPA, and a leading advocate for emission standards.

11 EBEs from Taiwan to U.S.: Dr. Fu-tien Jeng, Professor, Graduate Institute of Environmental Engineering, National Taiwan University
Jen-ta Fan, Engineering Department, Taiwan Cement Corporation
Yung-tai Tuan, Chief Environmental Department, Chien-tai Cement Corporation
Cheng-hsin Huang, Purchasing Manager, Universal Cement Corporation
Shih-Song Ho, Chief, Environmental Department, Hsin Hsin Cement Corporation
Mon-lee Tan, Chief of Operations and Engineering, Asia Cement Corporation
Tsu-hsu Lai, Environmental Engineer, Industrial Pollution Control Corporation
Su-Jeen Gau, Section Chief, Industrial Development Bureau

Ching-Shi Yang, Director, Air Quality Bureau, Environmental Protection Administration

Kuang-ming Hsien, Manager, China Technical Consultants, Inc.

Yung-Tai Yuan, Chief of Environmental Department, Chien Tai Cement Co., Ltd.

Pattana Group Review of U.S. Environmental Technologies -- Under the first phase of this exchange, the Pattana Group, a Thai environmental engineering company, visited environmental companies in the Portland, Oregon area to review oil recycling technologies. A second phase of the exchange in 1994 took representatives of Cascade Earth Sciences, Hydrokinetics Systems, and Northstar Environmental to Thailand to pursue specific project opportunities. In May, 1995 a third phase of this project took representatives of the Oregon Environmental Technology Association and xxx to Thailand to finalize details of a joint venture and explore additional avenues for cooperation.

2 EBE from U.S. to Thailand: Bill Snyder, Executive Director, Oregon Environmental Technology Association

Joe McDonald, President, Beta Control Systems

Total Quality Environmental Management Exchange -- The Gauntlett Group, Inc. participated in the EBE program to assess the receptiveness of Asian industry for training in TQEM methods. Under this exchange they focused on Asian suppliers of a U.S. multinational company.

2 EBEs from U.S. to Korea, Singapore and Malaysia:

Suwanna Gauntlett, President, the Gauntlett Group, Inc.

Norman Eder, Vice President, Office of Public Affairs, Oregon Graduate Institute of Science and Technology



To: Joyce Coffee
US-AEP
Fax: 202-835-0366

From: Larry C. Lai *Larry C. Lai*
WEC/MTL Group, Inc.
Fax: 703-524-2808

Date: July 14, 1995

Subject: Monthly Report for June, 1995

The following exchanges occurred during June, 1995

Oil Spill Response Vessel Exchange - Representatives from the Indonesian Ministry of Sea Communications visited MARCO in Washington State to view MARCO facilities and equipment in use by the U.S. Coast Guard.

6 EBEs from Indonesia to the U.S.:

- Ir. Drs. Abdul Razak Manan, MSI, Commissions for EIA, Ministry of Communication
- Ir. Tunjung Indrawan, Secretary of the Directorate General of Sea Communication
- C. Sutikno, Head of Subdirectorate on Ship Readiness, Directorate Sea and Coast Guard, Sea Communication
- Ir. Hari Budiharto, Directorate Port and Dredging, Directorate General of Sea Communication
- Ir. Saibun Pane, Research and Development Centre, Ministry of Communication
- Drs. Imam Hambali, Planning Division, Ministry of Communication

Electric Vehicle Exchange - Preparations continued for Chaz Haba of Planet Electric to visit India to pursue a joint venture with Bajaj Auto. This las exchange under the current CA will occur in July.

Appendix E

Six - Month Reports

Six Month Progress Report -- April 1, 1993

Six Month Progress Report -- October 1, 1993

Six Month Progress Report -- March 31, 1994

Six month Progress Report -- November, 1994

Six Month Progress Report -- April, 1995

Six Month Progress Report -- August, 1995

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SIX MONTH PROGRESS REPORT:

(September 23 - March 31, 1993)

FOR THE AID/WEC COOPERATIVE AGREEMENT

IN SUPPORT OF

THE U.S.-ASIA ENVIRONMENTAL PARTNERSHIP

April 1, 1993



World Environment Center 419 Park Avenue South, Suite 1800, New York, NY 10016
1600 Wilson Blvd, Suite 500, Arlington, VA 22209

Abbreviations:

AID	Agency for International Development
APELL	Awareness and Prevention of Emergencies at the Local Level
BVI	Bicentennial Volunteers, Inc.
CY	calendar year
ELI	Environmental Law Institute
FY	fiscal year
IIEC	International Institute for Energy Conservation
IEDS	International Environmental Development Service
OTA	Office of Technical Assistance
RTG	Royal Thai Government
STTA	Short-Term Technical Assistance
STPD	Short-Term Professional Development
TVA	Tennessee Valley Authority
UNDP	United Nations Development Programme
US-AEP	U.S.-Asia Environmental Partnership
USAID	U.S. Agency for International Development
WEC	World Environment Center
WRI	World Resources Institute

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Table 1

USAEP-WEC Business Exchanges
Status of the 100 STTA & STPD for FY 1993
As of March 31, 1993

Project/Activity	STTAs *		STPDs *	
	Identified/ Underway	Completed	Identified/ Underway	Completed
A. Yet-to-be Allocated in support of emerging opportunities	<u>10</u>		<u>10</u>	
* Darius DeGuzaman, Polydyne Inc., Philippine government waste-to-energy technology	1		6	
B. Initial Allocations				
1. Responsible Care/Corporate Environmental Initiatives	<u>4</u>			
Philippines: PBE Conference				
David Chittick, AT&T Engineering VP		1		
Burt Hamner, Washington Dept. of Ecology		1		
India: India Chemical Manufacturers Association/Responsible Care Workshop	5			
Polyolefins Industries				
2. Industrial Environmental Auditing	<u>5</u>		<u>4</u>	
India: Jodhpur Textile Industry Audit/Training	1		1	
Indian Institute of Technology				
Indonesia: Coal/Coal Mining/Mansfield Center, Montana			4	
Sri Lanka: Sri Lanka Pollution Prevention Training	5		2	
Thailand: Coal/Coal Mining/Mansfield Center, Montana			4	
Industrial waste minimization assessment	1			
3. Industrial Disaster Preparedness Strategies	<u>2</u>		<u>2</u>	
Thailand: Petrochemical emergency preparedness			3	
4. Electric Power Demand Side Management Strategies	<u>6</u>		<u>10</u>	
5. National Action Plans/Environmental Funds	<u>2</u>			
Thailand: John Austin, MOSTE Water Quality Standards	1			
6. Management and Implementation of Environmental Assessment	<u>1</u>		<u>4</u>	
Indonesia, Philippines, Thailand: Consultant company exchanges	3		6	
Sri Lanka: Kelani Tire Factory Assessment	1			
7. Office of Technical Assistance	<u>1</u>		<u>2</u>	
Philippines: Industrial Technology Development Institute & EMB	1		2	
Indonesia: Bappedal	1		2	
8. Constructed Wetland Wastewater Treatment Technologies	<u>1</u>		<u>4</u>	
India: New Delhi constructed wetland project				
Dennis Haag, George Butler and Associates	1			
Subijoy Dutta, US EPA	1			
S. Prakesh			1	
9. Certified Laboratory Systems	<u>2</u>			
Thailand: Triangle Labs	1			
10. Regional Environmental Forum - Urban Air Pollution	<u>16</u>		<u>14</u>	
Indonesia: Pacific Rim Urban Air Pollution Conference		12		
TOTALS	<u>Proposed</u>		<u>50</u>	
	Actual		23	31

* STTA: Short Term Technical Assistance

* STPD: Short Term Professional Development

Identified: Specific Opportunities Identified

Underway: Candidates, dates set

Completed: Exchange Completed

Note: Proposed allocations, underlined, are based on the November 6 work plan proposal.

U.S.- ASIA ENVIRONMENTAL PARTNERSHIP
WEC SEMI-ANNUAL PROGRESS REPORT
for the period ending March 31, 1993

1. Background

1A. Purpose of Cooperative Agreement

In September, 1992, the World Environment Center (WEC) entered into a Cooperative Agreement (CA) with the U.S. Agency for International Development (USAID) in Support of the United States-Asia Environmental Partnership (US-AEP). As defined in the Agreement: *The purpose of this CA is to support better environmental, health and safety policies and practices in the Asia region. The proposed effort will support the US-Asian Environmental Partnership Program (US-AEP) generally, and the Fellowships, Exchanges, and Training component in particular. The proposed activities would create or strengthen ties between U.S. and Asian companies, organizations and agencies. The CA will focus on industrial and urban issues but also include agro-industry and rural industrial and economic growth centers. The detailed program description is more specifically described in the proposal dated June 1, 1992 and the budget and explanation of line items dated September 3, 1992 (including the revised budget detail dated September 16, 1992)...*

1B. Progress Reports

Again from the CA: *Regular progress reports on the STTA and STPD activities will be submitted every six months and within 60 days of completion of any funded sub-activity. A mutually agreed format will be determined later.*

In the absence of specific guidelines on the format of this report, and also given the need for a major revision of WEC's first-year workplan, this Progress Report necessarily covers activities that have been pursued to date, but which may be substantially modified in the near future. This report is not intended to supplant or replace either a revised work plan, which is being submitted simultaneously with this progress report, or the regular quarterly reports.

2. Overview of Progress

Although the First Annual Work Plan for the CA submitted in early November was never approved, and is being revised significantly (see Section 2), reasonable progress was made in meeting the proposed annual targets for Short-Term Technical Assistance (STTA) and Short-Term Professional Development (STPD) activities (see Section 2B). Of the target 50 STTAs, 14 were completed, and an additional 23 were identified and are in final planning or implementation. Of the target 50 STPDS, 31 were identified and are in planning. (See Table 1.) Completed activities include:

- . in early December, implementation of a **workshop on pollution prevention in the U.S. and Asia and the activities of state pollution prevention agencies**, attended by representatives of five US. state governments and over thirty staff of AID and other US-AEP implementing agencies. [see Project 7]
- . in mid-January, co-sponsorship of the **Conference on Mega-Cities on the Pacific Rim and the Burden of Air Pollution**, providing travel support for 12 U.S. private and public sector expert participants, as well as for the participation of delegations from Malaysia, Singapore, and the Philippines [see Project 10]
- . in mid-March, provision of 2 STTA experts to the **Philippines Business for the Environment Conference on Corporate Environmental Policy**, to share U.S. corporate perspectives on the need for industry to establish strong environmental policies and programs of their own [see Project 1]

In addition, business development trips were conducted to India, Indonesia, the Philippines, Sri Lanka, and Thailand. Discussions have been held throughout the progress report period with US-AEP TR&D staff, with other implementing organizations under the Fellowships, Exchanges, and Training Component, with USAID and other USG offices in the field, and with Asian counterparts. Out of these discussions, a streamlined work program is being defined for the second half of the first year. This second phase of the US-AEP/WEC Environmental Business Exchanges program will more clearly reflect field demand and a business focus.

3. Status of WEC Programs

During the first six months of the CA, progress was made towards achieving the goals set for STTAs and STPDs. 16 STTAs were completed and 21 STTAs were active (either in planning or in progress); this being a total of 37 STTAs as compared to our annual goal of 50 STTAs. Also, at least 22 STPDs were active, as compared to an annual goal of 50 STPDs. All exchanges have been carefully thought-out and are consistent with the Work Plan. More detailed information regarding the status of STTAs and STPDs is presented on the attached Business Exchange Status Sheet.

4. Project Status: Summary of Progress Towards Goals/Outputs

Project 1. National/Local Responsible Care and Corporate Environmental Initiative Programs

The Indian Chemical Manufacturer's Association is confident that with information and inspiration from technical experts with experience in implementing Responsible Care, they could move to adopt formally the codes of Responsible Care by the year's end.

WEC/LAMP work at the WEC offices in Bangkok and Jakarta established their position and potential to supply Responsible Care information; they are working with local CMA companies to encourage the adoption of Responsible Care programs.

The Philippines Business for the Environment conference received positive reviews. Both USAID and PBE have requested that a similar conference be held in Cebu in late-September. This has set the stage for increasing industry environmental awareness in the region and helped business adopt corporate environmental practices.

From the PBE workshop and previous USAID/Manila programs, WEC has material for a first pollution prevention and corporate initiatives case book drawn from the Philippines experience.

A request has been received from the chairman of the Environmental Working Group of the ASEAN Chambers of Commerce and Industry for WEC support to a similar kind of meeting on a regional basis.

Project 2. Industrial Environmental Auditing

In Jodhpur, commitment to conduct a pollution prevention audit would result in concrete recommendations by textile industry experts for undertaking pollution prevention measures. It would also result in a handbook which would be used to apply to other textile industries in Rajasthan as well as other states. It is expected that this would set the stage for wider acceptance of pollution prevention audits in the future.

In **Sri Lanka**, the use of the five industry experts would result in concrete "industry-specific", in-plant recommendations for pollution prevention process changes. This is expected to set the trend in industry to incorporate future pollution prevention auditing.

In **Thailand**, technical assistance provided by the WEC waste minimization volunteer would result in specific recommendations for action by the factories targeted in the environmental rehabilitation project.

Project 3. Industrial Disaster Preparedness

In response to the severe air pollution incidents at Mae Moh, **Thailand**, in October, an EPA environmental action team was sent to assess the situation. WEC representatives attended the team's Washington de-briefing and several subsequent sessions with the US-Asean Council, and EPA, to coordinate action concerning business exchanges and training opportunities.

WEC/AEP staff participated in two LAMP/APELL seminars in **India** and **Bombay** in October, and a review briefing for WEC's ongoing LAMP work in the Asia region. WEC is currently reviewing trip reports from the LAMP/EPA team sent to the Ma Ta Phut and Rayong industrial estates in **Thailand** (January 1993), to coordinate exchanges to follow up on this team's evaluations and recommendations.

Project 4. Electric Power Demand Side Management Strategies

In February, WEC/AEP received a request from the **Philippines** National Power Corporation to provide experts from the International Institute for Energy Conservation to make presentations in the **Philippines** on Integrated Resource Planning and other DSM issues. WEC/AEP has informed IIEC that such an activity would likely not meet the emerging guidelines for WEC/USAEP activities.

Project 5. National Environmental Action Plans/ National Environmental Funds

In January, the Ministry of Science, Technology and the Environment requested technical advice from John Austin concerning water supply policies and management practice in **Thailand**. USAID/Thailand has expressed preference that this work be funded by the US-AEP.

WEC worked with the USEPA and WRI to identify U.S. experts to support the development of a National Environmental Policy and Action Plan. In late 1992, the Office of Environmental Policy and Planning decided to postpone such work for at least six months, while it concentrated on immediate annual planning and reorganization.

Project 6. Management and Implementation of Environmental Impact Assessments

Through meetings with consulting groups, both here and abroad, WEC has gained a better familiarity with current U.S. practices and with leading companies engaged in EIA work. WEC hopes to begin placing professionals from **Thai, Indonesian, Philippine** and **Indian** consulting firms with U.S. consulting firms in the near future.

Providing a WEC EIA expert in **Sri Lanka** would improve procedures and practices for environmental assessments in the region.

Project 7. Office of Technical Assistance

The December Pollution Prevention Workshop, the upcoming National Roundtable of State Pollution Prevention Programs, and the participation of state experts in WEC activities in Asia and Central and Eastern Europe continue to open access for US-AEP and AID to the significant resources inherent in the state OTAs.

Work in the **Philippines** with the Massachusetts OTA and efforts to bring Filipino professionals to the U.S. for exchanges, WEC is laying the groundwork for the transfer of an OTA program to a US-AEP Partner country.

The expert waste minimization training provided by Burt Hamner to industry and government in the **Philippines**, combined with the extensive transfer of pollution prevention publications, and the review of country-specific waste minimization case studies, is the foundation of a self-sustaining pollution prevention program in the **Philippines**.

Project 8. Constructed Wetland Wastewater Treatment Technologies

WEC requested US-AEP funding for an information gathering trip for Mr. S. Prakesh of DWSSU to learn more about operating and monitoring procedures of currently functional constructed wetlands in the U.S. This trip would also provide an opportunity for Mr. Prakesh to meet with the U.S. experts designing the wetland to fully coordinate plans before construction begins. This activity is currently under

WEC is collecting information on the status of constructed wetland systems in the Asia/Pacific region, especially through WEC's wetlands efforts in **Thailand**.

Project 9. Certified Laboratory Systems

WEC is gathering information on certified labs and the health and environmental effects of dioxin to share with interested parties in Thailand.

Dr. Tondeur's visit may be expected to catalyze Thai private and public sector realization of the need for and quality control measures necessary for a certified laboratory system, as well as lead to business opportunities for his and other U.S. environmental laboratory companies.

Project 10. Regional Environmental Forums

The formation of an on-going Steering Committee should facilitate efforts for greater exchange, cooperation, and harmonization of standards and priorities in the region and represent the creation of a new kind of regional collaboration in environmental problem-solving.

The comparative case studies prepared for the Jakarta workshop concerning urban air quality issues which represent the most up-to-date information on urban air quality in the Asia/Pacific -- including the U.S. -- region.

5. CA Staffing, Administration and Monitoring

During the six-months period, WEC's US-AEP staff in Washington has gradually reached a total of six persons. Mr. Will Knowland has served as overall project director, Mr. Larry Lai as Senior Project Manager, Ms. Swarupa Ganguli as Assistant Project Manager, Ms. Nancy Benioff and Ms. Natalie Kraft as Project Assistants, and Ms. Sarah Gober as Administrative Assistant. Administrative and accounting systems supporting US-AEP were established during the first quarter, and are coordinated with WEC's New York City headquarters. The first quarterly report, for September-December, was submitted in January. Bi-weekly summary activity reports have been submitted to the US-AEP Secretariat regularly since January.

6. Budget Summary

	AID	WEC
Total Funding (Year 1)	\$1,676,005	\$2,440,000
Estimated expenses/contributions through 3/31/93	\$384,770	\$237,200
Balance as of 3/31/93	\$1,291,235	\$2,202,800

ANNEX to SIX-MONTH PROGRESS REPORT:

Summary of Activities to Date

Note: The sections headed Background, Proposed US-AEP Activities and Expected Outputs are taken directly from the November 6, 1992 draft workplan, and are shown in grey shading. The Summary of Activity to Date sections briefly describe WEC/US-AEP efforts on these projects during the six-month period.

Project Areas:

- National/Local Responsible Care and Corporate Environmental Initiatives
- Industrial Environmental Auditing
- Industrial Disaster Preparedness
- Electric Power Demand Side Management Strategies
- National Environmental Action Plans/ National Environmental Funds
- Management and Implementation of Environmental Impact Assessments
- Office of Technical Assistance
- Constructed Wetland Wastewater Treatment Technologies
- Certified Laboratory Systems
- Regional Environmental Forums

Project 1. National/Local Responsible Care and Corporate Environmental Initiative Programs

Background:

Responsible Care is an initiative of the chemical industry to develop internal standards of practice for environmental, health, and safety management. Commitment to the principles of Responsible Care is now a condition for membership in the U.S. Chemical Manufacturers' Association (CMA) and is rapidly gaining acceptance worldwide. WEC has been working in Thailand for over a year to introduce and adapt Responsible Care to the local industry, and anticipates that formal acceptance can be gained this year. Local chemical industry associations in other countries of the region -- **India, Indonesia, Philippines, Hong Kong and Taiwan** -- have also been considering endorsement of Responsible Care. In addition, there is interest from the **Philippines** and other countries in sharing modern U.S. corporate environmental initiatives, such as 3M's Pollution Prevention Pays approach.

Proposed US-AEP Activities: collaboration with the U.S. Chemical Manufacturers' Association (CMA), to conduct:

- . 4 STTAs, concentrating initially on **Thailand, The Philippines, and India**
- . transfer documents and information to local chemical manufacturers associations, government agencies, NGOs and the press in the region
- . prepare a Handbook on introducing Responsible Care programs

Expected Outputs:

Immediate:

- . commitment of at least two (2) Asia/Pacific chemical manufacturer associations to responsible Care programs
- . preparation of a Handbook for Responsible Care programs

Longer-term:

- . for Asia/Pacific chemical industries to commit themselves to the Responsible Care Program will mark a watershed in the attitudes of local industry management
- . similarly, if Asia/Pacific businessmen are directly exposed to the emerging environmental thinking of American business leaders, their own commitment to environmental management may be transformed
- . a more level "playing field" for the international chemical industry
- . increased action and investment in pollution control, waste minimization, and accident prevention within the single most hazardous industrial sector, and Asia/Pacific industry generally

Summary of Activities to Date:

To ensure coordination and up-to-date and accurate information, WEC met with Garrity Baker at the U.S. Chemical Manufacturers Association to learn more about the Responsible Care initiative in the U.S. as well as international efforts currently underway. WEC also is looking for ways to foster cooperation with the U.S. CMA in an effort to spread corporate environmental initiatives in Asia.

Drawing on the resources of WEC's International Environmental Forum (IEF), WEC compiled a data base of WEC's member companies who are also CMA members with operations in Asia. In cooperation with WEC, these companies can potentially serve to "champion" the concept of environmental management practices in their industry associations.

In further efforts to gather information on chemical industry environmental initiatives, WEC/AEP staff attended the International Programme on Chemical Safety (ICPS) meeting on the follow-up to UNCED Agenda 21: Community Right-to-Know and Emissions Inventories Workshop in February 1993, and to the NSF/CSA sponsored briefing meeting for a program to develop comprehensive, voluntary, consensus U.S. Environmental Management Guidelines in March 1993. Both industry and government representatives clearly voiced the desire for better international coordination and standardization at both conferences.

Through the LAMP programs, WEC has already establish contacts with the Indian Chemical Manufacturers Association (ICMA). During a discussion with senior ICMA representatives in Bombay in March, US-AEP/WEC was asked to provide expert speakers to a May 1993 conference of the 250 member ICMA. Representatives from the U.S. chemical industry would discuss the difficulties, costs, and benefits of implementing Responsible Care at the factory level. WEC is currently looking for appropriate speakers for this conference.

WEC provided two experts for the Philippines Business for the Environment (PBE) conference: *Corporate Environmental Policies and Programs*, held March 22-23 in Manila. David Chittick, Environment and Health and Safety Engineering Vice President, AT&T, provided the key note speech: *The Greening of the Corporation: The Quality Model and Environmental Protection*. Burton Hamner, Environmental Planner, Washington Department of Ecology, led a session entitled: *Elements of Corporate Environmental Policy* and provided case studies from 16 U.S. companies.

Following the conference, Mr. Hamner led a discussion with representatives from retail, consumer and industry groups, and held two full-day waste minimization/corporate management workshops with Voluntary Organization of Industry Concerned for the Environment (VOICE) and the Department of Environment and Natural Resources (DENR), Region 3 and 4. In addition, he assisted in reviewing and finalizing the case studies of successful Philippine waste minimization efforts presented at the January 1993 WEC-AID-EMB sponsored waste minimization workshop. He also began laying the ground work for conducting a capabilities assessment of Philippine

Project 3. Industrial Disaster Preparedness

Background:

Throughout the Asia/Pacific region, the shadow of Bhopal haunts industrial operations -- both domestic and international. The safety of major American industrial investments in locations such as Thailand's Eastern Seaboard are dependent upon the actions of neighboring industries, local government, and the surrounding community. WEC has recently joined with AID, EPA, and UNEP to develop Local Accident Management and Prevention (LAMP) programs in India, Indonesia, Thailand, and Mexico. While such programs will require several years to implement, the basics of the process should, based on experience in these countries, be ready for summarizing and sharing more broadly during 1993.

Proposed US-AEP Activities: use of industry and/or EPA volunteers to introduce or enhance Awareness and Prevention of Emergencies at the Local Level (APELL) and LAMP activities and extend them to additional countries

- . 2 STTAs
- . 2 STPDs
- . transfer of documents, information, and software programs to industries and government agencies
- . prepare a Handbook for industrial disaster preparedness and prevention programs

Expected Outputs:

Immediate:

- . accelerated adoption of APELL and LAMP programs by at least one additional Asia/Pacific country
- . preparation of a Handbook or case study report for industrial disaster mitigation and prevention programs

Longer-term:

- . accelerated adoption of APELL and LAMP programs throughout Asia/Pacific
- . increased acceptance of related programs, such as Responsible Care prevention and/or mitigation of disasters, both for local companies and communities, and for American and other international investors

Summary of Activities to Date:

- . Through participation in LAMP Seminars and progress reviews, and through briefings with the EPA action team from Mae Moh and the LAMP team from Ma Ta Phut and Rayong, WEC/AEP has identified three potential candidates for STPDs.

Project 4. Electric Power Demand Side Management Strategies

Background:

Electric utility demand generally exceeds 10 percent annual growth in much of the region. As utilities have found in the U.S., the most attractive "new" source of electric power supply is conservation. Over the past three years, with the initiative and support of the International Institute for Energy Conservation (IIEC), Thailand has made a major policy turn-around, and now embraces a strong demand side management (DSM) program. WEC would collaborate with IIEC to apply this experience to the Philippines, as a model for other US-AEP countries.

Proposed US-AEP Activities: use of IIEC, EPA, and DOE experts and industry volunteers to introduce utility demand-side management concepts and assist in developing a national program

- . 6 STTAs
- . 10 STPDs, mainly to visit and work with leading conservation-oriented power utilities in the U.S.
- . transfer of documents, information, and software programs to utilities, industries and government electric power and energy policy agencies
- . prepare Handbook for electric power demand side management programs

Expected Outputs:

Immediate:

- . introduction of a DSM program concepts and design of national program in at least one additional country (tentatively: Philippines)
- . preparation of a Handbook for demand side management programs

Longer-term:

- . significantly reduced power investment requirements throughout the region
- . greater efficiency of energy use by public and industry, resulting in less environmental destruction both for development of new power plants and in emissions of pollutants, including acid rain precursors and greenhouse gases
- . expanded market and opportunities for efficient light bulbs and energy-saving machinery

Summary of Activities to Date:

Since December, WEC/AEP staff have been sitting on the U.S. Working Group of the Global Energy Efficiency Initiative. This group brings together members of various energy related organizations to discuss energy efficiency initiatives worldwide. To date, the focus has been on Brazil and Mexico. WEC hopes to bring the Asian experience to the table through work with the US-AEP.

WEC has also been compiling a bibliography of sources on energy efficiency issues in Asia. Data sources covered to date include: the growth of energy use in the region corresponding to increases in GNP, per capita energy use, energy inputs per unit output in gross national product, energy shortages in the region, and time/historical comparisons of energy efficiency. This information will be background for a handbook detailing the Asian experience with energy efficiency initiatives.

WEC has corresponded with the Synergic Resources Corporation regarding their June 1993 conference entitled, "DSM and the Global Environment." This conference will convene experts to focus their attention on the environmental impacts of acid rain, global warming, the destruction of the ozone layer -- all effected by power generating activities. WEC would arrange a study tour for utility and government officials from the Philippines to attend this conference and gain further understanding of DSM, integrated resource management, and the range of energy efficient technologies and services in the U.S.

Project 7. Office of Technical Assistance

Background:

In the U.S., some 30 state governments have established offices of technical assistance (OTAs) -- centers for technical information and advisory services to local industry for waste minimization and pollution control available. Drawing upon staff of the Massachusetts OTA, WEC has worked with the Philippine Government to assess the feasibility for creating such capacity in the Philippines.

Proposed US-AEP Activities:

- . briefing meeting with AEP and USAID of selected state OTA representatives
- . 1 STTA: to work with establishment of an OTA in the Philippines
- . 2 STPDs: for fellows to work within U.S. OTAs
- . transfer of documents and information
- . prepare a summary report and a Handbook on accessing U.S. OTAs and introduction of an OTA system to the Philippines associations

Expected Outputs:

Immediate:

- . publication and distribution of report and Handbook on OTA programs
- . establish access for US-AEP and AID to the significant resources inherent in the state OTAs
- . initial transfer of an OTA program to at least one US-AEP partner country
- . experience of STPD fellows with U.S. technologies and sources of expertise and information

Longer-term:

- . creation of self-sustaining Asia/Pacific country sources of technical information and sources of equipment and services to factories, with consequent reductions in waste and pollution
- . linkages between Asia/Pacific OTAs and U.S. OTAs and sources of services and equipment

Summary of Activities to Date:

On December 4, 1992, US-AEP, USAID/Asia Bureau, and WEC co-sponsored a pollution prevention workshop in Washington, D.C. The workshop provided a forum for discussing the experiences of pollution prevention programs conducted by five U.S. state governments and exploring the applicability of these experiences to developing countries in the Asia/Pacific region. Representatives from four state trade offices also participated. The states focus on cost-effective, hands-on assistance to small and medium-size businesses where the major incentives to reducing hazardous waste includes savings from reduced chemical purchases, lower water consumption and wastewater disposal, improved worker safety and overall improved industrial management. This is particularly attractive in situations where regulations are nonexistent or weakly enforced. The general consensus of the meeting was that the state programs have enormous potential for transfer to US-AEP host countries, and could help them benefit from U.S. experience, avoiding some of the unnecessary pitfalls.

As a follow-up to the December workshop, WEC/US-AEP was asked to take the lead in facilitating an international session at the April 1993 meeting of the National Roundtable of State Pollution Prevention Programs. The Roundtable is a national forum promoting the development, implementation and evaluation of efforts to avoid, eliminate or reduce waste generation to all media. The membership includes 480 professionals representing 83 national, state and local government agencies, private industry and trade associations. WEC is currently finalizing the agenda and list of speakers for the session entitled: *International Opportunities in Pollution Prevention*. In addition to presenting WEC's on-going waste minimization program, and providing USAID the opportunity to present various international programs, WEC hopes to encourage Roundtable participants to become volunteer experts for future WEC waste minimization activities.

WEC/US-AEP held preliminary discussions with the Hazardous Waste Directorate of BAPEDAL, the Indonesian Environmental Impact Management Agency, to identify professionals to participate in exchanges with several state OTAs and pollution prevention programs.

In response to a request from the government of the Philippines, WEC has been working to bring two Filipino professionals, one from ITDI, and one from the Environmental Management Bureau (EMB), to participate in a one-month on-the-job-training opportunity at the Massachusetts Office of Technical Assistance, the Massachusetts Department of Environmental Protection, and Region I EPA. These exchanges have been temporarily postponed at the request of USAID/Manila until they can be better coordinated with mission and EMB activities.

In addition, to Tim Greiner's efforts, Burton Hamner of the Washington State Department of Ecology (Washington technical assistance office), recently participated in the Philippine Business for the Environment conference: *Corporate Environmental Policies and Programs*. (For a detailed description, please see Corporate Environmental

Project 8. Constructed Wetland Wastewater Treatment Technologies

Background:

Use of constructed wetlands is a proven low-cost means of treating both domestic and industrial wastewater in the U.S. WEC has worked over the past two years to introduce this U.S.-based technology to the Asia/Pacific region, initially in **Thailand**, in cooperation with USAID, Bicentennial Volunteers, Inc. (BVI) and the Tennessee Valley Authority (TVA). By the end of 1993, several pilot programs should be established and operating in Thailand.

Proposed US-AEP Activities:

- . 1 STTA
- . 4 STPDs, to gain experience in design and operation of constructed wetland systems
- . transfer of documents and information
- . prepare a summary report on the status of constructed wetland systems in Asia/Pacific, and a Handbook for introducing and utilizing the technology

Expected Outputs:

Immediate:

- . completion of the introduction of constructed wetland technology to Asia/Pacific, with application in 1-2 countries
- . transfer of technology and expertise to Asia/Pacific environmental engineers
- . preparation of a Handbook for Constructed Wetlands
- . effective treatment of wastewater at the pilot sites

Longer-term:

- . widespread application of constructed wetlands technology in Asia/Pacific
- . contacts with U.S. companies that specialize in design and management constructed wetlands technology
- . effective treatment of wastewater at reduced levels of water pollution at many sites

Summary of Activities to Date:

In cooperation with the Dehli Water Supply and Sewerage Undertaking (DWSSU) and their interest in cleaning up the Yamuna River in New Dehli, India, Mr. Subijoy Dutta of the US-EPA approached WEC for assistance in developing a constructed wetland for this severely polluted waterway. Working with constructed wetlands specialist Mr. Dennis Haag, of George Butler and Associates, a Kansas based engineering firm, the DWSSU drew up an appropriate plan and is committed to begin construction this spring. WEC/US-AEP met with the DWSSU in New Dehli to assess the seriousness of the situation and the dedication and ability of the DWSSU.

NOTE:

WEC has also continued constructed wetlands work with the USAID Mission in Thailand. Four sites are currently in progress. Under the bilateral agreement with USAID/Thailand WEC sponsored a US wetlands expert to assess the current Thailand activity and will sponsor a visit by the Permanent Secretary of the Ministry of Science, Technology and the Environment in April 1993 that will include a visit to two constructed wetlands sites in Florida.

Project 9. Certified Laboratory Systems

Background:

An essential pre-condition to effective enforcement and to industrial self-management of emissions is accurate, consistent laboratory analysis of effluent and ambient samples. U.S. experience and capabilities in this area are extensive, but certification and quality assurance/quality control programs are still weak or lacking in the US-AEP region.

Proposed US-AEP Activities:

- . 2 STTAs by EPA and/or private sector laboratory system managers: to work with one or more governments ready to initiate a certified laboratory system
- . transfer of documents and information
- . prepare a summary report on the status of laboratory facilities and quality control in the region, and a Handbook for introducing and utilizing such systems

Expected Outputs:

Immediate:

- . introduction of the certified laboratory system program concept and design of national program in at least one US-AEP partner country
- . preparation of a Handbook for establishing a certified laboratory system

Longer-term:

- . creation of national certified laboratory systems, with consequent demand for equipment and training
- . improved ability of governments and private industries to monitor and evaluate their environmental performance, and to obtain accurate information about environmental issues

Summary of Activities to Date:

Dr. Yves Tondeur, President & CEO of Triangle Laboratories, a North Carolina based firm specializing in chemical analysis of dioxins and furans to travel to **Thailand**. Phoenix Pulp and Paper Company in **Bangkok** has invited Dr. Tondeur to deliver a paper to a conference on environmental issues they are sponsoring for industry and government officials. WEC has also arranged for Dr. Tondeur to work with the Environmental Research and Training Center to discuss laboratory certification and quality control, do sampling dioxin work at several **Thai** pulp and paper companies and conduct a seminar on the improved management of chemical analysis for environmental laboratories and quality assurance in chemical measurements.

Project 10. Regional Environmental Forums

Background:

There is considerable practical experience, both within the region and from the U.S., in solving specific environmental problems such as urban air and water pollution, solid and hazardous wastes, and effective environmental administration and policy. But there has been distressingly little exchange of information and experience. Over the past year, WEC has begun creation of a forum process that can facilitate and sustain such exchanges. A Steering Committee comprised of leaders of environmental agencies from seven Asian countries has met in **Singapore** in early 1992 to set the general agenda for series of workshops and conferences on Mega-Cities on the Pacific Rim and the Burden of Air Pollution. An intensive workshop on reducing emissions from vehicles was held in Los Angeles last August, and a major working conference is planned for February, to be followed by workshops and policy dialogue at both the regional and national levels. This model effort will be supported, and at least one additional topical regional forum will be initiated.

Proposed US-AEP Activities:

- . 10 STTAs
- . 8 STPDs, to participate in workshops and other meetings both in the U.S. and in the region
- . transfer of documents and information
- . preparation of comparative case studies, country profiles, and national case studies

Expected Outputs:

Immediate:

- . comparative case studies of the region's experience -- including that of the U.S. -- in dealing with urban air quality issues
- . preparation of various reports and articles drawn from the Forum's workshops and meetings
- . 1-2 workshops and/or conferences, providing participants with opportunities to share experiences directly, and to observe U.S. technologies and expertise

Longer-term:

- . improved access to information sources and to sources of technology and expertise
- . improved markets for air monitoring and air pollution control equipment
- . greater exchange, cooperation, and harmonization of standards and priorities in the region
- . creation of a new kind of regional collaboration in environmental problem-solving

Summary of Activities to Date:

The Megacities on the Pacific Rim and the Burden of Air Pollution Conference, held in **Jakarta** in mid-February, was a major regional workshop that brought together a U.S. business and other experts from the U.S., with forty delegates from seven Asian countries and Mexico. US-AEP support contributed to the participation of 12 of the U.S. technical experts and the delegations from **Malaysia, Singapore and the Philippines.**

During the February workshop, participants shared and identified project and exchange opportunities in the areas of stationary source emissions, mobile source emissions, health and economic impacts, institutional and regulatory frameworks, and mobilizing individuals and communities.

A Steering Committee comprised of the heads of the delegations met after the workshop to discuss follow-up activities and exchanges. The meeting resulted in the formation of an ongoing Steering Committee (SC) to facilitate the implementation of identified projects. Country coordinators will be designated by each SC member to implement air quality programs. WEC will coordinate with the SC to identify common priority projects and initiate fund raising and implementation action.

Workshop proceedings are being printed and distributed to all members of the delegations, funders and organizations who have a stake in air quality programs. The proceedings will offer a summary of the conference activities and will contain a matrix of planned follow-up projects.

Note:

Based on the success of the conference, five senior environmental managers from Mexico were invited by the Governor of **Jakarta** to re-convene in **Jakarta**, May 1-5, 1993, to discuss technical exchanges in the areas of air, water and municipal solid waste projects. The Executive Director of the South Coast Air Quality Management District (SCAQMD) has opened SCAQMD facilities to provide professional training and internships to conference delegates as well as other air quality professionals in the Asia region. WEC will coordinate with the SC and SCAQMD to initiate training and internship activities.

Emerging Opportunities

Background:

Of the original work plan, WEC allocated 10 STTAs and 10 STPDs to support emerging opportunities.

Summary of Activities to Date:

Polydyne, Inc., a management consulting and systems engineering service, was referred by the US-AEP Secretariat to WEC in late February. Polydyne has been requested by the Government of the **Philippines** to conduct a preliminary feasibility study for developing a waste-to-energy (WTE) facility to serve Metro Manila. From preliminary data gathered, Polydyne determined that the most suitable technology is one developed by Energy Answers Corporation (EAC) of Rochester, Massachusetts.

Polydyne feels that although the GOP requested assistance in bringing WTE technology to the **Philippines**, the government still needs additional information on the available technologies. To assist the GOP in this area, Polydyne proposes sending a senior EAC officer (to be supported by WEC/US-AEP funds), to the **Philippines** for a one-to two-week period, in mid-April. The EAC official would conduct a WTE seminar and engage in research, discussion and identification of WTE technologies appropriate to the **Philippines**.

Following EAC's visit, Polydyne, with WEC/US-AEP assistance, proposes bringing 4-6 senior Philippine officials to the U.S. for a two-week study tour. The tour would be designed to familiarize the **Philippines** officials with the technology options available and would include visits in several eastern states including Massachusetts, New York, and Florida.

WEC has received mission concurrence to proceed with this exchange, and is awaiting an updated letter of request from the GOP. WEC is in the process of finalizing a scope of work, itinerary and travel arrangements for the EAC official, and has begun identifying Filipino candidates and U.S. sites for the proposed WTE technology study tour.

SIX MONTH PROGRESS REPORT:

(April 1 - September 30, 1993)

FOR THE AID/WEC COOPERATIVE AGREEMENT

IN SUPPORT OF

THE U.S.-ASIA ENVIRONMENTAL PARTNERSHIP

October 1, 1993



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**Six Month Report-WEC Cooperative Agreement (CA)
in Support of the U.S. Asian Environmental Partnership
(US-AEP)
(March 30, 1993 through September 30, 1993)**

1. Status of work under the CA

1.1 Environmental Business Exchange Activity Status

During this reporting period, the World Environment Center (WEC) received approval of its April 15, 1993 work plan for activities to be carried out in support of the US-AEP. This workplan reflected a significant shift in the previous draft workplan. Notably, it narrowed the focus of WEC's activities to industry-based Environmental Business Exchanges, and gave primary consideration to mission-driven activities. Due to this shift in direction, WEC terminated all previous activities that were in progress. A total of 54 exchanges had been in various stages of planning, and 14 exchanges had been completed.

1.2 EBE Status (March 30-June 30, 1993)

From March 30 to June 30, 1993, WEC focussed on developing strategies for marketing EBEs. It was decided that EBEs would be generated at two levels. The first level would consist of responding to mission requests from major USAID missions including India, Sri Lanka, Philippines, Indonesia, and Thailand. The second level would consist of aggressive marketing programs in countries without USAID missions. Three programs were identified: Corporate Environmental Initiatives, Factory Assessment Programs, and Technology Assessment Programs. To facilitate this marketing strategy, one-page descriptions of these programs were designed for mass circulation.

In order to work closely with mission priority activities, WEC and the US-AEP Secretariat sent out a series of cables to the five missions mentioned above. The cables allocated a specific number of exchanges to each mission. Accordingly, USAID/India was allocated 30 exchanges, USAID/Thailand was allocated 15 exchanges, and USAID/Indonesia, USAID/Sri Lanka, and USAID/Philippines were each allocated 10 exchanges. The mission strategy stipulated that US-AEP/WEC would complement the work of the existing environment programs of the mission.

With regard to other regional Asian programs, a senior WEC program manager attended the July conference in Hong Kong to make appropriate contacts to initiate activities for countries without USAID mission such as Hong Kong, Malaysia, Singapore, South Korea, and Taiwan.

A total of 14 exchanges were initiated during this period. One exchange was

completed and one exchange was cancelled. The following are brief descriptions of the activities that were planned and/or completed during this period.

● **Integrated Approach to Waste Handling and Disposal in the Philippines.** WEC provided an expert from Energy Answers Corporation (EAC)/Polydyne to provide information to government officials on EAC's Integrated System Approach (including combustion of waste for generation of electricity, composting, and recycling) for managing municipal solid waste. EAC/Polydyne also evaluated the need and possibility of successful implementation of such a system. This project was completed in May, 1993.

● **Technology Assessment Mission: Cement and Pulp and Paper Industries.** In response to a request from USAID/Philippines, Mr. Lauro Guevara was proposed as an EBE candidate. WEC arranged a six-week exchange that emphasizes plant site visits to demonstrate U.S. technology and visits to U.S. manufacturers of environmental control products relevant to the cement and pulp and paper industry. Companies on the tour include: Mead Paper, Weyerhaeuser, Scott Paper Company, Simpson Tacoma Kraft, Stone Container Corporation, Medusa Cement, Holman Cement, and 3M. Mr. Guevara will also attend a course offered by USETTI and an EPA conference. This project is expected to start October, 1993.

● **Support to Urban Air (URBAIR) workshops.** WEC assisted the World Bank's Metropolitan Environmental Improvement Project (MEIP) by providing a U.S. air pollution and planning expert to assist in the development of national air pollution control action plans. These plans will be the results of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocation. An air pollution control expert went to Manila and to Jakarta to attend the URBAIR workshops in July, 1993.

● **Study of Air Monitoring Network Needs.** The Electric Generating Authority of Thailand (EGAT) is evaluating alternative systems for a national air quality monitoring network. Radian Corporation provided an expert to explore options with EGAT officials. The expert travelled to Taiwan to observe the Taiwan EPA system and the advantages and disadvantages of various configurations and software systems. This project was completed in July, 1993.

● **Demand Side Management (DSM) Joint Venture.** At the request of USAID/Thailand, WEC started planning an exchange of staff between RCG/Hagler Bailly and TEAM Consulting of Thailand. Through this program, RCG/Hagler will train TEAM staff in DSM and evaluate the potential for forming a joint venture. The project is expected to take place October, 1993.

● **CHEMTREC Training.** Following a request from the Thai Ministry of Science, Technology, and the Environment (MOSTE), and with the support of

USAID/Thailand, WEC is working with the Chemical Manufacturer's Association (CMA) to identify a CHEMTREC expert who can evaluate Thai needs, and the feasibility of installing a similar system for MOSTE. This project is scheduled for October, 1993.

1.3 EBE Status (June 30-September 30, 1993)

The past quarter witnessed an acceleration of EBE activities. The quarter began with an agreement between the US-AEP Secretariat and WEC to complete 48 EBEs by the end of 1993. 24 exchanges would be from Asia to the U.S. and 24 would be from U.S. to Asia. WEC continued to focus on the EBE generating strategies identified last quarter. In lieu of this, major progress was made with both the India and the Sri Lanka missions where WEC started working with the Trade in Environment Services and Technology (TEST) project in India and the Natural Resources Policy and Planning Project (NAREPP) project in Sri Lanka. The following projects delineate the activities which resulted from leveraging mission activities. In addition, the missions in Indonesia, in the Philippines, and in Thailand sent more requests for exchanges, and support to the URBAIR workshops extended to India and Nepal.

• **Technology Evaluation of Electric Tuk Tuks.** Pholasith Tuk-Tuk Company Ltd. of Bangkok expressed interest in developing electric tuk-tuks. WEC is following up on the pairing of Pholasith with the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT). A tuk-tuk and an extra engine and transmission have been sent to AECT who will both perform the conversion and prepare a conversion kit for use in demonstrations in Bangkok.

• **Thailand Reforestation Project.** USAID/Thailand is funding the planting of 750,000 trees in Khao Yai National Park (the Royal Thai Government seeks to plant a total of 500,000,000 trees to commemorate the 50th anniversary of His Majesty). In supporting this effort, and in seeking to bring U.S. expertise to bear, representatives of the Oregon Forest Resources Coalition (a confederation of private sector forestry and nursery companies, science, education, and government interested in the sustainable development and management of forest resources) worked with the Royal Forestry Department for two weeks. These exchanges have established a relationship between the Coalition and the Royal Thai Government and the Thai private sector. It also provided the coalition opportunities to identify and assess the potential for business opportunities and provide the scientific data necessary for negotiating a carbon dioxide offset for a U.S. utility company. This project was completed in September, 1993.

• **Philippine Business for the Environment (PBE) Conference.** An expert from the Washington Department of Ecology was asked to participate in a conference hosted by the PBE. This conference, which will be held in Cebu

this October, will be a repeat presentation of the first PBE conference held in March, 1993.

•**South East Asia Iron and Steel Institute (SEASI) Electric Arc Furnace Dust Treatment Workshop.** WEC provided two U.S. steel industry experts to speak on the management on electric arc furnace dust at the SEASI conference in Malaysia.

•**Sri Lanka Technology Information Center.** In conjunction with the World Bank's Metropolitan Environmental Improvement Project (MEIP), WEC has identified the individuals responsible for the State of Minnesota's leading-edge institutions that disseminate and encourage industry's consideration and implementation of environmental protection measures. WEC is sending delegates from: a Minnesota policy-making institution, the Office of Waste Management, an industry association/affiliation; the Waste Reduction Institute; and the Minnesota Trade Office. The delegation will meet with Sri Lankan counterparts for a week-long session to develop the best Sri Lankan model for continued technical outreach and training for the private sector. The project is expected to be initiated October, 1993.

•**Sri Lanka Factory Assessments.** Four industry sectors (metal finishing, canneries, paint, and leather tanning) were identified by USAID/Sri Lanka as needing U.S. expertise in optimizing their production processes and minimizing and treating the waste generated. The experts identified by WEC will perform factory assessments at two sites within each sector. This project will be initiated October, 1993.

•**Support to URBAIR Action Plans in Nepal.** WEC is assisting the World Bank's MEIP program by providing a U.S. air pollution and planning expert to help develop national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials and will set forth government priorities and budget allocations. The project is expected to be initiated October, 1993.

•**Technology Assessment Mission: Pulp and Paper Industry.** As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC is bringing representatives of the Indonesian Pulp and Paper industry to tour U.S. industries to evaluate state-of-the-art techniques and technologies. The project is expected to be initiated November, 1993.

•**Waste Minimization Technology Transfer: Textile Industry.** WEC is providing two experts from the U.S. textile industry to provide training to Indonesian industries on state-of-the-art waste minimization techniques. The project is expected to be initiated November, 1993.

•**Fluid Power Industries Technology Demonstrations (FPI).** WEC is sending

four representatives from Fluid Power Industries (FPI) to India. FPI will be discussing a technology they have developed-real pressure control valves for use in diesel emissions-with local Indian companies including Voltas, Telco, Larsen & Toubro, Neptune, and Bharat Forge.

•**Trade in Environmental Services and Technology (TEST) Program Cooperation.** WEC is cooperating with Sanders International to identify opportunities for leveraging those activities under the Mission's TEST program that are consistent with the US-AEP/WEC mandate. In October, WEC is bringing over two Indian industry officials. The first official will be evaluating incinerator technology and the second official will be evaluating air filter technology.

•**Textile Industry: Review of Pollution Prevention/Control Technology.** WEC is working with AT International to bring a group of textile industry executives to the U.S. to review pollution prevention and control technologies relevant to bleaching and dyeing operations. This project is expected to be initiated November, 1993.

2. Comparison of accomplishments with established goals

WEC had projected the completion of 48 exchanges by December 28, 1993. Between the period April 1 through September 30, WEC completed eight exchanges from the U.S. to Asia. However, 20 additional exchanges from the U.S. to Asia were identified and planned during this period as well as 15 exchanges from Asia to the U.S. These projects are scheduled to take place during the months of October and November. WEC is currently identifying the remaining 13 exchanges scheduled for completion by December, 1993.

3. Status of finances and expenditures

Total Budget	\$3,271,130
Cumulative Expenses (8/31/93)	\$688,496.9
Balance	\$2,582,633
Pro Bono Contribution (8/31/93)	\$99,546

SIX MONTH PROGRESS REPORT:

(October 1993 - March 1994)

FOR THE AID/WEC COOPERATIVE AGREEMENT

IN SUPPORT OF

THE U.S.-ASIA ENVIRONMENTAL PARTNERSHIP

March 31, 1994



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**Six Month Report-WEC Cooperative Agreement (CA)
in Support of the U.S.-Asian Environmental Partnership
(US-AEP)**

1.0 Status of work under the CA: Environmental Business Exchange (EBE) Activities

This report, which covers EBE activities from October 1, 1993 to March 31, 1994, is divided into two discrete parts. The first part covers the quarter October 1, 1993 to December 31, 1993, and the second part covers the quarter January 1-March 31, 1994.

1.1 EBE Status (October 1-December 31, 1993)

This quarter marked WEC's highest level of activity achieved under the US-AEP cooperative agreement. There were three main reasons for this increased level of activity: the fruition of planning activities conducted during the previous quarter, close cooperation with USAID/India's Trade in Environmental Services and Technology (TEST) program, and successful marketing of USAID missions in Sri Lanka and Nepal.

During this quarter, WEC met with MSI in several goal-setting sessions. These sessions have resulted in suggestions that WEC increase focus on executing exchanges that raise awareness of U.S. technologies, capabilities, and experience in Asia rather than increasing the awareness of U.S. companies about environmentally-related business opportunities in Asia.

a. India

TEST Program Cooperation -- WEC began cooperation with Sanders International in identifying opportunities for leveraging activities under the USAID Mission's TEST program that are consistent with the US-AEP mandate. Activities being undertaken as part of this collaborative effort are listed below.

Evaluation of Incinerator Technology -- WEC arranged a tour of U.S. facilities for an Indian industry official interested in evaluating incinerator technology for hazardous waste treatment. Project initiation: October, 1993.

Diesel Emissions Control Technology -- In a technology transfer program, WEC supported Fluid Power Incorporated (FPI) in demonstrating a real-pressure control valve for use in diesel engine emissions systems to reduce particulate emissions. Project initiation: October, 1993.

Air Filter Technology Evaluation -- WEC supported a technology evaluation program by INALSA, an Indian manufacturer of air filters. INALSA is seeking to identify cost effective technologies and options that might be introduced in India. U.S. manufacturers included in the tour were Pneumafil Corporation, Donaldson Northland Supercell, Dorr-Oliver, Air Cleaning Specialists of California, and Room Cleaning Engineering. Project initiation: October, 1993.

Demonstration of "Linductor" Oil Recovery System -- Under this exchange, Yankee Environmental Services met with a number of firms to introduce their new technology for vacuuming spilled oil to the Indian market. Meetings were conducted with Mahindra and Mahindra, Madda Controls, and Ion Exchange. Project initiation: November, 1993.

Demonstration of Real-Time Toxic Emissions Monitoring Systems -- K3 Corporation manufactures software systems to integrate environmental sensors, computers, and telecommunications to provide effective industry analytical and management tools. Under this exchange, K3 met with C.G. Hartmen and Braun, Blue Star Ltd., and Assorted Instruments Manufacturing. Project initiation: November, 1993.

Technology Transfer: Fluidized Bed Chemical Recovery System for Paper Mill Black Liquor -- Enders Process Equipment uses a fluidized bed reactor system to recover pulping chemicals and provide for the pollution free destruction of organic pulping residue by thermal oxidation. Under this exchange, Enders met with Indian companies interested in this technology: UP Straw and Agro Products, Ltd., Grasim Industries, Harihar Polyfibers Ltd., Shreyans Paper Mills, Ltd., West coast Paper Mills Ltd., Shiva Paper Mills, Ltd., ABC Paper Mills, Ltd., and Zenith Papers. Project initiation: November, 1993.

Oil Absorbent Demonstration -- Ab-Sorb manufactures a low-cost material for use in cleaning and absorbing spilled oil and other substances. Potential applications range from shop floor use to major oil spill response activities. The company believes that there is greatest potential for recovery and reuse of spilled petroleum products using the Ab-sorb product. Under this exchange, Ab-Sorb explored joint ventures with potential Indian partners. Project initiation: November, 1993.

Industrial Wastewater Treatment Technology Assessment Exchange -- Representatives of Ion Exchange traveled to the U.S. to evaluate wastewater treatment technologies relevant to the pulp and paper, tannery, and iron and steel industries. U.S. industries included in the tour were: Kinetic Recovery Corporation, Kinetico Engineered Systems, Inc., Memtek Corporation, Osmonics Incorporated, Koch Membrane Systems, Green Bay Packaging, Black and Veatch, Zimpro Environmental, Krupp Wilputte Corp., and Thetford Systems, Inc. Project initiation: December, 1993.

Review of Incinerator Operations -- Pure Tech and it's sister company, Cyno Clean, are advancing plans to build a hazardous waste incinerator near Madras. Under this exchange technical representatives of Pure Tech visited the Sikes incinerator facility operated by International Technology (IT) Corp. Project initiation: December, 1993

Metropolitan Environmental Improvement Project (MEIP) - URBAIR -- WEC, in support of the World Bank's MEIP program, provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials, and will set forth government priorities and budget allocations. Project initiation: December, 1994.

b. Indonesia

Technology Assessment Mission: Pulp and Paper Industry -- As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC brought representatives of the Indonesian pulp and paper industry to tour U.S. industries and evaluate state-of-the-art techniques and technologies. U.S. institutions/facilities visited were: National Council of the Paper Industry for Air and Stream Improvement, Inc., Willamette Industries, Inc., Union Camp Corp., Sonoco Paper Products, and Weyerhaeuser. Follow-up activities will occur with Sonoco for introduction of chemical recovery technologies. Project initiation: October, 1993.

Technology Assessment Mission: Metal Finishing Industry -- As a follow-on to WEC waste minimization training workshops and factory assessments in Indonesia, WEC brought representatives of the Indonesian metal finishing industry to tour U.S. industries to evaluate state-of-the-art techniques and technologies. Project initiation: December, 1993.

Waste Minimization Technology Transfer: Textile Industry -- WEC provided an expert from U.S. textile industry to lead a training session for Indonesian industries on state-of-the-art waste minimization techniques. He conducted factory assessments at seven textile industries in the Jakarta area. Project initiation: October, 1993.

c. Korea

Flue Gas Desulfurization Technology Assessment -- in cooperation with Radian Corporation, WEC sponsored the participation of officials from Korea Electric Power Corporation (KEPCO) on tour of U.S. flue gas desulfurization installations. Included on the tour were: Electric Power Research Institute's Hydrogen Sulphur Test Center, General Electric's Environmental Services Division, Babcock and Wilcox, and Combustion Engineers. Project initiation: December, 1993.

Review of Mercury Recovery and Hazardous Waste Treatment Technology -- EMC is planning to build six hazardous waste treatment facilities in the central part of Korea, and a mercury recovery facility. WEC arranged a tour of US facilities that provided EMC with both an overview and specific details of US technology in each of these areas, as well as on industrial wastewater treatment, and public education efforts. Project initiation: November, 1993.

d. Nepal

Metropolitan Environmental Improvement Project (MEIP) - URBAIR -- Joining US-AEP and MEIP resources, WEC provided a U.S. air pollution and planning expert to assist in the development of national air pollution control plans. These plans will be the result of work group sessions and conferences among government and private sector officials and will set forth government priorities and budget allocations. Project initiation: December, 1993.

Electric Vehicle Technology Transfer – As a follow-on to a successful NASDA grant demonstrating electric vehicle technology in Kathmandu, WEC sponsored an exchange for four Nepali businessmen interested in learning about the state-of-the-art in electric vehicle technology. The exchange included meetings with representatives of Advanced Electric Car Technology and the Electric Power Research Institute, and included attendance at the Second National Conference on Electric Vehicle Infrastructure in Scottsdale, Arizona. Project initiation: December, 1993.

e. Philippines

Philippine Business for the Environment Conference (PBE), Cebu, Philippines – In March, 1993, WEC provided two experts for the PBE Conference "Corporate Environmental Policies and Programs". One of these experts, Mr. Burt Hamner, was invited by PBE for a repeat presentation at Cebu, Philippines. Project initiation: October, 1993.

Technology Assessment Mission – Cement and Pulp & Paper Industries – U.S.AID/Philippines referred Mr. Guevara to WEC as a possible candidate for the Environmental Business Exchange Program. WEC arranged an exchange emphasizing plant site visits that demonstrated U.S. technology, and visits to U.S. manufacturers of environmental control products relevant to the cement and pulp & paper industry. Companies on the tour included: Mead Paper, Weyerhaeuser, Scott Paper Company, Simpson Tacoma Kraft, Medusa Cement, Holnam Cement, and 3M. Mr. Guevara also attended a course offered by USETI and an EPA conference. Project initiation: September, 1993.

Technology Assessment Program - Smokey Mountain Project – R-II Builders, Inc. was awarded the Smokey Mountain Development and Reclamation Project. In addition to cleaning up the dump site and providing housing for the 3,500 families living there, the project will also establish a modern, state-of-the-art incinerator complex with a throughput of 1,400 metric tons per day. This exchange will allow representatives of R-II Builders, Inc. to evaluate U.S. technology for flue gas conditioning. The exchange included visits to Ogden Martin's Energy/Resource Recovery Facility, Wisconsin Electric's Port Washington Municipal Waste Incinerator, Post, Buckley, Schuh & Jernigan, Inc., and NaTec Resources. Project initiation: December, 1993.

f. Sri Lanka

Technology Information Center -- Working in concert with the World Bank's Metropolitan Environmental Improvement Project (MEIP), WEC identified the individuals responsible for the State of Minnesota's leading-edge institutions that disseminate and encourage industry's consideration and implementation of environmental protection measures. WEC sent delegates from: a Minnesota policy-making institution, the Office of Waste Management; an industry association/affiliation, WRITAR; and the government representative and "linking" institution, the Minnesota Trade Office. This delegation met with Sri Lankan counterparts for a week-long session to develop the best Sri Lankan model for continued technical outreach and training for the private sector. Project initiation: October, 1993.

Factory Assessments -- Four industry sectors (metal finishing, canneries, paint, and leather tanning) were identified by U.S.AID/Sri Lanka as needing U.S. expertise in optimizing production processes and in minimizing and treating the wastes generated. Experts identified by WEC performed factory assessments at two sites within each sector. The experts provided training for local consultants and also participated in an informal workshop. Project initiation: October, 1993.

g. Thailand

Demand-Side Management (DSM) Joint Venture -- At the request of U.S.AID/Thailand, WEC is facilitating the exchange of staff between RCG/Hagler-Bailly and TEAM Consulting of Thailand. Through this program RCG/Hagler-Bailly will train TEAM staff in DSM and evaluate the potential for forming a joint venture. Project initiation: October, 1993.

CHEMTREC Training -- Following a request from Thai Ministry of Science Technology and the Environment (MOSTE), and with the support of U.S.AID/Thailand, WEC worked with the Chemical Manufacturer's Association, to provide a CHEMTREC expert to evaluate Thai needs and the feasibility of installing a similar system for MOSTE, and make presentations on the workings of CHEMTREC. Project initiation: October, 1993.

Technology Evaluation of Electric Tuk-Tuks -- Pholasith Tuk-Tuk Company Ltd. of Bangkok expressed interest in developing electric tuk-tuks. WEC followed-up on the pairing (by R.J. Gurley of U.S.AID/Thailand) of Pholasith Tuk-Tuk Company with the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT). A tuk-tuk and an extra engine and transmission were sent to AECT who performed the conversion and prepared a conversion kit for use in demonstrations in Bangkok. As a result of this exchange, a joint venture has been established and will begin production of electric vehicles in a new factory in 1994. Project initiation: November, 1993.

Thailand Reforestation Project -- U.S.AID/Thailand is funding the planting of 750,000 trees in Khao Yai National Park (the Royal Thai Government seeks to plant 500,000,000 trees to commemorate the 50th anniversary of His Majesty). In supporting this effort, and seeking to bring U.S. expertise to bear, representatives of the Oregon Forest Resources Coalition (a confederation of private sector forestry and nursery companies, science, education, and government, interested in the sustainable development and management of forest resources) worked with the Royal Forestry Department for two weeks. These exchanges established a relationship between the Coalition and the Royal Thai Government and the Thai private sector. It also provided the coalition opportunities to identify and assess the potential for business opportunities, and provide the scientific data necessary for negotiating a carbon dioxide offset for a U.S. utility company. As a result of this exchange, officials from the RTG are visiting Oregon to pursue business opportunities. Project initiation: September, 1993.

COPEC Mission to Design Carbon Offset Projects -- COPEC will meet with the Thailand Environmental Institute and the Royal Thai Forestry Department to explore and define carbon "offsets". This mission was designed to provide an entree for U.S. firms into Thai energy service and forestry management markets. Project initiation: November, 1993.

Development of Thai Environment and Safety Certification Program -- The Thai Ministry of Industry and the Ministry of Science, Technology and Environment are interested in encouraging the development of private, commercial environmental and safety certification programs. Under this exchange the sharing of U.S. expertise in environment and safety was explored by HSB Professional Loss Control, with SEECCO, a Thai company. Project initiation: November, 1993.

1.2 Comparison of accomplishments with established goals

Agreements with the Program Officer, Lew Reade, Director-General, US-AEP, and Tony Marcil, President and CEO of WEC, established a goal of completing 24 exchanges from US to Asia and 24 exchanges from Asia to US during the period July 6 and December 31, 1993. During this 6-month time frame, both goals were exceeded: 42 exchanges occurred from U.S. to Asia, and 28 occurred from Asia to the U.S.

1.3 EBE Status (January 1-March 31, 1994)

Possibly due to the holiday season, planning for EBEs by WEC partners was relatively slow during the first quarter of 1994. Exchange activity is expected to resume to previous high levels during the second quarter of 1994.

WEC continued efforts to evaluate the quality of EBEs. WEC sent questionnaires and letters to volunteer experts, host organizations, and beneficiary institutions for feedback on the evaluation of its exchanges. This feedback provided valuable input into gauging the utility of individual exchanges, and it will continue to be a major indicator in evaluating the overall WEC/US-AEP EBE program.

This quarter, WEC also published our Annual Report on US-AEP related activities in 1993. This report, which has been circulated to US-AEP, POD Implementing Organizations, USAID Missions, US&FCS offices, and volunteer experts, has been received favorably.

a. India

Auto Exhaust Emissions Control Demonstration/Technology Transfer -- WEC facilitated demonstration of technology for retrofitting non-catalytic converter-equipped vehicles with exhaust emissions control systems that promise to significantly reduce emissions. Officials of Lean Power Corporation met with Lucas-TVS, Lucas Indian Service, Mahindra and Mahindra, Maruti Udyog Ltd., Premier Automobiles, Hindustan Motors, Tata Engineering and Locomotive, Telco, and the Automotive Research Association of India. Project initiation: January, 1994.

Corporate Environmental Mission -- Representatives of IT Corp. met with officials of India's chemical, fertilizer, and tannery industries, as well as Federal, state and regulatory personnel to discuss IT Corp.'s understanding and experience with pollution prevention and waste minimization. Indian corporate environmental programs were reviewed, and alternative approaches discussed. IT Corp. also met with representatives of Pure Tech Corp. interested in incinerator technology, and discussed the supply of a turn-key incineration system for the Madras area. Project initiation: January, 1994.

Shriram Industrial Enterprises Limited (SIEL) Environmental Management and Safety Systems Survey -- A representative of SIEL visited the U.S. to evaluate technology related to environmental management and safety techniques in the chemical and aquaculture industries and in industrial parks, and fly ash utilization in thermal power plants. SIEL evaluated the cost effectiveness of these various technologies and options for them to be utilized in India. U.S. facilities included in the tour were: Research Triangle Foundation, Southern Star Shrimp Farm, Harlingen Shrimp Farm, Texas A&M University Aquaculture Research Center, Aquaculture Management Association, Dow Chemical Company, Radian Corporation, Tellico West Industrial Properties, Big River Conversion Systems Inc., Ferro Tech, and E.I. Du Pont de Nemours & Company. Project initiation: January, 1994.

Nuchem Wastewater Treatment Evaluation -- Nuchem, Ltd. has been working in the field of wastewater and effluent treatment based on electro dialysis and membrane technologies using reverse osmosis. They are expanding their understanding in the field of water and wastewater treatment through biological methods and will be coming to the U.S. to have discussions with various U.S. organizations in the field of biological wastewater treatment and other remediation technologies. Project initiation: February, 1994.

Transfer of Carbon Disulphide Removal Technology -- WEC is supporting a Radian Corporation mission to India to demonstrate technology for safely removing carbon disulphide during the manufacture of rayon. Indian companies that will meet with Radian include: Bombay Dyeing, Century Rayon, South India Viscose and Rayon, and Sudarshan Chemical Industries, Ltd. Project initiation: March 11, 1994.

b. Thailand

Development of Sustainable Linkages Between Thai Utilities and the U.S. Power Industry-- The Electric Generating Authority of Thailand (EGAT) has requested to participate in WEC's Environmental Business Exchange program. The delegation will have discussions with the Electric Power Research Institute (EPRI) about becoming an affiliate member. This relationship between EGAT and EPRI would establish a long-term, self sustaining linkage between the Thai utilities and the U.S. power industry. Project initiation: February, 1994.

Collaboration between Federation of Thai Industries (FTI) and the Industrial Environmental Organization (IEA)-- The FTI has invited IEA to explore long-term, sustainable linkages between U.S. and Thai industrial organizations. The participants from IEA will address two issues: formalizing the relationship between FTI and IEA; and initiating planning for the Industrial Environmental Conference and Exposition. Project initiation: February, 1994.

Urban Air Quality Monitoring Systems-- The Anti-Air Pollution Association and the Chulabhorn Research Institute's Center for Urban Environment have invited several representatives from BG Technologies to discuss and demonstrate technologies to obtain real time data for use in traffic control. The two representatives will obtain air quality data using a portable, multi-parameter system. They will also meet with several government and industry officials including: Industrial Estate Authority of Thailand, Board of

Investment, The Federation of Thai Industries, and Industrial Works Department. They will also meet with several Thai companies to identify a suitable Thai partner to work with in future operations in the country. Project initiation: February, 1994.

1.4 Comparison of accomplishments with established goals

Although no established numerical target was set for this quarter, 21 exchanges were completed. However, WEC has approximately 50 exchanges lined up for the upcoming quarter, and it is expected the large number of exchanges in April and May will make up for the reduced activity in the previous months.

2.0 Status of finances and expenditures

Total Budget	\$3,271,130
Cumulative Expenses (2/28/94)	\$1,466,936
Balance	\$1,804,194

SIX MONTH PROGRESS REPORT

APRIL - SEPTEMBER, 1994

USAID/WEC COOPERATIVE AGREEMENT

IN SUPPORT OF

THE US-ASIA ENVIRONMENTAL PARTNERSHIP

November, 1994



World Environment Center

419 Park Avenue South, Suite 1800, New York, NY 10016
1600 Wilson Blvd, Suite 500, Arlington, VA 22209

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SIX MONTH PROGRESS REPORT FOR THE
AID/WEC COOPERATIVE AGREEMENT IN SUPPORT OF THE
US-ASIA ENVIRONMENTAL PARTNERSHIP

1.0 Status of Activities Under the Cooperative Agreement: Environmental Business Exchange Program.

Exchange program activities continued at a frenetic pace through out this six month period, with 107 exchanges being completed . Also during this reporting period, ITRI completed an independant evaluation of activities performed under this cooperative agreement.

BANGLADESH

BANG-1. Factory Assessment of the Tannery Industry -- USAID/Dhaka has requested WEC assistance in performing pollution prevention assessments of tannery facilities in the Hazaribagh areas of Dhaka. Project initiation: September, 1994.

2 EBE from U.S. to Bangladesh:

Lawrence Barber, Director of Manufacturing (Rtrd.)
A. C. Lawrence Leather Company

Mark Pfefferle, Environmental Economist, Science
Applications International Corporation

INDIA

TEST Program Cooperation -- WEC continued cooperation with USAID/India's Trade in Environmental Services and Technology (TEST) program on activities consistent with the US-AEP mandate. Activities being undertaken as part of this collaborative effort are listed below.

- Diesel Fuel Conditioner Demonstration/Technology Transfer -- WEC supported this technology transfer project by facilitating a demonstration of Hammerdown diesel fuel conditioner which reduces emissions to the atmosphere at the Automotive Center in Pune. Meetings were held with Auroworld World, a private sector corporation, on the commercialization of the product in India. Project initiation: April, 1994.

1 EBE from U.S. to India:

Ben Motion, Chief Engineer, LV Petro

- Clean Technology for Paper Mills -- ThermoChem. Inc./Manufacturing and Technology Conversion International (MTCI) developed a technology for eliminating water pollution from mini-paper mills and distilleries while simultaneously recovering chemical and energy. This technology has been licensed to Esvin Advanced Technologies of India. Esvin has requested technical assistance in applying the licensed technology to straw-black liquor. While in the U.S. Esvin officials visited a Mead pulp mill, and a Weyerhaeuser pulp mill. The Project initiation:

June, 1994

2 EBEs from India to the U.S.: V.S. Venkatraman, Managing Director, Dr. M. Mahalingam, General Manager, ESVIN TECH

1 EBE from U.S. to India: K. Dural-Swamy Senior Vice President, Marketing, ThermoChem

• Assessment of "Green" Boiler Technology -- Delegates from the Indian Boilers Manufacturers' Association visited U.S. boiler manufacturers to study the latest in fuel-efficient and environmentally friendly boilers with the objective of importing and incorporating these technologies into the manufacture of boilers in India. While in the U.S., the delegation attended the American Boiler Manufacturers' Association Annual General Meeting. U.S. firm included in the U.S. itinerary included: John Zink Company, The International Boiler Works Company, American Schack Company, Industrial Boilers Company, Sellers Engineering Company, Mac Environmental, Eclipse Systems, Catalytic Systems Division, and Soil Purification, Inc. Project initiation: June, 1994.

7 EBEs from India to the U.S.: D.B. Baldawala, Director, Industrial Boilers, Ltd.

R.T. Arasu, Jt. Managing Director, Cethar Vessels Ltd.

N.K. Desai, Chief Executive, Laxmi Boilers

M.S. Walla, Director, Walla Engineering Associates

B.P. Trivedi, Partner, Jayant Welding & Engineering Works

V.N.G. Rao, Managing Director, Ignifluid Boilers India, Ltd.

E.M. George, General manager, Thermax Ltd.

• Evaluation of Biological Formulations for Industrial Wastestreams Treatment -- U.S. Biotech, Inc. of New Jersey, and Premier Ziba, Ltd. of New Delhi explored the transfer of biological (bacterial) formulations for use in treating industrial wastestreams in India. Under this exchange representatives of Premier Ziba visited U.S. Biotech Inc., facilities to further discussions and evaluations as a precursor to test marketing products to sugar processing, tannery and sewage treatment industries in India. Project initiation: June, 1994.

3 EBEs from India to the U.S.: Govind Srivastav, Lashman Srivastav and Dr. Jagathan, Premier Ziba.

INDI-2 Textile Industry -- Review of Pollution Prevention/Control Technology -- WEC worked with AT International to bring a group of textile industry executives to the U.S. to review pollution prevention and control technologies relevant to bleaching and dyeing operations. Project initiation: April, 1994.

8 EBEs from India to U.S.:

Kishenlal Garg, Digjam Fabrics

Amrit Raj Dhariwal, Mangal Textiles

Gautam Chopra, Munna Textiles

M.I. Daga, M. Processing House

Vikram Singh Rathore, Small Industries Development Bank of India.

Chattaran Desai, Technical Director, Paradise Prints

Giresh R. Luthera, Technical Director, Luthra Dyeing and Printing Mills

Bapu Deshapende, Senior Executive, Technical Service, Product Development, Bhavan Industries, Colourtex

INDI-5. Clean Coal Technology Evaluation -- The Indian coal industry can significantly benefit from U.S. coal washing operations that would reduce the amount of stone transported from mines, and thereby BTU value per ton of coal shipped. Under this exchange principals of India's coal industry visited the U.S., attending Coal Prep '94 and meeting with experts at the Center for Applied Energy Research, Roberts and Schaeffer, and Pennsylvania Electric's Keystone coal preparation facility. Project initiation: May, 1994.

5 EBEs from India to U.S.:

B.C. Misra

Director

Central Mine Planning and Design Institute

Amitav Banerjee

General Manager

Andrew Yule & Company

M. Rajagopal

Chief

Coal Preparation Division

Central Mine Planning and Design Institute

K.S. Rao

Sr. Joint President

Indo Gulf Fertilizers and Chemicals Corp.

M.W. Goklany
Executive Director, India Power Partners
Managing Director, Desein Private, Ltd.

INDI-6 Assessment of Solar Photovoltaic Technology -- Suryashakti Systems, Pvt. Ltd., manufactures solar photovoltaic power components and other renewable energy devices. The purpose of this exchange was to review U.S. technology in photovoltaics with the goal for forming joint ventures with U.S. firms. U.S. companies identified for the visit included: Radoo Products, Texas Instruments, BSAR Solar. Project initiation: July, 1994.

2 EBEs from India to the U.S.: Upendra Kamdar, Managing Director, Vijay Kamdar,
Director, Suryashakti Systems

INDI-9. Fly Ash Utilization Exchange -- Three U.S. companies interested in exploring the potential for establishing a facility in India to use up to 2000 tons of combustion products per day, resulting in commercial products that could be sold on the Indian market. This exchange will allow for evaluation of alternative sites, determination of optimal plant size, selection of an Indian partner, and discussions of project financing. Project initiation: August 1994.

3 EBEs from US to India: Jagdish Saluja, President, Vikint Systems International

Howard Fitzgerald, Manager, ReUse Technology

Carl Bell, Partner, The Delta Group.

INDONESIA

INDO-6 Environmental Management at Industrial Estates -- The Indonesian government recently passed strict new rules making the developers/managers of industrial estates responsible for emissions from resident industries. To assist developers in understanding and dealing with these new environmental requirements, WEC organized a tour of U.S. industrial parks in Rhode Island, Cleveland, Ohio, Houston, Texas, and Kansas City, Missouri. In addition the Indonesian Developers were given a short course on basic considerations for environmental monitoring. Project initiation: April, 1994.

8 EBEs from Indonesia to U.S.: Sjukur Lawigena, Division Head, Operation and
Property Management; Wilyadi Adinoto, Project
Manager for Industrial Estate, PT Bumi Serpong
Damai

A.J. Kristiadi, Manager of Operation, PT Grahbuana
Cikarang and PT Kawasan Industri Jababeka

Swastiono Donny Dewanto, Environmental Engineer,
Elisabeth Dessy, Asst. Manager of Business
Development, Ade Irwn Dwiyanu Machmudin.

Development Assistant, PT Lippo City Development

Diding Muchidin, Director and Senior Environmental Engineer, PT Jaya Arkonin Engineering Manggala Pratam.

Budi Sutjahjo, Deputy Director and Senior Environmental Engineer, PT Waseco Tirta

INDO-7 Sharing of GIS and Remote Sensing Expertise -- The AHT Group of Indonesia is interested in U.S. experience and expertise in geographic information systems (GIS) and remote sensing. More specifically, AHT is pursuing an Asian Development Bank funded project to develop the marine and Coastal Information System, a component of the Marine Resources Evaluation and Planning Project, and has identified U.S. expertise as necessary to the project. Project initiation: May, 1994

1 EBE from U.S. to Indonesia: Fran Stetina, International Data Systems Office/Goddard Space Flight Center

INDO-8 Factory Assessments for the Plywood Industry -- USAID/Indonesia requested WEC assistance in providing factory assessments for the plywood industry. Under this exchange U.S. experts traveled to Indonesia and performed five factory assessments and a brief workshop for industry and government officials. Project initiation: September, 1994

2 EBEs from U.S. to Indonesia: Dan Sjolseth, Weyerhaeuser
Albert Fellows, Boise Cascade Corp. (rtrd.)

KOREA

KORE-3. Assessment of U.S. Water Treatment Technology -- The City of Pusan, Korea has embarked on an ambitious infrastructure building initiative that includes the construction of sewage treatment facilities. Under this exchange, two officials from Pusan traveled to the U.S. and surveyed wastewater treatment facilities in several U.S. cities including: San Francisco, CA, Denver, CO, and El Paso, TX. CH2M Hill was the U.S. host for this visit. Project initiation: June/October, 1994.

4 EBEs from Korea to U.S.: Sang Hyoun Kim, Director General of Sewage Department, Construction Bureau, and Dr. Yoo Chan Jun, Senior Researcher, Research and Training Institute, Ryu Jang-soo, Director of the Construction Bureau, Kim U-Bong, Section Chief, Sewage Treatment, Pusan City

KORE-4. Waste-to-Energy Incineration Exchange -- Basic Envirotech is a finalist in competition to provide an incinerator plant to the Han Kook Tire Company, Korea. Under this exchange officials from Basic met with Han Kook and explained the more salient features of their patented processes. Project initiation: September, 1994.

2 EBEs from U.S. to Korea: John Basic, Jr., President, Peter Hage, International

Marketing Manager, Basic Envirotech.

MALAYSIA

MALA-2. Waste Water Monitoring Technology Evaluation -- HF Scientific explored technology transfer opportunities with Yomart Environmental Systems Sdn Bhd. of Malaysia. Yomart is interested in demonstrations of waste water monitoring equipment that might have wide application in the Malaysian marketplace. Project initiation: April, 1994.

1 EBE from U.S. to Malaysia: Robert J. Maley, President, HF Scientific

MALA-3. Environmental Impact Assessment Technology Transfer -- Petroliam National Berhad (Petronas) sought U.S. expertise in performing impact assessments and developing monitoring programs of offshore oil drilling projects. Petronas will be embarking on several large assessment projects this year. Under this exchange, Continental Shelf Associates (CSA) met with Petronas to further explore business opportunities. Project initiation: April, 1994.

1 EBE from U.S. to Malaysia: Dr. David Gettleton, President and Scientific Director, Continental Shelf Associates.

PHILIPPINES

PHIL-7. Technology Transfer - Solid Waste Baling Equipment -- Representatives of the Metro Manila Authority (MMA) travelled to the U.S. to evaluate the operation of Mosley solid waste baling equipment. MMA is seeking ways of extending the useful life of operating solid waste landfills. The addition of baling equipment would go a long way to achieving this end, as effective volume reduction through baling may be 50 percent. Project initiation: April, 1994.

3 EBES from Philippines to U.S.: Prospero I. Oreta, MMA Vice Chairman Mayor
Ofelia Monroy, Consultant, Urban Planning Section
MMA

Jose Paolo Sibal, Managing Director, Phoenix
Environmental Protection systems.

PHIL-8. Philippine National Oil Company (PNOC) Technology Assessment -- A consortium led by the California Energy Company have entered into a contract to assist PNOC in developing geothermal power. Hydrogen sulphide emissions are a major concern at geothermal sites, and the government has recently passed stringent regulations regarding H₂S emissions. As part of this project, exchanges were designed to allow for the training of PNOC officials on the chemistry dependent nature of hydrogen sulphide control options, and also allow for a tour of U.S. companies manufacturing alternative treatment systems. Project initiation: September, 1994

5 EBEs from Philippines to U.S.:

Herman Guillen, Engineering Design Manger; Hermes Ferrer, Geoscientific Manager; Dwight Maxino, production manager, Romy Jabonillo, Process and Instrumentation Coordinator; Frances Dolor, Planning Manager, Philippine National Oil Company (PNOC)

SINGAPORE

SING-1. Evaluation of Wastewater Treatment Systems -- Under this exchange Pacific Vinitex Pte. Ltd. of Singapore met with Hoffman Environmental, Inc. and Blue Pacific Environmental Services, Inc. to learn more about chemical wastewater treatment systems and explore possible licensing and joint venture agreements. Project initiation: August, 1994.

2 EBEs from Singapore to the U.S.:

Chua Boon Tat, Executive Director; and Lim Eng Chuan, Business Development Manager, Pacific Vinitex Pte. Ltd.

TAIWAN

TAIW-1. Electric Arc Furnace Dust Recycling -- Enviroscience, Inc. (ESI) has proprietary technology for the recycling electric arc furnace dust. E Chang Iron Steel Company of Taiwan is interested in acquiring ESI technology for recycling electric arc furnace dust, and initial discussions have been very promising. The exchange allowed the principals of the companies to meet and discuss technical and financial aspects of technology transfer. Project initiation April, 1994.

3 EBEs from U.S. to Taiwan:

C. Tom Philipp, President and Owner, Bob H. Sims, Manager of Engineering, Don Warner, Manager, Contracts, Enviroscience, Inc.

TAIW-2. TEPA Review of U.S. Experiences in Wastewater and Harbor Management -- The AIT facilitated the visit to the U.S. of a delegation of Taiwan county environmental directors, primarily to view U.S. activities and achievements in harbor and wastewater management. The delegation visited Boston, Chicago, and Honolulu. U.S. companies hosting the delegation in each city were: CDM, Inc., WMX, and CH2M Hill International, respectively. WEC assisted in arranging appropriate itineraries for the delegation and on-the-ground logistics. Project initiation: June, 1994.

9 EBEs from Taiwan to U.S.:

Li Kung-cheh, Commissioner, EP Dept. Taiwan Provincial Government

Chu Liu-chao, Director, Bureau of Environmental Protection, Hua-lien County

Huang Sheng-fa, Director, Bureau of Environmental Protection, Changhua County

Wu Tien-chi, Director, Bureau of Environmental

Protection, Chiayi County

Hong Chin-tien, Director, Bureau of Environmental Protection, Kaoshiung County

Kuo Kun-ming, National Institute of Environmental Training, EPA

Huang Chi-lin, Taitung County EP Director

Wu Gin-son, Director, Bureau of Public Health and Environment, Kinmen

Liu Cheng-ying, Director, Bureau of Public Health and the Environment, Lien-chieng County

THAILAND

THAI-1. Demand-Side Management (DSM) Joint Venture -- At the request of USAID/Thailand, WEC is facilitating the exchange of staff between RCG/Hagler Bailly and TEAM Consulting of Thailand. Through this program RCG/Hagler will train TEAM staff in DSM and evaluate the potential for forming a joint venture. Project initiation: October, 1993/August, 1994.

2 EBEs from Thailand to U.S.:

Suree Yantapanit, Deputy Managing Director, Padern
Chaiyasingh, Senior Electrical Engineer, TEAM
Consultants

THAI-11. The Eastern Water Resources Development and Management Company, Ltd -- Eastern Water was established by the Provincial Waterworks Authority (PWA) and charged with the management of scarce water resources on the Eastern Seaboard. A U.S. tour would be planned to provide these individuals with exposure to water supply and distribution equipment, GIS, metering, and meter reading equipment; institutions with expertise in sound water resources management, pricing policies, and water reclamation and conservation. A second leg of the exchange would provide for two representatives of U.S. companies to visit Thailand to provide follow-up assistance. Project initiation: April, 1994.

4 EBEs from Thailand to U.S.:

Dr. Wanchai Ghooprasert, President and CEO
Wanchai Lawatanatrakul, Vice President
Phirawat Buasap, Vice President
Pairoj Sattayasansakul, Senior Engineer

THAI-12. Orlando, Florida/Songkhla, Thailand, Twinning Exchange -- RHUDO, USAID/Thailand requested US AEP support for developing a twinning relationship between the cities of Orlando, Florida, and Songkhla, Thailand. Under this exchange public works officials from the two cities discussed common problems and shared possible solutions. The proposed twinning would be conducted in two phases. Individuals who would be participating in this exchange from Thailand are: the Songkhla Director of Engineering, the City Manager, and either the Mayor or Deputy Mayor. A second phase of

the program would send two officials from Orlando, and one private sector representative to Thailand.
Project initiation: August, 1994.

4 EBEs from U.S. to Thailand: Octavio Serrano, Director of Solid Waste, and David Metzker, Director of Public Works, City of Orlando, Florida
Wendy Masteller, President; Chip Swindell, Vice President, Ecotech Consultants, Inc.

THAI-13. Pacific Adobe Technology Transfer Exchange -- Pacific Adobe, a leader in the earth building industry, manufactures a variety of earth press machines suitable for transportation to rural and remote areas. The company has a demonstration development established in Chiang Mai, Thailand. Under this exchange Pacific Adobe met with Mahaphant Fibre-Cement Co., a Thai consortium that is a likely distributor, and Sahakol, that is interested in manufacturing the equipment in Thailand. Project initiation: July, 1994.

2 EBEs from U.S. to Thailand: Forest Sprague, President, Pacific Adobe
Joe Simpson, President/owner, TECFAR

THAI-14. Chiang Mai Solid Waste Management -- McGill Environmental Systems (MES) has been studying solid waste management problems in Chiang Mai, and have proposed solid waste management support services including the construction of a transfer station that would include composting and sorting facilities. McGill S&P International, a U.S.-Thai partnership has been formed to construct and operate the transfer station, should the project be successful. Under this exchange McGill completed engineering and budgeting activities, and continued negotiations with Chiang Mai officials. Project initiation: September, 1994.

2 EBEs from U.S. to Thailand: James McGill, President, and Styre Hanson, Engineer, McGill Environmental Systems

THAI-15. Thailand Department of Teacher Education Exchange -- The DTE is in the process of setting up 13 new environmental science centers each of which will have a modern environmental chemistry laboratory. Under this exchange representatives of the DTE visited U.S. manufacturers of laboratory instruments, and universities to help develop specifications for the needed purchases. Project initiation: September, 1994.

7 EBEs from Thailand to U.S. Sutep Pongsriwat, President, Chiangrai Teachers College. Assistant Professor of Biology
Dr. Saroj Theerailb, Assistant Professor of Chemistry, Ayudhaya Teachers College
Praluab Sooksomsoon, Assistant Professor of Chemistry, Loei Teachers College

Visharn Kongtawong, Associate Professor of Physics and Electronics, Piboonsongkram Teachers College

Neet Julabat, Instructor of Physics and Electronics, Petchaburi Teachers College

Boonsong Sapvethakarnkit, Instructor of Biology, Buriram Teachers College

Puangnoi Tavornyutitam, Finance Officer, DTE

MULTIPLE COUNTRY EXCHANGES

MULTI-1. Medical Waste Technology Assessment -- Business representative from Indonesia and Thailand expressed interest in EBEs that address U.S. medical waste treatment technologies. WEC conducted a 13 person exchange program for industry, hospital and government officials from both countries. The exchange included visits to facilities that employ and manufacture: medical waste incinerators, autoclaves, radiation equipment, and sharps containers. Project initiation: August, 1994.

9 EBEs from Indonesia to U.S.:

Dr. H. Ahmad Sanoesi Tambunan, Director, Rumah Sakit Islam, Jakarta

Dr. Noegroho Hadi Poerwowidago, Director, Rumah Sakit Bethesda, Jogjakarta

Dr. Junawati Gunawan, Director, Sakit Mitra Keluarga, Bekasi

Dr. Hadjat Santosa Digdowirogo, Deputy Director, Rumah Sakit Harapan Kita

Dr. Sofyan Mukti, Head, Directorate of Environmental Sanitation, Department of Health, Republic of Indonesia

Dr. Rajimun Muslihudin, Senior Staff, Directorate of Toxic and Hazardous Waste, the Environmental Impact Management Agency (Bapedal)

Albertus Arief Jusni, Assistant Project Manager, Lippo Village Hospital

Hartono Mangunsentana, President Director, PT Harimas Pratama

4 EBEs from Thailand to U.S.:

*Dr. Sismadi Partodimulyo, Director, Sismadi Group

Akdej Homsesthi, Director of Garbage Disposal
Division, Department of Public Cleansing, Bangkok
Metropolitan Administration

Nitaya Mahabhol, Extra-Ordinary Specialist in Public
Health Engineering, Ministry of Public Health

Dr. Anant Kiatfuengfoo, Managing Director, Thai
Board of Orthopedics Samrong Hospital,
Samutprakarn

Wirote Watcharakiatisak, Head, Environmental
Engineering Section, Dept. of Environmental Health,
Ministry of Public Health

* Sponsored by Waste Management International

2.0 Budget Status

Total CA funding:	\$4,017,452
Expended (9/30/94):	<u>\$2,472,595</u>
Balance (9/30/94):	\$1,500,897

SIX MONTH PROGRESS REPORT

OCTOBER, 1994 - MARCH, 1995

USAID/WEC COOPERATIVE AGREEMENT

IN SUPPORT OF

THE US-ASIA ENVIRONMENTAL PARTNERSHIP

April, 1995



World Environment Center

419 Park Avenue South, Suite 1800, New York, NY 10016
1600 Wilson Blvd, Suite 500, Arlington, VA 22209

SIX MONTH PROGRESS REPORT FOR THE
AID/WEC COOPERATIVE AGREEMENT IN SUPPORT OF THE
US-ASIA ENVIRONMENTAL PARTNERSHIP

1.0 Status of Activities Under the Cooperative Agreement: Environmental Business Exchange Program.

Exchange program activities continued at a rapid pace with 131 exchanges being completed.

HONG KONG

Environmental Technology Transfer Program -- WEC facilitated a technology transfer business exchange for Coleman Energy and Environmental Systems. Vastford Industrial Ltd., of Hong Kong was particularly interested in Coleman's ground penetrating radar, time domain electromagnetic buried object detector, and wireless remote surveillance/monitoring system. Project initiation: October, 1994.

2 EBEs from U.S. to Hong Kong: Bradley Kabanuk, Manager; Frank Jesse, International Corporate Counsel; Coleman Energy & Environmental Systems

China Light and Power Electric Vehicle Exchange -- China Light and Power (CLP) of Hong Kong was interested in exploring opportunities for using U.S. technology in expanding their push in electric vehicles. Under this exchange two officials from CLP conducted follow up meetings with past contacts including G.M. Hughes, Westinghouse, and Delco. They also viewed the latest developments in electric vehicle technology at the EVS12 conference. Project initiation: December, 1994.

2 EBEs from Hong Kong to U.S.: W.L. Brown, Liang Fleming, Special Projects Manager, China Light and Power

Hong Kong Productivity Council (HKPC) Electroplating Wastewater Recycling Tour -- The HKPC was interested in exploring U.S. technologies for recycling of wastewaters from plating operations. Under this exchange they visited facilities using equipment or operated by DeWallace, U.S. Filter, and EMCAT. Project initiation: December, 1994.

2 EBEs from Hong Kong to US: Rudolph Wan, William Chan, Consultants, Hong Kong Productivity Council

Solid Waste Landfill Exchange -- Canonic Environmental, an engineering design and geological services company has been in contact with several Hong Kong firms including: Gammon Engineering, Chun Wo Construction and Engineering, Enviro-Chem, and Square Construction Co., all interested in finding partners to pursue Hong Kong landfill projects that may total \$137 million. Project initiation: March, 1995.

2 EBEs from U.S. to Hong Kong: Neno Duplancic, P.E., Vice President and Brad Kordic, Business Development Manager, Canonic Environmental.

INDIA

INDI-1. TEST Program Cooperation -- WEC continued cooperation with Sanders International in identifying opportunities for leveraging activities under the USAID mission's Trade in Environmental Services and Technology (TEST) program that are consistent with the US-AEP mandate. Activities being undertaken as part of this collaborative effort are listed below. The TEST program cost shared some portion of all project below.

Technology Assessment Exchange -- Representatives of Nuchem Ltd. visited U.S. experts in biological waste treatment, facility audits, and the use of agricultural wastes for constructing light weight construction materials.

Project initiation: October, 1994.

2 EBEs from India to U.S.:

P. Bharm, Executive Director, and N. Shriram, Vice President of Technology and Operations, Nuchem Ltd.

Waste to Energy Technology Assessment -- Under this exchange Western Pacques India Ltd. (WPIL), an Indian environmental engineering company traveled to the U.S. to assess options for joint ventures and technology transfer. WPIL plans to build by 2010 an effluent and solid waste treatment plant to generate 2000 MW of power based on waste to energy technology. Project initiation: January, 1995.

2 EBEs from India to U.S.:

S.J. Bahn, S.A. Patwardhan, Western Pacques India Ltd. (WPIL)

Biomass Gasification Exchange -- Representatives of Ajinkyatara Cooperative Sugar traveled to the U.S. to review technologies for biomass gasification using bagasse from sugar plants and concentrated spent wash waters from distillery operations. The tour included: Thermo Chem Inc., Cratech, Hawaii Natural Energy Institute, Institute of Gas Technology, Battelle Columbus, and Bioenergy Development Corp. Project initiation: November, 1994.

4 EBEs from India to U.S.:

Vikramsinh H. Aparadh, Managing Director, L. Prabhakar, Technical Advisor, Ajinkyatara Company Cooperative Sugar Factory Ltd

P. Venkatramen, Managing Director, G. Ramanathan, General Manager, EASL.

Coal Washery Exchange -- Under this exchange Norwest Mine Services Inc. met with a number of private sector companies to explore possibilities for joint business ventures in Coal washery design, construction and operation. Norwest also met with government agencies to assess the impact of regulations on the ability of Norwest to compete in the Indian market place. Project initiation: October, 1994.

1 EBE from U.S. to India:

Donovan Symonds, President, Norwest Mine Services Inc.

Evaluation of Oil Refining and Recycling Technologies -- Vijayant Autocrafts participated in this exchange to review U.S. technologies for developing a lubricating oil refining and blending plant. Synthetic lubricant oil manufacturing were also of interest. Project initiation: November, 1994.

1 EBEs from India to U.S.:

Harshad Tolia, Chairman and Managing Director, Vijayant Autocrafts.

ICOLP Technology Cooperation Project -- The International Cooperative for Ozone Layer Protection (ICOLP) requested participation in the EBE program to fund the attendance of three experts to meet with Indian industry and government officials and discuss alternatives to the use of ozone depleting solvents (ODSs). ICOLP experts also instructed Indian industry on submitting project proposals to phase out the use of ODSs to the Multilateral Fund of the Montreal protocol. Project initiation: December, 1994.

3 EBEs from U.S. to India:

Ms. Urmi Ray, AT&T - Aqueous and semi-aqueous alternatives expert

Prathap Reddy, Ford Motor Company - No-Clean Technologies expert

Rano Basu Ray, ICOLP Project Coordinator.

Indian Cogeneration Exchange -- Eenergy International Corporation (EIC) represents a consortium of Duke Engineering Services, Lockheed Martin, Niagara-mohawk, and TransAlta Utilities Corp. EIC identified sites and sugar mills having potential for joint cogeneration projects using bagasse and other biomass fuels. Under this exchange EIC pursued negotiations which, if successful would result in 30 and 50 megawatt facilities. Project initiation: December, 1994.

3 EBEs from U.S. to India:

Frederick P. Renner, Consortium Project Manager, John Paul Moscarella,
Cogeneration Expert, EIC

Gene Minner, Engineer, NUS Haliburton

Remote Environmental Monitoring Exchange -- Under this exchange Environmental Risk and Insurance Management Services (ERIMS) visited Environmental Services Ltd. (ESL) of Anchorage, Alaska to assess ESL remote environmental monitoring equipment at use at U.S. installations. ERIMS also met with International Solar Electric Technology regarding possible joint venture projects. Project initiation: December, 1994.

2 EBEs from India to U.S.:

Dr. B.A. Giridhar, Deputy General Manager, Santosh Gupta, Jr. General
Manager, Environmental Risk and Insurance Management Services

Indian ESCO Exchange -- WEC was approached by RMA, the holder of the USAID EMCAT contract, and their subcontractor Kiona International, Inc. for assistance in sending U.S. ESCOs to India to meet with Indian companies (previously screened by Kiona) interested in pursuing joint ventures, and to attend the 11th Indian Engineering Trade Fair and ENCON 95. Project initiation: January, 1995.

6 EBEs from U.S. to India:

Donald Smith, CEO, Energy Masters Corp.

Flynn Bucy, International Manager, Proven Alternatives, Inc.

Michael Bobker, President, BEI Energy Corp.

James Crossman, President, Chris Subbarao, Engineer, Financial Energy
Management

Thomas Dreessen, President, Energy Performance Services

Demand Side Management Exchange -- Under this exchange the Ahmedabad Electricity Company of India and the Resources Development Foundation (RDF) pursued demand side management opportunities in India. RDF will provide the electric company with information on financing DSM and supplieside activities and on DSM planning and implementation. Project initiation: February, 1995.

2 EBEs from U.S. to India:

Subash Chandra, Principal, Charter Oak Energy

Kevin Fitzgerald, RDF consultant.

Energy Conversion Devices Exchange -- Under this exchange Ovonic Battery Company, a subsidiary of Energy Conversion Devices, Inc., held discussions with interested parties on the design and construct a fleet of two wheeled electric vehicles powered by proprietary nickel metal hydride rechargeable battery technology. Ovonic held meeting with government and industry representatives with the goal of forming joint ventures for the commercialization of the battery technology. Project initiation: February, 1995.

5 EBEs from U.S. to India:

Nancy M. Bacon, Senior Vice President, Energy Conversion Devices, Inc

Subhash Dhar, President, Anthony Osgood, Engineer, Raymond
Himmler, Battery Engineer, Ovonic Battery Company

Subhendu Guha, Vice President, United Solar Systems Corporation.

INDONESIA

Technology Assessment for Infrastructure Projects in Indonesia -- The US-AEP infrastructure representative in Jakarta requested participation in the EBE program Indonesian engineers involved in the development of Bumi Serpong Damai, a town being developed on the outskirts of Jakarta. The development plan includes establishment of water distribution and collection and sewage treatment. The Indonesians who participated in this exchange were interested in mechanical/electrical equipment, pipe, and pumping station designs. Project initiation : October, 1994.

3 EBEs from Indonesia to U.S.: Ir. Munawar Saleh, Urban Planning Manager, Ir. Rini Angraini,
Infrastructure Engineer, Trinawati Basuki, Quality Survey Manager, P.T.
Bumi Serpong Damal

U.S./Indonesia Joint Oil Spill Response Workshop -- The U.S. Minerals Management Service (MMS) in collaboration with the Indonesian Agency for Research and Assessment Technology (BPPT) hosted a joint oil spill response workshop. Under this exchange, US-AEP sponsored members of the U.S. private sector to make technical presentations. Project initiation January, 1995.

4 EBEs from U.S. to Indonesia: Steve Blackburn, Marketing Director, MARCO Pollution Control

Bill Gorham, Senior Scientist/Program Manager, ENSR Consulting &
Engineering

Bob Dalton, Executive Vice President, Global Industries Corporation

Atle Nordvic, Director, Applied Engineering Department, Marine Spill
Response Corporation

KOREA

Assessment of U.S. Water Treatment Technology -- The City of Pusan, Korea has embarked on an ambitious infrastructure building initiative that includes the construction of sewage treatment facilities. Under this exchange, two officials from Pusan traveled to the U.S. and survey wastewater treatment facilities in several U.S. cities including: San Francisco, CA, Denver, CO, and El Paso, TX. CH2M Hill was the U.S. host for this visit. Project initiation: June/October, 1994.

2 EBEs from Korea to U.S.: Ryu Jang-Soo, Director of the Construction Bureau, Kim U-Bong, Section
Chief, Sewage Treatment, Pusan City

Wastewater and Solid Waste Management Assessment -- UEDC officials visited the U.S. to meet with U.S. companies interested in participating in wastewater and solid waste management projects in Korea. Companies visited included: IT Corp, Re-Tech, Plasma Technology, WMX, and Foster Wheeler. Project initiation: October, 1994.

4 EBEs from Korea to U.S.: Kim Nak-Kyung, President, Min Hoon-Ki, President, Park Kwang-Jii,
Administrative Manager, UEDC

Kim Hak-Myung, President, Com-Tech Corp.

Packaging Resin and Nylon Recycling Technology Transfer -- Environmental Technologies, USA (ET) manufactures loose-fill packaging materials using agricultural materials and food extrusion technology. They are also utilize technologies capable of producing a 95% recycled nylon resin. Under this exchange representatives of ET traveled to Korea and met with Sun Hill Glucose Co. Ltd. to explore business opportunities for collaboration in distributing products in Asia. Project initiation: November, 1994.

2 EBEs from U.S. to Korea: Robin Young, President and CEO, Ed Boehmer, Chief Engineer,
Environmental Technologies.

Air Pollution Alert Exchange -- Four Korean government officials visited USEPA Region 5 and the South Coast Air Quality Control Board to gain familiarity with U.S. technology and methods for monitoring air pollution and alerting the public about pollution levels. Project initiation: February, 1995.

4 EBEs from Korea to U.S.:

Choi Ryang-II, Director, Heo Woo-Young, Assistant Director, Air Quality Policy Division, Ministry of the Environment

Choi Soo-Kun, Director, Han River Environmental Management Office, Ministry of the Environment

Youn Hyeog-Sig, Assistant Director, Environmental Protection Division, Incheon Metropolitan City

PHILIPPINES

Waste to Energy Technology Evaluation -- YSC has developed a waste to energy system suitable to the particular needs of Philippine waste management. The system will process high moisture content MSW through a hydrolysis and fermentation process that yields both a lignin like material that can be burnt, and chemicals for sale. Under this exchange officials of MMA visited the U.S. to evaluate this technology. Project initiation: October, 1994.

8 EBEs from Philippines to U.S.:

Senator Ramon Revilla, Chairman Public Works Committee

Rudolfo Fuentes, Director, Environmental Management Bureau, MMA

Prospero I. Oreta, Mayor of Malabon

Jessie L. Todoc, Energy Regulation Officer, Department of the Environment

Ofelia P. Monroy, Technical Aide to Mayor Oreta

Natividad M. Sibal, Legal Advisor to Mayor Oreta

Abelardo R. Topacio, Aid to Senator Revilla

Dionisio De La Serna, Chairman, Housing and Urban Development.

Pharmaceutical Waste Incineration Exchange -- Under this exchange Interphil Laboratories, a Philippine pharmaceuticals manufacturer met with U.S. incinerator manufacturers capable of treating pharmaceutical wastes. Project initiation: November, 1994.

1 EBE from Philippines to U.S.:

Eduardo Cabrera, Vice President, Interphil Labs. Inc.

SINGAPORE

Technology Transfer for Chemical Incineration -- Technochem Manufacturers Pte. Ltd. is interested in installing a waste oil recycling facility and chemical incinerator as part of a business expansion in industrial chemical waste management. Under this exchange, company officials toured Safety Kleen used oil re-refining operations and an Eli Lilly plant. They also observed operations of an ABB-Raymond rotary kiln incinerator. Project initiation: January, 1995.

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3 EBEs from Singapore to U.S.:

Ng Thin Teng, Director; Robert Lim, Operations Manager; Ng We Wee, Chemist, Technochem Manufacturers Pte. Ltd.

SRI LANKA

Plastics Recycling Technology Assessment -- Maharaja Organization Ltd. of Sri Lanka visited the U.S. to meet with experts in plastics recycling, with the goal of identifying joint venture partners for recycling facilities in Sri Lanka. Project initiation: November, 1994.

2 EBEs from Sri Lanka to U.S.:

N.S. Perera, B.S. Manukulasurlya, Maharaja Organization Ltd.

Moratuwa-Ratmalana Waste Minimization Project -- USAEP/WEC provided industrial and institutional experts to assist USAID/Sri Lanka in assessing opportunities for waste minimization, and recommend facilities most appropriate for waste minimization grant/loan programs and participation in public outreach efforts. Project initiation: February, 1995.

2 EBEs from U.S. to Sri Lanka:

Don Brosky, Pollution Prevention Specialist, 3M

Burt Hamner, Pollution Prevention Manager, Shapiro and Associates

Infrastructure Development Exchange -- Under this exchange Lalitha Jayaraman, Director, Environmental Infrastructure Unit, Secretariat for Infrastructure Development and Investment - a USAID sponsored activity to develop and facilitate BOO/BOT projects in Sri Lanka, attended the International Law Institute (ILI) conference on Financing Urban Environmental Infrastructure in Bangkok. Project initiation: February, 1995.

1 EBE from Sri Lanka to Thailand:

Lalitha Jayaraman, Director, Environmental Infrastructure Unit, Secretariat for Infrastructure Development and Investment

TAIWAN

Evaluation of Emissions Control Technologies -- China Steel Corporation in Kaoshiung evaluated Reaction Engineering International (formerly Energy and Environmental Research Corporation) technology for controlling NOx and SOx emissions from their industrial furnaces and boilers. Project initiation: November/December, 1994.

3 EBEs from U.S. to Taiwan:

Michael Heap, President, Dr. Philip Smith, Vice President of Technology, Stoney Chen, Director of Business Development, Reaction Engineering International

5 EBEs from Taiwan to U.S.:

Sing-Tsu Tsai, Manager, Iron Making Process Development, Tsan-Yin Ho, Associate Engineer, Energy and Environment Section, Dr. Seng Rung Wu, Group Leader, Combustion Technology, Kent C. T. Wu, Section Chief, Air Pollution Control, H. J. Liu, Manager, Utility Department, China Steel Corporation.

Descaling Technology Transfer -- Under this exchange Aqua-Flow, Inc. held meetings with Kailay Engineering, the largest environmental controls and mechanical company in Taiwan to discuss possible joint venture opportunities. Project initiation: January, 1995.

1 EBE from U.S. to Taiwan:

Alden L. Coke, President, Aqua-Flow, Inc.

Printing Industry Facility Assessments -- The Taiwan Industrial Development Bank has requested assistance from U.S. experts in assessing pollution prevention and waste minimization opportunities in the printing industry. Project initiation: January, 1995.

2 EBEs from U.S. to Taiwan:

Jeffrey Adrian, Environmental Director, The John Roberts Company

Gary Jones, Manager, Environmental Information Office, the Graphic Arts Technical Foundation

THAILAND

Pattana Group Review of U.S. Environmental Technologies -- Under this exchange, the Pattana Group, a Thai environmental engineering company, visited environmental companies in the Portland, Oregon area to review oil recycling technologies. A second phase of the exchange took representatives of Cascade Earth Sciences, Hydrokinetics Systems, and Northstar Environmental to Thailand to pursue specific project opportunities. Project initiation: October/December, 1994.

2 EBEs from Thailand to U.S.:

Dr. Hansa Sanguanno, Dr. Payow Boonprakob, Pattana Group.

2 EBEs from U.S. to Thailand:

Terry Rahe, President Cascade Earth Sciences

Jack Mahoney, Vice President, Northstar Environmental

MACRO Sanitary Landfill Design Exchange -- MACRO is a small Thai engineering design firm that has been recognized for their solid waste management expertise. The company wants to work with Public Works Department (PWD) officials in incorporating environmentally sound criteria for Thailand's municipal/solid waste treatment and disposal. Under this exchange MACRO met with SCS Engineers, CH2M Hill, and Post, Buckley, Schuh & Jernigan, to assess their interest and capabilities in assisting in the development of the Prachathisat Sanitary District municipal landfill, and based on this collaboration pursue a strategic alliance. Project initiation: November, 1994.

5 EBEs from Thailand to U.S.:

Supote Lohwacharin, Managing Director, Sompong Burinrathikul, Chief, Environmental Engineering Section, Wilairat Saifon, Senior Environmental Engineer, MACRO

Pranee Limtheansa, Environmental Engineer, Tammanoon Nuntasomboon, Environmental Engineer, PWD

Hotel Energy Audit Exchange -- Under this exchange Saangsan Consultants Ltd., Thailand met with Dorgan Associates, Inc., of Madison, Wisconsin, to share expertise in energy auditing procedures, the use of energy efficient technologies and storage systems, and other methods for reducing energy consumption. Potential projects have been identified in the hotel industry. Project initiation: January, 1995.

5 EBEs from Thailand to U.S.:

Monthon Kumpengsath, Managing Director, Thosaporn Predapun, Energy Audit Program Manager, Saangsan Consultants, Inc.

Dr. Chiraphol Sintunawa, Director, Association for Development of Environmental Quality

Jumpoon Chavasiri, Dusit Thani Group

Sawang Phoompoung, Royal Orchid Sheraton

Financing Urban Environmental Infrastructure -- The International Law Institute held a conference in Bangkok on

Financing Urban Environmental Infrastructure. The conference was designed to bring together U.S. firms and Thai municipal authorities, ministry officials, law firms, and commercial banks to explore the benefits of private sector financing. Project initiation: February, 1995.

4 EBEs from U.S. to Thailand: Howard Fry, Attorney, Blank, Rome, Comisky and McCauley
Dr. Ghon Rhee, Pacific-Basin Capital Markets Research Center,
University of Rhode Island
Rebecca Merrell, International Law Institute
Michael Curley, Attorney

Electric Vehicle Exchange -- U.S. Electricar, Inc. participated in the exchange program to hold meetings with the CEO Club of Thailand aimed at forming a joint venture. The company also exhibited a bus, scooter, and industrial vehicles at the Board of Investment Fair. Project initiation: February, 1995.

2 EBEs from U.S. to Thailand: Carl Perry, Vice Chairman, Strategic Partnering, Paul Kohlman, Field Engineer, Electrical Systems, U.S. Electricar.

Orlando, Florida/Songkhla, Thailand, Twinning Exchange -- RHUDO, USAID/Thailand requested US-AEP support for developing a twinning relationship between the cities of Orlando, Florida, and Songkhla, Thailand. Under this exchange public works officials from the two cities discussed common problems and share possible solutions. The second phase (Thailand to the U.S.) of this twinning was conducted October, 1994.

8 EBEs from Thailand to U.S.: Pracholi Agouru, Mayor, Wilai Saisunthorn, City Manager, Vera Intragul, Director of Sanitary Engineering, Banjit Panrangsi, Chief of Solid Waste Collection, Boonsaguan Wilairat, Director of Finance, Amornluck Intasay, Chief of Public Relations, Petchara Scott, Programmer Analyst, and Sukhon Lapittihison, Director of Health and the Environment, City of Songkhla, Thailand.

MULTIPLE COUNTRY EXCHANGES

Industry/NGO Linking Exchange -- Environmental Careers Organization (ECO) is a Boston-based NGO which provides other NGOs with sufficient technical expertise to work with the private sector and government agencies to promote pollution prevention and toxics use reduction. Under this exchange ECO met with NGOs in Asia to determine the level of interest in setting up parallel organizations that might build linkages between the NGO and industrial communities. Countries visited under this exchange included India, Taiwan, Hong Kong, and the Philippines. Project initiation: November, 1994.

2 EBEs from U.S. to Asia: Diane Mailey, Program Manager, Tim Greiner, Technical Specialist, ECO

CITES Tour with U.S. Fish and Wild Life Service (USFWS) -- Nominees from the governments of the Philippines, Bangladesh, India, Indonesia, and Nepal participated in a U.S. Fish and Wildlife Service tour of customs facilities and procedures employed in Los Angeles and San Francisco, and visited the USFWS forensics laboratory in Ashland, Oregon. Project initiation: January, 1995.

2 EBEs from Indonesia to U.S.: Ir. Dwiatmo Siswomartono, Director of Nature Reserve Management and Flora Fauna Conservation

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Drs. IGNN. Sutedja, Head of Species Traffic Section

2 EBEs from Bangladesh to U.S.:

Syed Salamat Ali, Deputy Chief Conservator of Forests, A.H.M.
Monzurul Karim, Conservator of Forests

2 EBEs from Philippines to U.S.:

Wilburt Dee, IPAS Director and concurrent Officer-in-Charge, Wildlife Resources Division, PAWS Chairman, Inter-Agency Wildlife Management Committee

Mary Jean Caleda, Officer-in-Charge Wildlife Resources Division, Vice Chairman, InterAgency Wildlife Management Committee, DENR Ninoy Aquino International Airport Wildlife Monitoring Team

2 EBEs from Nepal to U.S.:

Hum Prasad Adhikari, and Thir Bahadur, G.C., National Parks and Wildlife Conservation

2 EBEs from India to U.S.:

S.K. Das, Deputy Director of Wildlife Preservation, Eastern Zone, Calcutta, Surindra Kumar, Deputy Director of Wildlife Preservation, Northern Region Delhi.

Conservation Program Exchange -- In cooperation with the Smithsonian Institution, US-AEP undertook this exchange to conduct an initial survey, to identify American and Asian areas and institutions, their capabilities, needs, and expressions of interest to participate in a Conservation Exchange Program (CEP). The survey is focusing on national parks, zoos, aquariums, botanical gardens, natural history museums, and other appropriate areas to identify opportunities for "US to Asia" and "Asia to US" exchanges of fellowships, research, education, outreach and awareness programs, and training in fund raising efforts. Project initiation: February, 1995.

1 EBE from U.S. to Thailand/
Malaysia/Indonesia/Philippines:

Dr. Michael Stuewe, Consultant

GEMI Conference -- The Global Environmental Management Initiative (GEMI) is an organization dedicated to promoting environmental excellence by the business community. ASEAN EIP proposed 4 candidates to attend the GEMI annual conference under the US-AEP's Environmental Business Exchange Program. Project initiation: March, 1995.

1 EBE from Singapore to U.S.:

Jayaram Mennon, Director Manufacturing Services, Singapore
Manufacturer's Association

1 EBE from Indonesia to U.S.:

Ismid Hadad, President and Director, Resource Development Consultants

1 EBE from Malaysia to U.S.:

Wong Soo Kan, Safety and Quality Audit Manager, Malaysian Oxygen Bhd.

1 EBE from the Philippines to U.S.:

Arnold Salvador, Executive Director, Management Association of the Philippines

2.0 Budget

Total costs incurred as of March 31, 1995: \$3,442,452.00

Remaining budget as of March 31, 1995: \$575,000.00

FINAL

SIX MONTH PROGRESS REPORT

APRIL, 1995 - AUGUST, 1995

USAID/WEC COOPERATIVE AGREEMENT

IN SUPPORT OF

THE US-ASIA ENVIRONMENTAL PARTNERSHIP

August, 1995



World Environment Center
419 Park Avenue South, Suite 1800
New York, NY 10016

**SIX MONTH PROGRESS REPORT FOR THE
USAID/WEC COOPERATIVE AGREEMENT IN SUPPORT OF THE US-ASIA ENVIRONMENTAL
PARTNERSHIP**

1.0 Status of Activities Under the Cooperative Agreement: Environmental Business Exchange Program.

A total of 57 exchanges were completed during the final five months of the Cooperative Agreement.

HONG KONG

Bleaching and Dyeing Industry Exchange -- The Hong Kong Productivity Council participated in this exchange to evaluate U.S. clean technologies for the bleaching and dyeing (B&D) industry, focusing on dyes and chemicals, low volume waste generating processes and equipment, and recovery systems for water, caustics, dyes, and heat. The group visited: Gaston County Dyeing Machine Co.; Cotton, Inc.; Scholl America; Galey & Lord; and Burlington Chemical. In addition, the group participated in an orientation program at the North Carolina State University College of Textiles. The ultimate goal of this exchange was to provide a basis for the creation and installation of a number of demonstration plants into existing B&D facilities in Hong Kong utilizing this kind of technology. Project dates: May 18 to 26, 1995.

7 EBEs from Hong Kong to U.S.

Dr. Ellen Chan, Principal Environmental Officer, Environmental Protection Department, Government of Hong Kong

Raymond Leung, Senior Environmental Officer, Management Division; and Linus Wu, Associate Consultant, Textile and Apparel Division, Hong Kong Productivity Council

Wong Chi Wing, Supervisor, Repair and Maintenance Department, Satisfactory Printing and Dyeing Ltd.

K.K. Chan, Factory Manager, China Dyeing Holdings Ltd.

Chow Ming Cheung, Project Manager, Hing Fung Printing and Dyeing Co.

Leung Hing Ki, Plant Engineering Manager, Gold Wheat Investments, Ltd.

INDIA

TEST Program Cooperation -- WEC continued cooperation with Sanders International in identifying opportunities for leveraging activities under the USAID mission's Trade in Environmental Services and Technology (TEST) program that are consistent with the US-AEP mandate. Activities undertaken as part of this collaborative effort are listed below. The TEST program cost shared some portion of activities for the projects below.

1 EBE from India to U.S.: C.F. Dias, Executive Director, Dyna-K Stampings

Filter Exchange -- Uniexcel Laser is a manufacturer of stainless steel filters for treating wastestreams from the organic chemical industry. Under this exchange, Uniexcel Laser representatives met with U.S. firms that might license welding technology for sintered stainless steel. Possible U.S. partners include: Texcel; and Alabama Technologies. Project dates: April 4 to 24, 1995.

1 EBE from India to U.S.: S. Nagaswami, Managing Director, Uniexcel Laser

Environmental Services Exchange -- Vimta Labs is interested in strengthening their capabilities for analysis of dioxins and furans, conducting environmental assessments, environmental auditing, and bioremediation. U.S. companies participating in the exchange included: Harding Lawson; Law Engineering; and Tighe and Bond. Project dates: May 1 to 15, 1995.

2 EBEs from India to U.S.: Dr. S.P. Vasireddi, Chairman and Managing Director; and Dr. K.S.M. Rao, Director of Laboratory and Technical Manager, Vimta Labs

Delegation to Waste Expo '95 -- A delegation of Indian industry, municipal, and central government representatives visited the Waste Expo '95 in Chicago. Project dates: April 23 to May 3, 1995.

6 EBEs from India to U.S. Surjit K. Chaudhary, Municipal Commissioner, Madras Municipal Corporation

Dr. S.R. Maley, Vice President, Biotech Exel Industries Ltd.

Kunit Oza, Chairperson, Clean Bombay Foundation

C.M. Vij, Director & Chief Engineer, Municipal Corporation of Delhi

Tarun Khatwani, Manager - Project Development, Industrial Plants and Waste Treatment;

Asim Barman, Calcutta Municipal Corporation

Industrial Boilers Exchange -- As a follow up to an earlier exchange, a representative of the Indian company, Industrial Boilers Ltd., visited the U.S. to finalize a Memorandum of Understanding with Combustion Association, Inc. Project dates: May 14 to June 3, 1995.

1 EBE from India to U.S.: R.R. Engineer, Vice President (Technical), Industrial Boilers Ltd.

Photovoltaic Technology -- The J.S. Group participated in the exchange program to review U.S. technologies and identify companies that might be interested in collaboration in India. The delegation visited: Spire; United Solar Systems Corporation; ISET; and Global Photovoltaic. Project dates: May 22 to 31, 1995.

2 EBEs from India to U.S.: Brig. (Retd.) N.N. Sharma, Senior Advisor; and R. Sainath, General Manager, J.S. Group

INDONESIA

Ecotourism Exchange -- USAID/Jakarta requested the participation of Keith Sproule and Karen Ziffer of Private Agencies Collaborating Together (PACT) to assist in the development and presentation of an ecotourism workshop. The workshop, which ran from April 18 through 20 addressed awareness, knowledge, planning, and implementation of sound ecotourism initiatives. Project dates: April 10 to May 7, 1995.

2 EBEs from U.S. to Indonesia

Keith Sproule, Karen Ziffer, PACT

Oil Spill Response Vessel Exchange -- The Indonesian Government, as part of its effort to secure navigation safety and to prevent marine disasters in the Malacca and Singapore Straits - two of the busiest and most important shipping lanes in the world, particularly for oil tankers - is seeking to improve its fleet of marine disaster prevention ships. Specifically, the Indonesian Sea Communication (the Indonesian Coast Guard) intends to procure three units of 500 gross tonnage type marine disaster prevention ships. To this end, representatives from the Indonesian Ministry of Sea Communications visited MARCO Pollution Control, a designer and builder of marine disaster prevention ships located in Seattle, Washington. The Indonesian representatives viewed MARCO facilities and equipment currently in use by the U.S. Coast Guard. Project dates: June 25 to July 1, 1995.

6 EBEs from Indonesia to the U.S.:

Ir. Drs. Abdul Razak Manan, MSI, Commissions for EIA, Ministry of Communication

Ir. Tunjung Indrawan, Secretary of the Directorate General of Sea Communication

C. Sutikno, Head of Subdirectorate on Ship Readiness, Directorate Sea and Coast Guard, Sea Communications

Ir. Hari Budiharto, Directorate Port and Dredging, Directorate General of Sea Communication

Ir. Saibun Pane, Research and Development Centre, Ministry of Communication

Drs. Iman Hambali, Planning Division, Ministry of Communication

KOREA

Solid Waste Management Technology Exchange -- Representatives of the Korea Environmental Management Corporation visited the U.S. to view solid waste management technologies. EMC has plans for six new incineration facilities over the next five years. U.S. companies participating in the study tour included: Molten Metal Technology; IT Corporation; and Wheelabrator. Project dates: April 22 to May 5, 1995.

3 EBEs from Korea to U.S.

Bok, Jin Poong, Chairman; Kang, Ho-Jik, Manager - Waste Treatment Division; and Lee, Jun-Heung, Assistant Manager, Environmental Management Corporation

PHILIPPINES

Air Monitoring Technology Exchange - Norman Dela Cruz, President, First Signs, Incorporated, traveled to the U.S. to view particulate monitoring equipment. First Signs has been contracted by the Filipino Government to set up approximately 50 ambient air monitoring stations in and around Manila, the first such study of its kind. In order to procure the best equipment possible, Mr. Dela Cruz met with numerous air monitoring equipment manufacturers. Project dates: March 26 to April 13, 1995.

1 EBE from the Philippines to U.S. Norman Dela Cruz, President, First Signs, Inc.

Iron and Steel Industry Exchange -- ASEAN EIP has requested that representatives of the Philippine iron and steel industry visit the U.S. to review current environmental practices and technologies. Facilities visited during the tour included: Davy International, I/N Tek, Plasma Energy, Consteel, NUCOR, and ESL. Project dates: May 9 to 26, 1995.

5 EBEs from the Philippines to U.S.: Arther Florendo, Vice President, Bacnotan Steel Corporation

Felix Silva, Technical Consultant, Philippine Pipe and Foundry Corporation

Wilfredo Labayen, Executive Vice President, Phoenix Iron and Steel Corporation

Estefanio Gacad, Technical Services Manager, GST Philippines, Inc.

Lemuel E. Suan, Operations Engineer, Davao Steel Plant

TAIWAN

NOx Control Technology Exchange -- The Chinese Petroleum Corporation (CPC) and the Industrial Technology Research Institute (ITRI) of Taiwan participated in the EBE program to identify appropriate technologies for meeting increasingly stringent NOx emission standards in Taiwan. While in the U.S., the delegation met with: Uncoal; Mobile; University of Utah's Combustion Laboratory; Reaction Engineering International; and Coen Company. Project dates: May 22 to 30, 1995.

4 EBEs from Taiwan to U.S.: Dr. Hung-chung Shen, Industrial Materials Department; and Mr. Goa-shee Leu, Senior Engineer, Chinese Petroleum Corporation

Dr. Chien-chung Tsai, Combustion Technology Division; and Dr. Li-chaing Chen, Deputy Director, Industrial Research Institute

Cement Industry Exchange -- WEC organized a technology demonstration exchange including representatives of the largest Taiwan cement manufacturing industries, officials from Taiwan EPA, and a leading advocate for emission standards. The group toured: Ash Grove Cement Facility; South Coast Air Quality Management District; and Calaveras Cement. Additional meetings were held with: PSM International; Nalco Fuel Tech.; U.S. Environmental Protection Agency; and the Global Environmental Fund. Project dates: May 6 to 15, 1995.

10 EBEs from Taiwan to U.S.: Dr. Fu-tien Jeng, Professor, Graduate Institute of Environmental Engineering, National Taiwan University

Jen-ta Pan, Engineering Department, Taiwan Cement Corporation

Cheng-hsin Huang, Purchasing Manager, Universal Cement Corporation

Shih-Song Ho, Chief, Environmental Department, Hsin Hsin Cement Corporation

Mon-lee Tan, Chief of Operations and Engineering, Asia Cement Corporation

Tsu-hsu Lai, Environmental Engineer, Industrial Pollution Control Corporation

Su-Jeen Gau, Section Chief, Industrial Development Bureau

Ching-Shi Yang, Director, Air Quality Bureau, Environmental Protection Administration

Kuang-ming Hsien, Manager, China Technical Consultants, Inc.

Yung-Tsai Yuan, Chief of Environmental Department, Chien Tai Cement Co., Ltd.

THAILAND

The Eastern Water Resources Development and Management Company, Ltd -- Eastern Water was established by the Provincial Waterworks Authority (PWA) and charged with the management of scarce water resources on the Eastern Seaboard. In a follow-up to an earlier exchange, the President and CEO traveled to the U.S. to meet with water company officials and U.S. government agencies. Project dates: April 29 to May 15, 1995.

1 EBE from Thailand to U.S.: Dr. Wanchai Ghooprasert, President and CEO; The Eastern Water Resources Development and Management Company, Ltd

Oregon Pacific Group Technology Assessment -- In a follow-up to two earlier exchanges, two representatives of the Oregon Pacific Group visited Thailand to pursue a joint venture to provide environmental services. Project dates: May 12 to June 2, 1995.

2 EBEs from U.S. to Thailand: Bill Snyder, Executive Director, Oregon Environmental Technology Association

Joe McDonnell, President, Beta Control Systems

MULTIPLE COUNTRY EXCHANGES

Total Quality Environmental Management Exchange -- The Gauntlett Group, Inc. participated in the EBE program to assess the receptiveness of Asian industry for training in TQEM methods. Under this exchange they focused on Asian suppliers of a U.S. multinational company. The participants met with representatives of DHE-Demag in Singapore, Petroleam Nasional Bearhad in Kuala Lumpur,

Malaysia and in Seoul, Korea, Dow Chemical, Samsung, Daewoo Electronics, and Daewoo Car Manufacturers. Project dates: May 5 to 31, 1995.

2 EBEs from U.S. to Korea,
Singapore and Malaysia:

Suwanna Gauntlett, President, Gauntlett Group, Inc.

Norman Eader, Vice President, Office of Public Affairs,
Oregon Graduate Institute of Science and Technology.

Electric Vehicle Exchange -- Chaz Haba of Planet Electric visited India to pursue a joint venture with Bajaj Auto to produce electric vehicles. While in India, Mr. Haba also met with representatives of Ashok Leyland, a major Indian automotive manufacturer interested in developing electric vehicles. In addition to the meetings in India, Mr. Haba visited Bangkok, Thailand to provide a demonstration of electric vehicle technology to a delegation of the U.S.-Asia Environmental Partnership (US-AEP). Mr. Haba met with local Thai officials to promote the use of electric vehicle technology in Bangkok. Project dates: July 8 to 19, 1995.

1 EBE from U.S. to India:

Chaz Haba, President & CEO, Planet Electric, Inc.

2.0 Budget

Total costs incurred as of July 31, 1995:	\$3,900,000
Remaining budget as of July 31, 1995:	\$117,452

Appendix F

Work Plan

Work Plan - November 5, 1992

Work Plan - April 15, 1993

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**FIRST YEAR WORK PLAN FOR
THE AID/WEC COOPERATIVE AGREEMENT
IN SUPPORT OF
THE U.S.-ASIA ENVIRONMENTAL PARTNERSHIP**

November 5, 1992



World Environment Center 419 Park Avenue South, Suite 1800, New York, NY 10016
1600 Wilson Blvd Suite 500 Arlington, VA 22209

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Abbreviations:

AID	Agency for International Development
APELL	Awareness and Prevention of Emergencies at the Local Level
BVI	Bicentennial Volunteers, Inc.
CY	calendar year
ELI	Environmental Law Institute
FY	fiscal year
IIEC	International Institute for Energy Conservation
IEDS	International Environmental Development Service
OTA	Office of Technical Assistance
RTG	Royal Thai Government
STTA	Short-Term Technical Assistance
STPD	Short-Term Professional Development
TVA	Tennessee Valley Authority
UNDP	United Nations Development Programme
US-AEP	U.S.-Asia Environmental Partnership
USAID	U.S. Agency for International Development
WEC	World Environment Center
WRI	World Resources Institute

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Preface: Annual Work Plan Description

In accordance with Section E.2.1.(b) of the Cooperative Agreement's Attachment 1, Schedule, this detailed work plan covers the period from the effective date of the Agreement, September 23, 1992, through September 1993. It provides an outline of work planned, and identifies products to be completed under the Short-Term Technical Assistance (STTA) and Short-Term Professional Development (STPD) activities. As specified in the Agreement, this First Annual Work Plan gives particular attention to outputs. Outputs are related to specific environmental problem areas, to specific countries, and to specific technologies. They are also related to objectives and purposes above and beyond the accomplishment of exchange missions alone, and they are quantifiable. Attention is also given to opportunities for support and leverage, building on WEC's own programs in Asia and the programs of other organizations directly and indirectly involved in the US-AEP. Such support and leverage is appropriate both to fostering of the US-AEP over the long-term, as well as ensuring achievement of significant US-AEP accomplishments within the first year. In addition, a rough schedule of activities and quarterly budget estimates are provided. While the goals and targets of the work are firm, WEC is well aware that the nature of the CA requires flexibility and responsiveness to emerging opportunities generated throughout the US-AEP.

This First Year Work Plan is believed to be fully consistent with the terms of reference of the Cooperative Agreement, which in turn is based upon WEC's proposal for such an Agreement, submitted on June 1, 1992, with its modified budget submission dated September 17, 1992. The only significant departure from that most recent budget outline is the conversion into direct travel and communications cost lines what had been the "Business Development Trips" line. Since the original budget submissions were made, the US-AEP Secretariat and WEC itself have established or strengthened contacts and assessed program opportunities in most of the countries of the region, making WEC's traditional initial business development travel less necessary, but increasing the need for direct program support.

In submitting this work plan for the program already defined under the Cooperative Agreement, WEC notes its intention to submit to AID a supplemental but closely related activity for FY 1993: a Partnership Publications Program. This proposal arises out of WEC's work on the Energy Efficiency and Environmental Technology Clearinghouse Database with EPA and DOE, and from discussions between the US-AEP Secretariat and the Environmental Law Institute (ELI) regarding preparation of a Partnership newsletter, and discussions between WEC and ELI, and other organizations including the World Resources Institute (WRI) as to how to boost the communication of lessons learned throughout the Partnership, and to make accessible the kinds of business and issue-oriented information that can stimulate further Partnership progress, WEC anticipates collaborating with these and perhaps several other internationally-oriented environmental and publishing groups to make this supplemental proposal within the next two months. ##

1. Program Activities

In September 1992, the World Environment Center (WEC) entered into a two-year Cooperative Agreement with the U.S. Agency for International Development (AID) to support better environmental, health and safety policies and practices in the Asia region. Work under this Agreement will support the U.S.-Asia Environmental Partnership (US-AEP) generally, and the Fellowships, Exchanges, and Training component of the Partnership in particular.

The objective of the US-AEP is to move U.S. technology and capital to the resolution of Asia's environmental problems. WEC, which has an established reputation in Asia and worldwide for providing neutral and objective access to expertise, information, and technology, is pleased to support the US-AEP as a catalyst, responding to opportunities to strengthen linkages between both the U.S. and Asian partners. This will be accomplished through activities that create or enhance ties between U.S. and Asian companies, organizations, and agencies.

1.1 Types of Activities

Under the CA, WEC has been given support for three types of activities to support the US-AEP. The core of this WEC/US-AEP Cooperative Agreement is the design and implementation of approximately 100 short-term business exchanges per year. Under the terms of the Cooperative Agreement, these exchanges will occur under two programs: as (i) Short-Term Technical Assistance Activities, and (ii) Short-Term Professional Development Activities. These two programs will be augmented by a modest program to provide (iii) Supporting Information and Instrumentation. Together, these comprise the elements of the International Environmental Development Service (IEDS), WEC's ten-year old program of worldwide technical assistance and human resource development based on private-and-public sector volunteer services. Each of these kinds of activities are described below.

Program I: Short-Term Technical Assistance (STTA): individually tailored audit and assessment missions, organized on a *pro bono* or partially funded basis, from the United States to Asia. Such activities vary according to need and availability of appropriate technical services. They may be as brief as several days, or as long as several months. While *pro bono* services will be the preferred option for all technical assistance assignments, there will be situations in which paid consultant services will be required either as a complement to or in place of volunteer services. Paid services are expected to be needed for less than one out of five STTA activities.

Program II: Short-Term Professional Development (STPD): these activities will include, but not be limited to, on-the-job internships, seminars and workshops, and study tours of Asians to the United States. Short-term professional development activities

provide both Asian and US private and public sector officials with on-the-job experience at one or more U.S. industries, offices, or laboratories (based either in the US or in the region). The professional development assignments would generally be from one to six months duration. Study tours consist of briefings and field visits that are designed around specific environmental topics (e.g., pollution control and monitoring technologies, corporate health and safety programs, etc). These would usually be for one to six weeks in duration.

Program III: Supporting Information and Instrumentation. WEC's experience has proven that inputs of documents and literature, instrumentation, supplies and communications significantly enhance both technical assistance and professional development programs. This is modestly budgeted at \$200 per activity, or \$20,000 for the 100 STTA and STPD activities planned each year. Included in this category will be U.S.-source commodities and equipment. Equipment will consist of monitoring or analytical instruments or demonstration equipment. In addition to hardware and supplies, these activities may require computer data searches (e.g. from the Energy Efficiency and Environmental Technology Clearinghouse), computer software and models, or supplementary documents and publications. Other project enhancements may be in-country study tours or workshops, or costs of report preparation, translation, and publication, to ensure dissemination of the results of a STTA or STPD activity. As with other WEC activities, efforts will be made to procure *pro bono* contributions of such equipment, supplies, and services from the manufacturers or source. A significant portion of the funds allocated for this item may be expected to be used for shipping or postage costs.

1.2 FY 1993 Priorities:

Following from consultations with both the US-AEP Secretariat and the other Implementing Organizations for the Fellowships, Exchanges, and Training component, the **Priority Problem Areas** to be addressed under this Cooperative Agreement during FY 1993 are:

- urban and industrial environmental infrastructure;
- energy conservation and cleaner energy technology;
- development of standards and compliance; and
- monitoring systems and analysis of environmental information.

For the US-AEP as a whole, WEC understands that Strategic Initiatives are being formulated for:

- Electric Utilities, focussing on Demand Size Management and Clean Coal Technologies and
- Urban and Industrial Waste Water Treatment.

In addition, emphasis will also be given to introducing:

- Responsible Care Programs.

Accordingly, WEC will allocate most of its efforts to support these initiatives. Also, WEC's activities under the Agreement during FY 1993 will be targeted on the U.S. and the

following groups of Asian Countries:

- Group A: Countries in which WEC has an office and existing full-fledged WEC programs: Thailand, Indonesia
- Group B: Countries with on-going WEC activities: India, Philippines, Taiwan, Malaysia, Singapore
- Group C: Priority "new" WEC countries: Hong Kong, Korea, Sri Lanka
- Group D: The other countries of the region, some of which WEC has worked with, but which for various reasons appear to be of secondary priority in terms of relative significance for US-AEP: Bangladesh, Cambodia, China, Fiji, Laos, Micronesia, Mongolia, Nepal, Papua New Guinea, and Vanatau

Of these, and excluding China, the ten countries in Groups A-C cover approximately 94 percent of the population of the region and well over 90 percent of the region's industrial investment. WEC understands that these countries are also the top ten in priority for other US-AEP agencies as well. Accordingly, at least 90% of the effort and expenditures under the Agreement during FY 1993 are expected to serve these three country groups.

2. Strategy and Targets

2.1 Implementation Strategy

The goal of the US-AEP is to move U.S. technology and capital to the resolution of Asia's environmental problems. That the Asian countries have tremendous need for improved environmental technology and capital is obvious, as is the fact that the U.S. is a world leader in such technology. But getting U.S. technology and capital moved and applied effectively to Asia's environmental problems is not a simple undertaking. It is specific to country and sector. It is a function of policy and regulations, and institutional capacities on both sides. It is also a function of personal and institutional relationships. As Asian leaders from both private and public sectors have repeatedly phrased it: "Friends first, then business."

The World Environment Center has no mandate to promote business opportunities *per se*. WEC's mandate is to strengthen linkages between institutions and individuals, to facilitate the transfer and exchange of information, technology, experience, and expertise. In a broad sense, then, WEC's entire program in Asia supports the objectives of the US-AEP. By fostering the kinds of problem-solving collaborations that make friends and colleagues, commercial business opportunities are sure to follow and thrive. Without such friendly, collaborative relationships, such opportunities will be limited. As a catalyst in this process, WEC intends to remain neutral and independent of commercial and political interests, but at the same time recognizes that its activities will provide stimulus for commercial interactions among both Asian and U.S. partners.

Opportunities for such interactions and supporting work under the US-AEP are vast. Over recent months, during discussions with the US-AEP Secretariat and the other Implementing Organizations of the Fellowships, Exchanges, and Training component, as well as with U.S. business and Asian contacts, activities have been proposed. In order to select from among these, the projects (sub-activities of the Cooperative Agreement) will, first, be consistent with the **Priority Problem Areas** and the **Country** priorities defined in Section 1. In addition, six criteria have emerged for honing the FY 1993 agenda:

First, the activities should address problems of high national and regional priority, so that their value is enhanced by potential for transfer, adaptation, or commercialization on a broad scale;

Second, the activities should link business, government and non-governmental (public interest) groups from both the U.S. and Asia to address specific problems;

Third, the activities should address problems in which the U.S. has strong experience and capability, and/or in which there is a clear mutual interest between the U.S. and Asian partners;

Fourth, the activities should have good potential for long-term benefits, but should also have potential for measurable accomplishment within the first 12-months;

Fifth, the activities should extend or leverage the initiatives of other agencies and organizations working with the US-AEP, especially those of EPA and the other Implementing Organizations of the Fellowships, Exchanges, and Training component; and

Sixth, the activities should either establish a replicable model program for addressing a particular problem, or should create or strengthen forums for on-going collaborative exchange and transfer of information, experience, expertise, and technology between the U.S. and Asian partners.

2.2 Projects (Sub-Activities) Agenda

Following from the FY 1993 Priorities presented in Section 1.2, and the Selection Criteria posed in Section 2.1, WEC proposes, first, that 20 STTA and STPD exchanges (i.e. 20 percent of the budgeted number) be held in reserve to support the two US-AEP Strategic Initiatives planned for FY 1993, and other priority initiatives that may emerge during the course of the year.

The other 80 STTA and STPD positions will be applied toward an initial list of eleven projects -- "sub-activities" in the language of the Cooperative Agreement -- that fit with the FY 1993 Priorities and Criteria. Most of these build upon and leverage on-going WEC activities in the region. Several of them directly support the two Strategic Initiatives. These eleven projects are:

1. National/Local Responsible Care and Corporate Environmental Initiative Programs
2. Industrial Environmental Auditing
3. Industrial Disaster Preparedness Strategies
4. Electric Power Demand Side Management Strategies
5. National Environmental Action Plans/National Environmental Funds
6. Management and Implementation of Environmental Assessments
7. Offices of Technical Assistance
8. Constructed Wetland Wastewater Treatment Technologies
9. Certified Laboratory Systems
10. Regional Environmental Forum: Mega-Cities on the Pacific Rim and the Burden of Air Pollution
11. Regional Environmental Forum: Mega-Cities on the Pacific Rim and the Problems of Water Supply and Wastewater Treatment

On the following pages, brief summaries are presented of why these projects were selected, the level and nature of effort needed to conduct them, and their anticipated outputs. As defined in the Sixth Selection Criteria above, they fall into one of two categories. The first nine projects will establish replicable **Model Programs** for addressing particular problems or introducing specific technologies, while the final two projects will create **Forums** for on-going collaborative exchange and transfer of information, experience, expertise, and technology between the U.S. and Asian partners.

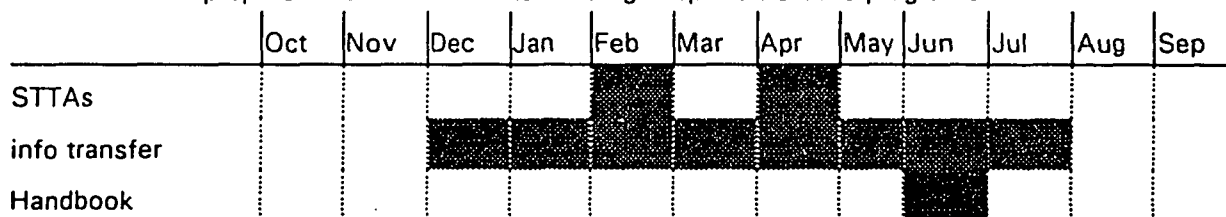
The Model Programs will draw extensively upon the past and on-going efforts WEC and others to develop programmatic tools for addressing environmental problems in the region. A significant output of each of these Model Program activities will be the preparation of a practical Program Handbook or case study, describing the kind of program, its application and results, and recommendations for adaptation elsewhere. These handbooks would support the efforts of U.S. and Asian partners, and should facilitate widespread dissemination and adaptation under the US-AEP in future years.

**Project 1. National/Local Responsible Care and
Corporate Environmental Initiative Programs**

Background: Responsible Care is an initiative of the chemical industry to develop internal standards of practice for environmental, health, and safety management. Commitment to the principles of Responsible Care is now a condition for membership in the U.S. Chemical Manufacturers' Association (CMA) and is rapidly gaining acceptance worldwide. WEC has been working in Thailand for over a year to introduce and adapt Responsible Care to the local industry, and anticipates that formal acceptance can be gained this year. Local chemical industry associations in other countries of the region -- India, Indonesia, Philippines, Hong Kong and Taiwan -- have also been considering endorsement of Responsible Care. In addition, there is interest from the Philippines and other countries in sharing modern U.S. corporate environmental initiatives, such as 3M's Pollution Prevention Pays approach.

US-AEP Funded Activities: collaboration with the U.S. Chemical Manufacturers' Association (CMA), to conduct:

- . 4 STTAs, concentrating initially on Thailand, The Philippines, and India
- . transfer documents and information to local chemical manufacturers associations, government agencies, NGOs and the press in the region
- . prepare a Handbook on introducing Responsible Care programs



Supplementary Inputs:

- . staff services from CMA
- . services of STTA volunteers
- . documents and reports from CMA and others
- . services of Asian participants

Outputs:

Immediate:

- . commitment of at least two (2) Asian chemical manufacturer associations to responsible Care programs
- . preparation of a Handbook for Responsible Care programs

Longer-term:

- . for Asian chemical industries to commit themselves to the Responsible Care Program will mark a watershed in the attitudes of local industry management
- . similarly, if Asian businessmen are directly exposed to the emerging environmental thinking of American business leaders, their own commitment to environmental management may be transformed
- . a more level "playing field" for the international chemical industry
- . increased action and investment in pollution control, waste minimization, and accident prevention within the single most hazardous industrial sector, and Asian industry generally

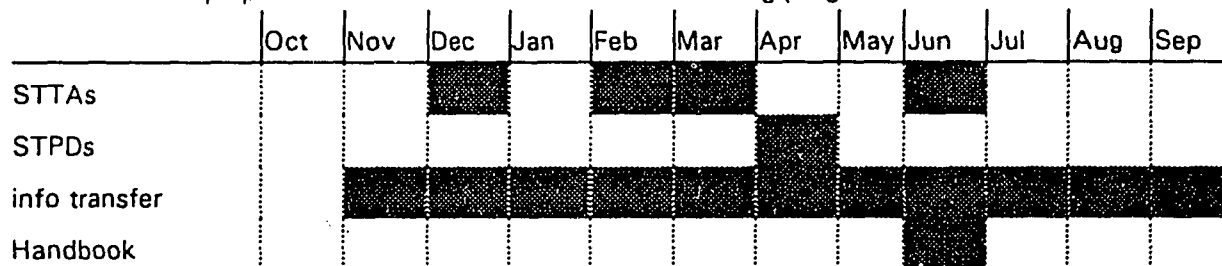
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Project 2. Industrial Environmental Auditing

Background: Environmental Auditing is the basic tool for factory-level environmental management, pollution prevention, and waste minimization. It may be applied either by enforcement agencies, as a means for monitoring industries, or by industry itself -- as the first step in taking environmental management initiatives and monitoring progress. In-factory environmental auditing has also been the basic tool of WEC's IEDS program over the past decade. Yet there are still no standardized procedures or systems for such auditing programs in any Asian country.

US-AEP Funded Activities: use of industry volunteers to introduce environmental auditing practices into several countries in the region (India, Taiwan, Indonesia, Sri Lanka, etc.)

- . 5 STTAs: current requests include chlorine and textile factories in India, a tire factory in Sri Lanka, and others to be determined
- . 4 STPDs, including at least two from the Confederation of Indian Industries, for professional opportunities to be arranged with U.S. manufacturing corporations and/or industrial engineering and environmental consulting companies
- . transfer of documents and information to government agencies, industrial associations, and local environmental and engineering consultant groups
- . prepare a Handbook on environmental auditing programs



Supplementary Inputs:

- . staff and logistical services from U.S. companies, including services of STTA volunteers and hosts of STPD fellows
- . services of participating Asian companies and organizations
- . documents and reports

Outputs:

Immediate:

- . introduction or extension of environmental auditing to new industrial sectors in at least three countries (India, Thailand, and Philippines)
- . specific recommendations from those audits for action by the target factories
- . initial set of Asian country engineers with direct experience in Environmental Auditing
- . preparation of a Handbook for environmental auditing programs

Longer-term:

- . widespread use of Environmental Auditing in Asia
- . introduction of new technologies and control equipment for industrial pollution control
- . expanded market and opportunities for local and joint ventures in industrial environmental management

Project 3. Industrial Disaster Preparedness

Background: Throughout Asia, the shadow of Bhopal haunts industrial operations -- both domestic and international. The safety of major American industrial investments in locations such as Thailand's Eastern Seaboard are dependent upon the actions of neighboring industries, local government, and the surrounding community. WEC has recently joined with AID, EPA, and UNEP to develop Local Accident Management and Prevention (LAMP) programs in India, Indonesia, Thailand, and Mexico. While such programs will require several years to implement, the basics of the process should, based on experience in these countries, be ready for summarizing and sharing more broadly during 1993.

US-AEP Funded Activities: use of industry and/or EPA volunteers to introduce or enhance Awareness and Prevention of Emergencies at the Local Level (APELL) and LAMP activities and extend them to additional countries

- . 2 STTAs
- . 2 STPDs
- . transfer of documents, information, and software programs to industries and government agencies
- . prepare a Handbook for industrial disaster preparedness and prevention programs

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
STTAs				■		■						
STPDs								■	■	■		
info transfer				■	■	■	■	■	■	■	■	■
Handbook											■	■

Supplementary Inputs:

- . staff services from U.S. companies, including services of STTA volunteers, and hosts of STPD fellows
- . staff services of participating Asian companies and organizations
- . staff services and travel of collaborators including UNEP and EPA
- . the existing LAMP program's technical assistance, workshops, local organizers, etc.

Outputs:

Immediate:

- . accelerated adoption of APELL and LAMP programs by at least one additional Asian country
- . preparation of a Handbook or case study report for industrial disaster mitigation and prevention programs

Longer-term:

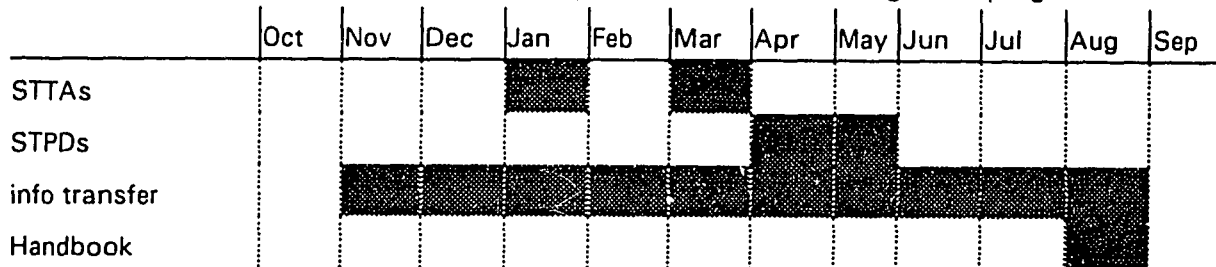
- . accelerated adoption of APELL and LAMP programs throughout Asia
- . increased acceptance of related programs, such as Responsible Care prevention and/or mitigation of disasters, both for local companies and communities, and for American and other international investors

Project 4. Electric Power Demand Side Management Strategies

Background: Electric utility demand generally exceeds 10 percent annual growth in much of the region. As utilities have found in the U.S., the most attractive "new" source of electric power supply is conservation. Over the past three years, with the initiative and support of the International Institute for Energy Conservation (IIEC), Thailand has made a major policy turn-around, and now embraces a strong demand side management (DSM) program. WEC would join with IIEC to apply this experience to the Philippines, as a model for other US-AEP countries.

US-AEP Funded Activities: use of IIEC, EPA, and DOE experts and industry volunteers to introduce utility demand-side management concepts and assist in developing a national program

- . 6 STTAs
- . 10 STPDs, mainly to visit and work with leading conservation-oriented power utilities in the U.S.
- . transfer of documents, information, and software programs to utilities, industries and government electric power and energy policy agencies
- . prepare Handbook for electric power demand side management programs



Supplementary Inputs:

- . staff services from IIEC, EPA, U.S. utilities and energy conservation technology companies, including services of STTA volunteers, and hosts of STPD fellows
- . staff services of participating Asian companies and organizations.

Outputs:

Immediate:

- . introduction of a DSM program concepts and design of national program in at least one additional country (tentatively: Philippines)
- . preparation of a Handbook for demand side management programs

Longer-term:

- . significantly reduced power investment requirements throughout the region
- . greater efficiency of energy use by public and industry, resulting in less environmental destruction both for development of new power plants and in emissions of pollutants, including acid rain precursors and greenhouse gases
- . expanded market and opportunities for efficient light bulbs and energy-saving machinery

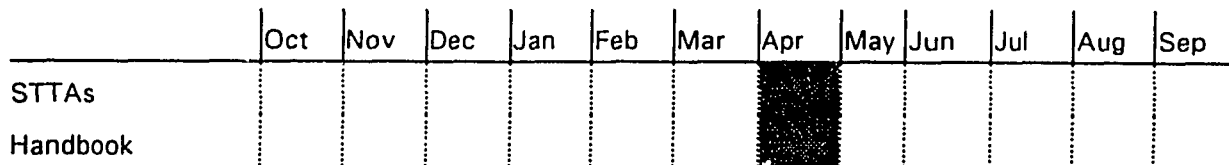
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Project 5. National Environmental Action Plans/National Environmental Funds

Background: Asian countries are overhauling their environmental laws and administrative systems, establishing environmental infrastructure funds, and preparing national action plans. WEC was involved in the first national environmental plans in East Europe, and has been asked by UNDP to arrange the technical assistance for Thailand's planned National Environment Policy and Environmental Management Plan. WEC anticipates working on these plans with EPA and private consultants in early 1993, then being able to summarize the experience in a program handbook for sharing and application in other US-AEP Partner countries.

US-AEP Funded Activities:

- . 2 STTAs
- . follow-up work with Thai environmental ministry to prepare a Handbook on the preparation of national environmental policies and management plans



Supplementary Inputs:

- . staff services from EPA, World Bank, ADB, RTG

Outputs:

Immediate:

- . capturing and summarizing the experience of Thailand's national environmental planning exercise, through preparation of a Handbook

Longer-term:

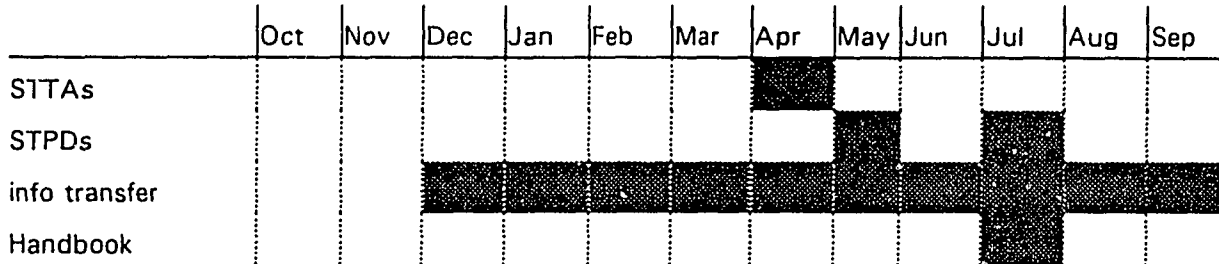
- . improved policies and practices in Thailand resulting from their national policy and management plans
- . adaptation of the national policy and planning process to other USA-AEP partner countries, with corresponding follow-on impacts

Project 6. Management and Implementation of Environmental Assessment

Background: Environmental assessment has become a widespread development planning tool, but it is generally implemented poorly in the region. EPA plans to offer an environmental assessment course for Taiwan, and U.S. companies have vast practical experience in preparation, management, and training for environmental assessment work. Some of these companies have expressed interest in working in the US-AEP region.

US-AEP Funded Activities:

- . 1 STTA: from a U.S. environmental consulting group, to be placed with an Asian environmental protection agency or engineering association to develop an in-country training and management program for environmental assessments
- . 4 STPDs, mainly drawn from graduates of the EPA environmental assessment training course, to work within private consulting companies working on environmental assessments and/or with government agencies that have oversight for environmental assessment at the national and state level
- . transfer of documents and information concerning environmental assessment



Supplementary Inputs:

- . prepare a Handbook strengthening environmental assessment procedures and practices
- . courses and staff services from EPA, U.S. private consulting companies, other agencies involved in STTA and STPDs
- . information and documents from EPA, other sources
- . staff services of participating Asian agencies and companies

Outputs:

Immediate:

- . strengthened practices and capabilities for management and implementation of environmental assessments
- . better familiarity with current U.S. practices, with U.S. sources of information, and with leading companies engaged in environmental assessment work

Longer-term:

- . improved procedures and practices for environmental assessment in the region
- . expanded opportunities for joint ventures for U.S. environmental consultants in Asian environmental assessment work

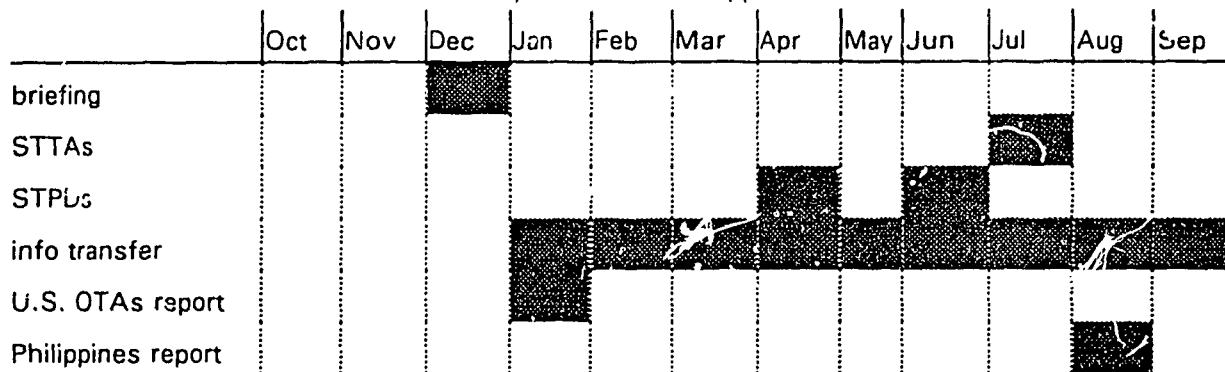
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Project 7. Offices of Technical Assistance

Background: In the U.S., some 30 state governments have established offices of technical assistance (OTAs) -- centers for technical information and advisory services to local industry for waste minimization and pollution control available. Drawing upon staff of the Massachusetts OTA, WEC has worked with the Philippine Government to assess the feasibility for creating such capacity in the Philippines.

US-AEP Funded Activities:

- . briefing meeting with AEP and USAID of selected state OTA representatives
- . 1 STTA: to work with establishment of an OTA in the Philippines
- . 2 STPDs: for fellows to work within U.S. OTAs
- . transfer of documents and information
- . prepare a summary report and a Handbook on accessing U.S. OTAs and introduction of an OTA system to the Philippines



Supplementary Inputs:

- . staff services from OTAs, EPA, U.S. industry hosts
- . staff services of participating Asian agencies
- . documents from EPA, OTAs, industrial associations

Outputs:

Immediate:

- . publication and distribution of report and Handbook on OTA programs
- . establish access for US-AEP and AID to the significant resources inherent in the state OTAs
- . initial transfer of an OTA program to at least one US-AEP partner country
- . experience of STPD fellows with U.S. technologies and sources of expertise and information

Longer-term:

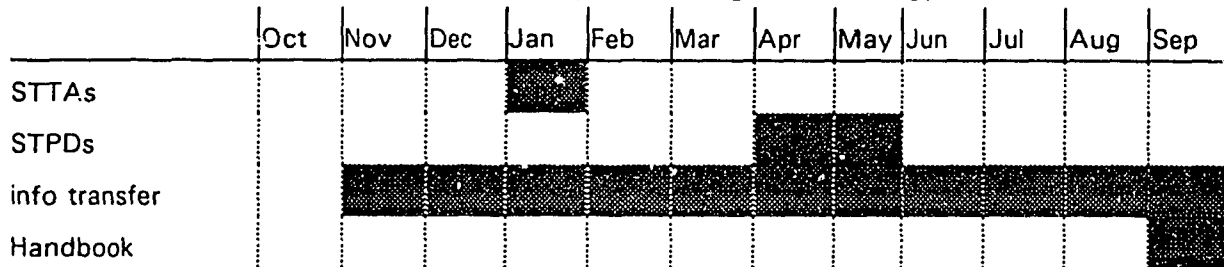
- . creation of self-sustaining Asian country sources of technical information and sources of equipment and services to factories, with consequent reductions in waste and pollution
- . linkages between Asian OTAs and U.S. OTAs and sources of services and equipment

Project 8. Constructed Wetland Wastewater Treatment Technologies

Background: Use of constructed wetlands is a proven low-cost means of treating both domestic and industrial wastewater in the U.S. WEC has worked over the past two years to introduce this U.S.-based technology to the Asia region, initially in Thailand, in cooperation with USAID, Bicentennial Volunteers, Inc. (BVI) and the Tennessee Valley Authority (TVA). By the end of 1993, several pilot programs should be established and operating in Thailand.

US-AEP Funded Activities:

- . 1 STTA
- . 4 STPDs, to gain experience in design and operation of constructed wetland systems
- . transfer of documents and information
- . prepare a summary report on the status of constructed wetland systems in Asia, and a Handbook for introducing and utilizing the technology



Supplementary Inputs:

- . staff services from EPA, TVA, private companies
- . staff services of participating Asian companies and organizations

Outputs:

Immediate:

- . completion of the introduction of constructed wetland technology to Asia, with application in 1-2 countries
- . transfer of technology and expertise to Asian environmental engineers
- . preparation of a Handbook for Constructed Wetlands
- . effective treatment of wastewater at the pilot sites

Longer-term:

- . widespread application of constructed wetlands technology in Asia
- . contacts with U.S. companies that specialize in design and management constructed wetlands technology
- . effective treatment of wastewater at reduced levels of water pollution at many sites

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Project 9. Certified Laboratory Systems

Background: An essential pre-condition to effective enforcement and to industrial self-management of emissions is accurate, consistent laboratory analysis of effluent and ambient samples. Certification and quality assurance/quality control programs are still weak or lacking in the US-AEP region.

US-AEP Funded Activities:

- . 2 STTAs by EPA and/or private sector laboratory system managers: to work with one or more governments ready to initiate a certified laboratory system
- . transfer of documents and information
- . prepare a summary report on the status of laboratory facilities and quality control in the region, and a Handbook for introducing and utilizing such systems

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
STTAs												
info transfer												
Handbook												

Supplementary Inputs:

- . staff services from STTA experts
- . staff services of participating Asian companies and organizations

Outputs:

Immediate:

- . introduction of the certified laboratory system program concept and design of national program in at least one US-AEP partner country
- . preparation of a Handbook for establishing a certified laboratory system

Longer-term:

- . creation of national certified laboratory systems, with consequent demand for equipment and training
- . improved ability of governments and private industries to monitor and evaluate their environmental performance, and to obtain accurate information about environmental issues

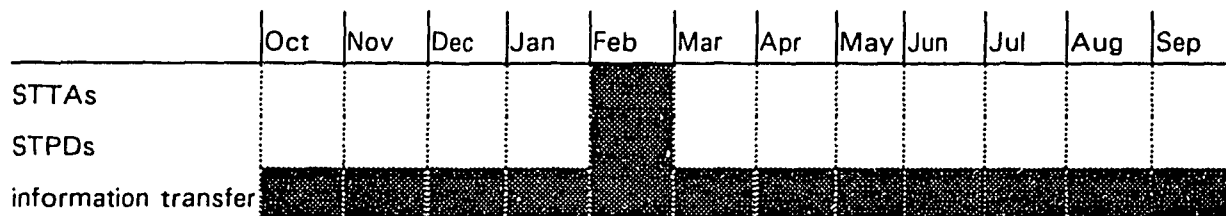
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**Project 10. Regional Environmental Forum:
Mega-Cities on the Pacific Rim and the Burden of Air Pollution**

Background: Urban air pollution is severe in the major cities of most Asian countries. There is considerable experience, both within the region and from the U.S., in solving specific aspects of the problem. But there has been very little exchange of information and experience. Over the past year, WEC has begun creation of a forum that promises to continue for several years as a vehicle for such exchanges. A Steering Committee comprised of leaders of environmental agencies from seven Asian countries has met and set the general agenda. An intensive workshop on reducing emissions from vehicles was held in Los Angeles last August, and a major working conference is planned for February, to be followed by workshops and policy dialogue at both the regional and national levels.

US-AEP Funded Activities:

- . 10 STTAs
- . 8 STPDs, to participate in workshops and other meetings both in the U.S. and in the region
- . transfer of documents and information
- . preparation of comparative case studies, country profiles, and national case studies



Supplementary Inputs:

- . staff services from U.S. and other conference and workshop participants
- . facilities of U.S. and Asian hosting institutions
- . funds for travel and comparative studies from other donors, and from conference observers

Outputs:

Immediate:

- . comparative case studies of the region's experience -- including that of the U.S. -- in dealing with urban air quality issues
- . preparation of various reports and articles drawn from the Forum's workshops and meetings
- . 1-2 workshops and/or conferences, providing participants with opportunities to share experiences directly, and to observe U.S. technologies and expertise

Longer-term:

- . improved access to information sources and to sources of technology and expertise
- . improved markets for air monitoring and air pollution control equipment
- . greater exchange, cooperation, and harmonization of standards and priorities in the region
- . creation of a new kind of regional collaboration in environmental problem-solving

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**Project 11. Regional Environmental Forum:
Mega-Cities on the Pacific Rim and the Problems of Water Supply and Wastewater Treatment**

Background: Water Supply and Wastewater Treatment are serious issues in most Asian cities, and pose particular problems to water-intensive industries such as textiles or pulp and paper. Major infrastructure projects for water management and treatment are underway or planned in most countries of the region. There is considerable experience, both within the region and from the U.S., in solving specific aspects of these problems. But there has been little exchange of information and experience. Over the past year, WEC has begun creation of a Regional Environmental Forum approach that should be effective for these issues.

US-AEP Funded Activities:

- . 8 STTAs
- . 6 STPDs, to participate in workshops and other meetings both in the U.S. and in the region
- . transfer of documents and information
- . preparation of comparative case studies, country profiles, and national case studies

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
STTAs												
STPDs												
information transfer												

Supplementary Inputs:

- . staff services from U.S. and other conference and workshop participants
- . facilities of U.S. and Asian hosting institutions
- . funds for travel and comparative studies from other donors, and from conference observers

Outputs:

Immediate:

- . a digest of the region's experience -- including that of the U.S. -- in dealing with urban water supply and wastewater treatment issues
- . preparation of various reports and articles drawn from the Forum's workshops and meetings
- . initiation of an on-going regional forum for sharing water and wastewater technologies, experience and expertise

Longer-term:

- . improved access to information sources and to sources of technology and expertise
- . improved markets for water monitoring and water pollution control equipment efficiency of machinery

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Allocation of the 100 STTA & STPD Positions for 1993

Project/Activity	STTAs	STPDs
A. US-AEP Strategic Initiatives for 1993		
Wastewater Treatment	10	10
Energy Conservation and Clean Energy		
B. WEC Projects		
1. National/Local Responsible Care and Corporate Environmental Initiatives Programs (NK)	4	-
2. Industrial Environmental Auditing (MB)	5	4
3. Industrial Disaster Preparedness Strategies	2	2
4. Electric Power Demand Side Management Strategies (MB NK)	6	10
5. National Environmental Action Plans/National Environmental Funds (MB NK)	2	-
6. Management and Implementation of Environmental Assessment (MB)	1	4
7. Office of Technical Assistance (MB)	1	2
8. Constructed Wetland Wastewater Treatment Technologies (NK)	1	4
9. Certified Laboratory Systems	2	-
10. Regional Environmental Forum - Urban Air Pollution	10	8
11. Regional Environmental Forum - Water Supply and Wastewater Treatment	6	6
TOTALS	50	50

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3. Schedule and Budget Summaries

3.1 Reporting and Clearance Procedures and Schedule

Drawing from the Attachment 1 Schedule of the Cooperative Agreement, the following types of reports are to be prepared and submitted to the AID Project Officer during the first year.

Progress Reports:

To be submitted every six months and within 60 days of completion of projects (sub-activities). A mutually agreed format will be determined. The first of the six-monthly reports will be submitted by end of March, 1993, and the second by end of September, 1993.

Other Reports, Findings, and Recommendations

Technical reports, findings, or recommendations as specified in the Work Plan. These will consist primarily of a series of Program Handbooks, which will summarize the environmental management tools as exemplified or developed under the eleven projects or sub-activities outlined in the Work Plan.

Also in accordance with the Attachment 1 Schedule of the Cooperative Agreement, it is understood that the AID Project Officer will be consulted and/or involved in, and must approve:

- . the Annual Workplan
- . Work Plan Revisions
- . Field Visits
- . Field Activities
- . Consultants
- . Participants
- . Principal Investigator

Requests for clearance on each of these will be copied to the US-AEP Secretariat.

3.2 Budget Estimates

A line-by-line estimate of total expenses for this first year program is presented in Table 3.2.1. A quarterly projection of expenses is presented in Table 3.2.2.

TABLE 3.2.1

**BUDGET SUMMARY FOR FIRST YEAR OF COOPERATIVE AGREEMENT
BETWEEN THE WORLD ENVIRONMENT CENTER AND
THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
IN SUPPORT OF THE U.S-ASIA ENVIRONMENTAL PARTNERSHIP**

Budget Lines	AID	WEC
1.0 <u>Direct Program Expenses</u>		
1.1 Program I: Short-Term Technical Assistance	359,000	640,000
1.2 Program II: Short-Term Professional Development	471,250	1,800,000
1.3 Documents/Instruments	20,000	
1.4 Program Support Travel	48,400	
1.5 Communications - Postage & Telephone	8,400	
2.0 <u>Indirect Support Expenses</u>		
2.1 Staff	334,435	
2.2 Overhead	434,520	
TOTALS	1,676,005	2,440,000

Notes:

1. All figures are in U.S. Dollars.
2. The "WEC" columns show an approximation of the typical value of pro bono services of volunteers from industry and other sources.

TABLE 3.2.2

**QUARTERLY BUDGET SUMMARY FOR FIRST YEAR OF COOPERATIVE AGREEMENT
BETWEEN THE WORLD ENVIRONMENT CENTER AND
THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
IN SUPPORT OF THE U.S-ASIA ENVIRONMENTAL PARTNERSHIP**

ITEMS	QUARTERS				FY 1993
	I	II	III	IV	TOTALS
Direct Expenses					
1.1 Program I: STTA	29,797	89,391	148,985	90,827	359,000
1.2 Program II: STPD	39,114	117,341	195,569	119,226	471,250
1.3 Documents/Instruments	1,660	4,980	8,300	5,060	20,000
1.4 Program Support Travel	9,680	14,520	14,520	9,680	48,400
1.5 Communications	1,680	2,100	2,520	2,100	8,400
Indirect Expenses					
2.1 Staff	83,609	83,609	83,609	83,609	334,435
2.1 Overhead	108,630	108,630	108,630	108,630	434,520
TOTALS	274,170	420,570	562,133	419,132	1,676,005

3.3 Staffing

WEC's principal contact for AID concerning all aspects of this Agreement will be Mr. Will Knowland, Senior Fellow in WEC's Washington office. He will be assisted by Mr. Larry Lai, Senior Project Manager. In addition, two Project Assistants and an Administrative Assistant will be assigned to work on the Cooperative Agreement full-time in the Washington office. Several New York office staff will support the project on a part-time basis.

Work under this Cooperative Agreement will be significantly strengthened by the presence of WEC's existing country representatives in Bangkok and Jakarta. In addition, drawing on an allowance within the salary line of the Budget, under this Cooperative Agreement WEC plans to establish a network of native Country Coordinators in at least six of the U.S.-AEP partner countries. Such Country Coordinators have been used in WEC's programs in Eastern Europe very successfully over the past year. These Country Coordinators will generally be full-time business or government professionals, available for approximately 40 hours a month to provide advice and logistical support services to volunteer specialists under the STTA program, and to participants in the STPD program. Tentatively, pending final coordination with the United States-Asia Environmental Partnership Secretariat, WEC plans to initiate such positions in the Philippines and in India before the end of CY 1992, and in at least four additional countries during the first year of the Agreement.

3.4 Sub-Contracts

In order to carry out this work program, WEC will work with a wide variety of individuals, groups and agencies. Collaborative, voluntary relationships will be established and utilized wherever possible. Simple contracts, to define terms of reference, procedures and responsibilities, are normally entered into with each WEC volunteer or consultant. Qualifications of each individual or institutional candidate, and draft terms of reference, will be submitted to the AID Project Officer for clearance and approval.

Need for several institutional sub-contracts have already been identified:

- Bicentennial Volunteers, Inc. (BVI), Knoxville, Tennessee, for work on constructed wetlands technologies, and service of activities with the TVA;
- RCG Hagler, Bailly, Inc., Arlington, Virginia, for technical support to the urban air pollution forum;
- the International Institute for Energy Conservation (IIEC), Washington, DC, for work on demand-side management strategies;
- the Center for the Study of Industry (CSI), New Delhi, India, for support of WEC/US-AEP activities in India; and
- Philippines Business for Environment (PBE), Manila, Philippines, for support of WEC/US-AEP activities in The Philippines.

Additional collaborators and contractors will be identified and cleared, in accordance with the terms of the Cooperative Agreement. ###

**WORK PLAN FOR THE AID/WEC
COOPERATIVE AGREEMENT
IN SUPPORT OF
THE U.S.-ASIA ENVIRONMENTAL PARTNERSHIP**

April 15, 1993



World Environment Center

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1600 Wilson Blvd, Suite 500, Arlington, VA 22209

Abbreviations:

AID	Agency for International Development
CY	calendar year
EBE	Environmental Business Exchange
FY	fiscal year
IEDS	International Environmental Development Service
NAREPP	Natural Resources and Environmental Policy Planning Project
RHUDO	Regional Housing and Urban Development Office
TEST	Trade in Environmental Services and Technologies project
TIPS	Technical Initiative for the Private Sector Project
TR&D	Tropical Research and Development
US-AEP	U.S.-Asia Environmental Partnership
USAID	U.S. Agency for International Development
WEC	World Environment Center

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Preface: Annual Work Plan Description

In September 1992, the World Environment Center (WEC) entered into a two-year Cooperative Agreement with the U.S. Agency for International Development (AID) to support better environmental, health and safety policies and practices in the Asia/Pacific region. Work under this Agreement will support the U.S.- Asia Environmental Partnership (US-AEP) generally, and in particular, the Human and Organizational Resources Development component of the Partnership.

Specifically, the CA is intended to promote thoughtful consideration of environmental challenges and possible approaches to environmental issues on the part of Senior Asian and Pacific Islands and American professionals. Eligible candidates under the Environmental Business Exchange Program would have important responsibility in the areas of environmental technology, management, and policy; and would have institutional affiliation with government, industry, or other non-governmental organizations.

This work plan is submitted in accordance with Section E.2.1.(b) of the Cooperative Agreement's Attachment 1. Previous draft work plans submitted to the US-AEP Secretariat in October, 1992, and January 1993, were reviewed by several parties including the Secretariat and the Working Group. WEC activities and expenditures to date have been consistent with these previous submitted work plans.

While the underlying program, and approach (use of EBEs) has not changed, this work plan represents a significant shift from the previous draft work plan. The most obvious re-direction is a narrowing of WEC's focus to industry-based EBEs (as opposed to a broader range of candidates who "*have institutional affiliation with government, industry, or other non-governmental organizations*" as specified in the CA), and giving primary consideration to mission-driven environmental programs.

The content of this work plan is the result of meetings with US-AEP Secretariat staff on March 19 and April 7, 1993. WEC understands US-AEP's request to focus on industry-based EBEs, to be flexible, and to undertake activities that are driven by the needs of USAID overseas missions. This understanding is reflected in this work plan. This work plan envisions continued and on-going discussions with the US-AEP Secretariat in the final selection and implementation of activities.

1. Program Activities

Under the Cooperative Agreement, WEC will support the US-AEP through the implementation of 200 environmental business exchanges (EBEs) during the 2-year duration of the Cooperative Agreement. These exchanges will be comprised primarily of private sector individuals interested in information and technology transfer. The exchange program has two components:

Environmental Business Exchanges: U.S. to Asia: individually tailored exchanges, organized on a *pro bono* or partially funded basis, from the United States to Asia/Pacific. Such activities vary according to need and availability of appropriate technical services. They may be as brief as several days, or as long as several months.

Environmental Business Exchanges: Asia to U.S.: these exchanges will include factory/industry visits and workshops for Asians and Pacific Islanders to United States industry. EBEs to the United States are designed around specific environmental topics (e.g., pollution control and monitoring technologies). These would usually be for one to six weeks in duration.

The program of EBEs will be supplemented by a modest effort to provide supporting information and instrumentation. In WEC's experience, inputs of documents and literature, instrumentation, supplies and communications significantly enhance both technical assistance and professional development programs. This is budgeted at \$200 per activity. Included in this category will be U.S.-source commodities and equipment. Equipment will consist of monitoring or analytical instruments or demonstration equipment. In addition to hardware and supplies, these activities may require computer data searches (e.g. from the Energy Efficiency and Environmental Technology Clearinghouse), computer software and models, or supplementary documents and publications. Other project enhancements may be in-country study tours or workshops, or costs of report preparation, translation, and publication, to ensure dissemination of the results of an EBE activity. As with other WEC activities, efforts will be made to procure *pro bono* contributions of such equipment, supplies, and services from the manufacturers or source. A significant portion of the funds allocated for this item may be expected to be used for shipping or postage costs.

1.1 Participating Countries

Activities under the Agreement will, subject to AID and USG legal and policy restriction, be targeted on the following groups of Asia/Pacific Countries:

- Group A: Countries with strong AID mission environmental programs: India, Indonesia, Thailand, Philippines, and Sri Lanka
- Group B: Countries and territories with great potential for environmental business exchanges: Hong Kong, Malaysia, Taiwan, Singapore, South Korea
- Group C: Other US-AEP countries and territories: Afghanistan, Bangladesh, Bhutan,

Brunei, Cambodia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Laos, Macau, Maldives, Micronesia, Mongolia, Nepal, Niue, Papua New Guinea, Republic of the Marshall Islands, Solomon Islands, Tonga, Tuvalu, Western Samoa, and Vanuatu

1.2 Development of Sub-activities

Per direction from US-AEP, and realizing both the time required to develop effective exchanges, and the longer-term commitment needed to bring US-AEP projects to fruition, this work plan goes beyond the first year alone, setting in place a frame work for accomplishing all 200 EBEs to be conducted during the two years of the Cooperative Agreement.

Opportunities for supporting work under the US-AEP are vast. Sub-activities may be divided into three areas, presented below.

1.2.1 Sub-activities in Group A Countries

Roughly one-third (75) of the EBEs are initially targeted for sub-activities in Group A countries. These sub-activities will be mission driven. In many cases it is hoped that sub-activities in this area will capitalize on leveraging opportunities. WEC understands that the resources of any one program are subject to competing demands and that the greatest benefit often results from leveraging available resources.

Discussions with USAID missions (from Group A countries) and US-AEP have identified four possible priority areas. The sub-activities listed below are provided as illustrative examples. It is anticipated that the final list of sub-activities will be developed following additional discussions with US-AEP and the AID Missions. WEC and the AID missions will reach formal agreement on the specific scope of activities before initiating exchanges.

Thailand: (15 EBEs initially programmed)

-- support for development of the Eastern Seaboard Initiative.

India: (30 EBEs initially programmed)

-- exchanges for U.S. and Indian industry executives for discussions of environmental issues and opportunities.

-- exchanges to support and augment TEST program environmental activities

Sri Lanka: (10 EBEs initially programmed)

-- Support of pollution prevention facility audits and training, in concert with the

Mission's TIPS, and NAREPP program activities, and programs initiated by the World Bank.

Philippines and Indonesia: (20 EBEs initially programmed)

-- Support of RHUDO water and waster water projects in the Philippines and Indonesia.

1.2.2 Sub-activities in Group B Countries and territories

WEC and US-AEP agree on the need to both capitalize on, and generate opportunities in Group B countries, which because of their strong economies have great potential for environmental business exchanges. In recognition of this potential a total of sixty five EBEs are initially programmed for activities in this area. WEC, in concert with US-AEP, will develop and implement a marketing program for Group B country and territory participation in the EBE program.

1.2.3 Un-programmed Exchanges

US-AEP and WEC understand that over the two years of the cooperative agreement, opportunities will arise that cannot be foreseen, and that are clearly deserving of support under the US-AEP. In addition, WEC will work with US-AEP to develop a set of generic environmental information and technology transfer programs that will be made available to all US-AEP countries and territories. Sixty EBEs make up the pool of exchanges that will be used to address these opportunities.

2. Administration

2.1 Reporting and Clearance Procedures and Schedule

Drawing from the Attachment 1, Schedule of the Cooperative Agreement, Progress Reports are to be submitted every six months and within 60 days of completion of sub-activities (sub-activities). A mutually agreed format will be determined. The first of the six-monthly reports will be submitted by end of March, 1993, and the second by end of September, 1993.

In addition, although not required under the Cooperative Agreement, WEC, together with other implementing agencies under the FET component, have begun a biweekly activity summary report. WEC will also provide a quarterly progress report memo to the Project Officer, the US-AEP Secretariat, and Tropical Resources and Development (TR&D). Begun in January, 1993, this memo highlights the previous quarter's activities and upcoming events.

Technical reports, findings, or recommendations will also be submitted to the US-AEP Secretariat, and TR&D, and circulated to other interested parties. These will consist

primarily of written reports and evaluations prepared by the EBEs. When such reports are proprietary, WEC will seek to have at least a summary version made available for distribution and review.

Also in accordance with the Attachment 1 Schedule of the Cooperative Agreement, it is understood that the AID Project Officer will be consulted and/or involved in, and must approve:

- . the Annual Work Plan
- . Work Plan Revisions
- . Field Visits
- . Field Activities
- . Consultants
- . Participants
- . Principal Investigator

Requests for clearance on each of these will be copied to the US-AEP Secretariat.

2.2 Budget

The total budget of this program for FY 1993 is \$4,116,005, of which 59 percent, or \$2,440,000 is to be provided in *pro bono* services arranged by WEC.

2.3 Staff and Contacts

Mr. Will Knowland, Director of WEC's Asia Programs has overall managerial responsibility for all WEC activities relating to Asia. WEC's principal contact for AID concerning all aspects of this Cooperative Agreement will be Mr. Larry C. Lai, Senior Project Manager. In addition, a Deputy Project Manager, two Project Assistants and an Administrative Assistant will work on the Cooperative Agreement in the Washington office, and several New York office staff will support the project on a part-time basis.

Project Officer for the Cooperative Agreement is Mr. Lewis P. Reade, Secretary-General, US-AEP. The TR&D Coordinator for the Human and Organizational Resources Development Component is Ms. Melissa Dann.

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Appendix G

Annual Reports

1993 - A YEAR OF ACHIEVEMENT

US-AEP/WEC Environmental Business Exchanges - 1994 Annual Report

1993 - A YEAR OF ACHIEVEMENT



ANNUAL REPORT FOR WORLD
ENVIRONMENT CENTER'S
COOPERATIVE AGREEMENT WITH
THE UNITED STATES - ASIA
ENVIRONMENTAL PARTNERSHIP
CA NO. AEP-0015-A-00-2055-00

US-AEP



United States-Asia
Environmental Partnership

ACKNOWLEDGEMENTS

Numerous individuals contributed significantly to World Environment Center (WEC) successes during 1993. WEC gratefully acknowledges the direction and vision provided by Lewis Reade, Director General of the US-Asia Environmental Partnership (US-AEP); and Cindy Sayers, Director of Technical Cooperation; Richard Shepard, Managing Director, Operations; Owen Cylke, Managing Director, Technical Coordination; all of the US-AEP Secretariat. WEC thanks Melissa Dann, Manager, Professional and Organizational Development Component - Biodiversity Conservation, Tropical Research and Development, Inc., (TR&D) for her day-to-day guidance and wisdom. Other TR&D staff who contributed greatly to WEC's program included: Joyce Coffee, Cinnamon Dornsife, Jacquie Farrell, Elise Gimbel, Peter Gourlay, Peter Illig, Ken Langer, Michael Met, Albert Short, Margret Sullivan, Willy Tjen, and Joe Youngblood.

Support from USAID missions and the US & Foreign Commercial Service in 1993 was vital to all US-AEP programs, including WEC's. In particular, WEC acknowledges the unselfish assistance provided by:

Adiwiyana, Project Manager, USAID/Indonesia
Roger Bloom, Deputy Chief, Agr/Rural Development, USAID/Nepal
Richard Brown, Mission Director, USAID/Sri Lanka
Viviann Gary, Director, Private Enterprise Development, USAID/Indonesia
James Gingerich, Chief, Agr/Rural Development, USAID/Nepal
R.J. Gurley, Business Advisor, USAID/Thailand
David W. Hess, Spec. Prof. Officer, Technology Development and Enterprise, USAID/India
Avanthi Jayatilake, Project Management Specialist, Environment, USAID/Sri Lanka
Richard Nishihara, Acting Director, Agro-Enterprise and Environment, USAID/Indonesia
Ken Prussner, Chief, Natural Resources, Agriculture and Decentralization, USAID/Philippines
Amitabha Ray, Chief, Environment & Energy Division, USAID/India
Thomas P. Reese, III, Mission Director, USAID/Thailand
Henry Richmond, Commercial Attaché, US&FCS/Hong Kong
Glenn Rutanen-Whaley, Chief, Environmental and Capital Projects Division, USAID/Sri Lanka
John Wood, Commercial Counsel, US&FCS/Bombay, India
Andy Wylegala, Commercial Officer, US&FCS/Korea

Assistance has also been provided by US-AEP Technical Representatives, especially Gerald Sanders and Chris Hazen in Hong Kong, Yogen Parikh and Vinay Gadkari in India, and Lee Chi-Sun in Korea.

WEC has been fortunate in finding strong working partners within US-AEP, in particular, the U.S. Environmental Protection Agency (USEPA), Office of International Activities: Marian Bailey, Asia Program Manager; J. Martin Dieu, International Specialist; and Wendy Comeau, International Specialist; and the National Association of State Development Agencies (NASDA): Daniel Waterman, Senior Program Manager, and Meaghan Conte, Business Development Associate. Their assistance and cooperation is greatly appreciated.

WEC activities under the US-Asia Environmental Partnership are carried out under Cooperative Agreement No. AEP-0015-A-00-2055-00. Mr. Larry C. Lai is WEC's Principal Investigator for this Cooperative Agreement.

The United States-Asia Environmental Partnership (US-AEP) ... is a coalition of Asian/Pacific and American businesses, community groups and governmental institutions which fosters solutions to Asia's environmental problems using U.S. experience, technology, and practice. The US-AEP program coordinates the participation of 25 U.S. government departments and agencies, thousands of businesses and non-governmental organizations which work with 34 nations and territories in Asia and the Pacific. The United States Agency for International Development (USAID) is the lead agency for the US-AEP program.

OVERVIEW

The World Environment Center is very proud of its contributions to the US-Asia Environmental Partnership (US-AEP) and our achievements during 1993. WEC has traditionally worked to address industrial and urban environmental problems in developing countries and, from the very beginning, we recognized the huge potential represented by the US-AEP. In great measure, that potential has been realized. Through this cooperative agreement, WEC broadened its existing programs in India, Indonesia, the Philippines, and Thailand, and broke new ground in Hong Kong, Korea, Nepal, and Sri Lanka.

While Hong Kong, Nepal, and Sri Lanka were new geographically, in substance they served to reinforce old lessons. WEC brought the technical skills and practical insights of our volunteer experts to local tannery, paint, metal finishing, and canning industries. These projects demonstrated again what WEC has known for many years; volunteer experts working one-on-one with their industry counterparts in developing countries results in pragmatic problem solving that is highly effective. Reductions in both industry operating expenses and pollution were direct results of these projects, and the longer term institution building efforts set in motion with USAID/Sri Lanka and the World Bank hold even greater promise.

1993 was also witness to WEC successes in leveraging resources and building bridges between donor programs. Cooperative programs were undertaken with USAID/India's Trade in Environmental Services and Technologies (TEST) program, and with the World Bank's Metropolitan Environmental Improvement Project (MEIP). We also built on pollution prevention training activities funded by USAID/Indonesia; bringing participants to the U.S. to view leading technologies.

While short-term environmental impacts are often hard to measure, WEC activities under the US-AEP Cooperative Agreement contributed to the introduction of electric vehicles to in Bangkok and Kathmandu; helped Thailand's reforestation efforts by introducing U.S. technology that could increase seedling survival rates by 1,000 percent; introduced Indonesian industrialists to state of the art U.S. waste management technologies and methods; and, working with the World Bank, provided expert assistance for the development of national action plans to combat air pollution in Manila, and Jakarta.

During 1993, WEC completed a total of 82 Environmental Business Exchanges, as part of 34 projects in 8 countries. As part of the planning and implementation of these exchanges, WEC *in-kind* contributions to US-AEP totalled more than one million dollars. A complete list of participants in these exchange programs is provided at the end of this report.

WEC is grateful to have had the opportunity to participate in the US-AEP, and to work with its various partners. In 1994 we will work with renewed dedication to help solve environmental problems throughout Asia.

Antony Marcil
President and CEO
World Environment Center

DEVELOPING ENVIRONMENTAL BUSINESS EXCHANGES

To understand the nature of WEC activities under the US-AEP Cooperative Agreement, it is important to first understand the process and the players. The exhibit below depicts the project initiation, review, approval, and implementation process for Environmental Business Exchanges.

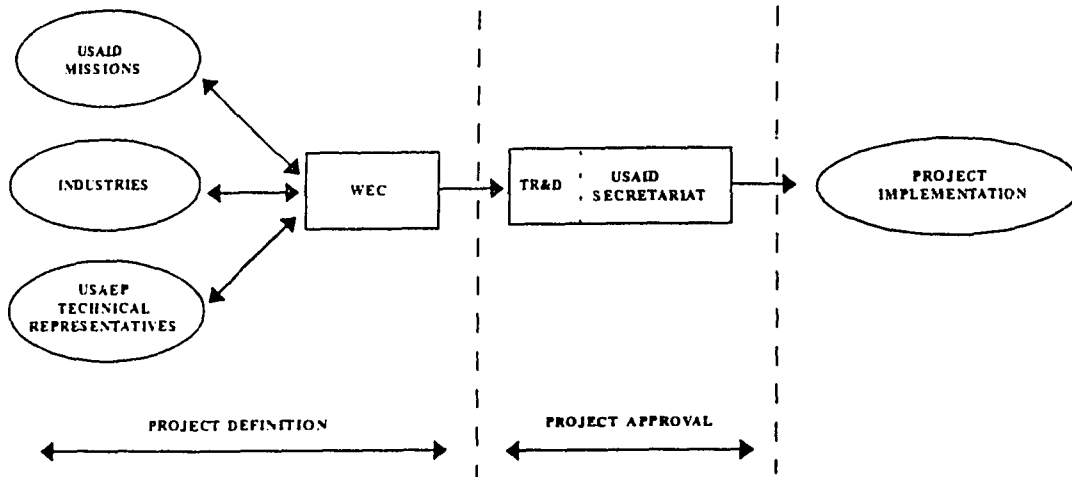


EXHIBIT 1. ENVIRONMENTAL BUSINESS EXCHANGE DEVELOPMENT AND APPROVAL PROCESS

Ideas for projects typically come from USAID missions, US-AEP technical representatives, individual industries, and associations. Through discussions with WEC, the project scopes are developed and refined, and USAID mission endorsement sought (in countries where missions exist). Once mission concurrence is received, the project scope (including names of participants, and proposed dates) are passed to Tropical Research & Development, the technical support contractor to the US-AEP Secretariat. Upon approval by the Secretariat, the project can commence.

With a potentially huge demand on the exchange program, US-AEP established certain priorities for approving projects, with the first tier being those supported by USAID missions. In fact, many missions have been allocated a number of exchanges to program according to mission priorities. Proposals for Exchanges from other US-AEP eligible countries were sought, based on three broadly defined WEC exchange programs: the Technology Assessment Programs; Factory Assessment Programs; and Corporate Environmental Programs. A summary of the selected activities completed under each of these programs in 1993 is provided below.

ENVIRONMENTAL BUSINESS EXCHANGE PROGRAMS

WEC's Environmental Business Exchange Programs under the US-AEP were designed to take advantage of WEC strengths in drawing on private sector technical expertise, and also provide a degree of structure for those seeking to participate in the programs. At the same time the programs were designed to be flexible, placing emphasis on projects and ideas that were consistent with the intent of the programs, as described below

The purpose of the Technology Assessment Program was to raise Asian industry and government awareness of the potential environmental solutions represented by the U.S. experience and technology. Thus, the program brought together Asian's with specific environmental problems or needs, and U.S. experts capable of meeting those needs. The venue for these programs was both in the U.S. and in Asian nations.

WEC's Factory Assessment Program, which demonstrates (and transfers) techniques and procedures used in U.S. industry, has been successful in Asia, Eastern Europe, and the Near East. Continuing this Program under the auspices of the US-AEP, experts from U.S. industry perform assessments of industrial facilities in Asia, identifying process and operational changes, with a goal of reducing operating costs, minimizing waste generation, and providing more effective treatment of the wastes that are generated.

Finally, through WEC's Corporate Environmental Program, WEC sought to introduce, or reinforce an environmental mindset on the part of corporate officers and decision makers in Asia seeking to make environmental considerations a part of normal business practice rather than a reaction to a regulatory mandate.

The following are brief descriptions of 1993 exchanges carried out under the three programs.

T ECHNOLOGY ASSESSMENT PROGRAM

The Technology Assessment Program provides a mechanism for Asia's industry officials to meet with their U.S. counterparts and evaluate new or alternative technologies for environmentally-safe production and pollution mitigation, working towards more sustainable industrial development. Each program is tailored to the needs of its participants. An exchange may focus on addressing a specific environmental problem within an industry's production process, or seek to improve the facility's overall environmental performance.

Programs have been designed to include: tours of U.S. environ-

mental technology and manufacturing companies; visits to facilities employing the target technologies to evaluate the reliability and appropriateness of the equipment; and, discussions with U.S. industry officials regarding cost savings and other benefits that result from installing the given technology.

Fourteen projects involving 35 exchanges (see Exhibit 2.) were undertaken under the Technology Assessment Program. Five of these projects were selected to represent the range of activities encompassed by this program, and are discussed below.

Evaluating Bangkok's Need for a Hazardous Chemical Accident Response System

The Exchange: At the present time, Thailand does not have a nation-wide indexing system for hazardous chemicals produced or imported into the country. It also lacks a source from which persons responding to emergencies involving hazardous chemicals may obtain information on their safe handling and disposal. One step to make the transport of hazardous chemicals safer, and to help preserve the lives and property of the people and industries, is the development of an emergency response center.

WEC worked with the Chemical Manufacturers Association (CMA) to provide an expert to describe and explain the CMA chemical data base and emergency hotline, the Chemical Transportation Emergency Center

PROJECT TITLE	PARTNERING ORGANIZATIONS	
	ASIAN	UNITED STATES
TRANSFERRING TECHNOLOGY FOR DEMAND-SIDE MANAGEMENT TO THAILAND	TEAM CONSULTING	RCG/HAGLER - BAILLY
EVALUATING BANGKOK'S NEEDS FOR A HAZARDOUS CHEMICAL ACCIDENT RESPONSE SYSTEM	THAI MINISTRY OF SCIENCE TECHNOLOGY AND THE ENVIRONMENT	CHEMICAL MANUFACTURER'S ASSOCIATION
EVALUATING THAILAND'S AIR MONITORING NEEDS	MINISTRY OF SCIENCE, TECHNOLOGY AND ENVIRONMENT (MOSTE), DEPARTMENT OF POLLUTION CONTROL (PCD); ELECTRICITY GENERATING AUTHORITY OF THAILAND (EGAT)	RADIAN CORPORATION
INTRODUCING ELECTRIC VEHICLES TO THAILAND	PHOLASITH TUK-TUK COMPANY LTD. OF BANGKOK	ADVANCED ELECTRIC CAR TECHNOLOGY; ELECTRIC POWER RESEARCH INSTITUTE
REFORESTING THAILAND	ROYAL THAI FORESTRY DEPARTMENT	OREGON FOREST RESOURCES COALITION; OREGON WOODS, INC.; OREGON STATE UNIVERSITY, DEPARTMENTS OF FORESTRY AND INTERNATIONAL RESEARCH AND DEVELOPMENT
ASSESSING U.S. ENVIRONMENTAL TECHNOLOGY FOR PHILIPPINE CEMENT AND PULP AND PAPER INDUSTRY	PHILIPPINE INVESTMENT MANAGEMENT CO. (PHINMA)	STONE CONTAINER; WEYEFHAUSER; SCOTT PAPER; SIMPSON TACOMA KRAFT; MEDUSA CEMENT; HOLNAM CEMENT; 3M
EVALUATING THE FEASIBILITY OF INTEGRATED WASTE HANDLING AND DISPOSAL FACILITIES IN THE PHILIPPINES	PHILIPPINE DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES	ENERGY ANSWERS CORP./POLYDYNE, INC.
SHARING U.S. EXPERIENCES IN THE MANAGEMENT OF ELECTRIC ARC FURNACES	SOUTH EAST ASIAN IRON AND STEEL INSTITUTE (SEASI)	INORGANIC RECYCLING CORP.
EVALUATING U.S. TECHNOLOGY FOR FLUE GAS CONDITIONING, MUNICIPAL SOLID WASTE LANDFILL DESIGN AND INCINERATION FOR USE IN THE SMOKEY MOUNTAIN RECLAMATION PROJECT	R-II BUILDERS, INC.	OGDEN MARTIN MUNICIPAL WASTE INCINERATOR; POST, BUCKLEY, SCHUH AND JERNIGAN, INC.; PORT WASHINGTON MUNICIPAL WASTE INCINERATOR; NATEC RESOURCES
INTRODUCING ELECTRIC VEHICLES TO NEPAL	CONSOLIDATED ENGINEERS; MERCANTILE COMPUTER CORPORATION; SOCIETY OF MECHANICAL ENGINEERS; SOUTH ASIAN TRADING CO. LTD.	ADVANCED ELECTRIC CAR TECHNOLOGY; ELECTRIC POWER RESEARCH INSTITUTE
ASSESSING U.S. TECHNOLOGIES AND TECHNIQUES IN THE PULP AND PAPER INDUSTRY FOR USE IN INDONESIA	PAKERIN; KERTAS LECES; SURABAYA AGUNG INDUSTRI PULP & KERTAS; INDAH KIAT PULP & PAPER CORP.	NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC.; WILLAMETTE INDUSTRIES, INC.; UNION CAMP CORP.; SONOCO PAPER PRODUCTS; WEYERHAUSER
ASSESSING U.S. TECHNOLOGIES AND TECHNIQUES IN THE METAL FINISHING INDUSTRY FOR USE IN INDONESIA	SUPRAREX RAYS; INDONESIA ZIPPER CO. LTD.; PADL KOMPONEN CORP.; PROBENGKEI	METAL SURFACES, INC.; ELECTROLIZING, INC.; METAL FINISHING ASSOCIATION OF CALIFORNIA; LAWRENCE LIVERMORE LABS; WASTE WATER TREATMENT SYSTEMS, INC.; READ RITE, INC.; ACTERON CORP.; SANTA CLARA PLATING COMPANY; UNITED AIRLINES; SAN FRANCISCO AIRPORT; NEW UNITED MOTORS; SAN JOSE WATER POLLUTION CONTROL DEPARTMENT
ASSESSING U.S. FLUE GAS DESULFURIZATION TECHNOLOGY FOR USE IN SOUTH KOREA	KOREA ELECTRIC POWER CO.	ELECTRIC POWER RESEARCH INSTITUTE, HYDROGEN SULPHUR TEST CENTER; GENERAL ELECTRIC, ENVIRONMENTAL SERVICES DIVISION; BABCOCK AND WILCOX; COMBUSTION ENGINEERS
ASSESSING U.S. TECHNOLOGY FOR MERCURY RECOVERY AND HAZARDOUS WASTE TREATMENT	ENVIRONMENT MANAGEMENT COMPANY (EMC)	INTERNATIONAL TECHNOLOGY CORPORATION (IT CORP); WMX TECHNOLOGIES

EXHIBIT 2. TECHNOLOGY ASSESSMENT ENVIRONMENTAL BUSINESS EXCHANGES

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(CHEMTREC®).

The CMA developed CHEMTREC® to provide hazard information warnings and guidance based on the name of the product and the nature of the problem. When the product can not be identified, CHEMTREC® makes every attempt to obtain information from the manufacturer, shipper, or consignee.

Alma Howard, Staff Executive (retired), of the CHEMTREC® Task Group, met with representatives of various Thai government agencies and chemical associations to demonstrate how CHEMTREC® functions and to determine the feasibility of establishing a similar system in Thailand, and, more broadly, the necessary steps for establishing an emergency response center.

The Result: The recommendations and conclusions from this exchange have identified the steps necessary to establishing an emergency response center: the development of a comprehensive indexing system, adoption of labeling regulations, and training for response center personnel, emergency site responders, and medical staffs. The Ministry of Industry's Head of Hazardous Substances Division has committed to pursue a standardized labeling system. In addition, various organizations, including the Pollution Control Department, the Industrial Works Department, the Center for Urban Development, the Fire Department, the National committee on Disaster Prevention, and the Federation of Thai Industries, have formed a working group to visit the U.S. for further

study of the CHEMTREC® system.

Introducing Electric Vehicles to Thailand and Nepal

The Exchange: Mobile sources are major contributors to the air pollution problems experienced in the rapidly expanding urban centers of Asia. High profile contributors to the mobile source problem in Bangkok and Kathmandu are the ubiquitous three-wheeled work-horses known locally as tuk-tuks, and tempus, respectively.

This project sought to capitalize on advances in U.S. technology to introduce zero-emission electric vehicle technology to the Thai and Nepali private sector.

Initial discussions between R.J. Gurley, Business Advisor to the USAID mission in Bangkok, and Dr. Supat of the Emissions and Noise Control Division of the Department of Pollution Control in Thailand, led them to Anan Supataravanich, the President and Managing Director of Pholasith Tuk-Tuk Industry Co., Ltd. Pholasith has a near monopoly on the tuk-tuk industry in Thailand and exports to India and Australia. Dr. Supat and Mr. Gurley found Mr. Anan to be very interested in the possibility of manufacturing electric vehicles.

Through the US-AEP/WEC exchange program, Pholasith Tuk-Tuk Company was brought together with the forefront of U.S. research and development and the private sector, as represented by David Porter, and Ed Riddel from the Electric Power Research Institute (EPRI), and Chaz Haba, President and CEO of Advanced Electric Car Tech-

nology, Inc. (AECT).

In a separate exchange, the delegates from Nepal were hosted in the U.S. by AECT and EPRI. While at AECT, they saw firsthand the cutting edge technology that seems perfectly applicable for electric vehicles in their local situation. The Nepalese businessmen also had the opportunity to meet with members of the Transportation Department at EPRI to explore the efficient transfer of U.S. electric vehicle technology to the streets of Kathmandu.

The Result: With Pholasith providing a tuk-tuk and an extra transmission, and AECT providing the re-engineering, the new electric vehicle was unveiled to Thai government, industry and the press with much fanfare. With continued support from USAID/Thailand, AECT and Pholasith Tuk-Tuk have signed a Letter of Intent and are expected to begin joint production of electric tuk-tuks in Thailand during 1994.

As a direct result of the Nepal - U.S. exchange, the Nepalese coalition placed a order for several electric vehicle conversion kits with the Thai - U.S. venture partners. If these initial shipments are, as expected, acceptable and effective, the Nepali coalition would like to have a fleet of electric tempus numbering in the hundreds serving as taxis in Kathmandu by the end of 1995.

Evaluating Thailand's National Air Monitoring Needs

The Exchange: Radian Corporation was invited by the Thai Government to assist the Pollution Control Department

(PCD) in planning an air quality monitoring network for Thailand. The US-AEP/WEC exchange program allowed Scott Jenkins, an air quality monitoring expert from Radian, to provide technical assistance and practical recommendations to the PCD.

Wanida Srichai, an Environmental Engineer with WEC/Thailand, accompanied Jenkins and Thai government officials to Taipei to familiarize them with the Taiwan Air Quality Monitoring Network. Designed by Radian, it is the largest air quality monitoring network installation in Asia.

After observing the demonstration in Taiwan the group proceeded to Bangkok. Jenkins reviewed the PCD's conceptual plan for the nationwide network. The commitment to develop air quality management programs to address the deteriorating air quality in Bangkok became apparent during discussions with PCD and the Ministry of Science, Technology, and the Environment. The officials expressed great interest in expanding these programs to include other urban areas beyond Bangkok.

The Result: Mr. Jenkins found that most of the equipment currently used for air quality monitoring was outdated and would not be easily integrated into a new network. Jenkins concluded that the PCD should consider implementing specific action plans in each of the four pollution control zones that they have established. These action plans should provide for the quantification of emissions and determine the need for and design of air quality measurement systems in each zone. He also recommended the establishment

of minimum acceptable criteria for data collection and management of the programs, as well as guidelines for implementing private air quality monitoring programs for individual facilities and/or industrial estates to determine the impacts on the surrounding population.

The Thai government recently awarded Radian a half-million dollar contract to develop an "Action Plan to Reduce Vehicle Emissions and Noise Pollution" in Bangkok. This multifaceted project is being funded by the World Bank.

Assessing U.S. Technology for Philippine Cement and Paper Industries

The Exchange: The Philippines Investment-Management Company. (PHINMA) approached USAID/Philippines with a request to provide their Vice President for Environment, Lauro D. Guevara, exposure to the latest in U.S. pollution control technologies and training in pollution prevention management techniques. PHINMA's main areas of business are cement production and the manufacture of sack kraft paper. The total output from PHINMA's six cement plants currently supplies approximately 40 percent of the entire Philippine market.

Currently in the Philippines, companies producing cement are required to obtain a permit certifying that their plants built before 1978 emit less than 500 mg/m³ of particulate, and newer plants emit less than 300 mg/m³. PHINMA's Board of Directors has made a commitment to have all of their plants emitting less than 100 mg/m³. The companies

operated by PHINMA will spend US\$200 million on pollution control technologies to achieve this goal.

PHINMA is also interested in building a facility to recycle paper. Currently, their paper operations mainly produce sack kraft for bags to support their cement operations. After seeing the operations of several U.S. producers, PHINMA has determined that most of the material used in the sack kraft, as well as other packaging stock, could be more economically and ecologically produced from recycled fibers.

WEC arranged plant site visits demonstrating environmental technology, including: 3M, Holnam Cement, Medusa Cement, Scott Paper, Stone Container, and Weyerhaeuser.

During this US-AEP/exchange, Guevara reviewed a range of U.S. environmental technologies in action. Guevara also spoke with equipment manufacturers and operators. He was particularly impressed with the developments in U.S. baghouse technology. PHINMA cement plants currently use electrostatic precipitators which, due to the erratic electricity supply and temperature extremes in the Philippines, have not been fully effective.

Also during this exchange, Mr. Guevara was able to meet with management from U.S. companies that have similar operations to PHINMA's. At Stone Container Company, he was hosted by Allen Koleff, Vice President for Environment and Health & Safety. Mr. Koleff and Mr. Guevara spoke at length about "getting commitment from the top" for true environmental

stewardship, and motivating the plant floor employee on how to minimize waste and recycle the waste that is produced.

The Result: The exchange provided Mr. Guevara with a good sense of the capabilities of U.S. pollution control technologies. Equally important, friendships were initiated between the Philippines and the U.S. that will allow for continued dialogue for sharing experiences and ideas.

Since returning to the Philippines, Mr. Guevara has been in great demand as a speaker, discussing his tour in the U.S. with others in the Manila industrial community, and at USAID/Philippines functions.

Reforestation Thailand

The Exchange: The Royal Thai Government has announced plans to plant 500,000,000 trees by 1996 in a massive reforestation effort to commemorate the 50th birthday of his Majesty, the King. In attempting to implement this very ambitious agenda, the Royal Thai Forestry Department approached USAID for technical assistance. Using existing planting methods, the Royal Thai Forestry Department has only a 20 percent sapling survival rate; far less than experienced in the U.S.

WEC, working with USAID/Thailand, assembled a program to allow three forestry experts from the U.S. to travel to Thailand: Rick Herson, President of Oregon Woods, Inc; experienced in forestry operation and management, including reforestation and land stewardship; Dr. Robin Rose, Associate Professor of nursery technology and reforestation, Department of Forest Science, College of Forestry,

Oregon State University; and Jim Peters, International Training Coordinator, Office of International Research and Development, Oregon State University, a community forestry specialist, currently studying on a comparative analysis of Oregon and Thailand resource dependent communities.

These experts evaluated Thai conditions and practices, and provided technical recommendations on nursery modernization, seedling quality criteria and seedling production, site preparation, and planting media to the Thai Forestry Department. They also identified opportunities for U.S. reforestation companies to participate in this enormous reforestation effort.

The Result: The team found that the nurseries and tree planting operations are well run; however, the Oregon experts predict that seedling production efficiency could be increased by up to 1,000 percent by using U.S. techniques. For improvement in the seedling production phase, it was suggested that a containerized-styroblock-system be considered.

The delegation found that the nursery systems for 48 native species of trees should be upgraded to the current advanced level of teak development. The group also found that the Thai black plastic poly-bag system was limiting the survival rate of saplings.

Since this exchange took place, a delegation of Thai businessman and government officials travelled to Oregon and several other western states to see the best in U.S. reforestation technologies. This follow-on trip was an excellent indication that the

exchange was effective and will have mutually beneficial and lasting results.

FACTORY ASSESSMENT PROGRAM

The Factory Assessment Program allows Asian industry officials to draw on the expertise of their U.S. counterparts and explore alternatives to achieve more environmentally sound and profitable operations. Through this program, the participants exchange ideas on the performance of environmental audits, the effectiveness of wastestream treatment systems, and best management practices to minimize or eliminate waste generation.

Throughout its history, WEC has successfully conducted more than 120 factory assessments in 20 countries, including Thailand, Indonesia, and the Philippines. Our expert volunteers have conducted environmental assessments of industries as varied as food processing, metal finishing and plating operations, petrochemicals, organic chemicals, pulp and paper, leather tanning, and textiles.

In 1993, WEC's Factory Assessment Program continued work in Indonesia, and was introduced to Sri Lanka for the first time.

Indonesian Pulp & Paper Industry Factory Assessment

The Exchange: The pulp and paper industry in Indonesia is a major source of water and air pollution. The use of appropriate environmental technology and management techniques are critical issues facing the industry. Under this US-AEP/WEC ex-

change, four representatives from Indonesian pulp and paper companies had the opportunity to review U.S. environmental technology in use at American pulp and paper plants. The delegates: Darono Wikanaji, Chemical Engineer, PT. Kertas Lece; Widya Tjahyana Lauwangsa, Senior Engineer, P.T. Pakerin; Warih Superiadi, Quality Control Department Engineer, Environmental Protection, P.T. Indah Kiat Pulp and Paper Corp., had the opportunity to observe technologies relating to water reduction and recycling, wastewater treatment, air pollution control, black liquor oxidation systems, and chemical recovery systems. Facilities visited included: Sonoco Paper Products, Willamet Industries, Inc., Union Camp, Weyerhaeuser, and the National Council of the Paper Industry for Air Stream Improvement, Inc. (NCASI).

The Result: Follow-up contacts have occurred between an Indonesian firm and Sonoco Paper to discuss transfer of a Sonoco chemical recovery system. Also, NCASI officials have provided the Indonesians with technical bulletins and reports relating to NCASI member companies.

Expanding Factory Assessment Programs in Sri Lanka

The Exchange: Much of industry in Sri Lanka is using technologies from the 1960s, consuming and tremendous amounts of energy resources, and polluting the local environment. USAID/Sri Lanka requested US-AEP/WEC assistance in performing factory assessments with the goal of introducing pollution prevention

measures by optimizing production, operations, and raw materials use; employing good housekeeping practices; and recommending waste treatment, as appropriate.

Factory assessments were conducted at metal finishing, canning, paint, and leather tanning facilities. The assessments broke new ground in introducing an analytical approach for conducting environmental audits. The concept was introduced in all four industries and consisted of: 1) developing a mission statement; 2) defining goals (e.g., eliminate waste, minimize waste, monitor waste); 3) identifying specific problem to be addressed to achieve the goals; 4) formulating and implementing solutions, and; 5) establishing a monitoring system to determine effectiveness.

Industry officials observed the analytical process carefully, often making process changes on the spot, while carefully considering other more complex suggestions. Sri Lankan consultants were also trained in audit procedures as part of this exchange, providing the potential for more widespread transfer of this knowledge.

The Result: The assessments had a strong impact. At seminars concluding each mission, representatives of the industries undergoing the assessments spoke enthusiastically to a wider industry audience. They reported details of new concepts and process changes that had already been implemented and the savings that had resulted in more efficient raw material usage (as well as reduced pollution).

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C O R P O R A T E E N V I R O N M E N T A L P R O G R A M

The Corporate Environmental Program brings industry leaders from the U.S. and Asian countries together for practical discussions of the challenges associated with environmental regulations. Topics of discussion for this program might include trends in environmental regulations, the greening of corporate philosophy in the U.S., the economics of environmental stewardship, and the environmental challenges faced by specific types of industries.

During 1993, projects undertaken as part of WEC's Corporate Environmental Program included: The Philippine Business for the Environment Conferences held in Manila and Cebu, Philippines, and the Sri Lanka Institution Building Exchange.

Conferences on Corporate Policies and Programs

The Exchange: The Conferences on Corporate Environmental Policies and Programs were organized by the Philippine Business for the Environment (PBE), a non-profit, industry-based Filipino NGO. In response to a request from PBE, US-AEP/WEC supported two U.S. experts who spoke to over 120 Filipino business executives and government leaders present at the conferences.

David Chittick, the Environmental and Safety Engineering Vice President of AT&T provided the keynote address: "The Greening of the Corporation" and Burton Hamner, Environmental Plan-

ning, Washington Department of Ecology, spoke on "Elements of a Corporate Environmental Policy" at the conference held in Manila. At the conference in Cebu, Burton Hamner presented his paper on corporate environmental policy.

The goal of the conferences was to assist Filipino corporations in integrating both their concern for sustainable development and their response to environmental pollution reduction initiatives and regulations, into corporate policies and programs.

Specifically, the conferences provided participants with: insights from local and international corporations that have adopted environmentally responsible corporate policies and programs; future trends in environmental policies and regulations affecting business and industry; and options and resources available to Philippine industry for environmental policies and programs.

The Result: The conference was successful in supplying participating executives with an understanding of corporate environmental policies as practiced in the U.S., enabling them to credibly introduce corporate environmentalism in their respective companies.

Conference presentations demonstrated the cost saving benefits of pollution reduction/prevention, and provided a general plan of action for formulating a company-specific corporate environmental policy. They also gave the participants specific examples of how U.S. companies have addressed pollution prevention and waste minimization concerns.

Conference participants made a formal commitment to pursue the development of corporate environmental policies in their respective companies.

Environmental Institution Building in Sri Lanka

The Exchange: In response to Sri Lanka's request for assistance in developing an effective program for industrial pollution control, WEC, through the US-AEP, and in coordination with the World Bank's Metropolitan Environmental Improvement Project (MEIP) and USAID/Sri Lanka, identified individuals responsible for the State of Minnesota's leading-edge institutions that disseminate and encourage industry's consideration and implementation of environmental protection measures. U.S. volunteer experts were: Kevin McDonald, a Senior Planner at the policy-making institution called the Minnesota Office of Waste Management; Terry Foecke, Director of WRITAR, an industry association/affiliation NGO; and Karin Nelson, Environmental Technology and Services Representative at the "linking" institution, the Minnesota Trade Office.

The goals of this exchange were to 1) gain first hand knowledge of the Sri Lankan industrial, economic, and environmental situation, 2) share Minnesota's experience in institution building and in linking the institution to the pollution prevention needs of industry, and 3) develop, with Sri Lankans, alternative approaches to building a waste minimization institution.

The Result: As a result of this exchange, the U.S. experts gained an understanding of the level of

technology, management practices, and views on waste minimization in Sri Lankan industry. This enabled the experts to begin discussions with the Sri Lankan representatives and develop models for a waste minimization institution tailored to fit Sri Lanka's needs. In addition, the exchange provided industry and government leaders with additional information on waste minimization and encouraged them to commit to the same in their policies and programs.

L LEVERAGED PROJECTS

One of the goals of the US-AEP/WEC program has been to offer support to environmental programs offered by other institutions, where shared goals exist. Such programs have included USAID mission initiatives, and regional and national programs being undertaken by donors such as the World Bank, and the United Nations Development Program (UNDP). Leveraged projects are attractive where they serve to advance US-AEP and WEC missions. They also minimize duplication of resources and efforts being directed at the same issue, and bring complementary capabilities to address problems more effectively.

Activities that US-AEP/WEC chose to leverage during 1993 were USAID/India's Trade in Environmental Services and Technologies (TEST) program, the World Bank's URBAIR initiative under the Metropolitan Environmental Improvement Program (MEIP), and the Megacities on the Pacific Rim and the Burden of Air Pollution Conference, in Jakarta Indonesia.

URBAIR activities were supported in Indonesia, the Philippines, Nepal and Bombay. The URBAIR/Manila project, the Megacities conference, and an example TEST exchange are highlighted below.

Developing an Urban Air Quality Management Strategy for Manila

The Exchange: The URBAIR project in Manila is driven by the need to address Manila's critical air pollution problems. Respirable Particulates (PM-10) in Manila range from 36 to 459 $\mu\text{g}/\text{m}^3$, more than three times the U.S. ambient air quality standards. The effect of this is clear in the Metro Manila area where visibility is limited to a few kilometers. From the outskirts of the urban area, it is possible to see a dark, heavy pall that hangs over the city. Resuspension of road dust, refuse disposal by open burning, diesel buses and cars, and emissions from industrial complexes in the Metro area all contribute to the high particulate matter concentration.

US-AEP/WEC sent Dr. Michael Ruby, President and Director of Engineering, Envirometrics, an air quality management expert to participate in the URBAIR workshop in Manila. Dr. Ruby assessed the nature and sources of air pollution in Manila, identified the legal and regulatory measures necessary to mitigate air pollution problems; and finally, recommended possible solutions, including technological options, to alleviate these problems.

Dr. Ruby spoke on the U.S. air quality management experience. His presentation focused on air pollution control issues in the United States with an emphasis

on the history of regulations, the role of NGOs, and the current state of research on air quality management. He also met with local government officials regarding the current institutional framework needed to support air quality management in the Philippines

The Result: Dr. Ruby determined that the legal and institutional framework was in place to address air pollution issues, and that the time was ripe for taking significant steps to controlling air pollution in the Metro Manila area.

In addition to making recommendations to the government for the development of an industrial emissions inventory, Dr. Ruby identified markets for U.S. technology. Specifically demand exists for: air pollution control equipment, motor vehicle emissions testing equipment, and particulate control equipment.

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IMPACT/EVALUATION OF ENVIRONMENTAL BUSINESS EXCHANGES

The goal of WEC's Environmental Business Exchange Programs has been to help address Asia's environmental problems by drawing on the environmental expertise and experiences of U.S. industry. The "one-to-one" program brought together the individuals (in Asia) with environmental problems and needs with those (from the U.S.) having potential solutions.

During 1993, WEC completed a total of 82 exchanges, as part of 34 projects, in 8 countries. Donations *in-kind* associated with these exchanges totalled \$1,084,303. WEC estimates that the EBE program was successful in bringing together more than 500 industry professionals from the U.S. and Asia.

The success of WEC's Environmental Business Exchange programs is predicated on the enthusiastic involvement of expert volunteers under WEC's International Environmental Development Service (IEDS), and the participation of U.S. industries that host visitors from Asia. Necessary WEC support for the volunteers includes: appropriate preparation for the exchange, developing travel itineraries, and ensuring that fruitful meetings and tours are conducted in the host Asian country.

To measure our success in each of these vital areas, WEC surveyed the volunteers and engaged in numerous telephone calls to get their perspective on what we were doing right, and what needed improvement. Rated on a scale of 1 to 5, with 1 being poor, and 5 being excellent; on average, IEDS participants rated WEC programs as follows:

- Quality of information provided as preparation for the project 4.15
- Quality of travel arrangements 4.58
- Appropriateness of meetings scheduled 4.16
- Appropriateness of tours/site visits conducted 4.23
- Value of project 4.45

Perhaps the most important of these indicators is the "Value of project." The high rating received is further amplified by comments provided by the U.S. partners.

"...opened up a number of future opportunities to work with various Thai government agencies..." Scott Jenkins, Radian Corporation

"Extremely valuable experience. Essential on-site information and understanding of needs in business community...as well as future projects were brought into context." Karin Nelson, Minnesota Trade Office

"Self-fulfillment from helping a third-world country." Larry Ring, Pillsbury Food, Green Giant Division

"This could be a long and fruitful relationship with Thailand in the area of

reforestation." Dr. Robin Rose, Oregon State University
"Meetings with potential clients in India have resulted in excellent interest
in our chemical recovery system for pulp and paper mills. In fact, Shreyans
Pulp and Paper has sent us a letter of intent for a complete plant..."
Joseph Enders, Enders Process Equipment Corporation

"We believe that the support of this project by US-AEP's Environmental
Business Exchange Program has made discussions smoother, more effective,
and increased the probability of joint success." Prakash Acharya, IT
Corporation

This people-to-people program has been successful in moving U.S. environmental expertise and practices to Asia. For ease of discussion, exchanges may be grouped into four categories based on the outcome of the exchange.

1. Where environmental benefits have been a direct result
2. Where increased understanding of available U.S. resources and expertise to the Asian market has resulted
3. Where Asian partners have adopted U.S. practices that will reduce pollution of the environment
4. Where Asian partners have committed their own resources to conduct exchange follow-up activities

Exhibit 3. provides a summary of the successes of WEC's Environmental Business Exchange Program. Each of the projects undertaken during 1993 was successful in at least one of the four categories for evaluation.

All of the exchanges achieved the goal of increasing Asian awareness (A) of U.S. expertise, equipment, and experience for addressing environmental problems. In assessing an exchange's environmental impact (E), a conservative approach was taken, highlighting only those exchanges which had an immediate impact. While more long range perspectives of environmental impact might be highly desirable, these would be speculative in nature. The promise of longer range environmental improvement is perhaps represented by the projects which resulted in the use of U.S. environmental practices (P).

Finally, the strong commitment of Asian partners to the U.S. environmental methods, expertise, and capabilities is best illustrated by those instances where actual resources (R) were expended by the Asians to conduct follow-up activities. These follow-up activities have included visits to the U.S., and the signing of letters of intent, or contracts.

PROJECTS SUMMARY	E	A	P	R
TEST Program Cooperation (multiple projects) - India		*		*
MEIP Support - India/Indonesia/Nepal/Philippines		*		
Megacities Conference - Indonesia		*		*
Pulp & Paper Industry Technology Assessment - Indonesia		*		*
Metal Finishing Industry Technology Assessment - Indonesia		*		
Waste Minimization Technology Transfer - Indonesia	*	*	*	
Flue Gas Desulfurization Technology Assessment - Korea		*		*
Mercury Recovery/Hazardous Waste Treatment Technology Assessment - Korea		*		*
SEASIS Conference Support - Malaysia		*		
Electric Vehicle Technology Assessment - Nepal		*		*
PBE Conference Support (Manila/Cebu) - Philippines		*	*	*
Cement and Paper Industry Technology Assessment - Philippines		*		*
Integrated Waste Handling/Disposal Technology Assessment - Philippines		*		
Smokey Mountain Project Technology Assessment - Philippines		*	*	*
Technical Information Center - Sri Lanka	*	*	*	
Demand Side Management Technology Transfer - Thailand		*	*	
CHEMTREC* Training - Thailand		*	*	
Air Monitoring Needs Assessment - Thailand		*		*
Electric Tuk-Tuk Technology Assessment - Thailand		*		*
Reforestation Project - Thailand	*	*	*	*
Carbon Offset Project Development - Thailand		*		
Environment and Safety Certification Program - Thailand		*	*	
Key:				
E = <u>E</u> nvironmental benefit was immediate result of exchange				
U = Asian partners gained increased <u>A</u> wareness of U.S. capabilities and experience				
P = Asian partners adopted U.S. <u>P</u> ractices as a result of the exchange				
R = Asian partners committed their own <u>R</u> esources to conduct exchange follow-up				

EXHIBIT 3. SUMMARY OF ENVIRONMENTAL BUSINESS EXCHANGE PROGRAM SUCCESSES

1993 PARTICIPANTS IN WEC's EBE PROGRAM

- * Sushil Amatya, Executive Director, Consolidated Engineers, Nepal
- * Raul A. Arellano, Jr., Vice President, R-II Builders, Inc., Philippines
- * Dr. Larry Berg, Director, Jessie M. Uruh Institute of Politics
- * Dr. Stephen Bryen, President, Lean Power Corporation
- * Ir. Bayu Cahyono, PT Padl Komponen Corporation, Indonesia
- * T. Chandran, Ion Exchange, India
- * Jan Chatten-Brown, Esq.
- * D. Chatterjee, Manager, INALSA, India
- * Dr. Satish Chilekar, Ion Exchange, India
- * David Chittick, Vice President for Engineering, AT&T, WEC Board Member
- * Dr. Chulapongs, Governor, Provincial Electric Authority, Thailand
- * Catherine Clerf, President CAC International
- * Jean Clinton, RCG/Hagler, Bailly
- * David Coel, Program Supervisor, South Coast Air Quality Management District
- * Jo Young Dae, Assistant Manager, Environmental Technology Section, Korea Electric Power Corporation (KEPCO), Korea
- * James Dewey, P.E., Vice President, HSB Professional Loss Control
- * Glenn Dunmire, Director, International Development, FPI
- * Joseph Enders, President, Enders Process Equipment
- * Joel Epstein, Vice President, RCG/Hagler, Bailly
- * Terry Foecke, Director, Waste Reduction Institute (WRITAR)
- * Dr. Stanley Greenfield, Senior Vice President, Systems Applications International
- * Lauro Guevara, Vice President for Environment, Philippine Investment Management Co. (PHINMA), Philippines
- * Chaz Haba, Chairman and CEO, Advanced Electric Car Technology Inc. (AECT)
- * Charles Hamilton, Vice President, Lean Power Corporation
- * Burt Hamner, Environmental Planner, Washington State Department of Ecology
- * Louis Harms, Vice President Engineering, FPI
- * Mary Harris, Vice President, RCG/Hagler, Bailly
- * Calvin Henning, President, Frost Paint Co.
- * Rick Herson, President, Oregon Woods, Inc.
- * Alma Howard, Chemical Manufacturer's Association
- * Scott Jenkins, Senior Program Manager, Radian Corporation
- * A. Goldwin Joseph, Pure Tech Engineering, India
- * G. Kharel, Consultant, Nepal
- * Kris Kudrnac, K3 Corporation
- * Widya Tjahyana Lauwangsa, PT Pakerin, Indonesia
- * Lee Shin-Bom, Executive Director, EMC, Korea
- * Christian Lint, President and Chairman, Yankee Engineering Services
- * Kernan Lipper, Esq., Staff Director, California State Assembly
- * Zulkifli Lubis, PT Indah Kiat Pulp & Paper Corporation, Indonesia
- * Harold Martinez, President and CEO, ABLE Industrial Products
- * Richard Mayer, Vice President of Operations and Director of Engineering, Advanced Electric Car Technology, Inc. (AECT)
- * Kevin McDonald, Senior Planner, Minnesota Office of Waste Management
- * Fiona Mikkelson, RCG/Hagler, Bailly
- * Kenneth L. Minnick, Environmental Compliance and Planning Manager (Rtrd.), Lukens Steel
- * Marilyn Morton, Government Relations, Parsons Corporation
- * Mr. Narashimhan, Pure Tech Engineering, India
- * Karin Nelson, Environmental Technology and Services Representative, Minnesota Trade Office
- * Park Hun Kyung, Environmental Section, Korea Electric Power Corporation Technology (KEPCO), Korea.

- * Dr. Pansak, Deputy Governor, National Electronics and Computer Technology Center, Thailand
- * Janice Perlman, Executive Director, Megacities Project
- * Jim Peters, International Training Coordinator, Office of International Research and Development, Oregon State University
- * David Porter, Manager, International Technology Transfer, Electric Power Research Institute (EPRI)
- * Ir. Jaya Agung Prastowo, PT Y.K.K. Indonesian Zipper Co. Ltd., Indonesia
- * S. Raj Bhandari, CEO of Mercantile Computers, Nepal
- * Ram Rathi, Executive Vice President, FPI
- * B. Ravi, Managing Director, Pure Tech Engineering, India
- * Ed Riddell, Program Manager, Electric Power Research Institute (EPRI)
- * Reghis Romero, Chairman, R-II Builders, Inc., Philippines
- * Dr. Robin Rose, Associate Professor, Department of Forestry, Oregon State University
- * James Rochow, Esq.
- * Michael Ruby, Director of Engineering, Envirometrics Inc.
- * Alan Sarko, Inorganic Recycling Corp.
- * Edmond Q. Sese, President, RII Builders, Inc., Philippines
- * K.B. Shrestha, Owner, South Asia Trading Co., Nepal
- * Jim Silvers, President/CEO FPI
- * John Smith, Vice President for Environment, S.B. Foot Tanning Company
- * Frank Stern, RCG/Hagler, Bailly
- * Marc Stuart, Senior Analyst, COPEC
- * John Studer, Automotive Engineer, Lean Power Corporation
- * Ir. Dadang Sudrajat, PT Suprarex Rays, Indonesia
- * Dr. Warih Supriadi, PT Surabaya Agung Industri Pulp & Kertas, Indonesia
- * Gordon Sutin, Executive Vice President, Energy Answers Corporation/Polydyne, Inc.
- * Tig Tuntivate, RCG/Hagler, Bailly
- * Ravi Vaidya, Ion Exchange, India
- * Atanasio Vercide, Vice President, Fabrication, R-II Builders, Inc., Philippines
- * Michael Walsh, Consultant
- * Jack Wallace, President and CEO, Ab-Sorb
- * Ir. Widya Wicaksana, PT Probengkei, Indonesia
- * Ir. Darono Wikanaji, PT Kertas Leces, Indonesia

The World Environment Center (WEC), a not-for-profit, nonadvocacy, independent organization, contributes to sustainable development worldwide by strengthening industrial and urban environmental, health, and safety policy and practices. WEC, founded in 1974 with seed funding from the United Nations Environment Programme, today receives funding and support from industry, government, and international organizations, corporate and private foundations, and the public.

The Center, serving as a bridge for the exchange of information and expertise among industry, government, and non-governmental organizations, has established three programs to achieve its mission.

**International Environment and
Development Service (IEDS)**

Using volunteer and other experts, IEDS makes environmental management expertise available directly to industries and governments in 32 countries at little or no cost. Since it was launched in 1982, IEDS has completed over 250 activities and worked with over 900 host-country professionals.

International Environment Forum (IEF)

The IEF, established in 1977, promotes ongoing and off-the-record dialogue between government and industry on environmental and resource management issues. Today, 60 multinational corporations, based in eight countries, and engaged in nine industrial sectors, participate in the IEF.

**WEC Gold Medal of International
Corporate Environmental Achievement**

The WEC Gold Medal honors multinational corporations which have outstanding, sustained, and well-implemented worldwide environmental programs. Every year since 1985, an independent international jury has selected the recipient of the WEC Gold Medal to provide international public recognition of industry's environmental accomplishments.

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WORLD ENVIRONMENT CENTER

US-AEP/WEC
Environmental Business Exchanges
1994



US-AEP



United States-Asia
Environmental Partnership

1994 Annual Report for the World Environment Center
Cooperative Agreement with the United States - Asia
Environmental Partnership.
CA No. AEP-0015-A-00-2055-00

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The World Environment Center (WEC) gratefully acknowledges the continued leadership and guidance provided by Lewis P. Reade, Director General of the United States - Asia Environmental Partnership (US-AEP), and members of the US-AEP Secretariat. As was the case in 1993, we also thank all members of the US-AEP technical support services contractor, TR&D, for their hard work and dedication.

In 1994, with the US-AEP well established and well known, the demand for our program of Environmental Business Exchanges (EBEs) grew steadily. During the year we completed 200 EBEs, a number that had been our goal for the entire two-year period of the cooperative agreement. This remarkable achievement was made possible by hard work and team work, both by our US-AEP partners and WEC staff.

USAID missions increasingly took advantage of this program to bolster mission priorities and programs, and US-AEP Technology Representatives used EBEs to cement existing relationships and build new bridges with local industry and government officials. As was the case in our first year, WEC achievements would not have been possible without their efforts.

Existing relationships with staff at the National Association of State Development Agencies (NASDA) continued to grow, with WEC participating in NASDA grant review committee meetings. To WEC, this particular relationship epitomized the kind of coordination and cooperation that should be the foundation of any worthwhile program. WEC found NASDA staff to always be professional and organized. We are particularly grateful for the contributions of Meaghan Conte, Julie Pike, and Lindsay Webb.

Within WEC the EBE program was the responsibility of Lisa Raudelunas, Manager of WEC Asia Programs. Larry Lai of MTL Group, Inc., served as the Principal investigator for this cooperative agreement.

Finally, WEC pays tribute to Jomar Ochoa, ONRAD, USAID/Manila who died in a traffic accident in March of 1995. Jomar had our respect and admiration as a caring individual and highly competent professional. We join the entire US-AEP family in mourning his passing and offer heartfelt condolences to his family.

The US-AEP ...

Led by the United States Agency for International Development (USAID), the United States - Asia Environmental Partnership (US-AEP) was founded in 1992 to assist in addressing environmental degradation and sustainable development issues in the Asia/Pacific region by mobilizing U.S. environmental experience, technology and practice. The program brings together the resources of 25 U.S. government agencies and thousands of businesses and non-governmental organizations that work with 35 nations and territories in Asia, preventing and controlling industrial pollution, assisting in the development of urban environmental infrastructure, and improving energy efficiency and employing renewable energy technologies. While individual US-AEP activities seek practical solutions to local problems, the cumulative effort positively affects global environmental issues.

OVERVIEW

In the World Environment Center's report *1993 A Year of Achievement*, for the cooperative agreement with the US-Asia Environmental Partnership, we promised that, "In 1994 we would work with renewed dedication to help solve environmental problems throughout Asia." That promise has been kept.

During 1994, demand for our program increased sharply. Responding to that demand, WEC completed 54 projects, involving 200 Environmental Business Exchange (EBE) participants, more than doubling the previous year's total. We conducted exchanges with Bangladesh (for the first time), Hong Kong, India, Indonesia, the Republic of Korea, Malaysia, the Philippines, Singapore, Sri Lanka, Taiwan, and Thailand. In 1994 WEC provided US-AEP with in-kind contributions totaling more than \$2,460,000.

The majority of exchanges fell under the rubric of the Technology Assessment Program, a program designed to allow Asian decision makers to evaluate the appropriateness of U.S. technology, experience, and practices in addressing their environmental problems. In numerous instances exchanges led to the introduction of U.S. goods and services to Asia, either through direct sales or through the formation of joint ventures.

In an era of shrinking federal budgets and possible reductions in foreign assistance, the U.S. Agency for International Development is taking a hard look at programs to ensure that they are productive. After its second year, this US-AEP/WEC has been that and more. In large part because of the US-AEP/WEC EBE program, substantially more U.S. pollution control technologies and techniques are being used in Asia; making the air easier and less harmful to breathe, reducing water pollution, and providing cost effective, efficient management of hazardous wastes.

Perhaps more important, in 1994 the EBE program brought together more than 2,500 environmental professionals. Many of these relationships between Asian and U.S. private sector and government officials have taken hold and will continue to grow in the coming years, providing continued benefits for partners from both sides of the Pacific, and for the environment.

Antony Marcil
President and CEO
World Environment Center

Environmental Business Exchange Programs

The Environmental Business Exchange (EBE) program was unchanged from 1993, with three sub-programs providing the structure: the Technology Assessment Program, the Factory Assessment Program, and the Corporate Environmental Program. The few changes that did occur in the program responded to practical needs. For example, we initiated intense multi-country exchanges to address environmental issues that were priorities for several countries in Asia.

Program	Number of projects	Number of Exchanges
Technology Assessment	45	164
Factory Assessment	2	4
Corporate Environmental	2	8
Other	5	24
1994 Total:	54	200

In 1994 the vast majority of projects fell under the rubric of the Technology Assessment Program. Under this program, a total of 45 projects, involving 164 exchanges, examined needs as diverse as environmentally friendly boiler technologies, the use of Meteor Burst Communications (MBC) technologies for collecting environmental data from remote locations, and the use of U.S. technology and native soils to make bricks without the air pollution associated with traditional brick kilns. Under this program US-AEP/WEC also continued support for USAID/India's Trade in Environmental Services and Technologies (TEST) activities.

WEC continued its worldwide program of factory assessments with two projects that responded to USAID mission requests for pollution prevention opportunity assessments. These projects targeted plywood facilities in Indonesia and tannery facilities in Bangladesh.

Two projects were carried out under the banner of Corporate Environmental Programs in 1994. Five additional projects were completed in 1994 which did not fall within the structure of the three pre-designed programs, but were consistent with overall US-AEP program goals. The ability to respond to demands in a flexible and opportunistic manner has been one of the strengths of the EBE program.

T echnology Assessment Program

As with all activities under the EBE program, the US-AEP/WEC Technology Assessment Program was field driven. Program activities both brought Asian decision makers to the U.S., and

took American businesses to Asia. During visits to the U.S., this program provided Asians: (1) the opportunity to visit U.S. facilities currently employing a technology or practice of interest and to speak directly with plant staff about the reliability of the approach, actual performance, and

if appropriate, operation and maintenance costs for equipment, and (2) access to the U.S. Environmental Protection Agency or other impartial experts. It also allowed U.S. industry to move beyond paper presentations, and be able to show-case company manufacturing facilities, and

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demonstrate products under actual operating conditions.

In many instances USAID missions and US-AEP Technology Representatives contributed to the success of exchanges by evaluating the capabilities and resources of potential Asian partners and arranging meetings with appropriate host country government officials wherever appropriate. Participants often spoke of the added credibility which accompanied their proposals and meetings when it was clear that their visits had U.S. government sponsorship.

The following examples illustrate the range of activities conducted under this program.

◇ **Environmentally Friendly Brick Making Technology.**

The Exchange: -- In many Asian cities the skies are darkened by stack emissions from brick kilns. Under this exchange representatives of Pacific Adobe, Inc., including President Forest Sprague, traveled to Thailand to explore possibilities for exporting their non-polluting brick making technology.

Building on groundwork conducted by Adobe and USAID/Thailand, meetings were set up with Sahakol Chasis Co. Ltd., and Mahaphant Fibre/Cement Public Company, Ltd

The Result: -- Arrangements were reached with the Thai companies, and Pacific Adobe, Inc. can now

proceed with plans to manufacture and distribute their earth building machines in Thailand for distribution in Asia. Sahakol will be licensed to build the Pacific Adobe machines, and Mahaphant will distribute the products. A new company, Pacific Adobe Thailand has been established to specialize in construction using Pacific Adobe technology and equipment.

◇ **Electric Arc Furnace (EAF) Dust Recycling Technology**

The Exchange: -- The steel industry in Taiwan produces about 120,000 million tons per year of EAF dust, with the bulk of this dust being buried in municipal landfills. In many locations, groundwater contamination resulting from leachate is becoming a serious problem. In 1992 the Taiwan Environmental Protection Agency (TEPA) launched a five-year green plan for a healthy environment. This plan includes free import duties, investment tax credits, and low interest loans to encourage private firms to improve the environment and recycle wastes.

Mr. C. Tom Philip, President, and Mr. B.H. Sims, Chief Engineer of Enviroscience, Inc. (ESI) were accompanied by their consultant Mr. Don Warner on a visit to E. Chang Iron and Steel Works in Taiwan. The purpose of the trip was to develop a preliminary proposal for services and assist in developing markets for products to be produced from the recycling technology. This trip was greatly enhanced by the efforts of Mary Ann Wo of the Arkansas

Industrial Development Commission.

The steel industry in Taiwan produces about 120,000 million tons per year of EAF dust ...

The Result: -- A Memorandum of Understanding was signed by ESI and Shiao-Kang Enterprises Company Ltd., a company owned by the President of E. Chang Iron and Steel Works. E. Chang is among seven steel companies that have jointly founded a waste recycling company which is negotiating with the Industrial Bureau to acquire the necessary land set aside for recycling operations.

◇ **Environmental Management at Industrial Estates**

The Exchange: -- BAPEDAL the Indonesian environmental protection agency recently passed new laws making the developers of industrial estates responsible for environmental emissions from those estates.

Under this exchange representatives of five industrial estate development companies visited the U.S. to review environmental monitoring methods, approaches for regulation of industrial emissions, and options for treatment. Participating in the delegation were Sjukur Lawigena, Division Head, Operation and Property

Management, and Wilyadi Adinoto, Project Manager for Industrial Estates, PT Bumi Serpong Damai; A.J. Kristiadi, Manager of Operation, PT Grahuana Cikarang and PT Kawasan Industri Jababeka; S. Donny Dewanto, Environmental Engineer, Elisabeth Dessy, Manager of Business Development, and Ade Irwn Dwiyana Machmudin, Development Assistant, PT Lippo City Development; Diding Muchidin, Director and Senior Environmental Engineer, PT Jaya Arkonin Engineering Manggala Pratama; and Budi Sutjahjo, Deputy Director and Senior Environmental Engineer, PT Waseco Tirta.

While in the U.S., the delegation visited eleven industrial parks, central waste processing facilities, and industrial waste treatment plants in Rhode Island, Ohio, Missouri, Kansas and Texas. They also attended a workshop on environmental assessment and pollution control at industrial estates.

The Result: -- The Indonesians were very interested in the U.S. system for regulating industrial emissions, and focused on the fact that many authorities, including enforcement, are delegated to the local level. They were also impressed by the fact that industries obey regulations established by USEPA and the local authorities.

They pointed out that many differences still exist between the U.S. and Indonesia with respect to the state of infrastructure development and attitudes toward

compliance. With the concept of environmental protection still being quite new, the delegation appreciated the need for short-term monitoring as a necessary step for ensuring that regulations are complied with.

They (the Indonesians) were also impressed by the fact that industries obey regulations established by USEPA and the local authorities.

◇ Meteor Burst Communication Technology

The Exchange: -- Under this exchange Mr. Santosh Gupta, Joint General Manager, and Dr. B.A. Giridhar, Deputy General Manager of Environment, Risk, and Insurance Management Services (ERIMS), India, visited the U.S. to assess experiences in using Meteor Burst Communication (MBC) systems.

The visit included meetings with Environmental Services Ltd. of Anchorage, AK who manufacture the communications equipment, and Soil Conservation Services (SCS) offices where the equipment is used. The SCS has 650 remote data collection sites throughout Idaho.

The Result: -- It was determined that the MBC system permits secure, reliable, low cost communications from widely

separated, unattended, remote locations which may be either fixed or mobile. The exchangees determined that this system was far superior to other systems in use in India and has huge market potential.

◇ Packaging Resin Technology

The Exchange: -- Environmental Technologies, Inc. (ETI) participated in the program to explore the viability of the South Korean market for two of their products: a starch-based loosefill system which allows for economical, transportable, quality loosefill replacement of expanded polystyrene (EPS); and a starch based plastic resin for injection molding (60 percent to 80 percent starch reacted with a plastic and utilizing either recycled or degradable products). ETI sought a South Korean partner to expand ETI's presence in the market.

The starch-based loosefill technology was of most interest to the Koreans since the European Economic Community (EEC) is legislating the ban of all import of EPS material into the EEC (Germany already has such legislation).

The Result: The exchange was successful in identifying a potential partner for ETI, Sun Hill Glucose Company, a member of the Sam Yang Group, a \$1.7mm vertically integrated company well respected in Korea with a presence throughout Asia. Sun Hill is most immediately interested in the starch-based loosefill with secondary interest in the starch plastic resin. Discussions for a license

agreement are continuing, and it is hoped that this will grow into a long term working relationship.

◇ Hydrogen Sulfide Abatement Technologies for Geothermal Power Plants

The Exchange: -- Philippine environmental regulations mandate a significant reduction in hydrogen sulfide emissions from geothermal power plants, and abatement of these emissions are included in a California Energy Company, Inc. (CECI) turn key contract with the Philippine National Oil Company - Energy Development Corporation (PNOC) for the 640 MW Leyte A Power Plant.

To assist PNOC in understanding alternative abatement technologies for hydrogen sulfide control, Mr. Francis Dolor, Planning Manager, Mr. Hermes Ferrer, Geoscientific Manager, Mr. Herman Guilen, Engineering Design Manager, Mr. Romy Jabonillo, Process Instrumentation Coordinator, and Mr. Dwight Maxino, Production Manager, PNOC, visited the U.S. to assess abatement systems based on performance, operational difficulties, and problems encountered. PNOC participants also attended the geothermal Resource Council's Geothermal Conference.

The Result -- PNOC officials gained familiarity with the advantages and disadvantages of gas injection methods for hydrogen sulfide control, abatement downstream of the turbine using a REDOX process,

and other methods such as the RT2 technology. The information gathered will assist PNOC in the technical evaluation, award, design and construction of hydrogen sulfide abatement systems for future geothermal power plants in the Philippines.

The information gathered will assist PNOC in the technical evaluation, award, design and construction of hydrogen sulfide abatement systems ...

◇ Medical Waste Management Technology

The Exchange: -- Medical waste management is of great concern throughout Asia, and Asian medical professionals expressed great interest in U.S. experiences in regulating medical wastes, and alternative methods for waste management.

This exchange brought together thirteen medical professionals (e.g., hospital managers, and doctors) from Thailand and Indonesia for a review of U.S. waste management practices.

Most hospitals in Indonesia do not have a comprehensive waste management system. Infectious and noninfectious wastes are handled collectively with ultimate disposal usually being by landfill.

While Thailand's systems for medical waste management are in

many ways more advanced than Indonesia's, the public hospital system is tremendously overburdened and underfunded. This fact is demonstrated by a comparison of the United Nation's recommended population to bed ratio of 250:1; and Thailand's ratio in 1992 of 720:1.

The delegation met with experts at USEPA, visited hospitals and manufacturers in the greater Chicago area, and in Minnesota.

Included on the tour were manufacturers of autoclave technologies, incinerators, electrothermal deactivation equipment, and microwave disinfection technologies. The delegation visited hospitals in both states, including the Mayo Clinic in Minnesota.

The Result: -- The delegation noted with interest the extensive use of disposable sharps and other supplies, and the size of the resulting waste stream. This contrasted markedly with their practice of reusing sterilized equipment.

Medical waste management is of great concern throughout Asia ...

Exposure to a wide range of waste management technologies was of particular interest to the delegation as they previously only had broad exposure to incineration as a management option.

As a direct result of this

exchange, one U.S. company, Stericycle, was invited to Indonesia to participate in workshops with local hospitals and evaluate possibilities for sales.

The following three exchange descriptions are illustrative of activities coordinated with **USAID/India's TEST program**. These exchanges have been included in the Technology Assessment Program discussion as all TEST activities related to technology assessments.

◇ Environmentally Sensitive Boiler Technology

The Exchange: -- A seven-member delegation from the Indian Boilers Manufacturers Association (IBMA) visited the U.S. to develop business relationships and review U.S. boiler technology. Less than fifteen percent of boilers in India currently operate using any pollution control devices. The delegation had the opportunity to assess: electrostatic precipitators, Venturi scrubbers, compact hybrid particulate collectors, and reverse gas fabric filters.

Less than fifteen percent of boilers in India currently operate using any pollution control devices.

The Result: -- The exchange served as a starting point from which three tangible results have

been realized. First, Industrial Boilers Ltd. (India) and Castone International Ltd. recently signed a Memorandum of Understanding to manufacture Castone's fly ash conversion equipment in India. Second, Ignifluid Boilers India Ltd. has been licensed by Tampella to manufacture their patented fluidized bed boiler technology. Third, Laxmi Boilers, India, and American Schack are currently discussing joint venture and/or licensing arrangements to produce heat recovery boilers in India.

◇ Paper Mill Clean Technology

The Exchange: -- This exchange was designed to assist Esvin Advanced Technologies Ltd. (Esvin Tech) in identifying pollution control technologies appropriate for their alcohol distilleries and mini-paper mills in India.

Mr. T.S. Venkataraman, Managing Director of Esvin Tech visited Manufacturing and Technology Conversion International, Inc. (MTCI) to learn about their indirect gasification technology and how it might be applied to rice straw liquors, commonly used in Indian paper mills.

The Result: -- MTCI's marketing representative, Thermochem, Inc. has given an exclusive licensing arrangement to Esvin Tech for the marketing and manufacture of MTCI's gasification technology. The financing proposal is currently under review by the Industrial Credit Investment Corporation of India (ICICI) with a decision expected in 1995.

◇ Evaluation of Biological Formulations for Waste Stream Treatment

The Exchange: -- Premier Ziba Ltd. (India) participated in this exchange to investigate U.S. Biotech Inc.'s bacterial formulation for treating water through the principle of "bio-augmentation" which occurs when large amounts of naturally occurring bacteria are introduced into a closed or partially closed system. After meeting with U.S. Biotech, Premier Ziba pursued routes of collaboration with U.S. Biotech by initiating pilot demonstration projects in India, and the reduction of import tariffs.

The Result: -- Premier Ziba and U.S. Biotech signed a distribution agreement which will allow Premier Ziba to market U.S. Biotech formulations in India.

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Factory Assessment Program

WEC factory assessment programs, examining opportunities for pollution prevention, waste minimization, and process optimization have been central to long term WEC programs in Indonesia, Thailand, and Central and Eastern Europe. In 1994, activities under this program continued, at USAID mission request, in Bangladesh and Indonesia.

◇ Indonesian Plywood Industry Factory Assessment

The Exchange: -- At the request

of USAID Indonesia, Danny Sjolseth, Director, Environmental and Analytical Sciences, Weyerhaeuser Company, and Bert Fellows, Manager, Technical Services, Boise Cascade Corporation, visited three plywood mills in Sumatra, Indonesia. The visit was coordinated with APKINDO, the Indonesian Wood Panels Association in Jakarta.

The assessments were designed to: (1) demonstrate the economic and environmental benefits of waste minimization in this industry, (2) provide industry and government representatives with hands-on experience in conducting facility waste minimization and process efficiency assessments, (3) provide facility and company management with no/low cost recommendations, and end-of-pipe processes that will result in significant reductions of pollutants, improved product quality, and increased economic benefits; and (4) provide industry with appropriate investment options for clean technologies, process modifications, and pollution prevention/control equipment. The team visited: P.T. Hutrindo Prajen Plywood Manufacturing Company, P.T. Sukes Sumatra Timber (SRI Group), and P.T. Kurnia Musi Plywood Industrial (Bumi Raya Utama Group).

The Result: -- In many cases the experts were impressed by Indonesian plywood operations. The experts made numerous recommendations for coordinating business planning between logging and various

manufacturing activities to optimize the value chain, safety and housekeeping, quality assurance and quality control, conducting waste beneficiation studies, disposal of glue wastes, and possible use of alternative glues.

The assessments were very well received, and USAID/Indonesia has been exploring possibilities for follow-on activities.

◇ Bangladesh Tannery Industry Factory Assessments

The Exchange: -- Tanneries clustered in the Hazaribagh area of Dhaka City discharge effluent to an impoundment behind a flood control embankment, with no continuous provision for outlet. Seepage to the aquifer is a continuing concern, with predictions being made that a serious water crisis for residents of the area may occur within a few years.

The experts made ... recommendations for considering business planning among logging and various manufacturing activities to optimize the value chain.

Under this exchange Lawrence Barber, Director of Manufacturing (Rtd.) AC Lawrence Leather Company, and Mark Pfefferle, Environmental Economist, Science Applications

International Corporation, visited six tanneries to identify pollution prevention, and also met with Bangladeshi environmental officials to identify opportunities for incorporating economic incentives into proposed environmental legislation.

The Result: -- The experts made specific recommendations for reducing the volume of wash waters, for reducing hydrated lime for hair removal purposes, deliming with carbon dioxide, recycling the chromium in spent liquors, and alternative means for disposal of fleshings at the tannery facilities.

Recommendations to the government for incorporating financial incentives into proposed environmental statutes included: the use of economic incentives as a supplement to command and control standards and limits, and alternative designs for incentive programs possibly marketable permits, emissions trading, environmental charges and taxes or fees, or grants and subsidies.

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Corporate Environmental Program

This program was designed to reinforce an environmental mind set on the part of corporate officers and decision makers in Asia seeking to make environmental considerations part of normal business practice rather than a reaction to a regulatory mandate

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◇ Exchange on Ozone Depleting Solvents

The Exchange: -- In support of efforts by the International Cooperative for Ozone Layer Protection (ICOLP), US-AEP/WEC supported the participation of Prathap Reddy, Ford Motor Company, Urmi Ray, AT&T, and Ranu Basu Ray, ICOLP Project Coordinator, at seminars in New Delhi and Bangalore, India.

The purpose of the seminars was to create an awareness of the extent of ozone depletion problems and have a panel of international experts discuss alternative technologies available to help companies reduce/eliminate the use of ozone depleting substances (ODS).

The Result: -- The experts found that there is a very large sector of small scale industries using CFC 113 and carbon tetrachloride for a variety of applications. Carbon tetrachloride is also widely used by the pharmaceutical industry. By comparison, larger companies were well aware of ODS problems and researching alternatives, and interest appeared evenly split between "no-clean" technologies and aqueous and semi-aqueous cleaning.

In general, the experts found Indian engineers, managers, and scientists to be seriously interested in a stepwise approach to ODS elimination.

Technical people attending the seminar wanted contact information for both aqueous chemistry companies and

equipment manufacturers, both of which were provided by the experts.

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Other Exchanges

◇ Building Industry/NGO Bridges

The Exchange -- Environmental Careers Organization (ECO) representatives Diane Mailey and Tim Greiner traveled to the Philippines, India, Hong Kong and Taiwan to assess possibilities for establishing Asian programs similar to ECO's Technical Advisor Program. This program places retired engineers and scientists as consultants to NGOs so that they can work effectively and collaboratively with the private sector in addressing environmental issues.

The Result: -- ECO found Asian NGOs ill-equipped to address the pollution problems that accompany the high industrial growth rates being experienced in Asia, and NGO capacity building appeared to be an overwhelming need. ECO also found that the role of NGOs as a stakeholder in environmental protection has been frequently overlooked. Finally, it was recognized that a U.S.- Asian partnership would lead to a more sustainable program, as U.S. technical expertise could be joined with local expertise and knowledge of industries.

One immediate result of this exchange was encouragement from the Asian Development

Bank that ECO pursue an ADB grant to support building NGO infrastructure in Asia.

◇ Urban Environmental Infrastructure Twinning Project

The Exchange: The City of Songkhla, Thailand and the City of Orlando, Florida participated in a twinning program to explore experiences and practices that could be shared with regard to wastewater treatment, and solid waste management. This activity was part of an ongoing program designed by USAID/Thailand's Regional Housing and Urban Development Office (RHUDO).

The most serious environmental challenges faced by Songkhla, a city of 90,000 was the need to develop adequate wastewater treatment facilities. Songkhla plans to construct a waste water treatment plant consisting of a series of facultative lagoons. The plant will be designed to produce an effluent of 20/30, BOD/TSS.

The Result: Orlando City staff recommendations included establishing long term water quality-based effluent standards for the treatment plant. This recommendation was based on the experience of several countries that secondary effluent can cause significant negative impacts on marine waters.

Other recommendations included: preparation of a plant O&M manual, alternatives for use of wetlands, and hyacinth ponds for wastewater treatment, and options for composting wastewater treatment sludge.

Results of Environmental Business Exchanges

An independent evaluation of WEC activities under this cooperative agreement was conducted by Investment and Trade Resources International (ITRI). The report (Final Report: Evaluation of WEC's Activities Under the US-AEP Cooperative Agreement, November 1994) included a presentation of the EBE program outcomes. Responses from individuals and organizations contacted through surveys and telephone calls, and analysis of the compiled findings formed the basis for ITRI report's findings on program outcomes. Findings were presented in the final report under the following three categories.

1. Responses of Asian Participants (hosts to American businessmen and visitors to the U.S.

Of the groups contacted during the evaluation, this was by far the most responsive. Surveys were sent to 42 Asian EBEs representing 26 organizations and 17

Asian hosts from 17 organizations. Eighteen responses (65 percent of organizations contacted) were received from the Asian EBEs and two responses (12 percent) were received from Asian hosts.

Almost one-fourth of the Asian EBEs stated that they planned to enter into licensing, distributorship, or similar agreements ...

- More than half the respondents indicated that they would purchase pollution control equipment within the next three years.
- Almost one-fourth of the Asian EBEs stated that they planned to enter into licensing, distributorship, or similar arrangements involving U.S. environmental technology within 1 - 3 years. Other results of their participation in the program cited by visitors to the U.S. included additional environment-related training for their work force and in one case, the creation of an environmental subsidiary.
- Fifteen firms stated that they followed up with U.S. host companies or institutions, and more than half undertook follow-up contact with a WEC office in either Asia or the U.S. Several others followed up with either the USAID mission, or US-AEP.
- Sixty-seven percent of the respondents indicated that the environment-related actions that they take over the next three years will result in a five to twenty five percent reduction in effluent or emissions from their facilities. One-third stated that their utilization of raw materials or feedstock will be significantly improved over the near term. Almost one-fourth, however, suggested that most of the effects would not be apparent over the next three years.
- Other near-term benefits resulting from the actions of program participants included: the disposal of "tons and tons of hazardous materials stored for decades"; improvements to urban conditions; development of environmental technologies appropriate to developing countries' needs, and improvements in working conditions

The Asian hosts were also asked to rate the usefulness of various forms of assistance provided through this cooperative agreement. The responses of the 18 EBEs are presented below.

Evaluation Topic	Rating*
Assisting Asian businessmen learn more about U.S. environmental technology and practices	3.47
Providing a cooperative forum for businesses, governments, and NGOs to better identify and jointly address their environmental needs	3.4
Leveraging other USAID and World Bank environmental programs by organizing conferences and handling logistical arrangements for participants	3.17
Providing impartial technical analysis and support to Asian governments and businesses to identify technologies appropriate to local needs	3.14

The scale equated to one as somewhat useful, and four as very useful.

2. Responses of USAID missions and US-AEP Technology Representatives

Individuals at each of the five key USAID missions were contacted, four responded. US-AEP Technology Representatives representing countries involved in past US-AEP business exchanges were contacted soliciting their insights on the program; two responded.

- USAID missions and Technology Representatives are generally satisfied that the exchanges are meeting their expectations - namely, they are resulting in further negotiations between targeted organizations or cementing strategic environmental alliances between U.S. and Asian organizations
- Most U.S. business people sent to Asia had either signed contracts or entered into negotiations with Asian firms.
- Asian EBEs sent to the U.S., has not yielded the same level of tangible transaction-related results.

3. Project Specific Findings

ITRI looked at 17 projects in great detail contacting U.S. program participants. The results of these evaluations were complementary of WEC logistical support services, and included the opinion that WEC volunteers and Asian offices were used effectively in implementing the exchanges. Virtually all individuals contacted were very positive about the potential for business as a direct result of the exchange.

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- | | |
|---|---|
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|---|---|

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The World Environment Center (WEC), a not-for-profit, non-advocacy, independent organization, contributes to sustainable development worldwide by strengthening industrial and urban environmental, health, and safety policy and practices. WEC, founded in 1974 with seed funding from the United Nations Environment Programme, today receives funding and support from industry, government, and international organizations, corporate and private foundations, and the public.

The Center, serving as a bridge for the exchange of information and expertise among industry, government, and non-governmental organizations, has established three programs to achieve its mission.

International Environment and Development Service (IEDS)

Using volunteer and other experts, IEDS makes environmental management expertise available directly to industries and governments in rapidly industrializing and emerging market countries at little or no cost. Since it was launched in 1982, IEDS has completed over 500 activities and provided opportunities for over 1,000 pro-bono experts to work with thousands of professionals from 44 countries.

International Environment Forum (IEF)

The IEF, established in 1977, promotes ongoing and off-the-record dialogue between government and industry on environment and resource management issues. Today, over 65 multinational corporations, based in nine countries, and engaged in ten industrial sectors, participate in the IEF.

WEC Gold Medal for International Corporate Environmental Achievement

The WEC Gold Medal was one of the first examples of public recognition for industry's global environmental accomplishments and leadership. An independent jury of international experts from various disciplines selects the recipient. Since 1985, the WEC Gold Medal has been presented to a corporation for its outstanding, creative, sustained, and well implemented global environmental policy and innovative programs and projects that stimulate nations and industry to enhance and protect the environment. Acceptance of the WEC Gold Medal constitutes not only public recognition of previous success but also a commitment by the recipient to maintaining or improving its commitment to environmental leadership.

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Appendix H

**Final Report:
Evaluation of WEC Activities Under the US-AEP Cooperative Agreement,
November 4, 1994**

**Final Report:
Evaluation of WEC's Activities Under the
US-AEP Cooperative Agreement**

November 4, 1994

Submitted to:

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Executive Summary

The World Environment Center, a not-for-profit, non-advocacy organization, received a grant from the U.S. Agency for International Development (USAID) / U.S. - Asia Environmental Partnership (US-AEP) for \$3,471,130 over a 2-year period from September 1992 to September 1994. WEC's non-federal pro bono contributions under this agreement were to total \$5,002,000, and were primarily in the form of time volunteered by U.S. environmental experts and Asian industry and government participants. The purpose of the grant is to "support better environmental, health, and safety policies and practices in the Asia region" through creating or strengthening ties between U.S. and Asian companies, organizations, and agencies. Specifically, the program is to conduct 100 individually tailored audit and assessment missions (U.S. exchangees to Asia) and 100 on-the-job internships, seminars, workshops or study tours of Asian exchangees to the U.S.

Program Summary

WEC got the program off to a quick start, and by the end of the second quarter had programmed or implemented 68% of the first year's exchanges based on its draft Work Plans. Disagreements emerged between WEC and the US-AEP Secretariat in late 1992 concerning the strategy and focus of the exchange effort. These differences were resolved through the April 15, 1993 Work Plan which set forth the Secretariat's strategy for implementing industry-to-industry, largely USAID Mission-driven environmental business exchanges (EBEs). At that point all existing plans for EBEs were terminated, and there was a virtual six-month hiatus in the program while WEC, the Secretariat, and staff of Tropical Research & Development (TR&D) assisted USAID Missions in programming the 75 EBE slots allotted to them under the April 1993 Work Plan. As of May 10, 1994, 145 EBEs (73% of the 200 targeted) had participated in 59 WEC environment business exchange projects. Fifty-seven (57%) of these EBEs were from USAID Mission identified projects; less than 10% of the EBEs originated from direct proposals from industry.

WEC exchanges covered a variety of industrial sectors, especially the urban sector and vehicles, and several environmental areas, particularly waste minimization, emissions, environmental management, and waste water. Sixty-eight percent (68%) of the EBE projects involved Technical Assessments, 8.5% involved Factory Assessments, almost 12% related to Corporate Environmental Programs, and the remainder involved leveraged efforts with the World Bank or other types of environmental assistance.

Findings and Conclusions

Of the individuals contacted for this evaluation, the vast majority saw the program as highly successful in promoting business relationships between individuals and organizations in the U.S. and Asia. In most cases, there was significant potential for transactions involving U.S. environmental experience, technology, and practices within 1-3 years as a result of relationships developed during the exchange. In many cases, actual business transactions (e.g., joint ventures, licenses, and distributorships), as well as sales have occurred.

The high quality support provided by WEC staff, particularly that related to logistical arrangements, directly contributed to the success of this exchange program. Moreover, the Principal Investigator's strong technical background, professionalism, and rapport with the US-AEP Secretariat and various Implementing Organizations, has had a significant, beneficial, effect on this effort. The involvement of key business-

oriented individuals and organizations, such as R.J. Gurley (Thailand) and USAID/India's TEST program, has enhanced the program's ability to target EBEs whose participation in the program can result in near-term economic and or environmental impacts.

Weaknesses in the program centered around its use of exchanges as stand-alone activities, and its lack of a coherent strategy for follow-up or engagement of participants (EBEs and Hosts) as long-term partners of WEC or the US-AEP. Furthermore, the effort, as it is being implemented, does not include any procedures for measuring its effectiveness or impact (beyond anecdotal evidence). The lack of an institutionalized approach or system within WEC for documenting and tracking volunteers (both EBEs and Hosts) also undermines WEC's ability to fully capitalize on the wealth of talent and expertise participating in this exchange effort.

Recommendations

The US-AEP / WEC cooperative agreement has met with considerable success, despite the difficulties encountered during its early implementation. Currently the US-AEP and WEC are finalizing an agreement to extend this effort through February 1995. In planning for this extension and for future environmental business exchange efforts, the evaluation team recommends that WEC pursue changes related to the following:

- Assuming that knowledge of economic / environmental impacts is desired by WEC, WEC should pursue an explicit mandate (and budget) related to continuation of its relationship with EBEs and Hosts. Procedures for tracking these impacts need to be included in the plan for project evaluation and monitoring, as well as in the grant agreements with EBE participants.
- Related to the above, WEC should expand its follow-up with EBEs and Hosts by developing a strategy and mechanisms for tracking and communicating the status of relationships initiated during exchanges and engaging EBEs and Hosts in the broader US-AEP and WEC programs.
- WEC should develop more coherent procedures and a system for tracking contact information and other relevant data for all program participants (EBEs and Hosts).
- Trip Reports should be redesigned to improve their usefulness, and WEC should develop a strategy for the distribution of key findings and lessons learned during the exchanges.
- WEC should institute more formal understandings or written agreements related to the responsibilities of various intermediate organizations (USAID Missions, TR&D, Tech Reps, or others) in designing, implementing, or following up activities connected with WEC's business exchange program.
- WEC should try to ensure that any extension to this cooperative agreement, or similar future effort by WEC, includes mechanisms for conducting ongoing evaluation and program monitoring, and that these procedures are clearly discussed in the work plan(s).

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I. Program Evaluation

1. Program Background

In mid 1991, the World Environment Center¹ was approached by senior officials of the U.S. Agency for International Development (USAID) to discuss a potential federal initiative involving collaboration of U.S. and Asian industry, government and non-government organizations aimed at improving environmental conditions and fostering sustainable development in Asia.

Formal announcement of the U.S.-Asia Environmental Partnership (US-AEP) was made by President Bush during a trip to Singapore in January 1992. The US-AEP was to consist of a coalition of American and Asian businesses joined together to support better environmental, health, and safety policies and practices in the Asia region. Equally important, the activities proposed under the US-AEP were intended to create or strengthen relationships between U.S. and Asian companies, organizations, and agencies. The US-AEP includes representation from a range of participating U.S. government agencies, under the leadership and primary funding of USAID.

Immediately following the President's announcement, USAID officials began work to articulate strategies and to develop implementing programs based on the previous year's discussions. Four main components emerged as the core of the US-AEP: environmental fellowships, exchanges, and training (FET); technology cooperation; energy and environmental infrastructure (EEI); and regional biodiversity conservation.

In February 1992, Antony Marcil, President of WEC, joined Henrietta Holsman Fore, Assistant Administrator for Asia, USAID, live on

WorldNet to present their image of the US-AEP and the role that WEC and other institutions would play in this innovative Partnership.

Justification for a non-competitive award to the WEC was prepared by Thomas Nicastro, Chief, Asia/DR/TR (April 29, 1992) based on the fact that WEC was the only institution with an effective two-way business exchange program already operating in Asia. Other institutions identified for cooperative agreements under the US-AEP's FET Component during this early period included The Asia Foundation (TAF), the newly formed U.S. Environmental Training Institute (USETI), and the U.S. Environmental Protection Agency (EPA).² WEC's proposal to the US-AEP was submitted on June 1, 1992, and

² Cooperative Agreements were signed with USETI on September 28, 1992 and with TAF on December 22, 1992. An inter-agency agreement was signed with EPA effective August 25, 1992.

TAF's objectives were threefold: 1) To provide opportunities to address significant environmental problems and identify relevant economic and technological solutions through professional affiliations, 2) to develop a network of environmental professionals in the U.S. and the Asia-Pacific region, and 3) to promote multi-disciplinary and cross-institutional discussions of environmental and natural resource issues and appropriate solutions to environmental problems.

The objective of USETI's CA was to increase awareness of environmental problems and potential solutions throughout Asia by: 1) improving access to information on appropriate environmental training courses available to Asian officials and businessmen; 2) improving the capacity of Asians to assess environmental problems and take action and to understand the full range of relevant U.S. technologies and practices, and 3) promoting environmentally sustainable technology and management principles.

EPA's objectives were to: 1) facilitate technology transfer through the development of long-term relationships and the development of professional and institutional networks and 2) create demand for policy reform and/or voluntary compliance with environmental regulations.

¹ WEC is a non-profit, non-advocacy organization founded in 1974 to serve as a bridge for the exchange of information and expertise among industry, government, non-governmental and international organizations.

the Cooperative Agreement (CA) was signed on September 24, 1992.³

2. The Cooperative Agreement

The Cooperative Agreement, No. AEP-0015-A-00-2055-00, between the US-AEP and WEC was signed on September 24, 1992. The stated purpose of the CA was to support better environmental, health, and safety policies and practices in the Asia region. The proposed effort was designed to support the US-AEP generally, and the FET component (later renamed the Professional and Organizational Development (POD) component) in particular. The CA is to focus on industrial and urban issues, but also include agro-industry and rural industrial and economic growth centers.

The grant, entitled *AID/WEC Cooperative Agreement In Support of the U.S.-Asia Environmental Partnership*, includes \$3,471,130 in authorized USAID funding and \$5,002,000 in non-federal cost sharing by WEC. The term is from September 24, 1992 to September 30, 1994.

Fifty-nine percent (59%) of the total CA budget was to be in the form of non-federal pro bono contributions. These services were based on an average value of US\$800/day for corporate, government, and NGO volunteer experts and counterpart contributions of staff time and local logistical support.

The CA includes funds for two program initiatives, the Short-Term Technical Assistance (STTA) and the Short-Term Professional

Development (STPD); business development activities by WEC; staff salaries (U.S. and Asian); and an evaluation. A description of each of these areas is provided below.

Short-Term Technical Assistance (STTA): 100 individually tailored audit and assessment missions, organized on a pro bono or partially funded, basis from the U.S. to Asia. Such activities were to vary according to need and availability of appropriate technical services. They were to be as brief as several days, or as long as several months. While pro bono services were to be the preferred option for all technical assistance assignments, there was a provision for up to one-fifth of these exchanges to involve paid consultants. The average cost to USAID was estimated at \$5,900 per exchange. Pro bono contributions were estimated at \$1,312,000 over two years.

Short-Term Professional Development (STPD): 100 activities including on-the-job internships, seminars and workshops, and study tours of Asians to the U.S. Like STTAs, STPDs' duration was to vary according to individual need and circumstances. Usually, however, they were to be of a longer duration than STTAs, averaging 45 days. The average cost to USAID for an STPD was estimated at \$9,425. Total pro bono contributions were estimated to amount to \$3,690,000 over the two years.

Business Development Surveys and Liaison: WEC proposed to undertake four comprehensive Business Development Survey trips during the CA. These trips were to include senior WEC staff and a senior industrial specialist seeking to expand existing WEC country programs and open WEC International Environment and Development Service (IEDS)⁴ programs in new countries (including Korea, Singapore,

³ The proposal's approach to implementing the business exchanges was consistent with the approaches being used on other existing CAs. At the time of the proposal, WEC held:

- three regional cooperative agreements (CA) with USAID in support of programs in Central and Eastern Europe, Asia, and the Near East;
- a bilateral agreement with USAID/Bangkok;
- a LAMP agreement with USAID/OFDA; and
- a bilateral agreement with USAID/Jakarta (under negotiation in mid-1992).

A bilateral grant agreement with USAID/Mamla was also entered into later in 1992.

⁴ Using volunteer and other experts, IEDS makes environmental management expertise available directly to industries and governments in 32 countries at little or no cost. Since it was launched in 1982, IEDS has completed over 250 activities and worked with over 900 host-country professionals.

and Taiwan). A total of four business development trips were planned for the two years. Four Liaison Trips to the region were also planned in order to facilitate the STTA and STPD programs.

Staff: Intensive, sustained administrative and in-house technical support was planned for the STTA and STPD programs. The budget provided for four full-time staff, complemented by part-time staff in both Arlington and New York City. Staff in WEC's Bangkok and Jakarta offices were also expected to contribute to implementation of the STTAs and STPDs. Funds were also allocated for six part-time country coordinators (to be designated during first year of the CA).

Evaluation: Funds were set aside in the CA to be allocated for a consultant team to conduct an evaluation of the program during the middle of the second year. Specifically, the CA provided for the evaluation to be coordinated with other US-AEP evaluations, so that the results could contribute to anticipated longer-term US-AEP programs.

3. Evaluation Team and Methodology

In May 1994, WEC contracted with Investment & Trade Resources International (ITRI) to conduct an evaluation of its performance under Cooperative Agreement with the US-AEP.

The evaluation was conducted by a team of three individuals: Tracie E. Monk (Team Leader), Edward Glaeser, and Alice Willard. Ms. Monk has a background in the environment and energy sectors and in supporting trade and investment activities in Southeast Asia. She was also part of a quality assurance team from Management Systems International / Resource Triangle Inc. working with the US-AEP in 1993-94, and is President of ITRI.

Both Mr. Glaeser and Ms. Willard are experienced in conducting USAID evaluations.

Over the last six years, Mr. Glaeser has led and/or participated in more than 16 evaluations and institution/management analyses for USAID, including the Private Rural Initiatives Project evaluation in Bangladesh (1994) and the evaluation of Indonesia's 16-year PVO Co-Financing I and II Projects. Ms. Willard has over 12 years of experience conducting USAID evaluations, including participation in a comprehensive review of 346 USAID evaluations for quality, completeness, and clarity.

A team planning meeting consisting of the WEC principal investigator, the US-AEP QA Officer, TR&D's Manager for the POD Component, and the evaluation team was held on May 18th at WEC's Arlington office. The evaluation team's strategy for conducting this final evaluation of the project was discussed, as were the team's concerns regarding the difficulty of securing field inputs given the lack of a travel budget and the requirement that the evaluation's final report be completed in advance of the MSI evaluation team's return from Asia. (An MSI team, under the leadership of the US-AEP QA Officer, was concurrently conducting an interim evaluation of the entire US-AEP program).

Following the May 18th meeting, WEC provided the evaluation team with contact information for most of the environmental business exchangees and for many of the Hosting institutions. A Microsoft Access relational database was developed and utilized to perform statistical analyses pertaining to the exchanges (see section II.3. of this report) and to assist the evaluation team in targeting and distributing survey questionnaires.

A stratified sample of the projects initiated prior to the evaluation was developed. This sample covered 17 of 59 projects (29%), and involved 7 of the 8 countries.⁵ It also included examples of three project types: technology

⁵ Note that while neither of Nepal's two exchange projects was selected for examination, the results of the exchange related to electrification of the three-wheel vehicle "tempo" was discussed with the hosting organization (J-PRI) and the USAID Mission.

assessment, factory assessment, and corporate environment program; and was illustrative of the various forms of WEC assistance provided to exchanges (substantive and logistical).

Members of the evaluation team personally interviewed 19 people: eight WEC staff in Arlington, VA and New York City; four members of the US-AEP Secretariat; five TR&D staff; the US-AEP QA Officer; and the Sanders International program manager for the TEST program.

Attempts were made to send surveys to each of the 69 Asian EBEs. Forty-two (42) EBE surveys were successfully transmitted by fax. These Asian EBEs represented 26 organizations. Asian Hosts were targeted based on their participation in one or more of the targeted projects. Out of a potential pool of 39 Host names, lack of contact information and communications difficulties limited the number of Host surveys distributed to 17.

Telephone interviews were conducted with nine U.S. EBEs and 14 U.S. Hosts who had participated in one or more of the 17 targeted projects. Individuals at six USAID Missions were contacted via Internet e-mail. US-AEP Technology Representatives representing countries involved in past US-AEP/WEC business exchanges (6 of the 9 Tech Reps) were sent faxes soliciting their insights on the program.

A list of all individuals interviewed or who responded to surveys, faxes or e-mail concerning this evaluation is provided as Appendix D.

The team expresses its sincere appreciation for the excellent cooperation and support received from WEC officials in Arlington and New York; from staff of US-AEP and TR&D; and from the numerous individuals and organizations participating in this program.

4. Scope and Organization of the Report

This report is divided into four major sections. Section I: *Program Evaluation*, provides background on the cooperative agreement and on how the evaluation was organized and conducted.

In Section II: *WEC Performance Against Program Targets and Objectives*, the results of the team's review of program documents, data analysis, interviews, and responses to surveys and other questions are provided in the form of statistical analyses of the overall program activities and summaries of significant findings.

Section III: *Evaluation Conclusions* provides the conclusions of the evaluation team, particularly related to the categories discussed in section II.6. Section IV: *Recommendations* includes suggestions for WEC related to its execution of future environmental business exchanges.

The categories examined in Sections II-IV were defined by the US-AEP's Interim Evaluation Team in an effort to be consistent across US-AEP program areas. Topics such as Total Quality Management (TQM) are therefore discussed in the findings and conclusions of this report, even though they were not a part of the original cooperative agreement between WEC and the US-AEP. Per the request of WEC and the US-AEP, the WEC evaluation team has limited the comments and recommendations contained in this document to WEC's activities under the cooperative agreement. We have refrained from commenting on the US-AEP's business exchange efforts or from making recommendations concerning US-AEP's involvement in any future environmental business exchange program since these topics will be covered by MSI, Inc. as a part of the US-AEP interim evaluation.

II. WEC Performance Against Program Targets and Objectives

1. Logframe

The program objectives, output, and outcomes as defined in the US-AEP logframe, which is based on the Workplan, are as follows:

STRATEGIC OBJECTIVE: To increase awareness of environmental problems and potential solutions throughout Asia by introducing environmental technologies, practices, and evaluation and problem solving tools and financial expertise.

PROGRAM OUTPUTS: 100 individually tailored audit and assessment missions. 100 on-the-job internships, seminars, workshops or study tours of Asians to the U.S. Four business development surveys and liaison trips. Project enhancements.

PROGRAM OUTCOMES: To create or strengthen ties between U.S. and Asian companies, organizations, and agencies. To identify and introduce relevant U.S. technologies, environmental practices, environmental evaluation and problem solving tools and/or financial expertise. To link learning and confidence building experiences to work situations and institutional settings which can contribute to institutional development.

A summary of Program Outputs is provided in sections II.3 and II.4 of this report; Program Outcomes, as communicated by individuals and organizations contacted during this evaluation, are discussed in section II.5.

2. Implementation Preparations and Start-Up

Review of program documentation and interviews with staff at WEC, the Secretariat, and

TR&D revealed that implementation of this cooperative agreement changed significantly following the submission of the final Work Plan in April 1993. For this reason, we have separated discussion of implementation into two distinct periods: (1) September 1992 - April 15, 1993 and (2) April 15, 1993 to May 10, 1994, when this evaluation was initiated. Most of the findings, conclusions, and recommendations provided in this report are derived from the latter performance period.

a. September 1992 - April 15, 1993

Following signature of the Cooperative Agreement (CA), WEC immediately began preparing for implementation of the exchange program based on its previous discussions with USAID officials and the strategies outlined in its proposal. The Program Manager, William Knowland, had been hired May 1992 following preliminary discussions with USAID. WEC hired the remaining program staff during the two-to-four months following the signing of the CA.

The CA required that WEC submit its First Annual Work Plan within 60 days of the effective date of the agreement. It further required that the Work Plan...

...give particular attention to outputs, emphasizing the steps which will be taken to enhance the developmental and environmental impacts from the proposed work. Outputs may be related to particular environmental problems, to particular countries, to a specific range of technologies, etc., but they must be related to objectives and purposes above and beyond the accomplishment of exchange missions alone, and they must be quantifiable. Attention will also be given to the opportunities for leverage, building on

WEC's own network and/or programs of other organizations.

A draft work plan was prepared and submitted to the US-AEP Secretariat on November 5, 1992. Revised work plans were submitted on December 17, 1992 and January 6, 1993 — none of which received approval from the US-AEP Secretariat. These plans were based on discussions with USAID officials during 1991-92, as well as the WEC proposal and the CA.

The first exchange occurred in February 1993, based on WEC's strategy as defined in the initial draft work plans. According to the first semi-annual progress report, 50 Short-Term Technical Assistance (STTA) exchange opportunities had been identified by WEC as of March 1993 — 23 were underway (candidates identified and dates set) and 14 were completed. An additional 50 Short-Term Professional Development (STPD) exchanges had been identified — 31 were underway.

At the same time that WEC was implementing its draft work plans, Henrietta Holsman Fore was leaving USAID and Molly Kux, the USAID Program Manager, was transferring oversight responsibility for the CA to the US-AEP Director General, Lewis P. Reade. Reade, in turn, was working with a newly organized Secretariat and new staff from TR&D to formulate his vision for the US-AEP program.

Discussions within the Secretariat and TR&D in late 1992 resulted in several findings which held significant consequences for the WEC effort. These included the following:

- A recognition within the Secretariat that the limited number of exchanges (WEC), fellowships (TAF), and training (USETI) supported under the US-AEP were, by themselves, unlikely to have a significant long-term effect on Asia's environmental sector — and that the goal should instead be to focus on creating an atmosphere conducive to furthering U.S.-Asian business relationships.

- The objectives of the three CAs under the FET component (WEC, TAF, and USETI) represented potential overlap and redundancy.
- Initial feedback from USAID Missions regarding the US-AEP program was negative — focusing on a perceived lack of focus within the US-AEP and poor coordination among the numerous implementing organizations who were sending business development missions to Asia.

The Secretariat expressed its concern with WEC's approach to the environmental business exchanges in a series of meetings between WEC staff (Will Knowland and Larry Lai) and the US-AEP Secretariat (Owen Cylke) and TR&D (Melissa Dann) beginning in late 1992. The Secretariat's vision for the program was further articulated during discussions held March 19 and April 7, 1993.

During this period two other significant events affected the program. The first was a decision made at the annual USAID Mission Directors' Conference in March 1993, to make the US-AEP activities more responsive to Mission priorities. By allocating 38% of WEC's total exchanges (75 of 200) to five priority Missions,⁶ the Secretariat hoped to: (1) enfranchise the Missions in the US-AEP program, allowing field control of a significant number of business exchange slots; and (2) ensure that Missions' priorities were supported under the US-AEP.

This shift effectively transferred much of WEC's project identification and design responsibilities to the field, while retaining its functions as the logistics coordinator. The change was also indicative of USAID's emergence as the dominant player in this interagency effort.

The second major event during this period was the April 1993 departure of the WEC's

⁶ India (50 exchanges); Indonesia (10); Philippines (10); Sri Lanka (10); and Thailand (15)

Director for Asia Programs. This resulted in Will Knowland's promotion to manage WEC's Asia cooperative and bilateral agreements. According to individuals interviewed, the designation of Larry Lai (who the Secretariat and TR&D perceived as industry-oriented and responsive to their needs) as primary contact for this CA during this period had a positive effect on what had become a strained relationship between the US-AEP staff and WEC management.⁷

During this period, both Knowland and WEC's President, Tony Marcil, expressed WEC's concern to the Secretariat regarding what they viewed as a one-sided redefinition of the CA by the Secretariat. In particular, they felt that the new strategy:

- failed to recognize the benefits of industry-government-NGO collaboration;
- was not consistent with WEC's position as a non-advocacy organization; and
- significantly reduced WEC's involvement in the substantive planning, design, and follow-up of exchanges.

b. April 15, 1993 - Present

The final Work Plan was submitted by WEC on April 15, 1993, based on the Secretariat's strategy for conducting business-to-business exchanges under the US-AEP. Concurrent with this submission, WEC terminated planning on all exchanges (54 of which were under development). From early April to June 30, 1993, WEC focused on developing strategies for marketing the environmental business exchanges (EBEs) to the USAID Missions as well as to non-Mission countries.

⁷ In July 1993 Lai was promoted to Principal Investigator with formal management responsibility for the CA. In January 1994, Lai converted from WEC staff to subcontractor status with the MTL Group, Inc. Day-to-day management of the CA continued under Lai; Swarupa Ganguli formally received responsibility for tracking financial aspects of the CA. Policy and management decision-making resided with Will Knowland as Director, Asia Programs.

The table in Appendix A summarizes key elements of WEC's strategy, as presented in the draft work plans and the largely Secretariat-defined work plan dated April 15, 1993.

Under the final Work Plan, the WEC exchange program had two components:

Environmental Business Exchanges - U.S. to Asia: individually tailored exchanges, organized on a pro bono or partially funded basis, from the U.S. to Asia/Pacific. Such activities were to vary according to need and availability of appropriate technical services; and vary in duration from several days to several months. In some instances the services of paid consultants were to be used to complement or replace volunteer services.

Environmental Business Exchanges - Asia to U.S.: these exchanges included factory/industry visits and workshops for Asians and Pacific Islanders visiting U.S. industry. EBEs to the U.S. were to be designed around specific topics (e.g., pollution control and monitoring technologies), from one to six weeks in duration.

These components contained three generic programs:

Factory Assessment Program which was designed to enable Asian industry representatives to draw upon U.S. expertise to perform environmental audits of plant facilities and equipment and reap the benefits of working smarter and greener while reducing operating costs.

Technology Assessment Program which complemented the Factory Assessment Program and provided a vehicle for small groups of Asian industry officials to meet with their U.S. counterparts to review and evaluate new and alternative technologies for process control and pollution mitigation.

Corporate Environmental Program which was to bring U.S. and Asian industry leaders

together to explore challenges posed by environmental concerns and regulations.

Thirty-eight percent (38%) of the 200 EBEs were reserved for programming by five USAID Missions. Thirty-three percent were to be drawn from proposals addressing the three generic program areas above. The remaining 29% were intended for targets of opportunity which might arise during the course of this program.

The program identification/design, approval, and implementation process is depicted in the figure on page 9. Note that according to WEC, approximately 35-40% of inquiries from industry were rejected by WEC due to general misconceptions or lack of understanding regarding the intent of the program. Approximately 95% of Asia-driven projects (from USAID or Tech Reps) were accepted. The few that did not occur were rejected due to a lack of adequate information on environmental need or anticipated outcome from the exchange.

Between early April and September 30, 1993, only eight environmental business exchanges (EBEs) occurred. A primary reason for this inactivity was the absence of USAID Mission participation. Concerns about WEC's ability to implement EBEs under the new Mission-directed strategy led Reade to prepare a letter agreement between the US-AEP and WEC (July 7, 1993)

specifying targets for the year. Intensive marketing of Missions by both WEC and the Secretariat / TR&D was ultimately successful with 63 EBEs implemented during the fourth quarter of 1993.

Over the last six to eight months, a new stakeholder in the US-AEP/WEC CA has emerged in the form of the US-AEP's Technology Cooperation Representatives (Tech Reps). During 1993, Tech Reps, working through the U.S. Department of Commerce's Foreign Commercial Service (US&FCS), were stationed in nine Asian countries.⁸ Their involvement in the US-AEP program expanded significantly during early 1994, and Tech Reps are playing an increasing role in identifying EBEs, coordinating local meetings and in-country logistics, and following-up with EBEs and Host institutions after exchanges are completed. As one member of the Secretariat explained, "WEC's business exchange program is <now> an arrow in the Tech Reps' quiver."

As of May 10, 1994, 145 EBEs had participated in 59 WEC environment business exchange projects. An additional 20 projects involving 60 EBEs were under development. A breakdown of the EBEs participating in this program as of the evaluation is provided in section II.3. of this report.

⁸ Tech Reps were first stationed in three countries as of October 1993, with a mandate to identify one environmental trade lead per day. In January 1994, six additional offices were formally opened. Since early 1994, Tech Reps have been encouraged by the Secretariat to work directly with other US-AEP Implementing Organizations, including WEC, thereby more fully responding to the needs of Asian and U.S. businesses, governments, and non-government organizations.

PROJECT IDENTIFICATION AND APPROVAL PROCESS

ASIA

①

Project Identified by:
 USAID Missions
 Tech. Rep.
 Industry

③

FIELD APPROVALS
 USAID Missions OR
 US&FCS (non-USAID
 countries only)

②

WEC AS GATEKEEPER

MUST IDENTIFY:
 - Environmental Need
 - Anticipated Outcomes

SHOULD INDICATE:
 -- Who (EBEs/Hosts)
 -- Where (Destination)
 -- When (Schedule)

⑥

WEC Logistical Support

- Travel Agent Functions
- Fine Tunes Program
- Assists with Trip Report

U.S.

①

Project Identified by:
 US-AEP Secretariat
 TR&D Staff
 Industry
 WEC

④

TR&D Review

⑤

**APPROVAL of
 US-AEP DIRECTOR
 GENERAL**

Project Implementation

Project Identification

Project Design

- Critical Step for WEC

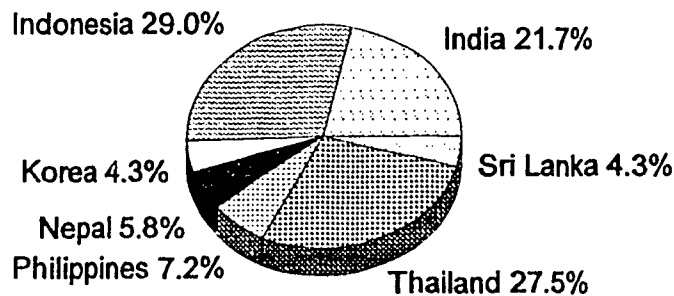
* - Not all projects involve WEC as Programmer

3. Analysis of Overall Activities (Outputs) To Date

As of the time of this evaluation, 145 individuals had participated in 59 exchange projects involving visits and technical discussions among over 250 firms and organizations. During this period, 69 EBEs from seven countries were hosted in the U.S., and 76 EBEs from the U.S. traveled to Asia. (See figures at right.) Approximately 9% of the total exchangees were female (not including exchangees participating in multiple projects).

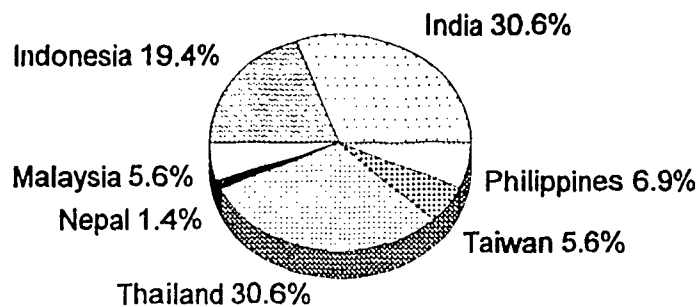
Distribution of Asian EBEs

(69 Asian EBEs)



Asian Countries Receiving U.S. EBEs

(76 U.S. EBEs)



356

Of the 59 projects, 40 involved technology assessments, seven dealt with the Corporate Environment, five were factory assessments (four of these were bundled into one large effort in Sri Lanka), three were leveraged efforts involving the World Bank, and four projects did not fit within these categories.

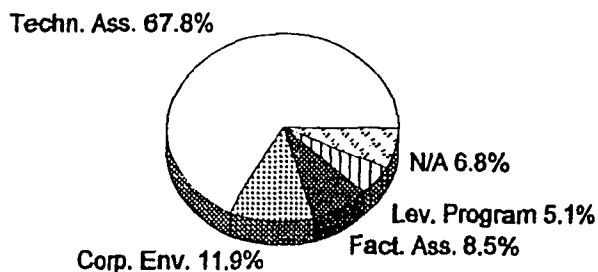
Sixty-six percent of these projects (39 of 59) were identified by the USAID Missions (including 15 through India's TEST program and 9 by R.J. Gurley of Thailand). The remainder were identified by industry (5), other US-AEP programs (4), World Bank (4), and WEC (3). In terms of total EBEs, 82 of the 145 (57%) were identified by the Missions; 10% each from US-AEP, Tech Reps, and WEC; and the remainder from the World Bank and industry.

Note that the percentages reflected in the various figures deviate from the targets originally set in the Work Plan: 38% from USAID Missions in the five targeted countries; 33% from Hong Kong, Malaysia, Taiwan, Singapore, or South Korea; and 29% from industry and in response to unforeseen opportunities.

Distribution of the projects by environmental concentration and by industry sectors are provided in the two tables on the next page.

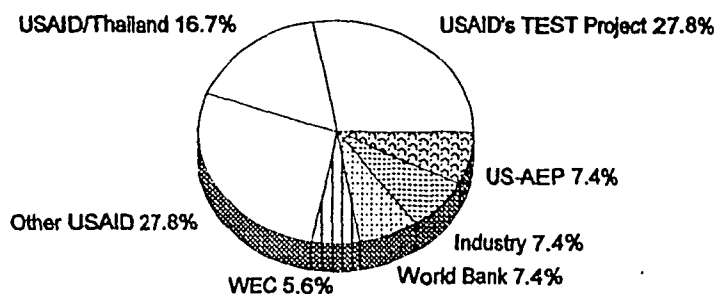
Types of Exchange Efforts

(59 Projects)



Sources of WEC EBE Projects

(Breakout of 59 Projects)



**WEC Exchanges:
Environmental Component**

Number of Projects	Type of Environmental Consideration
12	Waste Minimization
9	Emissions
9	Environmental Management
8	Waste Water
6	Alternative Fuels / Energy
4	Air Quality
4	Solid Waste
3	Hazardous Waste
9	Other Environmental Areas

Note: Some of the 59 actual projects targeted multiple environmental areas.

The Other Environmental Areas include: demand side management, integrated resource planning, reforestation, water, and weather.

As discussed in the Program Background section of this report, implementation of the CA suffered a serious delay as a result of the new strategy agreed to in the April 15, 1993 Work Plan. The WEC quarterly report dated June 30, 1993, states that reasons why goals were not being met revolved around the fact that the USAID Missions (other than USAID/Thailand) had yet to respond by identifying exchanges.

The following two graphics illustrate the execution of exchanges under the CA, charting planned EBEs (Asia to U.S. and U.S. to

**WEC Exchanges:
Industrial Sectors Covered**

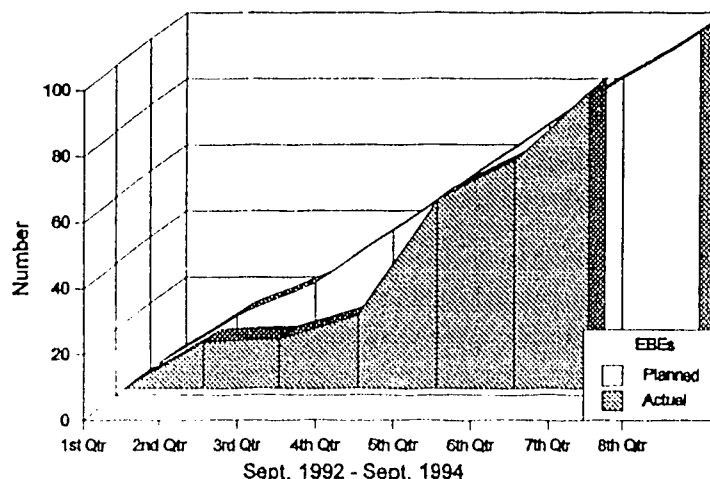
Number of Projects	Type of Industry/ Sector
18	General Industry
10	Urban Sector
7	Vehicles and Machinery
5	Petroleum / Petrochemicals
4	Chemicals, Pulp & Paper, Metals, Power (4 each)
3	Tanneries
2	Agriculture; Textiles; Natural Resources; Government (2 each)
4	Other Industries / Sectors

Note: Some of the projects targeted multiple industries or sectors, therefore the above numbers total more than 59.

The other industries covered include: fertilizers, industrial estates, and cement.

U.S. to Asia Exchanges

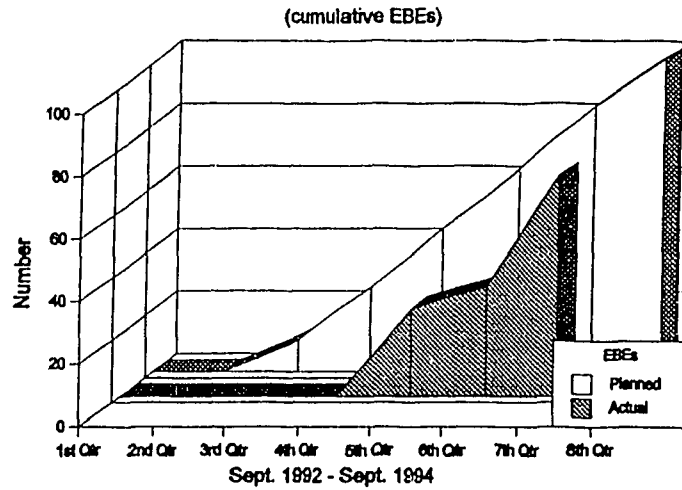
(cumulative EBEs)



Asia) as set forth in a memo from Larry Lai to Melissa Dann dated April 27, 1993.

It is important to note that despite a virtual hiatus in the project (April - September 1993), WEC successfully completed 71% of the Asia to U.S. exchanges (as of the May 1994), and had already implemented 90% of required U.S. EBEs to Asia. Given the EBEs currently planned for the period June - September 1994, WEC should clearly exceed the targets of 100 EBEs from the U.S. to Asia and 100 EBEs from Asia to the U.S.

Asia to U.S. Exchanges



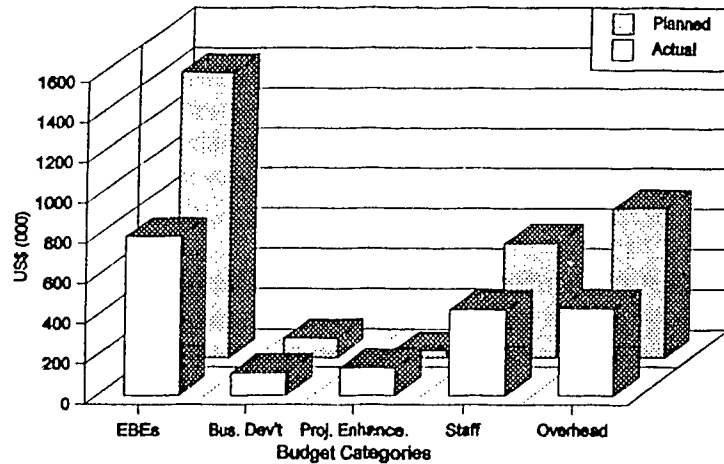
319

4. Analysis of Costs

Total project expenditures for this CA are running behind schedule. USAID authorized a budget of \$3,471,130 for this program, of which a total of \$3,271,130 has been obligated. As of June 6, 1994, a total of \$1,897,119 had been spent by WEC, leaving a balance of \$1,574,011 of authorized funds for the remaining four months of the project. According to WEC officials, \$110,000 of this amount involves costs which have already been incurred, but not paid. As of July 11, 1994, commitments for approved exchanges amounted to approximately \$388,946; plus WEC estimated that \$425,000 more would be needed to complete additional exchanges (\$250,000) and pay for staff costs (\$175,000) through

Total Program Expenditures

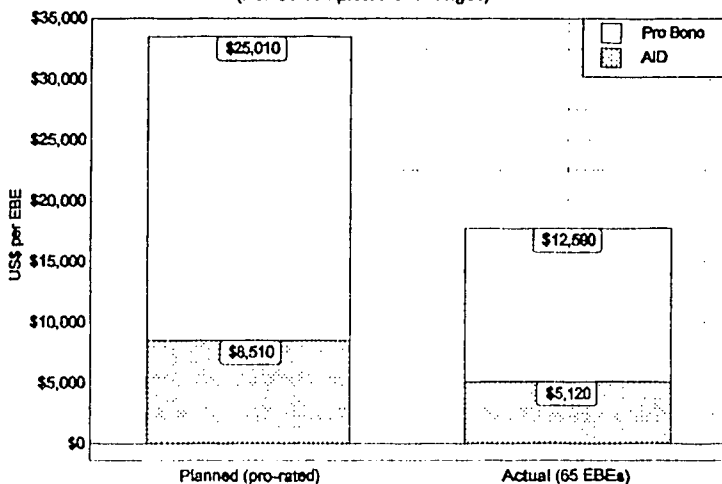
(thru June 6, 1993)



September 1994. At that time, there would be an estimated balance of \$650,000 of authorized funds remaining on the cooperative agreement (\$450,000 of obligated funds).

Direct Exchange Related Costs

(For 65 completed exchanges)



As of this evaluation, WEC has completed six of the eight budgeted business development survey/liaison trips to Asia. Another trip by WEC staff is planned for September 1994.

The original CA projected the average direct cost per exchange (not including WEC staff time, overhead, or similar expenses) at \$33,520. This was to include \$8,510 (25%) from USAID and \$25,010 (75%) in pro bono contributions from participants.

With many invoices still outstanding, a final accounting cannot be completed. However, of the 59 projects targeted for this evaluation, completed financial records were available for 33 projects involving 65 EBEs (see figure at left). The direct costs for these exchange projects averaged \$17,710 per EBE. Of this amount, USAID contributed an

average of \$5,120 (29%) and \$12,590 (71%) was provided through pro bono contributions by participants (both EBEs and Hosts).⁹

The significant difference between estimated expenditures per EBE and actual costs are due largely to the duration of the exchanges. Under the CA, the Short-Term Technical Assistance exchangees were expected to spend an average of 20 days on the exchange; Short-Term Professional Development exchangees were estimated at 45 days each. In reality, few of the exchanges lasted more than two to three weeks.

Under WEC's conservative approach to valuing pro bono contributions under this CA, other forms of contributions were not included in the calculations. For example, a number of participants interviewed during this evaluation spoke of in-house research and marketing efforts associated with these exchanges valued in the tens and hundreds of thousands of dollars. Contributions by other groups, i.e. TEST in the form of cost-sharing, and intermediary organizations such as the Small Industries Development Bank of India which assisted in project design and execution, are also excluded from WEC's calculation of pro bono contributions, as were the partial travel expenses born by certain other participants.

⁹ It is important to review the method of WEC's accounting for pro bono contributions. EBE's time is assigned a value of \$800/day. Each day of the exchange, plus two days preparation and two days Trip Report time are charged at that rate. Host's time is valued as \$800 per day of the exchange, e.g. the EBE may meet with eight Hosts one day, but a total value of \$800 is assigned for the day. Senior government personnel (EBEs and Hosts) are assigned a value of \$500/day.

In the case of the Nov. 1992 Megacities Conference in Indonesia, a pro bono value of \$136,000 was assigned to the project. This value covers the 34 conference participants, rather than being limited to the 12 funded under this CA. If the pro bono calculations are reduced to reflect only US-AEP participants, a value of approximately \$48,000 would be assigned. This would lower the percentage of pro bono vs. US-AEP contributions to 69% vs. the 75% anticipated in the CA.

5. Program Outcomes

Several individuals and organizations contributed to this report's findings on program outcomes. We have grouped these comments under the following three categories:

- Responses of Asian-based EBEs and Hosts (contacted through a survey questionnaire);
- Responses of Asian-based Intermediary Organizations (most of whom were contacted via Internet e-mail or fax); and
- Project Specific Descriptions and Findings (including 23 telephone interviews and specific survey responses related to 17 targeted exchange projects).

a. Responses of Asian-based EBEs and Hosts

Surveys were sent to 42 Asian EBEs representing 26 organizations and 17 Asian Hosts from 17 organizations. Eighteen responses (65% of organizations contacted) were received from the Asian EBEs and two responses (12%) were received from targeted Hosts. Findings from these survey responses are provided below.

Scope:

- Most of the exchangees found that the companies they met with were very appropriate to their needs.
- More than three-fourths of the respondents indicated that their primary expectation was either to improve their understanding of techniques/technologies available to address an environmental problem or to learn from the U.S. environmental experience. Less than a fifth of the respondents participated in their exchange in order to make business contacts or evaluate environmental technology in advance of a purchase.
- All but one respondent indicated that the exchange achieved their expectations, and 16 indicated that they would have liked to

have met with more businesses — none suggested that government officials be added to the exchanges, however, six suggested that more meetings be scheduled with non-government organizations.

Results:

- More than half of the respondents indicated that they would purchase pollution control equipment within three years of their exchange.
- Almost one-fourth of the Asian EBEs stated that they planned to enter into licensing, distributorship or similar business arrangements involving U.S. environmental technology within 1-3 years. Other results cited by the exchangees included additional environment-related training for their workforce and the creation of an environmental subsidiary.
- The majority of respondents saw themselves either engaging in further studies related to environmental problems or adopting new waste minimization or pollution prevention techniques following their exchange.
- Fifteen firms stated that they followed up with a Host company or institution, and more than half contacted a WEC office in either Asia or the U.S. Several others followed up with the USAID Mission, another US-AEP Program, or EPRI.
- Sixty-seven percent (67%) of the respondents indicated that the environment-related actions they take over the next three years will result in a 5 - 25% reduction in effluent or emissions from their facilities. One-third stated that their utilization of raw materials or feedstock will be significantly improved over the near-term. Almost one-fourth, however, suggested that most of the effects would

not be apparent over the next three years.

Other near-term benefits from the actions of these EBEs include: the disposal of "tons and tons of hazardous materials stored for decades"; improvements to urban conditions; development of environmental technologies appropriate to developing countries' needs; and improvements to working conditions.

Usefulness of Exchange:

- Respondents were asked to rate the usefulness of various forms of assistance provided through this CA. The responses of the 18 EBEs are summarized below. The scale equates 1 as somewhat useful and 4 as very useful.
 - Assisting Asian businesses to learn more about specific U.S. environmental practices and technology ranked highest, averaging 3.47.
 - Providing a cooperative forum for businesses, governments, and NGOs to better identify and jointly address their environmental requirements was 3.4.
 - Leveraging other USAID and World Bank environmental programs by organizing conferences and handling logistical arrangements for participants received an average ranking of 3.17.
 - Providing impartial technical analysis and support to Asian governments and businesses to identify technologies appropriate to local needs scored the least at 3.14.

Future EBE projects:

- In terms of additional recommendations so that the program becomes more responsive to exchangee needs...
 - two EBEs suggested that financing be given greater consideration;
 - two EBEs recommended improved targeting of exchanges, including a focus on decision-makers and emphasis on local

needs;

- two individuals emphasized the importance of learning about technologies "appropriate" to their needs;
 - two respondents requested that training be provided to their staff, particularly in the area of waste management;
 - several respondents suggested the need for additional materials (i.e., case studies) or follow-up visits, particularly related to waste minimization in the metals and textile industries; and
 - two EBEs requested additional follow-up involving business contacts, US-AEP, and WEC.
- Regarding additional forms of assistance for EBEs, four EBEs made specific suggestions related to financing. These included addition of financial institutions to EBEs' meetings and the provision of financial assistance (grants and loans), particularly for small businesses and new ventures.

Other suggestions included:

- continuing communications with EBEs, including establishing an exchange association or club and including EBEs in a Resource Listing;
- conducting more seminars with qualified speakers and supporting exhibitions of environmental protection and control equipment;
- providing EBEs with a list of investors who would be willing to invest locally; and
- improving coordination with USAID and interested local companies.

b. Responses of Asian-based Intermediate Organizations

Individuals at each of the five key USAID Missions were contacted via Internet e-mail — four responded. A USAID official in Santiago, Chile was also contacted concerning his recollections about the conception of the US-AEP.

US-AEP Technology Representatives representing countries involved in past US-AEP/WEC business exchanges (6 of the 9 Tech Reps) were sent faxes soliciting their insights on the program; two responded.

Information and comments from these individuals yielded the following findings regarding the exchange program:

WEC's Role:

- WEC's travel and logistical support was of high quality and, for the most part, flawless from their perspective.
- Larry Lai and WEC's project assistants are held in very high regard by field personnel.

Results:

- USAID Missions and Tech Reps are generally satisfied that the exchanges are meeting their expectations — namely, they are resulting in further negotiations between targeted organizations or cementing strategic environmental alliances between U.S. and Asian businesses or other organizations.¹⁰
- Most U.S. EBEs sent to Asia have either signed contracts or have entered into negotiations with Asian firms.
- The reverse, Asian EBEs sent to the U.S., has not yielded the same level of tangible, transaction-related results.

¹⁰ USAID/Philippines expressed concern that exchange participants do not always share the Mission's perspective of partnerships, which is a two-way relationship. Often, they explain, the U.S. counterpart is seen as a seller and the Philippines as a buyer.

Concerns:

- Lack of feedback, particularly related to the results of Asian EBEs' visits to the U.S., is perceived by most respondents as a significant weakness in the program. In particular, Missions note that this information would prove very useful in justifying and requesting additional resources to continue this type of activity.
- According to the Tech Reps and interviews with TR&D staff, the potential for conflict between Tech Reps and USAID Missions may be growing as each organization seeks to maximize its own priorities through use of WEC's exchange program. Missions' role as gatekeeper, allowing them to veto exchanges related to their country, requires attention before it jeopardizes the US-AEP's relationship with the Mission or the effectiveness of individual Tech Reps.
- One Mission requested that it be given more lead time prior to exchanges taking place and that it be kept informed of potential exchanges involving its country.

Future:

- Both USAID Missions and Tech Reps anticipate making greater use of the business exchange program in the future. Plans for use of WEC's business exchange positions should soon begin to appear in the Business Plans prepared by Tech Reps, and are already summarized in their monthly reports.

c. Project Specific Descriptions and Findings

A stratified sample of 17 projects was selected for more in-depth review by the evaluators. Of these 17 projects, one-quarter is related to USAID/India's Trade in Environmental

Services and Technologies (TEST) program.¹¹

This is consistent with the CA program as a whole, under which 15 of the 59 being examined for this CA involved leveraging the resources of TEST. Under this activity, WEC supported the administrative and travel functions of the exchanges. Substantive project design and identification of candidate EBEs and Hosts were largely performed by Sanders International.

Thirteen additional projects from seven countries were also selected. WEC's involvement in these efforts varied from minimal (issuing tickets and coordinating payments for hotel and per diem) as in the TEST exchanges to substantive (program design and execution) as in the recent Textile Industry exchanges from India. The results of 23 telephone interviews with U.S. EBEs and Hosts and survey questionnaires related to these efforts are presented below. Summaries of the 17 projects are provided as Appendix B at the back of this report.

WEC's Role:

- WEC's U.S. and Asian staff provided very good support to EBEs and Hosts, particularly related to travel logistics.
- WEC effectively utilized its IEDS volunteers and Asian offices in implementing many of the exchanges.

Results:

- Virtually all individuals contacted were very positive about the potential for business as a direct result of the exchange.

¹¹ TEST is implemented in India by the Industrial Credit and Investment Corporation of India (ICICI) and by Sanders International in the U.S. Its primary purpose is to identify and establish business relationships between Indian and American firms by serving as an intermediary between the disparate business and environmental cultures.

- Those exchanges identified and supported by R.J. Gurley (Thailand) and through USAID/India's TEST program appeared to have the greatest potential for near-term business results, e.g. less than one year.

Concerns:

- Many Hosts and EBEs felt that they would have been better prepared for the exchange had there been more time available during the project implementation process.
- Most respondents would have liked more follow-up by WEC, including feedback regarding the value of the visit and next steps planned by the EBE.
- Hosts tended to be less familiar with WEC and US-AEP in those instances where a prominent role was played by intermediate organizations (i.e., Sanders International) or consultants.
- New USAID regulations limiting use of business-level air travel by EBEs may adversely affect volunteers' willingness to participate in the program — particularly for those individuals who are not motivated by the prospect of near-term business opportunities. (For further details, see page 44.)

6. Key Findings

a. Management

1) Program Management

Problems related to philosophical differences in the approach to organizing and executing the EBE effort, coupled with new direction from USAID, hindered implementation of the program in early 1993. Prior to that time, WEC had been actively pursuing implementation as conceived in its proposal and the CA.

Disagreements among key players involved in discussions over the content of the CA Work Plan contributed to a perception of the CA by many WEC staff as:

- difficult and not conducive to collaboration between WEC and US-AEP staff and incompatible with WEC's image of itself as a non-advocacy organization; and
- not directly contributing to WEC's long-term goals to develop self-sustaining WEC-like organizations throughout Asia.

These perceptions, coupled with WEC management's confidence in Larry Lai's ability to implement a high quality program and to respond appropriately to the US-AEP Secretariat's evolving needs, led WEC senior managers to distance themselves from the day-to-day operation of this CA. While their lack of direct involvement had minimal effect on execution of the CA, it limited WEC's ability to benefit institutionally from the lessons learned and contacts gained through this relationship.

Currently no one on the CA staff has management authority, therefore approvals for invoices and other items must be sought from other WEC staff. At the same time, since Will Knowland's promotion, there has been minimal contact between WEC's senior management and members of the US-AEP Secretariat.

2) EBE Grant Application and Funding

The two page grant agreement (plus annexes) used for the US-AEP CA is the same as that used for all of WEC's volunteer specialists. As such, it specifically references WEC's IEDS program. Prior to executing an IEDS agreement, candidates must first be approved by the USAID Project Officer and the USAID Mission, as appropriate (see page 9).

In a few instances, most notably with Indian exchanges, WEC's process for distributing travel advances has caused difficulties for participants.

Given that their participation is generally under a "fully-funded" exchange, Indian participants are not permitted (by Indian law) to take foreign exchange with them on leaving the country. Typically WEC staff or consultants have met the exchangees on arrival in the U.S. and transferred an 80% cash advance to them directly. On one notable exchange, however, no monies were provided to the participants for two days.

File correspondence indicated that even when money was provided to Indian EBEs in a timely fashion, the fact that it was only 80% of the total funds necessary to pay for expenses placed an undue hardship on those individuals who had no independent source of dollars. This partial payment is required by the U.S. government regulations, given WEC's use of a letter of credit (L/C) with USAID as a part of its cash accrual accounting system.

3) Problem Identification and Resolution

Early communication and project implementation problems occurred in late 1992 due to a significant clash in philosophical approaches to implementing the CA. These differences reached crisis proportions in March/April 1993, at which point they were settled by WEC's agreement to accommodate to the US-AEP's demands.

The Secretariat's top-down management approach to problem identification and resolution may have hurt the program as a whole. Interviews with WEC personnel suggested that the wealth of skills and approaches which WEC could potentially bring to the program are not being effectively tapped due to an adversarial attitude which developed during the initial implementation of this effort.

Larry Lai, with a background in the consulting industry, rapidly established a type of client/contractor relationship with the US-AEP following his promotion to Principal Investigator for the CA. Significant praise by the staff of US-AEP / TR&D and Asian-based intermediaries regarding Lai's performance centers in large

measure on his professionalism and his responsiveness to their requests.

The April 15, 1993 Work Plan shifted WEC's focus away from directly responding to end-user clients toward responding to the needs of intermediary clients (who individually determine end-users' needs). This reactive (or responsive) approach elevated the importance of certain organizations, especially TR&D, in identifying and resolving problems on WEC's behalf. It also reduced WEC's position as a major player in the US-AEP program and weakened its ability to contribute organizationally to the resolution of problems which might arise within the US-AEP related to business exchanges.

b. Partners and Customers

1) Partners

Partnership is a term that has yet to be fully defined under the US-AEP. The findings below, however, attempt to describe the term as it affects the relationship between WEC and the US-AEP (primarily the Secretariat) and between WEC and the EBEs and Hosts participating in this program.

WEC and the US-AEP Secretariat:

The US-AEP had been first conceived by Henrietta Holsman Fore, USAID's Assistant Administrator for Asia and Chairperson of the US-AEP. It was Holsman that lined up USAID and White House support behind the program, and who first contacted key potential implementing partners, including WEC.

As a political appointee, Holsman Fore left USAID following the November 1992 elections. At the same time, Lew Reade, the US-AEP Director General, was defining his vision of what the program could become, and how best to implement it. Part of this definition included the refinement of the role of individual implementing organizations. Interviews with members of the Secretariat, TR&D, and WEC personnel, as well as a review of program documentation, suggests that "Partner" was defined as follows:

During Holsman: WEC and USAID perceived the objectives under this ambitious initiative as directly compatible with WEC's mandate. USAID's strategy for achieving these goals was in the nascent stages, yet as it was discussed with WEC, both parties felt that they could contribute as Partners to achieving a common objective, namely, bringing industry, government, and NGOs together to solve Asia's environmental problems. WEC assumed that the US-AEP was buying into its IEDS program and were prepared to focus and tailor the program accordingly. This view was supported by the USAID Project Manager for this CA, Molly Kux, who was also supervising WEC's CA with the Asia Bureau.

Under Reade: Faced with a very large and complicated program with significant overlap in programmatic functions and responsibilities, Reade sought to redefine elements of the Partnership in ways which would focus on the strength of each Implementing Organization, i.e. WEC's experience with the business community. Control over this agreement was also consolidated by Reade's assumption of the USAID Project Manager role, and delegating day-to-day oversight responsibilities to Melissa Dann of TR&D. The resulting focusing of WEC's effort effectively undermined WEC's perception of itself as a collaborator or full partner with the US-AEP program, and instead relegated them to the position of implementor of strategies conceived within the Secretariat.¹²

¹² USAID's attitude toward cooperative agreements in general has undergone a change in recent years, with the agency increasing its oversight and micro-management of agreements. According to individuals interviewed for this evaluation, USAID is increasingly implementing CAs as if they were service contracts — the involvement of the US-AEP Secretariat in the day-to-day operations of WEC's exchange program, according to interviewees, further illustrates the trend.

WEC - EBEs / Hosts:

With the exception of WEC IEDS volunteers, most of the individuals contacted indicated that they did not feel engaged as partners of WEC or the US-AEP in terms of a lasting relationship. Some of the Hosts contacted were not familiar with the US-AEP and a few did not initially recognize the WEC (having had a consultant or third party as their primary contact). Those that were familiar with the programs, expressed a strong desire to have feedback regarding the value of their contributions.

While very complimentary regarding the actual exchanges, many EBEs felt abandoned in its aftermath. There appears to be a strong desire among EBEs to continue their relationship with WEC / US-AEP. Many also expressed the desire to know more about other program participants, particularly those from similar industries and those facing similar environmental problems. The development of a network among EBEs was mentioned by one participant.

2) Customers

Under the original CA, the program appeared to focus on the end-user customer: the participating Asian or U.S. industry, governments, and NGOs with WEC taking the lead in designing a program to meet their needs. Over the last year, however, WEC's responsibilities have focused on executing exchanges designed by multiple intermediate customers, namely: the US-AEP Secretariat, TR&D, USAID Missions, and the Tech Reps.

The shift in who constitutes the program's primary customer(s) limits WEC's and others' ability to estimate program effectiveness or impact since the numerous customers do not represent a uniform agenda or set of objectives.

In some instances, the real value-added content of WEC's assistance to this program was its staff's ability to recognize areas where the end-users' needs were not being fully addressed. The willingness of these individuals to take responsibility and to redesign or tailor the

exchange in real-time, after the arrival of the Asian participant(s), significantly contributed to the overall success of some exchanges.

c. Working Relationships / Communications

Given the large number of individuals and organizations participating in this effort, working relationship and communications are discussed as they relate to specific participants. These include: WEC's relationships with the US-AEP Secretariat and TR&D, internal WEC relationships, WEC's relationships with other US-AEP Implementing Organizations, and its relationships with EBEs and Hosts.

1) WEC and US-AEP Secretariat / TR&D

The working relationships between principle staff supporting this CA (Larry Lai of WEC and Melissa Dann and Joyce Coffee of TR&D) have been very close and cooperative. Memos from TR&D note WEC's timeliness in submitting reports. Interviews with these staff and others at the Secretariat indicate a high regard for WEC's responsiveness both to contractually required reports and ad-hoc requests for information and assistance.

Working relationships between senior WEC officials and members of the Secretariat remain strained.

2) Internal WEC

The autonomy with which WEC project staff are vested is one reason for WEC's ability to attract and retain quality, dedicated personnel. However, comments from field personnel and the evaluation team's experience in requesting and reviewing data suggests that this independence, particularly in those cases where staff are geographically dispersed (i.e. in New York, Bangkok, or Jakarta), complicates the ability of project managers to provide quality assurance on specific efforts.

Programmatic information, including exchange-level financial records and contact information, are not consolidated, thus limiting CA staff's oversight and control. The lack of consolidated information on [redacted] Organizations also limits WEC's ability to institutionalize this valuable information, and to effectively expand their future outreach efforts. (It also limited the evaluation team's ability to contact participants of past exchanges to gain feedback on the results of the exchanges.) The ability of this type of working style to succeed is also very dependent on the personal rapport among individuals, and may be increasingly difficult to maintain as WEC continues to grow.¹³

WEC's EBE exchanges tend to have relatively short lead times and require participation from a broad strata of U.S. industry. WEC's International Environment Forum (IEF)¹⁴ corporate membership, on the other hand, is dominated by the oil industry and large manufacturing firms, with access through WEC's NY Corporate Program Office requiring 1-2 weeks turnaround. In addition, many of the corporate members have set a quota for exchanges available to WEC during the year. As such, there is a desire within WEC to leverage this support across programs with similar objectives. The uniqueness of the US-AEP CA (in terms of its focus on business transactions and breadth of environmental interests) means that it frequently does not permit WEC staff to leverage it with other programs utilizing IEF members. As a result of these factors, use of WEC's IEF members under this CA is more limited for than in some of WEC's other cooperative agreements.

¹³ Many organizations faced with similar challenges utilize technology to augment internal communications and expand staffs' access to critical data. Currently, WEC staff do not have e-mail or on-line database access, and rely on fax and telephone communications. Recently four Internet accounts were provided to WEC through VITA. While these accounts have yet to be utilized in expanding communications internally, one project assistant is communicating with USAIL-India via Internet, per the Mission's request.

¹⁴ The IEF was established in 1977 to promote ongoing and off-the-record dialogue between government and industry on environmental and resource management issues. Today, 60 multinational corporations, based in eight countries, and engaged in nine industrial sectors, participate in the IEF.

The decision to minimize the leveraging of the US-AEP CA's resources with those of other WEC cooperative agreements has limited the role of WEC's Asian offices. Currently, WEC's Bangkok and Jakarta office assist in communications with local USAID Mission personnel and in coordination of some Thai and Indonesian business exchanges.

3) With Other US-AEP Implementing Organizations

WEC's coordination with other US-AEP Implementing Organizations (IOs) was recognized as important in both the CA and the subsequent Work Plans. With the exception of the Technology Representatives, however, actual contact between WEC and other IOs tends to be ad-hoc and personalized, for example, one staff member communicates regularly with TAF as a result of their shared Asia Bureau cooperative agreements. While there is evidence of overtures by WEC to better coordinate WEC's US-AEP efforts with those of other organizations, particularly with the National Association of State Development Agencies (NASDA), there appears to have been little response. The perceived desire of the Secretariat to have each IO focus on its narrowly defined responsibilities may have adversely affected IOs' willingness (or ability) to directly collaborate amongst themselves.

According to staff from WEC and TR&D, with the exception of the QA Workshop last December 1993, there have been few attempts to bring US-AEP IOs together to discuss their programs or share ideas regarding implementation of the US-AEP. Virtually all interviewees described the US-AEP as a program with all control and direction radiating outward from the Secretariat. This approach would tend to negate the effectiveness of increased communications between Implementing Organizations.

One individual from TR&D expressed concern over a potential overlap between WEC's exchanges and NASDA's market-driven program. Overall, these two programs are similar in their industry-to-industry focus, and in the past, WEC

has actually funded exchanges rejected by NASDA. The market-driven component of NASDA's effort allots \$100,000 to each of the US-AEP Tech Reps to use on NASDA efforts, including potential reverse missions or business exchanges to the U.S. Given some Tech Reps' perception of USAID Missions as a hindrance to their use of WEC's exchange program, NASDA's program could be increasingly used to implement WEC-like environmental business exchanges.

4) With EBEs and Hosts

As the US-AEP program has matured, an increasing number of organizations are participating. For WEC, this has meant that the groups it relates to as "customers" has expanded to include TR&D, as well as the USAID Missions and Tech Reps — each with their own agendas and priorities. The involvement of multiple organizations in the design and execution of exchanges has increased the opportunities for miscommunication with EBEs, as occurred in the recent Clean Coal exchange from India. In this instance, confusion surrounded the various responsibilities of WEC vs. TR&D staff. While confusions of this sort have been rare in the program, the potential for future problems is growing commensurately with the increasing number of players.

In certain industries and environmental sectors, WEC has utilized the services of consultants to design exchanges and accompany EBEs. The use of these consultants and third party organizations effectively distances participants from direct contact with WEC or the US-AEP. While the practice appears to enhance EBEs' and Hosts' perception of the exchanges as directly relevant to their needs, there is little emphasis on enfranchising these participants or making them aware of WEC's or US-AEP's broader institutional mandates.

d. Evaluation Monitoring and Feedback

The process of monitoring and feedback was not addressed in the CA or in the final work plan.

In effect, these areas have been addressed through: (1) WEC's introduction of a feedback questionnaire in mid-1993 for EBEs and November 1993 for Hosts; and (2) this final evaluation, initiated in the final five months of the program.

The EBE feedback questionnaire, as designed, may result in skewed positive responses from participants, particularly Asian respondents who tend to respond to the Guttman scale questions at the highest point on the scale, i.e., as very good or excellent. The Host questionnaire, on the other hand, is very open-ended and may not provide sufficient structure for many participants to respond adequately. In both instances, the surveys are used as a one-shot follow-up to the exchange.

In the initial discussions with the US-AEP QA Team in 1993 and at the QA Workshop that December, WEC and other IOs noted the difficulty in monitoring progress given a perceived lack of specific program objectives or baseline against which to work. According to the Workshop Report, participants commented that ongoing monitoring of program results is not budgeted for or prioritized by the Secretariat. Since that time, WEC has not received further instructions from the Secretariat on how to proceed in this area, nor has WEC been a part of any forum to discuss how to improve US-AEP follow-up. WEC, as an institution, has also not seized the initiative to start its own follow-up with individuals or organizations participating in this program.

e. Resources

1) Resource Availability

WEC's staff are both knowledgeable in the environmental sector, and committed to the successful execution of exchanges and related training. Their dedication to the goal of improving environmental conditions in Asia has enabled them to endure working on what many staff perceive as a very difficult CA.

While WEC's internal equipment resources

(computers, copies, and faxes) are adequate, it has not developed the level of support systems and internal communications technology necessary to continue its growth while maintaining high quality programs. Weakness in two areas are particularly notable:

- (1) WEC does not have a means of systematically documenting the participation of volunteers and Hosts in its programs — the Volunteer Database is not being effectively maintained or utilized.
- (2) Knowledge and use of electronic communications, such as Internet, is minimal to non-existent among WEC staff; however, it could potentially significantly enhance communications between WEC and its offices globally, as well as with USAID Missions and with program participants throughout the world.

2) Staffing and Training

The two key individuals on the CA have been with the program since near its inception. Another project implementer in Arlington and one in New York have also been active on the CA on a part-time basis since early 1993.

While there has been a significant turn-over related to project assistants over the last 1-1/2 years, the changes have not affected the quality of individual exchanges. The absence of these individuals, however, may adversely affect WEC, given WEC's strong reliance on staff for its institutional memory.

WEC's training of new project assistants for this CA revolves around on-the-job support by Ganguli and Lai. In general, project assistants are encouraged to use their own initiative in designing and implementing exchanges, and to seek advice and assistance from a broad, knowledgeable, network of senior WEC technical personnel in Arlington and New York.

While there was recent US-AEP supported training for the use of US-AEP e-mail, the relevance or need for e-mail with TR&D was not

fully communicated, and to date no e-mail communications have occurred between WEC and TR&D.

f. Administration

1) Support Systems

The two travel agencies used by WEC for this CA, in particular the Here Today There Tomorrow agency in Washington, D.C., provide excellent support to the program. Forms and procedures have been developed by CA staff to communicate all relevant travel information, as well as the associated exchange-specific tracking codes to facilitate invoicing.

As an NGO, WEC uses a cash accrual accounting system. This system utilizes a letter of credit (L/C) with USAID. WEC personnel notify the financial office each month concerning anticipated invoices or requirements for funds. WEC accordingly will draw against the L/C.

Use of this L/C means that WEC must comply with USAID regulations specifying that only 80% of anticipated expenses can be advanced to EBEs. For some participants, this restriction has constituted a financial hardship (see page 38).

In accordance with this system, specific financial records are retained by the offices making payments, i.e. the Thai office keeps records for expenses related to exchanges it manages. While from an accounting perspective this system works well, it may not be fully responsive to the needs of project staff.

USAID is increasing the level of finance-specific oversight applied to cooperative agreements. Historically, USAID project staff's involvement in CA financial issues was minimal. Now increasing demands are being made to supply project- and task-specific financial information, including: distribution of funds by country, level and type of pro bono contributions for individual exchanges, ratio of program costs to staff/overhead expenditures, etc.

In light of these growing demands for financial data, WEC's current procedures merit further examination. While most of this information is available within the accounting office, it is not readily accessible to WEC project staff. In addition, it is provided to project personnel in an aggregate form which limits their ability to estimate outstanding expenses. Significant time is also required by CA staff to reconcile NY financial accounts according to US-AEP budget categories and to obtain financial records from other WEC offices in order to complete requisite reports for the US-AEP.

2) Files

Once a project is assigned to a project assistant or coordinator by Larry Lai, the project assistant is responsible for maintaining his/her own files (as is the practice throughout WEC). While it is assumed that all key correspondence and documents are maintained in the files, there is no internal quality control of this process nor are files centralized after completion of the exchange. The evaluation team's review of the files found that certain individual's files were in exemplary condition. For other project staff's files, however, key faxes and communications, and even approvals from the Secretariat and Missions, were often missing.

Of greatest concern to evaluators, however, was the notable absence in the files of contact information for the EBEs and Hosts. Even when contact information was found in the Trip Report's business card section, it generally was not comprehensive, nor did it provide insights as to the relative importance of individual Hosts.

3) Reports and Deliverables

WEC's responsiveness in complying with the reporting requirements of this CA is well documented. The notable exception related to the annual Work Plan. In this case, however, WEC submitted three drafts prior to coming to closure with the Secretariat on the fourth, and final, Work Plan.

Trip Reports are the major deliverable emerging from each exchange. They range in quality from very technically detailed with specific next steps delineated, to perfunctory, somewhat vacuous, compliance with the terms of the EBE agreement.

The Trip Reports are used internally within WEC to document the exchange and to provide insights during the design of subsequent exchanges. Because of WEC's perception of these documents as company-sensitive, the reports are not routinely distributed beyond the file copies which are sent to TR&D and the Secretariat.

On occasion, a copy of the Trip Report may be sent to the sponsoring USAID Mission, or relevant sections shared with a Host. It is rare, however, for the "lessons learned" through these exchanges to be shared with other organizations who possess needs or objectives similar to those examined during the exchange. As a result, the exchange experience is confined to individuals directly participating, with no attempt by WEC or the US-AEP to broaden its impact through circulation of the Trip Report or a more selective summary document.

g. Environmental/Economic Impacts

Overall the comments of program participants regarding the environmental and economic impacts of this program have been very positive. Survey responses and individuals interviewed during the evaluation indicated that the effort is resulting in relatively near-term, tangible, environmental and economic benefits. According to EBEs, Hosts, and intermediate customers (e.g., USAID Missions and Tech Reps), numerous business transactions have already taken place. These range from the \$100+ million joint venture between Advanced Electric Car Technology (AECT) of the U.S. and Thailand's Pholasith Tuk-Tuk Co., which will have an immediate, beneficial effect on urban air pollution, to numerous equipment sales and ventures established in support of USAID/India's TEST initiative.

Asian and U.S. respondents alike indicated

that they anticipate significant environmental improvements and business transactions over the next three years. More importantly, relationships have been initiated between U.S. and Asian industry, government agencies, and NGOs which potentially will enhance these groups' ability to cooperatively work together to further sustainable development in Asia.

Examples of these relationships include the near-term membership and participation of three Thai utilities in the research and corporate programs of the U.S.'s Electric Power Research Institute (EPRI) and the budding relationship between Thai agencies and the U.S. Federal Emergency Management Agency and the Chemical Manufacturers' Association. Opportunities have also increased for Asian government officials, academics, NGOs, and businessmen to join together to address environmental problems, as in the factory assessment of Sri Lanka's paint industry and the various waste minimization assessments and workshops conducted throughout the region. Further examples of current and/or anticipated business activities resulting from WEC's environmental business exchange program are discussed in section II.5. and Appendix B of this report.

While there is significant anecdotal evidence of this program's success, there are no measures or processes in place at WEC to regularly monitor actual environmental or economic impacts resulting from the exchanges. Such quantitative data are difficult to obtain due to:

- (a) the lead-time required for business contacts in Asia to result in tangible economic pay-backs to U.S. businesses is often longer than the two-year duration of this cooperative agreement;
- (b) the lack of organized follow-up monitoring or support by WEC following individual exchanges, limits WEC's ability to track results; and
- (c) lack of baseline criteria or specific objectives related to the desired outcomes of

this program (due in part to its demand- and field-driven character) complicates the measurement of impacts.

h. Total Quality Management (TQM)

TQM was not included as part of the cooperative agreement between WEC and the US-AEP. It was first introduced as an US-AEP initiative during meetings between WEC and the MSI Quality Assurance Team in October 1993 and at the US-AEP's Quality Assurance (QA) Workshop held December 15, 1993. Subsequent contact with the US-AEP's QA initiative was ad-hoc and included a request to WEC for financial data through September 1993; coordination with

the QA Officer regarding this evaluation's scope and schedule; and participation in a TR&D-sponsored e-mail workshop.

While all individuals interviewed were aware of the presence of the US-AEP's QA Officer, none of the staff at WEC were able to articulate what the QA effort consisted of or how it related to WEC's CA. In general, WEC staff expressed a strong sense of skepticism regarding the commitment of the US-AEP to TQM or to a continuous quality improvement process which might empower IOs as players in the definition or execution of the US-AEP. To date, WEC's contact with the US-AEP QA initiative has not resulted in any new processes or procedures being introduced to or implemented by WEC.

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III. Evaluation Conclusions

Overall, the WEC business exchange program has met with considerable success, despite the difficulties encountered during its early implementation. Summary conclusions related to WEC's performance under this cooperative agreement are grouped below according to the categories specified by the US-AEP interim evaluation team.

1. Management

a. Program Management

- ① The CA was staffed and initially implemented in a very structured and timely manner.
- ② The significant success of this activity is largely attributable to the leadership of the Principal Investigator, Larry Lai, and to the involvement of very capable and dedicated staff.
- ③ WEC's senior managers have distanced themselves from the day-to-day operations of the program.

b. Grant Application and Funding

- ① The grant process (an outgrowth of WEC's IEDS program) has effectively been adapted to meet the needs of this exchange program.
- ② In most instances, WEC's funding of grants (payment of travel, per diem, meals, and incidental expenses) has been timely. In a few instances, however, WEC's cash accrual accounting system and EBEs' foreign exchange laws have posed difficulties for exchangees during travel.

c. Problem Identification and Resolution

- ① The problems encountered during the first six months of this CA led to an estrangement between senior managers at WEC and the Secretariat.
- ② WEC's business exchange program is now geared toward satisfying intermediate customers (e.g., Secretariat, TR&D, USAID Missions, Tech Reps); these organizations (especially TR&D) often identifies and solves problems on WEC's behalf, distancing WEC from direct contact with some US-AEP participants.

2. Partners and Customers

a. Partners

WEC and the US-AEP Secretariat:

- ① The concept of the WEC - US-AEP "Partnership" was, in effect, redefined following Henrietta Holsman Fore's departure from USAID, resulting in WEC's assumption of a more narrowly focused role in the US-AEP program.
- ② A functional client-contractor relationship has been developed between WEC and the Secretariat, resulting in numerous successful business exchanges.

WEC - EBEs / Hosts:

- ① EBEs and Hosts alike tend to view the exchanges as isolated events and do not perceived themselves as partners of a larger US-AEP or WEC effort.
- ② The CA is not achieving its full potential for establishing long-term relationships

between WEC and American and Asian participants.

- ③ On those occasions where intermediate customers, third parties (such as TEST), and/or consultants play a primary role in communicating with EBEs and Hosts, WEC's involvement the exchange is often obscured.

b. Customers

- ① The definition of WEC's "Customer" under this CA has evolved over time, complicating WEC's ability to implement quality exchanges.
- ② WEC's Intermediate Customers view the exchange program as one of the more successful US-AEP activities, and see it as representing real and tangible benefits in the area of business-to-business exchanges.

3. Working Relationships / Communications

a. WEC and US-AEP Secretariat / TR&D

- ① Following its rough beginning, the working relationship between staff of WEC's CA and personnel at TR&D and the Secretariat has become very collegial.
- ② WEC is viewed by TR&D and the Secretariat as among the most responsive of the US-AEP Implementing Organizations.

b. Internal WEC

- ① WEC staff members and offices exercise significant independence and discretion in implementing their exchanges — this is both an institutional strength and weakness.

- ② Lai and other senior WEC personnel are viewed as valuable technical resources, providing inputs to the design of exchanges and identification of volunteers.

- ③ WEC's IEF Corporate Members do not contribute significantly to the execution of the CA.

- ④ WEC's Asian offices are not being utilized as originally intended under the CA.

c. With Other US-AEP Implementing Organizations

- ① Coordination with most US-AEP Implementing Organizations (except the Tech Reps) tends to be ad-hoc, and lacks the backing of the Secretariat.
- ② With the Tech Reps' emergence as an intermediate customer of WEC, is likely to lead to issues related to the linkage of WEC's business exchanges with Tech Rep objectives and WEC's interface with USAID Missions.
- ③ Opportunities may be being missed related to linking participants in WEC's business exchange program with activities of other IOs.

d. With EBEs and Hosts

- ① While the level of support provided by WEC varied across exchanges, there is general agreement concerning the high quality of logistical arrangements.
- ② In the instances where WEC's responsibilities are not clearly defined and may overlap those of others, problems can arise related to miscommunications.
- ③ In areas where intermediate organizations or consultants were the primary contact

with EBEs and Hosts, participants frequently did not recognize the US-AEP or WEC as the service provider.

4. Evaluation Monitoring and Feedback

- ① Monitoring / feedback was not addressed in the Work Plan and is not perceived by WEC as a significant feature of this program.
- ② Under the current Work Plan, it is difficult to estimate potential programmatic effectiveness or impacts due in part to a lack of follow-up with program participants.

5. Resources

a. Resource Availability

- ① The greatest resource offered by WEC is its people.
- ② WEC's internal corporate information resources (systems, databases, contact information) are deficient.
- ③ The field-directed, short turn-around nature of the EBE program significantly constrains WEC's ability or willingness to utilize its IEF Corporate Members or Asian Offices.

b. Staffing and Training

- ① While staff turn-over has occurred on the CA, it has not adversely affected the program.
- ② Training tends to be one-on-one in the initial stages of a new hire, with a significant emphasis on personal initiative.
- ③ Training in other areas, i.e., Internet, tends to be ad hoc.

6. Administration

a. Support Systems

- ① Very competent travel-related support is provided by local travel agencies.
- ② The accounting procedures and system used by WEC may not adequately support WEC project staff's ability to respond to the evolving financial information requirements of USAID's project personnel.

b. Files

- ① WEC's exchange files are occasionally incomplete, lacking key communications or approvals, and contact information for EBEs or Hosts is seldom readily accessible.

c. Reports and Deliverables

- ① WEC has been timely in meeting its contractual reporting and deliverable requirements.
- ② Trip Reports are not being effectively utilized under this effort.

7. Environmental/Economic Impacts

- ① WEC's business exchange effort has had a positive effect on applying U.S. environmental experience, technology, and practices to solve Asia's environmental problems.
- ② Information is not readily available or consistently monitored concerning the environmental and economic impacts of this program.

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8. Total Quality Management (TQM)

- ① The US-AEP's TQM initiatives are not clearly articulated to or understood by WEC.
- ② A strong degree of skepticism exists within WEC concerning the Secretariat's commitment to TQM which is customer-focused and entails a participatory approach to project management and implementation.

9. Program Strengths and Weaknesses

a. Strengths:

- ① Of the individuals contacted for this evaluation, the vast majority saw the program's major strength as its ability to promote tangible business relationships between business executives in the U.S. and Asia.
- ② The high quality support provided by WEC staff, particularly that related to logistical arrangements, was cited frequently as directly contributing to the success of this exchange program.
- ③ The Principal Investigator's, Larry Lai's strong technical background, professionalism, and rapport with the US-AEP Secretariat and various participating organizations, has had a beneficial effect on this effort.

- ④ The involvement of key business-oriented individuals and organizations, such as R.J. Gurley (Thailand) and USAID/India's TEST program, has enhanced the program's ability to target EBE's whose participation in the program can result in near-term (2-5 years) application of U.S. environmental experience, technology, and practices in Asia.

b. Weaknesses:

- ① The program uses exchanges as isolated activities and lacks a strategy for follow-up or engagement of participants (EBEs and Hosts) as partners of WEC or the US-AEP.
- ② The US-AEP's TQM concept has not been effectively defined or applied within the WEC environmental business exchange program.
- ③ The effort, as it is currently being implemented, does not lend itself to quantification of the program's effectiveness or impact (beyond anecdotal evidence).
- ④ The lack of an institutionalized approach or system within WEC for documenting and tracking volunteers (both EBEs and Hosts) undermines WEC's ability to fully capitalize on the wealth of talent and expertise participating in this and other WEC exchange efforts.

IV. Recommendations

Currently the US-AEP and WEC are finalizing an agreement to extend this effort through February 1995. At that time, it is likely that the US-AEP's environmental business exchange program will be part of a more comprehensive contract covering environmental fellowships, exchanges, and training. In advance of this transition or prior to similar business exchange efforts by WEC, the evaluation team recommends that WEC consider changes in the areas discussed below.

1. **Follow-Up with EBEs and Hosts** - As the primary weakness of this program, mechanisms and procedures to ensure appropriate follow-up should be given high priority by WEC. Specifically, the exchange program's follow-up should be designed to enfranchise participants. Internal to the exchange itself, efforts should be made to maintain contact with relevant parties and track the progress of business relationships. From a broader institutional perspective, all participants should be incorporated into a WEC participant database. Communications should be maintained with all participants. Ideally, a systematic approach to follow-up should include:
 - Communication with all involved parties — USAID Missions, Tech Reps, Hosts, Sponsors — regarding the value of the exchange and the next steps; these parties should then be kept apprised regarding the progress and results of the exchange over time.
 - Engagement of EBEs and Hosts as partners in the WEC business exchange program. This would require efforts to broaden EBEs' and Hosts' understanding of the objectives and programs available through WEC. It might also entail the development of new criteria and programs allowing subsequent participation by EBEs in additional US-AEP/WEC efforts — versus the one-shot approach that is currently the norm.

The "client" relationships cultivated under the TEST program might be explored as a possible model for cultivating and nurturing long-term relationships with businesses; R.J. Gurley's approach to partner relationship-building is also worthy of examination. Programs which require periodic reporting on results as part of their follow-up efforts include USETI's EPA funded efforts (requiring participants to set goals and periodically report on their progress), and NASDA's requirement for periodic reports on transactions related to its grants.

2. **Trip Reports** - As the primary "deliverable" from the exchanges, consideration should be given to redesigning the Trip Report to broaden its usefulness. If follow-up is to be expanded under this effort, then the trip report, in particular, should set forth the next steps for the EBE. This list of near-term and long-term goals could provide WEC with actual measures against which to assess the effectiveness or impact of the exchange. To assist EBEs in development of this report, a sample trip report should be provided as an attachment to the grant agreement.

In addition, WEC should consider ways to utilize and communicate aspects of the exchanges which might benefit other Asian and U.S. organizations. One model to consider is the U.S. government's Small Business Innovation Research (SBIR) program which requires short non-proprietary summaries of the objectives/results of federally support research, separate from the final report. A compilation of EBE summaries could be cross-indexed by country, technology, industry, etc. and be made available regularly to firms in the U.S. and Asia. These reports would likely be of value to industry, and might also serve as a source of potential business partners.

3. **Contact Information** - Contact information, related to both EBEs and Hosts, is sorely deficient on this CA. The lack of information on many participants and the absence of a workable database to track these individuals adversely affects the ability of WEC to fully utilize the expertise and contacts associated with these exchanges. While maintaining this type of information is not costly, it does require the direct attention and support of WEC management and the designation of specific responsibilities among WEC staff.

4. **Exchange Design/Implementation** - The number of players utilizing the business exchange program has expanded, and WEC is increasingly working through what we have termed "intermediate customers", e.g. the USAID Missions, Tech Reps, and TR&D, as well as sponsoring organizations and consultants. As such, the opportunities for misunderstandings and miscommunications are continuing to grow. WEC should consider instituting a process whereby it delineates the overall responsibilities of participating parties related to project design, execution, and follow-up. If these responsibilities are changed to fit the unique requirements of a specific exchange project, then the resulting responsibilities should be specified in writing in advance of the exchange.

5. **Evaluation and Monitoring** - Mechanisms for tracking project progress and results should be addressed in all Work Plans (including one for this CA covering the September 1994 - February 1995 extension period). Given the current importance that USAID is placing on effective evaluation and monitoring of its projects, WEC should conduct an internal review of its USAID CAs to determine the extent to which progress against objectives is being monitored.

6. **Economic / Environmental Impacts** - Currently, WEC does not systematically track the economic or environmental impacts of this program. Assuming that knowledge of these impacts is desired by WEC, several actions need to be taken:
 - (1) WEC needs to pursue an explicit mandate (and budget) related to continuation of its relationship with EBEs and Hosts after an exchange has taken place. In the three examples cited in "1." above, TEST, USETI, and NASDA all address follow-up and tracking of impacts in their work plans and have budgets for these purposes.
 - (2) The responsibilities of the EBEs and Hosts in terms of their long-term involvement with the WEC business exchange program and post-exchange reporting should be delineated in the EBE grant agreement.
 - (3) The responsibilities of WEC in terms of continuing its relationship with these individuals must be further defined and coordinated, as appropriate, with the various Implementing Organizations (particularly Tech Reps), as well as TR&D/ Secretariat.

**Appendix A:
Table Comparing Work Plans**

WORK PLANS	Pre - April 1993 Work Plans	April 1993 Work Plan (Final)
Outputs:	1) Short-Term Technical Assistance (STTA) - 50/yr 2) Short-Term Professional Develop. (STPD) - 50/yr 3) Supporting Information and Instrumentation	1) Asia to US EBEs - 50/yr 2) US to Asia EBEs - 50/yr
Participation:	Candidates who "have institutional affiliation with government, industry, or other non-governmental organizations" per CA	Candidates from business.
Strategy:	<p>WEC responsible for business development / project identification.</p> <p>The strategy targets Priority Problem Areas (see below) and target countries (see below) to "maximize the effectiveness of US-AEP resources, and to address priority environmental concerns in Asia, and to promote business, industry and utility partnerships in the region."</p> <p>In addition, 6 criteria were to be applied to each exchange (see below).</p>	<p>Primary consideration will be given to USAID Mission-driven environmental programs, particularly programs within five priority countries (75 EBEs).</p> <p>65 EBEs will be allocated to Group B countries (see below), which because of their strong economies have great potential for environmental business exchanges.</p> <p>The remaining 60 EBEs will be available to support a set of generic environmental information and technology transfer programs available to all US-AEP countries and territories and to support targets of opportunity which may arise during the course of this CA.</p>
Priorities:	<p>Priority Problem Areas:</p> <ol style="list-style-type: none"> 1) Urban and industrial environmental infrastructure; 2) Energy conservation and cleaner energy technology; 3) Development of standards and compliance; and 4) Monitoring systems and analysis of environmental information. <p>US-AEP Strategic Initiative Areas:</p> <ol style="list-style-type: none"> 1) Electric utilities, focussing on Demand Side Management and Clean Coal Technologies; 2) Urban and Industrial Waste Water Treatment; and 3) Responsible Care Programs. 	<p>Specific Mission priorities under these four areas include:</p> <ol style="list-style-type: none"> 1) Support for development of Thailand's Eastern Seaboard Initiative; 2) Exchanges for U.S. and Indian industry executives for discussion of environmental issues and opportunities. 3) Exchanges to support and augment TEST program environmental activities. 4) Support of pollution prevention facility audits and training, in concert with the Sri Lanka Mission's TIPS and NAREPP program activities, and programs initiated by the World Bank. 5) Support of the RHUDO water and waste water projects in the Philippines and Indonesia.

<p>High Impact Activities:</p>	<p>11 project areas (80% of EBEs):</p> <ol style="list-style-type: none"> 1) National/Local Responsible Care and Corporate Environmental Initiative Program; 2) Industrial Environmental Auditing; 3) Industrial Disaster Preparedness Strategies; 4) Electric Power Demand Side Mgmt. Strategies; 5) National Environmental Action Plans/National Environmental Funds; 6) Mgmt. and Implementation of Environmental Assessments; 7) Offices of Technical Assistance (states); 8) Constructed Wetland Wastewater Treatment Technologies; 9) Certified Laboratory Systems; 10) Regional Environmental Forum: Mega-Cities on the Pacific Rim and the Burden of Air Pollution; and 11) Regional Env. Forum: Mega-Cities on the Pacific Rim and the Problems of Water Supply and Wastewater Treatment. 	<p>N/A - Mission Driven; emphasis on business opportunities.</p>
<p>Project Selection Criteria:</p>	<p>Selection Criteria:</p> <ol style="list-style-type: none"> 1) Activities should address problems of high national and regional priority, so that their value is enhanced by potential for transfer, adaptation, or commercialization on a broader scale; 2) The activities should link business, government and NGOs from both the U.S. and Asia to address specific problems; 3) The activities should address problems in which the U.S. has strong experience and capability, and/or in which there is a clear mutual interest between the U.S. and Asian partners; 4) The activities should have good potential for long-term benefits, but should also have potential for measurable accomplishments within the first 12 months. 5) The activities should extend or leverage the initiatives of other agencies and organizations working with the US-AEP, especially those of EPA and the other Implementing Organizations of the FET component. 6) The activities should either establish a replicable model program for addressing a particular problem, or should create or strengthen forums for ongoing collaborative exchange and transfer of information, experience, expertise, and technology between the U.S. and Asian partners. 	<p>Mission Projects - utilize criteria of individual Mission.</p> <p>Secretariat/TR&D Criteria - opportunity-driven.</p> <p>Criteria for the 3 Generic Program Areas were developed in mid-1993. They specify that the proposed EBE should:</p> <ol style="list-style-type: none"> 1) Address problems of high priority so that the value of the exchange is enhanced by potential for transfer, adaption, or commercialization of technologies; 2) Complement environmental priorities that have been identified by the U.S. Embassy and /or USAID Mission in each country. 3) Address problems in which the U.S. has strong experience and capability and/or in which there is a clear mutual interest between the U.S. and Asian partners. 4) Have potential for a measurable achievement within the first 12 months as well as potential for longer-term benefits.

Target Countries:	<ol style="list-style-type: none"> 1) Countries with WEC Offices (Thailand & Indonesia) 2) Countries with ongoing WEC activities (India, Philippines, Taiwan, Malaysia & Singapore) 3) Priority new WEC countries (Hong Kong, Korea, Sri Lanka) 4) Secondary priority countries - less than 10% of EBEs (Bangladesh, Cambodia, China, Fiji, Laos, Micronesia, Mongolia, Nepal, Papua New Guinea, and Vanuata) 	<p>38% of EBEs (75 of 200) are programmed for identification by Missions from Group A countries. 33% are expected to come from Group B countries. The remaining 29% could come from Groups A, B, or C, based on the value of the proposed exchange (per 3 generic program areas).</p> <p>Group A: Countries with Strong USAID Environmental Programs: India, Indonesia, Thailand, Philippines, and Sri Lanka.</p> <p>Group B: Countries and territories with great potential for environmental business exchange: Hong Kong, Malaysia, Taiwan, Singapore, South Korea.</p> <p>Group C: Other US-AEP countries and territories (23 listed).</p>
Long-Term Impact / Sustainability	<p>Practical Program Handbooks or case studies to be developed for 9 of the 11 proposed program areas, allowing application/ adaptation of experience elsewhere.</p> <p>Immediate and longer-term anticipated outputs identified for each program area.</p> <p>Autonomous, self-sustaining WEC-like offices to be established in 4-6 countries.</p>	<p>Not Addressed.</p>

Appendix B: Results from the Review of 17 Targeted Projects

TEST: Air Filter Technology Evaluation - October 5-21, 1993

Description: WEC sponsored a technology evaluation visit by INALSA, an Indian manufacturer of air filters, to the U.S. INALSA sought to identify cost-effective options which could be introduced in India. WEC provided tickets and per diem, as this exchange was part of the 30 EBEs allocated to India.

Result: Of the three firms interviewed, the EBE had prior relationships with two, including the sale of equipment and initial negotiations. The primary result of the exchange was the continuing negotiation with one firm regarding a short-term agreement for licensing cylindrical cartridges. At the time of the phone interview, an additional visit by the EBE and his boss was about to occur to finalize this agreement.

TEST: Demonstration of "Linductor" Oil Recovery System - November 8 - 23, 1993

Description: An individual from Yankee Environmental Services and his marketing agent met with a number of firms to introduce their new technology for vacuuming spilled oil to the Indian market. This is a method developed by a captain working to salvage Prince William Sound after the Exxon Valdez disaster. WEC provided tickets and per diem for the EBEs.

Result: While the two principals could not be reached, the file contained a letter dated 1/10/94 informing WEC that Yankee had received three orders for the technology; two from the Indian Coast Guard and one from their sales representative in India.

TEST: Oil Absorbent Demonstration - November 8 - 22, 1993

Description: Ab-Sorb is a manufacturer of low-cost material for cleaning, especially for absorbing oil and other substances. Potential applications range from shop floor use to major oil spill response activities. The company believes that there is considerable potential for recovery and reuse of spilled petroleum products using this product and used the exchange to explore possible joint ventures in India. WEC provided tickets and per diem for the CEO of Ab-Sorb to travel to India to meet with prospective partners.

Result: At the time of the phone interview, a consultant for Ab-Sorb was in India (at the firm's expense) to discuss a partnership with a company in Delhi. The EBE prepared an extremely detailed trip report, which included a possible implementation plan for obtaining contracts in India.

TEST: Corporate Environmental Mission - January 15 - 31, 1994

Description: Two representatives of IT Corp. met with Indian chemical, fertilizer, and tannery industries, as well as with government personnel to discuss IT Corp's understanding and experience with pollution prevention and waste minimization. This included a review of several Indian corporate environmental programs. IT Corp. also met with Pure Tech Corp. to discuss incinerator technology and the purchase of a turn-key system for Madras. WEC provided logistical support.

Result: The company has invested approximately \$85,000 in preparing presentations, proposals, and other staff time in pursuing business opportunities, but has not yet closed any deals.

Textile Industry - April 23 - May 7, 1994

Description: This exchange involved nine individuals from India's textile and dye/printing industries to the U.S. to review pollution prevention/control technologies. The groundwork for this exchange was begun in February 1993 through discussions with Appropriate Technology International (ATI), followed by a business development trip by WEC to India in October 1993. Two WEC staff and WEC's textile consultant accompanied the delegation.

Result: The participation of strong partner organizations, the Small Industries Development Bank of India and ATI (USA) played a significant role in the success of this effort. Universally, the responses by EBEs and Hosts were positive. In particular, the EBEs noted the appropriateness of the institutions visited and the quality of the advance work and implementation of the visit by WEC and the consultant. Hosts were impressed by the open, frank discussions which took place. Specifically, the Hosts commented on the technical competence of the delegation, and indicated that they learned a great deal from the EBEs concerning both India's textile market and potential competitors. Hosts expressed the belief that business would eventually emerge from the exchange and the hope that WEC would actively follow-up on these visits. All the Hosts contacted indicated that they would be very interested in participating in similar business exchanges in the future.

Clean Coal Technology - May 1-9, 1994

Description: Five principals of India's coal industry visited the U.S., attending Coal Prep '94 and participated in meetings with experts at the Center for Applied Energy Research, Pennsylvania Electric's Keystone coal preparation facility, and various U.S. coal technology firms. The focus of the exchange was on exploring the benefits of coal washing, specifically with respect to reducing the amount of stone transported from mines and raising the subsequent BTU content of the coal.

Result: This project encountered significant difficulties during implementation. While it is an anomaly from WEC's perspective, the US-AEP as a whole should take note of the potential for communication and implementation problems once multiple parties become active in an exchange.

Project identification and EBE selection was negotiated directly between the USAID Mission in India and the US-AEP's EEI Component. WEC was notified of the upcoming exchange by TR&D on March 30th. Communications with DOE and with U.S. Hosts was by the US-AEP's EEI personnel. Confusion regarding who had responsibility for what activities under the exchange (TR&D as project sponsor versus WEC as exchange implementor) resulted in this high level delegation of Indian officials:

- being stranded with no money (per diem) for two days, having arrived in the U.S. without foreign exchange since this was a fully-funded exchange; and
- contacting the designated hotel and finding that no reservations existed (the reservation had been switched given the fact that the rates of the initial hotel were above government per diem levels).

In addition, the delegation had been scheduled to travel 30 hours without a layover, and had not been notified of the need to keep expense receipts for their exchange.

Problems faced by the exchangees were documented in a memo from the Director of India's Central Mine Planning & Design Institute of India to WEC dated May 9, 1994. The memo had been prepared by TR&D staff, and was forwarded to WEC approximately two weeks later. Apologies for the problems and inconvenience was conveyed in a letter to the Director from Larry Lai, dated June 2, 1994.

One Host was contacted concerning this project. The Host spoke highly of the two exchangees he met with, and fully anticipates continuing a dialogue with the Indians concerning

conventional coal cleaning technologies. The meeting focused on the economic benefits associated with coal cleaning and the need for further site-specific studies in India, as well as the need to involve the various players in the process, e.g. government regulators, transportation firms, coal mining companies, utilities, etc. The Host indicated that all communications on this exchange were through the consultant accompanying the EBEs or through TR&D, and that he had not had direct communications with WEC. Currently, the Host is waiting for TR&D to contact him concerning follow-up, including possible USAID funding for site-specific studies.

Technology Assessment Mission: Pulp and Paper Industry - October 24 - November 5, 1993

Description: This exchange consisted of six Indonesians visiting U.S. pulp and paper industries. The purpose of the study tour was to evaluate state-of-the-art techniques and technology for pollution prevention and waste water treatment, and chemical recovery related to manufacturing.

WEC combined funds from its USAID/Indonesia CA (to cover the costs of the two government officials) and its US-AEP CA (covering the expenses of the four industry representatives). This U.S. study tour was a follow-up to training workshops and factory assessments sponsored under WEC's USAID/Indonesia CA.

Result: According to the Hosts, WEC did an excellent job of setting up the exchange, including providing useful packets of information ahead of time and providing an escort for the group. One firm demonstrated recently developed processes for waste paper recycling, while another discussed its new bleaching technology. A representative from a national paper association indicated that the visit was important because it afforded the opportunity to highlight environmental concerns to members of the overseas paper industry in a forum that was likely to lead eventually to sales of U.S. services and equipment.

WEC followed-up with two of the Hosts regarding a possible technology transfer trip to Indonesia. Plans have not been finalized, and the firms suggested that they were not sure of the utility of such a trip until a true dialogue can begin. Cultural and language problems were cited by Hosts as a significant barrier to a "two-way" dialogue with the EBEs. In order to make future exchanges more productive, one interviewee suggested that Hosts should be provided with more detailed information on the situation in the country, size of facilities, nature of the problems, areas of greatest interests, etc. Another person suggested that had the WEC environmental expert who accompanied the team assisted with its design, the exchange might have been even more focused and appropriate to EBEs'/Hosts' needs.

Waste Minimization Technology Transfer: Textile Industry - November 10 -18, 1993

Description: The visit to Indonesia had four specific purposes: (1) for the EBE to re-visit plants originally audited by himself and one other expert as part of a USAID/WEC team in December 1992 in order to establish to what extent the waste minimization recommendations had been implemented; (2) to visit and audit additional textile plants in the Bandung area to provide them with information on how to reduce industrial wastes; (3) to observe existing waste treatment facilities at the plants and make recommendations for improvements; and (4) to observe and comment on safety-related conditions and practices.

The earlier team had found most plants visited used the same primary waste treatment philosophy, namely that of sedimentation lagoons. Most did not properly monitor pH, determine optimum levels of ferrous sulfate needed to achieve purification and only infrequently used laboratory analyses to measure other ingredients. All faced the problem of mounting solid waste, and many faced safety-related problems.

Result: The most frequently implemented recommendations involved the adoption of measures to reduce or avoid spillage and isolate

spilled materials. Recommendations related to process modifications and/or alternate chemical usage, however, had generally not been implemented due to lack of resources (outside help or in-house research facilities). Most safety measures recommended following the 1992 trip had not been implemented.

The EBE made numerous suggestions about pending recommendations and made additional recommendations. As a follow-up to this assessment, WEC plans to sponsor a U.S. study tour of four representatives of Indonesia's textile industry to the U.S. under the joint sponsorship of this CA and USAID/Indonesia later in 1994. Having participated on previous WEC IEDS exchanges, the EBE spoke highly of this trip's organization. He further indicated that WEC's Indonesia staff accompanied him throughout the tour and "contributed to the success of the trip by their valuable observations and comments."

Review of Mercury Recovery and Hazardous Waste Treatment Technology - November 30 - December 11, 1993

Description: The Korea Environmental Management Corp. (KEMC) is in the process of planning to build six hazardous waste treatment facilities in Korea, and a mercury recovery facility. The Executive Director of KEMC visited the U.S. in order to investigate the newest technology for mercury recovery, hazardous waste management, waste water treatment, as well as public outreach efforts and environmental education. U.S. Hosts included several U.S. environmental technology firms, the U.S. EPA, and one state municipality office.

Result: Information in the files and from interviews indicated that WEC staff did a good job of setting up and executing this exchange on very short notice. Two of the Hosts were asked to show the EBE state-of-the-art technology. The US EPA provided an overview of its field activities and its technical and educational materials. The EPA Host did indicate, however, that the EBE did not have a clear understanding as to what he expected from this meeting.

Subsequently, another EPA representative visited KEMC in Korea and agreed to provide relevant technical and educational materials.

Three of the Hosts visited were serious candidates for the possible provision of services and/or equipment. Of these firms, one was interviewed, and indicated that it followed-up independently with the EBE after the visit, including a trip to Korea. As yet, KEMC has not expressed interest in actual business transactions with the firm. The Host also indicated, that while his firm was very pleased to participate in the exchange, they had previously categorized KEMC as a competitor, rather than a potential buyer of their technology. The EBE was accompanied by WEC staff throughout the exchange.

Environmental Impact Assessment Technology Transfer - October 23 - November 2, 1993

Description: Continental Shelf Associates (CSA) sought to communicate its expertise in performing impact assessments and developing monitoring programs of offshore oil drilling projects to Petroliam National Berhad (Petronas), in anticipation of several large-scale assessments to be initiated by Petronas later this year.

Result: This visit by the President of CSA was a follow-up to a trip financed by the Florida Dept. of Commerce. He added Indonesia and the Philippines to his itinerary (at his own expense), and is in the process of trying to establish a partnership with a company in Indonesia. CSA provides services, not products, and views the trips as the first steps in a long term process.

One unusual feature of this exchange was the use of "Gold Key Services" supplied by Malaysia's US-AEP Tech Rep. CSA had already enlisted the assistance of the Malaysian Tech Rep prior to WEC being asked by the US-AEP to cover travel and per diem costs. WEC's role was therefore purely logistical. A fee of \$200 was charged by the Malaysian Tech Rep to cover costs associated with meetings; meetings in Indonesia were also supported by the local US-AEP Tech Rep, but at no charge.

Philippine Business for the Environment (PBE) Conference, Manila - March 19 - 27, 1993

Description: WEC provided two speakers for the PBE conference entitled, "Corporate Environmental Policies and Programs", one of whom was a WEC board member from AT&T. A waste minimization workshop for government inspectors and a waste minimization opportunity assessment at a Manila department store were also held.

Result: The evaluation team was unable to contact the EBEs; however, one Host responded indicating that he felt the exchange was very appropriate to his company's interests. He also suggested that a future exchange be developed to include companies engaged in environmental business (systems, equipment, and management). Letters in the file from other participants were very favorable, noting their new appreciation and capabilities related to identifying waste minimization needs and solutions facing their institutions. These positive responses led to one of the EBEs being asked to participate in a similar seminar in Cebu Philippines later that year.

Another interesting feature of this exchange was the wide distribution of the trip report. One EBE directly forwarded a copy of his report to the Philippine Business for the Environment (PBE), the Dept. of Environment and Natural Resources (DENR), USAID's Environmental Improvement Project, USAID's Asia Bureau, and USAID/Philippines. WEC staff also sent a copy to the Philippines' Environment Management Bureau for their review.

Technology Assessment Mission: Cement and Pulp & Paper Industries - September 20 - November 11, 1993

Description: USAID/Philippines referred the EBE to WEC in March 1993. The subsequent visit emphasized plant site visits, demonstrating U.S. technology and visits to U.S. manufacturers of environmental control products relevant to the cement and pulp & paper industry.

Result: A very elaborate Trip Report was prepared concerning the visit, and the EBE has spoken extensively in the Philippines concerning insights gained on the exchange. The two Hosts contacted, however, indicated that there had been no follow-up by the EBE since the visit. They found this surprising given that the visits themselves seemed to have been very good. Comments were also made about the high quality of the front-end arrangements by WEC staff, but lack of contact from WEC following the visit.¹⁵ Specific recommendations were made regarding WEC follow-up to provide Hosts with a letter outlining:

- what value the exchangee received from the meetings, and
- next steps, including the Host's potential role (if any) in follow-up.

Factory Assessment: Paint Industry - November 7 - 19, 1993

Description: The President of Frost Paint & Oil Corp. visited Sri Lanka to evaluate opportunities for waste minimization within the local paint industry. The EBE provided environmental audits of four manufacturing plants and a half-day workshop on waste minimization and pollution prevention in the paint and coatings industry. He also participated in a day-long, government-sponsored, symposium. The factory audits and industry workshop included participation by a local audit team, comprised of representatives from academia and industry.

Result: The linkage of industry with Sri Lanka's academia was viewed as a critical element to the

¹⁵ Note: contact information was only available for two of the Hosts — both of which were participants in WEC's IEDS program. One Host originally contacted WEC in response to a WEC solicitation for volunteers placed in a trade magazine (1991). He signed up for the IEDS program in 1992, then was contacted in Jun. 1993 regarding this visit. The other Host had been involved in this exchange and three WEC field assignments, however, lack of recent contact from WEC was leading him to search for other pro bono avenues. He also expressed confusion regarding who has responsibility for WEC Asian efforts: Will Knowland, as Director for Asia Programs versus Lisa Raudelunas who heads the Indonesia and Thai CAs.

success of this exchange by the EBE. Following the trip, he published an article in the University of Moratu's Chemical Engineering Department Journal on the necessity of close ties between industry and academia for achieving Sri Lanka's environmental protection goals. The EBE also followed up his visit by initiating a discussion between a U.S. manufacturer of waste water treatment supplies and equipment and a potential Sri Lankan distributor.

CHEMTREC Training -
October 21 - November 4, 1993

Description: Following a request from USAID/Thailand in May 1993, WEC worked with the Chemical Manufacturer's Association (CMA) to provide an expert to evaluate Thai needs related to emergency response. The EBE also examined the feasibility of installing a system, entitled Chemtree, at the Ministry of Science Technology and the Environment (MOSTE). This visit followed an earlier seminar presentation in Thailand by a representative of CMA (from OxyChem) who spoke about the CMA's Chemtree system.

Result: The EBE recommended that several steps be taken (including introducing standardized code for hazardous substances and training) prior to implementing the Chemtree model. The Thai government established a task force to implement the recommendations. Since then a Hazardous Materials Emergency Response (HMER) plan has been developed and actively endorsed by a committee involving 38 agencies; and the Thais initiated a relationship with the U.S. Federal Emergency Management Agency. In addition, the HEMP Committee has secured a facility and budget and developed a plan for establishing an Emergency Response Center of Thailand (ERCT) based on the Chemtree system.

These strongly favorable results have led R.J. Gurley (US-AEP/USAID) to request a follow-up visit by CMA. At the end of July 1994, the original OxyChem representative will extend his business trip to Thailand in order to hold discussions with Thai officials related to the

implementation of Chemtree.

One interesting finding from this exchange involved the fact that the EBE's recommendations were shared at a debriefing with representatives of the chemical industry and Thai government. This meeting elicited a subsequent dialogue within the business community and industry with government. Chemtrans, for example, was asked to comment by Occidental Chemical Far East Ltd. on suggestions involving the feasibility of night delivery of hazardous chemicals. This type of communication is critical in that it directly relates to the viability of new institutions and regulations. It is seldom, however, that the findings, recommendations, or trip reports developed by US-AEP/WEC exchanges have been formally used to encourage industry-industry or industry-government dialogue.

Technology Evaluation of Electric Tuk-Tuks -
October 1993 and November 1993

Description: Two sets of exchanges (4 people each) have taken place to further the relationships between the Electric Power Research Institute (EPRI) and Advanced Electric Car Technology (AECT) of the U.S. and Pholasith Tuk-Tuk Co., the Provincial Electric Authority, and National Electronics and Computer Technology Center of Thailand. The goal of the exchanges has been to support the joint venture between AECT and Pholasith aimed at retrofitting all Bangkok 2-cycle tuk-tuks with U.S. components to allow them to run on batteries. The environmental implications for improving Bangkok's air quality and AECT's revenues are immense. USAID's Energy and Infrastructure Office has become actively involved in this effort and has financed the initial tuk-tuk retrofits. The Thai government is committed now to the electrification of all tuk-tuks in the country, and the eventual electrification of all 2-cycle scooters, as well as extending the range of bicycles through the use of batteries. This electric vehicle (EV) project is generally hailed as one of the US-AEP's most unqualified successes. It is in part an outgrowth of the MOU signed by Vice President Gore and Thai officials in 1993 to pursue cooperation in areas associated with

Thailand's environmental.

Result: The potential economic, environmental and political significance of this budding relationship is tremendous for both the U.S. and Asia. The effort is well documented within the press, therefore, we will not elaborate except to say that a \$100 million (+) joint venture company should be established soon and that production from this manufacturing facility should have a dramatic affect on the environmental quality (air and noise) of Thailand, and that exports should similarly benefit urban areas in Indonesia, India, Vietnam, and South Africa.

Two individuals stand out as the spark behind this effort's success: R.J. Gurley, USAID/US-AEP's Private Sector consultant in Bangkok, and David Porter of the Electric Power Research Institute (EPRI).¹⁶ Gurley was the individual who first identified the need for EV technology for Bangkok's tuk-tuks and who enlisted Porter's help in developing an appropriate match. Together, Gurley and Porter have nurtured the various Thai and U.S. parties through the relationship-building stage, and through initial demonstration of retrofitted tuk-tuks. An effective coalition of private industry, government agencies, utilities, and NGOs has been developed, and has been instrumental to securing the financing and the government regulatory changes necessary to make the venture a success. According to both Gurley and Porter, the responsiveness and quality logistical support provided by WEC staff directly contributed to this effort's success.

¹⁶ Funding of the initial business exchanges was provided by the US-AEP. Continued financial support related to demonstration and facility start-up is being provided by USAID's Office of Energy and Infrastructure.

COPEC Mission to Design Carbon Offset Projects - November 30 - December 12, 1993

Description: An EBE from a Los Angeles-based firm specializing in brokering carbon offsets between electric utilities in industrialized nations and developing countries visited Thailand at the request of the USAID Mission. The EBE's visit was designed to introduce a wide range of Thai policy makers to the concept of forestry-based carbon offsets while also assessing an ongoing USAID reforestation project for additional financing. The EBE met with nine private and public sector organizations, as well as NGO representatives and USAID staff.

Result: The EBE commended the arrangements made for his visit by WEC and indicated that he views the exchange as successful. Since returning to the U.S., he has had detailed discussions with several parties regarding implementing an offset project in Thailand. He reports that several Thai officials and one industry leader showed particularly strong interest in using this financing mechanism to aid in an ongoing national reforestation effort. The EBE suggested, however, that a number of issues need resolution prior to U.S. industry's viewing Thailand as an attractive provider of forestry offsets — the ambiguous state of land tenure being the largest. It is expected, nonetheless, that a continuing dialogue will result, at the very least, in a pilot project in the next several years.

For its part, WEC has offered to further support COPEC's efforts in Thailand by looking elsewhere for opportunities for offset programs. COPEC is also sending its Managing Director to Thailand in July, in conjunction with his visit to Malaysia, where COPEC is engaged in a pioneering offset program.

Development of Sustainable Linkages Between Thai Utilities and the U.S. Power Industry - February 19 - 25, 1994

Description: The U.S.'s Electric Power Research Institute (EPRI) is actively seeking to expand its relationships with Asian utilities. Conversely,

Thai utilities stand to directly benefit from transfer of U.S. expertise and technology related to demand side management, energy efficiency, and emissions control. This exchange involved the travel of five senior executives of the Electrical Authority of Thailand (EGAT) and the Metropolitan Electric Authority (MEA) to the U.S. to learn more about EPRI and the types of benefits they might receive through membership in EPRI.

Result: The potential immediate and long-term benefits of Thai membership in EPRI, has led the US-AEP to intervene aggressively in promoting this relationship. To make membership more attainable, EPRI is allowing the three Thai utilities to join as a single member (\$350,000/year). The US-AEP has agreed to underwrite one-fourth of this membership for the first three years. To date, EPRI estimates that it has contributed more than \$150,000 toward establishing its relationship with Thai utilities and promoting the EV joint venture discussed above.

It is important to note that EPRI believes that WEC's contribution to this project was both direct (through excellent logistical support) and indirect (by reputation). The presence of a WEC Office in Thailand and the Thai utilities' and government's perception of WEC as a global (rather than U.S.) environmental organization lent a degree of impartiality and credibility to this exchange that would have been difficult to achieve under sponsorship by another group. EPRI further commented that WEC's presence has assisted R.J. Gurley's efforts to re-establish a collegial relationship between USAID and Thai utilities.

Other:

In March 1994, USAID changed its regulations concerning use of business class air travel using USAID funds. In one recent exchange, the Asian EBE cancelled the exchange after three weeks of work by WEC over a six-month period. In a letter to WEC, the EBE from Vam Organic Chemicals Ltd. (the largest alcohol producer in India), wrote:

I appreciate the efforts put in by you in arranging the meetings with various companies in U.S.A. I understand your limitations due to the regulations of U.S. government regarding the class of travel. ...I deeply regret that we have to cancel this visit at this stage after having spent a number of hours on both sides.

At this time, the implications of this regulatory change by USAID cannot be fully assessed. Inquiries of past EBEs made during the course of interviews did indicate that the change will influence their willingness to volunteer time. In the instances where the establishment of business relationships are sought by U.S. firms, the firm may choose to upgrade the tickets. In at least one recent case, however, the EBE expressed frustration at the fact that the bargain airfare obtained by WEC did not permit upgrading.

In those instances where U.S. executives volunteer their technical assistance, with no expectation of future business with the Hosts, the regulatory change may detrimentally affect WEC's ability to secure pro bono experts.

**Appendix C:
List of Documents Reviewed**

1993 - A Year of Achievement, Annual Report for World Environment Center's Cooperative Agreement with the U.S.-Asia Environmental Partnership, CA No. AEP-0015-A-00-2055-00.

Budget and Explanation of Line Items for A Cooperative Agreement with the U.S. Agency for International Development in Support of the U.S.-Asia Environmental Partnership, submitted by WEC, dated 9/3/92 and 9/17/92.

Cooperative Agreement (CA) AEP-0015-A-00-2055-00 between U.S. AID and WEC, dated 9/24/92.

Letter to Dan Waterman, NASDA, from Larry Lai, WEC, re: areas for collaboration and cooperation between WEC and NASDA under the US-AEP, dated August 18, 1993.

Letter to Melissa Dann, TR&D, from Larry Lai, WEC, re: Quarterly Budget Projections for the US-AEP/WEC Cooperative Agreement, dated April 27, 1993.

Letter to Tony Marcil, WEC, from L.P. Reade, US-AEP, specifying EBE targets for 1993, dated July 6, 1993.

Management Strategy for Implementation of our US-AEP Agreement, internal WEC memo; December 12, 1992.

Proposal for a Cooperative Agreement with the U.S. Agency for International Development in Support of the U.S.-Asia Environmental Partnership, submitted by WEC, June 1, 1992.

QA Workshop Report, submitted by MSI, Inc., January 1994.

Quarterly Progress Reports: September 23 - December 31, 1992; March 31 - June 30, 1993; and October 1 - December 31, 1993.

Six Month Progress Reports: September 23-March 31, 1993; April 1 - September 30, 1993; October 1 - March 31, 1994.

WEC IEDS Volunteer Service Agreement, draft form..

Work Plan for the AID/WEC Cooperative Agreement in Support of the U.S.-Asia Environmental Partnership, dated April 15, 1993.

Work Plans (draft) for the AID/WEC Cooperative Agreement in Support of the U.S.-Asia Environmental Partnership, submitted by WEC: November 5, 1992; December 17, 1992; and January 6, 1993.

Appendix D: Individuals Contacted During Evaluation

Individuals Interviewed

MSI:	Norman Endlich, US-AEP QA Officer
MTL Group, Inc.:	Larry Lai, Principal Investigator
Sanders Int'l:	Jeff Hallet, Program Manager (TEST)
TR&D:	Joyce Coffee, POD Component Melissa Dann, Manager POD Component Peter Gourley, Manager TC Component Kenneth Langer, Manager EEI Component Margaret Sullivan, Public Outreach
US-AEP Secretariat:	Owen Cylke, Director, Technical Coordination Lewis P. Reade, Director General Cindy Sayers, Director, Technical Cooperation Richard Sheppard, Director Operations
WEC (Arlington):	Swarupa Ganguli, Deputy Program Manager William Knowland, Director, Asia Natalie Kraft, Project Coordinator Joseph Rearden, Project Assistant
WEC (New York):	Antony Marcil, President Lisa Kaudelunas, Program Manager Cecilia Ho, Vice President, Finance

US-AEP Technology Representatives (responding to Fax)¹⁷

US-AEP/India	Vinay Gadkari
US-AEP/Indonesia	James M. Whittle
US-AEP/Malaysia	Cathy Fuselier

USAID Missions (responded to Internet e-mail)¹⁸

USAID/Indonesia	Adiwiyana
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¹⁷ US-AEP Offices in the following countries were sent faxes inquiring about the WEC program: India, Indonesia, Korea, Malaysia, Philippines, Taiwan, and Thailand.

¹⁸ One or more individuals at the following USAID Missions were sent e-mail inquiries via Internet: Chile (T. Nicastro), India (A. Ray & D. Hess), Indonesia (Jerry Bisson & Adiwiyana), Nepal (J. Gingerich), Philippines (J. Grayzel), Sri Lanka (A. Ray & G. Whaley), and Thailand (R.J. Gurley).

USAID/Nepal
USAID/Philippines
USAID/Santiago
USAID/Thailand

Roger A. Bloom
John A. Grayzel
Thomas Nicastro
R.J. Gurley

Asian EBEs (responding to Survey)¹⁹

Arkonin Engineering (Indonesia)
Bhavin Textiles/Colourtex (India)
Consolidated Engineering (Nepal)
Cyno Clean Co. Pvt.Ltd.
Electricity Gen. Authority of Thailand

Environmental Management Corp. (Korea)
Ignifluid Boilers India, Ltd.
INALSA (India)
Indian Boiler Manufacturers
India Power Partners
Luthra Dyeing & Printing Mills (India)
P.T. Bumi Serpong Damai (Indonesia)
P.T. Superex Raya Aluminum Extrusions
(Indonesia)
P.T. Waseco Tirta (Indonesia)
P.T. YKK Zipper Co. Ltd. (Indonesia)
Paradise Prints (India)
Philippine Investment and Mgmt. Consultants
Pure Tech Engineering (India)
R-II Builders (Philippines)
Small Industries Development Bank
of India
Thermax Ltd.

H. Diding Muchidin
Bapu Deshpande
Sushil K. Amatya
B. Ravi
Duandas Srisomwong
Somvonk Poshyananda
Lee Shin-Bom
V.N.G. Rao
D. Chatterjee
D.B. Baldawala
M.W. Goklany
Girish Luthra
Wilyadi Adinoto

Dadang Sudrajat
Budi Sutjahjo
Jaya Agung Prastowo
Chittaranjan Desai
Lauro D. Guevara
B. Ravi
Reghis Romero
Vikram R. Singh

Girish Trivedi

Asian Hosts (responding to Survey)²⁰

Chemtrans (Thailand)
DOW Philippines

Frank Carter
Jun P. Salipsip

U.S. EBEs (interviewed by telephone)

Ab-Sorb
Advanced Electric Car Technology (AECT)
Anceptive Packaging Council

Jack Wallace
Chaz Haba (*also Host*)
Jules Homans

¹⁹ 42 Asian EBEs from 26 organizations were sent survey forms; 18 individuals (17 organizations) responded by July 25, 1994. Four additional responses from four companies were received in August; their responses are not included in the body of the report.

²⁰ 17 Asian Hosts from 17 organizations were sent survey forms; 2 responded

Consultant (formerly DuPont)
Continental Shelf Associates
COPEC
Electric Power Research Institute (EPRI)
IT Corp.

Andrew Foldi
David Gettleson
Marc Stuart
David Porter (*also Host*)
Alan Baker
Prakesh Acharya

U.S. Hosts (interviewed by telephone)

CQ, Inc.
Gaston County Dyeing and Finishing Co.
Filter Specialists
HIAC/Royalco
National Council of Paper Industry
Pneumafil Corp.
Scott Paper
Shelyn, Inc.
Sonoco Paper Products
Tubular Textile Machinery
U.S. EPA
Union Camp Paper
WMX Technologies
Waste Management Disposal Services of MD

Dave Kehoe
Don Spurrier
Douglas Fitzgerald
Frank Carpenter
Dr. Isaiah Gelman
Ugo Bertolami
Wes Argo (retired)
Anne Laidlaw
Phillip Whichard
Jim Rodgers
Jentai Yang
Wes Foy
William Brown
Roy Nicholson

26/1

Appendix I
Reporting Requirement Approval



World Environment Center 419 Park Avenue South Suite 1800 New York, NY 10016 USA
Tel: (212) 683-4700 FAX: (212) 683-5053

MEMORANDUM

TO: M. Lewis P. Reade
Director General, US-AEP
U.S. Agency for International Development

FROM: Lisa A. Raudelunas
Manager, Asia Programs

DATE: May 26, 1995

SUBJECT: Cooperative Agreement # AEP-0016-A-00-2055-00

1995 JUN 14 AM 11:12

WEC is starting a review of reports and documents specified under our cooperative agreement to ensure that we have met all the reporting requirements. I am happy to say that no major problems been surfaced.

There are a few details that I would like your agreement on however.

- The cooperative agreement required the submission of annual reports and a final report. We provided the Secretariat with an annual report for 1993 that was widely distributed (1993 - A Year of Achievement). Our intent is to develop a second annual report for 1994 similar to the 1993 - A Year of Achievement, and then a final report as required. The final report would contain all items required under the cooperative agreement.
- Responding to requirements of the cooperative agreement, and the needs and requests of the Secretariat, WEC at various time in the past has provided the Secretariat with routine biweekly reports, monthly reports, quarterly reports, quarterly financial statements (to U.S.A.I.D. Office of Financial Management), six month reports, and monthly EBE summary. At present the biweekly and quarterly reports have been discontinued. I would like your concurrence that the monthly reports and six month reports, combined with the monthly EBE summary and quarterly financial statements fully meet your needs, and that the discontinued reports are no longer required.

I appreciate your assistance in this matter. Please feel free to contact me with any questions at 212-683-4700.

Please provide your concurrence by signing below and returning this page to our office. Thank you for your cooperation.

Approved:

M. Lewis P. Reade
Director General, US-AEP

Date:

5/26/95

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To	<i>Lisa Raudelunas</i>	From	<i>MLDann</i>
Co.		Co.	
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Fax #		Fax #	