

A Report of the
Office of Environmental and Natural Resources
Bureau for Global Programs
United States Agency for International Development

Final Report
**Environmental Pollution
Prevention Project**

(Draft)

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Environmental Pollution Prevention Project (EP3)
Project Number 936-5559
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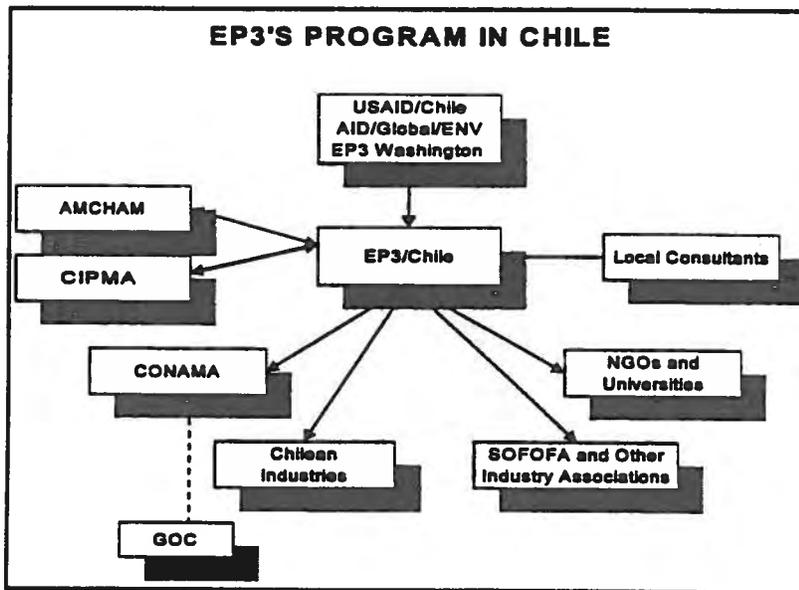
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5.1 CHILE

Contract Number:	PCE-5559-Q-00-3022-00, Delivery Order 1
Duration of the Program:	September 1993 - October 1996
EP3/Washington Manager:	Maurice Knight
USAID/Washington Manager:	Deborah Hanlon
USAID/Chile Manager:	Juan Carlos Diaz
Country Director:	Mauricio Roldan (1993-1994) Jorge David (1994-1996)
Country Staff:	Dolores Rodriguez, Project Manager

5.1.1 Background

The principal objective of the EP3/Chile program was to simultaneously develop the supply of and demand for pollution prevention knowledge, expertise, and technology. EP3/Chile was launched in September 1993 through a cooperative agreement with the American-



Chilean Chamber of Commerce (AMCHAM). The partnership with AMCHAM was intended to facilitate EP3's understanding of the local economy, business practices, and political sensitivities. USAID/Chile and AMCHAM oversaw EP3 project activities, which were implemented directly by AMCHAM for the first year of the project, and by a Chilean consulting firm Qualitek for the remaining two years of the project.

The Centro de Investigación y Planificación del Medio Ambiente (CIPMA), an environmental NGO, was EP3/Chile's counterpart in training and outreach activities. The Chilean Environmental Protection Agency (CONAMA) also sponsored training courses and became an important advocate of the adoption of pollution prevention and cleaner production concepts in government policy and industrial practices.

Of all the EP3 country programs, EP3/Chile made the most significant use of consultants to carry out program activities. Over 120 local consultants were trained and hired by EP3/Chile to conduct pollution prevention-related environmental assessment and implementation work.

5.1.2 Results

EP3/Chile achieved impressive economic and environmental benefits and led the way for improved industrial processes throughout the country. EP3 designed several good models for promoting pollution prevention in various industrial sectors. Model pollution prevention approaches were developed for the tannery, textile, metal finishing, chemical, and pharmaceutical industries. After the project's completion in October 1996, Qualitek, the consulting firm that managed the program, continued to offer pollution prevention services in Chile.

Technical Assistance to Industry

EP3 conducted PPDAs at 26 facilities in 6 industrial sectors and two diagnostic assessments in hospitals. Approximately 40% of the recommendations made by EP3/Chile were implemented. These recommendations resulted in an estimated total annual savings of \$1.9 million. The average savings per facility is \$72,000 per year, with an average one-time investment of \$53,000. Typical savings included reductions in chemical use, improvements in raw materials recovery, water and energy savings, improved product quality, etc. For example, over 1.4 million m³ of water per year were saved as a result of pollution prevention implementation at participating industries.

Table 5.1-1 summarizes the actual investments made and savings resulting from the implementation of pollution prevention measures recommended by EP3/Chile.

Table 5.1-1
Summary of Costs and Benefits of the Recommended Pollution Prevention Measures

Sector	No. of Facil.	% Options Implem.	% Pollution Reduction	Annual Water Savings, (m ³)	Investment Size (\$)		Annual Savings (\$)	
					Avg. per Facility	Total	Avg. per Facility	Total
Chemical	6	57	53	168,140	3,441	20,650	6,856	41,136
Food Process.	4	44	22	295,035	78,396	313,585	127,740	510,960
Hospitals	2	37	40	0	n.a.	n.a.	n.a.	n.a.
Mining	4	26	23	757,440	237,500	950,000	300,445	1,201,780
Printing	4	18	16	0	818	3,275	1,987	7,950
Tannery	3	48	49	107,500	29,066	87,200	32,050	96,150
Textiles	3	50	22	91,440	1,187	3,563	7,044	21,132
Total	26			1,419,555		1,378,273		1,879,108
Average		40	32		53,010		72,273	

n.a. -- data not available

Training and Outreach

EP3 worked with CIPMA to conduct a series of training sessions on pollution prevention for specific industry sectors. In addition to providing its training facilities, CIPMA developed publicity materials that were distributed to industry representatives and provided translation services for the training courses. Another aspect of CIPMA's work with EP3 involved establishing an environmental information center in Santiago. CIPMA was linked to eight regional network nodes that served the major industrial and urban areas of the country. EPA's US TIES funds were used to support CIPMA's training and information activities.

To institutionalize pollution prevention in Chile, EP3 trained a cadre of professionals from diverse institutions (government, consulting companies, universities, NGOs) and at various levels (e.g., executives, plant managers, process operators). For example:

- ▶ Twenty-five officials from CONAMA regional offices throughout Chile were trained in pollution prevention and training techniques.
- ▶ Over 30 local consultants were trained in pollution prevention auditing techniques and report writing through long-term participation in PPDAs and follow-up activities.

- ▶ Over 100 industry leaders were exposed to EP3/Chile results and educated in benefits of pollution prevention approaches at the Leadership Conference held in September 1996 in Santiago.
- ▶ To target specific industrial sectors, EP3/Chile staff conducted a number of breakfast meetings for representatives of tanning, textile, metal finishing, chemical, and pharmaceutical industries.
- ▶ EP3/Chile and CIPMA delivered three two-day training courses in pollution prevention for the dairy industry (in Valdivia), salmon production and processing (in Puerto Montt), and the chemical processing industry (in Santiago).

Table 5.1-2 summarizes the participation of different stakeholder groups in the 84 training and outreach events conducted by EP3/Chile throughout the program.

**Table 5.1-2
Participation in Training and Outreach Activities by Sector**

Sector	Total No. of Participants	Percentage
Industry	1,061	42.5
Government	309	12.4
NGOs	252	10.1
Universities	752	30.1
Consultants	123	4.9
Total	2,497	100.0

Pollution prevention training modules and course materials were developed by EP3/Washington and specifically tailored for use in Chile. This included translating materials into Spanish, incorporating information related to the specific economic characteristics of the regions where training was provided, and providing industrial or urban sector examples from Chile.

Policy Development

Although EP3/Chile got a late start in the policy arena, the program had an important impact on government officials' attitudes and policy with respect to pollution prevention and cleaner production.

EP3/Chile helped develop significant opportunities for cleaner production policy reform at the Chilean Ministry of Economy (MoE). Largely as a result of EP3's influence, the MoE has started to pursue pollution prevention activities, both at the national policy level and at the industrial sector/plant level. Most of this work is funded by the World Resources Institute and managed by INTEC, a state-owned technology institute.

In the fall of 1997, MoE established a 14-member Public-Private Committee on Clean Production. In a mission-oriented document published by the Committee in July of 1998, EP3 is presented as an important demonstration project for cleaner production in Chile. The Committee intends to use the experiences of EP3 companies as an input to its study to assess possible incentives and disincentives for adopting cleaner production in Chilean industry as a priority option in managing industrial wastes.

Qualitek, the consulting firm that managed EP3/Chile, was awarded an MoE project to develop a cleaner production strategy for Chile, "Diseño de Una Estrategia Estatal de Fomento a la Producción Limpia."

5.1.3 Project Milestones

The major events of the EP3 program in Chile are presented below. More details about EP3's activities in Chile can be found in the program's final report "EP3: Proyecto de Prevencion de la Contaminacion y Eficiencia Industrial" (in Spanish). Also see Appendix A for the list of EP3 deliverables.

**Table 5.1-3
Project Milestones: Chile**

Milestones	Dates
First PPDAs conducted	November 1993
Train-the-Trainer workshop with WEF and CONAMA	May 1995
Information center established in Santiago	September 1995
Breakfast meetings for several industrial sectors	April-July 1996
Leadership Conference	September 1996