POLLUTION PREVENTION IN CHILE
LESSONS LEARNED

The Environmental Pollution Prevention Project (EP3) was a $1.3 million, 3-year demonstration effort. It successfully introduced the concepts of pollution prevention and clean production to Chile's industrial sector. Twenty-six Pollution Prevention Diagnostic Assessments were completed at individual factories. The firms invested $1.4 million which generated annual savings of $1.9 million. They reduced their pollution load by 32 percent. Compared to "end-of-pipe" pollution treatment, firms found that with EP3 pollution prevention they could save money while also reducing environmental pollution. Pollution prevention is now fully accepted throughout Chile's industrial sector. While EP3 was successful at selling the pollution prevention message and having 26 factory demonstration efforts, there were some missed opportunities. The lessons that emerge from this assessment are summarized below.

1. **Institutionalization.** *A pilot effort is an excellent way to experiment and test ideas and methods, but it should include a plan to scale-up, disseminate and sustain successful approaches.*

EP3 assumed that pollution prevention techniques, once adopted, would generate substantial benefits. Firms would recognize the value of the EP3 approach and it would be adopted throughout the economy. EP3 was successful in creating a cadre of pollution engineers and working with the private sector. But it did not extend its message throughout the industrial sector and failed to develop close ties with the government or NGOs. There was no institutional arrangement to carry on the effort after USAID assistance ended. **When designing a pilot project, and as a project is implemented, a plan needs to be developed to make sure that benefits are sustained once the project ends. That usually requires an institutional structure with adequate funding and skills to maintain project benefits.**

2. **Replication.** *EP3 helped firms reduce pollution, increase profits and improve their competitive position. But participating firms were reluctant to share the newly learned techniques with their competitors.*

EP3 recognized that Pollution Prevention Diagnostic Assessments had to be customized to the unique production process of participating firms. But each firm closely guards its production techniques, not wanting to help its competitors. Agreements were made to protect this proprietary information. As a result there was limited dissemination to other firms in the same industry. The exceptions took place when the audit was done at a firm where the owner was an influential leader in the industry trade association. **Replication will not take place if it is a trade secret. A project needs to develop ways to replicate generic pollution prevention approaches**.

3. **Which types of firms to focus on?** *Good factory managers are those who understand costs, product development and marketing. They did well with pollution prevention.*

In Chile, firms with severe pollution problems often had financial problems due to weak management. They were producing the wrong product mix with inefficient machinery. They were the "losers." In contrast, good managers saw pollution prevention as an integral part of efficient production. They adopted pollution reduction and waste minimization as a way to save money and improve product quality. There is a tendency for pollution prevention programs to focus on the firms with the worst pollution problems. That may not be the best approach to achieve a sustained impact. **Pollution prevention efforts stand a better chance of success if they identify and work with the more progressive and better managed firms.**

4. **Timing**. *It is important to be "ahead of the wave," but if a pollution prevention program is too far ahead of a country's environmental consciouseness, benefits will be limited.*

When EP3 was launched environmental interest in the government and industry had just begun to grow. Chile had almost no environmental regulations in place. The law requiring Environmental Impact Assessments, the start of enforcement of pollution regulations and the establishment of CONOMA all took place as the project was coming to an end. Without regulations, or enforcement, the project focused on selling pollution prevention directly to industry as a cost-saving measure. That proved to be a difficult task. **If pollution laws are not in place, a pollution prevention program may need to work first with a country to develop its environmental policies and regulations, rather than trying to convince industry to adopt pollution prevention measures.**

5. **Regulation.** *Cost-savings alone may not be enough of an incentive to convince firms to adopt waste minimization and pollution prevention programs.*

Until the early 1990s, pollution laws were few and enforcement was rare. In addition, Chile had a history of a strong central government with the military in control up until 1990. Business leaders and the government still had an ingrained command and control mentality. With little concern about pollution and the absence of regulations, the project had difficulty convincing a large number of firms to adopt clean production measures. Many firms viewed pollution prevention as a cost that might not generate any return on investment. Several years later, firms became interested in clean production and pollution prevention when they faced the threat of pollution fines, government sanctions and penalties charged by the wastewater authority. **While both the "carrot and stick" (cost-savings and regulations) are important in motivating firms to take action, regulations and fines clearly focus the attention of factory managers and create demand for pollution prevention measures.**

6. Wholesale vs. Retail. *A project can not hope to reach all firms directly; it needs an intermediary to spread the message.*

There are 17,000 small- and medium- sized industrial firms in the Santiago metro area. EP3 realized it couldn't reach all of them directly, so it worked with industry groups and trade association. In some cases the associations were quite active and involved all members. However, such efforts had only limited success. The EP3 approach of providing general public training sessions and dealing with one factory at a time did not succeed in reaching very many firms. **A project can not hope to succeed with a "retail" approach. Impact will be greatest when an institutional structure (such as an industrial trade association or a clean-production center) exists to actively disseminate pollution prevention findings throughout an industry.**

7. An Integrated Approach. All pollution problems can not be solved solely by Clean Production and Pollution Prevention.

Many industries have already made capital investment for pollution control equipment. These systems must be considered as part of an integrated approach to pollution reduction. Cross-media effects must also be considered, e.g., solving a water pollution problem may result in the creation of air quality or solid waste disposal problems. One problem may simply be traded for another --- but not identified if the focus of the program is exclusively pollution prevention in one area. At least a rudimentary life cycle analysis should also be performed on the input materials, as well as the products. Change in input materials may reduce process wastes but may also increase or decrease environmental impacts associated with production and delivery of input materials, or may shift the environmental burden to another sector of the economy. **A balanced approach that considers integration of the industrial process, from start to finish , must be employed. The approach must consider inputs and their origin, cost effective clean production and pollution prevention measures, and sometimes end-of-pipe applications, and a reasonably complete life cycle analysis.**