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# FINAL REPORT

## ONGOING SUPPORT FOR CLEANER PRODUCTION PROGRAMS IN LATIN AMERICA AND THE CARIBBEAN

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# Final Report

## Ongoing Support for Cleaner Production Programs in Latin America and the Caribbean

## Contract No. LAG-I-00-98-00019-00
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**Disclaimer**

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.



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## 1. BACKGROUND

The economic slowdown in most industrial economies shortly after the turn of the new century, as this program started, challenged the resilience of economies in the LAC region. Their ability to weather recessions is partly determined by their level of exposure to the international economy, and also by the competitiveness of industry, manufacturing, and the service sector. The ties between cross-cutting issues such as economic growth and development, good governance, and environmental protection manifest themselves in different ways when the economic climate becomes volatile or uncertain. Industry may respond through labor force reductions, and resulting social pressures can test the very fabric of governing institutions. Companies unable to consider and implement innovative and creative approaches to business can be threatened, while firms that increase competitiveness, as through cleaner production, can manage risks to better weather difficult business conditions and position themselves to thrive when the economy improves.

USAID has invested critical resources since 1993 to promote the adoption of cleaner production practices to prevent and control water pollution and encourage energy efficiency. Key initiatives have included HFTE, Environmental Initiative for the Americas, Environmental Pollution Prevention Project (EP3), and the Environmental Law Program (ELP). Central elements for all of these and other projects have been to:

- Demonstrate to both industry and government the economic and environmental benefits (in terms of water, energy, solid waste, air and other natural resources) of cleaner production practices;
- Increase the overall level of technical knowledge within the LAC region, so that industry will be capable of implementing cleaner production practices;
- Assist countries to develop policies, tools, and regulatory frameworks that provide greater flexibility for industry in achieving compliance objectives; and
- Assist industry in developing tools and approaches, such as an inventory of case studies, and one-on-one auditing efforts with local experts, that encourage the adoption of cleaner production practices.

This Task Order allowed USAID's Latin America and Caribbean (LAC) Bureau and Economic Growth, Agriculture and Trade (EGAT) Bureaus to further introduce cleaner production and build upon previous programs. The focus under this task order was to develop several innovative programs and studies to enable stakeholders in the LAC region to catalyze specific opportunities for adopting cleaner production. Each activity was designed to focus on one of the following three themes: (1) supporting cleaner production centers and similar organizations; (2) addressing barriers to the acceptance of cleaner production concepts and practices; (3) facilitating information sharing and networking regionally. Of the nine activities and sub-activities undertaken through this task order, we conducted three programs geared toward each of these three themes.

# 2. CLEANER PRODUCTION TRAINING FOR THE ANDEAN REGION

Providers of cleaner production (CP) technical assistance in the Andean region, and indeed around the world, face a difficult task in persuading the private sector to take advantage of the services they provide. In most countries, regulatory incentives for investing in pollution prevention are weak or non-existent, and most business managers assume pollution prevention is equivalent to pollution control, in other words, strictly an economic cost from a business standpoint. Thus, providers of CP technical assistance must bridge formidable information gaps and attitudinal barriers to persuade clients about the potential cost savings achievable through cleaner production. PA sought to conduct training activities to address these issues while assisting Andean cleaner production centers (CPCs) and government officials in developing and implementing their services and programs.

## 2.1 EMS TRAINING

### 2.1.1 Task

Cleaner production is one component of environmental management. As a means to build greater capacity on the broader aspects of environmental management systems (EMS) within the CPCs in Bolivia and Peru, PA Government Services will conduct a training session for staff at each center. The objective of this task is to train technical staff at these CPCs in techniques to effectively develop industrial environmental management systems based on CP strategies. Another important objective of this task will be to provide training on planning and implementing an EMS based on the ISO 14000 standard. The program will provide theoretical and practical training to the staff, and serve as the basis for the EMS services these CPCs provide to industry and municipalities in the future. As such, the training will enable staff to describe and market their services to the private sector, industry associations, and government institutions to garner interest and demand for their services and form strategic partnerships. The training program will focus on the following issues:

- How to integrate CP into an EMS framework
- How to implement CP recommendations under an EMS framework; this will include a CP audit and in-plant EMS implementation work
- How to document results and develop a sustainable program for the industry

### 2.1.2 Accomplishments

*A. PERU*

In September 2002, PA conducted a training for staff at the Centro de Eficiencia Tecnológica – Perú (CET) on incorporating CP strategies into an EMS. Given the strategic value of this training and consistency with Mission targets, the activity was implemented leveraging full funding from USAID/Peru.

In Peru, PA introduced EMS and ISO 14001 to the CET staff, relating both to cleaner production. The CET found the presentations to be of a high quality, very didactic, and they were able to relate the instructor's information and practical experience in these topics to the local context.

PA also discussed CP business development per the model in Mexico, including the services offered, model reports, questionnaires used, etc. The group discussed methodologies for service delivery and proposals developed by the CET related to EMS. This information served as a basis from which to consider the development of the CET's evolving menu of services.

*B. BOLIVIA*

In Bolivia, PA conducted a similar training with the Centro de Promoción de Tecnologías Sostenibles (CPTS) as well as an EMS implementation at one company. While we planned this for February 2003, complications due to civil violence in La Paz forced PA's consultant to evacuate the country after barely initiating the training. PA continued the process via e-mail and telephone, guiding CPTS through the various topics in a more distance-learning format.

To continue the activity, but with funding from USAID/Bolivia, in May 2004, PA returned to La Paz to implement the EMS at a quinoa processing plant. During this visit, the team started by reviewing a previously completed cleaner production audit in the quinoa plant. Over the course of three days, the team visited the plant to learn details about the production process and observe all stages of production. The team interviewed all plant employees following a questionnaire that PA has effectively utilized in Mexico, learning about environmental management at the plant, and gleaning information about training and environmental priorities and legislation.

With this support from PA, both CET and CPTS now have the internal knowledge and experience to pursue similar business opportunities with other clients in their respective countries.

### 2.1.3 Recommendations

- In Peru, conduct follow-up with CET to ensure that they have maximized opportunities to penetrate the EMS services market. Consider follow-up training or shadow EMS audit opportunities.

- In Bolivia, conduct follow-up with CPTS to ensure that they have maximized opportunities to penetrate the EMS services market. Explore the potential for the application of EMS principles within municipalities.

### 2.1.4 Key Deliverables

- EMS training session for the cleaner production center in Peru (CET) (funded by USAID/Peru)

- EMS training session for the cleaner production center in Bolivia (CPTS)

- Implementation of EMS at one company in Bolivia with CPTS (funded by USAID/Bolivia)

## 2.2 CAPACITY BUILDING FOR ANDEAN POLICY OFFICIALS

### 2.2.1 Task

An environmental business exchange to the U.S. is a mature approach for capacity building with Andean policy officials, and builds on USAID's multi-faceted strategy to improve CP implementation through strengthening technical capacity, financing options, and policy incentives. Regulatory officials at these CPCs should be exposed to U.S. models of voluntary programs, policy incentives, and other regulatory measures that recognize the value of cleaner production approaches. To this end, PA will lead an environmental business exchange with government officials from the Andean region (Bolivia, Ecuador, Peru) to the United States. These officials will visit with representatives such as: Environmental Protection Agency, state level environmental authorities, industry associations, and/or industrial plant managers.

### 2.2.2 Accomplishments

PA made many efforts to select appropriate public sector participants for this activity, and began to developed a preliminary agenda for the program. However, after nearly a year of attempting to recruit the appropriate government officials for this program, we determined that weaknesses within the environmental agencies in these countries, among other reasons, generally made them unprepared to receive this level of assistance. Tense civil unrest in Bolivia made it impossible to confirm participants from the Ministry of Sustainable Development. In Ecuador, frequent personnel changes at the Ministry of Environment presented a similar challenge.

Consulting with the task order CTO in early 2004, PA redesigned this activity to support a workshop in Lima on economic instruments as a means to enhance environmental compliance. Developed in coordination with the National Fund for the Environment (FONAM), and the National Environmental Commission (CONAM), the workshop aligned well with USAID/Peru objectives, and largely leveraged Mission resources.

The workshop *Economic Instruments: Tools for Reducing Industrial Pollution*, was held in June 2004 at the Central Reserve Bank in Lima. The Economic Commission for Latin America and the Caribbean (ECLAC) co-hosted the event. PA relied upon resources from this task order to bring representatives knowledgeable about water and air pollution trading from the U.S. Environmental Protection Agency, as well as a representative from the U.S. Department of State who has been actively engaged in free trade agreement (FTA) negotiations, including the Central America Free Trade Agreement talks, as well as the ongoing Andean FTA discussions.

The program sought to provide a theoretical and practical understanding of the use and application of diverse economic instruments to improve environmental performance within industries in Peru. USAID/Peru funds allowed PA to also invite speakers from Colombia and Chile in order to illustrate experiences with economic instruments from other parts of the Andean region. Together with the expert U.S. and Peruvian speakers, the program presented a well balanced agenda, including case studies. Approximately 90 participants attended, representing the public sector (CONAM, DIGESA, Ministry of Production, Ministry of Economy and Finances, Ministry of Energy and Mines, among others), as well as NGOs and the private sector (represented by chambers, such as the National Society of Industry, SNI). Among topics covered in the program were:

- An overview of policies facilitating environmental management and sustainable development in Latin America.

- A definition of economic instruments and introduction to the appropriate application of voluntary measures and incentives to achieve changes in behavior favoring improved environmental management.

- Implications regarding free trade agreements, including the experiences of NAFTA, CAFTA, and ongoing negotiations between the U.S. and the Andean region to establish a free trade agreement, as well as the long-term goal to create a free trade area of the Americas (FTAA). [This speaker was funded by this task order].

- Industrial pollution charge systems, including their purpose, structure, and requirements for their appropriate application and operation to affect behavior change. This topic included a presentation of a model water pollution charge system established in the industrial city of 10$^{th}$ of Ramadan, Egypt, created with USAID assistance. Another presentation illustrated a water pollution charge system established in Colombia.

- Water pollution and air emissions trading systems being developed now in the U.S. through the Environmental Protection Agency. [Two speakers were funded by this task order for this purpose].

- Waste exchange systems, including international examples and the design of such a system for Peru already developed.

- Tax incentives for the purchase of cleaner technology.

- Deposit-refund systems.

- Air emission bond systems, with an example from Chile.

As part of the workshop, the participants were divided into three working groups, and dedicated one afternoon to consider the pros and cons of various economic instruments to address air emissions, water pollution, and solid waste concerns in Peru.

### 2.2.3 Recommendations and Lessons Learned

From a policy perspective, the Andean countries face institutional weaknesses that perhaps make U.S. models of environmental regulation and compliance beyond their short-term reach. Countries with a weak regulatory underpinning and/or poor enforcement capacity often hope that economic instruments and voluntary programs can help them overcome these failings. Experience shows, however, that economic instruments work best when used to strengthen functioning regulatory and enforcement regimes. There remains a wide knowledge gap in the appropriate application of different economic instruments, and therefore, much more training and institutional strengthening is required in Peru and certainly elsewhere. USAID should also recognize that not only environmental authorities should be involved in such training. Economic instruments

necessarily require the support of other government institutions, such as the ministry of industry, ministry of finance, ministry of health (or environmental health division), etc.

### 2.2.4 Key Deliverables

- Two-day workshop on economic instruments for public and private sector representatives in Peru. Presentations on Water Quality Trading, Emissions Trading, and Free Trade Agreement environmental requirements.

# 3. REGIONAL DISSEMINATION OF ANDEAN CP SUCCESSES

Under previous initiatives, including Task Order 01, Mission driven programs, and other donor and institutional efforts, a wide body of important CP information and case studies has been developed. In the interest to disseminate and replicate model cleaner production program successes and to share lessons learned, PA supported activities designed to disseminate such information to broader audiences.

## 3.1 INFORMATION DISSEMINATION

### 3.1.1 Task

In order to promote the value of CP approaches more broadly between the private and public sectors, PA will disseminate illustrative case studies through publications, CD-ROMs, or presentations at workshops and conferences. For example, one powerful tool in promoting CP concepts is company testimonials. Therefore, PA may support the participation of company representatives at appropriate conferences or events in the region. For example, the CPC in Ecuador is planning a national conference in September 2002; this would be a key opportunity for two company representatives from Bolivia to present their successful CP project experiences.

In addition, PA will translate up to four Bolivian CP case studies into English. This will serve to more broadly disseminate results among donor institutions such as foundations, multilateral development banks, and others. By so doing, USAID seeks to leverage new sources of financial support for CPCs.

### 3.1.2 Accomplishments

*A. CLEANER PRODUCTION CD-ROM*

In 2002, under Task Order 01, PA developed a CD-ROM entitled *Cleaner Production in Latin America and the Caribbean: An Information Resource*, containing documents, case studies, reports, website links, and other information on industrial cleaner production. Where possible, we attempted to include information available in Spanish. PA originally disseminated the CD to the CPCs throughout Latin America, and by the end of Task Order 01 in May 2002, PA had disseminated approximately 300 copies of the CD-ROM.

Under this Task Order, PA continued to distribute this valuable resource, distributing it at conferences, workshops, and other events, as well as responding directly to requests that came from as far away as the CPC in Hanoi and the CPC in Macedonia. Strong word-of-mouth publicity among CP professionals bolstered interest in the resource.

We distributed the CD at events such as:

- *Primera Convención de Producción Más Limpia* hosted with USAID/G-CAP support in Guatemala City in July 2002.
- *First Annual Green Hotels Conference* in Montego Bay, Jamaica in July 2002, hosted with USAID/Jamaica support.

- A CP training workshop in the Dominican Republic at the end of 2002, hosted with support from USAID/EGAT.

- *Mecanismos de Financiamiento para Actividades de Producción Más Limpia* in Antigua, Guatemala in October 2002, hosted by USAID/G-CAP.

- *PROARCA Round-Up*, San Pedro Sula, Honduras, February 2003, hosted by USAID/G-CAP.

- Meetings with USAID and other organizations in Bolivia, Mexico and Peru.

All told, during the course of this Task Order, PA and USAID distributed nearly another 300 copies of the cleaner production CD-ROM, making the total distribution almost 600.

*B. CLEANER PRODUCTION BROCHURE:*

Similar to the CD-ROM dissemination, in June 2002, under Task Order 01, PA published a new Cleaner Production brochure for USAID. The purpose of the brochure was to outline the role of USAID in cleaner production throughout the LAC region, and highlight the objectives and achievements of specific projects.

The brochure served as a primer and introduction for meetings, and was disseminated by PA and USAID at workshops, meetings, conferences, and events in Washington and throughout the LAC region. Over the course of this Task Order, we jointly distributed at least 400 copies of the CP brochure at many of the same events where we distributed the CD-ROM. The brochure reached audiences in the U.S., Central America, Bolivia, Jamaica, Mexico, and Peru, among other countries.

*C. CP PRESENTATIONS AT CONFERENCES AND EVENTS*

- PA pursued efforts to foster south-south cooperation in cleaner production. To this end, PA sent Victor Leaños García of Unagro, a Bolivian sugar company, to Ecuador in April 2003. Mr. Leaños presented at the inaugural events in Quito and Guayaquil to launch the Centro Ecuatoriano de Producción más Limpa's new Interamerican Development Bank-Multilateral Investment Fund program. He presented the pollution prevention measures adopted by Unagro after recommendations by CPTS-Bolivia. Unagro has invested $221,000 in pollution prevention measures, resulting in a $292,000 savings per harvest. They have reduced well water consumption by 66 percent, lead consumption by 89 percent, $N_AOH$ consumption by 33 percent, COD in the effluent by 305 tons per harvest, and reduced sugar losses by 41 tons per harvest. PA leveraged approximately $660 from CEPL to cover Mr. Leaños' local transportation, lodging, and per diem costs in Ecuador. PA only paid the international airfare between Bolivia and Ecuador for him to share the important results from CP efforts at his firm.

- PA assisted to disseminate cleaner production case studies and cleaner production information through the development of presentations for the EGAT Technology Transfer office. Some specific presentations or material used for presentations included:

- *Harnessing Technology Transfer for Sustainable Development Projects*, delivered to a delegation of South African chemical industry representatives, September 2003.

- *Promoting Cleaner Technology in Mining: Andean Region Case Study*, delivered to a SABIT mining delegation from Bulgaria in September 2003.

- *Catalyst for Competitiveness: USAID's Role in a Global Economy*, as a template presentation for the EGAT Technology Transfer Office, which links globalization themes and trade with sustainable development concepts. This was delivered at the LAC Environmental Officer's Meeting in Mexico City in February 2004; also to the RRB Meeting at American University in January 2004.

- PA assisted to disseminate other specific experiences in cleaner production through presentations at various conferences and workshops, including support to EGAT in preparing presentations for delivery. Some of these included, for example:

  - *Promoting Cleaner Technology in Mining: Andean Region Case Study*, delivered by USAID during a meeting at the World Bank, for a delegation of mining representatives from Kazakhstan, October 2003.

  - *Producción más Limpia para el Sector Hotelero* and other key presentations at a workshop in Panama City, Panama in December 2003, supported by USAID/EGAT.

  - *Inauguration of the Jamaica Manufacturers' Association Ltd. Resource Center for Cleaner Production* held in Kingston, Jamaica in July 2004, supported by USAID/Jamaica.

### *D. TRANSLATION OF FOUR CP CASE STUDIES FROM BOLIVIA*

In early 2003 PA translated four key case studies from the Bolivia CPTS experience. By translating from Spanish into English, CPTS expects to more thoroughly disseminate these cases among the English-speaking CP community to facilitate outreach beyond the LAC region and enhance exposure among potential new donors.

The four cases studies included:

- Cervecería Taquiña, S.A., a brewery in Cochabamba.
- Tusequis Ltda., a meat processor in El Alto.
- Ungaro, S.A., a sugar refinery in Santa Cruz.
- Avícola Vascal, S.A., a poultry slaughterhouse in Cochabamba.

*E. OTHER MATERIALS DEVELOPED*

PA developed a one-page handout for the new EGAT/EIT/TT office, *Technology Transfer Office: Catalyst for Competitiveness and Sustainable Development*. This document serves as a primer for events and meetings with colleagues and counterparts, domestic and international.

### 3.1.3 Key Deliverables

- Dissemination of CP materials (CP CD-ROM and USAID CP brochure) at conferences, workshops, events, and meetings as detailed above. Under this task order, we distributed approximately 300 copies of the CD and 400 copies of the brochure.
- South-south cooperation through presentations by Unagro, S.A. in Quito and Guayaquil, Ecuador hosted by the CPC-Ecuador.
- Development of six CP presentations for delivery with diverse international audiences as outlined above.
- Translation of four Bolivia CPTS case studies into English.
- Creation of a new handout for USAID's EGAT/EIT/TT office.

# 4. CENTRAL AMERICA CLEANER PRODUCTION FINANCING

## 4.1.1 Task

PA Government Services will collaborate with USAID/G-CAP and relevant institutions in Central America to identify solutions to cleaner production financing. G-CAP has an ambitious four-year program that seeks to encourage industries to adopt less polluting technologies and has requested LAC Bureau assistance to analyze the barriers to cleaner technology financing. Indeed, a key barrier to environmental technology transfer is the lack of access to financing. PA and G-CAP recognize that several potential solutions exist, but a study will examine whether a regional approach is viable, identify banking institutions that might participate in a pilot effort, and consider solutions such as leveraging multilateral credit lines, creating a loan guarantee program, or other possibilities to overcome this market challenge.

## 4.1.2 Accomplishments

PA collaborated with both USAID/G-CAP (though the PROARCA-SIGMA program), and the U.N. Environment Programme (UNEP), which were simultaneously seeking ways to address cleaner production financing barriers in Central America. In July 2002, PA participated in a CP financing working group meeting hosted by PROARCA-SIGMA, parallel to the *Primera Convención de Producción Más Limpia* in Guatemala City. Other participants included PROARCA-SIGMA staff, CORFO-Chile, UNEP, and the Central American Bank for Economic Integration (BCIE). Discussions focused on the experiences of each organization in cleaner production financing (successes and lessons learned), and possible solutions for Central America. This was a first step that was followed in August and September by national level studies in each country to identify existing sources of financing where cleaner production projects might qualify (funded by PROARCA). PA agreed to co-host a subsequent workshop to study the results identified and develop a strategy for PROARCA-SIGMA for cleaner production financing in the region.

In October 2002, PA co-hosted this follow-up CP financing working group meeting along with PROARCA-SIGMA in Antigua, Guatemala. The program, *Mecanismos de Financiamiento para Actividades de Producción Más Limpia*, included representatives from the BCIE, UNEP, USAID/G-CAP, PROARCA, and PA. The objective of the meeting was to determine potential strategies to address barriers to cleaner production financing in Central America. PROARCA (and in the case of Costa Rica, the Cleaner Production Center in Costa Rica), had completed research to identify existing resources and determine potential institutional partners and approaches to support CP financing. Consultants from each country shared the results of their findings, after which time the group began discussing national and regional strategies, including specific opportunities to work with BCIE.

On the following day, PA and PROARCA's manager for this program discussed the outcomes in greater detail, and considered a range of short, medium and long-term approaches to facilitate CP financing. As an outcome, in mid-December 2002, PA delivered a complete strategy for PROARCA, *Estrategias y Modelos de Financiamiento para Proyectos de Producción Más Limpia en América Central*. With the submission of this document, PA successfully completed this task, but continued providing assistance as possible.

For example, as discussed in Section 7 below, PA continued collaboration with UNEP. Also, PA made minor updates and revisions to the original strategy report for G-CAP. For instance, in considering the application of the DCA loan guarantee for cleaner production in the region, PA re-evaluated possible approaches in order to both maximize access to a DCA facility, as well as ensure regional coverage, even if through multiple banks. In addition, G-CAP invited PA to participate in the PROARCA Round-Up meeting held in San Pedro Sula, Honduras at the end of February 2003 to present the cleaner production topic and strategy. Ultimately, this assistance helped G-CAP to create DCA loan guarantee facilities for cleaner production in five Central American countries through multiple banks.

### 4.1.3 Key Deliverables

- With G-CAP, co-hosted the October 2002 workshop *Mecanismos de Financiamiento para Actividades de Producción Más Limpia* in Antigua, Guatemala.

- Completed a study on barriers to cleaner production financing that presents potential solutions for consideration by G-CAP: *Estrategias y Modelos de Financiamiento para Proyectos de Producción Más Limpia en América Central.*

- Presentation on CP financing strategy delivered at PROARCA Round-Up, *Financiando Producción más Limpia*, in February 2003 in San Pedro Sula, Honduras.

# 5. SUPPORT FOR A WASTE EXCHANGE OR RECYCLING PROGRAM

## 5.1.1 Task

The contractor will examine existing models of successful waste exchange or industrial recycling programs in Latin America and the U.S. to evaluate the potential to replicate efforts in promising countries of Central America or the Andean region. Perhaps the best example in the LAC region currently comes from the Cleaner Production Center (CPC) in Colombia. In this model, firms register offers and requests for residual byproducts, which may be on a one-time or ongoing basis. Partners providing outreach support and coordination for this program include regional offices of the Colombia CPC, chambers of commerce, industry associations, universities, and web portals.

Now that similar CPCs exist in some 13 LAC countries, and an ongoing regional network (led by UNIDO) is forming to share information and successes, there is a greater opportunity to share experiences, such as with an industrial waste exchange program. Waste exchanges also have the potential to create new enterprises by promoting entrepreneurialism in recycling and reuse. These efforts can create new, viable urban employment opportunities. USAID can support many facets of an exchange including start-up operations, developing a web portal to manage listings, technical assistance and training on the various uses for specific by-products, outreach to engage companies, etc.

The contractor will study existing waste exchange/industrial recycling models and prepare a feasibility plan for one interested institution in one USAID LAC country to develop a waste exchange program. The probable candidate is the CPC in Bolivia, which has already taken preliminary steps to develop a waste exchange database. In addition, USAID/Bolivia expects to contribute $30,000 to developing this initiative as it complements ongoing Mission efforts to curb industrial pollution. This activity will incorporate all themes under this task order, that of supporting a CPC, researching barriers to the implementation of such a program, and facilitating information sharing and networking regionally.

Subsequent to the completion of the above noted activities, with follow-on funding added to this task order, PA assisted USAID to provide continuing support to CPTS during a pilot stage process of the waste exchange, as well as support a new waste exchange effort in Peru (see Section 8). Ongoing support to CPTS included assistance to refine the Internet-based exchange platform, develop the pilot program, and analyze the results.

## 5.1.2 Accomplishments

The creation of a waste exchange (Bolsa de Residuos Industriales, BRI) in Bolivia was one of the most substantial undertakings of this task order, and was added through a modification in September 2002. PA initiated the effort in late 2002 by reviewing two major waste exchange models in the region, in Chile and Colombia. Based on lessons learned regarding approaches and modes of operation in these countries, as well as research on waste exchanges globally, PA worked with CPTS and the National Chamber of Industry (CNI) to establish a program suitable to the context of Bolivia, and that would continue working closely with both institutions.

From the outset we were sensitive about the importance to follow the waste management hierarchy: reduce, reuse, recycle. At the same time, we recognized early on that Bolivian

society has no real culture of recycling. This is not to say that reuse and recycling of materials does not occur. On the contrary, as in many poor developing countries, populations living at the margins of society extract all materials of value from waste dumps and landfills. However, this is fraught with associated risks to health and well being.

The key objective of this activity was to promote reuse and recycling. To achieve this, we established information and outreach systems to facilitate industrial and institutional waste reuse and recycling. In addition, PA sought to reinforce cleaner production practices with participating firms so as to reduce waste generation in the first instance; establish a platform for the supply and demand for waste; reduce environmental pollution due to poor waste management practices; and foment new activities and businesses related to solid waste reuse and recycling.

Under BRI, PA led numerous campaigns, each with their own targeted objectives, but with the overall goal of increasing environmental awareness, particularly about waste management, reuse, and recycling. In some cases BRI established the campaigns as part of our overall program start-up approach. In other cases, organizations or institutions contacted BRI seeking assistance to develop their own recycling programs and link into expertise, contacts, and resources available through BRI.

*A. CAMPAIGNS DEVELOPED BY BRI*

*i. Campaign with universities*

This effort consisted of establishing a competition among ten universities to recycle waste materials, primarily PET bottles. PA trained 2,500 students (mostly in technical and engineering fields) on recycling processes within and outside of the industrial sector. All of these students participated in campaigns, PET collection brigades, and waste recycling events with communication messages related to environmental protection and health.

Results through October 2004 were as follows:

| Waste | Weight | Number of units |
|---|---|---|
| Plastic bags | 125.5 Kg (277 lbs.) | 11,922 |
| Cardboard | 554.5 Kg (1,222 lbs.) | - |
| PET bottles | 3,188.0 Kg (7,028 lbs.) | 57,384 |

We also collected more limited quantities of glass and metal cans, although the effort was designed primarily around PET bottles. As is clear from the table above, this was the waste type collected in the largest quantity.

*Collecting recyclable material at Universidad Loyola*

### *ii. Campaign with Private Schools*

During 2004, BRI trained the students, instructors, and administrative staff at one private school in La Paz. In order for this outreach to touch more schools, BRI would need to propose the program when each school is planning their activities and curriculum for the coming year. We caught schools already in mid-course, making it difficult to integrate a new activity such as waste recycling. Even so, as far as we know, this was the first time that all school staff were included in this kind of environmental training, which has enabled the school to teach the children to separate waste as they discard it, and has facilitated recycling at the school. This will serve as an important attitudinal lesson for the children to begin recognizing the implications of waste, and behaving in ways that help to better manage waste.

### *iii. Campaign for Plastic Intravenous Bags in Hospitals and Clinics*

In October 2003, this activity started to collect large quantities of plastic IV bags used by hospitals and clinics. BRI entered into formal cooperation agreements with each health facility to outline the purpose and nature of the relationship between the waste exchange and the institution. BRI took care to place collection containers in five facilities that have regularly recycled this waste, as well as conduct some staff training. Our experience has been that some of the facilities have a good understanding about waste management and always follow the necessary requirements for recycling this waste. Other institution, however—by and large, public facilities—still have no real appreciation for the need to separate waste and manage it according to best practices and standards. Because of this, we lost the value of some collected materials because they were contaminated with hazardous biological wastes that were discarded together with the IV bags.


*Hospital San Gabriel*

To date, BRI has collected 11,504 plastic IV bags, weighing approximately 329 Kg (725 lbs.). In addition, BRI has occasionally benefited from the use of health facility laboratories to conduct analyses related to BRI activities.

To improve upon this program, BRI hopes to (1) expand the number of facilities participating; (2) conduct more training with hospital personnel in each facility; and (3) develop signs, posters, and instructions as reference materials for staff to easily follow and ensure proper handling and separation for recycling.

### *iv. Campaign with Public Schools and the Honorable Mayor's Office – La Paz*

This effort began with contacts between the BRI and Mayor's Environmental Quality Directorate. BRI began by providing environmental education to children at 10 public schools, aged 7. At each school we installed recycling bins donated by various Bolivian companies. Over time, this program grew to include 41 schools, conducting environmental education outreach to some 31,800 children from grades 3 to 5.

One of the key challenges working with these schools has been that many of their recyclable wastes also have organic residues from discarded food and beverages. The materials must be picked up frequently—every two days—which the BRI cannot do. BRI could collect the materials if the city could transport the waste to a transfer station. Indeed, the key next step is to implement a more efficient transport solution.

Through this effort, BRI has collected 1,643 Kg (3,622 lbs.) of plastic bags, representing approximately 161,014 milk bags, as well as 168 Kg (370 lbs.) of paper, and 98 Kg (216 lbs.) of PET bottles.


*Recycling posters made by children at the Juan Herschel school, part of teaching waste separation*

## *B. CAMPAIGNS DEVELOPED BY OTHERS AND ASSISTED BY BRI*

### *i. Campaign to Recycle in Copacabana*

After the Center for Community Studies (Centro de Estudios Comunitarios, CIEC) had monitored the pollution level in the tourist center of Copacabana, they realized that plastic was one of the most prevalent wastes contaminating the area. Based on this, CIEC contacted BRI seeking support to assist with recycling their plastic waste. The organization worked with the municipality and BRI to develop a solution.

This included (1) establishing a working group to collect plastic waste (especially PET bottles) around the municipality one day prior to trash collection; (2) using the same people to remove labels and clean the plastic waste for recycling; (3) establishing a transfer site for the plastics collected to facilitate later transport to La Paz by BRI.

Among the important achievements of the project are:

- The quantity of plastic waste on the streets of Copacabana and the beaches of Lake Titicaca have notably reduced, as monitored by CIEC. In newspaper ads, the organization has applauded the response of the community to clean their environment, further reinforcing community pride in environmental stewardship.

- three women have improved their income through the sale of the recyclable waste they collect and prepare for resale. While they did not previously have any regular income, they now jointly earn over Bs. 800 (US$100) per month. While this obviously represents a very modest income, it is an important start toward employment and a regular income.

The key challenge with this initiative remains the difficulty of transporting the waste to recyclers in La Paz and El Alto. The volumes collected in Copacabana are significant, and the capacity of BRI to transport them is rather limited (in volume per trip as well as frequency of trips). One possible solution is to crush the plastic, or make plastic chips on-site, which would substantially reduce the volume and enable transport of larger quantities per trip.

Recycling results from this campaign have been as follows:

- 1,008 Kg (2,222 lbs.) PET bottles
- 326 Kg (719 lbs.) polythyrene

*Plastics collected in Copacabana*

*ii. Campaign to Collect Plastic – Honorable Mayor's Office in Llallagua*

This initiative came from the Environment Directorate within the municipal government of Llallagua, which invited BRI to participate in and organize a system for municipal solid waste management. We first conducted training on topics including environment, recycling, and occupational health in Llallagua, Catavi, and Siglo XX in the fall of 2004. The trainings were held in schools, universities, and institutions of these three mining towns north of Potosí. In each locality, a working group coordinates recycling and collects waste for transport to La Paz and Oruro to sell to recyclers with assistance from BRI. The trainings reached children in grades 3 to 5 from six public and one private schools, 120 university students at the Universidad Siglo XX, and 70 members of various institutions within the municipality.

A major achievement of this effort is that BRI has simultaneously expanded its outreach and impact while building on what is otherwise an entirely locally-driven initiative. This has demonstrated the very serious level of interest and commitment by this municipality, and ensures a sustainable impact. Llallagua officials have efficiently supported BRI with all local preparations, planning and logistical support. The effort also demonstrates that BRI's role is coming to be recognized on a more national scale, and that it can in fact offer important support to fulfill municipal needs pertaining to solid waste management. Since the waste exchange started with an industrial focus, it is notable that BRI has actually played a critical role in promoting environmental education at many societal levels, including municipal operations.

Considering the short time period of support provided to the municipality, they have collected a substantial quantity of recyclable materials: 1,946 Kg (4,290 lbs.) of PET bottles, 500 Kg (1,102 lbs.) of plastic bags, and 1,000 Kg (2,204 lbs.) of paper. However, BRI is still working

on transport solutions since this cost often exceeds what can be justified to bring the material to recyclers in La Paz.

*iii. Campaign with the Schools in the Zona Sur*

This effort grew from a desire by the mothers of the students at the Calvert school to begin a recycling program. It subsequently expanded to include other schools: Franco Boliviano, Alemán, and Colesur. Working with the many volunteer mothers, BRI assisted to consider recycling solutions for the schools and to provide training. At the same time, BRI expanded the effort to collect wastes at the USAID/Bolivia Mission.

Recyclable materials collected from this campaign are given to a Center for Street Youth in El Alto, thereby establishing a linkage of mutual benefit, and one of strong interest to the mothers of the school children. This also effectively links two USAID programs since the Center for Street Youth receives support from USAID/Bolivia's democracy initiative. While we have provided environmental education to both groups, they now also share a better understanding of each other and can unite in the effort to create a cleaner and more environmentally sustainable Bolivia for the future.

*Calvert School collection bin*

Among the results of this campaign are the establishment of a collection center in El Alto, with labor support from the local street youth. We have also recycled the following materials:

- 987 Kg (2,176lbs.) of plastics
- 265 Kg (584 lbs.) of glass
- 149 Kg (328 lbs.) of paper
- 1,687 Kg (3,719 lbs.) of PET bottles

*Collection Center in El Alto*

BRI has supported the creation of the Center for Social Reinsertion Wasitata Yuriñani, an initiative receiving USAID democracy program assistance to help street youth in El Alto. Given severe poverty and lack of opportunities in the city, the program provides a meaningful support system for young people to earn an income and live under a safe roof. PA trained these youth, some of who now support La Papelera's new plastic recycling facility in El Alto.

*Street youth working at the Centro Wasitata Yuriñani sorting waste paper*

### *C. BROKERING THE SALE OF WASTE MATERIALS FROM COMPANIES, INSTITUTIONS, AND INDUSTRIES*

The BRI has always operated to serve public and private institutions to broker offers and demands for reusable waste byproducts. Organizations sometimes donate waste to the BRI, while at other times BRI pays a market price to purchase them. In brokering wastes, BRI has commercialized the following quantities of recyclable waste:

- 39,850 Kg (87,854 lbs.) of scrap metal
- 2,950 liters (779 gallons) of used motor oil
- 498 Kg (1,098 lbs.) of white glass
- 765 Kg (1,687 lbs.) of high density polythyrene
- 398 Kg (877 lbs.) of low density polythyrene
- 387 Kg (853 lbs.) of sawdust
- 285 Kg (638 lbs) of cardboard

### *D. LEVERAGED SUPPORT FOR BRI ACTIVITIES*

Many institutions have supported the growth and development of BRI activities to bolster USAID's core funding. This support has come in the form of office space, collection containers, a transport vehicle, logos and promotional material, etc., valued at over $16,000. We provide a summary of the items donated to BRI in the table below:

| Company | Material Donated | Quantity | Value $Us. - |
|---|---|---|---|
| La Papelera S.A. | Waste paper bins made of recycled cardboard | 500 | 725.00 |
| Laboratorios Alfa Ltda | Recycling bins for IV bags | 14 | 112.00 |
| La Cascada | Interim holding bins for IV bags | 50 | 115.00 |
| Monopol | Paint to logos on IV bag recycling bins | | 40.00 |
| Sodefac | Plastic bags for recycling collection | 700 | 91.00 |
| Danida | Business card holders made from recycled wood | 100 | 384.62 |
| Soboce | Recycling bins for use in schools | 3 | 22.50 |
| Laboratorios Bago | Recycling bins for use in schools | 4 | 30.00 |
| Inquidor | Recycling bins for use in schools | 4 | 30.00 |
| Ametex | Recycling bins for use in schools | 12 | 90.00 |
| Embol | Recycling bins for use in schools | 8 | 60.00 |
| Simsa | Recycling bins for use in schools | 12 | 90.00 |
| La Papelera S.A. | Recycling bins for use in schools | 24 | 180.00 |
| Cámara de Industrias | Use of office space for consultant | 12 meses | 360.00 |
| Cámara de Industrias | Internet access for consultant | 12 meses | 300.00 |
| Cámara de Industrias | Coffee breaks for consultant | 12 meses | 60.00 |
| Sigla Editores | Paper visors with BRI logo for campaign | 1000 | 126.58 |
| Soboce | T-shirts for campaign | 100 | 300.00 |
| Cia de Alimentos - Delizia | Ice cream for campaign | 120 | 8.00 |
| La francesa | Cookies for campaign | 140 | 19.00 |
| Soalpro | Cookies for campaign | 140 | 19.00 |
| Inal Ltda | Ice cream for campaign | 120 | 12.00 |
| Danida | In-kind support from Ninotschka Calderón (CNI) | 12 months | 7,200.00 |
| Danida | In-kind support from Freddy Chavez (CNI) | 12 months | 4,800.00 |
| Danida | Courier mailings | 154 | 29.62 |
| National Catholic Conference | Use of truck to transport materials | Savings 800Bs/mo. | 1,113.92 |
| **Total private support to BRI in US$** | | | **16,318.24** |

## *E. TRAINING*

Summarizing all of the training that PA conducted in environmental education, recycling, and other related topics, through the campaigns already noted above, PA conducted some 174 trainings at primary schools, secondary schools, universities, and professional institutes in La Paz, El Alto, Copacabana, Llallagua, and Oruro. These events reached approximately 46,465 persons. The topics covered generally emphasized environmental awareness education and recycling / waste separation, although the specific content varied by audience. PA conducted interventions at:

- 11 universities
- 3 technical universities
- 9 primary and secondary schools
- 4 institutions (including government and a shelter for street youth)

## *F. PUBLICITY*

BRI enjoyed fairly strong publicity through various media outlets in Bolivia, and particularly in La Paz where activities were centered. During 2004, BRI received the following media coverage about its activities:

- Print media: 8 articles in three newspapers
- Television: 5 appearances on 3 stations
- Radio: One interview.

## *G. OTHER ACHIEVEMENTS*

- Provided recommendations and technical assistance to the municipality of La Paz in the process of issuing a new tender for trash collection services. Partly through recommendations from BRI, the municipality included a provision in a new 5-year tender issue that the service provider must separate wastes for recycling.
- Catalyzed the creation of a new paper recycler in El Alto. In the course of its activities in recycling plastic, BRI already worked with established paper company La Papelera, S.A. The firm decided to diversify its activities by investing in a new PET bottle recycling facility, and has employed street youth from the community trained by PA and jointly receiving support from USAID/Bolivia's democracy program.
- Through its website, www.residuos.org.bo, the waste exchange has developed and made available extensive information resources about legal and technical issues,

such as cleaner production. It is also a platform to buy and sell wastes among participating organizations.

- In its short time of operation, BRI has seen the market price of certain recyclable materials increase substantially on local markets, increasing the value of recycling for those involved in the trade. Plastics and PET bottles, in particular, have seen price rises on the order of 300%.

### 5.1.3 Recommendations

Looking to the future, PA considers the following suggestions for the continued operation and growth of the BRI.

With respect to the continuation of ongoing efforts we note the following:

- The campaigns with public and private schools require a more formal system for transporting materials, particularly considering the fact that schools continue to join the program, and BRI has limited capacity. Baring recycling pick-up by the municipal solid waste management contractor, one option would be for each sub-mayorship to establish a transfer station where BRI could collect one time per week.

- The plastic IV bag initiative should be easily expand to additional facilities, including the La Paz General Hospital and perhaps others in the interior of the country, by providing the appropriate training.

- The effort in Copacabana could be strengthened by encouraging more local handling, including the creation of companies to handle collection, selection, and re-processing (depending on the material and potential local or regional market). BRI already is considering ways to replicate the Copacabana effort in other tourist destinations, including Coroico-Yungas, Tiwanaco-Altiplano, and mining centers such as Oruro.

The following include new activities that the BRI might consider as it seeks to grow and strengthen. Such efforts should consider support, development, and incentives for private sector participation for sustainability, and with a continued eye toward pollution prevention and best environmental management practices. Through training and assistance in implementation, BRI can help industries to access and participate in a more robust waste market.

- Foment cleaner production within recycling firms. In BRI's experience, it is often the case that the recycling firms (informal and formal), often do not employ best practices themselves. They could be more profitable and successful in their line of work if they were to undergo an environmental audit and rationalize their own processes for recycling. In-plant assessments and training could do a great deal to improve environmental and economic performance.

- BRI should assess ways to expand its reach to additional localities in Bolivia. It is already considering how to do so in the departments of Oruro, Cochabamba, and Chuquisaca. Such efforts would work with local firms in coordination with the regional Chambers of

Industry. As has been noted, some limited efforts in this regard have already begun, often through specific requests from authorities and organizations in the various departments.

- Assess the possibility to establish community recycling transfer stations. Working with the municipalities of La Paz, El Alto, and Viacha, BRI and municipal authorities could establish a means to directly purchase recyclable materials from residents, for subsequent transfer to the appropriate recycling firms. BRI could conduct training in the communities to launch the program and support its ongoing operation.

- Reinvigorate BRI's original vision to lead in waste material reuse research and testing, to find new applications for waste byproducts in production processes.

- Strengthen linkages with additional waste exchanges throughout the Latin America region. Based on contacts already established with waste exchange programs in Chile, Colombia, Peru, and Central America, much information can be shared regarding lessons learned, innovative approaches, and new ideas.

### 5.1.4 Key Deliverables

- Compilation of waste exchange models in Chile and Colombia: *Bolsa Nacional de Residuos y Subproductos Industriales (BORSI); Artículo para la Revista BORSI, Trip Report to Chile.*

- Report: *Establecimiento de la BRI.*

- Support to CPTS and CNI to create, develop and operate the waste exchange.

# 6. STUDY TRADE INCENTIVES

## 6.1.1 Task

Historically, USAID has focused strong attention on best practices for industry. While firms can achieve significant efficiency gains and pollution reductions through such "good housekeeping" measures, more significant improvements require changes in production and manufacturing technology. Since several Missions continue to prioritize industrial pollution threats (including Bolivia, G-CAP, Jamaica, Mexico, and Peru), this is a natural moment for USAID's cleaner production strategy to evolve toward a greater focus on technology transfer through trade. Indeed, USAID/Peru and LAC have already recognized the need for such a focus by creating a DCA portfolio loan guarantee that will extend financing to small and medium-sized enterprises for cleaner technology investments. However, USAID requires a deeper understanding of other drivers that influence a company's decision to invest in cleaner technology.

The U.S. is recognized as a world leader in the area of environmental technology and therefore has a strong competitive edge. Furthermore, the U.S. dominates the share of imports of many Latin American countries, and U.S. goods are often preferred to alternatives based on quality, cost, and ease of availability. What is more, with fast track trade negotiation authority a real possibility this year, the Bush administration is likely to reinvigorate efforts toward creating the Free Trade Area of the Americas (FTAA).

Incentives to trade can serve as an important driver to promote environmental technology transfer, while tariffs and other barriers hinder technology innovation. With this task, USAID seeks to understand which factors facilitate and hinder trade for environmental technology in order to most effectively promote eco-efficiency within industry in LAC countries. The study will seek to examine existing trade incentives in selected countries of the Americas, and assess the state of environmental technology import tariffs and trade regulations. Pollution prevention technologies should have favorable import policies that serve to reduce industrial pollution and make LAC industries more competitive. At the same time, such policies would open markets for U.S. environmental technology providers. The study should identify best policy practices for the Americas in order to promote trade in pollution prevention technologies.

## 6.1.2 Accomplishments

From the outset of this activity in early 2003, in consultation with the CTO, PA narrowed the scope in order to develop targeted recommendations that would most likely provide genuine guidance to catalyze technology transfer through best policy practices. To do so, we selected one sub-sector, food packaging.

We felt that the negotiation of non-tariff barriers is of significant importance for Latin American exporters, more so than tariff barriers in the case of Central America, which have decreased during the last years thanks to the unilateral benefits of the Caribbean Basin Initiative. Sanitary and Phytosanitary (SPS) regulations--including their environmental components--required by the US government are one (if not the most) important import barrier for manufactured or fresh food products originating in the region.

SPS regulations are applied not just to the food product itself, but also to the packaging materials used. As the food industry requires convenience and freshness, modern food packaging does more than just contain food. Packaging must catch the consumer' eye, provide value, be functional, assure product stability during storage and transportation, inform the consumer and authorities on the characteristics of the product, reflect any environmental/social certification, etc. Some technological developments have improved product attractiveness and stability but have also represented an increased environmental threat, like the utilization of metals, or the combination of different plastics in multi-layer packaging, which can be difficult to recycle. Therefore, product packaging and packaging waste is an area where international environmental and health regulations interact with the development and implementation of new products and materials.

The Food and Drug Administration (FDA) is the agency responsible for regulating food packaging in the US. FDA has certain standards that the food packaging industry must adhere to, including packaging materials and labels used by export companies sending products to the US. Constant research and regulations on health and environmental packaging issues may constitute a trade barrier for the Latin American food and beverage industry if it is unable to comply or adapt to those requirements in a reasonable period of time.

PA conducted extensive research, and in June 2003 attended an international conference on packaging materials in Mexico City. PA subsequently submitted the full report in October 2003, *Processed Food and Beverage Packaging: Environmental Policies for International Trade with Latin America* (also made available in Spanish). Some of the findings were that packaging material is indeed an important factor in international trade for the food and beverage industry. Since exporters seem to have the capability to make rapid adjustments according to needs and requirements, it does not appear that packaging material is a significant barrier to trade. On the other hand, firms unfamiliar with the regulations or which otherwise do not recognize their importance could face serious barriers to entry to international markets with an environmental conscience. For example, some firms may use dyes containing heavy metals in labeling, or plastics with additives.

Another issue is legislation in developed markets, which makes the packaging company or importer legally liable for the final disposition of their packaging waste. In this sense, importers look to ensure that packagers take into consideration this issue and simplify the import process. Therefore, importers favor firms that meet all of the existing regulations (ensure prohibited materials are not used, labeling is correct, etc.), as well as those that incorporate concepts such as waste minimization (strong but light weight materials, elimination of secondary packaging), and eco-design (easily recycled materials such as PET instead of PVC, or lighter materials to reduce energy costs of transportation, or the use of partially recycled materials). Another global trend is the regulation of additives in plastics, which can make recycling difficult.

Some innovative policies could be adopted by Latin American countries to improve the international competitiveness of their products, as well as more effectively harmonize legislation with policies in developed markets for waste minimization, reuse, and recycling. It appears that plastic is among the key challenges in Latin America, since glass, aluminum, and paper have higher levels of recycling and pose less of an environmental hazard. However, because of its value in marketing and technological advances (flexible packaging and "intelligent packaging"), plastics continue to be the preferred packaging material for the food and beverage industry.

### 6.1.3 Key Deliverables

- Proposed best policy practices for environmental technology transfer and trade related to the food and beverage sub-sector in the report, *Processed Food and Beverage Packaging: Environmental Policies for International Trade with Latin America.*

# 7. FINANCING MECHANISMS FOR INDUSTRIAL CLEANER PRODUCTION

USAID has supported efforts to remove barriers to financing cleaner production in the LAC region since 1999. The challenge of bridging the divide between entrepreneurs and bankers remains a difficult task because small and medium-sized enterprises (SMEs) have a limited understanding about bank expectations, and the financial sector tends to view all environmental projects through the prism of perceived risk rather than through a thorough understanding of cleaner production.

Various donors, including USAID, have supported the creation of cleaner production centers in 13 LAC countries. While some are established and others are quite new, the lack of financing has continued to stifle the wider adoption of cleaner technologies. Each center is helping companies to consider economically viable and environmentally sound process and technology changes and upgrades to improve competitiveness and environmental performance; yet, technological changes are very limited without greater participation from the investment community. To address this, under Task Order 01, USAID established a Development Credit Authority loan guarantee in Peru to facilitate cleaner production lending. Under this Task Order, USAID sought to continue to support efforts in the region to address the financing challenge.

## 7.1 DISSEMINATION OF DCA PERU EXPERIENCE

### 7.1.1 Task

As a pilot step during 2002, the LAC Bureau and the Peru Mission have joined efforts to create a loan portfolio guarantee for cleaner production and energy efficiency in Peru through the Development Credit Authority (DCA). Collaborating with USAID/Peru, LAC will provide back-up support for ongoing monitoring of the DCA Peru program to disseminate the results as a case study among the Missions and CP community in the region. Specifically, the Missions in Bolivia, G-CAP and Jamaica, have expressed interest in utilizing DCA for cleaner production and/or environmental management. In this way, the results from Peru will serve as an important case study for these Missions to analyze.

### 7.1.2 Accomplishments

Under the Peru DCA Loan Guarantee Fund for Enterprise Competitiveness, the Banco de Crédito del Perú, through the end of 2004, had disbursed four loans totaling $552,331 to firms in the textiles, glass, and agro-industrial sectors. By continually following developments in this DCA program, PA provided technical assistance and information dissemination regarding the Peru DCA experience to USAID Missions and other organizations in the region, as follows.

*A. BOLIVIA*

PA worked with the Centro de Promoción de Tecnologías Sostenibles (CPTS) to consider how to address the unique financing barriers given the confines of the challenging Bolivian financial market. Given the interest of USAID/Bolivia in this topic through their support to CPTS, PA leveraged Mission funding to travel to Lima with one CPTS representative in May 2004 to review the DCA structure, experience, and results to date to analyze how the mechanism might successfully operate in Bolivia. Naturally, conditions in Bolivia are unique.

The financial sector is weaker than Peru, the regulatory structure imposes different constraints, and the political and social situation has recently been quite volatile.

Previously, also in the effort to learn from other CP financing efforts in the region, PA sent Juan Cristóbal Birbuet of CPTS-Bolivia to participate in a United Nations Environment Programme course on cleaner production financing in Guatemala City in June 2003. The course included the following topics, among others: introduction to cleaner production (CP), the benefits of CP, measures that fall under the CP rubric, full cost accounting, business planning, financial evaluation, etc. The program included a discussion of the experiences UNEP has had with Guatemalan companies in its programs thus far. Course participants included banking officials (credit officers and area managers), micro credit bank representatives, government officials, and private sector firms.

In Bolivia, it is important to note that CPTS is already working with an existing fund established at Funda-Pro, a second-tier financial institution managing a loan fund for biomass and cleaner production. While funds exist, challenges exist on at least two basic fronts. First, commercial banks with access to this line of credit lack incentives and sufficient understanding about the fund to effectively utilize it. Second, companies that might wish to apply lack the capability to prepare the application and business plan. In this sense, no significant project pipeline has accumulated to suggest strong demand for the fund.

More specifically, we found that access to credit remains one key barrier to the adoption of CP practices in Bolivia. While the Biomass and CP Fund offers one approach to the solution, we recognize that it is far from a panacea, and requires dedicated, parallel technical assistance. Given its structure as a capitalized fund, however, the Biomass and CP Fund is actually designed to resolve the challenges of financing in an environment with a tight money supply. While Bolivia may have less liquidity in the financial market today than one or two years ago, a lack of liquidity is not the principle barrier to CP financing.

In fact, the more significant barrier to CP financing is financial institutions' perceived risk about such projects. Therefore, a solution that reduces the real level of risk is a more appropriate approach to facilitate CP financing in Bolivia under current conditions. This being the case, the option to establish a DCA loan portfolio guarantee remains a viable option. Nevertheless, it is necessary to carefully review the function of operations, particularly the nexus between technical assistance and DCA, to fully assess the applicability. Some important factors to consider regarding a guarantee program for Bolivia include:

- Pipeline: There is a need to generate demand and create a portfolio of projects, although it is important to recognize that CPTS will not do this on its own. While CPTS has conducted 37 cleaner production assessments, and fully documented 16 detailed case studies that illustrate the economic and environmental benefits of CP, it is clear that CPTS does not have the capacity to generate a sufficient deal flow. Rather, it is important to consider the possibility that the participating bank (or banks) will have to actively develop the pipeline and recognize projects presented to the bank that could be eligible or partially eligible for coverage. In this case, second tier technical assistance will be vital to the success of the portfolio development.

  It is also important to recognize that, since CPTS concentrated efforts in the Chapare region over the last year, it could not generate credit worthy projects. This is because agro-industry, farmers, and companies in the Chapare have become accustomed to subsidies provided by alternative development programs. This has created an

unfortunate culture of non-payment of loans, a climate in which commercial banks will not likely participate.

- Project size: More specific parameters will be evaluated based on the objectives of the guarantee, but initially USAID could expect DCA to fill a niche with medium-sized firms unable to access credit. No minimum loan amount need be set since the bank will auto-regulate this factor. In addition, PA recommends establishing a relatively low maximum loan amount, perhaps somewhere around $200,000 to $250,000, to ensure that the guarantee is not exhausted in just a few transactions. This will also depend on the targeted sectors as well as the financial institution selected. As a point of reference, the Biomass and CP Fund has a loan maximum of $100,000, and the DCA guarantee for CP in Peru has a loan maximum of $400,000.

- Candidate Institutions: CPTS considers that the most interesting financial institutions for a DCA would include Banco de Crédito, Banco Bisa, Banco Mercantil, Banco Santa Cruz, Prodem, and Caja Los Andes. Note that the Banco de Crédito is the same host institution for the DCA guarantee for CP in Peru, and they have expressed interest in the option of extending the program to their branch in Bolivia.

While further details regarding local financial conditions and possible solutions to CP financing are included in the final report submitted to USAID Bolivia under Task Order 803, it is important to reiterate that the Peru DCA experience proved an important model, with results and lessons learned analyzed by CPTS and PA in considering ways to address the CP financing challenge in Bolivia.

### *B. CENTRAL AMERICA*

Under Task Order 01, PA included DCA as one possible approach to stimulate CP financing in a White Paper report submitted to LAC and G-CAP prior to the start of PROARCA II. PA had met with both Banco Cuscatlán and Banco Multisectorial de Inversiones in San Salvador, and had found interest within these institutions to explore options with DCA.

Under this Task Order, PA was first invited to speak at a U.N. Environment Programme (UNEP) regional seminar, *Promoción de la Inversión en Producción más Limpia y sus Perspectivas*, held in Guatemala City in February 2003. PA presented its experience addressing CP financing, with particular emphasis on its most recent efforts in Peru. The presentation discussed the barrier presented by financing, and focused on a discussion about how PA, with USAID/LAC and USAID/Peru, determined to create a Development Credit Authority (DCA) loan guarantee fund for CP investments. This conclusion was reached in large measure because first, the alternatives are less attractive; second, a guarantee offers an important incentive to the bank; and third, DCA provides a sustainable solution over the long-term.

Interestingly, UNEP itself unveiled at this seminar it's own goal of creating a guarantee fund, since it had also concluded that a loan guarantee fund is the appropriate solution to the lack of available credit for CP projects in Central America. They were negotiating the creation of a guarantee fund with the Central American Bank for Economic Integration. Separately, USAID/G-CAP created several DCA loan guarantees to enable CP investments throughout Central America; PA was instrumental in helping G-CAP consider strategies to address CP financing barriers in the region, as discussed in Section 4 of this report.

### C. JAMAICA

With preliminary input and information from PA's experience creating the DCA loan guarantee in Peru, and strategy for CP financing in Central America, the Mission in Jamaica established a DCA guarantee with the Royal Bank of Trinidad and Tobago for "productivity enhancement" loans, which covers the Mission's economic and environment strategic objectives. These include expansions, efficiency improvements, and environmental management investments in Jamaican enterprises. It is open to all industrial sectors, including tourism and manufacturing. The Mission is in the early stages of considering a similar DCA mechanism for the Caribbean region.

### D. OTHER COUNTRIES

- PA was invited to present at the 4th Mexican Pollution Prevention Roundtable in Guadalajara in October 2003. PA presented the Peru DCA loan guarantee for cleaner technology investments program, as well as the CP financing strategy for Central America, in a presentation titled *Financiando Producción Más Limpia: Experiencias de Latinoamérica*. USAID/Mexico funded all travel-related costs of approximately $1,120.

- During the first calendar quarter of 2004, PA provided information and advice based on the Peru DCA model to USAID's Strengthen Reform and Enhance Energy Security in Armenia project. The subtask for Financing Energy Efficiency and Renewable Energy Projects is examining all avenues possible for financing, including DCA.

- In mid-2004, PA provided information and background on the Peru DCA model for consideration by a USAID tourism project along Egypt's Red Sea.

## 7.1.3 Recommendations and Lessons Learned

- USAID must recognize that any financial assistance package for cleaner technology investments is not complete without technical assistance. A DCA program on its own, without someone to help develop business plans and guide the bank(s) through the process at least at the beginning, is missing a critical ingredient. Failure to do so will almost certainly result in underutilization of the DCA fund.

- DCA remains a young concept when applied to cleaner technology investments. USAID should take care to review all experiences, recognizing that the structure of each program differs in important ways, as well as the local business, banking, and political context. USAID should take care not to jump to unwarranted conclusions hastily since change in the banking sector is always slow.

- USAID must carefully consider the indicators of success it chooses to use with a DCA guarantee. In fact, it is important that USAID not evaluate the success of a DCA program solely based on the number of loans, or dollar value the loans actually disbursed. As we learned from the experience in Peru, any analysis also needs to consider, for example:

    - Number of loans initiated under the DCA scheme, but successfully disbursed without the guarantee.

- Extent of environmental awareness promoted within the bank, and understanding about cleaner production, energy efficiency, and their inherent cost benefits.

- Extent of environmental awareness engendered among banks competing with the financial institution holding the DCA guarantee, recognizing evolving market expectations, requirements, and opportunities.

- Number of firms and workers exposed to tangible examples of cleaner technology, whether from receiving a DCA-backed loan or by knowing about one.

- Number of firms in the early stages of a CP audit that are motivated to implement simple low-cost measures knowing that they may be able to obtain credit for larger investments.

- Others.

### 7.1.4 Key Deliverables

- Results and experiences from the DCA-Peru program shared to provide technical and strategic guidance to Bolivia, Central America, and less directly, to other countries, including Jamaica, Egypt, and Armenia.

- Delivered presentations on the DCA experience in Peru at a UNEP conference in Guatemala, and the Mexican Pollution Prevention Roundtable's annual conference.

- Trained one CPC staff member in CP financing, through UNEP's training course.

## 7.2 PURSUE FOUNDATION SUPPORT FOR CLEANER PRODUCTION

### 7.2.1 Task

As part of its efforts during 2001, USAID researched foundations, venture capitalists, multilateral agencies, and other donors to identify potential counterpart sources of support for support cleaner production. During 2001 and 2002, USAID focused attention on the immediate areas of interest: creating the DCA guarantee fund for cleaner production in Peru, and assisting the CPCs in Bolivia and Peru to write proposals for the Multilateral Investment Fund of the Inter-American Development Bank. However, it is important for the CPCs to establish new relationships with other potential donors in order to diversify their sources of support and continue and expand their programs. USAID would like to assist LAC partners in the Andean region and/or Central America to develop proposals to submit for consideration to a more diverse set of organizations, including foundations. First, the contractor will inform partners in the Andean region and Central America about the funds potentially available through these institutions. Subsequently, the contractor will work with one or two partners that clearly buy-in to the concept to assist them in considering appropriate approaches to seek funding for cleaner production. Emphasis will be placed on obtaining funds for training, outreach, or technology transfer to improve industrial environmental performance.

### 7.2.2 Accomplishments

From the start, in consultation with the CTO, PA determined to develop a funding proposal with CPTS-Bolivia, considering that it is one of USAID's strongest CP programs. At the same time, PA and CPTS recognized that foundations would not provide funding overnight. As private philanthropic organizations, foundations have a great deal of discretion in selecting grant recipients, within the parameters of their mission and purpose. However, CPTS (as with most CP centers) had not been exposed to foundation support in the past. We recognized that it would take some time to cultivate the necessary relationships, but that the value to CPTS in the medium-term would be apparent, and it was with this vision that we embarked on this task at the beginning of 2003.

PA began by drafting a preliminary letter of inquiry to be used as a template for various foundations. As a first step, CPTS approached the Wallace Global Fund, Tinker Foundation, Kellogg Foundation, and a special fund within the Department for International Development (UK), to support specific cleaner production activities in Bolivia.

In responses from some of these organizations, PA found that cleaner production did not, ultimately, fit within the current strategic focus of Wallace, but Tinker seemed to offer the greatest promise. PA assisted CPTS to submit a final proposal to the Tinker Foundation to support CP efforts with small and medium-sized enterprises (SMEs), conduct outreach to government officials to create fiscal and regulatory incentives for SMEs, and subsequently share the case studies throughout the Andean region.

The proposal was submitted in mid-March 2004, per Tinker's timeline, following the specific guidelines set forth by the Foundation. So far as we know, this represents the first attempt by a cleaner production center in Latin America to secure funding from a U.S.-based foundation. CPTS requested $146,000 over two years for the initiative.

In late June, CPTS received notification that the Tinker Foundation would not be able to fund the proposed activity. While a specific debriefing as to the reasons was not possible, the PA team convened with CPTS in the fall to consider lessons from the experience. Our main conclusion was that the proposal was probably not regional enough in scope. For a subsequent attempt we recommend that (1) the Executive Director of CPTS meet with Tinker and other foundations in Washington and New York during his next visit to the U.S., and (2) we consider a more integrated approach with the cleaner production centers in Peru and/or Ecuador and Paraguay.

The first tier foundations with most promise remain the Tinker Foundation and Wallace Global Fund, although admittedly in the case of the latter our concept did not seem to fit their criteria last time around. A second tier group of foundations to consider should include Rockefeller Brothers Fund (though this currently seems more oriented toward climate change issues), Turner Foundation (which was not accepting proposals last year), and DFID's Business Linkages Challenge Fund.

### 7.2.3 Recommendations and Lessons Learned

- USAID should evaluate the strategy to seek foundation support. It appears to require a heavy amount of up-front investment to develop relationships individually with each one. USAID should also consider the needs, and whether the foundation(s) pursued

will add to the sustainability of the CPC or otherwise help to meet short-term institutional goals (as opposed to programmatic ones).

- If USAID determines that it in fact wants to continue exploring this possibility, a more personalized approach is needed, including visits by the CPC executive director to foundations to build rapport and most effectively target the most promising prospects.

### 7.2.4 Key Deliverables

- Letters of inquiry to foundations and donors.
- Proposal to the Tinker Foundation for CP support with CPTS-Bolivia: *Market Mechanisms for Cleaner Production in Bolivia: Harnessing Incentives for Change*.

# 8. SUPPORT TO REPLICATE WASTE EXCHANGE IN ONE LAC COUNTRY

## 8.1.1 Task

While some 13 countries in the Latin America/Caribbean (LAC) region have cleaner production centers (CPCs), only two have had experience with industrial waste exchange programs. Waste exchanges seek to assist companies to recycle and reuse waste by facilitating linkages between complementary industries, and by investigating new applications for waste byproducts. The existing LAC models were developed since 2000 in Chile and Colombia. Firms register offers and requests for residual byproducts, which may be on a one-time or ongoing basis. Partners providing outreach support and coordination can include chambers of commerce, industry associations, universities, and municipalities.

Given USAID's interests to encourage economic growth based on environmentally sustainable practices, USAID supports industrial recycling and environmental technology transfer. In this context, in FY03 USAID initiated a program with the Center for the Promotion of Sustainable Technology (CPTS) to examine the feasibility of creating a waste exchange in Bolivia. The effort has proved promising enough that CPTS has moved beyond a strict feasibility assessment to actual implementation of a pilot program with select companies.

In consultation with USAID, and based on lessons learned from the three existing waste exchange models in the LAC region, the Contractor will select one appropriate LAC country where the waste exchange can be replicated. The Contractor should work in coordination with the local CPC or similar organization to ensure continued success and results beyond the duration of USAID's support for the exchange. The Contractor will conduct a feasibility assessment evaluating technical and regulatory constraints to establish a waste exchange and help the local partner to consider a strategy for implementation.

## 8.1.2 Accomplishments

This activity was added to the task order with new funding in September 2003. In consultation with USAID/EGAT, USAID/LAC, and USAID/Peru, PA determined that Peru would be a strong candidate country for this activity. In December 2003 PA met with IPES, a private NGO dedicated to sustainable development in Latin America, oriented largely toward assisting disadvantaged segments of society through programs in local economic development, urban environmental management, and urban agriculture. In the area of environmental management, IPES specializes in the implementation of best practices with target groups, including local governments, public and private companies, education centers, and sector authorities. As its underpinning, IPES emphasizes the principles of pollution prevention, and compliance with environmental norms.

In 1999-2000 IPES began creating a waste exchange as an information system. IPES served as a reference center, and identified which entities were buying and selling different kinds of waste. IPES created a database with the information collected, and included information about relevant technical services available in Peru (such as laboratories and consulting). IPES delivered this as strategic advice to firms regarding best options for waste; however, many companies are unaware of the characteristics of their solid waste, and are therefore unsure of how to participate in a waste exchange.

At this early stage several years ago, IPES realized that Peru was not quite ready to deploy a waste exchange. Instead, IPES conducted training at 60-70 firms throughout Peru to conduct on-site solid waste management training to develop more capacity locally. IPES continues to see this as one of the most critical aspects to effectively launch a waste exchange, though progress has been made.

IPES had already conducted extensive research regarding waste exchanges around the world. Based on this, they informed the development process in Peru and created a guide in Spanish, "Operational Mechanisms for Waste Exchanges as a Part of Environmental Management" funded by USAID/Peru and coordinated by CONAM. As a next step, IPES and CONAM were seeking to create capacity to develop decentralized waste exchanges in industrial cities, such as Arequipa and Chiclayo. They expected that such exchanges could be tied to chambers of commerce or other similar local institutions.

In February 2004, PA and IPES devised the proposed work plan to develop a waste exchange in Peru. The activity focused around two key efforts. First, to finalize and publish a national guide for the creation of waste exchanges, which would be an official government (CONAM) publication, and would fulfill one of CONAM's obligations under the new General Law for Solid Waste. Second, we would promote an IPES waste exchange in Lima. The timing of this waste exchange support from USAID was especially important since it fit into the National Plan for Integrated Solid Waste Management. In this larger context, the exchange was to be part of a range of activities targeting cleaner production, recycling, environmental management, etc., within municipalities and companies.

We took into account many important considerations in developing the program. Environmental management of wastes within a firm can be defined as a discipline associated with pollution prevention, separation and collection, warehousing, transport, processing, and final disposition in such a way that affects the environment and workers as little as possible. Particular emphasis should be placed on pollution prevention and environmental compliance with legislation.

Peru's environmental norms are in the process of being developed. They have a preventive, integrated, and trans-sectoral focus. The General Law for Solid Waste N°. 27314 establishes rights, obligations, attributions and responsibilities of all society, to ensure sanitary and environmentally adequate solid waste management. They follow from the principles of waste minimization, environmental risk prevention, protection of public health, and the well being of the population.

In Peru, all cities face problems associated with the inadequate management of waste. These problems relate to air pollution, water and soil contamination, and the existence of problems related to occupational and public health. After an analysis based on the design of a conceptual framework, experts identified that the environmental problems associated with poor waste management practices are due to the lack of (1) information and awareness; (2) technical assistance; (3) environmental norms; (4) training and environmental capacity; and (5) research and the development of environmental solutions.

The lack of information and awareness are mainly due to a (1) lack of knowledge about waste recycling markets; (2) lack of knowledge about environmental services markets; (3) lack of knowledge about environmental solutions to waste problems; and (4) inadequate mechanisms to institutionalize these information systems.

In this way, the Waste Exchange is part of the solution to the challenges of information dissemination and awareness promotion since it is designed to be an information center. Its purpose is to improve environmental management, leading to improved industrial, commercial, and domestic waste management.

During July and August 2004, IPES validated the National Guide for the Creation of Waste Exchanges. IPES presented a draft of the guide at a workshop in August to a group of public and private sector representatives working on topics relevant to the waste exchange. With the feedback from this workshop, IPES revised and received final approval from CONAM to print the final version of the Guide, with an initial run of 500 copies for distribution.

IPES also began a marketing campaign to promote the new Guide, which included: (1) developing a database of over 1,000 persons and institutions relevant to waste exchange activities; (2) creating a newsletter (hard copy and electronic) to promote awareness and interest in the waste exchange; (3) enhancing the waste exchange website for ease of use and functionality (www.bolsaderesiduos.org.pe); (4) preparing press releases and participating in radio and television interviews.

As part of the dissemination campaign, IPES distributed the Guide to all 24 of the Regional Environmental Commissions throughout Peru, as well as 50 public and private sector organizations, NGOs, industry associations, universities, municipalities nationally. Throughout Latin America, IPES distributed copies of the guide to 40 centers for cleaner production, NGOs, municipalities, and cooperation agencies (including some based in Washington, D.C. and Europe). IPES also distributed 2,000 waste exchange brochures.

### 8.1.3 Key Deliverables

- Support to Peru to develop a waste exchange in Lima.
- Peer review and publication of 500 copies of the National Guide for the Creation of Waste Exchanges.
- Website development for the waste exchange.
- Information dissemination throughout Peru about the waste exchange through the Guide, brochure, website, and press releases and media interviews.