

ENVIRONMENTAL ACTION PROGRAMME SUPPORT PROJECT  
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

LITHUANIA FINAL REPORT

Contract No. DHR-C-00-95-00034-00

Submitted to:  
U.S. Agency for International Development  
and OAR/Lithuania

Submitted by:  
Chemonics International Inc.

Prepared by:  
Ramune Bieksiene, EAPS Financial Advisor  
Romas Lenkaitis, EAPS Environmental Technical Advisor  
Chemonics International Inc.

November 1997

## TABLE OF CONTENTS

---

I.	Facilitating the Financing of Pollution Prevention and Abatement Projects	1
	A. Background	1
	B. Project Preparation for Akmenes Cementas	3
	C. Grant Demonstration Project at the Vilkas Tannery in Kaunas	4
	D. Waste Minimization and Tannery Process Improvements	5
II.	Building Institutional Capacity: The Lithuanian Environmental Investment Fund	5
	A. The LEIF	5
	B. EAPS Assistance	6
	C. Providing Assistance After EAPS	8
III.	Key Learning Experience	9
	A. Investment Preparation for Akmenes Cementas	9
	B. Grant Demonstration Project at the Vilkas Tannery in Kaunas	9
	C. Building Institutional Capacity	9

# EAPS Lithuania Final Report

The Environmental Action Programme Support (EAPS) project in Lithuania was undertaken pursuant to U.S. Government commitments under the Environmental Action Programme (EAP) for Central and Eastern Europe, adopted in April 1993 in Lucerne, Switzerland. This program established a partnership of Central European and Western countries to develop policy and institutional reforms and implement priority investments aimed at addressing environmental risks to human health in the region.

The EAPS project supports EAP in improving environmental quality and reducing related health risks by:

- Facilitating the financing of economically viable pollution prevention and abatement projects
- Building institutional capacity in the environmental, technical, and financial evaluation of projects and in packaging environmental investments

The EAPS Lithuania project began in Spring 1995 with the development of an investment project for Akmenes Cementas, a major cement producing company in Northwestern Lithuania. A grant demonstration project for reducing chromium discharge from the Vilkas tannery in Kaunas was identified in September-October 1995. During the same period, the EAPS Lithuania team began assisting the Ministry of Environmental Protection (MEP) with institutional capacity building and development of the Lithuanian Environmental Investment Fund (LEIF).

A representative office of Chemonics International was established in October 1995 to facilitate project implementation. The office staff included Romas Lenkaitis, environmental technical advisor, and Ramune Bieksiene, financial advisor. The environmental technical advisor was responsible for investment project development and demonstration project implementation. The financial advisor was responsible for work with the MEP in developing the LEIF. The EAPS project also included additional components, such as training and consultation for potential LEIF applicants and assistance to the Organization for Economic Cooperation and Development in developing the Lithuanian National Environmental Investment Strategy.

## **I. Facilitating the Financing of Pollution Prevention and Abatement Projects**

### **A. Background**

The first project identification team visited Lithuania in September-October 1994 under the auspices of USAID's PRIDE project. The purpose of the mission was to select a representative sample of promising environmental projects and assess their economic and technical feasibility. Two potential projects were identified: one at the cement works of Akmenes Cementas and the other at the chemical facilities of Achema, Jonava.

Following the mission, Achema was able to obtain its own financing for approximately \$3 million in automation, monitoring, and control equipment. However, Akmenes Cementas requested assistance in seeking financing to upgrade two of its four large wet process kilns and to purchase equipment to monitor plant emissions. An in-depth evaluation of Akmenes' operations was recommended.

A follow-up mission to Akmenes took place in January 1995 to conduct a technical, financial, and health risk assessment of plant operations. The team performed a detailed assessment of the company's needs and identified a kiln improvement, emission control, and energy efficiency project estimated at \$3 million. Savings in raw materials and energy from the proposed changes were estimated at \$2.5 million per year. The EAPS team developed a proposal to be used as an investor prospectus. Based on the company's financial condition and the projected impact of the proposed capital investment program, USAID decided to develop this project through the EAP Project Preparation Committee.

In September 1995 an EAPS team visited Lithuania to identify a suitable grant demonstration project. USAID/W and the OAR/Lithuania had decided, in view of the shortage of affordable domestic capital for environmental investment loans in Lithuania, to concentrate on a single pilot activity, funded in part by a grant from USAID. The pilot project could be replicated by other project proponents in the country. The selected project had to conform, however, with EAP goals and the MEP's National Environmental Strategy.

The EAPS team, which included USAID/W and OAR/Lithuania staff, evaluated five potential grant demonstration projects in Kaunas. Two projects — one dealing with boiler efficiency improvements at a local district heating plant in Kaunas, and a heavy metal pollution reduction project at Vilkas tannery — met EAP criteria and the environmental priorities of the Lithuanian Government.

Both projects were evaluated by the project team in light of potential health risks, replicability, capacity building, and long-term viability. The evaluations were presented to the OAR/Lithuania and the MEP. They decided jointly that the pollution reduction project at Vilkas more closely supported Lithuania's primary environmental priority of addressing municipal and industrial wastewater discharges.

The investment preparation activity of the EAPS project therefore consisted of two main components:

- Technical assistance in project preparation and packaging to Akmenes Cementas, a cement producer in Northern Lithuania seeking investment in environmental and production process equipment
- Outright grants combined with technical assistance to Vilkas tannery in Kaunas to develop and implement a demonstration project for wastewater treatment (chromium removal)

## B. Project Preparation for Akmenes Cementas

The project preparation and packaging component included assistance in developing specifications for, procuring, and installing the following equipment:

- Instrumentation, controls, testing equipment, emission analyzers, upgrades of electrical equipment, recorders, and alarms for more efficient kiln operation (\$600,000)
- Upgrades of electrostatic precipitators for two kilns and two clinker coolers to increase recovery of clinker dust (\$800,000)
- Installation of material shredder for alternative low-cost fuels, such as tires and solid wastes (e.g., wood and organic materials) to replace higher-cost fuels (\$400,000)
- Refurbishment of the kiln heat exchange system, kiln seals, burner and firing system to improve energy efficiency (\$400,000)
- Modification of the clinker cooler and burner, and controls to increase process and energy efficiency (\$800,000)

After the assessment of Akmenes' needs for financing to improve its environmental performance, various international finance institutions, including the European Bank for Reconstruction and Development (EBRD), were approached as possible sources of financing. Akmenes management also met with a number of potential investors and sold 10 percent of its equity to a Norwegian company, Embra. Embra and its associated company, Bridge International, assisted Akmenes in developing a business plan and made an advance purchase of \$5 million in Akmenes production.

Following the contacts with the EBRD, the company decided to expand the proposed investment plan beyond the \$3 million already identified to include major rehabilitation of its production processes. Akmenes Cementas entered into negotiations with the EBRD to obtain financing for changing its clinker production method from wet to dry or semi-dry.

EAPS assisted Akmenes Cementas by performing financial, industrial, and environmental audits of the facility. The audit results were presented to the EBRD. EAPS assisted the company in preparing the full package of documents required to apply to the EBRD for a loan, except the business plan. Completion of the business plan was delayed while Akmenes Cementas, Embra, and the EBRD negotiated the scope of facility rehabilitation. Three options were proposed, ranging from comparatively cheap improvement of wet production to a very expensive shift to a dry clinker production method.

Because EAPS assistance was not needed during the negotiations, it was temporarily suspended. EAPS and Akmenes Cementas management agreed that assistance would be renewed at the company's request. However, the company has not asked for further assistance.

### **C. Grant Demonstration Project at the Vilkas Tannery in Kaunas**

Vilkas Tannery is situated in Kaunas City and is the second largest tannery in Lithuania. The company's most significant impact on the environment is its discharge into the Nemunas River of wastewater containing chromium.

Although Kaunas is the second largest city in Lithuania, it has no municipal wastewater treatment facilities. Construction of the Kaunas wastewater treatment plant began under a EU PHARE program and is scheduled for completion in 1998. Vilkas effluent will then be directed to the new plant, and Kaunas Municipality will impose strict heavy metal discharge limits considerably below the levels now present in Vilkas wastewater.

Total flow of chromium-containing wastewater from Vilkas is estimated at approximately 100 cubic meters per day. This wastewater is produced in a number of operations. Trivalent chromium concentrations in separate streams range from as low as 0.5 mg/l from fatliquoring to 250 mg/l from black dyeing and 600-800 mg/l from tanning. The staining process uses sodium dichromate, which is the source of hexavalent chromium. Its concentration in staining effluent can reach as high as 500 to 800 mg/l.

Before the new equipment was installed, wastewater containing chromium from staining and tanning was processed in batches in reaction tanks by acidification with sulfuric acid, reduction of hexavalent chromium to trivalent with thiosulfate, and sedimentation of chromium hydroxide following the addition of sodium carbonate. Chromium removal efficiency was approximately 95 to 98 percent. Because of the high influent chromium concentrations, however, the resulting effluent was still unacceptable at 45 to 80 mg/l. This effluent was later combined with other wastewater, diluting the chromium concentration to 2 to 3 mg/l for discharge into the river.

To address Vilkas' wastewater problem, the main objectives of the grant demonstration project in Vilkas were to:

- Reduce the overall chromium levels in wastewater discharge from Vilkas tannery
- Reduce the volume of chromium-bearing sludge
- Improve the overall performance of the existing sedimentation process, particularly suspended solids removal
- Replicate certain components of the Vilkas project in other Lithuanian industries, particularly those discharging heavy metals to municipal wastewater treatment systems

It was proposed to pump all chromium-containing wastewater, including high chromium tanning and staining effluent and low chromium neutralization, dyeing, rinsing, and fatliquoring effluents to the equalization tank. All flow would then be pumped to the galvanocoagulator for hexavalent chromium reduction and pass by gravity to a new inclined plate clarifier. Effluent from the clarifier would flow by gravity to the plant sewer. Sludge settled in the clarifier would be

pumped to a new filter press. Before the design of the chromium removal facility was finalized, chemical testing was performed to evaluate the effects of various chemicals and dosages on chromium removal.

The galvanocoagulators for hexavalent chrome reduction were purchased in Lithuania; all other equipment was procured in the United States. The following equipment was provided to the Vilkas tannery:

- Submersible pumps and float controls
- Diaphragm pumps
- Inclined plate clarifier
- Chemical metering pumps
- Polymer feed
- Filter press
- Effluent sampler
- Chrome analyzer
- Galvanocoagulator
- Air compressor
- Tools
- Safety equipment

The equipment was installed by Vilkas. The chromium removal facility was commissioned and began operation in September 1997.

#### **D. Waste Minimization and Tannery Process Improvements**

In addition to installing a new chromium removal facility, Vilkas staff were introduced to various waste minimization and tannery process improvements, including water recycling, chemical substitution, and modernization of dyeing processes. A technology transfer workshop for Lithuanian tanneries was carried out in Vilnius in Spring 1996 with the participation of leading European and U.S. tannery equipment and chemical suppliers. Representatives of Estonian, Latvian, and Polish tanneries were also invited to the workshop. Following the workshop, Vilkas began cooperating with several companies and is gradually improving its production processes.

## **II. Building Institutional Capacity: The Lithuanian Environmental Investment Fund**

### **A. The LEIF**

The majority of environmental investments are currently directed to the construction of wastewater treatment plants and allocated from the State Budget. Other sources of funds include loans and subsidies from foreign governments and international donor organizations, municipal funds, and company resources. The current system of granting subsidies to municipal institutions does not encourage the implementation of environmental projects.

The National Environmental Strategy of Lithuania proposed to establish an environmental investment fund as an incentive for economically feasible projects that would conserve resources

and minimize industrial pollution. After projects were implemented, revenues would be used to repay the fund, thus supporting its sustainability.

Such a fund would help create an environment for private sector growth and focus on eliminating major price distortions that impede efficient private investment, increasing access to markets through more effective trade policies, and improving the legal framework for commercial activities.

In 1995 the MEP, with EAPS support, started the process of establishing the environmental revolving fund envisaged in Lithuania's National Environmental Strategy. The Lithuanian Environmental Investment Fund (LEIF) was officially established as a non-profit public enterprise on November 11, 1996.

The LEIF's objective is to identify and (co-)finance small and medium-sized "win-win" projects that lack access to competitive commercial financing but can yield significant environmental benefits as well as generate a significant revenue stream. The fund is independent of the MEP and has its own statute describing the fund's mission and objectives, management and supervision structure, and main operating procedures. It is overseen by a Supervisory Board of representatives of various ministries and nongovernmental organizations, and has a managing director and small staff. To reduce financial risks to the LEIF, the MEP foresees including the services of a local bank in carrying out the financial loan processing activities and evaluating the creditworthiness of applicants.

The following revenue sources are available or potentially available to the LEIF:

- *Fines.* Various fees for non-compliance with environmental protection regulations. Revenues from these fines currently go to the State Environmental Fund, but should be made available to the LEIF, although not as its main source of revenue.
- *Emission charges.* Charges on the release or discharge of pollutants into air, water, or soil, based on quantity and type of pollutant. Thirty percent of the revenue from these charges currently go to the State Budget; the other 70 percent go to the municipalities. The Lithuanian Seimas (Parliament) is discussing amendments to the Law on Pollution Charges that would direct 50 percent of these revenues to the LEIF (with 30 percent to the State Budget and 20 percent to municipalities).
- *Product charges.* Charges levied on products or materials used in processes that generate pollution. Product charges are a potential source of revenue for the LEIF but are not levied at present. These charges and other possible sources of revenue are in the preparation stage.

## **B. EAPS Assistance**

### **B1. Summary of EAPS Assistance to the LEIF**

USAID, through EAPS, has provided major and pivotal support for establishing the LEIF, including:

- Preparation of legal regulations governing the LEIF and their harmonization with existing laws
- Drafting of the LEIF Operational Manual, including detailed instructions on environmental priorities, fund structure and management, project cycle procedures, and fund accounting procedures
- Preparation of project information and application forms
- Comprehensive assistance to the MEP in organizing Supervisory Board meetings and other meetings related to the LEIF
- Assistance in developing and implementing a campaign to disseminate information on the fund to potential proponents
- Preparation of various other public relations pieces (advertisements, informational letters, etc.) about the LEIF
- Assistance to the MEP in its relations with the banking sector and in reviewing the competence and stability of banks and other financial institutions in Lithuania
- Assistance to the LEIF's director in creating a portfolio of projects
- Assistance in the day-to-day activities of the LEIF (reviewing project applications, contacting proponents)
- Training LEIF staff and applicants, including two environmental finance seminars for industry and municipal officials
- Financing procurement of computer equipment, software, and furniture

## **B2. Results Achieved by EAPS Assistance**

During the last two years significant progress was made toward:

- Increasing citizen participation and public awareness
- Stimulating the private sector
- Forging a more stable financial environment
- Increasing collaboration among NGOs and government
- Developing a viable market-oriented financial sector

- Increasing cooperation with other financial institutions, foreign investors, and local authorities
- Continued decentralization of most environmental protection responsibilities and improved transparency and accountability

The largest share of support was provided to industry and municipal projects. Training seminars were organized, resulting in an increase in the number of applications submitted. Financing was approved for projects in the following areas:

- Liquid waste treatment and disposal — more than Lt. 9.7 million
- Solid waste disposal and landfill construction — more than Lt. 4.3 million
- Air emissions control — Lt. 6 million
- Other (waste recycling, etc.) — more than Lt. 2.5 million

### **C. Providing Assistance After EAPS**

To continue activities initiated by EAPS, a private consulting company, ENVAS, was established in 1997 by the EAPS team and professional associates. The company will be available to help the LEIF solve technical, environmental, financial, and legal problems; identify sources of financing; and prepare documentation for applications for financial assistance. ENVAS support for environmental investment projects may include:

- Estimating environmental benefits
- Technical, financial, and management analysis of projects
- Preparation of business, management, and financial plans
- Identification and analysis of financing sources
- Analysis of opportunities for financing debt servicing (for generating revenues, tariffs, charges, etc.)
- Legal analysis
- Completing credit/loan, grant, and soft loan applications
- Preparation of procurement or other needed documents
- Preparation of management and economic analyses for promoters of environmental investments

### III. Key Learning Experiences

The EAPS project provided opportunities to gain experience in three principal areas: investment preparation, grant demonstration projects, and building institutional capacity.

#### A. Investment Preparation for Akmenes Cementas

- EAPS provided the opportunity to gain experience in evaluating and packaging an investment proposal aimed at upgrading production processes and reducing environmental pollution at Akmenes Cementas, a cement producer in Northern Lithuania. The initial experience later provided the basis for expanding project packaging to include major rehabilitation of the facility and changes in its production processes.
- An additional learning experience at Akmenes Cementas came from performing financial, industrial, and environmental audits as required by the EBRD, which launched negotiations with the company on issuing loans for project implementation.

#### B. Grant Demonstration Project at the Vilkas Tannery in Kaunas

The principal learning experiences associated with developing the Vilkas grant demonstration project included:

- Specifying equipment for reducing chromium levels in wastewater discharge from Vilkas tannery and reducing the volume of chromium-bearing sludge
- Structuring a project that can be replicated in other Lithuanian industries, particularly those discharging heavy metals to municipal wastewater treatment systems
- Transferring technology to Lithuanian as well as Latvian, Estonian, and Polish tanneries for minimizing waste and improving the tannery process, including water recycling, chemical substitution, modernization of dye processes, etc., allowing tanneries to gradually improve their production processes

#### C. Building Institutional Capacity

The most important learning experiences associated with EAPS technical assistance to the LEIF involved:

- Working with various donors to lay the foundation for optimal future use of donor support as well as domestic resources for the LEIF
- Introducing a new (for Lithuania) financing mechanism, which impacts actual capital allocations for the environment protection sector
- Introducing concepts of tendering (restricted tenders, special conditions)
- Working with the mechanisms for regulating the use of domestic financing resources

- Understanding the roles, responsibilities, and funding resource limitations of an environmental investment fund
- Encouraging private sector investment in the environment through the LEIF
- Developing an application system for the LEIF that enables applicants to compete for scarce financial resources