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**Assistance to Environmental Management in Enterprises in the NIS**

USAID Activities in the NIS

Time Period: 1998 – 2001

Input to the EAP Task Force Progress Report for the Environment for Europe  
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**i) Assistance to Environmental Management in Enterprises in the NIS**

USAID: EcoLinks – The Eurasian-American Partnership for Environmentally Sustainable Economies (1998 – 2002)

Program Overview

EcoLinks is an initiative of the United States Agency for International Development (USAID), which promotes market-based solutions to environmental problems in Central and Eastern Europe and Eurasia. The EcoLinks program is successfully helping to initiate and promote better environmental management through partnering and commerce between the countries of Eastern Europe/ Eurasia and the United States. EcoLinks functions by providing financial assistance and by facilitating trade and investment partnering.

The EcoLinks Partnership Grants Program, which is active in a total of 18 countries throughout CEE and NIS, builds the capacity of businesses and municipalities to develop market-based solutions to urban and industrial environmental problems. In the NIS, EcoLinks activities have been implemented in Russia, Ukraine, Kazakhstan, Moldova, Georgia and, most recently, Turkmenistan. The Grants Program identifies, facilitates, and supports cross-border partnerships either within the region or between the region and the US. These partnerships help organizations in the region by providing them with access to the most up-to-date technologies and techniques in environmental management. By learning from each other or from US experience and capabilities, organizations in the region can expedite the implementation of innovative solutions for the serious environmental issues they face.

The EcoLinks Trade & Investment component involves an interagency agreement between USAID and the U.S. Department of Commerce (USDOC) that places EcoLinks Technology Representatives in selected Commercial Service offices in the region. These “Tech Reps” make use of several tools provided by USAID, USDOC and their host governments to identify business opportunities in the environmental sector, to link U.S. environmental technology firms with partners in the region and to assist in financing the associated environmental projects. These Trade & Investment activities complement the EcoLinks Grants Program, in that the Grants Program assists the Tech Reps in forming trade partners and the Tech Reps in turn facilitate follow-on financing of projects developed in the Grants Program.

Partnership Grants Program

There are two types of grants for which applicants from the US or the region may apply. Quick Response Awards (QRAs) typically provide travel funds to an organization to visit their potential partner in the country where they are located. The maximum value for a QRA is \$5,000, and they may be awarded in a matter of one to two weeks. At a maximum value of \$50,000, the Challenge Grant is a significant investment on the part of EcoLinks and also for the successful recipients who are responsible for providing matching resources of 25 percent of the grant value.

Typically, Challenge grants link a regional and a US partner, but a US partner is not required for EcoLinks grant support. Grants are available to facilitate partnerships among countries within the region, and a tremendous potential for intra-regional exchange of experience, has been identified. Many organizations in the region have

accumulated skills and knowledge in market finance and introducing modern technologies. EcoLinks grants are available to promote the exchange of local capacity with organizations that have had less exposure to new problem-solving approaches.

In addition to a number of countries in CEE, EcoLinks has Grants Program Officers based in Kazakhstan, Russia, Ukraine and the United States. They provide information regarding all aspects of the Grants Program to interested organizations, assist with management and implementation of the grant proposal process, and monitor grantees' progress in both the technical and administrative aspects of the grant.

**Challenge Grants Awarded in NIS**

(by Country, 1999 – 2001)

|                 |    |
|-----------------|----|
| Kazakhstan      | 10 |
| Russia Far East | 12 |
| Ukraine         | 23 |

One indicator of the success of the Challenge Grants aspect of EcoLinks is the level of additional funds raised by grantees to continue the activities initiated during their project. This financing often includes the purchase of environmental technologies or services. It is a very good indicator of the "multiplier effect" these relatively small grants can have in generating further environmental investments in new technologies. By the end of 2001, for data covering both NIS and CEE, grantees had obtained more than \$30 million in additional funds for projects in which EcoLinks contributed, representing a multiplier factor of 3.9 for every grant dollar awarded. One example of this "multiplier effect" in NIS from this past year includes a contribution by the Odessa regional government in Ukraine of \$450,000 to carry out a fuel switch, from heavy oil to natural gas, at the Teplodar Heat Boiler Plant.

Quick Response Awards (which can be as large as \$5000) help organizations initiate partnerships by providing the opportunity to meet with potential partners and discuss areas of possible cooperation. They are most often used to support travel for such activities as:

- Allowing one partner to visit another as to assist in preparing the grant application.
- Facilitating staff from a potential client visiting a technology demonstration.
- Providing for potential business partners to meet face to face.

Although travel is the most common activity, the QRAs can be used to meet the immediate and small-scale needs of organizations exploring potential partnerships within the framework of EcoLinks. Therefore QRA activities must either facilitate partner matching for a Challenge Grant or promote environmental trade and investment in some other way. While the majority of QRAs support travel between the US and the Region (or *vice versa*) approximately 12 percent of the awards are used to support intra-regional travel.

## **Quick Response Awards in NIS**

(by Country, 1999 – 2001)

|                 |    |
|-----------------|----|
| Georgia         | 3  |
| Kazakhstan      | 26 |
| Moldova         | 1  |
| Russia Far East | 34 |
| Turkmenistan    | 1  |
| Ukraine         | 26 |

The “multiplier effect” is even more evident in the case of the QRAs than it is with Challenge Grants. Since program inception, on a regional basis covering both CEE and NIS countries, a total of \$7.3 million in added investment has resulted from partnerships developed through QRAs. (The equivalent of \$5.62 of additional investment for every grant dollar spent.) QRAs are one of the favorite tools of the Technology Representatives since their rapid (two week) turnaround on decisions enable companies to respond very quickly to emerging opportunities. In one case, a QRA of only \$5,000 led to a \$5 million joint venture between two companies in Russia and the US to manufacture and distribute timber products from wood waste. Some examples of the “multiplier effect” in the NIS in the past year include:

- A \$1 million agreement between Florida Heat Pump Manufacturing Company of Fort Lauderdale, Florida and SKIF MX, Ltd. of Khabarovsk, Russia for SKIF to purchase and distribute Florida Heat Pump’s equipment for a 5 year period.
- After using a QRA to perform training on geographic information systems (GIS) and their utility in environmental management systems, Environmental Systems Research Institute of Redlands, California concluded an agreement to sell GIS system technology to the City of Kiev.

## Trade & Investment Activities in the NIS

Through the EcoLinks Trade and Investment Program, Technical Representatives (Tech Reps) provide an important link between enterprises and associations in the NIS region and US environmental technology and management firms. The Tech Reps worked very closely with the EcoLinks partners to develop and introduce a new database and website, which allows for the improved tracking of technology transfer opportunities. Currently the database, which has recently been adding 100 clients per week, includes over 1,000 US firms representing various sectors of the environmental and renewable/clean energy business community, such as pollution control and prevention, environmental management, treatment and disposal of solid and hazardous waste, and renewable and clean technologies.

Tech Reps also work one-on-one with US and local organizations to foster the crucial relationships necessary for partners to do business together. One example of the

success of the Tech Rep program has been in Kazakhstan. It took our Tech Rep almost two full years of work with the local firm to identify and facilitate the transfer of appropriate technologies for a local environmental problem.

In this particular example, Alash, a local firm that generated large volumes of carbide soot as part of their manufacturing process had approached the EcoLinks Tech Rep asking for help in locating an American environmental technology that could help them manage their waste problem. During their search for a solution, an Alash staffer was able to conduct an internship on environmental technologies for mining in the United States. While in the US, she identified Komarek Industries as having a technology, which involved high-pressure briquetting of the soot, as a likely vendor who could help solve her problem. Komarek technology offered the possibility to take a waste product and convert it into briquets that could be sold as an energy input to local steel mills.

One of the benchmarks for success in the EcoLinks Program is the establishment of long-term relationships between the US firms and the countries in which they work. Toward this end, Tech Reps conduct outreach in the region — activities with local business and municipal leaders to identify their environmental needs and partnering interests and to inform them of U.S. technologies and experience relevant to their needs. These activities include public seminars providing an opportunity for U.S. companies to present their capabilities and technologies.

ii) **Assistance to Environmental Management in Enterprises in the NIS**  
USAID: EcoLinks Grants in Environmental Management (1998 – 2001)  
Summary Project Information

**1999**

**KAZAKHSTAN**

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**Title:** Development and Implementation of EMS for Karaganda Region  
**Leader:** Administration of the Akim of Karaganda, Karaganda, Kazakhstan  
**Partner:** Eurasia Environmental Associates, LLC, Reston, VA, USA  
**Grant Total:** \$49,971

**Title:** Making Chips Production More Environmentally Friendly  
**Leader:** United Technologies Company, Talgar, Kazakhstan  
**Partner:** Environmental Control Opportunities, Richmond, VA, USA & Savory Snacks, L.L.C., Madison, WI, USA  
**Grant Total:** \$49,550

**RUSSIA FAR EAST**

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**Title:** Solid Waste Recycling Plant for Yuzhno-Sakhalinsk  
**Leader:** Spetsavto Municipal Enterprise, Yuzhno-Sakhalinsk, Russia  
**Partner:** Vaughn and Melton, Greenville, Tennessee  
**Grant Total:** \$50,000

**Title:** A Model Training Program for Assisting Khabarovsk Krai Municipalities to Create Effective Environmental Policies and Procedures Using Data from Environmental Audits  
**Leader:** Committee on Economics, Administration of Khabarovsk Krai, Khabarovsk, Russia  
**Partner:** American International University Network, Ltd., Lincoln, Nebraska  
**Grant Total:** \$49,804

**Title:** Incorporation of Environmentally Acceptable Air Pollution Control and Ash Utilization Technology at the Vladivostok Municipal Waste-to-Energy Facility.  
**Leader:** Special Plant #1 of Vladivostok ("Speczavod"), Vladivostok, Russia  
**Partner:** Energy & Environmental Consulting Engineers (EECE), Mission Viejo, California  
**Grant Total:** \$50,000

**UKRAINE**

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**Title:** Development of Waste Management Program for the City of Chervonograd  
**Leader:** Municipality of Chervonograd, Chervonograd, Ukraine  
**Partner:** EKOFOL-II S.A., Bytom, Poland  
**Grant Total:** \$49,700

**Title:** Identifying the Priority Policies and Measures to Mitigate the Impacts of Climate Change in Small and Medium-sized Cities in Ukraine.

**Leader:** Municipality of Berdychiv, Berdychiv, Ukraine

**Partner:** Ecoenergy International Corporation, Washington, DC, USA & Agency for Rational Energy Use and Ecology, Kiev, Ukraine

**Grant Total:** \$48,744

**Title:** Development of EMS and Preparation for Certification with ISO 14001 Requirements

**Leader:** Concern Stirol, Gorlovka, Ukraine

**Partner:** Futurepast, Inc., VA, USA

**Grant Total:** \$48,784

**Title:** Improvement of Energy Efficiency of Sanatoriums in Truskavets

**Leader:** JSC Truskavetskurort, Truskavets, Ukraine

**Partner:** Polish Network "Energy Cities", Krakow, Poland

**Grant Total:** \$ 40,598

**Title:** Developing Olymp Sausage as a Model of Clean Production

**Leader:** Olymp Sausage, Kopychintsi, Ukraine

**Partner:** Mead & Hunt International, Madison, WI, USA

**Grant Total:** \$43,440

## 2000

### KAZAKHSTAN

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**Title:** Reducing Pollution From Car-Wash Centers

**Leader:** Municipality of Almaty City, Kazakhstan

**Partner:** Shell Engineering & Associates, Inc., Columbia, MO, USA & Gornoe Buro, Ltd., Almaty, Kazakhstan

**Grant Total:** \$38,197

**Title:** Process Efficiency Upgrades and Cyanide Recycling at Akbakai Gold Mine

**Leader:** JSC Altynalmaz, Kazakhstan

**Partner:** EnviroNet Management Systems LLC, Arlington, VA, USA

**Grant Total:** \$49,101

### RUSSIA FAR EAST

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**Title:** Model Program of Waste Disposal Control at Sinegorskaya Mine

**Leader:** Sinegorskaya Mine, Yuzhno-Sakhalinsk, Russia

**Partner:** EarthFax Engineering, Inc., Midvale, Utah

**Grant Total:** \$47,754

**Title:** Minimization of Waste Products at a Heat Electric Power Station

**Leader:** Vladivostok Heat Electric Power Station 2 (VHEPS-2) of JSC Dalenergo, Russia

**Partner:** Power Tech Associates, P.C., Paramus, NJ, USA

**Grant Total:** \$45,675

**Title:** Modernization of Hot Water Supply Systems in Municipal Buildings

**Leader:** Department of Housing, Yuzhno-Sakhalinsk City Administration, Russia

**Partner:** Joseph Technology Corporation, Inc., Montvale, NJ, USA

**Grant Total:** \$50,000

### UKRAINE

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**Title:** Complex Preparation of Coal Mine Methane for Utilization

**Leader:** State Open Joint Stock Company "Krasnoarmeyska-Zakhidna N1 Mine"

**Partner:** BCKK Engineering, Inc., Midland, TX, USA

**Grant Total:** \$46,997

**Title:** Wood Biomass as an Alternative to Existing Conventional Energy

**Leader:** Verkhovina Region Administration, Ukraine

**Partner:** Sentech, Inc., Bethesda, MD, USA

**Grant Total:** \$41,814

**Title:** Reduction of Harmful Emissions by the Odessa Central Heating and Power Plant -

**Leader:** Regional Communal Utility Odessa CHPP-2, Teplodar, Odessa Oblast, Ukraine  
**Partner:** SRC International CS s.r.o., Prague, Czech Republic  
**Grant Total:** \$43,898

**Title:** Reducing Greenhouse Gases Emissions through Anaerobic Treatment of Wastewater

**Leader:** JSC "Bilosvyt-Uman" (Dairy), Uman, Cherkasy Oblast, Ukraine  
**Partner:** Biothane Corp., Camden, NJ, USA & MBS Ltd., Kiev, Ukraine  
**Grant Total:** \$49,258

**Title:** Reconstruction of Heat Supply System at "Izumrud" Enterprise

**Leader:** Joint-Stock Enterprise "Izumrud", Kiev, Ukraine  
**Partner:** "GOGAS Raduzhnij" Ltd., Vladimir, Russia & "LOTA" Ltd., Kiev, Ukraine  
**Grant Total:** \$42,671

## 2001-2002

### **KAZAKHSTAN**

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**Title:** Introduction of Cleaner Production Practices at FoodMaster's Dairies

**Leader:** FoodMaster Company, Almaty, Kazakhstan

**Partner:** Environmental Control Opportunities, LLC, Waynesboro, VA, USA

**Grant Total:** \$50,000

**Summary:** This project will help FoodMaster Co. identify alternative solutions to their environmental problems related to product waste generation, water use, and energy use at its five plants in Kazakhstan. Specifically, they will design a plan for implementing EMS and ISO 14000 standards, develop a cost-effective and ecologically sound plan for dealing with whey wastes, and decrease water consumption through conservation and recycling.

**Title:** Quality Management of the Drinking Water in Leninogorsk

**Leader:** Leninogorsk Vodokanal, Leninogorsk, Kazakhstan

**Partner:** EnviroSmith Engineering, Inc., Suwanee, GA, USA

**Grant Total:** \$50,000

**Summary:** The goal of this project is to improve the reliability and efficiency of the Leninogorsk Vodokanal water treatment plant. The partners will assess the condition of the plant, develop a near-term and long-term plan to renovate it and then prepare a feasibility study for long-term improvements. This study along with tender documents will be presented to financial institutions to fund the priority long-term improvements.

**Title:** Development of Integrated Solid Waste Management System at the Ferroalloys Plant

**Leader:** JSC Ferrochrome, Aktubinsk Ferroalloys Plant, TNC Kazchrome, Aktobe, Kazakhstan

**Partner:** EnSafe Inc., Memphis, Tennessee, USA

**Grant Total:** \$48,579

**Summary:** This project will work towards developing an integrated industrial solid waste management system for the Aktubinsk ferroalloys plant. The project will focus on low-carbon slag waste that is a major problem because of its high concentration of soluble, toxic hexavalent chromium. The current slag generation and management practices as well as the potential impacts on environmental receptors and human health will be reviewed. Following this review, a feasibility study will be performed to identify alternative waste management practices and an economic, beneficial use for the slag. The slag is comprised mostly of calcium oxide (or quick lime), a valuable and widely used industrial compound. Results of the study will be presented to Ferrochrome's top management for integration into the plant's operations.

### **RUSSIA FAR EAST**

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**Title:** Celina Water Conservation & Pollution Prevention Project

**Leader:** Celina Ltd., Yuzhno-Sakhalinsk, Russia

**Partner:** Loomis Austin, Inc., Austin, TX, USA

**Grant Total:** \$49,700

**Summary:** The goal of this project is to reduce or eliminate the water quality and wastewater problems at Celina's food processing facilities, while simultaneously decreasing production costs and improving operating efficiency. The specific objectives are to eliminate the frequent overflows at the facility as well as the high monthly costs of waste hauling, to become independent from the contaminated public water supply, to reduce potable water costs, and to reduce potable water consumption through wastewater recycling for non-potable water uses.

**Title:** Feasibility Study for the Production of Wood Pellets Using Harvest and Saw Mill Waste

**Leader:** OOO Kristal Ltd., Sakhalin, Russia

**Partner:** New England Wood Pellet, Inc., Jaffrey, New Hampshire, USA

**Grant Total:** \$50,000

**Summary:** Through this project, a feasibility study will be developed for the construction of a wood pellet plant to reduce waste from timber harvesting, improve environmental conditions and provide an alternative energy source. Wood pellets are made of 100% waste sawdust that would otherwise be left in the forest or sent to landfills. They can replace traditional fuels, such as coal and diesel fuel oil, for both households and industrial purposes.

**Title:** Alternative for Water Quality Improvement at Pavlovskoe Mine

**Leader:** JSC Primorskugol Mining Company, Vladivostok, Russia

**Partner:** EarthFax Engineering, Inc., Midvale, Utah, USA

**Grant Total:** \$50,000

**Summary:** This project will evaluate alternatives for improving the mine water management at a surface coal mine with a focus on improving the mine drainage system and the quality of water discharged from the mine. The partner will concentrate on alternatives that rely on technology applications with minimal consumption of power, water, and technical labor for implementation.

## UKRAINE

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**Title:** Reduction of Greenhouse Effect through Methane Utilization at Lugansk Landfill

**Leader:** JSC Protos, Lugansk, Ukraine

**Partner:** SCS Engineering, Inc., Reston, VA, USA

**Partner:** Scientific Engineering Center "Biomass", Kiev, Ukraine

**Grant Total:** \$49,930

**Summary:** The Lugansk Landfill managed by Protos emits almost 4 million cubic meters of methane into the atmosphere each year. The following activities are planned to address this issue. First a feasibility study will be developed to assess different solutions for a LFG extraction, collection and utilization system and then, based on the study results, a demonstration project of the system will be set up and monitored. Finally, a business plan and marketing strategy will be developed for the implementation of a LFG extraction, collection and utilization system for the entire Lugansk landfill.

**Title:** Integrated System for Managing Solid Waste for Donetsk Iron and Steel Works

**Leader:** OJSC Donetsk Iron and Steel Works (DMZ), Donetsk, Ukraine

**Partner:** ICF/EKO Ltd., Moscow, Russia

**Partner:** Ukrainian Center for Ecological Auditing and Insurance Ltd., Donetsk, Ukraine

**Grant Total:** \$48,091

**Summary:** The goal of this project is to develop a strategy for waste management and to minimize the industrial solid waste generated at DMZ. For the waste management plan, the partners will look at the current situation at the plant, conduct a risk and environmental analysis, and then develop an environmental policy and waste management program for DMZ.

**Title:** Environmentally Safe Water Consumption in Belgorod-Dnestrovsky City

**Leader:** Belgorod-Dnestrovsky Enterprise for Water Supply and Sewerage, Ukraine

**Partner:** SRC International CS, sro, Prague, Czech Republic

**Partner:** Century XXI, Ltd., Kiev, Ukraine

**Grant Total:** \$49,492

**Summary:** This project will develop a comprehensive strategy for water quality management in the Belgorod-Dnestrovsky city with the aim of improving the water supply and sewage water treatment efficiency, quality and reliability. After the major problems are identified, a range of potential measures will be suggested that would lead to substantial improvements in the city's water supply and sewage water treatment systems.

**Title:** The Industrial Organic Wastes Utilization Program Involving Waste Combustion for Heat Energy Production

**Leader:** The Stryi District State Administration, Lviv Region, Stryi, Ukraine

**Partner:** District Heating Research and Development Center, Warsaw District Heating Enterprise, Warsaw, Poland

**Partner:** Energy Service Company Unifers Ltd., Lviv, Ukraine

**Grant Total:** \$46,839

**Summary:** This project will assess the feasibility of using wood wastes produced by Stryi district enterprises for fuel for boiler stations and the impact of this activity on the environment. As part of the study, reconstructing the existing boiler stations and installing modern wood-burning heat boilers will be examined, as well as the possibility of introducing heat energy saving measures in buildings. Finally, an Action Plan will be developed for implementing the system in practice.

**Title:** Utilization of Biogas Extracted from Sewage at Ecotekhprom

**Leader:** Ekotekhprom, Ivano-Frankivsk, Ukraine

**Partner:** Energopol S.A., Lublin, Poland

**Grant Total:** \$49,673

**Summary:** The goal of this project is to determine the feasibility of using biogas produced from processing sewage at the sewage treatment plant to meet the plant's energy needs. Also, the project will modernize sludge handling at the plant. Modern sludge handling technology will help remove fermentation gas emissions, remove the need for grounding fields for sludge storage, and provide for both heat self-sufficiency and energy savings at the plant.

**Title:** Utilization of Wood Wastes for Energy Production at Belichi Woodworking Plant

**Leader:** Belichskiy DOK, Kotsiubinske, Kyiev, Ukraine

**Partner:** McNeil Technologies, Inc., Springfield, VA, USA

**Grant Total:** \$49,975

**Summary:** The goal of this project is to utilize the wood residues created at the Belichi woodworking plant by combusting it in a modern, clean-burning boiler for heat production. Wood biomass is an environmentally friendly fuel. It is CO<sub>2</sub> neutral and does not contain sulfur, chlorine and other elements hazardous to the atmosphere. All the heat produced would be used at the plant for drying lumber in the wood kilns and for heating the buildings in the winter.

iii) **Assistance to Environmental Management in Enterprises in the NIS**  
USAID: EcoLinks Grants in Environmental Management (1998 – 2002)  
Best Practices

### **1. Training Environmental Auditors in Russia Far East**

**Project Area:** Environmental Management Systems

**Location of Project:** Khabarovsk region, Russia, with a one-week training session in Washington, DC.

**Project Duration:** January-July 2000

**Project Partners:**

Project Leader: Khabarovsk Krai local government administration (Khabarovsk, Russia)

Project Partner: American International University Network, Ltd. (Lincoln, Nebraska)

Project Associate: Center for Ecological Services and Expertise (Khabarovsk, Russia)

**Abstract:** In 1999, of the approximately 500 environmental auditors in the Russian Federation, there were only 7 environmental auditors in the entire Russia Far East region. Furthermore, the State Committee on the Environment of the Russian Federation, the federal government body empowered to license environmental auditors, only licensed auditors who had completed training courses of the Center for Environmental Security (CES), located in Moscow, seven time zones away from Khabarovsk.

In the winter of 1999, the Khabarovsk Krai local government administration, together with their American partner, the American International University Network, was awarded an EcoLinks Challenge Grant to develop a model program to train environmental auditors in the Russia Far East region. The Project Team worked with trainers from CES to prepare a cadre of environmental auditors in Russia Far East consistent with Russian Federation standards. As a result of this EcoLinks-funded project, 26 environmental auditors were trained, and licensed by the State Committee on the Environment of the Russian Federation. The Project Team also developed a "train the trainers" component, whereby the newly licensed environmental auditors completed additional course work, qualifying them to conduct environmental audit training. This is the first instance of dual licensing of an environmental audit-training program in the Russian Federation.

In order to ensure the sustainability of the model training program, the Project Team worked to establish environmental audit and training components within the Center for Ecological Services and Expertise (CESE), in Khabarovsk. The components were developed in order to train future environmental auditors in the region and to help meet the need for conducting environmental audits in Russia Far East. CESE received accreditation from the State Committee on the Environment in July 2000. It is now the only organization outside of CES accredited by

the State Committee on the Environment to train environmental auditors in the Russian Federation.

The project can be considered a Best Practice for several reasons. First, a successful model program to train and license environmental auditors was developed, in cooperation with the appropriate government authorities. Second, the training program materials were adapted to develop a university course, "Environmental Auditing of Businesses and Enterprises", which is currently offered at two universities. Third, to ensure sustainability of the project, an environmental auditor-training component was established at an environmental consulting organization. In the first six months of operation, it received over \$30,000 in contracts to conduct environmental audits of several manufacturers in the area.

Further information can be found at:  
<http://www.ecolinks.org/bestprac.html>

## 2. Reducing Fly-Ash Emissions at the Vladivostok Municipal Waste-to-Energy Facility

**Name of Project: Clean Sky for Vladivostok: Incorporation of Environmentally Acceptable Air Pollution Control and Ash Utilization Technology at the Vladivostok Municipal Waste to Energy Facility**

**Project Area:** Cleaner Production

**Project Partners:**

Project Leader: Vladivostok Municipal Waste to Energy Facility "Speczavod 1"

Project Partner: Energy & Environmental Consulting Engineers (EECE), Mission Viejo, CA, USA

Project Associates: Daltechenergo (DTE); Testing Center Dalstroiiypysania (TDC); Pacific Institute of Distance Education and Technologies, Far Easter State University (PIDET)

**Location of Project:** Vladivostok, Russia

**Project duration:** February 2000 – January 2001

### Abstract

Speczavod N1 is the only waste-to-energy facility in Russia Far East. The Speczavod facility was built in a residential area of Vladivostok in 1979. The facility has three incinerator units and was designed to burn up to 432 tons of unsorted municipal waste per day and produce almost 400,000 tons of steam annually for residential heat and hot water production. Speczavod was originally equipped with electrostatic precipitator systems (EPS) to capture fly ash generated during the waste incineration process. These EPS units captured about 80% of the fly ash, however, due to the humid climate conditions in Vladivostok, they lasted only about 10 years. Speczavod was built without controls for acid gas emissions.

Before project implementation, Speczavod had a very negative public image and the previous city mayor had tried to close the facility. Speczavod was forced to run at less than full capacity because of unacceptably high fly ash emissions (approximately 2000 tons per year -- over 14 times higher than permitted levels). 232 tons of SO<sub>x</sub>, 78 tons of NO<sub>x</sub>, and 84 tons of CO were also emitted annually. Incinerator efficiency was low and burning temperatures frequently dropped to 300-500C. As a result of low incineration temperatures and the high level of organic material in Vladivostok's waste steam, dioxin emissions were also high.

In January 2000, Speczavod and its American partner Energy & Environmental Consulting Engineers (EECE) were awarded an EcoLinks Challenge Grant to identify options for reducing Speczavod's pollution emissions. Speczavod has already secured funding to implement several recommendations from the EcoLinks-funded project, which have resulted in significant decreases in fly-ash emissions, dioxins, CO and SO<sub>2</sub> emissions. As a result of the EcoLinks funded project, the energy efficiency of one of the incinerator units was increased by 36%, which in turn has resulted in significant economic benefits for Speczavod through increased steam production and sales and reduced auxiliary fuel purchase.

This project can be considered a Best Practice for several reasons. The Project Team was careful to develop low-cost recommendations appropriate to local conditions. The Team prioritized possible options, so that the most pressing needs could be addressed first. Furthermore, the Team's project findings/recommendations, and even developed technical plans, are highly transferable to waste-to-energy facilities in other countries in the region.

Further information can be found at:  
<http://www.ecolinks.org/bestprac.html>

### 3. Improving Environmental Performance at a Potato Chip Plant in Kazakhstan

**Name of Project:** Environmentally Friendly Potato Chip Production at the ASF Plant in Talgar, Kazakhstan

**Project Area:** Environmental Management Systems, Water Conservation and Recycling

**Project Partners:**

Project Leader: Almaty Snack Food Company Talgar Potato Chips Producing Factory (Talgar, Kazakhstan)

Project Partner: Savory Snacks, LLC (Madison, Wisconsin)

Project Partner: Environmental Control Opportunities, LLC (Richmond, Virginia)

Project Associate: FoodMaster (Kazakhstan)

**Location of Project:** Talgar, Kazakhstan

**Project duration:** February 2000 - January 2001

Abstract

The Almaty Snack Food Company (ASF) potato chip plant is a newly established (1998) company located in Talgar, Kazakhstan. The ASF plant is relatively small, employing 40 people and producing about 80 metric tons of chips per year. The potato chip processing plant is located in a former fruit storage warehouse, which did not have any on-site wastewater treatment facilities and is not hooked up to city sewage. As a result, during ASF's first year in production, over two metric tons of untreated wastewater from the plant were dumped into a nearby stream. Energy and water use levels were about 30% higher per unit of production than comparably sized plants in the United States, and correspondingly, production costs were almost prohibitively high. Plant management decided to look for options to minimize their impact on the surrounding environment and to make more efficient use of resources in order to lower their production costs.

Together with American partners Savory Snacks, LLC and Environmental Control Opportunities (ECO), ASF was awarded an EcoLinks Challenge Grant in February 2000 to design and implement an Environmental Management System (EMS) at the factory and to identify and implement measures to make more efficient use of natural resources in the production process. As a result of this EcoLinks funded project, a wastewater filtration and partial water recycling system was installed at the plant site. Improvements in processing and management practices were implemented, which have significantly reduced water and energy consumption at the plant. Following implementation of these practices, ASF's cost of production for 1 kilogram of chips dropped from \$3.60 to \$1.70. Working together with the American partner ECO, an EMS system was designed and implemented at ASF plant facilities.

The project can be considered a Best Practice because it shows the value of using a systematic approach to assess and address environmental problems. Using EMS training and development as a framework, the project team looked at the entire production process, from initial inputs to final product and waste outputs. This approach resulted in improvements that not only lowered the toxicity of waste and pollution, but also in several stages, prevented waste/pollution altogether. The project also demonstrates that for most small and medium sized producers in the NIS, relatively low cost improvements and changes in management practices may bring significant results not only to the environment, but to the company's bottom line.

Further information can be found at:  
<http://www.ecolinks.org/bestprac.html>

#### **4. Developing an Environmental Management System at Concern Stirol in Ukraine**

**Project Title:** The Development of an Environmental Management System and Preparation for Certification and Compliance with ISO 14001 Requirements at Concern Stirol

**Leader:** Concern Stirol, Donetsk Oblast, Ukraine

**Partners:** 1) Futurepast, Inc., Arlington, VA, USA; 2) Ukrainian Environmental Technology Center (UkrNTEC), Donetsk, Ukraine

**Location:** Donetsk Oblast, Ukraine

**Project Duration:** January 2000- February 2001

**EcoLinks Project Investment:** Total EcoLinks Project Investment: \$106,221; EcoLinks Grant Support: \$48,785; Project Team Cost Share Contribution: \$57,436

### Best Practice: Transferable Solution

This project is a Best Practice because Concern Stirol, a chemical manufacturing company in Ukraine, established itself as a model and an experienced guide and mentor in Environmental Management Systems (EMSs) and ISO 14000 series standards. The ISO 14000 series emphasizes an internationally established protocol and standard for controlling and monitoring harmful emissions and waste materials. With the support of an EcoLinks Challenge Grant, Concern Stirol used the EMS/ISO 14000 series to generate the framework and impetus for other companies throughout Ukraine to reduce the environmental impacts of industrial activity and increase their competitive stance in national and international markets.

Through this project, Concern Stirol becomes the first company to be certified in ISO 14001 procedures by a third party organization. Concern Stirol employees received expert training in environmental auditing to identify and control energy use, emissions, and waste. With the implementation of the EMS established in this project, Concern Stirol reduced ammonium emissions by 233 metric tons per year and ammonium nitrate emissions by 96 metric tons per year. Companies incorporating the system outlined in this project gain economic benefits including improving their access to loans, increasing their competitiveness, and reducing operation costs through energy savings.

### Project Summary

Ukraine is highly industrialized. The Donetsk region in eastern Ukraine has a disproportionately high share of industrial activity compared to the rest of the country. Companies are still in the early stages of preparing to meet national environmental policy objectives and internationally recognized environmental standards. In 1997 Ukraine adopted ISO 14001 as a national standard. The ISO 14000 series standardizes the field of environmental management systems and tools promoting consistent and effective organization and product evaluation (e.g., environmental auditing, environmental labeling, environmental performance evaluation, etc.). Prior to project implementation, Ukrainian companies had no experience preparing for third party ISO 14001 certification.

Concern Stirol, an open stockholding company founded in the 1930s, is one of the biggest manufacturers of ammonia, fertilizers, polystyrene, pharmaceutical products and building materials in Ukraine. It captures 80% of the external market for agricultural chemicals. While Concern Stirol has experience with environmental management programs, due to the scale of its operations (4,500 full-time employees and multiple large-scale production lines), it sought additional expertise on EMSs and ISO 14000 series standards.

With the support of an EcoLinks Challenge Grant, Concern Stirol teamed up with Futurepast, Inc. a US firm and UkrNTEC of Ukraine to establish an EMS that meets ISO 14001 standards. This project established the process by which Concern Stirol was able to design and implement an EMS qualifying it for ISO 14001 third party certification. Concern Stirol's final ISO 14001 third party certification was subsequently achieved.

To prepare for ISO 14001 certification, an initial assessment of environmental management practices at Concern Stirol was conducted and recommendations were provided. Additionally, employee trainings in EMS/ISO 14000 series standards with an emphasis on environmental auditing, on-site visits of model companies in the US, and a pre-registration audit were conducted. The notable outcomes of this project include initiation of the ISO 14001 third party certification process for companies in Ukraine, a reduction in harmful emissions with each new registrant, and improved competition and financial opportunities for companies in Ukraine. In the next sections, detailed descriptions of project activities, benefits, lessons learned, and project participant contact information are provided.

## **5. Improving Waste Management at Sinegorskaya Mine**

**Project Title: Model Program of Waste Disposal Control at Sinegorskaya Mine**

**Project Leader:** Shakhta Sinegorskaya, Sakhalin Region, Russia

**Project Partner:** EarthFax Engineering, Inc., Midvale, Utah

**Location of Project:** Sinegorsk, Sakhalin Island, Russia Far East

**Project Duration:** September 2000 - June 2001

**EcoLinks Project Contribution: EcoLinks Grant Support: \$47,754; Project Team Contribution: \$28,319.**

### Best Practice: Transferable Solutions

This project "Improving Waste Management at Sinegorskaya Mine" is an EcoLinks Best Practice. The project developed low tech, low cost measures to improve waste disposal and management at underground coal mines, minimizing the environmental impacts of mining. At the same time, the project assessed the potential to reuse the coal in rock waste piles, which will reduce the size and impact of the piles, while bringing additional revenue to the mine. The recommendations and Model Plan developed through this EcoLinks funded project are highly transferable to other underground coal mines in the NIS (with the exception of recommendations concerning the Sinegorsk town boiler).

### Project Summary

Underground coal mining has been conducted at the Sinegorskaya Mine since 1913. Beginning in 1945, waste rock generated from the mine has been deposited into waste rock piles at the site, the total volume of which is currently estimated at 4,000,000 m<sup>3</sup>. Because coal processing at the Sinegorskaya Mine is not highly efficient, these waste piles contain not only waste rock (shale and sandstone) but also a significant amount of coal.

This waste, now piled into four dumps at the edge of the town of Sinegorsk, presents a serious environmental hazard. In its current form, the waste piles have destroyed 19 hectares of landscape. Heavy metals from the piles leach into the groundwater and sediment from the piles runs off to adjacent areas, including into the Susuya River. Fine particle dust blows from the piles into the atmosphere and particulate matter content in the air near the mine exceeds permissible limits approximately 50% of the time. Finally,

because of the high coal content in the waste piles and the way the waste piles have been formed, the piles are subject to spontaneous combustion, with regular, frequent burns occurring in the summer months.

The goal of this project was to develop a Model Program to improve waste disposal and treatment at the Sinegorskaya Mine. The Project Team assessed the potential for initiating low and no cost measures at the mine to minimize the environmental impacts of coal mining and processing. Recommendations focused on four areas: (1) reducing and capturing the sediment/leaching from the piles; (2) recovering the coal in the waste piles; (3) improving waste disposal/treatment; and (4) improving efficiency of the coal-fired district heating boiler in the town of Sinegorsk. Results of the Project Team's analysis show that the coal in waste piles can be recovered with little processing, and that this coal represents a potential \$450,000 in additional annual revenue to the mine.

## **6. Comprehensive Program for Reduction of Harmful Emissions by the Odessa Central Heating and Power Plant 2**

### **Leader**

Regional Community Utility Odessa CHPP-2, Odessa Ukraine

### **Partners**

SRC International, Prague, Czech Republic

CENTURY XXI Ltd. Kiev, Ukraine

### **Location**

Teplodar, Odessa Region, Ukraine

### **Project Duration**

September 2000 – May 2001

Within a year of switching from excessively polluting bunker fuel to clean-burning natural gas, the heat-only boiler plant (HOBP) in Teplodar, the Ukraine, has cut its CO emissions by 70%, CO<sub>2</sub> by 20% and essentially eliminated SO<sub>2</sub>, V<sub>2</sub>O<sub>5</sub> and ash altogether. And proving that protecting the environment is good business, HOBP now produces a unit of heat at about half its previous cost.

Perhaps even more important, this EcoLinks Challenge Grant project demonstrated that lack of information is sometimes more of an obstacle than lack of funding in getting NIS municipalities to support environmental and energy efficiency projects. The Project Team, led by Regional Community Utility Odessa CHPP-2, used its EcoLinks grant to conduct a local energy audit, develop alternative emission reduction scenarios, and prepare forecasts quantifying their Action Plan's environmental and financial benefits. After reviewing the projections, the regional government of Odessa contributed \$460,000 for the oil-to-gas conversion of two of Teplodar's four boilers. Annual operating cost savings of \$200,000, will pay back that investment in just 2-1/2 years.

These improvements were long overdue. HOBP was originally constructed for the commissioning of a two-reactor nuclear heat and power plant, that because of the 1986 Chernobyl accident was never built. So HOBP remained the only heat source for more than 10,000 inhabitants, commercial consumers, and public services. Since the HOBP

was not intended for permanent use, its design did not observe environmental requirements. Neither did its continued operation. Emissions from the inefficient plant greatly exceeded permissible limits.

The first-year environmental and economic improvements are far from the end of the story. Conversion of HOBP to gas opens the door to installation of steam turbines, which would enable co-generation, allowing Teplodar to produce its own electricity at about half the cost of buying it.

Not limited to plant and the heat distribution network, the Project Team's thorough energy audit also examined the efficiency of customer apartment buildings and commercial establishments. Their report presented a range of no-, low-, and medium-cost energy-saving strategies customers can implement, all with payback times of less than two years.

**iv) Assistance to Environmental Management in Enterprises in the NIS**  
USAID: EAP Support Program Activities in Environmental Management (1998 – 2001)  
Summary Project Information

USAID EAP Support Program in Russia

The USAID EAP Support Program was initiated on March 17, 1995, and ran for six years. During that period, USAID obligated about \$17 million to carry out eight EAPS country programs, mainly in Central and Eastern Europe, and a few regional initiatives. In the NIS, the EAPS Russia program ran from late 1998 to late 1999 and involved a USAID obligation of \$450,000. The following summaries describe individual projects undertaken in Russia.

**Country:** Russia

**Project Name:** Environmental Management Systems Training

**Dates:** September-November 1999

**Summary Description:**

As part of its ongoing role in the US/Russia Regional Investment Initiative (RII), which was established to promote investments in selected regions of Russia, USAID (under its EAP Support Program) conducted a series of educational seminars in Environmental Management Systems (EMS) for local enterprises. The seminar objectives were to (1) incorporate EMS into the overall management systems of the enterprises as a means of continually improving environmental and economic performance and (2) explain why merging EMS with general management strategies increases the attractiveness of the enterprise to potential investors.

The centerpiece of the EMS program was a three-day EMS workshop, the culmination of a series of shorter seminars designed to generate local interest in the EMS philosophy and principles. Held on 1-3 November, 1999 at the Volga Department, Russian Engineering Academy (VDREA), the seminar was geared to teach EMS implementation methodology to enterprise managers and VDREA specialists, and to prepare them to conduct an initial environmental review. The workshop agenda covered:

- Pollution prevention (P2) program philosophy, experience and outcomes
- Familiarization with EMS terminology and concepts, and interrelation of EMS and P2
- Main elements of the ISO 14001 standard
- Strategy and planning
- Main aspects of EMS implementation
- Designing EMS program parameters for each of the participating enterprises
- P2 technology, audit, and practice
- Conducting an initial environmental review
- GAP analysis

At the end of the EMS workshop, each participant was awarded a certificate for completing the course. The IER methodologies discussed were compiled into a guidebook, which the participants used in December when they conducted IERs in their respective enterprises.

**Country:** Russia

**Project Name:** Initial Environmental Review

**Dates:** December 1999

**Summary Description:**

US AID EAP Support Program conducted an initial environmental review (IER) for the Samara Metallurgic Works (SMW), a branch of the Russian Aluminum Company. This review followed the Environmental Management Systems (EMS) workshop lead by EAPS in November 1999 in which SMW and other Russian enterprises participated. Specialists from SMW, enthused by the possibilities presented in the workshop, volunteered to partake in the IER. The IER and related EMS trainings were part of a larger effort, the US/Russia Regional Investment Initiative (RII), which was established to promote investments in selected regions of Russia by upgrading the environmental infrastructure of Russian industries, thereby making them more attractive to potential capital investors.

The IER was carried out in order to:

- Assess the enterprises' use of resources, quality control and labor safety.
- Determine the most promising directions for development of pollution prevention and EMS implementation.
- Develop recommendations for EMS implementation at the Samara Metallurgic Works:
- Increase awareness and motivation of enterprise management regarding pollution prevention and environmental management systems.

The EAPS team worked with the factory for five days. The majority of the time was spent evaluating waste problems, pollution issues and energy-saving opportunities. Other activities included planning meetings prior to the review, preparing the IER report, and meetings with SMW managers to review IER findings.

The IER concluded that Samara Metallurgic Works impacts the environment through its energy and material resource use, use of hazardous substances, and its general culture of production and labor safety. Improvements made in these areas as a result of the IER included reducing natural gas and raw materials consumption by the plant, replacing toxic and carcinogenic substances by less dangerous materials, and enhancing labor protection and safety measures. These activities provided a framework for future systematic assessments of the environmental conditions at the plant, which will occur when the Samara Metallurgic Works implements an EMS.

**Country:** Russia

**Project Type:** Investment Preparation

**Project Name:** Internet Training and Public Information Initiatives

**Dates:** 19-20 July 1999

**Summary Description:**

As part of the Regional Investment Initiative (RII) in Russia, EAPS assisted environmental managers from several Russian enterprises to become familiar with the Internet and to use it as a tool to solve environmental management problems.

The Internet training was initially intended to instruct managers from Russian enterprises to access practical pollution-prevention information relevant to their businesses on the world-wide web. Once it became clear, however, that the participants were unfamiliar with basic internet skills, EAPS realized it must bring participants up-to-speed on using then internet before moving on to complex problem-solving exercises.

Over the course of two full days, fifteen environmental officers and managers from factories in the Samara *oblast* became comfortable with accessing the Internet. By the end of the course, they were able to progress to problem-solving exercises such as finding alternatives to pollution problems in their enterprises, answering environmental management questions and looking up vendors to supply equipment or technical services.

The Internet training complemented a broader program of coordinated public information initiatives designed as part of the Samara RII. These initiatives were aimed at promoting an understanding of pollution prevention, environmental management systems, and the relationships of these to improved business performance and sustainable economic expansion; and also to raise awareness of the USAID/EAPS program in the Samara *oblast*. The public information initiatives included three public seminars, two newspaper articles, TV and radio coverage of EAPS events in Samara, and a 20-minute TV program broadcast repeatedly on local TV. The TV program was entitled "Small But Precious," and emphasized the environmental and economic benefits of even small no-cost/low-cost pollution prevention measures and modest-scale environmental management systems.

**Country:** Russia

**Project Name:** Pollution Prevention Audits in Samara

**Dates:** March 1999

**Summary Description:**

Samara, a city of one million located southeast of Moscow on the Volga River, is the largest industrial center in the Volga Region and trails only Moscow and St. Petersburg in terms of industrial output. However, one of the obstacles to attracting investment in Samara is severe environmental degradation and generally poor environmental management practices throughout the *oblast*. To address this issue EAPS undertook to demonstrate to Samara enterprises the link between sound environmental practices and sound business practices in a manner that required little financial burden on the part of enterprises.

Pollution prevention audits were conducted at four partner enterprises: Samara Bearing Plant, Samara Cable Company, Rodnik Vodka Company and Yukos Novokuybishev Oil Refinery. The objective of the audits was to identify and demonstrate the effects of low-cost environmental improvements and to introduce environmental management systems. Technical teams comprising U.S. and Russian experts and a representative from the enterprise conducted the pollution prevention audits, which were based on a standardized step-by-step pollution prevention methodology developed by EAPS. EAPS prepared and distributed a pollution prevention assessment source book to help

enterprises begin the process of developing environmental management plans and identifying low-cost pollution-prevention opportunities.

Examples of recommended pollution prevention measures and their impact include:

- Installation of control valves on bottle washing machines at Rodnik Vodka Company reduced water consumption and wastewater discharges by 50%, a savings of 648 m<sup>3</sup>/day;
- Use of a particle analyzer enabled the Cable Company and EAPS experts to develop a diagnostic test to reduce copper attrition, which reduced copper contamination in plant stormwater, improved quality of extruded wire, and reduced environmental health risks and feedstock material losses (a savings of up to \$1,000,000 based on U.S. prices); and
- Successful installation of an automatic relay device that turns ventilation and heat on/off when an exterior door is operated prompted the Bearing Plant to replicate this recommendation on six other exterior doors to significantly reduce energy consumption and save the company over \$30,000/year.

The assessments identified a combined total of approximately \$1.5 million per year in materials, reduced pollution fines, and energy savings. If widely implemented in the enterprises, the low-cost pollution prevention measures will result in significantly reduced wastewater discharges and emissions of airborne contaminants, thereby also reducing environmental health risks. Reduced health risks alone bring an additional potential savings in health care costs of several million dollars. Longer term, higher investment pollution prevention opportunities were also identified and documented in reports prepared on each enterprise.

**Country:** Russia

**Project Name:** No-Cost/Low-Cost Environmental Improvements

**Dates:** November 1998-September 1999

**Summary Description:**

The US/Russia Regional Investment Initiative (RII) was established to promote investments in selected regions of Russia, primarily the Samara *oblast*. An obstacle to attracting investments in Samara was the state of severe environmental degradation throughout the *oblast*. EAPS efforts aimed to promote business management practices that simultaneously improve environmental performance and production efficiency, potentially making the region's enterprises more appealing to investment capital sources.

During February and March 1999, Russian-American teams from the private and public sectors partook in pollution-prevention assessments for the following enterprises: Samara Cable Company, Samara Bearing Company, Yukos Novokuibyshevsk Oil Refinery and Rodnik Vodka Company. EAPS contributed to this effort by providing technical assistance in all steps leading to and throughout the assessment phase, and by preparing a standardized step-by-step guide entitled *In-Plant Environmental Assessment Sourcebook: A Guide to Pollution Prevention Planning*.

To prepare for the environmental assessments, EAPS undertook the following steps:

1. Created assessment teams including EAPS staff and local technical specialists
2. Collected relevant information for in-plant environmental assessments
3. Conducted preparatory in-plant assessment meetings to prepare managers and workers for the environmental assessments and involve them in planning, familiarize plant personnel with procedures and objectives, plan the assessment schedule and develop report formats
4. Held training workshop to familiarize teams with formal methodology for conducting in-plant pollution-prevention assessments (*In-Plant Environmental Assessment Sourcebook: A Guide to Pollution Prevention Planning* served as a training manual).
5. Lead assessment teams through partner enterprises to orient them to the physical layout of each plant

In the course of the in-plant assessments, the teams, lead by EAPS, were able to identify pollution-prevention and energy saving opportunities. Detailed technical reports and summaries of no-cost/low-cost pollution prevention recommendations, translated into Russian, were provided for each of the factories. Finally, EAPS assisted implementation of the pollution-prevention recommendations and supervised monitoring of their environmental and bottom-line benefits.