

PD-ABW-629

EcoLinks Partnership Grants Program
Quarterly Progress Report
January – March 2002

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**EcoLinks Partnership Grants
Quarterly Progress Report
January 1, 2002 – March 1, 2002**

Part I. Narrative Discussion

1. Brief overview of activity status and major accomplishments this quarter.

Status:

Challenge Grants: The first three cycles of grants have been closed. The fourth and fifth cycles are in progress, and the application process is underway for the fast-track cycle. To date 165 Challenge Grants have been awarded for a total of \$7.7 million.

Quick Response Awards: QRAs continue to be offered on a rolling basis. During the quarter, 41 Quick Response Awards were awarded for \$157,800. To date, 344 QRAs have been awarded for about \$1.4 million.

Financial: Estimated total program expenses at the end of the quarter are \$14.4 million. Total IIE cost share is \$3.6 million.

Major Achievements:

Grants Administration:

- A fast-track Challenge Grants cycle was launched in November 2001. On January 14, 238 concept papers were received and 95 were cleared to proceed to the full application stage. Full applications are due on April 8 and the selection panel meets on May 30. The country breakdown for concept papers received/approved is below:

| | | | |
|-----------|-------|-----------------|-------|
| Bulgaria | 63/23 | Romania | 56/19 |
| Croatia | 13/3 | Russia Far East | 22/12 |
| Bosnia | 4/2 | Kazakhstan | 14/7 |
| Macedonia | 32/14 | Ukraine | 34/15 |

- In connection with the fast-track cycle, the country program officers organized 6 proposal-writing workshops attended by 156 applicants.
- During the quarter, 41 Quick Response Awards were awarded for \$157,789. A listing is provided in Annex A. Of this total, 28 facilitated Challenge Grant applications and 13 promoted environmental trade and investment relationships.

- To date 344 QRAs have been awarded for \$1,435,700. The country breakdown is provided below:

| | | | |
|--------------------|----|--------------|----|
| Bulgaria | 53 | Lithuania | 5 |
| Bosnia Herzegovina | 5 | Macedonia | 28 |
| Croatia | 19 | Moldova | 1 |
| Czech Republic | 24 | Poland | 29 |
| Estonia | 1 | Russia | 33 |
| Georgia | 3 | Romania | 56 |
| Hungary | 22 | Slovakia | 5 |
| Kazakhstan | 30 | Turkmenistan | 1 |
| Latvia | 2 | Ukraine | 26 |
| | | Uzbekistan | 1 |

- A second survey among QRA awardees was conducted in February 2002. The survey's aim is to obtain information on results and follow-up activities as well as feedback on staff support. Questionnaires were sent to 44 grantees that received QRAs promoting environmental trade and investment during November 2000 – October 2001. The 66% response rate was quite high, and the main conclusions are listed below: *34%*

- 90% of the respondents reported that their Ecolinks partnerships were still continuing
- Partnerships were formed for a number of purposes - to establish licensing and distribution relationships or joint ventures (17 respondents); to obtain project financing and investment (5); and to exchange know-how and expertise (4).
- Eight respondents reported concrete results such equipment sales or distribution agreements, and the remainder stated that results were expected in the future (refer to next point).
- 28%* - 72% of the respondents rated the EcoLinks staff support as "excellent" and the remainder as "good"

- In the above QRA survey, five respondents reported trade and investment results amounting to \$2.1 million. Solar Turbines, Inc in San Diego reported a notable success in the modernization of a heating plant in Slovakia. Slovensky Hodvab, an aluminum producer, purchased a gas compressor for \$540,000 from Solar Turbines and placed an order for a gas turbine generator for \$990,000.
- To date grantees have reported that they have raised about \$43 million in additional funds for EcoLinks-related financing, trade or investment. A list of these post-grant successes is provided in Annex B.

- During the quarter, three Best Practices were prepared from closed Challenge Grants:
 - Reducing and controlling water losses in the municipal water distribution network in Tirgu Mures, Romania
 - Reconstructing the heat supply system at Izumrud, a gem cutting factory in Kiev, Ukraine
 - Promoting cleaner production in five counties in Croatia

These Best Practices are provided in Annex C.

- During the quarter, a study was prepared at the request of the USAID Mission in Croatia to assess the potential for financing environmental investments in the country. The study was primarily intended to provide an indication of the availability of funding for EcoLinks grantees and other private-sector companies and to identify any barriers that prohibit them from accessing this funding. The main conclusion was that there are sufficient funds for environmental activities available at commercial terms, but most companies lack the capacity to access those funds. To remedy this situation, assistance is needed to help Croatian companies identify the most appropriate financing mechanisms, structure their projects for financing, prepare the bankable documents and market their financing proposals to financing institutions. The entire study is provided in Annex D.
- With IIE cost-share funds, eight country directories of financing sources for environmental activities were prepared for Bulgaria, Romania, Croatia, Macedonia, Bosnia & Herzegovina, Ukraine, Kazakhstan and Russia Far East. These directories are intended to assist EcoLinks grantees and other project sponsors identify appropriate funding sources for their projects. International development banks, commercial banks, national government agencies, and venture capital funds are listed at both the local and regional levels. As an example, the directory for Croatia is provided as Annex E.

Program Outreach and Coordination:

- An 18-page Annual Marketing Report was produced. It described program achievements and developments in 2001; presented four success stories from Challenge Grants and listed all QRAs and Challenge Grants awarded during the year. The report was distributed to the USAID Missions, FCS Senior Commercial Officers and Tech Reps.
- Program achievements and successes were provided to Devtech for preparation of the Annual Partners Report.
- A press conference was organized in Kazakhstan in January to highlight the EcoLinks program in Kazakhstan and to introduce the new 5th cycle grantees. USAID Central Asia Mission Director Glenn Anders and CoP Winston Bowman spoke at the event

and the grantees briefly presented their projects. Thirteen TV agencies, three radio stations and eight newspapers attended the event. Five TV stations broadcast the press conference, and several newspapers published articles about the EcoLinks program and the new projects in Kazakhstan.

- The CoP met with the USAID Missions in Serbia, Bosnia, Croatia, Bulgaria and Romania to update them on the program and to inquire about their possible interest in buying into the program. The NIS RPM introduced the program to Craig Anderson, the new Deputy Director of Energy and Water at the USAID Mission in Kazakhstan.

Staffing Office and Network:

- The program officer in Kazakhstan resigned effective January 18 to accept a position with the USAID Mission. The candidate selected as her replacement declined the job offer due to the uncertainty of the program's extension. The program will be administered by the Program Coordinator, Olga Klimanova.
- Due to budget reductions requested by USAID, a few staff members and offices will be phased out over the next six months. Employee contracts will not be renewed for the Program Officers in Macedonia and Bulgaria when they expire on June 30 and November 15, respectively. The financial administrator will not be replaced when he resigns in April. The two satellite offices in Russia Far East will close at the end of October.

Cost Share and Financial Information:

- During the quarter, USAID requested reductions in the administrative budget in order to fund additional Challenge Grants in the fast-track cycle and QRAs through the end of the program. At the same time USAID agreed to provide another obligation of funds to make up for the difference that is needed to approve all acceptable applications for QRAs and Challenge Grants.
- By the end of the quarter, IIE's total cost-share contribution to the program amounted to \$3,588,700.
- Estimated total program expenditures to date are \$14.4 million. A preliminary financial report is attached as Appendix F. As soon as final expense reports are available from REC, a final financial report will be submitted.

2. Implementation issues identified last period and status of resolution.

- The extension of the program is still pending.

3. Implementation issues and/or procurement issues anticipated in the next reporting period.

- When the appropriate opportunity develops, it is recommended that USAID/W approach the USAID Missions and negotiate mission buy-in. A strategy for this needs to be developed.
- USAID's next obligation of funds is expected.
- Program guidelines and the website need to be modified to include Albania as an eligible country for QRAs.

April 29, 2002

IIE's Fourteenth Quarterly Report

For the Period: January 1, 2002 – March 31, 2002

Prepared by: Winston Bowman, IIE
Date Prepared: April 25, 2002

Part II. Basic Activity Information

| | | |
|---|---------------------------------|--------------|
| Activity Name: Eurasian-American Partnerships for Environmentally Sustainable Economies – EcoLinks | Life of Activity Value: | \$23,297,897 |
| Purpose of Activity: Promote market-based solutions to Environmental problems in CEE/NIS, with emphasis on the urban and industrial sectors. | Amount to be obligated: | \$ 5,794,194 |
| Implementing Partner: Institute of International Education (IIE) | Amount obligated: | \$17,503,703 |
| Award/Amendment No., Type (CA): EE-A-00-98-00020 | IPSES Funds 180-0039 (CEE) | \$ 8,849,057 |
| | EPT Funds 110-0003 (NIS) | \$ 5,518,681 |
| Period of Award: 07/01/98 to 06/30/03 | Funds Expended to Date (Total): | \$14,367,738 |
| CO/CTO/COP: Sherrill Facht (AO), Carl F. Maxwell (CTO), /Winston Bowman (COP). | Obligated Funds Remaining: | \$ 3,135,965 |
| Linked to S.O. No.: 1.6 Increased Environmental Management Capacity to Promote Sustainable Economic Growth | Next Obligation Due By: | |
| Intermediate Results Nos.: IR 1.6.2 (Trade), IR 1.6.3a (Best Practices), and IR 1.6.4 (Inst.) | | |

Part III. Results Performance

| Result Description | Result Indicator Performance | | | | | | | | | | |
|---|---|----------------------------------|-----|--|-----|------------------------------------|----|-------------------------------------|----|---------------------------------|----|
| <p>Result No. 1.6.3a: "Best Practices" Adopted by Industrial and Public Sectors.</p> | | | | | | | | | | | |
| <p>Results: Successfully operating environmental partnerships will be established to promote solutions to environmental problems appropriate to market-oriented economies and democratic societies.</p> | | | | | | | | | | | |
| <p>Indicators: (1) Number of projects that result in a best practice to solve an environmental problem; (2) Number of projects that result in a market-based solution to an environmental problem ; (3) Number of Quick Response Awards (QRAs) that result in a collaborative Challenge Grant Proposals.</p> | | | | | | | | | | | |
| <p><u>Result Indicator (1):</u> Number of projects that result in a best practice to solve an environmental problem</p> <p><u>Unit of Measurement:</u> same</p> | <table> <tr> <td>Life of Strategy Target:</td> <td>70</td> </tr> <tr> <td>Cumulative Achievement to Date:</td> <td>41</td> </tr> <tr> <td>Current Year Target (6/02):</td> <td>20</td> </tr> <tr> <td>Current Quarter Achievement:</td> <td>4</td> </tr> <tr> <td>Current Year Achievement</td> <td>16</td> </tr> </table> | Life of Strategy Target: | 70 | Cumulative Achievement to Date: | 41 | Current Year Target (6/02): | 20 | Current Quarter Achievement: | 4 | Current Year Achievement | 16 |
| Life of Strategy Target: | 70 | | | | | | | | | | |
| Cumulative Achievement to Date: | 41 | | | | | | | | | | |
| Current Year Target (6/02): | 20 | | | | | | | | | | |
| Current Quarter Achievement: | 4 | | | | | | | | | | |
| Current Year Achievement | 16 | | | | | | | | | | |
| <p><u>Result Indicator (2):</u> Number of projects that result in a market-based solution to an environmental problem</p> <p><u>Unit of Measurement:</u> same</p> | <table> <tr> <td>Life of Strategy Target:.</td> <td>225</td> </tr> <tr> <td>Cumulative Achievement to Date:</td> <td>92</td> </tr> <tr> <td>Current Year Target (6/02):</td> <td>45</td> </tr> <tr> <td>Current Quarter Achievement:</td> <td>5</td> </tr> <tr> <td>Current Year Achievement</td> <td>46</td> </tr> </table> | Life of Strategy Target:. | 225 | Cumulative Achievement to Date: | 92 | Current Year Target (6/02): | 45 | Current Quarter Achievement: | 5 | Current Year Achievement | 46 |
| Life of Strategy Target:. | 225 | | | | | | | | | | |
| Cumulative Achievement to Date: | 92 | | | | | | | | | | |
| Current Year Target (6/02): | 45 | | | | | | | | | | |
| Current Quarter Achievement: | 5 | | | | | | | | | | |
| Current Year Achievement | 46 | | | | | | | | | | |
| <p>Result No. 1.6.4: Increased Institutional Ability to Identify and Remedy Environmental Problems.</p> | | | | | | | | | | | |
| <p>Results: Successfully operating environmental partnerships will be established to promote solutions to environmental problems appropriate to market-oriented economies and democratic societies.</p> | | | | | | | | | | | |
| <p>Indicators: (1) Number of Challenge Grant proposals that met prescreening criteria. (2) Number of partner searches that result in an on-going relationship (e.g. challenge grant proposal); (3) Number of projects that result in institutional changes that enhance the project participant's ability to identify and remedy environmental problems.</p> | | | | | | | | | | | |
| <p><u>Result Indicator (1):</u> Number of Challenge Grant proposals that met prescreening criteria.</p> <p><u>Unit of Measurement:</u> same</p> | <table> <tr> <td>Life of Strategy Target:</td> <td>525</td> </tr> <tr> <td>Cumulative Achievement to Date:</td> <td>317</td> </tr> <tr> <td>Current Year Target (6/02):</td> <td>50</td> </tr> <tr> <td>Current Year Achievement:</td> <td>90</td> </tr> </table> | Life of Strategy Target: | 525 | Cumulative Achievement to Date: | 317 | Current Year Target (6/02): | 50 | Current Year Achievement: | 90 | | |
| Life of Strategy Target: | 525 | | | | | | | | | | |
| Cumulative Achievement to Date: | 317 | | | | | | | | | | |
| Current Year Target (6/02): | 50 | | | | | | | | | | |
| Current Year Achievement: | 90 | | | | | | | | | | |

| | |
|--|---|
| <p>Result Indicator (2): Number of partner searches that result in an on-going relationship (e.g. challenge grant proposal)</p> <p><u>Unit of Measurement:</u> same</p> | <p>Life of Strategy Target: 150 Cumulative Achievement to Date: 56 Current Program Year (6/02) Target: 15 Current Quarter Achievement: 0 Current Year Achievement: 6</p> <p>Note: Partner searches were not facilitated for the fast-track cycle.</p> |
| <p>Result Indicator (3): Number of projects that result in institutional changes that enhance the project participant's ability to identify and remedy environmental problems</p> <p><u>Unit of Measurement:</u> same</p> | <p>Life of Strategy Target: 150 Cumulative Achievement to Date: 61 Current Program Year (6/02) Target: 30 Current Quarter Achievement: 17 Current Year Achievement: 31</p> |
| <p>Result No. 1.6.2: Increased environmental trade, finance, and investment</p> <p>Results: Successfully operating environmental partnerships will be established to promote solutions to environmental problems appropriate to market-oriented economies and democratic societies.</p> <p>Indicators: (1) Number of QRAs that result in an agreement to pursue environmental trade, finance, or investment; will also track the number of QRAs that result in a Challenge Grant Proposal (2) Number of projects that result in an agreement to further pursue environmental trade, finance, or investment.</p> | |
| <p>Result Indicator (1): Number of QRAs that result in an agreement to pursue environmental trade, finance, or investment; also track the number that result in a Challenge Grant Proposal</p> <p><u>Unit of Measurement:</u> same</p> | <p>Life of Strategy Target: 350 Cumulative Achievement to Date: Total QRAs = 345, Trade -127, Grants - 218 Current Year Target (6/02): Total QRAs = 120, Trade - 40, Grants - 80 Current Quarter Achievement: Total QRAs = 41; Trade - 13; Grants - 28 Current Year Achievement: Total QRAs = 126; Trade - 43; Grants - 83</p> |
| <p>Result Indicator (2): Number of Challenge Grant projects that result in an agreement to further pursue environmental trade, finance, or investment.</p> <p><u>Unit of Measurement:</u> same</p> | <p>Life of Strategy Target:. 70 Cumulative Achievement to Date: 28 Current Year Target (6/02): 15 Current Quarter Achievement: 1 Current Year Achievement: 13</p> |

Annex A
ECOLINKS QUICK RESPONSE AWARDS
Jan - Mar 2002

| DATE OF AWARD | IIE NUMBER | GRANTEE | PROJECT TITLE | COUNTRY | PROJECT PARTNER | GRANT AMOUNT | ACTIVITY DATE | INITIATOR/STAFF |
|---------------|------------|-------------------------------------|---|---------------|--------------------------------|------------------|---------------|-----------------|
| 01/11/02 | 70224895 | G 2 International Company | Eco-products in Russia | US to RU | Izhmash International Trading | \$4,952 | Feb-02 | Ap/PT |
| 01/14/02 | 70224896 | Euro-Sep | Wastewater treatment and membranes | PL to US | R-V Industries, Inc | \$3,288 | Feb-02 | TR/AK |
| 01/16/02 | 70224897 | Bucharest Municipality | Meeting with the partner | RO to US | Lockheed Martin Co. | \$2,399 | Jan-02 | TR/PT |
| 01/16/02 | 70224898 | Agraro Consult, Ltd. | Minimization of mining impacts | RO to US | Golder Associates, Inc. | \$4,179 | Jan-02 | TR/PT |
| 01/16/02 | 70224899 | S. C. Termoelectrica S. A. | Use of ash/slag from thermal plants | RO to US | Aspen Petroleum Products | \$4,208 | Jan/Feb-02 | TR/AK |
| 01/31/02 | 70224900 | VODKA a.s. | Vacuum sewage technology | CZ to US | HVAC, Inc. | \$5,000 | Apr-02 | TR/PT |
| 01/24/02 | 70224901 | Phoenix Fuel Systems, Inc. | Municipal waste into fuel pellets | US to RO/HU | Energobit, CEVA Hungary | \$5,000 | Feb-02 | Ap/AK |
| 02/05/02 | 70224902 | Polytronix - 91 | Wind resource assessment | BG to Germany | Enron Wind Development Co | \$2,842 | Feb-02 | TR/PT |
| 02/07/02 | 70224903 | Tech-Pomp Sp. z. o. o. | Wastewater treatment pumps | PL to US | Gorman-Rupp International | \$4,972 | Feb-02 | TR/AK |
| 02/14/02 | 70224904 | Ramnicu Valcea City Hall | Energy efficiency master plan | RO to US | ERS, MA | \$4,886 | Mar-02 | Ap/IH |
| 03/01/02 | 70224905 | Clean Energy Commercialization | Energy efficiency and wood waste reuse | US to RO | Mobimpex | \$2,860 | Mar-02 | Ap/IH |
| 03/05/02 | 70224906 | Piatra neamt city hall | Use of wood waste for co-generation | RO to US | ESGI, Inc., DC | \$3,630 | Mar-02 | Ap/IH |
| 03/05/02 | 70224907 | District 3 | Energy Efficiency measures in schools | RO to US | Kiss + cathart, Inc., NY | \$3,486 | Mar-02 | Ap/IH |
| 03/05/02 | 70224908 | CELP | Water Pollution at zinc plating facilities | RO to US | EnPro, LLC | \$2,976 | Mar-02 | Ap/IH |
| 03/05/02 | 70224909 | RAHKAT Jsc | Water conservation at the plant | KZ to US | Benmol Eng., VA | \$4,125 | Mar-02 | Ap/IH |
| 03/05/02 | 70224910 | Textile Co. AHBK | Cleaner production at the plant | KZ to RU | JSC LaserVarior Akurs | \$3,676 | Mar-02 | Ap/IH |
| 03/05/02 | 70224911 | Almaty Power Consolidated | Cleaner production at the plant | KZ to RU | United Energy Syst. of Russia | \$3,800 | Mar-02 | Ap/IH |
| 03/05/02 | 70224912 | Kyzylorda City hall | Improvement of drinking water quality | KZ to US | The Sea Crest Group, CO | \$4,290 | Mar-02 | Ap/IH |
| 03/05/02 | 70224913 | Entrepreneurs for Utilization of En | Energy efficiency/ greenhouse gas reducti | CZ to UK | Yagotyn Sugar Plant | \$3,344 | Mar-02 | Ap/AK |
| 03/05/02 | 70224915 | Zhlti S. A. | Wastewater project | BG to US | VTech Environmental Services | \$4,080 | Mar-02 | Ap/AK |
| 03/05/02 | 70224916 | Pendergast Sami Group | Municipal wastewater and sewerage proje | US to BG | Municipality of Bansko | \$4,164 | Mar-02 | Ap/AK |
| 03/05/02 | 70224917 | Applied Energy Services Corp | Energy efficiency project | US to BG | Energocabel | \$4,250 | Mar-02 | Ap/AK |
| 03/05/02 | 70224918 | JSC Mayak | Utilization of electroplating waste | UK to PL | Ekomodern | \$3,227 | Mar-02 | Ap/AK |
| 03/05/02 | 70224919 | ELCON | Treatment of organic pollution | CR to CZ | DEKONT spol. s.r.o. | \$2,291 | Mar-02 | Ap/PT |
| 03/05/02 | 70224920 | Tetek AD | Energy conservation program | MK to US | ERM | \$5,000 | Mar-02 | Ap/PT |
| 03/05/02 | 70224922 | Toplifkacija AD | Energy efficiency measures in schools | MK to US | ICG, Ltd | \$4,506 | Mar-02 | Ap/PT |
| 03/05/02 | 70224923 | Vodovod | Leak abatement in water suplying network | MK to CZ | Hydroprojekt a.s. | \$2,976 | Mar-02 | Ap/PT |
| 03/05/02 | 70224924 | Local Government of Delcevo | Solid waste management | MK to US | Enviro Engineering, Inc. | \$3,802 | Mar-02 | Ap/PT |
| 03/05/02 | 70224925 | Blagoj Gjorev | Water quality management | MK to US | UEM, Inc. | \$4,260 | Mar-02 | Ap/PT |
| 06/07/02 | 70224926 | Paul Aldretti | Energy efficiency in rubber articles produc | US to BG | Zebra JSC | \$3,242 | Mar-02 | Ap/AK |
| 03/05/02 | 70224927 | City of Osijek | Waste as alternative fuel at the cement pl | CR to CZ,SL | Cemdesign, CEVA Internationa | \$4,407 | Mar-02 | Ap/PT |
| 03/05/02 | 70224928 | Clinical Hospital Mostar | Thermal processing of hospital waste | MK to CZ | IDOS Praha | \$3,460 | Mar-02 | Ap/PT |
| 03/05/02 | 70224929 | RZ Institute | Optimizing of the technological FeV chain | MK to BG | EKOTEH doo | \$1,600 | Mar-02 | Ap/PT |
| 03/05/02 | 70224930 | Agro Kuper | Implementation of on-site generator system | MK to US | Air Products and Chemicals, In | \$4,213 | Mar-02 | Ap/PT |
| 03/05/02 | 70224931 | Municipality of Prilep | Model of solid waste management system | MK to US | ISA, Inc. | \$4,866 | Mar-02 | Ap/PT |
| 03/07/02 | 70224932 | Andrea Zaveczi | Wind energy dealership agreements | HU to US | Bergey, Southwest Windpowe | \$4,140 | Mar-02 | TR/AK |
| 03/19/02 | 70225028 | Technology Transfer Enterprise | Establishing Environmental Data System | US to KZ | EISA | \$4,980 | Mar/May-02 | Ap/PT |
| 03/07/02 | 70225029 | Hephaestus | Reconstruction of cooling/heating system | US to MC | Makstil AD | \$3,500 | Mar-02 | Ap/PT |
| 03/22/02 | 70225030 | Aeromix Systems, Inc. | Locating distributors for aeration prod. | US to CZ, PL | Aquator | \$3,300 | Apr-02 | Ap/AK |
| 03/27/02 | 70225031 | Izumrud | Energy efficient cooling system | UK to US | Liebert | \$5,000 | Apr-02 | Ap/AK |
| 03/28/02 | 70225032 | N California WTC | Environmental matchmaking | US to BG | Zebra JSC | \$2,602 | Apr-02 | Ap/IH |
| TOTAL | | | | | | \$157,789 | | |

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**Annex B
Ecolinks Partnership Grants
Post-Grant Successes**

Quick Response Awards

U.S. Partner: ENSAT (Culpepper, VA)
Local Partner: Design Academy Kazgor (Kazakhstan)
Activity Description: Upgrade municipal water supply and sewage collection system for a portion of Aytrau city
Results: \$560,000 contract was awarded by World Bank

U.S. Partner: Ticon Trading, Inc. (San Rafael, California)
Local Partner : Olymp Plus Company, Ltd. (Russia)
Activity Description: Minimization and reuse of wood waste
Results: \$5 million joint venture established in Primorsky Krai to manufacture and sell timber products to China, Japan and the United States.

U.S. Partner: Wynn Oil Company (Azusa, California)
Local Partner: AYR ImEx (Vladivostok, Russia)
Activity Description: Pollution reduction of automotive fuel-system cleaning services
Results: \$240,000 in purchase of environmentally friendly automotive products and equipment

U.S. Partners: Genesis Technologies International (Atlanta, Georgia)
Pacific Environmental Management, Inc.
(San Francisco, California)
MicroBac International, Inc. (Round Rock, Texas)
Local Partner : PROTE Bioremediacja (Poland)
Activity Description: Application of bioremediation technology for soil and groundwater remediation in Eastern Europe.
Results: \$100,000 purchase of equipment from the US Partners.

U.S. Partner: Udell Technologies (Berkeley, California)
Local Partner : Envi-Aqua (Czech Republic)
Activity Description: Application of steam enhanced extraction technology to clean up land contaminated by oil products.
Results: estimated \$300,000 purchase of equipment from the US Partner over a two-year period.

U.S. Partner: APPLIED POWER Corporation (Lacey, Washington)
Local Partner : Lesoproduct Export Co. (Vladivostok, Russia)
Activity Description: Search for alternative source of power to reduce pollution and operating costs
Results: \$60,000 purchase of equipment from US partner

U.S. Partner: Koetter Dry Kiln, Inc.(Borden, Indiana)
Local Partner : Inkom Co, Ltd (Vladivostok, Russia)
Activity Description: Reduction of sawdust accumulation at this wood finishing company and search for woodwaste recycling and finger gluing technologies.
Results: \$60,000 purchase of energy-efficient dry kiln from US partner and agreement to be its official distributor in Russia Far East

U.S. Partner: Environmental Systems Research Institute (Redlands, California)
Local Partner: Ecomedservice (Ukraine)
Activity Description: Training of Kiev city authorities for use of GIS technologies as part of environmental management system in the city
Results: \$10,000 purchase of environmental GIS software

U.S. Partners: Florida Heat Pump Manufacturing Company (Fort Lauderdale, FL)
Peerless Pacific (Portland,OR)
Local Partner: SKIF MX, Ltd. (Khabarovsk, Russia)
Activity Description: training on geothermal heat pumps installation and maintenance, development of business contacts
Results: \$1 million agreement with Florida Heat Pump Manufacturing to purchase and distribute equipment over five years

U.S. Partner: Sentech Inc. (Bethesda, Maryland)
Local Partner: Verkhovina District Administration (Ukraine)
Project Description: Substitute wood waste for coal as an energy source for heating buildings in Verkhovina
Results: \$30,000 purchase of drying chamber and bracketing machine for wood waste by Top Trade, a local company, that will supply Verkhovina District Administration with wood-waste brackets

US Partner: Rosco Manufacturing (Madison, SD)
Local Partner: Silnicni Technika, (Czech Republic)
Activity description: Environmentally friendly road maintenance in 5 counties in Czech Republic
Results: \$235,000 sales of Rosco model RA-2000 Spray Patcher

US Partner: Integrated Consultants & Engineers, Inc. (Trafford, PA)
Local partner: LK Engineering (Czech Republic)
Activity description: Assessment of energy efficiency project opportunities in Brno
Results: A 50/50 joint-venture company "LKE Dynamic Power Technologies s.r.o" (\$3,000 invested by the US company)

US partner: MSE Technology Applications, Inc. (Butte, Montana)
Local partner: Municipality of Bytom (Poland)
Activity description: Application of plasma systems for the treatment of toxic waste in Bytom
Results: \$178,000 feasibility study (\$115,000 awarded by US Trade and Development Agency and \$63,000 contributed by MSE Technology Applications)

US partner: Cytec Industries (West Paterson, NJ)
Local Partner: Manti, Ltd., Bulgaria
Activity description: Drinking water purification in Bulgaria
Results: Manti was contracted as a general distributor of CYEC's water treatment technologies in Bulgaria

US partner: Coler & Colantonio, Inc. (Norwell, MA)
Local partner: The union of Upper Raba Communities (Poland)
Activity description: Application of US wastewater technology in Upper Raba River
Results: \$152,000 from US. TDA for purchase of US equipment under 2 demonstration projects to construct a low-pressure collection system in Brzaczowice and a modular wastewater treatment.

US Partner: Solar Turbines (San Diego, CA)
Local Partner: SMF Hodonin (Czech Republic)
Activity description: Modernization of Heating Plant at Slovensky Hodvab
Results: \$540,000 sales of gas compressor – July 2001; an order is placed for a \$990,000 gas turbine generator to be delivered at an aluminum plant in Slovakia – September 2002.

Challenge Grants

Project Leader: Municipality of Kisielice, Poland
U.S. Partner: AWS Scientific, Inc. (Albany, NY)
Project Description: Installation of electricity generation wind turbine in Kisielice Municipality.
Follow-up financing: \$1.9 million in financing to cover the total investment outlay for installation of the wind turbine, as follows:
- \$600,000 grant from Polish Ecofund
- \$200,000 grant from the Polish National Fund for Environmental Protection
- \$1.1 preferential loan at 5.4% from the Polish National Fund for Environmental Protection
- \$20,000 investment from municipality's own funds

Project Leader: Sofia Municipality (Bulgaria)
US Partner: Good Consulting, USA
Project Description: Prepare energy efficiency action plan for Sofia building stock
Follow-up Financing: \$105,000 from European Union to set up a Municipal Agency for Energy Management.
\$3 million loan from Black Sea Investment Bank to set up a Municipal Energy Efficiency Fund or an ESCO company to carry out the energy action plan for the next 2-3 years.

Project Leader: RAJAC (Iasi, Romania)
U.S. Partner: Cavanaugh & Associates (Winston-Salem, North Carolina)
Project Description: Water leakage detection
Follow-up financing: \$6.8 million investment from ISPA program

Project Leader: Organica Ecotechnologies Ltd (Budapest, Hungary)
U.S. Partner: Living Technologies (Burlington, Vermont)
Project Description: Biological treatment of wastewater
Follow-up financing: \$1.2 million in equity investment from Environmental Investment Partners, a venture capital fund

Project Leader: Special Plant #1 (Vladivostok, Russia)
U.S. Partner: Energy & Environment Consulting Engineers (Mission Viejo, California)
Project Description: Install air emission-control system and improve process efficiency
Follow-up Financing: \$70,000 was contributed by Vladivostok Municipality to install a fly ash capture system on one incinerator

Project Leader: Ravisz, 96 Kft (Budapest, Hungary)
U.S. Partner: Universal Technical Resource Services, Inc.
(Cherry Hill, NJ)
Project Description: Development of a system to convert hazardous waste from the local transportation industry to non-hazardous recyclable materials.
Follow-up financing: \$55,000 purchase of environmental technology/equipment by Ravisz

Project Leader: Association of Danube Municipalities
US Partner: CalRecovery (Hercules, CA)
BG Partner: Institute for Environmental Strategies
Project Description: Modernize municipal solid waste management through regional collaboration and private sector participation
Follow-up financing: \$86,500 interest-free loan given to Nikopol Municipality by the National Fund for Environmental Protection.

Project Leader: Arbanassi PLC. (Bulgaria)
Project Partner: Tetrahedron, Inc., USA
Project Description: Pollution Abatement Strategy for Arbanassi PLC.
Follow-up financing: Negotiations are underway to establish a joint venture company with Arbannassi, Tetrahedron Europe. U.S. Partner's share will amount to 60% of the total investment.

Project Leader: Odessa CHPP -2 (Ukraine)
Project Partner: SRC International, Czech Republic
Project Description: Feasibility study on energy saving measures at the heat-only boiler plant in Teplodar, Ukraine.
Follow-up financing: \$450,000 from the Odessa Regional government to implement a fuel switch (heavy oil to natural gas) on two of the four boilers at Teplodar.

Project Leader: Khabarovsk Krai Administration (Russia)
Project Partner: American International University Network, Nebraska
Project Description: Develop an environmental audit training and certification program in Russia Far East.
Follow-up financing: \$30,000 in contracts with local businesses to conduct environmental audits in the Khabarovsk area.

| | |
|------------------------|--|
| Project Leader: | Elprom Elin (Bulgaria) |
| Project Partner: | PA Government Services, Inc., USA |
| Project Description: | Conduct an Energy Audit of Elprom Elin |
| Follow-up financing: | - \$100 000 loan from the United Bulgarian Bank through the USAID- DCA guarantee program based on the energy conservation opportunities proposed in the energy audit - \$30 000 self-financed by Elprom Elin to optimize the automation process in the furnace and save energy. |
| <hr/> | |
| Project Leader: | Chervonograd Municipality (Ukraine) |
| Project Partner: | EKOFOL-II S.A, Poland |
| Project Description: | Develop a systematic program of municipal waste management for the City of Chervonograd |
| Follow-up financing: | \$60,000 was contributed by Lviv oblast and Chervonograd city administrations to build municipal solid waste processing plant |
| <hr/> | |
| Project Leader: | Elektrostopanstvo na Macedonia (Macedonia) |
| Project Partner: | Elektroprojekt, Zagreb, Croatia |
| Project Description: | Rehabilitate seven small hydro power plants |
| Follow-up financing: | \$19.6 million joint venture established, Machydro Project Co. A.D., to rehabilitate, operate and transfer the seven small hydro power plants over eleven years. This public-private partnership is financed by British V.R.O. Energy A.G. and Czech Hydropol Project & Management A.S.. |
| <hr/> | |
| Project Leader: | Compa (Sibiu, Romania) |
| U.S. Partner: | The Energy Group (Little Falls, NY) |
| Project Description: | Identify measures to reduce energy consumption at this automotive equipment manufacturing plant |
| Follow-up financing: | \$15,000 invested from own funds to install new equipment in galvanization manufacturing section (condensate traps, temperature and pressure regulators) |
| <hr/> | |
| Project Leader: | Elmet (Cluj, Romania) |
| U.S. Partner: | Hoffland Environmental, Inc (Silver Springs Road, Conroe, Texas) |
| Project Description: | Identify the best practice to reduce the quantity of water contaminated with cyanide and heavy metals resulting from the production process |
| Follow-up financing: | \$25,000 invested from Relansin, a national program, to apply a less polluting metal plating technology from cyanide to alkaline salted |

Project Leader:

**Bulgarian Branch Chamber of General Machine
Building, Bulgaria**

US Partner:

TeControl, USA

Project Description:

Training for twelve auditors to introduce EMS to Bulgarian machine-building companies and implement it as a follow-up activity in 3-5 pilot companies with the assistance of the U.S. Partner.

Follow-up activities:

\$30,000 contributed for ISO 14001 certification by three Bulgarian machine building companies (Chugunoleene-Ihtiman, Belasitsa-Petrich and Brist-Breznik) that passed the EMS certification audit conducted by the US company American Systems Registrars.

April 19,2002

Annex C

EcoLinks Best Practices

Controlling and Reducing Drinking Water Loss in Tirgu Mures, Romania

Project Title: Study for the implementation of a strategic plan to control and reduce drinking water losses in Tirgu Mures, Romania

Leader: Aquaserv, Tirgu Mures, Romania

Partner: Aquacust Water Loss Analysis Co. Ltd., Budapest, Hungary

Location: Tirgu Mures, Romania

Project Duration: September 2000–September 2001

EcoLinks Project Investment: Total EcoLinks Project Investment: \$68,102;
EcoLinks Grant Support: \$49,456; Project Team Cost Share Contribution: \$18,646.

Best Practice: Transferable Solution

This Best Practice established a system for detecting water leaks and reducing and controlling water loss in the municipal water distribution network in Tirgu Mures, Romania. Water companies and municipalities throughout Romania and Eastern Europe can use the same methodology to improve drinking water management including reduced energy and water consumption. This EcoLinks funded project developed an effective, transferable approach to address the problem of drinking water loss including 1) an audit of water loss; 2) a periodical leak detection system and a leak detection team; 3) a feasibility study for an on-line monitoring system, 4) a water loss reduction plan; and 5) a medium term investment plan.

Project Summary

Tirgu Mures is the municipal capitol city of Mures County. Its current population is 165,000 inhabitants and is expected to grow to 200,000 by 2010 with the expansion of Mures County that already includes several densely populated villages. The drinking water network for Mures County was originally built around the turn of the 20th century. It has been adjusted over time to meet the needs of the communities of Mures County, but over 50% of the system is 20 years old and many of the pipes are not protected against corrosion. The system needs to be sufficiently monitored and maintained to prevent and reduce water loss. With the support of an EcoLinks Challenge Grant, a collaborative effort between Aquaserv and two Hungarian consulting firms was initiated to create and implement a management system that prevents and reduces water loss.

Aquaserv is responsible for providing drinking water and wastewater services to Mures County. Operating the water distribution network poses several challenges. Water management is difficult because flow measurements are not systematically taken for all supply zones. There are a significant number of pipe bursts, and the

leakage rate is high in the network. It is often difficult to locate the source of pipe or valve leaks. Pipe materials, fittings and maintenance are poor. Measurement errors and leaks account for the bulk of all water loss in Mures County in 2000 (1,490,000 m³ per year). This loss costs Aquaserv \$77,257 (8.3% of its annual income). While Aquaserv has repaired the most damaged water pipes and has installed a centralized system for monitoring water pressure within the main pipes, it has yet to establish a systematic, integrated leak detection program and a strategic plan for reducing water loss.

To address the problem of water loss, several actions were taken. First, an assessment of water loss in the water distribution network of Tirgu Mures was conducted targeting three pilot areas. Data on water loss was gathered from these three sites. Using this data and other information sources, an audit report on water loss figures, economic factors associated with water loss, and recommendations for reducing and controlling water loss were prepared. A leak monitoring plan and a water loss reduction strategy were developed.

This project provides several capacity building, environmental, and economic benefits. It builds the organizational capacity to reduce municipal water loss by training key people to detect and manage leaks efficiently. Environmental benefits include a water savings of 490,000 m³ per year. Energy consumption is also notably reduced since less electricity is needed to treat and transport water and wastewater. Multiple economic savings are generated through reductions in costs associated with water and energy consumption, operational costs, and water and wastewater treatment costs.

Project Activities

The thrust of this project was to develop a leak detection system and a strategic plan for reducing and controlling water loss. The specific activities of the project are discussed in detail below.

1. Shared and prepared information on the water supply system

Action: Aquaserv conducted a presentation for project partners on the most important components of the city water supply system including the mains, pumping stations, hydrophore stations, reservoirs and the treatment plant.

Aquaserv prepared 116 map frames (i.e., a “mosaic”) of the water distribution network in Tirgu Mures, including connections, pits, valves, etc. The maps highlighted zones with similar piping structures and problems.

Product(s): 1) Presentation on city water supply system 2) One hundred and sixteen map frames of the Tirgu Mures water distribution network

2. Conducted an assessment of water loss in three pilot areas

Action: Selected and evaluated three pilot areas to conduct measurements of water flow and identify possible leaks. The following three pilot areas were inspected: Zone

in Tudor Vladimirescu, Hydrophore Zone in Tudor Vladimirescu, and Libertatii. Based on the results of the inspections, a work plan was developed.

Equipment to measure leaks including a flow meter, pressure meter, batteries and battery charger, and recording equipment was purchased. In preparation for data gathering, valve repairs and replacements were done, and pits were cleaned. Preliminary measurements were taken in the hydrophore zone in Tudor Vladimirescu after installing a flow meter and a data logger.

Measurements were then taken and recorded for all the pilot areas. For night measurements, the pilot areas were isolated by closing the valves and supplying them with water by making connections through the pit chambers. Night flow measurements were taken for each pilot area. Minimum night flow was determined for the distribution pipes. For day measurements, leakage sites were determined and dealt with on a customer-by-customer basis (Tirgu Mures has an individual metering system).

Product(s): 1) Pilot study focus 2) Work plan 3) Measuring equipment 4) Data on water flow and leaks

3. Prepared audit report

Action: An audit report was prepared based on multiple data sources (e.g., city documentation, measurements, etc.). The audit report included the results from two measurement periods, an economic analysis of water loss, conclusions and recommendations for reducing and controlling water loss.

Product(s): Audit Report

4. Initiated monitoring plan for evaluating leak detection methods

Action: A monitoring plan was initiated. It outlines two methods for monitoring leaks: 1) periodical leak detection using a portable minilaboratory for water leak checks every other year, and 2) on-line measurement system to detect leaks immediately. A feasibility study of an on-line leakage monitoring system was conducted and outlined the investment structure necessary to implement this system. The Feasibility Study provides an overview of the water supply and treatment system in Tirgu Mures and the features, costs, and benefits of an on-line leak detection system. Training sessions and the preparation of a manual on periodical leak detection procedures were completed. Aquaserv employees and employees from two other water companies were trained in managing leak issues. The training addressed managing leak information, making decisions regarding pipe breaks and repairs, managing pipe breaks and repairs, costs and benefits of periodical leak detection, and preparing the financial framework associated with decreasing daily consumption per capita. Work procedures for the periodical detection of leaks were established.

Product(s): 1) Feasibility Study, "On-Line Leakage Monitoring System" 2) Publication, "Network analysis and proposal regarding solutions for on-line monitoring of the drinking water distribution system parameters" 3) Software to process and store data from on-line measuring system 4) Trained personnel (including

five people from two other water companies) in leak detection: two day training for skilled personnel and three day training for execution personnel 5) Manual on Periodical Leak Detection Procedures 6) Document summary titled, "Necessary Resources for the Carrying Out of the Proposed Leakage Analysis Method" 7) Job descriptions

5. Developed strategic plan for reducing water loss

Action: Based on the audit results, a strategic plan was drafted. The plan includes an investment strategy, good housekeeping measures, a methodology for conducting a cost/benefit analysis of the process for detecting and reducing water leaks. The results of this plan provide the basis for making decisions on how and when to apply an on-line or periodical leak detection approach.

Project Benefits

There are multiple benefits produced by this project and the implementation of the proposed system. Aquaserv increases its organizational capacity to avoid wasteful water consumption. By reducing water loss, unnecessary pressure on water and energy resources is avoided. Additionally, the costs associated with energy and water consumption are reduced. These benefits are discussed in more detail in the following subsections.

Capacity Building Benefits

Aquaserv is responsible for delivering drinking water to a growing population in Mures County. This project establishes a collaborative network to improve Aquaserv's capacity to serve this community with drinking water. As part of this project, Aquaserv established two contacts in Hungary that provide technical support to address water loss problems. Aquaserv gained international working experience that will make it easier for them to participate in other collaborative projects emphasizing technology transfer.

Local expertise on reducing water loss was strengthened. Aquaserv trained personnel from their own company as well as from two other water companies in water leak detection and monitoring. Managers are being trained to oversee the periodical leak detection system. Aquaserv anticipates formally establishing a leak detection team.

Environmental Benefits

The most significant environmental benefit generated by this project is the reduction in the wasteful consumption of water and electricity. This project provides a method for monitoring drinking water flow so that it goes to the consumer and is not lost through leaks in the distribution network. By reducing water leaks, Aquaserv reduces the amount of unaccounted for water loss by 490,000m³ water per year. The number of leaks in the system shall be reduced by 50% in seven years from 2001. Electricity consumption is also reduced since less energy is required to treat and to transport drinking water from the River Mures, through the network, and to the consumer.

In addition to the more efficient use of water and energy resources, this project promotes certain environmental benefits associated with reductions in pollution. Since less electrical energy is needed to pump water from the river to the consumer and ultimately treat it as effluent, less CO₂ is released into the atmosphere. Additionally, fewer chemical pollutants from the wastewater treatment process are released into the River Mures.

Economic Benefits

By implementing this project, the costs associated with energy and water consumption, pipe and valve repairs, water and wastewater treatment, and operations are reduced. This is especially true over the long-term. The savings generated by the water management system outlined in this project will cover the expenses of implementing the proposed system in 5-10 years. The overall cost of implementing the water saving program is \$456,253.

Energy costs are reduced due to the reduction in water pumped into and through the distribution network. With a reduction in water being pumped into the network, electrical power consumption is reduced. This translates into the following estimated savings:

Table 1. Estimated Savings from reduced water and energy consumption

| | |
|--|-----------|
| Energy Cost Savings (each year after 7 th year of project operation) | \$46,499 |
| Savings from Reduction in Linear Pressure Losses (each year after 7 th year of project operation) | \$57,511 |
| Annual Savings from Reduced Amount of Water Pumped into the Water Treatment Plant | \$28,159 |
| Annual Savings from Reduced Water Treatment Costs | \$97,860 |
| Savings from Decrease in Operational Costs | \$398,724 |
| Savings from a Reduction in Needed Repairs (each year after 7 th year of project operation) | \$111,590 |

While repair costs will initially grow in the first seven years due to increased leak identification, repair costs will start to decrease by the third year due to lower mechanical stress on the pipes and overall network improvement. After the seventh year of operation, an annual savings of \$111,590 is anticipated from the reduction in needed repairs (estimated average cost of each repair is \$221) (Table 1.).

Chemical costs associated with water treatment will decline due to the decline in water demand from leaks. Approximately 80% of the drinking water ends up in the sewer and is treated by the wastewater treatment plant. A reduction in water pumped into the network will lead to a reduction in wastewater treatment costs totaling \$55,266 per year after the seventh year of project operation.

Lessons Learned

There are both opportunities and challenges in implementing this project. They are listed below to benefit those interested in implementing similar efforts in their regions.

- Purchasing equipment can take longer than expected due to internal equipment approval and payment procedures.
- Conducting preliminary measurements makes it easier to keep on schedule with regard to pipe and valve reparations.
- Maintaining a complete database facilitates access to data needed for project implementation. Complete and reliable data on the distribution network and water loss are needed to ensure the quality of findings and recommendations for water management.
- Measuring night flow is easier if hydrants can be used to supply water to certain areas.
- Good cooperation between partners can help to avoid major delays in project implementation.

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Project Partners

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Reconstruction of the Heat Supply System at Izumrud Enterprise, Kiev Ukraine

Project Title: Reconstruction of the Heat Supply System at Izumrud Enterprise

Leader: Izumrud Enterprise, Kiev, Ukraine

Partners: 1) GOGAS Raduzhnij, Vladimir, Russia; 2) LOTA Ltd, Kiev, Ukraine

Location: Kiev, Ukraine

Project Duration: September 15 2000- December 15 2001

EcoLinks Project Investment: Total Project Investment: \$61,466; EcoLinks Grant Support: \$42,671; Project Team Cost Share Contribution: \$18,795

Best Practice: Transferable Solutions

The project "Reconstruction of the Heat Supply System at Izumrud Enterprise" is an EcoLinks Best Practice. The project assessed the potential to improve the environmental and economic performance of the heat supply system at Izumrud Enterprise, a gem cutting factory located in Kiev, Ukraine. The methodology for conducting an energy audit of the heat supply system and the development and implementation of recommendations to improve the efficiency of the system is highly transferable to other industrial manufacturers with autonomous boiler heat systems in the NIS.

As a result of the efficiency improvement measures implemented through this project, Izumrud reduced its consumption of natural gas for heating by 15% and consumption of electric energy by over 10%. These reductions represent an annual savings of over \$8,000 per year. Efficiency improvements have also resulted in reduction of NO_x emissions by over 50%, reduction in CO emissions by over 45% and reduction in CO₂ emissions by almost 20%. Environmental fees paid for NO_x and CO emissions were likewise reduced by approximately 50%.

Project Summary

Izumrud Enterprise is a gem cutting factory located in Kiev, Ukraine. Izumrud facilities were built in 1969. In 1997, a modern, autonomous boiler for heat and hot water supply was constructed for the plant facilities (providing heat and hot water to over 80,000 m³ of building space). Prior to project implementation, however, the heat supply system (which supplies heat and hot water through over 5 km of pipes), had not been significantly upgraded since initial construction in 1969 and was badly in need of repairs and efficiency improvements.

The goal of this EcoLinks funded project was to increase the environmental and economic performance of the heat supply system at Izumrud. The Project Team first evaluated pre-project emissions levels from the heat supply system. This was followed by an energy audit of the heat supply system to identify heat losses and energy consumption. Three Izumrud employees, including Izumrud's Chief Engineer,

were trained in energy audit methodology during this stage of the project. Using the data from the energy audit, recommendations on improving the efficiency of the heat supply system were developed. Recommendations included both immediate low cost measures and higher cost measures for future implementation. During the final stages of this project, lower cost measures were implemented. Post-project emissions levels from the heat supply system were also measured, to quantify emissions reductions and heat savings.

As a result of efficiency improvement measures implemented through this project, Izumrud reduced its consumption of natural gas for heating by 15% and consumption of electric energy by over 10%. These reductions represent an annual savings of over \$8,000 per year. Efficiency improvements have also resulted in reduction of NO_x by over 50%, CO by over 45% and CO₂ by almost 20%. Environmental fees paid for NO_x and CO emissions were likewise reduced by approximately 50%.

Project Activities

The goal of this project was to increase the environmental and economic performance of the heat supply system at Izumrud. Project activities included the following:

1. Measuring Pre-project Emissions Levels

Action: The Project Leader subcontracted Demo, Ltd. to make pre-project measurements of the emissions from the heat supply system during low, average and high heat regimes (Demo Ltd. is licensed by the state to carry out such measurements and was recommended by the Kiev State Department for Ecological Safety). Emissions levels were registered and confirmed with the State Department of Ecological Safety and the Energy Savings Inspection Agency. These certified pre-project levels, as compared with certified post-project levels, later provided the basis for reduction in Izumrud's environmental fees paid for CO and NO_x emissions by approximately 50%.

Product(s): A technical report certifying pre-project emissions levels of the heat supply system, registered by the State Department of Ecological Safety and the Energy Savings Inspection Agency.

2. Conducting an Energy Audit of the Heat Supply System

Action: LOTA worked together with the Project Leader to develop an accurate scheme of the entire Izumrud heat supply system, including technical characteristics. Preliminary measurements of heat pressure throughout the system were made.

Project Partners, GOGAS and LOTA worked together in fine tuning the methodology to be used in conducting the energy audit. Audit measurements were made by LOTA and Izumrud staff. Preliminary findings from the audit showed that the main losses of the heat supply system were the result of unequal heat flows throughout the system; unstable gas pressure throughout the system; and obsolete, inefficient equipment,

most notably in the combustion air heater, the air conditioning and ventilation systems.

Product(s): (1) Methodology for conducting the energy audit at Izumrud was refined. (2) Energy audit completed.

3. Developing and Ranking Alternatives on Efficiency Improvements

Action: Working together with the Project Leader, Project Partners LOTA and GOGAS developed options for improving the efficiency of the entire heat supply system. Final recommendations included reconstructing the boiler automation system to optimize natural gas and air flows during combustion; installation of thermostatic valves and controls in the heating system to respond to heat demand and balance the system hydraulically; replacement of outdated pump equipment to balance hot water flow; replacement of washers; sealing off obsolete heat transport pipes; and replacement of outdated blast fans to optimize air flow during combustion.

The Project Team also developed additional, higher-cost recommendations concerning Izumrud's air conditioning system, which can be implemented in the future as funding allows.

Product(s): Recommendations for improving the efficiency of the heat supply system were developed.

4. Implementation of Selected Efficiency Improvement Measures

Action: Technical designs for carrying out the final recommendations listed in activity #3 above were jointly developed by the Project Partners LOTA and GOGAS. Implementation of these measures was carried out by Izumrud and the Scientific and Technical Center of Machine Industry, with consultation from LOTA. Implemented measures were tested for a one-month period during the heating season and fine-tuning adjustments were made.

Product(s): (1) Izumrud's boiler automation system was reconstructed; (2) Thermostatic valves and controls were installed in the heating system; (3) New pumps were installed; (4) Washers were replaced; (5) Unnecessary heat transport pipes were sealed off; (6) Blast fans were replaced.

5. Measuring Post-Project Emissions Levels

Action: Following the implementation of efficiency measures listed under point 4, Demo Ltd. once again measured emissions of the heat supply system. Results showed a significant reduction in NO_x, CO and CO₂ emissions. These results have been registered and confirmed with the State Department of Ecological Safety and the Energy Savings Inspection Agency.

Product(s): A technical report certifying post-project emissions levels of the heat supply system, registered by the State Department of Ecological Safety and the Energy Savings Inspection Agency.

Project Benefits

This project resulted in environmental, economic and capacity building benefits. Capacity building benefits were achieved through training for Izumrud staff in how to conduct an energy audit. Environmental benefits include significantly reduced emissions and reduced natural gas and electricity consumption. Finally, this project also brought significant financial benefits, through cost savings resulting from more efficient use of natural resources and reductions in environmental fees.

Capacity Building Benefits

Within the implementation of this project, Izumrud staff gained experience in conducting an energy audit and in analyzing audit results. This experience included methodology and data collection and calculation, as well as the use of measurement instruments. Through the involvement of Izumrud staff in the energy audit, Izumrud's team of engineers was able to observe firsthand the cost of energy losses to Izumrud. The training provided by LOTA and GOGAS to Izumrud staff in conducting an energy audit will not only allow Izumrud engineers to assess and monitor energy efficiency throughout the plant facilities in the future, but also convincingly demonstrated the cost of current energy losses.

Environmental Benefits

Through implementation of efficiency recommendations on the heat supply system, Izumrud reduced its consumption of natural gas for heating by 15% and consumption of electric energy by over 10%. These efficiency improvements have also resulted in reduction of NOx emissions by over 50%, CO by over 45% and CO₂ by almost 20%.

Implemented low-cost measures:

| | Pre-project annual emissions | Post-project annual emissions | Annual reduction |
|-----------------|------------------------------|-------------------------------|------------------|
| Nox | 0.785tons | 0.314tons | 0.472tons |
| CO | 0.412tons | 0.222tons | 0.190tons |
| CO ₂ | 1058tons | 857tons | 201tons |

Economic Benefits

Economic benefits from this project result from efficiency improvement measures carried out on the heat distribution system. Specifically, prior to project implementation, Izumrud enterprise's boiler used 345,000 m³ of natural gas per year. After efficiency measures, the boiler uses 245,000 m³ per year, equaling a savings of 100,000 m³. Since Izumrud pays \$68/per 1000 m³ of natural gas, this equals a savings of \$6,800 annually.

In addition, reconstruction of measures on the heat distribution system resulted in measurable savings in electric energy. Prior to project implementation, Izumrud consumed 162,000 kWh, annually. After reconstruction measures on the heating

system, electric consumption dropped to 144,000 kWh annually. Izumrud pays \$0.038 per kWh, thus energy savings represent almost \$700 a year in savings.

In connection with NOx and CO emissions reductions, Izumrud's corresponding environmental fees on NOx and CO will be reduced by approximately 50%.

Lessons Learned

Lessons learned during the implementation of this project include the following:

- In energy efficiency projects undertaken in the industrial sector in NIS countries, the most difficult part of project implementation is often convincing management that economic savings from implementing energy efficiency measures can be significant. In the case of the Izumrud project, for example, the participation of Izumrud staff in the energy audit was critical in convincing Izumrud's team of engineers and management that energy losses in the system represented real costs to the company.
- Such energy efficiency projects will be most attractive for industrial producers in countries like Ukraine, where energy tariffs have sharply risen over the past several years and are approaching actual market prices.

Contact Information

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Project Partners

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Cleaner Production in Osijek-Baranja County, Croatia

Project Title: Cleaner Production in Osijek-Baranja County, Croatia

Leader: Croatia Chamber of Economy-County Chamber Osijek

Partner: DekontUmwelttechnik Ltd. – Zlin, Czech Republic

Location: Counties Osijek, Darda, Erdut and Knezevi Vinogradi in Croatia

Project Duration: January 2000 – April 2001

EcoLinks Project Investment: Total EcoLinks Project Investment: \$61,329:

EcoLinks Grant Support: \$47,049; Project Team Cost Share Contribution: \$14, 280

Best Practice: Transferable Solution

This is a Best Practice, because it establishes a framework for building the capacity of local government and industry in the Balkans to promote environmental sustainability and economic efficiency through the implementation of Local Agenda 21 and application of the Cleaner Production methodology. There is also a high transferability of this project. Every new project, additionally, can be improved and modified according to the specifics of the participants. The development of case studies, part of the project program, provide a significant source of information on how companies reduce waste and improve efficiency.

Project Summary

Croatia was severely affected by war (1991-1995) and is in a stage of recovery and renewal. Local governments and industry must work to promote environmental and economic approaches to revitalize their economic, social, and environmental wellbeing. It is critical, for example, that in this period of transition to a free market economy, companies identify and adopt efficiency and pollution prevention measures.

The industrial sector in the County of Osijek and Baranja, Croatia is a significant source of pollution. Their activities take place near the rivers Drava and Dunav that are linked to drinking water sources. Minimizing waste (e.g., waste water, polluted air emissions, and solid hazardous and non-hazardous waste) would alleviate both financial burdens and detrimental environmental impacts.

Cleaner production (CP) is an approach that involves cost-effective measures for improving environmental performance. It is a preventive methodology that can be used to implement Environmental Management Systems (ISO 14000 and EMAS) and integrated pollution prevention and control (IPPC). A Cleaner Production framework facilitates the implementation of The National Network of Healthy Cities Program (NNHC) that aims at improving local environments and promoting sustainability in county and city development efforts. This approach includes personnel trainings and the development of case studies demonstrating environmental benefits and financial savings. It is further guided by the development of local environmental policy and the implementation of Local Agenda 21 addressing wastewater, air emissions, solid hazardous and non-hazardous waste issues.

Supported by an EcoLinks Challenge Grant, the Croatian Chamber of Economy-County Chamber Osijek and DecontUmwelttechnik, a consulting firm based in the Czech Republic, collaborated to design and implement a training program and establish case studies for promoting Cleaner Production, focusing mostly on Osijek County. The purpose of this project is to introduce Cleaner Production measures and facilitate the implementation of Local Agenda 21 across several counties in Croatia (e.g., Osijek, Darda, Erdut, and Knezevi Vinogradi) through trainings and case studies development. The emphasis of this project is on long-term interactive training.

Project Activities

The main goal of this project was to conduct interactive training in cleaner production measures and Local Agenda 21 and establish case studies. The following is a description of the project's activities.

1. Conducted preliminary marketing seminars

Action: Two seminars were conducted. A one-day marketing seminar was held for managers of companies located in Osijek County. An introductory one-day seminar was also conducted involving local government, universities, and NGOs.

Product(s): 1) Promotion materials 2) Two one-day seminars.

2. Conducted seminar on Cleaner Production

Action: A seminar was conducted while participants worked on actual Cleaner Production projects. Local authorities and NGOs were trained and prepared to initiate the implementation of Local Agenda 21. The first day of the seminar, an introduction to activated CP projects as part of the EcoLinks funded effort was made. A short evaluation of all the CP projects was made by trainers. Several presentations were made: 1) Energy Efficiency Audit and CP Methodology, Energy Efficiency Case Studies; 2) Financial Aspects of Environmental Protection and CP Economy; 3) European Union Legislation in the Field of Environmental Protection; 4) Integrated Pollution Prevention and Control (IPPC) and Best Available Techniques (BAT); 5) Implementation of CP measures and continuation of CP projects; and 6) CP in Practice in Czech Republic.

Product(s): 1) Detailed program including time schedule 2) Manuals and other training materials 3) one-day "train the trainer" workshop.

3. Conducted seminar on sustainable development and Local Agenda 21

Action: This seminar focused on the economic aspects of implementing sustainable development. It involved ten municipal officials (including from Counties Darda, Erdur, Bilje, Knezevi Vinogradi) and representatives from high-schools, universities, and NGOs.

Products: 1) Materials and program for seminar on sustainable development and Local Agenda 21.

4. Presented Cleaner Production projects to the management of the respective companies.

Action: In order to assure each company's commitment and approval for implementing CP measures, project presentations were made to company managers. Participants prepared final reports on their respective CP projects. Consultation sessions were provided.

Product(s): 1) Final reports 2) Consultations between CP trainers and CP project coordinators at the various companies.

5. Developed case studies based on CP projects

Action: Sixteen experts from six companies participated in initiating a total of eight CP projects. Company representatives developed and approved CP project design and implementation measures.

Product(s): The CP projects are as follows:

- 1) "Testing Possibilities for the Reduction of Wastewater Emissions and Anionactive Substances in Wastewater in Powder Detergents Production in Saponia d.d., Osijek"
- 2) "Testing Possibilities for the Reduction of Wastewater Emissions and Anionactive Substance in Wastewater in the Liquid Detergents Production in Saponia d.d., Osijek."
- 3) "Management of Raw and Secondary Materials, Reduction of Costs for Waste Water Treatment in the Metal Industry Osijek d.d."
- 4) "Measures for Reducing Water Consumption in the Thermal Power Plant, Osijek"
- 5) "Reduction of Losses at Belje Winery, Joint-Stock Company – Unit Beljski Vinogradi"
- 6) "Reducing Impurities During Unloading, Watering, and Washing Sugar Beats in Sugar Production, Osijek"
- 7) "Reduction of Suspended Solids in Wastewater in Sloboda, d.d. Osijek at Two Plants at the Bread and Biscuits Factory"
- 8) "Reducing Material Losses on 'Markins' Nail Polish Packaging in Cosmetics and Toiletries Production in Saponia d.d., Osijek"

6. Held consultations with CP project companies for case study development and CP project implementation

Action: Four consultations were held with each participating company to develop CP demonstration projects to establish case studies and for presentation at the third CP seminar.

Product(s): Project preparation steps: establish CP project time-schedule; conduct analyses (e.g., material and energy flows, setting indicators); generate CP options;

evaluate options; assess CP project (feasibility study; and identify problems, obstacles, and barriers to CP implementation.

7. Held consultations with local government officials and NGOs for initiating Local Agenda 21

Action: Two sets of consultations were provided for implementing Local Agenda 21 in the Town of Osijek and the County of Osijek-Baranja. The first set of consultations involved a project trainer, local authorities and local NGOs. The second set of consultations involved the Head of Osijek and Baranja County and associates from the Environmental Protection Department, and the Deputy Mayor of Osijek and associates from the Environmental Protection Department. The consultations focused on preparing a sustainable development strategy for the area by identifying needed activities. The consultations promoted the engagement of participants in the European campaign of "sustainable" cities and places. Preparations were made for the signing of the Aalborg Charter encouraging the support and commitment of key community members.

Product(s): 1) Preliminary activities for Local Agenda 21 preparation 2) Preliminary activities and materials for signing the Aalborg Charter.

8. Presented results and finalized the signing of the Aalborg Charter

Action: Participants gave presentations of their CP case studies to each other and project managers. The results of the different CP projects were presented in four seminars held in different counties throughout the region.

Product(s): 1) Presentations consisting of: short introduction of the involved company; CP project title; CP project preparation (e.g., focus, plan, objectives, etc.); analyses; recommendations; feasibility study, achieved or expected results including environmental and economic benefits; and implementation activities 2) Seminars of the CP projects results: three one-day seminars held in three different counties in the region and one half-day seminar in HGK-County Chamber Cakovec 3) Local Agenda 21 and Aalborg Charter materials 4) Web page and booklet of CP case studies.

Project Benefits

The emphasis of this project is on capacity building to prevent as well as solve environmental problems and to promote economic efficiency. Through extensive trainings, company representatives and local government officials gained the knowledge and experience necessary to apply Cleaner Production methodology and implement Local Agenda 21. By developing case studies, this knowledge could be shared and the results of Cleaner Production applications measured. These results of each case study project are shared here as part of the overall environmental and economic benefits demonstrated under this EcoLinks grant .

Capacity Building Benefits

This project provided technical expertise and a praxis forum for implementing two major environmental agendas: Cleaner Production approach that promotes economic efficiency as well as a cleaner environment and Local Agenda 21 that emphasizes environmental sustainability in development efforts. As a result of this project,

- Sixteen experts from 6 industrial companies were trained in Cleaner Production methods
- Six companies developed environmental policies and commenced CP implementation
- Seven CP demonstration projects (i.e., case studies) were initiated providing direct site-specific benefits as well as a basis for information sharing on CP practices.
- Ten municipal officials (representing a total of five municipalities) and representatives from high-schools, universities, and local NGOs were trained and began preparations for the implementation of Local Agenda 21
- The Head of the County of Osijek and Baranja and the Vice-Mayor of the Town of Osijek signed the Aalborg Charter, formally recognizing the need for sustainable development in the region.
- Dialogue between industry and the local community was enhanced encouraging the emergence of important networks involving diverse interests.

Environmental Benefits

The implementation of the eight CP projects developed and promoted through the CP training program established in this EcoLinks project collectively generated multiple environmental benefits. They are outlined in the following table.

| | |
|--|---|
| Waste reduction | 72,569 tons/year |
| Hazardous waste reduction | 245 kg/year |
| Waste water reduction | 1,452,000 m ³ /year |
| Emissions reduction | 350 tons/year |
| Reduction of raw materials consumption | 12.8 tons/year |
| Energy reduction | <ul style="list-style-type: none"> • 8,321 kW • 122,000 m³/year of natural gas |

Economic Benefits

| | |
|---------------------------|-------------------------|
| Investment needed | \$ 2,060,000 |
| Annual savings | \$1,261,000 - 1,493,000 |
| Payback period – in total | 1.4 -1.6 years |

For the eight CP projects a total financial savings of \$1.15 million per year is projected. A total investment of approximately \$1.72 with an average pay back period of 1.5 years is asserted.

Lessons Learned

There are both opportunities and challenges in implementing this project. They are listed below to benefit those interested in implementing similar efforts in their regions.

- Need to conduct simple viability assessment of companies intending to participate in the project to avoid “drop-outs” along the way. There was minimal support for implementing Cleaner Production projects within companies due to economic hardship. Two companies had to withdraw from the project due to bankruptcy.
- It was difficult to coordinate trainings, consultations, and preparation of demo-projects amongst project participants due to full schedules.
- Need to support and encourage company steering committees to overcome a general hesitation to estimate the benefits of the proposed Cleaner Production measures due to fears of underestimating the positive outcomes of the project. Companies can present estimations of benefits as “potential results” and then measure benefits after actual implementation of the cleaner production measures.
- Dialogue amongst the participating sectors (e.g., business, local government, and NGOs) that improves mutual understanding of needs, possibilities, and more effective and productive outcomes is strengthened through cooperative work on the project.
- Management skills and resources are needed to build future capacity building projects.
- The usefulness of the CP approach is affirmed by the fact that all projects achieved economic and environmental benefits from implementing CP principles.
- Need to pay special attention to the top management of participating companies as their commitment is essential. A half-day introductory seminar should be organized for the management of participating companies.

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Annex D

Financing Environmental Investments In Croatia

March, 2002



EURASIAN - AMERICAN PARTNERSHIP FOR
E C O L I N K S
ENVIRONMENTALLY SUSTAINABLE ECONOMIES

Financing Environmental Investments in Croatia

Introduction

The primary purpose of this study is to assess the financing prospects for grantees of USAID's EcoLinks Partnership Grants Program. In the private sector, these grantees are typically SMEs that are seeking financing to purchase environmental equipment that will improve both their environmental performance and operating efficiency. Their investment needs range from \$50,000 to \$2 million. The study is also relevant to other SMEs and many larger companies in Croatia that will eventually need to invest in environmental improvements in order to comply with EU standards and avoid environmental fees and penalties. At present environmental regulations are not strictly enforced in Croatia, and there are limited market incentives to improve environmental performance.

During February 11-22, 2002, the study team interviewed representatives of commercial banks, venture capital funds, multilateral financing institutions and Croatian government agencies to identify the funds available for environmental financing and any barriers to accessing those funds. Most of these institutions do not have funding programs specifically developed for environmental investments. However, environmental investments for the private sector are usually covered under funding programs for SME development or other special programs, such as programs for export-oriented industries or new technologies.

Although the study focuses on the private sector, a brief section is included on the potential for financing environmental investments in the municipal sector. These investments are usually considered under programs for infrastructure development.

PART I: Private Sector Financing

Sources of Financing

Currently, the principal funding sources for environmental investments are multilateral organizations, commercial banks, venture capital funds and Croatian government entities. With the exception of one ESCO fund, none of these institutions have specific environmental programs, though all of them reported that environmental projects are eligible if they meet required financing criteria. A national environmental fund providing grants or soft loans for environmental improvements has not yet been established in Croatia.

The different funding sources are discussed briefly below. The study team compiled information about the terms and conditions of each funding program, summarized in Annex A. This information is intended for comparative purposes only. Rates fluctuate daily, and the exact terms of financing are negotiated in view of the financial situation of a particular borrower. Also, there may be discrepancies in the amount of funds reported for specific programs or projects due to currency conversions and to different reporting periods. A list of the organizations that were contacted for interviews is provided in Appendix B.

Multilateral organizations

The World Bank, European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), and the Council of Europe Development Bank (CED) usually finance large industrial projects (over \$5-10 million). However, they have established framework facilities with intermediary banks, and in some cases the Croatian Bank for Reconstruction and Development (HBOR), to provide smaller, long-term loans to SMEs and to encourage competition among the commercial banks in lending to this sector.

These organizations reported that a total of \$128 million had been contributed to framework facilities over the past few years, as detailed below:

Framework Facilities for SME Financing

| | Intermediary Banks | HBOR | Total |
|------------|--------------------|----------------|-----------------|
| World Bank | \$14.6 million | \$0 | \$14.6 million |
| EBRD | \$54 million* | \$12 million | \$66 million |
| EIB | \$31.0 million | \$8.6 million | \$39.6 million |
| CED | 0 | \$8 million | \$8 million |
| Total | \$99.8 million | \$28.6 million | \$128.2 million |

*This amount represents two framework facilities signed in 1996 and 1999. 30% of funds are to be used for mortgage lending

The rates available through the World Bank and EBRD facilities are the same as commercial bank rates. The interest rates available through the EIB and HBOR facilities are somewhat lower. However, market rates have significantly declined in Croatia in 2002, and the spread between market rates and the rates available through the EIB/HBOR facilities have narrowed to the point where the additional paperwork and processing time required for EIB/HBOR financing may not be justified.

The intermediary banks that participate in these framework facilities are the following:

World Bank:

Erste & Steiermaerkische Bank d.d.

EBRD:

HVB Bank Croatia d.d.

Hypo Alpe-Adria-Bank d.d.

Erste & Steiermarkische Bank d.d.

Slavonska Banka d.d., Osijek

EIB:

HVB Croatia

Privredna Banka Zagreb d.d.

HBOR*:

Brodsko Posavska Banka d.d., Slavonski Brod
Centar Banka d.d., Zagreb
Credo Banka d.d., Split
Croatia Banka d.d., Zagreb
Dalmatinska Banka d.d., Zadar
Dubrovačka Banka d.d., Dubrovnik
Erste & Steiermarkische Bank d.d., Zagreb
Gospodarsko Kreditna Banka d.d., Zagreb
Hrvatska Postanska Banka d.d., Zagreb
Partner Banka d.d., Zagreb
Podravska Banka d.d., Koprivnica
Privredna Banka Zagreb d.d., Zagreb
Privredna Banka – Laguna Banka, Porec
Riadria Banka d.d., Rijeka
Riječka Banka, Rijeka
Samoborska Banka d.d., Samoborska
Sisacka Banka d.d., Sisak
Slatinska Banka d.d., Slatinska
Slavonska Banka d.d., Osijek
Zagrebacka Banka d.d., Osijek

*Other banks may participate as intermediaries depending on the type of loan program.

Commercial Banks

The study team contacted a number of commercial banks. All reported that there were plentiful funds available for SMEs, and that the environmental projects initiated by the EcoLinks program would qualify for their lending programs. However, when inquiring about terms and conditions, it was difficult to distinguish between the banks' standard lending programs and the framework facilities available from other other institutions (the multilateral organizations, HBOR, and the Ministry of Small and Medium Size Enterprises). Some banks did not mention these facilities until they were prompted several times, and then they said the terms were basically the same as those for their standard lending programs.

The annual market rates quoted by the banks usually ranged from 7 – 9% for long-term loans. However, HBOR and EIB offer rates as low as 6% for certain SMEs, and HBOR offers rates as low as 3% for larger, export-oriented companies. It appears that the banks are reluctant to engage in the additional paperwork and procedures that are required by these facilities. Some banks described the sponsoring organizations as bureaucratic, uncooperative and unresponsive.

According to one banker, in order to qualify for a commercial bank rate of 8%, the proposed project would need a minimum internal rate of return of 16 - 18% to demonstrate sufficient cash flow to repay the loan and cover other costs. In addition, most banks require a solid business plan or feasibility study, evidence of company stability and competent management, an environmental impact assessment, 100% collateral, and other "bankable documents".

Venture Capital Funds

A few venture capital funds making equity investments in privately owned SMEs operate in Croatia. They typically invest \$500,000 to \$5 million and become one of the owners of the firm. They expect a 25 – 30% return on their investment in a few years. These funds are not investing in projects, but in companies. They are seeking well-managed firms with clear ownership, a quality product or service and strong growth prospects.

Only one fund in Croatia specializes in the energy/environmental sector, the Dexia-Fondlec Energy Efficiency and Emissions Reduction Fund. This \$52 million fund primarily establishes and invests in ESCOs, or energy service companies. ESCOs enable companies to upgrade facilities and reduce energy costs by using projected cash flows from future energy savings for immediate investments. Within the framework of a performance contract, the Fund's project manager (EETEK) will identify energy savings opportunities for a company, implement the energy-efficiency measures at no initial cost to the company, maintain the energy-saving investment for the life of the contract, and guarantee energy savings which are used to pay back the initial investment. When the performance contract expires, the company can continue to benefit from reduced energy costs. EETEK finances the recommended energy efficient improvements with an equity investment (30%) and borrowed funds (70%). The borrowed funds are repaid from the cash flow generated from the savings realized from lower energy bills. The Fund's first investment in Croatia is expected to be announced soon.

Croatian Government Entities

There are several Croatian government institutions and funds that support SME development: the Croatian Bank for Reconstruction and Development (HBOR), the Ministry for Small and Medium Size Enterprises and BICRO.

The Croatian Bank for Reconstruction and Development (HBOR) is a state-owned development bank that promotes SMEs, shipbuilding, the development of a tourism industry and infrastructure financing. It also finances and insures export transactions. HBOR has two financing programs for the "Development of Private Small and Medium Entrepreneurship", a direct lending program and a program with 27 cooperating banks. These programs have about \$20 million each, and their terms and conditions are similar. SMEs that derive at least 30% of their sales from exports may qualify for the lowest interest rate of 6%. In 2000 HBOR approved \$9.8 million in loans under both programs.

For larger companies with greater financing needs, HBOR has another loan program, "Development of the Economy". Interest rates as low as 3% are available for export-oriented and war-damaged companies. In 2000 about \$16 million in loans was approved under this program.

HBOR representatives told the study team that it does not receive enough good projects. In particular, they said the project sponsors do not have the capacity to prepare solid project proposals and to identify appropriate investments. An outside consultant who advises the

Croatian Government on developing its National Environmental Action Plan confirmed this assessment.

The Ministry of Small and Medium Size Enterprises has two programs for financing SMEs, the "Enterprise" Program and the "New Technologies" Program. Both programs operate through intermediary banks, and the terms and conditions are very similar. The Enterprise Program has \$100 million in funds and it supports the modernization of production capacity, including the purchase of new equipment. Companies apply through local units of the local governments and self-governments that provide deposits as security to the intermediary banks. In some cases, these local units may subsidize the interest rate. However, the sixteen intermediary banks have the right to accept or decline the loan application.

The New Technologies Program has \$19 million in funds and it supports the introduction of technologies to SMEs. The technologies are not required to be state-of-the-art, but rather they should be new to the companies. Companies should apply through the Ministry that works with four intermediary banks: Zagrebacka Banka, Privredna Banka, Erste & Steirnaerkische Bank and Raiffeisen Bank Austria.

To date about \$56 million in loans have been approved under both programs. The study team was told that only about 10% of the applicants are able to comply with the loan requirements. Banks sometimes decline applications as "too risky" for these programs and then offer the applicant a standard loan with a higher interest rate. The Croatian Guarantee Agency (HGA) can guarantee loans up to \$50,000 but its effectiveness is questionable.

BICRO is a government investment fund sponsored by the Ministry of Science and Technology. The fund will soon be operational with about \$9 million to promote technology development in environment, biotechnology, medicine and civil engineering. In the environmental sector, BICRO invests in environmental protection or clean production technologies and technologies for saving energy and natural resources. Financing includes both grant funds (28%) and loans (72%) at subsidized rates.

U.S. Sources of Financing

There are several U.S. sources of financing, usually designed to support trade or investment with the U.S. However, it is believed that none of these programs have financed an environmental project in Croatia to date. Since information is widely available about them, these funding sources are only briefly mentioned below:

The Development Credit Authority (DCA) provides credit assistance through a loan guarantee program that covers up to 50% of the commercial risk of a borrower's default on a loan. In Croatia, energy efficiency projects are eligible for DCA support. The program is administered by Nexant, but not yet operational.

The Overseas Private Investment Corporation (OPIC) promotes U.S. investment in Croatia and other countries in the region by reducing the associated risks. OPIC insures investments against political risks related to currency inconvertibility, expropriation and political violence. It

also provides financing through direct loans or loan guaranties to projects that involve significant equity or management participation by U.S. businesses. OPIC normally can guarantee up to \$200 million per project. Direct loans are generally smaller and are available for transactions that involve small U.S. businesses. In addition, OPIC sponsors a number of equity funds to address the need for private equity and to promote private sector participation. The most notable fund for Croatia is the Southeast Europe Equity Fund (SEEF) managed by Soros Public Funds Management, but it does not target the environmental sector for investments.

The U.S. Trade and Development Agency (TDA) promotes private sector participation in infrastructure projects that represent significant U.S. export potential. TDA funds feasibility studies, orientation visits, training grants, business workshops and various forms of technical assistance in energy, environment, water resources and other sectors. In Croatia TDA has financed projects in the power, telecommunications and transportation sectors.

The Export Import Bank (Ex-IM Bank) helps finance the overseas sales of U.S. goods and services. The major programs of the Ex-Im Bank are working capital guarantees that cover 90 percent of the principal and interest on commercial loans to creditworthy SMEs that need funds to purchase U.S. goods or services for export; export credit insurance policies to protect against the political or commercial risks of a foreign buyer defaulting on payment; guarantees of commercial loans to foreign buyers of U.S. goods or services that cover 100 percent of principal and interest against both political and commercial risks of nonpayment; and direct loans that provide foreign buyers with competitive, fixed-rate financing for their purchases from the U.S. It is believed that Ex-Im Bank has not yet financed any trade-related transactions in Croatia.

PART II: Municipal Financing

There are huge needs for municipal infrastructure financing, but municipalities have limited capacity to borrow funds. They have a small tax base, and they are restricted from borrowing over 20% of their annual budgets. Only the city of Zagreb has a credit rating.

Most of the Croatian commercial banks do not have experience in structuring long-term capital projects. Consequently, most recent infrastructure projects have been financed through the multilateral organizations and HBOR. A few notable examples are described below:

- The World Bank (IBRD) is financing a \$100 million Coastal Cities Pollution Control Program to upgrade water infrastructure systems for 36 eligible municipalities along the Adriatic coastline. The funds are disbursed through HBOR.
- The World Bank (IBRD) and EBRD are major funders of a \$159 million Municipal Environmental Infrastructure Program, designed to improve sewerage, waste-water treatment and water supply systems in Split, Solin, Kastela and Trogir. The investment program also addresses the problem of severe pollution in Kastela Bay and the sea off Pula, with the aim to restore the quality of swimming water and boost the tourist trade. The World Bank and EBRD are contributing about \$36 million and \$50 million, respectively. The funds are disbursed through HBOR.

- The World Bank is financing a \$30 million district heating and energy efficiency project.
- EBRD is lending \$49 million to improve the Jakusevac landfill in Zagreb and \$7.5 million to upgrade Rijeka's wastewater systems.

In addition, HBOR administers a Loan Program for Reconstruction and Development of Communal Infrastructure. The program provides long-term loans for investments in water supply, sewerage, wastewater treatment and solid waste management. Loan applications up to \$2.3 million are submitted to 16 intermediary banks. Loan applications in excess of that amount are submitted directly to HBOR. In 2000 HBOR financed infrastructure projects amounting to \$8 million.

Example of the terms and conditions of the above programs are provided below:

Municipal Infrastructure Financing

| Organization | Type of Financing | Percent Financed of Total Costs | Range of Financing | Rates | Term | Other Conditions or Comments |
|--|-------------------|---------------------------------|----------------------|------------------------------------|---|---|
| EBRD | Loans | 55 –80% | Over Euro 10 million | Market rates (floating over LIBOR) | 10 – 15 years | |
| World Bank Coastal Cities Pollution Program | Loans | NA | Euro 2 –10 million | Market rates (floating over LIBOR) | 15 years | 36 municipalities are eligible |
| Croatian Bank of Reconstruction and Development (HBOR) | Loans | Up to 80% | No range | 7% fixed | Up to 15 years including 5 years grace period | Management fee is 1% and commitment fee is ½ % on undisbursed loan amount Security instruments: bills of exchange from units of local govts. |

It should be noted that HBOR has also started a Loan Program for the Financial Restructuring of Units of Local Government in Support of the Development of Communal Infrastructure. The idea is to reschedule and extend the maturities of the debt of selected municipalities so that they can qualify for additional infrastructure loans. The loan rate is 6% fixed for 12 years. The management fee is ½% and the commitment fee is ¼%.

Another potential financing source is the European Union. Unfortunately, the EU is only in the process of establishing its office in Croatia, and the study team was unable to obtain any information about its future plans for financing municipal infrastructure. As Croatia implements its National Environmental Action Plan with a view to EU Accession, the EU will likely support the development of municipal infrastructure.

The most likely future source of financing may be private sector investment, within the framework of public-private partnerships. Private sector capital and expertise are needed to

upgrade municipal infrastructure. Municipalities will need information about the different options for structuring public-private partnerships, and project opportunities will need to be disseminated to private-sector investors.

Conclusions

When discussing the availability of financing for environmental projects in the private sector, there are different viewpoints between project sponsors and financing institutions. While the project sponsors often say there is no money in Croatia for environmental projects, the financing institutions reply there is plenty of money, but there are no good projects. Upon further questioning, the project sponsors will add that financing is unavailable at affordable rates, in the 3 –6 % range, and financing institutions report that projects are not properly structured with high enough rates of return.

To sort out these different sets of expectations, it may be helpful to classify the sources of environmental funds into three groups: environmental funders at subsidized or market rates, general business funders at subsidized rates and general business funders at market rates.

Environmental Funders:

In Croatia, there are no environmental financing institutions, such as a state environmental fund, that offer subsidized rates. There is only one investment fund that specializes in the environmental/energy sector. It finances commercially structured projects with high rates of return, and it has not yet completed a transaction in Croatia.

General Business Funders (at subsidized rates):

The commercial banks have standard lending programs that support SME development, and some of them have framework facilities for this purpose contributed by multilateral organizations. A few of these framework facilities offer subsidized rates, but it is often difficult to obtain information about them since the commercial banks prefer to promote their standard lending programs. As market rates have dropped recently, the spread between the subsidized rates and the market rates is no longer high enough to justify the additional paperwork and time to fulfil the requirements of the subsidized programs.

General Business Funders (at market rates):

There appear to be plenty of funds available at market rates through commercial banks or investment funds that support general business development. These funders consider the purchase of environmental technology as a legitimate purpose for their financing, since this investment would help modernize the company and support its future growth and profitability.

However, there are a number of barriers that prevent firms from accessing these funds:

- Commercial banks and investment funds are more interested in the company's viability than in the merits of the environmental project. They look for stable companies with sufficient cash flow to repay the loan. In Croatia, ownership structures of companies are only beginning to become clear, and few companies have solid track records.

- Companies lack the capacity to structure their projects with a high enough internal rate of return to qualify for a commercial bank loan at market rates.
- Companies lack the capacity to prepare bankable documents that are required by the financing institution.
- Most financing institutions require 100% collateral for their loans or investments. This may be a problem for companies that have limited assets to pledge as security.
- Companies are not aware of the full range of available financing options, especially equity investments, and they lack experience in negotiating with financing institutions to obtain the most favorable terms.

In conclusion, there are sufficient funds for environmental activities available at commercial terms, but most companies lack the capacity to access those funds. To remedy this situation, USAID or other organizations might consider supporting workshops to assist Croatian companies to identify the most appropriate financing mechanisms, structure their projects for financing, prepare the bankable documents and market their financing proposals to financing institutions. Since banks are primarily interested in the overall credit worthiness of prospective borrowers, the workshops could show how an environmental project increases a company's cash flow to repay the loan. Companies could also receive guidance how to shop their financing proposals among several banks with the aim to increase competition and obtain the most favorable terms. As a follow-on activity, a financing consultant could work on an individual basis with those companies with the most promising projects and help them prepare a financing proposal.

Regarding financing prospects in the municipal sector, the main barrier is the limited borrowing capacity of municipalities. Most municipalities have exceeded their legal limit for debt. The near-term solution to financing municipal infrastructure projects may be attracting private sector participation. The study team did not assess the capacity of municipalities to develop public-private partnerships, but it is assumed that municipalities need assistance in structuring projects for private sector investment and operation. Also, municipal bond financing may be feasible for the city of Zagreb and possibly other municipalities, if the debt is guaranteed.

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Annex A
Sources of Financing Environmental Investments
in the Private Sector in Croatia

Comparative Terms and Conditions

| Commercial Banks | | | | | | |
|--|-------------------------------|--|---------------------------|--------------------------------|-------------------------|---|
| Organization | Type of Financing | Percent Financed of Total Costs | Range of Financing | Rates | Term | Other Conditions or Comments |
| Erste Steiermarkische Bank | Loans | 70% | Euro 50,000 to 2 million | 7 1/2 – 8% floating over LIBOR | 7 years (2 years grace) | 100% Collateral More favorable terms may be available through facilities with HBOR or Ministry of SMEs |
| HVB Croatia | Loans (EIB facility for SMEs) | 50% | NA | 6% Fixed | Up to 15 years | 100% Collateral Documentation and reporting requirements may be burdensome |
| Hypo Alpe Adria Bank | Loans | 70% | No minimum | 8 –9% floating over Euribor | 10 years | 100% Collateral More favorable terms may be available through facility with Ministry of SMEs |
| Privredna Bank | Loans | 70 –90% | No minimum | 8 –9% floating over Euribor | 10 years | More favorable terms may be available through facilities with EIB, HBOR or Ministry of SMEs |
| Zagrebacka Banka | Loans | Up to 100% | Euro 10,000 to 5 million | 7.5 – 9.5 % | 10 years | 100% Collateral Interest rate is 6% for an export-oriented company. More favorable terms may be available through facility with Ministry of SMEs, or HBOR |
| Investment Funds | | | | | | |
| Dexia-Fondlec Energy Efficiency & Emissions Reduction Fund | 30% equity 70% leverage | 100% | Euro 1 – 5 million | NA | NA | Fund requires 25% return on investment EETEK invests 30%, then borrows remainder based on cash flow from energy savings 100% collateral |
| Copernicus Adriatic | Equity | 25 -50% | Euro 1 –3 million | NA | NA | Fund requires 30% return on investment in 2-4 years |
| Small Enterprise Assistance Fund | Equity | Up to 50% | Euro 500,000- 1 million | NA | NA | Fund requires 30-35% return on investment in 3-7 years |
| Vienna Capital Partners | Equity | Less than 50% | Up to Euro 10 million | NA | NA | Fund requires 25% return on investment. No environmental investments to date. |

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| Organization | Type of Financing | Percent Financed of Total Costs | Range of Financing | Rates | Term | Other Conditions or Comments |
|---|-----------------------|---------------------------------|-------------------------|-----------------------|--------------------------|--|
| Croatian Government Institutions | | | | | | |
| Ministry of Small and Medium-sized Enterprises | | | | | | |
| 1. Enterprise Program (apply through local govts and one of 16 banks) | Loans | 100% | No range | 7.5% | 5 –10 years | Ministry provides deposits to intermediary banks that accept or decline the applications Collateral is required |
| 2. New Technologies Program (apply through Ministry and one of 4 banks) | Loans | 100% | No range | 7.5% | 5 –10 years | Collateral is required |
| Croatian Bank for Reconstruction and Development (HBOR) | | | | | | Collateral required for all programs |
| 1. Development of Private SMEs Program | | | | | | |
| • Direct Lending | Loans | Up to 70% | Euro 10,000 – 1 million | 6-9% | Up to 8 years | 1% Management Fee ¼% Commitment Fee on undisbursed loan amount |
| • Intermediary Banks | Loans | Up to 75% | Up to Euro 1 million | 6-9% | 4-10 years | 1% Handling Fee ¼% Commitment Fee on undisbursed loan amount |
| 2. Development of Economy Program (through banks) | Loans | Up to 80% | No range | 3-9% | Up to 10 years | ½% Management Fee ¼% Commitment Fee |
| BICRO (Ministry of Science & Technology) | 28% Grant 72% Loan | Up to 100% | Up to Euro 50,000 | Loan portion: 5.9% | Loan portion: 7 years | Fund supports new environmental technologies and other areas |
| Other | | | | | | |
| Development Credit Authority Program (USAID) | Loan Guarantee | NA | Up to 50% of bank loan | Market rates | Up to 10 years | DCA prefers investment from a private sector partner |

Appendix B
List of Organizations Contacted for Financing Study

| Organization | Contact Person | Tel. Number | Email Address |
|---|-------------------------|--------------------|--|
| Multilateral Organizations: | | | |
| World Bank (IFC) | Vedran Antoljak | 1-2387-236 | Vantoljak@ifc.org |
| World Bank (IBRD) | Vladimir Skendrovic | 1-238-7230 | Vskendrovic@worldbank.org |
| EBRD | Andrew Krapotkin | 1-4819-468 | Krapotk2@ebrd.com |
| European Investment Bank | Helen Kavvadia | 352-43-79-31-46 | h.kavvadia@eib.org |
| (Luxembourg) | Fabio Bargagli-Petrucci | 352-43-79-70-05 | f.bargagli@eib.org |
| Croatian Govt Entities: | | | |
| HBOR | Marija Kolaric | 1-4591-689 | Mkolaric@hbor.hr |
| | Biserka Birus | 1-4591-689 | Bbirus@hbor.hr |
| | Alen Kruhac | | |
| Ministry of Small and Medium Sized Enterprises | Drago Biondic | 1-4698-348 | Dbiondic@momsp.hr |
| Ministry of Environmental Protection and Physical Planning | Jana Kufrin | 1-6106-387 | Jasna.kufrin@mzopu.hr |
| | Dijana Juros | 1-6168-387 | Dijana.juros@mzopu.hr |
| BICRO | Miroslav Gabor | 1-6168-562 | Miroslav.gabor@bicro.hr |
| | Suzana Srpak | 1-6168-567 | Suzana.srpak@bicro.hr |
| Commercial Banks: | | | |
| Erste & Steiermarkische | Drazen Octenjak | 1-4561-915 | Octenjak@erstebank.com |
| HVB Croatia | Gerald Kern | 1-4800-799 | Gerald.kern@hr.hvb-cee.com |
| Hypo Alpe-Adria-Bank | Darko Bjelica | 1-6103- | darko.bjelica@hypo-alpe-adria.com |
| Privredna Banka Zagreb | Zeljko Stipetic | 1-4723-818 | Zeljko.stipetic@pbz.hr |
| | Andrea Turčin | 1-4723-663 | Andrea.turcin@pbz.hr |
| Zagrebacka Banka | Visnjica Machiedo | 1-4808-309 | Visnjica.machiedo@zaba.hr |
| Venture Capital Funds | | | |
| Copernicus | Maja Serdar | 1-4877-913 | m.serdar@copernicus-capital.com |
| Equitas (Dexia-Fonlec Energy Efficiency and Emissions Reduction Fund) | Mercy Bona Pavelic | 1-4883-210 | Equitas@zg.tel.hr |
| Small Enterprise Assistance Fund | Dino Bendekovic | 1-4811-912 | Dino.benekovic@seaf.hr |
| | Jasna Omeragic | 1-4811-912 | Jasna.omeragic@seaf.hr |
| Vienna Capital Partners | Gabriel Dielacher | 1-4811-500 | Gabriel.dielacher@vcp.tel.hr |
| Other | | | |
| SiVicon (consultant) | Viktor Simoncic | 44-547-952 | Igor.radisic@sk.tel.hr |

Annex E

Directory of Financial Sources For Environmental Activities In Croatia

March, 2002



EURASIAN - AMERICAN PARTNERSHIP FOR
E C O L I N K S
ENVIRONMENTALLY SUSTAINABLE ECONOMIES

Directory of Financial Sources in Croatia

Introduction: This Directory of Financial Sources was prepared by Environmental Resources Management and the Regional Environmental Center with support and funding from the Institute of International Education, in connection with the Institute's administration of USAID's EcoLinks Partnership Grants Program. The information below is meant to guide project sponsors in searching for appropriate financing sources for projects. The list of sources, which includes both equity investment sources and sources of loans, has been selected to include financial sources specializing in the country as well as regional sources. The list is not exhaustive, and it has been focused on the types of projects that are or could be addressed by the EcoLinks program.

At a basic level, the World Bank only lends money to governments. Also, its projects are usually large. Therefore, it is not practical for a project sponsor to apply to the World Bank for funding unless the project is part of a larger investment being undertaken by a ministry or government source. Both the International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD) will provide equity or loan financing directly to non-governmental, private enterprises. Their rates tend to be similar to commercial lenders, and they usually address projects of US\$ 3 to 5 million or more. Both the EBRD and the IFC invest in intermediaries in the region to make funds available for smaller projects—many of the EBRD intermediaries are listed below. For information regarding IFC intermediaries, contact the IFC local office.

The European Investment Bank finances smaller projects, through global loans (credit lines) to local financial institutions. These smaller projects are usually promoted by small and medium-size enterprises (SMEs) or by public bodies, e.g. municipalities. In CEE countries, EIB finances projects with a total cost between EUR 40.000 and EUR 25 million. As EIB can fund up to 50% of total project costs, it provides between EUR 20.000 and EUR 12.5 million. EIB is active in Croatia only since the end of 2001. The range of financing may be somewhat different in Croatia, because smaller global loans were issued and rates and conditions for financing are not yet available to the public. EIB intermediaries in Croatia are Croatian Bank for Reconstruction and Development (HBOR), Privredna banka Zagreb and HVB Bank Croatia.

Other sources listed below might be suitable for specific projects and sponsors.

World Bank Office

Ms. Vera Dugandzic

Trg. J.F. Kennedyja 6b, III Floor

10 000 Zagreb

Telephone: (385-1) 23-57-222

Facsimile: (385-1) 23-57-200

E-mail: vdugandzic@worldbank.org

Internet: <http://www.worldbank.hr>

Acting Country Manager: Mr Vladimir Skendrovic

Telephone: (385-1) 23-57-230

Facsimile: (385-1) 23-57-200

E-mail: yskendrovic@worldbank.org

IFC Office
c/o World Bank
Trg. J.F. Kennedyya 6b, III Floor
10 000 Zagreb
Telephone: (385-1) 23-57-222
Facsimile: (385-1) 23-57-200

Country Program Coordinator: Mr Vedran Antoljak
Telephone: (385-1) 23-57-236
Facsimile: (385-1) 23-57-233

EBRD Office
Petrijnska 59
5th Floor
10000 Zagreb
Croatia

Head of Office: Andrew Krapotkin
Tel: +385 1 4812 400
Fax: +385 1 4819 468
e-mail: krapotk2@ebrd.com

EIB office
Headquarters in Luxembourg
100, boulevard Konrad Adenauer
L-2950

Contacts: Ms. Helen Kavvadia
Tel. +352-43-79-31-46
Email: h.kavvadia@eib.org

Mr. Fabio Bargagli-Petrucci
Tel. +352-43-79-70-05
Fax. +352-43-79-62-86
Email: f.bargagli@eib.org

Small and medium – sized loan financing

HVB Bank Croatia d.d. (former Bank Austria Creditanstalt Croatia d.d.)

The EBRD has an equity participation in Bank Austria Creditanstalt Croatia d.d. This bank provides financial products and services to corporate and retail banking in both kuna and foreign currency. Services include corporate finance, export financing and mortgage lending.

**Bank Austria Creditanstalt Croatia
d.d.**

(changed name into
HVB Bank Croatia d.d.)

Jurišićeva 2
10000 Zagreb, Croatia

Contact: Mr Goran Gazivoda
Chairman of the Managing Board
Tel: +385 1 4800 704/708
Fax: +385 1 4800 899
Email: goran.gazivoda@hr.bacai.com

Contact: Mr Franz Friedl
Senior General Manager, Head of
Corporate Department
Tel: +385 1 4800 700
Fax: +385 1 4800 899
E-mail: franz.friedl@hr.bacai.com

Contact: Mr Gerald Kern
Head of Corporate Banking Division
Tel: +385 1 4800 799/790
Fax: +385 1 4800 998
Email: gerald.kern@hr.hvb-cee.com
Web site: www.hvb.hr

Hypo Alpe-Adria-Bank d.d.

Hypo Alpe-Adria-Bank d.d. operates in the Alpe-Adria region - Croatia, Slovenia, Carinthia, (Austria) and northeast Italy. The bank offers asset-based project financing (in particular mortgages) as well as trade financing products.

Hypo Alpe-Adria-Bank d.d.
Koturaska 47
10000 Zagreb, Croatia
Contacts: Mr Heinz Truskaller, Director
Ms Marina Buntic, Assistant to PR Board
Tel: +385 1 6103 501
Fax: +385 1 6103 555
Email: heinz.truskaller@hypo.hr
marina.buntic@hypo.hr
Contact: Mr Adolf Regenfelder
Head of Corporate Department, SMEs
Tel: +385 1 6103 551
Fax: +385 1 6103 630
Email: adolf.regenfelder@hypo.hr
Web site: www.hypo-alpe-adria.com
Contact: Mr Darko Bjelica,
Corporate Banking
Tel: +385 1 6103 541
Fax: +385 1 6103 630
Email: darko.bjelica@hypo-alpe-adria.com
www.hypo-alpe-adria.com

Slavonska Banka d.d. Osijek

The EBRD has an equity participation in Slavonska Banka d.d. Osijek, a regional bank operating in Eastern Slavonia. The bank provides medium and long-term loans to private SMEs for industrial development in the Slavonia and Baranja regions.

Slavonska Banka d.d.
PO Box 108, Kapucinska 29
31000 Osijek, Croatia
Contact: Mrs Snjezana Baric
Head of Board Assistance Department
Tel: +385 31 231 115
Fax: +385 31 201 039
Email: slbo@slbo.hr
Contact: Mrs Nada Anic
Head of Corporate Office Department
Tel: +385 31 231 410
Fax: +385 31 201 030
Email: slbo@slbo.hr
Contact: Mrs Nada Duvancic
Head of Corporate Banking Division
Tel: +385 31 231 200
Fax: +385 31 201 030
Email: slbo@slbo.hr
Web site: www.slbo.hr

Erste & Steiermärkische Bank d.d.

The EBRD has signed bank-to-bank loans with Bjelovarska Banka d.d. and Trgovacka Banka d.d., which merged with Cakovecka Banka d.d. in September 2000 to form Erste & Steiermärkische Bank d.d. The bank considers loans of up to DM 1 million to SMEs in the private sector. Loans may finance investments in fixed assets and working capital and may involve new projects or the modernization and expansion of existing business within the manufacturing, agriculture, hotel, tourism, energy conservation, environment, construction and trade and services sectors. Eligible SMEs must be legal entities and must be privately owned.

Erste & Steiermärkische Bank d.d.

Varsavska 3-5

10000 Zagreb, Croatia

Contacts: Mr Marko Krajina
Director, Corporate Lending;

Tel: +385 1 4561 911

Fax: +385 1 4561 910

Email: krajina@erstebank.com

Mr Drazen Octenjak

Head – Corporate Sector, Small and
Medium Clients Division

Tel: +385 1 4561 915

Fax: +385 1 4561 910

Email: octenjak@erstebank.com

Web site: www.esb.hr

Erste & Steiermärkische Bank d.d. Rijeka

Contact: Mr Alen Milakovic

SME Credit Department

Tel: +385 51 352 412

Fax: +385 51 352 400

Email: milakovic@erstebank.com

Erste & Steiermärkische Bank d.d. Bjelovar

Contact: Mr Zvonimir Zarec

SME Credit Department

Tel: +385 43 275 175

Fax: +385 43 275 176

Email: zarec@erstebank.com

Erste & Steiermärkische Bank d.d. Cakovec

Contact: Ms Snjezana Habunek

SME Credit Department

Tel: +385 40 311 433

Fax: +385 40 310 986

Email: habunek@erstebank.com

Erste & Steiermärkische Bank d.d. Zadar

Contact: Mr Sime Kevric

SME Credit Department

Tel: +385 43 275 175

Fax: +385 43 275 176

Email: kevrice@erstebank.com

Privredna-Banka Zabreb

Loans are available at commercial rates. However, more favorable terms may be available through facilities with EIB, HBOR of Ministry of SMEs.

Mr. Zeljko Stipetic – Head Corporate Sector
Ilica 5
10 000 Zagreb, Croatia
Telephone: (385-1) 4723-818
Facsimile: (385-1) 4723-922
E-mail: zeljko.stipetic@pbz.hr

For EIB facility:

Ms. Andreja Turčin
Kralja Držislava 5
10 000 Zagreb, Croatia
Telephone: (385-1) 4723-663

Zagrebacka-Banka

Loans are available at commercial rates. However, more favorable terms may be available through facilities with HBOR and Ministry of SMEs.

Ms. Visnjica Machiedo – Assistant Director
Retail Sales Management, Mass Market, Sales Management Dept.
Trg bana Jelacica 10
10 000 Zagreb, Croatia
Telephone: (385-1) 480-8309
Facsimile: (385-1) 481-3905
E-mail: visnjica.machiedo@zaba.hr

For HBOR facility:

Ms. Svea Škorić. Ms. Kudelnjak
Telephone: (385-1) 630-5444
Facsimile: (385-1) 630-5151

Equity Financing

Croatia Capital Partnership Ltd.

This fund invests in promising private SMEs based in Croatia. Buy-out and expansion investments are considered and all sectors are eligible. The average range is from US\$ 1.5 million to US\$ 3 million. Higher amounts may be considered due to a co-investment arrangement with Advent International.

COPERNICUS ADRIATIC d.o.o. (former Adriatic CP)

The co-founders of this venture capital fund are EBRD, Zagrebacka banka d.d., Cassamarca S.p.A., Erste Bank, IFC and Advent International. The fund provides private equity finance in the range \$1-3 million, 25-50% of equity share; the exit on the investment being 3-5 years.

Trg Bana Josipa Jelacica 3/Vi
10000 Zagreb, Croatia

Contacts: Mr Ante Cicin-Sain, Advisor; Mr Gavin Ryan, Executive Director

Tel: +385 1 481 9858

Fax: +385 1 481 6204

Email: adriatic-cp@zg.tel.hr; gavin.ryan@btinternet.com

Investment Analyst: Ms Maja Serdar

Trg N. Subica Zrinskog 6

10000 Zagreb, Croatia

Tel: +385 1 4877 913

Fax: +385 1 4877 901

Email: m.serdar@copernicus-capital.com; mserdar@cpad.hr

SEAF – Croatia (Small Enterprise Assistance Funds)

This investment fund is American limited liability company, which makes equity investments in small, and medium sized privately owned Croatian enterprises. This investment fund provides partner companies with capital, and receives an ownership stake in return, legally becoming one of the owners in the company. The typical investment size ranges from \$100,000 to 1 million for between 20% and 49% of the company; SEAF-Croatia is typically a minority shareholder in almost all business sectors. Exit from the equity investment is expected to take place in from three to seven years after the investment is made. In cooperation with other investment funds, SEAF-Croatia is capable of structuring equity investments in excess of \$1 million. Investors in SEAF are USAID, IFC (World Bank), SECO (Switzerland), NorFund (Norway), FinFund (Finland) and BSTDB (Black sea Trade and Development Bank). Among other countries, SEAF manages funds in Bulgaria, Romania and Macedonia.

SEAF Contacts in Croatia:

Britanski trg 5/II

10000 Zagreb, Croatia

Contacts:

Tel: +385 1 4811-912

Fax: +385 1 4823-558

Web site: www.seaf.hr

Mr. Jonathan Cooper, Director

Email: jonathan.cooper@seaf.hr

Mr. Dino Bendekovic, Deputy Director

Email: dino.bendekovic@seaf.hr

Ms Jasna Omeragic, Senior Investment Analyst

Email: jasna.omeragic@seaf.hr

Vienna Capital Partners

This is a venture capital fund that operates in several countries of CEE region. Its primary product is corporate finance advisory and besides, they are equity investors in media and communication companies. Future fund activities may involve energy sector.

Ilica 15
10000 Zagreb, Croatia
Contact: Mr Gabriel Dielacher, Partner
Tel: +385 1 4881-500
Fax: +385 1 4881-530
Mob: +385 91 4881 510
Email: gabriel.dielacher@vcp.tel.hr
Web site: www.vcpag.com

EQUITAS d.d.

EQUITAS is the US private firm, aimed at consulting and investment in Croatia, in the environmental and energy efficiency sector. EQUITAS is exclusive partner for Dexia-FondElec Energy Efficiency and Emissions Reduction Fund.

Dalmatinska 2
10000 Zagreb, Croatia
Contact: Mercy Bona Pavelic, Vice President of the Board
Tel: +385 1 4883-210/209
Fax: +385 1 4847-318
Mob: +385 91 6374-883
Email: equitas@zg.tel.hr

Croatian Government Institutions:

Croatian Bank for Reconstruction and Development (HBOR)

HBOR is a state-owned bank offering a variety of loan programs for SMEs and municipalities, mostly through intermediary banks. SMEs which need funds for environmental activities may apply for the loan programs for: Development of Economy & Development of Private SMEs. Municipalities are eligible to apply for the Loan Program of Reconstruction and Development of Communal Infrastructure. Conditions and contact information for each program are given at the web site.

Strossmayerov trg 9
10 000 Zagreb, Croatia
Contact: Ms. Marija Kolaric – Member of the Managing Board
Telephone: (385-1) 4591-689
Facsimile: (385-1) 4591-696
E-mail: mkolaric@hbor.hr
www.hbor.hr

BICRO (Business Innovation centre of Croatia)

BICRO is sponsored by the Ministry of Science and Technology. Together with the technology centers around Croatia, its goal is to implement The Croatian Program for Innovative Technology Development in the field of biotechnology, medicine, civil engineering and environmental protection. Projects regarding cleaner production technologies and technologies for saving the energy, materials and energy resources are eligible. Funds are granted mostly for private entrepreneurial projects partly in the form of the grant and partly in the form of the subsidized loan.

Ivana Lucica 5

10000 Zagreb, Croatia

Contact: Mr Miroslav Gabor, Deputy Financial Director

Tel: +385 1 6168 562

Fax: +385 1 6168 568

Email: miroslav.gabor@bicro.hr

Contact: Ms. Suzana Srpak

Email: suzana.srpak@bicro.hr

Ministry of Small and Medium Size Enterprises

This Ministry has two programs for financing SMEs, relevant for the environmental protection: the "Enterprise" Program and the "New Technologies" Program. Funds are available through intermediary banks, whereas the loan application is processed through the Ministry or the local governments. Both the Ministry and local governments provide deposits as security to intermediary banks.

Division for SMEs

Ksaver 200

10000 Zagreb, Croatia

Contact: Mr. Drago Biondić, Head of SMEs Restructuring Dept.

Tel: +385 1 4698 348, 4698 300

Fax: +385 1 4698 342

Email: dbiondic@momsp.hr

U.S. Institutions

The Development Credit Authority (DCA) provides credit assistance through a loan guarantee program that covers up to 50% of the commercial risk of a borrower's default on a loan. In Croatia energy efficiency projects are eligible for DCA support. DCA is not a separate program with its budget but derives from the Washington's Office of Development Credit (ODC), that has been established to support the USAID Missions' or Bureaus' use of this mechanism. To date, no direct loans have been issued and ODC is just finalizing the procedures to implement this aspect of the DCA. Goal of the program is to mobilize private capital to finance development initiatives and to demonstrate the economic viability of such investments. The program is administered by Nexant.

Contact in **NEXANT, Inc.:** Essam (Sam) Gouda
44 South Broadway
White Plains
New York 10601-4425
Tel: +1 202 326 1600
Fax: +1 202 326 1620
Email: Sgouda@msn.com

Contact in **USAID:** Ira Birnbaum
Team Leader for Energy Efficiency and Global Climate Change
EE/EEST/EI, Rm.5.10 RRB
1300 Pennsylvania Ave., N.W.
Washington, D.C. 20523
Tel: +1 202 712 1459
Fax: +1 202 216 3389
Email: ibirnbaum@usaid.gov

The Overseas Private Investment Corporation (OPIC) promotes U.S. investment in Croatia and other countries in the region by reducing the associated risks. OPIC insures investments against political risks related to currency inconvertibility, expropriation and political violence. It also provides financing through direct loans or loan guaranties to projects that involve significant equity or management participation by U.S. businesses. OPIC normally can guarantee up to \$200 million per project. Direct loans are generally smaller and are available for transactions that involve small U.S. businesses. In addition, OPIC sponsors a number of equity funds to address the need for private equity and to promote private sector participation. The most notable fund for Croatia is the Southeast Europe Equity Fund (SEEF) managed by Soros Public Funds Management, but it does not target the environmental sector for investments.

OPIC
Andrije Hebranga 11/II
10000 Zagreb, Croatia
Contact: John F. Moran
Tel: +385 1 492 3777
Fax: +385 1 492 1900
Email: jmoran@opic.gov

The U.S. Trade and Development Agency (TDA) promotes private sector participation in infrastructure projects that represent significant U.S. export potential. TDA funds feasibility studies, orientation visits, training grants, business workshops and various forms of technical assistance in energy, environment, water resources and other sectors. In Croatia TDA has financed projects in the power, telecommunications and transportation sectors.

US Embassy

Andrije Hebranga 11/II
10000 Zagreb, Croatia
Contact: Jeanette K. Miller
Tel: +385 1 492 1679, 385 1 492 3777
Fax: +385 1 492 1900
Email: jmiller-tda@inet.hr

General Regional Funds

AIG New Europe Fund

This fund makes direct or indirect equity and quasi-equity investments to fund investment programs, capital expenditure or working capital requirements of companies operating primarily in the Czech Republic, Hungary, Poland and Romania (the primary region) and Bulgaria, Croatia, FYR Macedonia, Moldova, the Slovak Republic, Slovenia and Ukraine (the secondary region) to achieve long-term capital growth. The Fund will usually hold more than 15 per cent of shares of a portfolio company, acquiring primary issues, typically in unquoted companies, but may acquire secondary shares, if this involves privatization or strengthening of the Fund's position in a company. The preferred investment size is between US\$ 10 million and US\$ 30 million.

AIG-CET Capital Management (Poland) Sp. z o.o.
Ul. Chopina 5A, Flat 20
00-559 Warsaw, Poland
Contact: Mr Pierre F Mellinger, Chief Executive Officer
Tel: +48 22 583 7000
Fax: +48 22 583 6969
Email: pmellinger@aig-cet.com.pl

Advent Central & Eastern Europe I & II

These funds provide finance and management assistance to companies in the private sector. The investment range is US\$ 5 million to US\$ 20 million. The funds finance projects in Croatia, the Czech Republic, Hungary, Poland, Romania and the Slovak Republic.

ACEE I is now fully-invested, investing is now only from ACEE II.

Advent International plc
158 Buckingham Palace Road
London SW1W 9TR, UK
Contact: Mrs Joanna James
Managing Director
Tel: +44 20 7333 5537
Fax: +44 20 7730 4119
E-mail: jjames@uk.adventinternational.com
Web site: www.adventinternational.com

Argus Capital Partners

This is a US\$ 172 million private equity fund, sponsored by Prudential Insurance of America, targeting the advanced countries of central and eastern Europe. The average investment size ranges from US\$ 8 million to US\$ 15 million with no sector specialisation. The Fund has offices in Prague, Budapest and Warsaw and will consider deals outside its priority target countries (Czech Republic, Hungary, Poland and Slovenia).

Argus Capital
4th Floor Culters Court
115 Houndsditch
London, EC3A 7BU, United Kingdom
Contact: Mr Ali Artunkal, Managing Director
Tel: +44 20 7398 2001
Fax: +44 20 7398 2003 Email: ali.artunkal@prudential.com

Capital Partners
ul. Emilii Plater
00-688 Warsaw, Poland
Contact: Mr Pawel Scott, Investment Director
Tel: +48 22 630 3031
Fax: +48 22 630 3033

Argus Capital Partners
Istenhegyi ut 40-a
1126 Budapest, Hungary
Contact: Mr Robert Hejja, Investment Director
Tel: + 361 391 0231
Fax: +361 391 0234

Dexia-FondElec Energy Efficiency and Emissions Reduction Fund

The EBRD, in conjunction with Dexia Project & Public Finance International Bank and FondElec Group Inc, has originated and sponsored a closed-end equity fund which makes private sector investments in energy efficiency and emissions-reducing projects in the EBRD's countries of operations. The fund aims to raise €150 million and invest in projects such as district heating, public lighting and industry. The EBRD and Dexia have each initially invested €20 million in the fund.

FondElec Group Inc.
Stamford Harbor Park, 333 Ludlow Street
Stamford, Connecticut 06902, United States of America
Contact: Mr George Sorenson, President
Tel: +1 203 326 4570
Fax: +1 203 326 4578
Email: ccasale@fondelec.com
Contact: Mr William Dinielli, Chief Financial Officer
Tel: +1 203 326 4570
Email: wdinielli@fondelec.com

EIF Central & Eastern European Power Fund

The EBRD is lead investor in the EIF Central & Eastern European Power Fund with targeted capital of US\$ 250 million. The investment strategy focuses on small and medium-sized investments (up to 350 MWe for generation, although it may consider larger assets in certain circumstances) in private power and heat generation, distribution and transmission projects. The minimum investment size is US\$5 million for power generation and distribution assets, with smaller investments considered on exception. The Fund may also invest in development companies established to pursue projects that qualify under the investment criteria. The minimum investment in such companies is US\$ 500,000. EIF is the leading fund manager focused exclusively on power and energy projects in both the United States of America and in several emerging markets.

EIF UK Management Ltd
Duke's Court, 32-36 Duke Street
St James's London, SW1Y 6DF, United Kingdom
Contact: Mr Thomas Murley, Managing Director
Tel: +44 20 7766 7162
Fax: +44 20 7766 7177
Email: tmurley@eifgroup.com
Contact: Mr Ludomir Serafin, Senior Investment Officer
Tel: +44 20 7766 7163
Fax: +44 20 7766 7177
Email: lserafin@eifgroup.com

Emerging Europe Capital Investors, LDC

Emerging Europe Capital Investors, LDC is an investment fund that will acquire equity and equity-related securities of companies operating in countries that are expected to join the EU. The Fund's objective is to achieve substantial long-term capital appreciation through the purchase and active management of such investments. The investment size range is typically US\$ 10 million to US\$ 20 million. The fund is managed by European Direct Capital Management (EDCM), a joint venture between State Street Corporation, a bank holding company listed on the New York Stock Exchange, and EEAM Limited, an investment firm of the management team.

EDCM co. Regus
Bank Center (Citibank Tower)
Szabadsag ter 7
1054 Budapest, Hungary
Contact: Mr Tamas Lederer, Regional Manager
Tel: +36 1 474 8146
Fax: +36 1 474 8181

European Direct Capital Management
Zitná 6/8
120 00 Prague 2, Czech Republic
Contacts: Mr Nigel P Williams, Chief Executive; Mr Roman Babka, Regional Manager
Tel: +420 2 2499 3200
Fax: +420 2 2499 3201
Email: nigel@edcm.com

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Environmental Investment Partners

This fund invests in profit-making environmental businesses in central and eastern Europe. The Fund invests between US\$ 0.5 million and US\$ 5 million in the equity capital of environmental companies. The fund is a passive financial investor and thus usually takes a share ownership of between 5 to 45 per cent of a company.

PP Investments
Ul. Piaskowa 12c
05510 Konstancin-Chylce, Poland
Contact: Mr Adam Pool, Chief Investment Officer
Tel: +48 22 756 3232
Fax: +48 22 756 4919
Email: eipl@eip.com.pl
Web site: www.eip.com.pl
www.ceeeif.com

Innova/98 L.P.

Innova/98 L.P. is a US\$ 125 million private equity fund managed by Innova Capital. The Fund targets emerging Europe and primarily focuses on Poland, Romania, Hungary and the Czech Republic. The fund also pursues investment in smaller or less developed markets in targeted sectors. The targeted investment range is between US\$ 3 million and US\$ 12 million.

Innova Capital
c/o Innova Capital Sp zoo
Aurum Building, ul. Walicow 11
00-865 Warsaw, Poland
Contacts: Mr Robert L Conn, Managing Partner; Mr Steven J Buckley, Managing Partner
Tel: +48 22 583 9400
Fax: +48 22 583 9420
Email: rconn@innovacap.com; sbuckley@innovacap.com
Web site: www.innovacap.com

New Europe East Investment Fund (NEE)

The EBRD, together with The Capital Group and other private institutional investors, sponsor the NEE, which invests in securities of companies located in central and eastern Europe. The Fund seeks to invest in new and existing companies and in listed securities. NEE will take no more than 15 per cent of the equity in any enterprise and no individual investment in a single enterprise may exceed US\$ 40 million. Typical investments range from US\$ 5 million to US\$ 15 million. Enterprises with strong western partners and high performing local management are preferred candidates for NEE investments.

Contact: Mr. Bill Parker, Representative
Capital International Ltd.
25 Bedford Street
London
WC2E 9HN
United Kingdom

TPG Co-Investment Fund

TPG Co-Investment Fund is a US\$ 187.5 million private equity facility managed by the US-based Texas Pacific Group (TPG). The facility covers all of the EBRD's countries of operations, but will focus on the CIS. The Fund concentrates on industries undergoing structural change and therefore primarily invests in the media, telecoms, IT and utilities sectors.

TPG Aurora
14-1 Tverskoy Boulevard
103009 Moscow, Russia
Contact: Mr Max Scherbakov, Managing Director
Tel: +7 095 797 5737
Fax: +7 095 797 5736
Email: max.scherbakov@tpg-aurora.ru

Aqua International Partners Fund

Equity investments in operating and special purpose companies involved in the treatment, bulk supply and distribution of water in emerging market countries. Associated with the U.S. Overseas Private Investment Corporation.

Contact Mr. John Sylvia
Texas Pacific Group
345 California Street, Suite 3300
San Francisco, CA 94104
tel: +1 415-743-1570
fax: +1 415-743-1504

Bancroft Eastern Europe Fund

Equity investments in distribution networks, basic manufacturing, consumer goods and related service networks. Associated with the U.S. Overseas Private Investment Corporation.

Contact: Mr. Fred Martin
President
Bancroft Group
7/11 Kensington High Street
London W8 5NP
United Kingdom
tel: +44 20 7368 3347
fax: + 44 20 7368 3348

Global Environment Emerging Markets Fund II

Equity investments in environment-oriented sectors relating to the developing financing, operating or supplying of infrastructure relating to clean energy and water. Associated with the U.S. Overseas Private Investment Corporation.

GEF Management Corporation
Contact: H. Jeff Leonard
1225 I (Eye) Street, NW
Suite 900
Washington, D.C. 2005
tel: +1 202 789 4500
fax: +1 202 789 4508

Southeast Europe Fund

Equity investment in companies from Albania, Bulgaria, Bosnia and Herzegovina, Croatia, FYR of Macedonia, Montenegro, Romania, Slovenia, and Turkey. Associated with the U.S. Overseas Private Investment Corporation.

Contact: Mr. Philippe Rombault
45 Oborishte St.
P.O. Box 147
1504 Sofia
Bulgaria
tel: +359 2 943 44 17