Environmental Action Programme Support Project
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ENVIRONMENTAL ACTION PROGRAMME SUPPORT PROJECT
POLAND

FINAL REPORT

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SECTION I

Overview

A. EAP and the History of EAPS

Endorsed by Eastern European and Western governments at the Ministerial Conference in April 1993 in Lucerne, Switzerland, the Environmental Action Programme (EAP), helps introduce market-based solutions and practices in environmental protection in the countries of Central and Eastern Europe. An important part of the program's mandate is local and national environmental policy development. Through policy development, the program has sought to lay a strong foundation for consistent and effective environmental protection by involving the public in identifying environmental problems and prioritizing protection activities. The program also focuses on strengthening environmental protection institutions and ensuring that environmental investments are properly selected and designed. In the 1993 EAP document, creating environmental policy, strengthening institutions, and implementing investments were presented as the "three legs" of what would become a strong market-based environmental protection system.

Turning EAP objectives into reality is still under way as various obstacles impeding full implementation are identified and addressed. An early problem was the lack of bankable environmental project packages for international and domestic financing. The USAID-financed Environmental Action Programme Support (EAPS) project was initiated to improve environmental project development and investment packaging through well-chosen, documented, and analyzed least-cost solutions. EAPS, an important U.S. government contribution to EAP implementation, has helped countries in transition prepare project packages and increased the supply of well-developed project proposals to submit to financing institutions.

B. EAPS in Poland

B1. EAPS Goals

In addition to its overall purpose, EAPS was dedicated to achieving two goals in Poland:

- Strengthen the ability of local governments and municipalities to package environmental projects
- Reduce environmental health risks

These goals are complementary, as air pollution generated at the municipal level is linked to environmental health risks. By helping municipalities develop environmental projects, with an emphasis on upgrading district heating systems, EAPS reduced air pollution while it strengthened local government ability to develop community infrastructure.

B2. Strategy to Achieve Goals

The EAPS strategy was to aid municipalities in addressing immediate environmental problems while helping project proponents and environmental financing organizations work together more effectively. Through its work, EAPS helped local government in Poland become more effective, responsive, and accountable to citizens.

EAPS implemented two types of activities. The first, environmental project development and investment packaging, provided technical assistance to project proponents—primarily municipalities—for preparing environmental investment projects. Project packaging activities focused on helping proponents attract financing for projects, greatly improving projects' prospects for implementation. EAPS also trained project proponents in applying for funding and disseminated information on the availability of concessional financing for environmental investment projects. These activities have helped municipalities successfully navigate the financing application process.

In the second activity area, EAPS developed management tools for local financing institutions. These tools have strengthened financing institutions and helped them better serve Poland's environmental investment market. The result is that worthy environmental investment projects can now obtain financing more quickly and efficiently.

B3. Strategic Objectives

EAPS operated under USAID/Poland's strategic objective framework. The strategic objective—to ensure that local government is effective, responsive, and accountable (SO 2.3)—is supported by the specific aim of strengthening the capacity of a wide range of local Polish institutions. Within this strategic objective EAPS contributed to achieving the overall intermediate result package of increasing local capacity to deliver services and manage local resources efficiently (IR 3) and especially contributed to achieving IR 3.1, which seeks to increase the technical and managerial capacity of local governments.

EAPS helped improve the quality of services for citizens by working with local governments to select economically viable solutions to environmental pollution problems, obtain project financing, and implement projects in a timely and efficient manner. EAPS increased local capacity to plan, finance, and manage infrastructure projects, selecting projects with a high potential for replication.

B4. Performance Objectives

Project packaging. USAID/Poland approved the following environmental project development and investment packaging performance objectives for the EAPS Poland program:

- At least 38 low-stack emission reduction projects and 5 other environmental projects provided with assistance. (Low-stack emissions reduction refers to reducing pollution from facilities with short smokestacks, which concentrate emissions in the immediate area.)

- At least 33 low-stack emissions reduction projects and 3 other environmental projects with applications for financing submitted

- At least 75 percent of applications approved

- A greater than 1 to 13 ratio of EAPS assistance to total project investment

- At least 10 different municipalities/*gminas* provided with assistance

The above performance objectives for environmental project development and investment packaging were substantially exceeded during EAPS implementation. EAPS prepared 85 investment packages, 75 of which involved low-stack emissions reduction. Of these, 37 applications have been approved

by environmental funds and 23 are currently pending. In 12 cases concessional financing was not required. Over 90 percent of applications were approved. The ratio of EAPS assistance costs to total project financing was 1 to 16, with each dollar spent for technical assistance mobilizing 16 dollars of financing. During the course of the three-year program, EAPS helped 20 *gminas* develop projects and receive external financing.

Institutional strengthening activities. EAPS carried out cross-cutting work with both municipalities and environmental funds to strengthen local and regional institutions. These activities were guided by the following performance objectives:

- At least 10 participants of EAPS-sponsored workshops on low-stack emissions reduction project financing successfully complete financing applications.
- At least five municipalities/*gminas* use the EAPS guide to environmental financing sources.
- Funds provided with the EAPS project appraisal manual reduce the length of the application appraisal process by 25 percent.
- Six *voivod* environmental funds adopt the EAPS cash-flow planning model.
- Six *voivod* environmental funds and Poland's national fund adopt the EAPS model for estimating the environmental impact of investment projects.

Institutional strengthening under EAPS met these objectives. EAPS-sponsored workshops on applying for environmental funding enabled more than 30 participants to submit financing applications. In addition EAPS produced a widely distributed guide to environmental financing sources that at least 20 *gminas* used to apply for financing. As a result of EAPS efforts, three regional environmental funds gained capacity in appraising applications rapidly and transparently.

B5. The EAPS Approach to Providing Assistance

The EAPS approach to assistance concentrated on two vital areas. First, EAPS helped proponents develop and package viable environmental investment projects. Secondly, the project carried out a range of activities to bolster environmental fund capacity and performance.

To help proponents develop and package viable projects, EAPS consultants worked closely with project proponents and involved them in major project development decisions. EAPS engaged local experts to design projects and established locally based steering committees to guide project implementation. To qualify for assistance, EAPS required projects proponents to obtain cofinancing from local institutions with environmental funds. This approach, which emphasized local participation from the early stages of project identification on through to investment packaging and implementation, helped establish local ownership for the process of identifying, screening, designing, and financing projects.

EAPS cooperated with municipalities from the start of each proposed activity to gather information and assess assistance needs. EAPS used the project screening phase to build informal and formal ties with municipal representatives, gaining their commitment and clarifying municipalities' expected contribution to projects. The screening phase identified projects with weak local commitment to providing information and sharing project costs; these projects were not approved.

Parallel to environmental project development and investment packaging were EAPS activities to strengthen environmental fund capacity to appraise projects, manage fund resources, and assist project proponents. In Poland demand for environmental financing is filled by a variety of institutions that receive private and public funding. Environmental funds, both national and *voivod*, play an essential role in providing financial backing for municipal improvements and other projects with environmental benefits. To help customers successfully navigate the process of applying for financing, EAPS created a guidebook to illustrate environmental financing options and worked one-on-one with project proponents to develop successful financing applications.

As part of the project's work to strengthen environmental fund capacity, EAPS helped the funds develop tools to use public funds for environmental investments more efficiently. The project assisted six environmental funds in improving investment analysis and management, helping the funds develop and computerize systems for cash-flow planning and environmental impact monitoring. Seven environmental funds currently use the two systems.

In addition EAPS prepared a project appraisal methodology that focused on environmental funds' target market: projects with relatively low profit margins that do not qualify for purely commercial financing and require grants or soft loans from environmental funds to cover part of total project costs. EAPS helped environmental funds implement the methodology, which increased the fairness and transparency of environmental fund decision making. To increase understanding of the appraisal process and boost the number of successful proposals, EAPS held a series of workshops to introduce the methodology to proponents and consultants. Through these activities EAPS staff members developed an in-depth understanding of the funds' institutional needs and funding priorities, and gradually transferred this knowledge to customers.

B6. EAPS Operational Management

EAPS was managed through the Chemonics home office in Washington, D.C., and a project field office in Warsaw. While the home office provided supervision, day-to-day operational management was delegated to the field office.

The Warsaw field office was staffed by a country manager, a senior finance advisor, environmental technical advisors, a chief office administrator, and an assistant office administrator. Five staff members managed subcontractors and liaised with project partners. Generally managed and staffed by local employees, the field office selected projects for development and investment packaging, prepared assistance plans and budgets, drafted contracts for technical assistance, and managed project development.

Within the field office the country manager oversaw day-to-day EAPS Poland activities, providing essential hands-on management. The senior finance and environmental technical advisors led EAPS activities in Katowice and Kraków. These advisors built the project portfolio, prepared scopes of work for subcontractors, and oversaw project development. Their close contact with project proponents and financial institutions was crucial in preparing financial plans and applying for project financing. Field office administrators maintained contact with the home office, processed and disseminated information, and ensured that staff members observed office procedures. They also supported the home office in preparing contracts, processing deliverables, and paying subcontractors.

SECTION II

Project Development and Investment Packaging

A. Low-Stack Emissions Reduction Projects

Reducing low-stack emissions serves several purposes. It improves ambient air quality and reduces the health threat posed by SO_2, NO_x and particulates. These reductions are often achieved by retrofitting heat-producing technologies, which provides additional benefits through energy and labor-cost savings.

To achieve these goals, many EAPS activities focused on converting heating facilities from coal to gas; in others, facilities were connected to district heating systems. EAPS also supported several innovative pilot projects to support clean energy use, including a geothermal project and an project using methane from a landfill as an energy substitute for coal. Finally, a number of EAPS low-stack emissions reduction projects improved the efficiency of coal-burning technologies. These efforts to reduce low-stack emissions help lower CO_2, a major component of greenhouse gases. In addition to environmental benefits, EAPS environmental project development and investment packaging helped local officials gain skills in managing projects from the concept stage to developing work plans, selecting contractors, and supervising investments. These skills will help municipal managers better serve citizens.

A1. Record of Assisted Projects

EAPS-assisted projects were generally financed by domestic sources, usually environmental funds. Investment packages ranged from $50,000 to $2 million, with most projects focused on reducing low-stack emissions. During its three years, EAPS assisted 78 low-stack emissions projects, each supported by a municipality. EAPS terminated assistance for three investments at the proponent's request. The application approval rate for projects was 96 percent. At the time of this report, 75 investments were completed or ongoing. Table 1 details results achieved.

Table 1. Low-Stack Emissions Reduction Projects

Project Characteristics	Number of Projects Packaged for Financing				Application Approval Rate
	Total Assisted	Total Planned	Number Submitted	Number Suspended	
Number of Project Packages	78	38	75	3	96%
Number of Municipalities/ Communities Assisted	20	10	20	0	n/a
Total Project Financing ($M)	n/a	n/a	32.9	27.1	n/a
Reduction of SO_2 Equivalent (T/A)	n/a	n/a	3,281	19,232	n/a
Reduction of CO_2 Equivalent (T/A)	n/a	n/a	46,280	46,962	n/a

EAPS assisted 20 municipalities and communities in developing and packaging financing for low-stack emissions projects. In the *gminas* of Kraków, Tarnów, Katowice, and Gliwice, EAPS prepared successful project financing applications. For the municipality of Kraków—where reducing low-stack emissions is a national priority—EAPS prepared 38 packages for financing. Three of these projects need further assistance, which will be based on studies that EAPS carried out. EAPS substantially exceeded its goal for low-stack emissions reduction projects: starting with a target of 38, EAPS assisted 75 projects. EAPS also exceeded its target for financing applications submitted, with applications submitted for 63 projects compared to a target of 33.

A2. Survey of Technical Options

Low-stack emissions reduction project development and packaging took several forms under EAPS. In some projects EAPS specialists worked to improve heating equipment efficiency; in other efforts they helped convert heating systems from coal-fired boilers or individual stoves to district heating systems. To select options for individual projects, EAPS staff members carried out detailed studies of heat requirements—energy audits—as well as cost/benefit analysis. In downtown Kraków's historic district, where projects lacked easy access to the city's district heating network, EAPS concentrated on converting heating sources from coal to gas. In Katowice several projects used heat provided by district heating companies. The following table presents data on the selection of technical options to eliminate low-stack emissions under EAPS.

Table 2. Options to Eliminate Low-Stack Emissions

Project Characteristics	Coal to Gas	Coal to District Heating	Combined Option	Total
Number of Packages	41	30	4	75
Number of Municipalities/Communities Assisted	12	14	3	n/a
Total Project Financing ($M)	8.7	21.7	2.5	32.9
Reduction of SO_2 Equivalent (T/A)	1,328	1,595	358	3,281
Reduction of CO_2 Equivalent (T/A)	26,705	11,456	8,119	46,280

In screening projects EAPS specialists often encountered boiler rooms with obsolete heating technology that had been in operation for 20 years or longer. To eliminate emissions from such equipment, many projects replaced old, inefficient coal-burning boilers with gas-fueled boilers. EAPS work in this area demonstrated that conversion from coal to gas adds flexibility to local heating networks and achieves savings in system operation and maintenance.

While cleaner than coal, gas is rarely used as a heating source in Polish communities and small municipalities. With large coal deposits and energy systems based on coal, Poland will continue to rely on the fuel for many years to come. In recognition of this fact, EAPS worked with district heating systems that run on coal to increase efficiency and reduce the harmful impact of coal pollution. District heating systems do not eliminate coal-burning emissions—instead they replace low stacks with high stacks, increasing energy efficiency and dispersing pollution over greater distances. District heating networks also reduce heating system maintenance costs.

A3. Review of Financing Data

Selecting the proper option for each project requires careful financial and technical analysis. EAPS identified high-quality consultants from selected companies to carry out technical assistance. In each case EAPS financed and prepared the conceptual technical design. In addition to technical analysis, EAPS funded technical assistance to produce detailed financial plans and assist project proponents in completing applications to environmental funds for co-financing. The table below presents project investment and assistance costs.

Table 3. Total Project Financing and Technical Assistance Costs

Location	Number of Projects	Total TA Costs of EAPS/Poland (US$ thousand)	Total Project Financing (US$ million)	Ratio (Total Cost of Assistance to Total Project Financing)
Kraków *Voivod*	38	398	3.0	1:7.5
Katowice *Voivod*	31	1,207	24.1	1:19
Tarnów *Voivod*	3	214	4.1	1:19
Bielsko-Biala *Voivod*	3	179	1.7	1:9
Total	75	1,998	32.9	1:16

As previously noted EAPS projects in the Kraków *voivod* involved conversions from coal to gas or district heating upgrades in Kraków's historic center. These projects required detailed financial studies and consultations with authorities responsible for construction, environmental protection, conservation, and heat and energy delivery. As a result EAPS assistance costs were substantially higher for these projects than for other assisted projects.

B. Other Environmental Projects

B1. Record of Assisted Projects

EAPS also assisted seven projects that did not involve low-stack emissions reduction. These projects were pilots or test cases in the sense that they were undertaken to identify technology and pave the way for alternative solutions. Table 4 presents the results achieved.

Table 4. Non-low Stack Emissions Reduction Project Development

Project Characteristics	Number of Financial Applications		Application Approval Rate
	Planned	Submitted	
Number of Projects	5	7	100%
Number of Municipalities/ Communities Assisted	n/a	4	n/a
Total Project Financing ($M)	n/a	74.8	n/a
Reduction of SO^2 Equivalent (T/A)	n/a	4,574	n/a

The projects involved lake reclamation, flue gas desulphurization, electricity generation through the use of landfill gas, small hydropower for renewable energy, and district heating system modernization through local deposits of natural gas.

A lake reclamation project was identified during the development of the Local Environmental Action Programme in the E»k municipality. While authorities agreed on the importance of reclaiming the lake, they disagreed on the feasibility of various technical reclamation methods. An American expert with U.S. experience in lake reclamation developed a terms of reference and scope of work for the effort. A Polish company was selected through open bidding to develop the project's technical design, including technology specifications. The design will be useful for replicating elsewhere in Poland, where many lakes require reclamation.

A project in Radom municipality to use methane landfill gas to generate electricity was identified during a training course on clean energy production. The town requested EAPS assistance to assess project feasibility, select technology, and prepare the technical conceptual design. In the project gas is tapped from a municipal landfill to power an electricity generator. The electricity is sold to the national power grid, earning income for the landfill company. Cooling water—a cost- and pollution-free byproduct of electricity generation—is used to warm nearby greenhouses owned by the landfill company, eliminating the need for polluting coal. The main conceptual work for this innovative project was completed by an American expert, who examined project feasibility and prepared guidelines for project development and management. Polish consultants developed the project's conceptual technical design along with a feasibility study and financing plan. The project design provides a model for other municipalities with landfills for using this readily available resource to lower biogas emissions and reduce coal use.

The largest EAPS-assisted project focused on tapping geothermal energy sources to replace coal and gas. This effort, the Geotermia Podhale project, received more EAPS technical assistance than any other project. The World Bank packaged the investment for international financing and EAPS paid for data analysis of seismic, geo-electric, log, and core samples, data interpretation for mapping and reservoir modeling, well testing, and site determination. The studies that EAPS supported were crucial in justifying a $15 million World Bank loan for the project.

B2. Review of Financing Data

For projects that moved beyond low-stack emissions, EAPS focused on developing replicable, innovative technical solutions and ensuring sustainability by transferring the capability to address difficult environmental issues to domestic consulting companies. Ensuring project financial viability was equally important. The following table presents the investment and assistance costs of this project category.

Table 5. Non-low Stack Emissions Reduction Project Financing and TA Costs

Projects	Number of Projects	EAPS/Poland Total TA Costs (US$ thousand)	Total Project Financing (US$ thousand)	Ratio (Total Costs of Assistance to Total Project Financing)
Non-low Stack Emissions Projects	6*	323*	4,799*	1:15

*The Geotermia Podhale project is excluded.

Geotermia Podhale claimed the lion's share of total project financing for projects outside the low-stack emissions reduction category, with total financing of about $70 million. The National Fund for Environmental Protection and Water Management was the biggest single source of money for the project, holding more than 80 percent of Geotermia Podhale Company shares. Total technical assistance costs of Geotermia was also the greatest at $154,993. Due to the distorting effect of its large size, the project was not included in calculations of the ratio of technical assistance costs to total project financing for projects outside the low-stack emissions reduction category.

EAPS implementation highlighted the fact that environmental projects in this category are generally more costly than projects that focus solely on reducing low-stack emissions. This was partially due to the fact that EAPS tended to use advanced pilot technical solutions for these projects. However, even with their high assistance costs—which were often increased by prolonged technical disputes—the financing mobilization rate for these projects was better than the rate for low-stack emissions reduction projects.

C. Institutional Strengthening to Assist Project Proponents

EAPS carried out a variety of institutional strengthening activities to assist project proponents. These activities included workshops to help proponents learn to prepare financing applications and development of a project financing guide. Institutional strengthening activities supporting project development and investment packaging are described below.

C1. Workshops on Preparing Financing Applications

Working with C4EP, another USAID project, EAPS developed workshops for project proponents on preparing financing applications for low-stack emissions reduction projects. The workshops took place in Katowice on September 19-20, 1996, and in Kraków on December 9-10, 1996. The Katowice and Kraków environmental funds co-sponsored the workshops, underscoring the funds' intention to use a competitive bidding process for financing projects in low-stack emissions reduction.

Participating in the two-day workshops were representatives of municipalities and private enterprises as well as variety of other participants including boiler operators from public-sector institutions and district heating companies. Members of the Tarnów fund's supervisory board attended the Kraków workshop to gain a better understanding of environmental fund procedures.

The goal of the workshops was to improve quality of applications submitted in response to the competitive grant program and provide information on *voivod* fund procedures. The workshops provided training in application procedures for low-stack emissions reduction projects, and also provided an opportunity for fund officers to comment on applications for specific projects. The sessions proved especially useful for shedding light on such issues as project environmental impact, economic effectiveness, and financial analysis. The workshops also provided information on legal, technical, and economic appendices for financing applications. Table 6 presents information on workshop arrangements, participation, and outcome.

Table 6. Finance Application Workshops in Katowice and Kraków

Activities	Number of Participants	Evaluation of the Workshop*	Number of Applications Submitted
Katowice Workshop	31	4.22	16
Kraków Workshop	31	4.26	15
Total	62	n/a	31

*Average of scores given by participants on evaluation forms. The maximum score was 5.

The workshops were well received by participants, who noted the clarity of the presentations and presenters' responsiveness to the problems and issues raised. The participants reported that the workshops helped them better understand the application questionnaire and complete it accurately; in addition the sessions increased their familiarity with the application process. In an indication of the workshops' success, participants submitted 31 financial applications in response to a competition for low-stack emissions reduction announced by the Katowice fund and Ecofund. Of these, 24 were approved and funded, more than twice the number of approved applications stipulated in EAPS performance objectives.

C2. Guide for Financing Environmental Investments

Poland's first published guide for financing environmental investments, "The Market For Financing Environmental Investment Projects," was prepared in 1996 with assistance from EAPS and C4EP. A total of 4,000 copies of the guide were distributed, with half co-financed by the Ministry of Environment, which hosted seminars on financing environmental projects to promote the guide.

After it was introduced on television and in newspapers, the EAPS office received several hundred requests for the guide from representatives of local communities and governments, consulting companies, libraries, nongovernmental organizations, and students. The copies that remained were mailed to *voivod* offices and statistical offices throughout the country. The guide, was well received and is currently being used by training institutions for courses on financing environmental investments.

To assess the guide's usefulness in obtaining environmental financing, EAPS sent out questionnaires to a sample of 82 communities. The program received 45 responses, a 55 percent rate of response. Table 7 presents the survey's results.

Table 7. Usefulness of Guide to Environmental Financing Sources

Comments on Guide's Usefulness	Number of Affirmative Answers	Share of All Answers Received
The guide was useful and very useful (contacts listed in the book were used, pages were copied and distributed).	33	73%
The guide prompted communities to prepare applications for environmental investment financing.	20	44%
The guide helped build capacity and activate staff employed by communities.	34	76%

The survey showed that at least 20 communities used the guide to apply for environmental investment financing. This result is three times higher than the performance objectives set for this particular task.

A second edition of 1,500 copies of the guide was printed in March 1998 and distributed to municipalities and communities throughout the country. The guide's second edition updated information on environmental financing sources.

SECTION III

Strengthening Environmental Funds

EAPS carried out a number of activities to strengthen environmental funds and increase their efficiency and effectiveness. The project's efforts included development of such tools as a project appraisal manual, a computerized cash-flow planning system, and a system for assessing projects' environmental impact. These activities are described below.

A. Project Appraisal and Selection Manual

EAPS developed a project appraisal and selection manual for the Kraków, Bielsko-Biala, and Gorzow Wielkopolski environmental funds. The manual was co-sponsored by the Central and Eastern Europe Environmental Economics and Policy (C4EP) project.

The manual describes fund procedures and presents guidelines for project proponents, including an explanation of required information and copies of questionnaires on investment and non-investment projects. Software, the manual's second component, records data through a two-step project pre-screening and screening procedure to assess to environmental effects and economic indicators.

The Kraków Voivod Fund for Environmental Protection and Water Management adopted the manual in December 1995, serving as a test site for evaluating the effectiveness of the manual in day-to-day use. The Bielsko-Biala Voivod Fund benefitted from the Kraków fund's experience, obtaining a special version of the manual that EAPS tailored to its needs. EAPS also participated in the manual's modification for the Gorzow Wielkopolski Fund, with changes to the manual carried out within the scope of the C4EP project work plan. Before the fund council adopted the modified manual, EAPS provided assistance to test it with potential project proponents. EAPS also helped put the modified manual into a user-friendly format originally developed for the Kraków fund. EAPS experts installed the software and surveyed fund staff on operational problems. The final product is compatible with fund hardware and complies with the fund's project selection priorities. To encourage use of the new tool, EAPS experts provided training to fund staff, along with detailed operating instructions.

B. Computerized Cash-Flow Planning System

The cash-flow planning system, developed with EAPS assistance for the regional environmental funds, is a tool for recording and forecasting cash flows. Before the system was developed, funds used old-fashioned ledger books and hand-written calculations to manage cash flow. In a few cases fund managers developed simple computerized spreadsheets. Without good tools for understanding cash flow, fund managers tended to maintain excessive margins and disbursed resources cautiously to avoid possible cash shortfalls. The State Auditing Authority, environmental authorities, and the press accused environmental funds of allowing cash stocks to lie idle rather than using funds to finance projects.

Six large *voivod* funds joined with EAPS to coordinate development and implementation of the cash-flow planning system. Participating funds from Katowice, Kraków, Wroc»aw, Bielsko-Biala, Szczecin, and Lublin committed 13 percent co-financing. Representatives from the funds and EAPS prepared a terms of reference, selected a contractor, and monitored project development and implementation. The Polish company PROLAN Ltd. in Gliwice was chosen to carry out system development, which took seven months. Installation, testing, and training took place in April 1998. The system consists of the following modules:

- *Catalogue of instruments*. This catalogue lists financial instruments used by the funds, such as grants, loans issued, current accounts, bank deposits, types of securities available on financial markets, statutory and other revenues, depreciation, and administrative expenses. Instruments are broken down by class, group, and actions required for each instrument's use. The catalogue also describes parameters, such as investment maturities and interest on loans, needed to determine algorithms for converting input data into financial flows for operation.

- *Chart of accounts*. This chart contains instrument values from the catalogue of instruments converted into a standard chart of accounts for tracking cash flow by year and month.

- *Indices*. This element provides user-defined values of algorithm indices assigned to particular instruments.

- *Output statements*. These statements describe cumulative net cash flow, providing information for each day over the program's 36-month period.

As conceived by EAPS and the *voivod* funds, the system's purpose was to provide information to support financial decision making for investment projects; in addition the system was designed to help fund managers efficiently allocate short-term liquid assets to various financial instruments. The system allows fund managers to carry out complex analysis of alternative scenarios, including forecasting the impact of different financial decisions on future fund liquidity. Since implementation the funds have used the system to balance financial resource in-flow and out-flow. With information on undisbursed cash on any day over three years, the system has helped fund managers better understand how profits and cash reserves change as financial instruments and instrument values in a portfolio modify over time.

C. Computer-Aided System to Assess Environmental Impact of Investments

This component's goal was to develop a computer-aided system for the funds to collect and confirm data on the environmental effects of the projects they finance. The effort involved a joint venture between EAPS and the National Fund for Environmental Protection and Water Management and *voivod* funds in Bielsko-Biala, Katowice, Kraków, Lublin, Lodz, and Szczecin. EAPS funded 90 percent of the cost of implementation and the seven funds covered the remaining 10 percent.

Representatives of the environmental funds formed a steering committee to oversee implementation of the effort. The committee successfully completed its work, with a computer application installed and tested in each participating fund. The system allows funds to access country-wide data on the environmental effects of investments. To assist users EAPS supported the development of a user manual to explain the system and its use.

The resulting system unified methodologies for describing and measuring environmental effects, permitting the aggregation of data. The system's development was an important step toward unifying data collection and encouraging environmental fund cooperation. By assisting in this effort, EAPS helped create a practical tool for reporting the environmental effects of investments. It also helped build fund capacity to measure the environmental benefits of fund-supported projects. The steering committee that oversaw the system's development has committed to ensuring its future use, maintenance, and development.

ANNEX A. Results of Low-Stack Emissions Reduction Project Development and Investment Packaging

A1. Investment Ongoing or Completed

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Andrychów municipality Tadeusz Woïniak Urz•d Miejski Rynek 15 34-120 Andrychów tel. +33 752 603.	District heating development and elimination of low-stack emissions from municipal coal boiler houses.	Economic analysis; conceptual design and emissions analysis; financial plan; finance applications; tender documentation.	First-stage grant application rejected by EcoFund. Scope of project and financial plan to be modified. Project to be implemented in 1999.	1,000,000	69,546	237,229	339,081	91,429	6	66.6	105
Bielsko-Bia»a municipality Jerzy Krawczyk Urzad Miasta Plac Ratuszowy 1, 43-300 Bielsko-Bia»a tel. +33 124444.	District heating development; elimination of coal stoves.	Verification of existing technical and financial analysis; conceptual technical and economic design; environmental impact analysis; finance applications.	Finance application submitted to Regional Environmental Fund in Bielsko-Bia»a in February 1998. Expected financial contribution is $163,000.	500 000	78 436	113 500	146 000	20 500	0.0	9.6	-537

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Central **Kraków** 63/65 Grodzka St. Lucjan Kublik Administracja Domów Kapitu»y Metropolitalnej ul. Poselska 7 Kraków tel. +12 4220038.	Boiler conversions from coal to gas; connection to district heating system.	Report on legal and ownership options for project implementation; energy audit; technical and economic analysis; financial plan; finance applications.	Finance applications submitted to the Municipal Environmental Fund in Kraków, expected financial contribution is $12,800. Finance application received preliminary approval from EcoFund; expected contribution is $24,000.	80 000	20 624	28 000	36 148	10 500	7.9	12.7	501
Tarnów Joint Hospital W»odzimierz Grabarz Wojewódzki Szpital Zespolony ul. Szpitalna 13 33-100 Tarnów tel. +14 211955.	Boiler conversion from coal to gas/oil.	Heat requirement analysis; comparison of project options; conceptual technical design; environmental impact analysis; financial plan; finance applications.	Grant application submitted to Regional Environmental Fund in Tarnów; expected financial contribution is $570,000. Expected financial contribution from National Environmental Fund is $380,000.	1 500 000	93 699	157 343	310 121	140 029	7	17.8	1267

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Zabrze 4 public schools (4 projects) Roman Urba½czyk Urz•d Miasta ul.Powsta½ców 5/7 41-800 Zabrze.	Modernization of boiler house.	Technical and economic assessments of modernization options; analysis of potential emissions reductions; finance applications.	Finance applications were approved as follows: EcoFund grant of $58,000, Regional Environmental Fund in Katowice grant of $58,000 and loan of $85,000.	291 000	19 004	25 500	55 139	22 500	4	12.2	571.4
Ekoterm sp. z o.o./ **Bieru½** Ludwik Jagoda Urz•d Miasta Rynek 14 43-155 Bieru½ tel. +32 2164035.	Connection of residential buildings to district heating.	Energy audit; prefeasibility study; conceptual technical design; environmental impact analysis; financial plan; finance applications.	Finance applications were approved as follows: EcoFund grant of $164,500, Regional Environmental Fund in Katowice grant of $164,500.	2 940 000	98 017	N/A	83 824	87 000	6.8	191.0	781.9
Gliwice Military Housing Janusz Ciemi“ga Oddzia» Terenowy WAM ul. Chopina 10 44-100 Gliwice tel. +32 319251 ext. 445.	Boiler conversion from coal to natural gas and connection of flat blocks to municipal district heating system.	Energy audits; analysis of modernization options; analysis of potential emissions reductions; financial plan; finance applications.	Grant application to the Regional Environmental Fund in Katowice submitted in May 1998. Expected financial contribution is $46,300.	250 000	70 934	N/A	na	16 000	11.7	32.1	1099.9
Hutki Nursing Home o. Józef Chomik Hutki 76 32-329 Boles»aw.	Boiler conversion from coal to gas; low-stack emissions reduction. Assisting local monastery.	Energy requirement analysis; technical and economic conceptual design; environmental impact analysis; detailed engineering design; finance applications.	Grant application submitted to the Regional Environmental Fund in Katowice, expected financial contribution is $111,000.	320 000	35 404	24 000	61 634	49 500	12.4	19.1	623.7

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Katowice municipal kindergartens 1st phase (3 projects) Jacek Kominek Zespó» Obs»ugi Jednostek OÑwiatowych w Katowicach tel. +32 253 9665.	Boiler conversions from coal to gas/oil; low-stack emissions reduction.	Energy audit; conceptual technical and economic design; environmental impact analysis; financial plan; financing applications.	Finance applications were approved as follows: EcoFund grant of $24,500, Regional Environmental Fund in Katowice grant of $24,500, Municipal Environmental Fund in Katowice grant of $34,500.	117 000	22 953	21 000	32 917	na	0.3	13.3	291.5
Katowice municipal kindergartens, 2nd phase (4 projects) Jacek Kominek Zespó» Obs»ugi Jednostek OÑwiatowych w Katowicach phone +32 253 9665.	Boiler conversions from coal to gas/oil; low-stack emissions reduction.	Energy audit; conceptual technical and economic design; environmental impact analysis; financial plan; financing applications.	Expected financial contribution from Regional Environmental Fund in Katowice is $51,500.	180 000	28 149	24 000	41 417	10 000	8.5	24.3	291.5
Katowice-Szopienice municipal housing Wojciech Gosiewski Urz•d Miejski ul. M»y½ska 4 40-098 Katowice tel. +32 253 9134.	Connection of residential buildings to district heating	Finance application.	Finance applications were approved as follows: EcoFund grant of $140,000, Regional Environmental Fund in Katowice grant of $91,000.	795 000	5 914	92 500	162 500	59 500	8.9	41.0	1171.2

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Knurów municipality Romuald Myga Urz•d Miejski ul. Szpitalna 9 49-194 Knurów tel. +32 235 1017.	Connection of municipal housing units to district heating; low-stack emissions reduction.	1st phase— project appraisal: inventory of buildings, energy audit 2nd phase—project development: feasibility study; conceptual technical and economic design; environmental impact analysis; financial plan; finance applications	Finance applications were approved as follows: EcoFund grant of $126,000, Regional Environmental Fund in Katowice grant of $126,000.	630 000	126 664	49 000	113 000	54 000	7.8	59.2	811.5
Koszutka-Katowice municipality Wojciech Gosiewski Urzad Miejski ul. M»y½ska 4 40-098 Katowice tel. +32 253 9134.	Connection of municipal housing units to district heating; low-stack emissions reduction.	Finance plan; finance applications.	Finance applications were approved as follows: EcoFund grant of $129,700 Regional Environmental Fund in Katowice grant of $129,700.	720 000	7 628	N/A	na	52 400	6.6	55.9	819.2

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Kraków second ring: coal to district heating (7 projects) Marek Jaglarz MPEC S.A. Al. Jana Pawła II 188 30-969 Kraków.	Boiler conversions from coal to district heating.	Environmental impact analysis; heat requirement analysis; financial plan; finance applications.	Grant application submitted to Municipal Environmental Fund in Kraków, expected financial contribution is $56,000. Grant application received preliminary approval from EcoFund, expected financial contribution is $117,000. Loan from Regional Fund in Kraków to be replaced by project proponent's equity.	233 000	49 032	95 698	136 439	na	1.1	50.6	1564.5
Kraków second ring: coal to district heating (7 projects) Marek Jaglarz MPEC S.A. Al. Jana Pawła II 188 30-969 Kraków.	Boiler conversions from coal to district heating.	Energy audit.	Projects under implementation by local district heating company. Total project costs paid by local district heating company.	239 000	28 028		24 343		37.3	24.1	424.4

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Kraków second ring: coal to gas (10 projects) Marek Jaglarz MPEC S.A. Al. Jana Pawła II 188 30-969 Kraków.	Boiler conversions from coal to gas.	Heat requirement analysis; financial plan; finance applications.	Grant application submitted to Municipal Environmental Fund in Kraków, expected financial contribution is $56,000. Grant application received preliminary approval from EcoFund, expected financial contribution is $117,000. Loan from Regional Fund in Kraków to be replaced by project proponent's equity.	400 000	77 299	129295	190 407	na	1.1	70.9	1198.7
Kraków second ring: coal to gas (5 projects) Marek Jaglarz MPEC S.A. Al. Jana Pawła II 188 30-969 Kraków.	Boiler conversions from coal to gas.	Energy audit.	Projects under implementation by local district heating company. Total project costs paid by local district heating company.	135 500	20 020		13 801		22.1	65.4	1253.3

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Kraków second ring: Pedagogical University Adam Kramarczyk Wyósza Szko»a Pedagogiczna ul. Podchor•óych 2 30-084 Kraków tel. +12 637 2548.	Boiler conversions from coal to gas and connection to district heating.	Finance plan; finance applications.	Finance application submitted to Municipal Environmental Fund in Kraków and Regional Environmental Fund in Kraków, expected financial contribution is $50,000.	125 000	6 565	14 511	20 235	635	0	12.5	130
Kraków second ring: Preventive Health Center Izabella Rumian Centrum Medycyny Profilaktycznej ul. Komorowskiego 2 30-106 Kraków tel. +12 422 5322.	Boiler conversions from coal to gas and connection to district heating.	Verification of analysis of energy needs and thermal modernization; finance plan; finance applications.	Implementation of project delayed for one year due to dispute over project site access to district heating system. Expected financial contribution from Regional Environmental Fund in Kraków.	45 000	4 726	15 883	19 680	12 571	34	8.7	137
Kraków 1st Ring: Assoc. of Peasants' Cooperatives Bohdan Laskosz Wojewódzki Zwi•zek Rolników, Kó»ek i Organizacji Rolniczych w Krakowie Plac Szczepa½ski 8 31-011 Kraków tel. +12 225 137.	Boiler conversion from coal to gas.	Conceptual technical design; energy audit; financial plan and applications; technical specification of tender documentation.	Grant application to EcoFund approved. First-stage loan application approved by Regional Environmental Fund in Kraków. Project proponent to submit final loan application to Regional Fund in Kraków in 1998.	40 000	24 757	8 369	12 545	7 784	18	8.8	276

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Kraków 1st Ring: Cooperative Printing House Eryk S»omka Drukarnia Zwiazkowa ul. Miko»ajska 13 31-027 Kraków tel. +12 220183.	Boiler conversion from coal to gas.	Conceptual technical design; energy audit; financial plan and applications; technical specification of tender documentation.	Finance applications were approved as follows: EcoFund grant of $10,000, Regional Environmental Fund in Kraków loan of $12,000, Municipal Environmental Fund in Kraków loan for $1,700. Project implemented.	40 000	28 545	8 000	12 074	4 000	7	2.5	48
Kraków 1st Ring: Historical Museum Andrzej Szczygie» Muzeum Historyczne Miasta Krakowa Pl. Wszystkich Đwi“tych 3/4 31-001 Kraków tel. +12 422 3264.	Boiler conversion from coal to gas.	Energy audit; technical concept of heating source; grant applications; tender documentation.	Grant application approved by EcoFund for $10,000. Grant application submitted to Municipal Environmental Fund in Kraków. Grant application submitted in March 1998 to Regional Environmental Fund in Kraków. Expected financial contribution is $20,000.	38 000	20 961	5 000	8 870	8 500	22	2.2	27

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Kraków 1st Ring: Hotel Polski W»adys»aw Skrzy½ski Hotel Polski pod Bia»ym Or»em ul. Pijarska 17 Kraków tel. +12 422 1144.	Boiler conversion from coal to gas.	Energy audit; tender documentation; finance applications.	Loan application submitted in March 1998 to Regional Environmental Fund in Kraków. Expected financial contribution is $40,000.	80 000	25 459	35 533	44 515	7 214	5	19.2	260
Kraków 1st Ring: National Czartoryskich Library Józef Wo»oszyn Muzeum Narodowe Biblioteka Czartoryskich Aleja 3-Maja 1 Kraków tel. +12 634 77.	Boiler conversion from coal to gas.	Conceptual technical design; energy audit; financial plan and applications; technical specification of tender documentation.	Grant application approved by EcoFund for $12,500. Grant application submitted in March 1998 to Regional Environmental Fund in Kraków. Expected financial contribution is $13,000.	27 000	24 710	6 745	9 495	5 518	24	4.3	82
Krupski M»yn municipality Tomasz Wojtczak Urz•d Gminy Krasickiego 65-693 Krupski M»yn tel. +32 285 7016.	Connection of residential buildings to gas boiler house.	Energy audit; prefeasibility study; environmental impact analysis; conceptual technical design; financial plan; financing application.	Grant applications were approved as follows: EcoFund grant of $192,000, Regional Environmental Fund in Katowice grant of $192,000.	1 000 000	88 413	142 000	239 880	72 000	11.4	101.6	788

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Mi“dzybrodzie òywieckie Hospital and Nursing Home Ewa Aksamit Niezr“cka Pa½stwowy Zak»ad Opieku½czo-Leczniczy 34-315 Mi“dzybrodzie òywieckie tel. +33 661 349, 661 350.	Modernization of heating system.	Financing applications; detailed engineering design.	Financing application submitted to Regional Environmental Fund in Bielsko-Bia»a. Expected financial contribution is $115,000.	175 000	31 392	44 000	70 176	33 500	27.1	12.4	900.3
Miko»ów municipality Zbigniew Majnusz Urz•d Miasta Rynek 16 43-190 Miko»ów.	District heating development and elimination of low-stack emissions from municipal housing.	Inventory of buildings; energy requirement analysis; conceptual technical and economic design; environmental impact analysis; financial plan; financing application.	Finance applications were approved as follows: EcoFund grant of $668,000, Regional Environmental Fund in Katowice grant of $668,000 and loan of $223,000.	2 300 000	98 025	227 000	453 927	132 500	2.2	232.9	1045.3
Gliwice Educational Facility Iwona Guzicka Towarzystwo Edukacyjne "Filomata" ul. K»odnicka 3 44-100 Gliwice tel. +32 230 7997.	Elimination of coal-fired boiler and connection to district heating.	Energy requirement analysis; conceptual technical and economic design; environmental impact analysis; financial plan; financing application.	Loan application for $6,000 was approved by Regional Environmental Fund in Katowice.	35 000	11 859	3 500	7 065	3 000	16.4	3.9	-13.1

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Racibórz Municipal Housing Andrzej Markowiak Urzad Miejski ul. Batorego 6 47-400 Racibórz tel. +36 415 2267.	District heating development; elimination of coal stoves.	Prefeasibility study; energy audit; conceptual design; environmental impact assessment; financial plan; finance application.	Finance applications were approved as follows: EcoFund grant of $135,000, Regional Environmental Fund in Katowice grant of $135,000.	1 040 000	98 032	233 500	301 000	26 000	0.0	89.6	764
Rydu»towy City Hospital Zbigniew ºyko Zak»ad Opieki Zdrowotnej ul. Plebiscytowa 69 44-280 Rydu»towy tel. 457704.	Boiler conversions from coal to gas.	1st phase—prefeasibility study; energy audit. 2nd phase—conceptual technical and economic design; environmental impact analysis; financial plan; financing application.	Grant application for $42,000 approved by Regional Environmental Fund in Katowice.	140 000	97 723	na	na	na	na	27.1	544.4
Đwi“toch»owice municipality Jordanowska St. Andrzej Porada Urz•d Miejski ul. Katowicka 54 41-600 Đwi“toch»owice tel. +32 452 520.	Connection of municipal buildings to district heating; low-stack emissions reduction.	Prefeasibility study on heating sources; conceptual technical and energy design; environmental impact analysis; financial plan; finance application.	Finance applications were approved as follows: EcoFund grant of $63,000, Regional Environmental Fund in Katowice grant of $63,000.[9]	5 390 000	86 150	33 500	65 000	27 000	5	330.6	883.0
Đwi“toch»owice municipality, Lipiny Andrzej Porada Urz•d Miejski ul. Katowicka 54 41-600 Đwi“toch»owice tel. +32 452 520.	Connection of municipal buildings to district heating; low-stack emissions reduction.	Prefeasibility study on heating sources; conceptual technical and energy design; environmental impact analysis; financial plan; finance application.	Finance applications were approved as follows: EcoFund grant of $22,500, Regional Environmental Fund in Katowice grant of $22,500.[10]	1 960 000	97 844	6 500	17 000	6 500	2.0	314.4	1693

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
Đwi“toch»owice municipality Przybyly St. Andrzej Porada Urz•d Miejski ul. Katowicka 54 41-600 Đwi“toch»owice tel. +32 452 520.	Connection of municipal buildings to district heating; low-stack emissions reduction.	Environmental impact analysis; financial plan; financing applications.	Finance application was approved as a part of joint application for Jordanowska project.	96 300	13 953	na	na	na	na	na	na
Đwi“toch»owice municipality Szkolna St. Andrzej Porada Urz•d Miejski ul. Katowicka 54 41-600 Đwi“toch»owice tel. +32 452 520.	Connection of municipal buildings to district heating; low-stack emissions reduction.	Environmental impact analysis; financial plan; financing applications.	Subsidized loan application for $26,000 approved by the Regional Environmental Fund in Katowice.	100 000	23 604	na	na	na	na	32.4	114.9
Tarnów Regional Penitentiary Jan Dziewo½ski Okr“gowy Inspektorat S»uóby Wi“ziennej w Krakowie ul. Montelupich 7 31-155 Kraków phone +12 634 5077.	Boiler conversion from coal to natural gas.	Verification of heat balance; analysis of thermal renovation measures and modernization options; conceptual technical design; tender documentation; financial plan; financing applications.	First-stage application received preliminary approval from Tarnów Regional Environmental Fund. Second-stage application submitted, expected contribution is $114,000. Grant application prepared for National Environmental Fund.	681 000	83 589	112 773	182 134	50 289	4	119.8	3352.7

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
The State Psychiatric Hospital in **Rybnik** Józef Cyran Urz•d Miejski ul. Chrobrego 2 44-200 Rybnik tel. +36 422 3011.	Boiler conversion from coal to natural gas and modernization of heat distribution network.	Verification of heat balance; analysis of insulation measures and modernization options; environmental impact assessment; conceptual design; tender documentation; financial plan; 1st and 2nd stage finance applications.	Finance applications were approved as follows: EcoFund grant of $410,800, Regional Environmental Fund in Katowice grant of $410,800.	2 000 000	96 456	374 860	248 576	38 422	0	300.5	6387.8
Voivodship Hospital in **Tarnów** Wies»aw Izworski Wydzia» Zdrowia Urz•d Wojewódzki w Tarnowie tel. +14 221428.	Boiler conversion from coal to natural gas and oil.	Energy requirement analysis; comparison of modernization options; air emissions analysis; conceptual engineering design.	A $130,000 grant agreement executed with the Regional Environmental Fund in Tarnów. Grant application submitted to the National Environmental Fund. The first new boiler was installed on January 13, 1997.	1 900 000	36 687	498 627	668 380	35 293	0	389.9	8457
Wodzis»aw Ðl•ski municipal housing Ireneusz Serwotka Urz•d Miejski ul. Bogumi½ska 4 44-300 Wodzis»aw tel. +36 455 1317.	Elimination of coal boilers and connection of flat blocks to district heating.	Economic analysis; cash-flow forecast; financial plan; finance applications.	Finance applications were approved as follows: EcoFund grant of $695,000, Regional Environmental Fund in Katowice loan of $193,000.	3 500 000	11 169	116 000	472 483	270 000	15.7	66.2	1638

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$][1]	Total EAPS Assistance Costs[2] [$]	O&M Costs of Project[3] [$/a]	Annualized Costs[4] [$/a]	O&M Savings[5] [$/a]	IRR[6] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][7]	Reduction of Emissions [metric tons of CO_2 equiv./a][8]
WSK **Kraków** S.A. Marek Stich WSK Kraków S.A. ul. Wroc»awska 53 30-011 Kraków tel. +12 331989.	Boiler conversion from coal to natural gas and oil.	Heat requirement analysis; least-cost study of investment; financial plan; finance application.	Project developed by project proponents based on technical assistance from EAPS.	1 500 000	66 922	512 800	640 795	0	0	403.0	6234
Zabrze municipal nursing home Roman Urba½czyk Urz•d Miasta ul. Powsta½ców 5/7 41-800 Zabrze.	Boiler conversions from coal to gas and oil.	Conceptual technical and economic design; tender documentation; finance applications.	Finance applications were approved as follows: EcoFund grant of $14,000, Katowice Regional Environmental Fund grant of $14,000.	100 000	12 181	16 500	23 500	24 000	34	1.0	102.4
Rudo»towice Nursing Home for Blind Children Norbert Calka Stowarzyszenie Niewidomych ul. Katowicka 77 41-500 Chrzanów tel. +32 414 257.	Boiler conversions from coal to gas; low-stack emissions reduction. Assisting local NGO, Polish Association of Blind People.	Energy requirement analysis; conceptual technical and economic design; environmental impact analysis; finance plan; finance applications.	Grant application for $28,000 approved by the Regional Environmental Fund in Katowice.	65 000	15 683	11 500	21 000	5 500	1	13.0	135.6
			TOTAL	**32,867,800**	**1,997,966**					**3,280.5**	**46,281.1**

A2. Investments Suspended

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Estimated Total Project Financing [$]	Total EAPS Assistance Costs [$]	O&M Costs of Project [$/a]	Annualized Costs [$/a]	O&M Savings [$/a]	IRR [%]	Estimated Reduction of Emissions [metric tons of SO2 equiv./a]	Estimated Reduction of Emissions [metric tons of CO2 equiv./a]
Che»m District Heating Zbigniew Bajko Urz•d Miasta ul. Lubelska 65 22-100 Che»m tel. +82 652 223.	Elimination of local boiler house and connection of housing units to district heating.	Energy audit.	Project suspended due to inability of project proponents to agree on project scope.	140 000	16 788	na[11]	na	na	na	na	na
Gliwice Rudolf Widziszowski PEC Gliwice ul. Królewskiej Tamy 44-100 Gliwice tel. +32 130 6906-6.	Boiler conversion from coal to gas/oil.	Financial plan.	Project abandoned per district heating company decision.	5 700 000	17 647	na	580 558	na	2.8	na	na
Rybnik District Heating Janusz Trojan Ekoterm Silesia ul. Podmiejska 1 Rybnik Wielopole tel. +36 739 1802	Elimination of local boiler house and connection of housing units.	Environmental impact study.	Project suspended per Rybnik decision	21 300 000	11 514	na	2 169 452	na	na	1931.9	46962
			TOTAL	**27,140,000**	**45,949**					1,931.9	46,962

ANNEX B. Results of Other Environmental Project Development and Investment Packaging

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$] [12]	Total EAPS Assistance Costs [$]	O&M Costs of Project[13] [$/a]	Annualized Costs [14] [$/a]	O&M Savings [15] [$/a]	IRR[16] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a] [17]	Reduction of Emissions [metric tons of CO_2 equiv./a] [18]
Chrzanów Hospital Ewa Potocka Zespó» Opieki Zdrowotnej ul. Szpitalna 51 32-500 Chrzanów tel. +35 33416.	Modernization of heating system.	Energy demand analysis; comparative analysis of project options; emissions analysis; conceptual technical design; financial plan; finance applications.	Grant application received preliminary approval from EcoFund, expected financial contribution is $350,000. Loan application to Regional Environmental Fund in Katowice, expected financial contribution is $535,000.	1 100 000	97 064	591 093	703 130	37 143	0	218.1	1162
Jastrz“bie Zdrój District Heating Company Wac»aw Bia»o½czyk PEC Jastrz“bie Zdrój ul. Wroc»awska 2 44-335 Jastrz“bie Zdrój.	Flue gas desulfurization.	Environmental impact analysis; finance applications.	Loan application submitted to the Regional Environmental Fund in Katowice. Expected financial contribution is $750,000.	1 500 000	19 628	66 000	216 000	na	na	1390	
Geotermia Podhale Stanis»aw Nagy AGH Aleja Mickiewicza 30 30-059 Kraków tel. +12 172 209.	Tapping geothermal energy sources to replace coal and gas.	Data analysis of seismic, geo-electric, log, and core samples; data interpretation for mapping and reservoir modeling; well testing and site determination.	Project is ongoing under World Bank auspices.	70 000 000	154 993	na	na	na	na	1995	130281.3

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$] [12]	Total EAPS Assistance Costs [$]	O&M Costs of Project[13] [$/a]	Annualized Costs [14] [$/a]	O&M Savings[15] [$/a]	IRR[16] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a][17]	Reduction of Emissions [metric tons of CO_2 equiv./a] [18]
Municipality of **E»k** Zdzis»aw Fadrowski Urz•d Miejski J. Pi»sudskiego 4 19-300 E»k tel. +87 610 3714.	Lake reclamation.	Technical assessment of conceptual engineering designs; conceptual design; detailed technical design; financial plan; finance applications.	Finance applications submitted to Regional Environmental Fund in Suwa»ki and EcoFund. Expected contribution is $168,000.	218 000	62 075	30 000	52 204	-30 000	na	-	-
Olcza-Water Power Station Ks. Tadeusz Lubiatowski Parafialny Klub Sportowy im. Ñw. Tadeusza Judy ul. Piszczory 13 34-502 Zakopane tel. +165 11905.	Small hydropower for renewable energy.	Finance plan.	GEF grant approved for $10,000. Project is implemented and under way.	14 170	0		1 443				
Radom Municipal Landfill Jerzy Go»“biewski RADKOM ul. W. Witosa 76 26-600 Radom tel. +48 44217.	Use of landfill gas to reduce biogas emissions.	Work plan; study of gas production and energy needs of landfill site; technical and economic comparison of options; conceptual design, financial plan, finance applications; tender documentation.	Grant application for $203,000 approved by EcoFund. Loan applications submitted to Radom Regional Environmental Fund and National Fund. Expected contribution is respectively $57,000 and $228,000.	667 700	112 617	98 000	166 007	na	26	4.5	12592.7

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$] [12]	Total EAPS Assistance Costs [$]	O&M Costs of Project[13] [$/a]	Annualized Costs [14] [$/a]	O&M Savings [15] [$/a]	IRR[16] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a] [17]	Reduction of Emissions [metric tons of CO_2 equiv./a] [18]
Skoczów district heating Barbara Hyrnik Urz•d Miejski 43-430 Skoczów tel. +33 533 854.	Modernization of district heating system.	Pre-feasibility study.	Project scope reconsidered by project proponent based on pre-feasibility study. Project under development by project proponent, to be implemented in 1998.	1 300 000	31 224	na	na	na	na	966.5	11960.6
			TOTAL	**74,799,170**	**477,600**					**4,574.1**	**154,834.6**

ANNEX C. Assistance for Institutional Strengthening

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$] [19]	Total EAPS Assistance Costs [$]	O&M Costs of Project [20] [$/a]	Annualized Costs [21] [$/a]	O&M Savings [22] [$/a]	IRR[23] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a] [24]	Reduction of Emissions [metric tons of CO_2 equiv./a] [25]
Workshop on preparation of finance applications for low-stack emissions reduction projects in Katowice region. 19-20 September 1996 Regional Environmental Fund in Katowice Jarzy Swaton tel. (32) 255 4790.	Training for 31 participants representing municipalities, public institutions, heating companies, and industrial enterprises on the project preparation and grant application process.	Development of a program and supporting materials for training.	Completed.	na	31 510	na	na	na	na	na	na
Workshop on preparation of finance applications for low-stack emissions reduction projects in Kraków region. 9-10 December 1996 Regional Environmental Fund in Kraków.	Training for 31 participants representing municipalities, public institutions, heating companies, and industrial enterprises on the project preparation and grant application process.	Development of a program and supporting materials for training.	Completed.	na	22 200	na	na	na	na	na	na

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$] [19]	Total EAPS Assistance Costs [$]	O&M Costs of Project [20] [$/a]	Annualized Costs [21] [$/a]	O&M Savings [22] [$/a]	IRR[23] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a] [24]	Reduction of Emissions [metric tons of CO_2 equiv./a] [25]
Publication of Guide to Financing Environmental Projects in Poland; First edition in 1996 co-sponsored by C4EP and the Ministry of Environmental Protection, Natural	A 200-page description and directory of finance sources for environmental projects in Poland. Abridged English-language edition was published in February 1997.	Development of the guide, editing and printing 4,000 copies (first edition) and 1,500 copies (second edition).	Completed.	na	19 373	na	na	na	na	na	na
Development of project appraisal system (software and manual) Regional Environmental Fund in Gorzow Zdzislawa Jastrebska tel. (95) 721 5480.	Improving project appraisal procedures.	Modifications developed and implemented for the Project Appraisal and Selection Manual. Changes were incorporated into the manual and software programs at the Regional Environmental Fund in Gorzow.	Completed.	Na	7 984	na	na	na	na	na	na

Project Description				Project Costs		Financial Viability				Environmental Health Benefits	Greenhouse Effects
Project Proponent/ Contact	Type of Project	TA Provided	Status of Financing at the Conclusion of EAPS	Total Project Financing [$] [19]	Total EAPS Assistance Costs [$]	O&M Costs of Project [20] [$/a]	Annualized Costs [21] [$/a]	O&M Savings [22] [$/a]	IRR[23] [%]	Reduction of Emissions [metric tons of SO_2 equiv./a] [24]	Reduction of Emissions [metric tons of CO_2 equiv./a] [25]
Development of computer-aided system for cash-flow planning for six regional environmental funds. Malgorzata Skucha tel. (33) 29 981.	Strengthening control over available financing.	Development of a scope of work, establishment of steering committee, selection of contractor, project oversight, implementation. 90% of total project costs were borne by EAPS.	Completed.	na	71 499	na	na	na	na	na	na
Development of standardized methodology for measuring environmental impact of investment projects. National and six regional environmental funds Graóyna Napiórkowska tel. (22) 492 280.	Strengthening capacity to measure and analyze environmental impact of investments supported by funds.	Development of a scope of work, establishment of steering committee, selection of contractor, overseeing project implementation. 90% of total project costs were borne by EAPS.	Completed.	na	74 918	na	na	na	na	na	na
				TOTAL	**227,485**						

ANNEX D

Principal EAPS Staff

The EAPS field office staff consisted of the following employees in 1998:

Stanislaw Sitnicki, country manager (replaced Glen Anderson)
Grzegorz Peszko, senior finance advisor
Jacek Podkanski, environmental technical advisor,
Barbara Letachowicz, environmental technical advisor
Benjamin Burg, chief office administrator (replaced Mark Hyman)
Magdalena Orlewicz-Sarnacka, assistant chief office administrator (replaced Urszula Markowska-Rogozinska, who replaced Agnieszka Markowska)

The curriculum vitae of principal EAPS staff are presented on the following pages.

STANISLAW SITNICKI
ul. Domaniewska 13/15 m.53
02-672 Warszawa
telephone: (22) 843 7260

PROFESSIONAL HISTORY

1996-1998	Country manager, Chemonics International, Environmental Action Programme Support (EAPS) project, Poland.
1993-1996	Executive director, Regional Environmental Center, Budapest, Hungary. Managed center and restructured its activities to respond to constituent needs.
1992-1993	Deputy director, Ekofund Foundation. Responsible for foundation operations, including development of project appraisal procedures and administrative manual.
1990-1992	Director, Environment Coordination and Management Department, Ministry of Environmental Protection, Natural Resources, and Forestry, Poland. Responsible for managing approximately $200 million in foreign assistance, including $18 million World Bank loan to improve environmental management.
1988-1990	Advisor to minister of environmental protection, Ministry of Environmental Protection, Natural Resources, and Forestry. Actively participated in developing Poland's environmental policy. Responsible for overseeing development of environmental monitoring system.
1970-1988	Assistant professor and associate professor, Central School of Planning and Statistics, Warsaw, Poland. Conducted lectures and seminars on political economy and environmental economics. Participated in several research programs in environmental protection.
EDUCATION	Ph.D., economics, Central School of Planning and Statistics.
LANGUAGES	Native Polish, fluent English, good Russian.

GRZEGORZ PESZKO
Kraków University of Economics
ul. Rakowicka 27, 31-510 Kraków
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PROFESSIONAL HISTORY

1995-1998 Senior finance advisor, Harvard Institute for International Development and Chemonics International, Environmental Action Programme Support (EAPS) project, Poland. Provided assistance in preparing environmental investment projects, including project management, financial and economic analysis, financial planning, finance packaging, and loan applications. Assisted in strengthening institutions financing environmental investments by providing services in project management, project cycle management, disbursement mechanisms, project appraisal, and cash-flow management.

1988-present Lecturer and researcher, Kraków University of Economics. Lectures and researches projects in environmental and resource economics, environmental policy, and environmental financing.

1998 Environmental finance specialist and team leader, PROEKO Ltd. Provided services to support World Bank project identification mission for an environmental investment project loan to Russia. Analyzed options for commercial banks' regional environmental funds in Russia and assessed their ability to operate as effective on-lending mechanisms for World Bank $200 million Environmental Investments project loan.

1997 Environmental economist, Milieu Ltd., environmental law consultancy, United Kingdom. Determined methodology and assessed costs of tailoring Lithuanian environmental law to meet key European Union environmental directives.

1997 Senior financial advisor, Agency for Energy and the Environment, Novem, Netherlands. Developed financial engineering software for external financing of energy efficiency investment projects under the SCORE Program.

1997 Consultant, environmental economics and costing, Environmental Resource Management, United Kingdom. Trained Ukrainian Ministry of Environmental Protection in calculating environmental policy costs.

1995-1996	Consultant, general equilibrium modeling and economic instruments, Kraków Academy of Economics, Grontmij Consulting Engineers, Netherlands. Developed cost methodologies and evaluated cost-effective strategies for achieving harmonization with European Community environmental standards. Developed cost methodology; designed cost-effective policy instruments, and macroeconomic (CGE) modeling.
1994-1995	Environmental finance consultant, principal co-author, OECD, Paris, France. Developed and drafted OECD policy paper on environmental funds in Central and Eastern Europe: "St. Petersburg Guidelines on the Use of Environmental Funds in the Transition to a Market Economy," CCET/ENV/EAP(94)13.
1993-1995	Policy analyst and economic advisor to the Polish Ministry of Environmental Protection, Central and Eastern Europe Environmental Economics and Policy (C4EP) project, Harvard Institute for International Development. Provided economic analysis of environmental policy, costs of environmental regulations, and analysis and design of environmental policy economic instruments.
EDUCATION	Ph.D., economics, Kraków University of Economics, Poland, 1997. M.S., economics, University College, London, United Kingdom, 1993. M.S., political science, Yagiellonian University, Kraków, Poland, 1987.
LANGUAGES	Native Polish, fluent English, good Russian, fair French.

JACEK PODKANSKI
ul. Strzelców Bytomskich 9/19
41-902 Bytom
telephone/fax: +48 (32) 81 52 45
e-mail: podkan@silesia.top.pl

PROFESSIONAL HISTORY

1996-1998	Environmental technical advisor, Chemonics International, Environmental Action Programme Support (EAPS) project, Poland. Provided project management, prepared investment projects, and assisted local governments.
1983-1997	Assistant professor, economics of chemical processes, Institute of Chemical Engineering, Polish Academy of Sciences. Polish representative to IEA Greenhouse Gas Research and Development Programme.
1991-1992	Consultant, freon substitutes, DuPont Company, United States.
1990-1991	Fulbright scholar, post-doctoral fellow, University of Delaware, Newark.
1994-1997	Consultant, Rybnik Power Plant and Institute of Non-Ferrous Metals.
EDUCATION	Ph.D., chemical engineering, Polish Academy of Sciences, Institute of Chemical Engineering.
LANGUAGES	Native Polish, fluent English, French, and Russian.

BARBARA LETACHOWICZ
ul. Kolorowa 24 m. 13
02-495 Warszawa
telephone: (22) 6627634

PROFESSIONAL HISTORY

1997-1998	Environmental technical advisor, Chemonics International, Environmental Action Programme Support (EAPS) project, Poland. Managed technical assistance to investment projects in water and solid waste.
1995-1997	Environmental technical advisor, Harvard Institute for International Development. Assisted in implementation of Central and Eastern Europe Environmental Economics and Policy (C4EP) project. Served as local engineering and technical expert for investment projects in water, wastewater, and solid waste. Provided assistance before and during technical assistance phase and managed projects in water, wastewater, and solid waste. Provided technical assistance in strengthening Polish environmental funds.
1994	Technical advisor, van Loon Environmental Systems B.V. Responsible for new clients, client service, and office management for supplier of industrial and domestic wastewater equipment.
1994	Sales representative, Hepworth via Nouvelles Emergences, Generik.
1992-1993	Technical advisor, Nijhuis Water B.V., Winterswijk, Holland. Provided client service, interpretation, technical documentation translation, and representation during international fair.
1984-1991	Assistant to process engineer, Engineering Bureau of Central Heating, Water Supply, and Sewerage Systems, Warsaw. Assisted process engineer in municipal wastewater treatment plants design and implementation. .
EDUCATION	M. S., environmental engineering, Warsaw University of Technology, 1983.
LANGUAGES	Native Polish, fluent English, fair Russian.

ANNEX E

Principal Subcontractors

DYNAMIKA
Krystyna Turkiewicz, president
44-100 Gliwice
Robotnicza 4a
Telephone: +48 (32) 318 293, 319 016
Fax: +48 (32) 382 486

A research and design company, DYNAMIKA was established in 1988. It employs around 40 people and has a turnover of $1 million a year. The company provides consulting services on heating systems, including district heating, boilers, heat plants, and internal central heating installations. DYNAMIKA's area of expertise includes environmental and energy efficiency problems related to heating, such as eliminating low-stack emissions, developing energy efficiency, and assessing the economic feasibility of insulation.

DYNAMIKA has developed several heating master plans for towns in the Katowice *voivod*. The firm’s highly qualified employees have performed hundreds of energy requirement and heating option analyses for buildings and districts. The company is experienced in preparing conceptual and detailed technical and economic designs and applying for support from financial institutions. DYNAMIKA's experts use modern technical and economic and ecological criteria to assess the feasibility of proposed solutions.

The company worked with local governments and EAPS to prepare more than 30 projects of various sizes, such as the $3.5 million Wodzis»aw project to connect several blocks of buildings to a district heating system and eliminate low-stack emissions, and the smaller Zabrze Municipal Nursing Home project to convert boilers from coal to gas and oil.

CityProf Consulting
Project Development and Management, Environmental Protection
Krzysztof Pilch, director
Ul. Chlopickiego 9
31-525 Kraków
Telephone/fax: +48-12-4113569

CityProf Consulting was founded in 1994 as a private consulting firm in Kraków, Poland. The firm specializes in environmental protection and energy systems, delivering the following services:

- Project development and management
- Project financing
- Technical audit and design

CityProf Consulting has implemented more than 50 comprehensive projects for more than 30 clients in a challenging political, social, and economic environment. The company combines knowledge of local realities with Western business principles and analytical tools. CityProf Consulting has a proven track record of successfully evaluating alternative approaches to project opportunities and developing sound recommendations that enable clients to make informed decisions on innovative and least-cost solutions in a rapidly evolving environment.

The firm's professional staff includes Polish individuals with postgraduate technical and business degrees from leading universities in Poland. CityProf employees are multilingual and possess international work experience. The company has developed strong working relationships with other consulting and industrial companies, scientific centers and independent experts that can be tapped as project needs arise.

For more than three years the company has worked with EAPS to develop financial packages for more than 20 investment projects. Examples include comprehensive modernization and emissions reduction from heating systems in hospitals in Rybnik ($2 million), Tarnów (two projects: $1.9 million and $1.3 million) and Chrzanów ($1.1 million). Other projects include district heating development and low-stack emission reduction in Rybnik ($21 million) and Andrychów ($1 million) and landfill gas recovery for a CHP plant in Radom ($700,000).

CityProf Consulting clients include both public organizations and private sector companies. International financing institutions and foreign aid organizations are important clients; other clients include the Polish government, regional and municipal authorities, and local industrial enterprises. Clients and projects have included: The World Bank, Chemonics International, U.S. Environmental Protection Agency, National Environmental Fund, regional environmental funds, municipal authorities of Kraków, Tarnów, Rybnik, and Andrychów, CHP plants in Kraków and Andrychów, and the Solvay chemical plant.

Biuro Rozwoju Krakowa S.A.
Jan Bieda, president
31-547 Kraków, ul. Kordylewskiego 11
Telephone: (48 12) 411-20-22
Fax: (48 12) 412-55-04

Biuro Rozwoju Krakowa S.A. (BRK) is an engineering design and consulting firm providing professional services since 1976. Its main areas of expertise include:

- Urban and rural planning: *gmina* development plans, studies of options for *gmina* development, site studies for designed investments, and plans for nature protection areas

- Technical, economic, and legal consulting: investment feasibility assessment, energy use improvement, energy audits, and conceptual technical solutions

- Technical infrastructure engineering design: building construction, roads, power engineering, gas engineering, and waste and wastewater management

Since 1992 BRK has been implementing a USAID- and U.S. Department of Energy-funded program to reduce air pollution from low-stack emissions sources in Kraków, eliminating 500 boiler houses and 24,000 home stoves.

Within Environmental Action Programme Support (EAPS), BRK has provided assistance to owners of buildings supplied with heat from local coal-fired boiler houses. Through an innovative legal formula, the municipal district heating company, MPEC S.A, owned by the Kraków *gmina*, is the third-party financier and implementing agent. Building owners, who do not bear the capital costs of boiler house elimination, provide MPEC S.A. with free access to boiler house areas, where MPEC S.A. installs modern heating sources and sells the heat produced to building owners. Costs are borne by MPEC S.A., supported by local environmental funds.

1. All numbers in U.S. dollars were calculated at the rate of exchange of $ 1=PLN 3.5.

2. Total EAPS assistance costs equal total subcontractors' costs plus overhead based on subcontractors' costs.

3. Refers to operation and maintenance (O&M) costs after the investment.

4. Annualized costs calculated according to the formula: (total project financing) x r / [1 - (1+r) $^{-n}$] + O&M costs; r = 8%, n = 20 years. Annualized cost refers to the minimum annual revenue required by the project to cover all its costs—investment, O&M, financing costs and return to investor.

5. O&M savings = O&M costs before the investment - O&M costs after the investment

6. IRR—internal rate of return. IRR is calculated from formula of net present value (NPV) of investment. It is the discount rate value at which NPV is equal to zero, and investment is at the margin of financial viability. IRR is a measure of project financial viability and debt-carrying capacity.

7. Calculated according to the formula: SO_2 equivalent = 1.0 x (SO_2 emission) + 2.9 x (particulates emission) + 2.9 x (NOx emission) + 0.5 x (CO emission).

8. Calculated according to the formula: CO_2 equivalent = 1.0 x (CO_2 emission) + 17 x (CH_4 emission).

9. Financing for the first phase of the project—$316,000; total investment outlays for Jordanowska project—$5,390,000. O&M and annualized costs, O&M savings, and IRR refer to the first phase of the project. Reductions of SO_2 and CO_2 emissions refer to the entire project.

10. Financing for the first phase of the project—$107,000; total investment outlay for Lipiny project—$1,960,000.

11. na—not available.

All numbers in U.S. dollars were calculated at the rate of exchange of $ 1=PLN 3.5.

Refers to operation and maintenance (O&M) costs after the investment.

Annualized costs calculated according to the formula: (total project financing) x r / [1 - (1+r) $^{-n}$] + O&M costs; r = 8%, n = 20 years. Annualized cost refers to the minimum annual revenue required by the project to cover all its costs—investment, O&M, financing costs, and return to investor.

O&M savings = O&M costs before the investment - O&M costs after the investment.

IRR—internal rate of return. IRR is calculated from the formula of net present value (NPV) of investment. It is the discount rate value at which NPV is equal to zero, and investment is at the margin of financial viability. IRR is a measure of project financial viability and debt-carrying capacity.

Calculated according to the formula: SO_2 equivalent = 1.0 x (SO_2 emission) + 2.9 x (particulates emission) + 2.9 x (NOx emission) + 0.5 x (CO emission).

Calculated according to the formula: CO_2 equivalent = 1.0 x (CO_2 emission) + 17 x (CH_4 emission).

All numbers in U.S. dollars were calculated at the rate of exchange of $ 1=PLN 3.5.

Refers to operation and maintenance (O&M) costs after the investment.

Annualized costs calculated according to the formula: (total project financing) x r / [1 - (1+r) $^{-n}$] + O&M costs; r = 8%, n = 20 years. Annualized cost refers to the minimum annual revenue required by the project to cover all its costs—investment, O&M, financing costs, and return to investor.

O&M savings = O&M costs before the investment - O&M costs after the investment.

IRR—internal rate of return. IRR is calculated from formula of net present value (NPV) of investment. It is the discount rate value at which NPV is equal to zero, and investment is at the margin of financial viability. IRR is a measure of project financial viability and debt-carrying capacity.

Calculated according to the formula: SO_2 equivalent = 1.0 x (SO_2 emission) + 2.9 x (particulates emission) + 2.9 x (NOx emission) + 0.5 x (CO emission).

Calculated according to the formula: CO_2 equivalent = 1.0 x (CO_2 emission) + 17 x (CH_4 emission).