

ENVIRONMENTAL ACTION PROGRAMME SUPPORT PROJECT
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

BULGARIA FINAL REPORT

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TABLE OF CONTENTS

| | | |
|---------|--|---|
| I. | Introduction | 1 |
| | A. EAPS Background | 1 |
| | B. EAPS in Bulgaria | 1 |
| II | Initial Phase: Municipal Conversion Reimbursement and Revolving Loan Fund for Residential Conversions | 3 |
| | A. Initial Program Focus and Design: 1996-1997 | 3 |
| | B. Summary of Initial EAPS Activities | 5 |
| | C. The Need to Change Course | 7 |
| III | Second Phase: Reimbursement for Municipal Conversions | 8 |
| | A. Divestiture from the Joint Venture | 8 |
| | B. The Restructured Project | 8 |
| ANNEX A | Principal Staff of EAPS Bulgaria | |

EAPS: Bulgaria Final Report

I. Introduction

A. EAPS Background

As Central and Eastern Europe (CEE) and the Newly Independent States (NIS) make the transition to open markets and democratic institutions, they face costly health and financial burdens from pervasive environmental contamination and mismanagement of natural resources. To address particularly harmful environmental problems, in April 1993 environmental ministers from Eastern and Western Europe developed and adopted the Environmental Action Programme in Lucerne, Switzerland. The program established a partnership between CEE, NIS, and Western countries, in which CEE and NIS countries undertake policy and institutional reforms, and Western governments and international financial institutions assist these reforms and the priority projects created to advance them. Through its Environmental Action Programme Support (EAPS) project, USAID supports the Environmental Action Programme and continues earlier activities in environmental management and economic development in the CEE and NIS regions.

EAPS primarily provides technical assistance for project selection and development and financial investment packaging. The project also provides assistance in institutional evaluation, capacity building, training, information dissemination, and work related to assessing and financing environmental projects, strengthening environmental funds, and improving environmental regulation and compliance. In addition, EAPS provides grant assistance for equipment to upgrade environmental performance.

B. EAPS in Bulgaria

B1. EAPS Goals

In Bulgaria the EAPS project was directed to assist the Municipality of Stara Zagora. In this city, the project team focused on three objectives:

- Reduce environmental health risk by converting the city's heating system of boilers fueled by highly polluting heavy oil to a natural gas distribution pipeline network.
- Cut heating fuel costs and improve heating efficiency to free resources for additional fuel conversions or other infrastructure development.
- Assist the municipality to attain a role as a utility regulator for the protection of the health and safety of its residents.

The EAPS project in Stara Zagora was intended to serve as a model for Bulgarian municipalities and the national government of how to reduce environmental health risk and develop a municipal utility management framework.

B2. Overview of EAPS in Bulgaria

One aspect of EAPS' assistance to convert to natural gas heating was a program of direct financial support to Stara Zagora to cover the cost of boiler conversions for selected municipal facilities. Under this activity, the municipality assumed full responsibility for requesting tender offers for the conversions and for contracting and supervising the work. EAPS reimbursed the city for the cost of individual completed conversions up to a specific maximum amount under a Fixed Amount Reimbursement agreement. Another aspect of EAPS assistance was helping to develop the municipality's role as utility regulator.

Early in the EAPS assistance program, the economic, legal, and programmatic context changed, requiring changes in implementation. For example, severe inflation contributed to a decision to eliminate a revolving fund component of the program, and passage of the new Municipal Property Act led to Stara Zagora's decision to divest itself of ownership interest in a joint venture with the private gas supplier.

B3. Strategic Objective

Initially the focus of the EAPS Bulgaria program was to reduce environmental health risk by converting heating fuel in public and residential buildings to natural gas. Later, the USAID reengineering Strategic Objective (SO) system was introduced throughout the agency. The EAPS Bulgaria program was not placed under SO 3.3, "reduce environmental health risk," but instead under SO 2.3, "promote local government that is effective, responsive and accountable." Within this strategic objective, EAPS has contributed to Intermediate Result 3 (IR 3), "increase local government capacity to deliver services and manage local resources efficiently," particularly IR 3.1, "increase the technical and managerial capacity of local government."

B4. Performance Objectives

The performance objectives were as follows:

- Convert 21 municipal boiler facilities to natural gas
- Form a utility commission whose responsibilities would grow to include:
 - helping the municipality interpret regulations and implement provisions of the Municipal Property Act
 - advising the municipality on how to fulfill its obligation to keep the public informed of the commission's actions
 - assisting the municipality to improve its performance in issuing and overseeing operating permits

B5. EAPS Operational Management

EAPS was managed through Chemonics' Washington, D.C., home office and project field offices in Sofia and Stara Zagora. While the home office provided supervision, day-to-day operational management was delegated to the field offices.

The Sofia field office was staffed by an environmental technical advisor. This advisor participated in selecting EAPS project activities, oversaw daily operations of EAPS Bulgaria activities, and served as an advisor to Stara Zagora and liaison among the Chemonics home office, the municipality, and Chemonics' subcontractors in Bulgaria. In addition, he served as technical supervisor for the facilities Stara Zagora proposed for conversion to natural gas and certification of cash reimbursements to the municipality for successful facility conversions.

The Stara Zagora field office was managed by the field coordinator, who provided overall supervision of local project activities, collection of relevant technical data, and project status report preparation. She also served as a liaison to USAID, the Municipal Council and Municipal Administration of Stara Zagora, and the Chemonics home office.

II. Initial Phase: Municipal Conversion Reimbursement and Revolving Loan Fund for Residential Conversions

A. Initial Program Focus and Design: 1996-1997

With high levels of sulfur dioxide, nitrous oxides, and other air pollutants, Stara Zagora has been designated an environmental "hot spot" in Bulgaria. Pollutants in residential areas stem largely from fuel emissions dispersed by the Maritsa East power plants located 30 km south of the city and by residential, municipal, and commercial buildings. The city has no district heating, and heat and hot water are furnished by individual boilers located in each building or by a central boiler facility serving more than one building. These boilers burn heavy oil or diesel oil and have no emission controls.

The joint venture with Overgas. The city's strategy to reduce these emissions was to extend natural gas lines and over time convert buildings to cleaner-burning natural gas. Initially, to implement this plan, the city entered into a joint venture with Overgas Ltd. in Sofia, in which the city had 48 percent interest and Overgas 52 percent. A private company, Overgas develops gas distribution systems and sells gas to end users.

Under the venture, Overgas designed a natural gas distribution system for Stara Zagora capable of making natural gas available to every building in the municipality. The plan was to implement the conversion in stages. Large industrial customers in the south of the city would be the first served. From Overgas' perspective, this was the logical starting point because current gas lines enter the city from the south and the high-volume industrial consumers there can be connected at a lower cost than that of smaller users. In addition, industrial users would pay for their own boiler conversions. The existing industrial boilers burn heavy oil.

Beyond this first stage, the conversion would move northward to the main residential and commercial areas. Overgas would cover the costs for installing the distribution system within

one meter of a building. The building owner (whether municipal, commercial, or residential) would be responsible for providing the gas meter and the remaining conversion costs.

Generally in U.S. communities converting to natural gas, the gas retailer finances the conversion and over several years recovers the cost through a gas surcharge to customers. Overgas, however, has insufficient capital to finance conversions at acceptable costs to residential customers. Its available capital is fully committed to extending its distribution systems.

Constraints to expanding the gas distribution network. Several factors constrain the next stage of conversion, expanding the natural gas distribution network into the main commercial and residential areas. To implement this stage, Overgas stated that it first needed sufficient commitments from industrial users to assure adequate demand and long-term revenue. Residential and commercial customers, however, were hesitant to register for conversions without an existing guaranteed supply, which contributed to Overgas' uncertainty about future demand within the city. In addition, the new Municipal Property Act, which prohibited private ownership of facilities constructed on municipal property, created uncertainty about the joint venture since the pipeline was to be constructed on municipal property. Further, since residents lack the resources for conversion, they would have to wait until funds were available through the revolving fund (discussed below) before making commitments. Generally, in any technology conversion, only a few individuals are willing to accept the risk and adopt the change before they have seen several applications of it.

Incentives for extending the gas distribution system. The EAPS Bulgaria project aimed to create an incentive for the joint venture to extend the gas distribution system and establish a revolving fund to finance residential conversions. The general framework of the initial phase of the project was as follows:

- The Municipality of Stara Zagora would finance approximately \$1 million in conversions of municipal buildings.
- USAID, through EAPS, would reimburse the municipality for the conversions.
- With the reimbursement, Stara Zagora would set up a revolving loan fund to finance households' conversions. The revolving fund would provide grants and Asoft@ loans for connecting residential units to the gas pipeline system, converting heating units or other appliances to gas, or buying gas-fueled boilers or other appliances. The terms of the loan, eligibility criteria, and other administrative details were to be developed before the fund's start-up.

For this initial phase, the work plan consisted of six related tasks:

- Design and implement a household survey and analyze the results
- Analyze energy prices and the cost of gas conversions
- Analyze the legal issues and prepare a USAID Memorandum of Understanding (MOU)
- Develop the municipal fund and loan program

- Conduct a boiler survey and conversion analysis and prepare the Fixed Amount Reimbursement agreement
- Design and implement a public awareness campaign

Progress made on the first five tasks are summarized below. The sixth task, the public awareness campaign, was carried out partly by EAPS, but mainly by a contractor working under the Local Government Initiative.

B. Summary of Initial EAPS Activities

B1. The Household Survey and Its Implications

A critical a priori assumption of the proposed project was that gas customers would find conversion economically advantageous and thus choose to convert. Upon approval of the project, EAPS undertook the household survey to see if this was a valid assumption.

The EAPS team and the Humanities Research Center, in cooperation with a team of professional interviewers, designed the survey. To elicit residents' opinions and attitudes toward a wide range of issues related to the conversion to gas heating, the survey addressed the following:

- Opinions concerning the city's environmental condition
- Knowledge of the gasification project
- Attitudes toward current methods of heating
- Perceptions of the advantages and disadvantages of natural gas versus current methods of heating
- Perceptions of conditions necessary to convert to natural gas heating
- Social, demographic, and income status

The survey results suggested that respondents were willing to convert to natural gas heating. The following are key findings of the survey:

- A majority (60 percent) of respondents thought that the environment was in very bad condition.
- Most (78 percent) cited air pollution as the most acute problem.
- Half of the respondents who considered the environment unsatisfactory also cited air pollution as one of the most acute problems.
- On average, younger respondents were more concerned about the environment and air pollution than older respondents.

The success of the municipality's gas conversion would depend on whether residents thought switching to natural gas would afford them attractive savings. If conversion costs are higher than expected, or if savings from using natural gas are less than projected, the payback period would be greater and conversions would be less attractive to residents (except those of higher income).

In apartment buildings with a single central heating unit, households would need to jointly finance the conversion. In such cases, which represent the majority of households in Stara Zagora, elderly and low-income residents would be less likely to support such an investment, unless the cost per household is low.

B2. Analysis of Energy Prices and the Cost of Conversions

As confirmed by an earlier household survey (conducted in 1995 by the Humanities Research Center in Sofia), a critical factor in a potential gas customer's willingness to change fuels is savings in annual fuel costs. Presumably, the level of savings should be large enough to recover the initial cost of connecting to the gas distribution system and modifying boilers or appliances for natural gas. The shorter the period required to recover these costs, the more attractive the option of converting to natural gas.

In an analysis completed in August 1997, EAPS confirmed the cost benefit of converting municipal heating facilities. The analysis indicated that the cost of conversion would be recovered within less than two years. It also indicated that there would be only a 12 percent drop in savings for every 32 percent jump in the price of natural gas. This relationship should promote confidence in the economic benefit of conversion.

B3. Legal Analysis and Preparation of USAID Documentation

To transfer funds from USAID to the Municipality of Stara Zagora, an agreement needed to be prepared and signed by both parties. EAPS recruited a Bulgarian lawyer to review the organization and bylaws of the joint venture. In this review, she determined the legal ability of the municipality to enter into agreements with USAID and EAPS for the reimbursement of funds through a Special Account, and assisted in preparing specific ordinances for the municipality to move forward with all agreements.

USAID took the lead in preparing an MOU between Stara Zagora and the agency, the first agreement of its kind in Bulgaria. In September 1995 an MOU was signed between the Government of the United States, acting through USAID, and the Municipality of Stara Zagora of Bulgaria to convert the city's residential buildings and municipal buildings or facilities to natural gas heating. The MOU envisioned that this cooperative effort would promote the development of natural gas utilities and be replicated in other communities in Bulgaria.

In addition to the MOU, EAPS and Stara Zagora prepared and signed a Fixed Amount Reimbursement (FAR) Agreement to establish a formal mechanism to reimburse Stara Zagora for the cost of municipal conversions.

B4. Development of the Municipal Fund and Loan Program

Under the terms of the MOU and FAR agreement, the municipality makes up-front payments for municipal conversions, USAID reimburses the municipality by placing funds in the Special Account, and the account is used to provide loans to residential borrowers. The Special Account would be established as a financial intermediary and kept for the duration of the natural gas conversion program. The management, supervision and administration, agent bank, budgeting, terms of residents' loans, and other issues related to the Special Account were considered in this initial stage of the project. However, these issues were not finalized, as the loan fund concept was eventually changed.

B5. Boiler Survey and Conversion Analysis

The boiler survey found that many boilers in residential buildings had not been operational for several years. Because of the difficult economic situation, residents use electric space heaters in one or two rooms during the winter and go without heat in the remaining areas of their apartment. Electric heaters are also used to provide hot water. Some apartment heaters have been dismantled, requiring rehabilitation of the whole system and making conversion more difficult.

Most block apartment buildings with a joint boiler have from 10 to 40 apartments. For apartment residents to share the cost of conversion, a joint agreement must be reached C a difficult task, especially in larger apartment buildings. During the boiler survey, it was revealed that the ownership of many joint boilers is unclear, which creates additional legal issues. These problems, however, do not exist with municipally owned buildings such as schools and day care centers.

C. The Need to Change Course

As mentioned above, Stara Zagora was expected to use its own resources to pay for converting municipal facilities, and then be reimbursed by the project. However, the municipal development budget for 1996 and 1997 was sharply reduced. With the skeletal budget remaining, gas conversions became a low priority. The municipality was therefore unable to pay for the municipal conversions from its own resources.

During this time, the country descended into deep economic crisis. From the end of 1996 to the beginning of 1997, inflation skyrocketed almost 3,000 percent. The government resigned and early parliamentary elections were held. In this extremely unstable economic environment, creating a special fund and loan program for residents to use for gas conversions was exceedingly difficult.

Due to these severe economic changes, the natural gas conversion program could not be completed in its envisioned form.

III. Second Phase: Reimbursement for Municipal Conversions

A. Divestiture from the Joint Venture

As the Municipality of Stara Zagora decided to withdraw from its joint venture with Overgas and assume its role as regulator, a utility commission was considered to monitor the natural gas conversion and gas system operation to protect citizens' interest and safety. The utility commission would consist of seven members based on EAPS recommendation and would include a variety of professionals, such as a lawyer, economist, engineer with utility experience, and local council member. These professionals are available in the city's current work force.

By Spring 1997 the Municipal Council had passed legislation creating the utility commission and appointed seven members to serve on it. The utility commission was given three initial responsibilities:

- Assist the vice mayor and the gasification coordinator in advising the council on negotiating and granting agreements with gas provider
- Provide oversight and control in their regulatory function to protect the health and safety of city residents
- Develop procedures and bylaws, subject to Municipal Council approval

The commission's formation and the decision to end the joint venture are unique to Stara Zagora and represent a major advance in Bulgarian municipal government. The national government and other municipalities have shown tremendous interest in the actions taken by the city. In meetings, national officials have indicated that they are observing the developments in Stara Zagora for potential replication in other municipalities. Officials are also eager to learn if the model can be used for utility regulation at the national level.

B. The Restructured Project

Due to the difficulties concerning the loan program for residential conversions, it was decided that EAPS would help fund conversions of municipal facilities such as schools, day care centers and hospitals. This is particularly beneficial to the citizens of Stara Zagora because towns have had difficulty supplying fuel to heat these facilities in winter under the current economy. Natural gas, a cheaper and more efficient fuel than oil and coal, can provide more flexibility for the municipal budget in securing year-round fuel resources.

In 1996 USAID and the Municipality of Stara Zagora amended the MOU to have EAPS provide the following assistance:

- Help identify boilers appropriate for natural gas conversion, develop technical specifications for boiler conversions, and estimate the cost of the conversions

- Upon documentation by the municipality of expenditures that are satisfactory to USAID, reimburse the city for boiler conversions in accordance with the Fixed Amount Reimbursement Methodology (see below)
- Disseminate information about the gas conversion effort to encourage citizen participation

EAPS developed the Fixed Amount Reimbursement Methodology to set the criteria and procedure for USAID to issue reimbursement for municipal boiler conversions. To develop the methodology, EAPS staff evaluated the potential types of gas conversions and appropriate rates for each component of the conversion process. Principal components include a gas burner, gas metering equipment, safety equipment such as gas sensor, lighting and exhaust fans, and piping. Each component was priced according to unit rates determined through an inspection of several boiler facilities targeted for conversion, a review of the component costs in proposed offers to Stara Zagora for conversion of representative boilers, and other data collected from various sources within Bulgaria. The evaluation covered combinations of boilers and burner types, sizes, and manufacturers; combinations of safety and gas-measuring equipment; required labor; and items such as transportation of materials and equipment, engineering, start-up and inspection.

The result of the evaluation was a practical methodology for determining the costs for the main types of boiler installations. However, should there be some extraordinary items or conditions in a conversion, adjustments may be necessary. Also, periodic adjustments may be required to account for changing price levels in Bulgaria, as well as changing prices for imported materials and equipment. All pricing information was calculated in U.S. dollars.

In June 1996 a Bulgarian engineering company, POVVIK, was selected to assist in developing standardized costs as the basis for cost reimbursement under the FAR. A total of 31 municipal facilities identified during the boiler survey were proposed for natural gas conversion under EAPS: 8 schools, 13 day care centers, an orphanage, a hospital, two polyclinics, a home for disabled people, the city hall, a city theater, a city supermarket, a swimming pool, and a sports arena. The 21 municipal boiler facilities converted to date are listed in the box below. A town map indicating the facilities targeted for conversion is presented on the next page.

Municipal Facilities Converted to Natural Gas

| | |
|---|---------------------------------------|
| Secondary School "Ivan Vazov" | Swimming Pool |
| 9 th Primary School #10 "Veselin Hantchev" | Polyclinic No. 1 |
| Primary School #10 | Day Care #20 |
| Day Care #29 | Day Care #2 |
| Day Care #9 | Day Care #7 |
| Day Care #"Nadezhda" | Day Care #5 |
| Day Care #6 | 5 th Primary School |
| Stara Zagora City Hall | Regional Hospital "Stoyan Kirkovitch" |
| Stara Zagora Drama Theatre | Day Care #35 |
| Secondary School "Vasil Levski" | Day Care #31 |

ANNEX A

Principal Staff of EAPS Bulgaria

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PROFESSIONAL HISTORY

- 1997-present** Technical expert, Supervision of Engineering Works project, Nuclear Power Plant Kozloduy, PHARE Program for Nuclear Safety.
- 1995-1998** Environmental technical advisor, Chemonics International, USAID Environmental Action Programme Support project, Bulgaria. Oversaw day-to-day operations, advised the Municipality of Stara Zagora, and provided technical supervision of facilities proposed for natural gas conversion.
- 1996-1997** Coordinator, Industrial Eco-Efficiency Program, World Environment Center, New York, Government of Switzerland.
- 1994-1997** Coordinator for Bulgaria, Technical Programmes, World Environment Center, sponsored by USAID. Involved in waste management and minimization and industrial environment initiatives. Assisted in establishing the Pollution Prevention Centre in Bulgaria.
- 1995-1996** Technical expert, USAID Central and Eastern Europe Environmental Economics and Policy project, Harvard Institute of International Development. Involved in environmental standards and regulations.
- 1992-1993** Graduate course instructor, heat and mass transfer, Technical University, Sofia.
- 1988-1992** Methods engineer. Heating and Refrigeration Department, Technical University, Sofia.

EDUCATION

Ph.D., engineering, Technical University, Sofia, 1993.

Diploma, heating, ventilation, and air conditioning engineering, Technical University, Sofia, 1988.

Certificate, international economic relations, University of National and World Economy, Sofia, 1985-1988.

Certificate, non-profit management, Sage College, Albany, New York, 1994.

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PROFESSIONAL HISTORY

- 1997-present** Board member, Bulgarian Society for Education and Culture.
- 1989-present** Consultant for environmental, youth, and development NGOs in Bulgaria. Provide training in environmental and project management and public participation in environmental decision-making and EIA procedures. Organized National Environmental NGO Meeting in April 1998.
- 1996-1998** Local coordinator, Chemonics International, USAID Environmental Action Programme Support project, Bulgaria. Coordinated local project activities aimed at gas conversions of municipal buildings. Collected and processed technical information; served as liaison to USAID, Municipal Council and Municipal Administration of Stara Zagora, and Chemonics= home office in Washington, D.C.; prepared project status reports.
- 1997-1998** National coordinator, Regional Environmental Center for Central and Eastern Europe, Budapest, Hungary. Surveyed access to environmental information and public participation in environmental decisions. Chaired the national round table discussion and prepared the national report presented at the 1998 Meeting of Ministers of Environment in Aarhus.
- 1995-1996** National coordinator, UNDP Eco-volunteers Program, Bonn. Supervised six environmental and development sub-projects.
- 1994-1995** National coordinator, International Council for Local Environmental Initiatives, European Secretariat, Freiburg, Germany.
- 1992-1993** Coordinator, Institute for Sustainable Communities, Vermont, USA. Coordinated field activities of the Policy and the Expert Committees to implement the Local Environmental Action Plan.
- 1989-1991** Board member, NGO “Ecoglasnost-Stara Zagora.”

EDUCATION

Preliminary Ph.D., Human Ecology Department, Free University Brussels, Belgium, 1995.

M.S., University of Chemical Technology and Metallurgy under consortium of seven European universities, Sofia, 1994. Received “Pirin Vodenicharov” for academic excellence.

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