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Proposal for Review

Project Title:	**Bulgaria: Ozone Depletion Substance Phase-out**
GEF Focal Area:	Phase-out of Ozone Depleting Substance (ODS)
Country Eligibility:	Bulgaria ratified the Montreal Protocol in October 1989 and with a per-capita GDP less than $ 4,000 is eligible to receive GEF assistance.
Total Project Cost:	US$ 18.7 million
GEF Financing:	US$ 11.9 million (including 15% contingency and 3% fee for local financial agent)
Government Financing:	Funding the Ozone Task Force in the Ministry of Environment to develop and implement the Country Program of ODS phase-out in Bulgaria.
Enterprise Financing:	US$ 7.1 million
Associated Project:	Stand-alone project
GEF Implementing Agency:	The World Bank
Executing Agency:	The World Bank
Local Counterpart Agency:	Bulgarian Ministry of Environment
Estimated Start Date:	September 1995
Project Duration:	less than 3 years
GEF Preparation Costs:	No PRIF or PPA resources were used

BULGARIA: OZONE DEPLETION SUBSTANCE PHASE-OUT

BACKGROUND

1. Bulgaria ratified the Montreal Protocol in October 1989 and is committed to the phase-out of halons and chlorofluorocarbons (CFCs) - ozone depleting substances (ODS) - as scheduled under the Protocol and subsequent London and Copenhagen Amendments. Parties to the Montreal Protocol agreed to phase out the production and consumption of CFCs and halons entirely by the year 2000 as set forth in the 1990 London Amendment. The Copenhagen Amendment of November 1992 shortened the allowable phase-out deadlines to 1996 for CFCs and 1994 for halons. All countries considered to be 'developed' under the U.N. system[1] must no longer import or export ODS or ODS products starting from January 1996. Bulgaria is classified under the Montreal Protocol as a non-Article 5 or a 'developed' country and has ODS-related industrial and commercial exports to developed West European countries. Thus, the Government of Bulgaria is committed to assist its enterprises in accelerating the process of conversion to non-ODS products.

2. The GEF provides financing to countries with a 1989 GDP of less than US$4,000 per capita to assist with ODS phase-out. Bulgaria, with per capita GDP of US$1,184 is eligible for GEF assistance. The Bulgarian Government has requested assistance from the Bank, as one of the implementing agencies of the GEF, in preparing and implementing a Project for the phase-out of ODS. The GEF will finance eligible incremental costs consistent with Montreal Protocol criteria and procedures, and eligible expenditures.

3. **ODS Sector Background**. Bulgaria has prepared with bilateral assistance from the Government of Denmark a country program for the phase-out of ODS by January 1996 (available from the World Bank, ENVGC, fax: 522-3256). An update of data collected for the Program indicates that in 1994, the ODS consumption was about 567 tons (not including the transitional substance HCFC-22), corresponding to an ozone depleting potential (ODP) of approximately 531 tons[2]. Bulgaria is not a producer of ODS and imports all ODS required for production. This represents a significant drop in ODS consumption since 1989 (when ODS consumption was 3,015 tons/yr), linked primarily to the economic recession experienced after the collapse of the former command and control regime. Many enterprises are no longer running at full capacity, thus reducing ODS consumption. The decline is also in part attributed to the conversion to CFC-free alternatives in the aerosol and flexible foam sector which were possible when the technology was easily applied and involved little increase in production costs.

4. There are at least 28 enterprises of varying production capacity which currently utilize ODS. Five sectors account for Bulgaria's primary ODS use: Refrigeration, 50% or 283 tons

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[1] Defined as "non-Article five" under the Montreal Protocol.

[2] ODS have different potential effects on the ozone layer. ODP is calculated based on the potential damage a substance has to the ozone layer, relative to that of CFC-11.

(of which over half is used for servicing with the remaining used in refrigerant foam equipment production); Solvents, 34% or 195 tons; Aerosols, 9% or 50 tons; Foams, 7% (non-refrigeration) or 37 tons); and Fire protection, <1% or 2 tons. By substance, CFCs account for about 90% of total ODS consumption (not including transitional substances) and should therefore be the focus of phase-out activities. Methyl chloroform (MCF - 6%), carbon tetrachloride (CTC - 4%) and halons (less than 1%) account for the remainder.

PROJECT OBJECTIVES AND BENEFITS

5. The objective is to assist Bulgaria in carrying out its transition to CFC-free technology in order to comply with its obligations under the Montreal Protocol and its amendments. It is expected that about 72% (417 of 567 MT) of ODS consumption in Bulgaria will be directly eliminated as a result of this project. Another 50 MT annual consumption will be reduced through recycling and servicing. The project will contribute to global efforts to protect the ozone layer and benefit human health and the environment. The sub-projects have the following key elements:

(a) they are part of the Country Program that outlines Bulgaria's plan to phase-out ODS as per the Montreal Protocol;
(b) Montreal Protocol methods of calculating incremental costs were used; and
(c) they underwent a technical review by the Ozone Operations Resource Group (OORG), set up by the World Bank to review sub-projects for financing under the Multilateral Fund of the Montreal Protocol.

PROJECT DESCRIPTION

6. In order to fulfill the stated objectives, the project consists of two components: (A) technology transfer investment component and (B) technical assistance and training component. Details of sub-projects are provided in the attachment. Table 1 summarizes the project components and cost.

(A) The technology transfer investment component consists of 15 sub-projects in the refrigeration, foam and solvent sectors:

(a) The refrigeration sector consists of six sub-projects ($ 4,509,921 proposed GEF financing) involving refrigerants and five involving foams. All of the sub-projects deal with the same technology transfer of conversion from the use of CFC-12 as refrigerant to HFC-134a. This technology has been chosen based on several criteria, including costs and viability. Although HFC-134a does have a global warming potential, the use in refrigerators is small and is unlikely to have a

significant impact on global warming, especially when compared to CO_2 emissions associated with the production of electricity used by a refrigerator over its lifetime, or to the total global emissions of fluorinated compounds. In terms of costs, the hydrocarbons alternative for refrigeration is viable, though slightly more expensive because of associated safety costs. HFC-134a has been chosen as the preferred alternative because the foreign technology partners have substantial experience with this technology. There are five enterprises associated with these sub-projects: MRAZ, VMZ, Frigo, Brist and Klimat Inkoms. All but Klimat are public enterprises. MRAZ is requesting financing for both the refrigerator production line and also an HFC-134a compressor production line. VMZ will only be requesting financing to convert a compressor line. The sub-projects consist of adapting the refrigerator or compressor production line in order to be able to use the replacement refrigerant (HFC-134a) and optimize the physical parameters of each design through a testing program so that lines of production can commence in a second phase. The unit abatement costs (UAC) and sub-project costs are summarized in Table 1.

(b) The foam sector consists of six sub-projects ($ 3,807,199 proposed GEF financing) which are primarily related to insulation foam needs of refrigerators and are thus associated with the same enterprises as above and will be carried out in coordination with the above sub-projects. These sub-projects all involve conversion from the use of CFC-11 to cyclopentane as a foaming agent. In addition, Vazhod, which produces foam cushions for bicycle and tractor seats is also requesting financing to convert to a cyclopentane foaming process. The effects of the new foaming agent on physical and energy parameters of the refrigerators will be tested and optimized. The selection of this technology involves the requirement of a technology partner to ensure the appropriate safety procedures are incorporated into the design and implementation of the sub-project.

(c) The solvents sector consists of three sub-projects (US$ 2,315,619 proposed GEF financing) which replace the use of CFC and MCF as a degreasing agent with a variety of alternatives including kerosine, water-based solvents and infrared drying systems. The three enterprises involved are DZU, VMZ and Opticoelectron, all public. The ODS-related products of these enterprises are ball and roller-bearings, hard disk drives and precision optical equipment. In these sectors, operational savings are yielded over a period of time which have been estimated and subtracted from the total amount of the project.

DUE TO THE RECENT MONTREAL PROTOCOL (MP) DECISION TO LIMIT ASSISTANCE TO EXPORTING ENTERPRISES, THE PROPOSED GRANT FINANCING BY GEF, WHICH FOLLOWS MP GUIDELINES, IS SUBJECT TO REVISION. FINAL FIGURES WILL BE AVAILABLE PRIOR TO THE MAY 1995 GEF COUNCIL MEETING AFTER THE EXPORT MARKET STRUCTURE IS MADE AVAILABLE TO THE WORLD BANK'S PRE-APPRAISAL MISSION IN APRIL 1995.

Requests for GEF Assistance to ODS Phase-out Projects in Bulgaria
Sub-project Overview

Code	Name	ODS Consump	Investment Cost	Technical Assistance	Incremental Operating Cost	Total GEF Project Cost	TOTAL GRANT w/ 3% LFA fees & 15% contlng.	UAC ($/kg)	Enterprise * Contribution	TOTAL PROJECT COST (w/ cont.)
NF1	Vazhod - Cyclopentane - Cushions for seats	25	$290,827	$0	$23,030	$313,857	$371,764	2.81		$360,936
NR10	Klimat Inkoms Cyclopentane-Commercial Fridge	10.5	$422,000	$0	$26,730	$448,730	$531,521	9.31	$10,020	$526,060
NR2	MRAZ Domestic Refrigeration Cyclopentane	44	$1,512,858	$0	$0	$1,512,858	$1,791,980	5.60	$275,100	$2,014,887
NR5	Frigo Display Cases using Cyclopentane	12.2	$300,360	$0	$27,267	$327,627	$388,074	6.24		$376,771
NR7	Binst Commercial Fridges to Cyclopentane	6.8	$284,298	$0	$11,685	$295,983	$350,592	8.60		$340,380
NR8	Zem Cyclopentane -Commercial & Domestic	16.2	$270,400	$0	$44,727	$315,127	$373,268	4.94		$362,398
SUBTOTAL FOAMS		**114.7**	**$3,080,743**	**$0**	**$133,439**	**$3,214,182**	**$3,807,199**	**5.53**	**$285,120**	**$3,981,429**
NR1	MRAZ Domestic Refrigeration HFC-134a	13.2	$284,568	$0	$0	$284,568	$337,071	3.50	$552,200	$879,453
NR11	VMZ Domestic Compressors HFC-134a	52.5	$300,000	$0	$0	$300,000	$355,350	7.80	$5,041,838	$5,386,838
NR3	MRAZ Commercial Compressors HFC-134a	70	$2,079,355	$0	$456,207	$2,535,562	$3,003,373	6.30	$433,000	$3,348,896
NR4	Frigo Commercial Display Cases HFC-134a	4.5	$169,500	$70,000	$82,446	$321,946	$381,345	27.10		$370,238
NR6	Binst Commercial Fridges HFC-134a	2.7	$130,500	$0	$36,191	$166,691	$197,445	21.80		$191,695
NR9	Klimat Inkoms HFC-134a	8	$108,000	$0	$90,680	$198,680	$235,336	13.20	$30,070	$258,552
SUBTOTAL REFRIGERATION		**150.9**	**$3,071,923**	**$70,000**	**$665,524**	**$3,807,447**	**$4,509,921**	**7.80**	**$6,057,108**	**$10,435,672**
NS1	DZU - Feasib. Study and Hard Disk Wash	48.1	$1,708,700	$0	($378,000)	$1,330,700	$1,576,214	3.30	$378,000	$1,908,305
NS2	VMZ - Feasib. Study and Ball Bearings Wash	52	$865,970	$20,000	($357,067)	$528,903	$626,486	0.61	$357,067	$965,305
NS3	Opticoelectron - DI Water - Optical equipment	2.4	$108,100	$0	($12,769)	$95,331	$112,920	5.65	$12,769	$122,400
SUBTOTAL SOLVENTS		**102.5**	**$2,682,770**	**$20,000**	**($747,836)**	**$1,954,934**	**$2,315,619**	**(3.01)**	**$747,836**	**$2,996,010**
NR12	Inst of Ref - Service Training	60	$0	$50,400	$184,340	$234,740	$278,050	2.05		$269,951
NR13	Inst of Ref - Service Recycling	39.6	$0	$451,800	$44,050	$495,850	$587,097	3.21	$13,291	$583,289
NR14	Inst of Ref - National Accredited Test Inst.	0	$0	$177,340	$19,000	$196,340	$232,565	#N/A		$225,791
TSC	Institutional Strengthening Component	0	$32,250	$75,800	$47,800	$155,850	$184,604	#N/A		$179,228
SUBTOTAL TA & TRAINING		**99.6**	**$32,250**	**$755,140**	**$295,190**	**$1,082,580**	**$1,282,316**	**4.25**	**$13,291**	**$1,258,258**
TOTAL		**469**	**$8,867,686**	**$845,140**	**$346,317**	**$10,059,143**	**$11,915,055**	**4.12**	**$7,103,355**	**$18,671,369**

(B) The technical assistance and training component (US$ 1,282,316 proposed GEF financing) consists of four sub-projects, three associated with the Institute of Refrigeration and the fourth would involve the institutional strengthening of the Ministry of Environment's Ozone Task Force (OTF).

(a) The Institute of Refrigeration is requesting financing for the development of a CFC-recycling and refrigeration maintenance program to train refrigeration technicians how to recycle CFCs and handle non-ODS refrigerants. The training course would be the first step in introducing a technicians accreditation system which would eventually be attached to the licensing of industries handling and importing ODS's. The institute is also responsible for national testing of compressors and condensing units according to Bulgarian legislation. They will thus be requesting financing to adapt their testing facilities to HFC-134a type units in order to ensure reliability of Bulgarian manufactured compressors.

(b) The Institutional Strengthening component supports the OTF for the implementation of Bulgaria's Country Program for the phase-out of ODS. The OTF is headed by a Project Director (a Deputy Minister of the Environment) and consists of six staff members whose primary responsibilities would be the overall designing, monitoring, and implementing the ODS phase-out strategy in accordance with the aims of the Montreal Protocol and the GEF. The OTF will facilitate ODS conversion at the industrial level, disseminate relevant information, and maintain open dialogue between the government agencies, industries and other institutions involved with ODS phase-out. The component would provide consulting services, equipment and support staff to the OTF in order to carry out their responsibilities for the overall management and monitoring of project progress. A management consultant would be provided in order to provide assistance with the preparation of operational procedures and guidelines, detailed terms of reference, design and establishment of a monitoring system which would be used to follow up on phase-out activities, and procurement of consultants and goods.

7. Key project documents available from the Regional Coordinator, ENVGC (fax: 522-3256) include: (a) Bulgaria Country Program for the Phasing out of ODS; (b) detailed voluminous sub-project descriptions including financial and technical analysis; (c) sub-project technical reviews.

RATIONALE FOR GEF FUNDING

8. The Project meets one of the four major objectives of the GEF: protection of the ozone layer. The Government has signed the Montreal Protocol, confirmed participation in the newly replenished GEF, and has shown its commitment to ODS phase-out through the preparation of

a Country Program, and is unable to request financing from the Montreal Protocol as it is not defined as an Article 5 country and local enterprises have difficulty accessing ODS phase out technology and receiving loans from local banks. The average unit abatement cost (UAC) for all sub-projects in the refrigeration sector is between $2.0-27$/kg ODP; for the solvents sector between 0.61-5.65$/Kg ODP replaced. This is within the expected range for these types of phase-out projects and has been accepted by the OORG.

PROJECT SUSTAINABILITY AND PARTICIPATION

9. The Government of Bulgaria is committed to phase out ODS as per the Country Program and the project will help the Government achieve its goal. Through the strengthening of the Ozone Task Force in the Ministry of Environment, continued monitoring and global environmental benefits will be achieved. Sustainability will be promoted through the careful selection of enterprises which are viable in the short, medium, and long terms.

10. As part of the development of the Country Program, the Ministry of Environment undertook consultations with a broad spectrum of enterprises and interested parties, including other ministries--including industry, economics, finance--NGOs, industry associations and others. Enterprises were given the opportunity to participate in the project as long as they could provide the necessary data for project staff to evaluate their financial viability, technological capabilities and eligibility for financial assistance. Consultations with enterprises and other interested parties continued through a series of country workshops held under the aegis of the Montreal Protocol on project preparation and implementation, as well as during project preparation.

11. The phase-out of ODS is included as one of the Government's objectives in the recent Update[3] of Bulgaria's Environmental Strategy Study. The Country Program includes policy recommendations, phase-out strategies, and an action plan to achieve ODS phase-out. A system for monitoring the mandatory refrigeration service technician re-education scheme is now under preparation by the Ministry of Environment and a formal ban on CFC use is planned. In 1992, the Government established the Ozone Task Force (OTF) which is responsible for communicating ODS related information to enterprises and assisting enterprises with the development of sub-projects to be submitted to the GEF for financing. The OTF consists of six staff, and is headed by a Deputy Minister of Environment. The major focus of the Task Force will be devoted to ODS conversion at the industrial level, information dissemination among government agencies, industries and others involved in ODS phase-out.

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3 Environmental Strategy Study - Update and Follow-Up, Grey Cover Report, December 30, 1994.

LESSONS FROM PREVIOUS BANK EXPERIENCE AND TECHNICAL REVIEW

12. Ozone phase-out projects are currently being prepared or implemented with the Bank as Trustee in about 15 countries including, for example, China, Turkey, Tunisia, Jordan, Brazil, India, Thailand and Venezuela. GEF ODS projects have been prepared or are under preparation in the Czech Republic, Slovakia and Hungary. In Venezuela, a project has been successfully completed. Experience indicates the need for flexibility and simplicity in the project design and financing mechanisms, well prepared sub-projects and implementation plans, and most importantly, the need to support to strengthen local capacity during the preparation and implementation of Project activities.

13. The project was reviewed by a specialist from the STAP roster who looked at overall project consistency with Montreal Protocol guidance and procedures, priority of project selection and consistency with Country Program objectives. In addition, each sub-project received a thorough technical analysis from technical specialists as part of the Bank's Ozone Operations Research Group (OORG) review process for Montreal Protocol projects. These reviews analyze sub-projects according to several criteria: appropriateness of technology, environmental impact, project cost effectiveness, implementation timeframe, safety issues, and eligibility of incremental costs. All 19 sub-projects have been accepted by the OORG reviewers.

PROJECT FINANCING, BUDGET, AND INCREMENTAL COSTS

14. A GEF grant of US$ 11.92 million is proposed, to cover eligible incremental costs for sub-projects, out of the total project cost of US$ 18.67 million (See Table I, page 4). The GEF grant amount includes 15 % contingency and a 3% fee for a local financial agent to administer the grant. The difference in costs between the GEF grant (the incremental costs) and the project cost will be borne by the enterprises. Due to the recent GEF decision to limit assistance to exporting enterprises, the level of grant is subject to a downward revision. Enterprises have been requested to provide a detailed export market structure and the information will be provided to the upcoming Bank's pre-appraisal mission in April 1995.

ISSUES AND ACTIONS

15. Project processing and institutional issues to be addressed include:

(a) Due to the recent Montreal Protocol Multilateral Fund decision to reduce assistance to exporting enterprises, the proposed grant financing by GEF is subject to downward revision. The enterprises have been requested to submit detailed information on their export markets and the information will be used to finalize the exact level of GEF assistance prior to the May 1995 GEF Council meeting.

(c) Ratification of the Grant Agreement by the Bulgarian Parliament could possibly slow down Project effectiveness. The Bank's pre-appraisal mission in April 1995 will discuss the possibility of obtaining a waiver for this Grant.

ENVIRONMENTAL IMPACT

16. The environmental risks of the project are primarily associated with the handling and use of cyclopentane, which is flammable, in the foam sector and the potential increase in wastewaters resulting from sub-projects in the solvents sector. Environmental analysis will be performed in accordance with the Bulgarian Environmental Protection Act which requires Environmental Impact Assessments (EIA) for investment projects. Appropriate application of environmental and safety measures will be applied as per the EIA.

INSTITUTIONAL FRAMEWORK AND PROJECT IMPLEMENTATION

17. The Ozone Task Force (OTF) in the Ministry of Environment will be the implementing agency for the project and will ensure that sub-projects are implemented in accordance with the Bank's and the Montreal Protocol guidelines. The OTF will be responsible for managing and coordinating project activities with other agencies and enterprises, analyzing and approving requests for disbursements, and monitoring and supervising sub-projects. Also, enterprises will be responsible for sub-project implementation and will report to the OTF on a periodic basis. The World Bank recommends that the Ministry of Environment uses The First Private Bank of Bulgaria as the local financial agent (LFA). The First Private Bank will manage and disburse grant funds for the sub-projects and directly reimburse suppliers for equipment, materials and supplies. A maximum fee of 3% of total project cost is proposed for the First Private Bank..

18. It is proposed to have a grant agreement between the World Bank and the Ministry of Environment and an administrative agreement between the Ministry and the First Private Bank. The First Private Bank will be responsible for making arrangements with the enterprises and drafting agreements which should be approved by the World Bank. An estimated schedule for the project is shown below:

Step	Estimated Date
GEF approval	May 1995
Bank Appraisal	May 1995
Negotiations	August 1995
Project Effectiveness	October 1995

ANNEX A: SUMMARY AND RECOMMENDATIONS OF THE TECHNICAL REVIEW

BULGARIA: OZONE DEPLETION SUBSTANCE PHASE-OUT

1. The technical review for the Bulgaria Ozone Depleting Substances phase-out project, as for all ODS projects, consists of two parts: the overall analysis of project and program integrity, priority of sub-projects, and consistency with other ODS projects financed by the Multilateral Fund; and (b) technical analysis of individual sub-projects undertaken by the Ozone Operations Resource Group (OORG). The OORG was established by the World Bank to undertake the analysis of proposed sub-projects for funding under the Multilateral Fund for the Montreal Protocol. It utilizes standard criteria against which to judge the technical viability and cost-effectiveness of a given sub-project. These include: appropriateness of the technology, environmental impact, project costs, implementation timeframe, lessons from experience, safety issues and final recommendations.

2. In the case of Bulgaria, the STAP reviewer's impression was that the project is well planned and will lead to a reduction in ODS of more than 80%. Given the short time frame for the implementation of phase-out projects in Eastern Europe, the technical assistance and training components are considered essential for the project. As well, the reviewer felt that the 19 sub-projects were well defined and could be accomplished within the suggested time frame.

3. At the time of the initial project review, about 8 sub-projects had not yet received OORG endorsement. Outstanding issues included a reevaluation of the equipment costs (for the refrigeration subsector), and an issue related to the choice of technology for the insulation project. All other sub-projects were accepted.

RECOMMENDATIONS

4. All 19 sub-projects have now been reviewed and approved by the OORG. Following the usual iterative process, the OORG comments were reviewed by the enterprises and the Bank, the proposed changes were made and the revised proposals resubmitted for OORG review. The overall recommendation is that all the components are ready for appraisal and implementation. Technical reviews are available from ENVGC, Fax # (202) 522-3256.