

II. RUSSIAN FEDERATION

PHASEOUT OF OZONE DEPLETING SUBSTANCES

BACKGROUND

General recognition of upper atmosphere ozone depletion in the mid-1980's has led to a substantial international effort to phase out Ozone Depleting Substances (ODS). These include chlorofluorocarbons (CFC's), halons, several halogenated solvents, and a class of transitional chemicals known as hydrochlorofluorocarbons (HCFC's). The basis of this effort is the 1987 Montreal Protocol, ratified by all developed and most developing countries. Further recognition that ozone depletion is occurring more rapidly than first anticipated has led to two protocol amendments which add materials to the list of regulated substances and accelerate phase out. The first, in June 1990 (London Amendment), added the two solvents, methyl chloroform (MCF) and carbon tetrachloride (CTC), as well as tightened the phase out schedule. The Copenhagen Amendment in November, 1992 added HCFC's and methyl bromide as regulated substances, and further accelerated phase out. The current developed-country phase out date for CFC's, MCF, and CTC is January 1996 and the date for halons is January 1994. Production levels of transitional HCFC's are frozen as of January 1996 with progressive reduction to phase out in 2030.

GEF Focal Area:	Climate Change
Country Eligibility:	<input type="checkbox"/> Eligible under financial mechanisms for FCCC/CBD
	<input checked="" type="checkbox"/> Eligible under paragraph 9(b) of the Instrument
Total Costs:	\$28 million
GEF Funding:	\$15 million
Implementing Agency:	World Bank
Executing Agency:	Russian Ministry of Environmental Protection and Natural Resources
Tentative Approval Date:	August, 1995
Project Duration:	2 years

Most developed countries are making substantial progress in eliminating ODS. Phase out is substantially complete for aerosols and fire fighting ODS chemicals. The balance should be effectively eliminated by the January, 1996 deadline in developed countries, except for Russia and former Eastern Block countries. Progress in developing countries has started and many countries will likely be phased out by about 2000. A few more years will likely be required in India and China, but phase out should also be ahead of the current developing world deadline of 2010.

The Former Soviet Union (FSU) ratified the Montreal Protocol in November, 1988 as a developed country. The Russian Federation continues the FSU membership in the Protocol and in January, 1992, Russia ratified the London Amendments. However, ratification of the Copenhagen Amendments has not occurred. Based on its ratification status as a developed country under the Montreal Protocol, Russia's obligations for ODS phase out are in accordance with the accelerated developed country schedule for halons (January 1994), and CFC, CTC and MCF (January 1996).

Russia is one of the world's largest producers and consumers of ODS. In 1990 when production peaked, it was estimated that 198,000 MT were produced, accounting for between 15 -20% of world production. In 1992, Russian ODS production had fallen by 26% to 146,500 MT. This production supplies 100% of the domestic market, as well as the requirements of the countries of the FSU, and other export markets that continue to exist. Russian domestic consumption also peaked in 1990 at approximately 70,000 MT and had fallen by 40% to 48,365 MT in 1992. Consumption continues to decrease primarily due to the economic downturn and, to a lesser extent, phase out action that has been taken. Five sectors account for Russia's ODS use: aerosols (46%), refrigeration and air-conditioning (27%), solvents (14%), foams (11%) and fire protection (2%).

Russia faces a serious dilemma. It is still legally bound by the developed country ODS phase out targets. Through the assignment of responsibility to the Ministry of Environmental Protection and Natural Resources (MEPNR), steps to fulfil these obligations have been initiated. However, the country's economic capability to complete this task has declined significantly since ratifying the London Amendments in 1992. At the same time, the changing targets and political/legal structure of the Montreal Protocol has not shown the flexibility to respond to Russia's changing economic situation. As a consequence, it is impossible for the country to meet its obligations in the proposed timeframe.

The Multilateral Fund for the Implementation of the Montreal Protocol (Multilateral Fund) was created to provide financial support to eligible developing countries in meeting their Montreal Protocol obligations. Russia is expected to be a developed country contributor to the Multilateral Fund, with in-kind contributions, although it has not done so to date. Provision has also been made for the Global Environment Facility (GEF) to provide limited financial support to several countries that do not meet Multilateral Fund criteria on country grounds, but nonetheless need technical and financial assistance. Russia is eligible for funding from the GEF. The Bank acts as an implementing agency for GEF assistance in ODS phase out.

GOVERNMENT'S OBJECTIVES AND STRATEGY

Development of an ODS phase out Country Program was completed in August 1994 with Danish support and Bank technical input. A position paper based on the Country Program has been prepared by MEPNR, describing an achievable phase out program. Assuming international financial assistance is available, it targets ODS phase out for 1999, somewhat ahead of the London Amendment schedule (January 2000), but slower than the Copenhagen Amendment schedule (January 1996). Production would be phased out consistent with domestic consumption phase out schedules, and with phase out schedules in countries of the FSU to which Russia is the sole supplier, particularly Ukraine and Belarus. This position paper was to be presented to the October, 1994 meeting of the Montreal Protocol parties. However, due to administrative delays in the final approval of the paper by the Government, this request was not made. Official approval is anticipated by the end of 1994 for consideration by the open-ended Working Group of the Montreal Protocol Parties in May, 1995. Russia's export of ODS to other countries after January, 1996 also would have to be accommodated on a transitional basis.

Russia has established the basic institutional structure to support the administration of the proposed ODS phase out program. An Inter-Agency Commission has been created to coordinate ODS policy among all relevant government agencies with specific subcommissions dealing with legal, technical, economic/institutional, and monitoring aspects. An ODS Task Force has been established by ministerial decree within MEPNR. It has been assigned overall responsibility for implementing the national phase out strategy and to act as secretariat for the Inter-Agency Commission. As documented in the Country Program (available on request), various policy and regulatory initiatives are currently under development within MEPNR including the issuing of production/import licenses, the introduction of sector specific bans, and allocation of economic support for ODS replacement projects at the industry level from Russian and international sources. However, only modest progress has been made regarding ODS phase out implementation and enforcement. The Government request to the World Bank/GEF for assistance is considered essential to support this effort.

BANK'S ROLE AND STRATEGY

All Bank GEF ODS projects are subject to the policy and technical review guidelines established by the Executive Committee of the Multilateral Fund under the MP, in addition to those required for GEF projects. Internal Bank procedures for Montreal Protocol operations are expected to be applied to complement GEF procedures to ensure consistency between the processing of GEF and MP operations whenever possible. The proposed GEF ODS project (the project) is consistent with the Bank's assistance strategy to the environmental sector and with its Country Assistance Strategy to Russia. The project is directed at the strengthening of institutional capacity and development of policies and regulatory actions required for implementation of the overall ODS phase out program. These are coupled with core investments at the enterprise level, both as demonstrations of effective pollution control and as significant contributors to the program. It will support the development of a market oriented economy by focusing direct financial assistance on viable enterprises requiring technological change to remain competitive under international environmental standards. It assists in redirecting public sector involvement in the economy through strengthening of institutional capacity. Finally, in the overall context of the ODS phase out program, the Government has requested the Bank to mobilize bilateral and multilateral grant funds in support of a key global environmental priority where such support would otherwise not be available.

The project is complementary to the Bank's overall support to Russia in the environmental sector. The technical assistance components of the Environmental Management Project (EMP) (IBRD loan RU-3806, \$110m, 1994) will enhance the management, resource and institutional capability within MEPNR, which in turn will be supportive of the administration of ODS phase out activities. Additionally, enterprise-specific ODS phase out sub-projects are expected to provide opportunities to use the financing capacity of the National Pollution Abatement Facility (NPAF) (\$50m sub-component of EMP). Cooperation between and integration with various Bank initiatives is considered important, in view of the scale of environmental problems that exist in Russia and limitations on resources available to address them.

During the pilot phase of the GEF, the Government received a GEF Project Preparation Advance (PPA) which, in addition to support from other donors, facilitated project preparation studies for structuring Russia's ODS phase out program.

PROJECT OBJECTIVES

The overall objective of the project is to assist Russia in the phase out of ODS consumption, in a manner consistent with its international obligations, while ensuring that this is accomplished with the minimum of economic dislocation. The proposed \$15m operation represents the first tranche of a phased \$60m project. The project has been agreed to within the context of a country programming exercise prepared along the same lines as country programs for the Multilateral Fund for the Montreal Protocol. The projects proposed in this first tranche are considered high priority, high impact actions which, following project appraisal, will quickly be ready for implementation. The second phase of the project will be presented to the GEF Council once those sub-projects are fully prepared and the grant agreement has been negotiated.

The project's more specific objectives are: i) to allow Russia to credibly meet its obligations under the Montreal Protocol within a realistic time frame; ii) to facilitate access to financial resources needed for ODS phase out from a range of international and domestic sources; iii) to provide specific technical assistance and institutional strengthening as required; iv) to fund enterprise specific investments in critical high consumption sectors; and v) to ensure that ODS phase out activities accommodate economic and social impacts that may result.

PROJECT DESIGN AND DESCRIPTION

The proposed project targets priority phase out activities in the aerosol and refrigeration sectors, along with the provision of specific technical assistance at both the institutional and enterprise levels. These sectors represent 70% of Russia's ODS consumption. Annex 1 represents the initial pipeline of ODS phase out sub-projects identified by project preparation work completed to date. For this first GEF project, priority will be given to sub-projects in the aerosol sector and to insulation sub-projects in the refrigeration sector. Fourteen additional sub-projects in these sectors, as well as a number in the solvent, halons and foam sectors, will be prepared for possible future GEF funding.

Aerosol Sector ODS consumption in the form of CFC propellants in Russia likely represents the largest single consumption phase out opportunity in the world today. The Russian Federation has an established aerosol industry that continues to consume large quantities of CFCs. The CFC aerosols (78% of total aerosols) are strongly favored by the cosmetic industry and are selling readily even in a suppressed economy. In 1992, consumption of CFCs by the aerosol industry totaled 33,000 metric tons, approximately 46% of the total ODS consumed in Russia. The three sub-projects submitted for consideration by the GEF for this first tranche account for about one-third of the ODS used by this important industry. Phase out in the aerosol sector has the highest impact and can be achieved relatively quickly, with a targeted completion date of 1997, according to the country program. The three aerosol sub-projects all utilize hydrocarbon aerosol propellant (HAP) as a replacement for CFC propellant in common aerosol sprays. HAP is a purified form of liquid petroleum gas (LPG) and is available in limited quantities in Russia. The technology for use of HAP has developed globally since 1980 and is readily available. However, in each sub-project, unique features affect the estimates of incremental project costs (see Annex 2).

Novosibirsk, the largest CFC consumer, has the greatest need and in order to use HAP safely, it must replace its entire can and valve making facility plus convert its filling operation. Its existing can manufacturing facilities cannot produce aerosol cans strong enough to withstand the higher pressures required for HAP. Precision valves are required to minimize leakage during storage and hence reduce fire

hazards associated with use of HAP. JSC Arnest can reuse its can making facility but must replace its valve facility and convert filling to HAP. Halogen JSC only needs to convert filling to HAP. Final selection of activities from those identified (Annex 2) will occur shortly.

Refrigeration Sector ODS consumption of refrigerant (CFC-12) and of foam blowing agent (CFC-11) for foam insulation in the manufacture of domestic, commercial and industrial refrigeration products, involves 4028 MT/year of ODS material. In addition, the refrigeration servicing sector is estimated to account for an annual consumption of 4,500 MT/year. Project preparation work has identified thirteen sub-projects that are ready for appraisal, originating in seven of the largest manufacturers of domestic refrigerators. Twelve of these sub-projects involve either redesign for replacement of CFC-12 with HFC-134a or substitution of cyclopentane for CFC-11 as the insulation foam blowing agent. The remaining sub-project uses isobutane as a refrigerant replacement, based on the demands of export markets in Western Europe, where this is the preferred replacement for CFC-12. Two sub-projects, one each from manufacturers of commercial and industrial refrigeration equipment, have also been prepared, again involving equipment redesign and manufacturing facility upgrading required for HFC-134a substitution.

Technical assistance (\$0.9m) will be directed to three key areas. Firstly, resources will be provided directly to MEPNR to support the regulatory and institutional actions proposed for the overall ODS phase out program as outlined in the Country Program. These actions include: a) development of an ODS production and consumption data reporting/monitoring system; b) implementation of ODS production import/export licenses and charges; c) introduction of sector specific bans; and d) establishment of an ODS account in the Federal Environment Fund. Secondly, feasibility studies will be funded in the following areas: a) evaluation of supply options for hydrocarbon based substitutes; b) development of drop-in ODS substitutes for existing refrigeration equipment; and c) development of effective organizational and training arrangements for refrigeration servicing. Thirdly, management assistance will be provided through employment of a full time ODS phase out program specialist within in the NPAF management unit, along with provision of consulting support to assist in the appraisal and supervision of sub-projects.

The project will be covered by an Umbrella Financial Agreement with MEPNR for GEF grant funds to be disbursed both to a range of enterprise specific sub-projects selected during appraisal from those identified during project preparation (Annex 2), and to key elements of technical assistance. The number of sub-projects will be limited by the availability of GEF grant funds. Priority will be given to those projects which are ready for immediate implementation, and which are the most cost effective in reducing ODS emissions. Criteria for selecting sub-projects will be agreed at appraisal but would likely include cost effectiveness, expected impact, and financial viability, consistent with procedures and practices of the Multilateral Fund of the Montreal Protocol.

Individual sub-projects will be covered by agreements between MEPNR and the participating enterprises. Both the Umbrella Agreement and Sub-project Agreements are to be patterned after those utilized for the Ozone Projects Trust Fund (OTF) in other countries. Sub-projects will be approved in accordance with the Bank's trustee obligations to the GEF and individual sub-project financing will be subject to prior approval by the GEF. Drafts of the Umbrella Agreement and Sub-project Agreements will be developed at appraisal and finalized at negotiations.

PROJECT COSTS AND FINANCING

Total project cost is estimated to be US\$28 million, of which US\$15 million applies to incremental costs eligible for GEF financing, including US\$13.65 million for incremental investment and one time sub-project costs, US\$0.45 million for a financial agent charge (3% of grant), and US\$0.9 million for technical assistance. US\$13 million will be financed by enterprises' funds, commercial banking sources and an ODS sub-loan window established within the NPAF. The GEF grant of US\$15 million will cover eligible incremental investments and one time costs for sub-projects, consistent with Multilateral Fund incremental costs eligibility criteria, but will exclude incremental operating costs. Agreements will be drafted at appraisal on the arrangements for co-financing sub-projects and on the use of the NPAF for project appraisal and supervision.

PROJECT IMPLEMENTATION

MEPNR will be responsible for overall project implementation and administration, utilizing the NPAF management unit and Center for Project Preparation and Implementation (CPPI) established for the EMP. Enterprises will be responsible for sub-project preparation and implementation.

The NPAF management unit will be staffed with a full time ODS phase out specialist who will be assisted by consultants. This unit will be responsible for sub-project appraisal, disbursement approvals, approval of sub-loans from the NPAF ODS loan window, co-financing arrangements, progress reports, and ensuring compliance with GEF procedures. The NPAF management unit will also be responsible for managing consultants contracted to carry out feasibility studies under the project's technical assistance component. The ODS Task Force within MEPNR will be responsible for managing the technical assistance components related to institution strengthening. The CPPI will provide procurement services.

PROJECT SUSTAINABILITY

Overall project sustainability is based on the Russian Federation's policy commitment to meet, ultimately, the country's obligations under the Montreal Protocol, and to provide a sound institutional and policy framework for its overall ODS phase out program. This institutional and policy framework will be supported indirectly by the EMP, and directly by the project through provision of technical assistance to MEPNR for strengthening its ODS phase out implementation operations. Sustainability of enterprise specific sub-projects is based on the measures taken in their selection. Project preparation work undertaken has identified and documented a wide range of individual sub-projects in critical consumption sectors with the assistance of local and foreign experts. Participating enterprises will be subject to a financial viability evaluation as a prerequisite to sub-project appraisal and final selection. Assessment of domestic and export market potential will be included in this evaluation. Project supervision will make provision for on-going assistance in preparation of financial management and marketing plans. Monitoring and evaluation of project implementation will be carried out by a unit in the Center for Project Preparation and Implementation set up for the Russia Environmental Management Project. Funds for technical assistance to help develop an ODS production and consumption data reporting and monitoring system are included in the project. This monitoring activity will continue beyond the life of the first tranche GEF grant and will influence the design of sub-projects proposed for future GEF tranches.

LESSONS FROM PREVIOUS BANK EXPERIENCE

The proposed project is only the second GEF funded ODS phase out project to be initiated and, therefore, direct Bank experience and associated lessons are limited. However the Bank, as the Multilateral Fund Implementing Agency, has implemented OTF ODS phase out projects in twenty countries. A number of lessons have been learned from experience with these projects, including: a) the importance of a national phase out policy or Country Program as a basis for assuring commitment and ownership by the client country; b) the value of strong enterprise/government linkages to achieve phase out objectives; c) the need for institutional strengthening and training for local implementation units and financial intermediaries; d) the utility of using umbrella grant agreements supporting a pipeline of sub-projects subject to individual approval and appraisal; and e) the importance of technical support in the preparation and review of sub-projects. Additional lessons have been learned from other the Bank projects in Russia, including the importance of: a) identifying a consistent, committed counterpart team with sufficient authority to move the project forward; b) coordinating key interested parties at the federal, regional and enterprise levels; c) paying early, detailed attention to procurement and other implementation issues; and d) involving local consultants and institutes in the process. The design, preparation and structure of the project incorporates these lessons in a number of ways. Project preparation work has involved a well defined country program and identification of a wide selection of sub-projects. The umbrella grant agreement model, covering a sub-project pipeline, is being utilized. Technical assistance directed at strengthening institutional capacity within the government, implementing agencies and enterprises has been provided for. Project processing procedures will parallel those used for OTF projects, including the utilization of the technical review capability established for these projects. Finally, established local implementation organizations developed through other Bank initiatives will be utilized.

RATIONALE FOR GEF FUNDING

Russia represents a major producer and consumer of ODS material but lacks the financial capacity to undertake comprehensive phase out in accordance with its obligations under the Montreal Protocol. As a developed country signatory to the Montreal Protocol, it is not eligible for support from the Multilateral Fund but is eligible for GEF funding. The project is consistent with GEF Guidelines for ODS phase out. These guidelines have been carefully developed to reflect MP policies and procedures, thus ensuring consistency of approach between GEF and MP projects. The guidelines endorse working with a range of enterprise specific sub-projects that offer substantive ODS phase out gains, but require investments for which the beneficiary enterprises would not be able to obtain sufficient financing from commercial sources. Within these sub-projects, grant funding is limited to eligible incremental investment costs, while the enterprises are responsible for financing the balance from their own resources or loans.

ENVIRONMENTAL ASPECTS

The project has been assigned a "B" rating for environmental assessment (EA) purposes. Each sub-project will be subject to environmental appraisal in accordance with the guidelines and procedures established by the NPAF management unit to meet both Russian Government and World Bank EA requirements. Potential environmental impacts include those associated with the flammability and air emissions characteristic of hydrocarbon-based non-ODS substitutes, and site specific impacts associated with manufacturing plant developments or modifications.

PROJECT BENEFITS AND RISKS

The project's primary benefit will be its contribution to ODS phase out in Russia which is now one of the largest sources of ODS in the world. The three aerosol sub-projects identified for possible first tranche GEF grant funding of \$15 million are estimated to reduce annual consumption by 6,300 MT, or about 13% of 1992 ODS consumption. The framework that the project provides and its facilitation of access to other resources will enhance Russia's ability to achieve its overall phase out schedule. The project will directly assist enterprises in modernization of manufacturing capability and in the development of export-ready products utilizing non-ODS technology. The institutional capacity for monitoring regulatory enforcement of ODS phase out will also be strengthened under the project.

Risks associated with the project are generally comparable to other industrial and institutional development activities in Russia. These include: a) the fragmented decision making process on environmental and investment matters at the federal and regional levels; b) the limited enforcement capability to support environmental initiatives; c) conflicting mandates and lack of cooperation between government agencies; d) lack of familiarity with Bank procedures, investment planning, and project management; e) difficulties in arranging financing of local costs for environmental investments; and f) the general economic climate in the country. Project specific risks are primarily associated with the sustained financial viability of participating enterprises, and the need to support ODS consumption phase out with domestic supply of substitute materials and equipment.

The project has been designed to mitigate these risks to the maximum degree possible. The general institutional risks associated with activities in Russia are mitigated by the overall institutional strengthening provided by the EMP, and the direct policy and regulatory assistance provided to MEPNR for ODS phase out. Administrative and project management risks are mitigated by focusing the project's implementation responsibility within the NPAF management unit, and by earmarking special ODS technical and project supervision resources. Risks associated with financing local costs are addressed by provision of co-financing assistance through the NPAF management unit. Project specific risks associated with enterprise viability and technical capability are mitigated by establishing a pipeline of candidate sub-projects from which the most viable and cost effective can be selected, using commercially proven management approaches and technology, and providing financial planning assistance as part of project implementation. The development of HAP supply capability for the aerosol sector is expected to be commercially viable and may offer a potential investment opportunity for the NPAF.

This project is not expected to cause any significant negative social impacts. It was prepared with the Russian aerosol industry with the objective of addressing ODS phase out in a comprehensive, equitable and efficient manner with minimal disruption to the industry, its workers and ultimately to consumers.

ISSUES

The following outstanding issues will be addressed during the course of appraisal and negotiations:

- a. assurance from MEPNR related to development of regulatory and policy action necessary to support ODS phase out, including availability of implementation and enforcement resources;

- b. confirmation of financial viability of participating enterprises, including ability to support sub-project investments with required financial resources not supplied by the project;
- c. agreement on the criteria to be used for selecting sub-projects to be financed by the GEF grant; and
- d. development of the Umbrella, sub-project, Co-financing and NPAF Implementation Agreements during appraisal for finalization at negotiations.

NEXT STEPS

It is anticipated that GEF approval of the project will be obtained in late February 1995. An appraisal mission will be undertaken in March 1995. Prior to appraisal the following steps need to be taken:

- a. carry out financial analysis and develop financial management plans of enterprises which have been identified as likely candidates to be included in this round of investments;
- b. review sub-project technical and cost proposals and revise in line with the OORG and Bank review recommendations; and
- c. identify local hydrocarbon supply services and need for parallel financing for development of substitute material supply capability.

Final Executive Project Summary
Phaseout of Ozone Depleting Substances in Russia

Country: Russian Federation
Sector: Environment

Fiscal Year: FY96

Basic Data:

Estimated Project Cost: US\$ 28 million
 Grant Amount: US\$ 15 million
 Recipient: Ministry of Environmental Protection and Natural Resources

Financing Plan (million US\$):

Project Components	GEF Grant	Enterprise Financing	Total
Investment Sub-Projects			
First Group			
(February 1995)	13.65	13.0	26.65
Technical Assistance	0.90	—	0.90
Financial Agency Charge	0.45	—	0.45
TOTAL	15.0	13.0	28.0

Key Steps in Preparation Schedule:

Initial IEPS	October 15, 1992
Pre-Appraisal	October 17, 1994
Final EPS	November 29, 1994
GEF STAP/OORG Review (First Sub-project Group)	December 18, 1994
GEF Council Approval (First Tranche)	February 23, 1995
Appraisal Departure	March 15, 1995
Negotiations	June 7, 1995
Approval	August 15, 1995

Government/Beneficiary Representatives:

Government:

Mr. Alexander A. Averchenkov, First Deputy Minister, Ministry of Environmental Protection and Natural Resources

Next Critical Steps:

By Enterprises:

Confirmation of participation based on the limitation of GEF funding for eligible incremental investment costs.

By Bank:

Submission of documentation for GEF Council approval of the overall project. Evaluation of enterprise financial viability in preparation for Appraisal. Select first group of sub-projects for funding.

SUMMARY OF QOS PHASE OUT SUB-PROJECTS PROPOSED FOR APPRAISAL

Sub-Project	Description	Capital Cost (\$M)	Operating Cost (\$M/yr)	Benefit (\$M/yr)	Net Present Value (\$M)	Internal Rate of Return (%)
AEROSOL SECTION						
a) Novosibirsk	MAP conversion: New filling line, can manufacturing and materials handling infrastructure	4.482	2.132	2.42	12,790.130	4,738.311
b) Ararat	MAP conversion: New filling line, valve fabrication, materials handling infrastructure, and training	2.000	2.167	2.25	7,371.513	2,334.228
c) Hologan	MAP conversion: New filling line and materials handling infrastructure	1.363	970	2.13	2,248.332	801.638
d) Almaty	Mechanical pump conversion: New blow molding filling line	2.220	771	2.42	5,702.500	233.000
SUB-TOTAL		11263	7040		29011337	8123337
DOMESTIC REFRIGERATION SECTION - INSULATION						
a) Krasnoyarsk	Conversion to Cyclohexane foam blowing: Framing lines replacement & insert infrastructure	302	338	11.1	11,272.700	5,375.300
b) Saratov	Conversion to Cyclohexane foam blowing: Foam equipment and training and replacement	210	210	8.1	2,333.158	2,934.314
c) Zlatoust	Conversion to Cyclohexane foam blowing: Product development, training and production line upgrade	282	294	8.3	9,767.000	4,782.900
d) Gorky	Conversion to Cyclohexane foam blowing: Product development, and training and replacement	202	202	8.2	7,972.773	2,198.000
e) Zlatoust	Conversion to Cyclohexane foam blowing: Product development, and training and replacement	230	72	8.3	723.998	2417827
f) Zlatoust	Conversion to Cyclohexane foam blowing: Product development, and training and replacement	18	18	17.4	4,920.500	333.300
g) Novosibirsk	Conversion to Cyclohexane foam blowing: Product development, and training and replacement	570	40	8.1	2,877.000	7,713.338
SUB-TOTAL		1864	1173		40463128	24940332
DOMESTIC REFRIGERATION SECTION - REFRIGERANT						
a) Krasnoyarsk	Conversion to Isobutane: Product redesign/test, new output filling, upgraded materials handling	133	133	7.3	2,385.000	2,085.380
b) Saratov	Conversion to R600a: Product redesign/test, training, filling and oil processing equipment	260	260	10.3	1,832.484	6,822.482
c) Zlatoust	Conversion to R600a: Product redesign/test, training, filling and oil processing equipment	243	80	8.0	2,108.180	4,084.000
d) Gorky	Conversion to R600a: Product redesign, new filling & oil processing lines, training, and replacement	168	168	13.3	3,037.423	7,043.700
e) Zlatoust	Conversion to R600a: Product redesign/test, training, new equipment & handling facilities	178	133	9.7	1,225.448	2,901.392
f) Zlatoust	Conversion to R600a: Product redesign, training, new equipment & handling facilities	126	150	83.8	7,900.000	12,838.000
SUB-TOTAL		1118	848		15323827	33807184
COMMERCIAL REFRIGERATION						
a) Yerevan	Conversion to R600a and R22: Compressor design, product design, new production equipment	444	100	30.0	2,870.000	7,543.938
INDUSTRIAL REFRIGERATION						
a) Kazan	Conversion to R600a: Compressor design, product design, new equipment and oil processing equipment, training and materials handling	230	200	9.9	6,832.440	107.540
TOTAL		15,204	9461	N/A	92,781.345	79,352.688

Note 1: Net of Under-Quota identified in Cost Est. 118

Note 2: Includes 31 Working Cost Savings

PROJECT COVER SHEET

COUNTRY:	Russian Federation	
PROJECT TITLE:	Conversion of aerosol production to HAP	
SECTOR:	Aerosols	
ODS USE IN SECTOR:	33,910 MT CFC per yr. - 1992	
PROJECT IMPACT:	4,482 MT CFC per yr. - 1992	
PROJECT DURATION:	2 years	
PROJECT ECONOMIC LIFE:	10 years	
PROJECT COSTS:	Incremental Capital Cost	\$ 16,300,000
	Incremental Operating Cost/Savings	\$ (4,020,000)
	Total Project Cost (Net of Savings)	\$12,280,000

PROJECT SUMMARY

The use of CFCs at NDCP will be eliminated through the conversion to hydrocarbon aerosol propellant (HAP). NDCP produced 30 million aerosol cans in 1992, corresponding to 12% of Russian aerosol can production. CFC usage was 4,482 MT in 1992, corresponding to 14% of CFC use in the aerosol sector. The project will contain two components: 1) plant conversion including propellant delivery and storage, can filling, and finished product storage, and 2) personnel training to assure safe operation of facilities and storage of products. HAP was selected as the most cost effective alternative evaluated.

Technical Assessment: The project has been reviewed and supported by OORG Technical Reviewer, Harry McCain. His comments are attached together with supplementary information pertaining to the review.

PROPOSED FINANCING ¹ :	\$ 12,650,000 - GEF Grant
	\$ 5,784,460 - NDCP
UNIT ABATEMENT COST:	0.33 \$/kg. CFC
IMPLEMENTING ENTERPRISE:	Novosibirsk Domestic Chemistry Company (NDCP)
IMPLEMENTING AGENCY:	The World Bank
COORDINATING NATIONAL BODY:	Ministry of Environmental Protection and Natural Resources

¹ The grant is will be for up to the amount proposed. It is based on 100% Russian ownership and includes Total Project Cost (Net of Savings) plus a 3% financial agent fee. A 15% contingency is included in the estimates of incremental capital cost.

PROJECT COVER SHEET

COUNTRY: Russian Federation

PROJECT TITLE: Conversion of aerosol production to HAP

SECTOR: Aerosols

ODS USE IN SECTOR: 33,910 MT CFC per yr. - 1992

PROJECT IMPACT: 1,563 MT CFC per yr. - 1991

PROJECT DURATION: 2 years

PROJECT ECONOMIC LIFE: 10 years

PROJECT COSTS:

Incremental Capital Cost	\$ 2,826,000
Incremental Operating Cost/Savings	\$ (640,900)
Total Project Cost (Net of Savings)	\$ 2,185,100

PROPOSED FINANCING²:

\$ 2,250,700 - GEF Grant
\$ 1,030,440 - Halogen

UNIT ABATEMENT COST: 0.19 \$/kg. CFC

IMPLEMENTING ENTERPRISE: Halogen Joint Stock Company

IMPLEMENTING AGENCY: The World Bank

PROJECT SUMMARY

The use of CFCs at Halogen will be eliminated through the conversion to hydrocarbon aerosol propellant (HAP). Halogen produced 16.5 million aerosol cans in 1991, corresponding to 5% of Russian aerosol can production. CFC usage was 1,565 MT in 1991, corresponding to 5% of CFC use in the aerosol sector. The project will contain two components: 1) plant conversion including propellant delivery and storage, can filling, and finished product storage, and 2) personnel training to assure safe operation of facilities and storage of products. HAP was selected as the most cost effective alternative evaluated.

Technical Assessment: The project has been reviewed and supported by OORG Technical Reviewer, Harry McCain. His comments are attached together with supplementary information pertaining to the review.

COORDINATING NATIONAL BODY: Ministry of Environmental Protection and Natural Resources

² The grant is will be for up to the amount proposed. It is based on 100% Russian ownership and includes Total Project Cost (Net of Savings) plus a 3% financial agent fee. A 15% contingency is included in the estimates of incremental capital cost.

PROJECT COVER SHEET

COUNTRY:	Russian Federation	
PROJECT TITLE:	Conversion of aerosol production to HAP	
SECTOR:	Aerosols	
ODS USE IN SECTOR:	33,910 MT CFC per yr. - 1992	
PROJECT IMPACT:	3,016 MT CFC per yr. - 1992	
PROJECT DURATION:	2 years	
PROJECT ECONOMIC LIFE:	10 years	
PROJECT COSTS:	Incremental Capital Cost	\$ 8,050,000
	Incremental Operating Cost/Savings	\$ (1,893,325)
	Total Project Cost (Net of Savings)	\$ 6,156,675
PROPOSED FINANCING ³ :	\$ 6,341,400 - GEF Grant	
	\$ 4,249,822 - JSC Arnest	
UNIT ABATEMENT COST:	0.30 \$/kg. CFC	

PROJECT SUMMARY

The use of CFCs at JSC Arnest will be eliminated through the conversion to hydrocarbon aerosol propellant (HAP). Arnest produced 33 million aerosol cans in 1992, corresponding to 16% of Russian aerosol can production. CFC usage was 3,016 MT in 1992, corresponding to 9% of CFC use in the aerosol sector. The project will contain two components: 1) plant conversion including propellant delivery and storage, can filling, and finished product storage, and 2) personnel training to assure safe operation of facilities and storage of products. HAP was selected as the most cost effective alternative evaluated.

Technical Assessment: The project has been reviewed and supported by OORG Technical Reviewer, Harry McCain. His comments are attached together with supplementary information pertaining to the review.

IMPLEMENTING ENTERPRISE:	JSC Arnest
IMPLEMENTING AGENCY:	The World Bank
COORDINATING NATIONAL BODY:	Ministry of Environmental Protection and Natural Resources

³ The grant is will be for up to the amount proposed. It is based on 100% Russian ownership and includes Total Project Cost (Net of Savings) plus a 3% financial agent fee. A 15% contingency is included in the estimates of incremental capital cost.

TECHNICAL OPINION

RUSSIA

PHASEOUT OF OZONE DEPLETING SUBSTANCES IN RUSSIA

Russia is a main ODS user in the world today, and a reduction in its emission is essential for the global phaseout program of ODS. Strong measures should therefore be taken to start the phaseout program for Russia as early as possible. It seems clear that if we want to have an efficient phaseout program for the Eastern European countries ODS reduction in Russia should be given the highest priority. A phaseout program for Russia is therefore recommended. For this first tranche the selection of sub-projects should follow the recommendations given below, including recommended revisions. It should be recognized that there will be other projects following at a later stage as part of the overall phaseout program for Russia.

The project focuses on the main areas of ODS use in Russia, which is first of all the aerosol sector, and secondly the refrigerator sector. Priorities are given to cost efficiencies and to projects which will give substantial reductions in ODS over the next years. Recommended phaseout projects in the aerosol sector alone, which consists of 3 sub-projects where CFCs are replaced by hydrocarbons, will lead to yearly reductions of as much as 9000 tons of ODS.

This clearly underlines the importance of ODS phaseout in Russia and the urgency in starting the phaseout program.

All of the aerosol sub-sector projects and refrigeration/insulation sub-sector projects have received a thorough technical review from specialists drawn from the Ozone Operations Resource Group (OORG). The OORG was established by the World Bank to undertake the analysis of proposed subprojects for funding under the Multilateral Fund for the Montreal Protocol (MP). The reviewers are internationally recognized experts in their respective fields and those selected to review the Eastern European GEF portfolio have each completed several project reviews over the past two years using MP criteria. The institutional strengthening and project monitoring components have been reviewed by the Montreal Protocol Office of the World Bank which routinely undertakes these reviews for the MP projects.

The OORG utilizes standard criteria against which to judge the technical viability and cost-effectiveness of a given sub-project. Topics which are addressed include: appropriateness of the technology, environmental impact, project costs, implementation timeframe, lessons from experience, safety issues and final recommendations. The issue most scrutinized in the sub-projects is invariably the project costs, which are looked at from the perspective of the eligibility of incremental costs, both capital investments as well as operating costs, including technology transfer fees, equipment purchases, institutional strengthening, and training costs.

As its name suggests, the OORG has a highly operational orientation, and so at any given point in time, the status of review is changing. For example, when I reviewed these projects on December 10, six projects had been disapproved pending changes in project design. Now, four enterprises have revised their proposals based on recommendations from the OORG and have incorporated the OORG comments and resubmitted the proposals to the OORG. This iterative process has been highly successful in the design of cost-effective, technically sound, projects under the Montreal Protocol. Based on the OORG documentation presented to me for review, it appears that the same level of thoroughness and integrity of the review process has been maintained for the GEF portfolio as well.

The OORG aerosol sector reviewer recommended the approval of three of the four aerosol projects. These three projects all proposed similar technologies. "The technology for the use of HAPs as a substitute for CFCs in aerosol products is well established, permanent, and not transitional....The only environmental shortcoming of the hydrocarbon aerosol propellants (HAPs) is their flammability which can be correctly handled with the appropriate and now well established HAP technology. The reviewer agrees with the determination to use HAPs as a replacement technology for CFCs used HAP is the most cost effective technology for this conversion." Because of its widespread availability, no licensing agreements or technology transfer agreements will be required.

At the top of the scale was the "conversion of aerosol production at JSC "Arnest" to ecologically clean H₂ propellants. This investment of approximately \$7m in GEF financing would result in the phase-out of 3,000M³ CFCs, with a unit abatement cost of \$0.35/Kg ODP. Not only is the total reduction at low cost an attractive feature, but the technology being advanced is well established and can be easily transferred to Russia. The reviewer was especially positive with regard to this project, noting that it had "all of the appropriate detail well presented and explained."

The two other projects, Halogen and Novosibirsk, were approved pending modification of pricing estimates for equipment purchases. Halogen needs only minor reworking, and is the most attractive sub-project from the unit abatements cost perspective: the project will result in a reduction of 1,563 MT/year in the use of CFCs at a unit abatement cost of \$0.179/Kg. Novosibirsk is the largest proposed investment and requires additional justification for some of the costs. As one of the major aerosol consumers in the country, its potential impact is enormous—the project would result in the phase-out of 4,482 MT/year of CFCs at a unit abatement cost of \$0.37.

Eight proposals for the refrigeration sector were reviewed by the OORG refrigeration sector reviewer: six domestic refrigeration, one commercial and one industrial refrigeration. Three of the eight proposals were recommended for approval, with modifications regarding possible need for licensing/technology transfer arrangements which may involve extra costs, more detailed description of testing procedures, and equipment to be used in the process, as various other specific technical requirements. Given the limited financial resources available in this GEF tranche, I understand that only one or perhaps two refrigeration sector projects could be financed now. If this is the case, the OORG reviews have established clear criteria for approval of sub-projects, and the task managers should use these proposed changes to rank the sub-projects (consistent, of course, with the criteria of cost-effectiveness and others set by the Montreal Protocol).

Considering the lack of economical and political stability in Russia, strong emphasis should be given during the appraisal of projects to institutional strengthening, technical assistance and other areas necessary to implement the phaseout program. Another issue which raises concern is safety in Russian factories in connection with the transformation of CFCs to HAP as propellant in aerosol cans due to the low safety standard in Russian factories. It should therefore be made clear during appraisal that risks and environmental issues are properly dealt with.