



**United Nations
Environment
Programme**

Distr.
LIMITED

UNEP/OzL.Pro/ExCom/27/35
23 February 1999

ORIGINAL: ENGLISH

EXECUTIVE COMMITTEE
OF THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Twenty-seventh Meeting
Montreal, 24-26 March 1999

PROJECT PROPOSAL: YUGOSLAVIA

This document consists of the comments and recommendations of the Fund Secretariat on the following project:

Foam

- Replacement of CFC-11 with cyclopentane foam blowing agent and CFC-12 with HFC-134a refrigerant in the manufacture of domestic refrigerators/freezers at Obod Electroindustjia

UNIDO

**PROJECT EVALUATION SHEET
YUGOSLAVIA**

SECTOR: REFRIGERATION ODS use in sector (1996): 449 ODP tonnes

Sub-sector cost-effectiveness thresholds: Domestic US \$13.76/kg

Project Titles:

- (a) Replacement of CFC-11 with cyclopentane foam blowing agent and CFC-12 with HFC-134a refrigerant in the manufacture of domestic refrigerators/freezers at Obod Electroindustija.

Project Data	Domestic	
	Obod	
ODS phase-out (ODP tonnes)		312
Proposed project duration (months)		24
Incremental capital cost (US \$)		1,691,372
- including contingency (%)		10
Incremental operational cost (US \$)		431,128
Total project cost (US \$)		2,132,340
Local ownership (%)		100
Export component (%)		<10
Amount requested (US \$) {Original}		2,132,340
{Revised}		
Cost effectiveness (US \$/kg)		6.83
National Coordinating Agency	Federal Ministry of Development, Science & Environment	
Implementing Agency	UNIDO	
Technical review completed?	Yes	

Secretariat's Recommendations:		
Amount recommended (US \$)		1,780,220
Project impact (ODP tonnes)		116.6
Cost effectiveness (US \$/kg)		9.92
Implementing Agency support cost (US \$)		
Total cost to Multilateral Fund (US \$)		

PROJECT DESCRIPTION

(a) Replacement of CFC-11 with cyclopentane foam blowing agent and CFC-12 with HFC-134a refrigerant in the manufacture of domestic refrigerators/freezers at Obod Electroindustija.

1. According to the country programme, ODS consumption in the Federal Republic of Yugoslavia (FRY) was 920 MT in 1996. The refrigeration sector is the largest, with ODS consumption of 449 MT in 1996. There are eight enterprises manufacturing domestic, commercial and air-conditioning refrigeration equipment.
2. Obod is the only manufacturer of domestic refrigerators and freezers in Yugoslavia. The company consist of three factories. Two of them located in the same manufacturing area. The company has six foaming lines equipped with seven high pressure dispensers and foaming jigs and fixtures. The company has also four lines for assembly and charging of appliances with the refrigerant. The installed capacity is 520,000 refrigerators and freezers per year. For several reasons the production declined from 510,000 units in 1988 to 130,843 units in 1997.
3. The project proposal is for phasing out of 116.6 ODP tonnes of CFC-12 and CFC-11 from production of domestic refrigerators and freezers. Obod gradually converted the refrigerant part of its production from CFC-12 to HFC-134a technology. Currently , all refrigerators are charged with HFC-134a refrigerant. The proposal requests funding incremental capital and operating costs for conversion to HFC-134a at US \$ 393,971 retroactively. Capital cost (US \$ 103,500) is associated with replacement of charging boards, new leak detectors and renovation of vacuum pumps. Incremental operating cost is related to the higher price of HFC-134a refrigerant and is requested for six months.
4. Foaming operations in all foaming lines in the three factories of Obod will be converted to cyclopentane. The conversion involves modification of existing six high pressure foaming machines, foaming fixtures, installation of new pre-mixing stations, a cyclopentane storage tank, and safety equipment associated with the flammable nature of cyclopentane blowing agent. The proposal includes engineering, commissioning, start-up services, cost of transportation and trials.
5. Incremental operating cost is related to the higher price of chemicals and is requested for six months.
6. Project implementation milestones are included in the project document.

SECRETARIAT S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Secretariat discussed with UNIDO the rationalization of the foaming operations in two factories located in one manufacturing area through combining production of cabinets and doors. Such an approach reduces the potential risk for an enterprise in handling flammable material and also keeps down the cost of safety equipment resulting in cost-effective, safe and sound engineering solutions. This approach was applied in the calculation of the eligible incremental cost for conversion of foam part of the project. The Secretariat discussed also the requested operating cost. Incremental operating cost was reduced on the basis of local prices for chemicals and compressors in Europe. The incremental capital and operating costs were agreed with UNIDO at the level of US \$ 1,780,220.

2. UNIDO requested US \$ 205,824 for support cost for the project calculated by applying 13% to the first US \$500,000 and 11% for the portion above US \$500,000. The conversion of the refrigerant part to HFC-134a technology was implemented in 1998 by the company. Incremental cost is requested retroactively.

RECOMMENDATIONS

1. The Secretariat recommends as follows:
 - to approve the incremental cost of the project at the funding level of US \$ 1,780,220;
 - to approve partial support cost for UNIDO in the amount US \$ 194,439 (foam part only);
 - to consider whether support cost should be applied to the retroactive portion of the request and if so at what percentage.