



**United Nations
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Executive Committee of
the Multilateral Fund for the
Implementation of the Montreal Protocol

Nineteenth Meeting
Montreal, 8-10 May 1996

PROJECT PROPOSAL: TURKEY

This document includes the Comments from the Fund Secretariat on the following project:

Refrigeration

- Engineering assistance for the elimination of ODS used in the production of freezers, coolers, ice makers, and ice cream machines at UGUR Makinalari Sanayi ve Ticaret, A.S. World Bank

PROJECT EVALUATION SHEET TURKEY

SECTOR: REFRIGERATION ODS use in sector (1993): 1,814 ODP tonnes

Sub-sector cost-effectiveness thresholds: Commercial refrigeration US \$15.21/kg
US \$/kg

Project Titles:

Engineering assistance for the elimination of ODS used in the production of freezers, coolers, ice makers, and ice cream machines at UGUR Makinalari Sanayi ve Ticaret, A.S.

Project Data	Commercial refrigeration
	UGUR Makinalari
ODS phase-out (ODP tonnes)	114,32
Proposed project duration (Yrs)	1.5
Incremental capital cost (US\$)	2,058,835
Contingency (%)	10
Incremental operational cost (US\$)	171,402
Total project cost (US\$)	1,975,217
Local ownership (%)	100
Export component (%)	23
Amount requested (US\$) {Original	1,975,217
{Revised	1,166,455
Cost effectiveness (US\$/kg)	11.83
National Coordinating Agency	TDF
Implementing Agency	World Bank
Technical review completed?	Yes

Secretariat's Recommendations	
Amount recommended (US \$)	1,166,455
Project impact (ODP tonnes)	64.6 (revised)
Cost effectiveness (US \$/kg)	11.73
Implementing Agency support cost (US\$)	151,639
Total cost to Multilateral Fund	1,318,094

PROJECT DESCRIPTION

Engineering assistance for the elimination of ODS used in the production of freezers, coolers, ice makers, and ice cream machines at UGUR Makinalari Sanayi ve Ticaret, A.S.

1. Consumption of CFCs in the domestic and commercial refrigeration sector in Turkey is 1,814 MT. There are six major domestic and commercial refrigerator and freezer manufacturers. The Executive Committee approved four CFC phase-out projects for three companies in Turkey.
2. UGUR is one of the two major producers of commercial freezers and coolers. The output is about 40,000 units per year. UGUR exports 23 per cent of its production to non-Article 5 countries.
3. The project will eliminate 114.3 ODP tonnes, including 14.54 tonnes of CFC-12 and 99.5 of CFC-11.
4. Conversion to HFC-134a refrigerant involves replacement and retrofitting of charging equipment, replacement of leak detectors compatible with HFC-134a; replacement of a number of vacuum pumps and retrofits of others; and procurement of testing equipment. The enterprise will use HFC-134a compressors manufactured in Turkey by Arcellic company for which a conversion project was approved at the 8th Meeting of the Executive Committee.
5. Conversion to cyclopentane entails the replacement of existing low pressure foam machines with high pressure machines, retrofit of existing high pressure machines, rebuilding of foam jigs, providing cyclopentane storage and delivery systems, and replacement of premixing stations. Conversion to cyclopentane necessitated also implementing a stringent safety programme to ensure personnel and plant safety owing to the flammable nature of cyclopentane.
6. Project requested allocations for provision of recovery/recycling and servicing equipment.
7. Net present value of first year of operating costs is requested in the project.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The chosen technologies are proven.
2. The Secretariat requested verifications of CFC-11 consumption in the enterprise. The consumption figure was revised accordingly.
3. The Secretariat has discussed with the World Bank the eligibility and incrementality of capital and operating costs associated with the refrigerant and foam components. Operating costs were recalculated to avoid double counting for incremental costs of compressors manufactured by Arcelic company.
4. Costs associated with recovery/recycling equipment were recognized as ineligible since a project for recovery and reclamation of CFC-12 in the refrigeration sector in Turkey was approved by the Executive Committee at its 7th Meeting at a cost of US \$400,000 to be implemented by the World bank. Costs of several budget items were brought in line with recent approvals given by the Executive Committee to similar items.
5. It was agreed that adjustments be made in the capital and operating costs accordingly.

RECOMMENDATIONS

1. The Fund Secretariat recommends approval of the project with associated support cost and the funding level shown below.

	Project Cost US \$	Support Cost US \$	Implementing Agency
Engineering assistance for the elimination of ODS used in the production of freezers, coolers, ice makers, and ice cream machines at UGUR Makinalari Sanayi ve Ticaret, A.S.	1,116,455	151,639	World Bank