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PROJECT PROPOSALS: PAKISTAN

This document includes the comments and recommendations from the Fund Secretariat on the following projects:

Refrigeration

- Conversion of refrigerator manufacture to HFC-134a refrigerant and cyclopentane foam blowing agent at Singer Pakistan Ltd. World Bank

Solvent

- Conversion of ODS cleaning and coating processes from CFC-113 to trichloroethylene and IPA at Treet Corporation Ltd., Lahore UNIDO
- Conversion of ODS coating processes from CFC-113 to trichloroethylene and IPA at Treet Corporation Ltd., Hyderabad UNIDO

PROJECT EVALUATION SHEET **PAKISTAN**

SECTOR: Refrigeration ODS use in sector (1994): 486 ODP tonnes

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

Project Titles:

Conversion of refrigerator manufacture to HFC-134a refrigerant and cyclopentane foam blowing agent at Singer Pakistan Ltd.

Project Data	Domestic
	Singer Pakistan
ODS phase-out (ODP tonnes)	17.8
Proposed project duration (Yrs)	2
Incremental capital cost (US\$)	649,000
Contingency (%)	10
Incremental operational cost (US\$)	55,711
Total project cost (US\$)	769,611
Local ownership (%)	30
Export component (%)	
Amount requested (US\$) {Original	231,000
{Revised	
Cost effectiveness (US\$/kg)	8.75
National Coordinating Agency	Ministry of Environment
Implementing Agency	World Bank
Technical review completed?	Yes

<i>Secretariat's Recommendations</i>	
Amount recommended (US \$)	177,918
Project impact (ODP tonnes)	17.8
Cost effectiveness (US \$/kg)	6.5
Implementing Agency support cost (US\$)	23,129
Total cost to Multilateral Fund	201,047

PROJECT DESCRIPTION

Conversion of refrigerator manufacture to HFC-134a refrigerant and cyclopentane foam blowing agent at Singer Pakistan Ltd.

1. In 1994, Pakistan's domestic refrigeration sector consumed 486 MT of CFCs, 30% of CFC consumption in the country. There are ten major domestic refrigerator and freezer producers in Pakistan. Three projects have been approved by the Executive Committee.
2. The current annual production is 20,000 units at Singer. Under the project submitted, Singer will eliminate a total consumption of 14.6 MT of CFC-12 and CFC-11 by converting to HFC-134a as the refrigerant and to cyclopentane as the blowing agent.
3. The project is not required to meet the 1999 freeze for Pakistan.
4. Conversion to HFC-134a involves the replacement of refrigerant charging boards, leak detectors, refitting existing vacuum system, model redesign and testing.
5. Conversion to cyclopentane entails the replacement of existing low pressure foam machines with high pressure machines, retrofitting of existing high pressure machines, modifying fixtures, providing cyclopentane storage and delivery systems, and replacement of premixing stations. Conversion to cyclopentane will necessitate also implementing a stringent safety programme to ensure personnel and plant safety owing to the flammable nature of cyclopentane.
6. Refrigerator model redesign and the technical aspects of the conversion including safety measures associated with cyclopentane application, will be supervised by a specialized consultant.
7. Incremental operating costs are associated with new HFC-134a compressor, refrigeration system optimization, higher cost of the refrigerant and extra polyurethane foam due to increased density. Incremental operating costs are calculated for six months of operation.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The project proposal contains a statement that 'the project is not required to meet the 1999 freeze for Pakistan. The project however, is a part of overall strategy of the accelerated phaseout'.
2. The chosen technologies are proven.
3. The Secretariat discussed with the World Bank the eligibility and incrementality of all cost items. The project budget has been adjusted accordingly. All the recommended amounts are below the cost-effectiveness thresholds of the sub-sector.

RECOMMENDATION

1 The Fund Secretariat recommends blanket approval of the project with associated support costs at the funding level indicated in the table below.

	<u>Project Cost</u> <u>US \$</u>	<u>Support Cost</u> <u>US \$</u>	<u>Implementing</u> <u>Agency</u>
Conversion of refrigerator manufacture to HFC-134a refrigerant and cyclopentane foam blowing agent at Singer Pakistan Ltd.	177,918	23,129	World Bank

PROJECT EVALUATION SHEET **PAKISTAN**

SECTOR: SOLVENT ODS use in sector (1994-95): 596.4 ODP tonnes

Sub-sector cost-effectiveness thresholds: CFC-113 19.73 US \$/kg

Project Titles:

- (a) Conversion of ODS Coating Processes from CFC-113 to trichlorethylene and IPA at Treet Corporation Ltd., Hyderabad
- (b) Conversion of ODS Cleaning and Coating Processes from CFC-113 to trichlorethylene and IPA at Treet Corporation Ltd., Lahore

Project Data	CFC-113	
	Treet (Hyderabad)	Treet (Lahore)
ODS phase-out (ODP tonnes)	18.89	40.67
Proposed project duration (Yrs)	1.5	1.5
Incremental capital cost (US \$)	225,500	533,500
Contingency (%)	10	10
Incremental operational cost (US \$)	95,672	(23,338)
Total project cost (US \$)	321,172	510,162
Local ownership (%)	100	100
Export component (%)	4	4
Amount requested (US \$) {Original}	370,660	647,650
{Revised}	321,172	510,162
Cost effectiveness (US \$/kg)	17.00	12.54
National Coordinating Agency	Ministry of Environment	
Implementing Agency	UNIDO	UNIDO
Technical review completed?	Yes	Yes

Secretariat's Recommendations:		
Amount recommended (US \$)	321,172	510,162
Project impact (ODP tonnes)	18.89	40.67
Cost effectiveness (US \$/kg)	17.00	12.54
Implementing Agency support cost (US \$)	41,752	66,321
Total cost to Multilateral Fund (US \$)	362,924	576,483

PROJECT DESCRIPTION

(a) Conversion of ODS Coating Processes from CFC-113 to trichlorethylene and IPA at Treet Corporation Ltd., Hyderabad

1. This project will phase out the use of 23.61 MT of CFC-113 at Treet Corporation Ltd., Hyderabad. CFC-113 is used as a carrier of PTFE material which is sprayed from electrostatically charged guns to razor blades' edges in a spray booth. A selection has been made in favour of dry isopropyl alcohol (IPA) as an alternate solvent. The existing spray unit will be replaced with a new spray unit compatible with IPA, which is flammable and has a low flash point. To avoid fire hazard, an automatic fire extinguishing system will be installed in the spray booth. The enterprise has already phased out the use of ODS cleaning solvents. The plant has an annual single shift capacity of about 100,000,000 razor blades and operates three shifts per day.

(b) Conversion of ODS Cleaning and Coating Processes from CFC-113 to trichlorethylene and IPA at Treet Corporation Ltd., Lahore

2. This project will phase out the use of 50.67 MT of CFC-113 at Treet Corporation Ltd., Lahore. It has application on two processes: a blade-cleaning process and a blade's edge coating process. The cleaning process is used for thorough cleaning of razor blades to remove grease, oil, swarf, abrasive, wax, etc. The ODS solvent (CFC-113) is utilized as a degreasing agent in a three stage Detrex brand degreaser. For blade coating, CFC-113 is used as a carrier of PTFE material which is sprayed on the edges of razor blades under an electrostatic charge. For the cleaning of razor blades a selection has been made in favor of an alternative solvent, trichloroethylene (TCE). A new degreasing unit with essential accessories compatible with TCE is proposed. Similarly, dry IPA has been selected as an alternative solvent for the spraying process. An existing unit will be replaced by a new unit compatible with IPA which is flammable and has a low flash point. To avoid hazard, an automatic fire extinguishing system is proposed. This plant also has an annual single shift capacity of about 100,000,000 razor blades and operates three shifts per day.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

Treet Corporation Hyderabad and Treet Corporation Lahore

1. Each proposal indicates how the project will assist Pakistan to meet the 1999 freeze.
2. The coating of the razor blades takes place in an automatic electrostatic spray booth. The coating material is dissolved in a solvent and sprayed on to the razor blades. The blade-coating system presently in place at the Hyderabad plant was designed in 1964 and constructed from components purchased abroad at an indicated cost of US \$71,000. At the Lahore plant, the

present blade coating system was purchased from a US supplier in 1983 at an indicated cost of US \$72,000. The Fund Secretariat discussed with the implementing agency the need for complete replacement of each blade coating system and the alternative of modifying the existing systems to meet the requirements of the new solvent. Since dry iso-propyl alcohol (IPA) is highly flammable, and the spraying process involves high voltages, specially designed explosion-proof equipment is required, necessitating replacement of the existing systems. Minor adjustments to the capital equipment lists for the spray coating process were agreed.

3. At the Lahore plant the project also involves the phase-out of CFC-113 in cleaning operations prior to coating. The cleaning process requires a purpose-designed machine which will use trichloroethylene, which has a low maximum exposure level. The eligible incremental cost for the machine was agreed as US \$250,000.

RECOMMENDATION

1 The Fund Secretariat recommends that the projects be given blanket approval at the funding level indicated in the table below.

<u>Project Title</u>	<u>Project Cost</u> <u>US \$</u>	<u>Support</u> <u>Cost US \$</u>	<u>Implementing</u> <u>Agency</u>
(a) Conversion of ODS Coating Processes from CFC-113 to trichloroethylene and IPA at Treet Corporation Ltd., Hyderabad	321,172	41,752	UNIDO
(b) Conversion of ODS Cleaning and Coating Processes from CFC-113 to trichloroethylene and IPA at Treet Corporation Ltd., Lahore	510,162	66,321	UNIDO