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Executive Committee of
the Multilateral Fund for the
Implementation of the Montreal Protocol

Twenty-second Meeting
Nairobi, 28-30 May 1997

PROJECT PROPOSALS: TURKEY

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

Foam

•	Conversion from CFC-11 into carbon dioxide and water for flexible molded foam at Suntas Foam and Mattress Industry and Commerce, Inc.	World Bank

Refrigeration

•	Conversion from CFC-11 into HCFC-141b at Teba	World Bank
•	Conversion from CFC-11, CFC-12 into cyclopentane and HFC-134a for commercial refrigeration at S.F.A. Sogutma Urunleri Sanayi Ve Tekstil Pazariama Ltd. Sti.	World Bank
•	Conversion from CFC-11 and CFC-12 into HCFC-141b and HFC-134a at Kulahcioglu	World Bank
•	Conversion from CFC-11 and CFC-12 into HCFC-141b and HFC-134a at Gumaksan	World Bank

PROJECT EVALUATION SHEET
TURKEY

SECTOR: Foams ODS use in sector (1995): 500 ODP tonnes

Sub-sector cost-effectiveness thresholds: Flexible 6.23 US $/kg

Project Titles:

Suntas - Conversion from CFC-22 into Carbon Dioxide and Water for Flexible Molded Foam

Project Data	**Flexible**
	Suntas
ODS phase-out (ODP tonnes)	11.3
Proposed project duration (Yrs)	2
Incremental capital cost (US $)	138,158
Contingency (%)	10
Incremental operational cost (US $)	42,928
Total project cost (US $)	181,086
Local ownership (%)	100
Export component (%)	22[1]
Amount requested (US $) {Original}	178,032
{Revised}	181,086
Cost effectiveness (US $/kg)	16.34
National Coordinating Agency	Technology Development foundation of Turkey (TTGV)
Implementing Agency	World Bank
Technical review completed?	Yes

Secretariat's Recommendations:	
Amount recommended (US $)	145,313
Project impact (ODP tonnes)	9.05
Cost effectiveness (US $/kg)	16.06
Implementing Agency support cost (US $)	18,891
Total cost to Multilateral Fund (US $)	164,204

[1] Export to non-Article 5 countries constitutes less than 10%.

PROJECT DESCRIPTION

Suntas - Conversion from CFC-22 into Carbon Dioxide and Water for Flexible Molded Foam

1. Suntas manufactures MDI based flexible molded foam and TDI based flexible slabstock foam, both used in the production of mattresses and furniture. The MDI based flexible molded foam which is the subject of the project document, is produced by means of a Gusmer H-2000 spray foam dispenser and moulds of different shapes. This production started in 1992 and the baseline is therefore approximately 4 years old. CFC-11 is used as blowing agent, but due to both the concern of future CFC-11 supply and foreseen market trends, Suntas reduced the CFC-11 content in 1995 and has now started trials using both water and carbon dioxide/water. The outcome of these trials is very promising and this project covers the conversion.

2. The project includes the adaptation of existing foam installation as well as the procurement of necessary additional equipment for operation with carbon dioxide and water, primarily polyol/carbon dioxide premixer, polyol and MDI temperature control systems and spray foam dispenser with sufficient capacity to handle the viscosity of the polyol. As the foreseen technology is rather new, Suntas requests technical assistance for both equipment selection and optimization of the formulation. Due to concern about future supply of CFC-11 as well as market trends, Suntas has already started the conversion and requests retroactive financing for part of the equipment.

   The project's capital costs include:

Description	Budget (US $)
Spray/pour foaming unit with variable ratio (US $28,528) temperature conditioning, heated hoses and spare parts	46,378
CO_2 frothing system including metering units for MDI and CO_2, and a premixer	26,100
Automated spray/pour system	27,500
Installation	5,000
Technology transfer, trials and training	30,000
Study tour	10,000

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The project was reviewed against the background of the company's baseline and work already done on the partial phaseout. The cost of a high pressure machine was not considered an incremental capital cost since this is already available (Gusmer H-200), however a retrofit cost of US $5,000 was to be provided, the selection of equipment for which the company is claiming US $5,000 should be covered under the technology transfer component of the project. Study tour is also ineligible since funds for training are provided. This activity could be covered under the training component of the project costs if the implementing agency considered it necessary. Agreed incremental capital cost to be paid retroactively should not attract the 10% contingency. On the basis of the above, the incremental capital costs would amount to US $102,385 including US $7,435 as contingency on items which are yet to be purchased.

2. The total project cost was determined to be US $145,313 including US $42,928 as incremental operational costs.

3. The CFC-11 consumption indicated in the project represents the average consumption for the years 1993-1995 instead of the three years preceding the project preparation (1994-1996) as required by Executive Committee Decision 17/10. The average CFC-11 consumption based on the data for 1994-1996 which were given in the project document as 13 tonnes, 9.25 tonnes and 4.875 tonnes respectively should be 9.05 tonnes. Therefore the calculation of the grant cost-effectiveness was based on CFC-11 consumption of 9.05 tonnes per year. Cost effectiveness: US $145,313/9050 kg = US $16.06/kg.

Impact of Project on Meeting the 1999 Freeze

4. The project document indicates: Pending confirmation from the government of Turkey, the project is not required to meet the 1999 freeze for Turkey. The project is, however, part of the overall strategy of the accelerated phase-out schedule adopted by Turkey and consistent with the country programme.

RECOMMENDATION

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

Project Title	Project Cost US $	Support Cost US $	Implementing Agency
Suntas - Conversion from CFC-22 into Carbon Dioxide and Water for Flexible Molded Foam	145,313	18,891	World Bank

PROJECT EVALUATION SHEET
TURKEY

SECTOR: Refrigeration ODS use in sector (1993): 1,645 ODP tonnes

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

Project Titles:
(a) Conversion from CFC-11 and CFC-12 into HCFC-141b and HFC-134a at Kulahcioglu
(b) Conversion from CFC-11 and CFC-12 into HCFC-141b and HFC-134a at Gumaksan
(c) Conversion from CFC-11 into HCFC-141b at TEBA
(d) Conversation from CFC-11, CFC-12 into cyclopentane and HFC-134a for commercial refrigeration at S.F.A. Sogutma Urunleri Sanayi Ve Tekstil Pazariama Ltd. Sti.

Project Data	Commercial			
	Kulahcioglu	**Gumaksan**	**TEBA**	**S.F.A.**
ODS phase-out (ODP tonnes)	4.0	2.3	3.508	25.63
Proposed project duration (Yrs)	1	1	1	1.75
Incremental capital cost (US$)	32,412	29,662	56,832	538,950
Contingency (%)	10	10	10	10
Incremental operational cost (US$)	45,807	32,403	6,682	401,060
Total project cost (US$)	78,219	62,065	63,514	994,805
Local ownership (%)	100	100	100	100
Export component (%)	nil	nil	nil	10
Amount requested (US$) {Original	60,840	35,195	53,357	597,327
{Revised				
Cost effectiveness (US$/kg)	15.21	15.21	15.21	19.14
National Coordinating Agency	Technology Development Foundation of Turkey (TTGV)			
Implementing Agency	World Bank	World Bank	World Bank	World Bank
Technical review completed?	Yes	Yes	Yes	Yes

Secretariat's Recommendations				
Amount recommended (US $)			27,468	389,832
Project impact (ODP tonnes)			3.508	25.63
Cost effectiveness (US $/kg)			7.83	15.21
Implementing Agency support cost (US$)			3,571	50,678
Total cost to Multilateral Fund			31,039	440,510

PROJECT DESCRIPTION

(a) Conversion from CFC-11 and CFC-12 into HCFC-141b and HFC-134a at Kulahcioglu

1. This proposal is for the replacement of CFC-11 used as a foam blowing agent with HCFC-141b, and CFC-12 used as refrigerant with HCFC-134a, in the production of commercial refrigerating appliances at Kulahcioglu. A total of 4.0 ODS tonnes per year will be phased out. The project includes adaptation of existing foam equipment to operate with HCFC-141b as well as procurement of some necessary new equipment to operate with the new working fluids. Technical assistance - provided by local specialists - for adaptation of the refrigerating circuit to use HFC-134a is foreseen as well as costs for test, trials and training. Funding for incremental operating costs for 2 years of full production with the new working fluids is requested.

(b) Conversion from CFC-11 and CFC-12 into HCFC-141b and HFC-134a at Gumaksan

2. This proposal is for the replacement of CFC-11 used as a foam blowing agent with HCFC-141b, and CFC-12 used a refrigerant with HCFC-134a, in the production of commercial refrigerating appliances at Gumaksan. A total of 2.3 ODS tonnes per year of ODS will be phased out. The project includes adaptation of existing foam equipment to operate with HCFC-141b as well as procurement of some necessary new equipment to operate with the new working fluids. Technical assistance - provided by local specialists - for adaptation of the refrigerating circuit to use HFC-134a is foreseen as well as costs for test, trials and training. Funding for incremental operating costs for 2 years of full production with the new working fluids is requested. Gumaksan is also requesting US $7,500 for retroactive financing to cover 10% of the costs for installation of a new test room.

(c) Conversion from CFC-11 into HCFC-141b at TEBA

3. This project covers the replacement of 3.508 ODP tonnes per year of CFC-11 used as foam blowing agent with HCFC-141b in the production of air-handling units at TEBA. The enterprise produces a variety of heating and air-conditioning appliances. HCFC-22 is used as the refrigerant for all the air-conditioning systems. Funding for essential capital equipment and incremental operating costs for 2 years of full production with the new working fluid is requested.

(d) Conversation from CFC-11, CFC-12 into cyclopentane and HFC-134a for commercial refrigeration at S.F.A. Sogutma Urunleri Sanayi Ve Tekstil Pazariama Ltd. Sti.

4. This proposal covers the replacement of CFC-11 used as foam blowing agent with cyclopentane and CFC-12 used as refrigerant with HFC-134a at S.F.A. resulting in phaseout of 25.33 ODP tonnes. Additionally, 0.33 ODP tonnes will be phased out replacing 1-1-1 trichloroethane solvent with non-ODS technology. The enterprise is one of three major manufacturers of commercial refrigeration products in Turkey. Conversion projects for two of them have been approved by the Executive Committee.

5. Funding for adaptation of new technologies, new production equipment and retrofitting of existing equipment is requested. The proposal includes also funding for safety equipment, safety audit and training associated with the flammable nature of cyclopentane blowing agent.

6. Incremental operating costs are requested for one year's duration. Incremental cost of new HFC-134a compressors at US $5.35 is included in the calculation of operating costs. S.F.A. buys its compressors from a number of compressor manufacturers including TEE (Arcelic), Turkey. Compressor conversion project for TEE Arcelic has been approved at the 8th Meeting of the Executive Committee.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

Kulahcioglu and Gumaksan

1. The project documents of these two enterprises advise that the projects are not required to meet the 1999 freeze, but is part of Turkey's strategy of accelerated phase-out.

2. The enterprises are small, producing only around 2000 commercial refrigeration units per year. It is noted that retrofit of existing low pressure foaming machines is proposed as an adequate technical solution for the production of rigid insulating foam using HCFC-141b, in contrast to the majority of proposals in which more costly high pressure machines are said to be essential.

3. The project documents each contain a section addressing justification of the use of HCFCs.

4. The only issue needing consideration before approval of the projects is incremental costs for HFC 134-a compressors. Since compressor conversion has been funded in Turkey, no recommendation can be made on this cost element, and thus the total project costs, until the policy on compressor costs has been decided by the Executive Committee. All other cost elements have been agreed with the World Bank. The project costs will be completed after a decision on compressor costs has been taken so that the projects can go forward for approval.

TEBA

5. The project document advises that the project is not required to meet the 1999 freeze, but is part of Turkey's strategy of accelerated phase-out.

6. Although submitted as a commercial refrigeration project, the conversion activity for which funding is requested is the manufacture of rigid foam insulation panels. 50 per cent of the panels are used to produce insulated air ducts used in the installation of air-conditioning systems.

The enterprise produces air-conditioning systems, with HCFC-22 as the refrigerant. The enterprise does not manufacture refrigerators. In keeping with precedents established for classification of similar projects for enterprises in Brazil, Malaysia and Egypt, the Fund Secretariat advised the World Bank that the project should be classified as rigid foam, with a sector threshold of US $7.83. The World Bank agreed that the project should be submitted for blanket approval with the level of grant set at the threshold limit and the remainder of the project cost to be contributed by the enterprise.

7. The project document contains a section addressing justification for the use of HCFCs.

S.F.A.

8. The project document advises that the project is not required to meet the 1999 freeze, but is part of Turkey's strategy of accelerated phase-out.

9. The Secretariat has discussed with the World Bank the eligibility and incrementality of all budget items. All cost elements have been agreed with the World Bank. S.F.A. uses HFC-134a compressors sourced from TEE (Arcelic) which are converted to HFC-134a technology with assistance from the Multilateral Fund. The issue of incremental costs for HFC-134a compressors will be discussed by the Executive Committee at the 22nd Meeting. The decision of the Executive Committee on incremental cost of HFC-134a compressors will not affect the amount of eligible grant since it is already capped by the threshold established for the commercial refrigeration sector.

RECOMMENDATIONS

1. The Fund Secretariat recommends approval of the projects for Gumaksan and Kulahcioglu. The level of funding for each project should be calculated on the basis of the decision taken by the Executive Committee on incremental operating costs for compressors.

2. The Fund Secretariat recommends blanket approval of the projects for TEBA and S.F.A. at the level of funding indicated in the table below.

	Project Cost US $	Support Cost US $	Implementing Agency
(a) Conversion from CFC-11 and CFC-12 into HCFC-141b and HFC-134a at Kulahcioglu	t.b.a.	t.b.a.	World Bank
(b) Conversion from CFC-11 and CFC-12 into HCFC-141b and HFC-134a at Gumaksan	t.b.a.	t.b.a.	World Bank
(c) Conversion from CFC-11 into HCFC-141b at TEBA	27,468	3,571	World Bank
(d) Conversation from CFC-11, CFC-12 into cyclopentane and HFC-134a for commercial refrigeration at S.F.A. Sogutma Urunleri Sanayi Ve Tekstil Pazariama Ltd. Sti.	389,832	50,678	World Bank