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Executive Committee of
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PROJECT PROPOSALS: BRAZIL

This document includes the Comments and Recommendations from the Fund Secretariat on the following projects:

Foam

- Umbrella project covering 6 companies for the conversion to CFC-free technology in the manufacture of integral rigid skin and flexible molded polyurethane foam (Rorispuma, Indek, Flexfom, Walrod, Rigiline, Magalhaes) UNDP

Refrigeration

- Elimination of CFC-11 and CFC-12 in the manufacture of domestic refrigerators and freezers at Multibras s.a. UNDP
- Elimination of CFC-11 and CFC-12 in the production of commercial refrigeration equipment at Reubli, S.A. World Bank

PROJECT DESCRIPTION

Umbrella project covering 6 companies for the conversion to CFC-free technology in the manufacture of integral rigid skin and flexible molded polyurethane foam (Rorispuma, Indek, Flexfom, Walrod, Rigiline, Magalhaes)

1. The umbrella project covers six companies in Brazil. The companies manufacture integral skin and/or integral skin molded foam products for various applications. Their consumption of CFC-11 and foam products are listed below:

	Consumption (tonnes ODP)	Products
Flexform	22	Automotive, furniture industries
Indek	8	Bicycle seats, furniture, gymnastic equipment
Magalhaes	2	Furniture industry
Rigiline	13	Gear shift knobs, arm rests for automobiles
Rorispuma	6	Furniture industry
Walrod	4	Steering wheels for trucks/cars

2. All the companies use low pressure machines except one which has one high pressure machine in addition to several low pressure machines. The equipment baseline of the companies is: Flexform four dispensers, Indek one dispenser, Magalhaes four dispensers, Rigiline nine dispensers including one high pressure dispenser, Rorispuma three dispensers and Walrod two dispensers.

3. CFC-11 will be phased out in all the companies by the use of HCFC-141b. Eventually all production will be converted to all water blown system. The capital cost involves the replacement of low pressure dispensers with high pressure for all the companies except Magalhaes where a premixer and heating oven only will be provided. The project should incur incremental operational costs but these are not being requested. Production trials, technology transfer and training will be undertaken as a package to reduce costs.

4. The cost of the project following discussions with UNDP's foam sector expert are as follows:

	Cost (US \$)	Project Impact (Tonnes ODP)	Cost-effectiveness
Flexform	210,000	21.4	9.81
Indek	85,000	7.32	11.61
Magalhaes	31,000	2.01	15.42
Rigiline	180,000	11.9	15.97
Rorispuma	85,000	5.49	15.48
Walrod	60,000	3.66	16.39
Sub-Total	651,000	51.78	
Contingency	65,000		
Technology transfer	30,000		
Total	746,000	51.78	14.41

5. Contingency and technology transfer will be a common fund that will be applied according to needs. These costs, though reflected in the project costs above, in practice are charges to only a few of the companies. Therefore, the cost-effectiveness values shown in the above table for Magalhaes, Rorispuma and Walrod will remain the same, while those of Flexform, Indek and Rigiline will increase when they absorb the contingency and technology transfer costs.

6. This provides a means of providing reasonable funds for all the companies while keeping the costs within the limits of the cost-effectiveness threshold.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The project consists of three small consuming enterprises which on their own may not have implementable projects. UNDP in its discussion maintained that the approach as described in the project description provides considerable savings in technology transfer and training and production trials. Another common facility UNDP intends to establish through the umbrella project is central stores for spare parts for the project which could also reduce costs and add to efficiency of the implementation of the project.

2. The cost-effectiveness values of the individual companies as calculated are within the threshold, so is the cost-effectiveness of the umbrella project as a whole.

RECOMMENDATIONS

1. The Executive Committee may wish to consider the project for approval on the merits of the approach proposed by UNDP. The cost of the project with associated support cost is as indicated below:

	Project Cost US \$	Support Cost US \$	Cost Effectiveness US \$/kg.
Umbrella project covering 6 companies for the conversion to CFC-free technology in the manufacture of integral rigid skin and flexible molded polyurethane foam (Rorispuma, Indek, Flexform, Walrod, Rigiline, Magalhães)	746,000	96,980	UNDP

PROJECT EVALUATION SHEET **BRAZIL**

SECTOR: REFRIGERATION ODS use in sector (1994): 7,000 ODP tonnes

Sub-sector cost-effectiveness thresholds: Domestic refrigeration US \$13.76/kg
Commercial refrigeration US \$15.21/kg

Project Titles:

- (a) Elimination of CFC-11 and CFC-12 in the manufacture of domestic refrigerators and freezers at Multibras s.a.
(b) Elimination of CFC-11 and CFC-12 in the production of commercial refrigeration equipment at REUBLI.

Project Data	Domestic	Commercial
	Multibras	REUBLI
ODS phase-out (ODP tonnes)	1,234	89.9
Proposed project duration (Yrs)	3	1.5
Incremental capital cost (US\$)	4,107,300	560,296
Contingency (%)	10	10
Incremental operational cost (US\$)	9,159,862	488,569
Total project cost (US\$)	13,267,162	1,048,865
Local ownership (%)	59.79	100
Export component (%)	0	0
Amount requested (US\$) {Original {Revised	683,757 ¹	1,048,865
Cost effectiveness (US\$/kg)	6.42	11.66
National Coordinating Agency	PROZON	PROZON
Implementing Agency	UNDP	World Bank
Technical review completed?	Yes	Yes

Secretariat's Recommendations		
Amount recommended (US \$)		
Project impact (ODP tonnes)		
Cost effectiveness (US \$/kg)		
Implementing Agency support cost (US\$)		
Total cost to Multilateral Fund		

¹ US \$683,757 is the amount being requested at this meeting. This amount was offset against the allocations approved for Multibras at the 17th Meeting. Two additional installments will be requested in 1997 and 1998

PROJECT DESCRIPTION

(a) Elimination of CFC-11 and CFC-12 in the manufacture of domestic refrigerators and freezers at Multibras s.a.

1. Consumption of CFCs in the refrigeration sector in Brazil is estimated at 7,000 tonnes. ODS consumption in manufacturing and installation of domestic, commercial and air-conditioning equipment is about 2,205 tonnes ODP.

2. Six major enterprises are engaged in the manufacture of domestic refrigerators and freezers. Multibras is the largest manufacturer of domestic appliances in Brazil accounting for approximately 62% of total production of domestic refrigerators and freezers. Multibras manufactures domestic appliances in three separate factories with ten independent production lines. ODS consumption was 911 tonnes of CFC-11 and 423 tonnes of CFC-12 in 1995.

3. Initial plans made in 1994 were based on conversion of one chest freezer production line. Thereafter, other refrigerator and freezer production lines were to be converted to non-CFC technology on line-by-line basis, based on the experience gained from the conversion of the chest freezer line. A project for the conversion of this production line was approved at the 17th Meeting of the Executive Committee. After careful study by Multibras, a new integrated project covering total ODS phase-out was prepared by UNDP. Because of the scale of its operations Multibras adopted a phased strategy for ODS replacement. ODS consumption will be eliminated at three production lines by 1997. The next four lines will be converted in 1998. The remaining four production lines will be converted to non-CFC technology in 1999.

4. The company opted for HCFC-141b to replace CFC-11 blowing agent and HFC-134a as a substitution of the CFC-12 refrigerant. Whilst recognizing the environmental benefits of cyclopentane versus HCFC-141b, Multibras selected HCFC-141b as a first stage, interim, replacement of CFC-11 as it provides the best energy efficiency, and the lowest investment and operational costs. The energy efficiency factor is strongly emphasized in the Governmental policy in the refrigeration industry in Brazil. Cyclopentane and water blown foam formulation do not meet the Multibras standards on energy efficiency. Liquid HFC technologies do not meet the criteria on maturity of the technology and availability. The company stated that additional costs needed for the transition to non-ODS technologies in the future will be totally covered by the company itself.

5. For conversion to HFC-134a, Multibras is requesting replacement and retrofit of charging and evacuation equipment, and leak detectors. New brazing work stations are also requested for the conversion, to reduce the exposure of hydroscopic lubricant in the compressor to the humid environment. The company recognized that the introduction of new brazing equipment is associated with substantial technological upgrades. Therefore, only 10 per cent of the cost of new equipment is requested.

6. For conversion to HCFC-141b, Multibras is requesting new pre-mixing and foam injecting equipment.

7. The costs of trials, testing, technology transfer and training are included in the requested budget.

8. Operating costs are calculated for a 6 month period, and are determined on a plant-by-plant basis. UNIDO indicated that "the incremental operating costs will be requested one year after activities in the plant start".

9. As indicated in paragraph 3 above, Multibras will implement the project in stages. However, the company is requesting approval of the project at the 19th meeting. The approved funds could be paid on three installments, one each in 1996, 1997 and 1998. The first installment would be offset against the amount approved for Multibras at the 17th Meeting

(b) Elimination of CFC-11 and CFC-12 in the production of commercial refrigeration equipment at REUBLI.

10. REUBLI company operates in the Brazilian commercial refrigeration sector which accounts for about 400 small and medium enterprises. The Executive Committee approved at its 18th Meeting two projects phasing out about 35 MT of CFCs. This project will eliminate 89.9 MT of CFC-11 and CFC-12 in manufacturing commercial chest freezers and coolers.

11. The conversion to HFC-134a will involve replacing the existing charging boards and leak detectors with equipment suitable for HFC-134a, retrofitting vacuum pumps and prototype testing.

12. The two available low pressure machines will be replaced with one high pressure machine. Existing cabinet and door jigs will be rebuilt to accommodate new requirements in foaming operations.

13. This company recognizes the transitional nature of HCFC technology. There are limitations in adapting the existing equipment to a safe operation with cyclopentane due to the fact that the factory is located in a residential area. It is not possible to obtain approval for foam blowing operations with highly flammable chemicals in a growing urban area. REUBLI's management accepts that all future costs related to a subsequent transition to zero-ODP technology will be borne by the company itself.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

(a) Elimination of CFC-11 and CFC-12 in the manufacture of domestic refrigerators and freezers at Multibras s.a.

1. While discussing the project with UNDP, the Secretariat raised several issues relating to the replacement of charging, reclaiming and evacuation equipment. It was agreed that the majority of these equipment should be retrofitted rather than replaced. It was also agreed that costs associated with additional refrigerant supply pipework are ineligible incremental costs.

2. The Fund Secretariat is still discussing with UNDP the eligibility and incrementality of capital and operating costs associated with the foam component. Results of the discussion will be reported to the Sub-Committee on Project Review.

(b) Elimination of CFC-11 and CFC-12 in the production of commercial refrigeration equipment at REUBLI.

3. The Fund Secretariat is still discussing with the World Bank the eligibility and incrementality of capital and operating costs associated with the foam and refrigerant components. Results of the discussion will be reported to the Sub-Committee on Project Review.