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Executive Committee of
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Implementation of the Montreal Protocol

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BILATERAL COOPERATION

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

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|---|----------------------|
| • Iran: Project preparation/technical assistance for MAC recycling and training in good servicing practices. | France |
| • Iran: Country Programme Update | France |
| • Lebanon: Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Furniture & Plastics Sarl (FAP) | France |
| • Lebanon: Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Fomaco Sarl | France |
| • Lebanon: Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Merza Foam Sarl | France |
| • Lebanon: Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Plastiflex Sarl | France |
| • Lebanon: Conversion to non-CFC technology in the manufacture of polyurethane flexible molded foam at Meuble Mode Sarl | France |
| • Lebanon: Conversion to non-CFC technology in the manufacture of rigid foam (sandwich panels) at Kilzi & Co. | France |
| • Namibia: Implementation of a Training Programme for Recovery and Recycling of Refrigerants | Finland |
| • Viet Nam: Demonstration project - CFC recycling and emissions reduction in the commercial refrigeration sector (Australia/UNDP) | Australian component |

PROJECT PROPOSAL IRAN

Project Title:

Project preparation/technical assistance for MAC recycling and training in good servicing practices.

PROJECT DESCRIPTION

1. There are an estimated 600,000 mobile air conditioning (MAC) units in Iran, consuming about 450 tonnes of CFC-12 in servicing activities.
2. The Islamic Republic of Iran has requested the Caisse Française de Développement to prepare an investment project in order to set up a recycling network in the MAC sector.
3. The project will also include a training programme for the technicians. The project will achieve the phasing out of more than 1,000 ODP tonnes of ODS.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. Caisse Française de Développement has received an official request from the Government of Iran for project preparation/technical assistance in the MAC sector. The project will consist of a training programme, and will result in the phasing out of more than 1,000 ODP tonnes of ODS.
2. This request is consistent with Iran's country programme, which was approved by the Executive Committee at its 10th Meeting. It does not conflict with other projects approved by the Executive Committee.

RECOMMENDATIONS

1. The proposal meets the guidelines of the Executive Committee and is recommended for approval in the amount requested, US \$30,000.
2. The Treasurer should offset US \$30,000 against the Government of France's 1996 contributions to the Fund.

PROJECT PROPOSAL IRAN

Project title:

Country Programme Update--IRAN

PROJECT DESCRIPTION

1. The Islamic Republic of Iran is in the process of updating its country programme which was approved at the 10th Meeting of the Executive Committee in June 1993.
2. In the old version of the country programme, the consumption of halons have been estimated as nil, but it seems there are about 400 tonnes of Halon 1211 and Halon 1301 used in the country. The aim of the project, therefore, is to assist the country in updating the country programme, mainly in the fire fighting sector.

COMMENTS

1. The Secretariat had detailed discussions with the Government of France in the light of decision 17/2 regarding the updating of data in country programmes since project preparation was requested for sectors where the country programme indicated there was no consumption.
2. Caisse Française de Développement has received an official request from the Government of Iran for the funding of a project aimed at updating their country programme. As the country programme was approved in June 1993, there are now discrepancies from the original estimates, particularly with regard to the country's consumption of halons.

RECOMMENDATIONS

1. The proposal meets the guidelines of the Executive Committee and is recommended for approval in the amount requested, US \$20,000.
2. The Treasurer should offset US \$20,000 against the Government of France's 1996 contributions to the Fund.

**PROJECT EVALUATION SHEET
LEBANON**

SECTOR: FOAM ODS use in sector (1995): 216 ODP tonnes

Sub-sector cost-effectiveness thresholds: Flexible slabstock Polyurethane US \$6.23/kg
Flexible molded Polyurethane (integral skin) US \$16.86/kg
Rigid Polyurethane US \$7.83/kg

Project Titles: (a) Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Furniture & Plastics Sarl (FAP)
(b) Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Fomaco Sarl
(c) Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Merza Foam Sarl
(d) Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Plastiflex Sarl
(e) Conversion to non-CFC technology in the manufacture of polyurethane flexible molded foam at Meuble Mode Sarl
(f) Conversion to non-CFC technology in the manufacture of rigid foam (sandwich panels) at Kilzi & Co.

National Coordinating Agency	Integral Skin				Rigid	
	FAP	Fomaco	Merza	Plastiflex	Meuble Mode	Kilzi & Co.
ODS (CFC-11) phase out (ODP tonnes)	28	26	45	42	10	25
Proposed project duration (Yrs)	1	1	1	1	1	1
Incremental capital cost (US\$)	172,700	161,700	176,000	176,000	49,500	132,000
Contingency (%)	10	10	10	10	10	10
Incremental operational cost (US\$)	7,640	negligible	1,300	negligible	71,990	103,530
Total project cost (US\$)	180,340	161,700	177,300	176,000	121,490	235,530
Local ownership (%)	100	100	100	100	100	100
Export component (%)	0	0	0	0	0	0
Amount requested (US\$) {Original	172,700	161,700	176,000	176,000	72,500	191,500
(Revised	128,700	154,000	108,172	154,000	55,700	141,000
Cost effectiveness (US\$/kg.)	6.17	6.22	3.91	4.19	7.25	7.66
National Coordinating Agency	Ministry of Environment					
Implementing Agency	CFD	CFD	CFD	CFD	CFD	CFD
Technical review completed?						
Secretariat's Recommendations						
Amount recommended (US \$)	128,700	154,000	108,172	154,000	55,700	141,000
Project Impact (ODP tonnes)	28	26	45	42	9	22.47
Cost effectiveness (US \$/kg)	4.60	5.92	2.40	3.66	6.19	6.28
Implementing Agency support cost (US\$)	NA	NA	NA	NA	NA	NA
Total cost to Multilateral Fund	128,700	154,000	108,172	154,000	55,700	141,000

PROJECT DESCRIPTION

Flexible Slabstock Polyurethane Foam Projects

- (a) Conversion to non-CFC technology in the manufacture of flexible foam (slabstocks) at Furniture & Plastics Sarl (FAP)
- (b) Conversion to non-CFC technology in the manufacture of flexible foam (slabstocks) at Fomaco Sarl
- (c) Conversion to non-CFC technology in the manufacture of flexible foam (slabstocks) at Merza Foam Sarl
- (d) Conversion to non-CFC technology in the manufacture of flexible foam (slabstocks) at Plastiflex Sarl

1. Four projects are being submitted for this sub-sector by the Government of France for bilateral cooperation. All the companies manufacture flexible slabstock polyurethane foam for the furniture industry.

2. Furniture and Plastics (FAP) operates a continuous Hyman-Carpenter vertifoam machine producing 1,200 tonnes of foam per year. It also operates a second Vikatalia discontinuous machine which produces 24 tonnes of foam per year and uses less than one tonne of CFC-11 per year. FAP will phase out the use of CFC-11 by the combination of water blowing and forced cooling, which will require softening additives. The capital cost of conversion includes the cost of installation of forced cooling system (US \$75,000) and additive system (US \$17,000), as well as technology transfer, training, start up and trials (US \$25,000). The process results in incremental operational costs on account of increased use of TDI and addition of a softening agent.

3. Fomaco, Merza Foam and Plastiflex all operate Laaderberg Maxfoam machines. Merza's Laaderberg F8 9420 series machine was installed in June 1995. The current annual production outputs of Fomaco, Merza and Plastiflex are 1,200 tonnes, 900 tonnes and 2,000 tonnes respectively. All the three companies will phase out CFC-11 by the use of methylene chloride combined with vacuum curing. The capital costs of each project relate to the provision of vacuum curing system (US \$70,000), ventilation system for process control and occupational safety (US \$35,000), flowmeter for methylene chloride (US \$3,000), metering system for softening agent (US \$7,000) and supervision, trials and training (US \$25,000). The projects for Fomaco, and Plastiflex will incur incremental operational costs which the companies are not claiming, while that of Merza will result in incremental operational savings.

Flexible Molded Foam Project (Integral Skin Sub-sector)

- (e) Conversion to non-CFC technology in the manufacture of polyurethane flexible molded foam at Meuble Mode Sarl

4. Meuble Mode produces flexible molded polyurethane foam cushions also for furniture applications. The company operates one high pressure machine and produces 50 tonnes of molded foams per year. Meuble Mode will phase out CFC-11 by the use of HCFC-141b as an interim process. It will phase out ultimately to water-blown technology when this becomes mature in the country.

5. The capital cost of the conversion relates to the modification of the existing dispenser (US \$25,000) and technology transfer, start up and trials (US \$17,000). The process results in incremental operational cost which the company is not claiming.

Rigid Polyurethane Foam Project

- (f) Conversion to non-CFC technology in the manufacture of rigid foam (sandwich panels) at Kilzi & Co.

6. Kilzi operates two low pressure machines (a 1975 Viking SP27 and a 1978 Cannon 60) producing 400 tonnes of rigid foam sandwich panels per year. Kilzi will phase out CFC-11 by the use of HCFC-141b as an interim process to the use of all water-blown technology in the final stage of phase out.

7. The capital cost of the project includes the cost of replacing the two low pressure dispensers with one high pressure dispenser (US \$80,000), technology transfer, start up and trials (US \$25,000). The project will incur incremental capital costs which the company is not claiming.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS**COMMENTS**Flexible Slabstock Polyurethane Foam Projects

1. Projects were submitted in this sub-sector for Lebanon by the Government of France and by UNIDO. Following review of these projects, the Secretariat had discussions with both UNIDO and Caisse Française de Développement (CFD) of France with a view to harmonizing the prices of chemicals and costs of common capital items such as technology transfer, start up and production trials. It therefore became necessary for both agencies to review some of the cost items and recalculate the incremental operational costs. Some items of capital cost such as the forced cooling system, technology transfer, training and trials were revised.

2. The harmonization of the project costs led to a decrease of technical assistance (technology transfer, training, trials) costs from US \$35,000 for some projects and US \$45,000 for others to US \$25,000 per project. The cost of the forced cooling system for the Vertifoam equipment (in FAP project) was revised from US \$100,000 to US \$75,000. The incremental operational cost or savings levels were also revised following the recalculation based on the prices of CFC-11 as US \$2.2/kg instead of US \$1.3/kg and methylene chloride as US \$0.9/kg instead of US \$1.0/kg. Consequently, one project Merza Foam realized incremental operational savings of US \$45,828 instead of incremental operational cost of US \$4,120.

3. The revised project costs are reflected in the project evaluation sheet. The Secretariat and the CFD have agreed to these costs.

Reasons for the Use of HCFC-141b by Meuble Mode and Kilzi & Co.

4. The project documents indicate that the whole range of substitute technologies were considered during the selection of the phase-out options. Although the final solution focused on water-blown technology, that technology was not yet mature and posed some problems including:

- decrease in insulation value
- the need to use more expensive polyol
- loss of rigidity of the foam due to escape of CO₂ bubbles from the foam during production.

On the other hand, the use of hydrocarbons as blowing agents would result in expensive projects because of the expensive safety equipment required. Furthermore, the plants are located in the center of town, making it unsafe to use inflammable substances or requiring expensive relocation of the plants.

5. The companies using HCFC-141b will not request additional funding for the final stage phase out.

Project Implementation

6. The projects will be supervised by Caisse Française de Développement, an agency of the Government of France. Technical assistance, which has been included in the project budgets, will be provided for making the necessary formulation adjustments, providing necessary training, and assisting the companies in the start-up and production trials.

RECOMMENDATIONS

1. The project proposals of the Government of France meet the guidelines of the Executive Committee on bilateral cooperation and are recommended for approval.

2. The Fund Secretariat recommends blanket approval of all the projects.

	Project Cost US \$	Support Cost US \$	Implementing Agency
(a) Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Furniture & Plastics Sarl (FAP)	128,700	Not Applicable	CFD France
(b) Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Fomaco Sarl	154,000	Not Applicable	CFD France
(c) Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Merza Foam Sarl	108,172	Not Applicable	CFD France
(d) Conversion to non-CFC technology in the manufacture of flexible foam (slabstock) at Plastiflex Sarl	154,000	Not Applicable	CFD France
(e) Conversion to non-CFC technology in the manufacture of polyurethane flexible molded foam at Meuble Mode Sarl	55,700	Not Applicable	CFD France
(f) Conversion to non-CFC technology in the manufacture of rigid foam (sandwich panels) at Kilzi & Co.	141,000	Not Applicable	CFD France

3. The Treasurer should offset the amount of US \$741,572 against the Government of France's 1996 contribution to the Multilateral Fund.

PROJECT EVALUATION SHEET **NAMIBIA**

SECTOR: Refrigeration ODS use in sector (1994): 31.3 metric tonnes

Sub-sector cost-effectiveness thresholds: n/a

Project Title:

Implementation of a Training Programme for Recovery and Recycling of Refrigerants

Project Data	
ODS phase-out (ODP tonnes)	15 tonnes (CFC-11 and CFC-12)
Proposed project duration	4 months
Incremental capital cost (US\$)	120,000
Contingency (%)	4
Incremental operational cost (US\$)	n/a
Total project cost (US\$) {Original	120,000
{Revised	113,440
Local ownership (%)	100
Export component (%)	0
Amount requested (US\$) {Original	110,000
{Revised	103,440
Cost effectiveness (US\$/kg)	2.00
National Coordinating Agency	Ministry of Trade and Industry
Implementing Agency	UNEP IE in cooperation with the Ministry for Foreign Affairs of Finland
Technical review completed?	no

<i>Secretariat's Recommendations</i>	
Amount recommended (US \$)	103,440
Project impact (ODP tonnes)	5.4
Cost effectiveness (US \$/kg)	19.16
Implementing Agency support cost (US\$)	(Note: UNEP will receive US \$6,400 from Finland)
Total cost to Multilateral Fund	103,440

PROJECT DESCRIPTION

Implementation of a Training Programme for Recovery and Recycling of Refrigerants

1. This project's objective is to implement a comprehensive training programme for the recovery and recycling of refrigerants in the refrigeration and air-conditioning sectors. The training programme will include 6 basic training and demonstration workshops (3 days each, 15 participants each, plus 2 additional days to be trained as trainers) for maintenance technicians/operators (90 persons) employed by the members of the Namibian Association of Refrigeration and Airconditioning Contractors (NARAC), and training of 5-6 trainers nominated by the NARAC and the Windhoek Vocational Training Centre (VTC).
2. The workshops will be held to familiarize all involved with the recovery/recycling equipment and explain the different methods of recovery using the equipment that will be supplied. The training workshops will also emphasize the need for good practices in the handling of refrigerants during servicing and installation.
3. The project will provide recovery and recycling equipment and create a recycling network to be run by the NARAC. A monitoring system (being a part in the operation of the National Ozone Office) covering the quantities of refrigerants recycled will be established by the Ministry of Trade and Industry, which also will issue recommendations on recovery and recycling. It is expected that the VTC will include a refrigerant recovery/recycling and good practices module in its regular courses ensuring that all future technicians do not need re-training in this aspect. After implementing this activity, it is expected that Namibia will not need any further direct support from the Multilateral Fund in phasing out ODS in the refrigeration sector.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Government of Finland has received an official request from the Government of Namibia for the preparation of a project which involves the implementation of a training programme for recovery and recycling of refrigerants in Namibia.
2. The Secretariat had detailed discussions with the Government of Finland on the role of UNEP in the project and the eligibility of various cost items. Based on established norms for the annual impact per recovery machine, the Secretariat estimates that the 20 recovery machines should result in the phase-out of 5.4 ODP tonnes.

3. This request is consistent with Namibia's country programme which was approved by the Executive Committee at its 18th Meeting. It does not conflict with other proposals submitted for approval by implementing agencies.

RECOMMENDATION

1. The proposal meets the guidelines of the Executive Committee and is recommended for approval in the amount requested, US \$103,440.

2. The Treasurer should offset US \$103,440 against the Government of Finland's 1996 contributions to the Fund.

SECTOR: **REFRIGERATION** ODS use in sector (1994): 317.0 ODP tonnes
CFC RECOVERY AND RECYCLING

Demonstration project on CFC recycling and emission reduction in the commercial refrigeration sector

Project Data	Recovery and recycling
ODS phase-out (ODP tonnes)	28.2 (including UNDP component)
Proposed project duration (Yrs)	2.0
Incremental capital cost (US \$)	450,903 (including UNDP component)
Incremental operational cost (US \$)	-
Total project cost (US \$)	450,903 (including UNDP component)
Amount requested (US \$) {Original}	282,687 (Australian component)
{Revised}	282,687 (Australian component)
Cost effectiveness (US \$/kg)	14.86 (including UNDP component)
National Coordinating Agency	Hydrometeorological Service of Vietnam
Implementing Agency	Government of Australia / UNDP
Technical review completed?	Yes

Amount recommended (US \$)	
Government of Australia	282,687
Project impact (ODP tonnes)	28.2 (including UNDP component)
Cost effectiveness (US \$/kg)	14.86 (including UNDP component)
Implementing Agency support cost (US\$)	n/a to Australia
Total cost to Multilateral Fund	282,687 (Australian component: with UNDP--472,771)

PROJECT DESCRIPTION

1. The project will be implemented through bilateral cooperation by the Government of Australia (through the Australian Environment Protection Agency) jointly with UNDP. A proposal for UNDP (with the same project description) is provided in document UNEP/OzL.Pro/ExCom/20/38).
2. The project will reduce the use of CFC in the commercial and industrial refrigeration and air-conditioning sub-sectors by implementing recovery and recycling strategies and other emission-control measures. It will also build the capacity of established institutions to provide training to refrigeration technicians.
3. The project consists of two stages. The first stage (Pilot), will identify, implement and evaluate various measures to reduce CFC emissions during equipment service in the city of Ho Chi Minh. During this stage, UNDP will consider incorporating cost-sharing or other innovative financing mechanisms for the purchase of recovery equipment for participating enterprises. After a thorough review of local conditions, including an investigation of potential operating savings and the willingness-to-pay at local enterprises, UNDP will determine whether such mechanisms are feasible, and can be incorporated into the project. Based on the case studies developed during the Pilot Stage, the second stage (Extension) will develop a solid core of enterprises employing low-ODS emissions techniques.
4. The outcomes of both phases will provide a solid foundation of technical knowledge, institutional training capacity, industry capacity and demonstrable economic benefits to ensure the ongoing proliferation of low-ODS CFC emission practices in the country. Furthermore, the proposed cost-sharing mechanism may bring added benefits to the project, *inter alia*, an increase in the cost-effectiveness of the project; an increase in recovery and recycling equipment, and the participation of a larger number of enterprises.

SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

COMMENTS

1. The Vietnam country programme, approved at the 19th Executive Committee Meeting (May 1996), reports a consumption of 22.42 metric tonnes of CFC-12, 2.26 metric tonnes of CFC-115 and 40.39 metric tonnes of HCFC-22 for servicing domestic refrigerators, commercial and air conditioning units and MAC units. However, the project document reports a consumption of 200 to 250 tonnes of ODS, primarily CFC-12 and R-502, in the refrigeration and air conditioning sectors.

2. The Fund Secretariat, recalling Decision 17/2 of the Executive Committee on significant difference between ODS data contained in a project and data in a country programme, informed the Government of Australia and UNDP that the Government of Vietnam should be made aware of the Executive Committee's policy and requested updating the ODS consumption figures in its country programme for the aerosol sector, and submitting the revised figures and a detailed explanation of the reasons for the variation.
3. The Government of Australia informed the Secretariat that the Government of Vietnam will submit an amendment to its country programme indicating the current consumption of controlled substances in the country.
4. Various activities associated with refrigerant emission controls, including recycling practices, have been approved by the Executive Committee, through bilateral cooperation by the Governments of France and the United States and through UNIDO's work programme. While these activities are targeted to different refrigeration subsectors, close coordination with the other donor countries and UNIDO during project implementation is required to avoid overlapping or duplication.
5. The project comprises a pilot phase in which recycling and other emission reduction strategies will be implemented and assessed and an extension phase in which a full emission reduction programme in commercial refrigeration will be put into place. Design of the extension phase will start one year after project approval. While the extension phase will be on the basis of the results of the pilot phase, the project costs are for full project implementation. If some of the equipment listed for the Extension stage would not be needed, the funds allocated will be used to increase the number of refrigeration technicians that will receive training and a recovery machine. If this is not feasible, the funds will be returned to the Multilateral Fund.
6. Costs related to technical assistance and training amount to about 40 per cent of the total project cost, which are high as compared to similar projects of this size. This is due to the need to conduct an efficient and effective analysis of the incentives to recover and recycle CFC in the Vietnam context. The technical assistance component will identify and address each of the financial, cultural and economic incentives of the enterprise managers, service technicians, equipment suppliers, customers and the government officials.

RECOMMENDATIONS

1. The Fund Secretariat recommends approval of the project with associated support costs at the funding levels indicated, subject to the condition in Recommendation 2 below:

Project	Project Cost US \$	Support Cost US \$	Implementing Agency
Demonstration project on CFC recycling and emission reduction in the commercial refrigeration sector (Government of Australia component)	282,687	Not applicable	Government of Australia

2. The Fund Secretariat recommends that approval of the projects be subject to any decision of the Executive Committee at the 20th Meeting in relation to the differences between sectoral consumption data reported in a country programme and data in a project.

3. Subject to condition in Recommendation 2, the bilateral component complies with guidelines for bilateral projects and the Treasurer should offset US \$282,687 against the Government of Australia's 1996 contributions to the Fund.