



LEBANON

NATIONAL PHASE-OUT MANAGEMENT PLAN FOR ANNEX-A, GROUP-I SUBSTANCES (CFCs)

Prepared jointly by

Ministry of Environment, Lebanon
United Nations Development Programme
Final Approved Version – 20 September 2004

**MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE
MONTREAL PROTOCOL ON SUBSTANCES THAT DEplete THE OZONE LAYER**

PROJECT COVER SHEET FOR MULTI-YEAR PROJECTS

COUNTRY LEBANON

PROJECT TITLE

National Phase-out Management Plan for Annex-A Group-I substances (CFCs) in Lebanon

BILATERAL/IMPLEMENTING AGENCY

UNDP – Lead Implementing Agency
Spain/GTZ – Cooperating Agency

SUB-PROJECT TITLE (S)

National Phase-out Management Plan Implementation and Coordination Phase-out in the Aerosols, Foams and Refrigeration (Mfg) Sectors Refrigeration (Sveg) Sector – Recovery and Recycling Training/demonstration and technical support

UNDP
UNDP
UNDP
Spain/GTZ

NATIONAL COORDINATING AGENCY

Ozone Office, Ministry of Environment

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN THE PROJECT

A. Article-7F Data (ODP MT for CY 2003, as of May 2004)

Annex-A Group-I Substances (CFCs) ODP MT	499.30	Annex-B Group-III Substances (TCA)	0
Annex-B Group-II Substances (CTC) ODP MT	0	Annex-E Group-I Substances (MeBr)	154.29

B. Country Programme Sectoral Data (ODP MT for CY 2003, as of May 2004)

Substance	Aerosols	Foams	Refrigeration	Substance	Solvents	Process Agent	Fumigant
CFC-11	0	65.35	21.5	CTC	0	0	0
CFC-12	17.25	0	389.5	TCA	0	0	0
CFC-115	0	0	5.70	MeBr	0	0	154.29

CFC CONSUMPTION REMAINING ELIGIBLE FOR FUNDING (ODP MT) 313

CURRENT YEAR BUSINESS PLAN: Funding level US\$ 229,000; Total Phase-out 30 ODP MT

PROJECT DATA		2004	2005	2006	2007	2008	2009	Total
Annex-A Group-I (CFCs)	Montreal Protocol Limits		362		109			
	Annual Consumption Limit	499	362	235	75	35	0	N/A
	Annual Phase-out from ongoing projects	82	0	0	0	0	0	82
	Annual Phase-out newly addressed	0	97	150	31	35	0	313
	Annual Unfunded Phase-out	55	30	10	9	0	0	104
Total ODS Consumption to be Phased Out		137	127	160	40	35	0	499
Total ODS Consumption to be Phased In (HCFCs)								
Project Costs (US\$)								
Funding for Lead Agency (UNDP)		1,061,420	350,000	200,000	100,000	65,000	0	1,776,420
Funding for Cooperating Agency (Spain/GTZ)		315,000	0	0	0	0	0	315,000
Total Project Funding		1,376,420	350,000	200,000	100,000	65,000	0	2,091,420
Support Costs (US\$)								
Support Cost for Lead Agency (UNDP)		79,607	26,250	15,000	7,500	4,875	0	133,232
Support Cost for Cooperating Agency (Spain/GTZ)		40,950	0	0	0	0	0	40,950
Total Support Costs		120,557	26,250	15,000	7,500	4,875	0	174,182
TOTAL COST TO MULTILATERAL FUND		1,496,977	376,250	215,000	107,500	69,875	0	2,265,602
PROJECT COST EFFECTIVENESS (US\$/kg/y)								

FUNDING REQUEST

Approval in principle of Total ODS Phase-out, Total Project Funding and Total Support Costs and approval of funding for the first tranche for 2004 of US\$ 1,376,420 plus support costs of US\$ 79,607 (UNDP) and US\$ 40,950 (Spain/GTZ) as indicated above.

Prepared by: UNDP in consultation with Ministry of Environment
Reviewed by: Lambert Kuijpers

Date: April – September 2004
Date: August 2004

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EXECUTIVE SUMMARY

Introduction

The National Phase-out Management Plan will phase out the remaining consumption of controlled substances under Annex-A, Group-I substances (CFCs) of the Montreal Protocol, in Lebanon over the period of 2004–2009. To achieve this target, a combination of investment, training, technical support and institutional support activities will be carried out. The National Phase-out Management Plan for CFCs will enable Lebanon to comply with the Montreal Protocol control schedule milestones of achieving 50% of the baseline consumption by 2005 and 15% of the baseline consumption by 2007. Complete phase-out is proposed to be achieved by 2009.

The National Phase-out Management Plan for CFCs will be implemented by Lebanon through the Ozone Office, with UNDP as the lead implementing agency and with GTZ-Germany as the cooperating agency. The project will be implemented through five annual implementation programs with annual targets for CFC consumption and phase-out.

CFC consumption and phase-out

The project aims at eliminating, over a period of five years (2004-2009), the remaining CFC consumption in Lebanon, which is calculated as the difference between the reported consumption during 2003 and the consumption from approved ongoing projects as of 31 December 2003, works out to 417 ODP MT. Of this, the calculated unfunded consumption is 313 ODP MT. This difference is primarily ascribed to the consumption originating from the southern part of Lebanon, which was liberated for access only in 2001. The source of residual CFC consumption by one enterprise in the aerosol sector, the enterprises in the foam and refrigeration (manufacturing) sectors and the residual CFC usage by the service establishments in the refrigeration (servicing) and MAC, has been identified in the CP Update as being from this southern part of Lebanon. The funding for addressing this residual CFC consumption from the southern part of Lebanon has been requested for the first time. Therefore, the National Phase-out Management Plan for CFCs requests a different basis for treatment of phase-out costs for this consumption, than what is normally considered for such Plans.

Strategy

The National Phase-out Management Plan will employ a combination of instruments, namely investment, technical support, training and institutional support to manage the supply and demand of CFCs in order to achieve its goal. The strategy is to eliminate the CFC consumption in the manufacturing sectors by 2005 and then gradually phase-out the consumption of CFCs in the refrigeration servicing sector by 2009. CFC consumption reduction schedule proposed is in advance of or in compliance with the control schedule of the Montreal Protocol. Any residual demand for CFCs thereafter will be met either through recycled CFCs or CFCs imported before 2009 under the allowable import quota. From the supply-side, the plan will rely on the application of import licensing to regulate the quantity of CFCs allowed into the country. On the demand side, the plan will use a combination of regulatory measures to reduce the demand to remain in balance with the supply of CFCs. In addition, the plan will reduce demand by completing the implementation of on-going projects and retirement or retrofitting of existing CFC-containing equipment including chillers and vehicles.

Funding and Disbursement

The Government of Lebanon seeks approval in principle of the total requested funding of US\$ 2,091,420, which will be disbursed in five tranches annually against a schedule of national CFC consumption and phase-out targets, which are either in advance of or in compliance with the Montreal Protocol schedule. The Government of Lebanon also requests maximum flexibility to utilize the approved funding to achieve the goals of the plan.

Costs

The total cost of and requested funding for the National Phase-out Management Plan is US\$ 2,091,420.

Component	Sector	Activity	Implementing Agency	Impact (ODP MT)	Budget (US\$)
Investment	Aerosols	Phase-out at remaining users	UNDP	17.00	69,700
	Foam	Phase-out at remaining users	UNDP	53.70	401,139
	Refrigeration (Mfg)	Phase-out at remaining users	UNDP	44.50	445,000
	Refrigeration (Svcg)	Technical Assistance/Recovery/Recycling	UNDP	45.00	636,500
Technical Support and Training	Refrigeration (Svcg)	Pilot retrofitting demonstration for end-users, Training programs for Master Trainers and Technicians	GTZ	Indirect	280,000
	Refrigeration (Svcg)	Technician Licensing Program Regulations/Codes of Practice	GTZ		35,000
Institutional Support	All	Plan management, monitoring, reporting, audits/verification, awareness, capacity building, policy development, regulation	UNDP	Indirect	224,081
TOTAL					2,091,420

Implementation and Management

The plan will be managed by Government of Lebanon through the Ozone Office, with the assistance of UNDP as the lead agency and GTZ-Germany as the cooperating agency.

Independent Audit and Monitoring

The Government of Lebanon, through the Ozone Office, will be responsible for the monitoring of the implementation of the plan and UNDP as the lead implementing agency, as may be required by the Executive Committee of the Multilateral Fund, will conduct an independent audit to confirm the achievement of the annual CFC consumption and phase-out targets.

PROJECT OF THE GOVERNMENT OF LEBANON
National Phase-out Management Plan for Annex-A Group-I substances (CFCs) in Lebanon

1. PROJECT OBJECTIVES

The objectives of this project are:

- a) To achieve complete phase-out of Annex-A, Group-I substances (CFCs) in Lebanon by 2009.
- b) To enable Lebanon to meet its obligations of phased ODS reductions in accordance with the control schedule of the Montreal Protocol.
- c) To ensure timely, sustainable and cost-effective CFC phase-out, through development and implementation of a combination of investment, technical support, training and policy/management support components.

2. BACKGROUND

2.1 Introduction

Lebanon is a Mediterranean country with a land area of about 10,500 sq. km and a population of about 4.2 million. About 80% of the population is urban. The key economic sectors are services (about 60% of the gross domestic product), industry (about 26% of the gross domestic product) and agriculture (about 14% of the gross domestic product).

2.2 Montreal Protocol Activities

Lebanon ratified the Vienna Convention and the Montreal Protocol along with the London Amendment in March 1993. The Copenhagen and Montreal Amendments were ratified in July 2000. The per capita consumption of ODS in Lebanon being less than 0.3 kg, Lebanon is classified under Article-5 (1) of the Montreal Protocol. In 1994, with the assistance of UNDP, Lebanon prepared a Country Programme incorporating the national strategy and action plan to phase out ODS in line with the Montreal Protocol control schedule. The action plan proposed to address the three key ODS consuming industry sectors, namely Aerosols, Foams and Refrigeration, through institutional and regulatory measures, awareness and information dissemination, technology transfer, technical assistance and monitoring.

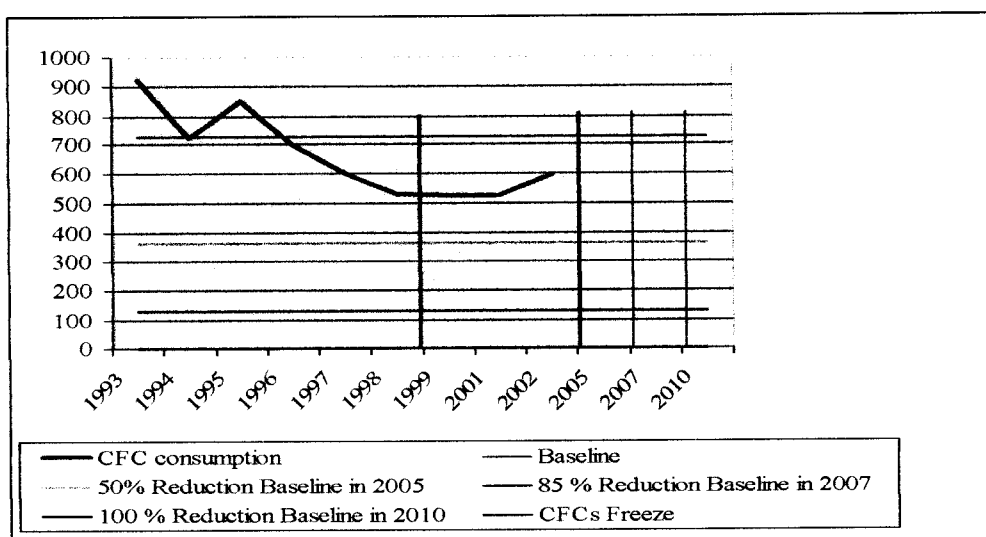


Fig. 1: CFC consumption trends in Lebanon

MMA

The annual CFC consumption data for Lebanon as reported under Article 7F of the Montreal Protocol from 1994 to 2002 are as below:

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002
CFC (MT)	730	815	734	618	536	527	540	562	596

Lebanon achieved the first milestone under the Montreal Protocol control schedule, namely, the freeze in consumption of CFCs to the baseline consumption level in 1999, mainly through implementing technology conversion projects in the main CFC consuming sectors, i.e., Aerosols, Foams and Refrigeration. In order to realistically assess the CFC consumption trends in the various sectors in Lebanon, the government initiated preparation of the Country Programme Update in 2002/2003 with the assistance of the UNDP and the industry, under which, all the ODS consuming sectors were resurveyed and the current CFC consumption data for all sectors was established. The CP Update survey identified additional CFC consumption in the Southern areas of Lebanon, which were reactivated since 2001. The updated country program also renewed and reinforced Lebanon's commitment, strategy and action plans to eliminate ODS and is intended to serve as a guideline for future activities related to meeting Lebanon's obligations under the Montreal Protocol. The updated country program outlines the required investment and institutional activities to achieve sustainable phase-out of CFCs. Realizing the needs of the industry and the economy, the updated Country Programme has set the target date for complete phase-out of Annex-A Group-I substances (CFCs) by 2009, through a comprehensive National Phase-out Management Plan.

In compliance with Decision 35/57 of the Executive Committee of the Multilateral Fund, upon completion of the CP Update survey, Lebanon has selected Option-2 for determining the starting point for addressing the remaining CFC consumption in Lebanon and accordingly informed the MLF Secretariat.

2.3 Institutional Framework

The activities related to ozone layer protection and implementation of the Montreal Protocol, are coordinated through the Ozone Office, within the Ministry of Environment.

To provide regulatory and policy support for enabling the industry to eliminate ODS, the Government of Lebanon has taken the following initiatives and actions:

- a) ODS were included in the list of items requiring import licensing in 1998
- b) Prohibition on imports of Halons from 1998.
- c) Exemption of all MLF funded inputs from import taxes from 1998
- d) Regulations on control and monitoring of ODS usage from 2003
- e) Active monitoring of the progress of implementation of projects funded by MLF
- f) Formulating guidelines and regulations as necessary for policy implementation
- g) Supporting public awareness initiatives and campaigns for promoting ozone layer protection at the consumer level.
- h) Regular interaction with other ministries and departments, industry representatives and implementing agencies for information dissemination related to impact of policy measures

2.4 Industry Structure

The CFC consuming sectors in Lebanon have experienced significant growth in the past two decades due to the consistent growth in the per capita incomes, the predominance of the tourism and service industry and the relatively low market penetration of aerosol, foam and refrigeration products in the past. CFCs are consumed as propellants (aerosols), blowing agents (foams) and refrigerants (in the manufacture and servicing of refrigeration and air-conditioning products).

2.4.1 Supply Industry

Production

There is no production of CFCs in Lebanon. The entire domestic demand is met through imports mainly from India, China and Europe.

Imports

The Government of Lebanon has designated certain importers for CFCs, who are licensed to import CFCs, mandated through the licensing regulation.

Distribution

The CFCs imported are sold to the users directly by the importers or indirectly through secondary distributors or retailers. CFCs are also supplied through service establishments and contractors. Considering the geography and size of the country, the availability of upstream supplies in general is satisfactory, however the quality and level of customer service and technical support is quite limited, mainly due to inadequate infrastructure and due to insufficient availability of trained and qualified staff.

2.4.2 User Industry

Manufacturing

There are several manufacturers of CFC-based equipment and products in the Aerosols, Foams and the Refrigeration Sectors, many of whom have converted to non-CFC technologies through the assistance of the Multilateral Fund. Most manufacturers are predominantly small and unorganized, with modest or low investments in plants and machinery. They also lack adequately trained and knowledgeable manpower.

Servicing

There is a significant existing population of domestic, commercial, industrial and transport refrigeration appliances, equipment and systems, and also of automobile air conditioning and refrigeration units, requiring servicing. Also, due to the economic growth in the past two decades, there are several office buildings and complexes served by CFC-based central air conditioning centrifugal chillers, which require servicing. As a result, there is a fast growing servicing sector comprising of a large number of servicing establishments.

A few service establishments are a part of the network of servicing centers owned or managed by the major domestic and commercial refrigeration equipment manufacturers and suppliers or a part of the network of local offices of the main dealers/distributors of refrigeration raw materials, components, consumables, etc. Most remaining service establishments are medium-sized and predominantly independent catering to small and medium-sized end users in the respective local markets. There are in addition, a large number of small servicing shops and freelancing service technicians.

End-users

The end-users of products containing CFCs are in the domestic (household refrigerators/freezers and hot/cold water dispensers), commercial (small shops and other small commercial establishments, mini markets, departmental stores and supermarkets), industrial (process refrigeration systems, cold stores, etc) and transport refrigeration sub-sectors (refrigerated trucks and trailers) and in the mobile air conditioning (passenger cars and buses) and chiller (centrifugal chiller plants) sub-sectors.

3. SECTOR BASELINE INFORMATION

3.1 Aerosol Sector

Non-Medical Products

The consumption of CFCs in the aerosol industry has decreased steadily from about 345 MT in 1994 to less than 20 MT of CFC-12 to date. There is one remaining manufacturer in Lebanon that uses CFCs (17 MT) as propellant, which was identified in the CP Update survey. The current status of the approved non-medical aerosol projects in Lebanon is tabulated below:

Table-1
Lebanon: Status of approved projects in the Aerosol Sector

MLF Number	Agency	Title/Name	Impact (ODP MT)	Grant (US\$)	Scheduled Completion Date	Status
LEB/ARS/19/INV/05	UNIDO	Cosmaline	87.70	240,125	May-1997	Completed
LEB/ARS/19/INV/06	UNIDO	Zeeni's Trading	212.00	397,618	May-1997	Completed
LEB/ARS/28/INV/30	UNDP	Incoma	53.54	179,198	Feb-2002	Completed
LEB/ARS/29/INV/32	UNDP	SME Group	50.70	354,924	Dec-2002	Completed
LEB/ARS/28/INV/35	UNDP	Societe Nougeaim	54.00	166,486	Feb-2002	Completed
Total			457.94	1,338,351		

The average cost effectiveness for projects in the aerosols sector was US\$ 2.93/kg.

Metered Dose Inhalers (MDI)

Lebanon does not produce any CFC-based MDIs. All MDIs are imported, mainly from developed countries.

3.2 Foam Sector

There are six medium-sized manufacturers of flexible slabstock foam and one manufacturer of flexible molded foam, all of which have been assisted through MLF. In the rigid foam sub-sector, there are two medium-sized manufacturers, one of whom has been assisted through MLF and about 13 SMEs, which have yet to be addressed. The status of the approved projects in the Foam Sector is tabulated below. The average cost-effectiveness is about US\$ 4.5/kg and the total unaddressed consumption is estimated at 65 MT.

Table-2
Lebanon: Status of approved projects in the Foam Sector

MLF Number	Agency	Title/Name	Impact (ODP MT)	Grant (US\$)	Scheduled Completion Date	Status
LEB/FOA/20/INV/09	UNIDO	Nasri Karam & Sons (FS)	22.00	112,824	Oct-1997	Completed
LEB/FOA/20/INV/10	AFD	Meuble Mode (FM)	9.00	55,700	Oct-1997	Completed
LEB/FOA/20/INV/11	AFD	Furniture and Plastic (FS)	28.00	128,700	Oct-1997	Completed
LEB/FOA/20/INV/12	AFD	Plastiflex (FS)	42.00	154,000	Oct-1997	Completed
LEB/FOA/20/INV/13	AFD	Merza Foam (FS)	45.00	108,172	Oct-1997	Completed
LEB/FOA/20/INV/14	AFD	Kilzi (Rigid)	22.47	141,000	Oct-1997	Completed
LEB/FOA/20/INV/15	AFD	Fomaco (FS)	26.00	154,000	Oct-1997	Completed
LEB/FOA/21/INV/18	UNIDO	Henri Abdallah (FS)	16.57	91,055	Feb-1998	Completed
Total			211.04	945,451		

3.3 Refrigeration Sector

Manufacturing

The Refrigeration Sector in Lebanon has about 76 manufacturers. There is one manufacturer of domestic refrigeration appliances and the remaining are manufacturers of commercial refrigeration equipment. Except the 34 SMEs (45 MT) in commercial refrigeration sector identified during the CP Update survey, all other enterprises have been assisted through MLF projects. The average cost-effectiveness was about US\$ 12.60/kg. The status of the approved projects in the Refrigeration Sector is tabulated below.

Table-3
Lebanon: Status of approved projects in the Refrigeration (Mfg) Sector

MLF Number	Agency	Title/Name	Impact (ODP MT)	Grant (US\$)	Scheduled Completion Date	Status
LEB/REF/22/INV/19	UNIDO	OPACO (DR)	135.00	1,483,827	Nov-1998	Completed
LEB/REF/23/INV/22	AFD	SME Group - 15 enterprises (CR)	10.40	166,605	Jun-1999	Completed
LEB/REF/29/INV/33	UNIDO	Group 1 - 6 enterprises (CR)	18.60	291,547	Dec-2001	Completed
LEB/REF/29/INV/34	UNDP	Farjallah (CR)	20.10	226,052	Dec-2002	Completed
LEB/REF/31/INV/36	UNIDO	Group 2 - 6 enterprises (CR)	15.66	229,606	Jan-2003	Completed*
LEB/REF/31/INV/39	UNIDO	Group 3 - 6 enterprises (CR)	15.80	235,603	Jan-2003	Completed*
LEB/REF/34/INV/45	UNIDO	Group 4 - 6 enterprises (CR)	18.75	316,029	Aug-2003	Completed*
Total			234.31	2,949,269		

* The projects are completed, however, a net consumption of 20 MT persisted during 2003 due to partial year operation with CFCs

Servicing

Following is the list of training, technical assistance and investment projects approved in the Refrigeration (Servicing) Sector in Lebanon:

Table-4
Lebanon: Status of approved projects in the Refrigeration (Servicing) Sector

MLF Number	Agency	Title/Name	Impact (ODP MT)	Grant (US\$)	Scheduled Completion Date	Status
LEB/REF/23/TRA/20	AFD	Training on R&R Equipment	0.00	52,668	June-1999	Completed
LEB/REF/23/TAS/21	AFD	Recovery/Recycling Demo	62.00	425,289	Dec-1998	Ongoing
LEB/REF/26/TRA/25	GTZ	Training on HC practices	0.00	49,500	Dec-1999	Completed
LEB/REF/28/TAS/29	AFD	TA - Chillers, customs, legal	0.00	45,750	Feb-2002	Ongoing
LEB/REF/28/TAS/31	GTZ	TA - Chillers, customs, legal	0.00	37,550	Feb-2002	Completed
Total			62.00	610,757		

One project for recovery/recycling demonstration was approved in Lebanon, which is implemented by AFD and currently ongoing. This project covers only a part of the refrigeration servicing sector, i.e., establishing a national recovery/reclamation network on a regional basis and only a part of the total number of service establishments in Lebanon were covered under this project

The training project implemented by GTZ targeted the training of technicians in improved operations, service and maintenance using hydrocarbons. Two training courses were conducted by the German training institution BFS, in cooperation with GTZ, UNEP and ALME at the Lebanon Ministry of Environment regarding good refrigeration practices and hydrocarbons as refrigerant in household refrigeration and air conditioners by means of a demonstration unit. A total of 45 technicians took part in these courses.

The results of these training activities showed that the Lebanese safety standards for commercial refrigeration units are very similar to the German norms. With minor modifications similar safety regulations can be established in Lebanon. However, conversion to hydrocarbon technology would seem more difficult, as the current electrical installations are problematic. There is further demand for training in hydrocarbon technologies. There is also a strong need for a nation-wide training in good refrigeration practices and design of emission free refrigeration systems, as both these components were not a part of the GTZ or AFD training projects.

Refrigeration Servicing (domestic and commercial refrigeration)

As per the CP Update survey, the estimated population of household refrigeration products is about 1,257,000 units, of which, 905,000 units are based on CFC-12 technology. The CFC consumption in servicing these appliances is estimated at 105 MT. Commercial refrigeration equipment such as chest freezers, bottle coolers, display cabinets, etc., is typically found in hotels, restaurants, supermarkets, hospitals, etc. The estimated population of commercial refrigeration equipment installations (including cold rooms) in Lebanon is about 407,400 units, of which, about 335,000 units are based on CFC-12 technology. The CFC consumption in servicing these equipment installations is estimated at 167 MT. There are about 310 servicing establishments catering to domestic, commercial and industrial refrigeration equipment, other than those covered by the ongoing recovery/recycling network project (of which, 50 are proposed to be supported under the Plan).

MAC and Transport Refrigeration Servicing

The CP Update survey estimated the total population of registered air-conditioned automobiles in Lebanon to be 493,000 vehicles, of which, 204,000 vehicles are equipped with CFC-12 based units. In addition, about 1,700 refrigerated trucks were identified, most of which were found to either use CFC-12 based systems, or were topped with CFC-12. The estimated CFC consumption in MAC and transport refrigeration servicing is 63 MT. There are about 125 workshops catering to servicing of mobile air conditioning and transport refrigeration equipment, in addition to those covered under the ongoing recovery/recycling network project.

Chiller Servicing

There are 32 CFC-based centrifugal chiller installations in Lebanon, of which, 16 have already converted to non-CFC technologies. The remaining 16 installations are in the process of conversion (either retrofitting or replacement) to non-CFC technologies, mainly for energy-efficiency reasons. The CFC consumption in servicing of these chillers is estimated to be about 2 MT annually. The CFC consumption in Chiller servicing will not be addressed by Government through this project, but through other means.

Training Establishments

There are an estimated 25 recognized and operational training institutions providing vocational education and courses in Refrigeration and Air Conditioning, of which 10 are proposed to be supported under the Plan. There are estimated to be between 2,000 and 2,500 skilled and semi-skilled refrigeration technicians in Lebanon, of which about 1,000 are proposed to be trained under the Plan

Summary

As per the findings of the CP Update survey, the total CFC consumption in Lebanon for 2003 is 417 MT, of which, 82 MT is from approved ongoing projects and the remaining 335 MT is unaddressed. Of this, 45 MT is from consumption in manufacturing activities and the remaining 290 MT is the consumption in servicing activities.

3.4 CFC Consumption and Phase-out Scenario

The overall baseline consumption of Annex-A, Group-I substances (CFCs) for all sectors in Lebanon, as reported by the Government of Lebanon is tabulated below:

Table-5
Lebanon: Baseline CFC Consumption Data (1995-97)

SECTOR	1995 (MT)	1996 (MT)	1997 (MT)	Average (MT)
Aerosols	131	127	10	89
Foams	285	285	250	273
Refrigeration	399	321	359	361
Total	815	733	619	723

The breakdown of CFC consumption in Lebanon for the various CFC-consuming sectors for CY 2003 is tabulated below:

Table-6
Lebanon: CFC Consumption Data for CY 2003

Sector	Baseline Consumption (1995-97 Avg.) (ODP MT)	Consumption for CY 2003 (ODP MT)	Consumption in approved ongoing projects (ODP MT)	Calculated remaining consumption (ODP MT)	Remaining Consumption as per the CP Update (ODP MT)
Aerosols	89	17	0	17	17
Foams	273	65	0	65	65
Refrigeration	361	417	82	335	335
TOTAL	723	499	82	417	417

In order to comply with the Montreal Protocol control target of 50% of the baseline consumption (which works out to 361.5 MT) by 2005, Lebanon would need to phase-out 55.5 MT additionally. At present, out of the total of 82 MT consumption from approved ongoing projects, 62 MT is from the ongoing recovery/recycling demonstration project, which has just commenced implementation and the results cannot be forthcoming for 1-2 years. The remaining 20 MT is the residual/partial year CFC consumption of three refrigeration projects completed during 2003.

Table-7
Lebanon: Remaining Eligible CFC Consumption

Details of Sources of Remaining Consumption identified in the CP Update Survey		Remaining Consumption in Sector as per CP Update Survey (ODP MT)	Consumption from ineligible enterprises (ODPMT)	Net remaining eligible consumption (ODP MT)
Aerosols	One aerosol filling enterprise	17.00	0	17.00
Foam	13 SMEs producing rigid foam	65.00	6.00	59.00
Refrigeration	35 SMEs in Mfg (45 MT) and Servicing (290 MT)	335.00	0	335.00
Total		417.00	6.00	411.00

Table 7 above, delineates the net remaining eligible CFC consumption in Lebanon.

MKH

4. PROJECT DESCRIPTION

The National Phase-out Management Plan for CFCs in Lebanon will be implemented through a combination of Investment, Technical support, Training and Institutional support components.

4.1 Investment Component

The investment component of the plan will focus on enabling the participant enterprises and establishments to physically eliminate CFCs from their production activities and would comprise of the following elements:

- Assessment of the technical requirements of conversion
- Determining the scope of international and local procurement
- Development of technical specifications and terms of reference for procurement
- Prequalification and short-listing of vendors
- International/local competitive bidding
- Techno-commercial evaluation of bids and vendor selection
- Procurement contracts
- Site preparation
- Customs clearance and delivery
- Installation and start-up
- Product and process trials
- Operator training
- Commissioning and phase-in of CFC-free production
- Destruction of redundant CFC-based baseline equipment

The above-mentioned activities will be implemented by implementing agencies as noted and will be supported through external process experts as required.

4.1.1 Aerosol Sector (UNDP)

The single remaining enterprise in the Aerosol Sector will be assisted for converting to hydrocarbon aerosol propellant, through provision of equipment, technical assistance and training, resulting in the elimination of 17 MT of CFCs in its manufacturing activities.

4.1.2 Foam Sector (UNDP)

The one remaining medium-sized enterprise in the rigid foam sub-sector will be provided with high-pressure foam equipment. The remaining 13 SMEs will be provided with low-medium pressure foam equipment, enabling conversion to HCFC-141b technology. The required technical assistance and training will be also provided, resulting in the elimination of 65 MT of CFCs in this sector upon completion of all activities. The phase-out in ineligible enterprises will not be funded under the plan, but will be facilitated by the government through appropriate regulation.

4.1.3 Refrigeration (Mfg) Sector (UNIDO)

In this sector, 35 enterprises were identified and verified as eligible to receive assistance through the Multilateral Fund. There are 7 enterprises with a significant foaming baseline. Due to the cost effectiveness considerations, only these enterprises will be provided with one low-pressure foam equipment each. All enterprises will be provided with one set of suitable refrigerant charging, evacuation and leak detection equipment and appropriate technical assistance and training. Upon completion of all activities at these 35 enterprises, about 45 MT of CFCs would be eliminated.

4.1.4 Refrigeration (Servicing) Sector

Recovery and Recycling Program (UNDP)

This sub-component will provide recovery & recycling equipment to service establishments, commensurate with their size and baseline conditions to ensure the following:

- CFC use is reduced to the extent feasible in servicing operations, by discontinuing venting and flushing and facilitating of reuse of CFCs through recycling
- Reducing the import demand for virgin CFCs
- Enhancing the capacity in the servicing establishments to facilitate early retrofitting of CFC-based equipment at their end-user clients.
- Facilitate creation of an inventory of recovered CFCs to meet to the extent possible, the servicing requirement of existing CFC-based equipment during the remaining economic life

As per the CP Update survey, there are about 310 servicing establishments catering to domestic, commercial and industrial refrigeration equipment and about 125 workshops catering to mobile air conditioning (MAC) and transport refrigeration equipment.

This sub-component will also provide demonstration equipment to the existing qualified and recognized training establishments, for strengthening their capacity and effectiveness in imparting hands-on training to prospective technicians on actual field-used equipment. This will result in reducing the technician's learning curve in these operations prior to their entering the field and would supplement the content of their vocational training curriculum.

As identified in the survey, there are about 25 qualified institutions offering regular curricula in Refrigeration and Air Conditioning. Each of these institutions will be provided with one set of demonstration equipment comprising of recovery equipment, recycling equipment, charging unit, vacuum pump, refrigerant identification kit and accessories, enabling these institutions to provide early and direct hands-on exposure to the technician trainees, as a curriculum supplement.

The projected direct impact of introduction of recovery and/or recycling in the CFC usage for servicing in the various sub-sectors is about 45 MT.

Pilot Retrofitting/Replacement Program for End Users (GTZ)

It is proposed to select up to 50 representative end-users from the typical refrigeration end use applications (cold storages, hospitals, supermarkets, restaurants, etc., but excluding chillers and MAC equipment) for carrying out a retrofitting/replacement demonstration. The end users will need to meet the following criteria:

- Should own and be a continuous operator of CFC-based refrigeration equipment installed prior to July 1995 but not earlier than 1990, with a contained CFC charge of at least 10 kg.
- Should be in business at the particular location since establishment
- Should be financially viable
- Should undertake if selected, to complete permanent retrofitting or replacement (as applicable) of the baseline CFC-based refrigeration equipment within six months, in accordance with the technical guidelines provided and destroy replaced CFC-based equipment (in case of replacement)
- Should undertake to provide to Ozone Office, free access to the retrofitted/replaced equipment for demonstration purposes, including advertisement/promotions or similar information dissemination activities, for a period of at least 3 years

The Ozone Office will carry out the qualification and selection of end users for participating in this pilot program, with technical assistance from the implementing agency. The upper limit of the number of participating end users would be 50 (as described above). The selected end users would then enter into a binding agreement with the Ozone Unit, incorporating appropriate legal, technical and operational provisions. Each end user would be provided financial assistance covering the actual retrofitting/replacement costs (excluding taxes) of up to a maximum of US\$ 3,000 against satisfactory completion of conversion and satisfactory documentation justifying the costs. Any balance funds would be applied towards creating additional such demonstration end users, until exhausted.

The expected outcomes of this pilot program would be:

- Availability of demonstration cases of successful retrofitting and replacement of CFC-based refrigeration systems for information dissemination and awareness
- Confidence building in other end users
- Precipitating early retrofitting and/or replacement decisions at other end users
- Reducing CFC demand for servicing of refrigeration equipment at end users

4.2 Training Component (GTZ)

Given that the Refrigeration (Servicing) Sector accounts for about 80% of the remaining consumption of CFCs in Lebanon, the sustainability of the outcomes of the National Phase-out Management Plan for CFCs would be significantly influenced by the capability and willingness of the large number of refrigeration technicians in this sector (of which only about 20% possess formal training) to implement practices that would lead to optimal and economical use of CFCs in servicing. To ensure that this important manpower base is positioned to contribute tangibly to the plan objectives, it is considered essential to deliver to these technicians, the requisite level of classroom and hands-on training pertaining to good practices in operation and maintenance of equipment, process and applications involved in CFC-based and substitute refrigerants, technologies and systems, with a specific emphasis on conservation, containment, recovery and recycling of refrigerants during servicing and zero emissions. The Training Component would comprise of the following:

4.2.1 Master Trainers Program

This sub-component will aim to create a pool of Master Trainers leading to a sustainable local capacity. The candidates for Master Trainers would be drawn from the faculty available in the existing training establishments and also from major service establishments, with the aim of preparing about 20 Master Trainers.

The training of Master Trainer candidates would be delivered through training workshops to be conducted by international experts designated by the implementing agency in consultation with the Ozone Unit. It is proposed to organize a training workshop of 3-weeks duration, in a way as to effectively target the geographical distribution of training and servicing establishments. The training curriculum would comprise of classroom presentations, practical demonstrations and field exposure visits. The training courses would include training materials and demonstration equipment and also cover development of curriculum for subsequent technician training (see 4.2.2 below)

4.2.2 Technicians Training Program

This sub-component will target the training of refrigeration technicians operating at the field level for their livelihoods, in good practices in refrigeration. Since these technicians are the first-level interface with the users of refrigeration equipment for servicing, it is considered crucial that maximum numbers of technicians are brought under the umbrella of training. While it would not be realistic to cover all existing technicians from the census established in the survey, it is considered feasible to impart training to about 500 skilled and up to 2,000 semi-skilled technicians.

Technician training for good practices in refrigeration would be carried out by the Master Trainers (see 4.2.1). The Ozone Office will organize information dissemination and awareness on the training program, through the major service establishments and training establishments, who would conduct the training course according to the curriculum developed in the Master Trainers sub-component, be equipped with demonstration equipment (see 4.1.4) and would also enroll the technicians for the course. The Technician Training program would be implemented in collaboration with the National Refrigeration Institute and would comprise of a course to be provided at 8 different locations in the country, spread over 5 days each, in order to outreach the approximately 2,500 technicians. The technicians would be provided with classroom and hands-on training, a guide in good practices, documentation and other technical reference materials. A key component of the course would be to reduce CFC emissions during servicing. Upon completion of the prescribed course they would be provided with a certificate.

4.2.3 Zero-emission Program

The zero-emission program will include qualification of refrigeration technicians in zero-emissions training, a new regulation and standard and certification in zero-emission. The program will comprise of the following elements:

- Adaptation of EU2037 standard for Lebanon to prevent, control and minimize leakages and to ensure recovery of substances from CFC containing systems.
- Introduction of a new standard similar to EN 378 - Refrigerating Systems and Heat Pumps - Safety and Environmental Requirements
- Certification of technicians and enterprises
- Training in emission reduction - Soldering TVE, layout and design of refrigeration systems

4.3 Technical Support Component (GTZ)

The three CFC- consuming sectors as a whole will need to be supported through provision of a technical support component for ensuring that phase-out actions and initiatives are not only technically sound but also sustainable, and consistent with the important priorities of the Government, which are to prevent industrial dislocation, obsolescence and adverse impact to the economy. The Technical Support component will assist the three sectors as a whole, for the following:

- Establishment of a licensing program for technicians
- Establishment quality and performance standards for aerosol, foam and refrigeration products
- Establishment of regulations and codes of practices for CFC usage, especially in the refrigeration manufacturing and servicing sectors.

4.4 Institutional Support Component (UNDP)

The implementation of the National Phase-out Management Plan for CFCs will need to be closely aligned and coordinated with the various policy, regulatory, fiscal, awareness and capacity-building actions, which the Government of Lebanon is taking and will need to take in future, in order to ensure that the implementation of the Plan is consistent with the Government priorities and its compliance obligations. Further, in view of the annual CFC reductions needed to be achieved under the terms of the National Phase-out Management Plan, the implementation of the Plan will need to be closely and efficiently managed and will introduce additional coordinating, reporting and monitoring activities. The Institutional Support component of the Plan will include the following activities, for the duration of the Plan:

- a) Coordinating the Plan implementation with the various Government policy actions
- b) Establishment of a time-bound policy development and enforcement program, covering various legislative, regulatory, incentive, disincentive and punitive actions to enable the Government to acquire and exercise the required mandates in order to ensure compliance by the industry with the phase-out obligations.
- c) Development and implementation of training, awareness and capacity-building activities for key government decision-makers and other institutional stakeholders, to ensure a high-level commitment to the Plan objectives and obligations.
- d) Awareness creation for the Plan and for the Government initiatives, among consumers and public, through workshops, media publicity and other information dissemination measures.
- e) Preparation of and reporting on annual implementation plans
- f) Verification and confirmation of CFC reductions through site visit and audits.

4.5 Action Plan

The implementation of the National Phase-out Management Plan for CFCs will involve actions on part of the Government and industry to achieve the targeted ODS reductions, through a coordinated approach combining the inputs to the sector through the investment, technical support, training and institutional support components, in close alignment with the required policy and regulatory measures. Annex-1 provides details of the actions in relation to the annual ODS reduction milestones and the corresponding funding disbursements.

4.6 Technology

The selection of the alternative technology for conversion would be governed by the following:

- a) Proven and reasonably mature technology
- b) Cost-effective conversion.
- c) Availability of the systems at favorable pricing.
- d) Critical properties that have to be obtained in the end product
- e) Compliance with established (local and international) standards on safety and environment.

The technology selected would also need to be easily adaptable at the (generally small-sized) recipient enterprises, which predominantly would be participating in this project. The selection of the technology would also need to be consistent with the priorities of the Government and industry and to ensure sustainability of the technology in the long-term.

4.6.1 Aerosols

Hydrocarbon aerosol propellants have been the principal alternatives to CFC-12 and CFC-11/12 blends employed worldwide. They are approved by the UNEP Technical Options Report on Aerosols, Sterilants and Miscellaneous Uses and Carbon Tetrachloride. At this time, they are the most widely accepted alternatives for substituting CFCs as aerosol propellants.

4.6.2 Foams

The presently available/emerging CFC-phase-out technologies, for rigid polyurethane insulating foams are:

CLASSIFICATION	LIQUID TECHNOLOGY	GASEOUS TECHNOLOGY
Low ODP technologies (Interim)	HCFC-141b, HCFC-141b + water	HCFCs (22, 142b, 22 + 142b/141b)
Zero ODP technologies (Permanent)	Water, Pentanes (n, iso, cyclo) HFC-245fa, HFC-365mfc, HFC-365/227	HFCs (134a, 152a)

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Interim Technologies

HCFC-22 (independently or in combination with HCFC-142b and more recently with HCFC-141b) based systems, due to the low boiling point of HCFC-22, cannot be supplied pre-blended and will require investments in full-fledged in-house blending facilities. HCFC-22 also has residual ODP.

HCFC-141b has a boiling point near ambient temperatures. HCFC-141b based systems are technically mature and commercially available. They also provide relatively the most acceptable insulation value and energy efficiency, and the lowest investment and operating costs vis-à-vis other options. No major changes in the auxiliary equipment/tooling in the production program, such as jig/mold redesign, are needed. However, HCFC-141b has residual ODP and is also an aggressive solvent.

Permanent Technologies

Pentane based (n-, iso-, cyclo) systems require extensive safety related provisions/investments due to their flammability. Due to safety considerations, the use of pre-blended systems is not viable and additional investments for in-house pre-mixing are required. Cyclopentane has miscibility limitations with polyols. The molded densities and insulation values are still inferior to those obtained with HCFC-141b. The advantages are their relatively lower operating costs; they are environmentally relatively safe (no ODP/GWP or health hazards) and constitute a permanent technology.

Hydrocarbons are thus, the preferred conversion technology for large and organized users, where safety requirements can be complied with and investments can be economically justified. In the present scenario, since most of the enterprises are small or medium-sized, application of hydrocarbon-based systems is not considered feasible.

Gaseous HFCs have been used successfully but cannot be applied widely at the present time, due to cost and availability factors.

For water-based systems, the insulation values, density and commercial availability are unsatisfactory at present. However, these systems have acceptable processing characteristics and are expected to be mature and commercially viable in the near future, especially for applications where insulation values are not very critical. In addition, they are environmentally safe (zero ODP/GWP, no health or safety hazards) and constitute a permanent technology. Since in the current situation the rigid foam is for insulation applications, applying water-based technology is not considered feasible.

Chemical and systems suppliers and the appliance industry have extensively evaluated liquid HFC-based systems. Preliminary trials with non-optimized formulations indicate lower molded foam densities, insulation values comparable to HCFC-141b and no solvent action. On the whole, liquid HFCs are considered to be the only potential zero-ODP alternatives to hydrocarbons. HFC-245fa is expected to be commercially produced beginning the mid-2002. Another candidate, a non-flammable blend of HFC-365mfc and HFC-227, is also planned for commercial production in the second half of 2002. Provided that the commercial and availability considerations are addressed, these substances can be considered to be viable long-term substitutes.

Based on the above considerations, the conversion will be to CFC-free systems in future, for the rigid polyurethane foam operations. Until the commercial introduction of mature CFC-free systems, HCFC-141b based systems will need to be used as an interim technology, to maintain product standards and acceptability.

4.6.3 Refrigeration

The alternative technologies for replacement of CFC-12 in small capacity hermetic/semi-hermetic refrigeration systems are as below:

HCFCs: HCFC-22, Blends

HFCs: HFC-134a, HFC-152a

Hydrocarbons: HC-290 (Propane), HC-600a (Isobutane), and HC290/600a (1:1 mixture of both)

HCFCs are not preferred long-term substitutes, due to their residual ODP.

Hydrocarbon technologies though environmentally safe (no ODP/GWP or health hazards) and technically acceptable, require elaborate safety/monitoring provisions and investments due to their flammability and will be suitable for cost-effective and financially sustainable transfer to small and medium-sized enterprises only when the appropriate level of safety precautions are adopted and adequate safety training is provided.

HFC-152a has higher discharge temperatures/pressures, is flammable and less stable at high temperatures and the technology for the same is not widely available.

HFC-134a technology as a replacement for CFC-12 based refrigeration systems, is universally accepted, especially in small hermetic/semi-hermetic systems. HFC-134a is a zero ODP option. The technology is commercially available. Hermetic compressors optimized for HFC-134a are commercially available. This technology is therefore the preferred conversion technology in this project for the conversion of small and medium-sized enterprises in the refrigeration (manufacturing) sector. For low-temperature applications using R-502, based on similar lines as above, R-404a will be the selected replacement technology.

5. INCREMENTAL COSTS AND FINANCING

The total eligible incremental costs and the requested grant funding is US\$ 2,091,420. Details are provided in Annex-2.

6. IMPLEMENTATION

6.1 Management

The overall management of the Plan will be carried out as described in Section 4.4, by the Ministry of Environment with the support of UNDP as the lead agency and GTZ as the cooperating agency.

The Ozone Office, within the purview of the Ministry of Environment will be responsible for management and monitoring of the implementation of the Phase-out Plan. The Ozone Office will be responsible for tracking the promulgation and enforcement of policy/legislations, the preparation of annual implementation plans and assist UNDP in the preparation of the progress reports to the Executive Committee of MLF. UNDP would conduct if necessary, an annual independent verification for confirming CFC consumption levels including spot checks and random visits, provide assistance for policy, management and technical support and supervise implementation activities.

6.2 Disbursement Schedule

Year	CFC Phase-out Target (ODP MT)			CFC Consumption Target (ODP MT)	Disbursement (US\$)
	From approved ongoing projects	From National Phase-out Management Plan	Total		
2004	82	55	137	499	1,376,420
2005	0	127	127	362	350,000
2006	0	160	160	235	200,000
2007	0	40	40	75	100,000
2008	0	35	35	35	65,000
2009	0	0	0	0	0
TOTAL	82	417	499		2,091,420

* This does not include the country contribution operational costs (Annex 3)

6.3 Funding Arrangements

Upon approval of the National Phase-out Management Plan for CFCs, the Government of Lebanon, through UNDP, requests the Executive Committee to authorize prompt disbursement of the first tranche of US\$ 1,376,420, to facilitate quick commencement of phase-out activities to be initiated soon, as they may not produce results until late 2005 or early 2006, contributing to the reduction of consumption starting only in 2006. The details of the planned activities under this Plan for 2004 and subsequent years are provided in Annex-1 (Action Plan and Monitoring Milestones).

7. RESULTS

This project will facilitate elimination of CFCs in Lebanon by 2009.

ANNEXES

- Annex-1: Action Plan and Monitoring Milestones
- Annex-2: Incremental Cost Calculations
- Annex-3: Budget details for operational costs – country contribution
- Annex-4: Draft Agreement

**ANNEX-1
ACTION PLAN AND MONITORING MILESTONES**

Year/ Action	Investment Component	Technical Support Component	Training Component	Institutional Support Component	Disbursement (US\$)	ODS reduction (MT)
2004	Procurement preparation for equipment in the aerosol, foam and refrigeration (mfg) sectors	None	None	Annual implementation programs prepared and approved.	1,376,420	137
2005	<ul style="list-style-type: none"> Phase-out of remaining CFCs in the Aerosols Sector Phase-out of remaining CFCs in the Foam Sector Phase-out of remaining CFCs in the Refrigeration (Mfg) Sector 50 end-users selected for demonstrating pilot retrofitting and replacement program First stage procurement of R&R equipment 	<ul style="list-style-type: none"> Preparation for initiating the Technician Licensing Program 	<ul style="list-style-type: none"> Delivery of training inputs to Master Trainers Information dissemination and publicity for enrolling refrigeration technicians Finalization of arrangements for commencing Technician Training program Commencement of Technician Training program and completion of training delivery to technicians 	<ul style="list-style-type: none"> Allocation of personnel within Ozone Office for plan management Preparation of Annual Implementation Program and reporting on 2004 implementation One training/capacity building workshop for institutional and government stakeholders One public awareness workshop Enforcement of import controls Verification of CFC reductions 	350,000	127
2006	<ul style="list-style-type: none"> R&R equipment operational at the service and training establishments Completion of pilot retrofitting/replacement demonstration conversions at selected end-users 	<ul style="list-style-type: none"> Product and quality standards preparation initiated Preparation of regulations and codes of practices for refrigeration initiated 	<ul style="list-style-type: none"> Commencement of Technician Training program and completion of training delivery to technicians 	<ul style="list-style-type: none"> Reporting on 2005 implementation Preparation of Annual Implementation Program Two Training/capacity building workshops for institutional and government stakeholders Two regional public awareness workshops Verification of CFC reductions 	200,000	160
2007		<ul style="list-style-type: none"> Technician Licensing Program in place. Product and quality standards in place Regulations and codes of practices for refrigeration in place 	<ul style="list-style-type: none"> Training delivery to technicians 	<ul style="list-style-type: none"> Reporting on 2004 implementation Preparation of Annual Implementation Program 2 Training/capacity building workshops for institutional and government stakeholders One regional public awareness workshop Verification of CFC reductions 	100,000	40

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Annex-1: Action Plan and Monitoring Milestones (Cont'd)

Year/ Action	Investment Component	Technical Support Component	Training Component	Policy/Management	Disbursement (US\$)	ODS reduction (MT)
2008			Training delivery to technicians	<ul style="list-style-type: none"> • Reporting on 2007 implementation of Annual Implementation Program for 2008 • One Training/capacity building workshops for institutional and government stakeholders • Two regional public awareness workshops • Verification of CFC reductions 	65,000	35
2009				<ul style="list-style-type: none"> • Reporting on 2008 implementation • Verification of CFC reductions • Final reporting on Plan implementation and conclusion 	0	0

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ANNEX-2
INCREMENTAL COSTS

1. Investment Component

A. Aerosol Sector (UNDP)

Description	Budget (US\$)
Conversion at one enterprise	55,000
Technical assistance	8,000
Contingencies	6,700
Total (A)	69,700

B. Foam Sector (UNDP)

Description	Budget (US\$)
Conversion at one enterprises	100,000
Conversion at selected SMEs	250,000
Technical assistance	40,000
Contingencies	11,139
Total (B)	401,139

C. Refrigeration (Mfg) Sector (UNDP)

Description	Budget (US\$)
Conversion at enterprises	375,000
Technical assistance	45,000
Contingencies	25,000
Total (C)	445,000

D. Refrigeration (Svcg) Sector

Assistance for promotion of ODS reductions through Recovery & Recycling (UNDP)

Activity	Budget (US\$)
Equipment (as necessary), training, etc.	575,000
Technical assistance	50,000
Contingencies	11,500
Sub-total	636,500
Total (D)	636,500

SUMMARY OF INVESTMENT COSTS

Aerosol Sector	69,700
Foam Sector	401,139
Refrigeration (Mfg) Sector	445,000
Refrigeration (Servicing) Sector	636,500
TOTAL (1 - Investment Component)	1,552,339

2. Technical Support Component (GTZ)

Activity	Inputs	Cost (US\$)
Establishing a Technician Licensing program	Technical and legal experts costs and initial costs of follow-up to finalize the regulations	20,000
Establishing regulations and codes of practices	Technical and legal experts costs and initial costs of follow-up to finalize the regulations	15,000
TOTAL (2 – Technical Support Component)		35,000

3. Training/Demonstration Component (GTZ)

Activity	Cost (US\$)
Training Programmes	
Master Trainers Program	30,000
Technician Training Program	100,000
Zero-emission Training Program	50,000
Training materials and logistics	50,000
Demonstration Programmes	
Pilot retrofitting/replacement demonstration programme	50,000
TOTAL (3 – Training Component)	280,000

4. Institutional Support Component (UNDP)

Activity	Cost (US\$)
Management, coordination and monitoring, reporting on annual programs for the Sector Plan *	120,000
Policy/regulations development and reform	30,000
Training/capacity-building programs/workshops for institutional and government stakeholders	25,000
Awareness creation and information dissemination programs	25,000
Verification and confirmation of CFC reductions	24,081
TOTAL (4 – Policy & Management Support Component)	224,081

* This includes payment to Government officials on condition that the Government of Lebanon allows that through an official legal binding document.

OVERALL SUMMARY OF INCREMENTAL COSTS

Activity	Cost (US\$)
Investment Component (UNDP)	1,552,339
Technical Support Component (GTZ)	35,000
Training/Demonstration Component (GTZ)	280,000
Institutional Support Component (UNDP)	224,081
GRAND TOTAL	2,091,420

Note: It is understood that the Government of Lebanon will have maximum flexibility for allocating the approved funding in a way that is determined to be the best for achieving the project objectives and compliance obligations.

ANNEX-3

BUDGET DETAILS FOR OPERATIONAL COSTS – COUNTRY CONTRIBUTION

The Ministry of Environment will provide counterpart funding to support the implementation of the National Phase-out Management Plan (NPMP) project. The expected level of counterpart funding to be provided by the Ministry has been estimated at US\$ 234,500. This sum will serve to support the project during the entirety of its implementation as detailed in the table below:

Item	Year 1	Year 2	Year 3	Year 4	Year 5
Equipment (Computers, Printers, etc...)	5,500	-	10,000	-	-
Rent of Offices including (electricity, water, phone, fax, heating, cooling, internet, building maintenance, cleaning & hygiene, etc...)	17,400	17,400	17,400	17,400	17,400
Consumables (stationery, hospitality, etc...)	8,000	6,000	6,000	6,000	6,000
Travel (International)	5,000	5,000	5,000	5,000	5,000
Awareness programmes (Public)	25,000	20,000	15,000	10,000	5,000
SUB-TOTAL	60,900	48,400	53,400	38,400	33,400
Total contribution from the government = US\$ 234,500.00					

ANNEX-4

DRAFT AGREEMENT BETWEEN LEBANON AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE PHASE-OUT OF ANNEX-A, GROUP-I SUBSTANCES (CFCs)

1. This Agreement represents the understanding between the Government of Lebanon (the "Country") and the Executive Committee with respect to the complete phase-out of controlled substances set out in Appendix 1-A (the "Substances") prior to 1 January 2009.
2. The Country agrees to phase out the controlled use of the Substances in accordance with the annual phase-out targets set out in row 1 of Appendix 2-A (the "Targets") and this Agreement. The annual phase-out targets will, at a minimum, correspond to the reduction schedules mandated by the Action Plan approved at the Fifteenth Meeting of the Parties to the Montreal Protocol. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to the Substances.
3. Subject to compliance by the Country with its obligations set out in this Agreement, the Executive Committee agrees in principle to provide the funding set out in row 5 of Appendix 2-A (the "Funding") to the Country. The Executive Committee will, in principle, provide this funding at the Executive Committee meetings specified in Appendix 3-A (the "Funding Disbursement Schedule").
4. The Country will meet the consumption limits for each Substance as indicated in Appendix 2-A. It will also accept independent verification by the relevant Implementing Agency of achievement of these consumption limits as described in paragraph 9 of this Agreement.
5. The Executive Committee will not provide the Funding in accordance with the Funding Disbursement Schedule unless the Country satisfies the following conditions at least 30 days prior to the applicable Executive Committee meeting set out in the Funding Disbursement Schedule:
 - (a) That the Country has met the Target for the applicable year;
 - (b) That the meeting of these Targets has been independently verified as described in paragraph 9; and
 - (c) That the Country has substantially completed all actions set out in the last Annual Implementation Programme; and
 - (d) That the Country has submitted and received endorsement from the Executive Committee for an annual implementation programme in the form of Appendix 4-A (the "Annual Implementation Programmes") in respect of the year for which funding is being requested.
6. The Country will ensure that it conducts accurate monitoring of its activities under this Agreement. The institutions set out in Appendix 5-A (the "Monitoring") will monitor and report on that monitoring in accordance with the roles and responsibilities set out in Appendix 5-A. This monitoring will also be subject to independent verification as described in paragraph 9.
7. While the Funding was determined on the basis of estimates of the needs of the Country to carry out its obligations under this Agreement, the Executive Committee agrees that the Government of Lebanon will have maximum flexibility for allocating the approved funding in a way that is determined to be the best for achieving the project objectives and compliance obligations and may use the Funding for other purposes that can be demonstrated to facilitate the smoothest possible phase-out, consistent with this Agreement, whether or not that use of funds was contemplated in determining the amount of funding under this Agreement. Any changes in the use of the Funding must, however, be documented in advance in the Country's Annual Implementation Programme, endorsed by the Executive Committee as described in sub-paragraph 5(d) and be subject to independent verification as described in paragraph 9.

8. Specific attention will be paid to the execution of the activities in the servicing sector, in particular:

(a) The Country would use the flexibility available under this Agreement to address specific needs that might arise during project implementation;

(b) The recovery and recycling programme for the refrigeration service sector would be implemented in stages so that resources can be diverted to other activities, such as additional training or procurement of service tools, if the proposed results are not achieved, and will be closely monitored in accordance with Appendix 5-A of this Agreement.

9. The Country agrees to assume overall responsibility for the management and implementation of this Agreement and of all activities undertaken by it or on its behalf to fulfill the obligations under this Agreement. UNDP (the "Lead IA") has agreed to be the lead implementing agency in respect of the Country's activities under this Agreement. The Lead IA will be responsible for carrying out the activities listed in Appendix 6-A, including but not limited to independent verification. The Country also agrees to periodic evaluations, which will be carried out under the monitoring and evaluation work programmes of the Multilateral Fund. The Executive Committee agrees, in principle, to provide UNDP and GTZ ("cooperating IA") with the fees set out in rows 7 and 9 of Appendix 2-A.

10. Should the Country, for any reason, not meet the Targets for the elimination of the Substances in all the Sectors or otherwise does not comply with this Agreement, then the Country agrees that it will not be entitled to the Funding in accordance with the Funding Disbursement Schedule. At the discretion of the Executive Committee, Funding will be reinstated according to a revised Funding Disbursement Schedule determined by the Executive Committee after the Country has demonstrated that it has satisfied all of its obligations that were due to be met prior to receipt of the next installment of Funding under the Funding Disbursement Schedule. The Country acknowledges that the Executive Committee may reduce the amount of the Funding by the amounts set out in Appendix 7-A in respect of each ODP tonne of reductions in consumption not achieved in any one year.

11. The Funding components of this Agreement will not be modified on the basis of any future Executive Committee decision that may affect the Funding of any other consumption sector projects or any other related activities in the Country.

12. The Country will comply with any reasonable request of the Executive Committee and the Lead IA to facilitate implementation of this Agreement. In particular, it will provide access by the Lead IA to information necessary to verify compliance with this Agreement.

13. All of the agreements set out in this Agreement are undertaken solely within the context of the Montreal Protocol and as specified in this Agreement. All terms used in this Agreement have the meaning ascribed to them in the Protocol unless otherwise defined herein.

Appendix 1-A: The Substances

Annex-A, Group-I: CFC-11, CFC-12, CFC-113, CFC-114 and CFC-115

Appendix 2-A: The Targets and Funding

Milestone/Parameter	2004	2005	2006	2007	2008	2009
Compliance Milestone*		362		109		
Maximum allowable consumption of Annex-A Group-I substances	499	362	235	75	35	0
Reduction from ongoing projects	82	0	0	0	0	0
New reduction under the Plan	55	127	160	40	35	0
Total Annual Reduction of Annex-A Group-I substances	137	127	160	40	35	0
Lead IA UNDP	1,061,420	350,000	200,000	100,000	65,000	0
Support Costs	79,607	26,250	15,000	7,500	4,875	
GTZ	315,000	0	0	0	0	0
Support Costs	40,950	0	0	0	0	0
Total Agreed Funding	1,376,420	350,000	200,000	100,000	65,000	0
Total Support Costs	120,557	26,250	15,000	7,500	4,875	0
Total Cost to Multilateral Fund	1,496,977	376,250	215,000	107,500	69,875	0

*According to the Action Plan approved at the Fifteenth Meeting of the Parties to the Montreal Protocol.

Appendix 3-A: Funding Disbursement Schedule

Except for 2004, funding will be considered for approval at the first meeting of the year of the annual programme.

Appendix 4-A: Format of Annual Implementation Programme

This first annual implementation programme for the ODS phase out plan for Lebanon covers the year 2004/2005 activities from the project proposal.

1. Data

Country	Lebanon
Year of plan	2004/2005
Number of years completed	0
Number of years remaining under the plan	5
Target ODS consumption of the preceding year (ODP MT)	499
Target ODS consumption of the year of plan (ODP MT)	499 (362 as of 01 January 2006)
Level of funding requested (US\$)	1,376,420
Implementing agency support costs (US\$)	120,557
Total cost to Multilateral Fund	1,496,977
Lead implementing agency	UNDP
Co-operating agencies	GTZ

2. Targets

Indicators		Preceding year	Year of plan	Reduction
Supply of ODS	Import	499	362	0
	Production	0	0	0
	Total (1)	499	362	139
Demand for ODS	Aerosol	17	17	17
	Foam	65	65	65
	Refrigeration	417	417	65

3. Industry Action

Sector	Consumption preceding Year (1)	Consumption Year of plan (2)	Reduction within year of plan (1)-(2)	Number of projects completed	Number of servicing related activities	ODS phase-out (ODP tonnes)
Aerosols	17	0	17	1	0	17
Foams	65	0	65	2	0	65
Refrigeration	417	352	65	1	2	65
Total	499	352	147	4	2	147

4. Technical assistance

Activity	Description	
Workshop for user industry (UNDP)	Objective	Initiating enterprise participation and phase-out activities for the participating enterprises in the Aerosol, Foams and Ref (Mfg) Sectors
	Target group	Prospective recipient enterprises
	Impact	Obtaining enterprise commitments for time-bound phase-out
Technical Assistance for procurement of equipment (UNDP)	Objective	Initiate procurement procedures for equipment to be provided to recipient enterprises for conversion to non-CFC technology for the in the Aerosols, Foams and Refrigeration (Mfg) Sectors
	Target group	Recipient enterprises in the Aerosol, Foams and Ref (Mfg) Sectors
	Impact	Finalization of specifications and vendor shortlists, international competitive bidding and issuance of purchase orders/contracts
Training Programs (GTZ)	Objective	To initiate the Master Trainers programme and zero-emission training program for Technicians
	Target group	Abut 20 Master Trainer candidates (for the Master Trainer programme) and Refrigeration Technicians and institutions (for zero-emission programme)
	Impact	Improved practices in servicing and reduction of emissions during servicing

5. Government Action

Policy/Activity Planned	Schedule of Implementation
Control on ODS imports	Continuing enforcement of existing controls
Public awareness	One public awareness workshop
Others	See below

The following activities are proposed for 2004, under the Policy and Management Support component:

- a) Monitoring of Plan implementation activities, obtaining participation by enterprises and obtaining phase-out commitments from enterprises.
- b) Organization of one user industry workshop.
- c) Organization of one awareness workshop.
- d) Preparation of annual implementation programme

6. Annual Budget

Activity	Planned Expenditures (US \$)
UNDP	
1. Equipment	894,339
2. Technical assistance	93,000
3. Workshops and awareness	20,000
4. Monitoring	54,081
GTZ	
Training programmes, technical support	315,000
Total	1,376,420

7. Administrative Fees

Implementing agency support costs for 2004:	UNDP	79,607
	GTZ	40,950
Total		120,557

Appendix 5-A: Monitoring Institutions and Roles

1. The monitoring process will be covered by the Ministry of Environment through the Ozone Office.
2. The consumption will be monitored through receiving the data from relevant government departments and crosschecking it with the data to be permanently collected from the distributors and consumers. At the same time, the Ozone Office and the Implementation Team will also be responsible for preparing the national Monitoring Plan of the implementation of the Plan to phase-out the Substances.
3. The reporting process will be responsibility of the Ozone Office. They have to timely collect and analyze all information and regularly submit the following reports:
 - (a) Annual reports on consumption of the Substances to be submitted to the Ozone Secretariat;
 - (b) Annual reports on progress of implementation of NPMP to be submitted to the Executive Committee of the Multilateral Fund; and
 - (c) Project-related reports to the Lead IA.
4. Concerning the evaluation process, the Ministry of Environment and the Lead IA will select and hire an independent consultant who will work in close cooperation with the Implementation team to evaluate the progress, quality and performance of the implementation of the Plan to phase out the Substances.
5. The consultant will have full access to all financial and technical data and information concerning the implementation of the Plan to phase out the Substances for reliable data collection and cross checking.

6. The consultant will prepare and submit to the Lead IA reports of activities on a quarterly basis and the reports on the status of implementation of the Plan to phase out the Substances and consumption figures annually. After consideration by the Lead IA the reports will be sent to the Ozone Office and the Implementation Team for consideration and follow up.

7. The responsibilities of the consultant will also include:

- (a) Development of recommendations for improvements/adjustments of the Plan to phase out the Substances;
- (b) Take into consideration comments from the Lead IA and the Ozone Office to the reports and react accordingly; and
- (c) Assist in the organization and participate in possible evaluation visits by the Lead IA or the Multilateral Fund Secretariat.

8. On the other hand, the Lead IA should:

- (a) Provide the independent consultant with all relevant information;
- (b) Provide the consultant with necessary support and advice;
- (c) Consider and comment on the submitted reports in a timely manner
- (d) Control the performance of the consultant in the most suitable manner.

Appendix 6-A: Role of the Lead IA

1. The Lead IA will be responsible for a range of activities along the lines of the following:

- (a) Ensuring performance and financial verification in accordance with this Agreement with its specific internal procedures and requirements as set out in the Country's phase-out plan;
- (b) Providing verification to the Executive Committee that the Targets have been met and associated annual activities have been completed as indicated in the annual implementation programme
- (c) Assisting the Country in preparation of the Annual Implementation Programme;
- (d) Ensuring that achievements in previous Annual Implementation Programmes are reflected in future Annual Implementation Programmes;
- (e) Reporting on the implementation of the Annual Implementation Programme commencing with the Annual Implementation Programme for 2005 to be prepared and submitted in 2004;
- (f) Ensuring that technical reviews undertaken by the Lead IA are carried out by appropriate independent technical experts;
- (g) Carrying out required supervision missions;
- (h) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Annual Implementation Programme and accurate data reporting;
- (i) Verification for the Executive Committee that consumption of the Substances has been eliminated in accordance with the Targets;
- (j) Coordinating activities with the cooperating IA, if any;
- (k) Ensuring that disbursements made to the Country are based on the use of the Indicators; and
- (l) Providing assistance with policy, management and technical support when required.

Appendix 6-B: Role of the Cooperating IA

In 2005, UNDP, under the mandate of the Multilateral Fund will commence implementation of the NPMP. GTZ will also commence their activities in 2005.

Appendix 7-A: Reductions in Funding for Failure to Comply

In accordance with paragraph 10 of the Agreement, the amount of funding provided may be reduced by US\$-----
- per ODP MT of reductions in consumption not achieved in the year.