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EXECUTIVE COMMITTEE OF  
THE MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL  
Forty-fourth Meeting  
Prague, 29 November-3 December 2004

**PROJECT PROPOSALS: LEBANON**

This document consists of the comments and recommendations of the Fund Secretariat on the following project proposals:

Fumigant

- Sector phase-out of methyl bromide in vegetable, cut flower and tobacco production (fourth tranche) UNDP
- Phase-out of methyl bromide for soil fumigation in strawberry production (progress report) UNIDO

Phase-out

- National phase-out management plan for Annex A Group I substances (CFCs) (first tranche) France, UNDP

**PROJECT EVALUATION SHEET  
LEBANON**

**SUB-PROJECT TITLES****BILATERAL/IMPLEMENTING AGENCY**

(a)	Sector phase-out of methyl bromide in vegetable, cut flower and tobacco production (fourth tranche)	UNDP
(b)	Phase-out of methyl bromide for soil fumigation in strawberry production (progress report)	UNIDO

<b>NATIONAL CO-ORDINATING AGENCY:</b>	Ministry of Environment
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**LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT****A: ARTICLE-7 DATA (ODP tonnes, 2003, as of October 2004)**

Annex E, methyl bromide	184.70		
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**B: COUNTRY PROGRAMME SECTORAL (ODP tonnes, 2003, as of October 2004)**

ODS	Foam	Ref.	Aerosol	ODS	Solvents	Process agent	Fumigant
				Methyl bromide			154.29

<b>CFC consumption remaining eligible for funding (ODP tonnes)</b>	n/a
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**CURRENT YEAR BUSINESS PLAN: Total funding US \$ million: total phase-out ODP tonnes.**

<b>PROJECT DATA</b>		2001	2002	2003	2004	2005	2006	
<b>ODS #1</b>  (ODP tonnes)	Montreal Protocol limits	236.5	204.7	158.6	<b>90.4</b>	43.3	0	
	Annual consumption limit							
	Annual phase-out from ongoing projects							
	Annual phase-out newly addressed (UNDP)	25.8	36.0	54.0	<b>36.0</b>	34.3		
	Annual phase-out newly addressed (UNIDO)	6.0	10.1	14.2	<b>11.1</b>	9.0		
<b>TOTAL ODS CONSUMPTION TO BE PHASED OUT</b>		31.8	46.1	68.2	<b>47.1</b>	43.3		
Project cost as originally submitted (US \$)					<b>400,000</b>			
<b>Final Project costs (US \$):</b>								
Funding for UNDP		800,000	600,000	500,000	<b>400,000</b>	300,000		
Funding for UNIDO		350,000	421,946	450,000	-	42,504		
<b>Total project funding</b>		1,150,000	1,021,946	950,000	<b>400,000</b>	342,504		
<b>Final Support costs (US \$)</b>								
Support cost for UNDP		98,000	76,000	37,500	<b>30,000</b>	22,500		
Support cost for UNIDO		45,500	54,853	33,750	-	3,188		
<b>Total support costs</b>		143,500	130,853	71,250	<b>30,000</b>	25,688		
<b>TOTAL COST TO MULTILATERAL FUND (US \$)</b>		1,293,500	1,152,799	1,021,250	<b>430,000</b>	368,192		
Final project cost effectiveness (US \$/kg)							n/a	

<b>SECRETARIAT'S RECOMMENDATION</b>	Blanket approval of the 2004 work programme
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## PROJECT DESCRIPTION

1. At its 34th Meeting, the Executive Committee approved in principle US \$4,421,945 (US \$2,600,000 and US \$1,821,945 for the projects to be implemented through UNDP and UNIDO respectively) as the total funds that would be available to the Government of Lebanon to achieve the complete phase-out of methyl bromide (MB) used as a soil fumigant in the production of vegetables, cut flowers, tobacco and strawberries (236.5 ODP tonnes).
2. In accordance with the agreed conditions, the Executive Committee has so far allocated US \$1,900,000 plus agency support costs for UNDP to phase out 115.8 ODP tonnes used in the production of vegetables, cut flowers and tobacco, and US \$1,221,946 plus agency support costs for UNIDO to phase out 30.3 ODP tonnes in the production of strawberries.
3. At its 43rd Meeting, the Executive Committee considered a request by the Government of Lebanon for a change of technology in the UNIDO project covering the phase-out of MB for soil fumigation in strawberry production (UNEP/OzL.Pro/ExCom/43/36). According to the report submitted by UNIDO to the 43rd Meeting, the fact that only a limited amount of MB phase-out had been achieved through the application of steam was due to a delay in the delivery of steaming machines in 2002, technical limitations pertaining to steam application (i.e., limited access to the production fields; longer application time; lack of adequate quality water; water and fuel replenishment; machine breakdown and associated time delays). Also, operating costs were much higher than previously estimated (i.e., high and constant increase in fuel prices; high labour costs and difficult payment facilities for farmers; and high rental cost of tractors to pull the steam machine). Under these circumstances, the soil steaming technology in Lebanon was not sustainable or economically viable.
4. Subsequently, through its Decision 43/28, the Executive Committee decided: to approve the request for a change of technology and to amend the agreement between the Government of Lebanon and the Committee accordingly to indicate a revised total project cost for the UNIDO part of US \$1,264,450 plus support costs of US \$137,291, including a final tranche planned for funding in 2005 at a cost of US \$42,504 plus support costs of US \$3,188.
5. The Government of Lebanon has submitted a funding request for implementation of the fourth phase of the project, as follows:
  - (a) US \$400,000 to phase out an additional 36.0 ODP tonnes used in the production of cut flowers and tobacco, under UNDP's implementation. The proposed activities include, inter alia:
    - (i) Follow-up training of the trainers in alternative techniques related to the cut flower and tobacco sectors and ongoing organization of farmer training sessions in all sectors;
    - (ii) Ongoing administration of field operations begun in 2003 by the project site engineers to: monitor activities launched in the vegetables sector; determine farms to be included in the next phase of the programme; enable

- farmers select alternatives; and supervise farmers to ensure proper application of alternatives at individual sites;
- (iii) Finalization of procurement of materials and equipment to be used in the cut flower sector, and initiation of production of tobacco seedlings using the floating tray system in the major tobacco production areas; and
- (b) Phase-out of an additional 11.1 ODP tonnes used in the production of strawberries, implemented by UNIDO. No additional costs are requested at the 44th Meeting. The proposed activities include, *inter alia*:
- (i) Identification of farmers to be included in the 2005 phase-out programme;
  - (ii) Continued implementation of training programmes for farmers on the MB alternatives they have selected and on integrated pest management systems;
  - (iii) Procurement and distribution of supplies for alternatives to farmers, to support them in the adoption of the MB alternatives; and
  - (iv) Monitoring the proper application of the alternatives by the project team; and
- (c) Coordination with the Ministry of Agriculture and the Ministry of the Environment's Ozone Office to finalize the new legislation aimed at controlling and decreasing MB imports in the next three years.

## **SECRETARIAT'S COMMENTS AND RECOMMENDATION**

### **COMMENTS**

6. The Government of Lebanon submitted a comprehensive report on the implementation of Phase III of the project. The Secretariat noted that the efforts of all stakeholders involved in the implementation of the MB phase-out projects have resulted in larger amounts of MB being phased out than originally planned.

7. In regard to the UNDP project, in 2004, a total of 61 ODP tonnes of MB were phased out in 1,154 greenhouses distributed throughout the different agricultural areas of Lebanon. A total of 4,542 farmers were trained in the application of the alternative methods proposed by the project. MB phase-out was supported by, *inter alia*, the train-the-trainers programme and the farmer training sessions in North and South Lebanon and in the Beka'a region; procurement of farm material/equipment and coordination with the Ministry of Agriculture for the establishment of new legislation to control and regulate MB.

8. The Secretariat noted that an agreement had been reached with the plastics producing industry in Lebanon to manufacture the thermal polyethylene sheets required for the application

of the soil solarization technology. UNDP indicated that the majority of farmers adopted soil solarization as the alternative to MB fumigation, due mainly to the positive results and yields obtained, the ease of application and the relatively low cost associated with this technology. In accordance with UNDP rules and regulations, an international bidding process had been launched to enhance the long-term sustainability of the soil solarization alternative. Concurrently, the project's management approached the local plastics industry to solicit its interest in producing the polyethylene sheets and invite it to participate in the project's procurement process, thus creating a market in support of the project's objectives. A local plastics manufacturer was able to produce the polyethylene according to the specifications requested by the project's management, and, having provided the best offer, was selected to supply the project with the requested quantity of polyethylene rolls.

9. The progress report on the UNIDO project component advised that in 2004, a total of 16.2 ODP tonnes of MB used in strawberry farms were phased out, notwithstanding the change in technology approved by the Executive Committee at its 43rd Meeting. In about 60 ha of land, MB had been replaced with newly approved technologies, namely crop rotation, soil solarization alone and in combination with reduced doses of chemicals, and, to a lesser extent, steam. Forty-five farmers from the North, South, and Beka'a production regions participated in the training programme; awareness campaigns on alternatives to MB have been organized for the farmers in parallel to the phase-out plan. So far, three steam boilers have been purchased. As for the project re-orientation, no further steam boilers are going to be purchased.

## RECOMMENDATION

10. The Fund Secretariat recommends blanket approval of the funding required for the UNDP project sub-component with associated support costs as indicated in the table below:

	<b>Project Title</b>	<b>Project Funding (US\$)</b>	<b>Support Cost (US\$)</b>	<b>Implementing Agency</b>
(a)	Sector phase-out of methyl bromide in vegetable, cut flower and tobacco production (fourth tranche)	400,000	30,000	UNDP

**PROJECT EVALUATION SHEET  
LEBANON**

**PROJECT TITLE****BILATERAL/IMPLEMENTING AGENCY**

(a)	National phase-out management plan for Annex A Group I substances (CFCs) (first tranche)	UNDP (Lead Agency)
(b)	National phase-out management plan for Annex A Group I substances (CFCs) (first tranche)	France (Cooperating Agency)

**NATIONAL CO-ORDINATING AGENCY:**

Ozone Unit, Ministry of Environment

**LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT****A: ARTICLE-7 DATA (ODP tonnes, 2003, as of October 2004))**

Annex A Group I, CFCs	480.20		
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**B: COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes, 2003, as of October 2004)**

ODS	Aerosol	Foam	Ref.	ODS	Solvents	Process agent	Fumigant
CFCs	17.25	65.35	Manufacturing 63.32				
		0	Servicing 351.10				

**CFC consumption remaining eligible for funding (ODP tonnes)**

312.5

**CURRENT YEAR BUSINESS PLAN: Total funding US \$229,000: total phase-out 30.0 ODP tonnes.**

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)								
<b>Project Costs (US\$)</b>								
Funding for Lead Agency (UNDP)		1,061,420	350,000	200,000	100,000	65,000	0	1,776,420
Funding for Cooperating Agency (France)			150,000	165,000	0	0	0	315,000
Total Project Funding		1,061,420	500,000	365,000	100,000	65,000	0	2,091,420
<b>Support Costs (US\$)</b>								
Support Cost for Lead Agency (UNDP)		79,607	26,250	15,000	7,500	4,875	0	133,232
Support Cost for Cooperating Agency (France)			19,500	21,450	0	0	0	40,950
Total Support Costs		79,607	45,750	36,450	7,500	4,875	0	174,182
TOTAL COST TO MULTILATERAL FUND		1,141,027	545,750	401,450	107,500	69,875	0	2,265,602
Project cost-effectiveness (US \$/kg)								

**SECRETARIAT'S RECOMMENDATION**

For individual consideration

## PROJECT DESCRIPTION

11. The Government of Lebanon has submitted for consideration by the Executive Committee at its 44th Meeting a national CFC phase-out management plan (NPP). Implementation of the plan will lead to the phase-out of the remaining consumption of Annex A, Group I (CFCs) substances (312.5 ODP tonnes), which represents the country's remaining CFC consumption. The requested cost of the plan, as submitted, is US \$3,040,000 (excluding agencies support costs). The TPMP would be implemented by UNDP, as the lead implementing agency, and the Government of France as the cooperating implementing agency.

### ODS consumption

12. The ODS consumption baselines for compliance and Montreal Protocol ODS consumption limits for 2005-2015 in Lebanon are as follows:

<b>Consumption limits (in ODP tonnes)</b>	<b>CFC</b>	<b>Methyl bromide</b>
Baseline consumption	725.5	152.4
2005	362.8	121.9
2007	108.8	121.9
2010	0	121.9
2015	0	0

13. In 2002, the Government of Lebanon reported to the Ozone Secretariat a total CFC consumption of 491.7 ODP tonnes. According to the Government of Lebanon, the CFC consumption forecast for the period 2003-2010 is presented in the following table (in ODP tonnes):

<b>Sector</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Aerosol sector	45	34	25	10	0	0	0	0
Foam sector	45	37	15	0	0	0	0	0
Domestic refrigeration	5	0	0	0	0	0	0	0
Commercial refrigeration	35	15	10	5	0	0	0	0
Refrigeration servicing	340	314	300	235	150	100	50	0
Total	470	400	350	250	150	100	50	0

### ODS phase-out projects approved for funding

14. So far, the Executive Committee has approved 55 projects and activities for Lebanon at a total cost of US \$10,553,380, to phase-out 1,120 ODP tonnes of ODS. As of December 2003, a total of 613.3 ODP tonnes had been phased out and US \$7,587,436 had been disbursed.

### Remaining CFC consumption eligible for funding

15. According to Decision 35/57, the remaining consumption eligible for funding for Lebanon was calculated at 47.1 ODP tonnes of CFCs on the basis of the Montreal Protocol baseline (Option 1) or 224.5 ODP tonnes on the basis of very recent consumption (Option 2) (document UNEP/OzL.Pro/ExCom/35/61).

16. At its 43rd Meeting, the Executive Committee considered the Lebanon country programme update submitted by the Government of Lebanon (UNEP/OzL.Pro/ExCom/43/47). The document reported that a comprehensive survey to assess remaining CFC consumption in the country was conducted in 2003. In particular, the survey targeted the Southern Lebanon and West Bekaa regions, which had previously been occupied and therefore had never been surveyed. It was found that 88 ODP tonnes of CFCs were still being used in that area of the country and had not been addressed by the Multilateral Fund. The sectoral distribution of the consumption is as follows: one aerosol plant (Chamsine) with a total consumption of 17 ODP tonnes of CFCs; eight small foam plants (out of 11 enterprises identified), with an average consumption of 53 ODP tonnes of CFCs; and eleven out of 34 SMEs manufacturing commercial refrigerators with an average consumption of 18 ODP tonnes. From the results of the survey conducted in the formerly occupied territories of Lebanon, and on the basis of Proviso A of Decision 35/57, the remaining CFC consumption eligible for funding calculated under Option 2 could be increased from 224.5 ODP tonnes to 312.5 ODP tonnes.

17. Subsequently, the Executive Committee decided, *inter alia*, to approve the country programme update for Lebanon and establish a consumption of 312.5 ODP tonnes of CFCs under Option 2 as the level of consumption remaining eligible for funding for Lebanon (Decision 43/35).

#### ODS regulations

18. The activities related to the Montreal Protocol are coordinated by the Ozone Office within the Ministry of Environment. The Government of Lebanon has implemented the following regulatory and policy initiatives and actions to support the phase-out of ODS:

- (a) Adding ODS to the list of items requiring import licensing (any request to import ODS must be endorsed by the Ministry of Environment); prohibiting halon imports; and a tax exemption granted by the Ministry of Finance for all imported equipment in Multilateral Fund projects since 1998;
- (b) Developing guidelines as necessary for policy implementation;
- (c) Preparing regulations on control and monitoring of ODS use, enforced since 2003;
- (d) Active monitoring of the progress of implementation of ODS phase-out investment and demonstration projects and other related activities funded by the Multilateral Fund;
- (e) Regular interaction with major stakeholders (government ministries and departments, industry representatives and implementing agencies) for information dissemination on ODS phase-out policies; and
- (f) Public awareness initiatives and education campaigns to promote the protection of the ozone layer.

### Manufacturing sector

19. There are several manufacturers of CFC-based equipment and products in the aerosol, foam and refrigeration sectors. Except for those enterprises that use ODS in their manufacturing processes, located in the Southern Lebanon and West Bekaa regions, all other manufacturers have converted to non-CFC technologies with the assistance of the Multilateral Fund.

20. There is only one enterprise still using 17 ODP tonnes of CFCs as propellant for the production of aerosol deodorants (300,000 cans/year). The NPP proposes converting the plant to hydrocarbon aerosol propellant (HAP), through the provision of basic manufacturing equipment capable of handling HAP safely, and through technical assistance and training. The total cost of conversion was estimated at US \$120,000, with a cost-effectiveness value of US \$7.09/kg.

21. In the foam sector, there is one remaining medium-sized enterprise and 13 SMEs manufacturing foam products (i.e., insulated sandwich panels for prefabricated houses, cold storage rooms, food packaging, pipe insulation, solar heat water panels and mattresses), with a total eligible consumption of 59 ODP tonnes. The NPP proposes to convert the foam operations to HCFC-141b technology as an interim technology to maintain product standards and acceptability until ODS-free technologies are commercially available in Lebanon. Conversion entails the provision of one high-pressure foam machine (for the medium-sized enterprise) and 13 low-medium pressure machines for the SMEs, technical assistance and training. The phase-out in ineligible enterprises, with a total consumption of 6 ODP tonnes, will not be funded under the plan, but will be facilitated by the Government through appropriate regulations. The total cost of conversion was estimated at US \$660,000, with a cost-effectiveness value of US \$11.19/kg.

22. In the refrigeration manufacturing sector, 35 enterprises were found to be using 45.2 ODP tonnes of CFCs in their manufacturing processes (6.3 ODP tonnes of CFC-11 used for foam insulation and 36.4 ODP tonnes of CFC-12 and 2.5 ODP tonnes of R-502 used as refrigerants). Five of these enterprises have a foaming equipment baseline. The NPP proposes to convert these enterprises to HCFC-141b and HFC-134a technologies for the foam insulation and refrigeration components, respectively. Conversion entails the provision of one low-pressure foam machine for each of the seven enterprises that have a foaming equipment baseline, one set of suitable refrigerant charging, evacuation and leak detection equipment to all enterprises, as well as technical assistance and training. The total cost of conversion was estimated at US \$660,000, with a cost-effectiveness value of US \$14.67/kg.

### The refrigeration servicing sector

23. The number of domestic refrigerators in the country is 1,257,000 units, of which 905,000 units are based on CFC-12 refrigerant. Annual CFC consumption to service these appliances is estimated at 105 ODP tonnes (about 20 per cent of domestic refrigerators are serviced annually). The commercial refrigeration equipment in operation, including chest freezers, bottle coolers, and display cabinets, among other equipment, is about 407,400 units, of which about 335,000 units run on CFC-12 refrigerant. CFC consumption to service that equipment is estimated at 167 ODP tonnes per year (about 25 per cent of the commercial

refrigeration systems in operation are serviced every year). There are about 310 workshops servicing domestic, commercial and industrial refrigeration equipment in the country.

24. There are also 493,000 vehicles fitted with MAC systems in Lebanon, of which 204,000 are fitted with CFC-12-based MAC units. In addition, about 1,700 refrigerated trucks were identified, most of which were found to use either CFC-12-based systems, or were topped up with CFC-12. The estimated annual CFC consumption in MAC and transport refrigeration servicing is 63 ODP tonnes (35 per cent of the MAC units are serviced annually). There are about 125 workshops servicing mobile air conditioning and transport refrigeration equipment.

25. There are 32 CFC-based centrifugal chiller installations in Lebanon, of which 16 have already converted to non-CFC technologies. The remaining 16 facilities are in the process of converting to non-CFC technologies (either retrofitting or replacement), mainly for energy-efficiency reasons. CFC consumption to service the chillers is estimated at about 3 ODP tonnes annually. CFC consumption in the chiller servicing sub-sector will not be addressed through this project; it will be addressed through other means.

26. The estimated number of technicians servicing all types of refrigeration systems is between 2,000 and 2,500, with different levels of technical skill and knowledge. About 1,000 technicians are proposed to be trained under the NPP. There are 25 training institutions providing vocational education and courses in refrigeration and air conditioning.

27. The current refrigerant prices per kg are: US \$2.50 for CFC-11, US \$3.16 for CFC-12, US \$5.22 for HFC-134a and US \$2.57 for HCFC-22.

#### Projects already approved in the refrigeration servicing sector

28. So far, the Executive Committee has approved the following projects in the refrigeration servicing sector in Lebanon:

- (a) Training of refrigeration technicians in recovery and recycling methodologies, approved at the 23rd Meeting, implemented by France (US \$52,668): to provide information on alternative technologies to managers of 14 small manufacturers of refrigerated display cases for the food industry, and to provide training for technicians to implement the use of HFCs in their manufactured products. The project was completed in October 2000;
- (b) Implementation of an ODS recovery and recycling network approved at the 23rd Meeting, implemented by France (US \$425,289): establishment of a national recovery and recycling network, including installation of reclamation facilities in the main regions of the country. This project is currently under implementation and covers only a part of the refrigeration servicing sector;
- (c) Training in improved operations, service and maintenance for refrigeration technicians using hydrocarbons, approved at the 26th Meeting, implemented by Germany (US \$49,500). Two training courses were conducted and a total of 45 technicians were trained. The results of the training activities demonstrated

that the Lebanese safety standards for commercial refrigeration units are similar to the norms in Germany. It was found that there is further demand for training in good refrigeration practices and for designing emission-free refrigeration systems;

- (d) Remaining issues for the RMP and preparation of a strategy and projects to reduce CFC emissions in centrifugal chillers, approved at the 28th Meeting for joint implementation by France (US \$45,750) and Germany (US \$37,550): identification, preparation and implementation of a customs officer training program and a chiller replacement strategy as part of a RMP. The project was completed in November 2001.

#### Additional non-investment phase-out activities

29. The NPP proposes to implement the following additional activities to address the phase-out of CFCs in the refrigeration servicing sector:

- (a) Recovery and recycling programme (US \$900,000): to provide recovery and recycling equipment to service establishments, commensurate with their size and baseline conditions, to ensure reductions in the consumption of CFCs in servicing operations by discontinuing venting and flushing and facilitating the reuse of CFCs through recycling, thus reducing the import demand for virgin CFCs, and to facilitate creation of an inventory of recovered CFCs to meet to the extent possible, the servicing requirements of existing CFC-based equipment;
- (b) Pilot retrofitting/replacement programme for end-users (US \$150,000): to select up to 50 commercial refrigeration end-users (excluding chillers and MAC units) to carry out a retrofitting/replacement demonstration. Each end-user would be provided with financial assistance covering retrofitting/replacement costs up to a maximum of US \$3,000 against satisfactory completion of conversion and satisfactory documentation justifying the costs; and
- (c) Training programme for refrigeration service technicians (US \$250,000). The training component of the NPP is comprised of the following sub-components: (i) a master trainers programme, aimed at creating a pool of 20 trainers drawn from the existing training establishments and from major service establishments (training will be provided through a 3-week workshop); (ii) training programme for about 500 skilled and up to 2,000 semi-skilled service technicians in good refrigeration servicing practices, to be implemented by the master trainers; and (iii) establishment of a zero-emission programme that will include qualification of refrigeration technicians in zero-emission training, a new regulation and standard, and zero-emission certification.

#### Technical support component of the NPP

30. The NPP includes a technical support component (US \$50,000) to ensure that CFC phase-out actions proposed in the aerosol, foam and refrigeration (both manufacturing and servicing) sectors are technically sound and sustainable, and prevent industrial dislocation and an

adverse impact on the economy. Specifically, the technical support component proposes the establishment of: (i) a licensing programme for refrigeration service technicians; (ii) quality and performance standards for aerosol, foam and refrigeration products; and (iii) regulations and codes of practice for CFC usage, especially in the refrigeration manufacturing and servicing sectors.

#### Institutional support component of the NPP

31. The implementation of the NPP will be coordinated with various policy, regulatory, fiscal, awareness and capacity-building actions, which the Government of Lebanon is currently implementing. Furthermore, implementation of the NPP will need to be closely and efficiently managed and will introduce additional coordinating, reporting and monitoring activities. In this regard, the NPP includes an institutional support component (US \$250,000) to:

- (a) Coordinate the implementation of the NPP with the various Government policy actions;
- (b) Establish a policy development and enforcement programme, covering legislative, regulatory, incentive, and punitive actions to enable the Government to acquire and exercise the required mandates in order to ensure industry compliance with the phase-out obligations;
- (c) Develop and implement training, awareness and capacity-building activities for Government decision-makers and other institutional stakeholders, to ensure a high-level commitment to the NPP objectives and obligations;
- (d) Implement awareness activities among consumers and the public, through workshops, media publicity and other information-dissemination measures; and
- (e) Prepare relevant annual implementation reports including verification and confirmation of CFC reductions through site visits and audits.

#### Cost of the NPP

32. The total cost of the NPP as submitted is US \$3,040,000, broken down as follows:

<b>Description</b>	<b>Cost (US \$)</b>
<b>Investment component</b>	
Aerosol sector	120,000
Foam sector	660,000
Refrigeration manufacturing subsector	660,000
Refrigeration servicing subsector	1,050,000
<b>Subtotal</b>	<b>2,490,000</b>

<b>Description</b>	<b>Cost (US \$)</b>
<b>Training programme</b>	
Master trainers programme	50,000
Service technician training programme	100,000
Zero-emission training programme	50,000
Training materials and logistics	50,000
<b>Subtotal</b>	<b>250,000</b>
<b>Technical support component</b>	
Establishment of technician licensing programme	25,000
Establishment of regulations and codes of practice	25,000
<b>Subtotal</b>	<b>50,000</b>
<b>Institutional support component</b>	
Management, coordination, monitoring and reporting	120,000
Development of policy and regulations	30,000
Capacity building for Government stakeholders	37,500
Awareness and information dissemination	37,500
Verification/confirmation of CFC phase-out	25,000
<b>Subtotal</b>	<b>250,000</b>
<b>Grand total</b>	<b>3,040,000</b>

## **SECRETARIAT'S COMMENTS AND RECOMMENDATION**

### **COMMENTS**

33. The Secretariat notes that the 2003 CFC consumption in Lebanon (470 ODP tonnes) is 255 ODP tonnes below Lebanon's CFC baseline consumption (e.g., 725.5 ODP tonnes).

#### Manufacturing sector

34. The Secretariat requested additional information regarding the aerosol, foam and refrigeration manufacturing enterprises that will be converted to non-CFC technologies. Specifically, CFC consumption by substance, date of establishment, equipment baseline; installed capacity; and 1995 and current production levels. Furthermore, the Secretariat noted that:

- (a) The cost-effectiveness of the conversion of the CFC-based aerosol plant to hydrocarbon technology was US \$7.06/kg; however, the average cost-effectiveness of the five aerosol plants that have already been funded in Lebanon is US \$2.93/kg and the cost-effectiveness threshold for the aerosol sector is US \$4.40;
- (b) The incremental costs for the conversion of the foam manufacturing plants were calculated on the basis of providing a high-pressure foam machine for one medium-sized enterprise and one low-medium pressure foam machine for each of the remaining 13 SMEs, irrespective of the existing baseline equipment;

- (c) The cost-effectiveness of the conversion of the foam sector was US \$11.18/kg, while the average cost-effectiveness of the eight foam plants already funded in Lebanon is US \$4.50/kg and the cost-effectiveness threshold for the rigid foam sector is US \$7.83;
- (d) The total ODS consumption to be phased in associated with the replacement of CFCs with HCFC-141b was not taken into consideration in the calculation of incremental costs;
- (e) The existing baseline equipment in the commercial refrigeration manufacturing plants was not taken into consideration in the calculation of incremental costs for the conversion to non-CFC technologies.

35. Subsequently, UNDP provided the information requested by the Secretariat and revised the calculation of incremental costs for all of the manufacturing plants in the aerosol, foam and commercial refrigeration sectors included in the NPP. The agreed level of funding is US \$915,839 with the following sectoral distribution:

- (a) US \$69,700 for the aerosol sector, calculated on the basis of the average cost-effectiveness of similar projects that have been approved by the Executive Committee;
- (b) US \$401,139 for the foam sector, calculated on the basis of the average cost effectiveness of similar umbrella projects that have been approved by the Executive Committee and taking into consideration the phase-in associated with the replacement of CFCs by HCFC-141b (i.e., 6.3 ODP tonnes);
- (c) US \$445,000 for the commercial refrigeration manufacturing sector, calculated on the basis of US \$10.00/kg, taking into account that insulation foam operations are not performed in 30 of the 35 enterprises, the small quantity of equipment manufactured annually (i.e., 23 enterprises manufactured less than 20 units per year), and the phase-in associated with the replacement of CFCs by HCFC-141b (i.e., 0.7 ODP tonnes).

#### HCFC-141b technology

36. The Government of Lebanon submitted a letter endorsing the choice of HCFC-141b technology and stating that it had been clearly explained to them that no further resources could be requested from the Multilateral Fund for any future replacement of the transitional HCFC technology selected (Decision 38/38). The letter is attached to the present document.

#### Refrigeration servicing sector

37. The Secretariat discussed with UNDP the following issues related to CFC consumption in the refrigeration servicing sector in Lebanon. Specifically, the rationale used to calculate the consumption of CFCs in the domestic, commercial and MAC sub-sectors; more detailed information on the CFC-based commercial refrigeration equipment in operation (number of units

by refrigerant charge and by type of equipment); and information on the current prices of CFC and non-CFC refrigerants in Lebanon. All of these issues were addressed and further documented by UNDP.

38. About 30 per cent of the total cost of the NPP as submitted (US \$900,000) is for the establishment of a recovery and recycling programme. In this regard, the Secretariat solicited additional information from UNDP regarding the implementation of the recovery/recycling scheme approved for Lebanon at the 23rd Meeting of the Executive Committee (implemented by the Government of France), emphasizing the problems encountered, how they were addressed, lessons learned and the current status of the programme.

Proposal by the Secretariat

39. The Secretariat pointed out to UNDP that:

- (a) Over the last several meetings, the Executive Committee has approved a number of national/sectoral phase-out plans in a number of non-LVC countries with little or no remaining consumption in the refrigeration or other manufacturing sectors;
- (b) The cost-effectiveness value associated with the refrigeration servicing component of those plans has been approved at US \$5.00/kg, which is about US \$2.00 below the cost-effectiveness value of the Lebanon servicing sector phase-out (calculated on the basis of a total cost of US \$1.35 million to phase out 192 ODP tonnes of CFCs);
- (c) Due to the complexity of the refrigeration servicing sector, and given the limited success achieved so far in CFC phase-out from the large number of recovery/recycling schemes and incentive programmes for end-users under implementation the Secretariat has proposed, since the 41st Meeting, an alternative approach to addressing ODS phase-out in the refrigeration servicing sector. This would provide for a large portion of the funds available (i.e., US \$951,500 for Lebanon) to be fully allocated under one umbrella technical assistance component (without specific project budget lines for recovery machines, or drop-in kits, or tools for technicians). During project implementation, funds would be withdrawn from the technical assistance component to address specific needs as they arose; and
- (d) Through this approach, the Government of Lebanon and the relevant implementing agencies would have full flexibility in using the funds available.

40. Subsequently, UNDP agreed to adopt this approach, and revised the sub-projects related to the refrigeration servicing sector accordingly.

41. An additional US \$225,000 was agreed for the monitoring and management unit (12 per cent of project costs).

Agreement

42. The draft agreement between the Government of Lebanon and the Executive Committee for the complete phase-out of Annex A (Group I) substances is presented in Annex I to the present document.

Change of bilateral agency

43. At the time of the submission of the Lebanon TPMP proposal, the cooperating implementing agency selected by the Government of Lebanon was Germany. However, subsequent to the conclusion of the discussion of the project between UNDP (the lead implementing agency) and the Secretariat, the Government of Germany submitted an official communication indicating that the Government of France would be the bilateral cooperating agency that would implement some of the TPM components. The reason for the change of the bilateral agency was that Germany's maximum level of funding for bilateral cooperation in the 2003-2005 triennium has been fully utilized.

44. The Secretariat also received a letter from the Government of France officially re-submitting the Lebanon TPM proposal with the components that would be implemented by France and a letter from the Directorate General of Environment of the Ministry of Environment of Lebanon indicating its agreement to the change of bilateral cooperating agency.

**RECOMMENDATION**

45. The Executive Committee may wish to consider:

- (a) Approving in principle the national CFC phase-out management plan for Lebanon at a total level of funding of US \$2,091,420 plus agency support costs of US \$174,182 for France and UNDP;
- (b) Also approving the Agreement between the Government of Lebanon and the Executive Committee contained in Annex I to the present document; and
- (c) Further approving funding of US \$1,061,420 plus support costs of US \$79,607 for UNDP for the first tranche of the project.

## Annex I

### **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 use of ozone depleting 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 Appendix 2-A (the “Targets, and Funding”) 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 with the following paragraphs 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 “Targets, and 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 Approval 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 Approval Schedule unless the Country satisfies the following conditions at least 30 days prior to the applicable Executive Committee meeting set out in the Funding Approval 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 “Format for 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 Institutions and Roles”) 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 will be implemented in stages so that resources can be diverted to other activities, such as additional training or procurement of service tools, in cases where 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 fulfil the obligations under this Agreement. UNDP (the “Lead IA”) has agreed to be the lead implementing agency and the Government of France (“Co-operating IA”) has agreed to be a co-operating 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 France (“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 Appendix 1-A 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 Approval Schedule. At the discretion of the Executive Committee, Funding will be reinstated according to a revised Funding Approval 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 instalment of Funding under the Funding Approval 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 the amount exceeding the Maximum Allowable Total Consumption of Annex A Group I substances limit (Appendix 2-A) 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 and the Co-operating 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

Row	Milestone/Parameter	2004	2005	2006	2007	2008	2009	Total
1.	Compliance Milestone* (ODP tonnes)		362		109			
2.	Maximum allowable consumption of Annex-A Group-I substances (ODP tonnes)	499	362	235	75	35	0	
3.	Reduction from ongoing projects (ODP tonnes)	82	0	0	0	0	0	82
4.	New reduction under the Plan (ODP tonnes)	55**	127	160	40	35	0	417
5.	Total Annual Reduction of Annex-A Group-I substances (ODP tonnes)	137	127	160	40	35	0	499
6.	Lead IA UNDP (US \$)	1,061,420	350,000	200,000	100,000	65,000	0	1,776,420
7.	Support Costs (US \$)	79,607	26,250	15,000	7,500	4,875		133,232
8.	France (US \$)	0	150,000	165,000	0	0	0	315,000
9.	Support Costs (US \$)	0	19,500	21,450	0	0	0	40,950
10.	Total Agreed Funding (US \$)	1,061,420	500,000	365,000	100,000	65,000	0	2,091,420
11.	Total Support Costs (US \$)	79,697	45,750	36,450	7,500	4,875	0	174,182
12.	Total Cost to Multilateral Fund (US \$)	1,141,027	545,750	401,450	107,500	69,875	0	2,265,602

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

\*\* New reduction in 2004 is unfunded.

### Appendix 3-A: Funding Approval Schedule

14. Funding other than payments in 2004, will be considered for approval at the first meeting of the year of the annual implementation programme.

**Appendix 4-A: Format for Annual Implementation Programme**

1. This format is proposed for use by the Article 5 country to prepare the annual implementation programme for the implementation of performance-based ODS phase-out plans; however, it should be modified to suit the specific needs of each plan

**1. Data**

Country	
Year of plan	
# of years completed	
# of years remaining under the plan	
Target ODS consumption of the preceding year	
Target ODS consumption of the year of plan	
Level of funding requested	
Lead implementing agency	
Co-operating agency(ies)	

**2. Targets**

<b>Target:</b>				
Indicators		Preceding Year	Year of Plan	Reduction
Supply of ODS	Import			
	Production*			
	<b>Total (1)</b>			
Demand of ODS	Manufacturing			
	Servicing			
	Stockpiling			
	<b>Total (2)</b>			

\* For ODS-producing countries

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 (in ODP tonnes)
<b>Manufacturing</b>						
Aerosol						
Foam						
Refrigeration						
Solvents						
Other						
<b>Total</b>						
<b>Servicing</b>						
Refrigeration						
<b>Total</b>						
<b>GRAND TOTAL</b>						

4. **Technical Assistance**

Proposed Activity: \_\_\_\_\_  
 Objective: \_\_\_\_\_  
 Target Group: \_\_\_\_\_  
 Impact: \_\_\_\_\_

5. **Government Action**

Policy/Activity Planned	Schedule of Implementation
Type of Policy Control on ODS Import: servicing, etc	
Public Awareness	
Others	

6. **Annual Budget**

Activity	Planned Expenditures (US \$)
<b>TOTAL</b>	

7. **Administrative Fees**

### **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**

9. The Lead IA will be responsible for a range of activities specified in the project document as follows:
  - (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 of the preceding year and preparing an Annual Implementation Programme for the year of submission to the Executive Committee;
  - (f) Ensuring that technical reviews undertaken by the Lead IA are carried out by appropriate 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) Ensuring that disbursements are made to the country in a timely and effective manner; and;

- (k) Providing assistance with policy, management and technical support when required.

**Appendix 6-B: Role of the Cooperating Implementing Agency**

10. The Government of France as co-implementing agency, will be:

- (a) Assisting the Country in the implementation and verification of the activities to be undertaken by France as funded in rows 8 and 9 of Appendix 2-A and as specified in the project document;
- (b) Ensuring that disbursements are made to the Country in a timely and effective manner;
- (c) Reporting to the Lead Agency on these activities; and
- (d) Providing assistance relating to the activities being undertaken when required.

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

11. In accordance with paragraph 10 of the Agreement, the amount of funding provided may be reduced by US \$13,365 per ODP tonne of reductions in consumption not achieved in the year.

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Date: Aug 30, 2004

Ref No: OZ 15/04

**Ms. Maria Nolan, Chief Officer  
Secretariat of the Multilateral Fund for the  
Implementation of the Montreal Protocol  
1800 McGill College Avenue  
Quebec H3A 3J6  
CANADA**

**Subject: Submission of Lebanon's National Phase-out Management Plan  
for Group I, Annex A Substances for funding under the Montreal Protocol  
on Substances that Deplete the Ozone Layer – Projects involving HCFCs**

Dear Ms. Nolan,

In line with decisions 27/13 and 38/38 of the Executive Committee and in recognition of Article 2F of the Montreal Protocol, the Government of Lebanon:

1. Confirms that it had reviewed the specific situations at the enterprises included in the NPMP project document.
2. States that based on the prevailing circumstances at the present time the conversion of these enterprises requires the use of HCFC-141b for the interim period as stipulated in the Montreal Protocol.
3. Confirms that the recipient enterprises understood that no funding would be available from the Fund for the future conversion from HCFCs for the said enterprises whenever such a conversion to other alternatives will be required.

Thanking you for your ongoing cooperation and support, I remain

Sincerely Yours,

**Mazen K. Hussein  
Ozone Office Manager  
Ministry of Environment**

OZONE OFFICE

CC. Mrs. Dominique Kayser, Programme Coordinator – Montreal Protocol Unit UNDP  
Ms. Rola Sheikh, Ozone Office Focal Point- MoE